

Sampler Controller Type 6771-21/-22

Operating instruction

BA 000411

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1 Device description

The controller type 6771-xx serves as an electronic control unit for the ULTRASAMPLER[®] sampling system.

This efficient device, equipped with an On/Off output module and a microprocessor-controlled data processing unit, has a robust aluminium die cast casing and is even suited to the tough conditions on tank trucks.

A two-line alphanumeric LC display with background illumination serves to display all indications. 16 characters with a maximum height of 8 mm can be represented per line. The effective size of the screen display is 100 x 24 mm.

Four LEDs serve to signal operating conditions.

The device can be operated by means of a membrane keypad with 16 keys.

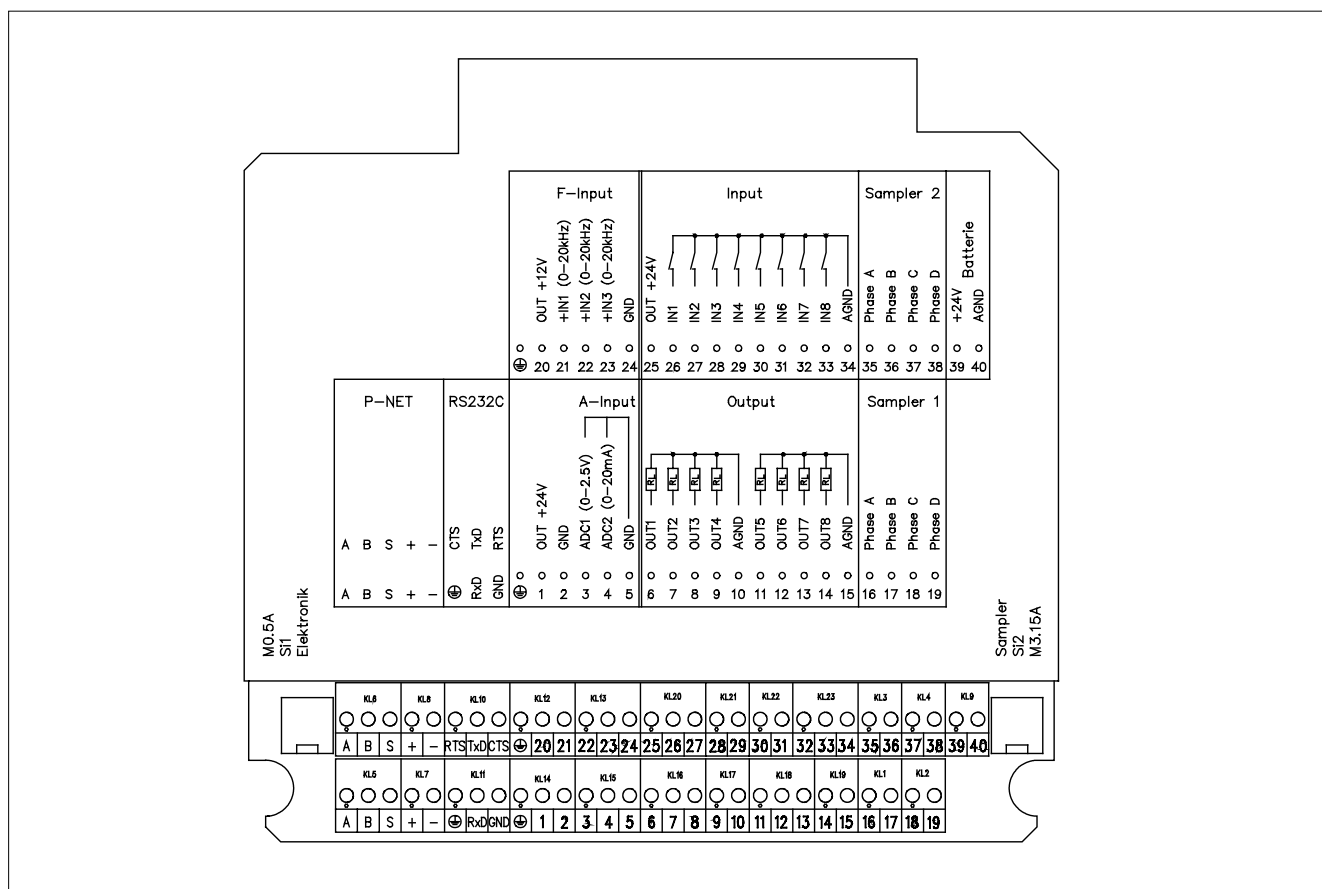
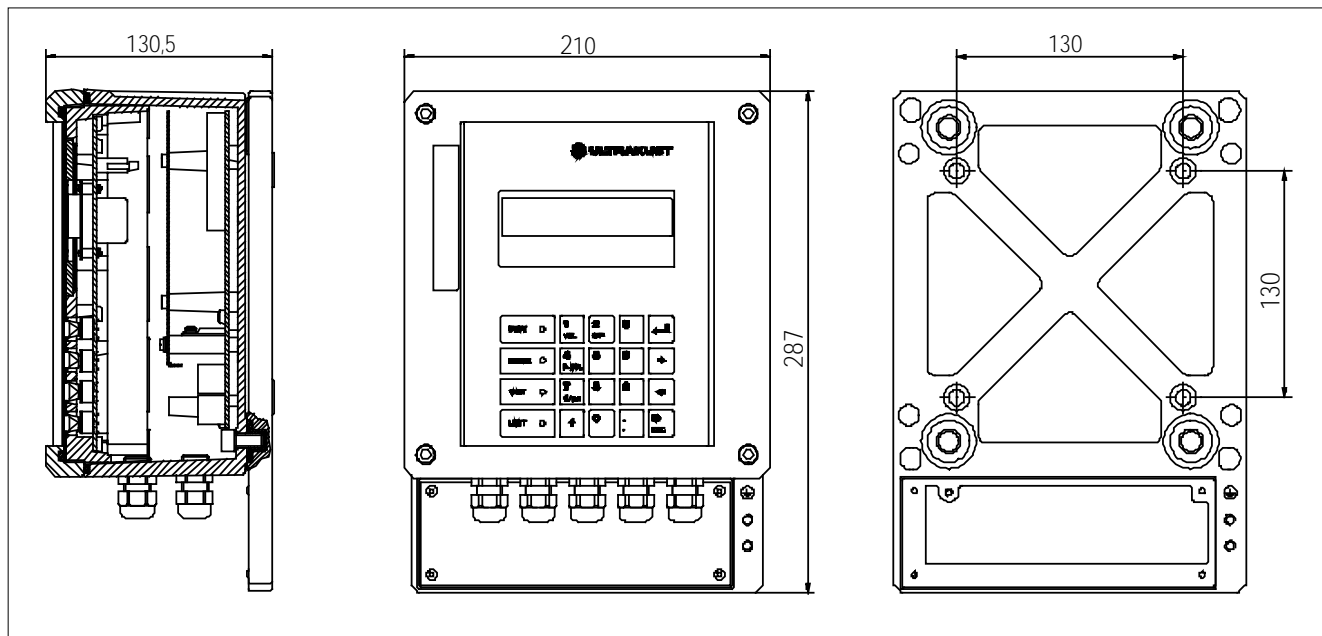


