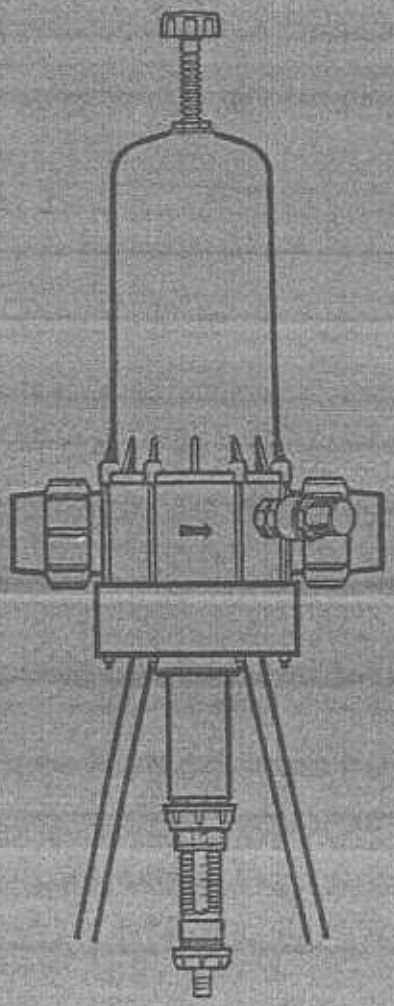
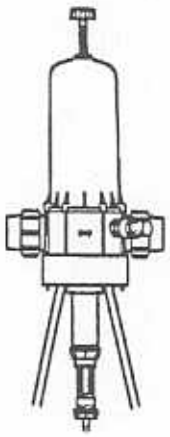
DOSATRON®
INTERNATIONAL



PROPORTIONAL INJECTOR D 20 S

USER'S GUIDE

SUMMARY



SPECIFICATIONS

- Practical operating **flow range** : 220 to 4400 I.G.P.H. (1 m^3/h to 20 m^3/h)
- Hydraulic motor **capacity** : (About 1.1 Imp. Gal (5 L) for every 2 clicks of the piston
- Operating **pressure** : 2 p.s.i. to 140 p.s.i. (0,12 Bar to 10 Bar) at a temperature lower than 40°C. (105° F)

- Adjustable **ratios** : 1 : 500 to 1 : 50 (0,2 % to 2 %)
- Mesh filter at water inlet
- Mixing chamber
- By-pass

} Incorporated

- **Pipe connections** : 2" diam (ø 63 mm)

Maximum operating temperature : 40°C (105° F)

UNIT SIZE

Total height including legs : 55" (140 cm)
of which motor : 26½" (67 cm)
injector : 16" (41 cm) max.
Overall width : 15" (38 cm)
Weight : 40 lb (18 kg)

SHIPPING CONTENTS

- 1 Proportional Injector D20S
- 1 set of legs
- 1 suction intake tube ¾" int. diam x 1⅛" ext. diam (ø 20 x 28)
- 1 vacuum-breaker valve + connecting nipple
- 1 strainer

SHIPPING SIZE

- 40" x 17" x 13½" (1m x 0,43 m x 0,34 m)

SHIPPING WEIGHT

- 50 lb (23 kg)

CHAPTER 1

INSTALLATION

RECOMMENDATIONS

I°/ *GENERAL REMARKS*

- In a case where the irrigation installation is higher than the proportional injector itself, there is a possible risk of water flowing back through the unit. So it is recommended to install a non-return valve, downstream.
- Do not install the unit above an acid container. (Risk of acid fumes attacking the injector).
- Do not install the injector on the suction side of the supply pump. (Risk of Siphoning).
- The injector should be protected from frost and from sources of excessive heat.
- The maximum operating temperature, without reduction of working specification, is 105° F (40°C). Between 105°F and 140° F (40°C and 60°C) the working pressure should not exceed 85 p.s.i. (6 bar).

II°/ *ASSEMBLY SHOULD BE CARRIED OUT WITHOUT TOOLS*

Except for fitting the vacuum breaker valve (for which a spanner or wrench will be required) and the suction intake tube (screwdriver).

III°/ *CLOUDY WATER*

In the case of cloudy water, it is **imperative** to install a 300 micron - 50 mesh filter upstream of the unit.

IV°/ *WATER HAMMER*

- For installations subject to water-hammer it is necessary to install a protection device.
- For automatic installations, slow opening solenoid valves are preferable.
- For installations in differents plots, operate the valves in cross mode, i.e. as one opens, another one closes.

ASSEMBLY OF THE D 20S

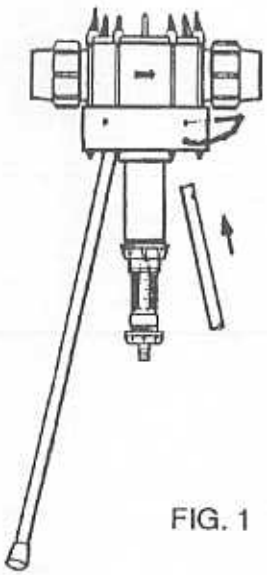
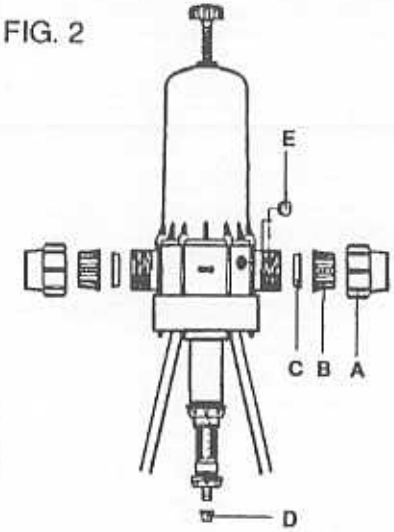


FIG. 1

- Insert the legs into the corresponding holes in the body **(Fig. 1)** and secure them by means of the 4 cotter pins attached to the body.

FIG. 2



- Remove the nuts **(Fig. 2 - Item. A)** and ferrules **(Fig. 2 - Item. B)** from the water inlet and outlet.

