



Operating instructions

Solenoid-Diaphragm Dosing Pumps Type MAGDOS



Operating instructions MAGDOS LT
and MAGDOS DE/DX
Lutz-Jesco GmbH, 2003

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Content

1. Safety	5-7
1.1 General	5
1.2 Warnings used in this Operating Manual	5
1.3 Qualifikation and training of personnel	5
1.4 Hazards due to non-compliance with the safety instructions	5
1.5 Safe operation	5
1.6 Safety instructions for the owner/operator	6
1.7 Safety instructions for inspection, maintenance and installation work	6
1.8 Unauthorized modification and production of spare parts	6
1.9 Impermissible modes of operation	6
1.10 Dosing of chemicals	6-7
1.11 Scope of delivery	7
2. General	7
3. Functional	8
4. Technical data	9-11
4.1 Technical data MAGDOS LT	9
4.2 Technical data MAGDOS DE/DX 01...12	10
4.3 Technical data MAGDOS DE/DX 20...100	11
5. Performance curves	12-14
5.1 Performance curves MAGDOS LT	12
5.2 Performance curves MAGDOS DE/DX	13-14
6. Type codes	15-19
6.1 Type codes MAGDOS LT	15
6.2 Type codes MAGDOS DE 01...12	16
6.3 Type codes MAGDOS DE 20...100	17
6.4 Type codes MAGDOS DX 01...12	18
6.5 Type codes MAGDOS DX 20...100	19
7. Installation	20-22
7.1 General notes of instruction	20
7.2 Installation location	20
7.3 Water meter installation	20
7.4 Electrical connection	20-21
7.5 Level control	21
7.6 Injection fitting assembly	21
7.7 Installation example	22

8. Operating	23-25
8.1 Setting of flow rate	23
8.2 Operation of MAGDOS LT	23
8.2.1 Selection of operating mode	23-25
8.2.2 Adjustment of pressure	24
8.2.3 Factory setting	24
8.3 Operation of MAGDOS DE/DX	24-25
8.3.1 Selection of operating mode	25
9. Start up	25-26
10. Maintenance	26-30
10.1 Replacing the diaphragm	26-27
10.2 Valves	27-28
10.3 Drive solenoids	28
10.4 Correction of stroke length adjustment	28-29
10.5 Circuit diagram of the control board	29-30
11. Spare parts	31
12. Troubleshooting	32
13. Certificate of conformity	33

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1. Safety

1.1 General

This Operating Manual contains basic information to be noted during installation, operation and maintenance. It is therefore essential that the Manual be read by the fitter 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 pump/system for reference at all times.

In addition to the general safety instructions set out under this main heading Safety, the special safety precautions set out under the other main headings must also be observed, for instance in conjunction with private use.

1.2 Warnings used in this Operating Manual

This Operating Manual contains warnings which may endanger persons, the environment and the pump/system if they are disregarded. These warnings are identified by the hazard symbol



safety mark in accordance with DIN 4844-W9

The following symbol is used in conjunction with electric power



safety mark in accordance with DIN 4844-W8

The word

Caution

appears in conjunction with safety instructions which may endanger the machine and its operation if disregarded.

Markings which are affixed directly to the pump, such as

- Cable markings
- Markings for fluid connections

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

Note

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

1.3 Qualification and training of personnel

The personnel employed for operation, maintenance, inspection and installation must be suitably 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 requisite know-how must be duly trained and instructed. If necessary, this can also be undertaken by the manufacturer/supplier on behalf of the pump's owner. In addition, the owner must also ensure that the relevant personnel are fully familiar with and have understood the contents of the Operating Manual.

1.4 Hazards due to non-compliance with the safety instructions

Failure to comply with the safety instructions may endanger not only persons, but also the environment and the 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:

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

1.5 Safe operation

The safety instructions contained in this Operating 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. at the shaft seal) of hazardous substances (e.g. explosive, toxic, hot substances) must be discharged in such a way as to exclude all danger to persons and the environment. Statutory regulations must be observed.
- Danger due to electric power must be excluded (for further details, refer to the VDE regulations and the regulations of the local public utilities).

1.7 Safety instructions for inspection, maintenance and installation work

The owner must ensure that all maintenance, inspection and installation work is undertaken by authorized and duly qualified skilled personnel who have also studied the Operating Manual in depth. The pump must always have come to a complete stop before starting any work on the pump. The procedure specified in the Operating Manual for shutting down the pump/system must be observed without fail.

Pumps or units in contact with potentially harmful media must be decontaminated.

All safety mechanisms and guards must be refitted and reactivated as soon as the work is complete. The points set out in the section Installation and commissioning must be observed before starting the pump/system.

1.8 Unauthorized modification and production of spare parts

The machine 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 extinguished if other 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 our contract documents, especially the letter confirming the order. The limit values specified in these documents must never be exceeded.

1.10 Dosing of chemicals



- When working on dosing installations, the local safety rules must be observed (e.g. wear personal protective clothes).
- Before working on the dosing pump and plant, disconnect it from the mains supply and protect it against reconnection. Before the power supply is switched on again, the dosing lines must be connected so that any chemical left in the dosing head cannot spurt out.
- The dosing head of the pump as well as connections and lines of the plant may be under pressure. Working on the dosing plant requires special safety precautions and may only be carried out by instructed technical personnel.
- Before working on the dosing head, valves and connections, flush the pump with a harmless medium (mainly water) to avoid unintentional contact with the metered medium.

Caution

- Never look into the open end of a clogged line or valve.
- Before startup, all screwed connections must be checked for correct tightness and, if necessary, must be tightened up using appropriate tools.
- If connections at the dosing head are unscrewed 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 might also destroy the diaphragm at its mounting points.
- When changing the chemical, check whether the materials used for the dosing pump and the other plant parts are chemically resistant. If there is the danger of a chemical reaction between different media, a thorough cleaning first is mandatory.
- After adjusting the stroke length, the locking screw must be retightened. Otherwise the adjusting knob might change its position thus causing faulty flow rates.

- After changing the electrical connections, e.g. removing the level control, the screwed cable joint must be closed in order to ensure the protection class of the dosing pump.

Caution

- MAGDOS are not suitable for explosive gas atmospheres.



- If the solenoid drive of the pump is to be accessed the mains line must be disconnected and the pump must cool for one hour. Otherwise you might burn yourself on the metallic parts of the solenoid.

1.11 Scope of delivery

Note

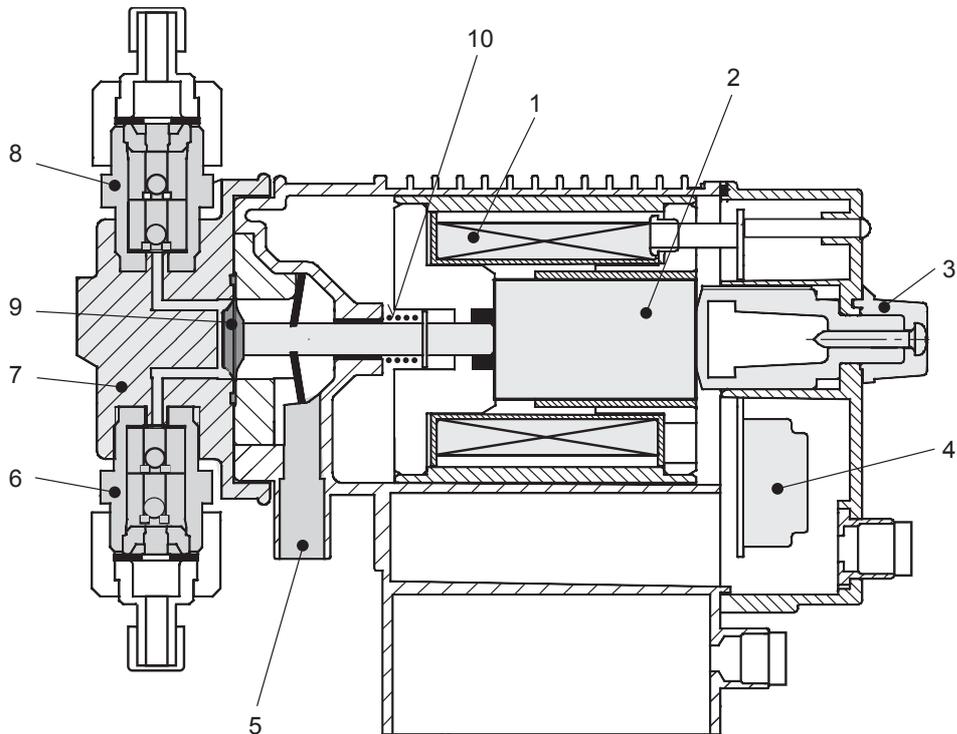
Please unpack the dosing pump and ordered accessories carefully in order not to miss small parts. Immediately compare the scope of delivery to the delivery note. If there are any discrepancies, try to find out the reason.

2. General

Dosing pumps are used to add chemicals specifically in various processes. The main application of MAGDOS is water treatment but also in other chemical processes it meets the requirements.

All versions are available for certification according to DVGW-DIN 19635.

3. Functional



Explanation

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

The coil (1) of the drive solenoid is actuated in a pulsating manner by the electronics (4) in the MAGDOS pump. The solenoid armature (2) forces the working diaphragm (9) to the left and displaces the liquid in the dosing head (7). The liquid escapes through the discharge valve (8) into the delivery line. When the solenoid is de-energized, the spring (10) moves the armature (2) and diaphragm (9) back to the right. A negative pressure is produced in the dosing head (7) and liquid is drawn in through the suction valve (6).

