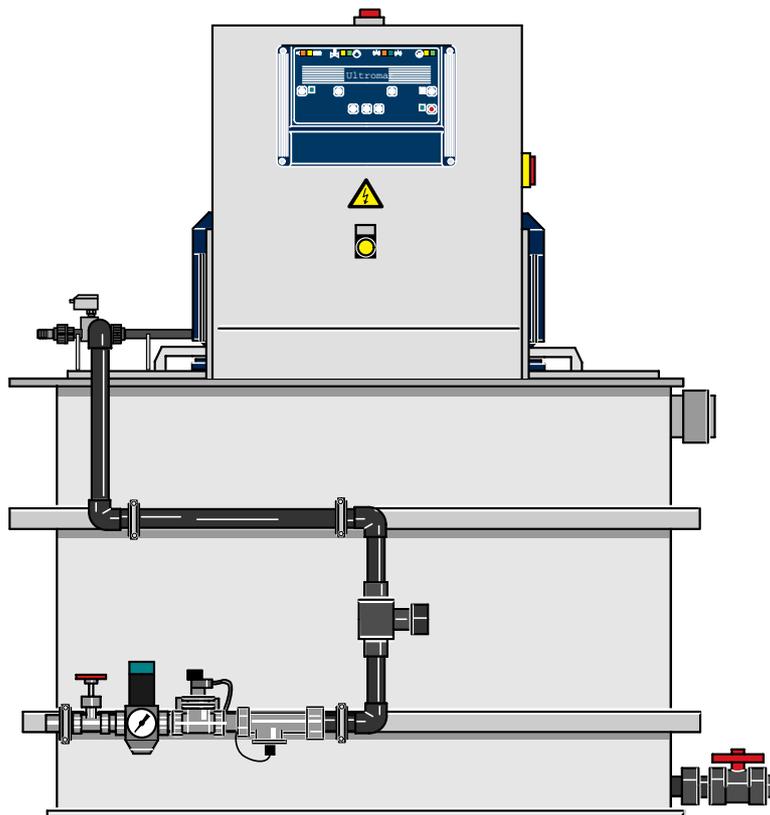


Operating Instructions

Ultromat® AF/96 Series V 4.0

Throughflow system for polyelectrolyte preparation



**Please read the operating instructions through completely before commissioning this equipment.
Do not discard! Any part which has been subject to misuse is excluded from the warranty!**

Printing:

Operating Instructions for Ultromat® AF/96 Series V 4.0
Throughflow system for polyelectrolyte preparation
© ProMinent Dosiertechnik GmbH, 2003

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Subject to technical alteration.

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General User Guidelines

Please read through the following user guidelines. Familiarity with these points ensures optimum use of the operating instructions.

On the fold-out page after the title page you will find the overviews “control elements and key functions” and “operating/settings diagrams”.

You will find it useful to open out the “control elements and key functions” overview as you read this instructions manual.

Key points in the text are indicated as follows:

- Enumerated points / Hints

Working guidelines:

NOTE

Guidelines are intended to make your work easier.

Safety guidelines:



WARNING

Describes a potentially dangerous situation. Could result in loss of life or serious injury if preventative measures are not taken.



IMPORTANT

Describes a potentially threatening situation. Could result in damage to property if preventative measures are not taken.

1 Transport and Storage of the Plant

The Ultromat® plant may be moved only when it is empty and using the correct lifting gear. During transportation of the tank there should be nothing which might place pressure on the tank walls. Heavy jolts and bumps should be avoided at all costs. When using fork lifts, use long forks which extend to the full width of the tank.

If transportation is carried out by crane, even when lifting lugs are attached to the plant, fix the slings in such a way as to avoid sheering forces at all costs. Sheering forces which act while the tank is under transportation lead to damage of the tank walls and the welded seams.

Ultromat® models 4000 and/or 8000, if fitted with lifting lugs, can be lifted with a tie-bar only. The tie bar must be at least 10 - 20 cm longer than the tank being transported.

For transportation and storage of the plant, the surrounding air temperature should be between -5 °C to +50 °C . The plant should be stored in an area which is dust-free as far as possible, and protected from rain, damp (no condensing water) and direct sunlight.

Direct sunlight leads to colour changes and distortion and/or tears forming in the coating material.

NOTE

The Ultromat® should not be transported in temperatures below -5 °C due to the fact that cold causes brittleness in the plastic coating, which can lead to damage to the welded seams, tank walls and strengthening framework.

2 Plant Information

2.1 Applications

The Ultromat® AF/96 is a fully automatic polyelectrolyte preparation plant. The system can be used wherever liquid polymers are used in the preparation of process solutions. The Ultromat® AF is ideal for a variety of process control applications, e.g. in the areas of water treatment, wastewater treatment and paper manufacture.

2.2 Capacity

2.2.1 Ultromat® AF/96

The plant is designed for the fully automatic production of polyelectrolyte stock solution. It can be used with practically all conventional liquid polyelectrolytes.

Controlled by the Ultromat® program, concentrations may be preprogrammed within a range of 0.05 to 1.0 %. The viscosity of the polymer solution which is produced must not, however, exceed the value of 1500 mPas. The instructions concerning viscosity of differing polymer solutions can be found in the user's data documents from the individual polymer suppliers.

To fully exploit the batching range, it may be occasionally necessary to adjust the flow rate of the water in-flow. Concentrations above 0.5 % can lead to a decrease in the effectiveness of the batch capacity.

The maturation period of a stock solution is dependant upon the extraction rate and the capacity (volume) of the Ultromat® and lasts approx. 60 minutes for a maximum extraction rate. The plant capacities range from a maximum 400 l of prepared solution per hour for the AF 400, to 8000 l for the AF 8000.

The Ultromat® AF/96 is fitted with a dosing tube for the injection of liquid concentrates. This tube can be fitted optionally with a back pressure valve and thermal dosing monitor (only with eccentric screw pumps).

Liquid concentrate dosing pumps are supplied with a choice of the following control options:

Control option	Description
Speed controller	An internal Speed controller varies concentrate pump frequency up to maximum 0.37 kW. Fitting an external fan will increase the pump setting range. The external fan can be connected at the control cabinet. It is not necessary to monitor temperature of motor coil.
4-20 mA	Actuation of Beta®, gamma/ L and Sigma pumps via 4-20 mA signal.

2.3 Ultromat® AF/96 Dimensions

Type	dimensions (mm)	water inlet nominal width weights	empty/ operational	overflow/ connector dimension	power supply	agitator
AF 400	L = 1285 B = 950 H = 1418 H1 = 516	R 1"	140/ 540 kg	DN 40/ DN 25	1.5 kW	0.25 kW 750 U/min IP 55
AF 1000	L = 2448 B = 1011 H = 1602 H1 = 866	R 1"	350/ 1350 kg	DN 50/ DN 25	2.6 kW	0.55 kW 750 U/min IP 55
AF 2000	L = 3160 B = 1175 H = 1755 H1 = 1016	R 1"	400/ 2400 kg	DN 50/ DN 32	3.2 kW	0.75 kW 750 U/min IP 55
AF 4000	L = 3180 B = 1520 H = 2015 H1 = 1516	R 1½"	550/ 4550 kg	DN 65/ DN 40	5.0 kW	1.1 kW 750 U/min IP 55
AF 8000	L = 4300 B = 2000 H = 2000 H1 = 1518	R 2"	1150/ 9150 kg	DN 80/ DN 50	9.5 kW	2.2 kW 750 U/min IP 55

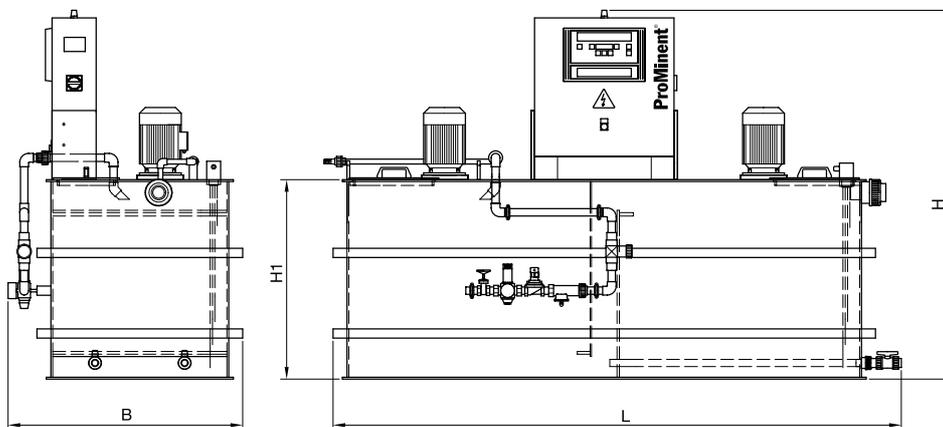


Diagram 1: Ultromat® Dimensions

3 Description of Functions

3.1 Plant Construction

All plant parts for wetting, dissolving and maturing of polyelectrolytes are assembled together to form a compact unit. The Ultramat® system comprises the enclosed two compartment tank (a), water pipe work (b), stirring assemblies (c), control cabinet (d) and plumbing connections for the supply of the liquid polymer. The tank is made of PP. There is a choice of PVC or PP available for the water pipework, fitted with brass mechanismus.

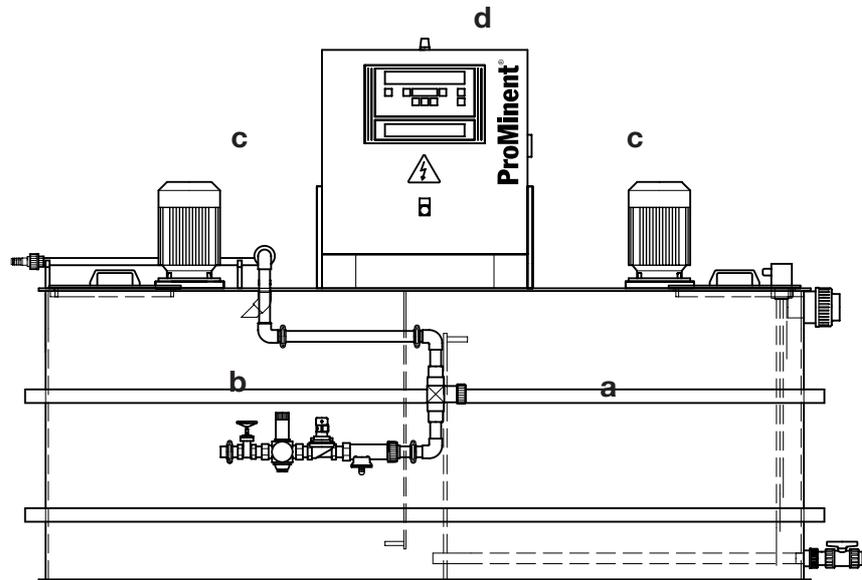


Diagram 2: Ultramat® AF/96

The seals are made of EPDM. For the treatment of non-alkaline polyelectrolytes, unsaturated hydrocarbons, which attack these seals, the plant can be fitted with Viton® seals. The agitator shafts and agitator blades are made entirely from stainless steel.

3.2 Description of Individual Units

3.2.1 Two compartment batching tank

The enclosed PP tank with stirrer connections, the bracket for the control cabinet, and the overflow, empty and discharge connections is divided into two compartments. Preparation and storage compartments guarantee a sufficient time lapse and maturing period for the stock solution. The division of the tank furthermore prevents mature solution mixing with freshly batched solution and allows continual extraction.

The liquid level in the storage compartment is monitored by a liquid level sensor. In addition to the “maximum” and “minimum” contacts which start and/or finish the automatic batching process, the unit is also fitted with an “empty” contact, which protects the system from running when empty, and a further sensor to protect against over-fill (over-fill safety cut-out optional). All inspection openings in the tank are protected by covers which are firmly screwed in position.

