



**COLBERGE**  
water systems

Automatic polyelectrolyte preparation systems

**Polymaker - PLM**

PLM8-PLM12-PLM18-PLM25-PLM34

PLM52-PLM75-PLM120

## **Operating Instructions Manual**

This manual is vital for properly installing and operating the equipment being described in it.

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## 01 Introduction

The automatic equipment for preparing polyelectrolyte powder and emulsion are complete pre-installations which ensure continued dilution of powdered and emulsion polymers.

When you want to prepare polyelectrolyte powder must change the command manual the switchboard for Powder and if you want to prepare polyelectrolyte emulsion must change for Liquid.

## 02 General aspects

The automatic equipment for preparing polyelectrolyte are complete pre-installations which ensure continued dilution of powdered or emulsion polymers, in concentration ranging from 1 to 5 g/l, which are ideally applied in water and wastewater-treatment plants, sludge-dehydration units and industry, such as pulp and paper, among others.

The result of this dilution is a product with a high degree of viscosity (proportional to its concentration), sticky and slippery to the touch.

Given their molecular complexity, polymers form very long linear structures that are sensitive to vigorous Agitation and which are hard to dilute; thus, the first Water-Powder contact is crucial, so that the resulting mixture is free of hard-to-dissolve lumps. Growth of such structures to a reasonable size takes at least 30 minutes, with this incubation time period serving as a basis for calculating these units.

The physical features of powdered polymers are highly sensitive to the environment, chiefly to humidity, since they are hygroscopic.

Commercial polyelectrolytes may have different gradings, actual and apparent densities, and so the equipment needs to be calibrated to the specific product of each installation.

## 03 Reception, storage and handling

When receiving the equipment, it should be carefully examined to make sure it comes complete, according to the description in this manual, as per the accompanying guide, and to check to see that it does not have any obvious damage.

We recommend it be stored in a safe environment, sheltered from shocks, dust, rain, direct sunlight and aggressive surroundings in general.

Prolonged storage limits the application of the warranty.

The means available for moving the equipment must be in accordance with the weight of the parts to be handled, in order to safeguard the physical integrity of operators and of the equipment itself.

PLM are relatively stable structures when placed on a flat surface, but need to be moved gently, using maximum care, completely free of water and dust, without any type of connection (electrical, water supply, sewer or dosing pump). It must be lifted by latching on to the points created specifically for this purpose and approached from the back part of the tank (the area weighing the most), thereby preventing damage to the connections on the underside.

Before first moving the equipment, evaluate the balance of the centers of force, so as to carry out the smallest possible number of movements until it arrives at its final position without creating momentum.

All PLM units are previously tested to ensure maximum reliability when installed. The results of these tests are recorded on an appropriate sheet of paper and signed by the technician in charge, thereby becoming a constituent part of the supply.

## 04 Description and operation

With the PLM series, Colberge has developed fully automatic equipment for preparing polyelectrolyte solutions from powder or emulsion.

When the level at the start of the cycle is reached in the dosing chamber, water and powder or emulsion are drawn into the first chamber; using a preferential system of connecting vessels, this causes overflow from the incubation chamber to the dosing chamber, thereby reaching the end-of-cycle level and cutting off water and powder or emulsion intake in the equipment.

As consumption of the prepared polymer takes place, the level decreases, thus causing the preparation cycle to continually restart. All operations are monitored using sensors and parameters whose job is to detect any abnormality, and when they do, this results in caution alarms and, in a few cases, the equipment stops automatically.

## 05 Construction elements

### 05 Construction elements / Tank

The tank is made entirely of PE80. Because this is plastic material, it is quite resistant to aggressive atmospheric conditions which typically occur in this type of facility (unlike with Stainless Steel, even AISI 316), thereby retaining its appearance and highly resistant physical features for a long time.

The tank is divided into three compartments, in order to distinguish each stage of the procedure: from the dilution stage in the first chamber, to incubation in the second chamber, to dosing in the third and final chamber.

Each chamber has a built-in inspection hole enabling the product to be examined at every stage of the procedure.

Reinforcements are applied to larger equipment, so as to provide an even more sturdier structure.

There is a common sewer outlet linked to the first two chambers, a sewer at the third chamber, in the front part of the tank, and one on the side of the third chamber for dosing. All connections come with corresponding shutoff valves.