1.1 Technical data

Technical data	Type 6771-21	Type 6771-22
CPU data	16 / 32 Bit processor, 256 kByte Flash, 256 kByte RAM, EEPROM 2 kByte, real-time clock, battery-backed, watchdog timing	
Ambient conditions		
Permissible operating temperature	-20 ... +60 °C	
Permissible storage temperature	-30 ... +85 °C	
Climatic classification	ISF	
Display	alphanumeric, 2 x 16 digits, with background illumination	
Status displays	4 LED	
Keyboard	Membrane keyboard, 16 keys	
Interfaces		
P-NET	serial, asynchronous, baud rate 76800 bit/s	
Serial interface	RS232C	
Inputs		
Analog inputs	0 ... 2.5 V, 0 ... 20 mA	
Frequency inputs	3 x 0 ... 20 kHz	
Digital inputs eightfold	Switching current about 10 mA	
Outputs		
Switching outputs eightfold	With control of voltage supply of open Load <120 mA and of short-circuit. $I_{max} = 1.0 A$	
Stepper motor outputs	1	2
Electrical data		
Auxiliary energy CPU	DC 24 V (16 – 35 V); 250 mA	
Auxiliary energy DC 24 ... 30 V	Digital inputs	Common ground
	Switching outputs	OUT1 – OUT4 max. 3.6 A; OUT5 – OUT8 max. 3.6 A (reversible fuse)
	Stepper motor outputs	Maximum fuse 3.15 A; medium time-lag
Electrical connection	Screw terminals in the base	
Mechanical data		
Weight	5.2 kg	
Dimensions	210 x 287 x 130.5 mm	
Casing	Robust aluminium diecast casing, blue powder paint; controller bracket: aluminium diecast, bright	
Protection classification:	IP65	
Assembly	Controller bracket is locked in position by means of 4 x M8 assembly screws	

1.2 Assembly and wiring

The assembly of the Controller has to be carried out according to the service instruction MAK 3002.



1.2.1.1 Allocation of inputs and outputs

The inputs and outputs are firmly assigned to the respective functions and can't be selected freely.
 The inputs and outputs are minus switching.
 The maximum permissible current per output is 0.8A.

Output/Input	Signal	Remarks
Outputs		
OUT 1	Release of pump (MSW)	If the pump is released, the „throttling“ output is activated at the same time. After the expiry of suction time 1, „throttling“ is deactivated.
OUT 2	Throttling	
OUT 3	Alarm signal if there is a fault	
OUT 4	Outlet cassette	Only with Bottle Drive
OUT 5	reserved	for star 2
OUT 6	radial engine	Bottle Drive
OUT 7	upward (lifting motor)	Bottle Drive
OUT 8	downward (lifting motor)	Bottle Drive
Eingänge		
IN 1	Bottle in position 1	
IN 2	Bottle in position 2	
IN 3	Free	
IN 4	Free	
IN 5	Free	
IN 6	Free	
IN 7	Star in position	Bottle Drive
IN 8	Bottle at the bottom	Bottle Drive

1.2.1.2 Wiring

The following wiring diagram and the suggestion for configuration serve as examples. With regard to the configuration of your individual system, you will get expert advice from our service staff.

