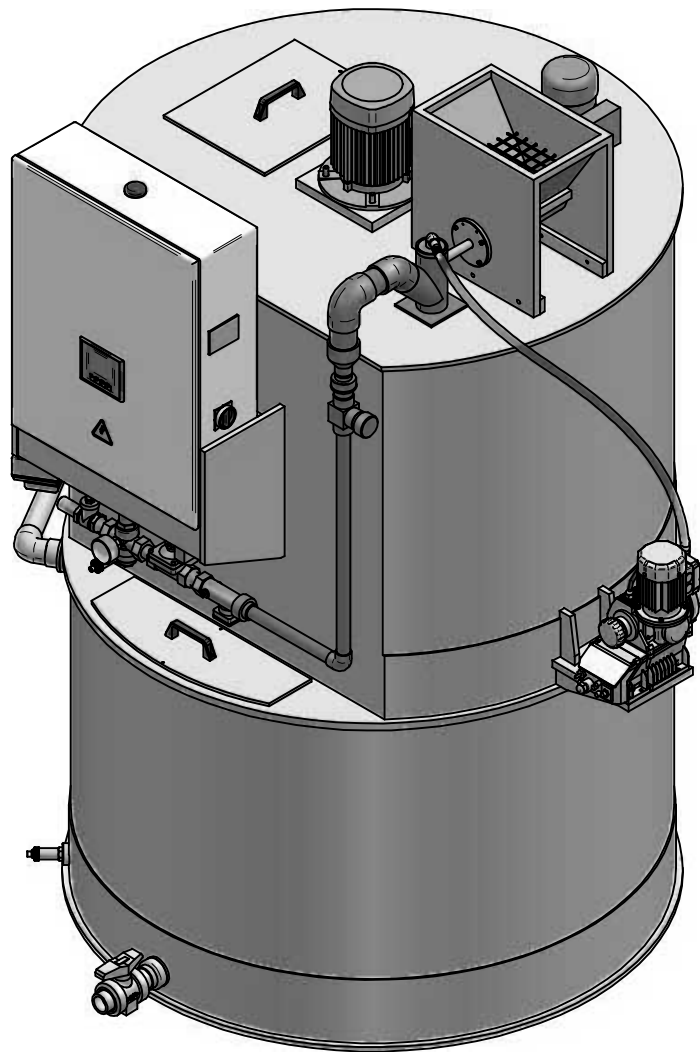


# Assembly and operating instructions

Ultromat® ULDa

Doubledecker system



A0888

Please carefully read these operating instructions before use! · Do not discard!  
The operator shall be liable for any damage caused by installation or operating errors!  
Technical changes reserved.

### General non-discriminatory approach

In order to make it easier to read, this document uses the male form in grammatical structures but with an implied neutral sense. It is aimed equally at both men and women. We kindly ask female readers for their understanding in this simplification of the text.

### Supplementary information

Read the following supplementary information in its entirety!

The following are highlighted separately in the document:

- Enumerated lists
- Instructions
  - ⇒ Results of the instructions

### Information



*This provides important information relating to the correct operation of the system or is intended to make your work easier.*

### Safety information

Safety information are provided with detailed descriptions of the endangering situation, see 🔗 *Chapter 2.1 'Explanation of the safety information' on page 8*

# Table of contents

<b>1</b>	<b>Product identification.....</b>	<b>6</b>
1.1	Identity code ULDa .....	6
<b>2</b>	<b>Safety and responsibility.....</b>	<b>8</b>
2.1	Explanation of the safety information.....	8
2.2	Correct and Proper Use.....	9
2.3	Users' qualifications.....	10
2.4	Ultromat® Safety Information.....	10
2.5	Description and testing of safety equipment.....	12
2.6	Sound Pressure Level.....	13
<b>3</b>	<b>Transporting and storing the system.....</b>	<b>14</b>
<b>4</b>	<b>Information on the system.....</b>	<b>15</b>
4.1	Design.....	15
4.2	Technical data.....	15
<b>5</b>	<b>Construction and function.....</b>	<b>18</b>
5.1	System construction.....	18
5.2	Description of the units.....	18
5.2.1	Doubledecker storage tank.....	19
5.2.2	Crane Lifting Lugs.....	19
5.2.3	Water fitting with flush fitting.....	19
5.2.4	Powder feeder.....	21
5.2.5	Vibrator .....	21
5.2.6	Stirrer.....	21
5.2.7	Control cabinet.....	22
5.2.8	Power Socket for connection of a powder feeder device... ..	22
5.2.9	Concentrate piping .....	22
5.2.10	Evaluation - water low in the redilution unit.....	22
5.2.11	Empty signal for concentrate tank .....	22
5.2.12	Dosing monitor for liquid concentrate.....	23
5.2.13	Top hopper 50 l, 75 l and 100 l .....	23
5.2.14	Powder feeder device for automatic refilling .....	23
<b>6</b>	<b>Assembly and installation.....</b>	<b>24</b>
6.1	Assembly.....	24
6.2	Installation, hydraulic.....	24
6.3	Installation, electrical.....	25
6.3.1	Mains Power Connection.....	25
6.3.2	Adjusting the capacitive sensors.....	26
<b>7</b>	<b>Operation of the Sinamics G110 frequency converter.....</b>	<b>27</b>
7.1	Function of the operating elements.....	27
7.2	Adjustment of the frequency converter.....	28
<b>8</b>	<b>Setting the additional components.....</b>	<b>30</b>
8.1	Adjusting the Capacitive Sensor.....	30
8.2	Setting the Sigma (Factory Settings).....	30
<b>9</b>	<b>General Notes on Operation.....</b>	<b>32</b>
9.1	Operating Menu .....	33
9.2	Start screen.....	35
9.3	Operating mode change.....	35
9.4	User administration.....	37
9.4.1	User groups.....	37
9.4.2	Login.....	38
9.5	Entering values on the touch panel.....	39
9.6	Selecting the dosing product.....	40
9.7	Remote Operation.....	41

9.8	Jump to the Archive [F3].....	41
9.9	Level display.....	42
9.10	Water supply.....	43
9.11	Redilution.....	43
9.12	Operating mode MANUAL .....	43
9.13	Maturing time.....	44
<b>10</b>	<b>Operating Menu [F2].....</b>	<b>46</b>
10.1	Parameters.....	46
10.1.1	Parameter [WATER].....	47
10.1.2	Parameter [Stirrer].....	48
10.1.3	Parameter [Powder].....	49
10.1.4	Parameter [Liquid].....	50
10.1.5	Parameters [Level].....	51
10.2	Calibration.....	52
10.2.1	Calibration Powder.....	53
10.2.2	Calibration liquid concentrate.....	54
10.2.3	Calibration Flow monitor ("Spectra" only).....	55
10.2.4	Calibration Water.....	56
10.3	System.....	57
10.3.1	Changing the language.....	57
10.3.2	Setting date and time.....	58
10.3.3	Touch Panel.....	59
10.4	Concentration.....	60
10.5	Information.....	61
10.5.1	Ultromat Identity code.....	61
10.5.2	Software Version.....	62
10.6	Service.....	63
10.6.1	Service.....	63
<b>11</b>	<b>Operation of the system.....</b>	<b>67</b>
11.1	Normal mode.....	67
11.1.1	Prerequisites for correct and proper operation.....	67
11.1.2	Refilling the feed hopper with powdered polymer .....	67
11.1.3	Refilling the concentrate storage tank with liquid polymer.....	67
11.2	Behaviour When Switching on Mains Power and in the Event of Mains Power Failure.....	68
11.3	Decommissioning.....	68
11.4	Disposal of used parts.....	69
<b>12</b>	<b>Incorrect Operation of the System.....</b>	<b>70</b>
<b>13</b>	<b>Commissioning.....</b>	<b>71</b>
<b>14</b>	<b>Maintenance.....</b>	<b>72</b>
14.1	Inspect the powder feeder and wetting apparatus.....	72
14.2	Cleaning the filter insert in the pressure reducer.....	72
14.3	Checking and cleaning the solenoid valve.....	72
14.4	Remove the flow meter (turboDOS) and test.....	73
14.5	Removing the cover of an inspection opening.....	73
14.6	Cleaning the surface of the storage tank.....	73
<b>15</b>	<b>Fault Messages.....</b>	<b>74</b>
15.1	Troubleshooting.....	74
15.2	General notes on fault messages.....	75
15.3	Faults - Cause - Remedy.....	75
<b>16</b>	<b>Systems / data sheets.....</b>	<b>78</b>
16.1	Logical states.....	78
16.2	Operating Menu .....	33
16.3	Commissioning Report.....	82

16.4 Lubricating plan..... 83

16.5 Control sequence..... 83

16.6 EC Declaration of Conformity for Machinery..... 84

**17 Index..... 85**

# 1 Product identification

## 1.1 Identity code ULDa

U L D a	Type / Container Size / Extraction rate		
	0400	Doubledecker system / 2x400 l / 400 l/h	
	1000	Doubledecker system / 2x1000 l / 1000 l/h	
	2000	Doubledecker system / 2x2000 l / 2000 l/h	
		Construction	
	N	Normal	
	S	Mirror imaged	
		Electrical connection	
	A	400 VAC, 50/60 Hz (3ph, N, PE)	
		Control	
	0	PLC S7-1200	
	1	PLC S7-1200 with PROFIBUS® + DP/DP coupler	
	2	PLC S7-1200 with PROFINET® + PN/PN coupler	
		Options	
	0	without options	
		Powder feeder	
	P0	none	
	P1	Powder feeder (0400)	
	P2	Powder feeder (1000)	
	P3	Powder feeder (2000)	
		Vibrator for powder feeder	
	0	none	
	1	with vibrator for powder feeder	
		Powder feeder device, top hopper	
	0	none	
	1	Top hopper 50 l	
	2	Top hopper 75 l	
	3	Top hopper 100 l	
	4	Top hopper 50 l + powder feeder device	
	5	Top hopper 75 l + powder feeder device	
	6	Top hopper 100 l + powder feeder device	
	7	with adapter cover + powder feeder device	
		Liquid concentrate pump	
	L0	none	
	L1	with Sigma	
	L2	with Spectra	
	L3	prepared for Sigma	

U L D a	Type / Container Size / Extraction rate												
									L4	prepared for Spectra			
										Monitoring for liquid concentrate pump			
										0	none		
										1	with float switch for concentrate tank		
										2	with flow monitor (Spectra only)		
										3	with float switch and flow monitor (Spectra only)		
										Water pipework for flush valve			
										1	Y-flush inlet, PVC (0400)		
										2	Y-flush inlet, PVC (1000)		
										3	Y-flush inlet, PVC (2000)		
										4	Wetting cone, PVC (0400)		
										5	Wetting cone, PVC (1000)		
										6	Wetting cone, PVC (2000)		
										7	Wetting cone, PP (0400)		
										8	Wetting cone, PP (1000)		
										9	Wetting cone, PP (2000)		
										Set			
										BG	Bulgarian	LV	Latvian
										CZ	Czech	MS	Malay
										DA	Danish	NL	Dutch
										DE	German	NO	Norwegian
										EL	Greek	PL	Polish
										EN	English	PT	Portuguese
										ES	Spanish	RO	Romanian
										ET	Estonian	RU	Russian
										FI	Finnish	SK	Slovakian
										FR	French	SL	Slovenian
									HR	Croatian	SV	Swedish	
									HU	Hungarian	TR	Turkish	
									IT	Italian	ZH	Chinese	
LT	Lithuanian												

## 2 Safety and responsibility

### About this product

The Ultromat® manufactured by ProMinent is an automatic polyelectrolyte preparation system. It can be used in any application where synthetic polymers are to be automatically prepared to form polymer solutions to act as flocculation aids. As such a dissolving station, the system is suitable for a large number of process engineering applications, e.g. in the water treatment sector, in waste water treatment and paper manufacture.

### 2.1 Explanation of the safety information

#### Introduction

These operating instructions provide information on the technical data and functions of the product. These operating instructions provide detailed safety information and are provided as clear step-by-step instructions.

The safety information and notes are categorised according to the following scheme. A number of different symbols are used to denote different situations. The symbols shown here serve only as examples.



#### **DANGER!**

##### **Nature and source of the danger**

Consequence: Fatal or very serious injuries.

Measure to be taken to avoid this danger

Danger!

- Denotes an immediate threatening danger. If this is disregarded, it will result in fatal or very serious injuries.



#### **WARNING!**

##### **Nature and source of the danger**

Possible consequence: Fatal or very serious injuries.

Measure to be taken to avoid this danger

Warning!

- Denotes a possibly hazardous situation. If this is disregarded, it could result in fatal or very serious injuries.



#### **CAUTION!**

##### **Nature and source of the danger**

Possible consequence: Slight or minor injuries, material damage.

Measure to be taken to avoid this danger

Caution!

- Denotes a possibly hazardous situation. If this is disregarded, it could result in slight or minor injuries. May also be used as a warning about material damage.





**NOTICE!**

**Nature and source of the danger**

Damage to the product or its surroundings

Measure to be taken to avoid this danger

Note!

- Denotes a possibly damaging situation. If this is disregarded, the product or an object in its vicinity could be damaged.



**Type of information**

*Hints on use and additional information*

*Source of the information, additional measures*

*Information!*

- *Denotes hints on use and other useful information. It does not indicate a hazardous or damaging situation.*

## 2.2 Correct and Proper Use



**WARNING!**

**Danger caused by incorrect use!**

Incorrect use of the Ultromat® can result in hazardous situations.

- The Ultromat® is only designed to produce a polymer solution as a flocculent from powdered polymer or liquid concentrate and with drinking water.
- All other uses or a modification of the system are only permitted with the written authorisation of ProMinent Dosiertechnik GmbH, Heidelberg!
- The system is not designed for use in areas at risk from explosion!
- The correct and proper operation of the system cannot be guaranteed if non-genuine parts or third party accessories are used.
- Please observe the relevant national regulations and the information provided in the operating instructions at all phases of the system's life!
- The Ultromat® may only be operated by adequately qualified personnel

## 2.3 Users' qualifications



### WARNING!

#### Danger of injury with inadequately qualified personnel!

The operator of the plant / device is responsible for ensuring that the qualifications are fulfilled.

If inadequately qualified personnel work on the unit or loiter in the hazard zone of the unit, this could result in dangers that could cause serious injuries and material damage.

- All work on the unit should therefore only be conducted by qualified personnel.
- Unqualified personnel should be kept away from the hazard zone

Training	Definition
Instructed personnel	An instructed person is deemed to be a person who has been instructed and, if required, trained in the tasks assigned to him/her and possible dangers that could result from improper behaviour, as well as having been instructed in the required protective equipment and protective measures.
Trained user	A trained user is a person who fulfils the requirements made of an instructed person and who has also received additional training specific to the system from ProMinent or another authorised distribution partner.
Trained qualified personnel	A qualified employee is deemed to be a person who is able to assess the tasks assigned to him and recognize possible hazards based on his/her training, knowledge and experience, as well as knowledge of pertinent regulations. The assessment of a person's technical training can also be based on several years of work in the relevant field.
Electrician	<p>Electricians are deemed to be people, who are able to complete work on electrical systems and recognize and avoid possible hazards independently based on his/her technical training and experience, as well as knowledge of pertinent standards and regulations.</p> <p>Electricians should be specifically trained for the working environment in which they are employed and know the relevant standards and regulations.</p> <p>Electricians must comply with the provisions of the applicable statutory directives on accident prevention.</p>
Customer Service department	Customer Service department refers to service technicians, who have received proven training and have been authorised by ProMinent to work on the system.



### Note for the system operator

*The pertinent accident prevention regulations, as well as all other generally acknowledged safety regulations, must be adhered to!*

## 2.4 Ultromat® Safety Information



### WARNING!

#### Qualification of personnel

Danger due to incorrect operation of the system

The operating personnel must be instructed by a ProMinent service technician" (When the system is first operated)

The operating instructions must be available by the system!

**WARNING!****Danger of electric shock!**

Possible consequence: Fatal or very serious injuries

The control cabinet must always be closed during operation.

The mains switch must be set to "0" and secured against restart before any installation or maintenance work can begin.

**CAUTION!****Propellers are rotating in the reservoirs!**

Slight or minor injuries.

Switch off the system and only then remove the screwed cover of an inspection opening!

**CAUTION!****A screw conveyor and a loosening wheel are located under the safety guard of the dry material feeder.**

Slight or minor injuries. Material damage.

Do not reach into the dry material feeder.

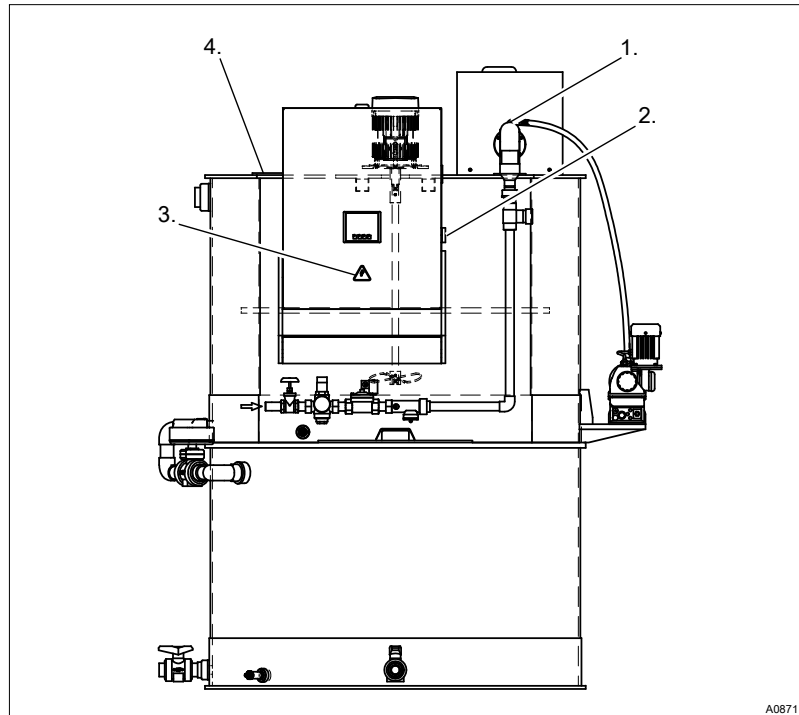
**CAUTION!****Hot surface!**

Incorrectly set heating on the metering pipe may become hot!

Ensure that the metering pipe heating is correctly set!

## 2.5 Description and testing of safety equipment

### Safety Equipment



*Fig. 1: Safety Equipment*

1. "Warning of hot surfaces" warning label
2. Main switch
3. "Warning of hazardous electrical voltage" warning label
4. Cover of inspection opening with "Warning of injury to hands" warning label

#### Main switch

The red-yellow main switch on the right-hand side of the control cabinet disconnects the system and any connected units.

Test: When all parts of the system are operational, switch the main switch to 'Off' - all of the parts must stop - all the lights must go out.

#### Covers of inspection openings

The screw covers of the inspection openings prevent persons injuring their hands on the rotating propellers of the stirrers.

Test: Check that the covers of the inspection openings are being used and are secured with screws

## Warning labels

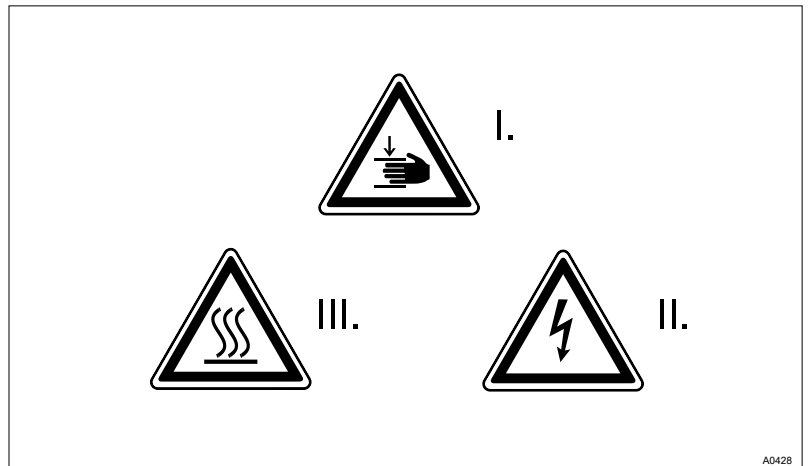


Fig. 2: Warning labels


- I. Warning of injury to hands
- II. Warning of hazardous electrical voltage
- III. Warning of hot surfaces

Test: Check whether the labels are still affixed and legible.

