LES PLASTIQUES CY-BO

1750 RUE BERLIER,
LAVAL, QUÉBEC,
CANADA H7L 4A1
TEL : 450-696-4000
FAX : 450-696-4444

DOSINGBOX®

Installation, operation and maintenance manual

	Acids
	Bases
	Sulfuric acid
	Sodium hypochlorite

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INTRODUCTION

Congratulations! The DOSINGBOX® is the best chemical injection system on the market. It's also the safest for the people and the environment.

WARRANTY

The pump cabinet(s) is warranted without defects in materials and workmanship at the delivery date. The warranty exclusively covers the product itself and is limited to its original value. It does not cover items damaged by use or as a result of modifications.

The injection system is guaranteed 1 year against leaks.

All threaded fittings, including unions, must be checked, manually tightened as necessary **before** system startup.
A loose threaded fitting or union is not a leak.
No guarantee applies in case of non-compliance with this manual.

Damages suffered during delivery: Incoterms 2010 apply.
Missing, mistake or forgotten:
Contact our customer service (450) 696-4000
* Other warranties may apply depending on the components.

RECEIVING

When receiving your injection system, examine it carefully for any breakage or defects.

STORING

At ambient temperature, sheltered from inclement weather, shocks and vibrations.

CLEANING

The DOSINGBOX® can be cleaned with water or with a solution made of water and gentle soap.
The water temperature or cleaning solution is to be less than 35°C.
Never clean the DOSINGBOX® with a solvent or a solvent-based solution.

SAFETY

HYGIENE AND SAFETY INSTRUCTIONS

Personnel responsible for unpacking, handling, installing and operating this material should read and respect the contents of this manual to:

- Prevent personal hazard;
- Ensure the reliability of the equipment;
- Prevent any error due to improper handling.

Before any intervention on the cabinet (intervention on the pump, piping or process equipment of the cabinet):

- Stop the pump(s) ;
- Prevent accidental pump starting by blocking (padlocking) the switch and/or removing the fuse from the power supply;
- Place a note at the switch location to inform that an intervention is in progress.

When detecting anomalies, switch off the motors.

PROTECTION AGAINST CHEMICAL HAZARD

When commissioning the cabinet and the pumps, the personnel must take all the usual precautions against the risks of projection, burning and pollution due to the chemicals used (ask for and read carefully the safety data sheet of the chemical product available from the supplier).

Never open the cabinet without express authorization;
Never handle a piping element without authorization;
Never pull on piping;

Make the connections «storage ⟶ injection» and «injection ⟶ process» according to the guidelines.

Never open the purge valve of the cabinet without being ready to collect any contents of the pipe or retention of the cabinet.

Evacuate toxic gases to the appropriate place.

INAPPROPRIATE USE

The DOSINGBOX® injection system is designed and manufactured for the injection of liquid chemicals.
It is **not** designed for the following products: explosive, gaseous, highly viscous, abrasive, solid, compressible and liquid containing particles or long fibers.

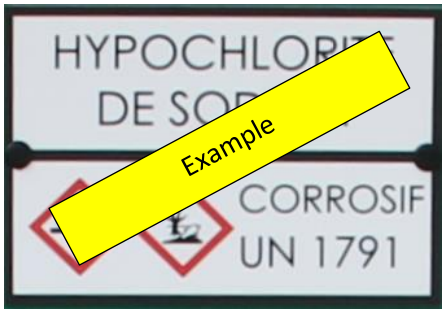
SAFETY

PPE COMPARTMENT (Personal protection equipment)

Every DOSINGBOX® is delivered with a PPE in its destined compartment. The customer is responsible of making sure a PPE is always available for the operator.

It is the responsibility of the user to wear this protective equipment before working on the injection system in service.

IDENTIFICATION PLATE



Your DOSINGBOX® is complete with its identification plate.
Allowing quick and easy identification.

The complete system is intended for the injection of the liquid chemical mentioned on the identification plate **ONLY**.

CHEMICAL COMPATIBILITY

The DOSINGBOX® is designed and manufactured for the dosing of chemicals that may be hazardous for users and the environment.

The materials (piping, valves, pumps) selected to assemble the injection system were offered by Cy-Bo Plastics based on the information provided by the customer.

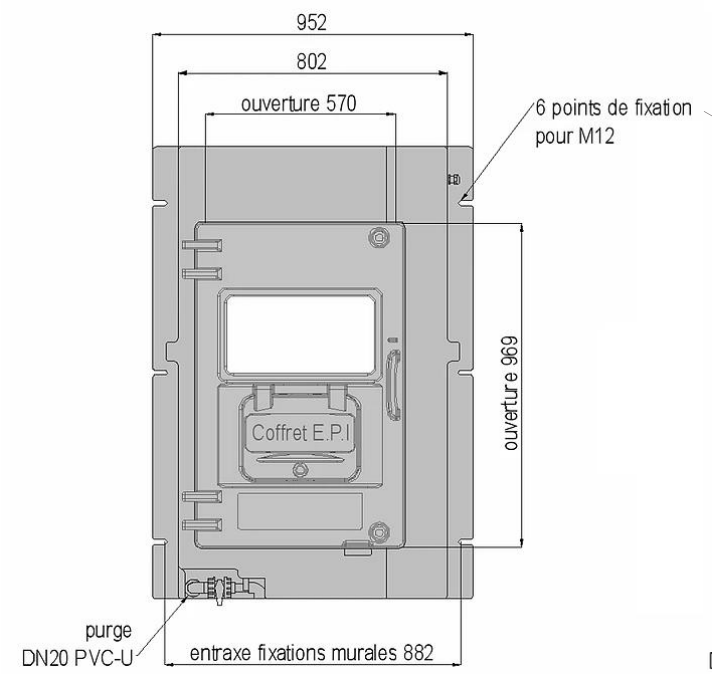
Following the technical exchanges between the customer and Cy-Bo Plastics, the customer authorizes Cy-Bo Plastics to assemble the pumping circuit using the proposed materials. Therefore, only the customer is responsible for the choice of materials used for the manufacture of the cabinet itself and the assembly of piping and process equipment.

