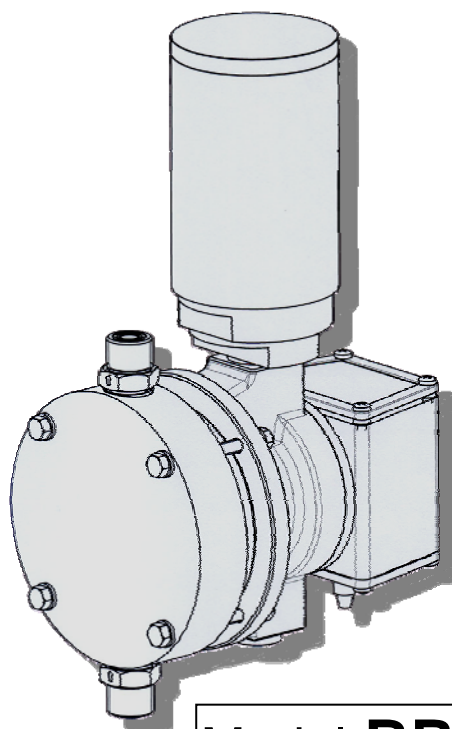
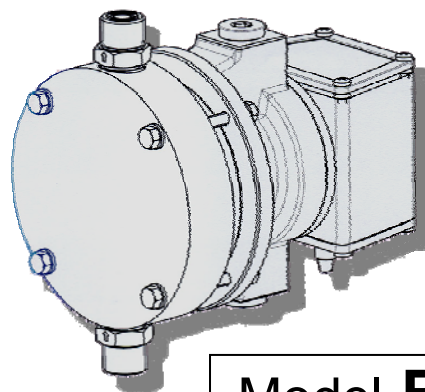




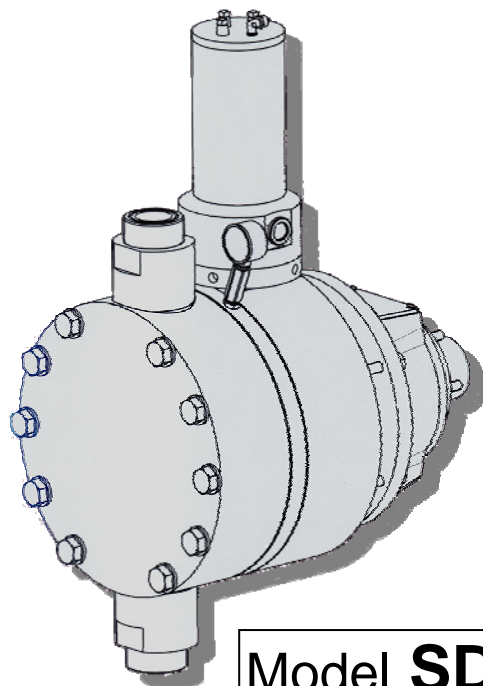
# Diaphragm interposed fluid head Use and maintenance manual



Model **BR**



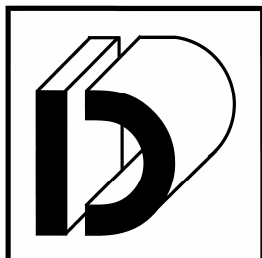
Model **B**



Model **SD**



## Positive displacement metering pump



PDP Series	
Type	I 250
	I 350



## GENERAL WARNING



### *General instructions*

We thank you for choosing this product and recommend you read this manual carefully before starting installing the dosing pump. Please pay particular attention to the safety warnings marked with pictographs.

Complying with the rules and prescriptions herein ensures safe use and proper maintenance.

The Use and Maintenance Manual is an integral part of the machinery and must be easily accessible by the operators and maintenance staff, so it should be stored intact in a safe place.

### *Technical assistance*

Standard and extra maintenance must be carried out according to the instructions contained in this manual. For technical assistance and spare parts, please contact **DOSEURO®S.r.l.** main office, your dealer or installer, and report the data on the label attached to the pump:

- ✓ **Pump type**
- ✓ **ID number**
- ✓ **Year of construction**

If repairs to the pump are not carried out according to the instructions herein, or are done in a way that affects integrity or modifies its characteristics, the manufacturer shall incur no liability for people's safety and faulty operation of the pump.

