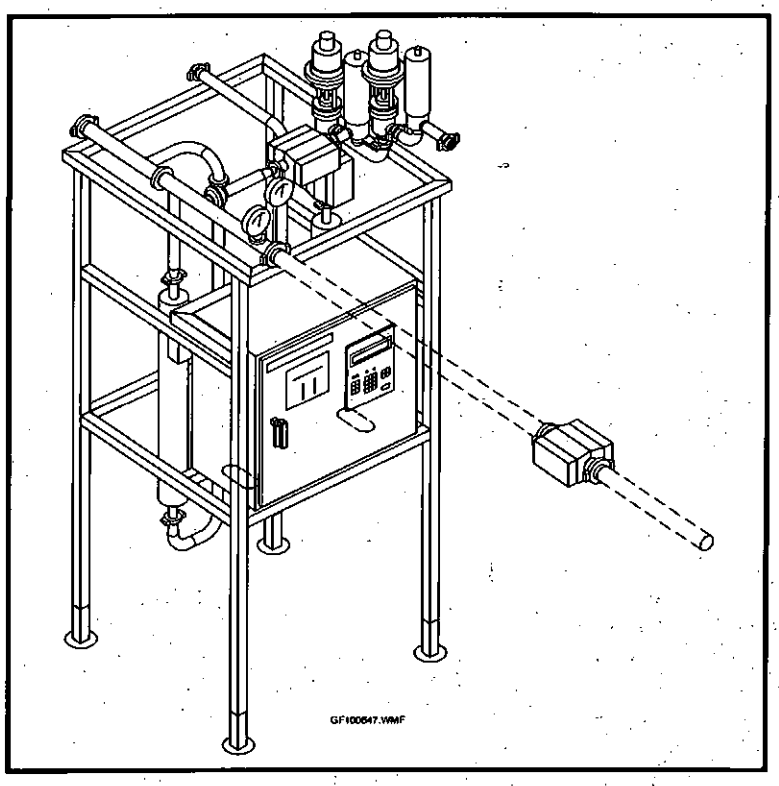
OM
Operation Manual

Tetra Alfast® 200
Type 210 & 220



Tetra Pak

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Tetra Pak

Tetra Pak Dairy & Beverage Systems AB

Table of content

Introduction 1

Equipment 1

Document 2

Safety precautions 3

Use of hazard information 3

General 4

Cleaning solution 5

Generai description 7

Applications 7

Requirements of personnel 7

Operator station 7

Risk area 7

Process description 11

Operation modes 15

Controi panei 17

Operator module 18

Supervision of faults 25

Fault list 27

Preparation 29

Operation 31

Update input fat content 31

Cream/skimmilk preselect volume 33

Cream/skimmilk reset of volume 34

Select operation mode 37

Fat content, manual control 39

Cascade control

2.242509-01.TOC

activate/deactivate 40
Display DT11 values. 43
Display DT21 values 44
Operation, remote control 45
Back-up operation 46
Hand keys 46
Switches and potentiometers 47
Control module 49

Cleaning 51
Cleaning, remote control 53

Sampling of product 55

Settings 57
Standardization method 57
Available parameters 62

Introduction

This section contains basic information about this manual and the Tetra Pak equipment described.

WARNING! To ensure maximum safety, always read the section **Safety precautions** before carrying out any work on the unit.

Equipment

Intended use of this Tetra Pak equipment

This unit is intended for use according to the specifications in **Technical data** (see **Technical Manual**) and related documents.

Tetra Pak will not be held responsible for injury or damage if the equipment is used for any other purpose.

Service

If problems are encountered when operating the unit, contact the nearest Tetra Pak service station.

Manufacturer

This Tetra Pak equipment was produced by:

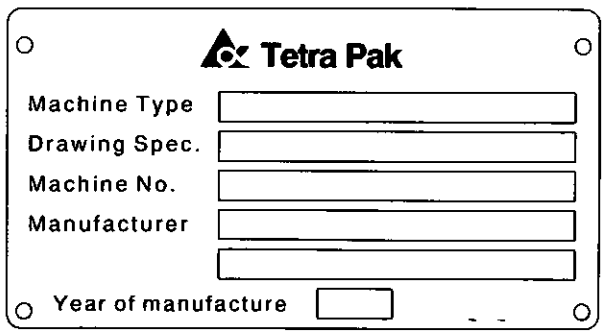
Tetra Pak Dairy & Beverage Systems AB
Box 64
S-221 00 LUND
Sweden

Unit identification

All units carry a machine plate stating:

- unit identification
- data unique to the unit

Have this information available before contacting Tetra Pak concerning this particular unit.



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Document

Operation Manual (OM)

The purpose of this Operation Manual is to provide the operator with information on how to operate the machine.

