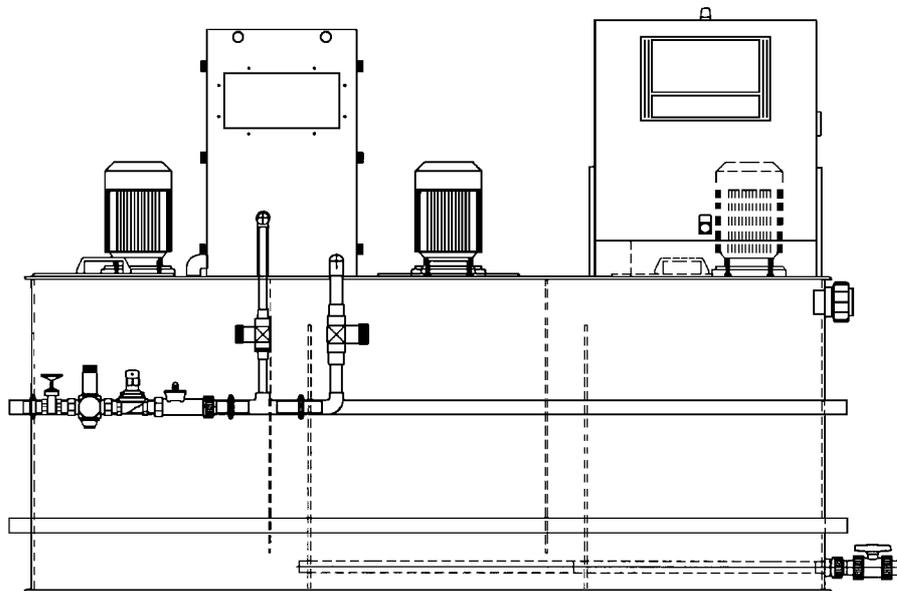


# Operating Instructions

## Ultromat® AT/96 and ATF/96 Series V 4.0

Three-compartment Plant for the Preparation of Polyelectrolyte



**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® AT/96 und ATF/96 Serie V 4.0  
Three-compartment Plant for the Preparation of Polyelectrolyte  
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Subject to technical alteration.

## Table of Contents

General User Guidelines	
<b>1 Transport and Storage of the Plant</b>	<b>7</b>
<b>2 Plant Information</b>	<b>7</b>
2.1 Applications	7
2.2 Capacity	7
2.2.1 Ultromat® AT/96 (for powdered polymer batching)	7
2.2.2 Ultromat® ATF/96 (for powder and liquid polymer batching)	8
2.3 Ultromat® AT/96 Dimensions	8
2.4 Ultromat® ATF/96 Dimensions	9
<b>3 Description of Functions</b>	<b>10</b>
3.1 Plant Construction	10
3.2 Description of Individual Units	10
3.2.1 Three-compartment Tank	10
3.2.2 Inlet water system and wetting equipment	10
3.2.3 Powder Feeder	11
3.2.4 Agitators	11
3.2.5 Control Cabinet	12
3.2.6 Concentrate Pipework (ATF/96 only)	12
3.3 Plant Function	12
3.4 Operating Methods	13
3.4.1 Preparation Operation	13
3.4.2 Settings Configuration Option	13
3.4.3 Remote Control Option	13
3.5 Ultromat® Options	13
3.5.1 Storage Compartment Agitator (Agitator 3)	13
3.5.2 Remote Control	13
3.5.3 Overflow Safety Cut-out	13
3.5.4 Evaluation of After Dilution Unit	14
3.5.5 Power Socket for Automatic Hopper Loader	14
3.5.6 Empty Signal for Concentrate Supply Drum (Ultromat® ATF only)	14
3.5.7 Liquid Concentrate Dosing Monitoring (Ultromat® ATF only)	14
3.6 Ultromat® Accessories	14
3.6.1 Detachable Hopper; 50 L, 75 L and 100 L	14
3.6.2 Automatic Hopper Loader for Powdered Polymers	14
3.6.3 BIG-BAG Batching Unit	14
3.6.4 Step Ladder	14
3.6.5 After Dilution Unit	15
3.6.6 Lifting lugs	15
<b>4 General Safety Guidelines</b>	<b>15</b>
<b>5 Assembly and Installation</b>	<b>16</b>
5.1 Installation of the Plant	16
5.2 Electrical Installation	16
5.2.1 Connecting Mains Supply Cable	16
5.2.2 Opening the Controller (see diagram 4)	16
5.3 Fitting Options	16

<b>6</b>	<b>Controller</b>	<b>17</b>
6.1	Design and Function	17
6.1.1	Display and Operation Module	17
6.1.2	Display Supplement (Displays State)	18
6.1.3	Operating Elements	18
6.1.4	Operating State Displays and Plant Operation	18
6.2	Menu System	19
6.2.1	Menu Layout	19
6.3	Operating the Controller - Selecting a Menu Option	19
6.4	Display Mode	20
6.4.1	Normal Operation	20
6.4.2	Interrupting Normal Operation	20
6.4.3	Identcode Display	20
<b>7</b>	<b>Commissioning</b>	<b>20</b>
7.1	Assembly, Initial Tasks	20
7.2	Checking Identcode	21
7.3	Start up Settings	22
7.3.1	Setting Feed Water Minimum Flow	22
7.3.2	Setting Feeder Screw Pipe Heater	22
7.3.3	Setting Prerinsing Time and Rinsing Delay Time	23
7.3.4	Agitators 1 and 2	23
7.3.5	Agitator 3	23
7.3.6	Concentrate Pump Minimum Frequency	23
7.3.7	Change Access Code	23
7.4	Concentration Settings	24
7.5	Calibration Settings	24
7.5.1	Adjust Water Flow	24
7.5.2	Calibration of Powder Feeder	24
7.5.3	Calibration of Dosing Pump for Liquid Concentrate (Ultromat® ATF)	25
7.5.4	Configuring Dosing Monitor for Liquid Concentrate (Ultromat® ATF)	25
7.6	Service Menu	25
7.6.1	Flow settings	25
7.6.2	Testing agitator and powder feeder	26
7.6.3	Running Ultromat® empty	26
7.7	Speed Controller Settings	27
7.7.1	Ultromat® AT Configuration	27
7.7.2	Configuration of Ultromat® ATF ("Speed controller" control option)	27
7.8	Level Sensor Settings	28
7.9	Commissioning	28
<b>8</b>	<b>Operating the Plant</b>	<b>28</b>
8.1	Normal Operation	28
8.1.1	Preconditions for Correct Operation	28
8.1.2	Supplying Dry Feeder with Powder	29
8.2	Switching On Mains Power and Mains Power Failure Procedure	29
8.3	Emergency Measures	29
8.4	Plant Idle	29

<b>9</b>	<b>Operational Errors</b>	<b>30</b>
<b>10</b>	<b>Plant Malfunctions/Error Messages - Breakdown Advice</b>	<b>30</b>
10.1	Fault Identification/Malfunctions/Breakdown Advice	31
10.2	Malfunctions in the Water Inlet Pipe	32
10.2.1	Water In-Flow Malfunctions	32
10.2.2	Water Meter Malfunctions	32
10.2.3	Solenoid Malfunctions	32
10.3	Powder-Feed Malfunctions	32
10.4	Malfunctions in the Wetting cone	32
10.5	Malfunctions in the Storage compartment	33
10.5.1	Storage compartment Runs Dry	33
10.5.2	Overflow in Storage compartment	33
10.5.3	Contradictory Liquid level Messages in the Storage compartment	33
10.6	Agitator Malfunctions	33
10.7	Concentration Errors	33
10.8	Error Messages in Initial Start Up	34
10.9	Hardware Fault Analysis	34
10.10	Dilution Faults	34
<b>11</b>	<b>Maintenance</b>	<b>34</b>
11.1	Inspecting the Dry Feeder and the Wetting cone	34
11.2	Cleaning the Filter Insert in the Pressure-Reducing Valve	34
11.3	Opening and Cleaning the Solenoid Valve	34
11.4	Dismantling and Examining the Flow Meter (turboDOS)	35
11.5	Changing the Mains Power Safety Fuse in the Controller	35
11.6	Removing the Inspection Cover on the Three Compartment Tank	35
11.7	Rinsing the Multi-chamber Tank	35
<b>12</b>	<b>Appendix</b>	<b>36</b>
12.1	Declaration of Conformity	36
12.2	Assembly Drawing AT 400	37
12.3	Assembly Drawing AT 1000	38
12.4	Assembly Drawing AT 2000	39
12.5	Assembly Drawing AT 4000	40
12.6	Assembly Drawing AT 8000	41
12.7	Assembly Drawing ATF 4000	42
12.8	Assembly Drawing ATF 1000	43
12.9	Assembly Drawing ATF 2000	44
12.10	Assembly Drawing ATF 4000	45
12.11	Assembly Drawing ATF 8000	46
12.12	Programming Menu Ultromat® AT/96	47
12.13	Programming Menu Ultromat® ATF/96	48
12.14	Commissioning Protocol	49

### 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:

#### ***IMPORTANT***

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.



#### ***NOTICE***

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.

#### **IMPORTANT**

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® AT/96 is a fully automatic polyelectrolyte preparation plant. It can be used wherever liquid polyelectrolyte solutions need to be prepared automatically. Its central function, which is to dissolve solids, makes the plant ideally suited to a variety of technical processing applications, e.g. in the water treatment industry, waste water treatment and paper manufacture. Ultromat® ATF/96 can be used with either powdered polyelectrolytes or liquid polymers.

#### 2.2 Capacity

##### 2.2.1 Ultromat® AT/96 (for powdered polymer batching):

The plant is designed for the fully automatic production of polyelectrolyte stock solution. It may be used for nearly all commercial electrolytes in powder form.

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 AT 400, to 8000 l for the AT 8000.

### 2.2.2 Ultromat® ATF/96 (for powder and liquid polymer batching)

The Ultromat® ATF/96 can be used for the preparation of either powder or liquid polymers. Ultromat® ATF/96 can be transferred from powder- to liquid-preparation mode using the key-operated switch in the door of the control cabinet. This deactivates the dry feeder and activates the concentrate dosing pump. The Ultromat® ATF/96 is also 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	Internal Speed controller varies concentrate pump frequency up to maximum 0.37 kW. The speed controller can be transferred via a contactor from the concentrate pump (eccentric screw pump) to dry feeder and vice-versa. 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	Control of gamma, Vario and Sigma pumps via 4-20 mA signal

### 2.3 Ultromat® AT/96 Dimensions

Type	dimensions (mm)	water inlet nominal width	empty/operational weights	overflow/connector dimension	power supply	agitator	dry feeder capacity
<b>AT 400</b>	L = 1770 B = 915 H = 1250 H1= 516	R 1"	190/ 590 kg	DN 40/ DN 25	1.5 kW	0.18 kW 750 rpm IP 55	1.3 - 29 L/h TD 18.20
<b>AT 1000</b>	L = 2410 B = 950 H = 1605 H1= 866	R 1"	400/ 1400 kg	DN 50/ DN 25	2.6 kW	0.55 kW 750 rpm IP 55	1.3 - 29 L/h TD 18.20
<b>AT 2000</b>	L = 3070 B = 1090 H = 1755 H1= 1016	R 1"	450/ 2450 kg	DN 50/ DN 32	3.2 kW	0.75 kW 750 rpm IP 55	1.3 - 29 L/h TD 18.20
<b>AT 4000</b>	L = 3181 B = 1521 H = 2263 H1= 1516	R 1½"	600/ 4600 kg	DN 65/ DN 40	5.0 kW	1.1 kW 750 rpm IP 55	6 - 132 L/h TD 30.20
<b>AT 8000</b>	L = 4434 B = 1910 H = 2350 H1= 1518	R 2"	1200/ 10000 kg	DN 80/ DN 50	9.5 kW	2.2 kW 750 rpm IP 55	12 - 264 L/h TD 38.20

2.4 Ultromat® ATF/96 Dimensions

Type	dimensions (mm)	water inlet: nominal diameter	empty/operational weights	overflow/extraction connector	power supply	agitator	concentrate dosing tube
<b>ATF 400</b>	L = 1770 B = 915 H = 1250 H1 = 516	R 1"	190/ 590 kg	DN 40/ DN 25	1.5 kW	0.18 kW 750 rpm IP 55	DN 15
<b>ATF 1000</b>	L = 2410 B = 950 H = 1605 H1 = 866	R 1"	400/ 1400 kg	DN 50/ DN 25	2.6 kW	0.55 kW 750 rpm IP 55	DN 15
<b>ATF 2000</b>	L = 3070 B = 1090 H = 1755 H1 = 1016	R 1"	450/ 2450 kg	DN 50/ DN 32	3.2 kW	0.75 kW 750 rpm IP 55	DN 15
<b>ATF 4000</b>	L = 3181 B = 1521 H = 2263 H1 = 1516	R 1½"	600/ 4600 kg	DN 65/ DN 40	5.0 kW	1.1 kW 750 rpm IP 55	DN 20
<b>ATF 8000</b>	L = 4434 B = 1910 H = 2350 H1 = 1518	R 2"	1200/ 9200 kg	DN 80/ DN 50	9.5 kW	2.2 kW 750 rpm IP 55	DN 20

N.B. Ultromat® power supply is used for device incorporating three agitators.