## 05 Construction elements / Agitators

The agitators that are applied to the dilution and maturation chambers are slow-turning, so as not to interfere with the growth of polymer chains, while providing the liquid mass with effective mixing. The shaft and screw are made entirely of AISI 316 Stainless Steel.



*Agitators are always connected, even when there is something preventing the equipment from operating continuously, either because of an alarm, a lack of water, or otherwise, and so it is imperative that inspection holes be opened when the agitator is stopped, using the appropriate selector for this purpose.*

## 05 Construction elements / Level probe

The ultrasonic level probe placed in the dosing chamber controls the start and end of the preparation cycle, depending on the level measured there. This also provides continuous information regarding the equipment's autonomy and the alarm (with equipment interlock) by maximum or minimum level due to some abnormality, such as with the water intake electrovalve.

Because this is a measuring system that doesn't involve actual contact with the product, the operator is assured operation that doesn't require either preventive or corrective maintenance, thereby doing away with consumables and/or time with cleaning and replacing components.

The acrylic probe support serves to provide shock protection while minimizing the effect of condensation of water droplets on the probe's surface. In places with high temperatures, this occurrence will have to be monitored more closely to prevent incorrect level measurements and resulting disturbances in operating the equipment.

## 05 Construction elements / Hydraulic system (water intake)

Particular attention is required when providing the system with water, as this is one of the requisites for proper operation within the parameters for which it was designed.

Pure water containing no suspended solids is to be used, at a pressure of 2 - 3 bar.

The shut off valve closes the system by cutting off supply.

Put the manual command [2] on the electrical switchboard in powder or liquid the system will operate the electrovalve for type of polyelectrolyte.

When the system work with polyelectrolyte powder all the system of polyelectrolyte emulsion will stand by and the inverse can also be done.

Electrovalve (24 VDC) responds to commands for the start and end of the preparation cycle, thereby making it automatic. If the water is not totally free of solids, there may be disturbances in electrovalve opening and/or closing controls, and this occurrence could result in extreme cases, with polymer overflowing or becoming totally used up without any replenishment.

The pressure control valve serves to maintain a preset flow rate (within certain limits), regardless of fluctuations in grid pressure.

The flow meter shows instantaneous flow rate for the power frame console, as it allows for automatic adjustment of dosing, depending on the variations detected at the water intake point. If a deficient flow rate is detected, the automatic routine will stop and a direct intervention by the operator will be necessary to start up again.

The disperser makes sure all powder particles are already wet when making contact with the solution in the dilution chamber, thereby preventing the appearance of hard-to-dissolve lumps.

The inline mixer ensures a perfect blend of water with the emulsion polymer when it arrives in the dilution chamber, thereby preventing the appearance of lumps.

## 05 Construction elements / **Dosing pump for polyelectrolyte emulsion**

The dosing pump is of the type electromagnetic diaphragm, with special head for viscous products. For details consult the operating manual of the specific pump installed.

## 05 Construction elements / **Dry feeder for polyelectrolyte powder**

The dry feeder consists of the dosing vessel and worm gear, activated by a geared motor designed to operate at a speed range of 1:10, thus enabling a variety of concentrations to be prepared, as selected by the operator at the console.

Because of its construction/application, a noise may be heard (which is normal) in the structure during operation.

The hopper, with a total capacity of around 50 liters, is made of PE80 and comes with a built-in cover on top for supplying the powder.

At the bottom of the hopper there is a device for detecting a shortage of powder, which must not contain aggregates on its surface, in order to operate correctly. O detector emits a caution alarm (without locking the equipment) regarding the need to refill the system with powder.

The powder outlet cylinder de includes the heating resistance to prevent humidity and the formation of polymer "blocks" during the waiting periods between two cycles.

The outlet cylinder enters the protective cup, which fits into the point where the powder enters the tank.



*Always stop the system when replenishing the powder and cleaning the detector, to prevent possible harm to the operator caused by the screw that turns at the bottom of the dosing vessel.*

*The protective cup must always be in place when automatically operating the equipment, and it may be removed only when calibrating the dosing screw, during routine operations.*

*After long periods without operating the equipment, rearming it will require particular attention when cleaning the dosing screw. The formation of polyelectrolyte "stones" around the screw may even lead to its destruction.*

05 Construction elements / **Electrical Switchboard**

The electrical switchboard's interior includes those components that will make sure the equipment works properly, such as the automaton, Dry feeder speed regulator, circuit breakers, contactors, relays, connecting terminals and differential protection. All electrical cables are kept safely inside the tank's own structure, as they are passed inside/outside using suitable glands.