3.2.2 Inlet water system and wetting equipment

The water pipework supplies the plant with the water required to dissolve the dosed polymer. The pressure control valve, which incorporates a strainer, limits and maintains the correct operating pressure. A solenoid valve automatically opens and closes the water inlet. The turbine counter (ProMinent® turboDOS) continuously relays the flow volume at any time to the controller. The water flow is set using the regulating valve at the commissioning stage. A manually operated stop valve also allows the water supply to be cut off to allow maintenance work to be carried out. Viton® is a registered trademark of DuPont Dow Elastomers

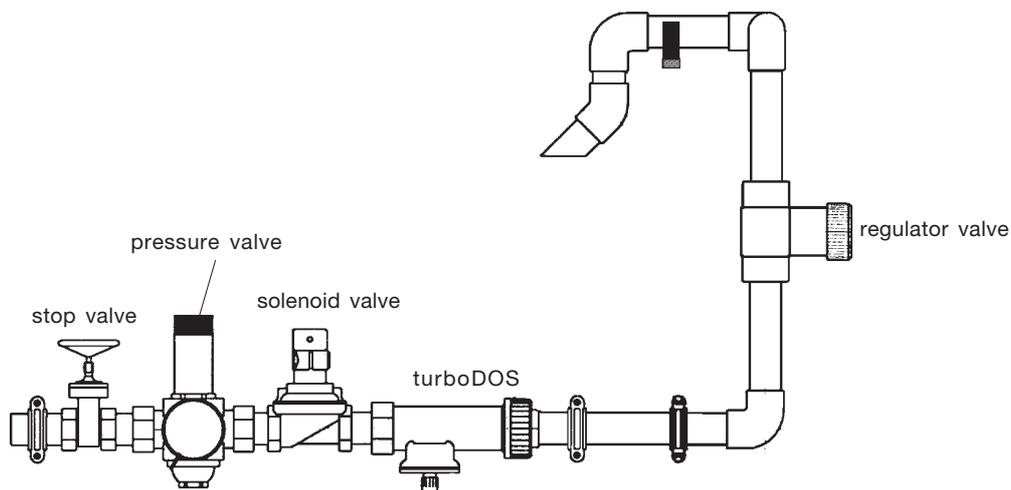


Diagram 3: Water Apparatur with wetting cone

3.2.3 Agitators

The Ultramat® is fitted with two electric agitators. The agitators ensure adequate circulation of the solution in the storage compartment.



WARNING

The agitators will continue to run for the pre-set time span even if the plant has been turned on/off using the start/stop key. Even if a malfunction has occurred, with exception of malfunctions of the agitators themselves the agitators will continue to run intermittently.

3.2.4 Control Cabinet

All the electrical control and command equipment required to operate the plant, in particular the controller for the Ultramat® and the frequency inverter which controls the dry feeder, are located inside the control cabinet.

3.2.5 Concentrate Pipework

The Ultramat® AF is fitted with the following pipework for delivery of liquid concentrates to the batching compartment:

Type	Tubes + Hose nozzle	Options
AF 400	DN 15	<ul style="list-style-type: none"> • flow monitor • back pressure valve
AF 1000	DN 15	<ul style="list-style-type: none"> • flow monitor • back pressure valve
AF 2000	DN 15	<ul style="list-style-type: none"> • flow monitor • back pressure valve
AF 4000	DN 20	<ul style="list-style-type: none"> • flow monitor • back pressure valve
AF 8000	DN 20	<ul style="list-style-type: none"> • flow monitor • back pressure valve

3.3 Plant Function

The in-flow of the water is automatically turned on or off according to the operating state, by a solenoid valve. A turbine counter continuously tracks and monitors the flow of water through the plant. The concentrate pump transfers the polymer into the batching compartment in proportion to the dilution water flow. Once there, an agitator completes the dissolving process to produce a solution. From the preparation chamber the solution flows past a weir into the maturing chamber and finally reaches the storage compartment after it has spent sufficient time maturing.

The solution in the chamber is ready to use and can then be extracted. The division of the tank prevents, to a great extent, the matured solution from mixing with the freshly batched solution.

3.4 Operating Methods

3.4.1 Preparation Operation

Once the minimum liquid-level in the storage compartment is reached, the Ultromat® starts the batching process. The solenoid valve opens and the concentrate pump starts to feed in the metering chemical after the preset delay period. When it reaches the max. level the controller switches off the concentrate pump and closes the solenoid valve.

3.4.2 Settings Configuration Option

All the necessary configurations required to commission the machine are entered when the machine is in settings mode. In this mode, the controller deactivates any functions which might interfere with settings. When calibrating the concentrate pump the water intake solenoid valve remains closed. When setting the water intake the concentrate pump remains off.

3.4.3 Remote Control Option

The plant can be activated or stopped from a remote centre by selecting the "remote control" option. The batching process is still carried out fully automatically, when plant is activated via remote control. The configuration and display of the operating parameters are carried out on site.

3.5 Ultromat® Options

There is a range of optional accessories available for the Ultromat® to expand the functionality of the system even further.

3.5.1 Remote Control

Operating or stop states can be controlled via remote control. Ultromat® can be activated or stopped using an external switch.

Operating signals are transmitted via a dry contact. The signals are as follows:

contact closed:

- Plant is operational
- No malfunctions

contact open:

- Plant was stopped on site or by remote
- Malfunction

3.5.2 Overflow Safety Cut-out

The overflow safety cut-out signals an overflow in the Ultromat® storage compartment and triggers an alarm.

3.5.3 Evaluation of After Dilution Unit

The after dilution unit is used to further dilute the batched polymer solutions. The polymer solution is pumped out of the Ultromat® storage compartment into the after dilution unit. A solenoid valve introduces dilution water into the unit. A flow meter, connected downstream, with a low-flow contact, monitors the dilution water.

The “dilution unit values” option checks the rotameter minimum-liquid-levels contact. If the min. contact indicates lack of water, Ultromat® operation is interrupted, and the discharge pump (polymer solution) is paused.

3.5.4 Empty Signal for Concentrate Supply Drum

The “concentrate drum empty” signal-option contains a sensor which can be located on the outside of plastic hoppers. If the drum is metallic, this kind of sensor cannot be used. In this case, a floating sensor may be introduced into the drum from above.

3.5.5 Liquid Concentrate Dosing Monitoring

Dosing monitoring can be carried out with eccentric screw pumps only.

The dosing monitor consists of a flow adapter and a thermal flow sensor. To set flow monitor configurations select “set dosing monitor” settings menu.

3.6 Ultromat® Accessories

The following accessories are available for the Ultromat® AF/96:

3.6.1 Dilution Unit

As the Ultromat® plants can operate with highly-concentrated solutions, in many cases it is appropriate to treat highly concentrated stock solutions by a dilution process. Polyelectrolyte solutions with a higher concentration last longer, and so a dilution station connected downstream increases the dosing and extraction capacity of the plant. Care must be taken, however, that the viscosity of the stock solution does not exceed a value of 1500 mPa. The dilution stations, which are supplied as complete units, have been designed specifically to fit the dimensions of the equipment, and for a dilution-to-volume ratio of 1 : 5. A choice of models is available.

3.6.2 Lifting lugs

4 lifting lugs facilitate securing and manoeuvring of plant.

4 General Safety Guidelines



WARNING

The plant delivered is constructed to generally recognised technical standards and is safe to operate as long as specified safety guidelines are observed.

When working with Ultromat® plant, however, there are certain safety aspects which you must be aware of. These are given below.

- Throughout all installation and maintenance work, the plant must be disconnected from the power supply. Measures must be taken to ensure that no unauthorised personnel can interfere with the plant during this time. This applies especially for work on electrical circuitry. The control cabinet must be kept locked at all times. Danger of Death!
- All work on the Ultromat® plant must be carried out by trained specialists only.
- For safety reasons the operation of the plant may only be assigned to persons who are familiar with its function and who have been instructed correspondingly.
- The tank cover, which is screwed on and which covers the inspection openings, may only be removed for maintenance purposes. On no account remove the cover and reach inside the tank chambers while the plant is switched on. The agitators may start to run unexpectedly. Danger of Injury!
- Each time plant is connected to mains power, or when power is restored after a mains power failure the agitators will automatically restart.
- Spilled liquid polymer or leaked electrolyte solution must be cleaned up as soon as possible - increased risk of slipping!
- The warning notices attached to the plant must be observed.



WARNING

Individual re-fitting and alterations to the plant are not permitted and the manufacturers will not be held responsible for any damage resulting from such actions. Equally, the effective running of the plant when using non-original parts and accessories cannot be guaranteed. The relevant accident prevention regulations and other generally recognised technical safety regulations must be observed.

5 Assembly and Installation

The plant is completely assembled by the manufacturer and undergoes function-testing prior to delivery. The cabling between the control cabinet and the electrical units is connected and ready for operation.

5.1 Installation of the Plant

For the plant installation a fixed (concrete) flat floor area must be available, which will accommodate the dimensions and the operating weight of the plant. Furthermore, care must be taken to ensure that the plant is easily accessible at all times for operating, maintenance and filling with powder. The permissible surrounding temperature ranges from 5 °C to 40 °C. The plant must not be placed in direct sunlight. When connecting with water supply, overflow and drainage pipes make sure dimensions are correct. Overflow and drainage pipes should be fitted with gradients and must be able to operate without back-pressure.

The water must be of potable quality. It must be free from mechanical impurities and suspended particles.

The incoming water pressure must not be less than 3.5 bar, and not more than 6 bar.

5.2 Electrical Installation

The electrical installation must be carried out by a qualified electrician.



WARNING

The plant must be disconnected from power throughout all installation and maintenance work. Measures must be taken to ensure that no unauthorised personnel can switch on the plant during this time.

5.2.1 Connecting Mains Supply Cable

Connecting the mains supply cable must be carried out exactly in accordance with the circuit diagram (in the control cabinet pocket). The mains cable is passed through a corresponding opening in the control cabinet and connected correctly to the terminal block provided.

When connecting the electrical unit always pay attention that terminals are correctly arranged and that the direction of rotation of the motors (agitators, dry feeder) is correct.

5.2.2 Opening the Controller



WARNING

Before opening the controller, ensure that the plant is not connected to the power supply.

- To open the plastic housing, first of all remove the four countersunk screws in the corners of the cover. The upper section is attached to the lower section by additional snap hooks.
- The snap hooks can be released by exerting pressure downwards onto the upper edge of the cover using the index fingers, and simultaneously pulling forwards a little. Then the whole upper section can be drawn forwards.
- Warning! Upper and lower sections must be separated carefully as they are connected to each other by a short ribbon cable!
- Now the upper section can be placed in the 80 mm high insert using the two guide-rails. In this “parked state” all connector terminals and safety fuses are freely accessible.

5.3 Fitting Options

Some options require reconfiguration of the controller and can therefore only be fitted by our service personnel. Refitting procedures must be done correctly and should be carried out by our experts, in order to ensure that effective plant operation is maintained.

6 Controller

6.1 Design and Function

The Ultramat® controller is housed in a rugged self-contained plastic housing (for installation into electrical control panel, protection system IP 54). It combines the relevant microprocessor controller and its terminal board with the necessary connector terminals, the mains connector and the safety fuses along with all the insertion cards for inputs and outputs.

All information necessary for operating the plant, such as error messages, warnings and values, along with the entire menu system, is displayed according to precedence on a two row LED display.

Malfunctions due to power failures and electrical overload are prevented by a number of safety measures. All stored parameter and configuration data is protected from breaks in the power supply.

6.1.1 Display and Operation Module

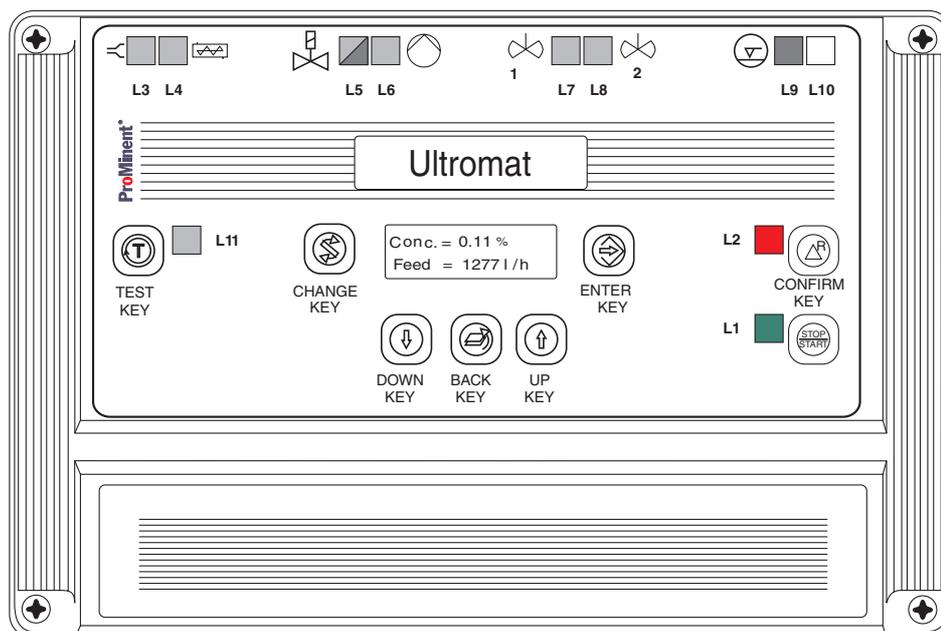


Diagram 4: Control Panel, Ultromat® Controller

6.1.2 Display Supplement (Displays State)

L1	green LED LED off	plant in operating state plant in stopped state
L2	red LED	malfunction (flashing light) warning (continuous light)
L3	green LED	-
L4	green LED	controlling concentrate pump
L5	green LED red LED	controlling solenoid valve flow below set minimum flow
L6	green LED	controlling discharge pump (stock solution)
L7	green LED	controlling agitators, chamber 1
L8	green LED	controlling agitator, chamber 2
L9	red LED	-
L10	-	-
L11	green LED	functioning only in calibration mode and in test modes
	LCD display	2 lines, max. 16 characters each

6.1.3 Operating Elements

start/stop key	switch Ultromat® into operating or stopped states
confirm key	confirms an alarm warning
test key	start/stop button for calibrating
enter key	saves a value, jumps to next menu point
change key	change in the menu
down key	alters numerical value
back key	goes back in menu
up key	alters numerical value
siren key	separate key in door of control cabinet to cancel alarm (does not confirm alarm!)