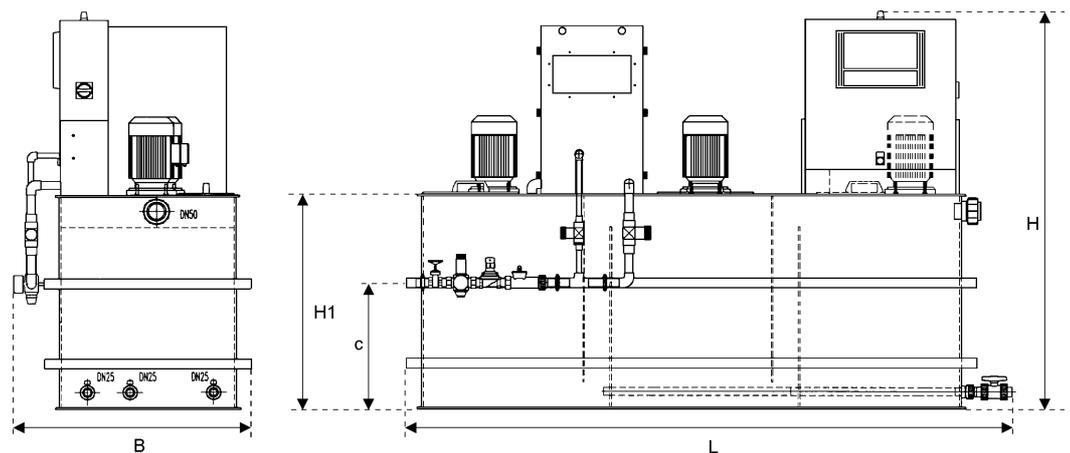


Diagram 1: Ultromat® Dimensions

### 3 Description of Functions

#### 3.1 Plant Construction

All plant parts for powder pre-storage, powder feed, wetting, dissolving and maturing of polyelectrolytes are assembled together to form a compact unit. The Ultromat® plant consists of the closed three compartment tank (a), the water pipework (b) with wetting cone (c), the dry feeder, (d) including a 20 l feed hopper, the agitators (e) and the control cabinet (f). Tanks, wetting cones and dry feeders are made from PP. There is a choice of PVC or PP available for the water pipework, fitted with brass mechanismus.

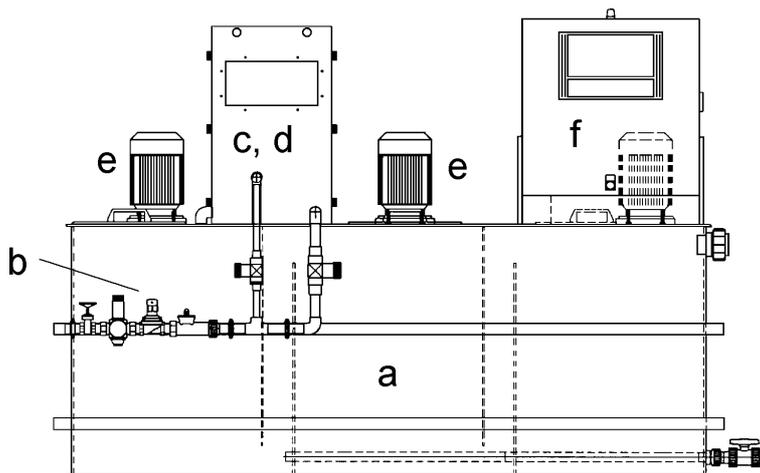


Diagram 2: Ultromat® AT/96

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, and the dry feeder conveyor unit are made entirely from stainless steel.

#### 3.2 Description of Individual Units

##### 3.2.1 Three-compartment Tank

The closed PP tank unit with agitator tie bars, brackets for the dry feeder and control cabinet, along with overflow, emptying and extracting connectors, is divided into three separate chambers. Preparation, maturing 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 powder. 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 wetting cone with mixing appliance, overflow, and level sensors to monitor overflow situations, maintains the intensive wetting of Polyelectrolyte powder with water. A manually operated stop valve also allows the water supply to be cut off to allow maintenance work to be carried out.

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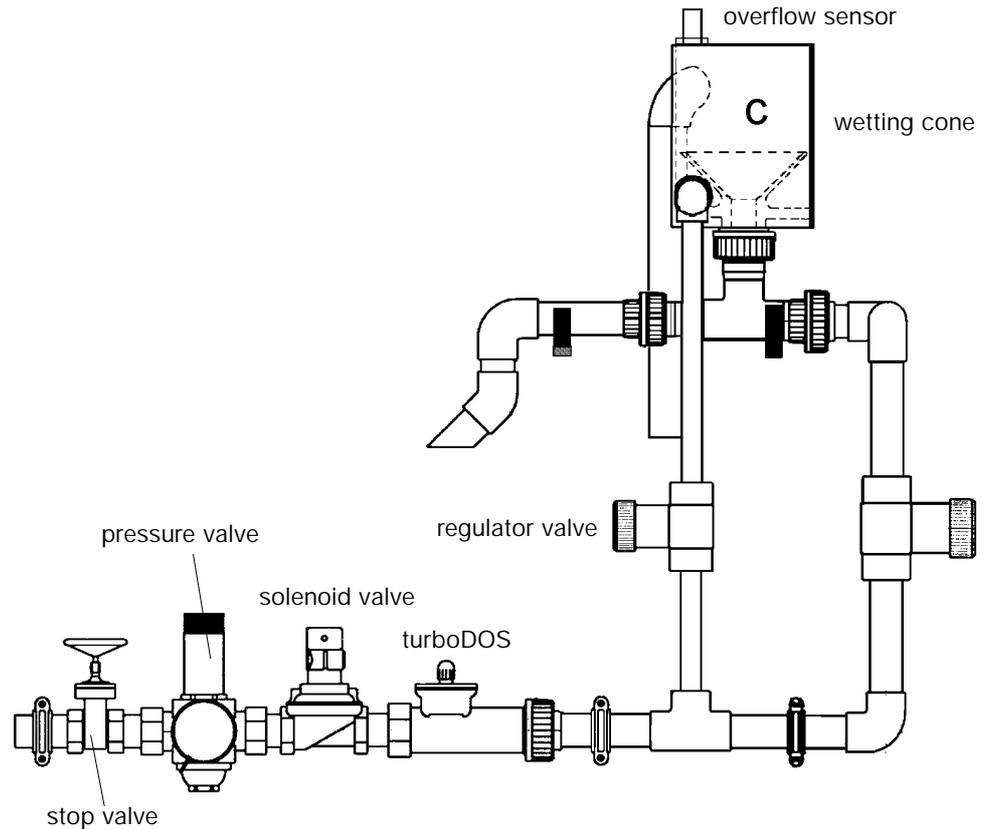


Diagram 3: Water Apparatur with wetting cone

### 3.2.3 Powder Feeder

Further information about the construction and operation of the feeder may be found in the appendix of the separate Operating Instructions Manual. Feeder screw pipe back-stop flap, feeder screw pipe heater and the minimum fill level sensor for the dry feeder are standard Ultramat® treatment plant components. The frequency to the feeder is changed to give quantity-proportional dosing of polyelectrolyte powder to water.

A stable protective screen made from PP protects and surrounds the feeder and the mixing equipment.

### 3.2.4 Agitators

The Ultramat® is fitted with two electric agitators. A third agitator can be optionally supplied for the storage compartment. The agitators ensure adequate circulation of the solution in the storage compartment. A single controller controls the agitators in both the preparation and maturing compartments.



#### **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.

### 3.2.5 Control Cabinet

All the electrical control and command equipment required to operate the plant, in particular the controller for the Ultromat® and the frequency inverter which controls the dry feeder, are located inside the control cabinet, next to the mains supply circuit and the safety fuses. The Ultromat® ATF control cabinet is also fitted with a key-operated switch for selecting powder or liquid preparation modes.

### 3.2.6 Concentrate Pipework (ATF/96 only)

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

TypE	Large tubes	Hose nozzle	Options
ATF 400	DN 15	DN 15	<ul style="list-style-type: none"><li>· flow monitor</li><li>· non-return valve</li></ul>
ATF 1000	DN 15	DN 15	<ul style="list-style-type: none"><li>· flow monitor</li><li>· non-return valve</li></ul>
ATF 2000	DN 15	DN 15	<ul style="list-style-type: none"><li>· flow monitor</li><li>· non-return valve</li></ul>
ATF 4000	DN 20	DN 20	<ul style="list-style-type: none"><li>· flow monitor</li><li>· non-return valve</li></ul>
ATF 8000	DN 20	DN 20	<ul style="list-style-type: none"><li>· flow monitor</li><li>· non-return valve</li></ul>

### 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 dry feeder conveys the polyelectrolyte powder in proportion to the flow of water. The powder falls into the wetting cone where it is wetted evenly by a partial flow of water. This ensures that the dosing powder is prevented from forming into lumps. The main flow of water is administered by means of a mixing plant and creates light pressure at the hopper outlet. 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.

In order to prevent powder deposits from the wetting cone from entering the tank, even at the start of the batching process, the activation of the dry feeder is controlled by a timer, rather than by a solenoid valve, i.e. before the dry feeder starts to run, water flows in for a few seconds. At the end of the batching process the opposite procedure takes place. When the maximum level is reached in the storage compartment, the dry feeder is immediately switched off, but the water continues to flow through for a few seconds more.

A breaker wheel ensures continuous extraction of the dosing powder which is located above the feeder screw. In addition, a feeder screw pipe heater removes any moisture from the pipe, and so prevents dosing powder from blocking the pipe.

### **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 after the pre-rinse period the dry feeder commences feeding powder. When the maximum liquid-level is reached, the controller switches off the dry feeder and then closes the solenoid valve after the post-rinsing period.

The Ultromat® switches to “batching” mode.

#### **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 dry feeder, a process which involves dismantling the wetting cone, the water supply solenoid valve remains closed. Feed can be activated and stopped independently of water flow. The dry feeder remains switched off while water flow rate is configured.

#### **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 options available for the Ultromat® to improve plant efficiency.

#### **3.5.1 Storage Compartment Agitator (Agitator 3)**

The Ultromat® AT is supplied with two electric agitators. A third agitator for the batching chamber can be supplied as an option.

#### **3.5.2 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

#### **3.5.3 Overflow Safety Cut-out**

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

### 3.5.4 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. The Ultromat® is fitted with a dry contact for control of the discharge pump (discharge pump release). This contact is closed when liquid-levels in the storage compartment reach "minimum liquid-level". It opens when liquid-levels fall below the "minimum liquid level" once more. The discharge pump is normally controlled via an external switch (motor start combination). As the discharge pump may be switched on and off externally, there is an additional input on the Ultromat controller to detect signals from the starter motor (dry auxiliary contact). The min. contact on the rotameter is only detected when the discharge pump is running, closing the dry auxiliary contact on the starter motor. If the discharge pump is not running, the dry contact is not closed and there is no detection of min. contact on the flow meter.

### 3.5.5 Power Socket for Automatic Hopper Loader

For connection of a conveyor unit the Ultromat® can be fitted with a power socket, including an overload safety cut-out. This is fitted to the side of the control cabinet.

### 3.5.6 Empty Signal for Concentrate Supply Drum (Ultromat® ATF only)

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.

### 3.5.7 Liquid Concentrate Dosing Monitoring (Ultromat® ATF only)

The Ultromat® ATF/96 can be used either with liquid or powdered polymers. In "liquid" preparation mode a pump injects the concentrate into the Ultromat® batching compartment. 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® AT/96 and ATF/96.

### 3.6.1 Detachable Hopper; 50 L, 75 L and 100 L

To enable operators to increase supply of dosing powder, detachable hoppers with additional capacities of 50, 75 and 100 L are available.

### 3.6.2 Automatic Hopper Loader for Powdered Polymers

We supply a pneumatic conveyor unit for automatic filling of powder feeder hopper. The conveyor unit can be connected straight to the powder feeder using an adapter.

A 50 L detachable hopper with connector adapter is recommended for the short periods when the conveyor unit is being serviced.

### 3.6.3 BIG-BAG Batching Unit

A range of designs is available to suit different requirements. The special BIG-BAG feed station is designed for use with the small conveyor unit, and a special cover attachment is available for direct feed of extension hoppers.

### 3.6.4 Step Ladder

If the dry feeder is not equipped with automatic feed operation, a mobile step ladder is recommended in order to facilitate manual filling of the dry feeder. Access is gained from the front of the feeder.

### 3.6.5 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.

### 3.6.6 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.
- Spilt polyelectrolyte powder or, occasionally polyelectrolyte solution spillages, are to be removed immediately from the surrounding area - increased danger from slippery surfaces!
- 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 (see diagram 4)



##### **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

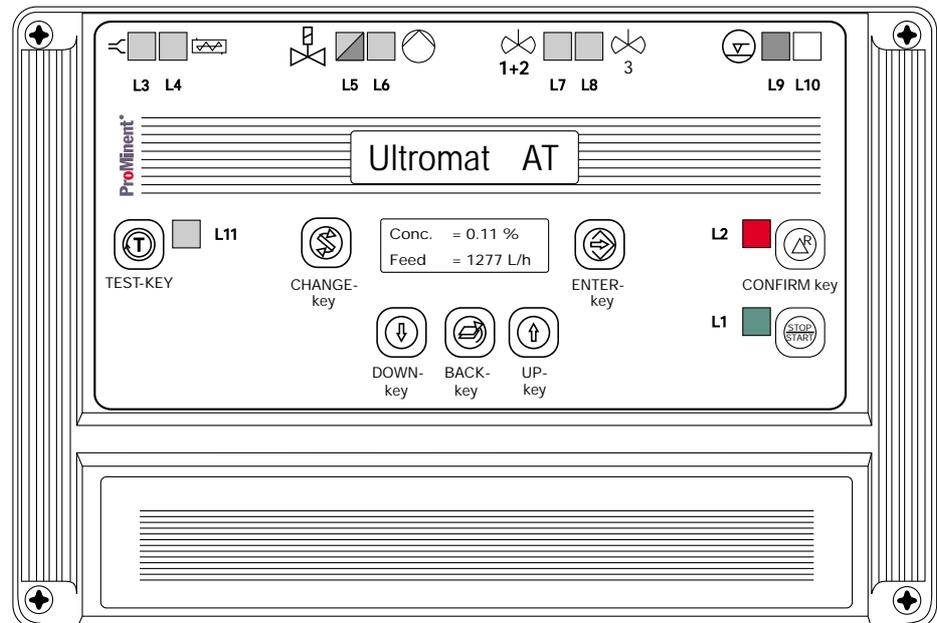


Diagram 4: Control Panel, Ultramat® Controller

## 6.1.2 Display Supplement (Displays State)

L1	green LED displayed LED off	plant in operating state plant in stopped state
L2	red LED displayed	malfunction (flashing light) warning (continuous light)
L3	green LED displayed	controlling feeder screw pipe
L4	green LED displayed	controlling dosing (dry feeders for AT design and/or concentrate pump for ATF option)
L5	green LED displayed red LED displayed	controlling water in-flow flow below set minimum flow
L6	green LED displayed	controlling discharge pump (stock solution)
L7	green LED displayed	controlling agitators, chambers 1+2
L8	green LED displayed	controlling agitator, chamber 3 (option)
L9	red LED displayed	powder low in dry feeder
L10	-	-
L11	green LED displayed	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 Ultramat® into operating or stopped states
confirm key	confirms an alarm warning
test key	start/stop button for calibrating dry product metering hopper, liquid concentrate pump, water feed setting and monitoring facility, test facilities
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.
- Powder and liquid operating parameters are stored separately in the Ultramat® ATF. Change from one operating mode to the other by selecting "powder" or "liquid" using the key-operated switch in the door of the control cabinet. Prior to this, disconnect Ultramat® from the power supply. If not, a warning "switch off first" will appear once the selected operational mode is activated. The power supply must then be switched off for approx. 10 sec. After reconnection the controller returns the Ultramat® to the selected operating mode.