- Remove the protective caps from the water inlet and outlet **(Fig. 2 - Item. C)**, from the injector concentrate intake **(Fig. 2 - Item. D)** and from the body **(Fig. 2 - Item. E).**

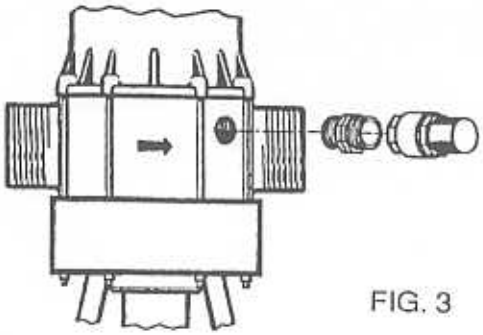


FIG. 3

- Wrap several turns of P.T.F.E. (Teflon) tape round the threads of the adaptor nipple.
- Screw the nipple into the vacuum-breaker valve.
- Screw the assembly into the body **(Fig. 3).**

CONNECTING TO THE WATER SUPPLY

For connecting to polyethylene or polypropylene pipe :

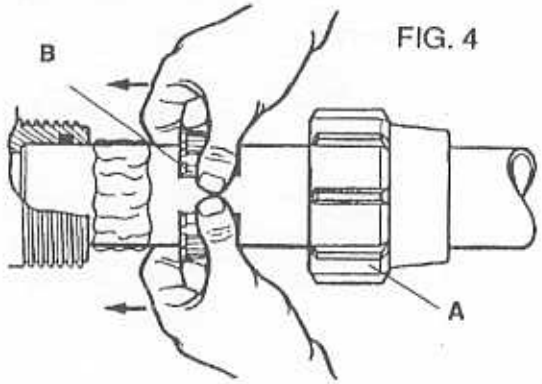
- Bevel the end of the pipe and slide on nut **A** and then ferrule **B.**
- Slide pipes into water inlet and outlet **(Fig. 4).**
- The bevel on the pipe eases its introduction
- **Make sure** the pipe has been pushed past the "O" ring which ensures a watertight seal.
- Hand-tighten the nut.

For connecting to PVC pipe :

- Proceed as for the polyethylene and polypropylene pipes but before sliding the ferrules into position spread PVC adhesive on the pipe where the ferrules are to be mounted.
- Then place the ferrules over the pipe using both thumbs in the slot to widen the ferrule and avoid scraping off the adhesive **(Fig. 4).**

Then hand tighten the nut.

FIG. 4



NOTE : Wait for 1 hour before putting into operation. The nut and ferrule will not adhere to the PVC glue and they can therefore be dismantled easily at a later date.

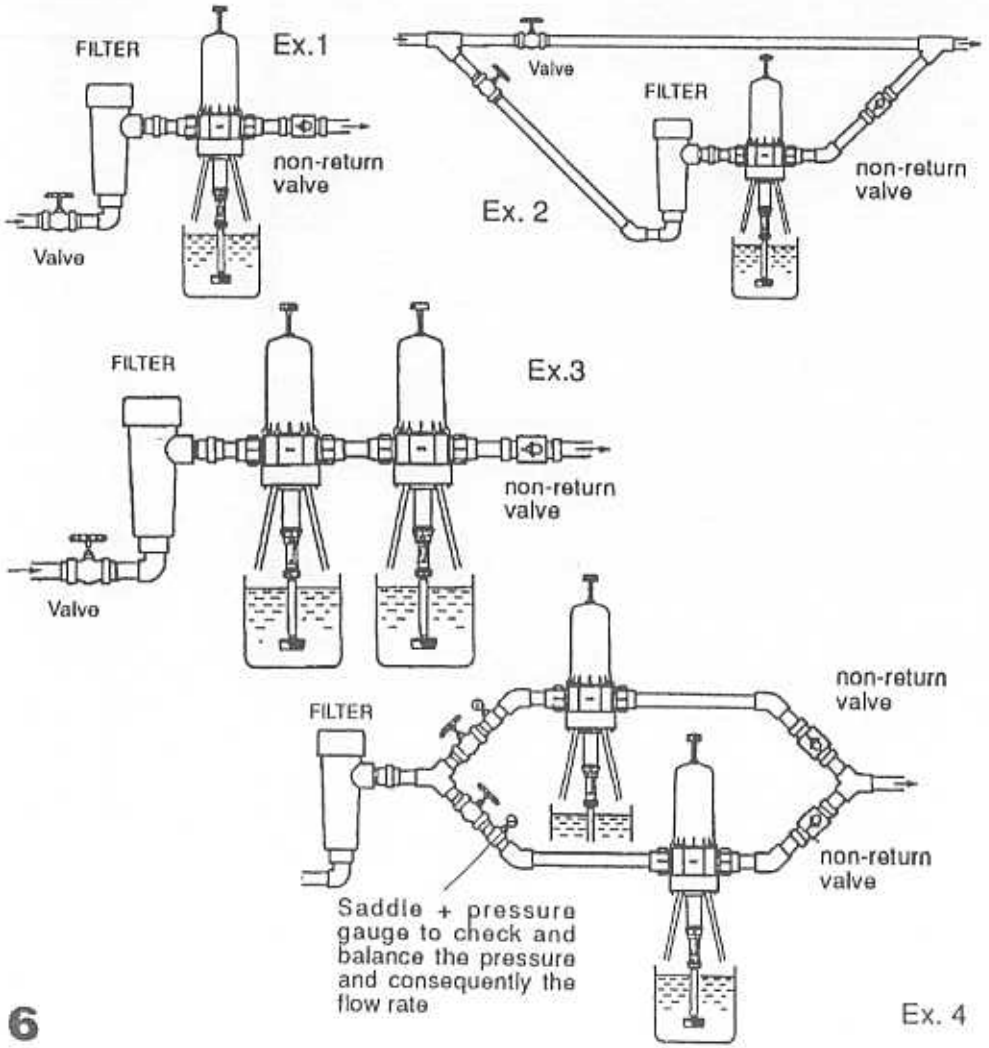
FOR INFORMATION : **PVC pipes are dry to the touch, if you burn a portion of it you will notice that it does not burn easily and gives off thick black smoke.**

- When connecting the injector to the water supply, be sure the water flows in the direction of the arrow on the motor body.

WHEN CONNECTING AN IRRIGATION SYSTEM EITHER TO THE PUBLIC WATER SUPPLY OR TO ITS OWN WATER SOURCE, YOU MUST RESPECT THE REGULATIONS IN FORCE CONCERNING PROTECTION OF THE SOURCE I.E. BACKFLOW PREVENTION, ETC.