Functional overview

	MAGDOS LT	MAGDOS DE	MAGDOS DX
Internal operation	25/50/100%	0...100%	0...100%
Control with pulse frequency (relay contact)	X	X	X
Pulse step up and step down	-	-	1:64 to 64:1
Control with 0(4)...20mA	-	-	X
Energy adjustment	X	-	-
Level control	single	2-fold	2-fold
Alarm relay	-	optional	optional

4. Technical data

4.1 Technical data MAGDOS LT

MAGDOS LT	02	06	1	3	4	6
Max. flow rate at average pressure*	0.28 l/h	0.7 l/h	1.4 l/h	2.8 l/h	3.7 l/h	5.5 l/h
Flow rate at max. pressure *	0.14 l/h	0.48 l/h	0.9 l/h	1.6 l/h	3.3 l/h	5.2 l/h
Max. backpressure *	12 bar	16 bar	16 bar	16 bar	12 bar	10 bar
Max. stroke frequency	80/min					120/min
Suction lift	3 m water head (for non-effervescent media)					
Max. supply pressure	800 mbar					
Power supply	115 V or 230 V, +/- 10 %, 50 / 60 Hz					
Power supply cable	2 m (230V with shock-proof plug, 115 V with UL-/CSA-plug)					
Power consumption	30 W					
max. Power consumption during dosing stroke	230 V: 2,9 A, 115 V: 4,3 A					
Soldered fuse	3.15 A slow					
Protection class	IP 65					
Insulation class	F					
Input pulse duration	> 10 ms					
Voltage at level connection	5 VDC, for potential-free switching outputs					
Voltage at pulse input	5 VDC, for potential-free switching outputs					
Max. ambient temperature	45 °C (with PVC parts 40 °C)					
Max. medium temperature	50 °C (with PVC parts 35 °C)					
Weight	approx. 2,7 kg					

* The exact metered quantities can be seen from the delivery characteristics in chapter 5.

4.2 Technical data MAGDOS DE/DX 01...12

MAGDOS DE/DX 01...12	01	03	07	2	4	8	12
Flow rate at average pressure *	0.1 l/h	0.46 l/h	0.72 l/h	1.86 l/h	3.9 l/h	6 l/h	12 l/h
Max. backpressure *	10 bar	6 bar	10 bar	10 bar	10 bar	10 bar	4 bar
Max. stroke frequency	100/min						
Suction lift	3 m water head**						
Power supply	115 V or 230 V, +/- 10 %, 50 / 60Hz						
Power supply cable	2 m (230 V with shock-proof plug, 115 V with UL-/CSA-plug)						
Power consumption	230 V: 30 W, 115 V: 33 W						
Max. consumption during dosing stroke	230 V: 2,3 A, 115 V: 3,6 A						
Soldered fuse	230 V: T 0,8 A, 115 V: T 1,6 A						
Protection class	IP 65						
Insulation class	F						
Input pulse duration	> 30 ms						
Solenoid excitation time per pulse	230 V: 60 ms, 115 V: 80 ms						
Warning alarm relay with changeover contact (optional)	250 V AC 2,5 A ; 30 V DC 2,5 A						
Voltage at level connection	5 VDC, for potential-free switching outputs						
Voltage at pulse input	5 VDC, for potential-free switching outputs						
Impedance to 0/4...20 mA input	150 Ohm						
Max. ambient temperature	40 °C						
Max. medium temperature	50 °C (with PVC parts 35 °C)						
Weight	approx. 2,9 kg (plastic-heads), approx. 3,5 kg (SS-head)						

* The exact metered quantities can be seen from the delivery characteristics in chapter 5.

** DE/DX8 max. 2m water head; DE/DX12 max. 1.2m water head

4.3 Technical data MAGDOS DE/DX 20...100

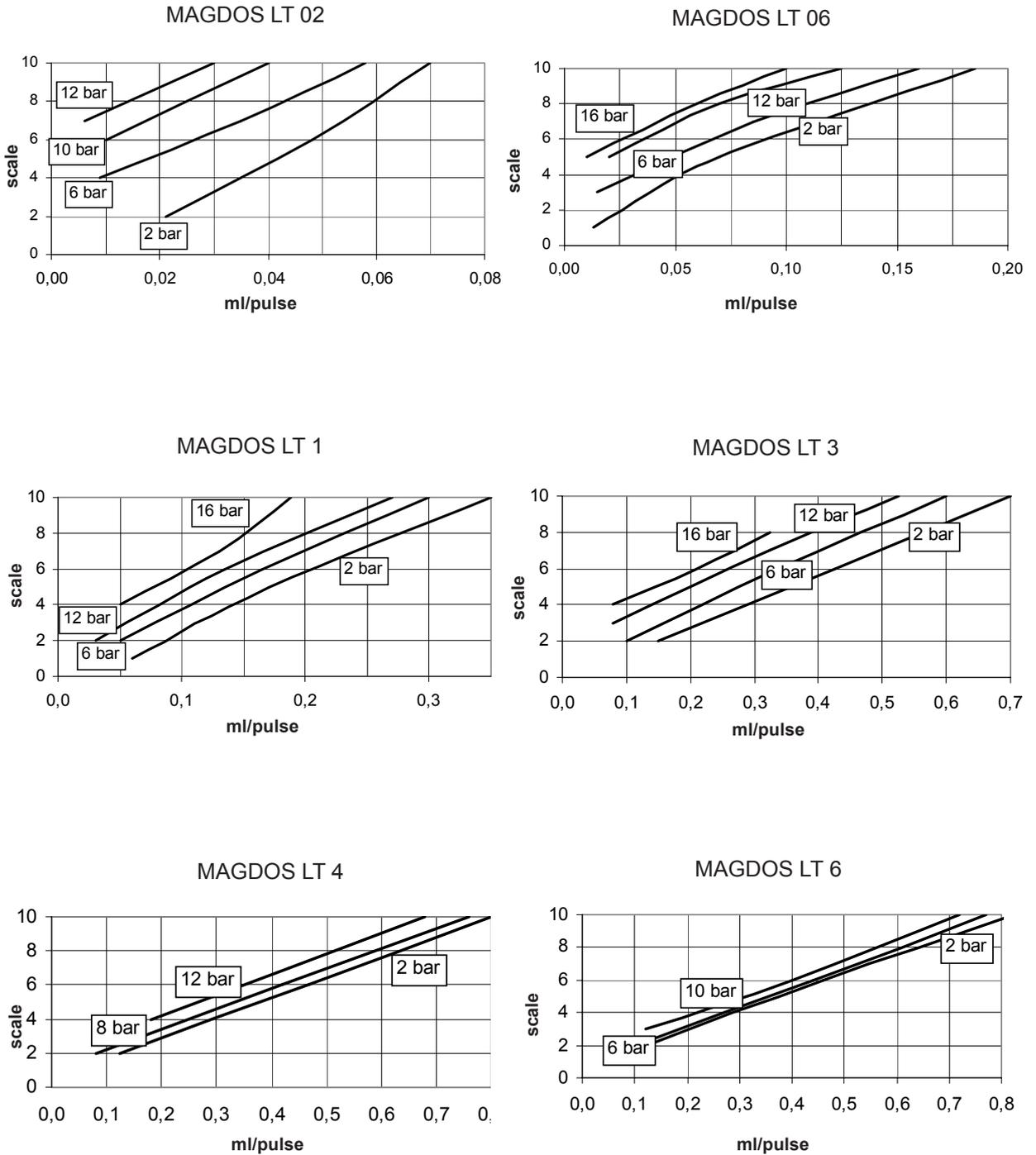
MAGDOS DE/DX 20...100	20	40	100
Flow rate at average pressure *	20.2 l/h	50.4 l/h	115 l/h
Max. backpressure *	10 bar	4 bar	1.5 bar
Max. stroke frequency	70/min		
Suction lift	1,2 m WS		
Power supply	115 V or 230 V, +/- 10 %, 50 / 60Hz		
Power supply cable	2 m (230 V with shock-proof plug, 115 V with UL-/CSA-plug)		
Power consumption	230 V: 70 W, 115 V: 66 W		
Max. consumption during dosing stroke	230 V: 4,1 A, 115 V: 7,4 A		
Soldered fuse	230 V: T 2 A, 115 V: T 4 A		
Protection class	IP 65		
Insulation class	F		
Input pulse duration	> 30 ms		
Solenoid excitation time per pulse	230 V: 160 ms, 115 V: 190 ms		
Warning alarm relay with changeover contact (optional)	250 V AC 2,5 A ; 30 V DC 2,5 A		
Voltage at level connection	5 VDC, for potential-free switching outputs		
Voltage at pulse input	5 VDC, for potential-free switching outputs		
Impedance to 0/4...20 mA input	150 Ohm		
Max. ambient temperature	40 °C		
Max. medium temperature	50 °C (with PVC-parts 35 °C)		
Weight	12.5 kg** (plastic-head), 20 kg** (SS-head)		

* The exact metered quantities can be seen from the delivery characteristics in chapter 5.