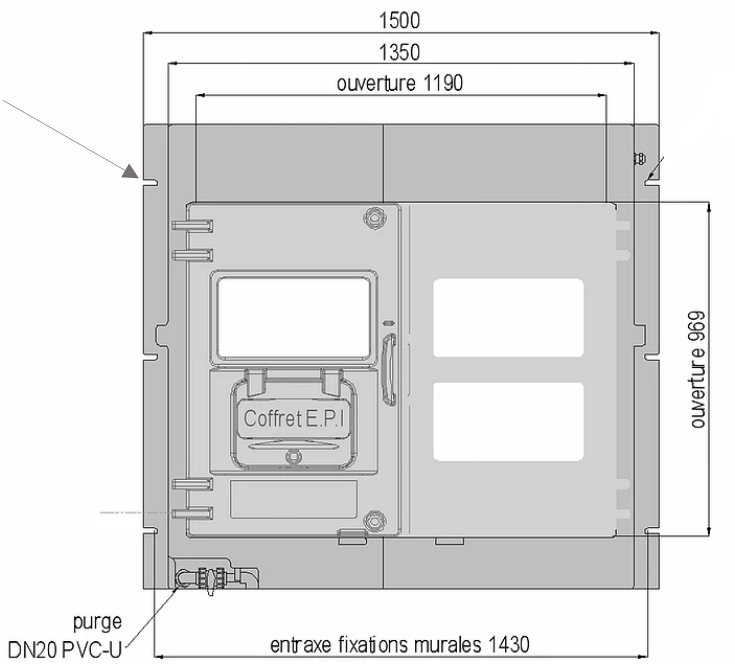
DOUBLE CONTAINMENT CONNECTIONS (Optional)

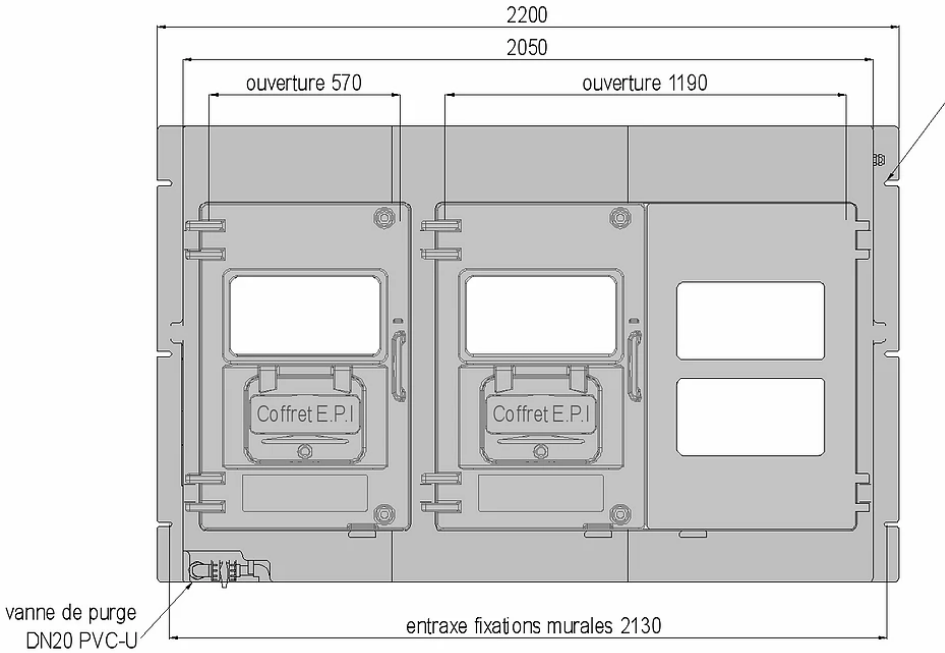
The double containment option on the DOSINGBOX® allows you to connect double wall piping to the inlet and/or outlet for more security in your installations.

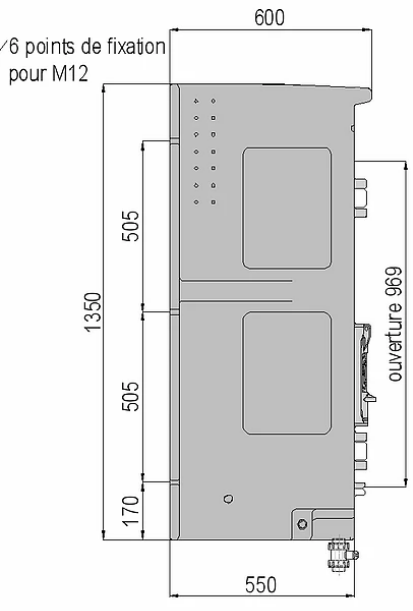
DIMENSIONS

If you ordered a custom box or tablet, refer to your approval drawing.

