

TOSHCON

INSTRUCTION MANUAL

DOSING PUMP

Manufactured By :-

TOSHCON JESCO (INDIA) PVT. LTD.,

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Model

S. No.

1. GENERAL

Toshcon Jesco MAGDOS MD solenoid metering pumps are leakage free, electronically controlled magnetically driven diaphragm pumps for accurate dosing of chemicals. One of the advantageous feature of the magnetically driven pumps is its outstanding ability to respond in proportion to pulse-signals. Each pulse-also a continuous pulse-corresponds to only one metering stroke. As the pumps can be pulsed either by an internal control or by contact closures, optocouplers or 0(4).... 20 mA signals, they can be used in a wide range of applications. Diaphragm pumps are also safe against dry running provided that the remnants of the chemical being pumped does not crystalize within the dosing head when air is introduced.

HOUSING

The complete pump housing is made up of Aluminium alloy to ensure high temperature stability and resistance to fracture. Heat dissipation is augmented by the large vertical cooling fins, by this means high energy density is achieved. These Housing are power coated with rugged chemically resistant epoxy material.

METERING HEAD

The metering head in many respects is the most important part of the pump. It is required to regulate the volume being dozed. It is resistant chemically & abrasively to process media. These are available in highly resistant plastic materials like PVC or PP, also available in stainless steel and teflon material.

MAGNETIC DRIVE

A low noise DC solenoid which can produce a 4 mm maximum stroke, for models up to 12 Lt./Hr. and 6 mm for models up to 100 Lt./Hr. serves as the drive for the metering head. A continuously adjustable, stroke length can be adjusted from 0...4 mm and 0...6 mm depending on the pump size.

DIAPHRAGM

The diaphragm is made up of fabric reinforced rubber, which has a metal part vulcanised into it for attachment to the drive shaft. Rubber used here in its general form and refers to hyplon, Viton or EPDM, that can be protected by Teflon coating.

The main advantage of a diaphragm is that it operates in a

sealed environment so that no poisonous, aggressive & harmful media can escape. The diaphragm itself is usually unaffected by abrasive media.

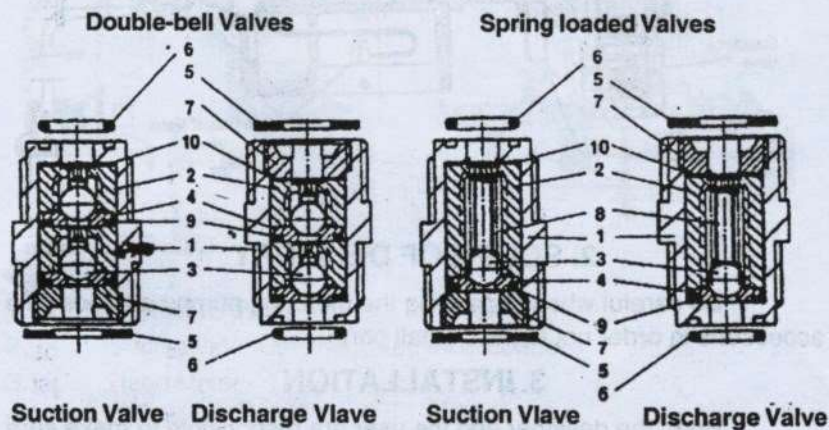
DIAPHRAGM FLANGE

The diaphragm flanges are so designed that if there is a rupture of diaphragm, chemical does not reach the magnetic drive but it is drained off at the bottom. A leakage probe can be provided to the bottom which enables that pump to be switched off when the first drop appears.

VALVES

The suction & discharge valves perform the most important function to ensure that dosing takes place in one direction only & that there is no return flow. These are double-ball type & available in PVC, PP, SS and teflon material.