## 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 "Programming Menu"). If desired, the controller automatically changes the settings menu back to the display menu after 10 minutes.

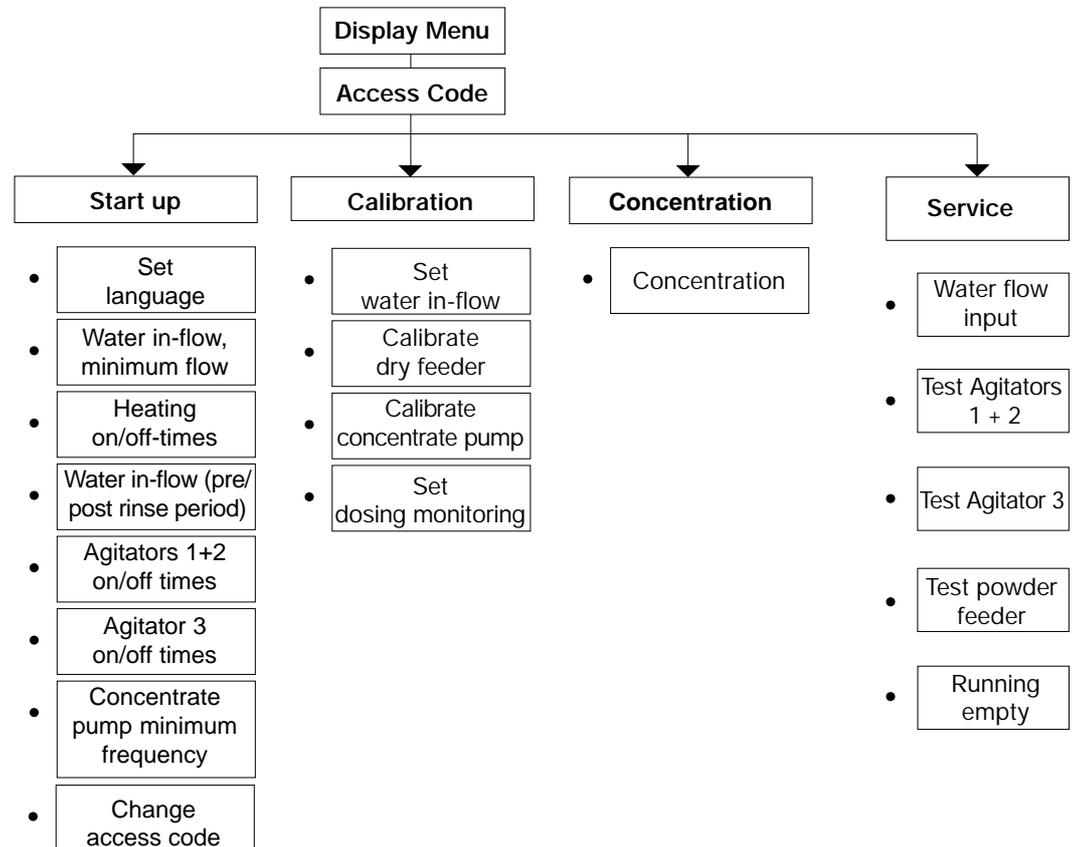


Diagram 5: Menu Structure

## 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:

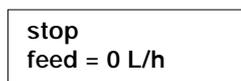


Once maximum liquid-level in the storage compartment is reached, the following messages appear on the controller display:

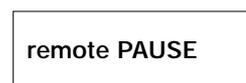


#### 6.4.2 Interrupting Normal Operation

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



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



#### 6.4.3 Identcode Display

Press the Change key to display the Identcode "ULSaTxxxxxxxx" (as shown in the second row of the controller software version (e.g. :02/4.1) and the operating mode, e.g. "Fluid" (F) or "Powder" (P).

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 additionally necessary to connect the liquid concentrate supply pipe for Ultramat® model ATF.

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 feed = 0 L/h".

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.

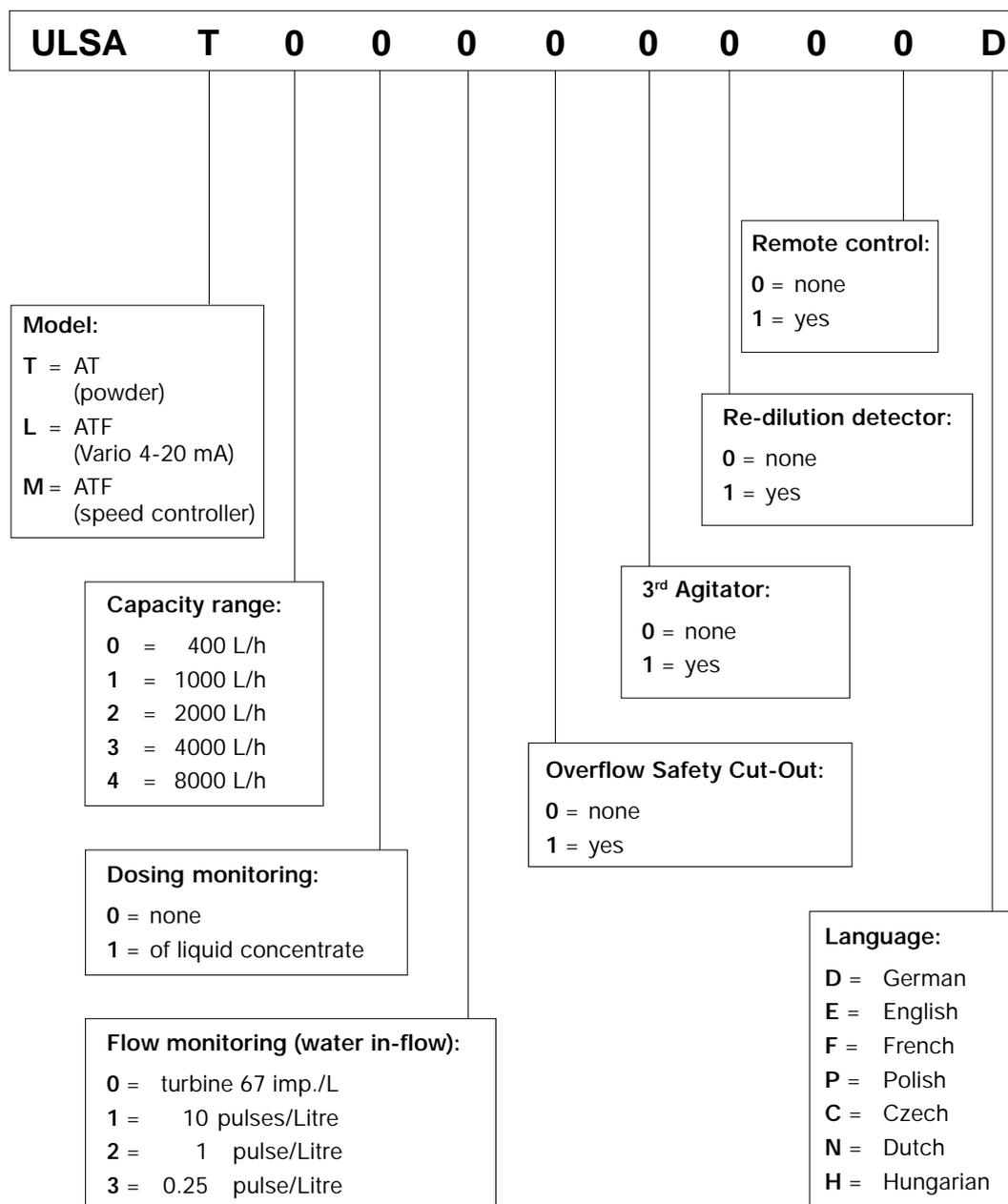


Diagramm 6: Identcode

## 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
feed water minimum flow		} 0 - 12.000 l/h
AT 400:	500 l/h	
AT 1000:	1200 l/h	
AT 2000:	2400 l/h	
AT 4000:	5000 l/h	
AT 8000:	10000 l/h	
Heating on-time	5 sec.	1 - 10 sec.
Heating off-time	35 sec.	30 - 100 sec.
Prerinsing time	7 sec.	0 - 30 sec.
Rinsing delay	5 min.	0 - 30 min.
Agitator 1+2 on-time	15 min.	5 - 50 min.
Agitator 1+2 off-time	15 min.	5 - 50 min.
Agitator 3 on-time	5 min.	0 - 20 min.
Agitator 3 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

If water volume falls due to pressure drop in the water supply, the water level in the wetting cone falls. The water volume must be above 80 % of the set water in-flow quantity, to ensure there is sufficient water entering the wetting cone. Too little water may cause dosed powder to clog the wetting cone and interrupt the batching process.

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

### 7.3.2 Setting Feeder Screw Pipe Heater

Select “**Heating on-time?**” by pressing Enter key again. Click Enter key repeatedly until the actual on time is displayed. Use up/down keys to increase/reduce time period. Confirm with Enter key.

Alter/set off-time in the same way.

#### **IMPORTANT**

On/off times should be selected so that the feeder screw pipe temperature does not exceed hand-heat of 40 °C. Higher temperatures can lead to caking of powder which can cause irreparable damage to feeder screw.

### 7.3.3 Setting Prerinsing Time and Rinsing Delay Time

To prevent dosing powder adhering to the inside of the wetting cone, prerinsing and delay periods can be programmed into the batching water flow. This ensures sufficient rinsing at either end of the process.

After the solenoid valve opens, water flows for a few seconds until the wetting cone has been rinsed sufficiently. After the prerinsing period is complete the flow rate should have levelled out and the inside surface of the wetting cone should be completely wet.

Once the maximum level in the storage compartment has been reached, the dry feeder is switched off. The solenoid valve is closed once the delay period has elapsed. The delay period should be long enough to ensure sufficient rinsing of wetting cone.

### 7.3.4 Agitators 1 and 2

The agitators are automatically re-activated each time a new batching process begins. After the maximum liquid-level has been reached in the third chamber the two agitators continue to run for a pre-set period in pulse/pause mode.

Select menus: "Agitator 1+2 on-time" and "Agitator 1+2 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.

### 7.3.5 Agitator 3

The third 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.

### 7.3.6 Concentrate Pump Minimum Frequency

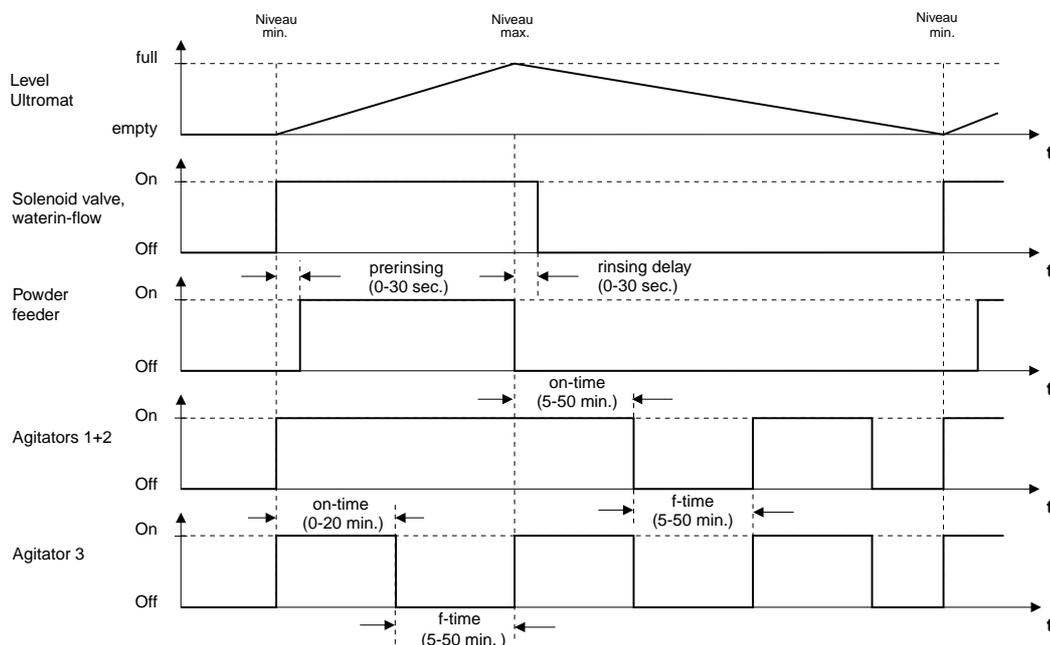
The "Concentrate pump min. frequency" parameter is only applicable for models, where the concentrate dosing pump is controlled via the speed controller. During batching, frequency must not fall below the speed controller minimum frequency.

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.

### 7.3.7 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.



## 7.4 Concentration Settings

The Ultromat® can operate with liquid concentrates of 0.05 % to 1.0 %, as long as polymer solution viscosity does not exceed 1500 mPas.

To set concentrations of less than 0.1% and greater than 0.5 % the required concentration must be achieved by correctly configuring the batching water flow. If plant operates at concentrations of less than 0.1 % and greater than 0.5 %, plant capacity is reduced.

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 Ultromat® is stopped using the Stop key.