** DE/DX20 10.5 kg or 12 kg

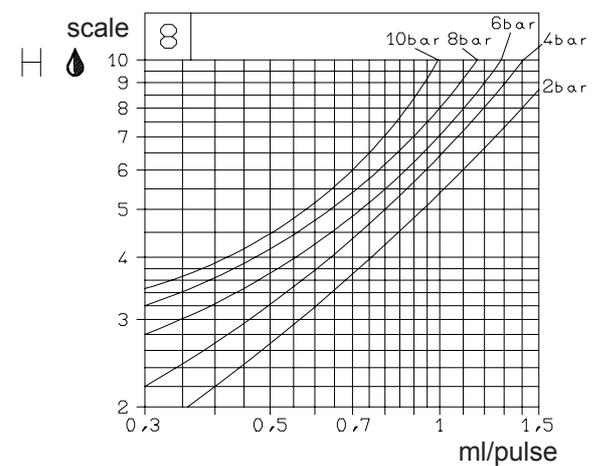
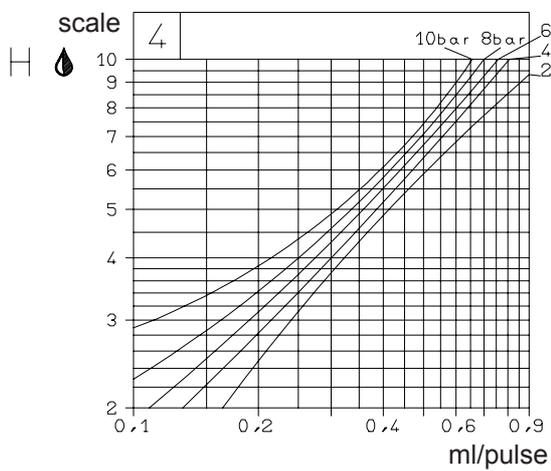
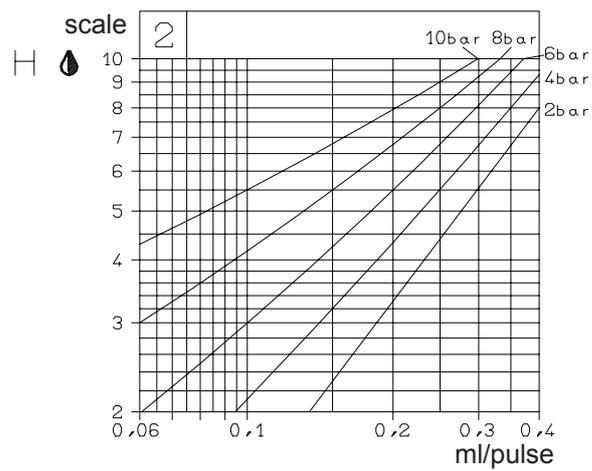
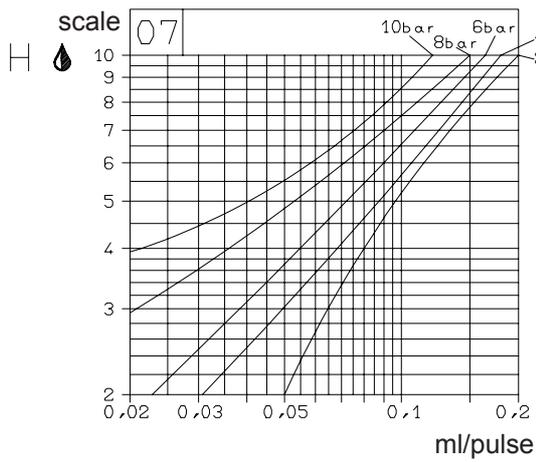
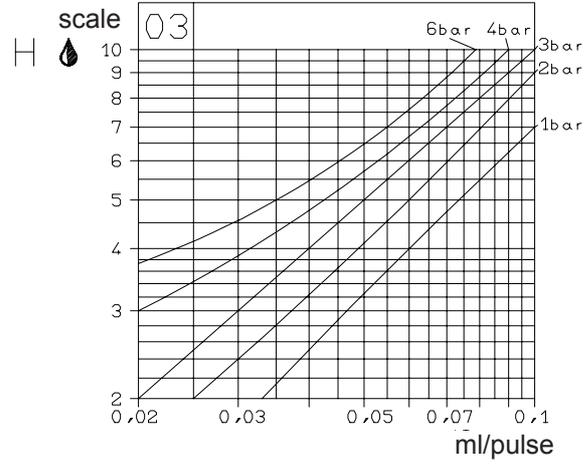
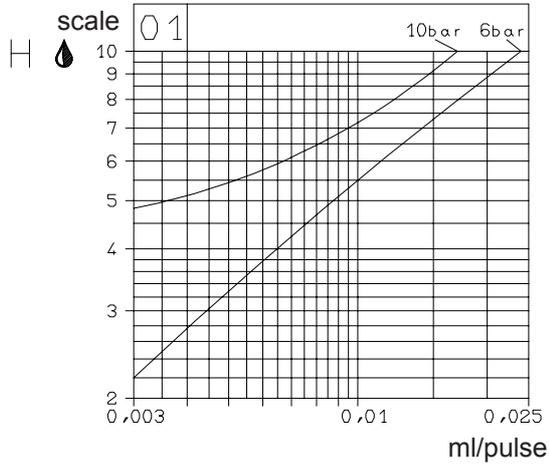
5. Performance curves

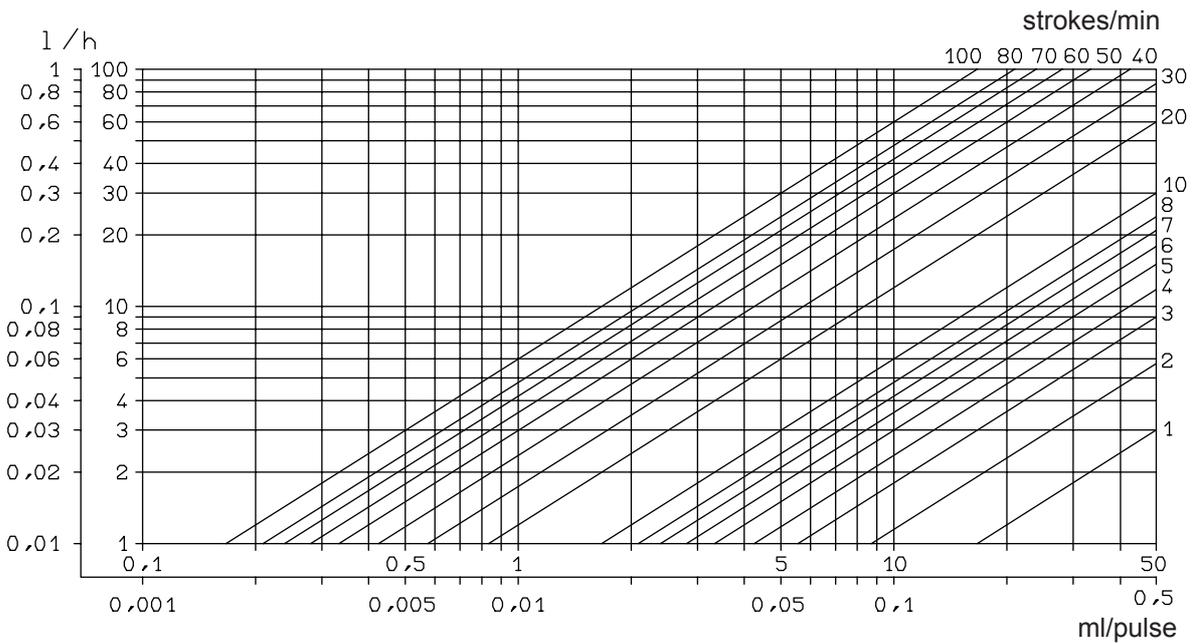
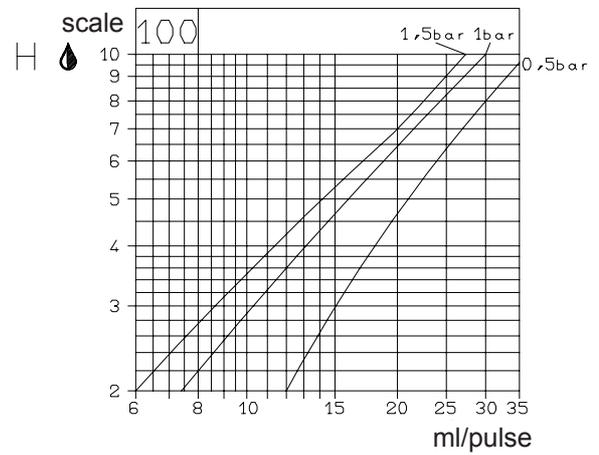
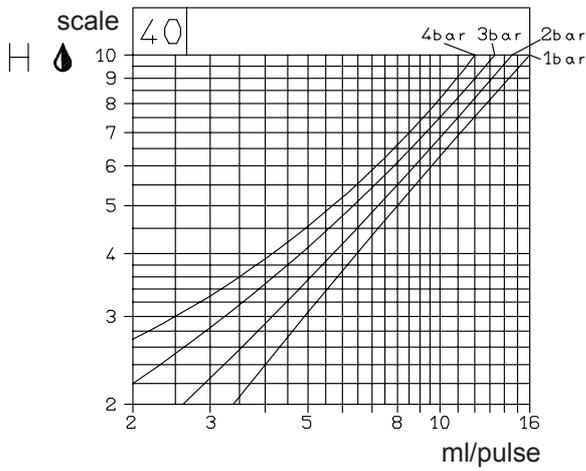
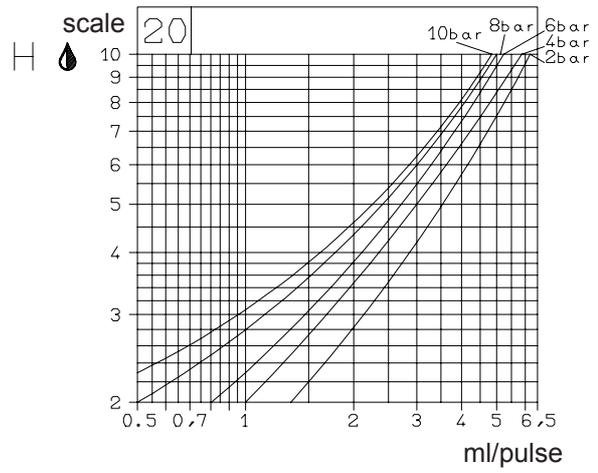
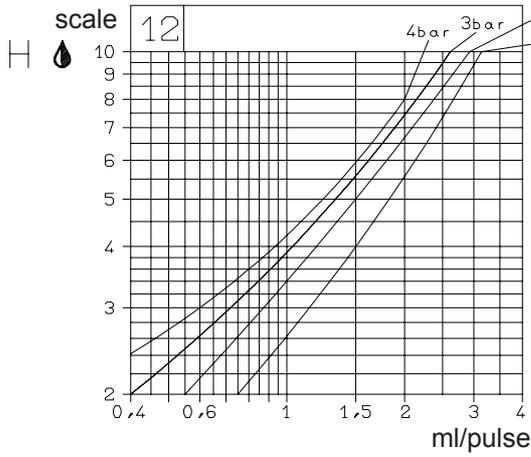
5.1 Performance curves MAGDOS LT



The performance of the pump depends on the viscosity of the medium and hydraulic installation conditions. The curves refer to water at 20° C.