6.1.4 Operating State Displays and Plant Operation

- The Ultramat® is switched on and off using the main switch located on the side of the control cabinet.
- Once switched on, the plant may be in the operating state (L1: green LED on) or in stopped state (L1: red LED on). To stop and start the operating processes use the STOP/START key.
- A dry remote contact can be used to switch the Ultramat® into the stop state (only for models fitted with “remote control” option). When operating process is stopped by remote control, “Remote control, PAUSE” appears on the LCD display.
- The test key is used during the calibration procedure, to start or stop an action. Whenever the test key should, or may be pressed during calibration, the LED (L11) will flash. Triggering an action using the test key causes a green LED (L11) to light up, and it remains on continuously until the action ceases.
- The red “Alarm” indicator (L2) is located next to the “Confirm” key. During normal operation it is off. If a malfunction occurs, however, it flashes until the malfunction is corrected and the error message is confirmed. Acknowledging the error removes the error message and turns off LED. If there is more than one malfunction present, all texts will be displayed in turn, for approximately two seconds each.
- The alarm siren is deactivated using the separate “Siren off” key in the front door of the control cabinet. This does not deactivate the current alarm.

6.2 Menu System

6.2.1 Menu Layout

The menu is divided into display level and settings level. In the display level, the operating state of the plant alarms is displayed. In the settings level, the parameters for the control of the plant can be altered, and calibration carried out (see also section 12.7 “Control Menu”). If desired, the controller automatically changes the settings menu back to the display menu after 10 minutes.

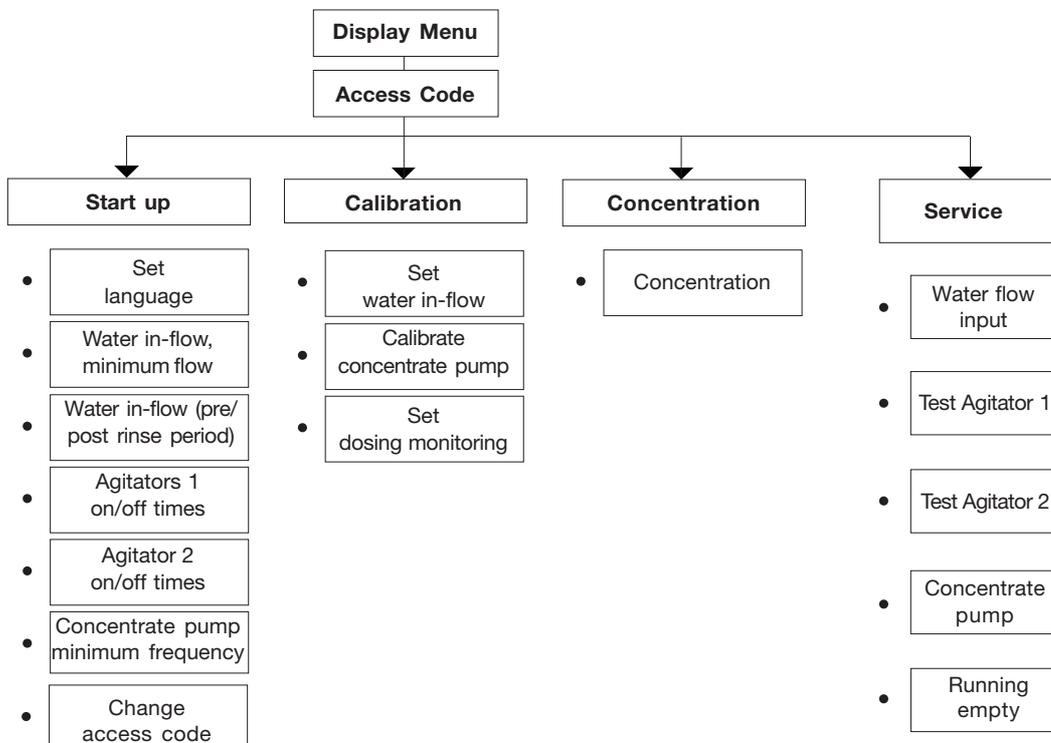


Diagram 5: Menu Structure

6.3 Operating the Controller - Selecting a Menu Option



Enter key

To confirm and/or save a displayed value or setting



Change key

To change displays within a menu level



Back key

Goes back to the previous level, while in the operating menu.
The steps appear in the order given in the previous diagram.

Press Enter key to change from the display menu to the settings menu. Press Enter again, and then enter access code (factory setting 1000). Then use “Change” key to toggle between “Settings Start Up”, “Settings Calibration”, “Settings Concentration” and “Settings Service”. All the menus which follow may be selected by using the Enter key.

The entry of a value or parameter is carried out using the arrow keys “Decrease Value” and “Increase Value”. Generally the last value that was set is displayed. A new value can be entered over this one. By pressing one of the arrow keys continuously, it will change at an ever increasing rate. By continually entering and confirming, you can travel through the menus. With the help of the Back key you can revert any time to the previous menu level.

6.4 Display Mode

6.4.1 Normal Operation

The following messages appear in the controller display during batching operation:

conc. = x.xx %
feed = xxx l/h

Once maximum liquid-level in the storage compartment is reached, the following messages appear on the controller display:

conc. = x.xx %
feed = 0 l/h



discharge stock
feed = 0 l/h

6.4.2 Interrupting Normal Operation

Using the Start/Stop key will stop and/or start normal operation. In the stop state the following message will appear on the display:

conc. = x.xx %
STOP



discharge stock
STOP

If the stop signal is a remote-control input, then the following message appears on the display:

remote PAUSE

6.4.3 Identcode Display

Press the Change key to display the Identcode “**ULSaxxxxxxxxxx**” (as shown in the second row of the controller software version (e.g. :02/4.3) and the operating mode, e.g. “Fluid” (F).

In case of claims and customer service requirements for operational malfunctions these codes must be given to ProMinent Dosiertechnik GmbH.

7 Commissioning

7.1 Assembly, Initial Tasks

During assembly it is absolutely essential that the handling and positioning instructions given in sections 1 and 5 are followed correctly. Make-up water, extraction and overflow pipes must be connected up and checked to ensure they are water tight and in working order.

It is necessary to connect the liquid concentrate supply pipe for Ultramat® model AF.

Before starting up for the first time, mechanical and electrical connections must be checked thoroughly to ensure that they are correctly connected up (e.g. motor rotation direction, power supply etc.).

It must be ensured that the voltage, frequency and current going into the control cabinet comply with the instructions given on the nameplate (on the right-hand side of the control cabinet).

Powder should be available in ready quantities and meet the required quality standards.

After switching on the main switch, the LCD displays the message “STOP”.

If a different message appears, use the Start/Stop key until the Stop message appears. When using remote control option you may see “remote PAUSE” on the display. In this case the plant must be released from central switching station control.

7.2 Checking Identcode

Use the change-key in display mode to change to the Identcode display. Press the change key again to return to normal operating display.

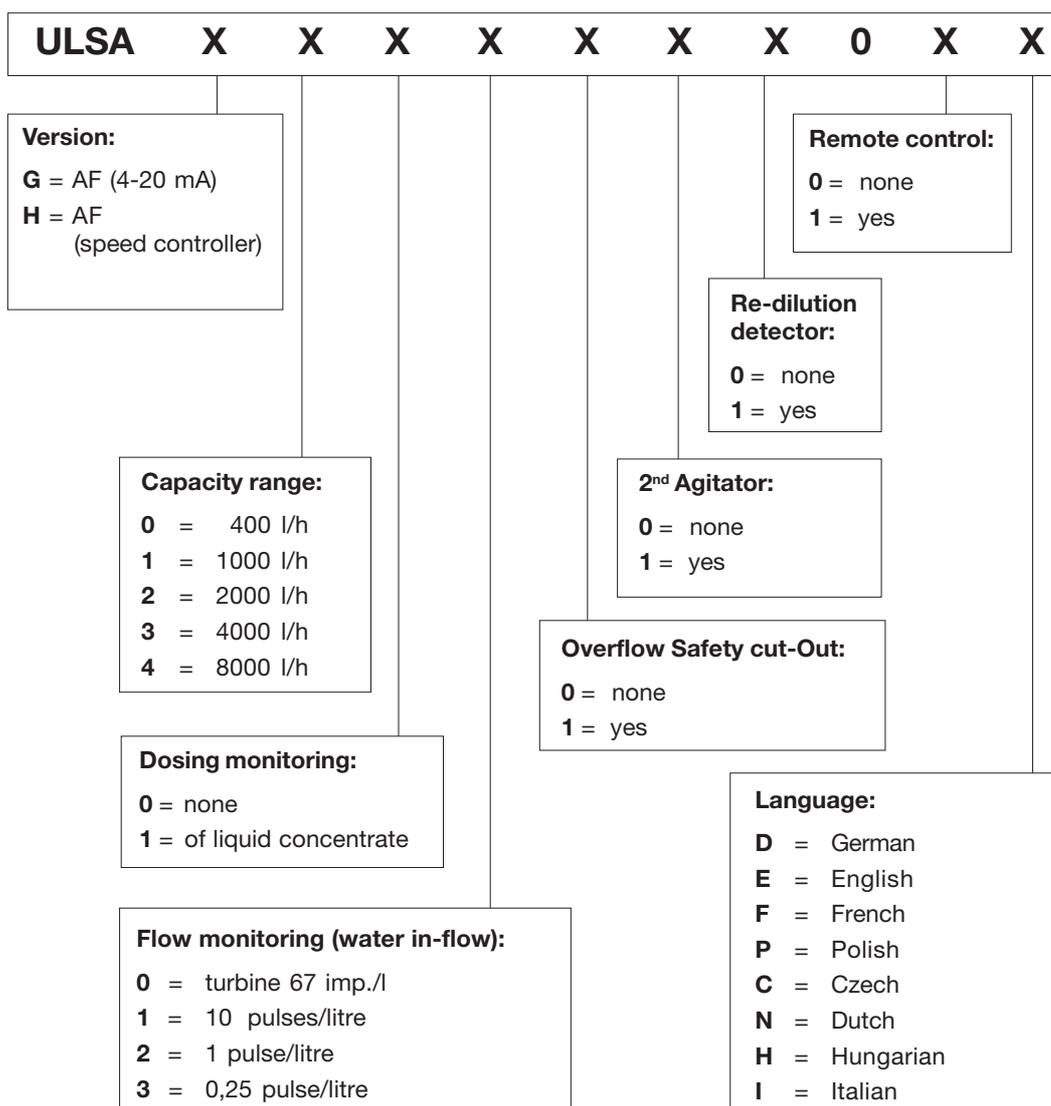


Diagram 6: Identcode

7.3 Start up Settings

Plant is supplied with the following default settings, which are accessed from the “settings start up” menu:

Parameter	Default values	Range
Language	D	D, E, F, P, C, N, H, I
feed water minimum flow		
AF 400:	500 l/h	} 0 - 12.000 l/h
AF 1000:	1200 l/h	
AF 2000:	2400 l/h	
AF 4000:	5000 l/h	
AF 8000:	10000 l/h	
Prerinsing time	7 sec.	0 - 30 sec.
Rinsing delay	5 min.	0 - 30 min.
Agitator 1 on-time	15 min.	5 - 50 min.
Agitator 1 off-time	15 min.	5 - 50 min.
Agitator 2 on-time	5 min.	0 - 20 min.
Agitator 2 off-time	10 min.	5 - 50 min.
Concentrate pump min. frequency	25 Hz	0 - 50 Hz
Change access code	1000	1000 - 9999

Values are adapted to process requirements during commissioning.

7.3.1 Setting Feed Water Minimum Flow

Select “**feedwater minimum flow**” using **Enter key** and use up/down keys to raise/lower the value.

7.3.2 Setting Prerinsing Time and Rinsing Delay Time

To prevent material from clogging the system, a preset lead and run down period can be set for the batching water.

7.3.3 Agitators 1

The stirrer is automatically restarted with every new batching operation. After the end of the batching operation the stirrer continues to run in pulse/pause mode.

Select menus: “Agitator 1 on-time” and “Agitator 1 off-time”. Click on Enter and then use Up/Down keys to alter values. Press Enter again to relay the new settings to the controller.

7.3.4 Agitators 2

The second agitator starts automatically once each batching process has commenced and runs in pulse/pause mode. The choice of appropriate on-off intervals results in effective mixing without damaging the matured macro-molecules.

7.3.5 Concentrate Pump Minimum Frequency

The „Concentrate pump min. frequency“ parameter is only available if the concentrate metering pump is operated by the optional frequency converter. During batching, frequency must not fall below the speed controller minimum frequency.