Select from the following configurations:

Calibration settings applicable	Models where applicable	Operations where
· Set batching water in-flow	AT and ATF	Powder and liquid
· Calibrate dry feeder	AT and ATF	Powder
· Calibrate concentrate pump	ATF	Liquid
· Set dosing monitor	ATF	Liquid

### 7.5.1 Adjust Water Flow

The flow of feed water should be adjusted as follows:

Ultromat®	Water flow
AT 400, ATF 400	1500 l/h
AT 1000, ATF 1000	1500 l/h
AT 2000, ATF 2000	3000 l/h
AT 4000, ATF 4000	6000 l/h
AT 8000, ATF 8000	12 000 l/h

- In “**Adjust water flow**” menu, select “**Water 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.
- Use a large screwdriver (**min. 10 mm**) to adjust water-flow setting at the left-hand adjustment T-piece (smaller set value). Water level in the wetting cone should level out at approximately 15 to 20 mm below the overflow pipe outlet. Once a stable water level is reached, the required water-rate is set at the right-hand regulator valve (larger set value). The current flow can be read off the controller display.
- Once the operating state is stabilised, it may be necessary to re-regulate the water-flow to the wetting cone, in order to ensure adequate rinsing.
- Press the T key once more to end settings procedure.

### 7.5.2 Calibration of Powder Feeder

- Unscrew and remove wetting cone.
- In the “**Calibrate powder feeder**” menu select “**Powder feeder**” using Enter key. LED next to test key flashes.
- Hold a light PE container (fill-volume minimum 500 g) beneath the feeder screw pipe, press the test key. The dry feeder will commence operating at full speed. When there is sufficient powder in the container, stop the dry feeder by pressing the test key once more.

- Weigh collected powder and program the controller with the weight in grams using the up/down keys.
- After pressing the Enter key the controller calculates the dosing capacity in grams/minute and saves the value.
- After calibrating the dry feeder, reassemble the wetting cone.

### 7.5.3 Calibration of Dosing Pump for Liquid Concentrate (Ultromat® ATF)

- 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.

### 7.5.4 Configuring Dosing Monitor for Liquid Concentrate (Ultromat® ATF)

Dosing monitoring is only applicable for models including “frequency inverter” option, controlling eccentric screw pump. It is not applicable for “4-20 mA” models.

Control option	Pump	Dosing monitoring
Speed controller	• Eccentric screw pump	yes
4-20 mA	• gamma 4/5 • Vario • 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 Service Menu

### 7.6.1 Flow settings

The “flow setting” menu is required when the turboDOS or the contact water meter fails. Until these functions are restored the Ultromat® can be operated in emergency operating mode. As a flow meter no longer delivers a signal, a fixed value is entered in the “manual flow input” 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 “automatic flow measurement”.

## 7.6.2 Testing agitator and powder feeder

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

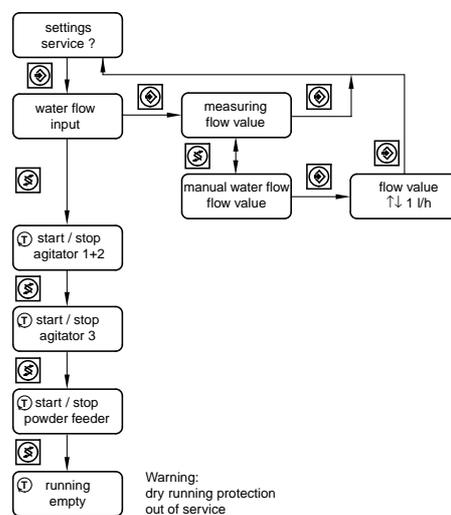
The following menus are available

- Test agitator 1+2
- Test agitator 3
- Test powder feeder

## 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.



## 7.7 Speed Controller Settings

### 7.7.1 Ultromat® AT Configuration

The speed controller Altivar 18 is supplied with the following factory settings:

Parameter	Value	Unit	Range	Description
rdy	display		-	speed controller ready
FrH	display	Hz	-	frequency set point
LCr	display	A	-	motor current
rFr	display	HZ	-	frequency of rotation
Uln	display	V	-	mains voltage
bFr	50	Hz	50/60	mains frequency
ACC	0.1	s	0.1 - 3600	linear acceleration ramp
dEC	0.1	s	0.1 - 3600	linear deceleration ramp
LSP	0	Hz	0 - HSP	low speed at 4 mA
HSP	100	Hz	tFr - LSP	high speed at 20 mA
FLG	33		00 - 100	frequency loop gain
lth	1.1	A	0.9 - 2.2	motor thermal protection
JPF	0	Hz	0 - HSP	cancellation of a critical speed
idC	1.5	A		automatic DC injection braking
tdC	0.5	s		automatic injection braking time
Ufr	25		0 - 100	enabling the torque to be optimised
SP3	5	Hz		3rd preset speed
SP4	25	Hz		4th preset speed
FLt	display			display of the last fault which occurred
L2A	yes		no / yes	Access to level 2 parameters
Uft	n		L - nLd	selection of type of voltage/frequency ratio
tUn	no		no / yes	auto-tune
UnS	230	V		nominal motor voltage (rating plate)
FrS	50	Hz	50/60	nominal motor frequency (rating plate)
tFr	100	Hz		maximum output frequency
brA	YES			automatic adaption of the deceleration ramp time
SLP	3,3	Hz		slip compensation
tLS	0	s		limiting of operation time at low speed
L12	rrS			reassignment of logic input LI2
L13	PS2			reassignment of logic input LI3
L14	PS4			reassignment of logic input LI4
L0	SrA			assignment of logic input
AIC	SAI			assignment of the analogue input AIC/AI2
CrL	4	mA	0 / 4	configuration of input AI/AI2
SPr	no			automatic catching a spinning load
SFr	4	kHz	2.2 - 12.0	switching frequency
StP	no		no / yes	controlled stop on power break
Atr	no		no / yes	automatic restart
FCS	no		no / yes	return to the factory preset
CPU	11.04			software version

#### 7.7.2 Configuration of Ultromat® ATF ("Speed controller" control option)

After selecting "Liquid" operating mode, "Thermal motor protection = lth" parameter must be adjusted to correspond to liquid concentrate pump. The "HSP = high speed at 20 mA" parameter must not be changed in liquid mode, as the speed controller is controlled by 4-12 mA current signal. Maximum frequency is 50 Hz.

### 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 k $\Omega$  to 25 k $\Omega$  (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

Assuming set-up and installation have been correctly carried out, the three inspection openings are closed firmly and the feed hopper is filled with the appropriate dosing powder. 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.



#### **WARNING**

**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 Ultromat<sup>®</sup> 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 the feed hopper with powder, the rapid correction of malfunctions when operation is interrupted, and maintenance of the Ultromat<sup>®</sup>. 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. Each error message can, however, be altered to a warning by pressing the „Confirm Alarm“ key, so that the plant, if necessary, can resume provisional operation. In such cases the operating personnel must bear the responsibility for removing the cause of the malfunction as quickly as possible so that a more serious malfunction does not develop. A plant in warning mode must nevertheless be closely monitored in the meantime.

### 8.1.2 Supplying Dry Feeder with Powder



**WARNING**

When filling the dry feeder, take care that operating personnel are not likely to slip on spilt polyelectrolyte powder. This can make surfaces very slippery when there is moisture present. It should be cleared up immediately.

If the feed hopper is not filled automatically, using one of the optional accessories, the dosing powder hopper must be continually checked and filled regularly. Filling can take place during operation. The feed hopper cover must actually be removed and the dosing powder carefully poured in.

### 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. When the mains power is switched on, furthermore, the warning light and siren will be activated for around 0.5 seconds.

#### 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 Ultromat® 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 Ultromat® 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.

**IMPORTANT**

If not in use for more than 2 days, the powder feeder must be completely emptied.

### 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 3500 mPas.

The preset parameter values for the speed controller may not be altered on site. The parameters have been preprogrammed in the factory for use with the appropriate dry feeder. A possible operational error can arise when the cause of an error in the plant is not removed, and the confirm key has been thoughtlessly pressed. The original malfunctions can lead to more severe ones, which will threaten the plant operation simply because the plant has recommenced operating (see section 10). Confirming an error message before removing the physical cause of the malfunction must only be done in exceptional circumstances, not as a general rule. The cause of the malfunction must be removed immediately afterwards and a plant in warning mode must be carefully monitored in the meantime.

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.

**10.1 Fault Identification/Malfunctions/Breakdown Advice**

<b>Fault</b>	<b>Message on LCD display</b>	<b>Effect</b>	<b>Delay</b>	<b>Red LED</b>	<b>Alarm relay</b>	<b>Action</b>
<b>Warnings</b>						
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
Powder/liquid mains operation selection activated	Power down first	Stop state	1 sec.	On	Off	Switch on/off switch
In-flow monitor	Water flow high		3 sec.	Off	Off	Adjust in-flow
<b>Malfunction</b>						
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
Dry feeder powder level	Lack of powder	Stop state	3 sec.	Flashing	On	Refill dry feeder
Overflow wetting cone	Wetting cone error	Stop state	3 sec.	Flashing	On	Correct fault
Level sensor defect, compartment 3	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 3	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 in-flow rate falls below the set minimum value for longer than 3 seconds the dry feeder will be de-activated and the message "Water Flow Low" will appear in the display. 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 dry feeder 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. Keep checking the water level in the wetting cone as you do this.
- 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 Powder-Feed Malfunctions

When the level sensor in the dry feeder signals "powder low", the controller stops the plant operation.

Fault-analysis information for the dry feeder may be found in the separate operating manual for the dry feeder under section 7 "Problem Solving Measures".

### 10.4 Malfunctions in the Wetting cone

If the warning sensor for the overflow monitor in the wetting cone is activated, the error message "Wetting Cone Error" appears. At the same time the batching process is automatically interrupted. The dry feeder is switched off and the solenoid valve will close as well, after a short interval.

##### **Possible causes and counter-measures:**

- The wetting cone is blocked with dosing powder. Solution: In case of emergency dismantle wetting cone (hopper and mixer) and clean carefully so that the water can flow freely again.
- There is too much water flowing through the wetting cone. Solution: Reset the water flow. In particular reduce the partial flow through the wetting cone.

### 10.5 Malfunctions in the Storage compartment

#### 10.5.1 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 (taking into account dry feeder capacity). Otherwise the dosing capacity can be correspondingly increased by installing a diluting station.

#### 10.5.2 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.

#### 10.5.3 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 "Unlogical level". The level switch should be cleaned if necessary and its controlling relay should be checked.

### 10.6 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.

### 10.7 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.

### 10.8 Error Messages in Initial Start Up

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

### 10.9 Hardware Fault Analysis

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

### 10.10 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 Inspecting the Dry Feeder and the Wetting cone

The dry feeder should be regularly checked during operation to ensure it is operating correctly. It is not normally necessary to move the protective screen as observation should be possible using the inspection window. This is assuming, however, that the window is cleaned from time to time. For the dry feeder to operate smoothly, pay attention in particular that the solenoid locking flap opens and closes correctly and that the dosing powder is travelling through the feeder effectively. There is no need to check the dry feeder drive mechanism in general. The gearing is supplied permanently lubricated. If the plant is correctly operated, only the felt rings which form part of the drive shaft seal will need replacing.

At the same time as inspecting the dry feeder, the wetting cone should also be inspected. When doing this, make sure that the conical washing-in area of the hopper is completely under water during operation and that no powder lumps are forming.

### 11.2 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.

### 11.3 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.

#### 11.4 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.

#### 11.5 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.

#### 11.6 Removing the Inspection Cover on the Three Compartment 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.

#### 11.7 Rinsing the Multi-chamber 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.

## 12.1 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***

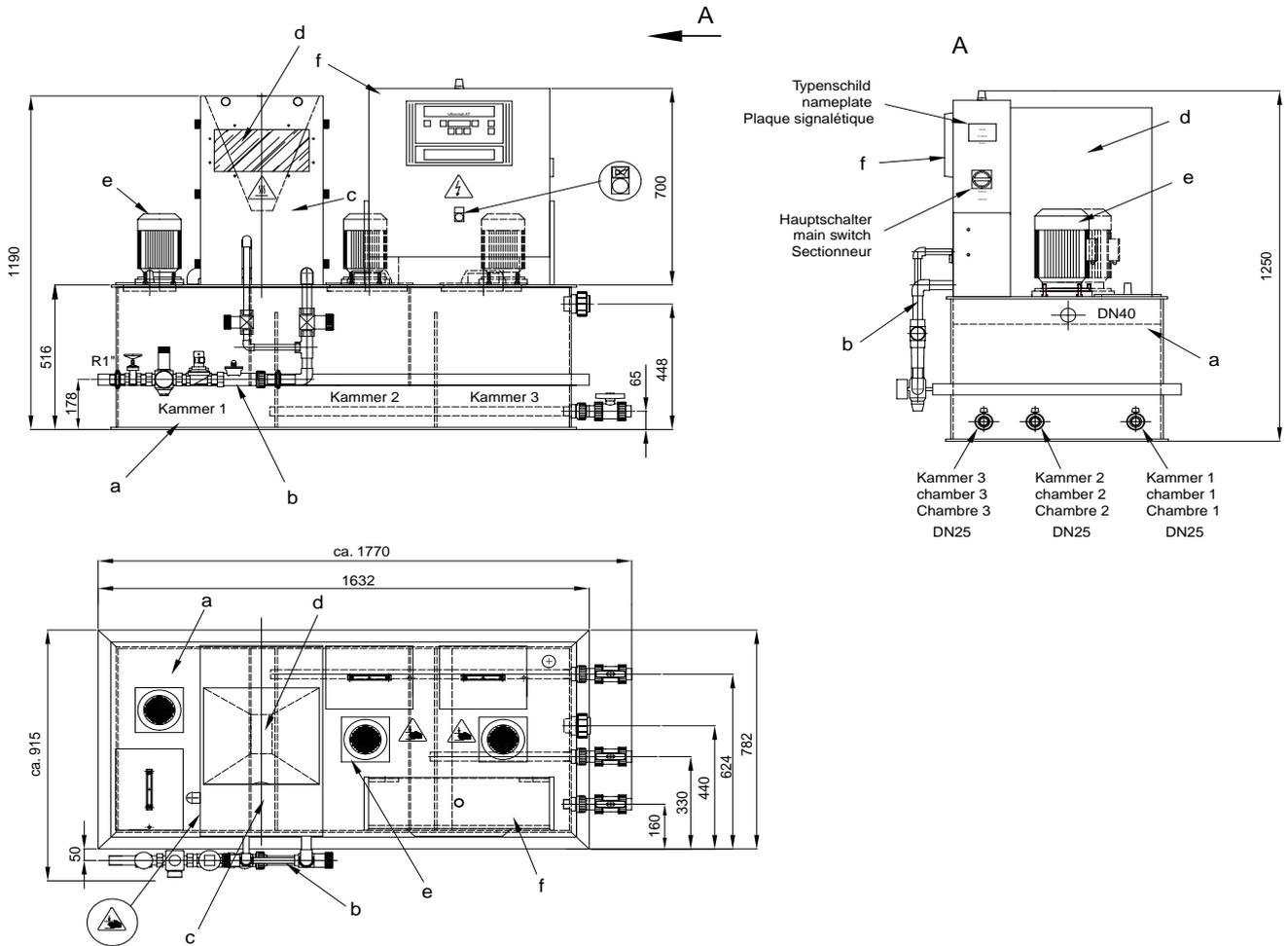
National standards and other  
technical specifications used,  
in particular :