The electrical switchboard, which is made of beige fiber, with two safety latches, includes a console [11] on its front panel for viewing data and configuring the equipment and the following elements in order to aid in basic control operations.



Legend:1 - Electrical switchboard



Legend:2 - Synoptic



The general external switch [1] cuts off power supply to every component on the electrical switchboard.

**Four switches:**

- [2] Operating and stopping the dilution agitator;
- [3] Operating and stopping the incubation agitator;
- [4] Manual, automatic and stopping the dosing pump;
- [5] Powder polymer or emulsion polymer .

**Nine bi-colored Led's displaying the status for:**

- [6] Dilution agitator  
(Green – operating, Red – thermal or Off - stopped);
- [7] Maturation agitator  
(Green – operating, Red – thermal or Off - stopped);
- [8] Dry feeder  
(Green – operating, Red – thermal or Off - stopped);
- [9] Level of polyelectrolyte solution  
(Green – OK or Red – Alarm low level);
- [10] Electrovalve of dosing polyelectrolyte powder  
(Green – Open, Red – Flow Alarm or Off - closed);
- [11] Electrovalve of dosing polyelectrolyte in emulsion  
(Green – Open, Red – Flow Alarm or Off - closed);
- [12] Powder sensor  
(Green – OK or Red – needs powder);
- [13] Alarm or operation of dosing pump  
(Green – Operating or Red – alarm of dosing pump);
- [14] Level of dosing pump  
(Red – Alarm low level ).

05 Constrution elements / **Contacts terminal**

## Power connection

	~230 V				~230 V				~400V				~400 V				~230 V				~230 V			
	L1	L2	L3	N	PE	L1	L2	L3	PE	L1	L2	L3	PE	L1	L2	L3	PE	L1	N	PE	PE			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21			
Power supply																								
Dry feeder																								
Dilution Agiator																								
Mixation Agiator																								
Heating Sieve																								
Dosing pump																								

## Command connection

[illegible]

## 06 Polymaker PLM Installation



*Since we are dealing with compact equipment, installation is relatively quick and easy. However, this should be carried out only by suitably trained personnel, in order to prevent risks and damage to themselves, to others or to the equipment.*

*The installation's location must comprise a flat, ample space, on a hard surface that will bear the weight of the equipment when full, with proper lighting and sheltered from atmospheric disturbances. Access to all the equipment's elements must always be provided so as to facilitate powder-replenishing operations, inspections inside the chambers, configuring and checking console parameters and the water intake assembly, a general power cut on the electrical switchboard as well as adjustment of the extraction pump.*

Check to see whether the elements comprising the assembly remain firmly fastened to its station bases.

The main tank's cover is welded or fastened using multiple screws, and moving it is unnecessary under any circumstances.

Due to its features, any spillage (no matter how slight) of powdered or dissolved polymer and emulsion or dissolved polymer must be cleaned immediately with paper or a dry cloth.

Any type of modifications or replacement of any of its components may cause unpredictable accidents.

Observe general safety and operating standards and regulations which are appropriate for the location where the PLM is to be installed.

## 06 Polymaker Installation / **Hydraulic installation**



*Water is supplied via the shutoff valve installed in the hydraulic system of the preparing equipment. The water shall require "grid" features that will guarantee the absence of sand or other insoluble matter that could prevent the elements of the hydraulic system from operating properly.*

The minimum pressure to be confirmed at the control valve is 2bar, in order to record the flow rates expected for the equipment to work properly.

Turn the water on and check to make sure there are no leaks.



*If there is accidental splashing or spurting that reaches any of the electrical components, stop the installation immediately until these are totally dry.*

## 06 Polymaker Installation / **Electrical installation**

Any electrical work must be performed by accredited electricians and with the equipment shut off.



*The external general selector on the switchboard can only be opened when it is in the OFF position. Under any other circumstances, the switchboard must remain locked using the two existing locks for this purpose.*

Check to see whether the available power supply features are in accordance with the specifications on the identification plate on the preparing equipment, which is installed on the front part of the hopper.

Select a cable whose section and insulation class are in accordance with the power to be installed, and make sure it has no defect whatsoever. The cable needs to enter the switchboard through the gland that is provided and installed for this purpose, in order to ensure the protection index.

These three phases plus neutral and earth must be connected, according to the circuit diagram provided as an attachment to this manual.

