Pro Dispensing Board

Service Manual

COLEMAN HANNA CARWASH SYSTEMS LLC

AN O'HANRAHAN COLEMAN COMPANY

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/ColemanHannaCarwash

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1.0 Introduction

The Hanna Pro Dispensing Board (Dosatron™ Dilution Station) represents another innovative product by Hanna and offers the car wash owner a highly reliable option to provide top service to their customers at an affordable cost.

Each stainless steel wall-mounted board (Figure 1-1) can hold up to three Dosatron dispensers and includes a filtered incoming water manifold and plumbing. Standard dispenser is a RE2 for 1:50 to 1:500 dilution, 11 GPM (2.5 m^3/h) max. If solutions are below 3.5 PH, above 12 PH, or are citrus based products use PVDF dispensers.

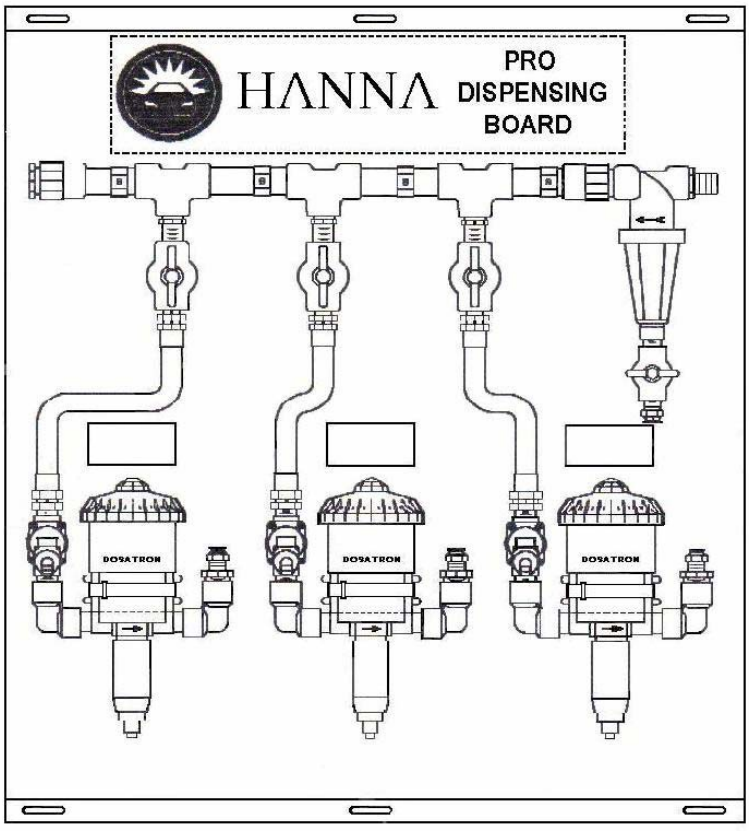

Figure 1-1 Typical Three-Dispenser Board

The Dosatron dispensers give an accurate and uniform feeding of chemicals into water lines and are available for a multitude of chemical applications such as tire and wash preparation, chemical tire applicators, foamers, clearcoat applicators, etc. (see Table 1-1). The dispensers are offered in a wide injection range and also available for harsh chemical applications (PVDF) and low and high PH levels (see Table 1-2).

Table 1-1 Dosatron Usage

CHEMICAL APPLICATION	DOSATRON DISPENSER				AIR PUMP STATION		CHEMICAL MIXING STATION
	RE 2	RE 5 & RE10	RE 1500	RE 3000	¼ in.	½ in.	
Tire & Wheel Prep	NR	NR	NR	NR	NR	R	NR
Chemical Tire Applicator	NR	NR	NR	NR	NR	R	NR
Pre-Soak	R**	R**	R**	NR	NR	R	NR
Foamer, Single	R**	NR	NR	NR	R	NR	NR
Foamer, Double	R**	NR	NR	NR	R	NR	NR
Foamer, Triple	R**	NR	NR	NR	R	NR	NR
Under Carriage Applicator	R**	R**	NR	NR	NR	R	R
Clearcoat	NR	NR	R**	R**	NR	R	R
Sealer Wax	NR	NR	R**	R**	NR	R	R
Drying Agent	NR	NR	R**	R**	NR	R	R

R Recommended

R** Recommended but is dependent on chemical dilution ratio and PH. See chart below.

NR Not Recommended

DOSATRON DISPENSER INFO.

	Injection Range	
RE 2	1:50 To 1:500	
RE 5	1:20 To 1:100	
RE 10	1:10 To 1:33	
RE1500	1:500 To 1:1500	
RE3000	1:1000 To 1:3000	

Table 1- 2 Dosatron Dispenser Selection Guide

Dispenser	Hanna P/N	Dilution Range	PH Range	Citrus Approved
D25RE2	812073	1:50 to 1:500	Below 3.5 Above 12.0	No
D25RE5	812074	1:20 to 1:100	Below 3.5 Above 12.0	No
D25RE10	812152	1:10 to 1:33	Below 3.5 Above 12.0	No
D25RE1500	812075	1:500 to 1:1500	Below 3.5 Above 12.0	No
D45RE3000	812076	1:1000 to 1:3000	Below 3.5 Above 12.0	No
D25RE2 PVDF	812077	1:50 to 1:500	All	Yes
D25RE5 PVDF	812078	1:20 to 1:100	All	Yes
D25RE10 PVDF	812153	1:10 to 1:33	All	Yes
D25RE1500 PVDF	812079	1:500 to 1:1500	All	Yes
D45RE3000 PVDF	812154	1:1000 to 1:3000	All	Yes

1.1 Design Features

Dosatron chemical dispensers (Figure 1-2) are ideally suited for low-flow/low-pressure washes as well high-flow/high-pressure washes. Dosatron delivers with a full line of water driven proportional dispensers that provide reliable and repeatable results regardless of fluctuations in water pressure or flow.

In addition, the space saving design eliminates the need for open reservoirs and repressurization pumps. Less equipment means fewer problems and more usable area in your supply room. There are no orifices to block or replace and simple installation with easy external adjustment is a certainty.

Your future success in business demands a properly cleaned vehicle with efficient use of chemical and water resources. Customer satisfaction is the ultimate goal of Hanna and one key component is proper chemical management. This requires a different approach to chemical dispensing equipment than the status quo.

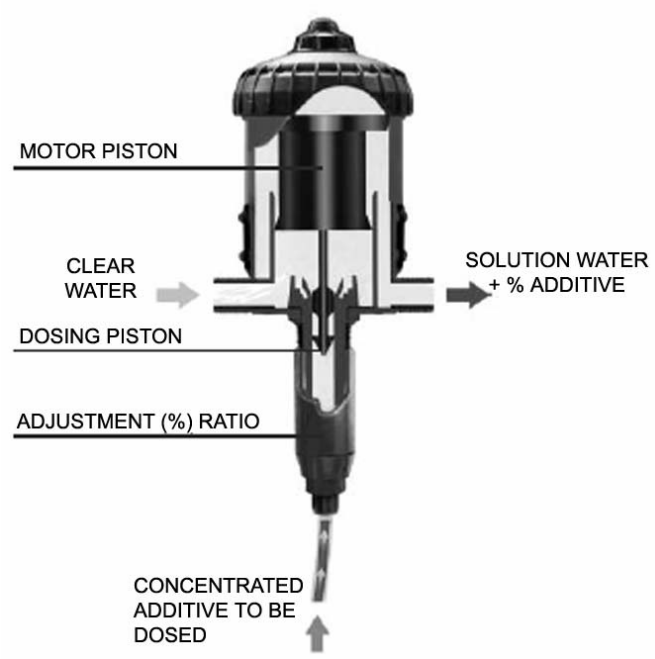

Figure 1-2 Dosatron Dispenser Cross-Section View

1.2 Basic Operation

Installed directly in the water supply line, the Dosatron dispenser operates by using water pressure as the power source. The water activates the dispenser, which takes up the required percentage of concentrate. Inside the dispenser, the concentrate is mixed with water. The water pressure forces the solution downstream. The dose of concentrate will be directly proportional to the volume of water entering the dispenser, regardless of variations in flow or pressure which may occur in the main line. See Table 1-3 for complete Dosatron specifications.

Table 1-3 Dosatron Specifications

	D25	D25 F 0.2	D 25 F 2	D25 RE 1500	D 25 RE 2	D 25 RE 5	D 25 RE 10
Practical operating flow range: 10 l/h mini - 2.5 m3 maxi [1/3 US Pint/min - 11 US GPM]							
Operating pressure:							
Bar	0.30 – 6	0.30 – 6	0.30 – 6	0.30 – 6	0.30 – 6	0.30 – 6	0.30 – 4
PSI	4.3 – 85	4.3 – 85	4.3 – 85	4.3 – 85	4.3 – 85	4.3 – 85	4.3 – 57
Externally or fixed adjustable injection ratio:							
%	0.8	0.2	2	0.07 – 0.2	0.2 – 2	1 – 5	3 – 10
Ratio	1:128	1:500	1:50	1:1500–1:500	1:500 – 1:50	1:100 – 1:20	1:33 – 1:10
Concentrated additive injection:							
Mini l/h – Maxi l/h	0.08 – 20	0.02 – 5	0.2 – 50	0.007 – 5	0.02 – 50	0.1 – 125	0.3 – 250
US Fl. oz/min - US GPM	0.05 Fl. Oz/min 0.088 GPM	0.01 Fl. Oz/min 2.82 Fl. Oz/min	0.11 Fl. Oz/min 1.76 Pints/min	0.0039 Fl Oz/min 2.82 Fl. Oz/min	0.011 Fl Oz/min 0.22 GPM	0.056 Fl Oz/min 4.4 Pints/min	0.17 Fl. Oz/min 1.1 GPM
Maximum operating temperature: 40 °C [104 ° F]							
Connections (NPT/BSP): Ø 20x27 mm [3/4"]							
Hydraulic motor capacity (for every 2 clicks of the piston) : about 0.45 in l [0.118 US Gallons]							
NOTE: The Dosatron is not preset. See the section on ADJUSTING THE INJECTING RATE							
UNIT SIZE							
Diameter: cm ["]	12.7 [5]	12.7 [5]	12.7 [5]	12.7 [5]	12.7 [5]	12.7 [5]	12.7 [5]
Total height: cm ["]	33.9 [13 ¾]	31.9 [12 ¾]	33.9 [13 ¾]	39.9 [13 ¾]	39.9 [13 ¾]	39.9 [13 ¾]	39.9 [13 ¾]
Width: cm ["]	16 [6 5/16]	16 [6 5/16]	16 [6 5/16]	16 [6 5/16]	16 [6 5/16]	16 [6 5/16]	16 [6 5/16]
Weight: ± kg [lbs]	1.0 [2.2]	1.0 [2.2]	1.0 [2.2]	1.2 [2.7]	1.2 [2.7]	1.2 [2.7]	1.2 [2.7]
SHIPPING CONTENTS: 1 DOSATRON / 1 mounting bracket for DOSATRON / 1 suction tube of concentrated additive / 1 strainer / 1 owner's manual • PACKAGE SIZE : 52 x 16.8 x 17.5 cm [20 1/2" x 6 5/8" x 6 7/8"] • PACKAGE WEIGHT : 1.7 kg environ [~ 3.7 US lbs]							

1.3 Pro Dispensing Boards

Figures 1-3, 1-4, and 1-5 show the three types of board layouts.