Date/manufacturer's signature : ***12.03.02***

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

12.2 Assembly Drawing AT 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 a la matière utilisée.

**Positionen:**

**Standardausführung :**

- a. Behälter PP inkl. Schaltschrankkonsole
- b. Wasserverrohrung in PVC/Messing, alle Dichtungen in EPDM
- c. Einspül- und Vermischungseinrichtung
- d. Trockengutdosierer PP inkl. Kullisse, Heizung, Verschlusskappe, Lockerungsrad
- e. Rührwerke in 1. und 2. Kammer
- f. Schaltschrank/Steuerung

nicht zum Lieferumfang der Standardausführung gehört das Rührwerk in Kammer 3

**Positions:**

**standard equipment:**

- a. tank PP incl. console for control panel
- b. water piping made of PVC/brass, all gaskets made of EPDM
- c. mixing vessel
- d. powder feeder and hopper incl. crank, heating, closing cap aerating wheel
- e. stirrer in chamber 1 & 2
- f. control panel

standard equipment not includes electric stirrer in chamber 3

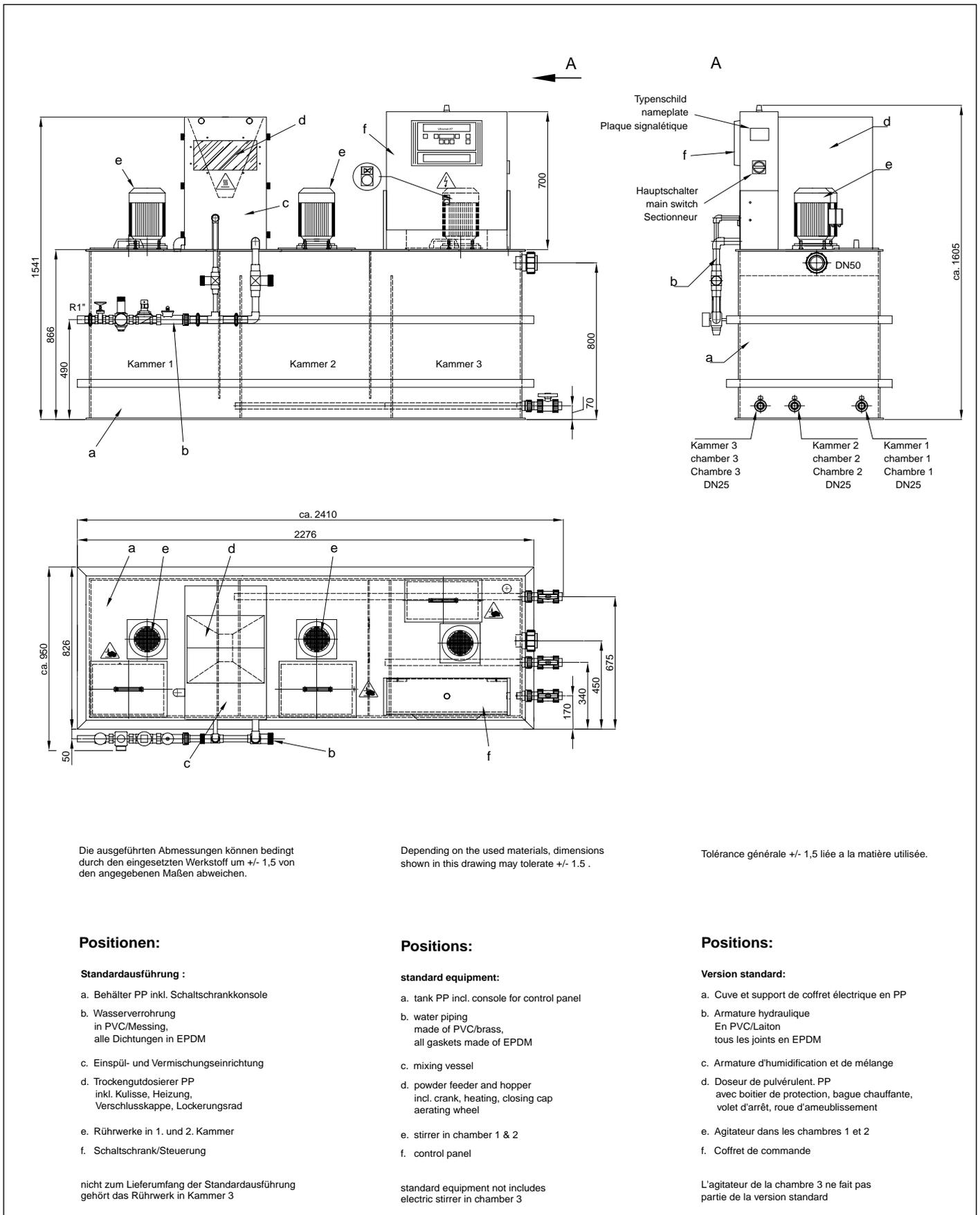
**Positions:**

**Version standard:**

- a. Cuve et support de coffret électrique en PP
- b. Armature hydraulique En PVC/Laiton tous les joints en EPDM
- c. Armature d'humidification et de mélange
- d. Doseur de pulvérulent. PP avec boîtier de protection, bague chauffante, volet d'arrêt, roue d'ameublissement
- e. Agitateur dans les chambres 1 et 2
- f. Coffret de commande

L'agitateur de la chambre 3 ne fait pas partie de la version standard

12.3 Assembly Drawing AT 1000



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. Einspül- und Vermischungseinrichtung
- d. Trockengutdosierer PP inkl. Kulissee, Heizung, Verschlusskappe, Lockerungsrad
- e. Rührwerke in 1. und 2. Kammer
- f. Schaltschrank/Steuerung

nicht zum Lieferumfang der Standardausführung gehört das Rührwerk in Kammer 3

**Positions:**

**standard equipment:**

- a. tank PP incl. console for control panel
- b. water piping made of PVC/brass, all gaskets made of EPDM
- c. mixing vessel
- d. powder feeder and hopper incl. crank, heating, closing cap aerating wheel
- e. stirrer in chamber 1 & 2
- f. control panel

standard equipment not includes electric stirrer in chamber 3

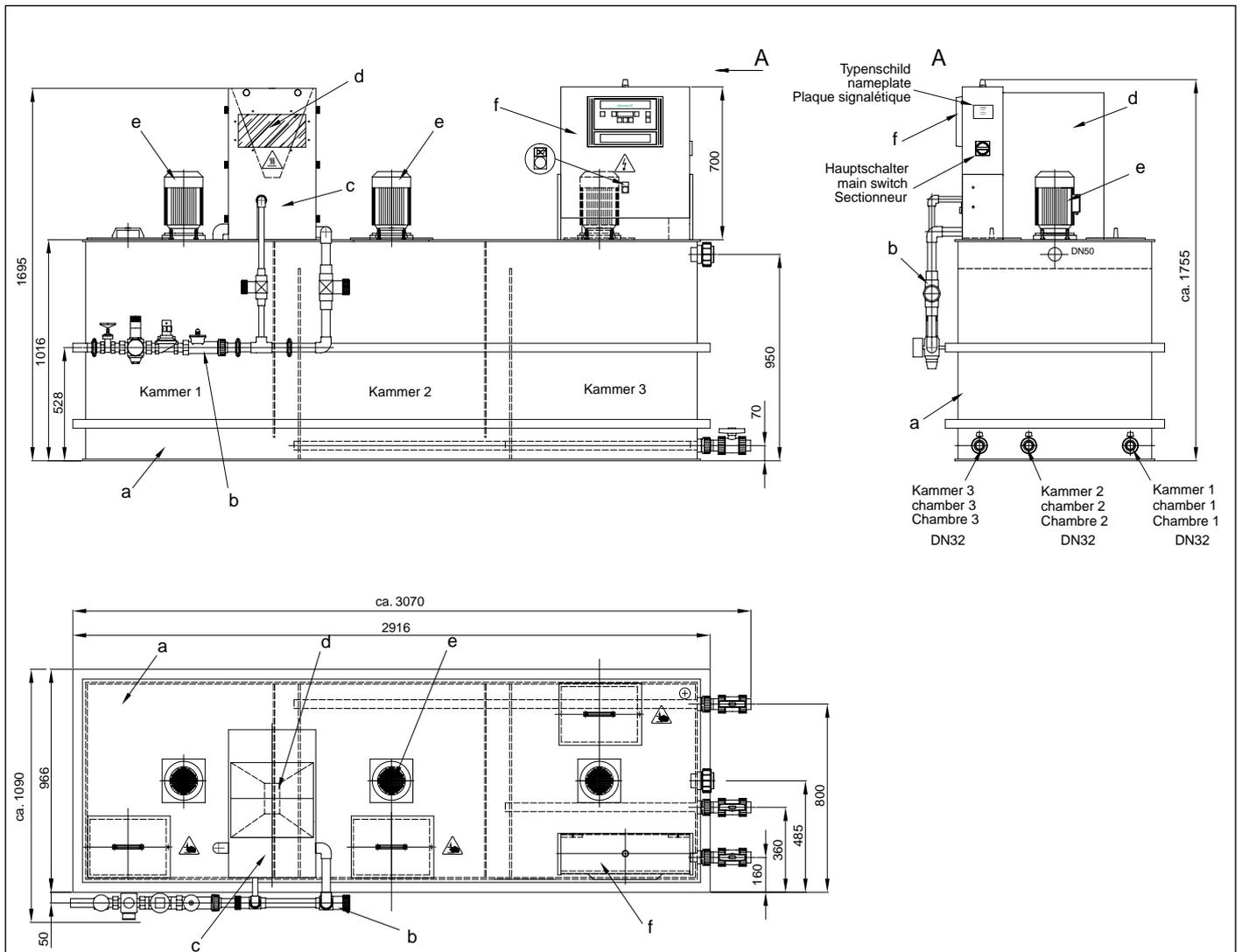
**Positions:**

**Versoin standard:**

- a. Cuve et support de coffret électrique en PP
- b. Armature hydraulique En PVC/Laiton tous les joints en EPDM
- c. Armature d'humidification et de mélange
- d. Doseur de pulvérulent. PP avec boîtier de protection, bague chauffante, volet d'arrêt, roue d'ameublissement
- e. Agitateur dans les chambres 1 et 2
- f. Coffret de commande

L'agitateur de la chambre 3 ne fait pas partie de la version standard

12.4 Assembly Drawing AT 2000



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. Einspül- und Vermischungseinrichtung
- d. Trockengutdosierer PP inkl. Kulissee, Heizung, Verschlusskappe, Lockerungsrad
- e. Rührwerke in 1. und 2. Kammer
- f. Schaltschrank/Steuerung

nicht zum Lieferumfang der Standardausführung gehört das Rührwerk in Kammer 3

**Positions:**

**standard equipment:**

- a. tank PP incl. console for control panel
- b. water piping made of PVC/brass, all gaskets made of EPDM
- c. mixing vessel
- d. powder feeder and hopper incl. crank, heating, closing cap aerating wheel
- e. stirrer in chamber 1 & 2
- f. control panel

standard equipment not includes electric stirrer in chamber 3

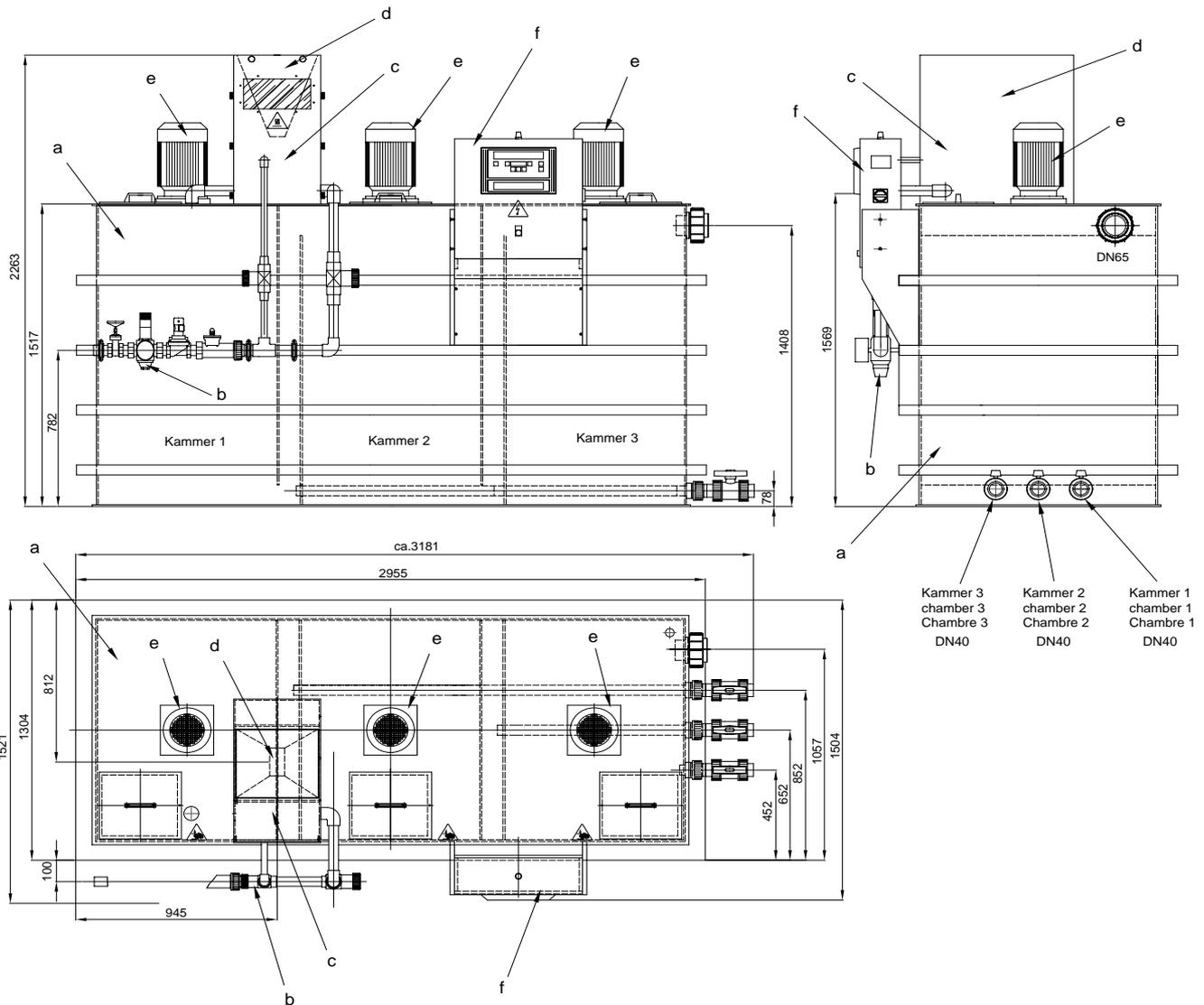
**Positions:**

**Version standard:**

- a. Cuve et support de coffret électrique en PP
- b. Armature hydraulique En PVC/Laiton tous les joints en EPDM
- c. Armature d'humidification et de mélange
- d. Doseur de pulvérulent. PP avec boîtier de protection, bague chauffante, volet d'arrêt, roue d'ameublissement
- e. Agitateur dans les chambres 1 et 2
- f. Coffret de commande