The conducting wires must be connected to the switchboard with riveted terminals, so as to prevent the risk of undesired contact.

After installing the general power supply, close the switchboard using the two locks and move the general external selector to the [ON] position and check to make sure of the following:

- Thermal lights are not on;
- The console is lit;
- Check the operation of the dilution agitator, using the manual selector;
- Check the operation of the incubation agitator, using the manual selector;
- Check the operation of the dry feeder in manual mode, using the manual selector;

Make sure the motors are turning clockwise and make corrections, if necessary, by switching two phase conductors of the power supply cable at the electrical switchboard, in keeping with the standards described previously.

- Visually check to make sure the agitator is working properly and that there is nothing preventing the shaft and screw from turning. Naturally, slight buckling may occur when agitators are in operation in empty tanks;
- Check to see whether the motor grille is completely unobstructed, so as to provide the motor with proper cooling;
- Make sure there are no strange noises while the motors are in operation;

After 10 minutes of continuous operation, check current intensity in the 3 phases, using a hook-on meter and compare with the individual plate of each motor. Repeat the process using the prepared polyelectrolyte solution.

## 07 Commissioning for powder or emulsion polyelectrolyte system

Following the hydraulic and electrical installation, the next step, consisting of filling the hopper with polyelectrolyte, shall be performed with the switchboard's external selector set to OFF. Bear in mind that its autonomy shall not be longer than one week, so as to prevent the formation of covers and lumps in the powder found in the hopper. The protective cover shall be removed only during this operation.

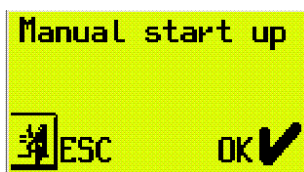
Set the dosing selector to manual until a continuous powder or emulsion flow rate is obtained. It is advisable to perform the first calibration at this time, as per the indication shown on the console, otherwise, the equipment will be set to the factory's default calibration.

In order for the preparing equipment to operate continually, the last chamber must not be below the minimum level, and so the next step involves filling the equipment, using the electrovalve in manual mode. The ideal flow rate for continuous operation shall be observed and adjusted, using the valves that are installed for this purpose.

Set the Agitators selectors to [ON] and check their operation.

Set the Dry feeder selector to automatic.

## 07 Commissioning / Automatic start up



After installing and turning on the power supply of the Polymaker PLM equipment, the message "Low Level" will appear, followed by the screen signaling the equipment start up, following confirmation of the alarm message using the **OK** button.

On the screen signaling start up, and after pressing **OK**, the solenoid valve shifts to manual mode, and the it's red indicator led in manual mode becomes active.

The solenoid valve will remain in manual mode until it reaches the level that will enable its operation in automatic mode, by making the connection independently, and the it's status led then becomes green.

The water intake will now continue with the system in automatic mode, until 100% autonomy is achieved.

The manual startup screen will always appear whenever the graphic console shows the indication of low level, as it then suggests the immediate resumption of the level required for reverting to operation in automatic mode, or, by pressing **ESC**, this procedure can be aborted, thereby shifting to the main screen, while the electrovalve remains inactive; thus, any eventual problems with the system may be corrected.

## 08 Configuration

The equipment is configured via the console, by personnel that is authorized for this purpose and who know the password providing access to the parameterization area.

Configuration is quite simple, as it uses a graphic console and several visual indicators, thereby making its operation quite intuitive.

The menu was structured in rotating fashion, while making it possible to browse the various sub-menus in both directions using the left and right keys.

## 08 Configuration / Graphic Screen



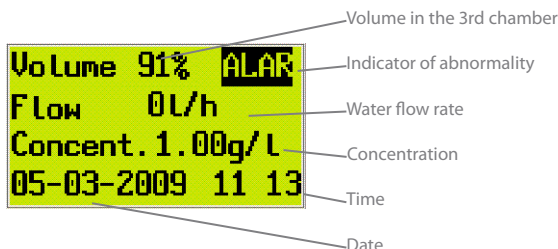
The graphic display gives an intuitive idea about the way as the unit is working.

The errors are appointed with blinking icons.

- - Active the automatic transition (each 4 s) between graphic and main screen.
- ALT - Coming back to Fix screens mode.
- ESC - Log off.

When pressing the left and right arrow keys, the following menus can be accessed:

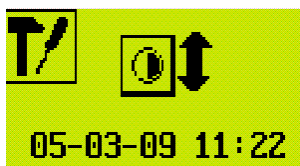
08 Configuration / **Main Screen**



The main menu is that which contains all the essential information and which monitors the status and operation of the Polymaker PLM.