## 2.6 Sound Pressure Level

The sound pressure level is < 70 dB (A) for powdered polymer, according to EN ISO 11202:1997 (Acoustics - Noise emission from machinery and equipment)

### 3 Transporting and storing the system

User qualification: trained user, see  Chapter 2.3 'Users' qualifications' on page 10



**WARNING!**

**High system weight**

Possible consequence: Death or severe injuries, if the floor cannot support the system and breaks.

Measure: Ensure that the floor of the installation site can support the weight of both the empty and full system.



**WARNING!**

**Never stand under suspended loads.**

Possible consequence: Fatal or very serious injuries

- It is prohibited to walk under or stand underneath suspended loads
- When lifting and transporting the Ultromat ensure it cannot slip or topple
- Use suitable approved lifting tackle. Observe the information given in the lifting equipment data sheets.



**CAUTION!**

**Possibility of damage to the system during transport**

Improper transport can result in system damage.

- Only move the Ultromat® system when empty
- The storage tank wall must not be subjected to point loading
- Avoid heavy vibration and impact loads
- Only move the system with suitable hoisting and lifting equipment
- When using forklift trucks, use long forks, which extend across the entire depth of the storage tank
- If a crane is used, attach the slings, even if lifting lugs are fitted, such that shear forces are avoided

**Ambient conditions for storage and transport**

Permissible ambient temperature: -5 °C to +50 °C.

Humidity: None. Rain and condensation not permitted.

Other: No dust, no direct sunlight.

## 4 Information on the system

The Ultromat® manufactured by ProMinent is an automatic polyelectrolyte preparation system.

It can be used in any application where synthetic polymers are to be automatically prepared to form polymer solutions e.g. to act as flocculation aids. As such a dissolving station, the system is suitable for a large number of process engineering applications, e.g. in the water treatment sector, in waste water treatment and paper manufacture.

### 4.1 Design

The system is designed for the fully automatic batching of polymer solutions.

Almost all commercially available polymers can be used. Under the control of Ultromat® systems, concentrations from 0.05 to 1.0 % can be set. The viscosity of the polymer solution produced must not however exceed 1500 mPas. Please refer to the polymer suppliers' application data sheets for information about the viscosity of the different polymer solutions.

Adjust the flow rate of the preparation water to make full use of the preparation range. Concentrations of greater than 0.5 % can reduce the capacity of the preparation performance.

The maturing time available for the production of a polymer solution depends on the extraction rate and the volumetric capacity of the Ultromat® and is approximately 60 minutes at a maximum extraction rate. The system capacities extend from max. 400 l usage solution per hour for the Ultromat® 400 up to 2,000 l for the Ultromat® 2000.

### 4.2 Technical data



*Please refer to the dimensions sheet for the precise dimensions of your Ultromat® system*

### Ultromat® ULDa

Ultromat® ULDa	400	1000	2000
Storage tank volume (l)	2x400	2x1000	2x2000
Extraction rate (l/h)	400	1000	2000
Maturing time (min)	60		
Solution concentration (%)	0.05 - 1.0		
Dimensions LxWxH (mm)	1638x1351 x2030	1902x1615 x2514	2288x2005 x3149
Net weight (kg)	400	450	600
Total weight (kg)	1200	2450	4600
Overflow connection	DN 40	DN 50	DN 65
Extraction connection	DN 25	DN 32	DN 40
Water supply for redilution	1"	1 1/4"	1 1/2"
Liquid concentrate - pipework	DN 15	DN 15	DN 20
Max. water supply	1,600 l/h	4,000 l/h	8,000 l/h
Electrical rating	1.5 kW	2.6 kW	3.2 kW
External fuse	32 A	32 A	32 A
Degree of protection control cabinet	IP 55	IP 55	IP 55
<b>Stirrer 1</b>			
Performance	0.75 kW	1.10 kW	2.20 kW
Speed (50 Hz)	700 rpm	700 rpm	700 rpm
Degree of protection	IP 55	IP 55	IP 55
<b>Powder feeder</b>			
Type	TGD 11	TGD 18	TGD 55
Maximum capacity	11 kg/h	18 kg/h	55 kg/h
<b>Pressure sensor (2 piece)</b>			
Part number	1038273	1038273	1038273
Type	dT P30	dT P30	dT P30
Measuring range	0-160 mbar	0-160 mbar	0-160 mbar
Signal	1 - 6 V	1 - 6 V	1 - 6 V
<b>Turbodos</b>			
Part number	1025379	1025379	1025379
Pulse/litre	67.5	67.5	67.5
Output	PNP	PNP	PNP

### Metering pumps of the Ultromat® ULDa

Ultromat® ULDa	400	1000	2000
Sigma			
Type S1CaH	12035	12035	10050
Capacity	35 l/h	35 l/h	50 l/h



Ultromat® ULDa	400	1000	2000
Degree of protection	IP 65	IP 65	IP 65
Spectra			
Type Spectra	12 / 33 F	12 / 33 F	12 / 100 F
Capacity	33 l/h	33 l/h	100 l/h
Degree of protection	IP 55	IP 55	IP 55

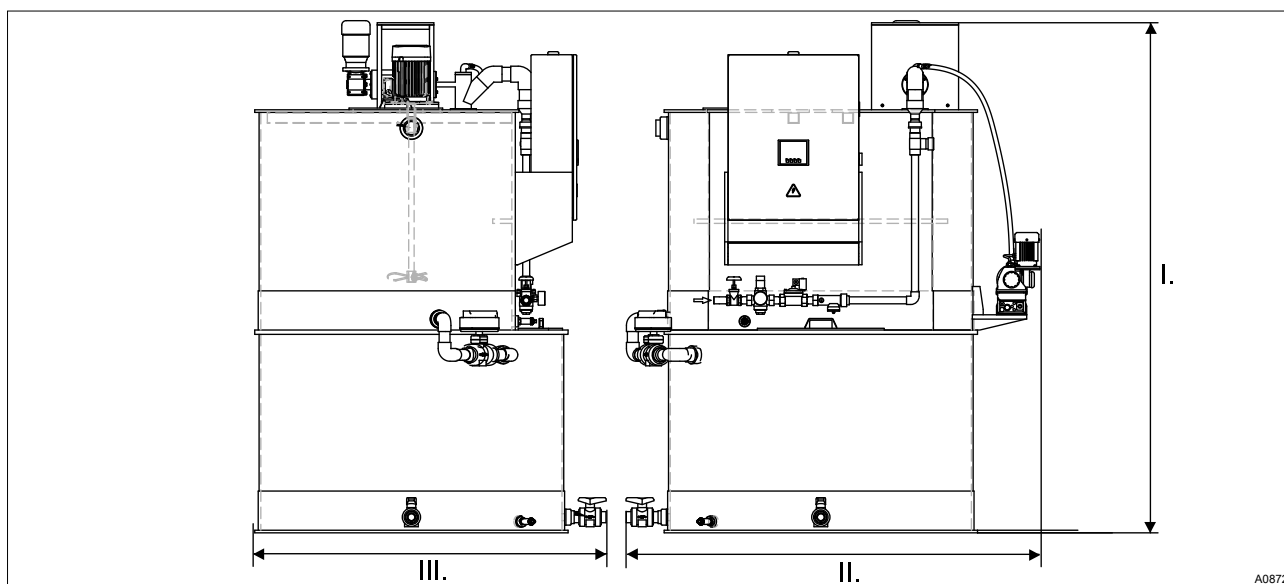


Fig. 3: System dimensions

- I. Height (H)
- II. Width (B)
- III. Length (L)

#### Ambient conditions

	Value
Storage and transport temperature	- 5 °C ... + 50 °C
Operation temperature	+ 5 °C ... + 40 °C
Storage and operation air humidity	< 92 % relative air humidity (non-condensing)
Powdered polymer air humidity	Observe the instructions of the polymer manufacturer. If necessary use an air dehumidifier
System sound pressure level	< 70 dB (A)

## 5 Construction and function

### 5.1 System construction

The system parts for powder storage, powder metering, wetting, dissolving and maturing of the powder polymers are combined in a compact unit.

An Ultromat® is assembled using the identity code from the following functional units:

- Water fitting (1)
- Concentrate pump (2)
- Stirrer (3)
- Flush fitting (4)
- Powder feeder (5)
- Control cabinet (6)
- Storage tank (7) (upper/lower)
- Motorised valve (8)

The flush fittings and water piping are available in either PVC or PP.

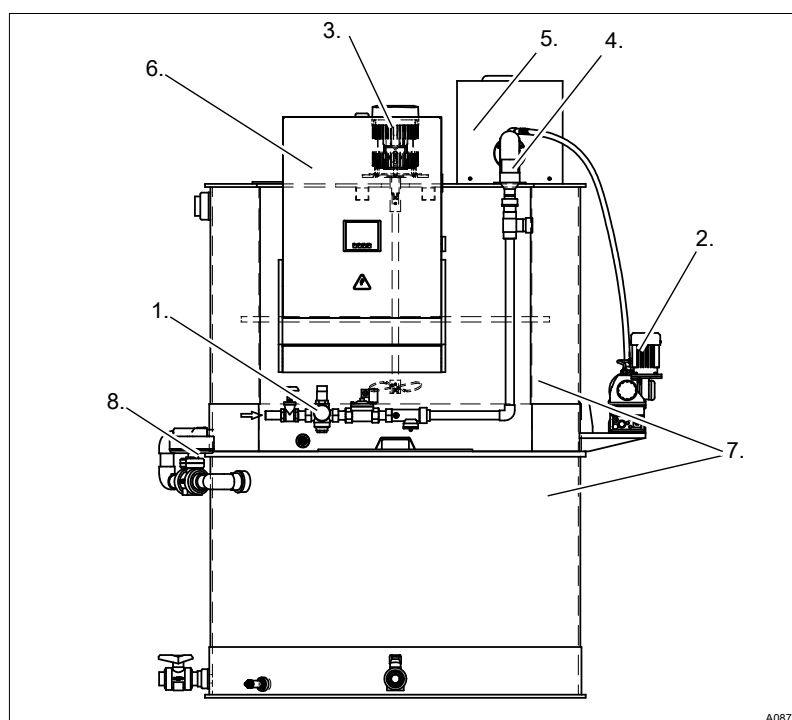


Fig. 4: System construction

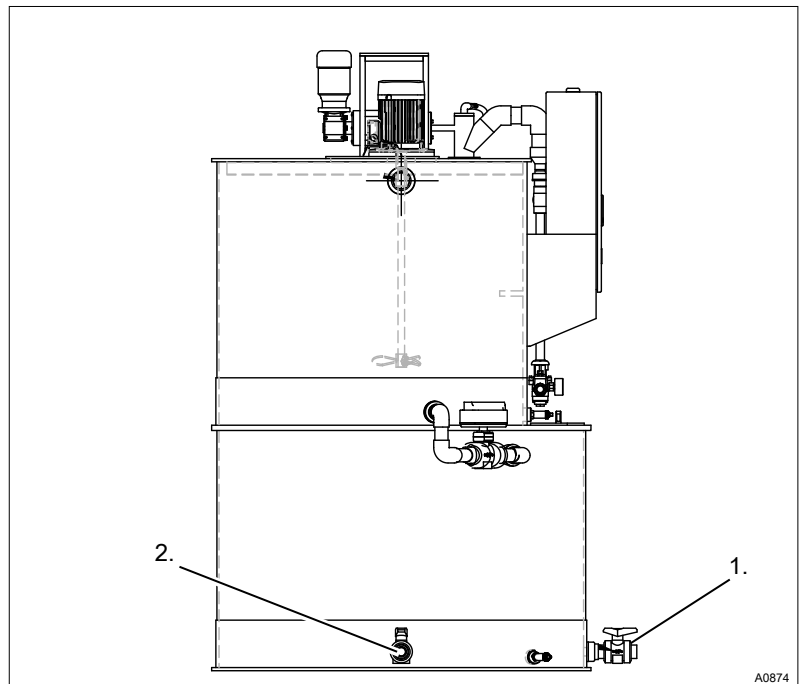
The seals are made from EPDM as standard. The stirrer shafts and propellers of the stirrers plus the liquid end of the powder feeder are made from corrosion-resistant stainless steel.

### 5.2 Description of the units



*The units are only available, if they were selected with the identity code.*

### 5.2.1 Doubledecker storage tank



*Fig. 5: Extraction openings*

1. Extraction cock for the matured polymer (Chamber bottom)
2. Drainage cock

The closed design PP doubledecker storage tank with stirrer traverses, brackets for powder feeder and control cabinet, plug drainage and extraction connections is divided into two separate chambers. This ensures sufficient polymer solution maturing time. The division of the doubledecker storage tank moreover prevents the mixing of matured and freshly prepared solution and enables continuous extraction.

All inspection openings of the doubledecker storage tank are secured with threaded covers that can be tightly secured.

The liquid level in both chambers is continuously measured using pressure sensors.

### 5.2.2 Crane Lifting Lugs

For easier handling of the system, a suitable hoisting device can be attached to the four lifting lugs.

### 5.2.3 Water fitting with flush fitting

The water pipework supplies the system with the required preparation water. The pressure reducer with filter insert ensures that the pressure is limited and maintained at the correct operating pressure. A solenoid valve automatically opens and closes the water inlet. The flow meter used, continuously reports the current flow rate to the control. During commissioning the two regulating valves are used to set the water flow rate. The flush fitting ensures that the polymer powder is intensively wetted with preparation water. A manual shut-off valve also shuts off the supply of water if maintenance work is necessary.

There are two versions of flush fitting:

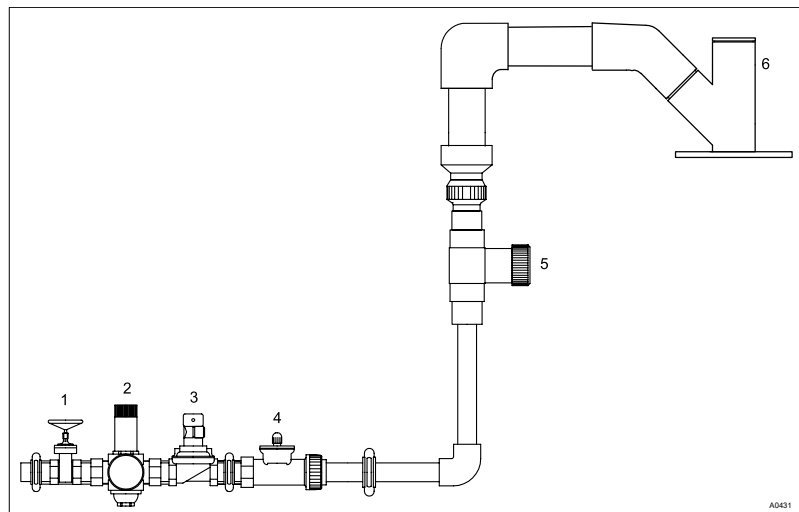
- Y-flush inlet
- Wetting cone

With the wetting cone, the flushing process is more complicated, as described above:

The powdered polymer falls into the wetting cone, where it is uniformly wetted with a partial flow from the preparation water. This ensures clumping of the feed chemical does not occur.

The main flow of the preparation water produces, by way of a mixing device, a slight vacuum at the outlet of the cone. Consequently, the wetted powder is sucked out and then travels with the preparation water into chamber 1.

The switching on of the powder feeder is controlled to occur at a time delay after the solenoid valve activation. Consequently at the start of the preparation process, no powder deposits can occur in the flush fitting. There is always a water flow for a few seconds before the powder feeder starts. At the end of the preparation process, the reverse procedure is followed. The system switches off immediately once the upper level is reached. However, the water continues to run for a few seconds after this.



*Fig. 6: Water fitting with Y-flush inlet*

1. Shut-off valve
2. Pressure reducer
3. Solenoid valve
4. Flow meter
5. Regulating valve
6. Y-flush inlet

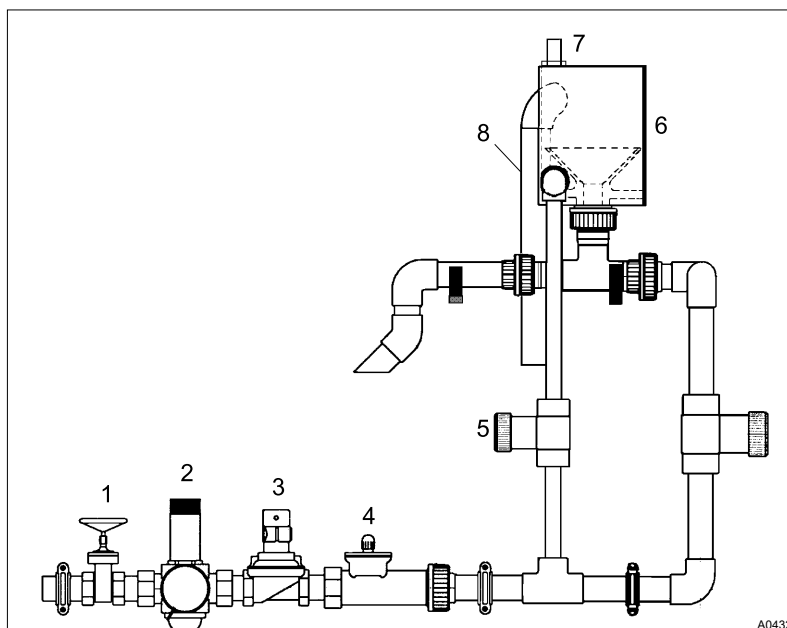


Fig. 7: Water fitting with wetting cone

1. Shut-off valve
2. Pressure reducer
3. Solenoid valve
4. Flow meter
5. Regulating valves
6. Wetting cone
7. Overflow sensor
8. Overflow

## 5.2.4 Powder feeder

Please refer to the separate operating instructions entitled "Dry Feeder" for detailed information about the design and function of this device.

The heater of the feeder screw pipe and the minimum fill level sensor for the dry material hopper are fitted as standard to the Ultramat® treatment systems. The dry feeder is activated by a frequency converter to ensure quantity-proportional dosing of the powdered polymer into the preparation water. A loosening wheel is fitted directly above the feeder screw for the continuous discharge of the powdered polymer. A metering pipe heating system also removes any moisture that has penetrated the unit and thus prevents any caking of the powdered polymer.

## 5.2.5 Vibrator

The vibrator helps to prevent bridging in the dry material feeder so that the powdered polymer matures better.

## 5.2.6 Stirrer



### CAUTION!

The stirrer can start up abruptly once it is connected to mains voltage.

The Ultromat® is fitted with an electric stirrer as standard. The stirrer ensures that the polymer solution is gently agitated.

### 5.2.7 Control cabinet

The control cabinet contains, alongside the power supply and the fuses, all the electrical control and command devices necessary for operation of the system, especially the Ultromat® control and the frequency converter for control of the powder feeder.

### 5.2.8 Power Socket for connection of a powder feeder device

The Ultromat® has a power socket for connection of a powder feeder device. The power socket is secured to the dry feeder and is electrically protected by a circuit breaker.

### 5.2.9 Concentrate piping

The Ultromat® is equipped with the following pipework for metering of liquid concentrate:

Ultromat® type	Pipe diameter	Tube nozzle
400	DN 15	DN 15
1000	DN 15	DN 15
2000	DN 20	DN 20

### 5.2.10 Evaluation - water low in the redilution unit

The redilution unit is used to redilute the prepared polymer solution. To do this the feed pump transports the polymer solution out of the Ultromat® storage tank into the redilution unit.

The dilution water is fed into the redilution unit via a solenoid valve. A downstream float flow meter with a minimum contact monitors the dilution water.

The Ultromat provides a potential-free contact (feed pump enable) for control of the feed pump. This contact is closed if the level undershoots the low flow contact in the bottom chamber and opens once the low flow contact is exceeded again. The feed pump is normally controlled using an external circuit (combination starter motor).

As the feed pump can be switched on and off externally, there is an additional input at the Ultromat control for determining the state of the motor starter (potential-free auxiliary contact). The evaluation of the min. contact at the flow meter is only carried out if the feed pump is running and consequently the potential-free auxiliary contact at the motor starter has been closed.

If the feed pump is stationary, the potential-free contact is not closed and the min. contact at the flow meter is not evaluated.

### 5.2.11 Empty signal for concentrate tank

The *'Empty signal concentrate tank'* option comprises a float switch, which is inserted from above in the delivery drum.