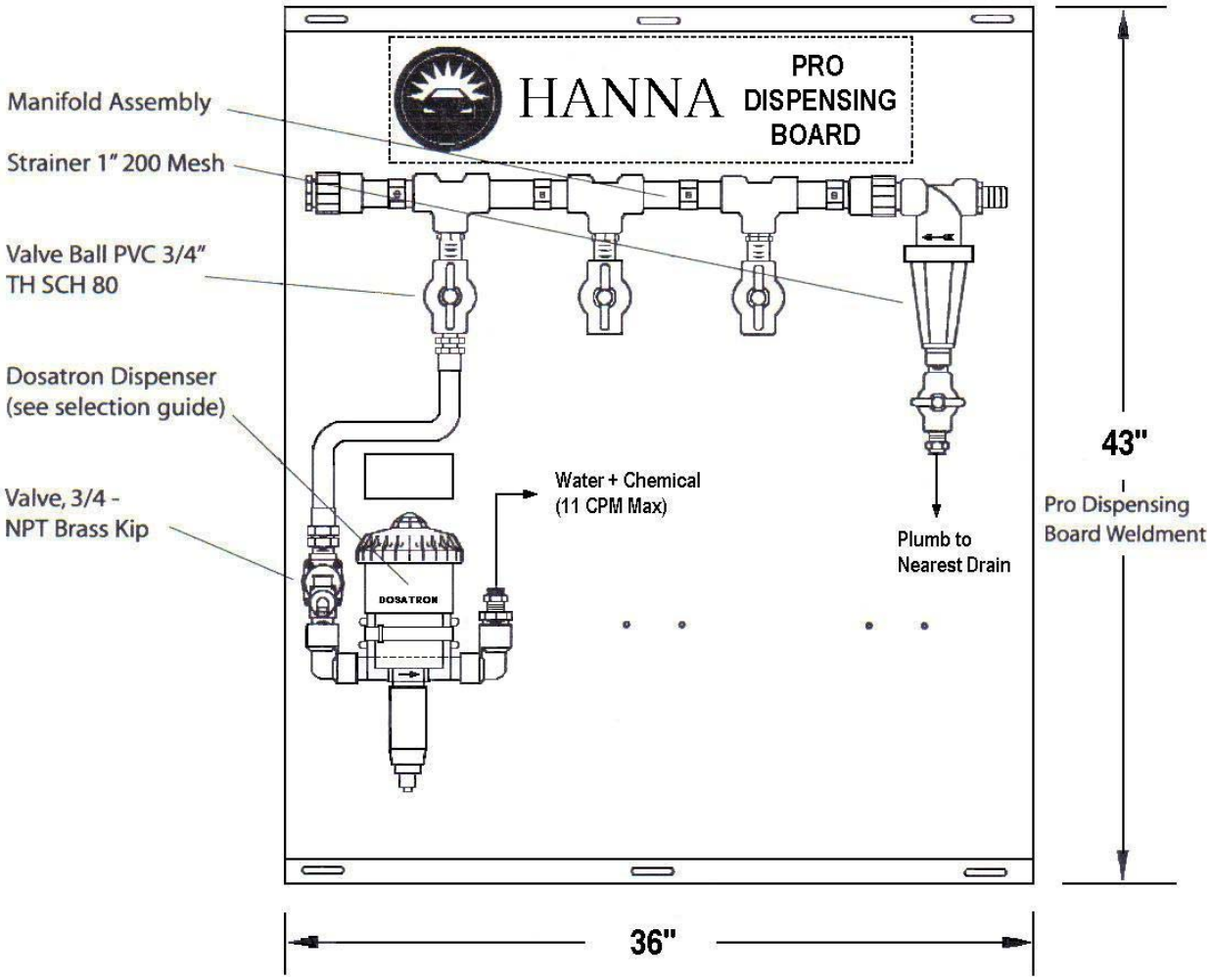

Figure 1-3 One Dispenser Board

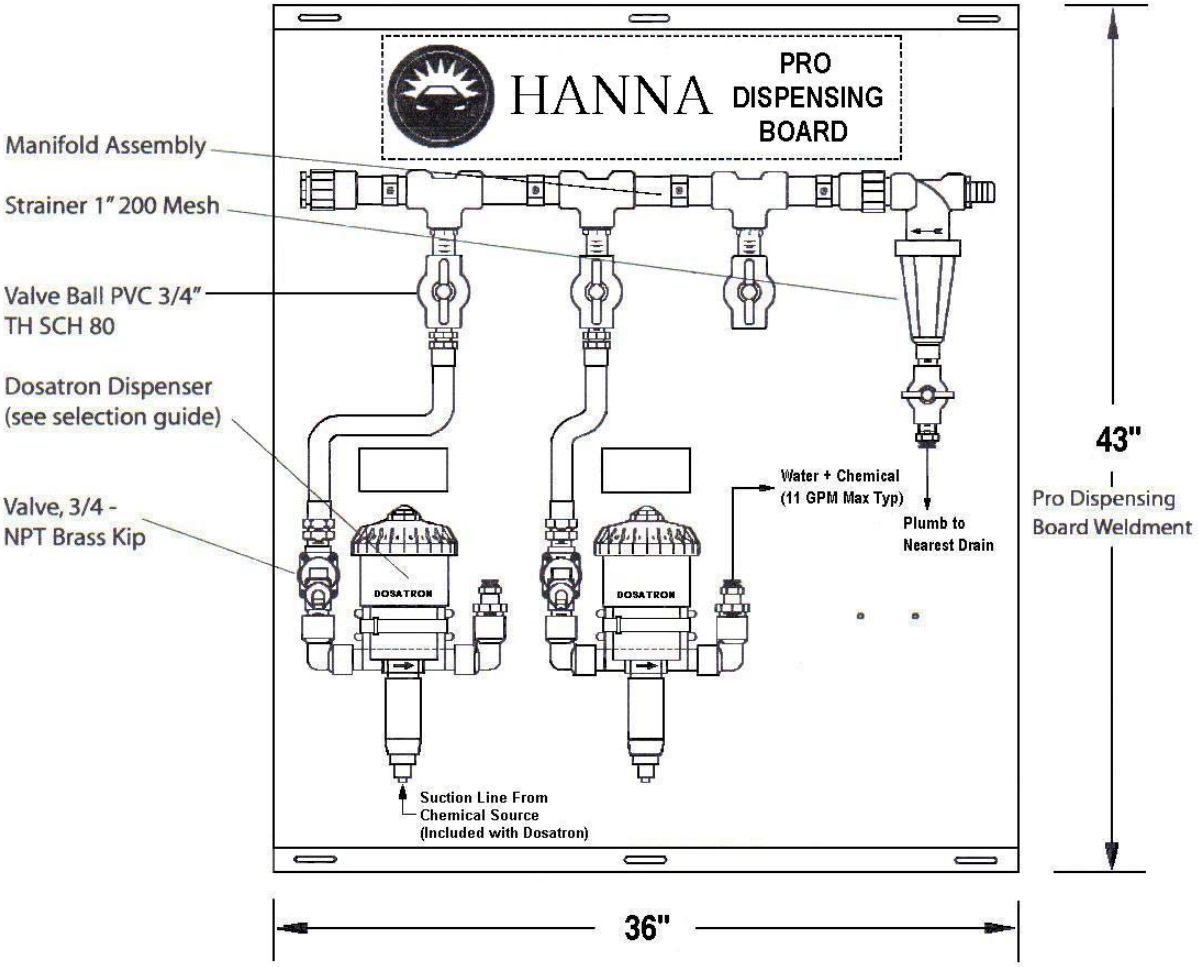

Figure 1-4 Two Dispenser Board

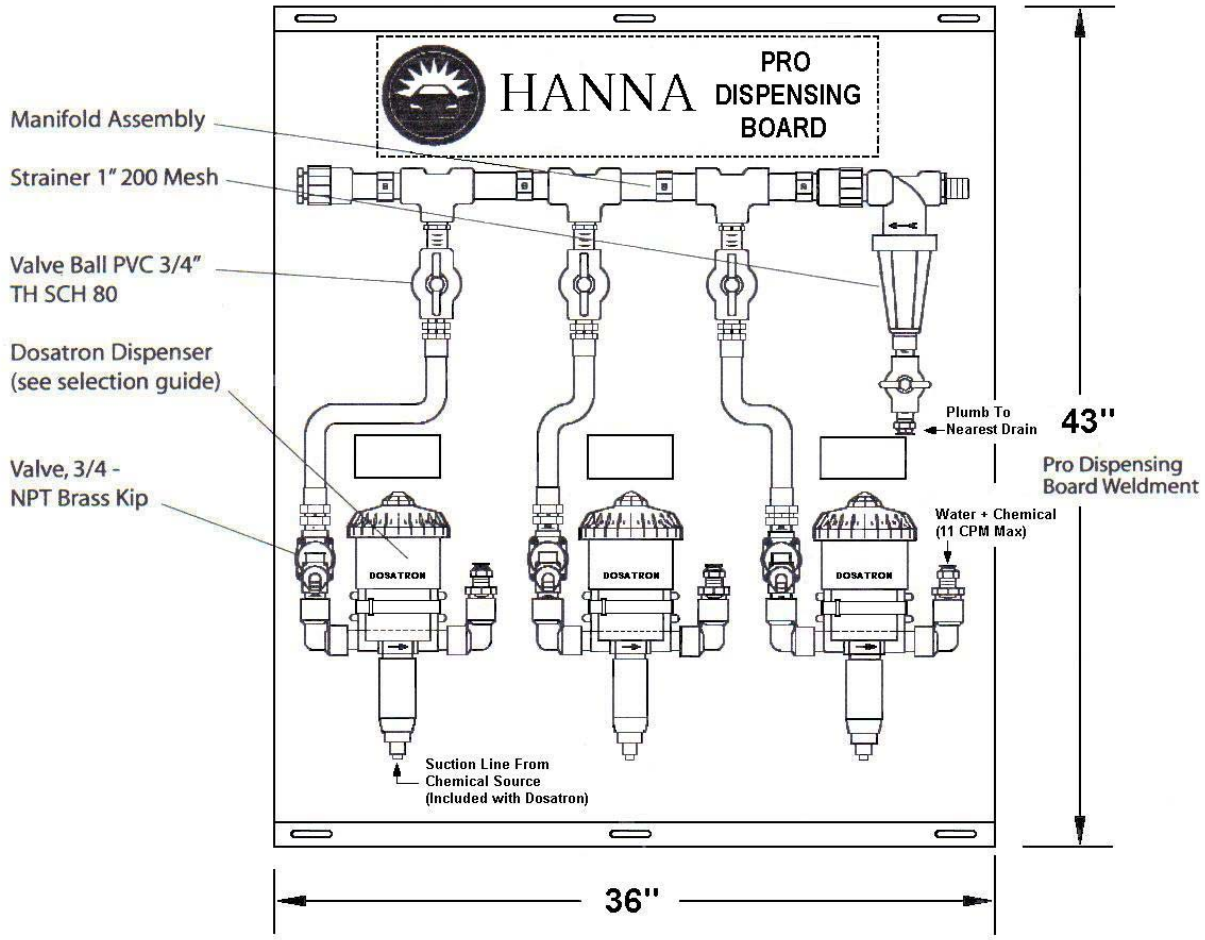

Figure 1-5 Three Dispenser Board

2.0 Safety

Keep the following safety rules in mind when installing and using Hanna Car Wash System Equipment:

NOTE*: Always follow local and national trade codes when installing any equipment.*

- Always disconnect power from any electrical device or component prior to servicing.
- Unplug the unit or use proper lock-out procedures so that no one can inadvertently turn the power on while you are working on that equipment.
- Always power down the control box before unplugging or plugging in quick disconnects.
- Use caution when maintaining any piece of equipment.
- Wear protective clothing and eyewear when using power tools.
- Direct discharge of high-pressure water and chemicals away from you and other persons, or direct it into approved containers.
- Keep equipment clean for proper operation.
- Keep hands or any body parts away from equipment while in operation.
- If you need to disassemble a part for service or repair, re-assemble equipment according to instructions.
- Be sure all components are firmly screwed or latched into position.
- Observe safety and handling instructions of the chemical manufacturers.
- Wear protective clothing and eyewear when dispensing or working with chemicals or other potentially hazardous materials.

2.1 Cautions, Warnings, and Notes

Throughout this manual there are various messages concerning safety – please heed these warnings!

2.1.1 Cautions

Cautions warn against a potential hazard that, if not avoided, may result in minor or moderate injury. Caution signs also alert against unsafe practices that may cause property damage.

CAUTION: ***DO NOT TOUCH THE BLUE BUTTON! IT IS THE SYSTEM BUTTON AND USED FOR CONFIGURATION.***

2.1.2 Warnings

Warning messages warn against a potential hazard that, if not avoided, may result in serious injury or death.

WARNING: ***DO NOT REMOVE PLUGS UNDER ELECTRICAL POWER. MAIN ELECTRICAL POWER MUST BE SHUT OFF BEFORE DISCONNECTING OR CONNECTING ANY PLUG OR CABLE ON THE SPRAY HEAD.***

2.1.3 Notes

Note means reader take note. Notes contain helpful suggestions.

NOTE: *This parameter should NOT be changed when attempting to make system adjustments.*

3.0 Warranty Information

3.1 Distributor/Customer Delivery Acceptance

Before signing for delivery, the distributor/customer must check the equipment for piece count and damage.

3.1.1 Piece Count

Every packing list has the total number of pieces shipped from Hanna. The number of pieces will vary, but is usually between 1 and 20. Check the bill and count the pieces on the load. Be aware that several large items will only count as one piece if they are banded together. Any discrepancies (shortages) in piece count must be clearly noted on the Bill of Lading.

The installing distributor/customer has 14 days from receipt of the equipment to report any shortages to Jim Coleman Company/Hanna (JCC/H). Because of this time frame, it is important to take a COMPLETE inventory as soon as possible.

3.1.2 Damage

Inspect the load thoroughly before unloading, and make note of any visible damage on the bill of lading before you sign it. This will help later if a freight damage claim is filed against the freight carrier. Remember that the freight carrier is responsible for any damage during transit. Hidden damage may show up later as you uncrate equipment. If so, notify the freight company's nearest office as soon as possible.

3.2 Filing Freight Claims

If damage is discovered during uncrating, immediately call the freight carrier's nearest office for an onsite inspection of damage. Do not throw any crating materials away, save them for the carrier's representative to inspect. To recover damages, mail copies of the carrier's claim form, the invoice for repairs, the delivery receipt, and the inspection report to the carrier within 90 days of the delivery date.

3.3 Pre-Installation

Look for the crates with "Hardware Kit" or "Manuals" stenciled on the sides. These are the only two crates that you want to open immediately. The Hardware Kit provides all the bolts, washers, and nuts that you will need to bolt the equipment together. The manuals and drawings will cover installation, assembly, parts identification, and operation.

At the time of startup, be sure to complete form 1111, "Hanna Start-up Review and Warranty Report" (page 3-7) and return it to:

Jim Coleman Company/Hanna
Attn: Quality Systems Manager
7901 Blankenship Drive
Houston, TX 77055

This report is essential to both Hanna and the distributor. It helps Hanna to review the initial start-up procedures and settings, and it validates the warranty period. This is very important, as no warranty will be allowed until this form is on file at Hanna.