Tetra Pak recommend that you study it carefully, and - above all - ensure its availability to those who will be operating the unit.

Furthermore, it is important that you:

- keep the manual for the life of the equipment
- pass the manual on to any subsequent owner or user of the equipment.

Tetra Pak will not be held responsible for any breakdown of the equipment caused by the owner's failure to follow the instructions given in this manual.

Design modifications

The information given in this document is in accordance with the design and construction of the machine at the time it was delivered by the Tetra Pak machine production facility.

Further copies

Additional copies can be ordered from the nearest Tetra Pak service station.

When ordering technical publications, always quote the **document number** printed on the front cover of the document concerned.

Document producer

This document was produced by:

Tetra Pak Dairy & Beverage Systems AB
Box 64
S-221 00 LUND
Sweden

Number of pages

This document contains a total of 68 pages.

Safety precautions

To ensure maximum safety for the operator, always read this section carefully before carrying out any work on the equipment.

Use of hazard information

Hazard information in this documentation is defined s follows:

DANGER! Failure to observe this information results in immediate danger to life.

WARNING! Failure to observe this information can result in major personal injury or loss of life

Caution! Failure to observe this information can result in minor personal injury or damage to the equipment.

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General

Only trained personnel are allowed to operate the machine. The machine may only be used in accordance with the instructions given in the manuals delivered with the equipment.

If the **Safety precautions** are not followed, there is risk of personal injury.

This is an automated machine. It is controlled by a process controller and will change its mode of operation without operator intervention. All personnel must therefore:

- stay outside the safety area
- regard all electrical equipment as live
- regard all pipes as hot
- use hearing protection.

Before carrying out maintenance and repair:

- shut off main steam supply
- switch off power
- allow the machine to cool down and adjust to atmospheric pressure
- inform the operator and other relevant personnel about the work you intend to do
- post warning signs in prominent places.

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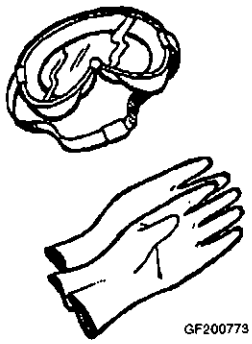
Pipes and other parts of this machine may be hot. Contact with hot equipment may result in severe burns. Avoid contact with hot equipment.

This machine operates under pressurized conditions. All personnel must therefore:

- watch out for leakage
- depressurize the equipment before attempting maintenance and repair work

Keep the doors of the control panel closed to protect it from water and steam.

Cleaning solution



Handling of cleaning solution

Cleaning solutions normally contain caustic soda (NaOH) or nitric acid (HNO_3). These chemicals may cause burning to skin and eyes. Follow the instructions given by the supplier.

Whenever there is a risk of exposure to these chemicals, always wear:

- safety glasses
- protective gloves
- shoes made of PVC or PE plastic, or rubber
- apron.

In the case of an accident involving cleaning solution, the basic rule is to rinse the affected area as soon as possible with as much water as possible.

For this reason, always make sure that the showers work, that there are additional washing facilities, and that an eyewash device is available at or near each machine site.

Emergency precautions

If swallowed

If you happen to swallow cleaning solution:

- drink large amounts of lukewarm water (in order to dilute the cleaning solution); then seek medical attention immediately.

Contact with eyes

If cleaning solution is splashed into your eyes:

- wash the eyes thoroughly with lukewarm water for 15 minutes (keep eyelids widely apart); then seek medical attention immediately.

Contact with skin or clothes

If cleaning solution comes into contact with skin or clothes:

- rinse immediately with plenty of water
- thoroughly wash the clothes before they are worn again. If skin burns appear, seek medical advice immediately.

If inhaled

If you experience irritation or pain due to having inhaled vaporized cleaning solution:

- leave the affected area to get fresh air. If the symptoms become worse, seek medical advice.

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General description

Applications

The Tetra Pak automatic direct standardisation equipment Tetra Alfast type 210 and 220 is designed to handle the following applications:

- skimming of whole milk and standardisation of cream
- standardisation of both cream and milk

Requirements of personnel

Operator: basic knowledge of industrial processes

Caution! **Unauthorized personnel**
Operation by unauthorized personnel may endanger personnel and property

Operator station

At the operator module, which is located in:

a) the operator panel, or

b) in a panel in the control room

Note! Tetra Alfast can also be controlled by a remote master control system.