### **5.2.12 Dosing monitor for liquid concentrate**

The Ultromat® can be operated with liquid polymer. The concentrate pump doses the concentrate into chamber 1. The dosing monitor can only be used when an eccentric screw pump is being used. The dosing monitor comprises a flow adapter and a flow sensor.

### **5.2.13 Top hopper 50 l, 75 l and 100 l**

Should an enlarged powder reservoir be required, top hoppers with an additional volumetric capacity of 50, 75 and 100 litres are available.

### **5.2.14 Powder feeder device for automatic refilling**

A powder conveyor unit can be used for the automatic filling of the powder hopper with powdered polymer. A powder feeder device can be mounted directly onto the dry feeder or top hopper by means of an adapter plate. The installation of a 50 l top hopper with an adapter connection is recommended to overcome short periods of service work on the powder conveyor or when there is a high consumption of powder.

## 6 Assembly and installation

User qualification, mechanical installation: trained qualified personnel, see  
🔗 *Chapter 2.3 'Users' qualifications' on page 10*

User qualification, electrical installation: Electrical technician, see  
🔗 *Chapter 2.3 'Users' qualifications' on page 10*

The system is fully factory pre-assembled. The cabling between the control cabinet and the electrical power units is fully installed.

### 6.1 Assembly



#### **WARNING!**

##### **High system weight**

Possible consequence: Death or severe injuries, if the floor cannot support the system and breaks.

Measure: Ensure that the floor of the installation site can support the weight of both the empty and full system.



#### ***Selection of the installation site***

*The system must be easily accessible at all times for operation, maintenance and filling.*

#### **Ambient conditions for operation**

Permissible ambient temperature: +5 °C to +40 °C.

Humidity: None. Rain and condensation not permitted.

Other: No dust, no direct sunlight.

### 6.2 Installation, hydraulic



#### **CAUTION!**

##### **Possible environmental damage due to the polymer solution is possible**

Observe the safety data sheet for the polymer, as well as statutory regulations for disposal when draining the drainage lines and the overflow line.

#### **Requirements:**

- The preparation water must be of drinking water quality and must be free of solids and suspended particles
- The inlet water pressure must be between 3 and 5 bar
- The dimensioning of the process water, overflow and drainage lines must be correct





**NOTICE!**

- Route the overflow and drainage lines with a slope. These must be operated without back pressure
- To drain the system install a T-piece with a stopcock to provide a drainage option between the chamber 3 shut-off valve and the feed pump

1. ➤ Connect the preparation water line to the water fitting
2. ➤ Connect the concentrate pump line for the liquid polymer
3. ➤ If available: Connect the feed pump (not contained in the scope of supply) to the extraction line
4. ➤ Connect up the drainage lines and lead into a suitable drain
5. ➤ Connect up the overflow line to the overflow connector and lead into a suitable drainage

## 6.3 Installation, electrical



**WARNING!**

**Live parts!**

Possible consequence: Fatal or very serious injuries

- Measure: Always disconnect the system from the mains power supply at the electrical connections before carrying out any installation work
- Secure the system to prevent it being switched back on again

### 6.3.1 Mains Power Connection



**CAUTION!**

**Danger of malfunction!**

Ensure that the terminals are assigned correctly when connecting the units.

Ensure that the motors rotate in the right direction ... when connecting the stirrers, powder feeders, motor pumps.

1. ➤ Connect the electrical supply cable as shown in the wiring diagram (see the pouch in the control cabinet)
2. ➤ Guide the mains cable through an appropriate opening in the system control cabinet and connect it in the cabinet to the provided terminal strip

### 6.3.2 Adjusting the capacitive sensors



*The capacitive sensors for reporting a shortage of powder in the powder feeder or an overflow in the wetting cone must be checked and possibly adjusted.*

*The sensor has a yellow LED at its cable end to indicate the switching state and also a countersunk adjustment screw to adjust its sensitivity.*

Materials required:

- 1 small screwdriver

The sensor is checked and adjusted in 2 steps:

**With the powder feeder empty (or normal water flow in the wetting cone)**

**1.** ➤ The yellow LED on the sensor is off - the setting is correct

**2.** ➤ The yellow LED on the sensor is on

⇒ Reduce the sensitivity using the adjustment screw (turn anti-clockwise) until the LED goes out.

**If the powder feeder is full (or the water of the wetting cone is overflowing):**

**3.** ➤ The yellow LED on the sensor is on

⇒ The setting is correct.

**4.** ➤ The yellow LED on the sensor is off

⇒ Increase the sensitivity using the adjustment screw (turn clockwise) until the LED lights up.

## 7 Operation of the Sinamics G110 frequency converter

Frequency Converter = FC

### 7.1 Function of the operating elements

The parameters of the frequency converter are set in the factory using the dry feeders and liquid concentrate pumps used in the Ultromat. Once the liquid concentrate pump is connected (not contained in the scope of supply), the parameters must be checked locally and adjusted to match the liquid concentrate pump.



Fig. 8: Sinamics G110 frequency converter

	Function	Remarks
<b>I</b>	Starts the motor	Key deactivated
<b>O</b>	Stops the motor	Key deactivated
<b>O</b>	Switches over the direction of rotation	Key deactivated
<b>FN</b>	Key jumps to [r0000] Fault acknowledgement	
<b>P</b>	Access to parameters	
<b>▲</b>	Increase value	
<b>▼</b>	Reduce value	
<b>JOG</b>	Jog motor	Key deactivated

## 7.2 Adjustment of the frequency converter

The frequency converter parameters are set in the factory on the dry feeder and liquid concentrate pump.

Here, the following parameters differ from the standard parameters of the frequency converter (FC):

**Settings for the dry feeder:**

Parameter G110	Dry feeder values
0003	3
0305	1.22 A
0307	0.18 kW
0311	1360 RPM
0700	5
1000	5
1082	100 Hz
1120	0.1 s
1121	0.1 s
1210	4
2000	100 Hz
2010	9
2011	1
2012	2
2013	4
2014	6000

**Settings for the Spectra liquid concentrate pump:**

Parameter G110	Spectra values
0003	3
0305	1.9 A
0307	0.37 kW
0311	1380 RPM
0700	5
0731	4
1000	5
1082	83 Hz
1120	0.1 s
1121	0.1 s
1210	4
2000	83 Hz
2010	9
2011	2
2012	2
2013	4
2014	6000

## 8 Setting the additional components

### 8.1 Adjusting the Capacitive Sensor

The capacitive sensor for reporting a shortage of powder in the dry material feeder must be checked and possibly adjusted.

The sensor has a yellow LED at its cable end to indicate the switching state and also a sunken adjustment screw to adjust its sensitivity.

The sensor is checked and adjusted in 2 steps:

**With an empty dry material feeder**

1. ➤ The yellow LED on the sensor is not illuminated - the setting is correct.
2. ➤ The yellow LED on the sensor is illuminated:
  - ⇒ Reduce the sensitivity on the adjustment screw (turn anti-clockwise) until the LED goes out.

**With a filled dry material feeder**

1. ➤ The yellow LED on the sensor is not illuminated - the setting is correct.
2. ➤ The yellow LED on the sensor is not illuminated:
  - ⇒ Increase the sensitivity on the adjustment screw (turn clockwise) until the LED is illuminated.

### 8.2 Setting the Sigma (Factory Settings)

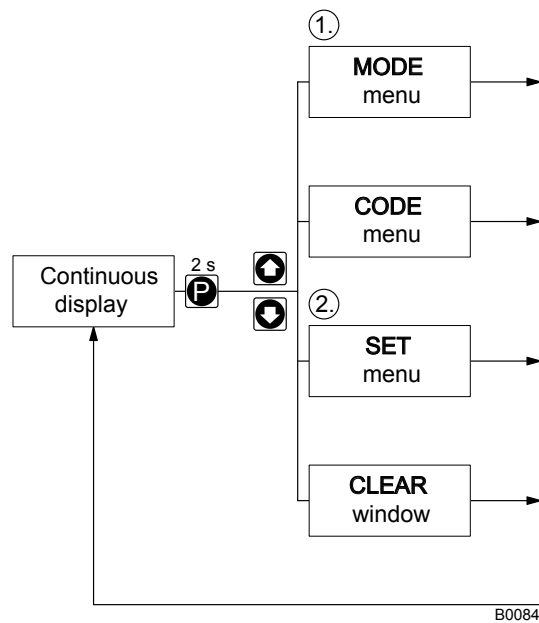


Fig. 9: Adjustment mode menus

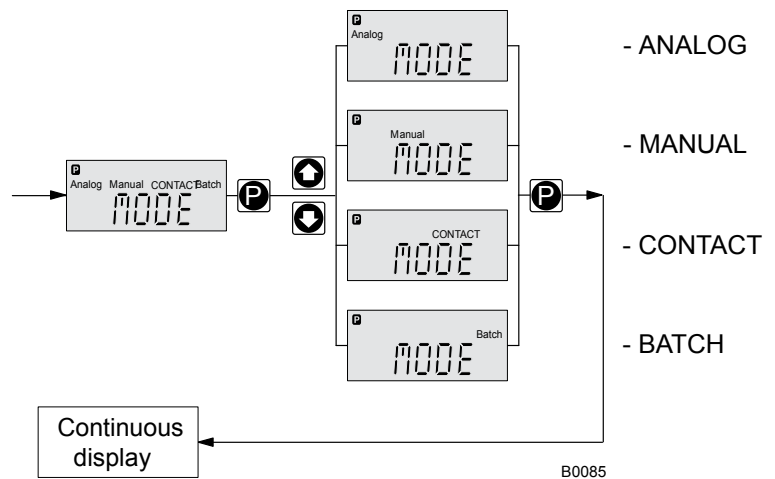


Fig. 10: Selecting the operating mode (MODE menu)

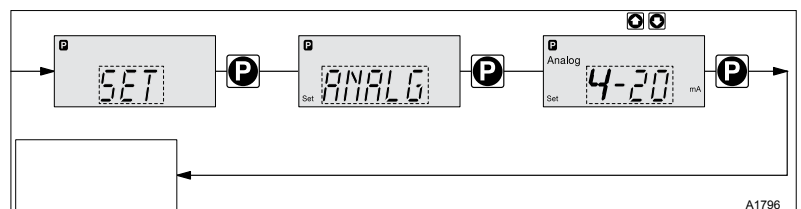


Fig. 11: [Analog] operating mode settings

### Setting "Analog" operating mode

1. ➔ Keep the **[P]** key pressed until the display flashes. Then release the **[P]** key
  2. ➔ Press the arrow key until **[MODE]** appears on the display. Then press the **[P]** key
  3. ➔ Keep the arrow key pressed until **[ANALOG]** appears on the display. Then press the **[P]** key
- ⇒ The pump is now operating in Analog mode.



If the red LED display lights up and **[ANALG]** appears on the display, then the pump is not receiving an analog signal.

### Setting the analog input 4 ... 20 mA

1. ➔ Keep the **[P]** key pressed until the display flashes. Then release the **[P]** key
  2. ➔ Keep the arrow key pressed until **[SET]** appears on the display. Then press the **[P]** key
  3. ➔ Keep the arrow key pressed until **[ANALG]** appears on the display. Then press the **[P]** key
  4. ➔ Keep the arrow key pressed until **[4...20 mA]** appears on the display. Then press the **[P]** key
- ⇒ The pump reacts proportionally to the current signal, 4 mA = 0 strokes/min., 20 mA = maximum rate.
5. ➔ Use the START/STOP key to start or stop the pump.

## 9 General Notes on Operation

The Ultromat is equipped with the KTP 400 operating unit to visualise the control process. You can operate the control using the touch display and the 4 function keys. The operating unit communicates with the S7-1200 control via the PROFINET/Ethernet interface.

The visualisation of the Ultromat to be controlled is sufficient to represent the most important Ultromat functions. Warnings and fault messages are also displayed as text and saved in an archive. Up to a maximum of 100 text messages can be called up.

You can intuitively input control parameters or carry out a calibration as well as other operating functions by calling up operating screens.

A brief training session is sufficient to allow you to operate the Ultromat. Please carefully read the operating instructions prior to use.

The operation of the system in manual mode must only be carried out by experienced service technicians. Here, knowledge of the detailed control process is particularly important, so that incorrect operations can be avoided.

An alarm is reported by the Ultromat audibly and visually via the integral horn and alarm lamp. To switch off the horn, press the reset key *[F4]* on the panel immediately. The horn alarm is deleted, however the alarm remains until the cause of the fault is rectified and the reset key *[F4]* is pressed again.

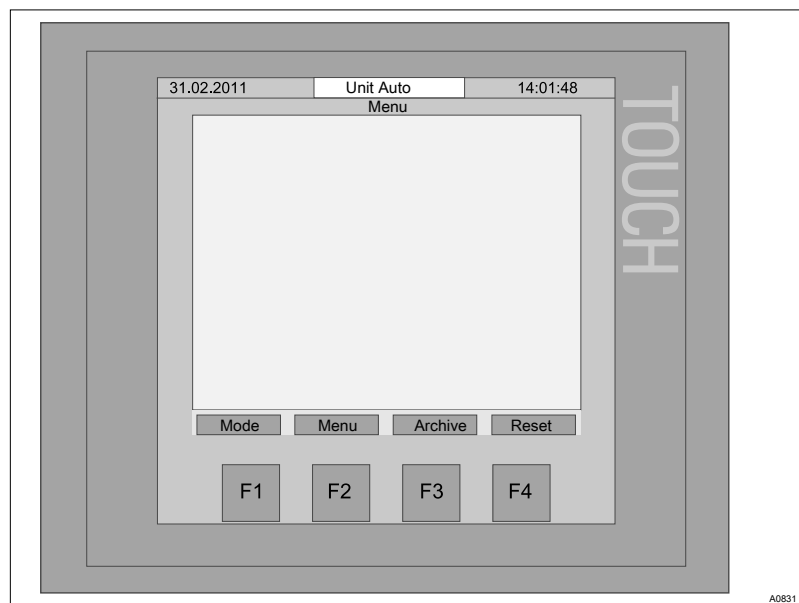


Fig. 12: Operating Menu



## 9.1 Operating Menu

Keys	Level 1	Level 2	Input
[F1] Mode	STOP / AUTO / MANUAL		[Change powder/liquid]
[F2] Mode	PARAMETER	Water	Pre-rinse; post-rinse/flush period; min. flow
		Stirrer	Stirrer On / Off
		Level top	Max-Max; Max; Start Polymer; Min
		Level bottom	Max-Max; Min; Min-Min
		Powder	Heater ON/OFF
			Vibrator ON/OFF
			Maturing time
		Liquid	Min. setpoint freq. conv.
			Maturing time
	Calibration (F1 mode stop)	Powder	Calibration time
			Elapsed time
			Enter weight
			Capacity
		Liquid	Calibration time
			Elapsed time
			Enter weight
			Capacity
		Flow monitor	Switching point
			Start/Stop
		Water	Actual flow:
			Calibration Water
	System	Set	[DE], [EN], [FR], [ES], [PT],
			Confirm language
			START
		Set date and time	31.02.2014 12:13:14
			[dd.mm.yyyy hh:mm:ss]
		Touch panel	Contrast (+) (-)
			Clean screen
			Calibrate touch
	Concentration		Powder
			Liquid
			Liquid active ingredient
			Intern / Extern (PROFIBUS® / PROFINET®)
	Info	Identity code	Type
			Variable
			Polymer
			Options

Keys	Level 1	Level 2	Input
		Version	Version Touchpanel:
			Creation date
			Version S7 Project:
			Creation date
			Project
	Service	Water meter	Mode measurement: Auto / Manual
			Manual value
			Pulse rate <i>[DFM]</i>
		Run empty	Stop / On
		Pressure sensor	Sensor measured value
			Measured value
			Offset
		Factory setting	Factory settings reset
			Identity code: Change
<i>[F3]</i> Archive			
<i>[F4]</i> Reset			

## 9.2 Start screen

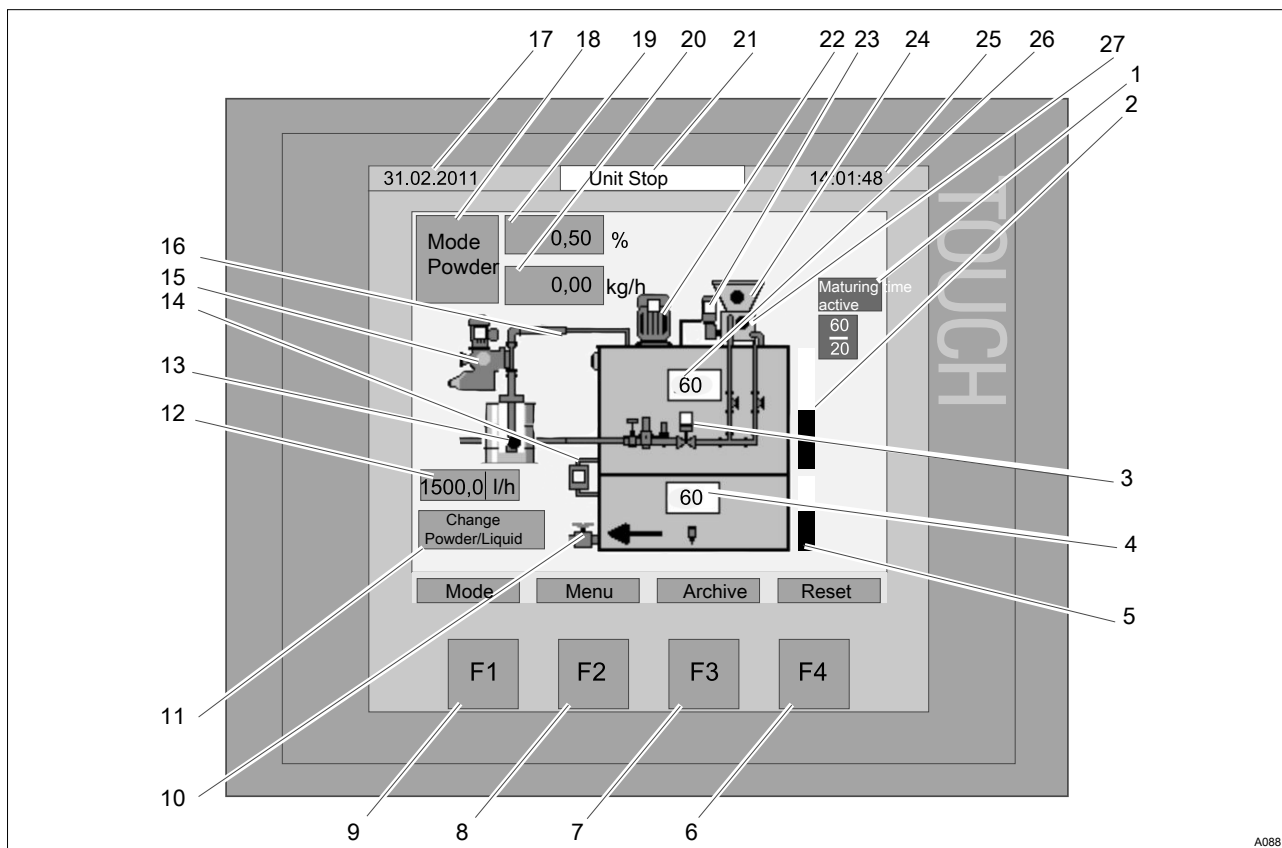


Fig. 13: Start screen

- |    |  |    |  |
|----|--|----|--|
| 1  | Maturing time active (60/20) total maturing time / already elapsed time in minutes | 15 | Pump-liquid concentrate (white=off), (black=on), (flashing=fault)        |
| 2  | Level indicator Chamber top (0 ... 100 %)  | 16 | Flow sensor liquid concentrate (white=NOK), (black=OK), (flashing=fault) |
| 3  | Water supply (white=valve closed) (black=valve open)                               | 17 | Date   |
| 4  | Level display in [mm]  | 18 | Display of the current dosing product (powder/liquid)                    |
| 5  | Level indicator Chamber bottom (0 ... 100 %)                                       | 19 | Display of the desired concentration                                     |
| 6  | Function key [F4] [RESET]  | 20 | Display of the current capacity in [kg/h]                                |
| 7  | Function key [F4] jump to the [Archive]  | 21 | Ultramat operating mode status bar: [STOP], [AUTO], [MANUAL]             |
| 8  | Function key [F2] jump to the [Menu]   | 22 | Stirrer (white=off), (black=on), (flashing=fault)                        |
| 9  | Function key [F1] switchover operating mode [STOP], [AUTO], [MANUAL]               | 23 | Dry Feeder (white=off), (black=on), (flashing=fault)                     |
| 10 | Extraction enable display (no arrow=no enable // arrow = enable)                   | 24 | Dry product empty signal (white=NOK), (black=OK), (flashing=fault)       |
| 11 | Switch (Powder/Liquid)   | 25 | Time   |
| 12 | Display water supply [l/h]   | 26 | Level display in [mm]  |
| 13 | Empty message liquid concentrate (white=NOK), (black=OK), (flashing=fault)         | 27 | Wetting cone overflow (white=NOK), (black=OK), (flashing=fault)          |
| 14 | Motorised ball valve (white=closed // black=open)                                  |    |  |

## 9.3 Operating mode change

### Operating mode change

You can switch operating mode using the [F1] function key.