**DOSEURO®S.r.l.** Via G. Carducci,141 - I-20093 Cologno Monzese (MI) Italy

Sales office: Ph. 0227301324 – Fax 0226700883

Web site: [www.doseuro.com](http://www.doseuro.com)

E-mail: [info@doseuro.com](mailto:info@doseuro.com)

### *Liability*

Non-compliance with the instructions contained in this Use and Maintenance Manual shall release the manufacturer from all responsibilities.

For any information which is not included in or cannot be inferred from the following pages, contact

**DOSEURO®S.r.l.**



Via G. Carducci, 141  
I-20093 Cologno Monzese (Mi) Italy  
Ph. +39 0227301324  
Fax +39 0226700883



**DOSEURO®** S.r.l.

*The Right Dosing Choice*



## DECLARATION OF COMPLIANCE

**DOSEURO®** S.r.l. With main office in:  
Via G. Carducci, 141 - I-20093 Cologno Monzese (Mi) Italy

Hereby declares under its responsibility that the products belonging to the following trade category:

### POSITIVE DISPLACEMENT METERING PUMPS

**PDP Series Type: B - BR - SD**

**Model: I 250 - I 350**

Are according with the indications regarding the following directives:

Directive 2006/42 EEC	Machinery Directive (and any subsequent modifications).
Directive 2004/108 EEC	Electromagnetic Compatibility.
Directive 2006/95 EEC	Electric material low voltage end.

As well as with the following harmonised rules for Safety:

UNI EN 12100-1:2009	Safety of machinery
UNI EN 12100-2:2009	Design principles part 2.
CEI EN 60204 -1 - 98	Electrical equipment of machinery.

**The technical documentation is available in our office.**

#### **PLACE AND DATA:**

**Cologno Monzese - January 2010**

UP TECHNICAL FILE

EDITORIAL STATEMENT OF COMPLIANCE

**CDA President**

**Technical Direction**

MICCICHE' TULLIO  
Via G. Carducci, 141  
I-20093 Cologno Monzese (Mi)

MICCICHE' TULLIO



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## Chapter 1 SIGNS USED

It is important to draw your attention to the symbols used in this document to highlight the residual risks associated with the suitable use of the pump.

The following pictographs use different shapes and colors to indicate general warnings and the behavior required for the operator to carry out all of the activities in full safety according to specific symbol indications.

Features of safety signs			
Color	Shape	Meaning	Indications and details
Yellow Orange yellow		Warning	Warns you to be careful, pay attention to mechanical risks or potential dangers of various kinds in the working environment.
Light blue		Instruction	Informs workers about personal protection devices to be used and specific behaviour required.

### 1.1 Symbols

#### ATTENTION!

Non-compliance with safety rules can cause minor personal injury or damage to property.



#### DANGER!

Non-compliance with safety rules can cause personal injury or damage to property.



#### DANGER OF SERIOUS INJURY!

Non-compliance with safety rules can cause serious injury or serious damage to property.



These general instructions are valid only in combination with specific instructions of use of dosing pumps and hydraulic accessories.

### 1.2 Protective clothing



To carry out any maintenance activities on the pump or plant, the operator must wear personal protection devices according to the law in force (81/08) to avoid skin contact with the pumped liquid, i.e.:

***protective gloves and goggles, respiratory masks, protective headphones or earplugs, protective suit, safety shoes.***



# INSTALLATION INSTRUCTIONS



## 1.2

### Protective clothing



**ATTENTION!**

To carry out any maintenance activities on the pump or plant, the operator must wear personal protection devices according to the law in force (81/08) to avoid skin contact with the pumped liquid, i.e.:

*Protective gloves and goggles, respiratory masks, protective headphones or earplugs, protective suit, safety shoes.*

#### COMPULSORY SIGNS

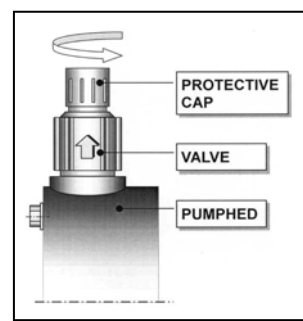


## Chapter 2

### BLOCK REMOVAL

Before installing the pump, make sure to remove all protective caps located on the suction inlets and the valve delivery system.

If the pump remained out of service for a long period of time, before installation, it is recommended to verify that pump head screws have not loosened and that the oil contained in the vessel is not below the level as a result of leaks from the seal gaskets, if necessary, proceed with replacement in order to avoid serious damage to property or injury to persons.



## Chapter 3

### SUCTION CIRCUIT CONNECTION

Following are some recommendations installers should follow for proper installation.