Suction & Discharge Valves

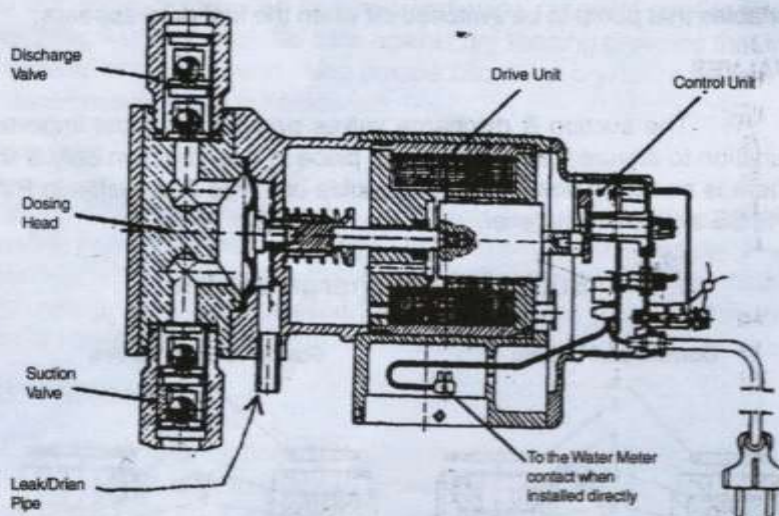


ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1.	Valve Body	6.	O-ring
2.	Ball Guide	7.	Cover Plug
3.	Valve Ball Ø 6.5	8.	Valve Spring
4.	Valve Seat	9.	O-ring
10.	Flat Gasket	11.	Gasket

CONTROL UNIT

The electronic control for the MAGDOS solenoid metering pump allows easy adaption to all requirements of domestic water treatment and waste water treatment. The use of ICs, LEDs, etc. minimizes the number of components and increases reliability. The basic version contains all the necessary standard features.

GENERAL ASSEMBLY OF DOSING PUMP



2. SCOPE OF DELIVERY

Be careful when unpacking the metering pumps and possible accessories in order not to miss small parts.

3. INSTALLATION

Both, the designer and the user are responsible to make sure that the whole plant including the metering pump is constructed so that neither parts of the plant nor building are severely damaged in the case of chemical leakage due to a diaphragm failure or burst tubing. When constructing chemical plants, the installation must be carried out so that no consequential damages appear which are unreasonably high in comparison to the value of the pump. Therefore we recommend to install leakage probes and containment tanks.

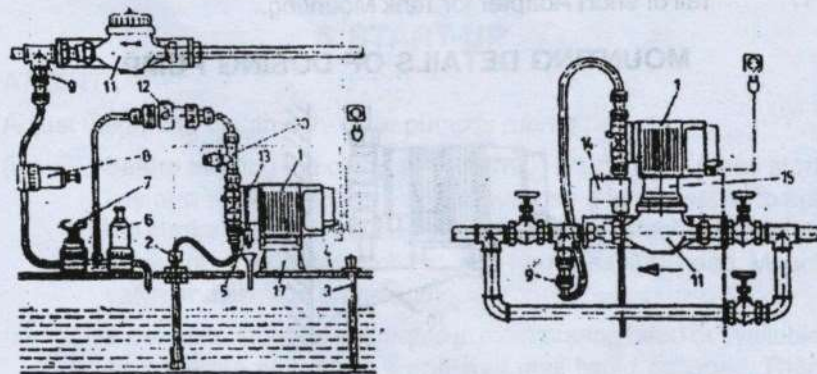
Operating and maintenance personnel should be able to easily access the pump. We recommend to mount the pump on separate wall brackets which should be fixed to outer vessel instead of interior wall

adjacent living rooms etc. It is also recommended to use up to three valve assemblies as shown in installation example in order to increase the metering reliability and accuracy, protect the plant against inadmissible pressures and simplify maintenance. Ambient temperatures exceeding 40° C are not permitted. Radiant heat of apparatus and heat exchangers must be kept in limits allowing the pump to sufficiently carry off its own specific heat. Exposure to direct sunlight should be avoided.

Although the diaphragm metering pumps have protection of class IP65, they should not be installed outside without any roof. The pumps can be mounted directly on chemical tanks, wall brackets or water meters by using an adapter.

Wiring must be carried out by a specialist according to the local regulations.