➡ If you press [F1],

⇒ then a window opens with the button for the operating modes [STOP], [AUTO], [MANUAL] and the button for [BACK].



The current operating mode is displayed in the status bar.

### Operating mode STOP

In *[STOP]* operating mode, all drives and the water supply valve (10) are switched off. No new preparation is started. The content of chamber 3 can be extracted down to the level *[Min Min]*. If the level falls below this, the error message '*Ultromat tank empty*' is displayed.

### Operating mode AUTO

In *[AUTO]* operating mode, the automatic preparation process is started, as soon as the Chamber 3 level *[MIN]* is undershot. Exception: The Ultromat receives no external release or the function '*Run. empty*' is selected in the service menu.

### Operating mode MANUAL



#### NOTICE!

This operating mode is only for service technicians. To avoid damage to the system, only service technicians may operate the system in *[MANUAL]* operating mode.

In *[MANUAL]* operating mode, all drives and valves are initially switched off. By pressing the buttons (not currently visible) above the symbols, of the water supply valve (10), stirrers (1, 15, 24) and pump (13), you can switch the drives on and off and close and open the valves manually. In *[MANUAL]* operating mode you can set the capacity in the input field which appears from 0 ... 100 %.

## 9.4 User administration

### 9.4.1 User groups

Touch panel operation is subdivided into 3 groups:

- General operation
- Advanced operation (User + 5050)
- Service (Service + 5555)

Activity	User rights for user groups		
	General Operation	Advanced Operation	Service
Unit Stop - Unit Auto switchover	X	X	X
Switchover dry product/liquid concentrate	X	X	X
Change concentration	X	X	X
Change active Ingredient liquid concentrate		X	X
Read parameter data	X		
Change parameter data		X	X
Carry out calibration		X	X
Read calibration data	X	X	X
Read info	X	X	X
Change language		X	X
Set date and time		X	X
Change system functions		X	X
Reset factory settings			X
Switchover flow measurement auto/manual			X
Change flow measurement pulse parameter			X
Activate Run. empty			X

## 9.4.2 Login

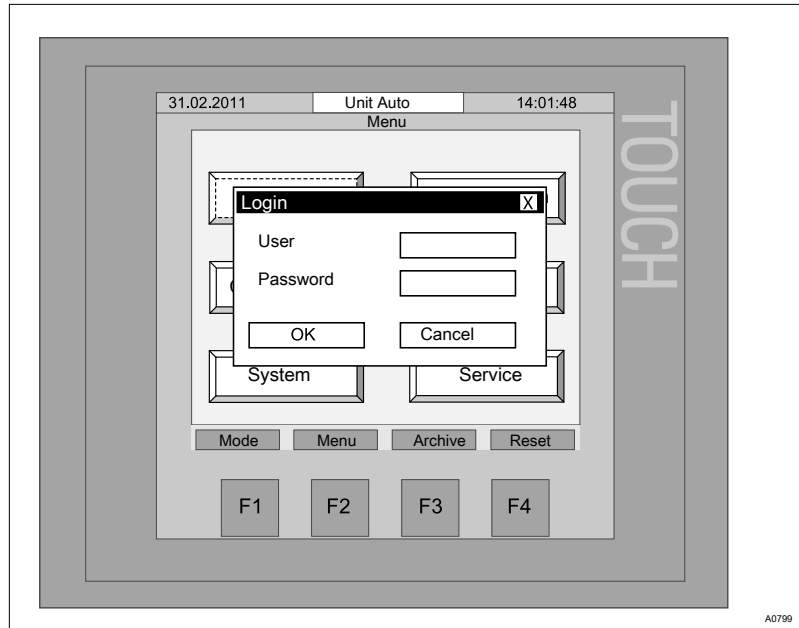


Fig. 14: User administration

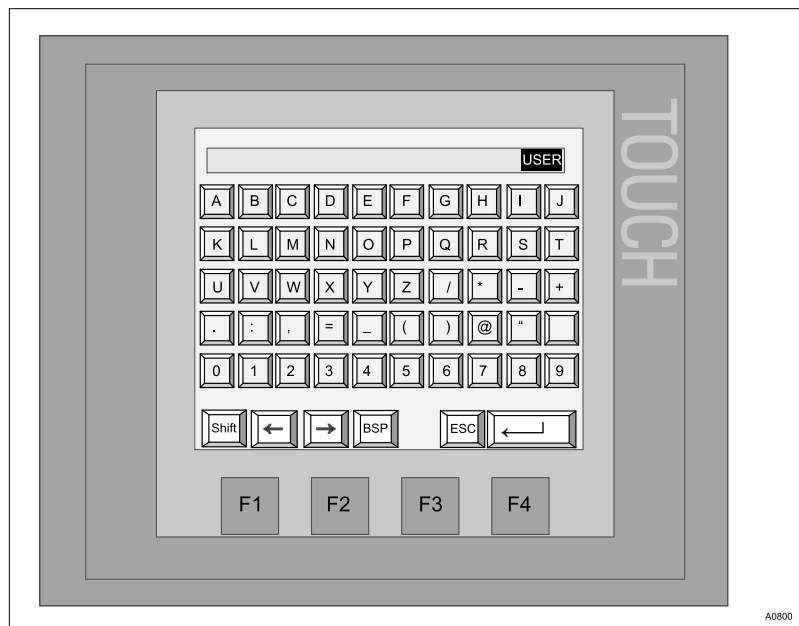


Fig. 15: Login screen keyboard

If you call a function on the touch panel, which requires higher user rights, the login window appears automatically for entry of user and password.

If you activate the *[User]* field, the screen keyboard appears and the user-name can be entered. After entry, the name is confirmed with the ↵-key.

Then, using the same approach, you can fill in the *[password]* entry field. The password is not displayed in plain text

## 9.5 Entering values on the touch panel

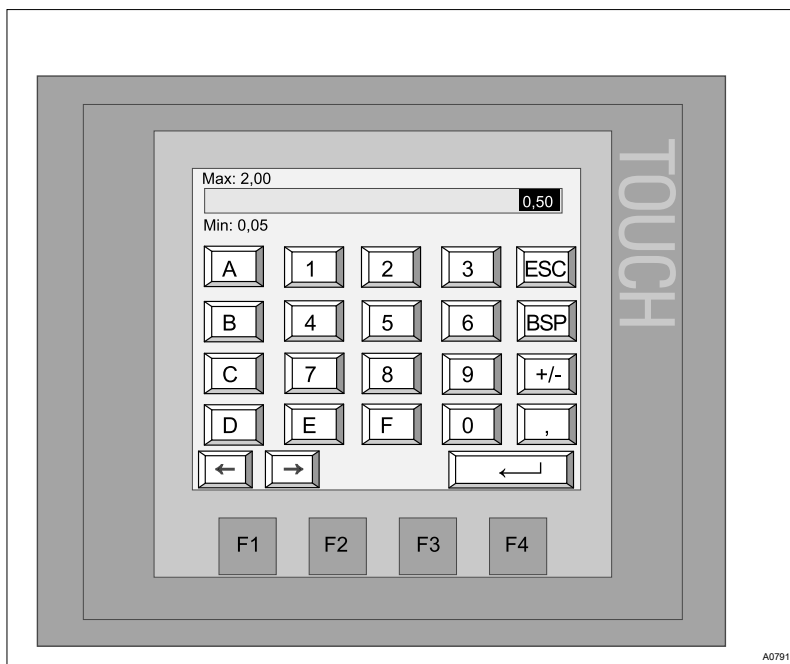


Fig. 16: Entering values on the touch panel

1. ➔ Touch an entry field on the touch panel
  - ⇒ The virtual keyboard appears for value entry.



*The MIN and MAX limits are displayed at the top left of the touch panel.*

2. ➔ Enter the desired value and press the ↵-Key
  - ⇒ The value set is transferred to the PLC.
3. ➔ To quit the menu, without saving the value, the ESC key must be pressed

## 9.6 Selecting the dosing product

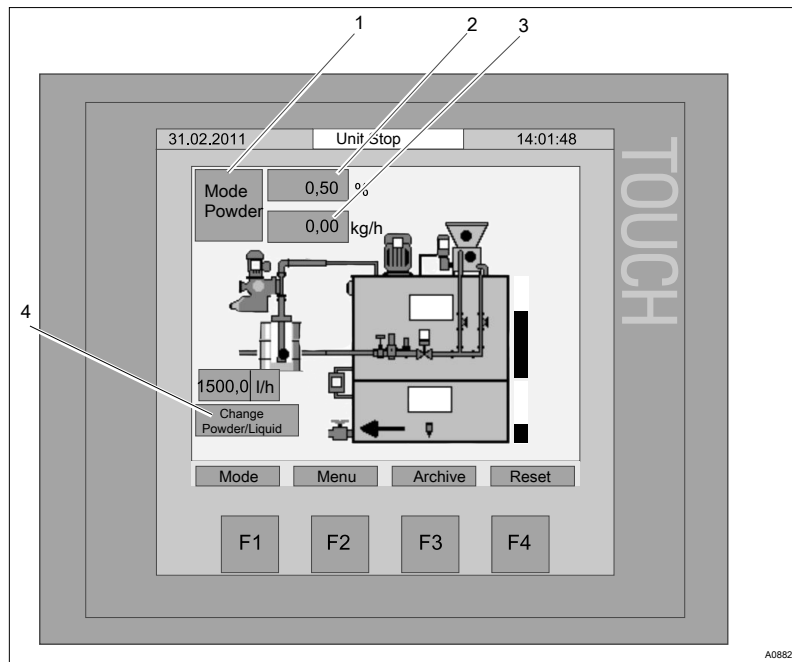


Fig. 17: Selecting the dosing product

- 1 Display of the currently used dosing product
- 2 Display of the concentration
- 3 Display of the feed rate
- 4 Button [Change Powder / Liquid]



*You can only change the dosing product with the system switched off, mode [STOP].*

*The change takes place via the button [Change Powder / Liquid] (2).*

*The current status (1) is displayed at the top left of the display.*



## 9.7 Remote Operation

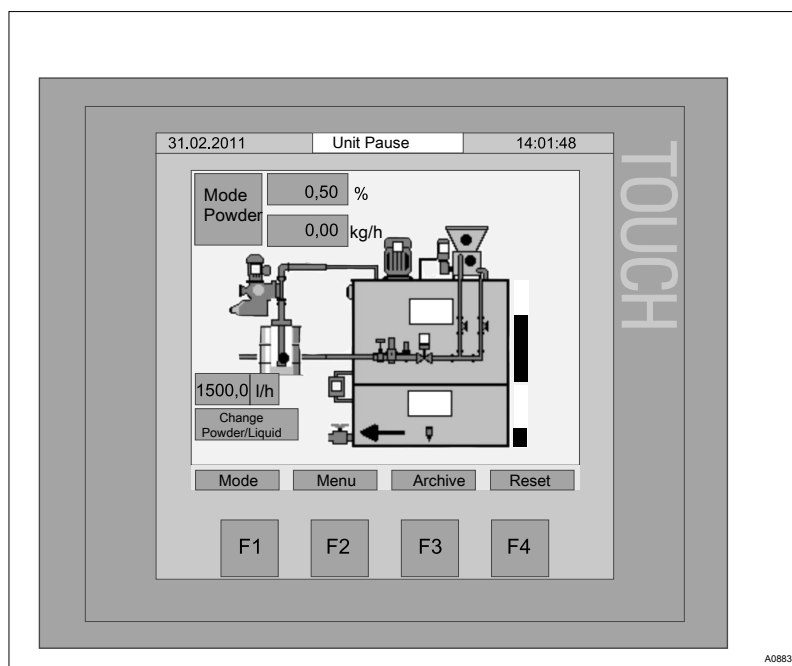


Fig. 18: System in operating mode [PAUSE]

The Ultramat can be set to the operating mode [PAUSE] using an external switch.

During operating mode [PAUSE], no new preparation can be started. The content of the bottom chamber can be extracted down to the level [Min Min].

## 9.8 Jump to the Archive [F3]

The function key [F3] is used to jump to the [Archive]. The last 100 faults are saved in the archive. These faults can then be called up for troubleshooting using the function key [F3].

## 9.9 Level display

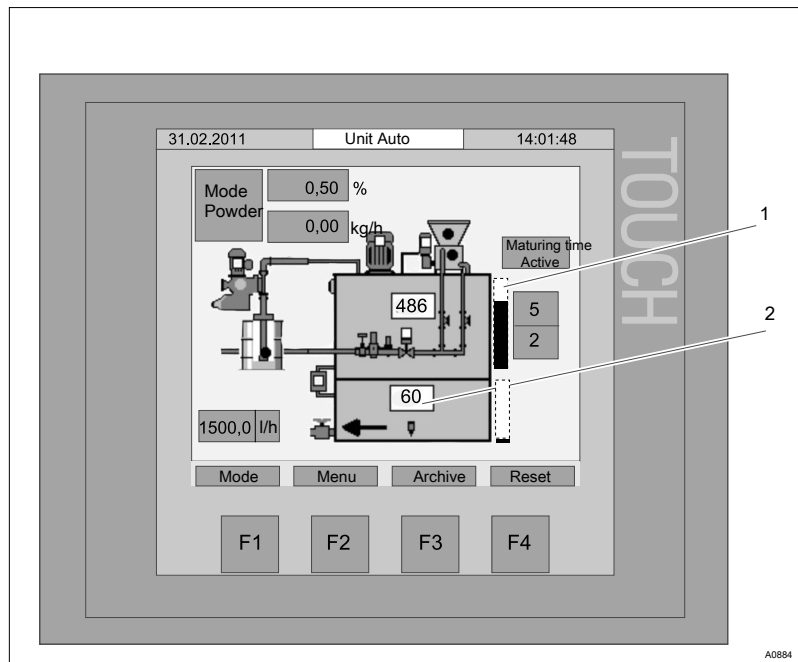


Fig. 19: Level measurement

- 1 Bar indicator of the current level
- 2 Current level in [mm]



### NOTICE!

**Incorrect measurement due to contamination of the pressure sensor**

To avoid incorrect measurements, the pressure sensor must be cleaned during system maintenance.

Level measurement takes place using pressure sensors. The [mBar] to [mm] conversion takes place in the PLC.

## 9.10 Water supply

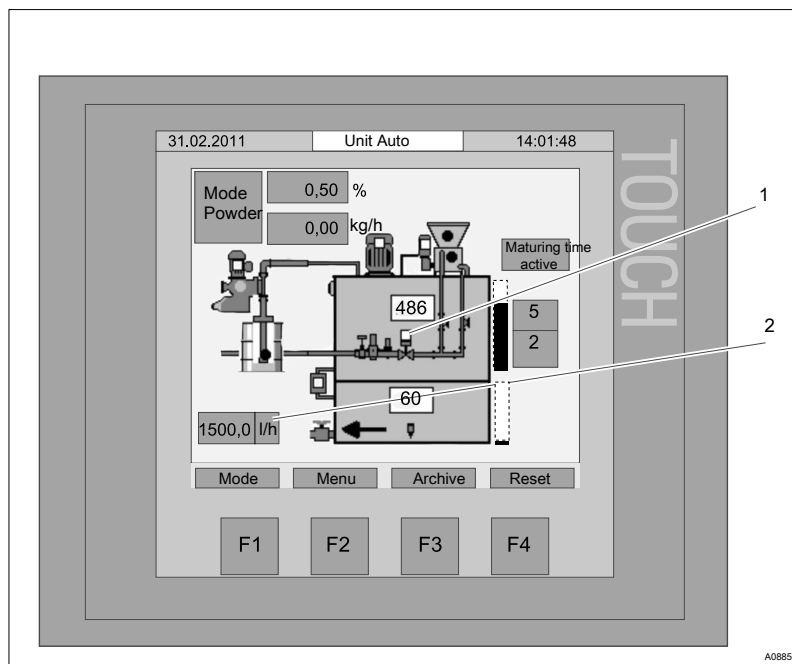


Fig. 20: Water supply

- 1 Process water solenoid valve display (white = off // black = on)
- 2 Process water flow volume in [l/h]

The flow volume is measured using a pulse encoder in the water fitting. The flow volume is monitored. If the limit value (adjustable in the parameter menu) is undershot, a warning is first output. If the flow volume is not increased above this limit value, then the system switches to fault mode and the preparation process is interrupted.



*If flow measurement does not function, the system can be operated with a preset value. You can find the setting for this in the service menu.*

## 9.11 Redilution

This function is used by the control to monitor a downstream redilution unit. For this, the running signal of the transfer pump is signalled via a potential-free contact. Additionally, the control has an input, which monitors a limit switch in the water supply line. If the limit switch is not active '5 s' after switching on of the pump, a fault message appears on the touch panel and the fault indicating relay triggers.

## 9.12 Operating mode MANUAL



### NOTICE!

This operating mode is only for service technicians. To avoid damage to the system, only service technicians may operate the system in [MANUAL] operating mode.

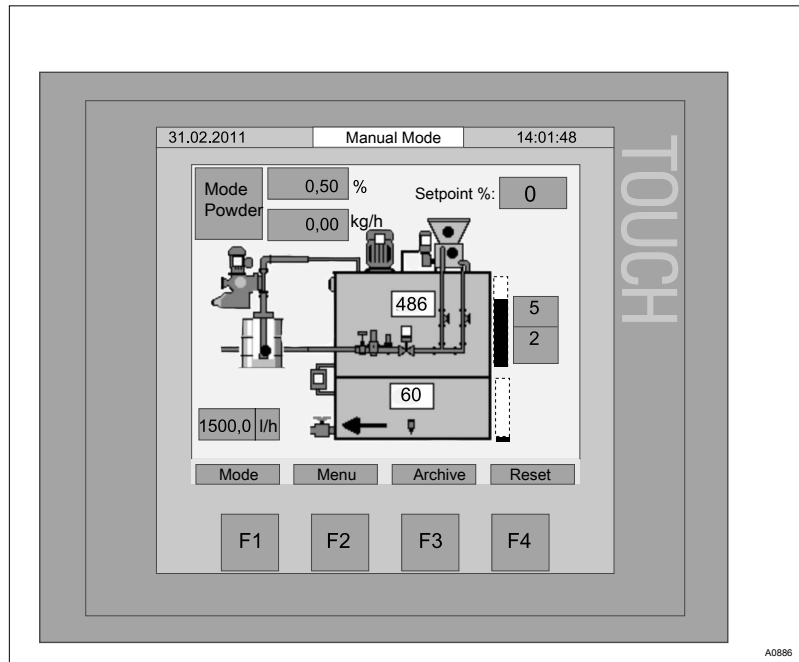


Fig. 21: Operating mode [MANUAL]

In [MANUAL] operating mode, it is possible to switch the individual drives on and off independently. To switchover to operating mode [MANUAL] press the [MODE] key in the start screen and then the [MANUAL] key.

You can switch the individual drives on manually. To do this, you must touch the points corresponding to the drives on the touch panel. If a drive is activated, the drive point is lighted up in black. If a drive is deactivated, the drive point is lighted up in white.

