

MAGDOS MK up to 12 l/h

MB 1 02 15/1

General

The magnetic dosing pumps of the MAGDOS MK series are gland-less diaphragm pumps with electromagnetic drive with all-plastic moulded enclosure in PPO GV. The prime benefit of magnetic drive is the outstanding proportional controllability which is dependent on impulses (for example from a water meter). Each impulse, including continuous impulse, corresponds only to one dosage stroke.

MAGDOS magnetic dosing pumps are manufactured according to modern production methods using high quality materials. Selected high quality components are used in the controls to ensure a high degree of reliability. The range of applications is widened by control through the use of contacts, optocouplers or direct input O (4) ... 20mA and the facility to switch to internal (self-pulsing) control. The pumps are designed on the modular principle: dosing head, drive, and control system. The MAGDOS is maintenance and service-free when it is properly installed and suitable operated.

For 20 to 100 l/hr MAGDOS MD Series dosing pumps see MB 1 02 02.

For contact head water meters see MB 1 37 01.

Plastic Casing

The complete pump casing is extruded from chemically-resistant, inherently stable plastics. The high glass fibre content of the 'mix' ensures high temperature stability and resistance to fracture.

The Dosing Head

Those parts making contact with the chemical medium are constructed of highly corrosion-resistant stabilised plastics, stainless steels, ceramic and glass. Suction and discharge valves are designed as double-ball valves. On request spring-loaded single-ball valves can be supplied.

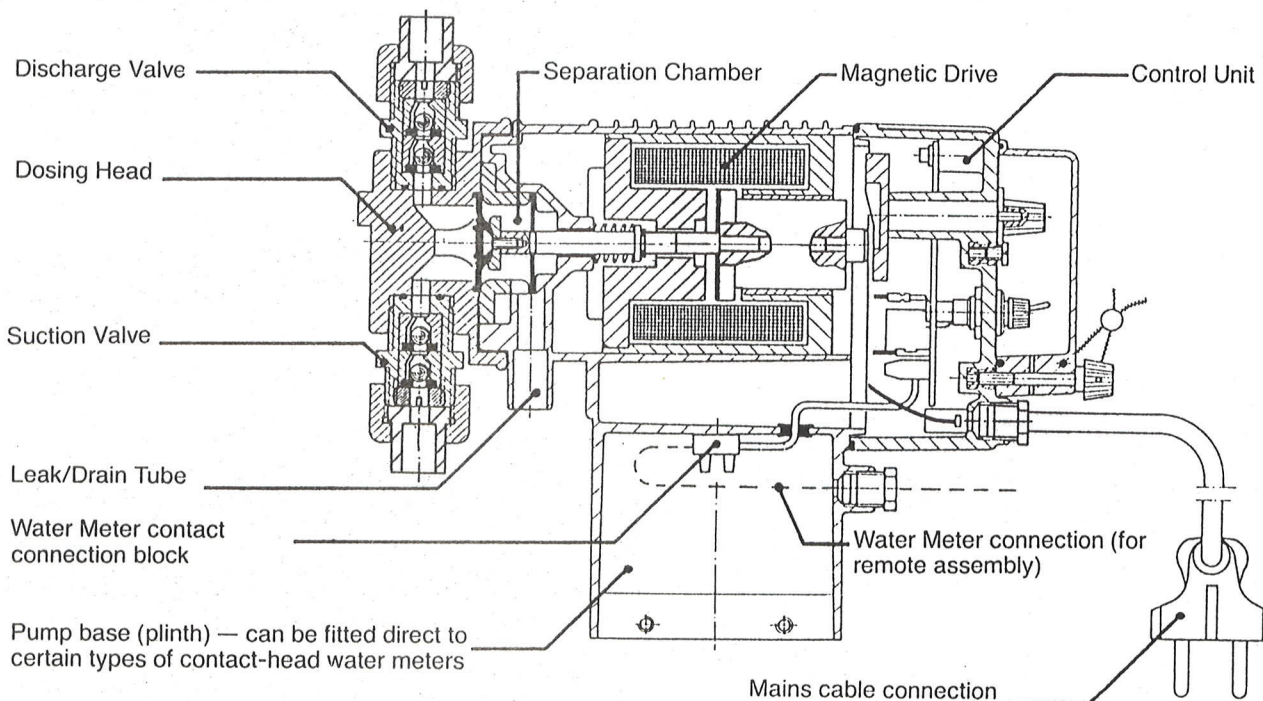
Separation Chamber

In this case of severely aggressive media the risk of chemical action or corrosion exists if the diaphragm breaks as a result of wear.

Hence, the diaphragm flange is plastic-coated and designed so that the leakage is controlled and led off by a drainage tube (by free gravity into, for example, a collecting funnel) and no corrosion on the pump results. The leakage can be sensed immediately by use of the leakage-probe (see data sheet MB 1 31 01), and the pump will stop immediately.



tested according to DVGW
W504 and DIN 19635



MAGDOS MK up to 12 l/h

MB 1 02 15/2

Magnetic Drive

A low noise dc magnet, which can produce a maximum of 4 mm stroke, serves as the drive for the dosing head. Using the continuously adjustable stroke limit stop 0 ... 4 mm stroke can be set depending on pump size.

Reduction gearing or rotating components are not required. This results in high operational reliability and freedom from maintenance. The armature runs in a maintenance-free PTFE-DU bush assembly.

Control Unit

The electronic control of the MAGDOS magnetic dosing pump makes possible adaption of the pump to all requirements of domestic water engineering, water treatment, and waste water processing. Level N suppression is fitted. Use of IC's, LED's, etc., minimises the number of components used and increases reliability.

The basic model already contains all necessary standard functions:

- (a) Switch-over for internal timing (self pulsing) control and external impulse control.
- (b) LED operation light (green) with concurrent stroke indication by extinguishing this LED momentarily with each pump stroke. LED-Container-Empty light (red).
- (c) Linear stroke frequency potentiometer together with the mechanical stroke adjustment a total adjustability ratio of over 1 : 500 is achieved.
- (d) Fuse accessible from outside.
- (e) Dry-running-protection with connected level indicator switch. A conductivity probe (two-bar electrode) is sufficient for monitoring level and which acts directly on the control electronic system without interconnection of a separate level-relay.

Conductivity of the medium must be at least 20µS.

- (f) Level monitoring probes can be quite easily connected with jack plugs. The level control is designed as self-monitoring, i.e. the pump will give an empty signal even in the event of a cable break, and immediately stops.

A dummy plug is inserted for operation without level switch. The lines for the external control, e.g. to the water meter contact and to the level-switch, are galvanically separated from the mains and have a voltage of about 15 V.

- (g) In general, two connection possibilities are available for the water meter:

Direct construction of the pump with the internal cabling and external connection via cable and gland.

- (h) The control is limited for external operation so that no more than 104 strokes/min. can be accepted.

Additional Components

- (a) Fault indicator relay with volt-free changeover contact, which can indicate mains failure in closed circuit configuration, low chemical tank level, cable breakage or faulty plug and socket or terminal connection (e.g. the supply from a centralised control panel can be used for the supply relay contacts).
- (b) Alternatively fault indicator optocoupler, which switches on at every pump stroke (pump stroke auto counting). (E.g. if the stroke optocoupler is used no second water meter is necessary to control water softener regeneration)
- (c) Under external control (e.g. from the water meter) pulses are also re-transmitted if the pump is inhibited due to low chemical level or ruptured diaphragm signals.

MAGDOS MK as a Final Control Element

The MAGDOS electronic system permits control of the pump up to 104 strokes per minute via external impulse inputs. Floating and volt-free normally open contacts (NOC's) of the impulse emitters, metering mechanisms, contact head water meters or optional contact flow meters can be used for control; hence externally controlled proportional dosing is achieved. The MAGDOS dosing pumps can be controlled via contacts, which are given by process operating sequences or for example, from conveyor belts.

The pump can serve as a final control element for pH, Redox and all other controls with impulse frequency modulated controller outputs.