INSTALLATION EXAMPLE



1. MAGDOS Pump
2. Suction line with integrated level control
3. Hand Mixer
4. Chemical Tank
5. Leakage probe for monitoring the Diaphragm
6. Relief/Safety valve
7. Shut off valve for isolating the pump from the plant
8. Back Pressure valve for Max. Metering Accuracy
9. Injection Fitting with Non-Return Valve
10. Venting as Separate part or integrated in Metering Head
11. Water Meter with Contact Unit
12. Pulsation Dampener for Reducing pressure peaks and smoothing the flow

13. Separation Chamber (Recommended if the media could damage the pump in the case of a diaphragm failure)

ATTENTION

Leakage must be discharged into a collection funnel using a short inclining drain pipe (and can then be returned to the chemical tank). The outlet of the drain pipe must be visible in order to see the leakage.

14. Priming Aid. This equipment allows to easily start up particularly small pumps.

15. Water Meter Spacer

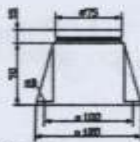
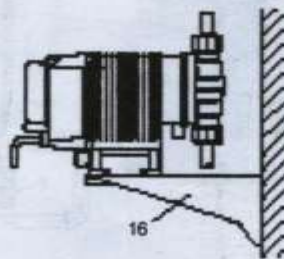
ATTENTION

The spacer is required to avoid the water meter contact that affect the drive solenoid.

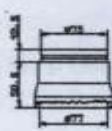
16. Wall bracket

17. Tall or short Adapter for Tank Mounting.

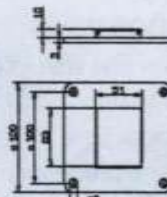
MOUNTING DETAILS OF DOSING PUMP



Pump base
Part No.: 21559

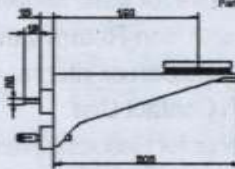
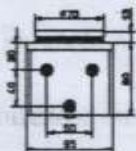


Adapter
Part No.: 21891



Adapter for mounting on standard tanks (max. 600)
Part No.: 20775

for mounting on 400 tanks
Part No.: 20586



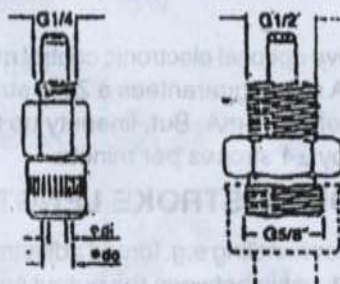
Wall bracket
Part No.: 20582

Mounting kit with 4 screws
Part No.: 25155

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4. INJECTION FITTING ASSEMBLY

Injection nozzles prevent the liquid from returning to the pump by using either a spring loaded ball valve or a hose valve. We recommend vertical injection from bottom to top to allow air to escape thereby avoiding chemical precipitation. Experiences made with the particular metering chemical and all appropriate characteristics must be taken into account.



5. START-UP

ATTENTION

Adjust the stroke length only while pump is running

- (i) Before starting the pump set "internal" (L L L L) or press start key and allow to prime. For this purpose it is advisable to set the stroke to "10". If the pump doesn't prime, remove discharge valve and pour water or chemical (if harmless) into head. Mount valve and allow to prime again.
- (ii) If a venting facility is integrated in the metering head or available as separate unit, open it and wait until liquid escapes. Then close it again. In the case of effervescent liquids allow the liquid to escape permanently (approx. 1 drop for 1.....3 strokes)
- (iii) When correct operation is achieved, set to required output and lock adjusting knob.
- (iv) In case of externally actuated pumps, set pump to "external".

Regulating Unit.

The MAGDOS electronics allow to control the pump with 104 strokes per minute up to 12 Lt./Hr and 74 Strokes per minute up to 100 Lt./Hr capacity models via external pulse signals. Floating and voltfree normally open contact (NOC) of pulse emitters, meters contact water meters or any other contact flow meters can be used for control. Thus external pumps can also be controlled via contacts provided by process. The pump is suitable to serve as a regulating unit for pH, Redox and all other controllers with pulse frequency modulated output.