example

ULTRASAMPLER® „Stand alone“ sampling system

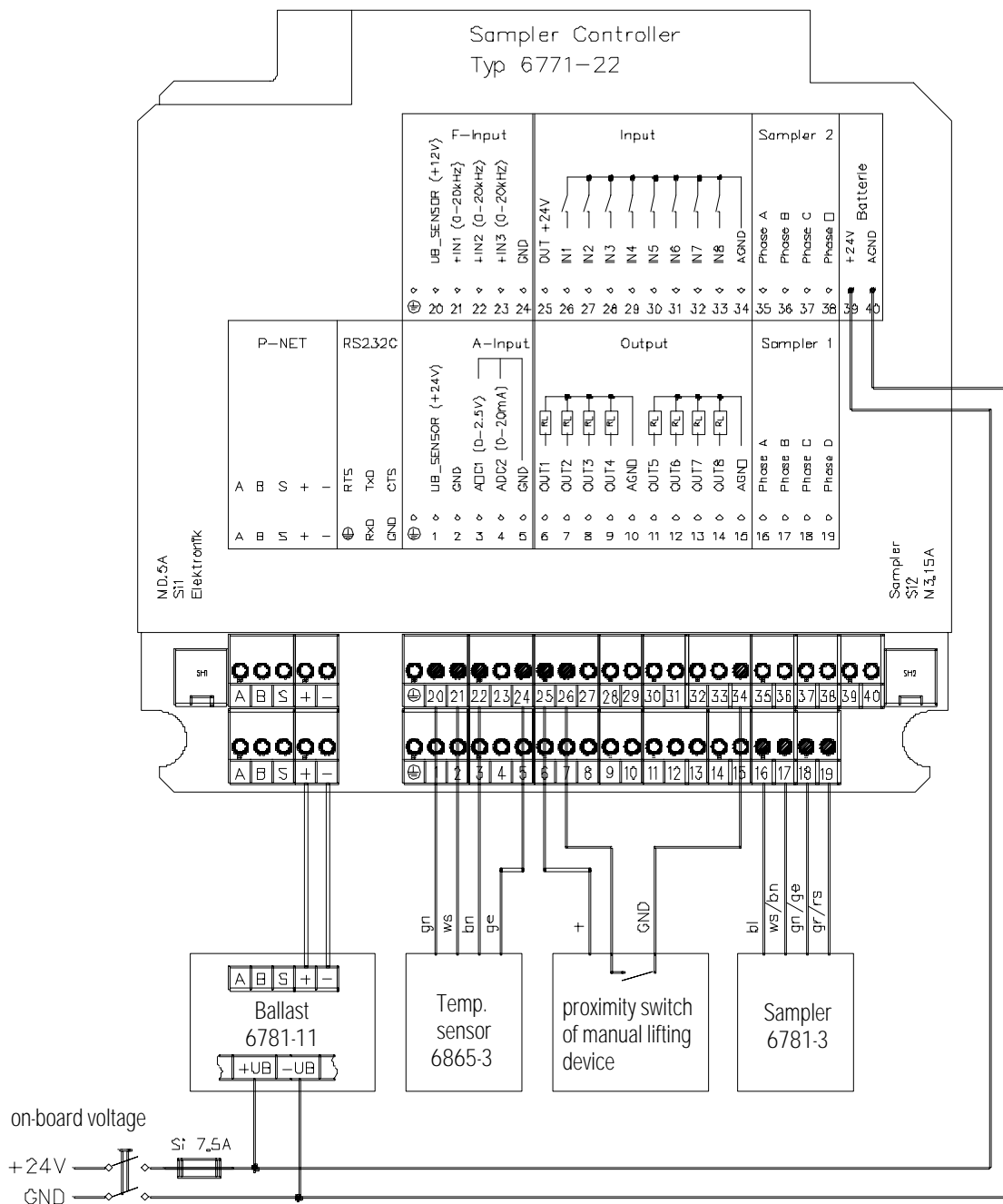
The system consists of:

1	Sampler-Controller	Type 6771-21
1	Ballast	Type 6781-11
1	Temperature sensor with milk sensor	Type 6865-3
1	Manual lifting device with proximity switch (bottle in position)	
1	Sampler	Type 6871-3

Wiring diagram

(example)

Suggestion for corresponding configuration on page 1-6.












Instructions for use: diameter of voltage supply cables at least 1.5 mm², permissible current of the outputs max. 0.8 A.





Suggestion for configuration

Menu	Submenu	Parameter	Explanations
sampler general	mode sampler 1	1 sample	Supplier sampling
	mode sampler 2	off	
	mode pump contr	normal	Pump release is activated
	sensor signal	milk sensor	
	calming distance	short	
	FLM nom. width	50 mm	No FLM installed
	bottle sensor	input 1	
	pump capacity 1	xxx l/min	Suction performance stage 1
	pumping time 1	xxx s	Suction time stage 1
	pump capacity 2	xxx l/min	
	pumping time 2	0 s	
	pump capacity 3	xxx l/min	
	flushing min. qty.	20 l	Minimum rinse quantity
	tank smpl. set	0 l	Total sampling quantity (tank)
finish time	0 s		
sampler 1	preflushing	off	
	samp. bottle vo	35 ml	
	calibr. factor	270 μ l/ rev.	
	filling limit	120%	
	start delay	xx s	
	stop delay	xx s	
	pause deduction	00 s	Only for ACRAM
	preflush. freq.	5000 Hz	
	preflush steps	650	
sampler 2	off		
temperature sensor	frequ. 0°C	xxx Hz	
	frequ. 25°C	xxx Hz	
language		english	