L'agitateur de la chambre 3 ne fait pas partie de la version standard

12.5 Assembly Drawing AT 4000



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. Einspül- und Vermischungseinrichtung
- d. Trockengutdosierer PP inkl. Kulissee, Heizung, Verschlusskappe, Lockerungsrad
- e. Rührwerke in 1. und 2. Kammer
- f. Schaltschrank/Steuerung

nicht zum Lieferumfang der Standardausführung gehört das Rührwerk in Kammer 3

**Positions:**

**standard equipment:**

- a. tank PP incl. console for control panel
- b. water piping made of PVC/brass, all gaskets made of EPDM
- c. mixing vessel
- d. powder feeder and hopper incl. crank, heating, closing cap aerating wheel
- e. stirrer in chamber 1 & 2
- f. control panel

standard equipment not includes electric stirrer in chamber 3

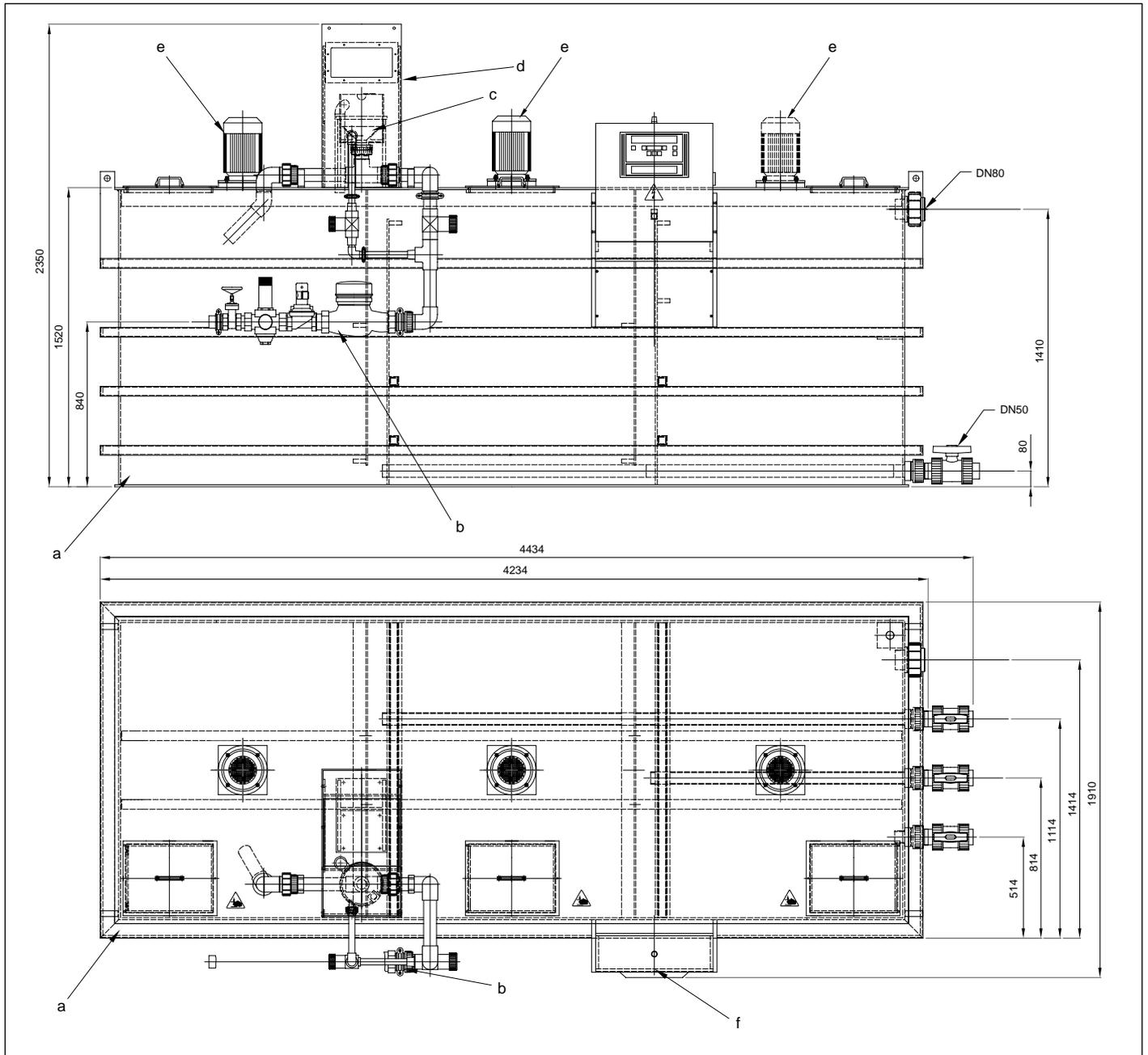
**Positions:**

**Version standard:**

- a. Cuve et support de coffret électrique en PP
- b. Armature hydraulique En PVC/Laiton tous les joints en EPDM
- c. Armature d'humidification et de mélange
- d. Doseur de pulvérulent. PP avec boîtier de protection, bague chauffante, volet d'arrêt, roue d'ameublissement
- e. Agitateur dans les chambres 1 et 2
- f. Coffret de commande

L'agitateur de la chambre 3 ne fait pas partie de la version standard.

12.6 Assembly Drawing AT 8000



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. Einspül- und Vermischungseinrichtung
- d. Trockengutdosierer PP inkl. Kulissee, Heizung, Verschlusskappe, Lockerungsrad
- e. Rührwerke in 1. und 2. Kammer
- f. Schaltschrank/Steuerung

nicht zum Lieferumfang der Standardausführung gehört das Rührwerk in Kammer 3

**Positions:**

**standard equipment:**

- a. tank PP incl. console for control panel
- b. water piping made of PVC/brass, all gaskets made of EPDM
- c. mixing vessel
- d. powder feeder and hopper incl. crank, heating, closing cap aerating wheel
- e. stirrer in chamber 1 & 2
- f. control panel

standard equipment not includes electric stirrer in chamber 3

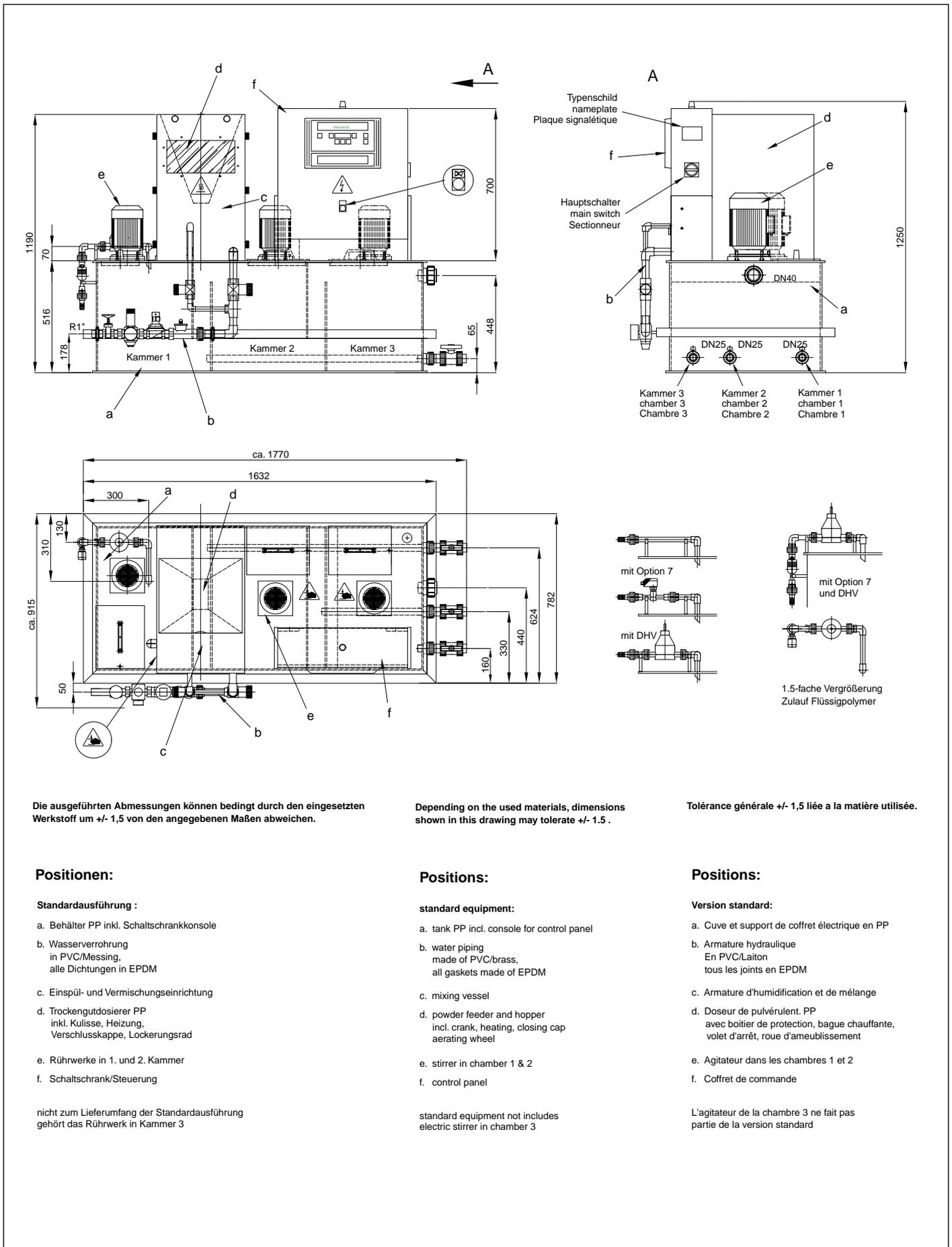
**Positions:**

**Version standard:**

- a. Cuve et support de coffret électrique in PP
- b. Armature hydraulique En PVC/Laiton tous les joints en EPDM
- c. Armature d'humidification et de mélange
- d. Doseur de pulvérulent. PP avec boîtier de protection, bague chauffante, volet d'arrêt, roue d'ameublissement
- e. Agitateur dans les chambres 1 et 2
- f. Coffret de commande

L'agitateur de la chambre 3 ne fait pas partie de la version standard.

12.7 Assembly Drawing ATF 4000



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. Einspül- und Vermischungseinrichtung
- d. Trockengutdosierer PP inkl. Kulisse, Heizung, Verschlusskappe, Lockerungsrad
- e. Rührwerke in 1. und 2. Kammer
- f. Schaltschrank/Steuerung

nicht zum Lieferumfang der Standardausführung gehört das Rührwerk in Kammer 3

**Positions:**

**standard equipment:**

- a. tank PP incl. console for control panel
- b. water piping made of PVC/brass, all gaskets made of EPDM
- c. mixing vessel
- d. powder feeder and hopper incl. crank, heating, closing cap aerating wheel
- e. stirrer in chamber 1 & 2
- f. control panel