5.2 Performance curves MAGDOS DE/DX





The performance of the pump depends on the viscosity of the medium and hydraulic installation conditions. The curves refer to water at 18° C and a suction lift of 0.6 m.

6. Type codes

6.1 Type codes MAGDOS LT

The MAGDOS LT can be ordered in a variety of different versions using the following code:

Drive	Head	Control unit 230 V, 50 Hz	Suction valve Discharge valve	Suction connection	Discharge connection
0002 - 02 0006 - 06 0001 - 1 0003 - 3 0004 - 4 0006 - 6	C - PVC P - PP V - PVDF S - Edelstahl 1.4571 Z - Sonder- Werkstoff	23 - 230V, 50/60 Hz 11 - 115V, 50/60 Hz	Double-ball valves with seals made of: 1 - EPDM/Hypalon® 2 - Viton® 3 - PTFE Spring-loaded single ball valves with seals made of: 5 - EPDM/Hypalon® 6 - Viton® 7 - PTFE 9 - Special valve	Tubing connection A - d 4/6 B - d 6/12 C - d 6/9 Hose liner E - d 6 Cemented connection J - d 10 K - d 12 Threaded connection N - G 1/4 i Z - Special connection	1) 2)
Frames indicate the standard version, e.g.: C - PVC For order example and explanation see general "MATCH CODE SYSTEM" page.					

Example:

A Magdos LT3 fitted with PVC dosing head and double-ball valves with Viton® seals is required. On the suction side a 4/6 mm tubing is to be connected, on the discharge side, a d12 PVC is to be installed.

Order code: 0102L-0030-C-23-2-A-K

6.2 Type codes MAGDOS DE 01...12

The MAGDOS DE can be ordered in a variety of different versions using the following code:

Drive	Head	Control unit 230 V, 50 Hz	Suction valve	Suction connection	Discharge connection
0001 - 01	C - PVC	Internal pulse control	Double-ball valves	Tubing connection	
0003 - 03	M - PMMA	0...100 min-1, external pulse control 1:1,	with seals made of:	A - d 4/6 1)	
0007 - 07	V - PVDF	level control with alarm signaling and main alarm	1 - EPDM/Hypalon® □	B - d 6/12 2)	
0002 - 2	S - St. steel 1,4571	-S - as above plus warning alarm relay	2 - Viton® □	Hose liner	
0004 - 4	Z - Special material	-D - as above plus digital display	3 - PTFE	E - d 6	
0008 - 8		SD - as above plus warning alarm relay and digital display	Spring-loaded single ball valves with seals made of:	Cemented connection	
0012 - 12			5 - EPDM/Hypalon® □	J - d 10	
			6 - Viton® □	K - d 12	
			7 - PTFE	Threaded connection	
			9 - Special valve	N - G 1/4 i	
				Screw connection (Ermeto)	
				R - d 6	
				T - d 10	
				Z - Special connection	

0 1 0 2 A	MATCH-CODE	0102A=MAGDOS DE
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Frames indicate the standard version, e.g.:

For order example and explanation see general "MATCH CODE SYSTEM" page.

1) Connection suction side
2) Connection discharge side
For DE01 and 03 pumps, 1) is the standard version for suction+discharge side.

6.3 Type codes MAGDOS DE 20...100

The MAGDOS DE can be ordered in a variety of different versions using the following code:

0 1 0 2 A									
MATCH-CODE 0102A=MAGDOS DE									
Drive	Head	Control unit 230 V, 50/60 Hz	Suction valve Discharge valve	Suction connection	Discharge connection				
0020- 20 0040- 40 0100- 100	C - PVC 1) P - PP 3) S - St. steel 1.4571 Z - Special material	--- Internal pulse control 0...70min-1, external pulse control 1:1, level control with alarm signaling and main alarm -S - as above plus warning alarm relay -D - as above plus digital display SD - as above plus warning alarm relay and digital display	Double-ball valves with seals made of: 1 - Hypalon® 2 - Viton® 4- AF Spring-loaded single ball valves with seals made of: 5 - Hypalon® 6 - Viton® 7 - AF 9 - Special valve	Tubing connection B - d 6/12 2) Hose liner E - d 6 1) G - d 9 2) H - d 16 Cemented connection J - d 10 1) K - d 12 1) L - d 16 2) M - d 20 3) Threaded connection N - G 1/4 1) O - G 3/8 3) P - G 1/2 3) Flanged connection X - DN 15 PN 10 3) Z - Special connection					
Frames indicate the standard version, e.g.: C - PVC									
For order example and explanation see general "MATCH CODE SYSTEM" page.									

6.4 Type codes MAGDOS DX 01...12

The MAGDOS DX can be ordered in a variety of different versions using the following code:

0	1	0	2	B	MATCH-CODE 0102B=MAGDOS DX	
Drive	Head	Control unit	Suction valve	Suction connection	Discharge connection	
0001 - 01 0003 - 03 0007 - 07 0002 - 2 0004 - 4 0008 - 8 0012 - 12	C - PVC M - PMMA V - PVDF S - St. steel 1,4571 Z - Special material	230 V, 50 Hz --- Internal pulse control 0... 100min-1, external pulse control 1:1, level control with alarm signaling and main alarm, pulse division and multiplication, 0/4...20mA signal input -S - as above plus warning alarm relay -D - as above plus digital display SD - as above plus warning alarm relay and digital display	Discharge valve Double-ball valves with seals made of: 1 - EPDM/Hypalon® 2 - Viton® 3 - PTFE Spring-loaded single ball valves with seals made of: 5 - EPDM/Hypalon® 6 - Viton® 7 - PTFE 9 - Special valve	Tubing connection A - d 4/6 1) B - d 6/12 2) Hose liner E - d 6 Cemented connection J - d 10 K - d 12 Threaded connection N - G 1/4 Screw connection (Ermeto) R - d 6 T - d 10 Z - Special connection	1) Connection suction side 2) Connection discharge side For DX01 and 03 pumps, 1) is the standard version for suction & discharge side.	

6.5 Type codes MAGDOS DX 20...100

The MAGDOS DX can be ordered in a variety of different versions using the following code:

Drive	Head	Control unit	Suction valve	Suction connection	Discharge connection
0020- 20 0040- 40 0100- 100	C - PVC 1) P - PP 3) S - St. steel 1.4571 Z - Special material	230 V, 50/60 Hz --- Internal pulse control 0...70min-1, external pulse control 1:1, level control with alarm signaling and main alarm, pulse division and multiplication 0/4...20mA signal input -S - as above plus warning alarm relay -D - as above plus digital display SD - as above plus warning alarm relay and digital display	Double-ball valves with seals made of: 1 - Hypalon® 2 - Viton® 4- AF Spring-loaded single-ball valves with seals made of: 5 - Hypalon® 6 - Viton® 8 - AF 9 - Special valve	Tubing connection B - d 6/12 1) Hose liner E - d 6 1) G - d 9 2) H - d 16 Cemented connection J - d 10 1) K - d 12 1) L - d 16 2) M - d 20 3) Threaded connection N - G 1/4 1) O - G 3/8 3) P - G 1/2 3) Flanged connection X - DN 15 PN 10 3) Z - Special connection	

1) DX 20
2) DX 40
3) DX 40 and DX 100

Frames indicate the standard version, e.g.: C - PVC
For order example and explanation see general "MATCH CODE SYSTEM" page.

7. Installation

7.1 General notes of instruction

For the selection of a dosing pump when designing a plant as well as for the installation and operation, the local rules must be observed. This applies to the selection of suitable pump materials, the handling of the chemicals and the electrical installation. At the same time the technical data of the dosing pump (see chapter 4) must be taken into consideration, and the plant must be designed correspondingly (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 plant including the dosing pump is constructed so that neither plant equipment nor buildings are damaged severely 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 source of danger, the installation must be carried out so that no unreasonably high consequential damages occur even if the dosing pump fails. Therefore we recommend to install leakage probes and containment tanks.

The drain pipe of the dosing head must be visible to be able to detect any diaphragm rupture. 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 to use additional fittings. These include backpressure 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. Plast parts (especially PVC parts) can be screwed and unscrewed more easily if the thread is lubricated with silicone grease before.

Caution

For this purpose, the compatibility with the chemical to be metered must be checked.

7.2 Installation location

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

The running noise 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 pump on wall brackets which, for the same reason, should be fixed to outer walls instead of interior walls adjacent to occupied rooms. It is also possible to mount the pump directly on the chemical supply tank.

Please note the ambient temperature of the pump (see 4 Technical data). 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 avoided. If the dosing pump is installed outside, provide a roof to protect it against weather.

7.3 Water meter installation

The MAGDOS LT can be controlled by any standard contact water meters. To avoid interferences or faulty pulses, the pump must not be fixed directly to the water meter. Direct mounting is acceptable if a separator (Part No. 21801) is used. Due to this fact the pump should be mounted on a chemical supply tank or wall brackets. The pulse sequence of the water meter must be tuned to the maximum stroke frequency of the dosing pump (see 4. Technical data).