Output

Pump Discharge (output) is dependent on the viscosity of the medium and the hydraulic installation conditions. For water at 20 °C, and a lift of 0.6 M (system filled air-free), the values in the graphs on page MB 1 02 15/4 apply. Max. lift 120 mbars. Max. temperature of the medium for uPVC heads: 35 °C, for stainless steel heads: 50 °C.

Technical Data

Electrical Connection	220/240 V 50/60 Hz Connection with a Schuko (earthing contact plug) 1,5 m
Power consumption (medium output at 104 stroke per minute)	33 W
Current Consumption	Max. 2 A during stroke
Fusing	1,6 AF
Protection Class	IP 65
Insulation Class	B
Suppression Degree	N
Input Impulse Length	at least 30 ms
Excitation time of the Magnet per Impulse	60 ms
Signal Relay	Changeover Contact
	Making or Breaking Capacity
	max. 2,5 A at 250 V AC 500 VA AC, 100 Watt
Stroke Optocoupler	30 V DC 20 mA
Voltage to the Level Probe	15 V AC min. 20 µS
Necessary min. conductivity	ca. 80 µS
Voltage to Pulse control	15 V DC
Impedance for input 0(4)...20 mA	200 Ohms 1*
Weight	plastic dosing head ss dosing head
	ca. 2,6 kg ca. 3,0 kg

1* Linearity

The inexpensive optional electronic control module for 0(4)...20 mA direct control signal guarantees a zero stroke frequency at 0 or 4 mA as applicable, but linearity up to maximum 20 mA may deviate typically by + or - 5 strokes per minute.

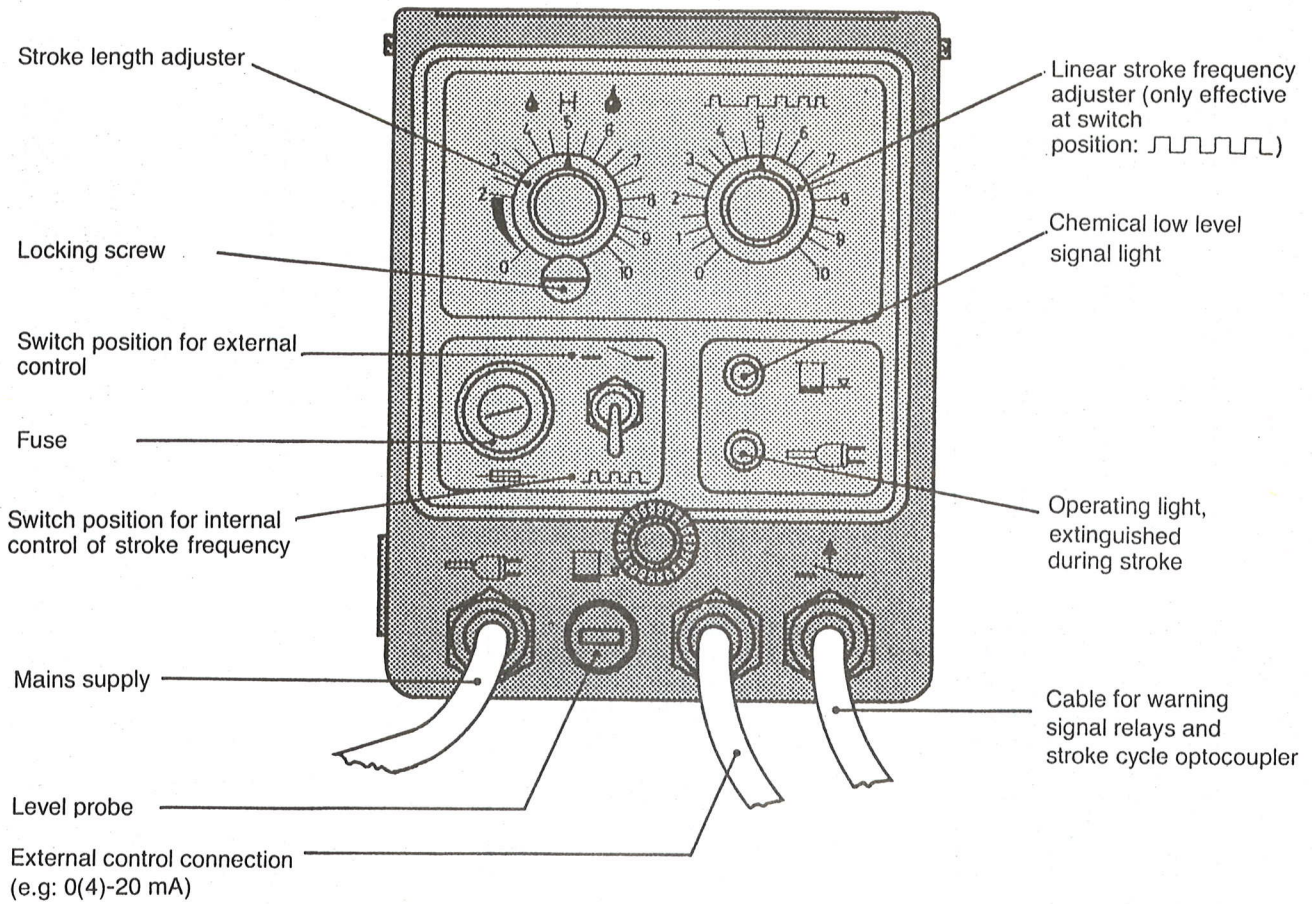
Galvanic separation

With magnetic dosing pumps with automatic control from 0(4)...20 mA it is extremely important that the signal line does not come into contact with earth, if the signal source is not isolated. For level monitoring with 2 bar electrodes earth connection is possible and leads to disturbances: therefore the signal source must be potential-free or a potential separation unit (isolator) according to MB 4 08 01 must be installed.

The above fault indication and stroke functions can be used simultaneously.

MAGDOS MK up to 12 l/h

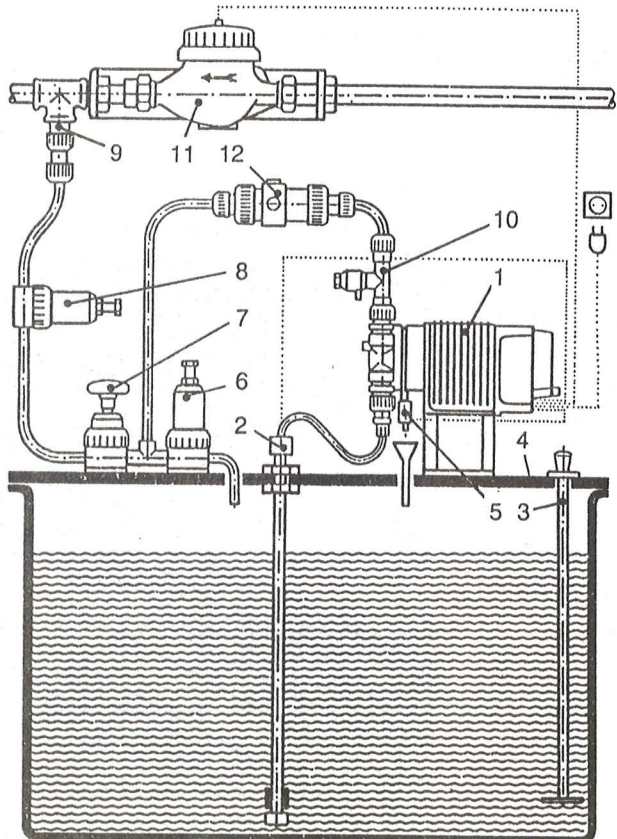
MB 1 02 15/3



Installation Example

1. MAGDOS
2. Suction Pipe
3. Hand Mixer
4. Tank
5. Leakage Probe
6. Relief Valve
7. Isolating Valve
8. Pressure Sustaining Valve
9. Injection Point
10. Venting Valve
11. Water Meter
12. Pulsation Damper