INSTALLATION HINTS

The units can be connected directly to the main water line **(Ex. 1)**, or on a by-pass **(Ex. 2)**. They can be mounted in series **(Ex. 3)** depending on the needs of your installation.
If your flow rate is above the operating limits of the injector, you can mount a second unit in parallel **(Ex. 4),** which enables you to double your injection capacity. All of our models can be mounted in this way. **WARNING ! A balanced parallel system is difficult to achieve.**



Ex. 4

CHAPTER 2

PUTTING THE INJECTOR INTO OPERATION

RECOMMENDATIONS

MAXIMUM FLOW

If your injector clicks more than **32 times**, that is **16 cycles** in **15 seconds**, you have exceeded MAXIMUM FLOW ; you must install a second unit in parallel (See page 6).

PUTTING THE INJECTOR INTO OPERATION

- Screw the by-pass knob halfway down.

- Connect the suction tube fitted with its strainer to the injector and immerse it in the stock solution tank.

IMPORTANT ! **- Ensure that the strainer is a least 4" (10 cm) above the bottom of the tank to avoid sucking up the insoluble particles that may damage the injector assembly (Fig. 5).**

- Do not put the strainer on the ground.

- Slowly turn on the water.

- As soon as water is seen to flow from around the screw thread of the by-pass knob, fully unscrew the knob.

- The time required to prime the unit depends on the water flow. To purge the air from the suction tube, set the injection rate at 2% (1 : 50). Once the unit is primed, adjust to the required injection ratio.

- Ensure that the suction intake tube is correctly fastened to the barbed fitting so as to be airtight.

WHAT YOU SHOULD DO

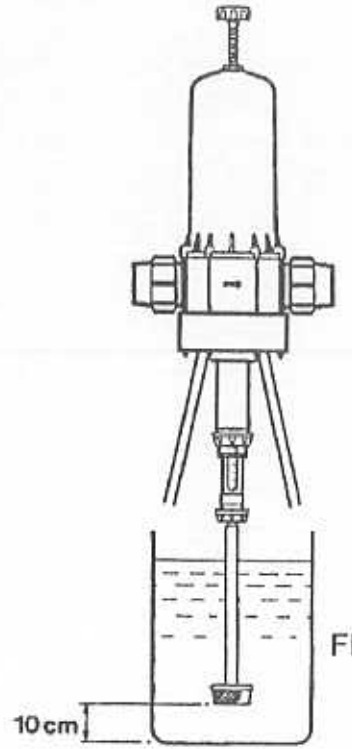


FIG. 5

WHAT YOU MUST NOT DO

UNDER NO CIRCUMSTANCE SHOULD THE SOLUTION LEVEL BE ABOVE THE WATER INLET.

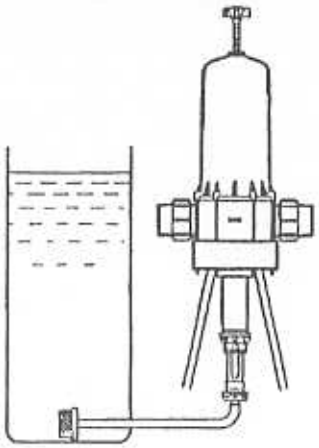


FIG. 6

INCORPORATED BY-PASS :

A mechanism to either start or stop the injection of the stock solution.

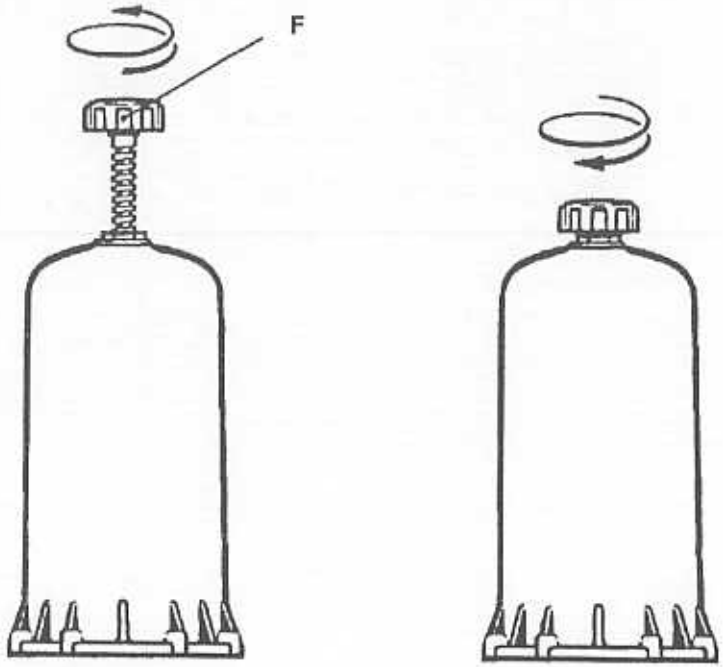


FIG. 7a

FIG. 7b

Injection mode :

- Unscrew fully the by-pass knob on the top of the unit **(Fig. 7a - Item. F).**
- The hydraulic motor is set in motion and a noticeable "clicking" noise can be heard.

By-pass mode :

- Screw down the by-pass knob as far as possible **(Fig. 7b).**
- The injection stops (no motor noise). The irrigation water continues to pass through the unit.

NOTE ! It is normal that water leaks from around the by-pass knob thread in the intermediate position.

ADJUSTING THE INJECTION RATIO

IMPORTANT ! USE NO TOOLS

Ratio adjustements must be made when there is no pressure in the unit.

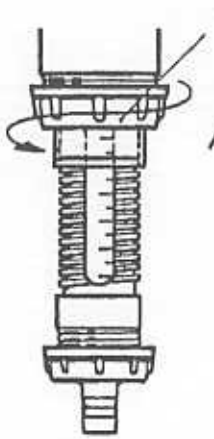


FIG. 8a

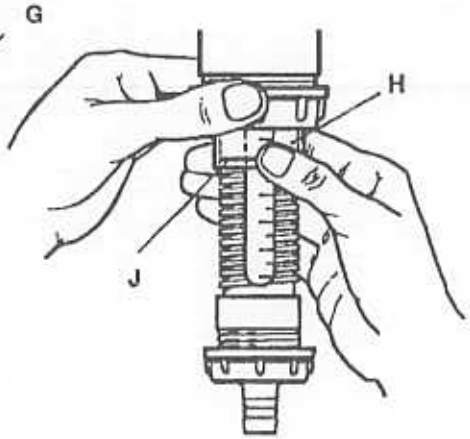


FIG. 8b

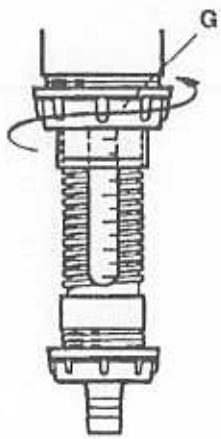


FIG. 8c

1°) - Loosen the nut **(Fig. 8a - Item G)**

2°) - Hold it while screwing or unscrewing the transparent nut **(Fig. 8b - Item. H)**

3°) - Align the black line on the transparent nut with the required injection ratio indicated on the graduated scale **(Fig. 8b - Item. J)**

4°) - Tighten the nut **(Fig. 8c - Item. G)**

HOW TO DRAIN THE UNIT
(In case of frost risks).