At slow motor speeds the cooling effect of the fan on the motor coil is greatly reduced. This can cause irreparable damage to the motor. Set the minimum permissible motor frequency when pumps are not fan-cooled.

Where fans are fitted, the “Min. frequency” can be set to approx. 0 Hz. This greatly increases the pump frequency-range.

7.3.6 Change Access Code

Select the final settings-menu: “Change access code” to alter the four-figure default access code. Keep new code in a safe place.

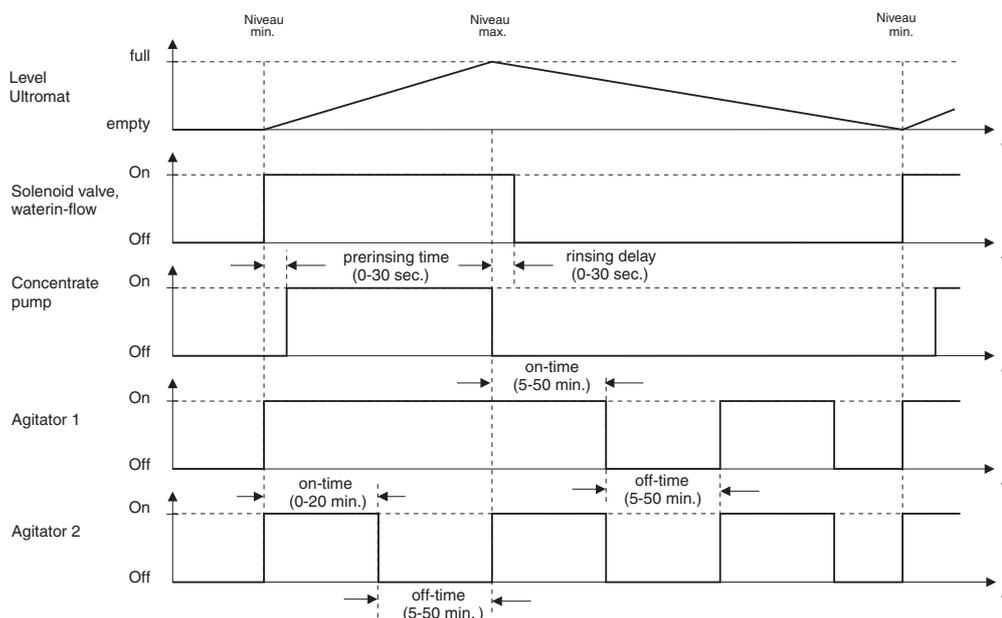


Diagram: 7

7.4 Concentration Settings

The Ultramat® can handle solutions of 0.05 % to 1.0 %, but the viscosity of the polymer solution must not exceed 1500 mPas.

Select sub-menu “Settings concentration” using Enter key. “Concentration” appears on the display. Select the required concentration using the up/down keys.

7.5 Calibration Settings

The calibration menu appears only, when Ultramat® is stopped using the Stop key.

Select from the following configurations:

- adjust water flow
- calibrate concentrate pump
- adjust flow control

7.5.1 Adjust Water Flow

The flow of feed water should be adjusted as follows:

Ultramat®	Water Flow
AF 400	1500 l/h
AF 1000	1500 l/h
AF 2000	3000 l/h
AF 4000	6000 l/h
AF 8000	12 000 l/h

- Set the pressure reducing valve to 3 bar output pressure (solenoid valve closed).
- In “**feed water minimum flow**” menu, select “**minimum flow**” using enter key. LED next to the Test key on the control panel flashes
- Remove caps on both the regulating valves.
- Click on test key in the appropriate menu option. Solenoid valve opens and the current flow is displayed.

- Set the required water volume at the regulating valve using a screwdriver (approx. with 10mm). The current flow can be read off the controller display.
- Press the T key once more to end settings procedure.

7.5.2 Calibration of Dosing Pump for Liquid Concentrate

- Determine unladen weight of the collector tank.
- Open feeder screw pipe.
- In the **“Calibrate concentrate pump”** menu, select “concentrate pump” using Enter key. LED next to test key flashes.
- Press the Test key to start the concentrate pump. The concentrate enters the collector tank.
- Press the Test key again to stop the pump. Weigh polymer quantity collected and program the controller with the weight in grams using the Up/Down keys.
- Pressing the Enter key instructs the controller to calculate the dosing capacity in grams/minute and saves the value.

7.5.3 Configuring Dosing Monitor for Liquid Concentrate

The feed monitor is available only if the Ultramat® AF is ordered with the „Switch to frequency converter“ control variant for the operation of eccentric screw pumps. It is not applicable for “4-20 mA” models.

Control option	Pump	Dosing monitoring
Speed controller	• Eccentric screw pump	yes
4-20 mA	• gamma/ L • Beta® • Sigma	no

- In **“adjust flow control”** menu, select **“flow control”** using Enter key. LED next to test key flashes.
- Use arrow keys to select about 10 % less than the minimum flow value. Press Test key to start concentrate pump.
- Push button on flow monitor to activate the “learn” process.
- Stop pump using test key.
- Press Enter to end configuration process.

Remark:

Minimum flow limit-values are set depending upon “Minimum frequency” parameters. To set low flow-limit values, the minimum frequency in the “Concentrate pump minimum frequency” menu must also have been re-set to a correspondingly low value. Once flow monitor has been configured, the concentrate pump minimum frequency is readjusted to its previous value.

IMPORTANT

The concentrate pump minimum frequency must be re-set to 25 Hz, after configuration of dosing monitoring. Lower values will cause irreparable damage to pump motor.

7.6 Setting Service

7.6.1 Flow settings

The “water flow input” menu is required when the turboDOS or the contact water meter fails. Until these functions are restored the Ultramat® can be operated in emergency operating mode. As a flow meter no longer delivers a signal, a fixed value is entered in the “manual water flow value” menu. As a batch is processed the controller no longer obtains the flow values from the flow meter.

It refers instead back to the fixed value. The fixed value input must naturally correspond to the previous intake value. This procedure should be used as briefly as possible. Since the water intake is not precisely determined, discrepancies can occur in the polymer solution concentration. After flow meter function has been restored the system must be switched back to “measuring flow value”.

7.6.2 Testing stirrer assemblies and concentrate pump

The agitator and concentrate pump can be switched on and off manually. Select the corresponding menu and press the T key.

The following menus are available

- Test agitator 1
- Test agitator 2
- Testing concentrate pump

7.6.3 Running Ultramat® empty

The “empty running” menu prevents a new batch from being processed in the Ultramat® and enables the booster pump (transfer pump) connected downstream to continue to run until material contents have dropped below the empty level.

Select the “empty running” menu option to activate the function and press the T key.

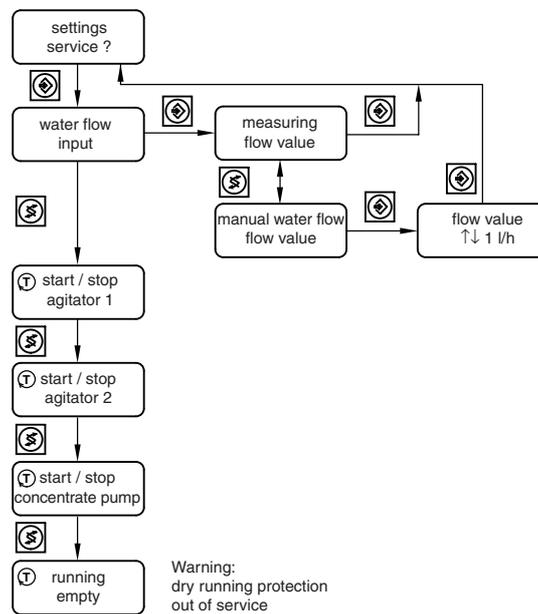
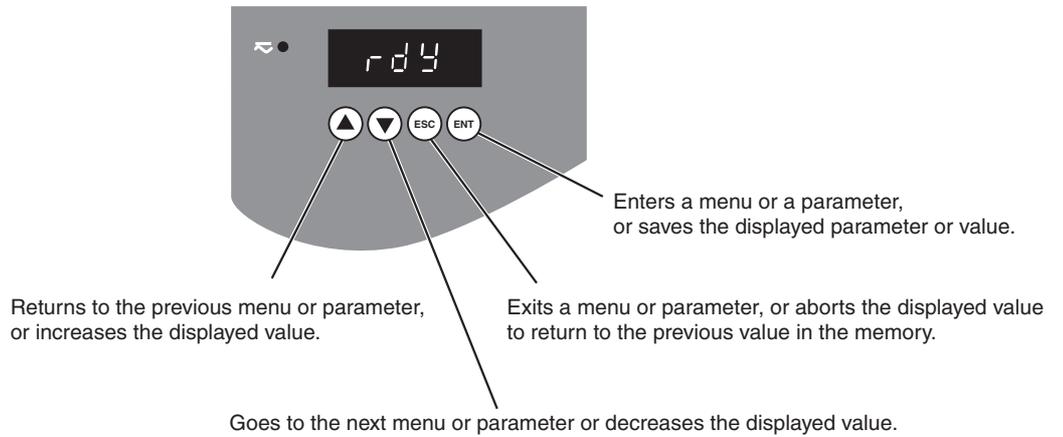


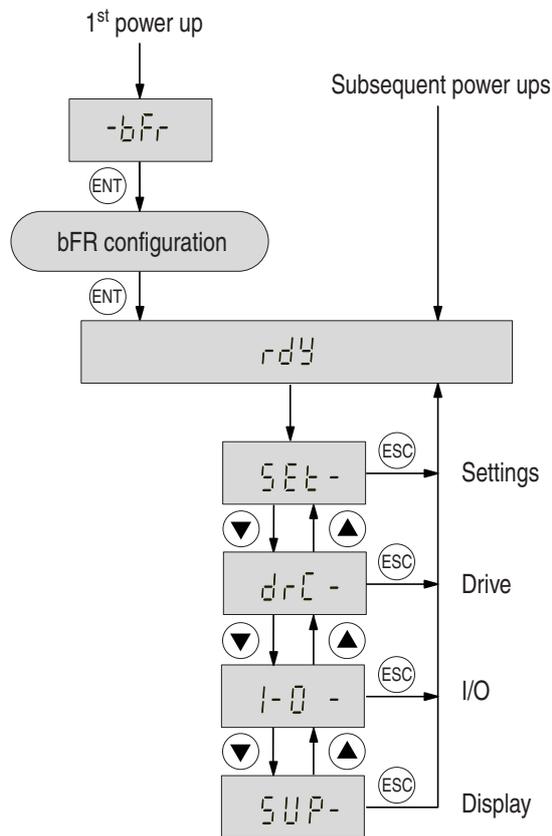
Diagram 8

7.7 Setting frequency converter

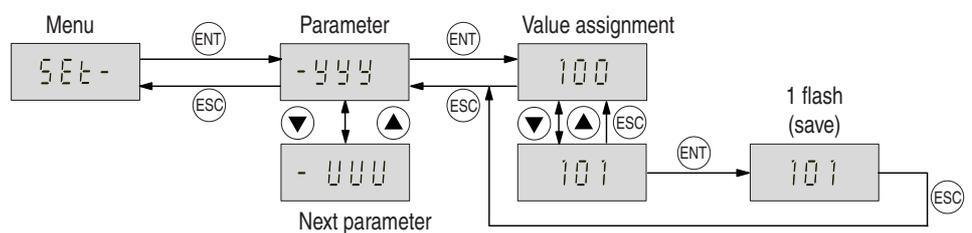
7.7.1 Function of the keys and the display



7.7.2 Access to menus



7.7.3 Access to Parameters



Commissioning

7.7.4 Setting frequency converter

The speed controller is supplied with the following factory settings:

Parameter	Value	Unit	Range	Description
bFr	50	Hz	50 / 60	Nominal motor frequency (50 or 60 Hz)

Parameter „I-O“ (Input / Output):

Parameter	Value	Unit	Range	Description
tCC	2C		2C/3C	2- or 3-wire control
LI2	no*		rrS ... no	Logic input LI2
LI3	no*		PS2 ... no	Logic input LI3
LI4	no*		PS4 ... no	Logic input LI4
AIC	SAI		SAI/P11/PIA	Analog input AIC/AI2
CrL	4,0	mA	0 – 20	Minimum value on input AIC
CrH	20,0	mA	4 – 20	Maximum value on input AIC
A0	no*		rFr/OL0/OPR/no	Analog output
A0t	0,0		0 / 4	Scaling analog output
r2	no*		SrA ... no	Relay R2
Add	1		1-31	address of speed controller (serial link)
bdr	19,2	kBaud	19,2 / 9,6	transmission speed

Parameter „drC“ (Drive):

Parameter	Value	Unit	Range	Description
UnS	230	V	200-240	Nominal motor voltage (name plate)
FrS	50	Hz	40 - 400	Nominal motor frequency (name plate)
tUn	no		no/yes/(done)	Auto-tuning
tFr	100*	Hz	40 - 400	Maximum output frequency
UFt	n		n/nLd/P/L	Selection of the type of voltage
brA	yes		no / yes	Adaption of deceleration time
Frt	0,0		0 – HSP	Ramp switch frequency
SFr	4,0	kHz	2 – 15	Switching frequency
nrd	no*		no / yes	Modulation of switching frequency
Atr	USF*		no / yes / USF	Automatic restart
OPL	yes		no / yes	Enables the motor phase failure fault OPF
StP	no		no / yes	Enables the line supply phase failure fault
FLr	no		no / yes	Smooth restart
drn	no		no / yes	Fault USF
SdS	30		1 – 200	Scale factor for parameter SPd
FCS	no		no / yes	Return to factory settings

Parameter “SEt” (Settings):

Parameter	Value	Unit	Range	Description
ACC	0,1*	s	0,1 - 3600	Acceleration ramp time
dEC	0,1*	s	0,1 - 3600	Deceleration ramp time
LSP	0,0	Hz	0 - HSP	Low speed at 4 mA
HSP	100*	Hz	LSP – tFr	High speed at 20 mA
ItH	1,6*	A	1,6 - 3,7/ntH	Motor thermal protection
UFr	20	%	0 – 100	Optimizes the torque at very low speed
SLP	0*	Hz	0,0 – 5,0	Slip compensation
FLG	33	%	0 – 100	Frequency loop gain
idC	2,3	A	0,1 – 3,3	Level of DC injection braking current
tdC	0,5	s	0,0 – 25,4	DC injection stand still braking
JPF	0,0	Hz	0 – HSP	Skip frequency
tLS	0,0	s	0 - 25,5	Low speed operating time

* After returning to the factory settings with parameter „FCS“, the market values (*) have to be changed.