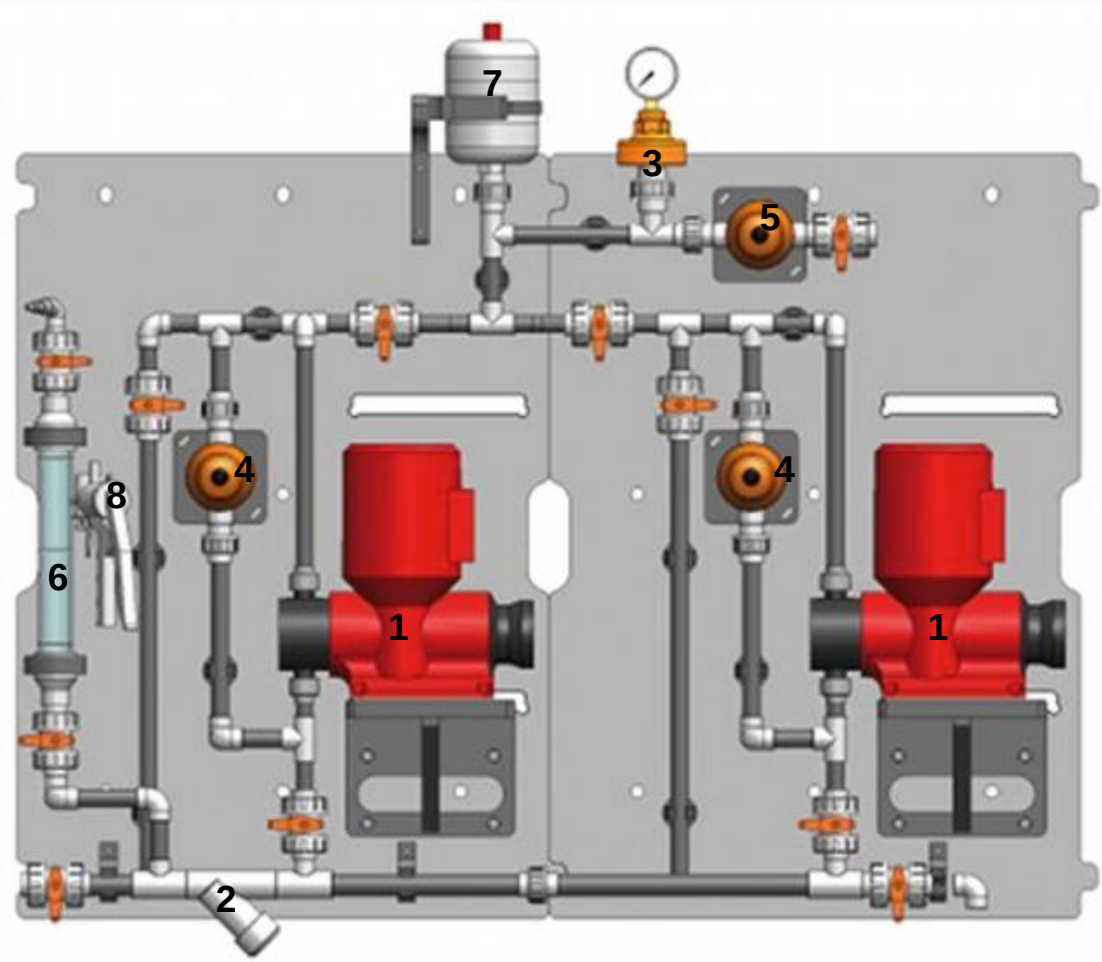








COMPONENTS IDENTIFICATION



1	Dosing pump
2	Y-strainer
3	Gauge and guard
4	Pressure relief valve
5	Back pressure valve
6	Calibration cylinder
7	Pulsation dampener
8	Manual priming pump

INSTALLATION

On the wall, on a support provided for this purpose or on a tank.

Caution, installation on a tank:
Only if it has been designed and manufactured for this purpose.

NEVER INSTALL THE DOSINGBOX ON A ROTOMOLDED TANK.

ENVIRONMENT

- Use temperature cabinet -30°C to 50°C / Pumps 0°C to 50°C
- Do not install next to a heat source;
- Keep away from flammable materials;
- Protect the equipment against mechanical shock;
- Maintain sufficient space around the cabinet to ensure a smooth flow of operators and to be able to open the doors in their entirety;
- Avoid vibrations.

FIXATION

- Fix the cabinet in a vertical position, against a wall, a tank or on a support by its rear face;
- Make sure the support is strong enough to support the cabinet and its equipment without deformation;
- Use the 6 anchors located on the back side;
- Use anchors (not supplied) adapted to the mounting bracket.

The installation and commissioning of the injection system requires the connection of the plumbing and the power supply. Only qualified and certified people can do these manipulations.

LEAKAGE AND CALIBRATION TEST

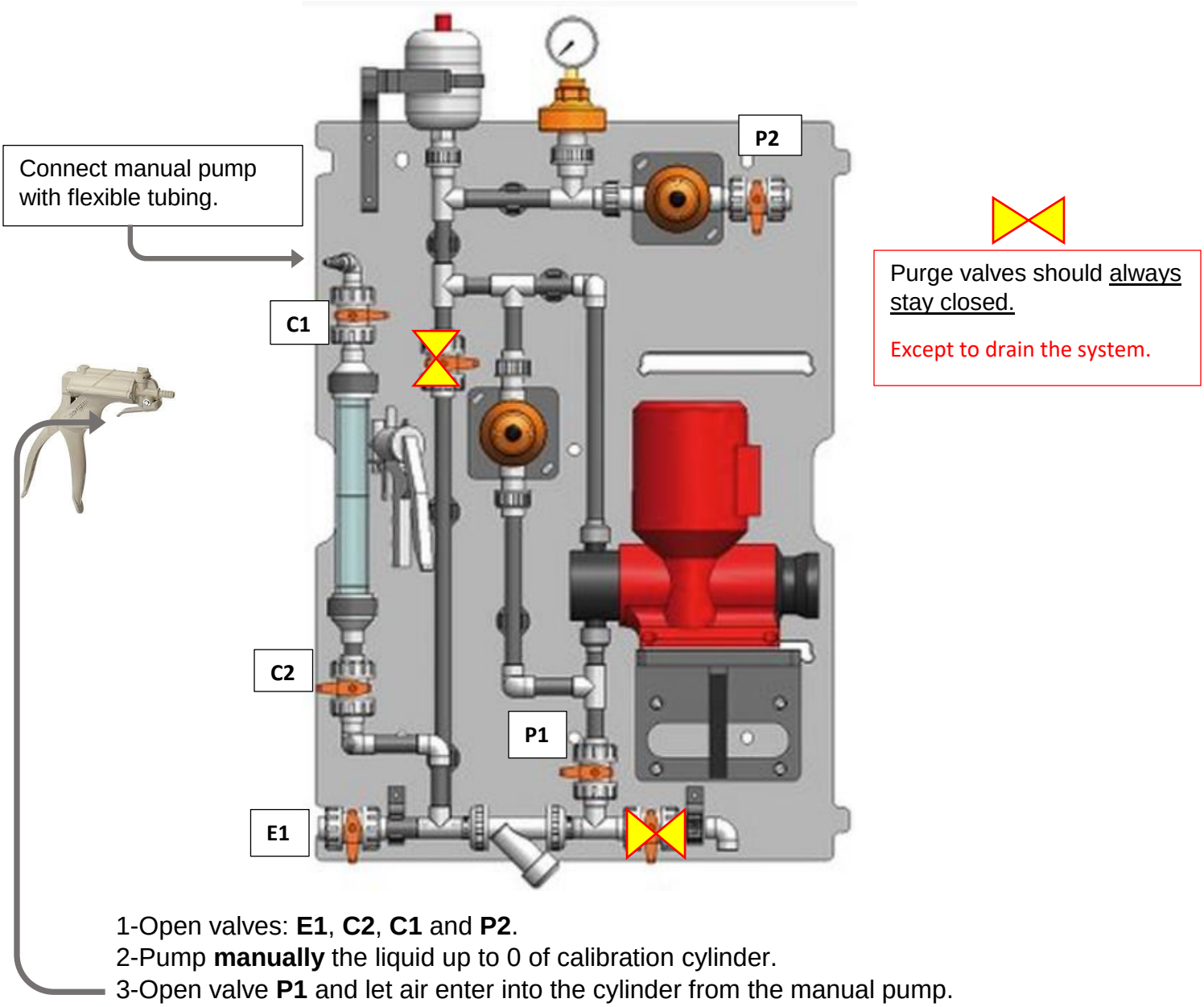
Your injection system has been tested and calibrated at Cy-Bo with water. Some chemicals react with water. When such reactions are likely to occur, be sure to drain and dry the entire lines before introducing the chemical.