Risk area

2 - 3 metres around the equipment due to:

- hot pipes and equipment
- jets of hot liquid

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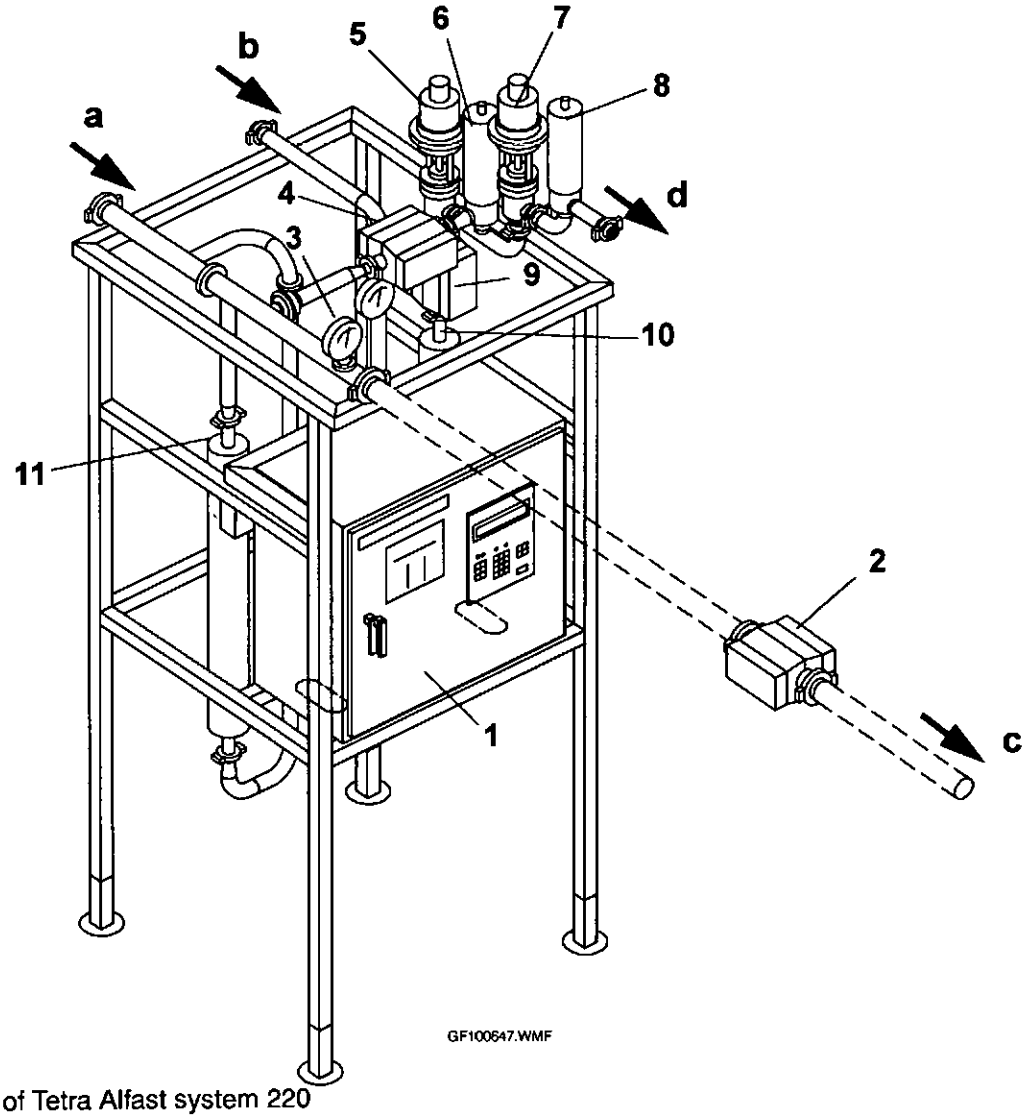
Denominations

1 Control panel
2 Flow transmitter (FT41), standardised milk
3 Pressure gauge, remix pressure
4 Flow transmitter (FT31), cream remixing
5 Control valve (CV21), cream fat content
6 Shut-off valve (SV31), full remix of cream
7 Control valve (CV51), milk fat content
8 Shut-off valve (SV50), (if applicable)
9 Flow transmitter (FT21), standardised cream
10 Density transmitter, cream (DT21)
11 Density transmitter, skim milk (DT11), only Tetra Alfast 220

a) Skim milk from separator
b) Cream from separator
c) Skim milk
d) Standardised surplus cream



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Typical layout of Tetra Alfast system 220

Density transmitter

Provides continuous on-line measurement of liquid density. The centre tube of the transmitter, through which the product flows, is made to vibrate at one of its natural frequencies, which is modified by the liquid contained herein. This frequency is a function of the overall mass per unit length of the tube and hence of the density of the contained liquid.

Flow transmitter

Provides continuous on-line measurement of liquid flows. The transmitter contains no moving parts.

Control panel

Available in two designs:

a) With **operator module** and fat content **recorder** placed in the front door

b) With **operator module** and fat content **recorder** remotely located, e.g. in a control room cabinet.