7.4 Electrical connection

The electrical connection of the dosing pump must be made according to the local rules and may only be carried out by technical personnel. As a standard the MAGDOS is connected using a shock-proof plug.



Note

The dosing pumps are not suited to be used in explosive gas atmospheres.

Signal cables must not be laid parallel to high-voltage current lines or supply mains. Lay supply and signal lines in separate channels. In the case

of junctions, a 90° angle is required. If signal lines are more than 2 meters long, shielded cables must be used.

To avoid incorrect metering after the process is finished, the dosing pump must be locked electrically and hydraulically.

7.5 Level control

If a level control is connected, screw a plastic sleeve must be onto the jack plug in order to keep the protection class. The required sleeve is part of the level control (also in combination with a suction line).

A connected level control causes the dosing pump to stop if the chemical level in the supply tank is low. Thus air bubbles are prevented from entering the suction line and the dosing head. The red LED lights. As soon as the level sensor contact is closed again, the pump restarts.

The level sensor must be designed as a max. make contact.

- MAGDOS LT

This pump type identifies automatically if the level input is connected. If no plug is connected, the MAGDOS LT operates as if the contact was closed.

- MAGDOS DE/DX

These types have a low-level warning. When the first contact breaks, the red LED begins to flash and the alarm relay (optional) is activated. The pump only stops when the second contact breaks and the red LED lights up continuously.

The function „low-level warning“ is not possible when using a two-pin connector.

Note

A blind connector (Art. No. 29115) must be fitted if a level switch is not connected

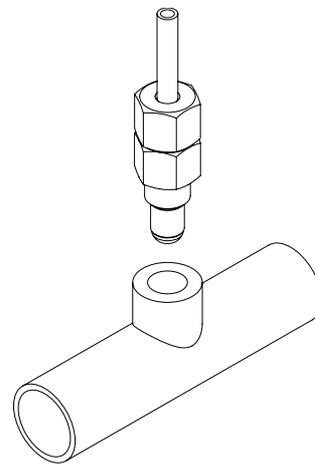
- MAGDOS DX

The level LED has a dual function in this pump. It also begins to flash when the input signal drops below 4 mA in 4...20 mA mode (broken wire).

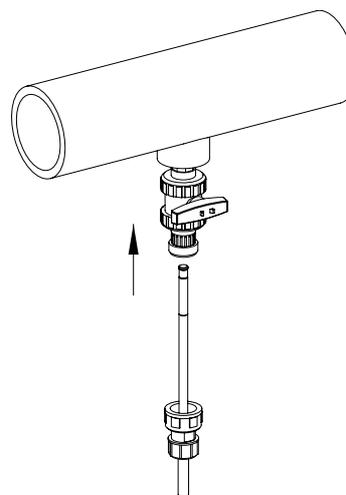
7.6 Injection fitting assembly

Injection fittings are used to mix the metered medium into a main stream and simultaneously fulfil a non-return function. The injection fitting 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, in order to ensure that air bubbles are not entrapped. For this type of installation, it is advisable to select a form in which the injection fitting can be sealed off when removed.

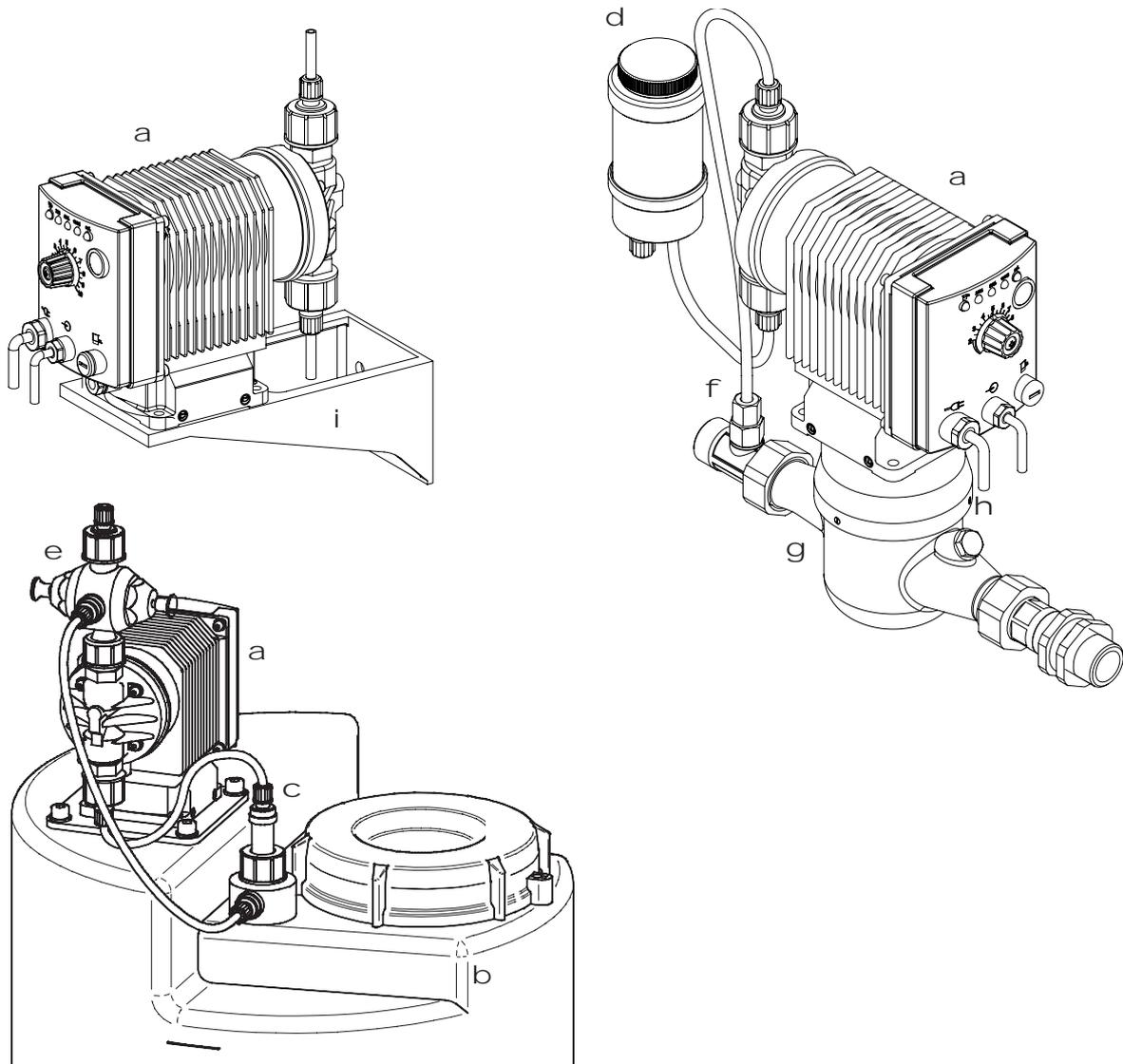
Injection fitting S from above



Extractable injection fitting from down below



7.7 Installation examples



Explanation

- 1 MAGDOS LT
- 2 Chemical tank
- 3 Suction line with integrated low level control
- 4 Priming aid

This equipment allows easy startup of small pumps in particular. The entrained gas serves as a pulsation dampener.

- 5 Multifunction valve Pentabloc
- 6 Injection nozzle with non-return valve
- 7 Water meter with contact unit
- 8 Water meter spacer

ATTENTION! The spacer is required to avoid that the drive solenoid affects the water meter contact.

- 9 Wall bracket

8. Operation

8.1 Setting of flow rate

The flow rate is defined by two parameters:

1. Volumetric displacement per dosing stroke

The stroke adjustment limits the movement of the diaphragm. Adjusting the stroke length does not have a linearly proportional effect on the stroke volume. The volume per dosing stroke is shown in the performance curves.

For adjustment unscrew the locking screw, adjust the desired value and retighten the locking screw.

Caution

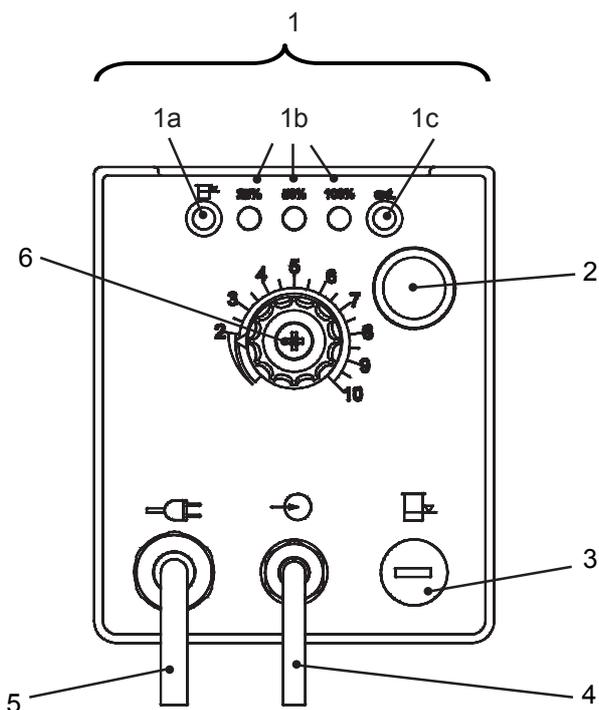
Do not adjust the stroke length during standstill but only during the dosing stroke.

2. Stroke frequency

Changing the stroke frequency has a directly proportional effect on the flow rate. It is either set to a fixed value or defined by an external pulse generator (e.g. electronic controller or contact water meter).