START-UP

Check the tightness of each fitting before pressurizing.
Never create exothermic reactions in the pipes.
In case of rinsing, completely purge and dry the lines and all equipment before putting back into service (pay particular attention to the valves).

PRIMING PROCEDURE

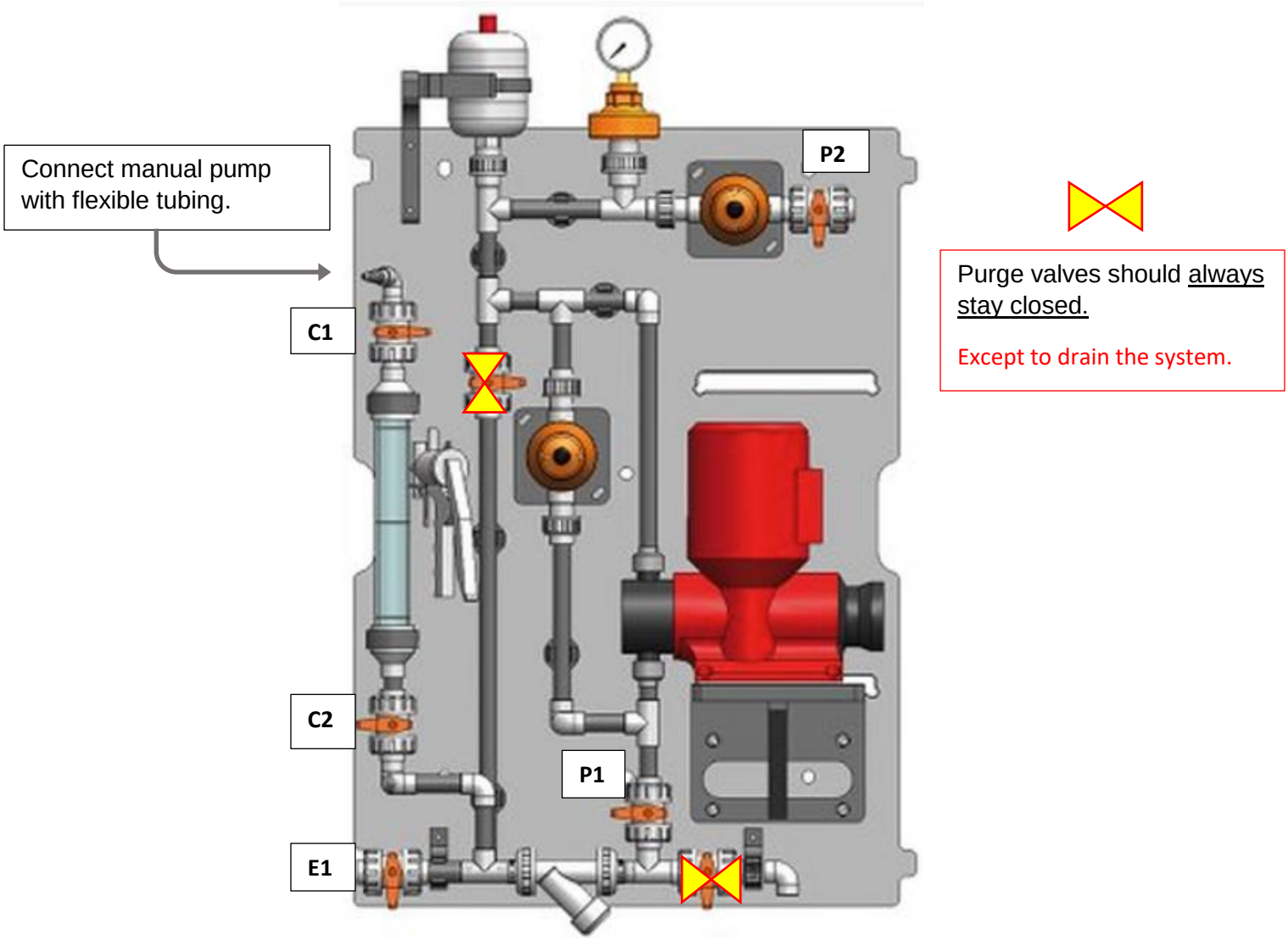
→ Refer to pump manual. (Annex A)



1-Open valves: **E1**, **C2**, **C1** and **P2**.
2-Pump **manually** the liquid up to 0 of calibration cylinder.
3-Open valve **P1** and let air enter into the cylinder from the manual pump.
4-Close **C2** and **C1** (cylinder is empty).
5-Start pump.

FLOW CALIBRATION PROCEDURE

→ Refer to pump manual. (Annex A)

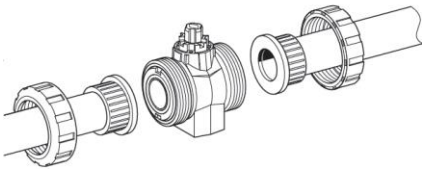


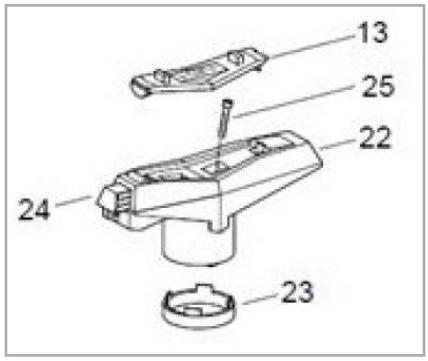
1-Open valves: **E1**, **P2**, **C2** and **C1.**
2-Pump **manually** the liquid up to above 0 of the calibration cylinder.
3-Close valve **E1**.
4-Disconnect the manual pump to let air into the cylinder from **C1**.
5-Open valve **P1**.
6-Start pump.
7-Time the liquid displacement between 2 graduations.
8-Calculate the flow.

COMPLETE PART LIST WITH EXPLODED VIEW

MANUAL BALL VALVE

The injection system contains several manual valves with double unions. This type of connection allows easy and quick replacement of the valve body.