Parameter „SUP“ (Display):

Parameter	Display	Unit	Description
FrH	Display	Hz	Set point frequency
rFr	Display	Hz	Output frequency
SPd	Display	Hz	Calculated frequency
LCr	Display	A	Motor current
OPr	Display	%	Estimated motor power
ULn	Display	V	Line voltage
tHr	Display	%	Thermal state motor
tHd	Display	%	Thermal state speed controller
LFt	Display		View last faults
CPU	Display		Software version
rdy	Display		Speed controller ready
dcb	Display		DC injection braking in progress
rtrY	Display		Automatic restart in progress
nSt	Display		Freewheel stop command
FSt	Display		Fast stop command

7.8 Level Sensor Settings

The max. and min. dry feeder liquid levels in the storage compartment are analysed by level sensor. The operating threshold sensitivity of the level sensor can be adjusted between 0.5 kΩ to 25 kΩ (corresponds to 0-10 on the scale) using an adjusting wheel on the front of the sensor. The operating threshold sensitivity is adjusted to correspond to the conductivity of the batching in-flow water. 10 = greatest sensitivity. Scale value should be raised when conductivity is low.

7.9 Commissioning

Subject to correct set up and installation. The two inspection openings are permanently closed and the concentrate pump is connected to the fluid concentrate. After setting all operational parameters and completing calibration the plant can be started up.

Press the Start/Stop key to set the plant running. The plant commences operating and the automatic batching process will begin. During this first phase the plant must be monitored carefully. Check particularly that the level sensors are functioning correctly the first time a controlling position is reached.

The error message “Storage tank empty” is unavoidable at this stage, as all compartments are empty. This error message must therefore be confirmed.



IMPORTANT

Before starting the batching process the operating personnel must ensure that the emptying valves for the preparation and maturing chambers are closed.

8 Operating the Plant

8.1 Normal Operation

8.1.1 Preconditions for Correct Operation

To ensure malfunction-free operation of the Ultramat® plant there are important basic preconditions. The first of these are that the set-up and installation has been carried out according to the instructions given. It is vital that the operating parameters are set within reasonable limits and that calibration has been carried out conscientiously. This is particularly important as far as the level sensors are concerned. These cannot carry out their monitoring functions effectively if not correctly adjusted. It is important to note that there should be no on-site changes to parameters for the speed controller. In addition to these basic preconditions there is a series of points which must be taken into consideration when working with the plant itself. In particular the general safety notes (see section 4) must be observed.

The operation of the plant is only permitted to trained personnel who are familiar with the plant. The work of operating staff is limited chiefly to filling with powder, the rapid correction of malfunctions when operation is interrupted, and maintenance of the Ultramat®. In addition, staff are expected to monitor the processes regularly, and make sure all plant components are working correctly. One aspect of this, for example, is the occasional checking of display lights using the Test key. The control of the plant itself takes place automatically, however. Controller settings need not normally be carried out further during operation.

The plant can be completely shut down or re-started using the Start/Stop key during any phase of operation. An exception, however, is the re-starting of the plant after a malfunction occurrence. The general procedure involves the removal of the cause of the malfunction (see section 10 for more details) before confirming the corresponding error message.

8.2 Switching On Mains Power and Mains Power Failure Procedure

a) Switching on mains power

Each time the mains power is switched on, agitators commence operating regardless of the liquid level of the chambers. The plant only starts, however, when the batching process starts once the minimum switching position is reached in the storage compartment. If there is a power failure, however short, during the batching process, the batching process will not commence when the power is switched back on.

b) Mains power failure procedure

After a power failure or a long break in the power, which has led to re-activating the controller, the plant recommences operating according to the state in which it was before the power failure. If the storage compartment levels are within the specified range, batching will not begin, even if, prior to the power failure, a batching process had been underway.



WARNING

After a power failure the agitators will start running automatically.

8.3 Emergency Measures

In an emergency the plant must be disconnected from the mains power using the main control. This will automatically cause the plant and all electrical systems to shut down.



WARNING

Using the “Start/Stop” key on its own is not enough in an emergency as the control is based on a toggle system and does not differentiate between two distinct switch states.

8.4 Plant Idle

Usually the plant is shut down using the Start/Stop key. If shut down is followed by a period where it is foreseeable that the plant will be lying idle for some time, the Ultramat® should also be disconnected from the mains power using the main switch. The main switch must be used in order to prevent unauthorised reactivation of the plant.

During periods for longer than 2 days, when Ultramat® is not in use, all tank compartments must also be completely emptied. Emptying takes place using the pipe-connectors which are fitted on each compartment for this purpose. Rinse the tank thoroughly with water.

9 Operational Errors

In order to avoid, as far as is possible, entering operational parameters incorrectly in the setup period, access to those menus relevant for the correct operation of the plant is limited. Only a small group of personnel have access to the code menus. These must be people who are familiar with the way the plant functions, and who are permitted to enter or change operating parameters. It must be restated that the maximum viscosity value for concentration settings must not exceed 1500 mPas.

In general, the danger from any form of operational error can be minimised as long as the Ultramat® is handled sensibly and with due care. Continuing function checks during operation forms as much a part of this as does following the steps given in the relevant sections of this instruction manual. Sources of malfunctions which can be easily solved are very often due to incorrectly set emptying valves and stopcocks in the water inlet pipes. Making sure the dry feeder hopper is filled with fresh material in good time is crucial to ensure troublefree operation.



WARNING

To prevent possible dangers from any remaining risks, follow all safety precautions when working with the Ultramat® plant.

10 Plant Malfunctions/Error Messages - Breakdown Advice

A plant malfunction is signalled acoustically via the warning siren and visually via the red warning light on the controller display in the control cabinet. In addition, the cause of the malfunction will be displayed in the controller display. The warning siren can be deactivated using the separate “Siren Off” key located in the front door of the control cabinet. The error analysis can take place based on the error message.

In order that the plant can recommence operation after a malfunction occurrence the “Confirm Alarm” key must be pressed to remove the error message once the cause of the malfunction has been removed.

When an alarm is triggered, agitators continue to run in pulse/pause mode.

The (polymer solution) discharge pump release, connected downstream, is not affected.

Possible malfunctions can arise, due to manufacturer’s settings, which may affect the warning or display systems in the plant. If a malfunction should arise which does not appear in this list, or if a malfunction described in the list cannot be solved using the guidance given in the breakdown advice section, then please contact our customer service department.



WARNING

If, to remove the cause of a malfunction in the system, it is necessary to carry out work on the Ultramat® itself, then ensure that the plant is disconnected from mains power throughout and that it cannot be reactivated by unauthorised personnel. Agitators continue to run for the preset period in pulse/pause mode even after an error signal or when plant has been stopped using Stop-key.

It is crucial to effective plant operation that the level sensors are working correctly. When onsite settings are carried out, however, it may be found that a proximity sensor or a concentrate flow sensor has been set too sensitively, or suddenly responds to different operating conditions and gives a false warning signal for a nonexistent malfunction as a consequence. This possibility should be taken into consideration whenever an error analysis is undertaken. If sensors prove themselves to be too insensitive, it will be necessary to reset those sensors.

Plant Malfunctions/Error Messages - Breakdown Advice

10.1 Fault Identification/Malfunctions/Breakdown Advice

Fault	Message on LCD display	Effect	Delay	Red LED	Alarm relay	Action
Warnings						
In-flow monitor	Water flow low	Dosing, stopped in-flow active	3 sec.	On	Off	Increase in-flow
Concentrate pump minimum frequency	Min. frequency!		5 sec.	On	Off	Increase in-flow
In-flow monitor	Water flow high		3 sec.	Off	Off	Adjust in-flow
Malfunction						
Agitator malfunction	Agitator error	Stop state	1 sec.	Flashing	On	Correct fault
Minimum sensor liquid level indicator	Stock empty	Stop state	5 sec.	Flashing	On	Check level LSALL
Water in-flow below min. volume	Water flow low	Stop state	20 sec.	Flashing	On	Check water in-flow
Level sensor defect, compartment 2	Stock level error	Stop state	5 sec.	Flashing	On	Check level sensor
Concentrate pump error switch	Fluid pump error	Stop state	2 sec.	Flashing	On	Check motor-protection
Speed controller malfunction	Inverter error	Stop state	5 sec.	Flashing	On	Check speed controller
Overflow compartment 2	Stock overflow	Stop state	1 sec.	Flashing	On	Check LSAHH level sensor
Dilution monitor	Dilution error	Stop state	3 sec.	Flashing	On	Correct fault
Concentrate drum empty	Concentrate low	Stop state	10 sec.	Flashing	On	Replenish concentrate
Dosing monitor	Flow contr. error	Stop state	20 sec.	Flashing	On	Replenish concentrate
Controller malfunction	Slot "n" failure	Stop state	1 sec.	Flashing	On	Check circuit board
Power supply off	-	Plant shut down	-	Off	On	Identify cause

Warnings do not require acknowledgment. The alarm light remains on continuously, the alarm is not triggered. When the cause of the fault has been removed, plant will automatically recommence normal operation.

10.2 Malfunctions in the Water Inlet Pipe

10.2.1 Water In-Flow Malfunctions

If the water intake flow falls below the lower pre-set limit for longer than 3 seconds the concentrate pump is switched off and the message „Water flow low“ appears. After a total of 20 seconds of continuing low water flow a malfunction will be registered. The water inlet valve is closed. The message “Water Flow Low” remains on the display.

If the water flow reaches the set minimum value again within the next 20 seconds the concentrate pump will control back on after the “prerinse” period has elapsed.

Possible causes and countermeasures:

- Dirt in the pressure reducing valve. Solution: Clean filter-insert in pressure reducing valve.
- Operating pressure is too low. Solution: First of all check the strainer in the pressure reducing valve visually. If there is no dirt in there, reposition the throttle in the pressure reducing valve.
- The stop valve in the water pipe is not fully open. Solution: Turn tap CCW as far as it will go.

10.2.2 Water Meter Malfunctions

If the flow meter does not register flow when a batching process is in operation, the error message “Water Flow Low” appears. It is assumed that the turbine inside the flow meter is not running freely. The water meter should therefore be completely dismantled and cleaned.

10.2.3 Solenoid Malfunctions

During malfunction the solenoid will no longer open and close correctly.

Possible causes and countermeasures:

- Solenoid connections have worked loose. Solution: Check the cable connection and fix if necessary.
- The throttle hole or the pilot hole in the valve outlet is blocked. Solution: Open the solenoid carefully and clean the inside of the housing.
- The membrane inside the valve is defective. Solution: Replace with new valve.

10.3 Malfunctions in the Storage compartment

10.3.1 Storage compartment Runs Dry

If the sensor which detects when the chamber is running dry triggers the “stock empty”, then “stock empty” will appear in the display. Once the alarm has been confirmed, the discharge pump is paused until the minimum liquid-level in the storage compartment is reached.

Possible causes and counter measures:

- All chambers are empty. Solution cannot get past the weir into the storage compartment. Solution: Ensure beforehand that all emptying valves are closed. Start plant operating and wait until all chambers have filled up sufficiently, and working solution can be continually extracted.
- Extraction rate exceeds the plant capacity. Solution: In exceptional cases and within narrow boundaries it is possible to raise the extraction capacity at the cost of the resting period of the Polyelectrolyte solution. Otherwise the dosing capacity can be correspondingly increased by installing a diluting station.