For an effective adaptation of the dosing pump to the process, it can be set to different stroke frequencies in the case of internal operation.

8.2 Operation MAGDOS LT

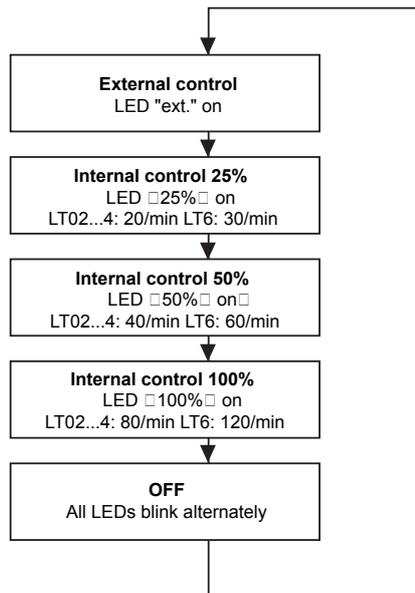


Explanation

- 1 Operating LEDs
 - 1a level (red)
 - 1b internal (green)
 - 1c external (green)
- 2 Key for operating mode and programming
- 3 Jack for level probe connection
- 4 Pulse input cable
- 5 Mains cable
- 6 Stroke adjustment with scale and locking screw

8.2.1 Selection of operating mode

By pressing the key for approx. 1 second each time, the operating mode is set according to the following diagram. The operating mode is stored automatically. After an interruption of the power supply the pump continues to work in the operating mode selected before.



In external mode, a dosing stroke is performed for every pulse received.

Note

Pulses are not saved when the pump is driven at more than the maximum pulse rate (see 4. Technical data).

8.2.2 Adjustment to pressure

This function is only available with MAGDOS LT!

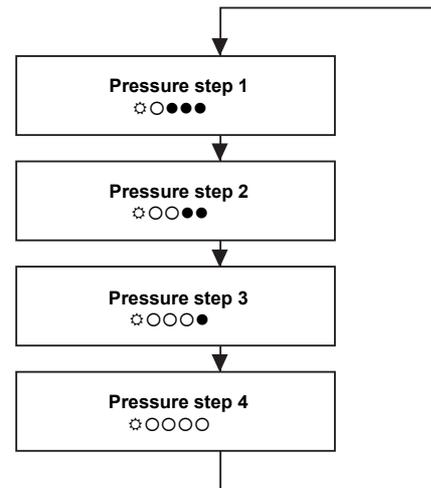
The MAGDOS LT controls the energy supply of the stroke solenoid electronically. Thus the user can adapt the pump easily to the operating pressure. As a result the energy consumption and noise level can be reduced to an optimum level. At the same time the dosing stroke is carried out more smoothly and pressure peaks in the line system are decreased.

To go to the setting mode, keep the key pressed for 3 seconds. In the setting mode the red LED (level) blinks and the number of lit green LEDs indicates the energy level.

By pressing the key shortly you move between the different energy levels, by keeping the key pressed for 3 seconds you switch back to the operating mode. The pump does not leave the setting mode automatically.

Status of LEDs:

◊ = blink ○ = on ● = off



Energy level	1	2	3	4
	for pressures up to			
LT 02	4 bar	8 bar	12 bar	-
LT 06	6 bar	12 bar	16 bar	-
LT 1	4 bar	10 bar	16 bar	-
LT 3	-	6 bar	12 bar	16 bar
LT 4	2 bar	4 bar	10 bar	12 bar
LT 6	2 bar	6 bar	8 bar	10 bar

If the stroke length setting is less than 100%, the MAGDOS LT is able to also deliver against higher pressures.

8.2.3 Factory setting

This function is only available with MAGDOS LT!

Depending on the performance version, the MAGDOS LT works at different maximum stroke frequencies. These are preset in the factory. If the pump is to be changed to another size, it might become necessary to adjust the maximum stroke frequency.

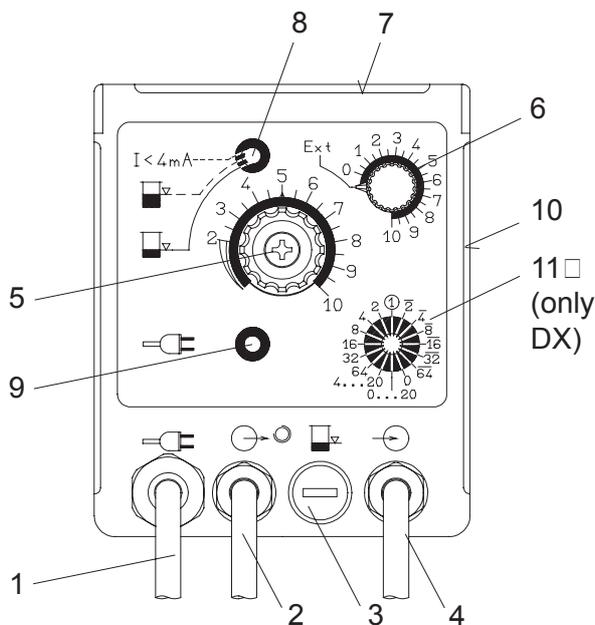
Keep the key pressed for 10 seconds. The LEDs "level" and "ext." start to blink. By pressing the key shortly, the max. stroke frequency changes to

another value. To store the selected value and return to the operating mode, keep the key pressed for 3 seconds. The pump does not leave the setting mode automatically.

Status of LEDs	Max. stroke frequency	Factory setting for
☉○○○☉	120 min ⁻¹	LT 6
☉○●●☉	80 min ⁻¹	LT 02...4

Increasing the stroke frequency causes a reduction of the maximally achievable backpressure at the same time.

8.3 Operation MAGDOS DE/DX



Explanation

- 1 Power supply
- 2 Cable for warning alarm relay (optional)
- 3 Jack for level probe sensor
- 4 Cable for pulse input
at DX also mA-input cable
- 5 Stroke adjustment with scale and locking screw
- 6 Rotary switch for operating mode and stroke frequency
- 7 Digital display (optional)
- 8 Operating LED level (red)
- 9 Operating LED power supply (green)
- 10 Calibration table
- 11 Selector switch for external control (only MAGDOS DX)

8.3.1 Selection of operating mode

MAGDOS DE

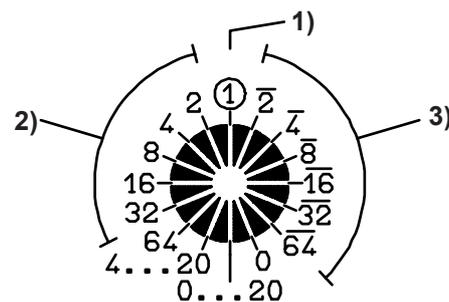
In internal mode, the number of strokes (0..100 per minute) is infinitely set via the rotary switch (6). External mode is activated by turning to the left-hand stop (beyond the detent). A dosing stroke is executed with every pulse received in external mode.

Note

Pulses are not saved when the pump is driven at more than the maximum pulse rate. (see 4. Technical data).

MAGDOS DX

In addition to the functions of the MAGDOS DE, optional functions can also be selected for external operation with the MAGDOS DX. The additional mode selector has the following positions:



- 1) Pulse 1:1
- 2) Pulse multiplication 2 / 4 / 8 / 16 / 32 / 64
- 3) Pulse division 2 / 4 / 8 / 16 / 32 / 64

Signal input 0...20mA or 4...20mA
Pump standstill on „0“

9. Startup



Personal protective equipment must be worn during all work on the dosing pump!

1. For first startup, set pump to internal operation with 100% stroke frequency and allow pump to prime. For this purpose, it is advisable to set the stroke to „10“. If the pump does not prime, switch pump off, remove discharge valve and pour water or chemical (if harmless!) into dosing head.



Ensure that the line is not under pressure before disconnecting it, otherwise chemical could splash out.

After this mount valve, switch on the pump and allow it to prime again (priming aid is recommended, see installation examples).

- If a venting facility is integrated in the dosing head or is available as separate unit, open it while the pump is running until liquid escapes. Then close it again. In the case of effervescent media allow the liquid to flow off 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.

- When correct operation is achieved, set desired flow rate and lock adjusting knob. For a first approximation refer to the calibration table attached to the pump which shows the stroke length setting for a selected flow rate per stroke (ml/pulse) as a function of the backpressure. Intermediate values must be mediated.

Example:

bar	0.05	0.10	0.15	0.20	0.25	0.30	0.35	ml imp
2	-	2.6	4.3	5.8	7.3	8.7	10.0	 H LT 1
6	2.0	3.8	5.5	7.1	8.5	10.0	-	
12	2.8	4.8	6.5	8.0	9.4	-	-	
16	4.0	5.8	8.0	-	-	-	-	

Required quantity: 0.15 ml/pulse at 6 bar. The value found is H = 5.5 and must be set on the stroke adjusting knob when the pump is running.

Note

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

- In the case of externally controlled pumps (e.g. by water meters), set pump „external“. To check the function, initiate the water flow by opening a water valve and wait for pulse generation.
- The manufacturer of the dosing equipment is not responsible for damages due to excessive or low flow rates resulting from faulty pump settings or insufficient and incorrect installation of peripheral fittings.

10. 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 checks are required regularly. Periodic maintenance protects the dosing pump against shutdowns.

Caution

The dosing pump may have to be re-adjusted after changing the diaphragm or replacing other parts on the pump. See 10.4: Correcting the stroke length adjustment.