- MB 1 02 15
- MB 1 22 01
- MB 1 36 02
- MB 1 20 01
- MB 1 31 01
- MB 1 25 01
- MB 1 24 01
- MB 1 25 01
- MB 1 23 01
- MB 1 33 03
- MB 1 37 01
- MB 1 27 01

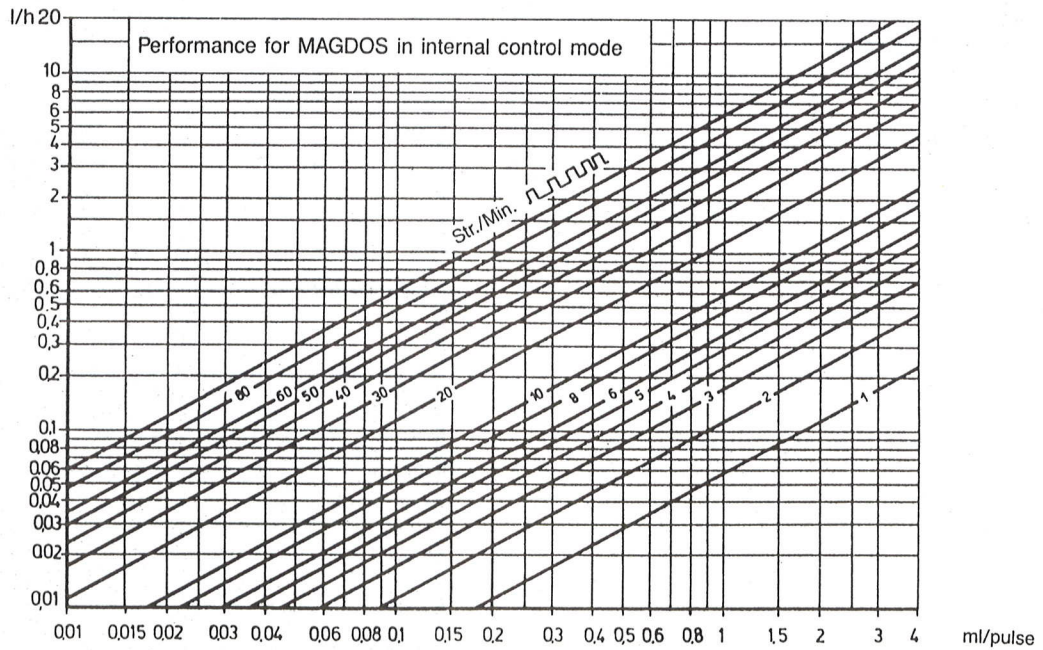
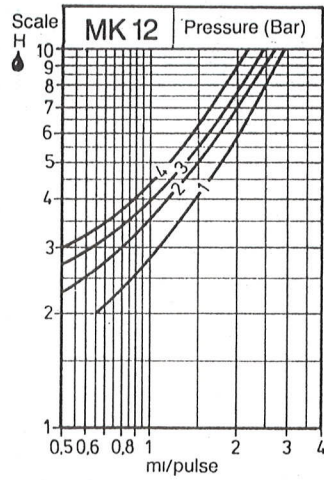
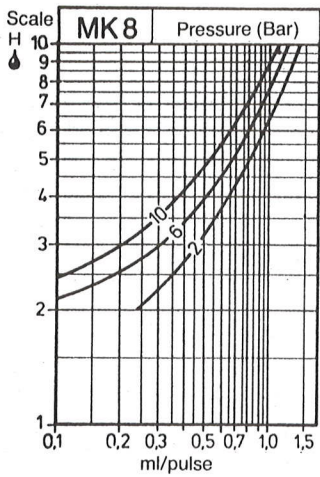
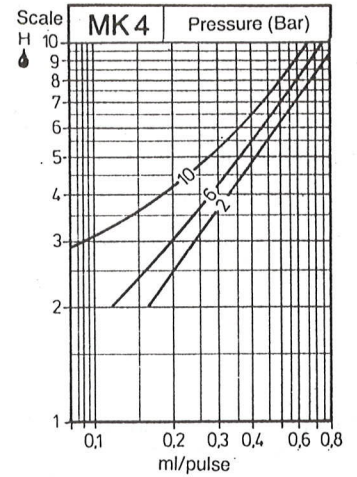
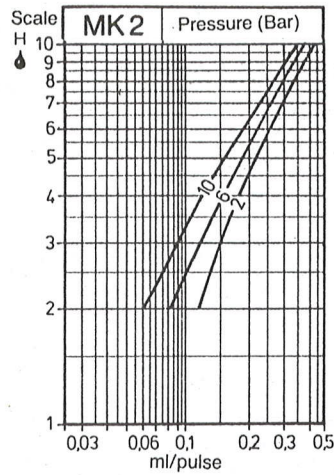
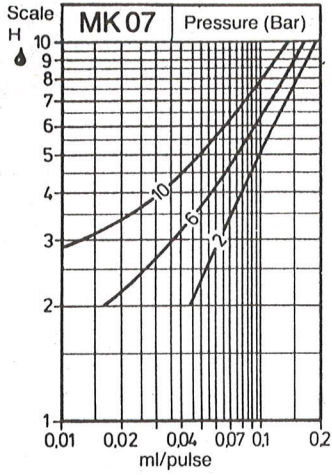


MAGDOS MK up to 12 l/h

MB 1 02 15/4

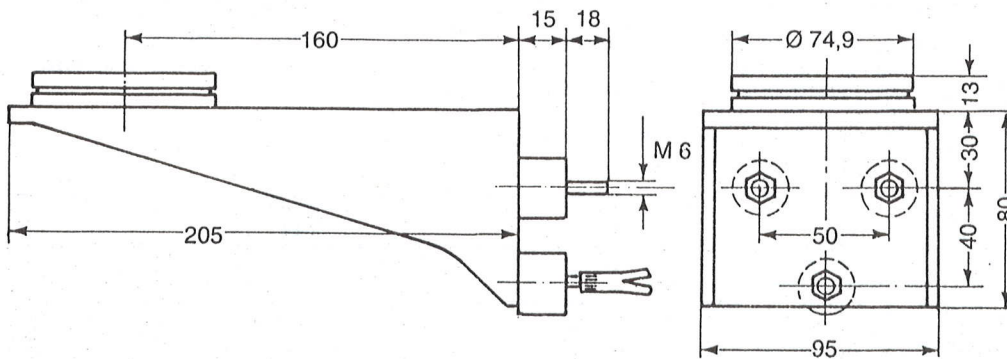
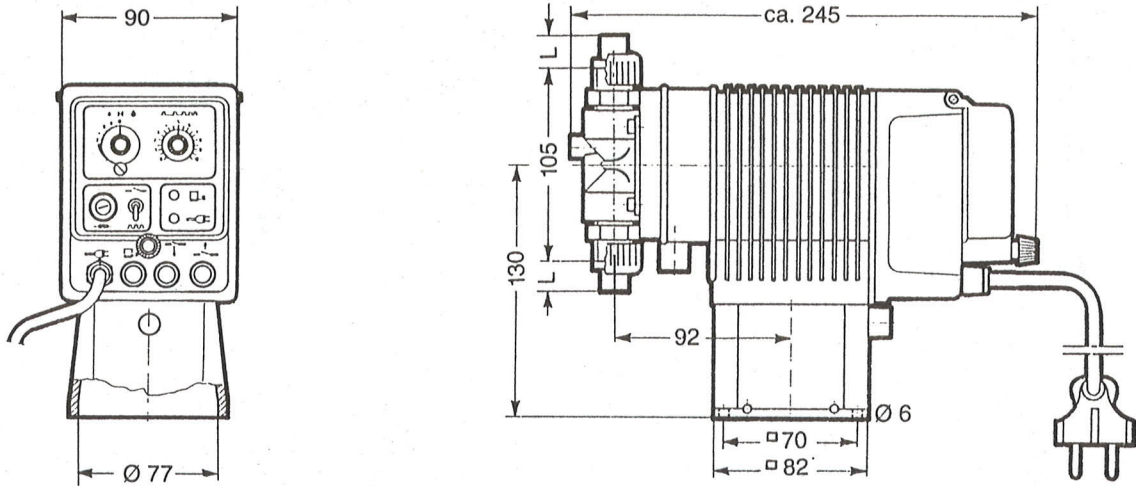
Performance Curves

applicable to water at a lift of 0.6 M



MAGDOS MK up to 12 l/h

MB 1 02 15/5



Wall Bracket 26.502

Mounting Kit with washers 25.155

Example of an Order

The requirement is for a magnetic dosing pump for phosphate dosing and driven from the water meter contact. The pump must dose 0.4 ml against 8 bar per stroke. The pump must stand on the supply container. A signal relay must be available for remote monitoring.