NOTE: *Please be sure to keep a copy of this form for your records.*

3.4 Hanna Warranty Claim Procedure

1. Owner/Customer notifies installer/distributor of warranty claim.
2. Installer/distributor notifies Hanna Quality Systems of a claim.
3. Warranty/Quality Representative at Hanna:
   - Reviews Hanna files to determine applicable warranty period.
   - Discusses with distributor/customer possible reasons for component failure.
   - Issues an order for shipment of a replacement part (as appropriate).
   - Issues a Returned Goods Authorization (RGA) number.
   - Transmits by fax a copy of the RGA and replacement order confirmation to the distributor.

- Attaches a copy of the RGA to the replacement order and sends it to Manufacturing for shipment. Warranty shipments from Hanna will be PREPAID for ground transportation only (UPS-Ground, truck, etc.). All forms of quick shipments will be at the expense of the distributor or customer.

- Distributor/customer submits prepayment via credit card or check prior to shipment of replacement part. Upon acceptance of warranty claim, Hanna will reimburse distributor/ customer for prepayment (see steps number 5 and 6 below for claim processing procedures).

4. The distributor/customer, upon receiving the replacement part, will:

   - Add comments to the RGA included with the shipping ticket to further clarify the problem with the proposed warranted part.

   - Ship the defective part and the RGA to Hanna within 30 days, freight PREPAID.

   - Be sure that the RGA number is plainly visible on the package exterior.

5. The returned part, when received at Hanna, will be logged as received and inspected for validity of claim.

   - If the part is a Hanna manufactured part, evaluation, will be completed within five working days.

   - If the part is a vendor item, evaluation may take up to 45 days or more.

6. When evaluation is completed, a Hanna Warranty/Quality representative will contact the distributor/customer and notify them if their claim has been accepted or rejected.

   - If the warranty claim is rejected, evaluation reports and reason for rejection will be sent. Distributor/customer may elect to have the parts discarded or returned to them freight collect.

   - If the warranty claim is accepted, an appropriate credit will be given to the distributor/ customer.

7. We at Hanna are dedicated to assisting our distributors/customers. Valid warranty claims are welcome. However, parts returned without pre-authorization and/or without a RGA number will not be accepted. We cannot accept shipments that are sent other than freight PREPAID.

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HANNA WARRANTY START-UP REVIEW / CONVEYORIZED SYSTEM

Hanna Distributor_____ Equipment Order # _____
Car Wash Name _____
Owner's Name_____ Phone _____
Address _____
Type of Equipment_____

	YES	NO
CORRELATOR		
Top plate moves freely both ways		
Guide Rails move freely		
CONVEYOR		
Conveyor Speed – cars per hour		
Chain tension set to specs		
Shipping nut removed (RCV)		
Roller-up forks adjusted to specs		
Fork cylinder moves smoothly		
Air/oil pressure adjusted to specs		
Cancel switch properly located		
Trap doors move freely		
Welds between sections ground smooth		
Conveyor hydraulic connections tight		
HYDRAULIC SYSTEM		
All fittings/lines clean & tight		
Oil in tank above "low-level" control		
Low-level control switch operating		
Approved "EP" hydraulic oil used		
RECLAIM SYSTEM		
Suction line piping clean and tight		
Discharge piping clean and tight		
Relief bypass valve free to operate		
Pits free of oil and floating debris		
Barrel screen and foot valve clean		
Inlets to pits unobstructed		
CHEMICAL FEED UNIT		
Air pressure set at 55-60 PSI		
Water pressure set at 50-58 PSI		
All fittings at pump tight and leak-free		
All line fittings tight and leak-free		
All intake lines free from kinks		
ARCHES		
All jets aimed according to specs		
Actuators operating to specs		
Air pressures set to specs		
Foamer – is there adequate foam		
Spray wax operating to specs		
Polish wax operating to specs		
Rinse functioning with drying agent		
Final rinse provides complete coverage		
BRUSHES		
Correct rotation directions		
Brush RPM set to specs		
Proper brush penetration		
Shocks functioning properly		
All couplings and flanges tight		
Proper water application		

	YES	NO
TIRE WASHERS		
Proper brush height		
Base plates level		
CTA treadles as per specs		
Treadles operating freely		
Spring tension set to specs		
Speed set to specs		
MITTERS		
Curtain RPM set to specs		
Curtains installed & trimmed properly		
Basket movements smooth		
Sufficient water on curtains		
All bearings lubricated		
AIR DRYER		
Type/Model of air dryer _____		
Supply voltage and phasing _____		
Amp draw on phase legs _____		
Size of thermals/breakers _____		
MCC provided by HCW		
Checked for proper impeller rotations		
Motors protected from direct water		
Intakes protected and unobstructed		
Cone linkage moves freely		
Checked for leaks and unusual noises		
All bearings lubricated		
COMMON AIR SYSTEM		
Excessive water in air system lines		
Proper oilers installed		
Normal system pressure set at 120 psi		
COMPUTER		
Computer type/model _____		
EPROM chip version number _____		

REPAIRS & ADJUSTMENTS

_____
_____

COMMENTS

_____
_____

CUSTOMER ACCEPTANCE: Owner acknowledges they have received instruction for proper equipment operation & received a full set of manuals.

OWNER: _____
Signature: _____

HCW form 1111, 5/5/2004

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LIMITED WARRANTY

The Manufacturer warrants any component or part of the Jim Coleman Company Car Wash equipment to be free from defects in material and workmanship for a period of one year from date of shipment, with the exception of such parts as are commonly recognized to be subject to wear in normal usage, such as high pressure hoses, swivels, nozzles, safety shut off guns, etc., which are warranted for ninety (90) days. All electrical parts not manufactured by Jim Coleman Company are warranted to be free from defects in material and workmanship for a period of ninety (90) days. Electrical motors shall be covered under manufacturer's warranty for a period of one year, unless otherwise specified. Jim Coleman Company electronic controls, such as timers, coin acceptors and computer monitoring equipment, carry a one-year warranty. Claims under this warranty must be asserted in writing within the one-year period covered by this warranty.

Any component or part alleged to be defective in material or workmanship shall, at option of Manufacturer be returned with shipping cost prepaid. If upon examination, such component or part is found to be defective in workmanship or materials, Manufacturer, at its option will either repair or replace such component or part and shall ship such repaired or replaced component or parts F.O.B. factory, Houston, Texas. The cost of such replacement or repair shall be the exclusive remedy for any breach of any warranty and Manufacturer shall not be liable to any person for consequential damages for injury or commercial loss resulting from any breach of any warranty. This warrant does not cover any labor installation cost, either with respect to the original equipment or with respect to the repaired or replaced component or part defective in workmanship or materials. Jim Coleman Company does not warrant loss of income, should there be any during such time repairs are being made.

This warranty does not apply to components or parts which have been misused, altered, neglected, or not installed, adjusted, maintained, or used in accordance with applicable codes and ordinances and in accordance with Manufacturer's recommendations as to such factors.

This warranty is in lieu of all warranties, express or implied, of either Manufacturer or seller, and Manufacturer makes no warranty against infringement of the like, makes no warranty of merchantability, makes no warranty of fitness for a particular purpose, and makes no other warranty, express or implied, including implied warranty arising from course of dealing or usage of trade.

This warranty does not apply to damage resulting from improper operation or abuse, exceeding the rated capacities of the unit, running foreign particles or non related solutions through pumps or valves, using acidic solutions, improper installation or maintenance, operational neglect, neglect of manufacturers recommended maintenance, use of water containing solids in excess of twenty microns in diameter or 2000 PPM, damage caused by customer, unjustifiable nuisance calls or acts of God.

Compliance with any local governmental laws or regulations relating to the location, use or operation of the equipment, its use in conjunction with other equipment, shall be the responsibility of the purchaser. The rights and obligations of the parties shall be governed by the state of Texas.

JCC form 3334, 2/17/2005

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RETURNED GOODS AUTHORIZATION (RGA)

Customer Account No.: _____ Date: _____
Customer: _____ Ref. Equip No.: _____
_____ Ref. Sales No.: _____
_____ Start Up Date: _____

PARTS TO BE RETURNED

Qty.	Parts #	Description	Reason For Return

Return parts, shipping PREPAID to: **Jim Coleman Company/Hanna**
7901 Blankenship Drive
Houston, TX 77055

Important Note: If the parts listed above are not received within 45 days from the date of shipment of the replacement parts from JCC/H, then credit for the returned parts will be disallowed and the invoice becomes due and immediately payable. This form MUST accompany ALL returned parts.

No Form = No Credit

Do Not Write Below This Line. To Be Completed By Jim Coleman Company/Hanna Customer Service Department Only.

Date Parts Received: _____ Checked In By: _____
Disposition: ☐ Salvage/Discard Comments: _____
☐ Hanna Evaluation _____
☐ Engineering Review _____
☐ Vendor Evaluation _____
Approved: _____ By Whom: _____
Parts Complete: _____ Credit Memo No: _____

HCW form 2222, 3/02/2005

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4.0 Installation

The following information is a suggested means for installation of the Pro Dispensing Board. It is understandable not all installations are the same, nor accomplished with the same ease. Therefore, many of your own ideas, experiences, and installation tricks are encouraged and should be implemented.

Prior to the actual installation, an on-site visit and observations are recommended. This is especially true if the location is other than new and/or not of Hanna design. Check for the local utilities, making sure of proper access location and supply sizing. If anything must be changed, do so prior to the day of installation. Deficiencies discovered at the time of installation will greatly delay the project.

4.1 Installation Requirements

Before the board is mounted to the wall, you should consider the following.

1. Water Source:
   - Make sure the water source is close to the board.
   - Install a shut-off valve in the water supply coming to the board.
   - Determine if the water supply is coming from the left, right, above, or below.
2. Wall Space:
   - You will need a clear wall space about 48 in. (121.92 cm) by 48 in. (121.92 cm).
   - Mount the board in a location so that adjustments can be made easily.
   - Make sure there is enough room under the board for pails or barrels.
3. Lines from Board:
   - Plan ahead where the lines are going to be routed from the board to the applicator.
   - Try to keep lines from the board to your applicator as short as possible.
   - Try to mount outgoing pipes, hoses, tubing, etc., so that each line can be traced later if a problem occurs.
4. Electrical Requirements:
   - The board will be supplying a solution for the applicator with city water pressure from each dispenser on the board.
   - The solenoid(s) are located on the board on the inlet side of each dispenser.

4.2 General Requirements

Before getting started, you must find the proper location for your new Hanna Pro Dispensing Board. We recommend a minimum clear wall space of about 48 in. (121.92 cm) by 48 in. (121.92 cm) for proper operation. The clear area is defined as any space that allows clear access to the board, but will not interfere with or be interfered with by other devices.

The Pro Dispensing Board is designed to make installation easy and quick. The board mounts directly to a wall using up to ¼ in. (6 mm) screws, bolts, nail pins, or concrete anchors depending on the type of wall construction. Three attaching slots are located on both the top and the bottom of the panel. A minimum of four anchors should be installed.

After the Board has been attached to the wall, hook up the water supply. This incoming water supply needs a valve to shut off the water for future repairs. A 1 in. (2.54 cm) hose barb has been supplied at the inlet water filter. Attachment to the water supply can utilize this hose barb or hard plumbed directly to the filter. If hard plumbing is used, make sure a union is installed on the inlet side of the filter to make repairs in the future possible.

Plumb the ball valve below the filter to a floor drain or the reclaim pit using nylon tubing. The board is equipped with a 200 mesh (80 micron) filter. This filter will need to be cleaned (flushed) once each day. If the filter is not cleaned properly, water flow will be reduced to the board and your applicators. To clean the filter, simply open the ball valve for about 30 seconds and flush the filtered contaminates to the drain. Shut the valve when the filter is clean.

Plumbing from the dispensers to your applicator can be in ½ in. (12 mm) nylon tubing, ¾ in. (20 mm) water hose, or pipe (PVC, copper, galvanized, etc.). Install a union if hard plumbing is used.

4.3 Pre-Installation Remarks

- When connecting a Dosatron 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., back-flow prevention, etc.

- In the case where the water installation is higher than the Dosatron itself, there is a possi-

ble risk of water and concentrate flowing back through the Dosatron. In this case, installing a non-return valve downstream is recommended.

- The location of the board and concentrate container should be accessible, but it should also be away from the risk of hazardous chemicals contaminating the solution in the container.

- Do NOT install the Dosatron just above an acid container (risk of acid fumes attacking the Dosatron), and protect it from possible contact with corrosive products.

- Protect the Dosatron from freezing temperatures by draining it and store it away from sources of excessive heat.

- Do NOT install the Dosatron on the suction side of the supply pump (risk of siphoning).

- During any maintenance the operator must stay in front of the Dosatron and wear protective eyewear and gloves.

- It is the responsibility of the owner/operator to replace the injection seals annually to ensure precise injection.

- It is the responsibility of the owner/operator to check that the flow and pressure of the installation does NOT exceed the Dosatron specifications.

- It is the responsibility of the owner/operator of the Dosatron to determine the correct amount of solution and injection ratio to obtain the desired result.

- An air inlet, an impurity, or a chemical attack on the seal can interrupt the dosing function. It is recommended to periodically check that the solution is being correctly drawn up into the Dosatron.

- For installations subject to water hammer, a protection device such as a check valve or union ball check must be fitted (pressure/flow control system).