10.1 Replacing the diaphragm

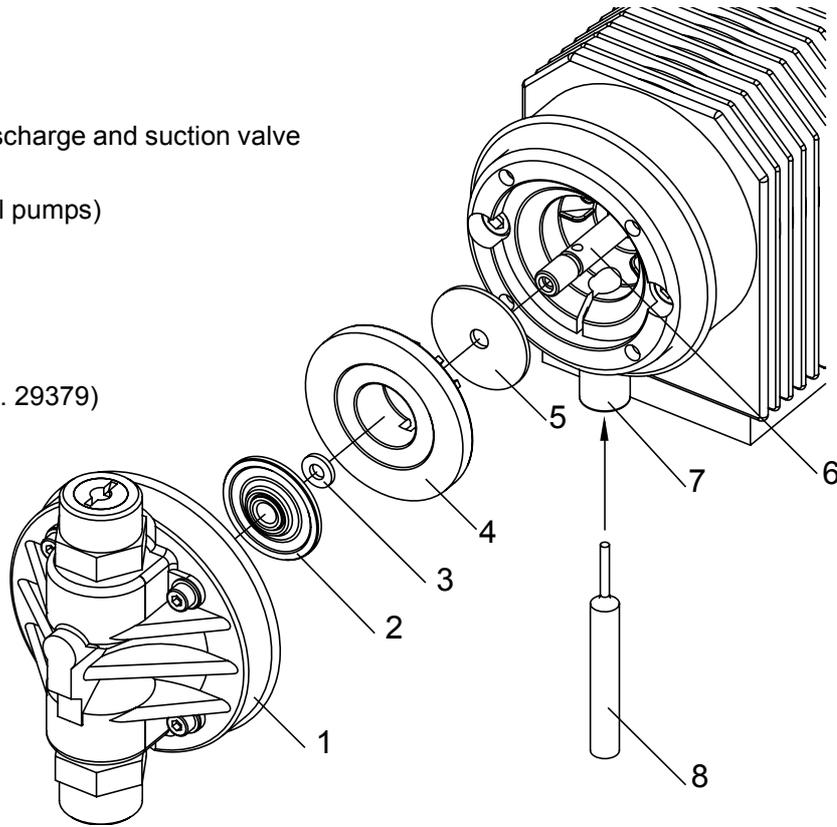
The diaphragm can be easily removed. It can be reached after disassembling the dosing head.



The pump must always be depressurized and rinsed with water or a suitable medium before starting any work on the pump.

To facilitate the removal of the old diaphragm, first set the stroke to „0“ while the pump is running. If the diaphragm rod is turning, it can be stopped by means of a locking pin. The drilled hole in the diaphragm rod can be accessed through the drain pipe.

- 1 Dosing head with discharge and suction valve
- 2 Diaphragm
- 3 Support plate (not all pumps)
- 4 Diaphragm inset
- 5 Deflector plate
- 6 Diaphragm rod
- 7 Drain pipe
- 8 Locking pin (Part No. 29379)



Note

It is advisable to grease the diaphragm rod with Molykote DX when changing the diaphragm.

- at the opening in the housing
- diaphragm thread

The deflector plate must rest in the diaphragm rod groove. Make sure that it is not clamped between diaphragm rod and support plate. The support plate must be cleaned before installation and replaced if damaged.

10.2 Valves

The dosing pump valves must be cleaned regularly.

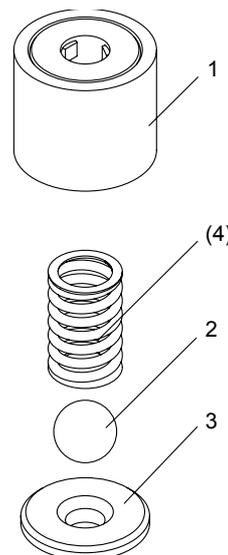
Note

Soiled valves will reduce the dosing accuracy.



The pump must always be depressurized and rinsed with water or a suitable medium before starting any work on the pump. Suction and discharge valve are identical. The valve housings are merely installed in opposite directions.

Basic design of the valve:

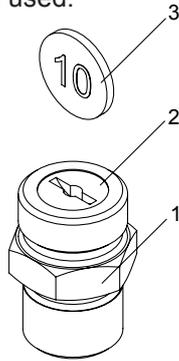


- 1 Ball guide
- 2 Valve ball
- 3 Valve seat
- 4 Valve spring (optional)

Valve balls and valve seats are parts of the spare parts kit.

Valve DN3 and DN4

These valves are pre-assembled units which can be unscrewed from the dosing head without falling apart into their individual parts. A screwdriver with 10 mm bit is required to disassemble the valves. A coin can also be used.



- 1 Valve body
- 2 Screwed-in valve plug
- 3 Coin dia. 20x2mm

10.3 Drive solenoids

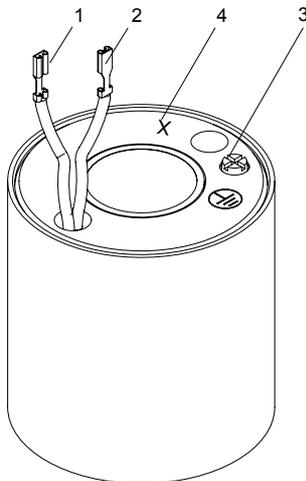


Unplug the mains connector before opening the pump.

To check, measure the electrical resistance of the solenoid coil when it has cooled.

Note

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



- 1, 2 Power supply
- 3 Earth connection
- 4 Letter (see table)

The solenoids differ, depending on the pump version.

Pump type	Resistance at 20°C +/-5%			
	230V~	Letter	115V~	Letter
DE, DX 01...03	113 Ω	"M"	30 Ω	"R"
DE, DX 07...2	113 Ω	"N"	30 Ω	"T"
DE, DX 4...12	91 Ω	"O"	30 Ω	"T"
DE, DX 20...100	51 Ω	"G"	14 Ω	"H"
LT 02...6	72 Ω	"V"	17 Ω	"W"

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.



The resistance between the power supply connections and the protective earth connection must be equal to ∞Ω.

Reconnect the leads as shown in the circuit diagrams after measuring the resistance in the coil.



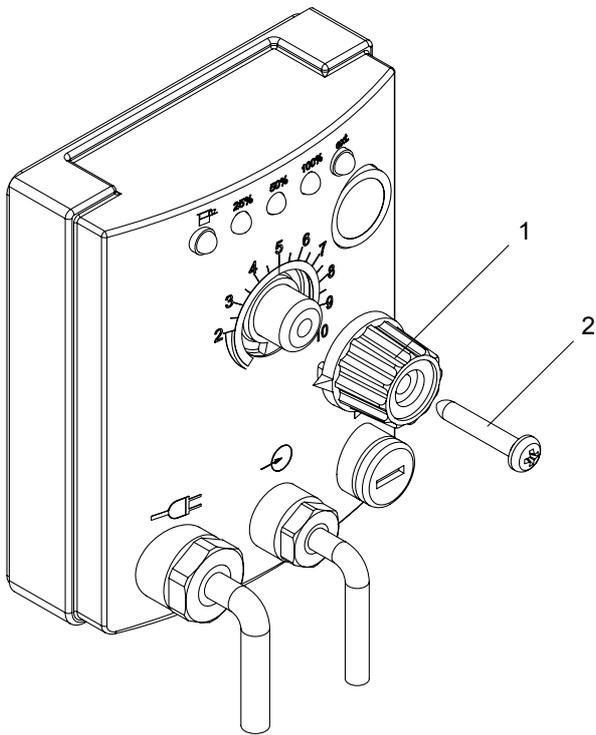
The protective earth conductor must be reconnected under all circumstances.

10.4 Correction of stroke length adjustment

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



To avoid excessive dosing, the dosing line must be returned to the chemical supply tank during setting.



1 Stroke length adjusting knob
2 Locking screw

1. Pump set to internal control.
2. Regardless of the indicator position, unscrew the locking screw and turn the stroke length adjusting knob counterclockwise until the pump no longer delivers or, in the case of pressureless operation, only minimum delivered.

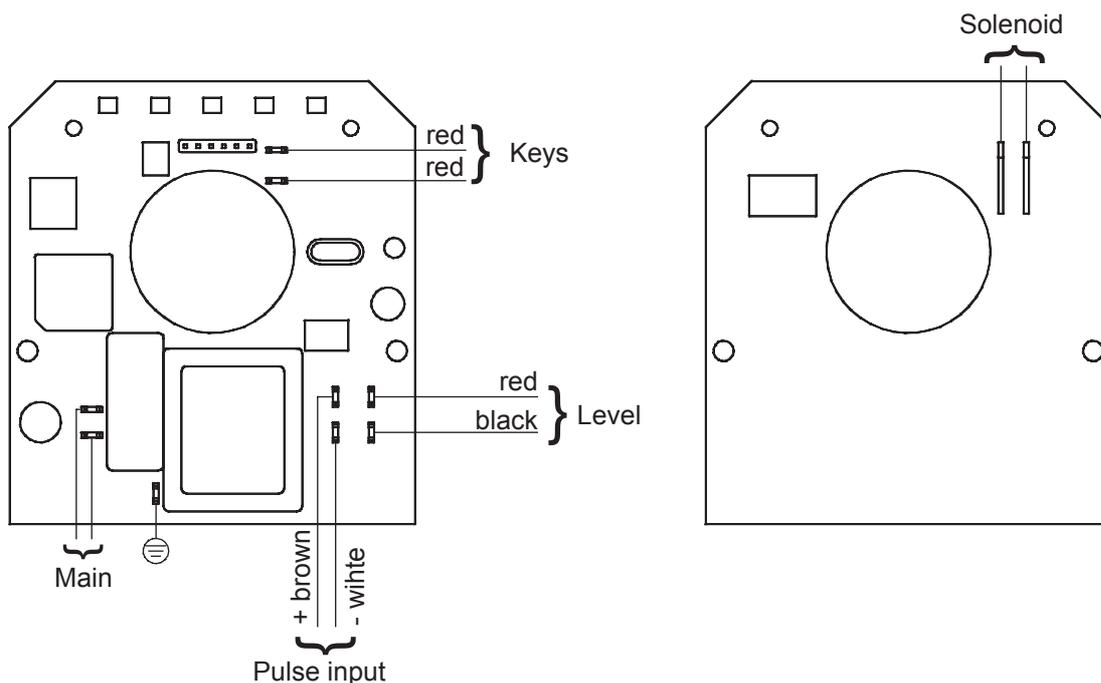
Note

Do not use force. Due to the elasticity of the stop buffer, 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 unscrewing the locking screw, turn it to clockwise and reattach it. Then adjust zero delivery.