**DANGER!**

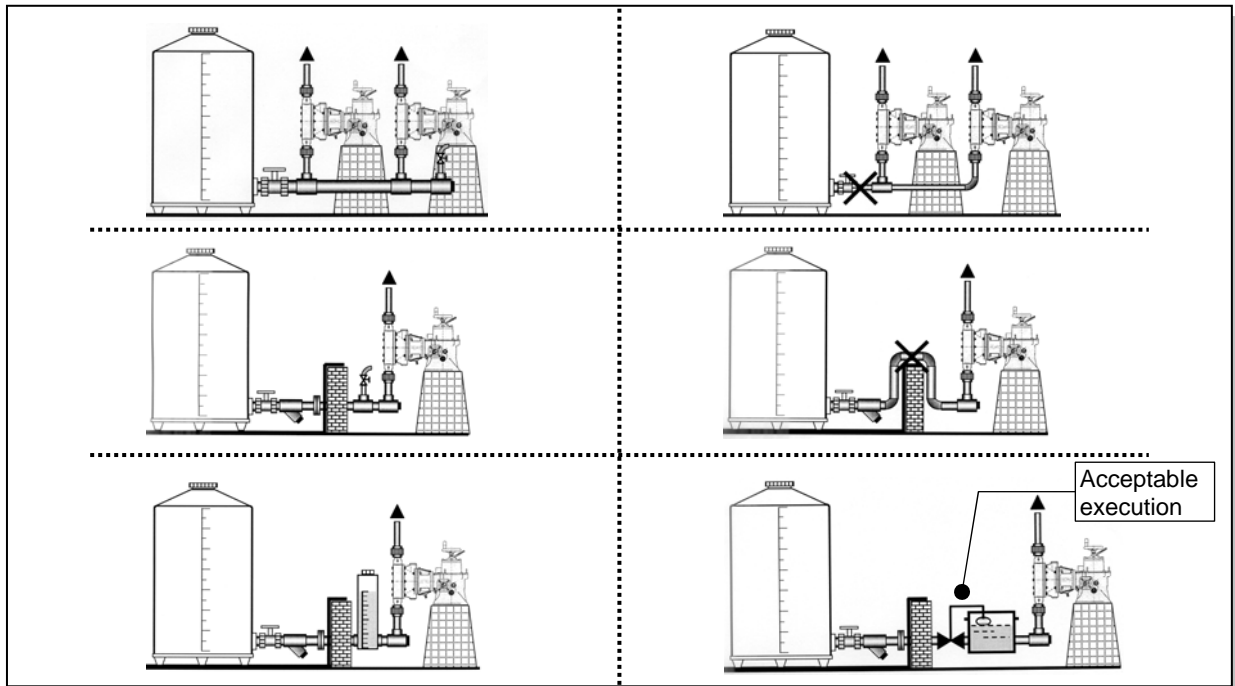
- Before connecting the pipes to the pump connections, wash the pipes of any stray fragments, welding drops, pieces of gaskets, etc.
- The suction pipe must be as short and linear as possible, no longer than 3 m high, and a large bend is recommended for each angle of the pipe.
- If the pump is installed upstream, we recommend you install the bottom valve at the beginning of the suction line.
- Avoid creating a reverse gradient to let air bubbles out and make sure the suction system is airtight.
- The nominal diameter of suction pipes and fittings must be the same as that of the pump valves or higher in case of high viscosity liquids.
- Speed of fluid in pipe **cannot exceed 0.7 m/s** for liquids with viscosity up to 100 mPa - (cPs).