10.3.2 Overflow in Storage compartment

If the Ultramat® does not control off the batching process once the maximum level has been reached, the overflow sensor (optional) will detect the rising level and interrupt the batching process. The error message “Stock overflow” will appear in the display. The controller will stop the batching process and close the solenoid.



WARNING

On no account remove inspection cover and reach inside the chamber if a malfunction occurs. The agitator is still in operation and can commence turning unexpectedly.

Possible Causes and Counter measures:

- The liquid level control that finishes the batching process has not triggered when the maximum level has been reached. Solution: Control off the plant with the main switch, in order to stop the agitators. Then dismantle the liquid level sensor and clean. Following replacement, check the control functions.

10.3.3 Contradictory Liquid level Messages in the Storage compartment

If the level sensors in the storage compartment send out two contradictory signals the display will read "stock level error". The level switch should be cleaned if necessary and its controlling relay should be checked.

10.4 Agitator Malfunctions

The monitoring of the agitators is carried out by the motor protection switch. When a defect occurs, however, only the error message "Agitator Defect" will appear in the display. In the event of malfunction it should be checked whether the motor protection switch has triggered. The relevant motor should be checked for damage and should be replaced if necessary.

10.5 Concentration Errors

If the water flow is that high, that the dry feeder cannot convey enough powder to achieve the preset concentration, the message "water flow high" will appear. No alarm will be triggered, but the actual concentration will be displayed. In this case reduce the water flow.

10.6 Error Messages in Initial Start Up

If the extraction compartment is empty when plant commissioning takes place, the message "Stock empty" appears and an alarm is sounded. Once alarm is confirmed, batching recommences and alarm stops. The "Stock empty" message remains until minimum liquid level is reached. Once minimum liquid level is reached, discharge pump connected downstream is activated.

10.7 Hardware Fault Analysis

If the controller registers an internal hardware fault, please contact the ProMinent customer service department.

10.8 Dilution Faults

The dilution unit is fitted with a flow meter which detects the water flow. A limit contact monitors the minimum water flow. If the water flowing through the dilution unit falls below the preset measured variable, the error message "Dilution error" will appear. Countermeasures involve identifying the cause of the problem and restoring water flow.

11 Maintenance



WARNING

The plant should be disconnected from the mains power throughout all maintenance work, and there must be no possibility that unauthorised personnel can reactivate the plant.

11.1 Cleaning the Filter Insert in the Pressure-Reducing Valve

The amount of dirt in the pressure reducing valve can easily be judged by examining the transparent filter container. At the latest, when 2/3 of the filtration inserts have become clogged with dirt, the filter insert should be cleaned. As the rate at which filtration inserts are becoming clogged increases, the amount of water entering the plant is reduced. This leads to possible faults due to insufficient water in-flow.

To dismantle the filter insert, the plant should be placed into the stopped state. As the pressure reducing valve is located upstream from the solenoid valve, the stop valve should always be manually closed. The exact procedure for dismantling and reassembly of the insert may be found in the appendix of the manufacturer's instruction manual.

11.2 Opening and Cleaning the Solenoid Valve

Before opening the solenoid valve the stop valve, located upstream, should be completely closed to close off the water flow. It is not necessary to dismantle the valve to open it. The four bolts should be unscrewed and the valve cap along with the rinsing insert removed (take care with the cable!). Next remove the inner parts and inspect the membrane for damage. At this point, the housing, in particular the throttle hole and the small pilot hole in the valve outlet, can be cleaned. Take care, when re-assembling, that the parts are put together in the correct order. Further instructions and the relevant diagram can be found in the appendix of the manufacturer's instruction manual.

11.3 Dismantling and Examining the Flow Meter (turboDOS)

For safety reasons, when dismantling the flow meter too, the stop valve should be closed manually. The plant is effectively shut down. To dismantle the turbine rev. counter remove the corresponding screws in the water pipework. Then the turbine wheel inside the water meter can be checked to ensure it is running freely, and cleaned if necessary. When handling the flow meter always be careful with the cable.

When re-assembling, check direction of flow has been taken into account. The PG threaded connector must point downwards.

11.4 Changing the Mains Power Safety Fuse in the Controller



WARNING

To change the safety fuse the plant should be disconnected from the mains power - Danger of Death!

The mains power safety fuse is located in a safety-fuse holder in the controller. It is accessed by opening the controller housing and placing the upper section in the "parked state". After releasing the bayonet fitting on the safety fuse connector, the defective safety fuse can be removed and replaced with a new one. Refasten the bayonet fitting and close the housing.

11.5 Disassembling the inspection cover on the two compartment batching tank



WARNING

When plant is controlled on do not remove the inspection cover. The agitators can start running unexpectedly - Danger of Injury!

Generally the plant should only be operated with the inspection cover fixed firmly in position. Only the cover on the storage compartment may be removed during operation when inspecting the liquid level and to monitor the level sensors (controlling correctly). We recommend that care be taken, however, and on no account should you reach inside the chamber.

You must always remember to check that before the plant is put into operation, all covers are in position and fastened down.

11.6 Flushing the tank

In order to remove remaining polyelectrolyte solution and to prevent clogging of the dosing system the tank must be thoroughly rinsed with water if it is to be left idle for any length of time. The plant should be stopped and disconnected from mains power for safety reasons. Only then can the inspection covers be removed, so that the inside of the tank can be cleaned. In addition the entire wetting cone should be rinsed again.

12 Appendix
12.1 Declaration of Conformity

EC Declaration of Conformity

We,

ProMinent Dosiertechnik GmbH
Im Schuhmachergewann 5 - 11
D - 69123 Heidelberg

hereby declare that, on the basis of its functional concept and design and in the version brought into circulation by us, the product specified in the following complies with the relevant, fundamental safety and health stipulations laid down by EC regulations.
Any modification to the product not approved by us will invalidate this declaration.

Product description : *Polyelectrolyte preparation system, Ultromat*

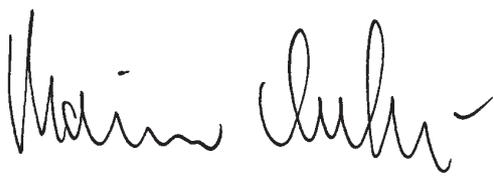
Product type : *AT / ATF / AF / ATP / ATPF / ATD / ATFD / MT*

Serial number : *see type identification plate on device*

Relevant EC regulations : *EC - machine regulation (89/392/EEC) subsequently 93/44/EEC*
EC - low voltage regulation (73/23/EEC)
EC - EMC - regulation 89/336/EEC subsequently 92/31/EEC

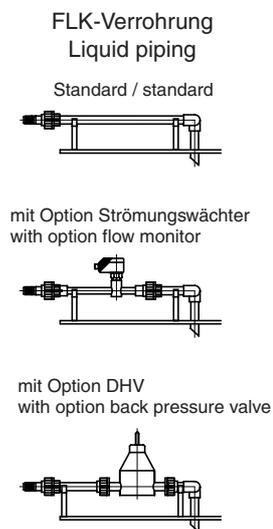
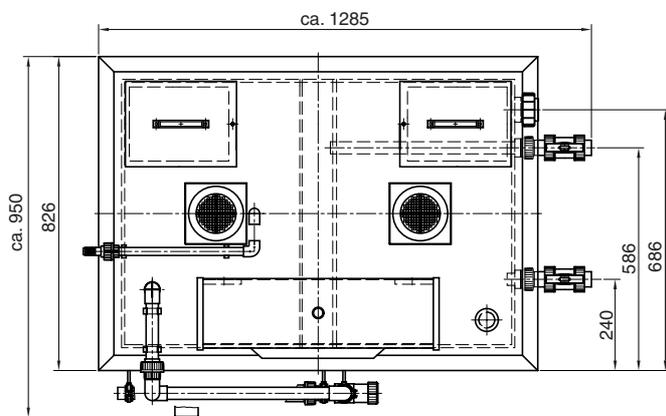
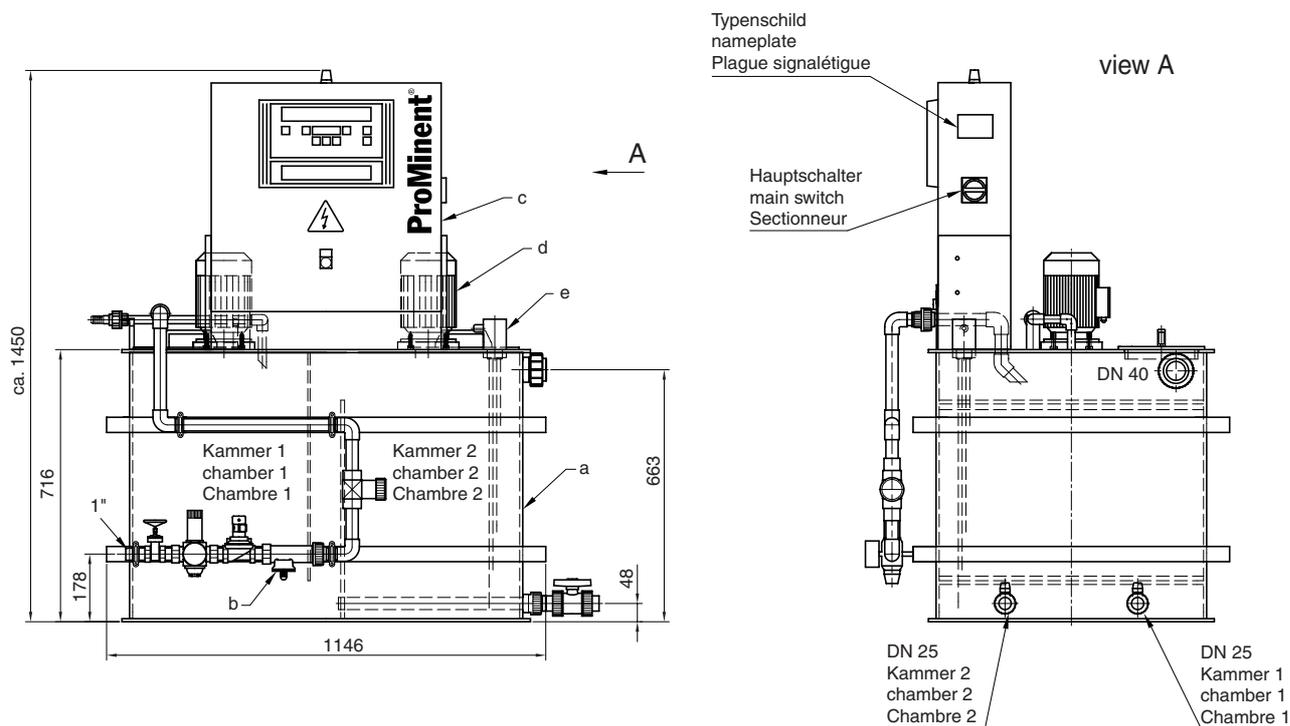
Harmonised standards used,
in particular : *EN 292-1, EN 292-2, EN 563*
EN 60204-1
EN 50081-1/2, EN 50082-1/2

National standards and other
technical specifications used,
in particular :

Date/manufacturer's signature : *12.03.02* 

The undersigned : *Dr. Rainer V. Dulger, Executive Vice President R&D and Production*

12.2 Assembly Drawing AF 400



Die ausgeführten Abmessungen können bedingt durch den eingesetzten Werkstoff um +/- 1,5 von den angegebenen Maßen abweichen.

Depending on the used materials, dimensions shown in this drawing may tolerate +/- 1.5 .

Tolérance générale +/- 1,5 liée à la matière utilisée.