Selection of the Pump

- (a) Referring to the discharge capacity of 0.4 ml/stroke, the MAGDOS MK 4.. pump in the MK 4 curve is selected. On account of the signal relay, the control unit no. 29.255 under type MK 4-ASR in Table 2 is selected.
- (b) In Table 1 select the drive unit no. 29.245.
- (c) Under 'Dosing Head' select no. 23.809 (uPVC is compatible with phosphate).
- (d) The suction and discharge valves are selected as no. 20.890 and no. 20.891 (uPVC and Viton are resistant).

(e) Vacuum (i.e.: suction) connections for hose \varnothing 4/6, no 20.975 and discharge connection \varnothing 6/12 no 19.180: see Table 3.

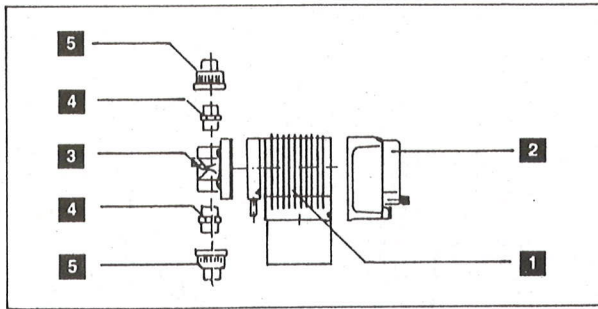
(f) The suction line, preferably with level monitor, is selected from MB 1 22 01.

Thus the order will be: MAGDOS MK 4ASR comprising:

1 Drive	29.245
2 Control	29.255
3 Dosing Head	23.809
4 Suction Valve Discharge Valve	20.890 20.891
5 Suction connection 4/6 Discharge connection 6/12	20.975 19.180

MAGDOS MK up to 12 l/h

MB 1 02 15/6



Selection Tables

In order to offer the user a wide variety of pumps, the proportioning pumps have been divided into the most important functional groups. The pump may be individually made up as required. The user must make up the pump from:

- 1** Drive
- 2** Control Unit
- 3** Dosing Head
- 4** Valves
- 5** Connections

The numbers of the pump drawing refer to the appropriate selection tables.

1	
Pump type	Drive complete
MK 07	29.244
MK 2	...
MK 4	29.245
MK 8	29.246
MK 12	29.247

2									
Pump Type	Control type								
	Contact Head Water Meter			0...20 mA			4...20 mA		
	...A	...ASR	...AHO	...N	...NSR	...NHO	...V	...VSR	...VHO
MK 07	29.248	29.253	29.258	29.137	29.142	29.147	29.152	29.157	29.162
MK 2	29.249	29.254	29.259	29.138	29.143	29.148	29.153	29.158	29.163
MK 4	29.250	29.255	29.260	29.139	29.144	29.149	29.154	29.159	29.164
MK 8	29.251	29.256	29.261	29.140	29.145	29.150	29.155	29.160	29.165
MK 12	29.252	29.257	29.262	29.141	29.146	29.151	29.156	29.161	29.166

Possibilities of control

- MK...A Standard model — can be switched from internal to external control.
- MK...N Switchable from remote 0-20 mA signal to internal pulse control
- MK...V Switchable from remote 4-20 mA signal to internal pulse control

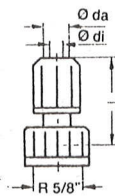
Additional functions

- ...SR Warning Signal Relay
- ...HO Stroke Optocoupler

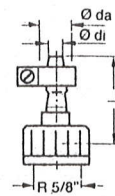
3				
	MK 07	MK 2 u. 4	MK 8	MK 12
PVC	25.188	23.809	23.810	23.811
PVDF	28.115	28.117	28.119	29.178
1.4571	25.189	23.812	23.813	23.814

4				
Housing Material		uPVC	PVDF	1.4571
Sealing Material		Viton	PTFE	PTFE
Double-ball Valves	Suction	20.890	28.111	24.029
	Discharge	20.891	28.112	24.030
Spring-loaded Valves	Suction	25.087	29.385	25.089
	Discharge	25.088	29.384	25.090

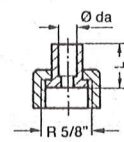
5							
DN	Abb.	di	da	L	PVC	PVDF	1.4571
4	A	4	6	31	20.975	29.387	
	E		6	43			24.959
6	A	6	8	42	25.176		
	A	6	12	51	19.180	28.124	
	B	6	12	30	23.092		23.093
	C		10	15	23.087		
	C		12	15	23.089		
	E		10	20			23.090
	E		12	20			23.091
D		R 1/4"	20	23.088	29.179	22.999	



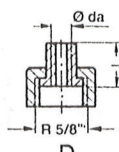
A
Hose clamp connection



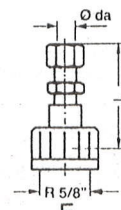
B
Hose Clip connection



C
Solvent-cement connection



D
Threaded connection

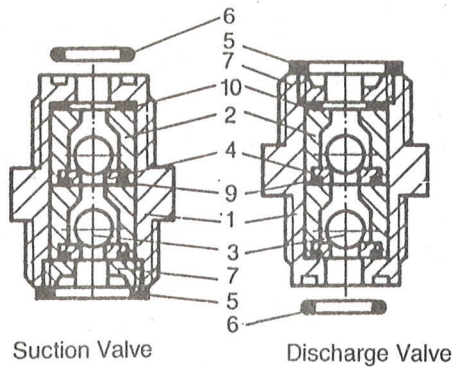


E
Ermeto connection

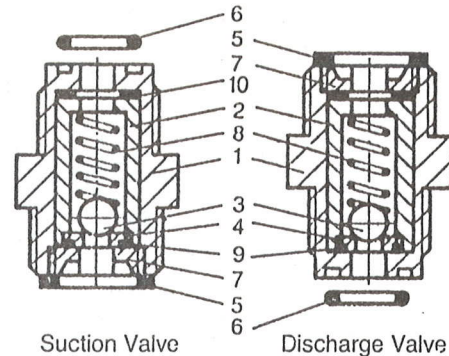
MAGDOS MK up to 12 l/h

Drive Unit with Diaphragm ET 1 02 15/1

Double-ball Valve

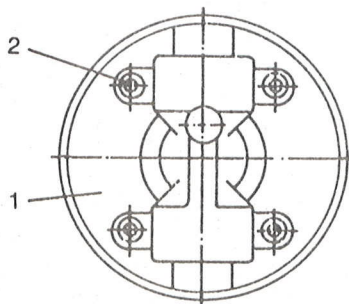


Spring-loaded Valve



Item No.	Description	Part No.	Material	Double-ball Valve			Spring-loaded Valve		
				uPVC	PVDF	1.4571	uPVC	PVDF	1.4571
1	Valve Body	20.845	uPVC	1	—	—	1	—	—
	Valve Body	28.108	PVDF	—	1	—	—	1	—
	Valve Body	19.289	1.4571	—	—	1	—	—	1
2	Ball Guide	19.294	uPVC	2	—	—	—	—	—
	Ball Guide	28.109	PVDF	—	2	—	—	—	—
	Ball Guide	19.293	1.4571	—	—	2	—	—	—
	Ball Guide	24.066	uPVC	—	—	—	1	—	—
	Ball Guide	29.386	PVDF	—	—	—	—	1	—
	Ball Guide	24.067	1.4571	—	—	—	—	—	1
3	Ball dia. 6,5	29.778	Glas	2	2	—	1	1	—
	Ball dia. 6,5	18.044	1.4401	—	—	2	—	—	1
4	Valve Seat	81.460	PVDF	2	2	2	1	1	1
5	Gasket	81.138	Viton	1	—	—	1	—	—
	Gasket	81.580	PTFE	—	1	1	—	1	1
6	O-Ring	81.384	Viton	1	—	—	1	—	—
	O-Ring	80.617	PTFE	—	1	1	—	1	1
7	Plug	19.299	uPVC	1	—	—	1	—	—
	Plug	28.110	PVDF	—	1	—	—	1	—
	Plug	24.031	1.4571	—	—	1	—	—	1
8	Valve Spring	25.081	Hastelloy	—	—	—	1	1	1
9	O-Ring	80.013	Viton	2	2	—	1	—	—
	O-Ring	80.627	PTFE	—	2	2	—	1	1
10	Gasket	81.526	Viton	1	1	—	1	—	—
	Gasket	81.585	PTFE	—	1	1	—	1	1
Suction Valve assembly				20.890	28.111	24.029	25.087	29.385	25.089
Discharge Valve assembly				20.891	28.112	24.030	25.088	29.384	25.090