The panel contains:

- **operator module** with keyboard and display (only for version 1 above)
- **recorder** for fat content (only for version 1 above)
- **control module**
- **components** for power supply

The **operator module** is the operator's means of communication with the control module.

The **operator module** is used to:

- enter data and commands into the control module
- display data, such as measured values, setpoint, messages etc.

The **control module** contains:

- the computer that controls the standardisation process
- connectors for external computer communication
- LED for alarm indication
- connectors for input and output signals
- push buttons for operator communication
- LED indicators for input and output signals

Fat content recorder registers fat content in the milk (blue pen) and the cream (red pen). A recording of 100% on the paper corresponds to:

- milk fat content
- cream fat content of 50%.

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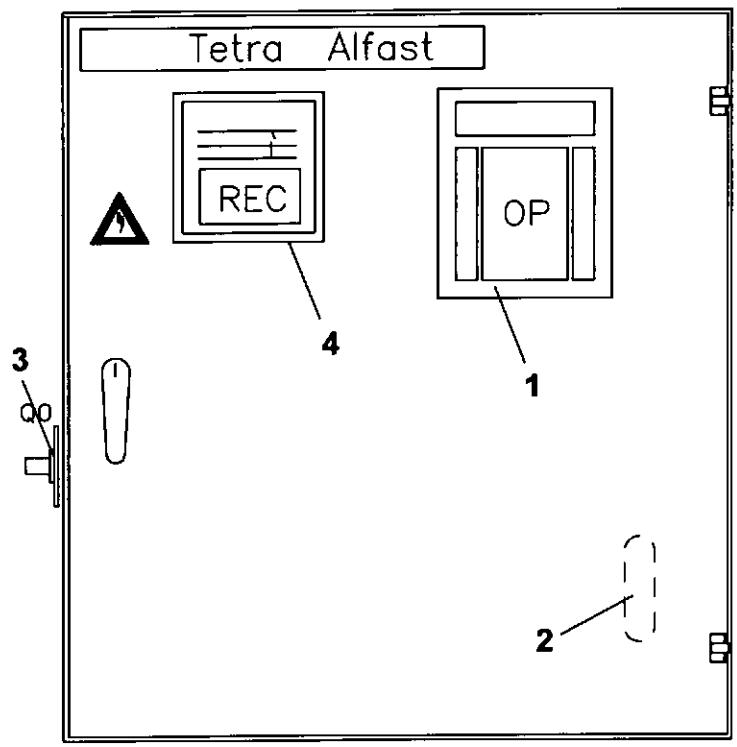
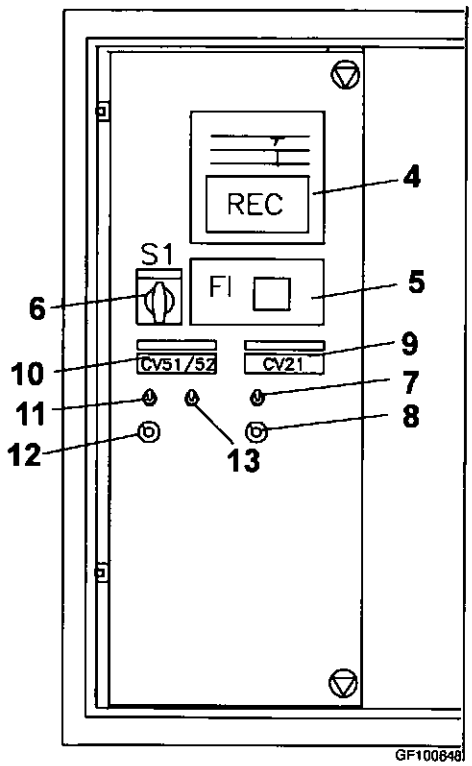
Components in the Tetra Alfast panel

1 Operator module
2 Air-regulating valve (PC0)
3 Main switch (Q0)
4 Recorder for fat content (TR)
5 Flow indicator (FI1)
6 Selector for flow indicator (S1)
7 Indicator for control valve position, cream fat (I21)
8 Selector manual/automatic cream (fat control (S21)
9 Potentiometer for control valve positioning, cream fat, during manual operation (R21)
10 Indicator for control valve position, milk fat (I51)
11 Selector manual/automatic milk fat control (S51)
12 Potentiometer for control valve positioning, milk fat, during manual operation (R51)
13 Selector manual/automatic control of shut-off valve in the remix pipe (S31)





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Process description

The process is carried out in two steps:

1 Skimming of whole milk

2 Standardisation of cream fat content

3 Standardisation of milk fat (three methods available):

- standardisation to a specified constant fat content.