On the screen shown above, it is possible to activate the following drives in [MANUAL] operating mode:

- Switch on/off the solenoid valve for the water supply
- Switch the stirrer on/off
- Switch the liquid concentrate pump on/off
- Switch the dry feeder on/off

## 9.13 Maturing time



*You can set the duration of the maturing time in the parameter menu under the corresponding dosing product.*

*The maturing time for powder and liquid concentrate can be set differently.*

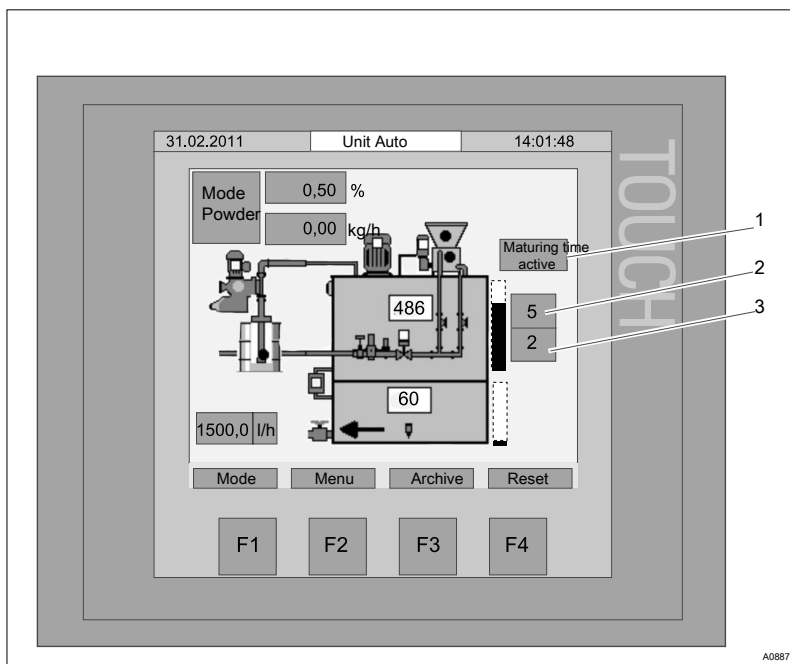


Fig. 22: Maturing time

- 1 Maturing time active (flashing text field)
- 2 Total maturing time
- 3 Elapsed maturing time

Depending on the dosing product, a maturing time may be necessary which the polymer requires to become usable. The maturing time elapses before the top chamber can be emptied into the bottom chamber.

If the product has a long maturing time, then the throughput volume of the system can be reduced.

## 10 Operating Menu [F2]

The function key [F2] is used to jump to the [Menu]. Further settings can be made in the menu.

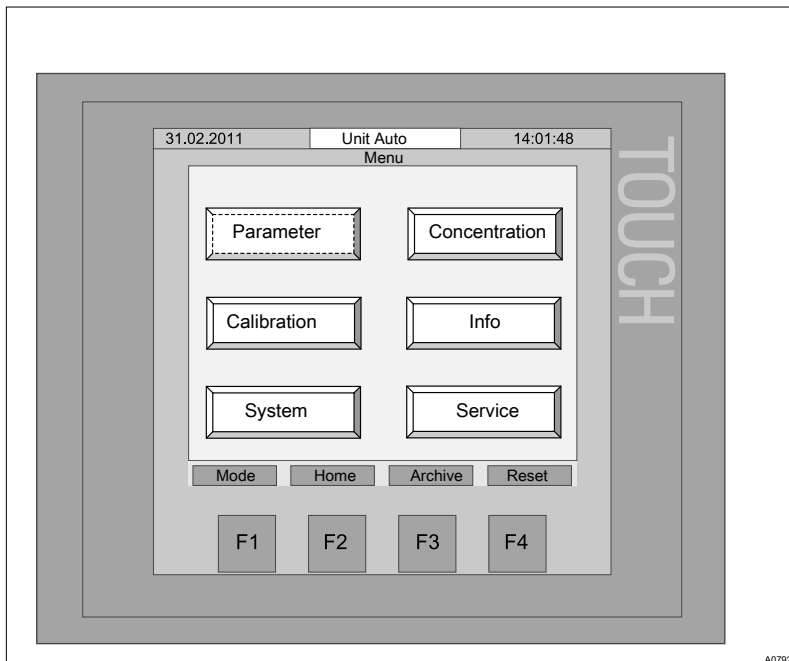


Fig. 23: Jump to the menu

Parameters	refer to ↗ Chapter 10.1 'Parameters' on page 46
Calibration	refer to ↗ Chapter 10.2 'Calibration' on page 52
System	refer to ↗ Chapter 10.3 'System' on page 57
Concentration	refer to ↗ Chapter 10.4 'Concentration' on page 60
Info	refer to ↗ Chapter 10.5 'Information' on page 61
Service	refer to ↗ Chapter 10.6 'Service' on page 63

### 10.1 Parameters

The parameters can be set for the following fields

- Water
- Stirrer
- Level (pressure sensors)
- Powder
- Liquid

## 10.1.1 Parameter [WATER]

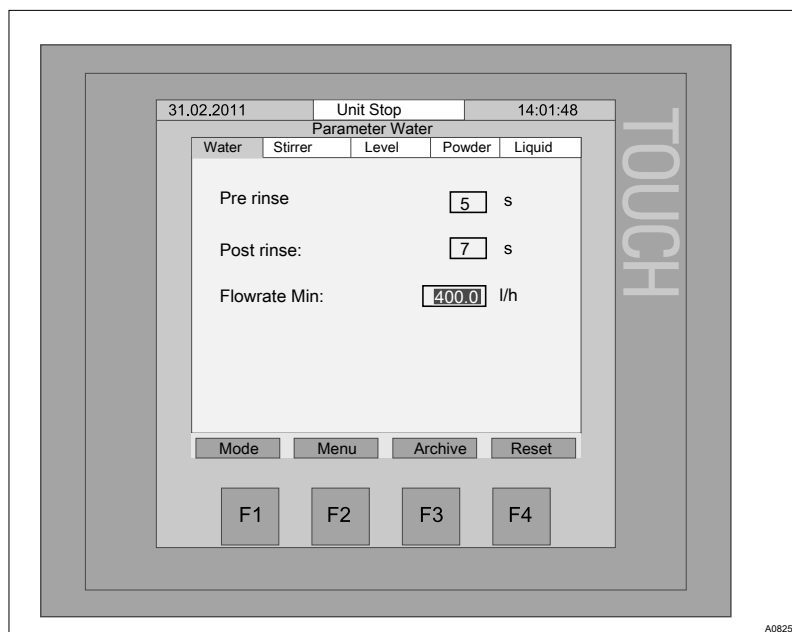


Fig. 24: Parameter [WATER]

Parameter	Factory setting	Adjustment range
Pre rinse	7 s	1 - 30 s
Post-rinse	5 s	1 - 30 s
Min. water supply	See table <a href="#">↗ Table on page 47</a>	0 - 200000 l/h

Ultromat	Water supply	Min. water supply
400	1600	400
1000	4000	1000
2000	8000	2000

If the current water supply is lower than the set minimum water supply, the system generates a warning: *[Warning: Water supply too low.]*

If the current water supply remains lower than the set minimum water supply, then after 20 seconds the system generates a fault message: *[Fault: Water supply too low. Ultromat set to stop.]* The Ultromat interrupts the preparation operation.

## 10.1.2 Parameter [Stirrer]

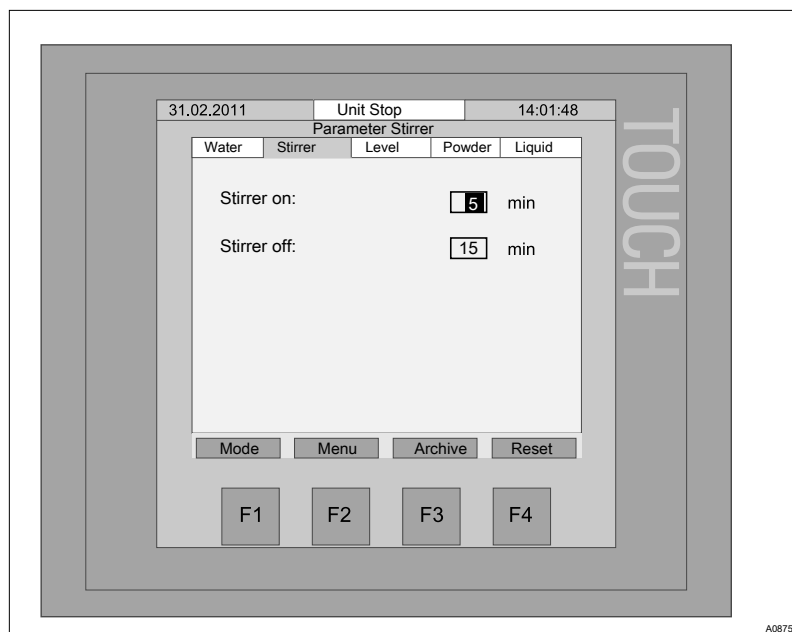


Fig. 25: Parameter [Stirrer]

After the preparation operation, the stirrer can continue running in *[Pulse/Pause mode]*. You can set the parameters for the switching on and off times as follows:

Parameters	Factory setting	Setting range
Stirrer on	5 minutes	5 - 60 minutes
Stirrer off*	15 minutes	0 - 60 minutes
* Continuous operation: Stirrer off = 0 minutes		



## 10.1.3 Parameter [Powder]

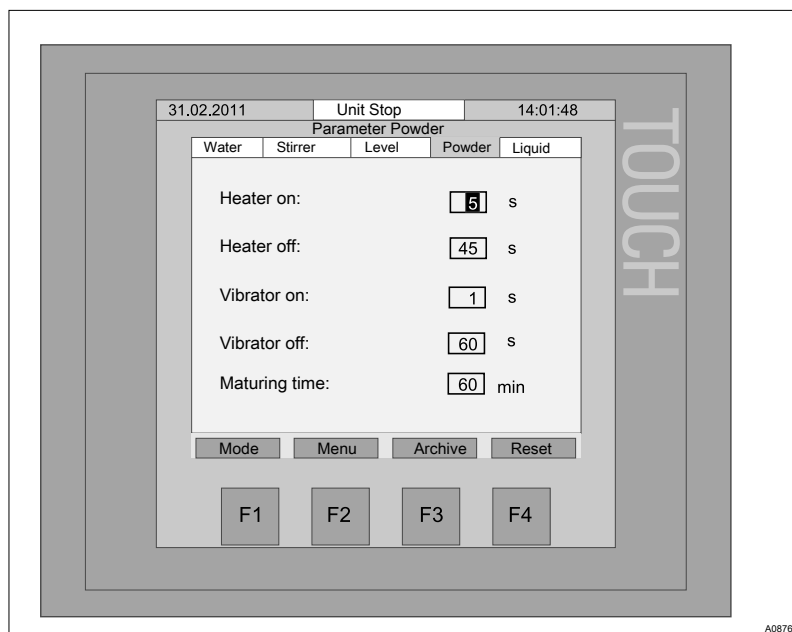


Fig. 26: Parameter [Powder]

A metering pipe heating system also removes any moisture that has penetrated the unit and thus prevents any caking of the powder.

The vibrator prevents the forming of bridges in the dry feeder.

Parameter	Factory setting	Adjustment range
Heater on	5 s	1 - 10 s
Heater off	45 s	30 - 100 s
Vibrator on	1 s	0 - 30 s
Vibrator off	60 s	0 - 999 s
Maturing time	5 min	0 - 100 min

## 10.1.4 Parameter [Liquid]

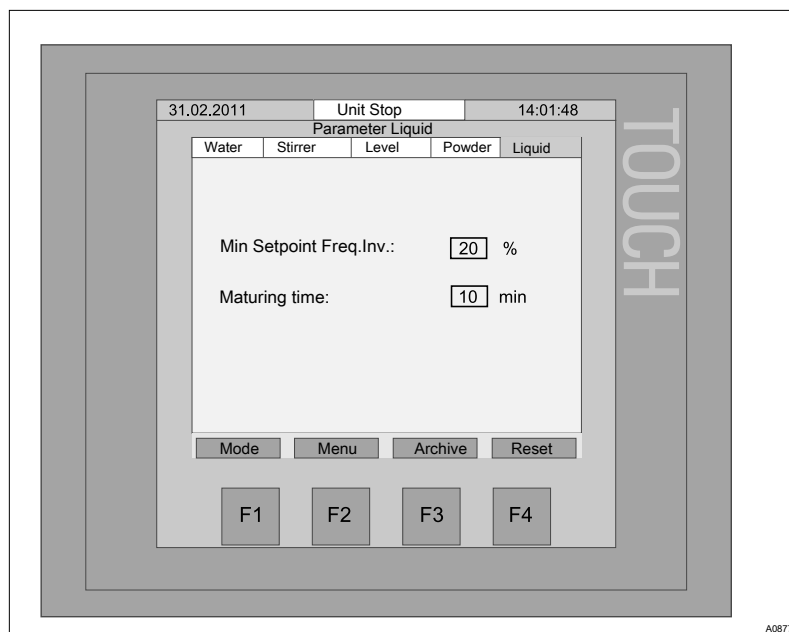


Fig. 27: Parameter [Liquid]

Parameter	Factory setting	Adjustment range
Min. setpoint frequency converter	20 %	0 – 50 %
Maturing time	5 min	0 - 100 min



### **Concentrate pump minimum frequency**

The liquid concentrate pump should be equipped with an external fan so that the pump can be operated without limitations in the range from 0 to 86 Hz.

If a liquid concentrate pump is used without an external fan, the winding of the pump motor must be protected against overheating at low speeds. A minimum frequency is set accordingly. If the actual frequency of the liquid concentrate pump is lower than the set concentrate pump minimum frequency for a period > 5 seconds, then the system generates a fault message.

[Warning: Liquid concentrate pump - min. capacity reached] and the liquid concentrate pump continues running at the set minimum frequency.

Counter measure: Increase the water flow rate or the desired concentration.

## 10.1.5 Parameters [Level]

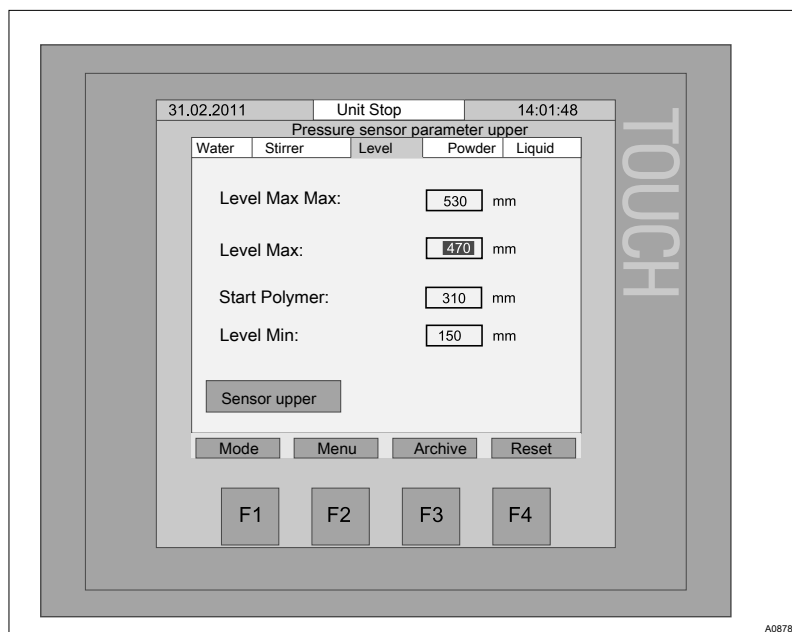


Fig. 28: Parameters [Level], sensor top

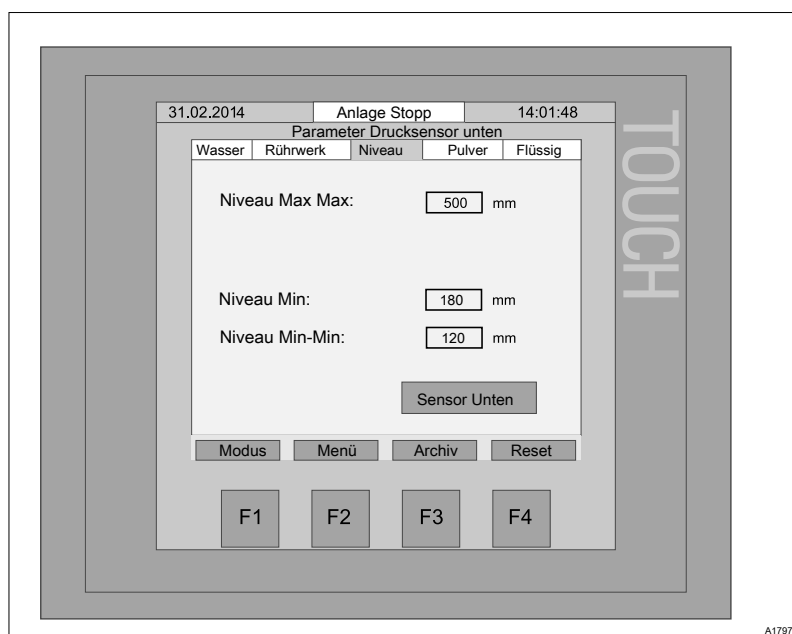


Fig. 29: Parameters [Level], sensor bottom

Parameters	Remark
Level Max Max [upper/lower]	The [Level Max Max] is used to monitor for overfilling. If overfilling occurs, an [Overfill] alarm is signalled.
Level Max [upper]	If the [Level Max] is exceeded, Ultromat preparation is stopped.
Level Min [upper]	If the [Level Min] is undershot, Ultromat preparation is started.
Start Polymer [upper]	If the [Level Start Polymer] is undershot, polymer metering and also the stirrer is started.

Parameters	Remark
Level Min [lower]	If the [Level Min] is undershot, the top storage tank is emptied into the bottom tank.
Level Min Min [lower]	If the [Level Min Min] is undershot, an alarm message appears and the release for extraction is cancelled.

### Upper switching level of the doubledecker system:

ULDa upper	400	1000	2000
Max-Max	530	880	1160
Max	470	820	1090
Start Polymer	310	400	480
Min	150	150	260
All values given in millimetres			

### Lower switching level of the doubledecker system:

ULDa lower	400	1000	2000
Max-Max	500	810	1100
Min	180	130	260
Min-Min	120	80	160
All values given in millimetres			

## 10.2 Calibration

The calibration menu is for calibration of the following fields:

- Calibration Powder
- Calibration Liquid
- Calibration Flow monitor
- Calibration Water

Before the first switching on of the system in automatic mode, you must calibrate the dry feeder and the liquid concentrate pump. The system must be switched off during calibration. Unit [Stop]. If you have not yet calibrated the system and you switch the system to [AUTO] mode, then the following message appears on the display  
[Fault: Dry feeder not calibrated] or Fault:  
[Liquid concentrate pump not calibrated] and the system switches to [FAULT] mode.

## 10.2.1 Calibration Powder

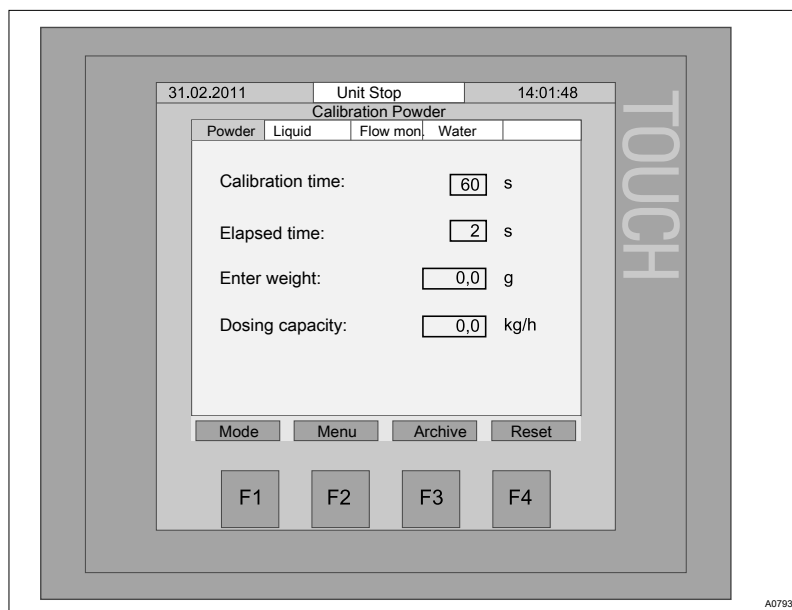


Fig. 30: Dry product calibration

Parameter	Factory setting	Adjustment range
Enter calibration time	60 s	0 - 999 s
Enter weight	-	99999.9

## Carry out calibration

**Interrupting the calibration**

You can end the calibration at any time by pressing the [STOP] key.