- Change the suction tube as soon as it seems damaged by the chemical.
- Relieve the pressure after use (advised).
- Rinsing of the Dosatron is required when changing chemicals and before handling the Dosatron to avoid any contact with the chemical.
- Before applying any aggressive chemicals, please consult your distributor to confirm compatibility with the dosing pump.
- A water filter (200 mesh) is installed on your dispensing board prior to the Dosatron dispensers. If a filter is missing or not installed, abrasive substances can cause the Dosatron dispenser to deteriorate prematurely.
- All assembly should be done without tools, hand tighten only.

4.4 Pro Dispensing Board Installation

NOTE: *For installations on all water systems you must conform to all local, state, and federal laws concerning the use of fertilizer and chemical injection devices.*

1. Read this manual prior to opening crates or installing equipment.
2. Carefully open crates and identify the individual parts for assembly using the enclosed check list. If there are any missing parts, notify your Hanna distributor immediately (see warranty information in Chapter 3.0).
3. Place the board in the wash bay. When all pieces for your configuration have been set in place, take the time to recheck all the layout dimensions using your conceptual drawing.
4. Make sure you have the board located within easy reach of the applicator (try to keep lines from the board to your applicator as short as possible).
5. Mount outgoing pipes, hoses, tubing, etc., so that each line can be traced later if a problem occurs.

6. Anchor the board to the wall using 1/4 in. diameter anchor bolts not less than 3 in. long.

7. Install the board, being careful to follow the layout drawings.

8. Install all lines and fittings to your applicator.

WARNING: ***IMPROPER SELECTION OR IMPROPER INSTALLATION OF ELECTRICAL CAN CAUSE DEATH, PERSONAL INJURY, AND PROPERTY DAMAGE.***

9. Install electrical power to solenoids using 24 VAC.

10. Connect water lines to your water system intake. See Section 4.5.

11. Connect tubes to your solutions. See Section 4.5.

WARNING: ***IT IS RECOMMENDED TO LABEL ALL WATER LINES WITH A WARNING ABOUT THE INJECTED SOLUTION (EXAMPLE: NOT FOR HUMAN CONSUMPTION).***

12. Make sure to adjust your Dosatrons for proper dilution ratio. See Section 5.2.4.

13. Make sure the components are assembled correctly.

14. Operate the system. Check for leaks and smooth operation.

4.5 Connecting Water and Solution to the Pro Dispensing Board

The Pro Dispensing Board can be connected to the water supply by means of Ø 20 x 27 (3/4*) bore flexible hose and hose tail fittings with hose clips. Make certain that the water flows in the direction of the arrows on the motor body.

The Dosatron dispenser is delivered with a suction tube (cut it to the needed length) enabling its

use with a large capacity concentrate container. The tube must be fitted with its strainer and weights. The instructions for fitting the tube are to be found in Section 5.2.3.

NOTE: *The maximum suction height is 4 meters (13 feet).*

CAUTION: ***DO NOT PUT THE SUCTION TUBE STRAINER ON THE BOTTOM OF THE STOCK SOLUTION CONTAINER. THE STRAINER MUST BE SUSPENDED AT LEAST 10 CM ABOVE THE BOTTOM OF THE TANK TO AVOID SUCKING UP THE INSOLUBLE PARTICLES THAT MAY DAMAGE THE INJECTOR ASSEMBLY.***

Under no circumstance should the solution level be above the water inlet of the Dosatron dispenser (see Figure 4-1).

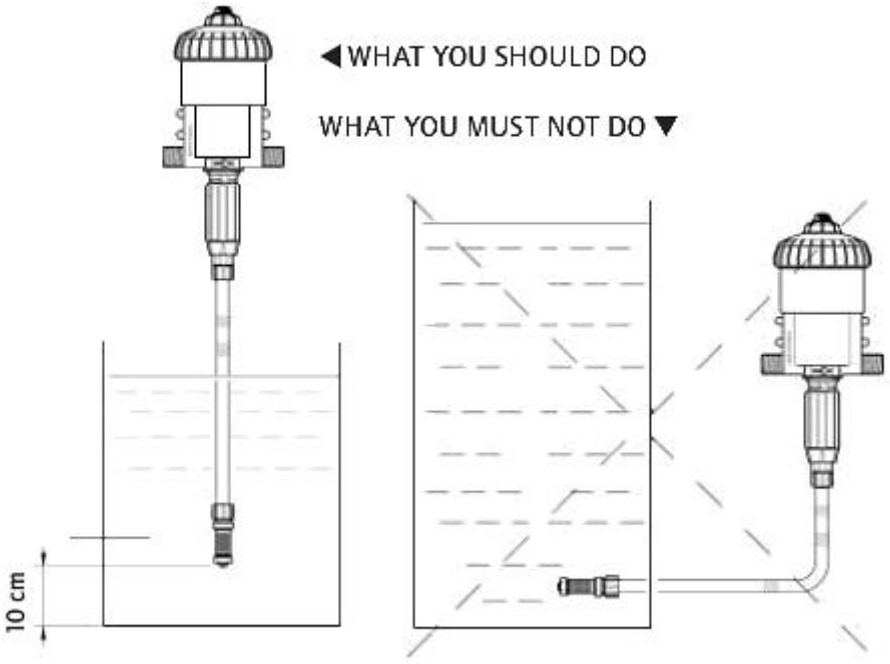

Figure 4-1 Location of Suction Tube Strainer

To prolong the working life of the Dosatron dispenser it is advisable to clean your filter (200 mesh - 80 microns) daily. This is imperative if the water contains impurities or particles, especially if the water comes from a well.

NOTE: *A filter is recommended and required for the warranty to be valid.*

If your flow rate is above the operating limits of the Dosatron dispenser, you must install a dispenser with a higher flow capacity. If your dispenser clicks more than 40 times — that is 20 cycles in 15 seconds — you are close to the maximum flow limit. See Table 4-1 for flow rates.

Table 4-1 Dosatron Flow Rates

Per 15 Seconds D25 11 GPM	
Clicks	GPM
4-1/2	1
15	3
22	5
31	7
39	9
46	11

4.6 Using the Dosatron for the First Time

1. Partially open the water inlet valve.

2. Press the bleed button on the top of the Dosatron dispenser (see Figure 4-2).

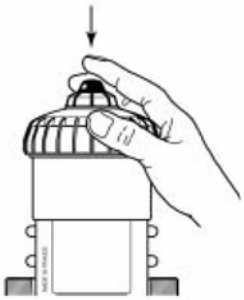

Figure 4-2 Bleed Button

3. When a constant flow of water is seen coming from around the bleed button (no "spitting" of air), release the button.

4. Open the water inlet valve slowly. The Dosatron is self-priming.

5. Operate the Dosatron until the product to be dosed is drawn up into the doser body (the product is visible through the plastic tube).

6. When the Dosatron is working, it makes a characteristic “click-clack” noise.

NOTE: *The time required to prime the suction tube depends on the water flow-rate, the ratio setting and the length of the suction tube. To bleed the air from the suction tube and accelerate the priming, set the injection rate at maximum. Once the dispenser is primed, adjust to the required injection rate (see Section 5.2.4).*

The Dosatron dispenser may be fitted in its upper part with an optional function bypass (Figure 4-3):

- Bypass set to the ON position; the Dosatron dispenser works and the concentrate is drawn up.

- Bypass set to the OFF position; the Dosatron dispenser is stopped and does NOT draw up the product.

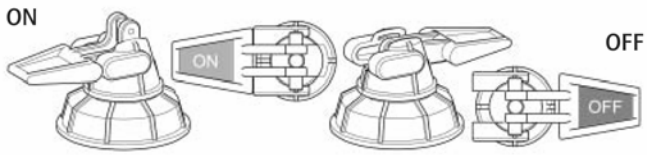

Figure 4-3 Bypass Valve

4.7 Operational Questions

1. Why is there water in my dispenser/injector?
   - Each unit is tested prior to shipping.

2. What additional equipment is recommended for optimal performance?
   - A 200 mesh (80 micron) filter installed upstream of your unit (standard on the Pro Dispensing Board).
   - A pressure regulator if your in-line water pressure exceeds the maximum allowable for the unit.
   - A one-way check valve is needed against water hammer if a solenoid is located downstream of the dispenser.

3. How are the units mounted or held in place?
   - Each unit comes complete with a mounting bracket mounted on the board. The dispenser snaps into the bracket easily and securely. In addition, a Velcro strap is included to add extra stability.

4. Do I need to purge the air on the dispenser every time at start-up?
   - Only at the initial start-up or installation. The water flow going through the unit is enough to take the air out of the unit.

5. How do I choose the right unit for my application?
   - It depends on water flow, dilution rate, and chemical being used. Call your local Hanna distributor for the correct dispenser.

6. Can acid be injected?
   - Most acids can be injected, depending on the concentration of the acid and water temperatures. With each increase of 1 degree Celsius, acid aggressively increases 10-fold. No more than 5% acid should be injected. Infuric acid, hydro-fluoric acid and citrus-based chemicals are not recommended on the standard units. However, PVDF, Side/Inject and Hastelloy options allow for these.

7. What is the maximum water temperature that can flow through the unit?
   - 104 degrees Fahrenheit (40 degrees Celsius) is the maximum recommended threshold.

8. Is there and easy way to determine flow through the unit?
   - Count the clicks. If the unit clicks more than 40 times in 15 seconds, the maximum flow of 11 gallons (41.64 L) per minute is being exceeded.

9. Why is there mesh on the suction strainers?
   - To avoid particles from being injected into the unit. Clean this strainer in the concentrate bucket each time a new bucket is opened.

10. How long can the suction hose be away from the unit and still work?
    - 25 feet (7.62 m) maximum horizontally and 13 feet (3.96 m) vertically.

11. How thick of a solution will the units pull?
    - It depends upon parameters such as use, temperature, and how much flow you need. Most fresh car wash solutions work very well.
    - Don't let your chemicals freeze. If this happens, throw then out and replace with new chemicals.

12. What are the diameters available on the intake hose?
    - ¼" (6 mm), ½" (12 mm), ¾" (20 mm). Different models have different sizes.

13. Can I buy a longer section of intake hose?
    - Yes, this can be purchased through your Hanna distributor.

14. Can I buy any O-ring or seal instead of a Dosatron part?
    - We do not recommend this, as it will void your warranty. Dosatron cannot guarantee the quality of those seals. Dosatron seals are made to standards that meet the needs of the units.

15. What does PVDF stand for?
    - Polyvinylidene Fluoride. It is a mixture of Teflon and Polypropylene, and should be used when injecting corrosive materials.

16. What can I do to stop my unit from stalling at low flow rates?
    - Refer to flow parameters. Check to see if piston shells need to be changed – look for scoring or wear in the body and on the piston flange. Do you have a 200 mesh filter installed ahead of the dispenser to protect from scoring?

17. How do I increase my flow capacity?
    - If your flow needs have doubled, you can buy a larger unit or install a parallel system. A parallel assembly will work up to a maximum of three units.

18. Are there any guidelines for preventive maintenance?
    - Flush the 200 mesh filters daily.
    - Turn water on to the unit slowly.
    - Keep strainers at the end of the long clear intake hose clean. Clean with each new chemical bucket.
    - Replace dosing seal kit each year — including cone and spring in check valve seal kit.

19. What is the life expectancy for the units?
    - The life of the unit depends on water quality, chemicals injected and preventive maintenance performed.

20. What is the life expectancy for the seals?
    - Dosing seals get the most wear. They should be replaced every year, or sooner depending on the chemical injected.

21. I have an old unit; can I still get parts for it?
    - Yes, your Hanna distributor will have or can get all the necessary parts needed.

22. How much should I spend on a repair?
    - It depends on the unit. It is usually recommended to buy a new unit if the repair cost is equal to half or more of the cost of a new unit. If less than half, it is suggested that it be repaired.

5.0 Parts and Maintenance

5.1 General Maintenance

The Pro Dispensing Board requires periodic inspection and maintenance. However, there are only a few items that should be inspected on a regular basis. For the first month of operation it is advisable to check, on a weekly basis, hardware and fittings for tightness.

Daily Maintenance

- ✓ Check the unit for proper operation prior to washing the first vehicle each day
- ✓ Check for proper delivery of water/soap solution
- ✓ Check lines and fittings for leaks
- ✓ Rinse the injection areas after using the Dosatron. To do this, insert the suction tube into container of clean water and inject about a 1/4 liter (1/15 U.S. gallon).

Weekly Maintenance

- ✓ Check water system solenoid valve for positive on/off operation
- ✓ Check for cleanliness

Yearly Maintenance

- ✓ Replace the dosing seals as well as the suction tube annually to ensure proper injection.

5.2 Dosatron Maintenance

	**WARNING:** ***BEFORE DISMANTLING ANY PART OF THE INJECTION ASSEMBLY, IT IS ADVISABLE TO OPERATE THE DOSATRON AND INJECT CLEAN WATER TO RINSE THROUGH THE INJECTION SYSTEM. THIS MINIMIZES THE RISKS OF CONTACT WITH CONCENTRATED SOLUTIONS IN THE INJECTION ASSEMBLY. DURING ANY SUCH INTERVENTION, WEAR SPECTACLES AND PROTECTION GLOVES!***

5.2.1 Periodic Maintenance

When using soluble products to be made up into solutions, it is recommended to periodically dismantle the entire dosing section every six months.