3. Put off and attach knob so that the indicator is pointing to „0“. With the knob tightly held, fasten locking screw.
4. Gauge the capacity of the pump by liters according to a setting of the output table. If there is a major discrepancy, correct the knob position.

**10.5 Circuit diagram of the control board
MAGDOS LT**



11. Spare parts

Genuine spare parts from Lutz-Jesco must be used.

Wear parts for the MAGDOS are available as a set of spare parts containing the following:

- Pump diaphragm
- Valve balls
- Valve seats
- all seals

Parts are also available separately as listed in the table.

Spare parts kit MAGDOS DE/DX 01...12 and MAGDOS LT 02...6

Dosing head	Seals	DE/DX 01	DE/DX 03	DE/DX 07	DE/DX 2...4	DE/DX 8	DE/DX 12	LT 02...06	LT 1...6
PMMA, PVC, PP	Viton®	33066	29742	29746		29748	29750	29746	
PMMA, PVC, PP	EPDM	35596	-	33696		33697	33698	33696	
PMMA, PVC, PP	PTFE	33067	-	29759		29790	29791	29759	
PVDF	Viton®	35232	33853	33854		33855	33856	33854	
PVDF	PTFE	-	33858	33859		33860	33861	33859	
1.4571	Viton®	-	-	37159		-	-	37159	
1.4571	EPDM	-	-	37158		-	-	37158	
1.4571	PTFE	-	29758	29747		29749	29751	29747	

Separate parts MAGDOS DE/DX 01...12 and MAGDOS LT 02...6

Separate parts	DE/DX 01	DE/DX 03	DE/DX 07	DE/DX 2...4	DE/DX 8	DE/DX 12	LT 02...06	LT 1...6
Diaphragm allone	81683	81424			81463	81464	81424	
Deflector plate	22066							
Support plate	-	-	-	29312	23892	33897	37093	37094
Buffer	81680			78509				

Spare parts kit MAGDOS DE/DX 20...100

Dosing head	Seals	DE/DX 20	DE/DX 40	DE/DX 100
PVC, PP	Viton®	27803	27805	27807
PVC, PP	Hypalon®	27802	27804	27806
1.4571	AF	27808	27810	27812

Separate parts MAGDOS DE/DX 20...100

Spare parts	DE/DX 20	DE/DX 40	DE/DX 100
Diaphragm allone	81465	81466	81467
Deflector plate	22056	22057	22058
Support plate	28977	-	-
Buffer	78511		

The following spare parts are available for standard accessories. (Refer to the corresponding documentation for other spare parts.)

Injection fitting with tubing valve

Spare tubing Viton® 81244

Spare tubing EPDM 81452

Multifunction valve Pentabloc

Spare parts kit with diaphragm and seals:

G 5/8, Viton® 35326

G 5/8, EPDM/Hypalon® 35327

G 3/4, Viton® 35328

G 3/4, EPDM/Hypalon® 35329

12. Troubleshooting

NATURE OF PROBLEM	POSSIBLE CAUSE	RECOMMENDED ACTION
Pump not delivering or output too low.	Valves leaking or blocked.	Clean valves and bleed pump. See also start-up of pump.
	Valves incorrectly installed.	Reassemble valves. Ensure that valve balls are located above valveseats.
	Suction valve or suction line leaking or blocked.	Clean and seal suction line.
	Suction lift too high.	Install pump at lower position.
		Install pulsation dampener on suction side.
		Install priming aid.
Viscosity too high.	Install spring-loaded valves.	
	Enlarge line cross-section.	
	Use special metering head. -----> Contact Lutz-Jesco.	
No stroke movement observed.	Pump set to zero stroke.	Correctly adjust pump stroke.
	Diaphragm return spring broken.	Replace spring.
	Fuse blown, LEDs off.	Check power supply line, replace fuse.
	Solenoid defective.	Check coil resistance and isolation; replace solenoid, if required.
Red low liquid level indication LED on.	Feed tank empty; level control or dummy plug incorrectly inserted, Cable break.	Fill tank or check suction line.
Frequent diaphragm failures.	No support plate. See Maintenance.	Replace diaphragm with support plate. When replacing diaphragm, check if deflector plate or diaphragm rod have been corroded by pumped fluid.
	Diaphragm was not screwed into the diaphragm rod as far as stop.	Screw in new diaphragm as far as stop. Support plate must then be clamped between diaphragm and diaphragm rod.
	Back pressure to high (measured at discharge connection of pump).	Check system. Clean blocked injection nozzle. Reduce pressure peaks resulting from extremely long tubes by installing pulsation dampeners.
	Media sediment in dosing head.	Flush dosing head.
Pump delivering too much.	Pressure on suction side too high. (Pump siphoning).	Install back pressure or suction controller
	Stroke stop shifted.	Readjust stop.
	Stroke frequency too high.	Reduce frequency.

If the problem cannot be corrected on the basis of the above data, return the pump to the factory or contact our After-Sales Service for further measures. Repairs will be carried out immediately.

EU-Konformitätserklärung

Der Unterzeichnete Lutz-Jesco GmbH, Am Bostelberge 19, 30900 Wedemark, bestätigt, dass die nachfolgend bezeichneten Geräte in der von uns in Verkehr gebrachten Ausführung die Anforderungen der harmonisierten EU-Richtlinien, EU-Sicherheitsstandards und produktspezifischen Standards erfüllen. Bei einer nicht mit uns abgestimmten Änderung der Geräte verliert diese Erklärung ihre Gültigkeit.

(EN) EU Certificate of Conformity

The undersigned Lutz-Jesco GmbH, Am Bostelberge 19, 30900 Wedemark, hereby certifies that, when leaving our factory, the units indicated below are in accordance with the harmonised EU guidelines, EU standards of safety and product specific standards. This certificate becomes void if the units are modified without our approval.

(FR) Certificat de conformité aux directives européennes

Le constructeur, soussigné: Lutz-Jesco GmbH, Am Bostelberge 19, 30900 Wedemark, déclare qu'à la sortie de ses usines le matériel neuf désigné ci-dessous était conforme aux prescriptions des directives européennes énoncées ci-après et conforme aux règles de sécurité et autres règles qui lui sont applicables dans le cadre de l'Union européenne. Toute modification portée sur ce produit sans l'accord express de Jesco supprime la validité de ce certificat.

(ES) Declaración de conformidad de la UE

El que subscribe Lutz-Jesco GmbH, Am Bostelberge 19, 30900 Wedemark, declara que la presente mercancía, objeto de la presente declaración, cumple con todas las normas de la UE, en lo que a normas técnicas, de homologación y de seguridad se refiere, En caso de realizar cualquier modificación en la presente mercancía sin nuestra previa autorización, esta declaración pierde su validez.

(NL) EU-overeenstemmingsverklaring

Ondergetekende Lutz-Jesco GmbH, Am Bostelberge 19, 30900 Wedemark, 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.

(HU) EG (EK)– Egyezőségi nyilatkozat

A Lutz-Jesco GmbH, Am Bostelberge 19, 30900 Wedemark ezúton kijelenti, hogy a szóban forgó termék annak tervezése és szerkezeti módja, valamint forgalomba hozott kivitele alapján a vonatkozó alapvető biztonság technikai és egészségügyi követelményeknek és az alábbi felsorolt EG –irányelveknek minden szempontból megfelel. A terméken engedélyünk nélkül végrehajtott módosítások következtében jelen nyilatkozat érvényét veszíti.

Bezeichnung des Gerätes:	Magnet-Dosierpumpe
Description of the unit:	Solenoid Metering Pump
Désignation du matériel:	Pompe doseuse électromagnétique
Descripción de la mercancía:	Bomba Dosificadora tipo Solenoide
Omschrijving van het apparaat:	Magneetdosserpomp
A termék megnevezése:	Mágneses adagolószivattyúk

Typ / Type / Tipo / Típusjelölés:	EU-Richtlinie / EU directives/ Directives européennes / Normativa UE / EU-richtlijnen / Vonatkozó EG-irányelvek	Harmonisierte Normen / harmonized standards / Normes harmonisées / Estándares acordemente / Toegepaste normeringen / Hatályos normák
MAGDOS LC		
MAGDOS LT		
MAGDOS DE	2006/95/EG	EN ISO 12100-1 : 2003
MAGDOS DX	2006/42/EG	EN ISO 12100-2 : 2003
MAGDOS FL	2004/108/EG	EN 809 : 1998
MAGDOS EL		EN 50081-1 : 01.92
MAGDOS E		EN 50081-2 : 08.93
MAGDOS MK		EN 50082-1 : 01.92
MAGDOS MD		EN 50082-2 : 03.95

Angewandte nationale Normen und technische Spezifikationen, insbesondere:
DIN 19 635, Dosiergeräte zur Behandlung von Trinkwasser

i.V. Dipl. Ing. Klaus Albert
Lutz-Jesco, Wedemark, 01.02.2008

Technische Leitung / Technical Departement Manager / Direction technique /
Dirección Técnica / Hoofd technische dienst / Műszaki irodavezető



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