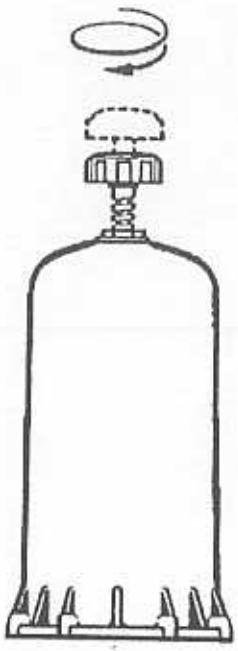


FIG. 9

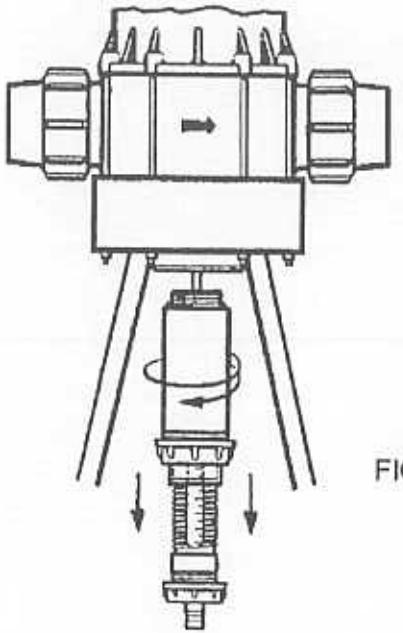


FIG. 10

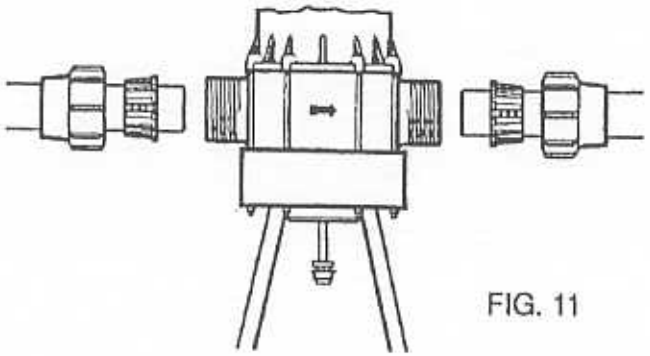
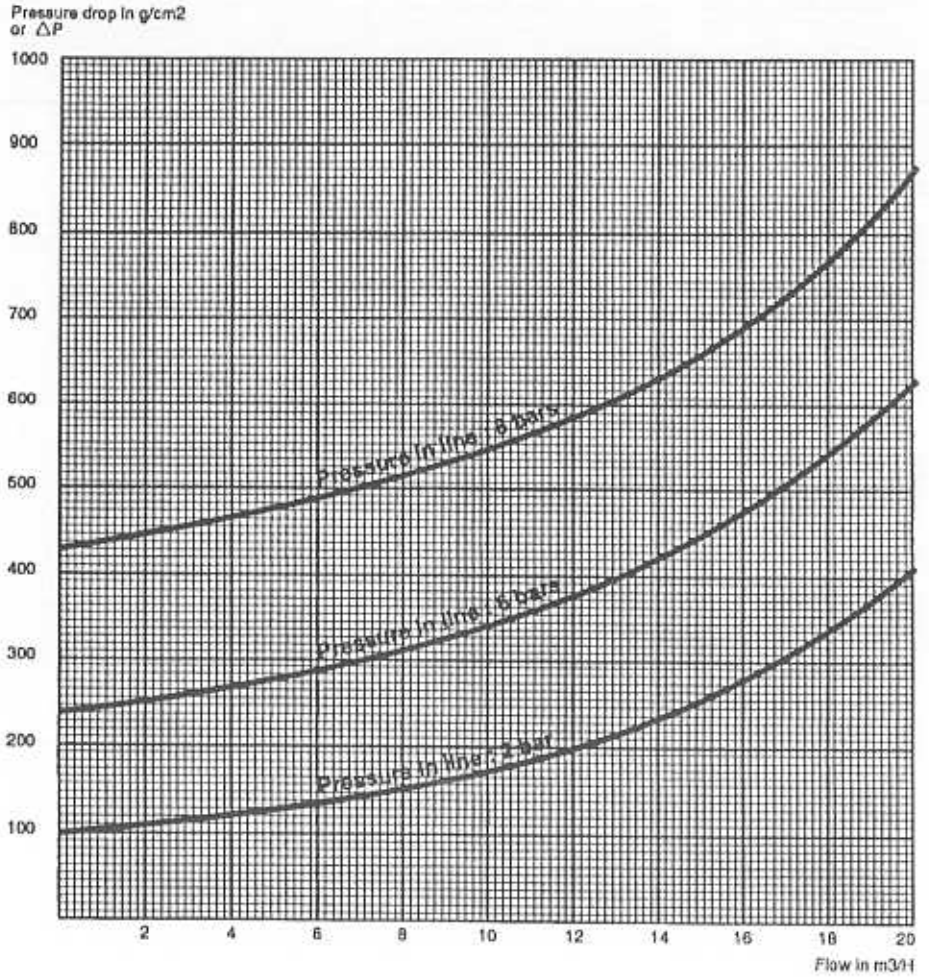


FIG. 11

1°) - Close the valve upstream of the unit
2°) - Allow the pressure to drop
3°) - Close the valve downstream of the unit
4°) - Once the valves upstream and downstream of the unit have been shut off :
- Screw the by-pass knob halfway down **(Fig. 9)**.
- Unscrew and remove the injection assembly **(Fig. 10)**
- Disconnect the unit from the pipeline **(Fig. 11)**

It is preferable to take the injector under cover to drain it.