Thoroughly rinse all the elements of the dosing part with water and re-assemble them after having previously lubricated the seal (see Figure 5-1) with a silicone lubricant, in case of difficulty in re-fitting.

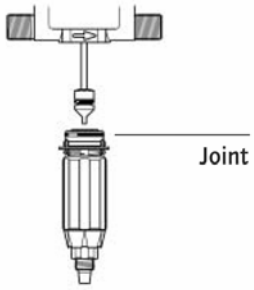

Figure 5-1 Seal Location

Before putting the Dosatron into operation after a non-use period, remove the motor piston and soak it in lukewarm water (< 40°C) overnight. This helps to dissolve any deposits which may have dried onto the piston motor.

5.2.2 How to Drain the Dosatron (in case of freezing temperature)

1. Turn off the water supply.

2. Remove the injection assembly (see "Changing the Piston Motor" in Section 5.2.7).

3. Remove the screw top and the motor piston.

4. Disconnect the water inlet and outlet fittings.

5. Remove the motor body from the mounting bracket, unscrew the screw top and empty any remaining water.

6. Once you clean the seal, the Dosatron can be re-assembled (see Figure 5-2).

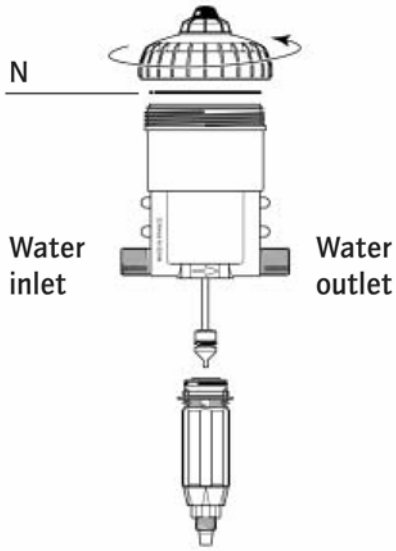

Figure 5-2 Draining the Dosatron Dispenser

5.2.3 Fitting the Suction Tube

1. Unscrew the nut (E in left side of Figure 5-3) at the bottom of the injection assembly and thread it onto the tube.

2. Push the tube onto the dip tube insert as far as it will go and screw the nut up by hand.

3. Identical process for viscous products option (E in right side of Figure 5-3).

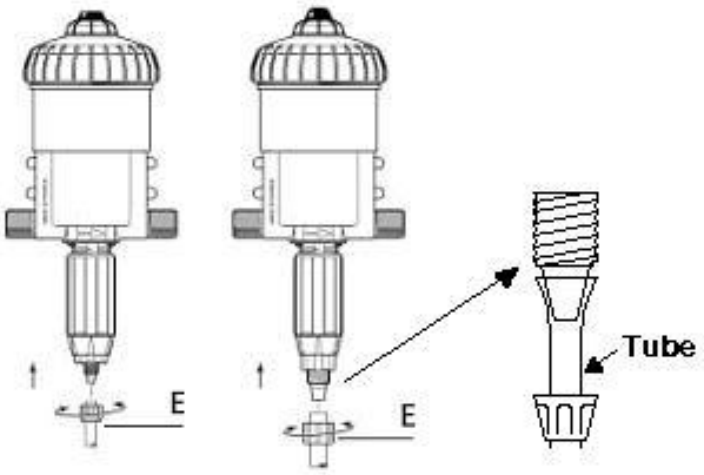

Figure 5-3 Inserting the Tube Assembly

5.2.4 Adjusting the Injection Rate with Pressure Off

NOTE: *Use no tools!*

1. Turn off the water supply and allow the pressure to drop to zero.

NOTE: *Adjustment must be made when there is no pressure in the Dosatron.*

2. Unscrew the locking ring (B in Figure 5-4).

3. Screw or unscrew the setting sleeve (D in Figure 5-4) to bring the top of the sleeve into line with the desired injection rate. See Table 5-1 for dilution rates.

4. Tighten the locking ring.

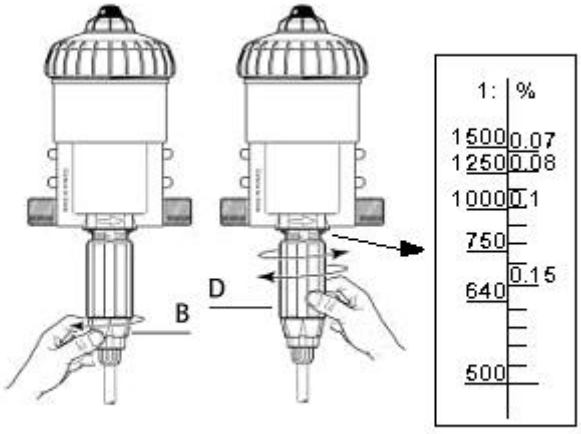

Figure 5-4 Setting the Injection Rate

International Conversions

Principle: Setting at 1% fi 1/100 = 1 part of concentrate into 100 parts of water.

For example: Setting at 2% fi 2/100 = 2 parts of concentrate into 100 parts of water.
Ratio fi 1/50.

Table 5-1 Dosatron Dilution Conversion Chart

Dosatron Dilution Conversion Chart		
Ratio	Percentage	oz/gal
1:5	20.000	25.600
1:7	14.286	18.286
1:9	11.111	14.222
1:10	10.000	12.800
1:20	5.000	6.400
1:25	4.000	5.120
1:40	2.500	3.200
1:50	2.000	2.560
1:60	1.667	2.133
1:80	1.250	1.600
1:90	1.111	1.422
1:100	1.000	1.280
1:150	0.667	0.853
1:175	0.571	0.731
1:200	0.500	0.640
1:300	0.333	0.427
1:350	0.286	0.366
1:400	0.250	0.320
1:500	0.200	0.256
1:600	0.167	0.213
1:700	0.143	0.183
1:750	0.133	0.171
1:800	0.125	0.160
1:900	0.111	0.142
1:1000	0.100	0.128
1:1250	0.080	0.102
1:1500	0.067	0.085
1:2000	0.050	0.064
1:3000	0.033	0.043

5.2.5 Changing Seals in the Injection Assembly

Frequency: Once per year.

NOTE: *Use no tool or metallic utensils.*

1. Pinch the component and the seal between your finger and thumb, and push toward one side to deform the seal (see top section of Figure 5-5).

2. Increase the deformation, grip the part of the seal that is exposed, and pull it out of its groove (see bottom section of Figure 5-5).

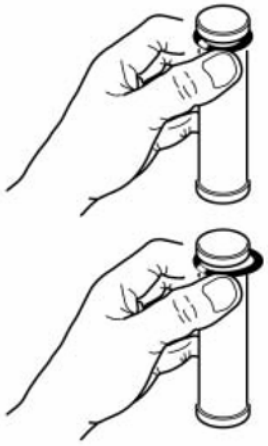

Figure 5-5 Changing the Seal

3. Clean the seal seating without any tools.

4. Do refitting by hand, being careful that the seal is not twisted once in place, which would impair its efficiency.

5.2.6 Cleaning and Refitting the Suction Valve

1. Turn off the water supply and allow the pressure to drop to zero.

2. Unscrew the nut (E in Figure 5-6) and pull downwards to remove the suction tube (T in Figure 5-6).

3. Unscrew and remove the black nut (N in Figure 5-6).

4. Pull downwards to remove the suction valve assembly.

5. Thoroughly rinse the different parts with clean water and re-assemble them.

6. Put the valve back (P in Figure 5-6) in the doser body (D in Figure 5-6) and push it in the back.

7. Check that the return spring is working (except for models RE 5 and RE 10).

8. Re-assemble by hand in the reverse order of the above steps.

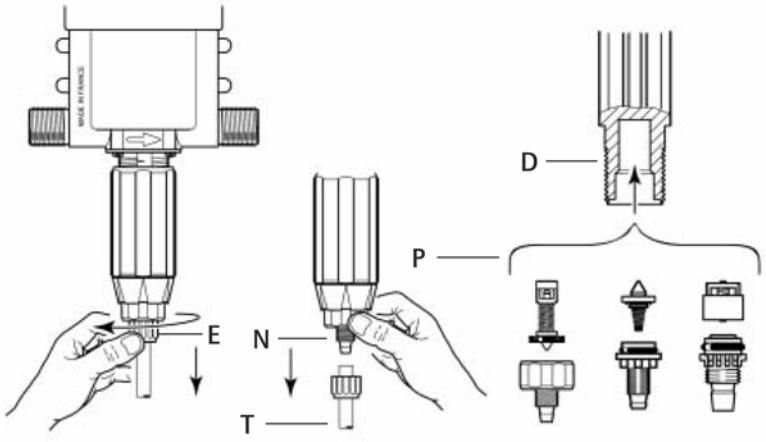

Figure 5-6 Cleaning and Refitting the Suction Valve

5.2.7 Changing the Piston Motor

1. Turn off the water supply and allow the pressure to drop to zero.

2. Take off the suction tube of product (A on Figure 5-7).

3. Unscrew the injection part by hand or by means of a long cruciform screwdriver, according to the dispenser type (A on Figure 5-7).

4. Pull downwards to remove the dosing piece (C on Figure 5-7).

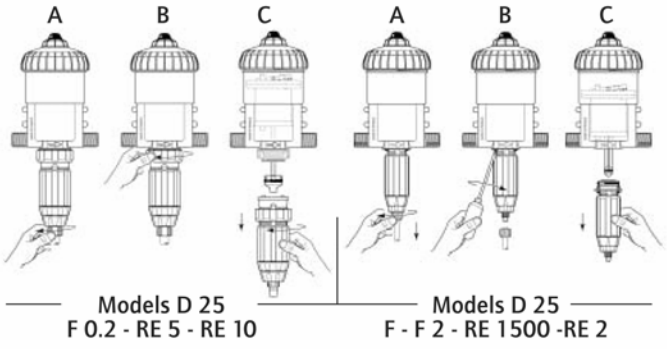

Figure 5-7 Changing the Piston Motor

5. Unscrew the screw top by hand (C on Figure 5-8) and remove it.

6. Remove the motor piston (M on Figure 5-8) by pulling it up.

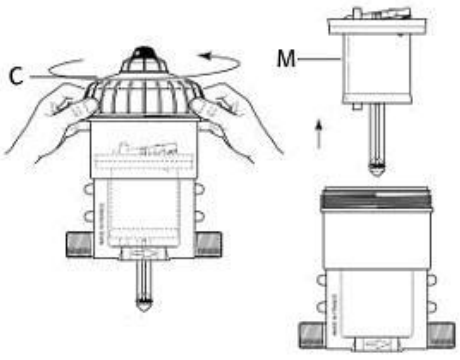

Figure 5-8 Removing the Motor Piston

7. Change and re-assemble in the reverse order to the above.

8. Refit the screw top (take care not to damage its seal) and tighten by hand.

5.2.8 Changing the Dosing Seals

1. Change the seals once a year.

2. Turn off the water supply and allow the pressure to drop to zero.

3. Take off the suction tube and remove the injection assembly as described in this chapter.

4. Pull downwards to remove the injection assembly.

5. Change the seal of the suction valve and/or the seal of the grooved fitting. See Table 5-2 for seal kit part numbers.

6. Re-assemble in the reverse order of the above steps.

Table 5-2 Dosatron Kit Part Numbers

Unit Model	Seal Kit Dosatron No.	Maintenance Kit Dosatron No.
D25RE2	ED252 AF	MKD25RE2 AF
D25RE2 PVDF	ED252 VF	MKD25RE2 VF
D25RE5	ED255 AF	MKD25RE5 AF
D25RE10	ED2510 AF	MKD25RE10 AF
D25RE1500	ED251500 AF	MKD25RE1500 AF
D25RE1500 PVDF	ED251500 VF	MKD25RE1500 VF
D45RE3000	ED063 AF	N/A
D45RE3000 PVDF	ED063 VF	N/A

5.3 Spare Parts List

Table 5-3 shows the recommended spare parts to be kept on hand by the Distributor and Owner/Operator.

Table 5-3 Recommended Spare Parts List

Recommended Parts	Part Number	Distributor Carries Part In Stock	Owner/Operator[1] (Distributor Support) Carries Part In Stock	Owner/Operator[2] (No Distributor Support) Carries Part In Stock
Strainer, 200 Mesh	365837	YES	NO	YES
PVC Ball Valve, ½ in.	324384	YES	NO	YES
Hose Barb, 1 x 1 HS x MPT	621245	YES	NO	YES
PVCSCH80 Close Nipple, ½ in.	310268	YES	NO	YES
Conn PF, 1/2 in. MPT x ½ in. Poly Flow	118588	YES	NO	YES

1. Recommends what spare parts should be kept on hand by the Car Wash Owner/Operator if there is close support from the distributor and parts are quickly obtainable.
2. Recommends what spare parts should be kept on hand by the Car Wash Owner/Operator if there is NOT close support from the distributor and parts are NOT quickly obtainable.

5.4 Board Serial Number Information

Important!
The serial numbers on your units are stamped into the bell housing of each dispenser.
Please record this number in the space below and refer to it when you call your distributor or Hanna Car Wash Systems for information, parts, and service.