## CONNECTION EXAMPLES

### CORRECT APPLICATION

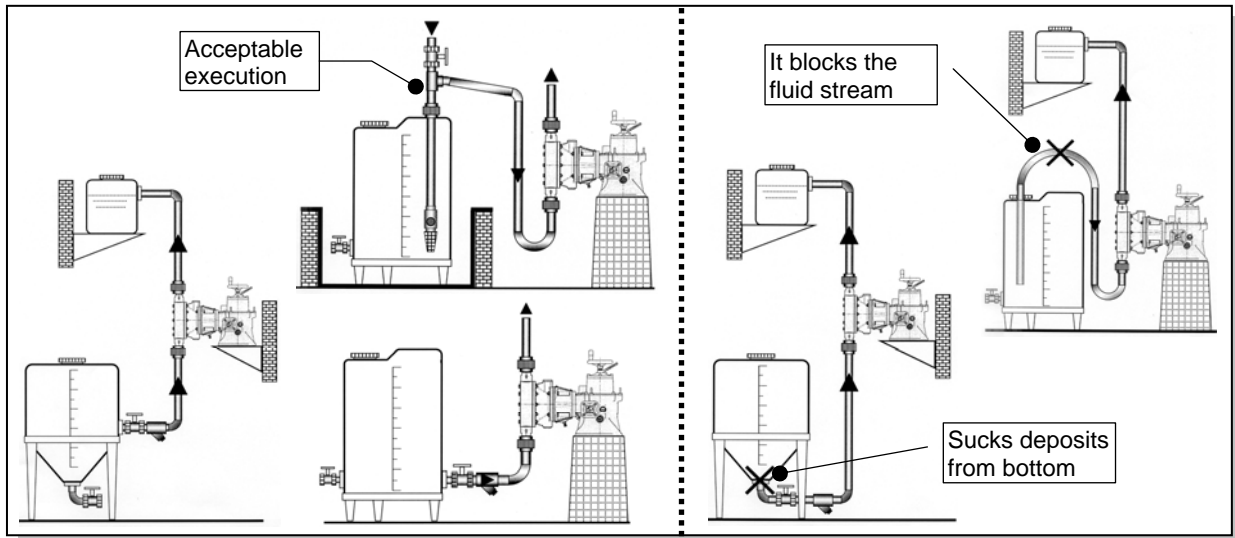
### WRONG APPLICATION



## CONNECTION EXAMPLES

### CORRECT APPLICATION

### WRONG APPLICATION



## Chapter 4

## DELIVERY CIRCUIT CONNECTION

Proper realization of the delivery pipe path is particular important to ensure the good functioning of the pump. Moreover, careful fixing is required, particularly if the pipe is subject to high strain conditions. For this purpose, following is a list of indications installers should comply with to build the system properly.





# INSTALLATION INSTRUCTIONS

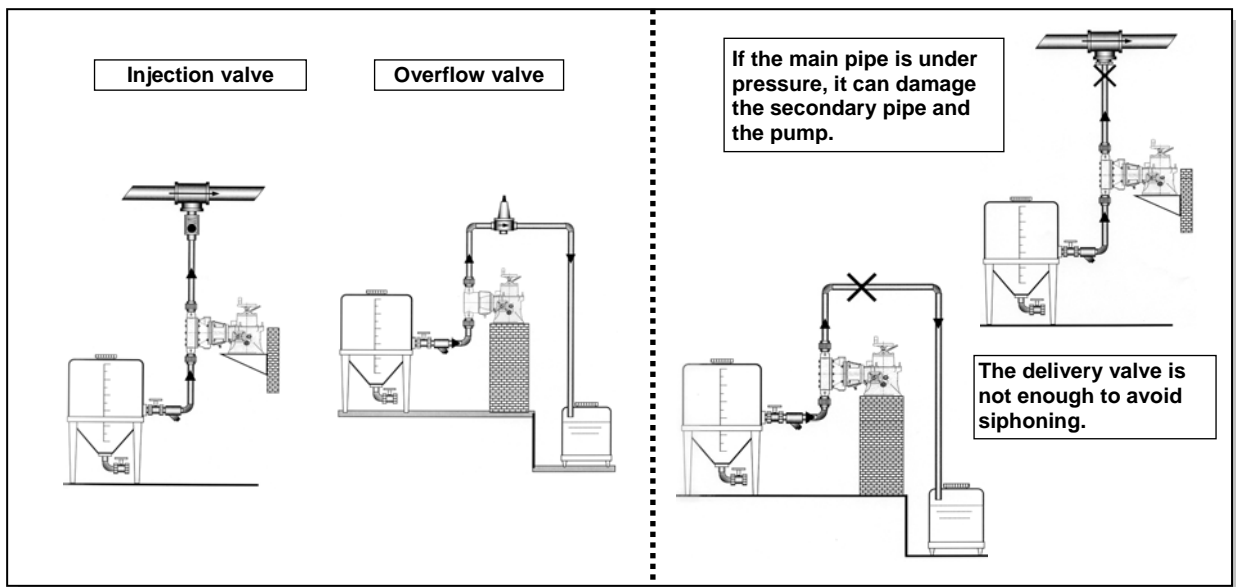


**DANGER!**

- ❑ Pipe path should be as straight as possible; the pipe should be supported independently to prevent expansion due to heat sources that may affect the pump head.
- ❑ Provide one or more T-couplings after the delivery flange that can be used for installing pressure gauges, safety valves, and pulsation dampers.
- ❑ Always install a safety valve and a drain valve on the delivery system to protect the plant and make maintenance and starting of the pump easier.