## Materials required:

- Weighing scales
- PE bag (capacity min. 500 g)

1. ➤ Loosen the screw fastenings to remove the wetting cone
2. ➤ Hold a PE bag (min. fill-volume 500 g) beneath the feeder screw pipe
3. ➤ Start the calibration by pressing the [START] key.
4. ➤ Wait until the calibration time has elapsed
5. ➤ Weigh the feed chemical caught in the PE bag
6. ➤ Enter the determined weigh as the [ENTER WEIGHT] parameter in the control
  - ⇒ The capacity is recalculated and displayed as the parameter [CAPACITY] in [kg/h]
7. ➤ Refit the wetting cone once the dry feeder has been calibrated

## 10.2.2 Calibration liquid concentrate

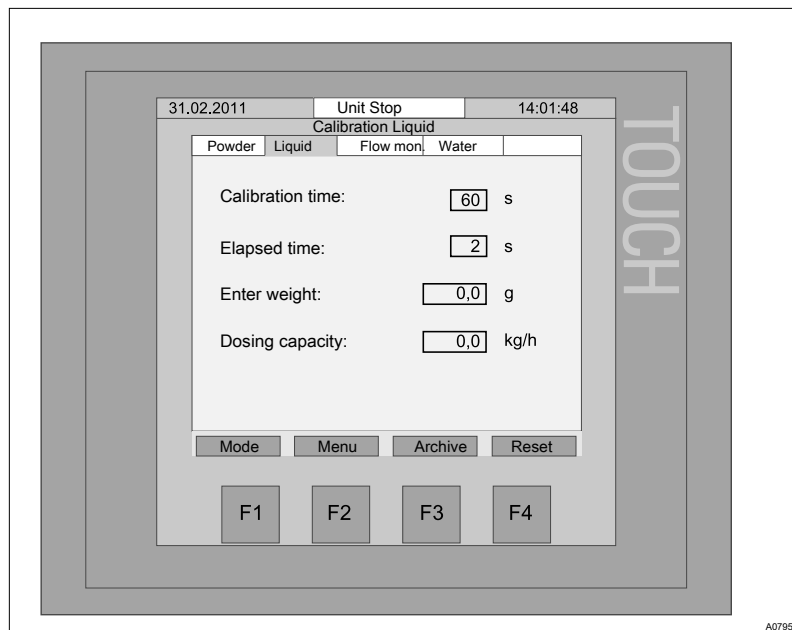


Fig. 31: Calibration liquid concentrate

Parameter	Factory setting	Adjustment range
Enter calibration time	60 s	0 - 999 s
Enter weight	-	99999.9

## Carry out calibration

**Interrupting the calibration**

You can end the calibration at any time by pressing the [STOP] key.

## Materials required:

- Weighing scales
  - Collecting vessel (fill-volume min. 1 l)
1. Determine the net weight of the collecting vessel
  2. Open the metering line at a suitable point
  3. Hold the collecting vessel beneath the opening in the metering line
  4. Start the calibration by pressing the [START] key.
  5. Wait until the calibration time has elapsed
  6. Weigh the captured amount of liquid concentrate
  7. Enter the determined weigh as the [ENTER WEIGHT] parameter in the control
    - ⇒ The capacity is recalculated and displayed as the parameter [CAPACITY] in [kg/h]
  8. Close the metering line so that it is again leak-tight

### 10.2.3 Calibration Flow monitor ("Spectra" only)



*Before the first switching on of the system in automatic mode, you must calibrate the liquid concentrate pump and then the flow monitor.*

*The system must be switched off during calibration. Unit [Stop].*

*If you operate the system for longer than 20 seconds beneath the switching point for the minimum metering quantity, then the following message appears on the display [Fault: Check liquid concentrate flow sensor] and the system switches to [FAULT] mode.*

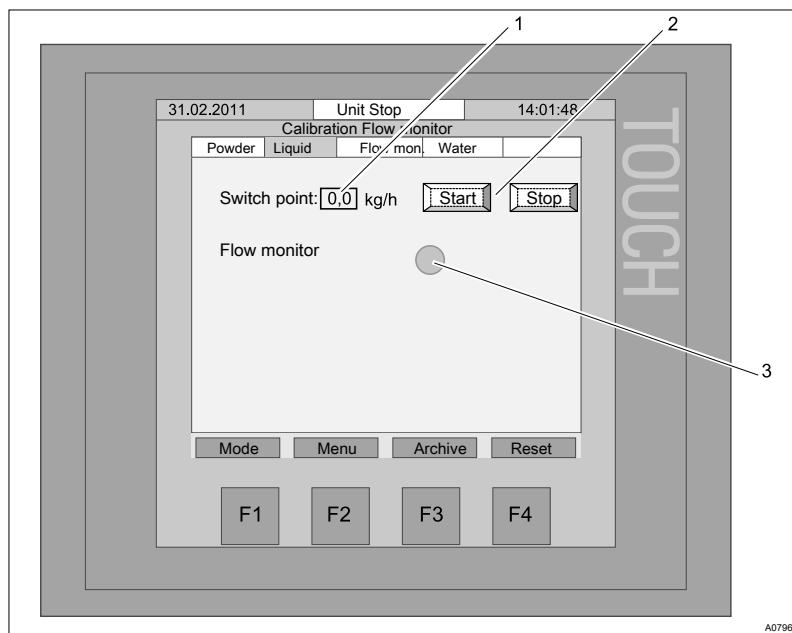


Fig. 32: Calibration flow sensor

- 1 Enter the metering quantity in [kg/h]
- 2 [START/STOP] the liquid concentrate pump with entered metering quantity
- 3 Display of the [flow sensor] signal; white=switch point undershot // grey=switch point exceeded

Parameter	Factory setting	Adjustment range
Switching point	-	0 to maximum capacity of the liquid concentrate pump

#### Carry out calibration



#### **Interrupting the calibration**

*You can end the calibration at any time by pressing the [STOP] key.*

1. Enter the metering quantity which corresponds to the minimum metering quantity during standard operation in Text field (1)
2. Start the liquid concentrate pump using the button [START] (2)

3. ➤ If the liquid concentrate pump is running with the set frequency, you can set the switching point of the flow sensor using the potentiometer on the flow sensor.
  - ⇒ The flow sensor is set correctly, if the switching point is just below the minimum dosing quantity in standard operation. The *[Flow sensor]* signal display (3) changes from grey to white.
4. ➤ Stop the liquid concentrate pump using the button *[STOP]* (2)

## 10.2.4 Calibration Water



*You must adjust the Ultromat water supply during commissioning. Ultromats with one wetting cone have two water supply lines. You must distributed these water supplies using needle valves so that the wetting cone is not over- or under-filled (1 cm below the lower overflow edge).*

Ultromat	Water supply
400	1600
1000	4000
2000	8000

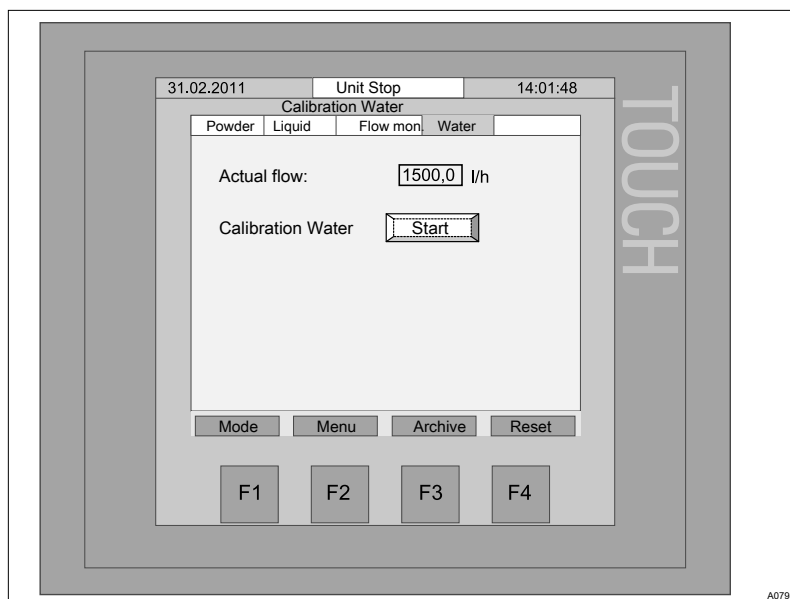


Fig. 33: Calibration Water

### Carry out calibration



#### **Interrupting the calibration**

*You can interrupt the calibration at any time by pressing the *[STOP]* key.*

1. ➤ Start the calibration using the button *[START]*
  - ⇒ The water solenoid valve opens.
2. ➤ Adjust the water supply so that the water supply value is displayed in *[l/h]* is displayed in the display
3. ➤ Stop the calibration using the button *[STOP]*
  - ⇒ The water solenoid valve is closed.



## 10.3 System

The "System" menu allows setting of the following fields:

- Language
- Date and time
- Touch Panel

### 10.3.1 Changing the language

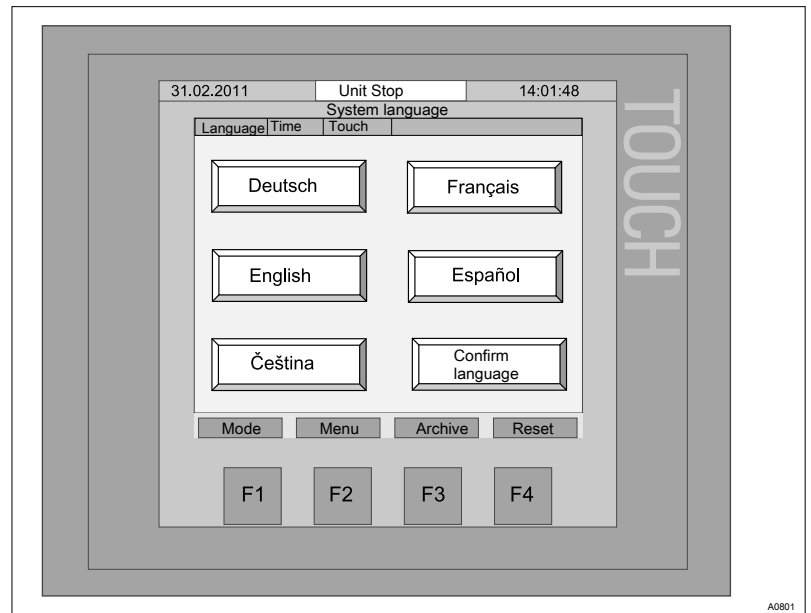


Fig. 34: Changing the language

To change the displayed language, you must proceed as follows:

1. ➤ Select the desired language
2. ➤ Touch the button *[Confirm language]*
  - ⇒ The message *[shutting down]* is displayed.
3. ➤ Touch the button *[Start]*
  - ⇒ The selected language is active.

### 10.3.2 Setting date and time

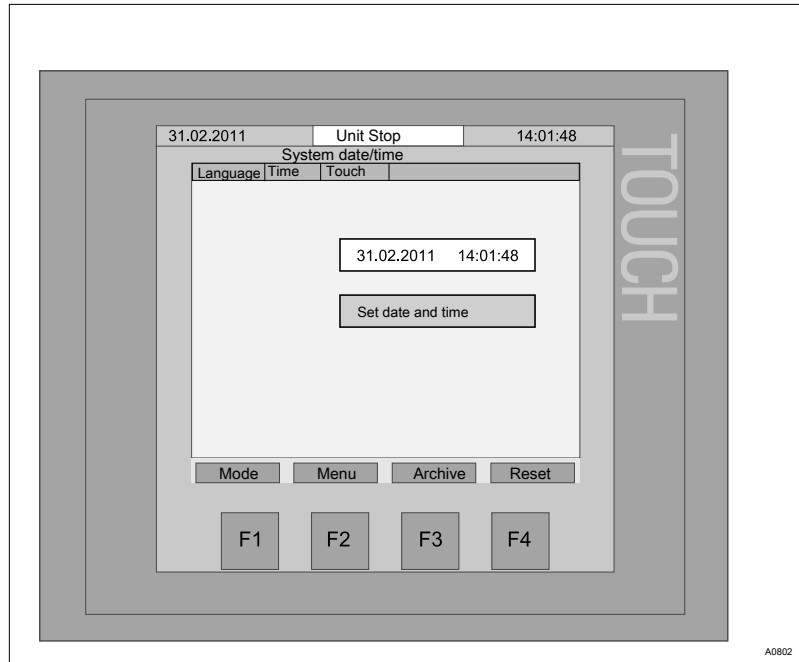


Fig. 35: Setting date and time

The date and time are set as follows:

1. ➤ Touch the button on which the time is displayed  
⇒ The display changes to the value input view.
2. ➤ Press [BSP] to delete the displayed date
3. ➤ Using the keys [0-9] enter the actual date in the format [dd.mm.yyyy]. Example: 31.02.2011



Decimal point = Key above the [0]

4. ➤ Enter empty spaces, to do this touch the key to the right of [0]
5. ➤ Enter the time in the format [hh:mm:ss]. Example: 14:01:48



Colon = press [+/\*] key, then confirm[:]  
Number pad = Press key [0-9]

6. ➤ Press the Enter key
7. ➤ Touch the button [Set date and time]  
⇒ The set time is accepted by the system.

### 10.3.3 Touch Panel

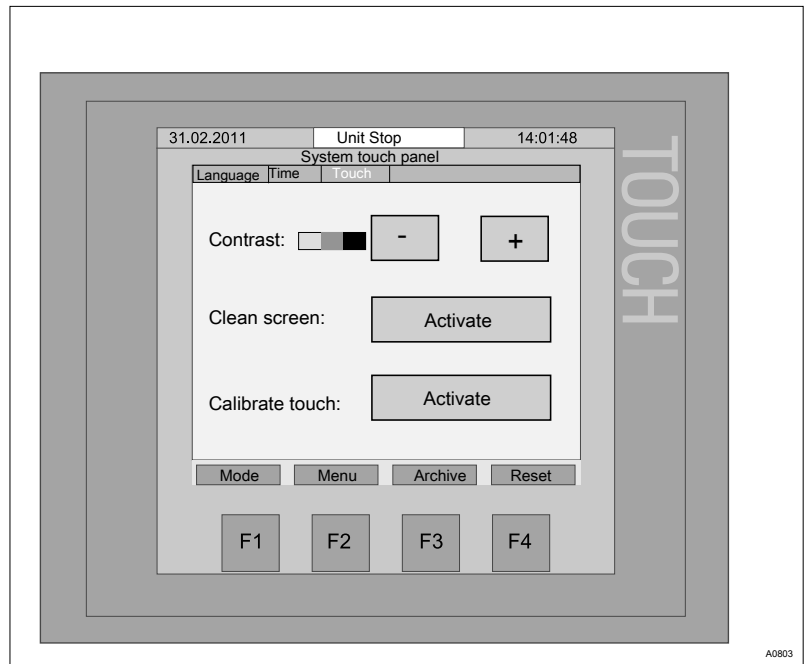


Fig. 36: Display [System]

#### Contrast:

You can set the touch panel contrast using the buttons **[+]** and **[-]**.

#### Clean screen:



*The function [Clean screen] is available to permit cleaning of the touch panel. Using the [Clean screen] function, the touch panel is deactivated for the set time and consequently cleaning of the touch panel is possible without inadvertently triggering functions.*

You can call the function **[Clean screen]** via the button **[Activate]**.

#### Calibrate touch:

You can call the function **[Calibrate touch]** via the button **[Activate]**. This is for renewed calibration of sensors if the touch function is insufficiently accurate.

1. ➤ Press **[Activate]**
2. ➤ Touch the displayed cross five times with the finger
3. ➤ Touch the touch panel once more so that the calibration value is accepted

## 10.4 Concentration



If the PROFIBUS® or PROFINET® are included in the scope of supply, the [Concentration] and the [Intern] / [Extern] keys appear on the display. In [Intern] mode, the setpoints for the concentration (Powder and Liquid) are specified by the control panel. The process management system can only read data. In [Extern] mode, the setpoints for the concentration are specified by the process management system. Additionally in [Extern] mode, the Ultromat can be switched to Pause and a fault acknowledged using the profibus. Further information is available in the supplementary PROFIBUS® or PROFINET® instructions. If the PROFIBUS® or PROFINET® are not connected, select the [Intern] setting.

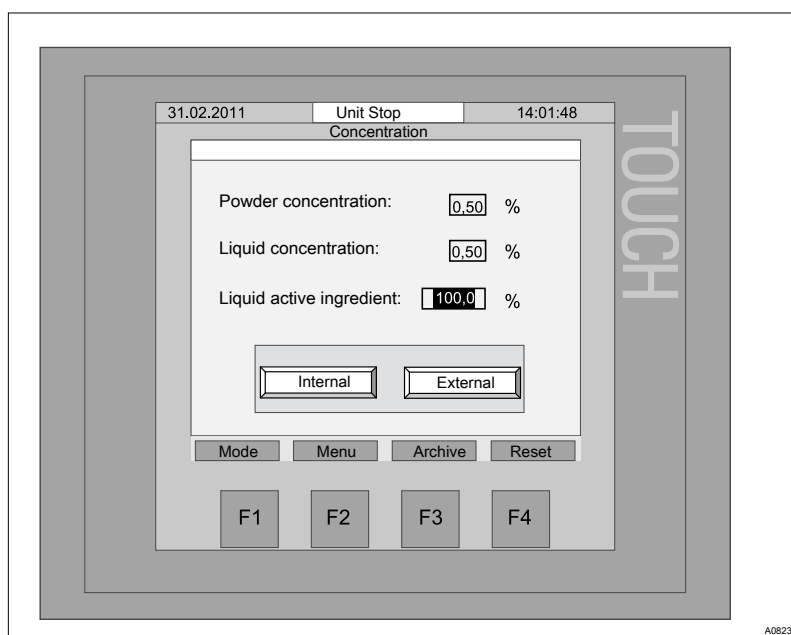


Fig. 37: Concentration Powder / Liquid

Parameters	Factory setting	Setting range
Powder concentration	0.5 %	0.05 - 2.00 %
Liquid concentration	0.5 %	0.05 - 2.00 %
Liquid active ingredient	100 %	10 - 100 %
PROFIBUS® /PROFINET® (Intern / Extern)	Intern	Intern or Extern



The parameters [Powder/Liquid concentration] can be used to adjust the concentration of the prepared polymer solution set in the Ultromat. The parameter [Liquid active ingredient] specifies how high the content of the active ingredient is in the liquid polymer.



#### **Liquid active ingredient**

The liquid polymers are provided with different active ingredients. If the active ingredient content of the powder is 100 %, then the active ingredient fraction of the liquid polymer is generally in a range below 50 % (typically 40 %).

In practice it is generally desirable to use the same concentrations settings with the liquid polymer as for the powder product. Therefore the concentration of active ingredient in the liquid polymer (typically 40 %) is entered in the control.

## 10.5 Information

### 10.5.1 Ultromat Identity code

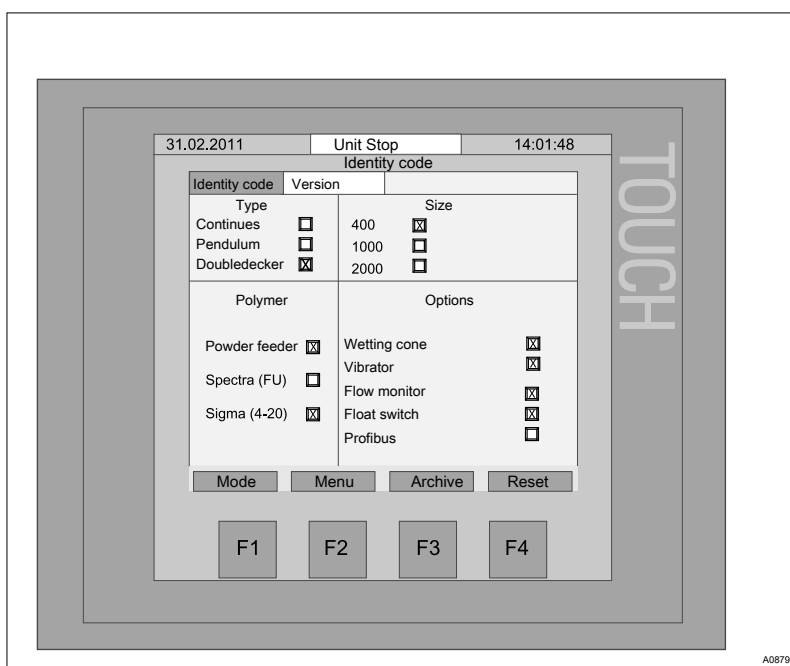


Fig. 38: Ultromat Identity code

By pressing F2 [MENU] > [INFO] you can access the [Identcode] screen. Here you can read-off with which features the Ultromat is equipped.