CUSTOMER SERVICE 1-800-288-6927

	Model #	Serial #	Purchase Date
Bank 1	_____	_____	_____
Bank 2	_____	_____	_____
Bank 3	_____	_____	_____
Bank 4	_____	_____	_____
Bank 5	_____	_____	_____
Bank 6	_____	_____	_____
Bank 7	_____	_____	_____
Bank 8	_____	_____	_____
Bank 9	_____	_____	_____
Bank 10	_____	_____	_____
Bank 11	_____	_____	_____
Bank 12	_____	_____	_____
Bank 13	_____	_____	_____
Bank 14	_____	_____	_____
Bank 15	_____	_____	_____
Bank 16	_____	_____	_____
Bank 17	_____	_____	_____
Bank 18	_____	_____	_____

6.0 Troubleshooting

This chapter helps you solve common system problems. If you are still unable to find a solution after reading through this section, please call your distributor for technical assistance.

6.1 Pro Dispensing Board Problems

Problem	Possible Solutions
▪ UNIT IS NEW AND WILL NOT WORK	▪ Make sure the valve on the outlet side is open so that the water can flow through the unit. ▪ Make sure the arrow at the base of the body is pointing in the direction of the water flow. ▪ Also make sure all the protective caps have been taken off, including the small red one on the injection tube.
▪ UNIT DRAWS UP SOLUTION, BUT DROPS IT BACK DOWN	▪ The parts in the check valve could be damaged, missing, installed incorrectly or the valve could be kept open by debris or the injection hose may not be hooked up properly. ▪ Replace defective parts as necessary. ▪ Change dosing seal kit. Pay particular attention to the seal and cone.
▪ WHAT COULD CAUSE A HORIZONTAL CRACK ALONG THE BASE OF THE BODY OF THE UNIT?	▪ It could be caused by acid contained in the chemicals and/or by water hammer. If the crack is discolored, it is due to acid not being flushed. Watch for discoloration. Chemical deterioration is the likeliest answer. If the body is discolored and/or the plastic has been attacked, you may need to change to the PVDF body.

Problem	Possible Solutions
▪ WHAT COULD CAUSE PINHOLES ON THE BODY OF THE UNIT?	▪ This is due to acid or other corrosive splashing onto the unit. Chemical deterioration is the likeliest answer. You may need to change to the PVDF body.
▪ WHY DOES WATER LEAK BACK INTO THE CONCENTRATE CONTAINER?	▪ Check the check valve assembly — you could have worn seals, a blockage or missing parts. Check the injection hose to make sure it is completely attached.
▪ WHY ISN'T THE UNIT CLICKING?	▪ It could be due to any or all of the following — low flow, broken spring, worn piston shells, swollen poly-sheets, missing O-rings, or the unit could have a problem with the piston motor.
▪ WHY DOES THE INJECTION STEM BLOW OUT OF THE UNIT?	▪ The medium nut is loose or cracked — too much pressure or flow going through the unit. Most of the time this is caused from water hammer in the system. Install a check valve after the outlet of your unit.
▪ WHY DOES THE UNIT UNDER INJECT?	▪ It could be due to low flow, too-thick solution, air leaks, or worn dosing seals and stem. Worn seals and air leaks are the main causes. Adjust the unit to the correct injection rate and continue to test the unit for accuracy. If the rate continues to diminish, new seals are needed.
▪ WHY IS THE UNIT LEAKING AT THE BLACK NUT UNDER THE BODY?	▪ The diffuser is not properly aligned inside the body. Check the assembly drawing for proper alignment.

Problem	Possible Solutions
▪ WHY CAN'T I JUST SEND THE PISTON IN FOR REPAIR?	▪ The service department needs to see the whole unit to make a complete assessment of what is wrong with the unit and what may have caused the problem. The piston might not tell the whole story. The bell housing or body may be scored and repair of the piston in this case would not solve the problem. Every unit is thoroughly tested before shipping to the customer.
▪ UNIT CLICKED TWICE AND THEN STOPPED.	▪ The unit may have started too quickly or you may have a broken spring. Turn the water off and turn it on slowly with the solenoid activated. If this doesn't work, reset the piston.
▪ WHY IS THE UNIT SQUEAKING LOUDLY?	▪ There is not enough lubricity in the unit between the piston and the bell housing. Adding a small amount of liquid detergent or wetting agent to the concentrate can be helpful.
▪ CAN YOU SEND A LOANER WHILE THE UNIT IS IN FOR REPAIR?	▪ We do not typically send out loaners since in the majority of cases, we have it back to the customer in three days. If this is not acceptable, you can buy a spare dispenser for emergencies.
▪ CAN I USE GLUE TO FIX A CRACK?	▪ Due to the pressures inside the unit, this is not recommended. It more than likely will seep through to the inside surface. The bond is not strong enough to withhold the pressures. Cracked parts need to be replaced.

Problem	**Possible Solutions**
▪ DOSATRON DOES NOT START OR STOP	▪ Piston stalled -- reset piston by hand ▪ Bleed air from unit with bleed button ▪ Maximum flow exceeded: 1. Reduce flow, restart unit 2. Unscrew the screw top 3. Take off the piston and check piston valve seals to ensure correct position ▪ Piston motor is damaged -- return unit to your service center for repair.
▪ WATER FLOWING BACK INTO CONCENTRATE CONTAINER	▪ Contaminated, worn, or missing check valve parts -- clean or replace
▪ NO SUCTION OF CONCENTRATE	▪ The piston motor has stopped -- change piston motor ▪ Air leak (inlet) in the suction tube -- clean suction tube and strainer ▪ Blocked suction tube or clogged strainer -- clean or replace ▪ Missing or worn check valve seal -- clean or replace ▪ Missing or worn plunger seal -- clean or replace ▪ Worn injection stem -- replace
▪ LEAKS IN THE VICINITY OF THE FIXING METALLIC RING UNDER THE BODY HOUSING	▪ Injector sleeve seal is damaged or positioned incorrectly – replace
▪ LEAKS BETWEEN THE SETTING SLEEVE AND LOCKING RING	▪ Injector assembly seal damaged, positioned incorrectly or missing
▪ LEAKS BETWEEN THE BODY AND SCREWTOP	▪ Screw top seal is damaged, positioned incorrectly or missing -- unscrew the screw top, clean the seal seating, replace or change the seal, and position correctly the screw top.

Appendix A

Table of Drawings

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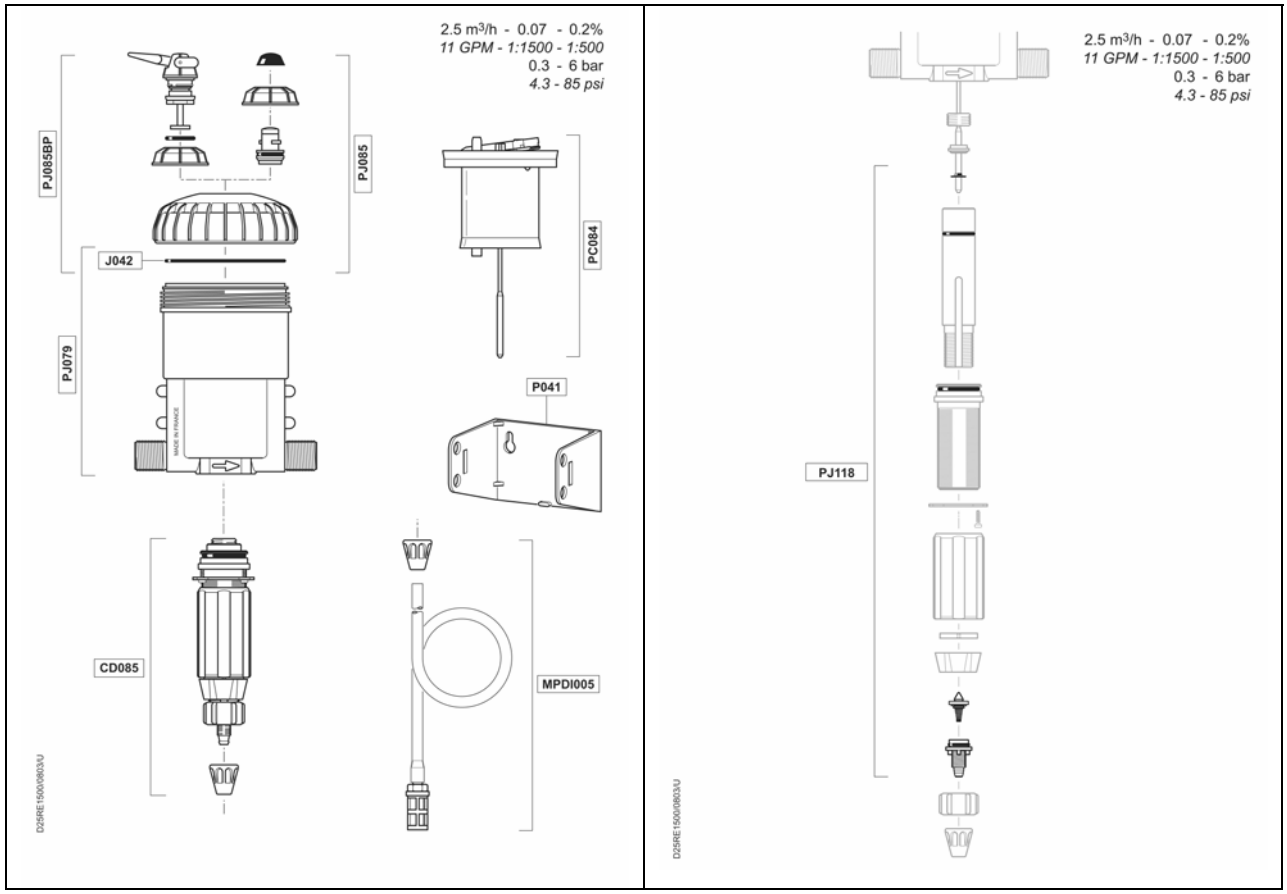
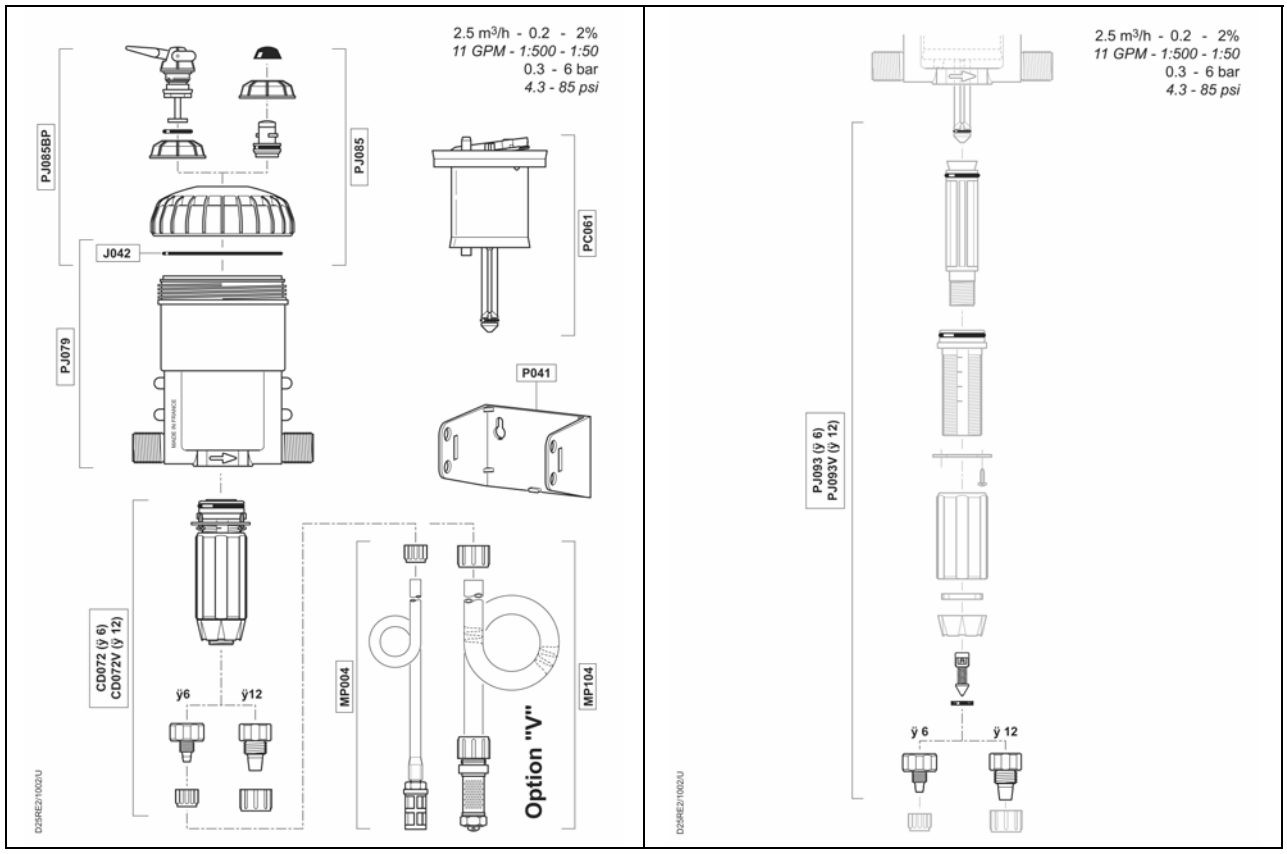
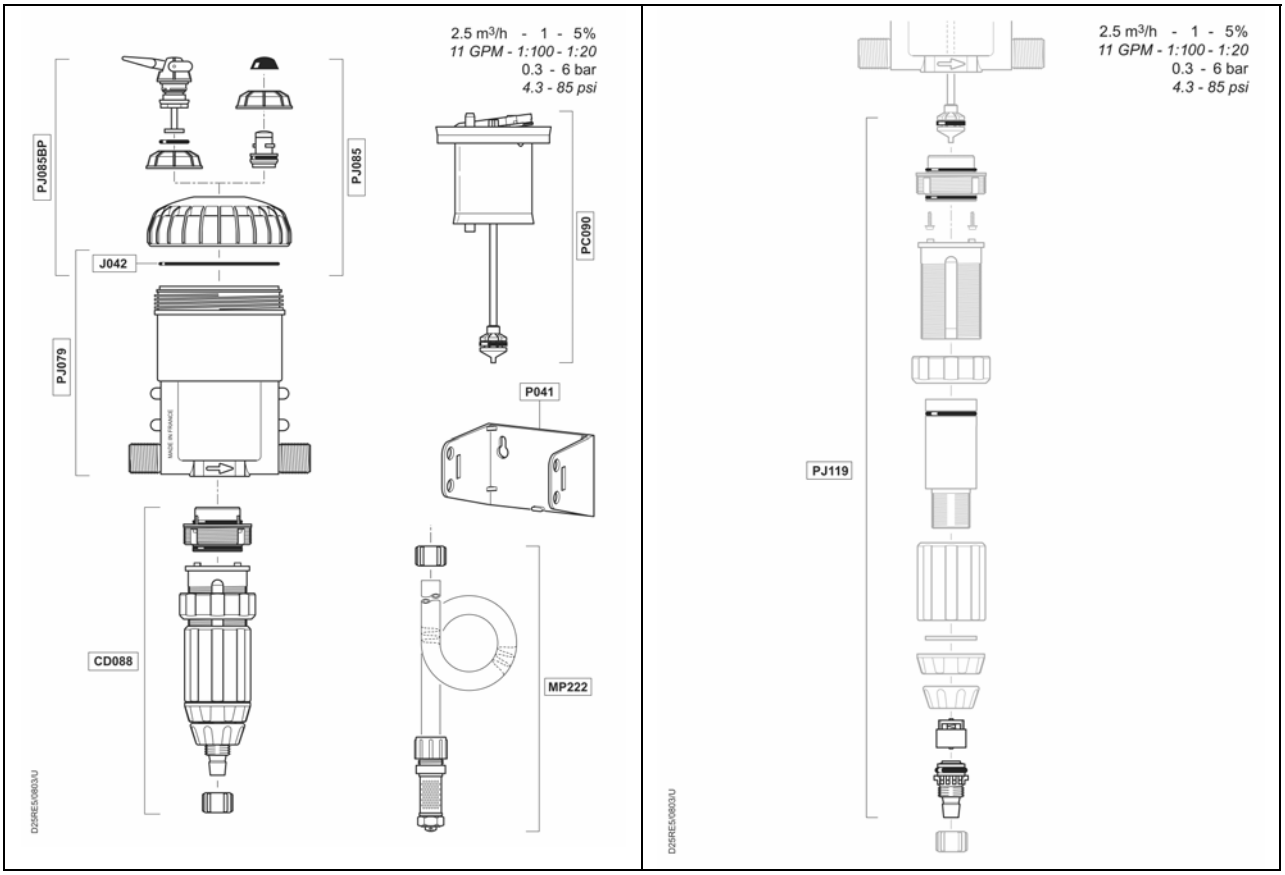
Parts Diagram D 25 RE 1500