1.3 Key functions

Key	Function
	Numeric keys
	„Enter“ key (call submenus and parameter selection, confirm entries)
	Leaf forward
	Leaf backward
	„Escape“ button (quit parameter selection without confirming the change, delete entered character, return to the next higher menu level)
	Direct selection of „Expected quantity“ display
	Direct selection of „Cleaning“ menu
	Direct selection of „Volume of sampling bottles“ display
	Direct selection of „Temperature“ display

1.4 Status displays

LED	Meaning
	Flashes about once a second in normal operation
	Lights up if an error has occurred (e.g.: error during the self-test, wrong parameter value, wrong expected quantity ...)
	Lights up if the sampler is waiting for a signal (e.g.: bottle is not in position, proximity switch is defective or has not been adjusted, milk flow is not recognized...)
	Lights up if the controller is operated beyond its specified data.

2 Safety requirements

The appliances have been built conforming to the statutory regulations and, after having been thoroughly checked, have left the factory in perfectly sound condition.

- The appliances have to be installed and maintained by skilled staff.
- Make sure that the data and operating conditions specified by BARTEC are complied with.
- Before installing the device and taking it into service, please read the operating instruction. If you have any questions on certain issues, you will get expert information by our staff.
- If a fault occurs, please write down all errors indicated on the display and check if they can be removed. If the device can't be repaired on the spot, send the device - together with a detailed error description - to BARTEC to have it repaired.
- Switch off the device immediately and protect it from being switched on again if there is the risk that it can't be operated without danger any more (e.g. when there are visible damages).

Disclaimer

BARTEC will not be responsible for damages resulting from the fact that safety instructions aren't observed or that the operating instruction or the operating conditions are disregarded.

3 Operation

3.1 Put into operation

The Sampler-Controller has no switch. It is put into operation when the 24 V supply voltage is connected.

3.1.1 Self-test

After the device has been turned on, at first a self-test is triggered. The following messages are displayed in the following order.

S-BIOS **V 1.00**
Date **280623**

BIOS-version and creation date are displayed

Checksum Test
OK

Checksum test BIOS

RAM-Test
256 KB OK

Test of internal RAM

EEProm-Test
OK

Response test EEPROMs

ADC-Test
OK

Test of the internal real-time clock

RTC-Test
OK

Test of the internal real-time clock

Sampler V.1.02
Date 991013

Version and creation date of the user software are displayed

Checksum Test
OK

Checksum test of user software

preset quantity
0 l

The self-test has been terminated successfully, the system is ready for operation and is waiting for the input of an expected quantity

3.2 Sampling

preset quantity
0 l

samp. bottle vol.
21.5ml 21.5ml

enter = end
42.0ml 42.0ml

After the termination of the self-test, the device automatically moves on to the sampling mode. Depending on the configuration, the sampling starts automatically after an expected quantity has been entered, if the sampling bottle is recognized in position (bottle is below the sampler needle) and if milk flow is recognized (by flow level meter or milk sensor).

Type the expected quantity and press „Enter“. The display shows the current filling level of the sampling bottles. The filling process can't be aborted.

As soon as the sampling bottle is filled, the counting stops. The upper line displays the periodical message „Enter=end“. Press „Enter“ to terminate the latest sampling; the Sampler-Controller is ready for the next sampling.

If a second sampler is configured, the operation doesn't change. The second sampler is automatically started together with the first one.

3.2.1 Change of display or of menu

On the user level, you can switch over to other displays and call other menus. Press [↔] or [↔] to leaf forward or backward in the menus.

If you leaf forward, the following messages are displayed in this order:

samp. bottle vol.
42.0ml 42.0ml

temperature
0.0°C

sensor/flow
100.0% 150.0l/m

tank sampl. start
enter = yes

cleaning start
enter = yes

configuration >

The current sampling volume with consideration of the pre-set filling limit for Sampler 1 and Sampler 2 is displayed.

The measured milk temperature is displayed.

Filling degree and flow rate of the milk sensor (flow level meter operation) are displayed. Without the flow level meter, the display only shows if there is milk or if there isn't (0 or 100%). The displayed flow rate is the flow rate corresponding to the pump configuration.

Press „Enter“ to start the tank sampler.

Press „Enter“ to start the cleaning of the sampler. Press „Enter“ once more to stop the cleaning which has already started.