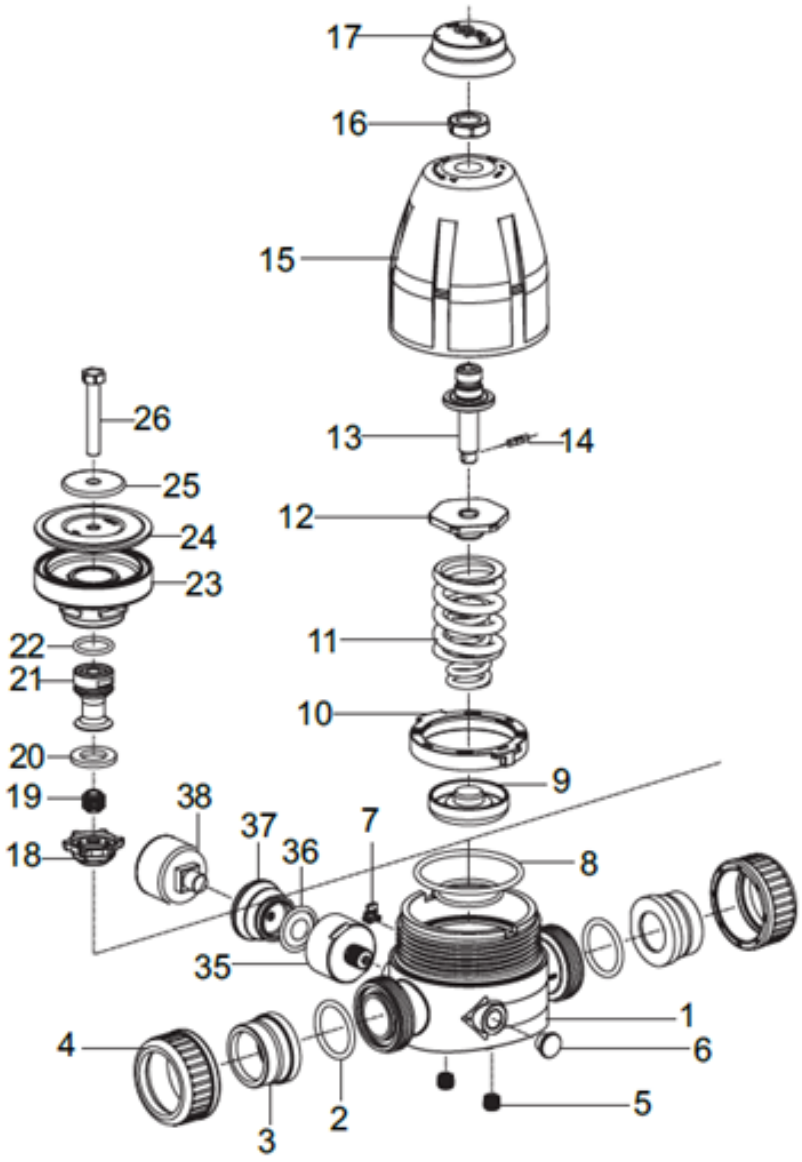


Multifunctional lever

Pos.	Description	Pos.	Description
1	Body	11	Stem seal
2	Union bush	12	Standard lever
3	Connecting part	13	Lever clip
4	Union nut	14	Threaded insert
5	Ball	22	Multi-functional lever
6	Stem	23	Spacer
7	Ball seal	24	Unlocking latch
8	Backing seal	25	Fastening screw (Torx)
9	Body seal	30	Mounting plate
10	Union seal	31	Fastening screws

PRESSURE RELIEF VALVE

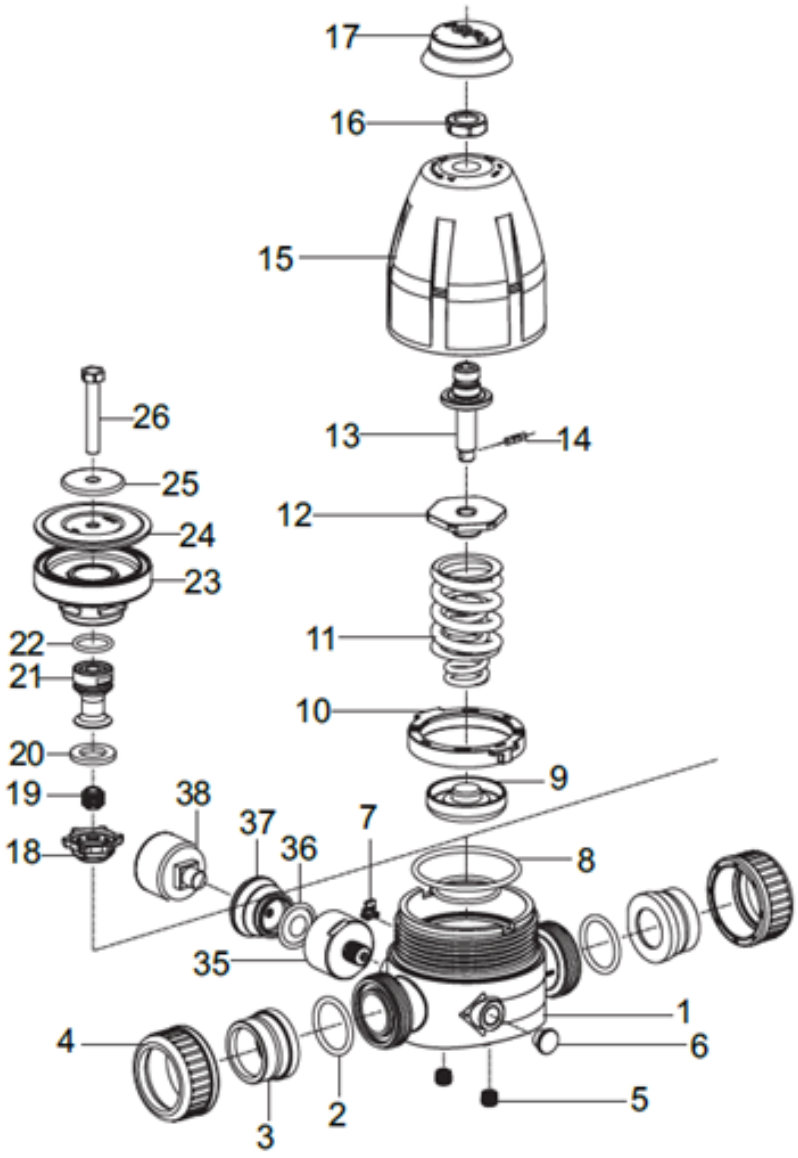
This valve is essential to your injection system. It must be adjusted to a pressure lower than the weakest point of the discharge circuit. It opens in case of overpressure to protect your equipment. The fluid is redirected to the suction of the pump or to the storage tank.



1	Valve body
2	Face seal
3	Union end
4	Union nut
5	Threaded insert
6	Gauge port plug
7	Indicator tab
8	Cartridge seal set
9	Pressure piece
10	Retaining ring
11	Spring set
12	Spring retainer
13	Spindle
14	Spindle pin
15	Bonnet
16	Adjustment screw nut
17	Protective cap
18	Cartridge nut cover
19	Cartridge nut
20	Cartridge flat gasket
21	Piston
22	Piston seal
23	Cartridge
24	Diaphragm
25	Diaphragm plate

BACK PRESSURE VALVE

The back-pressure valve provides a constant pressure on the pump outlet, thus ensuring the injection pressure. It also prevents siphoning. It must be adjusted to the desired injection pressure; this value must be lower than the opening pressure of the pressure relief valve.