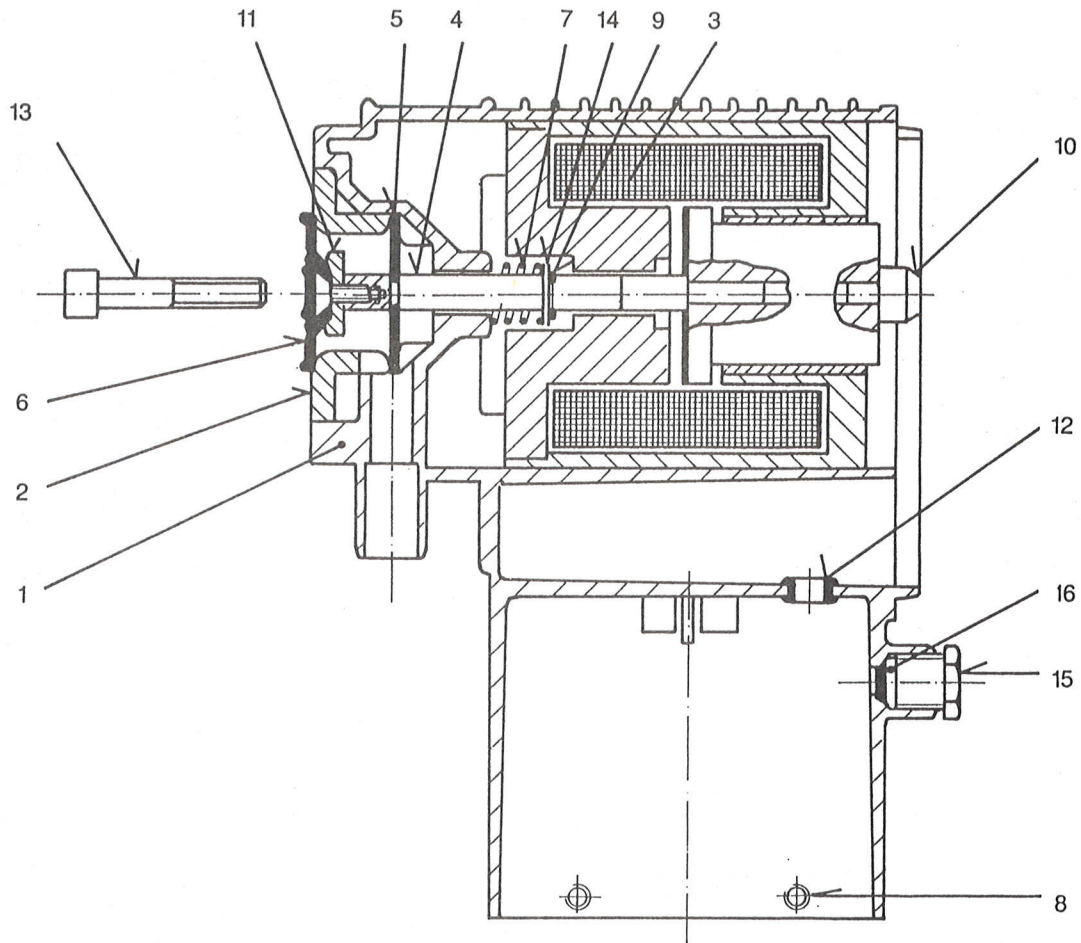
Dosing Head



Pump Type	Material	Dosing head complete	Diaphragm Housing Pos. 1	Screw A 2 Pos. 2
MK 07	PVC	25.188	22.526	83.409
	PVDF	28.115	28.114	
	1.4571	25.189	22.527	
MK 2 MK 4	PVC	23.809	21.603	
	PVDF	28.117	28.116	
	1.4571	23.812	21.611	
MK 8	PVC	23.810	21.222	
	PVDF	28.119	28.118	
	1.4571	23.813	21.612	
MK 12	PVC	23.811	22.399	
	PVDF	29.173	28.689	
	1.4571	23.814	21.613	

MAGDOS MK up to 12 l/h

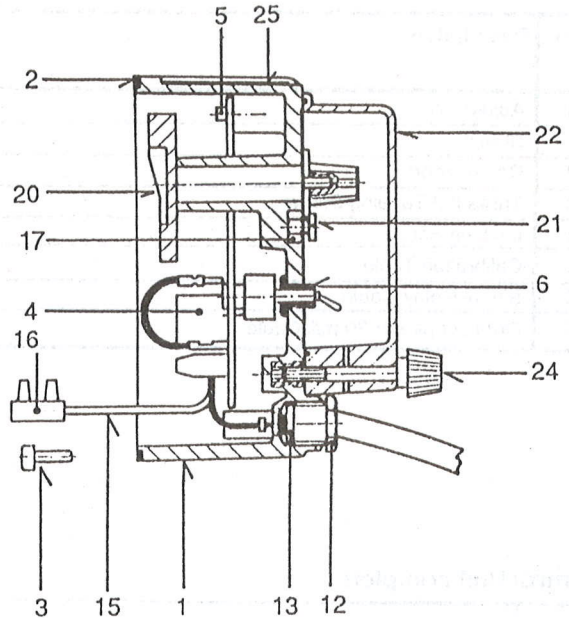
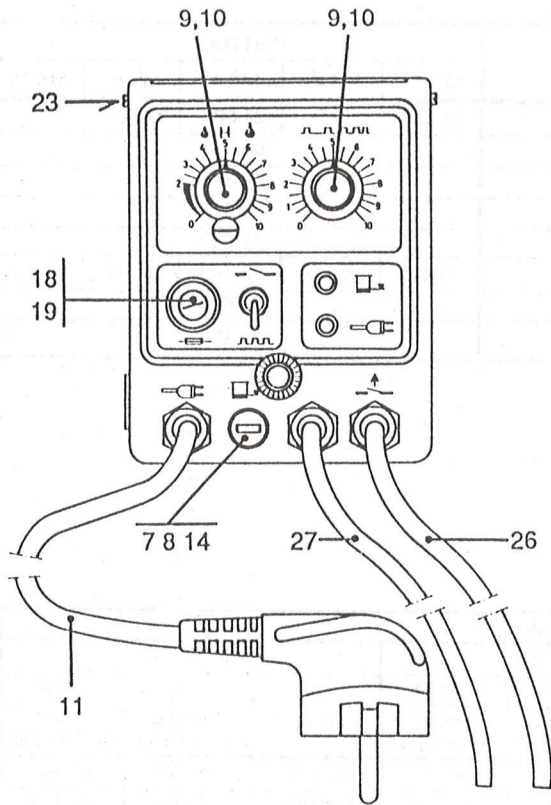
ET 1 02 15/2 Drive Unit with Diaphragm