## CONNECTION EXAMPLES

### CORRECT APPLICATION



## Chapter 5

## LEAKAGE COLLECTION SYSTEMS



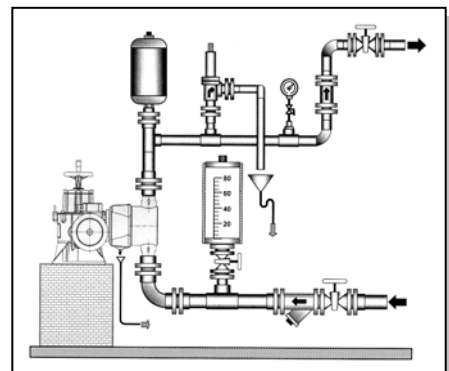
**RESIDUAL RISK!**

A proper leakage or drip collection system is required for safe discharge of harmful liquids. Use the pipe holder of the covering under the head-holding lantern, if applicable, to make connection and leakage drainage due to worn out gaskets easier.

## Chapter 6

## PLENUM CHAMBER INSTALLATION

The use of a plenum chamber installed on the delivery system is often required. Benefits include: more steady flow rate, no vibrations on the line, protection against pressure peaks and water hammering.







## Chapter 7

## OPERATIONS TO BE PERFORMED ON A **B** type HEAD

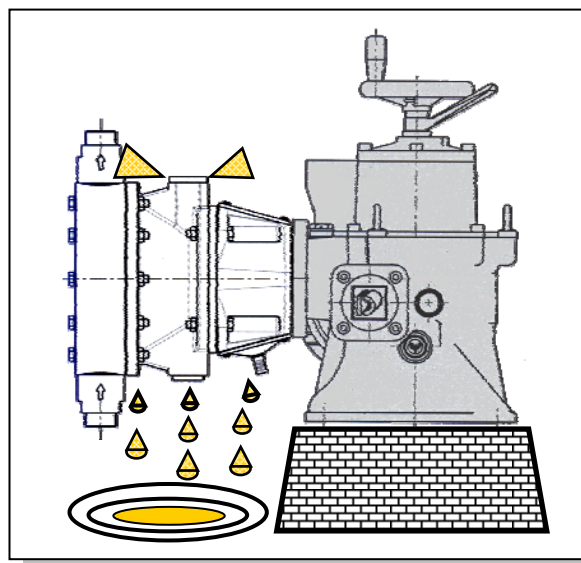
### 7.1

### Regular check of the head

Neglect can cause damage or malfunctioning, which requires extra maintenance just to check proper operation. Regular checks of the pumping head must be performed to ensure pump safety and high performance.

#### Checks to be performed include:

- ✓ There are no oil leaks from filler cap and drain plug, diaphragm or piston seal. Any such leaks can lead to reduced capacity and breakage of the diaphragm.
- ✓ There are no leaks of pumped fluid from the valves.



### 7.2

### Problems and fixes

With reduced capacity, leaks of oil or liquid, the following checks are recommended.



#### ATTENTION!

**If any of such problems occur, readily intervene to avoid safety issues, as well as reduced capacity and efficiency of the pump.**

**Before doing any repairs on your dosing pump, the maintenance staff must verify that the pump is idle and disconnected from the power supply and the plant is depressurized and empty.**

#### □ INCONVENIENCES

- 3 Check the suction filter.
- 3 Make sure that valves are clean, unclogged and not worn out. Replace them if necessary.
- 3 Check that pipes are not clogged.
- 3 Check that the line pressure has not increased.
- 3 Remove the oil filler cap, top up oil if necessary and close the cap again.
- 3 After these checks have been performed, the pump capacity should be as required. Otherwise, the oil chamber contains air, which has entered through the piston seal.
- 3 This means that the suction pipe is damaged (leading to very high flow resistance.)

#### □ FIXES

- 3 Check the pipe connections.
- 3 Increase the suction pipe inner diameter so it is larger than the valve.
- 3 Mount wide-angle bends.
- 3 Place the pump downstream.