The main screen is the normal operating mode, which shows the autonomy of the prepared polymer, the water intake flow rate when the equipment is in the preparation cycle and the polymer concentration which was last selected. The center shows the eventual occurrence of an alarm, as confirmed by the operator, with the corresponding error message.

**DEL** - Access to settings menu of display brightness, date and time. The values can be changed with the arrows keys and confirmed via the **OK** button.



**ALT**, **DEL** - Intensify the display brightness

**\*** - Decrease the display brightness / Logout user (see the password of the system).

**ESC** - Decrease the display brightness of the system /Exit menu.

**OK** - Accessing functions, Access the parameter changes.

08 Configuration / **Password**




The Polymaker PLM is protected against an eventual intrusion attempt by an unauthorized operator.

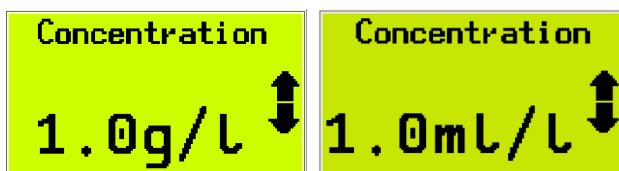
The password cannot be changed by the user, as this is a numeric value that can be chosen by the buyer and programmed by the manufacturer.

The default password, which is 123, can be entered using the up or down arrows (thereby modifying the value of each digit) and using the left and right arrow keys (for positioning the cursor).

The password needs to be entered whenever starting the Polymaker PLM after a power cut.

The password also needs to be entered after pressing the user logout key, as shown by the  key on the main screen.

08 Configuration / **Selecting the concentration for powder or emulsion**



This can be modified by pressing the up or down arrow keys in increments of 0,1 g/L or 0,1 ml/L and by pressing the left or right arrow keys in increments of 1 g/L.

Concentrations range from 1.0 g/l to 5.0 g/l or 1.0ml/L to 5.0ml/L.



08 Configuration / **Agitators timing**





The agitators' factory configuration is set for continuous operation; however, timer-control mode can be activated, by setting the period of time (maximum 240 min) when they are stopped and when they are in operation, and such time periods are independent of one another.

This way, the agitators' energy consumption can be optimized according to how often polyelectrolyte is prepared.

To change the configuration to timer-control mode, the following steps need to be taken:

Press the  key.

Next, after the values in front of the ON and OFF option appear, press . You will then see the intermittent cursor under the ON option.

Using the  and  keys, select the parameter to be modified, and the intermittent cursor will be placed above it.

After selecting the parameter to be modified, press  once again.

Using the  and  keys, adjust the value in minutes, and then press , so that the desired value is memorized.

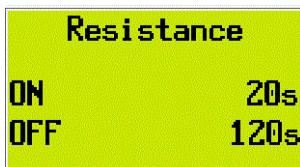
To switch decimal places, use the  or  keys. After pressing , the cursor will automatically move on to the other parameter and repeat the procedure.

After modifying the values, press , so that the intermittent cursor will disappear.

To once again change the configuration of the agitators to "Always On" mode, just press the  key, and the configured values will disappear from the display.

These previously configured values won't disappear from memory, even if the unit runs out of energy.

08 Configuration / **Resistance**



The standard value of the resistance when it is turned on is 20s and 120s when is turned off, or approximately 30 degrees.

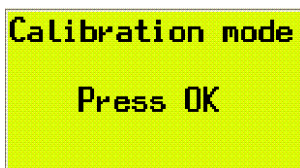
08 Configuration / **Calibrating the dry feeder**

The calibration of the dosing screw is very important, as this will enable the Polymaker PLM to make the necessary adjustments to the dosing rate, taking into account the amount of polymer and the instantaneous flow rate, so that the previously selected concentration is accurately prepared.

To calibrate the powder meter, you will need a scale, which can be an ordinary kitchen scale. Prior to collecting the samples, determine the weight of the collecting container.




The dosing screw is calibrated using two samples obtained during 5 minutes worth of operating time, at different speeds.




After confirmation by pressing **OK**, the following sequence appears.


The calibration procedure may be aborted at any time, by pressing **ESC**.


**calibrate**  
**Point 1press OK**  
 **Esc**


After confirming by pressing , the 5-minute cycle begins, for the first calibration point.