Feature	Note
Wetting cone	The wetting cone should improve the mixing of polymer and water.
Vibrator	Only in the 'dry feeder' version. The vibrator is to improve the sliding down of the polymer.
Flow monitor	Only in the 'Spectra (FC)' version. Monitors the flow of liquid concentrate in the line.

Feature	Note
Float switch	Only in the 'Liquid' version. Monitors the liquid level of the liquid concentrate in the storage tank.
Profibus	Interface for data exchange

### 10.5.2 Software Version



Fig. 39: Software Version

In this display you can read-off the version of the touch panel and the S7 project as well as its creation date. Likewise the system project number can be read off.

## 10.6 Service

### 10.6.1 Service

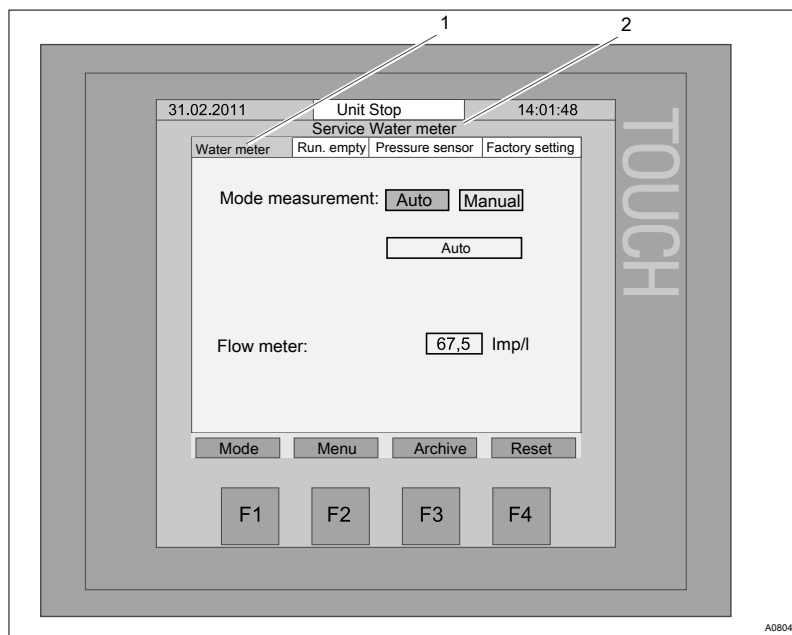


Fig. 40: Service

- 1 Button for jumping to the various service groups
- 2 Title of the current service group

#### 10.6.1.1 Service - Water meter

##### Manual flow entry:

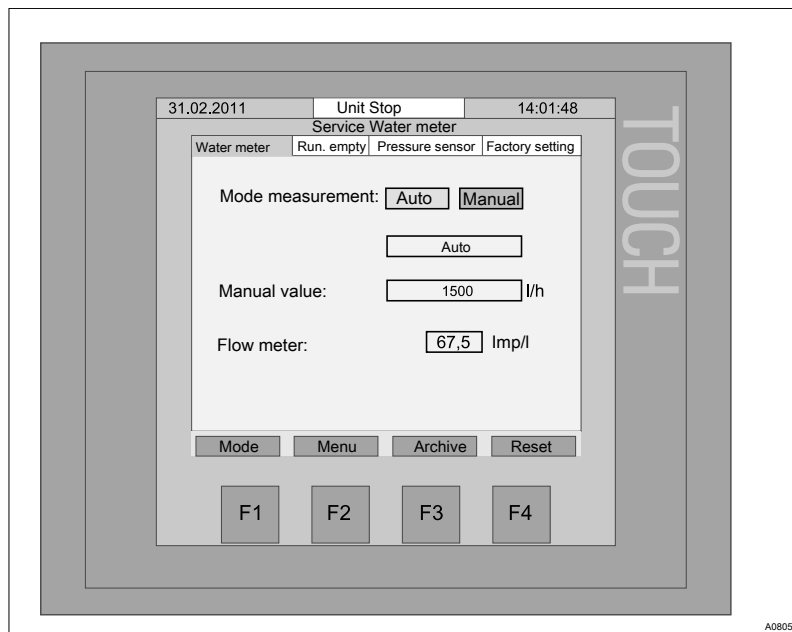


Fig. 41: Manual flow entry

In the event of failure of the automatic water flow measurement, you can switch to manual flow measurement for emergency operation. This means automatic measurement is out of service.

This is helpful if the flow meter is defective, but the system is to remain in operation until the function is restored. The value for the manual setting of the water flow is entered in [litres per hour] and is activated by the key [Manual].

### Flow meter:

The flow volume is measured using a pulse encoder. This encoder gives a *[number of pulses per litre]* of water. This field is used to enter the correct pulse number when using different pulse encoders.

### 10.6.1.2 Service running empty

#### Running empty:



*The system cannot be run empty in [Unit Auto].*

*You cannot run the system empty in automatic mode. If the third chamber is empty, it is immediately refilled.*

*Therefore to run empty, you must switch off automatic mode.*

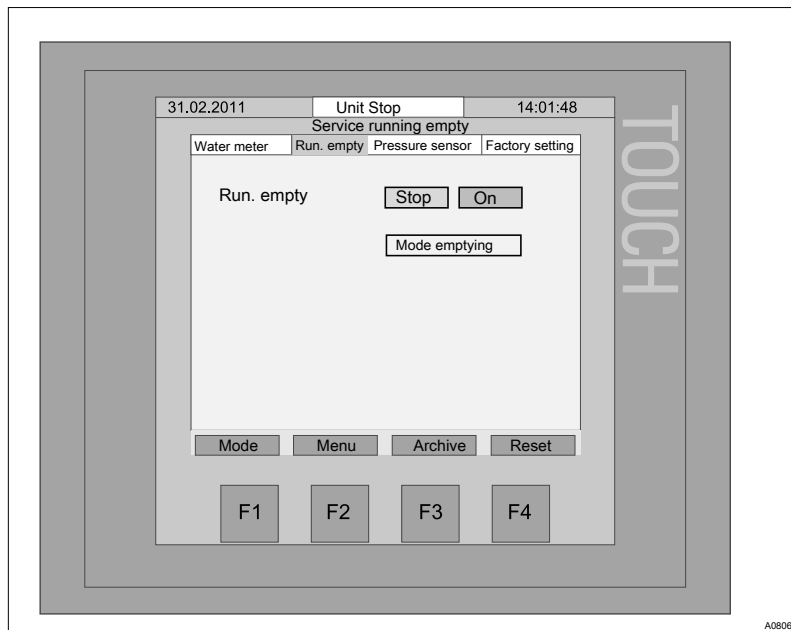


Fig. 42: Service running empty

1. First you must switch the system to *[Unit Stop]* via the start menu
2. Then in the *[Service]* menu you must switch the parameter *[Run. empty]* to *[On]*
  - ⇒ Now you can safely empty the storage tank down to the dry running level.



*If you switch to [Unit Auto], the function [Run. empty] becomes inactive.*



## 10.6.1.3 Service - pressure sensor

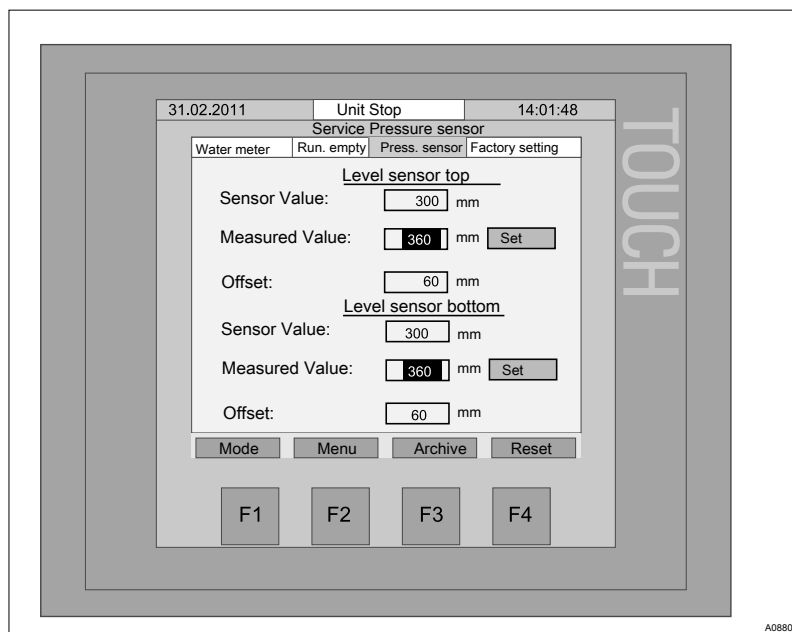


Fig. 43: Service - pressure sensor

**Sensor Value:**

The *[Sensor Value]* contains the measured filling height of the storage tank. It does not represent the actual filling height. So that the correct filling height can be displayed, you must add the dead zone in the lower part of the storage tank (approx. 60 mm) to the *[Sensor Value]*.

**Measured Value:**

To determine the dead zone of the storage tank, you must fill the storage tank to at least 50 %. Now you can measure the filling height with a dip stick. You must enter this value in *[mm]* in the text field *[Measured Value]*.

The offset is calculated by the pressing the button *[Set]*.

**Offset:**

Display of the current offset (offset = dead zone).

Measured Value = Sensor Value + Offset

### 10.6.1.4 Service - Reset

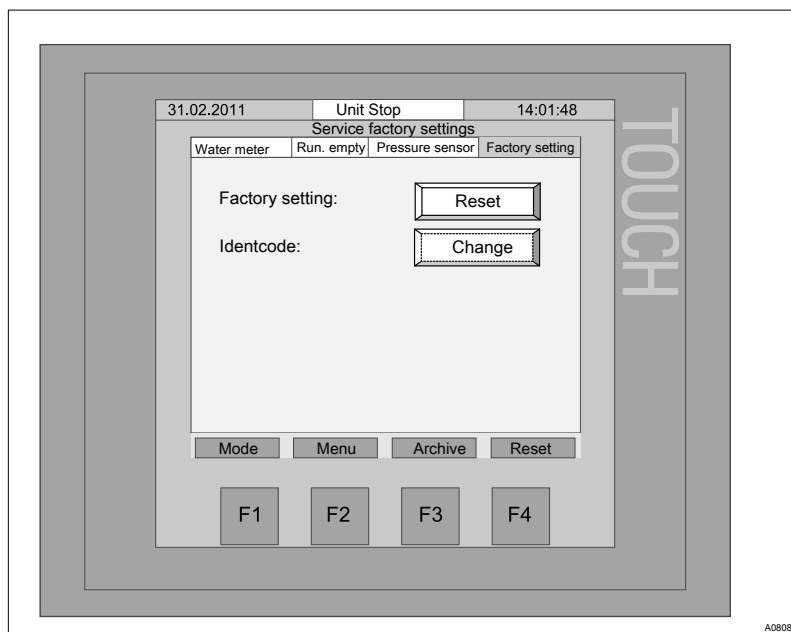


Fig. 44: Service - Reset

#### Factory setting:

You reset the parameters of the Ultramat to the factory settings via the *[Reset]* button.

#### Identcode:



#### NOTICE!

Incorrect functions can arise, if the incorrect identcode (identity code) is entered.

The function is password protected.

You can change the identity code via the button *[Identcode]*.

## 11 Operation of the system

User qualification, system operation: trained user, see [Chapter 2.3](#) 'Users' qualifications' on page 10



### **WARNING!**

#### **Danger of slipping**

Danger due to the escaping of water or polymer.

Mixtures of polymer and water are slippery

- Ensure that you have a secure foothold when filling the dry product hopper
- Immediately remove any spilled powdered polymer or leaked polymer solution
- Always observe the safety data sheet for the polymer used.

### 11.1 Normal mode

#### 11.1.1 Prerequisites for correct and proper operation



### **WARNING!**

#### **Danger due to system operation**

The system may only be operated by instructed personnel

- The system can in principle be stopped and restarted in every operating phase
- The cause of a fault should be eliminated before the corresponding fault message is acknowledged. However, you can silence the horn by pressing the key 'Horn off'.

Requirements:

- A reasonable operating parameter set-up
- An accurate calibration
- No unauthorised parameter changes to the frequency converter

#### 11.1.2 Refilling the feed hopper with powdered polymer

If the feed hopper is not automatically filled by a small feed unit, the supply of powdered polymer must be continuously checked and refilled in good time.

This can be done while the system is operational. To do so, remove the cover of the feed hopper and carefully shake in powdered polymer.

#### 11.1.3 Refilling the concentrate storage tank with liquid polymer

If the concentrate storage tank is not automatically refilled, the reservoir of liquid polymer must be continuously checked and refilled in good time.

## 11.2 Behaviour When Switching on Mains Power and in the Event of Mains Power Failure



### WARNING!

#### Automatic start-up

Each time mains power is switched on, the stirrers start up without regard to the system status measured

Each time mains power is switched on, preparation mode can commence.

Therefore keep all covers or inspection openings closed.

If it is necessary to work on the system, disconnect the system from the mains and secure it to prevent switching back on.

### Switching on mains power

Each time mains power is switched on, the stirrers start up without regard to the system status measured

By contrast, the system only starts in preparation mode if the Min. Switch point has been reached in reservoir 3. If there is a loss of mains power during preparation mode, even if only for a short period, once mains power is reconnected, preparation mode is not continued.

### Behaviour in the event of loss of mains power

Following a mains power failure, or in the event of a longer loss of mains power, which results in the controller being restarted, the controller will unrestrictedly continue with the operation of the system based on the statuses measured. If the level of the storage tank is within the normal range, no preparation operation will be started even if a preparation process was running prior to the interruption.

## 11.3 Decommissioning



### WARNING!

#### System transportation

Danger due to the high weight of the system.

If the system is to be moved, observe chapter without fail

### For a short period

➔ Press and hold key *[F1]*, and select *[Stop]* mode.

### For a longer period

1. ➔ Switch the main switch to 'Off'
2. ➔ Lock the main switch to prevent unauthorised switching back on of the system

For more than 2 days



#### CAUTION!

##### The liquid end and the lines can become blocked


When bringing back into service, the liquid polymer must not come into contact with rinsing water

Clear any rinsing water from the liquid end and lines

- Rinse the liquid end, the concentrate pump, the suction line and the discharge line
- Dismantle and dry the liquid end of the concentrate pump
- Clean the suction line and discharge line with suitable cleaning devices

1. ➤ Switch the main switch to 'Off'
2. ➤ Lock the main switch to prevent unauthorised switching back on of the system
3. ➤ Pull out the mains plug
4. ➤ Completely empty the powder feeder
5. ➤ Empty the storage tank through the provided connector
6. ➤ Carefully rinse the storage tank with water
7. ➤ Also rinse the rinsing apparatus (hopper and mixing device) once more with water
8. ➤ Carefully flush the line between the shut-off valve of chamber 3 and the feed pump. (Should an flushing connector have been installed, this will simplify flushing.)

## 11.4 Disposal of used parts

- **Users' qualification:** instructed persons, see  *Chapter 2.3 'Users' qualifications' on page 10*



#### NOTICE!

##### Regulations governing disposal of used parts

- Note the current national regulations and legal standards which apply in your country








ProMinent Dosiertechnik GmbH, Heidelberg will take back decontaminated used devices providing that they are covered by adequate postage.

## 12 Incorrect Operation of the System

- The incorrect position of the discharge valves can result in malfunction
- The incorrect position of the shut-off valves in the water supply line can result in malfunction
- Unauthorised persons must be prevented from entering or changing operating parameters. Enter the access code
- The preset parameter values for the frequency converter must not be changed. They are factory-set on the powder feeder
- When setting the concentration, the maximum viscosity limit of 1500 mPas must not be exceeded
- If you fail to refill the polymer reservoir, the system will stop
- If you do not clear the cause of a system-side fault and the enter key is pressed, incorrect device behaviour can result
- Further, more serious faults may occur should the system be operated without the original faults having been eliminated

## 13 Commissioning

During commissioning, proceed according to the following plan:

Step	Activity
1	Assembly and installation, see  Chapter 6 'Assembly and installation' on page 24
2	Adjusting the capacitive sensors, see  Chapter 6.3.2 'Adjusting the capacitive sensors' on page 26
3	Check the parameters, see  Chapter 10.1 'Parameters' on page 46
4	Check date and time, see  Chapter 10.3.2 'Setting date and time' on page 58
5	Perform calibration, see  Chapter 10.2 'Calibration' on page 52
6	Adjust concentration, see  Chapter 10.4 'Concentration' on page 60
7	Switch system to operating mode [AUTO], see  'Operating mode AUTO' on page 36



### CAUTION!

#### Water damage possible

Large volumes of water or polymer solution can escape from the system. Monitor the operation of the system in this start-up phase




- Prior to the start of the preparation process, ensure that the drainage cocks are closed for all chambers.
- Monitor in particular the correct switching operation of the liquid level sensor when it first reaches the switching point in question.



#### Fault message "Ultromat tank is empty"

The fault message [Ultromat tank is empty] is unavoidable, as all chambers are now empty. Acknowledge this fault.

#### Requirements:

- Correct and proper assembly and installation of the system has been checked
  - The drainage cocks for the chambers are closed
  - The feed hopper has been filled with the intended powdered polymer
  - The concentrate storage tank has been filled with the intended liquid polymer
1.  All the operating parameters have been set
  2.  All of the necessary devices have been calibrated
  3.  Set the system in operation by switching into operating mode [AUTO]
    - ⇒ The system starts up and begins the automatic preparation process.

## 14 Maintenance

### 14.1 Inspect the powder feeder and wetting apparatus

#### Powder feeder

1. ➤ Inspect the powder feeder regularly during operation to ensure that it is working correctly

2. ➤ Check that the powdered polymer is being dosed correctly

#### Wetting equipment

3. ➤ Check whether the conical wetting area of the wetting cone is completely rinsed over with water and that no powder deposits form

### 14.2 Cleaning the filter insert in the pressure reducer



*You must clean the filter insert no later than when 2/3 of the throughput surface of the screen insert is dirty.*

1. ➤ To remove the filter insert, you must place the system in *[Stop]* mode by pressing the *[F1]* key.

2. ➤ Manually close the shut-off valve upstream of the pressure reducer

3. ➤ Details of the subsequent procedure, can be found in the manufacturer's instructions for the pressure reducer.

### 14.3 Checking and cleaning the solenoid valve



#### WARNING!

##### Danger of electric shock!

Possible consequence: Fatal or very serious injuries

The control cabinet must always be closed during operation

The main switch must be set to '0' and secured against restart before any installation or maintenance work can begin.



#### CAUTION!

##### Possibility of incorrect system operation

- When handling the solenoid valve always be aware of the cable
- When assembling, take note of the correct position and layout of the parts



#### NOTICE!

##### More information

You can find more information and the corresponding drawing contained in the solenoid valve operating instructions in the appendix to this documentation.

1. ➤ Fully close the upstream shut-off valve

2. ➤ Undo the four socket cap screws on the housing and remove the valve cap together with the rinsing attachment

⇨ Look out for the cable.

3. ➤ Remove the inserts



4. ➞ Check the diaphragm for damage
5. ➞ Clean the housing inner, especially the throttling port and the small pre-spill port in the valve outlet

## 14.4 Remove the flow meter (turboDOS) and test



### CAUTION!

#### Possibility of incorrect system operation

- When handling the flow meter always be aware of the cable
- When refitting the flow meter, note the flow arrow on the housing

1. ➞ Start the system with the *[F1]* key *[Stop]* mode.
2. ➞ Close the stopcock in the water supply line
3. ➞ To remove the flow meter, undo the corresponding threaded connector in the water piping
4. ➞ Check the turbine wheel within the flow meter to ensure it rotates freely and clean as necessary
5. ➞ Fit the flow meter with the correct alignment in the water supply line (flow arrow)

## 14.5 Removing the cover of an inspection opening



### CAUTION!

#### Propellers are rotating in the storage tanks!

Slight or minor injuries.