(Only Tetra Alfast 220)

- standardisation of ratio F/SNF (fat/solids non fat) or
- standardisation of ratio F/TS (fat/total solids)

Skimming of whole milk

The amount of fat in the skim milk is mainly determined by separator type, pressure in the separator skim milk outlet pipe and the fat content in the whole milk.

A change in pressure in the separator skim milk outlet pipe will result in a change in the fat content in the skim milk.

Only Tetra Alfast 220

The density of the skim milk is measured by means of the density transmitter DT11. Compensated for the measured fat contents in the skim milk the solids non fat can then be calculated.

Cream standardisation

The flow from the separator cream outlet determines the fat content in the cream. The flow required depends on the fat content of the whole milk and the desired cream fat content. A change in whole milk fat content will result in a change in cream fat content. It is thus necessary to adjust the cream flow to maintain a constant cream fat content.

The cream flow is measured by flow transmitter FT21 and controlled by control valve CV21.

Calculation of flow setpoint is based on mass-balance.

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Cascade control is used to calculate the fat content in the incoming whole milk. Cascade control works by comparing:

- the flow through flow transmitter FT21 (this is inversely proportional to the cream fat content) and
- the density measured by the density transmitter DT21 (the density is reversed proportional to the cream fat content)

If the deviation in whole milk fat content exceeds a maximum limit (see parameters) the following measures will be taken:

- an alarm is given (Cascade control off)
- the information from the density transmitter is no longer used in calculating whole milk fat content
- control of cream flow is now based on the initial whole milk fat content and information from the flow transmitter.

Milk standardisation

This is achieved by mixing standardised cream with skim milk in suitable proportions.

The cream flow to the mixing point is measured by flow transmitter FT31 and controlled by control valve CV51.

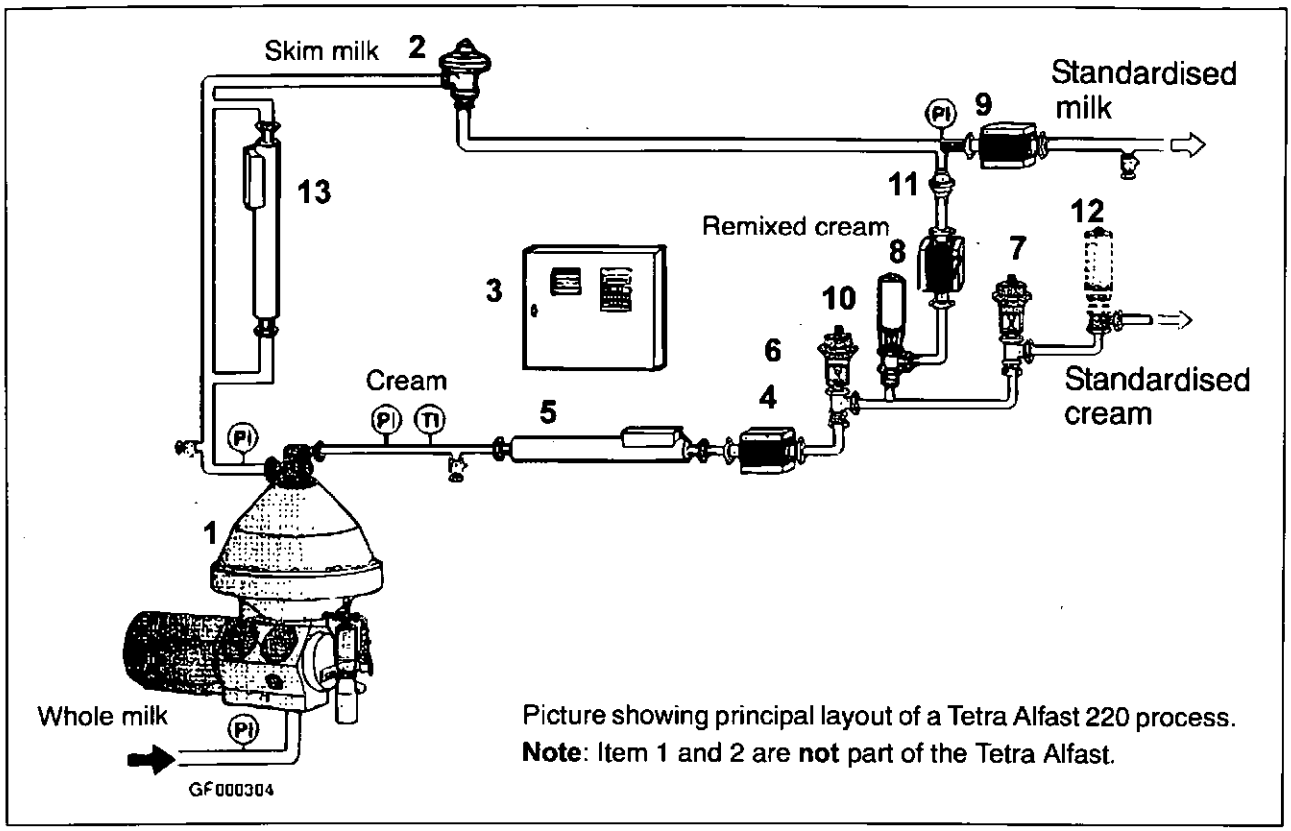
Calculation of remix cream flow is based on mass-balance.