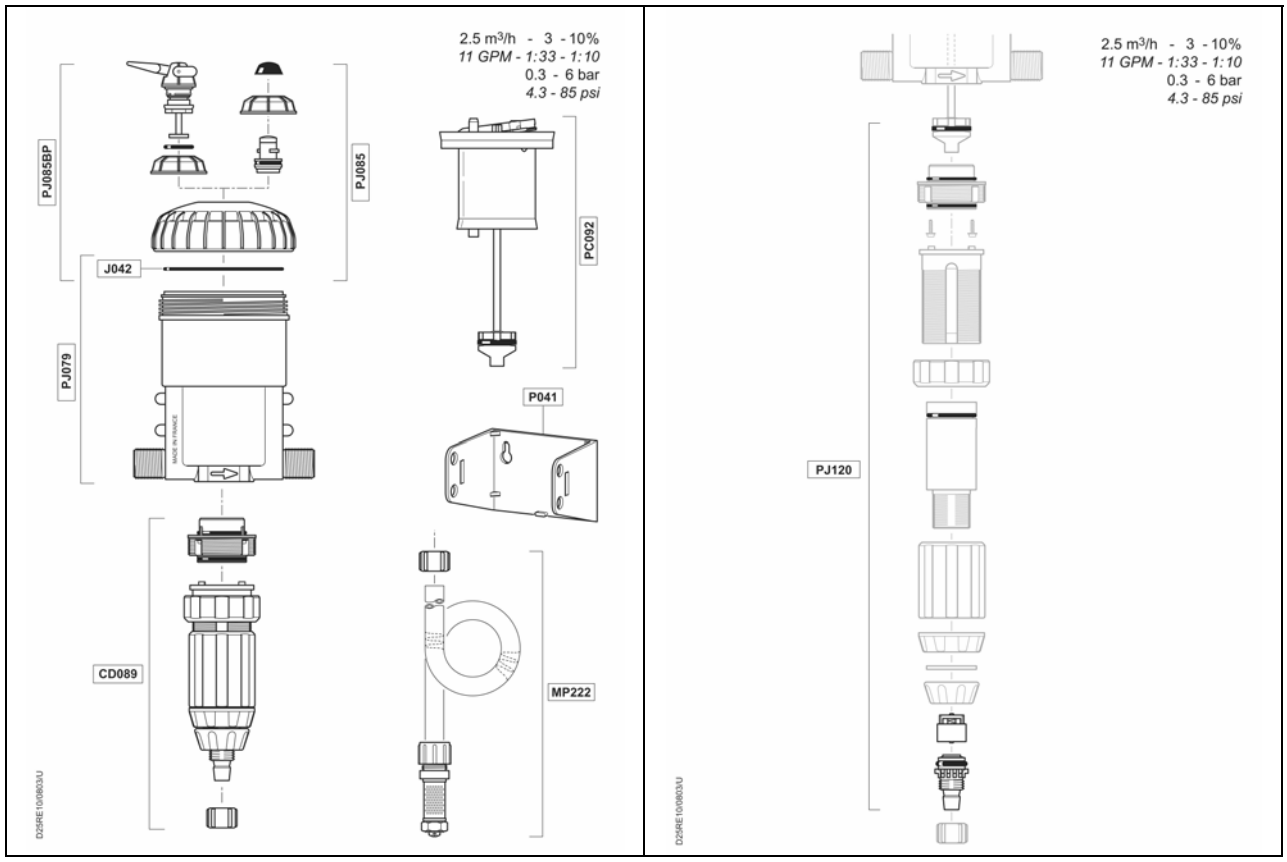
Parts Diagram D 25 RE 2



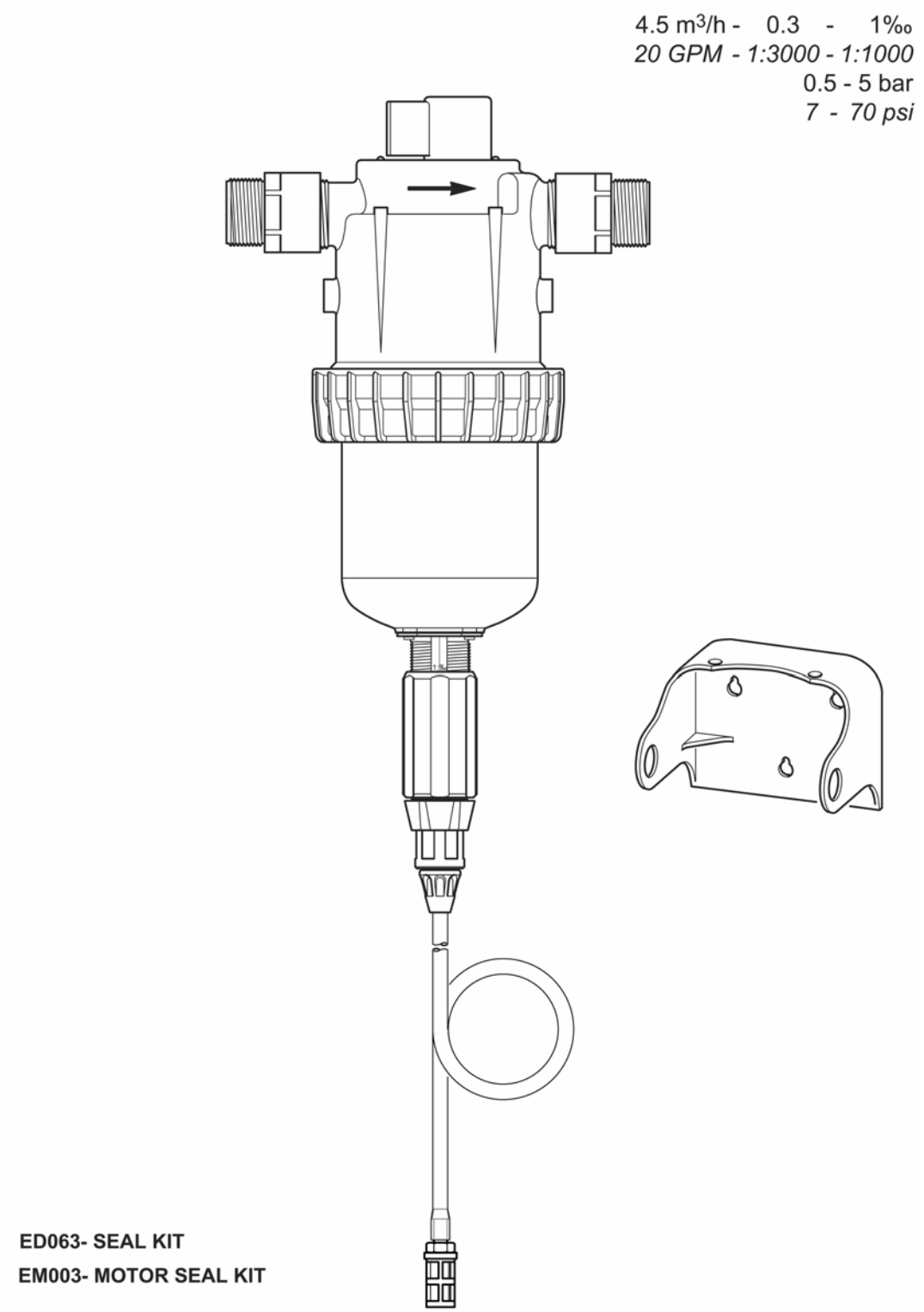
Parts Diagram D 25 RE 5



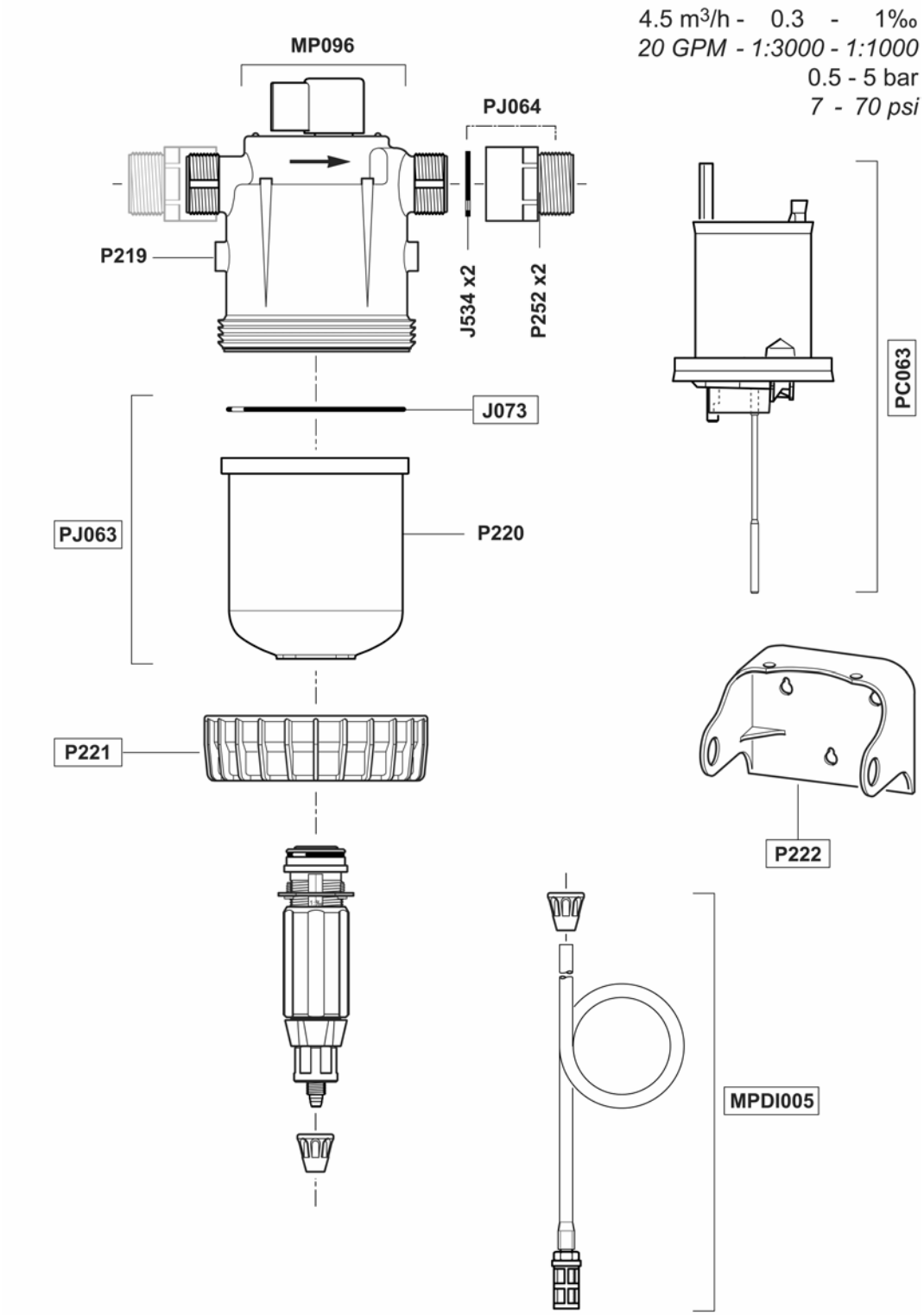
Parts Diagram D 25 RE 10



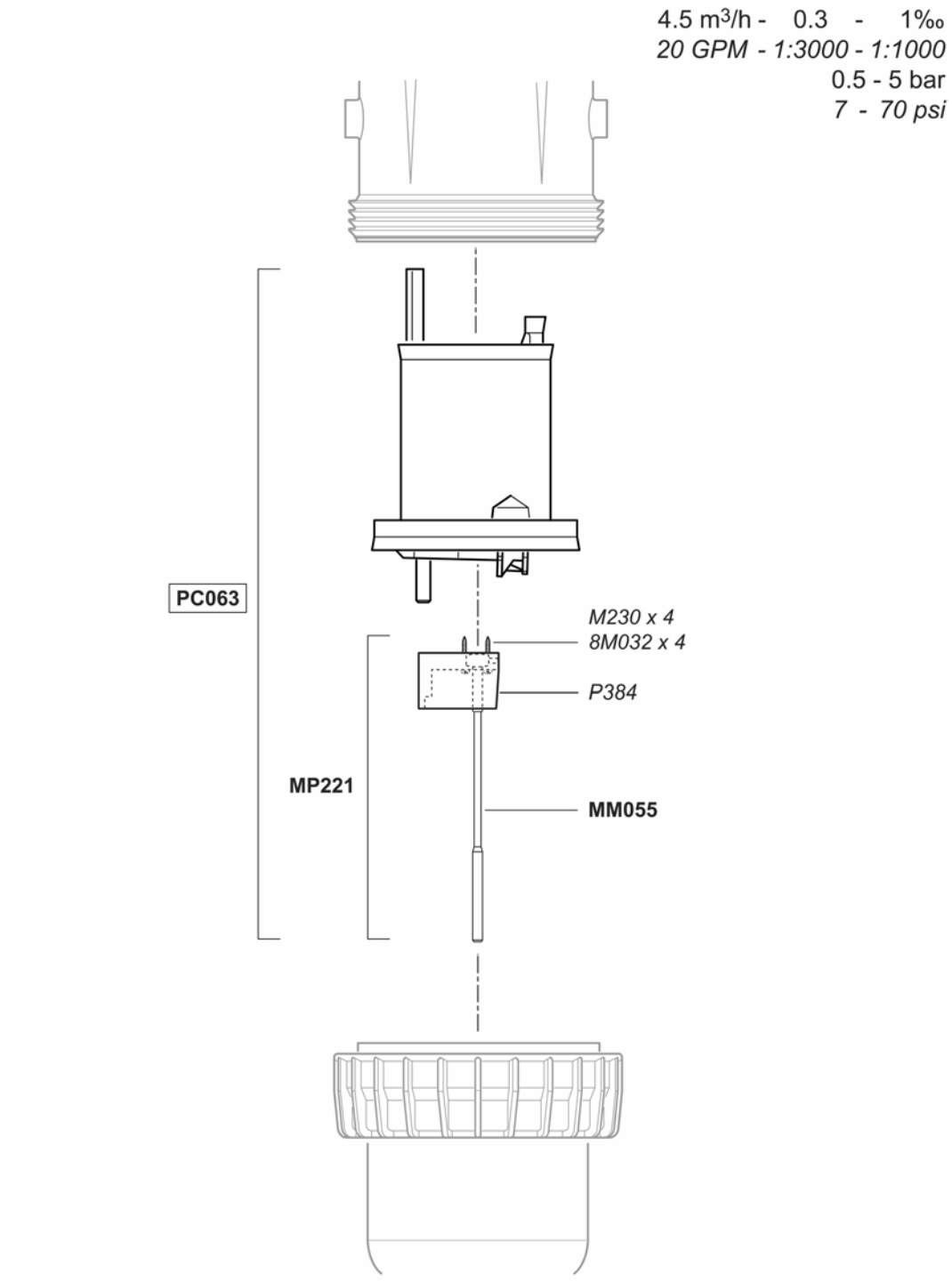
Parts Diagram D 45 RE 3000 (1 of 6)