1	Valve body
2	Face seal
3	Union end
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6	Gauge port plug
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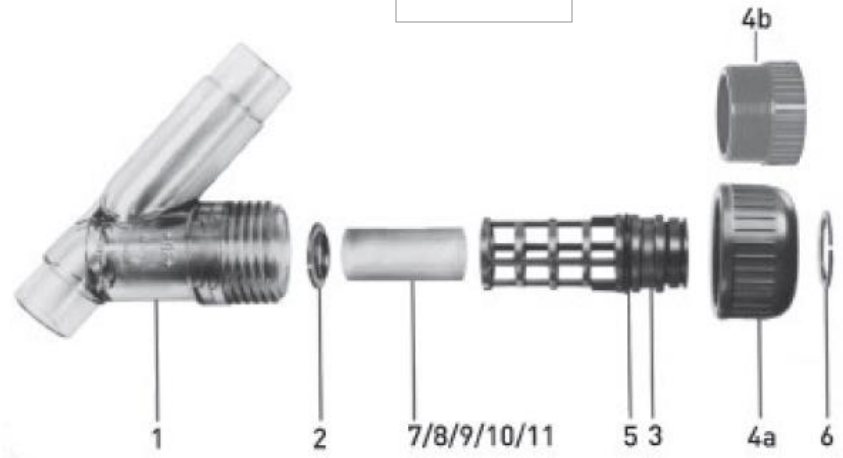
12	Spring retainer
13	Spindle
14	Spindle pin
15	Bonnet
16	Adjustment screw nut
17	Protective cap
18	Cartridge nut cover
19	Cartridge nut
20	Cartridge flat gasket
21	Piston
22	Piston seal
23	Cartridge
24	Diaphragm
25	Diaphragm plate

Y STRAINER

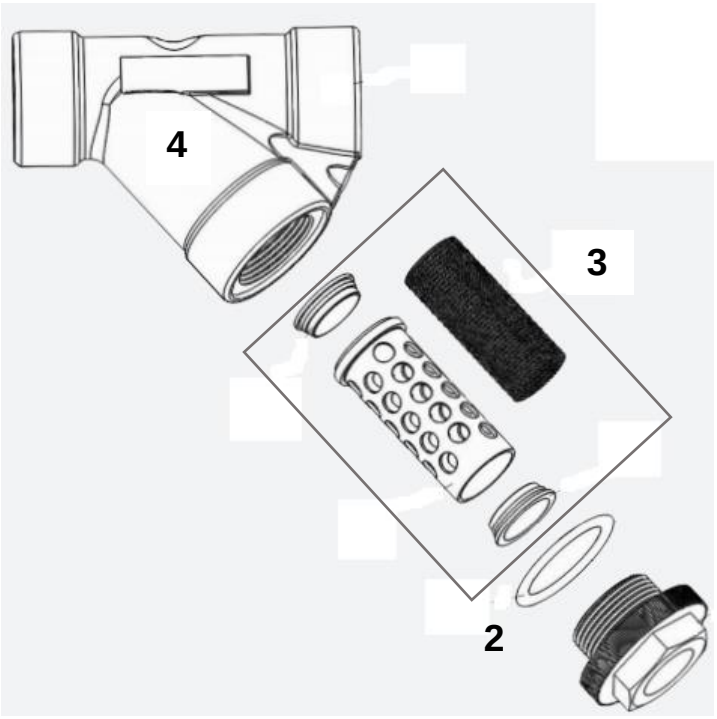
The Y strainer prevents the introduction of unwanted particles into the pumping circuit. It protects your valve seats, pump and pressure regulating valves diaphragms.

PVC clear

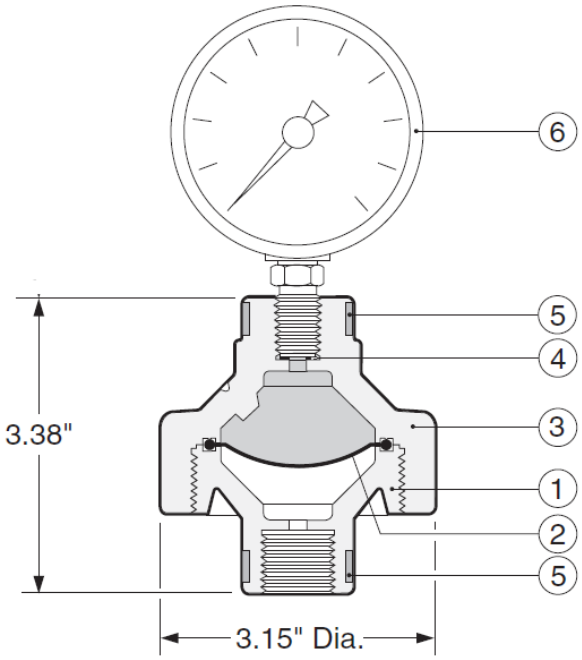


Item	Description
1	Body
2	Screen support ring
3	Screen cage
4a	Valve nut
4b	Tamping (only for PVC-U, DN65 and DN80)
5	Body seal
6	Circlip
7	Slotted casing PVC-U (0,5 mm)
8	Slotted casing PVC-U (0,8 mm)
9	Slotted casing PVC-U (1,4 mm)
10	Slotted casing PVC-U (2,2 mm)
11	Slotted casing stainless steel (0,5 mm)
12	Slotted casing PPH
13	Screen cage bracket
14	Valve end metric PP-H
15	Nut PP-H

	CPVC	PVDF
1	CAP	CAP
2	O'RING SEAL	O'RING SEAL
3	SCREEN	CARTRIDGE
4	BODY	BODY



GAUGE WITH GUARD



The pressure gauge is an **indispensable** instrument for your injection system. It informs you of the discharge pressure of the pump and allows you to adjust the pressures of the back pressure and pressure relief valve.

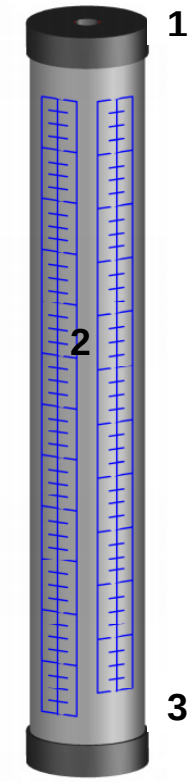
1	Body
2	Diaphragm (PTFE)
3	Bonnet
4	Gasket
5	Stainless steel bands
6	Pressure gauge

CALIBRATION CYLINDER

Calibration cylinders allow you to accurately calibrate the flow of your dosing pump. They are made of clear PVC or borosilicate glass according to the required chemical compatibility.