FLOW/PRESSURE DROP CURVE OF THE D 20 S



CHAPTER 3

MAINTENANCE

RECOMMENDATIONS

I°) When using soluble products to be made up into solutions, it is recommended to periodically dismantle the entire injecting portion, copiously rinse it with water and re-assemble it after having previously lubricated the seal Ref. 20J011 **Fig. 12** with a silicone lubricant.

II°) An air inlet, an impurity or a seal's failure can interrupt the injecting function; periodically check out that the product is correctly drawn up, thus incorporated into the water.

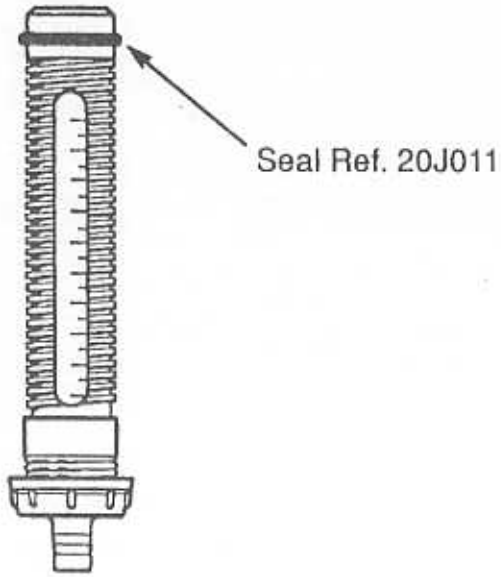


FIG. 12

CHANGING SEALS IN THE INJECTION ASSEMBLY

IMPORTANT ! USE NO TOOLS

I°) - CHANGING THE PISTON PLUNGER SEAL

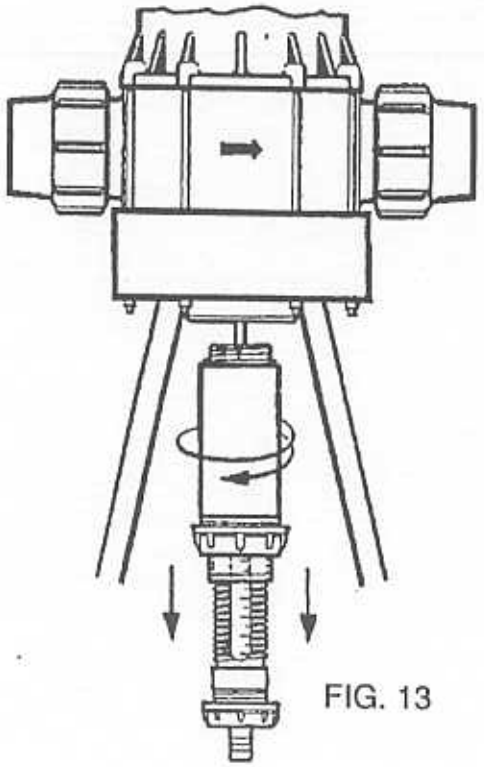


FIG. 13

Unscrew and remove the injection assembly **(Fig. 13)**

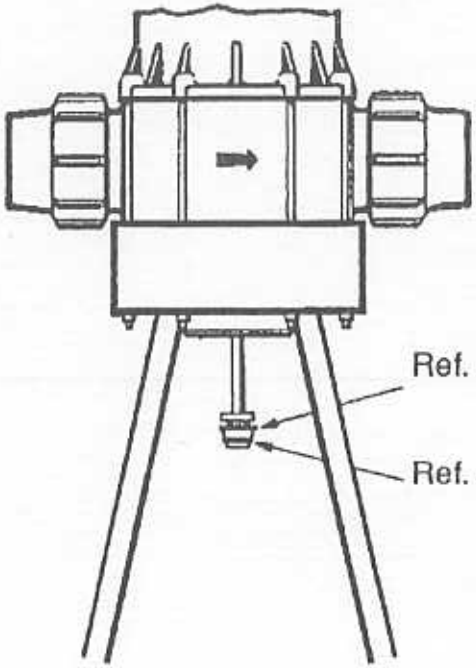


FIG. 14

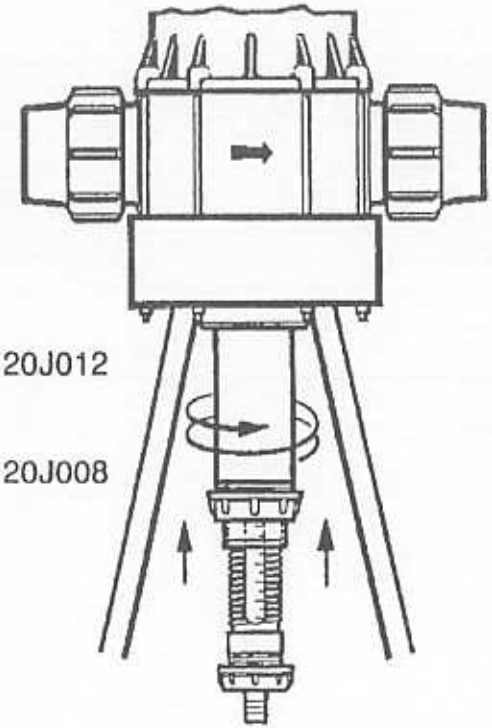


FIG. 15

- Change the rectangular section seal **Ref. 20J012** and the "O" - Ring **Ref. 20J008** (plunger pin retainer).

- Replace the injection assembly. Take care not to damage the screw thread.

II°) - CHANGING SUCTION VALVE SEALS

L = Short valve
M = Long valve

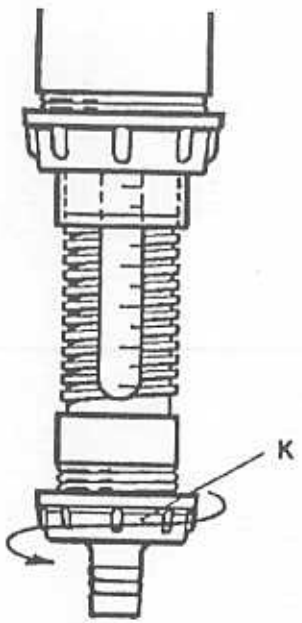


FIG. 16

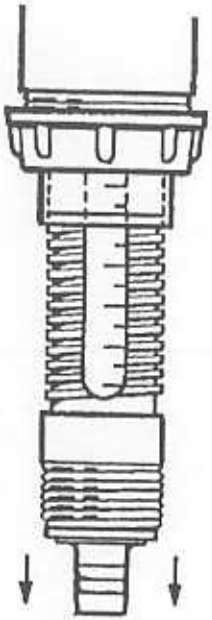
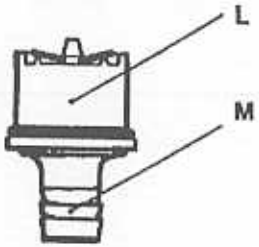


FIG. 17



Valve assembly

1°) - Unscrew the black plastic nut **(Fig. 16 - Item K)** and pull downwards **(Fig. 17)** to remove the valve assembly.