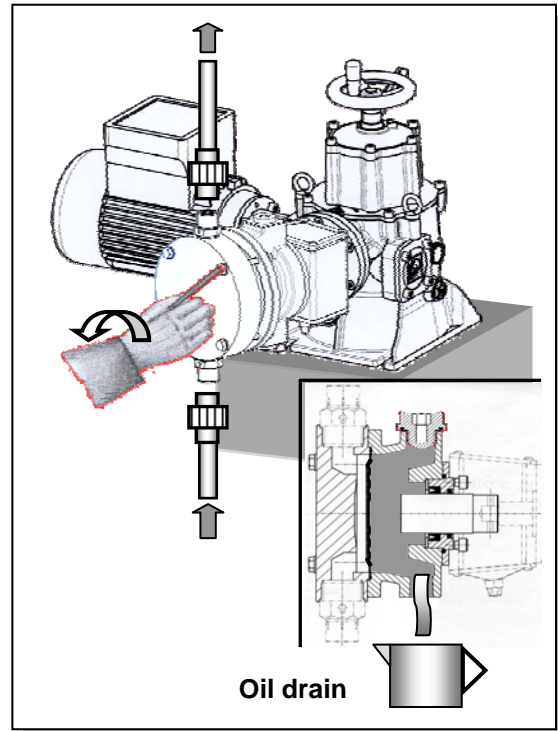
## 7.3

### *Dismounting the head and replacing the diaphragm*

This pump series features a head, which is directly fixed to the oil chamber. Therefore, maintenance of the components requires the oil in the chamber to be drained.

#### **Proceed as follows:**

- Disconnect the pipes from the valves.
  - Unscrew the plug at the bottom to drain the oil chamber. Let the content out into a container and dispose of the product according to existing regulations.
  - Loosen the screws on the front of the pumping head.
  - Remove the pump head.
  - Remove the diaphragm and replace it if damaged.
  - Remove the oil chamber.
  - Remove the gasket holder ring from the piston to check if gasket and piston are worn out. Replace them if necessary.
- ❑ **After all maintenance operations have been completed, reinstall the components proceeding in the opposite order than they were disassembled.**



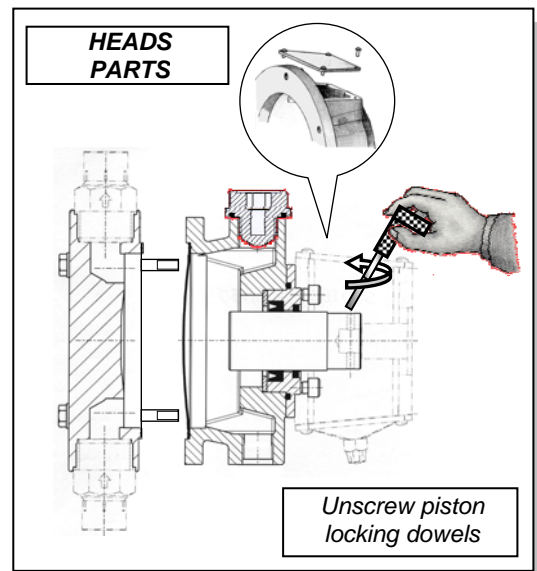
## 7.4

### *Dismounting and remounting the piston*

The piston is locked to the slide through two dowels. One is visible on the top, whereas the other one is hidden at the bottom.

To disassemble the piston, proceed as follows:

- ✓ Remove the head and take out the oil chamber.
  - ✓ Remove the lantern protections.
  - ✓ Loosen the locking screws to disassemble the gasket gland disk.
  - ✓ Unscrew the visible dowel.
  - ✓ Remove the protection located at the bottom of the lantern.
  - ✓ Unscrew the lower dowel and remove the piston.
- ❑ **After all operations have been completed, reinstall the components proceeding in the opposite order than they were disassembled.**



**Note: WHEN REASSEMBLING THE PISTON, PAY ATTENTION TO TIGHTEN THE TWO DOWELS WITH THE SAME TORQUE TO ENSURE THE PISTON IS COAXIAL TO THE SLIDE.**