standard equipment not includes electric stirrer in chamber 3

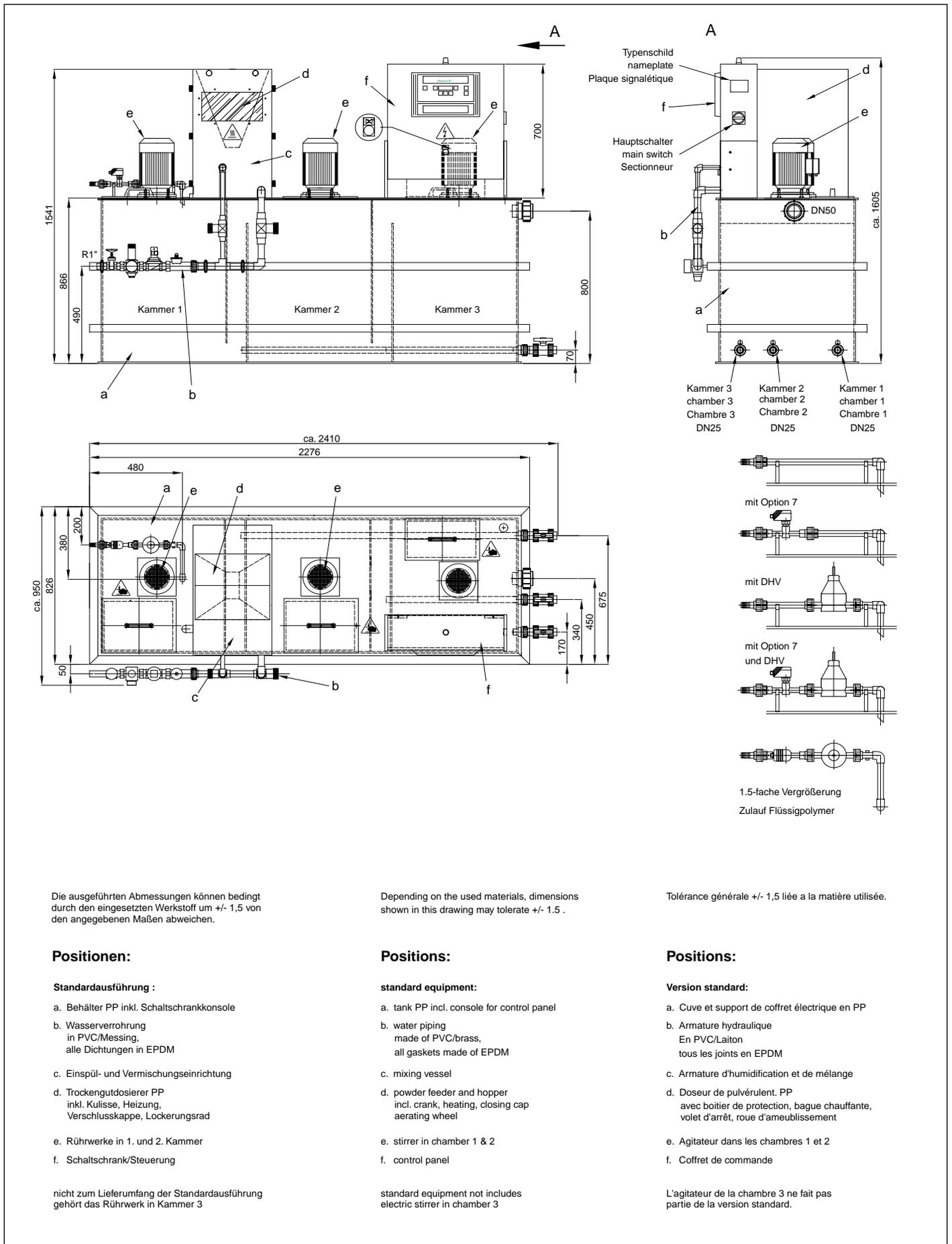
**Positions:**

**Version standard:**

- a. Cuve et support de coffret électrique en PP
- b. Armature hydraulique En PVC/Laiton tous les joints en EPDM
- c. Armature d'humidification et de mélange
- d. Doseur de pulvérulent. PP avec boîtier de protection, bague chauffante, volet d'arrêt, roue d'ameublissement
- e. Agitateur dans les chambres 1 et 2
- f. Coffret de commande

L'agitateur de la chambre 3 ne fait pas partie de la version standard

12.8 Assembly Drawing ATF 1000



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. Einspül- und Vermischungseinrichtung
- d. Trockengutdosierer PP inkl. Kulisse, Heizung, Verschlusskappe, Lockerungsrad
- e. Rührwerke in 1. und 2. Kammer
- f. Schaltschrank/Steuerung

nicht zum Lieferumfang der Standardausführung gehört das Rührwerk in Kammer 3

**Positions:**

**standard equipment:**

- a. tank PP incl. console for control panel
- b. water piping made of PVC/brass, all gaskets made of EPDM
- c. mixing vessel
- d. powder feeder and hopper incl. crank, heating, closing cap aerating wheel
- e. stirrer in chamber 1 & 2
- f. control panel

standard equipment not includes electric stirrer in chamber 3

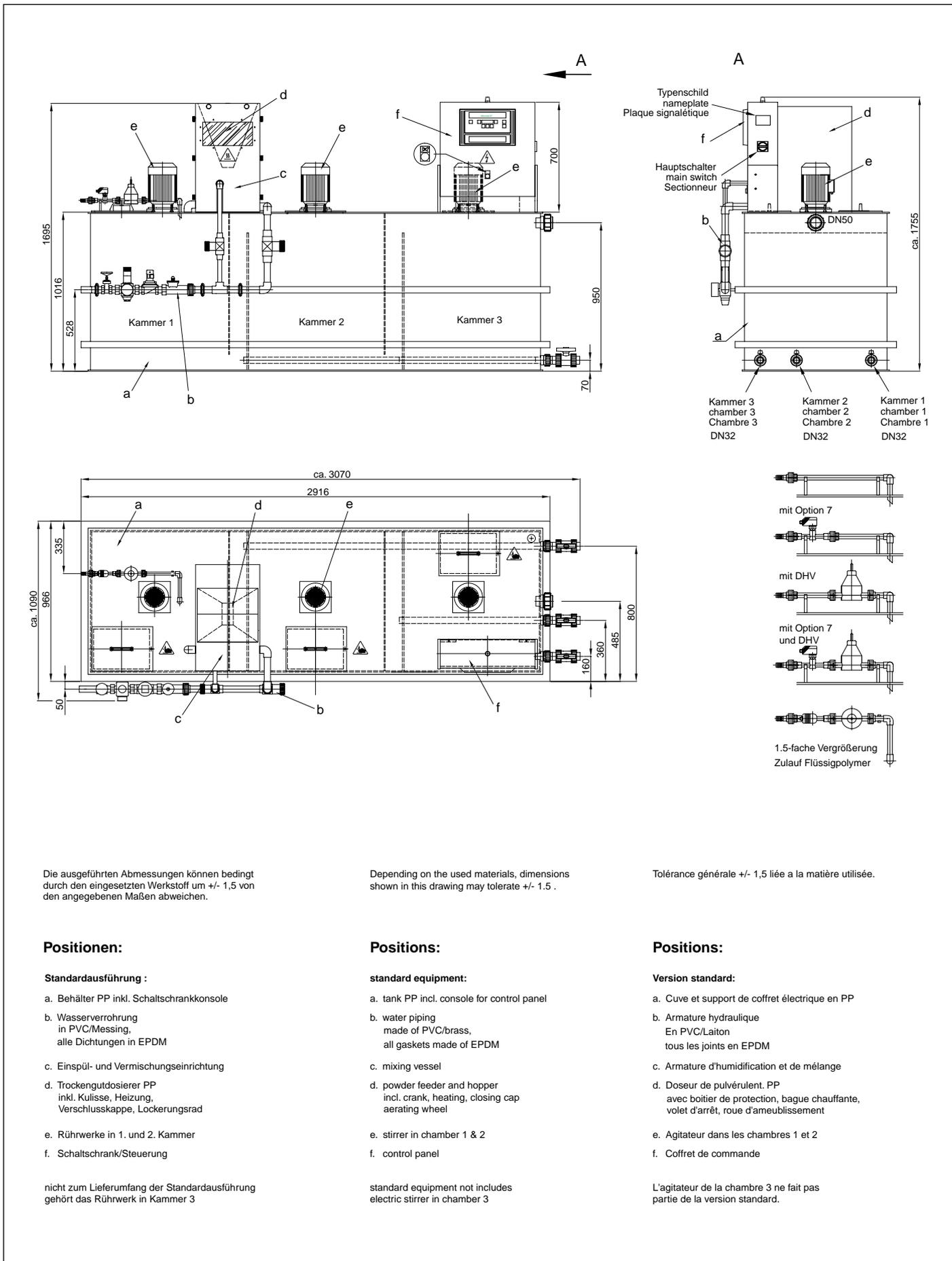
**Positions:**

**Version standard:**

- a. Cuve et support de coffret électrique en PP
- b. Armature hydraulique En PVC/Laiton tous les joints en EPDM
- c. Armature d'humidification et de mélange
- d. Doseur de pulvérulent PP avec boîtier de protection, bague chauffante, volet d'arrêt, roue d'ameublissement
- e. Agitateur dans les chambres 1 et 2
- f. Coffret de commande

L'agitateur de la chambre 3 ne fait pas partie de la version standard.

12.9 Assembly Drawing ATF 2000



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. Wasserrohrverrohrung in PVC/Messing, alle Dichtungen in EPDM
- c. Einspül- und Vermischungseinrichtung
- d. Trockengutdosierer PP inkl. Kulissee, Heizung, Verschlusskappe, Lockerungsrad
- e. Rührwerke in 1. und 2. Kammer
- f. Schaltschrank/Steuerung

nicht zum Lieferumfang der Standardausführung gehört das Rührwerk in Kammer 3

**Positions:**

**standard equipment:**

- a. tank PP incl. console for control panel
- b. water piping made of PVC/brass, all gaskets made of EPDM
- c. mixing vessel
- d. powder feeder and hopper incl. crank, heating, closing cap aerating wheel
- e. stirrer in chamber 1 & 2
- f. control panel

standard equipment not includes electric stirrer in chamber 3

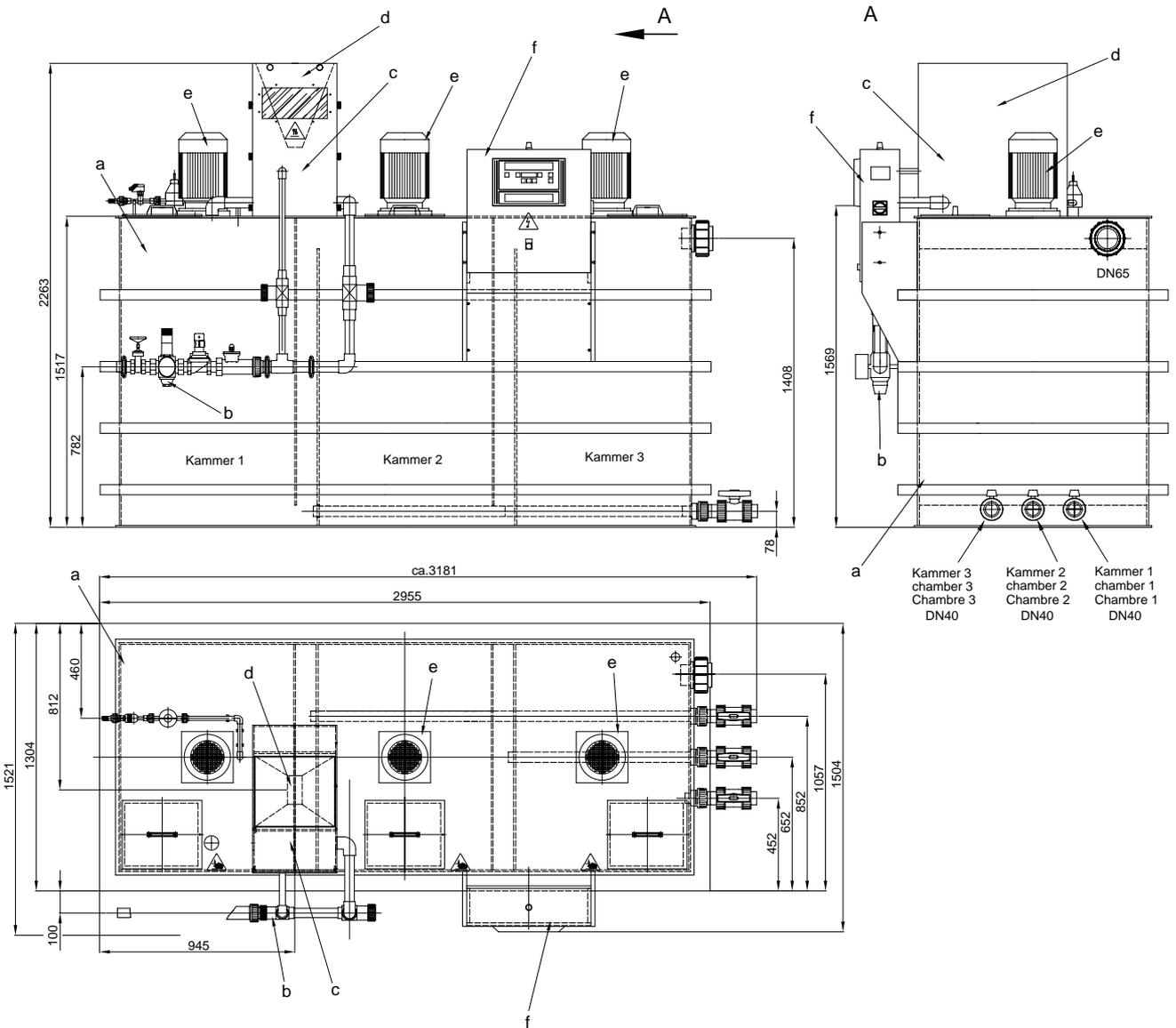
**Positions:**

**Version standard:**

- a. Cuve et support de coffret électrique en PP
- b. Armature hydraulique En PVC/Laiton tous les joints en EPDM
- c. Armature d'humidification et de mélange
- d. Doseur de pulvérulent. PP avec boîtier de protection, bague chauffante, volet d'arrêt, roue d'ameublissement
- e. Agitateur dans les chambres 1 et 2
- f. Coffret de commande

L'agitateur de la chambre 3 ne fait pas partie de la version standard.