The volume of your cylinder was determined at the design stage of your chemical injection system in accordance to the required flow.

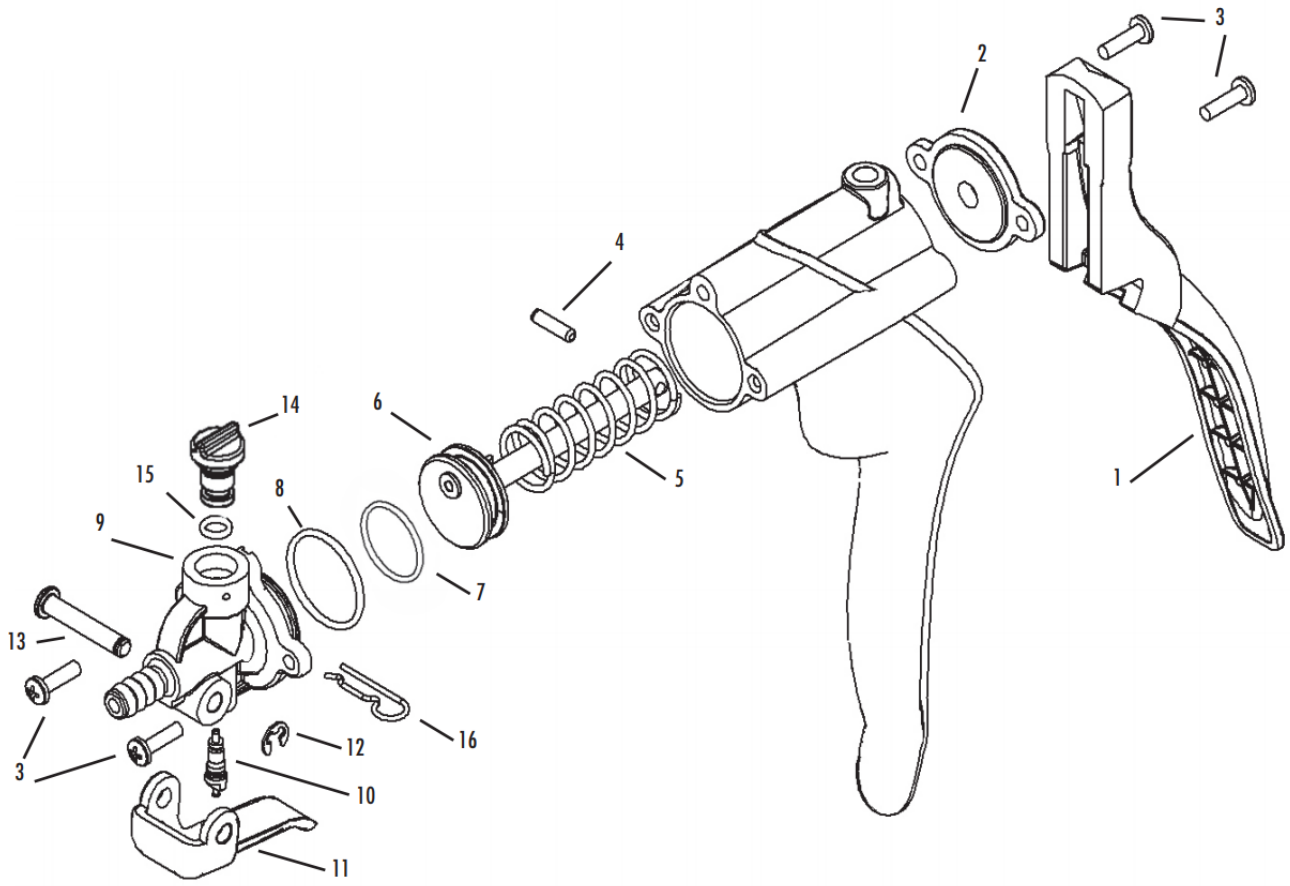
1	Connection FNPT
2	Graduated tube
3	Connection FNPT



Calibration cylinders aren't built for internal pressure or vacuum. Be sure to follow the instructions in this manual carefully to prevent accidents due to suspicious handling.

MANUAL PRIMING PUMP

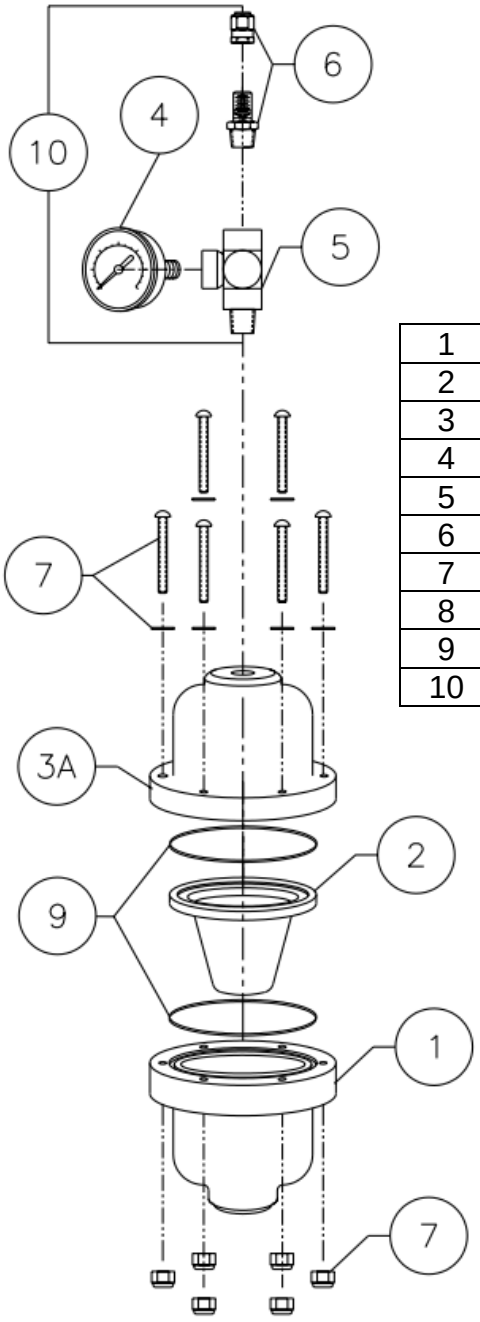
The manual priming pump is made of PVC, it is used when the metering pumps are in suction. It is connected via a flexible tubing into the top of the calibration cylinder. It helps to bring the liquid up to the entrance of the DOSINGBOX® to facilitate the priming of the pumps.
The maximal vacuum created is 85 kPa (12 psi)
Flexible tubing ¼''I.D. in PVC or LDPE.