**Running at:**  
**1/5min**  
 **Esc**


Following this five-minute period, weigh the collected polymer and enter this value using the up or down arrows in increments of 10g, using the left or right arrows in increments of 100 g.


**Insert value:**  
**120gPoint 1**  
 **Esc**

After confirming by pressing , the same procedure begins for the second calibration point.

**calibrate**  
**Point 2press OK**  
 **Esc**

After confirming by pressing , the 5-minute cycle begins, for the second calibration point.


Running at:  
1/5min  
 Esc

Insert value:  
450g Point 2  
 Esc

After completing the routine of the second calibration point, the result of the weighings is shown, along with the ideal flow rate for operating the preparing equipment over the entire range of concentrations.

Results:  
Point 1 120g  
Point 2 450g  
Flow 1215L/h

#### 08 Configuration / Results of the last calibration

Calibration   
Point 1 120g  
Point 2 450g  
Flow 1215L/h


This screen enables us to review the results obtained in the last calibration, taking into account the fact that, in the event of a power cut, these values will be lost, and the factory-default settings will be used.

08 Configuration / **Calibrating the dosing pump**

**Calibration mode**  
  
**Press OK**





After confirmation by pressing OK, the following sequence appears.


The calibration procedure may be aborted at any time, by pressing **ESC**.


**calibrate**  
**Point 1press OK**  
 **Esc**

After confirming by pressing **OK**, the 5-minute cycle begins, for the first calibration point.


**Running at:**  
**1/5min**  
 **Esc**

Following this five-minute period, weigh the collected polymer and enter this value using the  or  arrows in increments of 10g, using the  or  arrows in increments of 100 g.


**Insert value**  
**0mLPoint 1**  
 **Esc**


**Insert value**  
**240mLPoint 1**  
 **Esc**

After confirming by pressing **OK**, the same procedure begins for the second calibration point.

calibrate  
Point 2press OK  
 Esc

Running at:  
1/5min  
 Esc

Insert value  
0mLPoint 2  
 Esc

Insert value  
960mLPoint 2  
 Esc

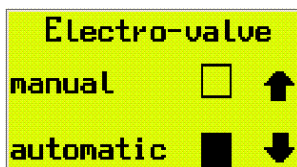
After confirming by pressing , the 5-minute cycle begins, for the second calibration point.

After completing the routine of the second calibration point, the result of the weighings is shown, along with the ideal flow rate for operating the preparing equipment over the entire range of concentrations.

Results  
Point 1 240mL  
point 2 960mL  
Flow 2592L/h

08 Configuration / **Solenoid valve**

The solenoid valve's operating mode can be either manual or automatic, by responding to preparation cycles between levels.



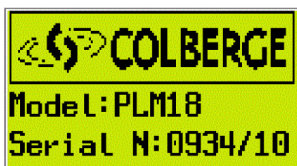
The use of this functionality is quite important, for example, for diluting the concentration found inside, in the event of maintenance, to allow for faster and easier removal, or, in the event of failure or malfunction, where the level in the third chamber becomes too low for the equipment to operate normally and safely, thereby forcing water intake and restoring the level to normal operation settings in automatic mode.

The status of the solenoid valve is also supplemented by display of the solenoid valve symbol on the main screen as well as by two leds located at the top right of the graphic console, where the green led represents automatic mode, and the red led stands for manual mode.

08 Configuration / **Program version**



08 Configuration / **Model and serial number**



08 Configuration / Alarms list



The alarm list will be available always when exist any fault condition and there is two different kind of alarms.

**Thermal Alarms**



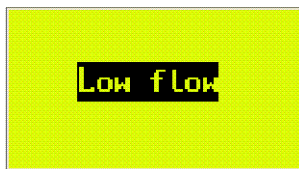
**Failures**



09 Errors and alarms

If, for any reason, the flow rate is significantly different, an error message may occur, since it becomes impossible for the powder meter motor regulator to achieve the rotation speed required to achieve the ratio of water flow rate / amount of polymer for the selected concentration.





This message appears when the water flow rate is lower than the minimum required for preparing the selected concentration.



This message appears when the water flow rate is higher than the maximum required for preparing the selected concentration.



This message appears when the level of powder inside the hopper has just entered the reserve level, comprising some 10 Kg.



When the level is below the safety minimum level.



When the level is above the safety maximum level.