Cleaning

Cleaning of the Tetra Alfast unit is carried out together with the surrounding equipment. Follow the cleaning instructions for upstream and downstream equipment.

Recommended cleaning intervals:

- after every production shift.



Picture showing principal layout of a Tetra Alfast 220 process.
Note: Item 1 and 2 are **not** part of the Tetra Alfast.

1 Separator
2 Constant pressure valve for skim milk
3 Control panel
4 Flow transmitter for cream, FT21
5 Density transmitter for cream, DT21
6 Control valve for cream, CV21
7 Control valve for surplus cream, CV51
8 Flow transmitter for remix cream, FT31
9 Flow transmitter for standardised milk, FT41
10 Shut-off valve for remix cream, SV31
11 Non-return valve
12 Shut off valve for standardised cream, SV50 (if applicable)
13 Density transmitter for skim milk, DT11 (only Tetra Alfast 220)

Product flow

Whole milk, preheated to 50-65°C, flows to the separator

The separator produces:

- skim milk with a fat content of approx. 0.04-0.06%F
- cream with a preset fat content, normally 30-45%F

Skim milk

- flows through density transmitter DT11 (Only Tetra Alfast 220)
- flows through a constant-pressure valve to the remixing point
- the skim milk (or remixed milk) continues through flow transmitter FT41 to subsequent treatment

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Cream

- flows through density transmitter DT21
- flows through flow transmitter FT21 to control valve CV21

then flows

a) through shut-off valve SV31, flow transmitter FT31 and a non-return valve to the remixing point

b) through control valve CV51 and

if applicable, through shut-off valve SV50

to subsequent treatment.

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Operation modes

Operation modes are selected by a **Quick choice** function. Operation modes are used for:

- preset fat content setpoint
- special functions.

These choices can also be made from external control systems by link or via relay. For detailed information, see table concerning available parameters.

The following choices are supported:

#1-#14 Cream fat contents
These choices include preset setpoints for milk fat contents. The setpoints can be changed by the operator.

#17 Circulation
Used when the surrounding equipment e.g. a pasteuriser is not in production.

During circulation Tetra Alfast will:

- stop accumulating amounts of produced skim milk/cream
- not give any fat content alarm
- stop the fat content recorder, if the cascade control is switched off

#18 Valve freeze/cascade freeze
Performs one of the following functions (selected via parameter):

- Maintaining a constant output signal to control valve for a period of time
- Maintaining the calculated value of whole milk fat content constant for a period of time

#19 Cleaning
This choice contains setpoints used to obtain good cleaning results.

#20 Keyboard locking
Used to avoid unintentional use of the operator module.

If an attempt is made to use the keyboard a message will be displayed stating that the keyboard is locked.

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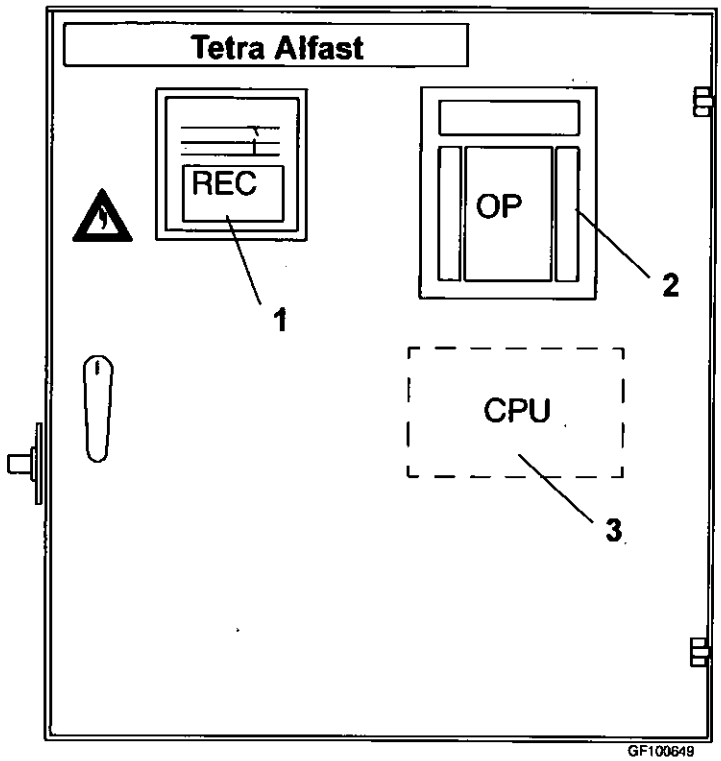
Control panel