OUTPUT

The output is dependent upon the viscosity of the fluid and the particular hydraulic installation conditions. For water at 20°C and a suction lift of 0.6m (system is air free) the performance curves are shown. Maximum liquid temperature for PVC heads 35°C, for PVDF and Stainless Steel heads. 50°C.

LINEARITY

The inexpensive optional electronic control module for automatic control with (4)...20 mA signal guarantees a Zero stroke frequency with a direct control signal of 0 or 4mA. But, linearity up to maximum 20mA may deviate typically by ± 4 strokes per minute.

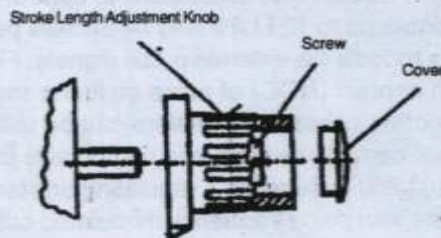
6. CORRECTION OF STROKE LENGTH SETTING

Due to improper handling e.g. forced adjustment while the pump is not running, the relationship between the output and the scale reading may be disturbed. For correction, proceed as follows:

- (i) Switch pump to automatic control at frequency setting = "10"
- (ii) Regardless of the indicator position, turn the left-hand stroke length adjustment knob counter clockwise until the pump no longer delivers, or in the case of no pressure delivery, had reached the min. flow rate. Switch off the pump.
- (iii) Remove the protective cover from the stroke length adjustment knob and loosen the screw.
- (iv) Adjust the knob so that indicator is pointing to "0" and with the knob tightly, held at a scale distance of 0.5 mm. fasten the screw. Replace cover. If necessary, run pump according to a setting from the output table. If there is a major discrepancy, correct the knob position.

ATTENTION

If zero delivery could not be attained because the knob reached the stop position remove the knob after loosening the fastening screw, turn it to the right and reattach it. Then turn again to the left until the pump no longer deliver.

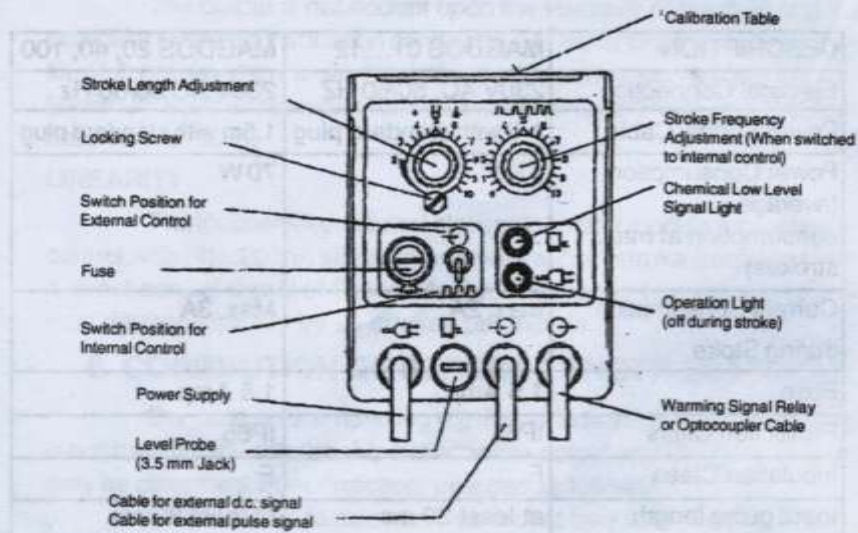


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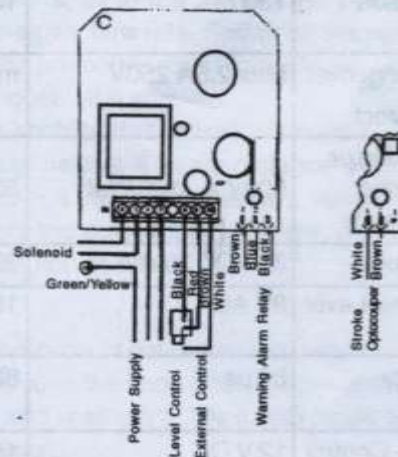
7. TECHNICAL DATA