2°) - Remove the seal **Ref. 20J014** at the top of the short valve L **(Fig. 18)** and replace it **(Fig. 19).** To position it correctly hold it as shown in **Fig. 19**, and turn it around the valve nipple until it seats in position underneath it. Take care not to damage the circular ridge against which the seal closes.

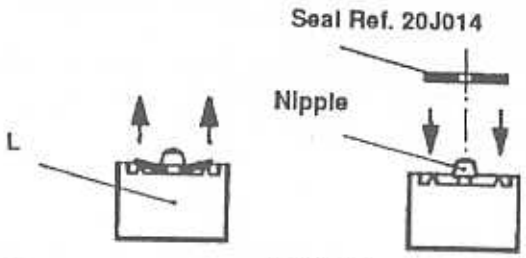


FIG. 18

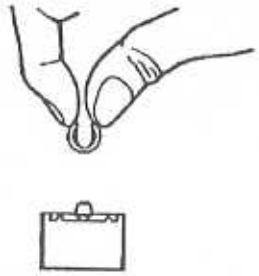


FIG. 19

3°) - Change the seal **Ref. 20J014** of the long valve in the same way as for the short valve **(Fig. 20).**

- Change the "O" - ring **Ref. 20J015 (Fig. 20).**

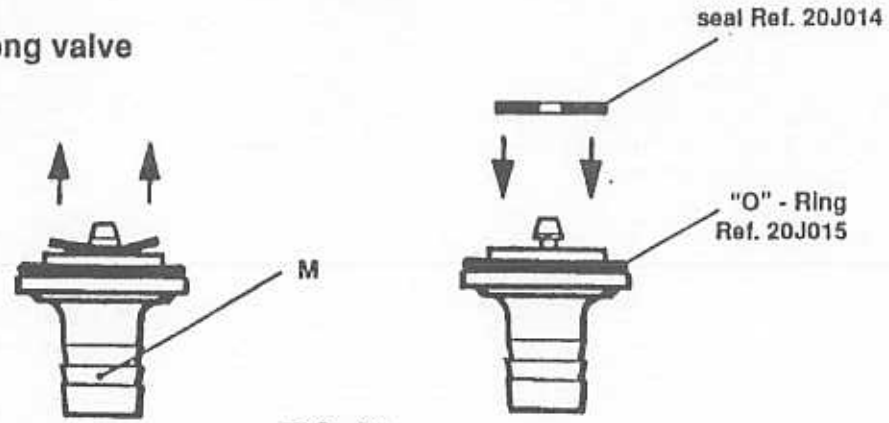


FIG. 20

RE-ASSEMBLY

- Insert the short valve into the injector body, followed by the long valve **(Fig. 21).**
- Screw on the black nut. **(Fig. 22 - Item K)**

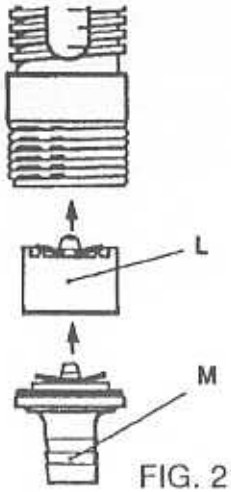


FIG. 21

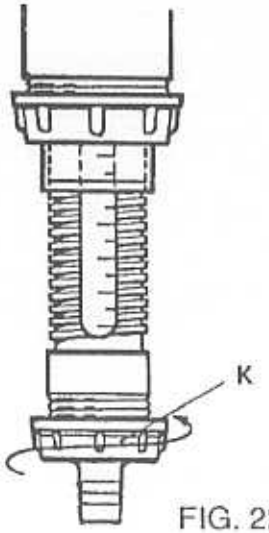


FIG. 22

FAULT FINDING

FAULTS	DIAGNOSIS	REMEDIES
1 - MOTOR INCIDENTS YOUR INJECTOR DOES NOT START OR STOPS		Check that your installation allows correct operation of the injector. e.g. Direction of flow.
		Check that the water is ON or that the solenoid valves are energised. (switched on)
	The air has not been bled from the unit	See CHAPTER PUTTING THE PROPORTIONAL INJECTOR INTO OPERATION p.11
	Maximum flow exceeded	Reduce the flow, and put again into operation.
	Damage in the motor mechanism.	Return the unit to your supplier.
2 - INJECTION INCIDENTS WATER FLOWING BACK INTO THE SOLUTION TANK	Worn out or contaminated seals.	Change the seals in the injection assembly (see p. 17,18 & 19).
NO SUCTION OF PRODUCT	The hydraulic motor is stopped.	See above. MOTOR INCIDENTS
	Check out the suction height. (important : the limit is 4 m)(13 feet).	Reduce it if necessary.
	Air intake in the suction pipe.	Check the tightening of the hose clips
	Blocked suction tube or clogged up strainer.	Clean these items (important : Avoid putting the strainer at the bottom of the drum. Always leave a minimum of 10 cm) (4").
UNDER INJECTION	Suction of air Suction pipe incorrectly primed.	Prime the suction pipe.
	Maximum flow exceeded.	Reduce the flow
	Worn plunger or plunger seal.	Change.
	Worn injector body.	Change.
3 - LEAKS CONNECTION LEAKS	Seal is badly positioned or cut.	Position it correctly or replace it.
	Pipe is not correctly inserted.	Insert it correctly.

This document does not form a contractual engagement on the part of DOSATRON INTERNATIONAL and is for information only.
The company reserves the right to alter product specification or appearance without prior notice.

WARRANTY

DOSATRON INTERNATIONAL, will replace any part considered as originally defective during the first 12 months from the date of purchase.

This guarantee will operate provided that the faults noted do not come from defective installation or misuse of the proportional injector.