12.10 Assembly Drawing ATF 4000



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. Einspül- und Vermischungseinrichtung
- d. Trockengutdosierer PP inkl. Kulissee, Heizung, Verschlusskappe, Lockerungsrad
- e. Rührwerke in 1. und 2. Kammer
- f. Schaltschrank/Steuerung

nicht zum Lieferumfang der Standardausführung gehört das Rührwerk in Kammer 3

**Positions:**

**standard equipment:**

- a. tank PP incl. console for control panel
- b. water piping made of PVC/brass, all gaskets made of EPDM
- c. mixing vessel
- d. powder feeder and hopper incl. crank, heating, closing cap aerating wheel
- e. stirrer in chamber 1 & 2
- f. control panel

standard equipment not includes electric stirrer in chamber 3

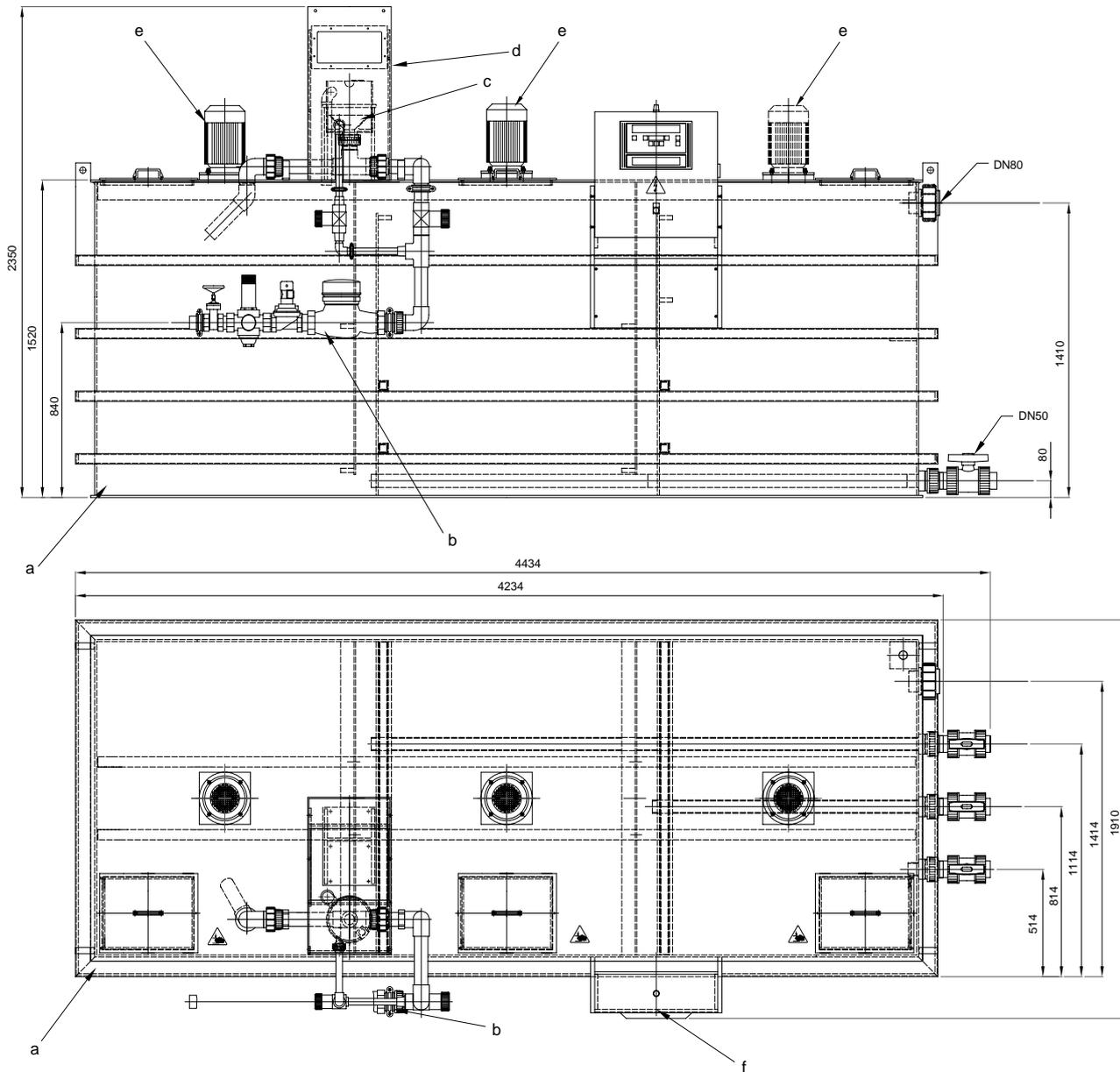
**Positions:**

**Version standard:**

- a. Cuve et support de coffret électrique en PP
- b. Armature hydraulique En PVC/Laiton tous les joints en EPDM
- c. Armature d'humidification et de mélange
- d. Doseur de pulvérulent. PP avec boîtier de protection, bague chauffante, volet d'arrêt, roue d'ameublissement
- e. Agitateur dans les chambres 1 et 2
- f. Coffret de commande

L'agitateur de la chambre 3 ne fait pas partie de la version standard.

12.11 Assembly Drawing ATF 8000



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. Einspül- und Vermischungseinrichtung
- d. Trockengutdosierer PP inkl. Kulissee, Heizung, Verschlusskappe, Lockerungsrad
- e. Rührwerke in 1. und 2. Kammer
- f. Schaltschrank/Steuerung

nicht zum Lieferumfang der Standardausführung gehört das Rührwerk in Kammer 3

**Positions:**

**standard equipment:**

- a. tank PP incl. console for control panel
- b. water piping made of PVC/brass, all gaskets made of EPDM
- c. mixing vessel
- d. powder feeder and hopper incl. crank, heating, closing cap aerating wheel
- e. stirrer in chamber 1 & 2
- f. control panel

standard equipment not includes electric stirrer in chamber 3

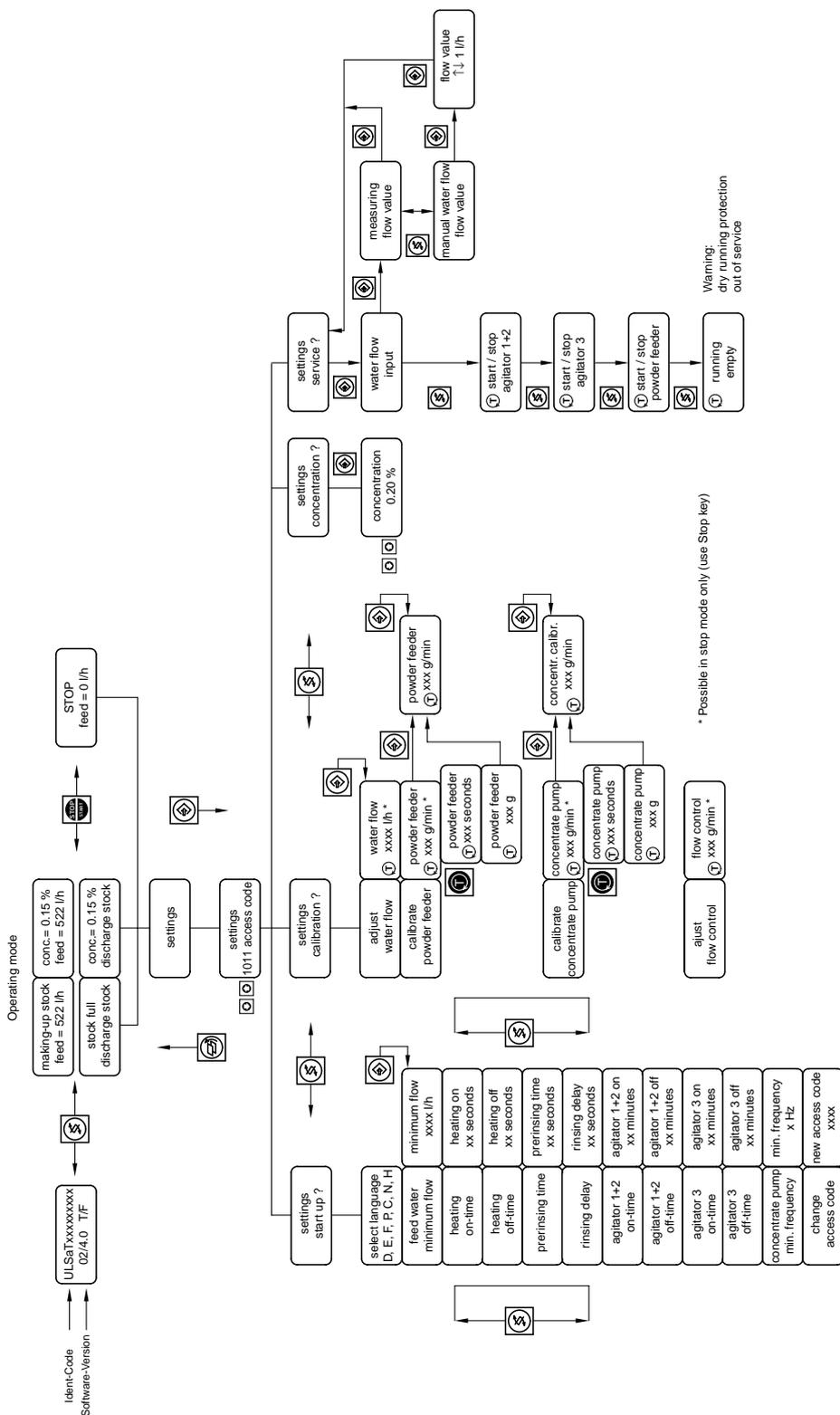
**Positions:**

**Version standard:**

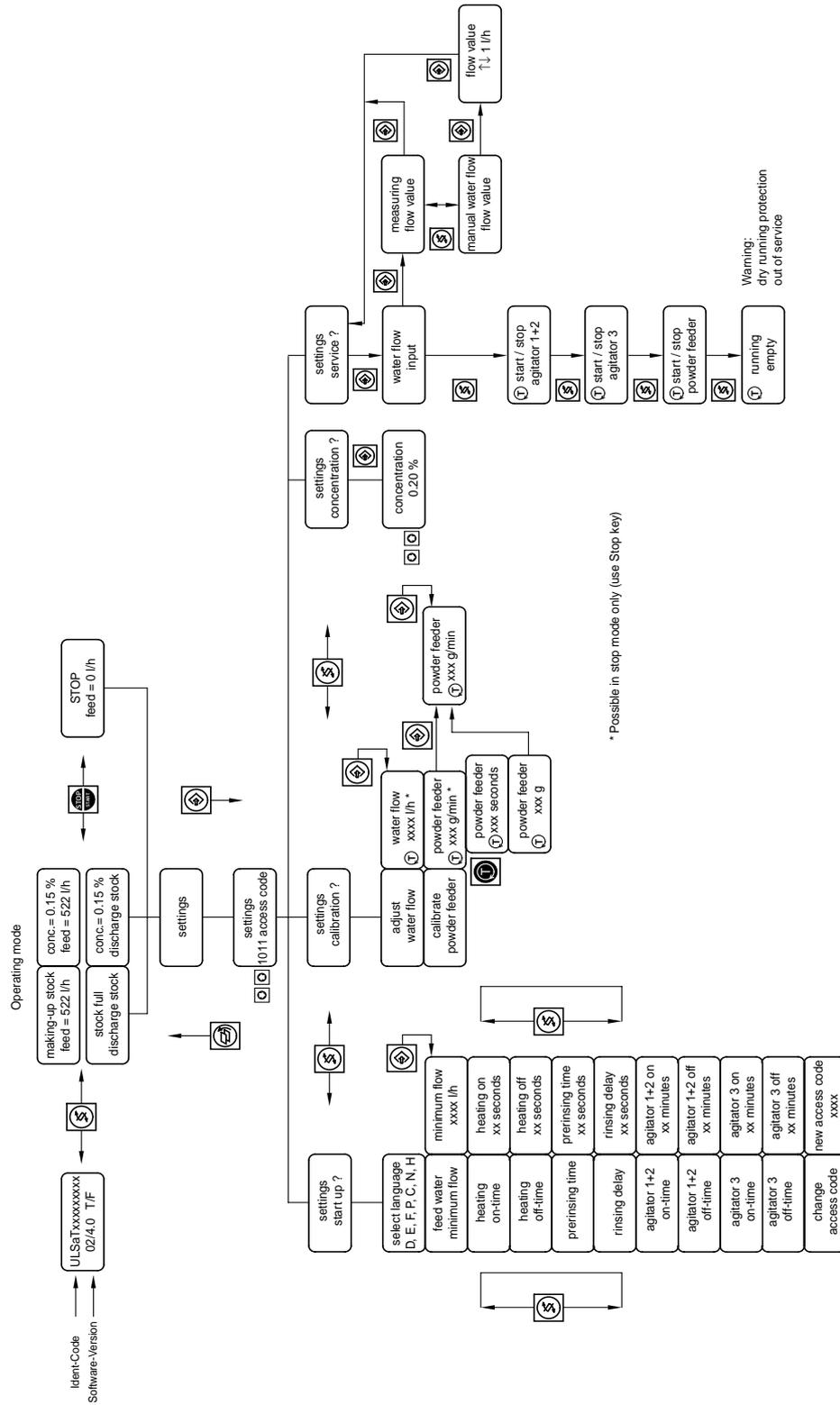
- a. Cuve et support de coffret électrique en PP
- b. Armature hydraulique En PVC/Laiton tous les joints en EPDM
- c. Armature d'humidification et de mélange
- d. Doseur de pulvérulent. PP avec boîtier de protection, bague chauffante, volet d'arrêt, roue d'ameublissement
- e. Agitateur dans les chambres 1 et 2
- f. Coffret de commande

L'agitateur de la chambre 3 ne fait pas partie de la version standard.

12.12 Programming Menu Ultramat® AT/96



12.13 Programming Menu Ultramat® ATF/96



## 12.14 Commissioning Protocol

## Ultramat® AT/96 and ATF/96 Commissioning Protocol

**Ultramat type:**

AT/96       400                       1 000                       2 000                       4 000                       8 000  
 ATF/96     400                       1 000                       2 000                       4 000                       8 000

**Ident-code:**

ULSA								0		
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**Software version:**

/	
02/4.1	T

example

**Project number:**

--

**Calibration settings:**

	Powder	Liquid	
Concentration			%
Calibrated feed rate			g/min
Water in flow			L/h
Flow monitor switch threshold			g/min

**Commissioning settings:**

Commissioning parameters	Default setting	Powder operation setting	Liquid operation setting
AT 400 min. water in flow	500 L/h		
AT 1000 min. water in flow	1 200 L/h		
AT 2000 min. water in flow	2 400 L/h		
AT 4000 min. water in flow	5 000 L/h		
AT 8000 min. water in flow	10 000 L/h		
Heater on time	5 sec		
Heater off time	35 sec		
In flow pre rinse period	7 sec		
In flow post rinse period	5 sec		
Agitators 1 + 2 on time	15 min		
Agitators 1 + 2 off time	15 min		
Agitator 3 on time	5 min		
Agitator 3 off time	10 min		
Concentrate pump min. frequency	25 Hz		
Access code	1000		

Powder product    Trade name: \_\_\_\_\_                      Supplier: \_\_\_\_\_

Liquid product    Trade name: \_\_\_\_\_                      Supplier: \_\_\_\_\_

Client: \_\_\_\_\_                      Date: \_\_\_\_\_

Location: \_\_\_\_\_