Positionen:

Standardausführung :

- a. Behälter PP inkl. Schaltschrankkonsole
- b. Wasserverrohrung
in PVC/Messing,
alle Dichtungen in EPDM
- c. Schaltschrank/Steuerung
- d. Rührwerke in 1. und 2. Kammer
- e. Niveausonde

Positions:

standard equipment:

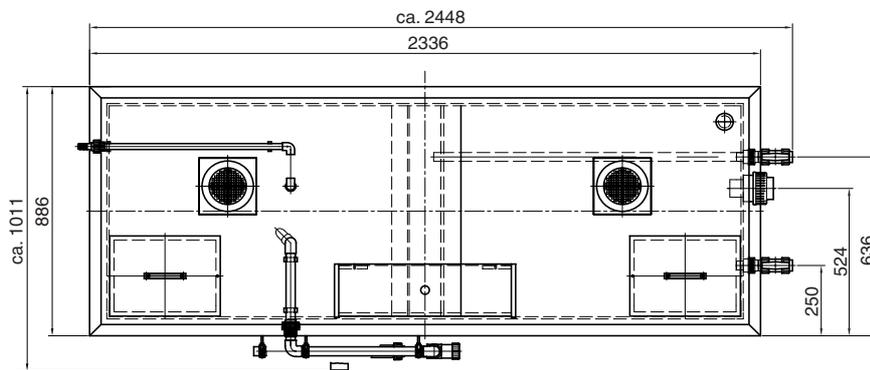
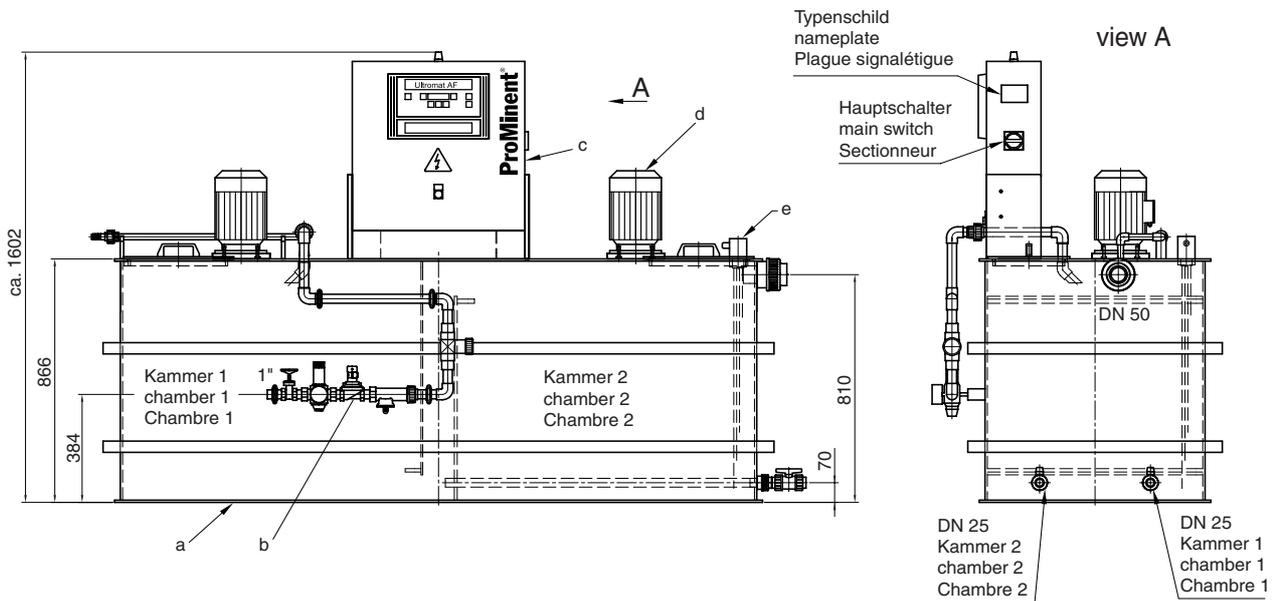
- a. tank PP incl. console for control panel
- b. water piping
made of PVC/brass,
all gaskets made of EPDM
- c. control panel
- d. stirrer in chamber 1 & 2
- e. level sensor

Positions:

Version standard:

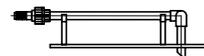
- a. Cuve et support de coffret électrique en PP
- b. Armature hydraulique
En PVC/Laiton
tous les joints en EPDM
- c. Coffret de commande
- d. Agitateur dans les chambres 1 et 2
- e. Sonde de niveau

12.3 Assembly Drawing AF 1000

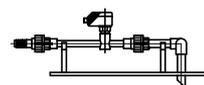


FLK-Verrohrung
Liquid piping

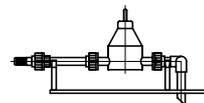
Standard / standard



mit Option Strömungswächter
with option flow monitor



mit Option DHV
with option back pressure valve



Die ausgeführten Abmessungen können bedingt durch den eingesetzten Werkstoff um +/- 1,5 von den angegebenen Maßen abweichen.

Depending on the used materials, dimensions shown in this drawing may tolerate +/- 1.5 .

Tolérance générale +/- 1,5 liée a la matière utilisée.

Positionen:

Standardausführung :

- a. Behälter PP inkl. Schaltschrankkonsole
- b. Wasserverrohrung
in PVC/Messing,
alle Dichtungen in EPDM
- c. Schaltschrank/Steuerung
- d. Rührwerke in 1. und 2. Kammer
- e. Niveausonde

Positions:

standard equipment:

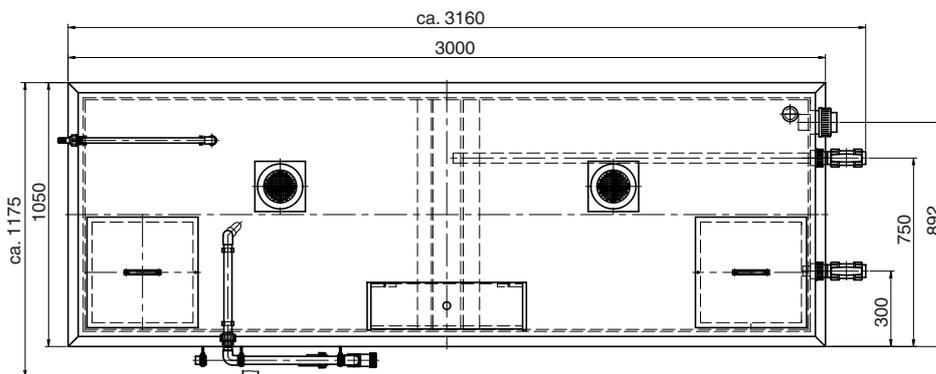
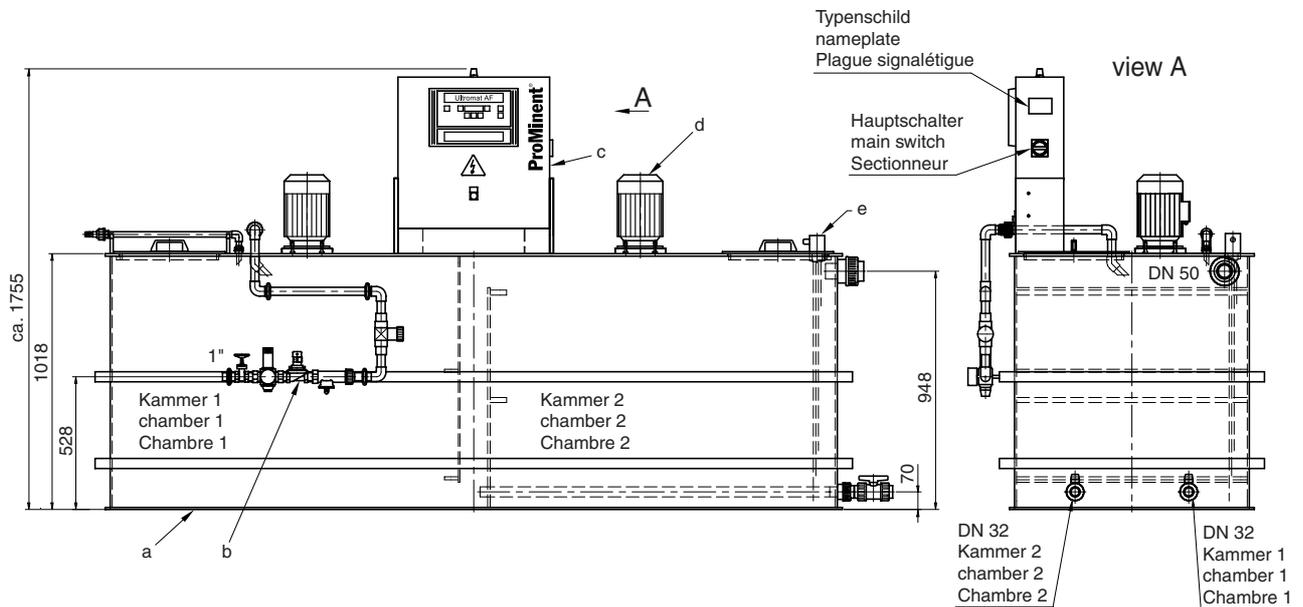
- a. tank PP incl. console for control panel
- b. water piping
made of PVC/brass,
all gaskets made of EPDM
- c. control panel
- d. stirrer in chamber 1 & 2
- e. level sensor

Positions:

Version standard:

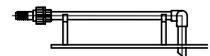
- a. Cuve et support de coffret électrique en PP
- b. Armature hydraulique
En PVC/Laiton
tous les joints en EPDM
- c. Coffret de commande
- d. Agitateur dans les chambres 1 et 2
- e. Sonde de niveau

12.4 Assembly Drawing AF 2000

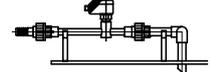


FLK-Verrohrung
Liquid piping

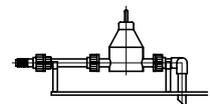
Standard / standard



mit Option Strömungswächter
with option flow monitor



mit Option DHV
with option back pressure valve



Die ausgeführten Abmessungen können bedingt durch den eingesetzten Werkstoff um +/- 1,5 von den angegebenen Maßen abweichen.

Depending on the used materials, dimensions shown in this drawing may tolerate +/- 1.5 .

Toiérance générale +/- 1,5 liée a la matière utilisée.

Positionen:

Standardausführung :

- a. Behälter PP inkl. Schaltschrankkonsole
- b. Wasserverrohrung
in PVC/Messing,
alle Dichtungen in EPDM
- c. Schaltschrank
- d. Rührwerke in 1. und 2. Kammer
- e. Niveausonde

Positions:

standard equipment:

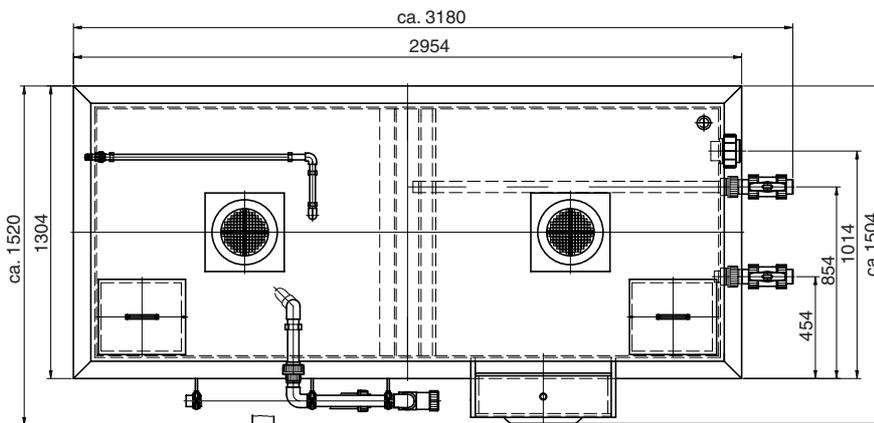
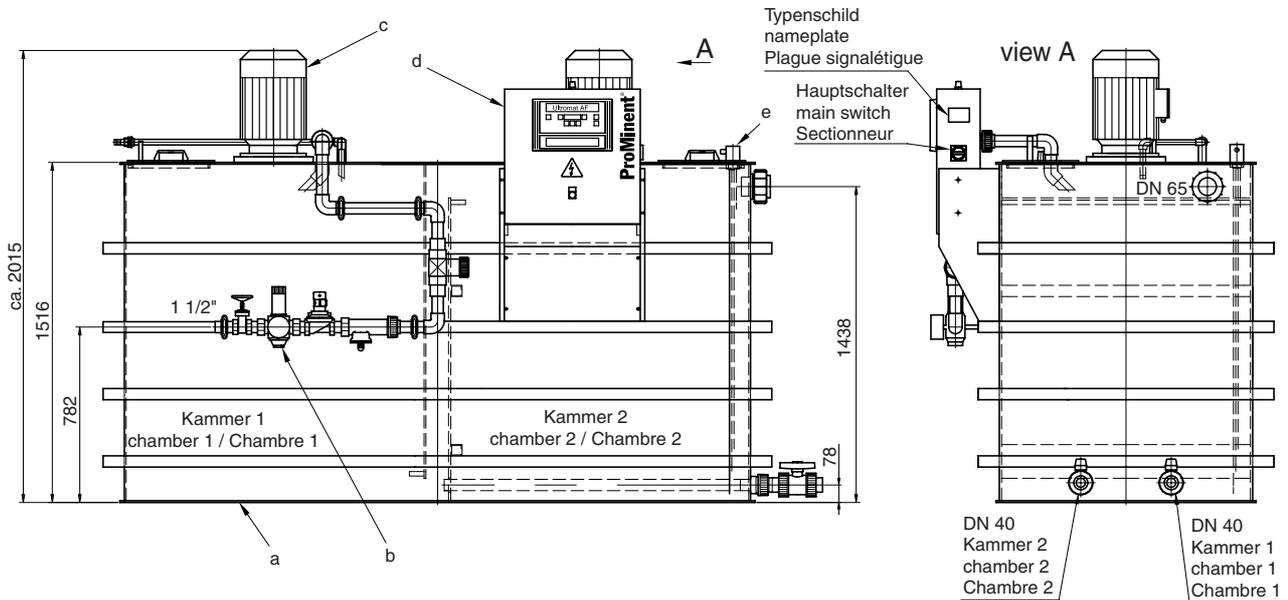
- a. tank PP incl. console for control panel
- b. water piping
made of PVC/brass,
all gaskets made of EPDM
- c. control panel
- d. stirrer in chamber 1 & 2
- e. level sensor

Positions:

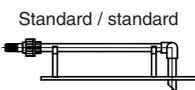
Version standard:

- a. Cuve et support de coffret électrique en PP
- b. Armature hydraulique
En PVC/Laiton
tous les joints en EPDM
- c. Coffret de commande
- d. Agitateur dans les chambres 1 et 2
- e. Sonde de niveau

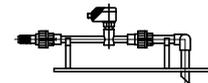
12.5 Assembly Drawing AF 4000



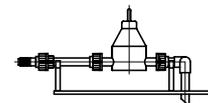
FLK-Verrohrung
Liquid piping



mit Option Strömungswächter
with option flow monitor



mit Option DHV
with option back pressure valve



Die ausgeführten Abmessungen können bedingt durch den eingesetzten Werkstoff um +/- 1,5 von den angegebenen Maßen abweichen.