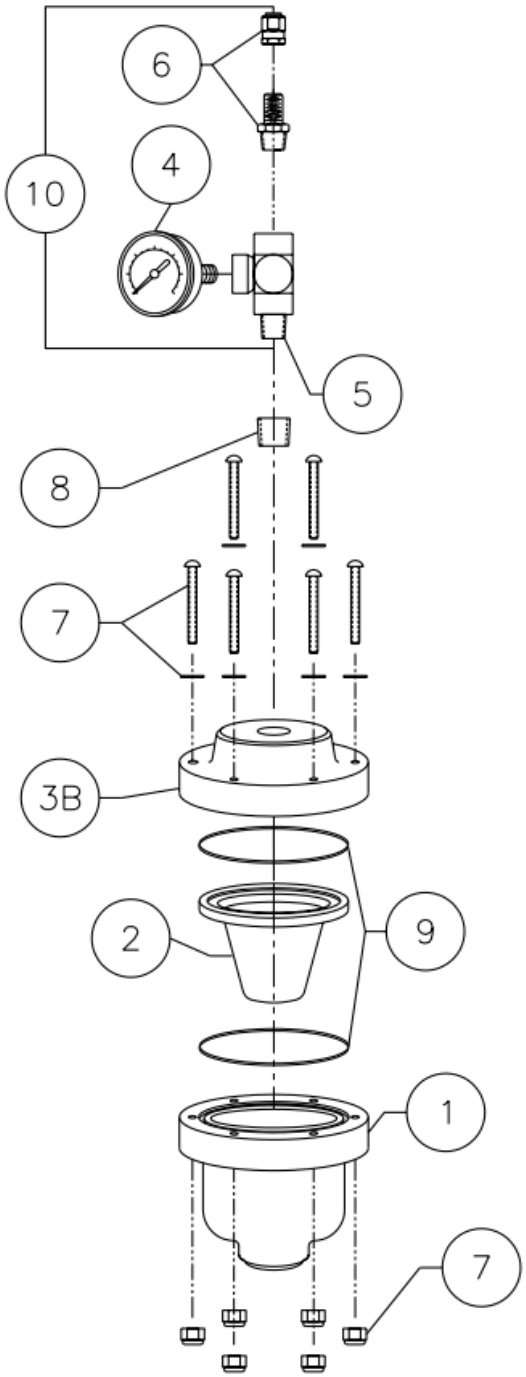
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
824551	X															
MVM8901			X	X	X	X	X	X	X	X						
824550														X	X	X
824552											X	X	X			
824553		X														
824493										X						

PULSATION DAMPENER

The pulsation damper extends the life of your injection system. It reduces the vibrations produced by the pulsating movement of the diaphragm pump. It prevents hydraulic shocks and establishes a more laminar flow.



1	Wetted housing
2	Membrane
3	Non wetted housing
4	Gauge
5	Tee
6	Valve air charge
7	Fastener assembly
8	Bushing
9	O'ring
10	Chargeable air assy



PREVENTIVE MAINTENANCE

The preventive maintenance routine is a general recommendation.
Your injection system is specific to your application, your process, your pumping circuit, your chemical and its characteristics (temperature, viscosity, density, stability ...) for these reasons we strongly recommend to establish/adjust the frequency of this routine according to your GOOD JUDGMENT.

Dosing pump	Refer to pump operation manual. (Annex A)
Manual valves	Visual inspection to detect any leaks or anomalies. They do not require any special maintenance, except those that are always in the same position should be operated 1-2 times a year to validate the proper operation.
Y-strainer	Visual inspection to detect any leaks or anomalies. Empty the sieve when it is clogged or when the pressure drop is too great.
Gauge and guard	Visual inspection to detect any leaks or anomalies. Replace the diaphragm annually.
Pressure relief valve	Visual inspection to detect any leaks or anomalies. Close the P2 valve at the outlet of the system to increase the pressure until the pressure relief valve opens to its opening pressure. Replace the diaphragm and o'rings annually.
Back pressure valve	Visual inspection to detect any leaks or anomalies. Replace the diaphragm and o'rings annually.
Calibration cylinder	Visual inspection to detect any leaks or anomalies. Clean as needed.
Pulsation dampener	Visual inspection to detect any leaks or anomalies. Check the air pressure versus the set point and top up with nitrogen as needed. Replace the membrane and o'rings annually.
Piping and tubing	Visual inspection to detect any leaks or anomalies.

All replacement parts needed to maintain your injection system are available from Cy-Bo Plastics.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
No flow at discharge.	Air entering suction line.	Check fittings for tightness. (Retighten by hand if required) Check integrity of piping or tubing. Check level in tank, it must be above foot valve inlet.
	Air trapped in suction line.	Re-configure suction line to eliminate air pocket.
	Suction line kinked or clogged.	Inspect. adjust or replace tubing.
	Chemical tank empty.	Re-fill tank and re-prime pump.
	Pump not primed, air or gas in system.	Re-prime pump
	Air or gas bubbles forming in chemical.	Reduce suction lift or change to flooded suction. Consider chemical storage temperature.
	Strainer clogged	Check strainer and clean.
	Pressure relief valve open.	Check pressure relief valve integrity. Check pressure relief valve setting.
	Pump: Diaphragm worn or ruptured; Foot valve worn or clogged; Low flow pump setting; Electrical problem.	Refer to pump manual (Annex A)
Piping vibration.	Pulsation dampener malfunction.	Check pulsation dampener integrity. Check dampener air pressure.
Injection rate too high or too low.	Pump output setting incorrect.	Perform flow calibration.
	Chemical concentration too high or too low.	Adjust chemical source strength.
	Siphoning into well or low-pressure point.	Add a back-pressure valve at injection point.
	Injector clogged or worn.	Check injector for solids or corrosion. Clean as necessary or replace.
Irregular fluctuating injection rate	Back pressure valve.	Check back-pressure valve integrity. Check back pressure valve setting.
Leaky fittings	Loose fittings.	Retighten fittings (by hand only).
	Chemical attack.	Determine material compatibility, change as necessary.
Tubing failure.	Chemical attack.	Determine material compatibility, change as necessary.
	Sunlight U.V. exposure.	Change to U.V. resistant tubing.

You cannot fix the problem, contact customer service

(450) 696-4000. We are here to help.