DESCRIPTION		MAGDOS 01....12	MAGDOS 20, 40, 100
Electical Connection		230V AC, 50/60 HZ	230V AC 50/60 Hz
Power Supply Cable		1.5 with standard plug	1.5m with standard plug
Power Consumption (average consumption at max. strokes)		33 W	70 W
Current Consumption during Stoke		max. 2A	Max. 3A
Fuse		1.5 Amp.	1.5 Amp.
Protection Class		IP65	IP65
Insulation Class		F	F
Input pulse length required to triger a stroke		at least 30 ms	at least 30 ms
Solenoid Excitation Time per Pulse		130 ms	190 ms
Warning Alarm Relay	Changeover Contact	Max 2.5A 250V	max. 2.5A 250V
	Making or braking Capacity	500V A 100 Watt	500 V A 100 Watt
Stroke Optocoupler		30 VDC 20 mA	30 VDC 20mA
Voltage to the low Level Probe		9V AC	15V AC
Min. Conductivity Required		80 μ s	80 μ s
Voltage to pulse Control		12 V DC	15 V DC
Resistance for Input 0(4)....20mA		200 Ohm	200 Ohm

8. CONTROL PANEL MAGDOS MD 230 V AC/50 HZ



9. WIRING DIAGRAM



Level Control :

8 & 9 level sufficient
 Red LED off.
 Green LED on
 Voltage approx, 9 V AC & 15 V
 AC External pulse Control
 9 & 10 closed over 30 ms period.

Warning Alarm Relay :

1 & 2 closed in case of failure, e.g.
 low level, power supply failure.
 defective fuse, dummy plug or
 level detector jack plug not
 inserted
 RED LED on.

produces 1 stroke. Green LED off during pulse
 Voltage approx 12 V DC & 15 V
 DC signal Control
 Signal entry 9 & 10
 0...20 mA or 4...20 mA
 correspond to 0 ... 100 stroke/min
 & 0...70 stroke/min.

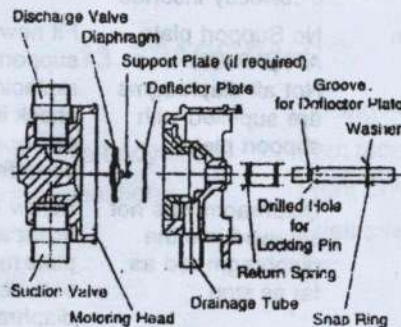
1 & 3 closed during operation.
 Green LED on.
 Stroke Optocoupler
 1 & 2 closed (low resistance) during stroke.

10. REPLACING THE DIAPHRAGM

The diaphragm can be easily removed and replaced according to the exploded drawing. To facilitate removal of the diaphragm, first set the stroke to "0" while 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 drainage channel.

Grease diaphragm rod with Molycote.

The deflector plate must rest in the diaphragm rod groove. Ensure that it is not clamped between the diaphragm rod and the support plate. Clean or replace the support plate before mounting it.



11. TROUBLE SHOOTING

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 ball are Located above valve seats.
	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 tube cross-section Use special metering head. Contact TOSHCON JESCO
No Stroke Movemet observed	Pump set to zero stroke Diaphragm return spring broken Fuse blown, LED's off Solenoid defective	Correctly adjust pump stroke Replace spring Check power supply line Replace fuse. Check coil resistance and isolation. Replace solenoid if required.
Low liquid level indication Red LED on.	Feed tank empty level incorrect or dummy plug incorrectly inserted	Fill tank or check suction line
Frequent diaphragm failures	No Support plate ATTENTION Not all diaphragms are supplied with support plates. Diaphragm was not screwed into the diaphragm rod as far as stop Back pressure too high (Measured at discharge connection of pump)	Fit new diaphragm with support plate when replacing diaphragm. check if deflector plate or diaphragm rod have been corroded by pumped fluid Screw in new diaphragm as far as stop. Support plate must then be clamped between diaphragm and diaphragm rod. Check system. Clean blocked injection nozzle Reduce Pressure peaks resulting from extremely long tubes by installing pulsation dampeners.
Pump delivering too much	Media sediments in head Pressure on suction side too high (pump siphoning) Stroke stop shifted Stroke frequency too high.	Flush metering head Install back pressure valve in discharge line. Ajust Stroke Adjuster Reduce frequency

If the problem cannot be corrected on the basis of the above data, contact out After Sale Service Officers or return the pump to the factory. Repairs will be carried out immediately.