By means of the configuration menu, you can adjust the system to the actual operation conditions via various parameter settings. The configuration menus are described in the following chapter.

You can call certain displays directly without leafing backward or forward. Press the Shift key and another key. The variety of key combinations is described in tabular form under 1.3 Key Functions.

4 Configuration

Via the "Configuration" menus, you make all settings necessary for the operation of the control software or required for the individual configuration of your device. If you quit the "Configuration" menu, all configuration data are saved automatically.

The configuration parameters are protected by different passwords (s. 4.2).

4.1 Call the configuration

configuration >

Select the „Configuration“ menu and press „Enter“.

<legitimation>
0 14.03.00 12:07

The lower display line shows the access authorization, the current date and time.

Press „Enter“ twice to display the password input.

4.2 Enter the password

<password input
█

Three different passwords for the Sampler-Controller can be entered.

Depending on the password which has been entered, the respective access authorization is displayed.

If you don't type a valid password, you can call the "Configuration" menu, but you can't make any changes.

4.2.1 Driver password

After the driver password has been entered, authorization 1 is granted.

With authorization 1, only the configuration of the sampling bottle volume can be changed.

The driver password is the sum of day, month and hour (as shown in the display).

Driver password = day + month + hour

Example

Date: 19 03 2000, 08:17

Driver password= 19 + 3 + 8 = 30

4.2.2 User password

The user password is the password of the truck pool manager. This password is created by means of a max. three-figure operator code; this operator code can be defined by the truck pool manager. The user password grants access with authorization 2. With it, you can change configuration data that aren't subject to the calibration obligation, for example switching off and on certain options and hardware modules.

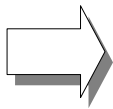
User password = driver password x (operator code + 1) + operator code

Example

Driver password = 30 operator code = 120

User password = 30 x 121 + 120 = 3750

When the device is delivered, its user code = 0. Thus, the user password is the same as the driver password.



If the password is entered without success (the display shows authorization 0), this may result from the fact that the system time isn't in conformity with the current time. To create the password, use date and time as shown in the display.

<legitimation >
2 14.03.00 13:02

<user code
█

Change user code

You can only change the user code if you have typed the user password correctly. The display must show authorization 2.

Press „Enter“. The password input is displayed again. Press [↵] to leaf forward to the input of the user code. Press „Enter“. Now you can type the new user code.

4.2.3 Service password

By typing the service password, you gain access to all configuration possibilities (authorization 3). The service password is created according to a special mode and is changed periodically. It isn't told anybody except the authorized service staff.

The service password can consist of numbers and letters. Press the corresponding numeric buttons to enter numbers. To enter letters, press the shift button [⇧] and both arrow keys to leaf forward and backward within the alphabet.

The following example illustrates the way how to enter such a combination.

Example Enter the service password 1AE20:

<password input
1A █

Press [1], the digit „1“ appears in the first position on the screen, the cursor moves to the next position.

To enter the letter „A“, keep the “Shift” key pressed and press [↵].

The display shows the letter „A“. To enter the letter „E“, keep the “Shift” key pressed and press [↵] several times until the letter „E“ is displayed.. To enter “20”, press the corresponding numeric keys again..

4.3 Change the program parameters

Within the “Configuration” menu, you use the arrow keys to select the configuration menus. If the menu name is between two arrow tips pointing outward, this means that the displayed menu has further submenus.

As soon as you have selected a menu, press „Enter“ to reach the next menu level where you can select further menus. If a displayed menu doesn't contain any submenus but only parameters, there is only one arrow tip before the menu name. Press „Enter“ now to reach the level where you can change the parameters. The parameters are between two arrow tips pointing inwards. Use the arrow keys to change the respective setting.

Press the Escape button [C] to return to the next higher menu level.

Example You want to set the parameter „FLM nominal bore“ to 65mm.
Enter the user password according to the instruction:

Display:  (lower line: authorization, date, time)

Press [Æ].

Display: 

Press „Enter“ to select submenus of the <Sampler general> menu.