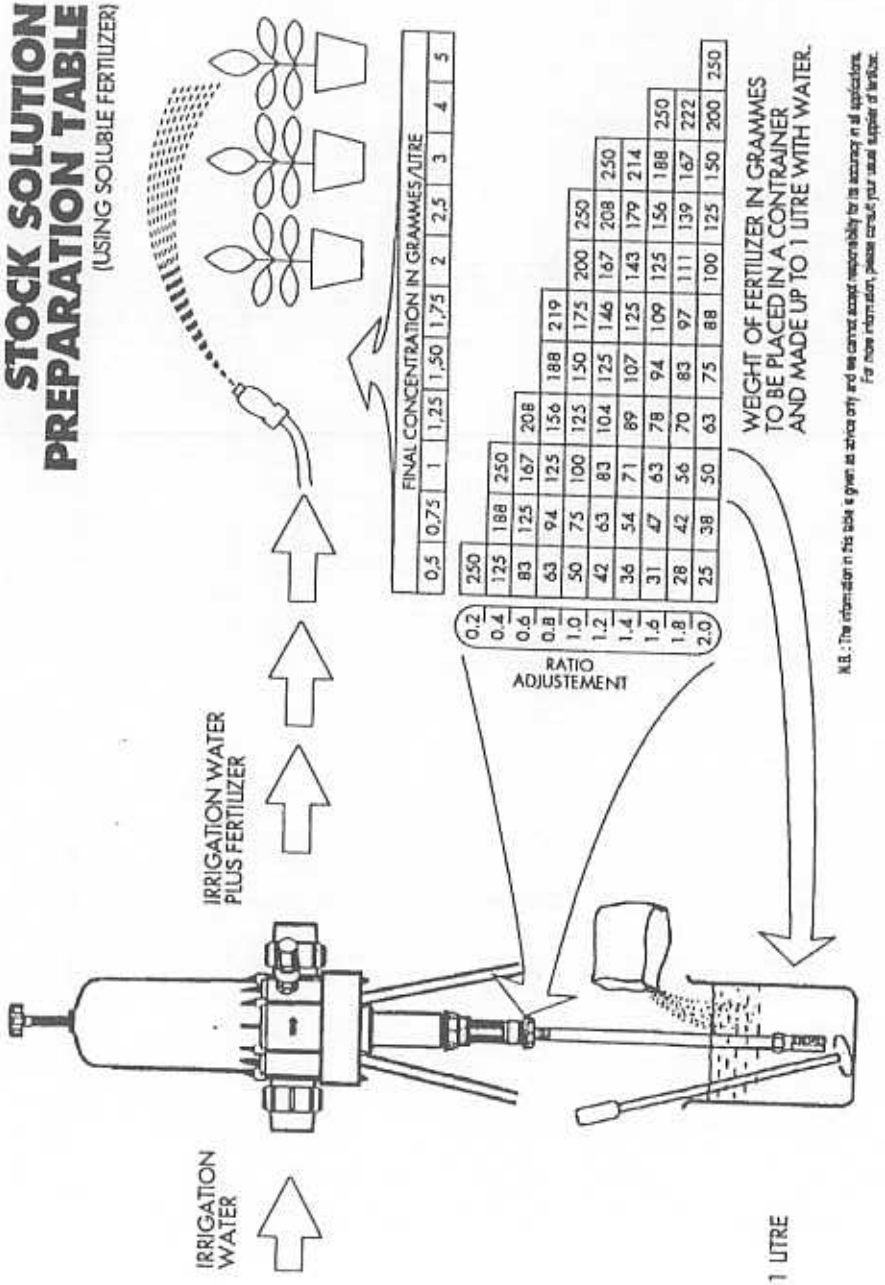
Any damage caused by the use of a tool will not be covered by the manufacturer's warranty.

DOSATRON INTERNATIONAL

DECLINES ALL RESPONSIBILITY IF THE PROPORTIONAL INJECTOR IS USED UNDER CONDITIONS OUTSIDE OF ITS OPERATING TOLERANCE AS INDICATED HEREIN.

STOCK SOLUTION PREPARATION TABLE

(USING SOLUBLE FERTILIZER)



FINAL CONCENTRATION IN GRAMMES/LITRE									
0,5	0,75	1	1,25	1,50	1,75	2	2,5	3	4	5

RATIO ADJUSTEMENT	WEIGHT OF FERTILIZER IN GRAMMES TO BE PLACED IN A CONTRAINER AND MADE UP TO 1 LITRE WITH WATER.									
0.2	250	125	188	250						
0.4	125	83	125	167	208					
0.6	83	63	94	125	156	188	219			
0.8	63	50	75	100	125	150	175	200	250	
1.0	50	42	63	83	104	125	146	167	208	250
1.2	42	36	54	71	89	107	125	143	179	214
1.4	36	31	47	63	78	94	109	125	156	188
1.6	31	28	42	56	70	83	97	111	139	167
1.8	28	25	38	50	63	75	88	100	125	150
2.0	25									