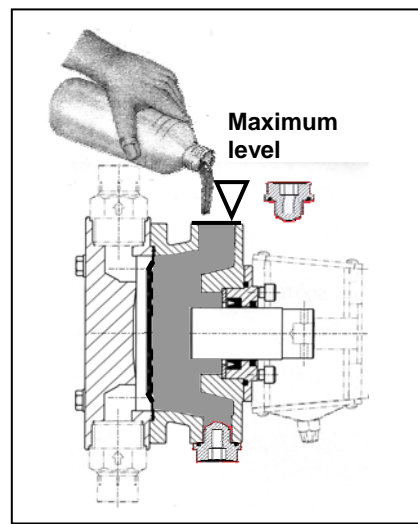
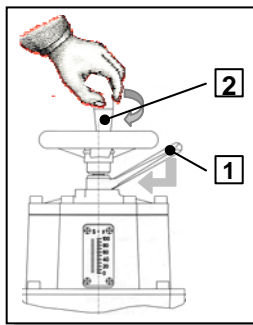
## 7.5 *Filling the oil chamber*

Once the maintenance operations are completed and the head has been reassembled, fill the oil chamber as described below:

- Turn the adjusting hand wheel clockwise to move the piston to the front idle point (i.e. 0% of stroke). This is made easier by connecting the pump to the electrical power supply.

Loosen the **block handle (1)** of the adjusting screw, so the **hand wheel (2)** is free to rotate.

Clockwise (↻) to increase the stroke.  
Counterclockwise (↺) to decrease the stroke.



- At the end, if the pump was electrically powered, turn it off for full safety.
  - Fill the chamber with (**NUTO or PHARMA**) oil up to the cap face, hit lightly with a rubber hammer to let out the air bubbles formed while filling the chamber, top up oil and lock the cap gently. For quantities, see the table.
- ☐ **The pump is now ready to operate and can be connected to the plant.**



## Chapter 8

## OPERATIONS TO BE PERFORMED ON A **BR** type HEAD

Note: For maintenance programs, see the chapters for the "**B** type head"

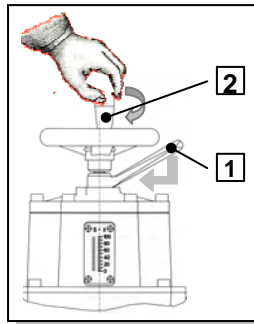
### 8.1

### Adjusting the circulation tank and topping up oil

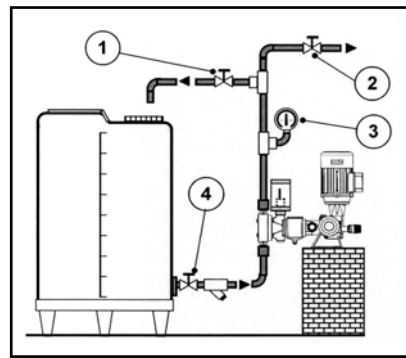
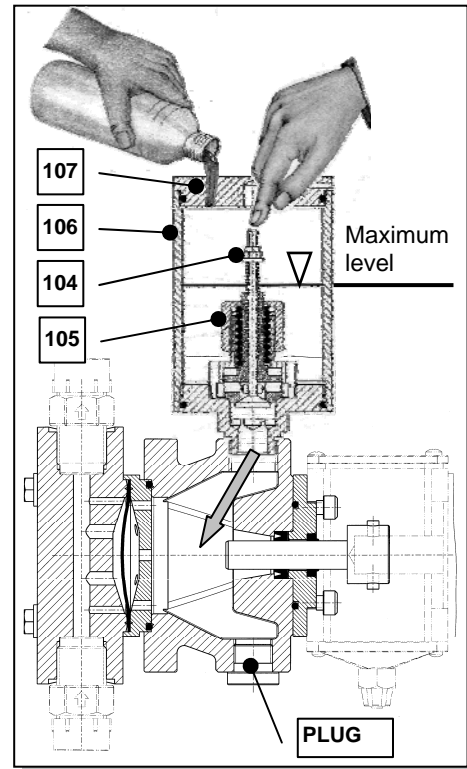
Once the maintenance operations are completed, follow the instructions below to adjust circulation and fill the oil chamber and tank with (**NUTO H 32 or PHARMA**) oil:

- 1 Check the drain plug at bottom is closed.
- 2 Turn the adjusting knob clockwise to move the piston to 0% stroke.