## 10 Maintenance

Any maintenance on agitators must be performed when these are stopped, so as to make sure that no third party is able to cause them to go into operation.

Regularly check the fixations of mechanical components such as agitators.

The motors used are rolling sealed, so no need for any maintenance throughout life.

Check regularly for cleaned fan to provide a good cooling of the engine, prolonging its useful life.

The gearmotor are protected by anticorrosive paint RAL 7001.

Component	Recommended action	Checking	Cleaning	Disassembly and Cleaning
Electrical Switchboard	Check cables and connections	semi-annually	semi-annually	
	Check front lamps	daily		
Ultrasound level	Check the surface of probe	daily	weekly	
Solenoid valves	Check the seals			yearly
Control valve				yearly
Pressure gauge	indicates pressure	daily		
Flowmeter	PVC housing. Check the paddle wheel and the seals.	monthly		
Disperser	Check for blockages	semi-annually		as necessary
Dosing cup	Accumulation of lumps on walls		weekly	
Resistance	Temperature	weekly		
Extractor	Quality of polymer	weekly		yearly
Powder meter	Noises and fastenings	daily		
Seal	Leak-tightness	semi-annually		
Powder detector	Check the surface of probe		weekly	
Dry feeder motor	General evaluation	weekly		
	Check the fastening washer	monthly		
	Check the ventilator			monthly
Agitators motor	General evaluation	weekly		
	Check the fastening washer	monthly		
	Check the ventilator			monthly
	Lubricating oil leaks	monthly		
Relief valves	Fastenings of screws	semi-annually		
	Open and close	monthly		as necessary
Tank	Accentuated distortions	daily		
	leaks	daily		

Are available the following maintenance Kit's:

**KIT "A"** - PLM8; PLM12;  
**KIT "B"** - PLM18; PLM25;  
**KIT "C"** - PLM34 PLM52;  
**KIT "D"** - PLM75; PLM120.

## 11 Disassembly

If it becomes necessary to disassemble the Preparing equipment, this should be carried out when the equipment is stopped and making sure no third party can cause it to go into operation, and in the reverse sequence relative to the steps given for Electrical Installation and Hydraulic Installation.

## 12 Troubleshooting

### **Motors that do not start**

- There is no electric current;
- The selector is set to OFF;
- Switchboard protection activated;
- The cable is cut;
- The power supply features are not the ones recommended;
- One of the phases is disconnected;

### **Motor is experiencing unusual overheating**

- The ventilator is dirty, stopped, broken or blocked;
- The screw is stuck, thereby requiring additional strain;
- The power supply features are not the ones recommended;
- One of the phases is disconnected;

### **Agitator showing unusual vibration**

- The fastening points of the support-based geared motor are loose;
- The main shaft is warped;
- The agitator is running on empty;

### **Unusual noise**

- The motor bearings are worn;
- The reducer bearings and/or gears are worn;
- The agitator is not perfectly aligned vertically;
- The moveable parts are scraping or hitting against a foreign body;
- The powder meter is working in dry mode or the polymer has hardened inside the outlet pipe;

**The Liquid is not moving**

- The agitator is not working because the motor des not start up;
- The screw loosened from the main shaft;

**The level does not rise**

- There is no water supply;
- Water pressure is insufficient;
- The water sprinkler is stopped up;
- Check for any breaks in the tank or outlet connections;
- The relief valves are open;
- Error in reading the probe due to poor electrical contact or dirt;

**The maximum level was exceeded**

- The solenoid valve did not close;
- The solenoid valve is in manual mode;
- Error in reading the probe due to poor electrical contact, dirt, or moisture;

**The powder meter detector does not work**

- Dirt accumulated on the probe's surface;
- Position lamp off, showing a lack of current;

13 **"EC" Declaration of conformity**



**Dosag, Equipamentos de Dosagens, Lda**

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Portugal

***"EC" Declaration of conformity***

Dosag, Lda states that the equipment shown has been in conformity with the requirements of the general provisions of the following European directives since 2003.

EC - Low voltage regulation (2006/95/EC)

EC - Machine regulation (2006/42/EC)

EC - EMC - regulation (2004/108/EC)

Trademark: Colberge - Polymaker PLM

Equipment: Automatic polyelectrolyte powder and emulsion preparation system

Models: PLM8 - PLM12 - PLM18 - PLM34 - PLM52 - PLM75 - PLM120

Albarraque, Março 2010

Dosag Lda





**COLBERGE**  
water systems