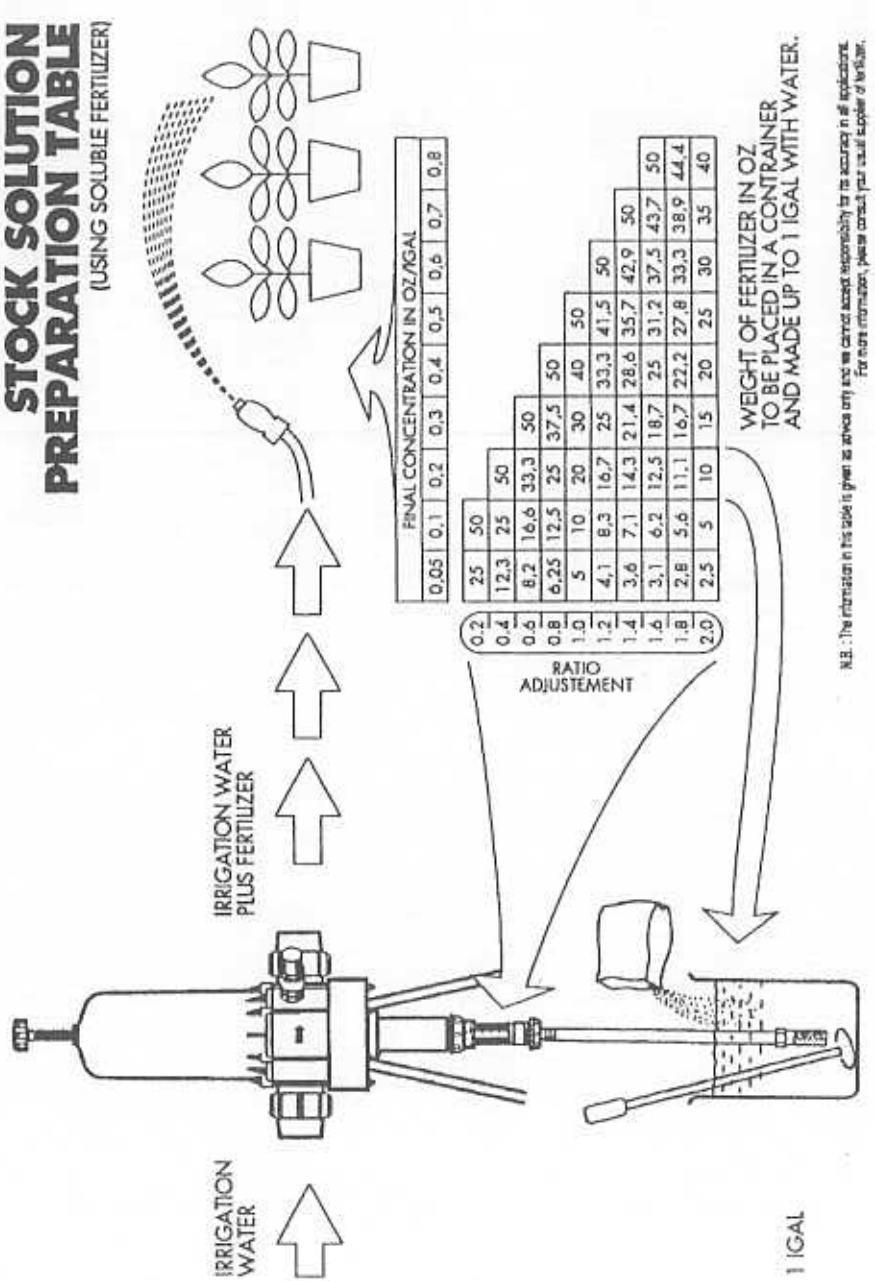
	250	188	250							
	125	125	167	208						
	83	94	125	156	188	219				
	63	75	100	125	150	175	200	250		
	50	63	83	104	125	146	167	208	250	
	42	54	71	89	107	125	143	179	214	
	36	47	63	78	94	109	125	156	188	250
	31	42	56	70	83	97	111	139	167	222
	28	38	50	63	75	88	100	125	150	200
	25									

N.B. : The information in this table is given as advice only and we cannot accept responsibility for its accuracy in all applications.
For more information, please consult your usual supplier of fertilizer.

FOR LIQUID FERTILIZERS :
Divide the weight of fertilizer necessary to obtain 1 litre or 1 igal stock solution by the density of the fertilizer.
Therefore, you obtain the **volume** of liquid fertilizer to be put into a container and add up water to get 1 litre or 1 igal.

STOCK SOLUTION PREPARATION TABLE

(USING SOLUBLE FERTILIZER)



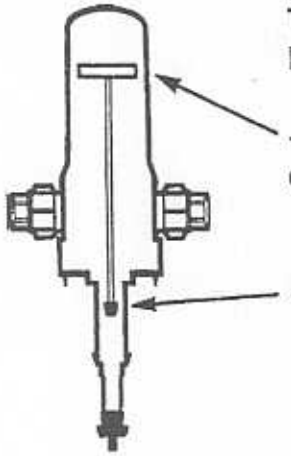
FINAL CONCENTRATION IN OZ/IGAL							
0,05	0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8

RATIO ADJUSTEMENT	WEIGHT OF FERTILIZER IN OZ TO BE PLACED IN A CONTRAINER AND MADE UP TO 1 IGAL WITH WATER.								
0.2	25	50							
0.4	12,3	25	50						
0.6	8,2	16,6	33,3	50					
0.8	6,25	12,5	25	37,5	50				
1.0	5	10	20	30	40	50			
1.2	4,1	8,3	16,7	25	33,3	41,5	50		
1.4	3,6	7,1	14,3	21,4	28,6	35,7	42,9	50	
1.6	3,1	6,2	12,5	18,7	25	31,2	37,5	43,7	50
1.8	2,8	5,6	11,1	16,7	22,2	27,8	33,3	38,9	44,4
2.0	2,5	5	10	15	20	25	30	35	40

N.B. : The information in this table is given as advice only and we cannot accept responsibility for its accuracy in all applications.
For more information, please consult your usual supplier of fertilizer.

FOR LIQUID FERTILIZERS :
Divide the weight of fertilizer necessary to obtain 1 litre or 1 igal stock solution by the density of the fertilizer.
Therefore, you obtain the **volume** of liquid fertilizer to be put into a container and add up water to get 1 litre or 1 igal.

KNOW YOUR FLOW... A SIMPLE METHOD

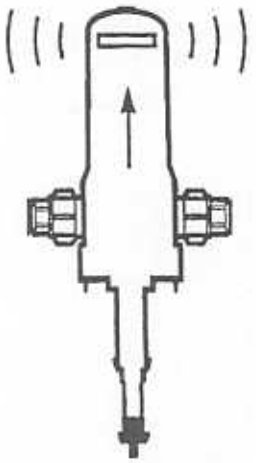


THE PROPORTIONAL INJECTOR IS COMPOSED OF :

- a driving volumetric hydraulic piston motor connected to :

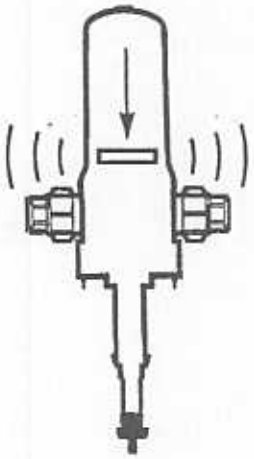
- an injector piston

The speed of the motor is proportional to the flow of water passing through the system - the greater the flow the faster it goes. In its up and down movement, you can hear the piston motor "click" :



Once
in the up position

Once in the
down position



Count the number of clicks in 20 seconds.
Multiply x 100 = **flow of water in imperial gallons/hour.**

Count the number of clicks in 24 seconds.
Multiply x 100 = **flow of water in u.s. gallons/hour.**

Count the number of clicks in 90 seconds.
Multiply x 100 = **flow of water in litres/hour.**