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Denomination

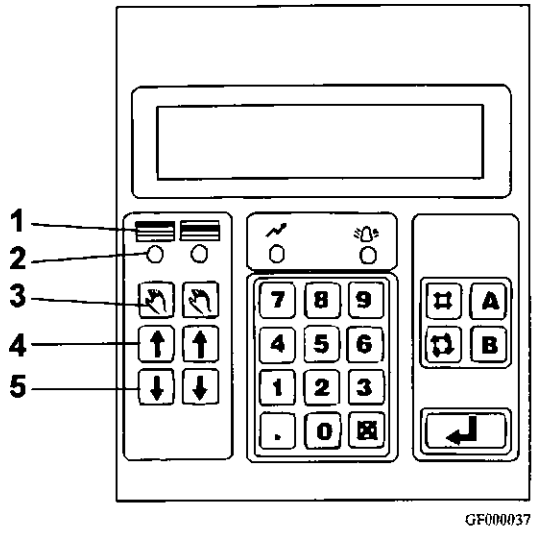
On the front:

1 Recorder
channel 1, blue pen, milk fat content (0-5%),
channel 2, red pen, cream fat content (0-50%)

2 Operator panel with display and keys

3 Control module (Inside the cabinet)

Operator module



Left side

This part is used for manual control of fat content and stepping between text levels in lines 1 and 2 on the display:

1 **Display symbols**
   - **Left column**: top line on the display, milk
   - **Right column**: second line on the display, cream

2 **LEDs:** activated LED indicates that
   - manual fat control is selected
   - total remix is selected
   - skimming is selected

3 **Hand key**: selection/deselection of automatic control

4 **Arrow-up key**: is used to
   - increase fat content during manual control
   - scroll to next sub-level on corresponding line on the display

5 **Arrow-down key**: is used to
   - decrease fat content during manual control
   - scroll to previous sub-level on corresponding line on the display.

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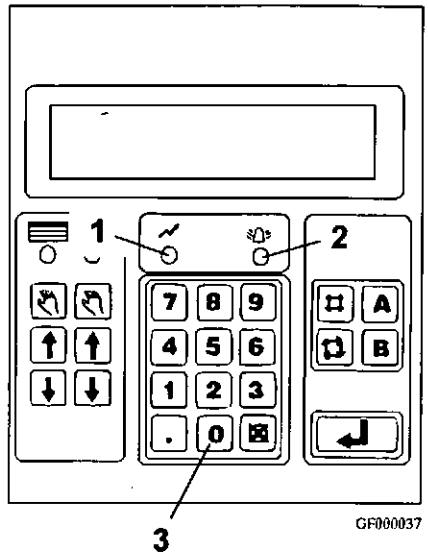

In the middle

1 Communication LED (left): activated LED indicates that communication between operator module and control module is working.

2 Alarm LED (right): indicates alarm

- flashing light indicates unacknowledged alarm
- steady light indicates that the alarms are acknowledged but remains.

3 Numerical keys: contains numerical keys (0-9), decimal point key and erase key.

Erase key is used to:

- erase keyed in values during change of values
- acknowledge alarms (to acknowledge alarms, the cursor must be positioned on line 4).

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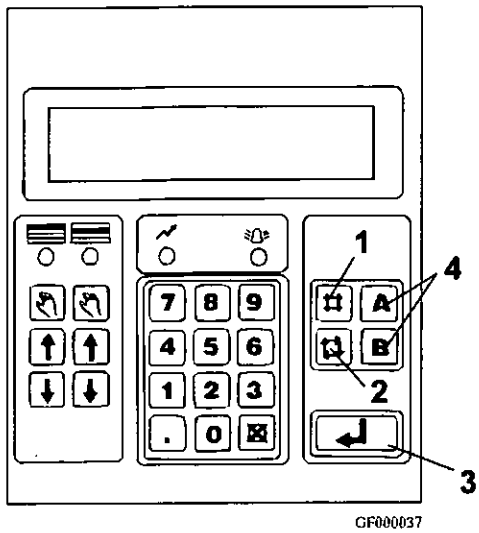

To the right

1 **Quick choice key**: used to
   - select preset fat contents during production
   - select special functions

2 **Cursor key**: used to position the cursor on the display

3 **ENTER key**: used to
   - confirm keyed-in values
   - scroll between alarms
   - proceed to next parameter

4 **Parameter keys**: are used to change or check a parameter value
   - **A** parameters: system parameters
   - **B** parameters: process parameters
   - For a list of available parameters, please see chapter **Settings.**