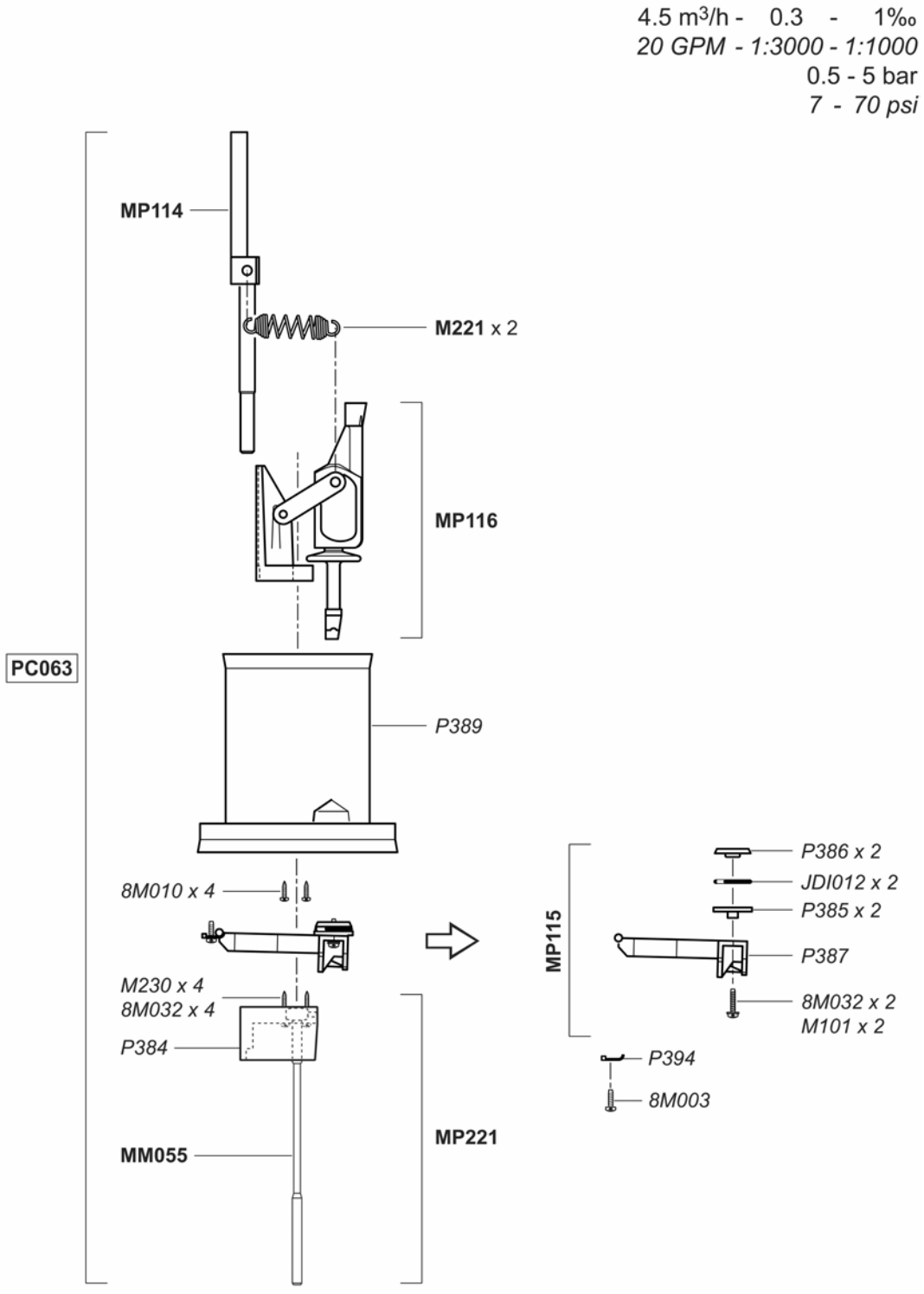
Parts Diagram D 45 RE 3000 (2 of 6)



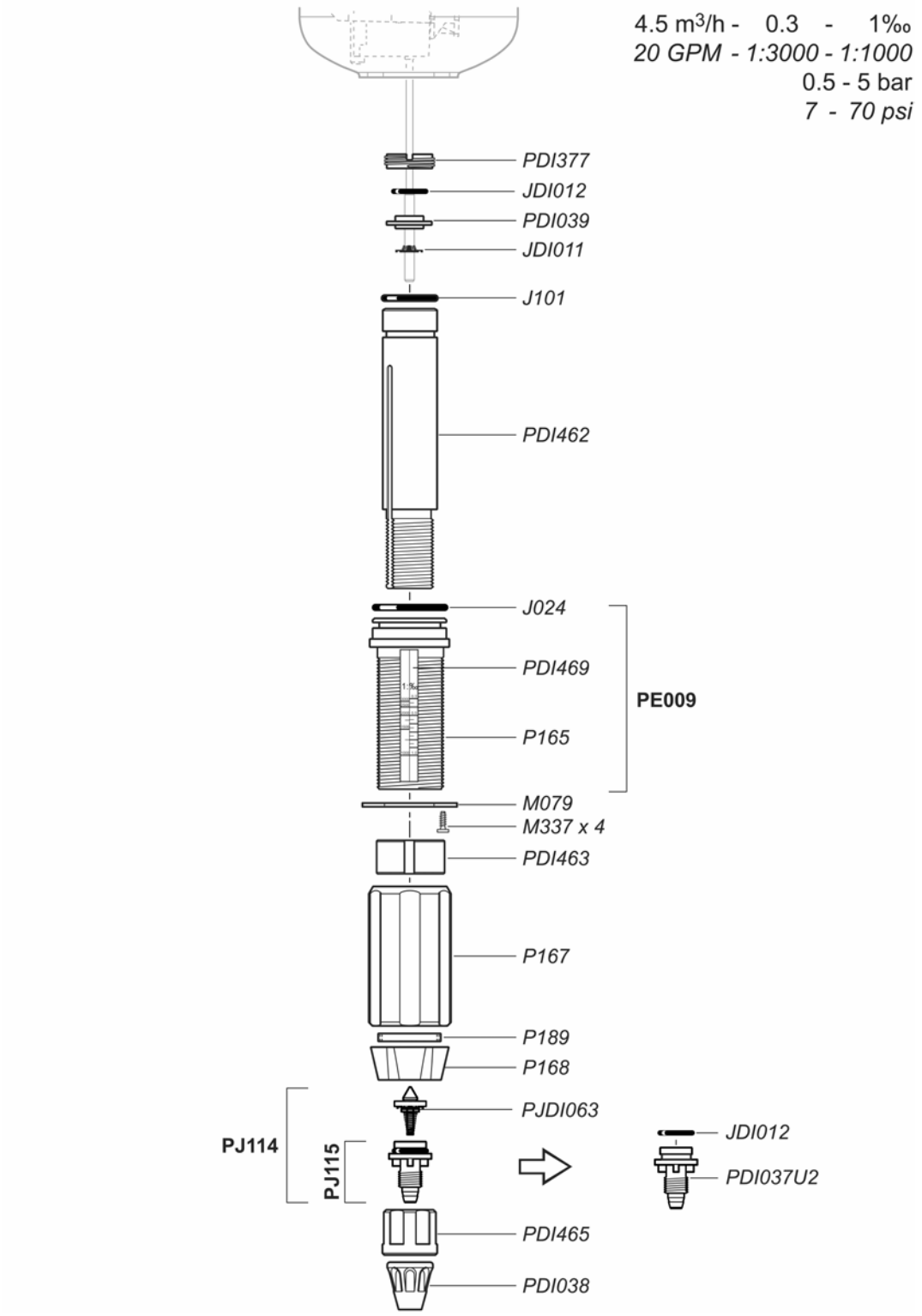
Parts Diagram D 45 RE 3000 (3 of 6)



Parts Diagram D 45 RE 3000 (4 of 6)



Parts Diagram D 45 RE 3000 (5 of 6)



Parts Diagram D 45 RE 3000 (6 of 6)