ATTENTION

If the maintenance of the pump is not carried out properly as recommended, TOSHCON JESCO will not be responsible for any guarantee/ warrantee.

12. RECOMMENDED ACCESSORIES

- | | | | |
|-----|--------------------|-----|---|
| (1) | Foot Valve | (2) | Injection fittings |
| (3) | Pulsation Dampener | (4) | Pressure Relief Valve |
| (5) | Level Sensor Probe | (6) | Pentablock |
| (7) | Priming Aid | (8) | Metering Head Venting attachment (For effervescent media) |

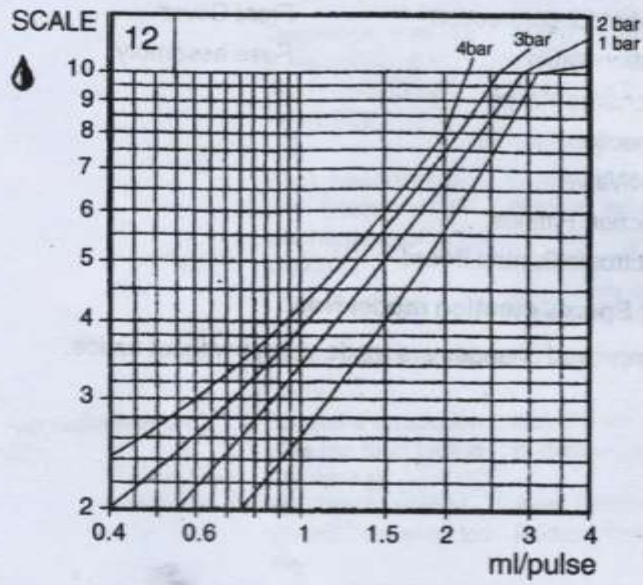
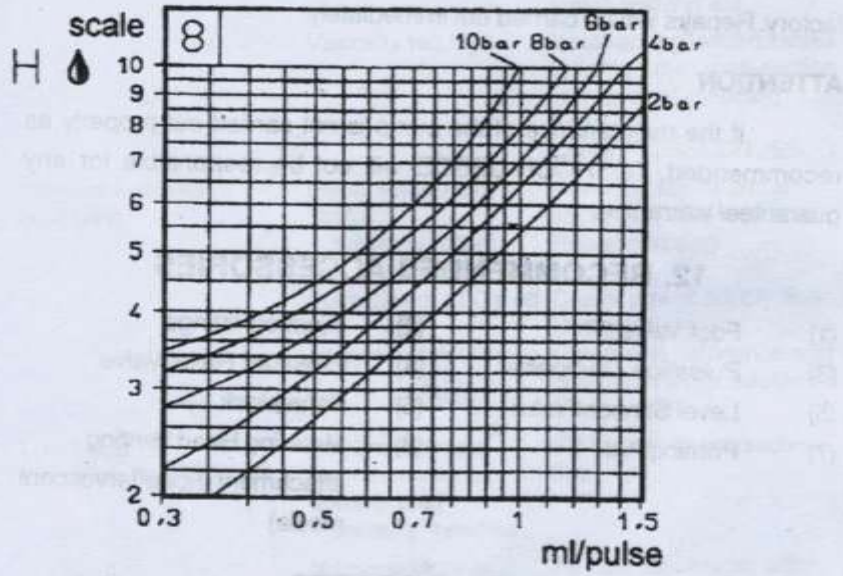
13. SPARE PARTS