Item	No.	Description	Part-no.				
			MK 07	MK 2	MK 4	MK 8	MK 12
1	1	Housing			27.078		
2	1	Diaphragm insert	28.849		28.850	28.851	28.852
3	1	Magnet complete			29.439		
4	1	Diaphragm Rod			29.243		
5	1	Deflector Washer			22.066		
6	1	Diaphragm			81.424	81.463	81.464
7	1	Return Spring			29.382		
8	4	Grub Screw			83.613		
9	1	Circlip			84.154		
10	1	Stroke Stop (included in magnet compl.)			21.584		
11	1	Diaphragm Support Plate	—		29.312	23.892	—
12	1	Cable Grommet			77.693		
13	2	Screws for magnet connection			83.514		
14	1	Washer			84.144		
15	1	Cable Gland Nut			78.786		
16	1	Gland Seal			78.787		
		Drive complete	29.244		29.245	29.246	29.247

MAGDOS MK up to 12 l/h

Control Unit ET 1 02 15/3



Item	Description	Part No.				
		MK 07	MK 2	MK 4	MK 8	MK 12
1	Housing Cover			29.265		
2	Seal			81.609		
3	Cylinder Head Screw			83.409		
4	Electronics ...A			78.790		
	...ASR			78.791		
	...AHO			78.792		
	...N			78.793		
	...NSR			78.794		
	...NHO			78.795		
	...V			78.796		
	...VSR			78.797		
	...VHO			78.798		
5	Screw			83.653		
6	Nozzle			78.813		
7	Jack Plug Socket			25.092		
8	Dummy Plug			29.115		
9	Adjusting Knob-Frequency			26.053		
10	Covering Cap			26.052		
11	Mains Cable & Plug			77.868		
12	Gland Nut			78.786		
13	Gland Seal			78.787		
14	Dummy Plug			78.788		
15	Hook-up Cable for Water Meter			22.501		
16	Insulator/Terminal			22.502		
17	Hexagonal Nut			83.670		
18	Fuseholder and Cable			25.091		
19	Fuse			77.594		

MAGDOS MK up to 12 l/h

ET 1 02 15/4 Control Unit

Item	Description	Part No.				
		MK 07	MK 2	MK 4	MK 8	MK 12
20	Adjust. Stop	21.607		21.585	21.586	
21	Screw	83.070				
22	Cover Hood	22.247				
23	Threaded Tapping Screw	83.543				
24	Locking Screw	21.587				
25	Calibration Table	29.441	29.442	29.443	29.444	29.445
26	Signal Relay Cable	78.800				
27	Opto-coupler or 20 mA Cable	25.104				

Control Unit complete

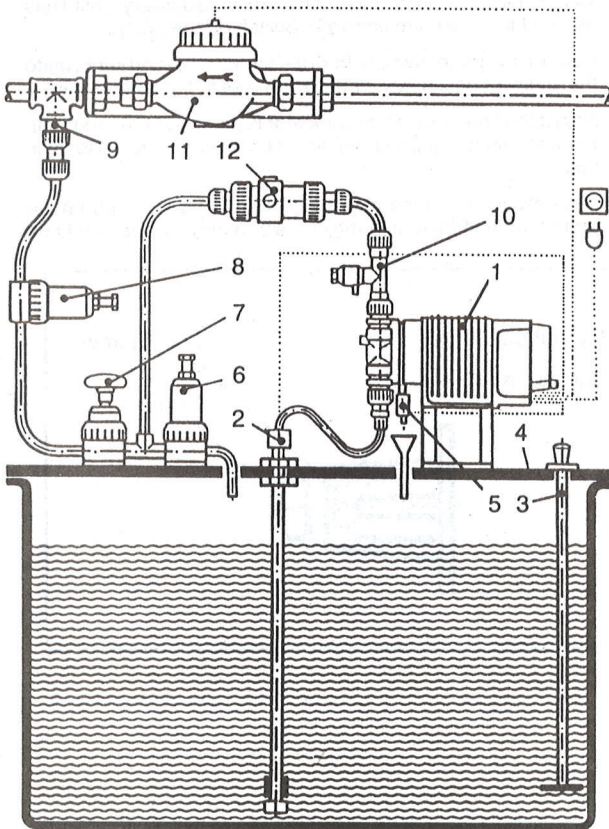
Pump type	Control type								
	Contact Head Water Meter			0...20 mA			4...20 mA		
	...A	...ASR	...A HO	...N	...NSR	...NHO	...V	...VSR	...VHO
	Standard	Warning-Signal Relay	Stroke Optocoupler	Standard	Warning Signal Relay	Stroke Optocoupler	Standard	Warning Signal Relay	Stroke Optocoupler
MK 07	29.248	29.253	29.258	29.137	29.142	29.147	29.152	29.157	29.162
MK 2	29.249	29.254	29.259	29.138	29.143	29.148	29.153	29.158	29.163
MK 4	29.250	29.255	29.260	29.139	29.144	29.149	29.154	29.159	29.164
MK 8	29.251	29.256	29.261	29.140	29.145	29.150	29.155	29.160	29.165
MK 12	29.252	29.257	29.262	29.141	29.146	29.151	29.156	29.161	29.166

MAGDOS MK up to 12 l/h

Operating & Maintenance Instructions BW 1 02 15/1

Introduction

Proportioning systems with magnetic pumps in the MAGDOS MK Series are constructed and connected according to the following explanatory sketches.

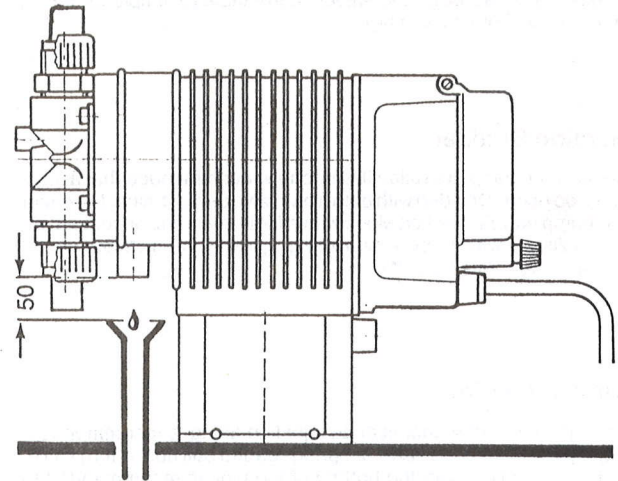


1. MAGDOS	MB 1 02 15
2. Suction Pipe	MB 1 22 01
3. Hand Mixer	MB 1 36 02
4. Tank	MB 1 20 01
5. Leakage Probe	MB 1 31 01
6. Relief Valve	MB 1 25 01
7. Isolating Valve	MB 1 24 01
8. Pressure Sustaining Valve	MB 1 25 01
9. Injection Point	MB 1 23 01
10. Venting Valve	MB 1 33 03
11. Water Meter	MB 1 37 01
12. Pulsation Damper	MB 1 27 01

Pump Installation

The pump must be installed so that the valves are in a fully vertical position. The valves must not be loaded mechanically by the pipe connections. The separating chamber drainage connection must, if necessary, be run underneath the diaphragm flange into a collection funnel.

Note: The drainage connection must **not** be fed **directly** into the storage tank, because otherwise escaping gases may penetrate behind the diaphragm during operation. A space of 50 mm must therefore be left between the drainage pipe and the collection funnel. The funnel can be fed back into the tank by means of the cover or, if the chemical permits this, may be extended to an inclined channel. Under no circumstance must the drainage pipe be run at a higher level than the dosing head, because otherwise back pressure will be generated in the event of leakage. The space between the drainage pipe and the collection funnel also enables any leakage to be observed.