Switch off the system and only then remove the screwed cover of an inspection opening.

As a matter of principle, the system must only be operated with the covers of the inspection openings tightly screwed in place. The covers may only be removed temporarily:

- To check the liquid level
- To check the liquid level sensors for correct switching operation
  - After the inspection work, replace all covers and secure

## 14.6 Cleaning the surface of the storage tank

From time to time clean the surface of the storage tank, as with time, a slippery film can form on it. Always observe the instructions on the safety data sheet for the polymer used.

# 15 Fault Messages

## 15.1 Troubleshooting

User qualification, troubleshooting: trained user, see ↗ *Chapter 2.3 'Users' qualifications' on page 10*

User qualification, troubleshooting (unspecified faults): Customer service, see ↗ *Chapter 2.3 'Users' qualifications' on page 10*



### **WARNING!**

#### **Automatic start-up**

Each time mains power is switched on, the stirrers start up without regard to the system status measured

Each time mains power is switched on, preparation mode can commence.

Therefore keep all covers or inspection openings closed.

If it is necessary to work on the system, disconnect the system from the mains and secure it to prevent switching back on.



*Refer also to the operating instructions for purchased parts when troubleshooting.*

### **Collective alarm**

A system fault/malfunction (collective alarm) is acoustically reported with a warning tone and visually by the red warning light on the control cabinet. The controller also displays a fault message. The warning tone can be switched off by pressing *[Reset F4]*.

The activation of the downstream feed pump (polymer solution) remains unaffected by the collective alarm.

### **Acknowledgement**

The fault message must be acknowledged with the Reset key once the cause of the fault has been eliminated so that the system can restart operation following the fault.

### **Unspecified faults**

Should a problem occur, which is not included in this list or should a listed fault not be remedied by the suggested troubleshooting measures, please contact ProMinent®-ProMaqua®Customer Services to remedy the problem.

### **Sensors**

For every fault analysis it should first be considered that a capacitive proximity sensor or a concentrate flow sensor may possibly be incorrectly signalling a fault (because its sensitivity has been set too high or it is triggering/responding to suddenly changed ambient conditions).

## 15.2 General notes on fault messages



### Acknowledging fault messages

You must acknowledge fault messages.

If the system generates a fault message, optical and acoustic signalling of the fault is triggered. Simultaneously with the generation of the fault message a message about the type and time of the fault is output to the display of the operating panel.

No.	Time	Date
6	17:38:03	08:06:2011
Fault: Check pressure sensor		

A0809

Fig. 45: Fault message on the display

The fault and the number of occurrences of the fault are signalled by the following fault symbol



A0810

Fig. 46: Fault

If you have cleared the fault, the optical and acoustic signalling is reset by pressing the key **[RESET]** (F4) and the fault message on the display is deleted.

If you have not cleared the fault, only the acoustic signalling is reset by pressing the key **[RESET]** (F4). The optical alarm display as does the fault message.

In parallel to the optical signalling of the alarm the fault switches the system output **[COLLECTIVE ALARM]**. If a fault occurs, the output **[COLLECTIVE ALARM]** is activated (switches from 0 to 1).

## 15.3 Faults - Cause - Remedy

Fault message	Cause	Remedy	Stop preparation Stop	Extraction blocked
Dry feeder is not calibrated	Dry feeder not yet calibrated	Calibrate the dry feeder	YES	NO
Check dry feeder frequency converter	Frequency converter defective	Check frequency converter	YES	NO
	Frequency converter parametrisation is incorrect	Check frequency converter parameters		
Powder feeder is empty	Feed hopper is empty	Fill the feed hopper	YES	NO
	Digital input defective	Check digital input		
	Powder sensor defective	Check powder sensor		
Dry feeder - max. capacity reached	Dry feeder calibration is faulty	Repeat dry feeder calibration	NO	NO
	Water supply too high	Reduce water supply		
	Concentration parameter too high	Reduce concentration parameter		

## Fault Messages

Fault message	Cause	Remedy	Stop preparation Stop	Extraction blocked
Liquid concentrate pump is not calibrated	Liquid concentrate pump is not yet calibrated	Calibrate the liquid concentrate pump		
Check liquid concentrate pump Sigma	Pump defective	Check pump	YES	NO
Check frequency converter liquid concentrate pump	Frequency converter defective	Check frequency converter	YES	NO
	Frequency converter parametrisation is incorrect	Check frequency converter parameters		
The liquid concentrate storage tank is empty	Storage tank is empty	Fill storage tank	YES	NO
	Float switch defective	Check float switch		
	Digital input defective	Check digital input		
Check liquid concentrate flow sensor	Storage tank is empty	Fill storage tank	YES	NO
	The flow sensor is not correctly adjusted	Calibrate flow sensor		
	Digital input defective	Check digital input		
Liquid concentrate pump - max. capacity reached	Liquid concentrate pump calibration is faulty	Repeat liquid concentrate pump calibration	NO	NO
	Water supply too high	Reduce water supply		
	Concentration parameter too high	Reduce concentration parameter		
Liquid concentrate pump - min. capacity reached	Concentration parameter too low	Increase concentration parameter	NO	NO
	Water supply too low	Increase water supply		
	Liquid concentrate pump calibration is faulty	Calibrate the liquid concentrate pump		
Water supply too low	Minimum water supply parameter too high	Check minimum water supply parameter	NO	NO
	Variations in the water supply	Check the water supply		
	Filter bowl blocked	Clean the filter bowl		
	Pressure reducer set incorrectly	Set pressure reducer correctly		
	Water meter defective	Check water meter		
	Digital input defective	Check digital input		
Water supply too low. Ultromat stop	Minimum water supply parameter too high	Check minimum water supply parameter	YES	NO
	Water supply failed	Check the water supply		
	Variations in the water supply	Check the water supply		
	Filter blocked	Clean the filter		
	Pressure reducer set incorrectly	Set pressure reducer correctly		
	Water meter defective	Check water meter		
	Digital input defective	Check digital input		
Wetting cone too full	Needle valves to the wetting cone not set correctly	Adjust the needle valves	YES	NO
	Wetting cone blocked	Clean the wetting cone		

<b>Fault message</b>	<b>Cause</b>	<b>Remedy</b>	<b>Stop preparation Stop</b>	<b>Extraction blocked</b>
	Sensor defective	Check sensors		
	Digital input defective	Check digital input		
Ultromat storage tank is empty (lower)	Extraction from the Ultromat is too high	Reduce extraction	NO	YES
	Water supply too low	Increase water supply		
	Pressure sensor defective	Check pressure sensor		
Ultromat reservoir too full (upper/lower)	Post-rinse/flush period parameter too high	Check post-rinse/flush period parameter	YES	NO
	Solenoid valve defective	Checking the solenoid valve		
	Pressure sensor defective	Check pressure sensor		
Check pressure sensor (upper/lower)	Sensor defective	Check sensors	YES	YES
	Analogue input defective	Check analogue input		
Stirrer motor protection switch triggered	Defective motor	Check motor	YES	NO
	Stirrer sluggish	Mechanically check stirrer		
	Motor protection switch set incorrectly	Check motor protection switch setting		
	Digital input defective	Check digital input		
Water low in the redilution unit	Water supply to redilution unit failed	Check water supply to redilution unit	NO	NO
	Limit switch defective	Check limit switch		
	Digital input defective	Check digital input		
1F2 fuse activated	Short circuit	Check for short circuit	YES	NO
	Connected devices defective	Check devices		
	Digital input defective	Check digital input		
1F6 fuse activated	Short circuit	Check for short circuit	YES	NO
	Connected devices defective	Check devices		
	Digital input defective	Check digital input		
Fault PROFIBUS®	PROFIBUS® faulty	Check PROFIBUS®	YES	NO
	Cable defective	Check cable	YES	NO
	Plug defective	Check plug	YES	NO
	Address not correct	Check PROFIBUS® parameters	YES	NO
Fault PROFINET®	PROFINET® faulty	Check PROFINET®	YES	NO
	Cable defective	Check cable	YES	NO
	Plug defective	Check plug	YES	NO
	IP address and PROFINET® name not allocated	Check allocation	YES	NO

## 16 Systems / data sheets

### 16.1 Logical states

Logical states of the digital inputs:

Input	Signal identifier	Logical state*	State description
DI A.0	Turbodos	-	
DI A.1	Fault voltage 230 V	1	Voltage OK
		0	Fault
DI A.2	Fault voltage 24 V	1	Voltage OK
		0	Fault
DI A.3	Fault stirrer	1	Stirrer OK
		0	Fault
DI A.4	Remote Operation	1	Remote control not active
		0	Remote control active
DI A.5	Redilution pump	1	Transfer pump on (water supply available)
		0	Transfer pump off (water supply available)
DI A.6	Redilution flow monitor	1	Flow present
		0	Flow not present
DI A.7	Motorised ball valve feedback	1	Motorised ball valve open
		0	Motorised ball valve closed
DI B.0	Lack of powder dry feeder	1	Powder present
		0	Powder not present
DI B.1	Overflow wetting cone	1	Wetting cone OK
		0	Wetting cone overflow
DI B.2	Float switch liquid concentrate	1	Liquid concentrate present
		0	Liquid concentrate empty
DI B.3	Liquid concentrate flow monitor	1	Liquid concentrate flow present
		0	Liquid concentrate flow not present
DI B.4	Liquid concentrate pump fault	1	Liquid concentrate pump OK
		0	Liquid concentrate pump fault

\*) 1 = 24 VDC; 0 = 0 VDC

## Logical states of the digital outputs:

Input	Signal identifier	Logical state*	State description
DQ A.0	Ready for operation	0	Ultromat not ready
		1	Ultromat ready
DQ A.1	Dry run	0	Dry run (chamber 3 is empty)
		1	Chamber 3 is full
DQ A.2	Collective alarm	0	No collective alarm
		1	Collective alarm active
DQ A.3	Horn	0	Horn off
		1	Horn on
DQ A.4	Solenoid valve	0	Solenoid valve closed
		1	Solenoid valve open
DQ A.5	Stirrer	0	Stirrer off
		1	Stirrer on
DQ A.6	Ht. above sea level		
DQ A.7	Heating	0	Heater off
		1	Heater on
DQ B.0	Vibrator	0	Vibrator off
		1	Vibrator on
DQ B.1	Motorised ball valve	0	Motorised ball valve closed
		1	Motorised ball valve open
*) 1 = 24 VDC; 0 = 0 VDC			

## 16.2 Operating Menu

Keys	Level 1	Level 2	Input
[F1] Mode	STOP / AUTO / MANUAL		[Change powder/liquid]
[F2] Mode	PARAMETER	Water	Pre-rinse; post-rinse/flush period; min. flow
		Stirrer	Stirrer On / Off
		Level top	Max-Max; Max; Start Polymer; Min
		Level bottom	Max-Max; Min; Min-Min
		Powder	Heater ON/OFF
			Vibrator ON/OFF
			Maturing time
		Liquid	Min. setpoint freq. conv.
			Maturing time
	Calibration (F1 mode stop)	Powder	Calibration time
			Elapsed time
			Enter weight
			Capacity
		Liquid	Calibration time
			Elapsed time
			Enter weight
			Capacity
		Flow monitor	Switching point
			Start/Stop
		Water	Actual flow:
			Calibration Water
	System	Set	[DE], [EN], [FR], [ES], [PT],
			Confirm language
			START
		Set date and time	31.02.2014 12:13:14
			[dd.mm.yyyy hh:mm:ss]
		Touch panel	Contrast (+) (-)
			Clean screen
			Calibrate touch
	Concentration		Powder
			Liquid
			Liquid active ingredient
			Intern / Extern (PROFIBUS® / PROFINET®)
	Info	Identity code	Type
			Variable
			Polymer
			Options



Keys	Level 1	Level 2	Input
		Version	Version Touchpanel:
			Creation date
			Version S7 Project:
			Creation date
			Project
	Service	Water meter	Mode measurement: Auto / Manual
			Manual value
			Pulse rate <i>[DFM]</i>
		Run empty	Stop / On
		Pressure sensor	Sensor measured value
			Measured value
			Offset
		Factory setting	Factory settings reset
			Identity code: Change
<i>[F3]</i> Archive			
<i>[F4]</i> Reset			

## 16.3 Commissioning Report

**Ultromat® commissioning report**  
**Ultromat® ULDa**  
☐ 400      ☐ 1 000      ☐ 2 000

---

Identification code:  

ULDa

Software Version:  
 Version S7 Project   
 Version Touchpanel

Project number:

---

Calibration settings / concentration:

Parameter:	Powder	Liquid
Concentration:		%
Active Ingredient:	-	%
Calibrated metering capacity:		kg/h
Water supply:		l/h
Flow monitor switching level:		kg/h

Commissioning parameter settings	Default setting	Adjustment
Feed water min. flow Ultromat® 400	400 l/h	
Feed water min. flow Ultromat® 1000	1 000 l/h	
Feed water min. flow Ultromat® 2000	2 000 l/h	
Heating switch-on time	5 s	
Heating switch-off time	45 s	
Vibrator on	1 s	
Vibrator off	60 s	
Supply lead-in time	7 s	
Supply run-on time	5 s	
Stirrer 1 + 2 on time	5 min	
Stirrer 1 + 2 off time	15 min	
Concentrate pump minimum frequency	20 Hz	

Powdered polymer trade name: \_\_\_\_\_  
  
 Liquid polymer trade name: \_\_\_\_\_

Supplier: \_\_\_\_\_  
  
 Supplier: \_\_\_\_\_

---

Customer: \_\_\_\_\_  
  
 Installation place: \_\_\_\_\_

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

Fig. 47: Commissioning Report

## 16.4 Lubricating plan

Except the Spectra pump all Ultromat drives are maintenance free.

Units	Gearbox	Interval	Oil	Volume
Stirrers	-	-	-	-
Sigma	-	-	-	-
Spectra	SK01-71L/4	10,000 h / 2 years	ISO VG 220	250 ml
Dry material feeder	SK1 SD	Maintenance free	-	-

## 16.5 Control sequence

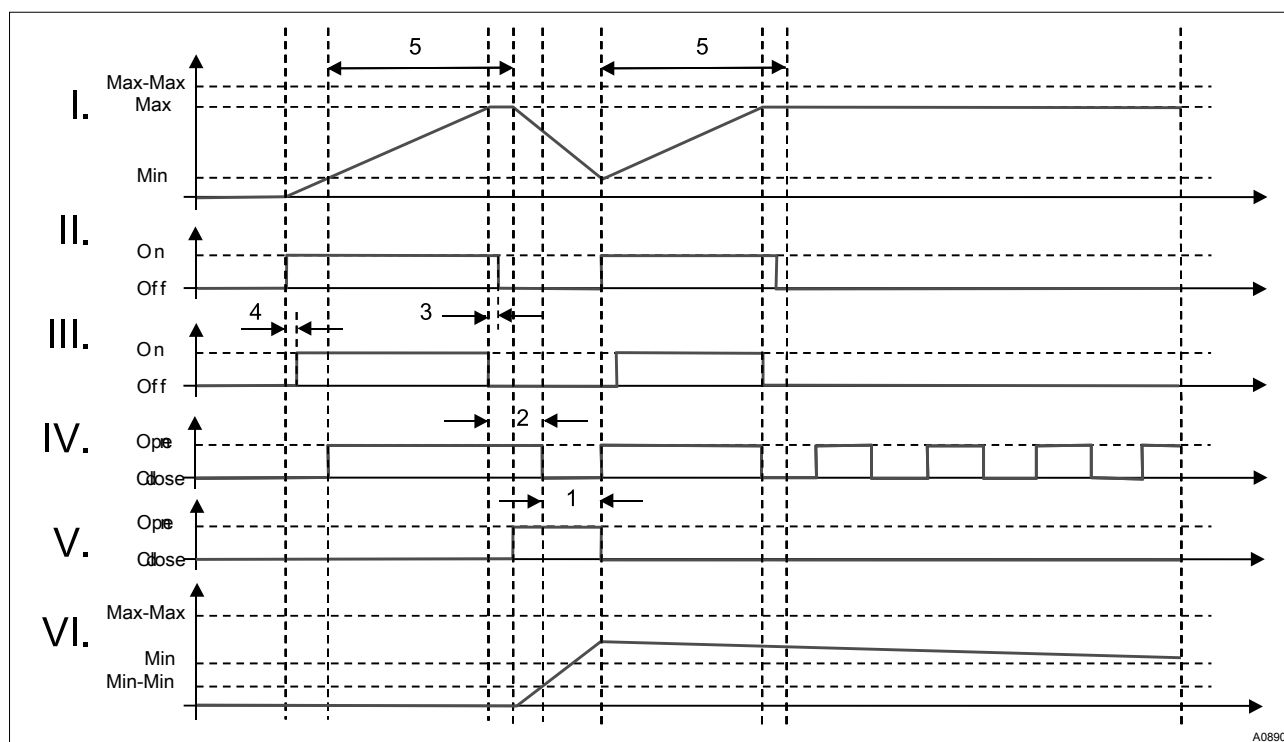


Fig. 48: Control sequence

- I. Storage tank upper
- II. Water
- III. Polymer
- IV. Stirrer
- V. Motorised ball valve
- VI. Storage tank bottom

- 1. Off time
- 2. On time
- 3. Post-rinse
- 4. Pre rinse
- 5. Maturing time

## 16.6 EC Declaration of Conformity for Machinery

In accordance with DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, Appendix I, BASIC HEALTH AND SAFETY REQUIREMENTS, section 1.7.4.2. C.

We,

- ProMinent Systems s.r.o.
- Fügnerova ul. 567
- CZ - 33601 Blovice

hereby declares that the product specified in the following, complies with the relevant basic health and safety requirements of the EC Directive, on the basis of its functional concept and design and in the version distributed by us. This declaration loses its validity in the event of a modification to the product not agreed with us.

### Extract from the EC Declaration of Conformity

Designation of the product:	Automatic polyelectrolyte treatment system, Ultromat S7-1200
Serial number:	refer to nameplate on the device
Relevant EC directives:	EC Machinery Directive (2006/42/EC) EC EMC Directive (2004/108/EC) EC Low Voltage Directive (2006/95/EC)
Harmonised standards applied, in particular:	CSN EN 60204-1 ed.2:2007 CSN EN ISO 4413:2011 CSN EN 61000-2-4 ed.2:2003 CSN EN 12100 CSN EN 953+A1:2009 CSN EN 55011 ed.3:2010 CSN EN 61140 ed.2:2003 CSN EN 60446 ed.2:2008
Date:	01/08/2011

You can find the EC Declaration of Conformity as a download under <http://www.prominent.de/Service/Download-Service.aspx>

## 17 Index

### A

About this product.....	8
Ambient conditions.....	14, 24
Ambient temperature.....	14, 24
Applied harmonised standards.....	84

### C

Capacitive sensor.....	30
Covers of inspection openings.....	12

### D

Designation of the product.....	84
Dimensions sheet.....	15
Drinking water quality.....	25

### F

Flocculation aid.....	15
Frequency converter (FC).....	28

### G

General non-discriminatory approach.....	2
--	---

### H

High system weight.....	14, 24
How long is the maturing time?.....	15

### I

Inlet water pressure.....	25
Inspection openings.....	12

### M

Main switch.....	12
------------------	----

### N

non-discriminatory approach.....	2
----------------------------------	---

### P

Profibus.....	60, 77
Pump.....	31

### R

Relevant EC directives.....	84
-----------------------------	----

### S

Safety Equipment.....	12
Safety information.....	8
Sensor.....	30
Serial number.....	84
Setting the Sigma (Factory Settings).....	31
Sigma.....	31
Stainless steel.....	18
Start Polymer.....	52
Stirrer stirrer shafts.....	18
Storing the system.....	14, 24
Swinging loads.....	14
System damage during transport.....	14
System dimensions.....	17

### U

Ultromat Safety Information.....	10
Users' qualifications.....	10

### W

Warning labels.....	13
What concentrations are possible?.....	15
What is the purpose of the powder feeder device?.....	23
What viscosities are possible?.....	15







ProMinent Dosiertechnik GmbH  
Im Schuhmachergewann 5 - 11  
D-69123 Heidelberg  
Telephone: +49 6221 842-0  
Fax: +49 6221 842-419  
email: [info@prominent.com](mailto:info@prominent.com)  
Internet: [www.prominent.com](http://www.prominent.com)

985881, 3, en\_GB