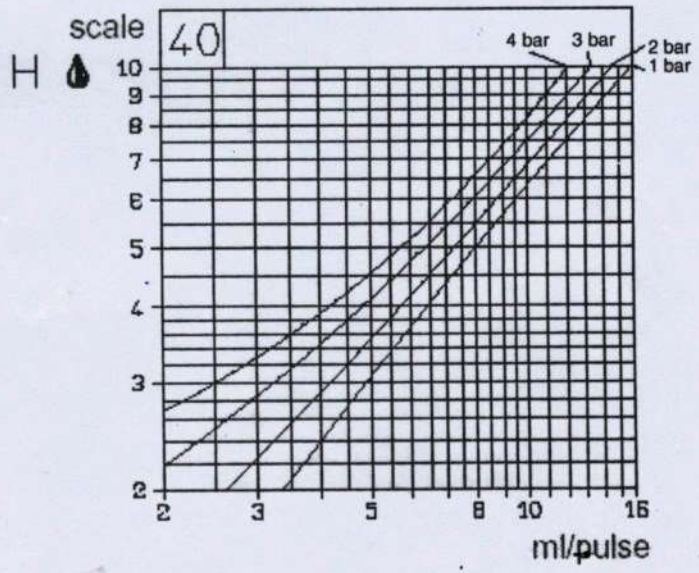
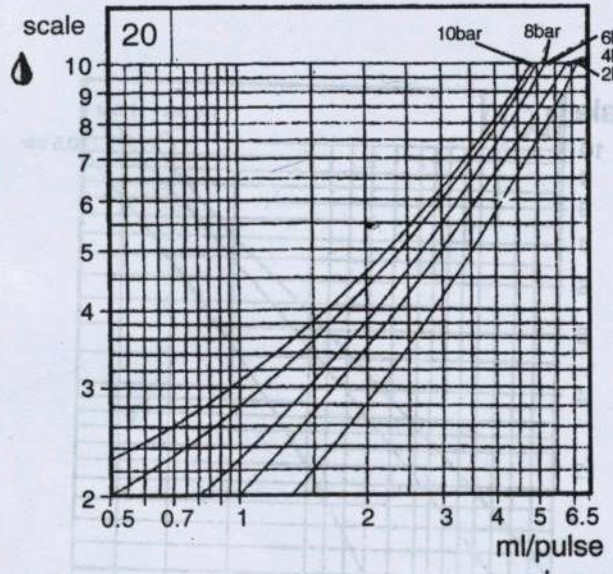
Diaphragm	Dosing head
O-rings for valve body	Foot mounting
Gasket for connection	Front Cover
Suction Valve	Fuse assembly
Discharge Valve	
Conection	
Foot Valve	
Injection Fittings	
Electronic Control Board	

For Spares mention model Nos.

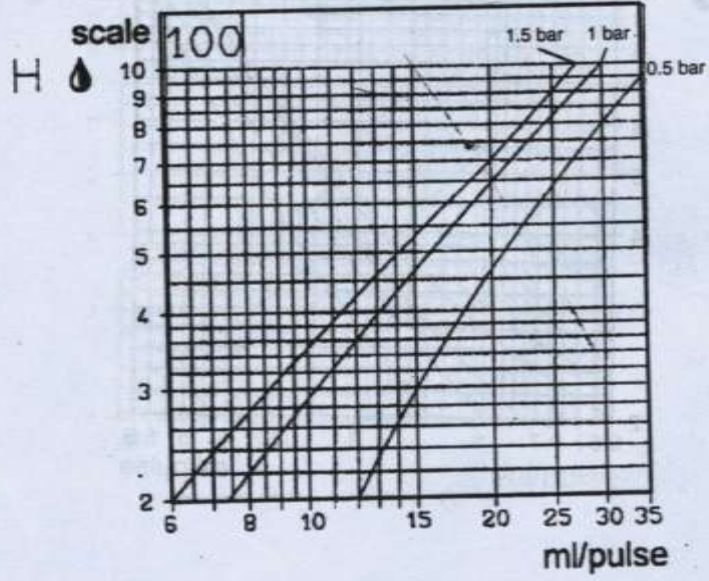
Note :- Improved changes are made always without notice.