Technical Data

Electrical Connection	220/240 V 50/60 Hz Connection with a Schuko (earthing contact plug) 1,5 m	
Power consumption (medium output at 100 stroke per minute)	33 W	
Current Consumption	Max. 2 A during stroke	
Fusing	1,6 AF	
Protection Class	IP 65	
Insulation Class	B	
Suppression Degree	N	
Input Impulse Length	at least 30 ms	
Excitation time of the Magnet per Impulse	60 ms	
Signal Relay	Cangeover Contact	max. 2,5 A at 250 V AC
	Making or Breaking Capacity	500 VA AC, 100 Watt
Stroke Optocoupler	30 V DC 20 mA	
Voltage to the Level Probe	15 V AC min. 20 µS	
Necessary min. conductivity	ca. 80 µS	
Voltage to Pulse control	15 V DC	
Impedance for input 0(4)...20 mA	200 Ohms 1*	
Weight	plastic dosing head	ca. 2,6 kg
	ss dosing head	ca. 3,0 kg

1* Linearity

The inexpensive optional electronic control module for 0(4)...20 mA direct control signal guarantees a zero stroke frequency at 0 or 4 mA as applicable, but linearity up to maximum 20 mA may deviate typically by + or - 5 strokes per minute.

Galvanic separation

With magnetic dosing pumps with automatic control from 0(4)...20 mA it is extremely important that the signal line does not come into contact with earth, if the signal source is not isolated. For level monitoring with 2 bar electrodes earth connection is possible and leads to disturbances: therefore the signal source must be potential-free or a potential separation unit (isolator) according to MB 4 08 01 must be installed.

MAGDOS MK up to 12 l/h

BW 1 02 15/2 Operating & Maintenance Instructions

Pump Delivery

Pump delivery is dependent on the viscosity of the medium and the hydraulic installation conditions. For water at 20°C, and a lift of 0.6 M (system filled air-free), the values in the table (example for MK 4) apply. (See Commissioning).

Suction Strainer

For perfect pump operation it is strongly recommended that a foot-valve be used, provided with both a ball valve and a strainer to protect the pump valves. Suction pipes with a footvalve, (and on request also equipped with a level monitoring system) are included in the supply range (MB 1 22 01).


Injection Point

For injection of the chemical an injection fitting is recommended, equipped with a hose valve or spring-loaded ball non-return valve. Vertical injection from the bottom of the pipe is recommended to allow air to escape, thereby avoiding possible chemical precipitation. Consideration must be given to all appropriate characteristics of the types of chemical.


Commissioning

Note:

Do not adjust the stroke length when the pump is stationary, but only during the suction stroke.

- Fill storage tank with chemical.
- If provided, insert the jack plug for the suction pipe (or the dummy plug) and water meter.
- Connect pump to unit plug.
- Switch pump to „Internal“ () and allow to prime. For this purpose it is advisable to set the stroke to 10. If the pump does not prime, detach the discharge valve and pour water or chemical into the head.

Replace valve and allow to prime again.

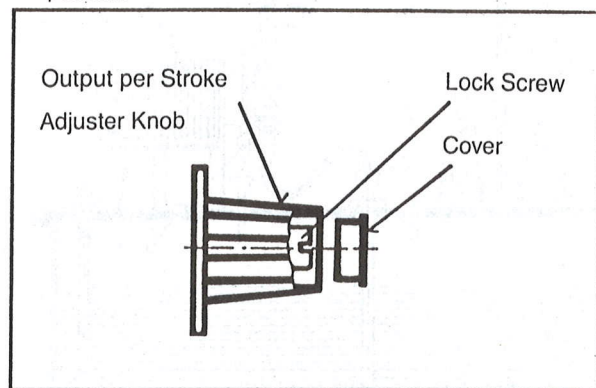
- If a venting valve according to MB 1 33 03 has been installed, it must be opened until liquid escapes.
- When correct operation is achieved, set to the required output and lock the adjusting knob.
- In the case of externally actuated pumps (e.g. for water meter operation), switch the pump over to „External“ (). Generate the water flow by opening a water valve in the line and check pulsing.


The pumps are provided with a table from which the stroke length can be read off for a selected output per stroke (ml/stroke). The back pressure influences are taken into consideration in the table, and intermediate values must be extrapolated.

Correction of Stroke Length Setting

The relationship between the output and the scale reading may be disturbed by improper handling, e.g. forced adjustment when stationary. A correction must be carried out as follows:

1. Switch pump to automatic control at frequency setting "10".
2. Regardless of the position of the indicator, turn the left-hand stroke length adjusting knob anticlockwise until the pump no longer delivers or, in the case of no-pressure delivery, until it has attained the minimum flow rate. Switch off the pump.
3. Remove the protective cap from the stroke adjusting knob, undo the screw (if necessary, apply a light tap to the screw head).
4. Adjust the knob so that the indicator is pointing to "0" and, with the knob tightly gripped, tighten the screw securely. Replace cap.
5. If necessary, drain the pump, according to a setting from the output table. If there is a major discrepancy, correct the knob position.



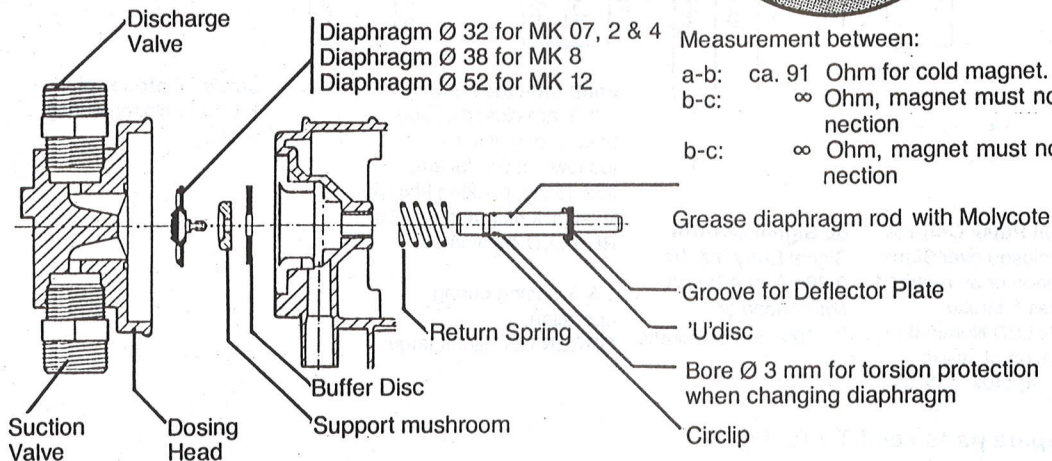
ml/imp	0,05	0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	
bar	 H H ₂ O						ca. ± 15% H ₂ O			MK 4
2	—	—	2,5	3,6	4,8	5,9	7,1	8,2	9,4	
4	—	—	2,7	3,9	5,2	6,5	7,8	9,1	—	
6	—	—	3,1	4,3	5,6	6,9	8,2	9,4	—	
8	1,8	2,4	3,5	4,8	6,0	7,3	8,7	—	—	
10	2,6	3,1	4,2	5,3	6,5	7,8	9,1	—	—	

MAGDOS MK up to 12 l/h

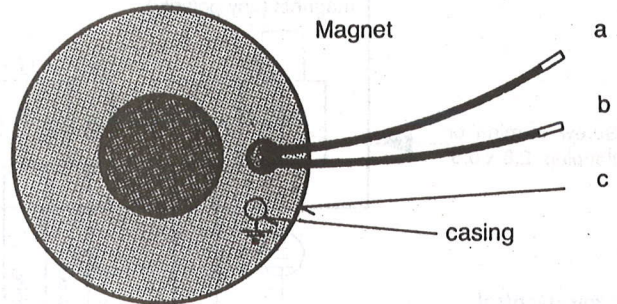
Operating & Maintenance Instructions BW 1 02 15/3

Replacing the Diaphragm

Removing and replacing the diaphragm is a simple matter, and is carried out according to the exploded drawing. The deflector plate must **not** be clamped between the diaphragm rod and the support mushroom, but must rest in the groove of the diaphragm rod.