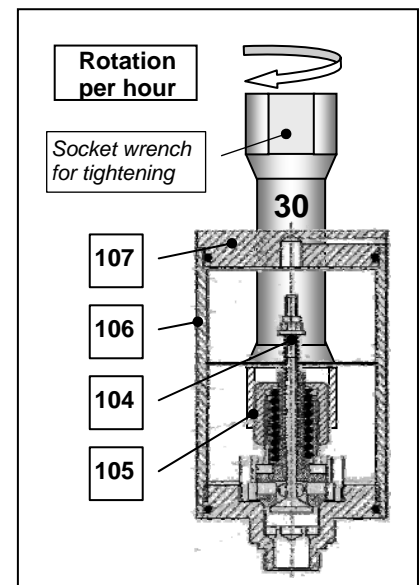
Loosen the **block handle (1)** of the adjusting screw, so the **hand wheel (2)** is free to rotate.



- 3 Loosen the nut that adjusts the circulation valve spring (pos. 105).
- 4 Loosen the nut that adjusts the reset valve spring (pos. 104).
- 5 **Start the pump.**
- 6 Pour oil into the tank up to the mark provided and press the reset valve for the oil to start entering the oil chamber.
- 7 Repeat this operation till you see oil inside the tank, which means the oil chamber is filled properly.
- 8 Slowly tighten the reset spring nut (pos. 104) until the oil in the tank is still. Perform this operation under actual conditions but without pressure on the delivery system (open valve "1" – close valve "2").



- 9 To set pressure to the system close the valve "1" and open the valve "2". The oil in the tank will start moving.
- 10 Slowly tighten the circulation spring nut until oil is still again and the pressure gauge "3" indicates the system pressure.





# MAINTENANCE INSTRUCTIONS



❑ To check the operation has been completed successfully, proceed as follows:

- 11 Close valve "2". The circulation system will start moving the oil and the pressure gauge "3" will show the adjustment pressure (it must be 10-15% higher than the pressure indicated when valve "2" is open).
- 12 If you open valve "2" oil will be still again.  
Close valve "4" for the circulation system to start. Open valve "4" again to keep oil still.

**Note:** If there are air bubbles while oil is circulating:  
the reset valve spring has been adjusted too high, STEP 7 (repeat all steps from 7 onwards).

❑ If there is heavy leakage on the suction system:

- Check the filter.
- The pipe diameter must be larger than the pump connection and the pipe path must be as short and straight as possible, with wide-angle bends.
- The pump must be installed 1 m upstream, or downstream which is the recommended position.

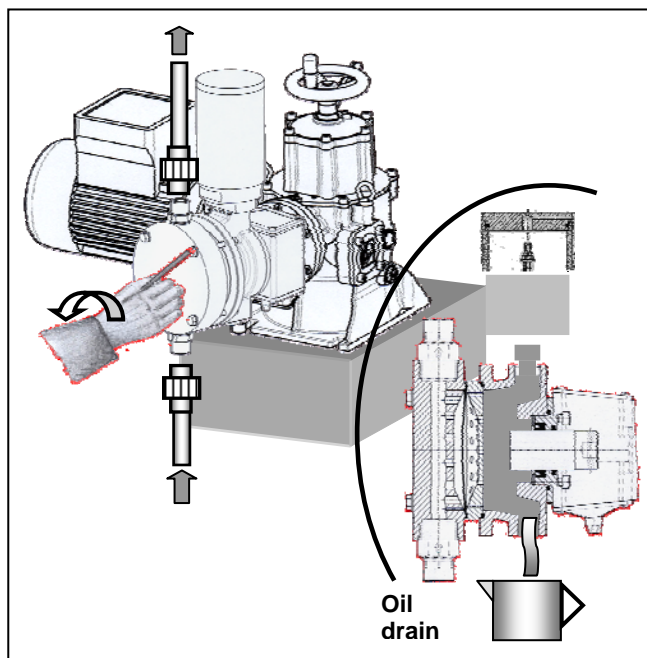
## *Dismounting the head and replacing the diaphragm*

This pump series features a head, which is directly fixed to the oil chamber. Therefore, maintenance of the components requires the oil in the chamber to be drained.

**Before doing any repairs on your dosing pump, the maintenance staff must verify that the pump is idle and disconnected from the power supply and the plant is depressurized and empty.**

**Proceed as follows:**

- Disconnect the pipes from the valves.
- Unscrew the plug at the bottom to drain the oil chamber. Let the content out into a container and dispose of the product according to existing regulations.
- Loosen the screws on the front of the pumping head.
- Remove the pump head.
- Remove the diaphragm and replace it if damaged.
- Remove the oil chamber.
- Remove the gasket holder ring from the piston to check if gasket and piston are worn out. Replace them if necessary.



❑ After all maintenance operations have been completed, reinstall the components proceeding in the opposite order than they were disassembled.