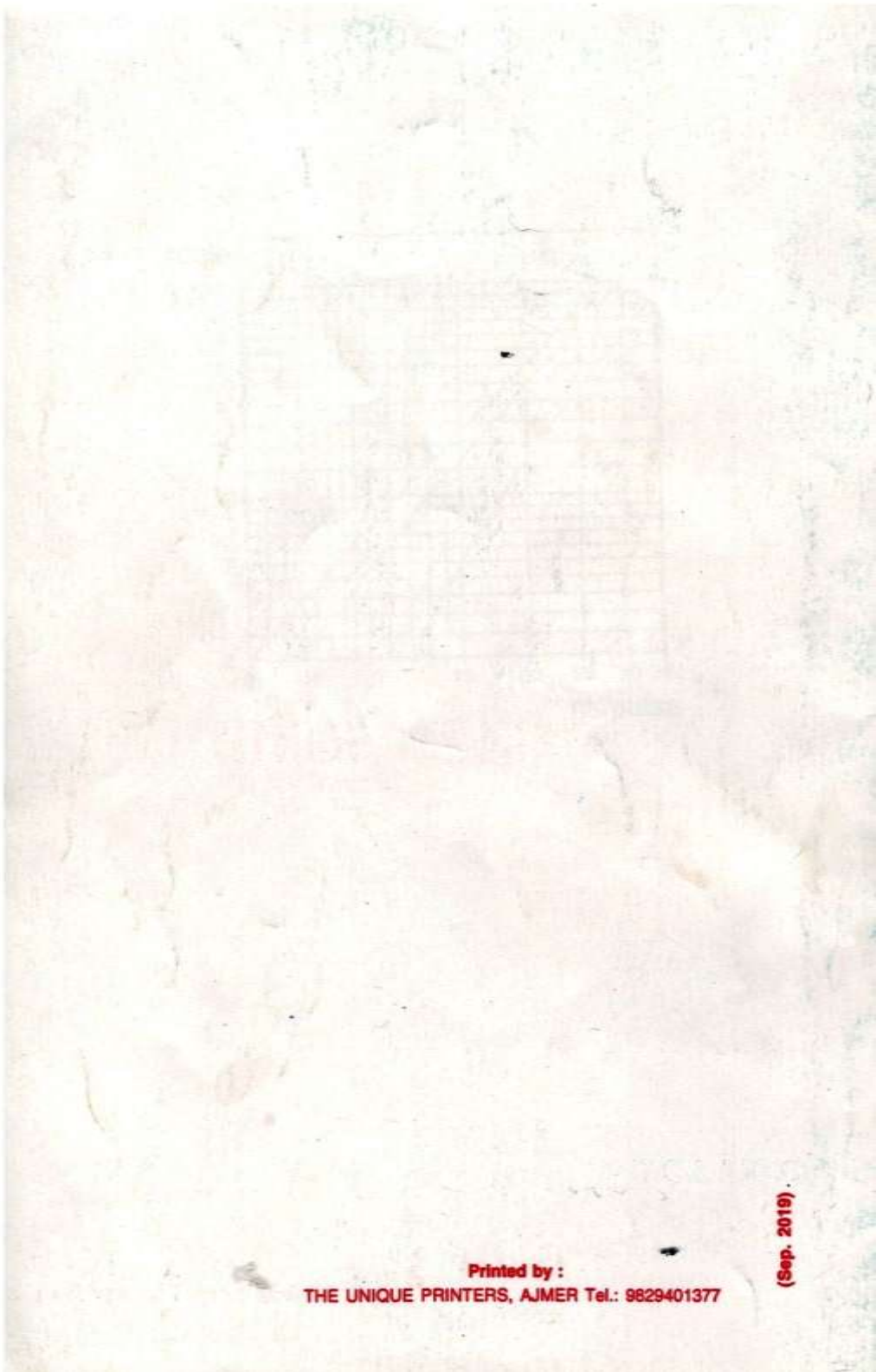
14. STANDARD PERFORMANCE CURVES





14 STANDARD PERFORMANCE CURVES





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