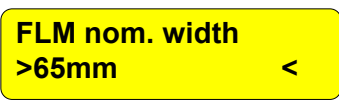
Display:  (The display in the lower line depends on the current configuration.)

Press [Æ] several times until the following message appears (5 x).

Display:  (The display in the lower line depends on the current configuration.)

Press „Enter“ to reach the selection of possible parameters for the nominal bore.

Press [Æ] oder [æ] several times, until the desired nominal bore is shown in the lower line.

Display: 

Press „Enter“ to confirm the selected parameter and to quit the parameter selection.
If you don't want to make further settings, press „Escape“ several times until you have quit the “Configuration” menu.

Display: 

Now press [Æ] or [æ] to select the menu or the display.

The following table lists all menus with their submenus and parameters.

Menu	Submenu	Parameter	Explanations	Legitimation
legitimation	password input		Enter the password	
	user code		Enter /change the operator code	2
sampler general	mode sampler1	1. sample	Supplier sampling	2
		tank sample	Sampling during the entire tour	
		off	No sampler is connected	
	mode sampler2	2. sample		2
		tank sample		
		off		
	mode pump contr.	normal	Pump release is activated	2
		2 speed pump	Pump performance is increased in 2 stages	
		bottle drive	Bottle drive is activated	
		normal + bottle	Pump is released and bottle drive is activated	
		2 speed+ bottle	Pump performance is increased in 2 stages + bottle drive is activated	
		bottle + 3002	Bottle drive is connected, control via 3002Controller	
		bottle drive 2		
		normal + botDr2 2 speed + botDr2	Not available as from program version 1.03	
	off	No outputs are activated		
	sensor signal	flow level meter		2
		milk sensor		
		off		
	calming distance	short	<30 cm	2
		long	>30 cm	
none				
FLM nom. width	50mm		2	
	65mm			
	76mm			
bottle sensor	input 1	Bottle in position	2	
	input 1 + 2	Bottle in position at Sampler 1 and Sampler 2		
	off			
pump capacity 1	xxx l/min	Enter the throttled suction performance	2	
pumping time 1	xx s	Enter the suction time for throttled suction performance	2	
pump capacity 2	xxx l/min	Enter the suction performance of stage 1	2	
pump time 2	xx s	Enter the suction time of stage 1	2	
pump capacity 3	xxx l/min	Enter the suction performance of stage 2	2	
flush. min. qty.	xx l	Minimum rinsing quantity	2	
tank smpl.set	xxxx l	Total collection quantity (tank)	2	
finish time	xx s	Automatic termination after xx seconds	2	
sampler 1	preflushing	on	(Input quantity has to be higher than minimum rinsing quantity)	2
		off		
	samp. bottle vo.	xx ml	Filling quantity (e.g. 35 ml)	1
	calibr. factor	xxx µl/rev.		2
	filling limit	xxx %	Filling limit (e.g. 120% = 42 ml)	2
	start delay	x,x s		2
	stop delay	x,x s		2
	pause deduction	x,x ml	Only ACRAM (correction of faults resulting from entrapped air – without FLM)	2
	preflush. freq	xxxx Hz	Adjust the prerinse characteristic	2
	preflush steps	xxx		2
Sampler 2	see Sampler 1			
temp. probe	frequ. 0°C	xxx Hz	read off temperature sensor	2
	frequ. 25°C	xxx Hz	read off temperature sensor	

Menu	Submenu	Parameter	Explanations	Legitimation	
language		German		2	
		English			
Bios-Setup	Corresponds to BIOS-Setup for system 3002 (see „Instruction manual BIOS-Setup system 3002“)			2	
test	inputs	11111111	Input conditions are displayed	2	
	outputs	11111111 1111 11	Output conditions are displayed	2	
	sampler 1	rotate			2
		Freq. (Hz): xxxx			
		Cnts: xxxx			
		motor test x			
	sampler 2	see sampler 1			
	ADC-inputs	x,xx V x,xx mA		2	
	freq. input 1	xxx Hz		2	
	freq. input 2	xxx Hz		2	
freq. input 3	xxx Hz		2		
default par.?			3		
serial no.			3		