Testing instructions for MAGDOS drive magnets



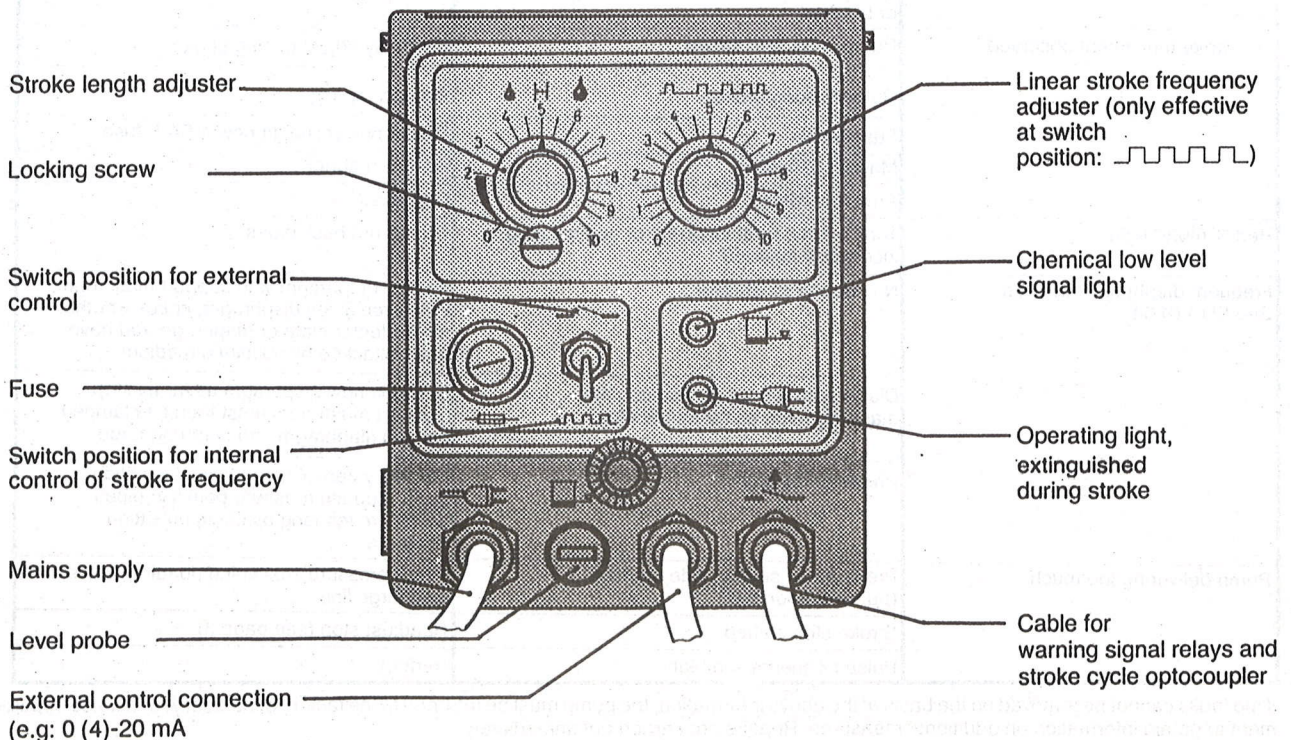
Measurement between:

a-b: ca. 91 Ohm for cold magnet.

b-c: ∞ Ohm, magnet must not have any earth connection

b-c: ∞ Ohm, magnet must not have any earth connection

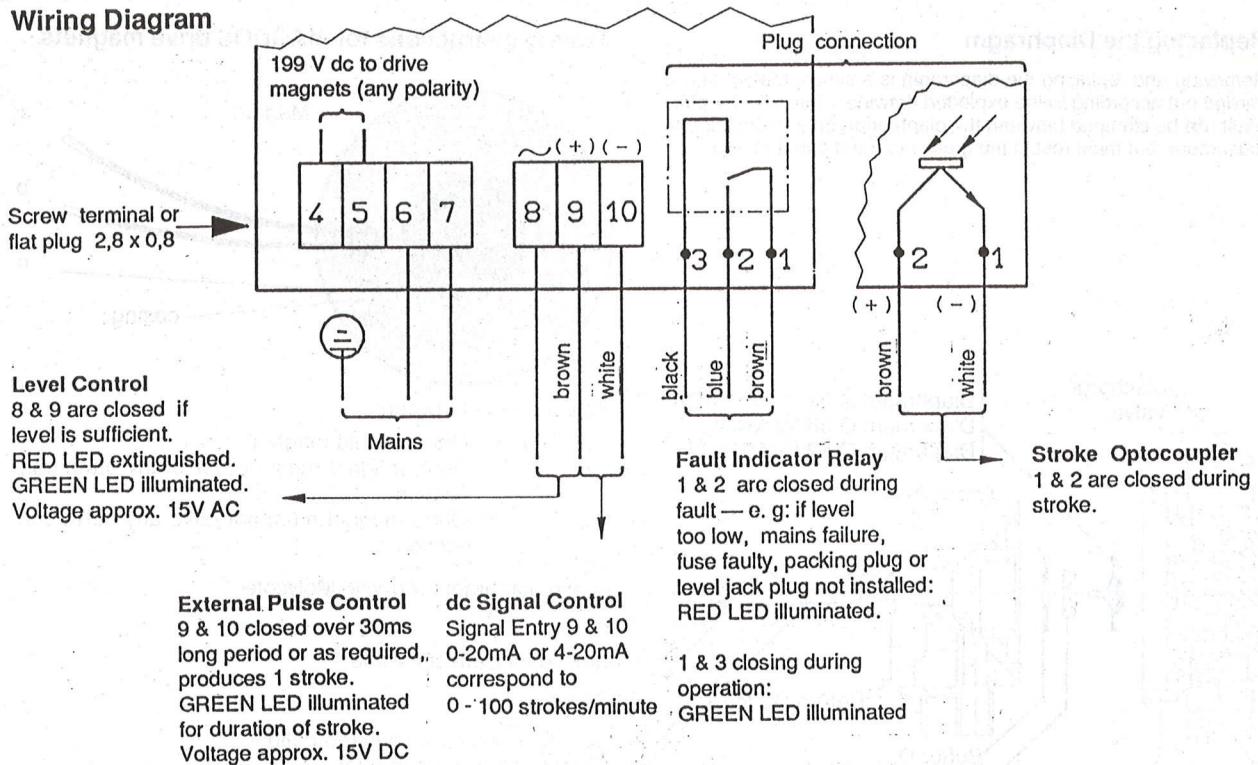
Control Panel



MAGDOS MK up to 12 l/h

BW 1 02 15/4 Operating & Maintenance Instructions

Wiring Diagram



Fault Analysis (for spare parts see ET 1 02 15)

Nature of Fault	Possible Cause	Removal of the Fault
Pump not delivering or output too low	Valves leaking or blocked	Clean valves and bleed pump. (See also commissioning of pump.) See also SD 1 01 03
	Valves are incorrectly installed	Reassemble valves making sure that the valve balls are located above the valve seats.
	Suction valve or intake pipe leaking or blocked	Clean and seal suction pipe.
No stroke movement observed	Pump is on zero stroke	Correctly adjust dosing stroke
	Return spring broken	Replace spring
	Fuse blown	Check power line, fit new 1,6A F fuse
	Magnet defective	Fit new magnet
	Armature fouled	Degrease
Red "Empty" light	Tank empty: level incorrect or dummy plug incorrectly inserted	Top up or check pipes
Frequent diaphragm ruptures See SD 1 01 04	No support mushroom	Fit new diaphragm with support mushroom. When replacing diaphragm, check whether the deflector plate or diaphragm rod have been attacked by splashed medium.
	Diaphragm is not screwed into the diaphragm rod as far as the stop	Screw in new diaphragm as far as stop. Support mushroom must then be clamped between diaphragm and diaphragm rod.
	Pressure too high	Check system. Clean blocked injection point. Reduce pressure peaks in pipes which are too long by fitting pulsation dampers.
Pump delivering too much	Pressure on suction side too high (pump syphoning)	Install pressure sustaining (loading) valve in discharge line.
	Stroke stop shifted	Readjust stop (see page 3)
	Pulse frequency too high	Reduce

If the faults cannot be removed on the basis of the above information, the pump must be returned to the factory or contact your service department to obtain information on additional measures. Repairs are carried out immediately.