Depending on the used materials, dimensions shown in this drawing may tolerate +/- 1.5 .

Tolérance générale +/- 1.5 liée à la matière utilisée.

Positionen:**Standardausführung :**

- a. Behälter PP inkl. Schaltschrankkonsole
- b. Wasserverrohrung
in PVC/Messing,
alle Dichtungen in EPDM
- c. Schaltschrank
- d. Rührwerke in 1. und 2. Kammer
- e. Niveausonde

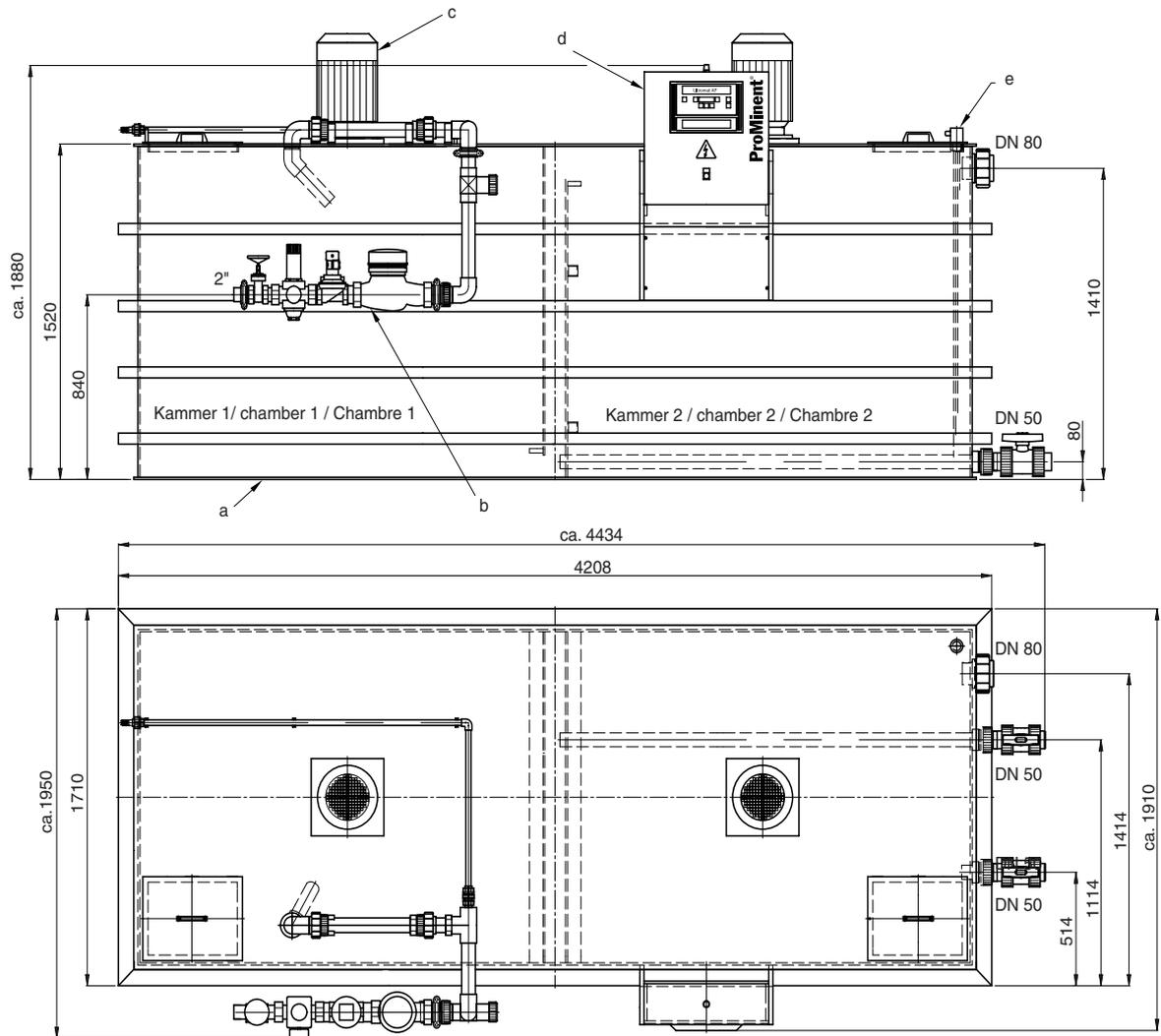
Positions:**standard equipment:**

- a. tank PP incl. console for control panel
- b. water piping
made of PVC/brass,
all gaskets made of EPDM
- c. control panel
- d. stirrer in chamber 1 & 2
- e. level sensor

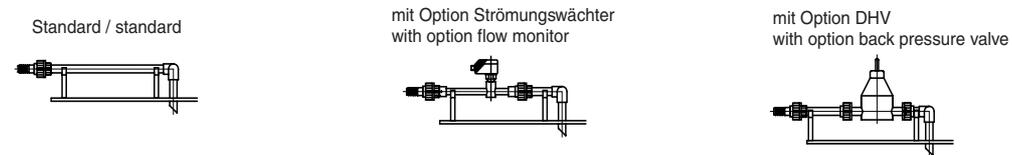
Positions:**Version standard:**

- a. Cuve et support de coffret électrique en PP
- b. Armature hydraulique
En PVC/Laiton
tous les joints en EPDM
- c. Coffret de commande
- d. Agitateur dans les chambres 1 et 2
- e. Sonde de niveau

12.6 Assembly Drawing AF 8000



FLK-Verrohrung / Liquid piping



Die ausgeführten Abmessungen können bedingt durch den eingesetzten Werkstoff um +/- 1,5 von den angegebenen Maßen abweichen.

Depending on the used materials, dimensions shown in this drawing may tolerate +/- 1.5 .

Tolérance générale +/- 1,5 liée a la matière utilisée.

Positionen:

Standardausführung :

- a. Behälter PP inkl. Schaltschrankkonsole
- b. Wasserverrohrung
in PVC/Messing,
alle Dichtungen in EPDM
- c. Schaltschrank
- d. Rührwerke in 1. und 2. Kammer
- e. Niveausonde

Positions:

standard equipment:

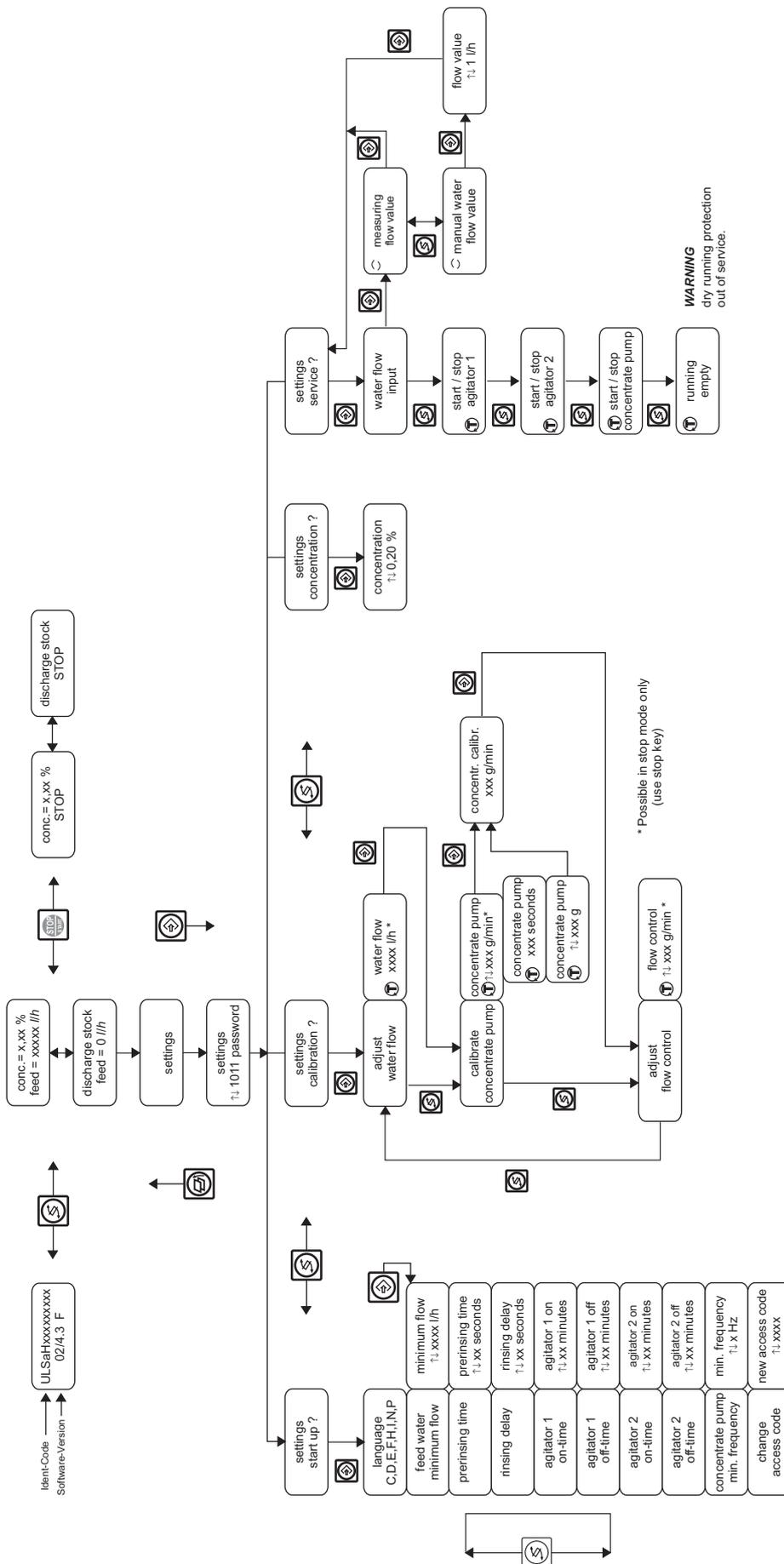
- a. tank PP incl. console for control panel
- b. water piping
made of PVC/brass,
all gaskets made of EPDM
- c. control panel
- d. stirrer in chamber 1 & 2
- e. level sensor

Positions:

Version standard:

- a. Cuve et support de coffret électrique en PP
- b. Armature hydraulique
En PVC/Laiton
tous les joints en EPDM
- c. Coffret de commande
- d. Agitateur dans les chambres 1 et 2
- e. Sonde de niveau

12.7 Programming Menu Ultramat® AF/96



12.8 Commissioning Protocol

Commissioning Protocol Ultromat® AF/96

Ultromat type:

AF 400/96 AF 1000/96 AF 2000/96 AF 4000/96 AF 8000/96

Ident-code:

ULSA								0		
------	--	--	--	--	--	--	--	---	--	--

Software version:

	/	
example	02/4.3	F

Project-number:

--

Calibration settings:

Parameter	setting
Concentration (%)	
Calibrated feedrate (g/min)	
Water in flow (l/h)	
Flow monitor switch threshold (g/min)	

Commissioning settings

Parameter	Default setting	setting
feed water minimum flow AF 400	500 l/h	
feed water minimum flow AF 1000	1 200 l/h	
feed water minimum flow AF 2000	2 400 l/h	
feed water minimum flow AF 4000	5 000 l/h	
feed water minimum flow AF 8000	10 000 l/h	
prerinsing time	7 Sec.	
rinsing delay	5 Sec.	
agitator 1 on-time	15 Min.	
agitator 1 off-time	15 Min.	
agitator 2 on-time	5 Min.	
agitator 2 off-time	10 Min.	
concentrate pump	25 Hz	
min. frequency		
password	1000	

Liquid product, Trade name: _____ supplier: _____

Client: _____

Date: _____

Location: _____