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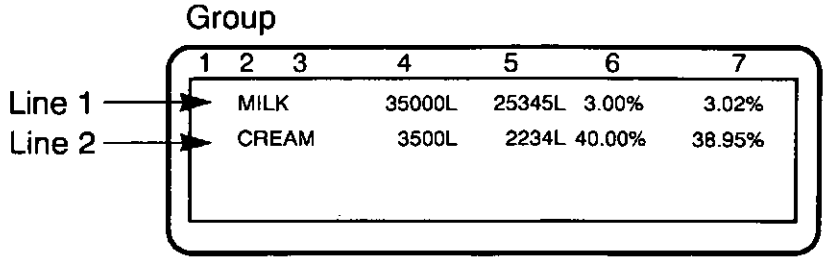
Operator display



The display unit has four lines that are used as follows:

- **Line 1**: information concerning milk
- **Line 2**: information concerning cream

These lines are divided into 7 groups:

group 1 indicates:

- '→'cursor position
- '*', meaning that the keyboard is blocked due to manual change of values on the control module.

group 2 indicates:

- display level (blank is normal information, 1 or 2 is sub-level information)

group 3 indicates:

- denomination (milk, cream...)

group 4 is used to:

- preset volume of milk/cream to be produced before an alarm is given
- indicate preset volume

group 5 is used to:

- indicate actual volume of milk/cream produced since counter was last set at zero
- change produced volume (e.g. set to zero)

group 6 is used to:

- indicate standardised milk/cream fat content setpoint

group 7 is used to:

- indicate actual standardised milk/cream fat content

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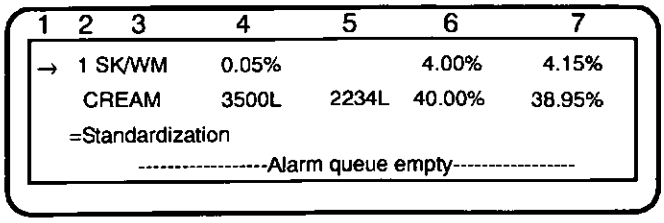
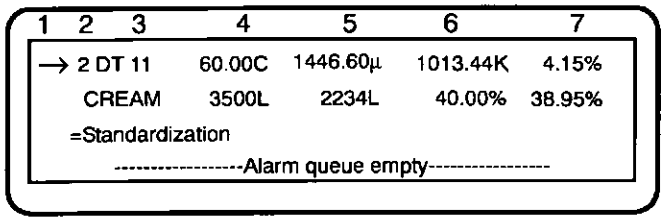


Line 1, sub-level 1 is used to indicate/change fat content for

- Skim milk (group 4)
- Whole milk (group 6)

and to display

- calculated whole milk fat content (group 7)



Line 1, sub-level 2 (only Tetra Alfast 120/220): is used to display information on the skim milk density measurements.

The following information is displayed:

- skim milk temperature, degrees Celsius, (group 4)
- vibration period of density transmitter, microseconds, (group 5)
- calculated skim milk density, kg/m^3, (group 6)
- calculated total solids content in the skim milk, %TS (group 7).

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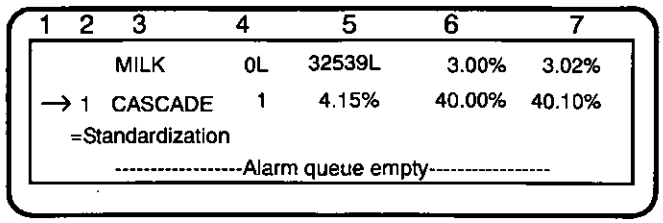
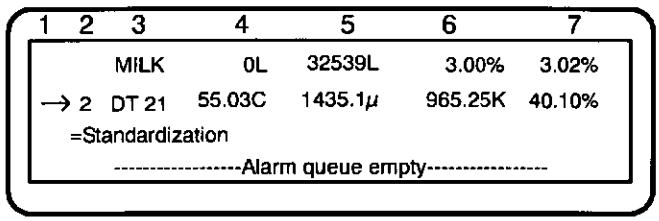


Line 2, sub-level 1: is used to activate/deactivate the cascade control.

The following information is displayed:

- cascade control status (group 4)
- **0** = not selected
- **1** = selected
- calculated whole milk fat content, %F (group 5)
- standardised cream fat content set-point, %F (group 6)
- calculated standardised cream fat content, %F (group 7)



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Line 2, sub-level 2: is used to display information on the cream density measurements.

The following information is displayed:

- cream temperature, degrees Celsius, (group 4)
- vibration period of density transmitter, microseconds, (group 5)
- calculated cream density, kg/m^3, (group 6)
- calculated cream fat content, %F, (group 7).

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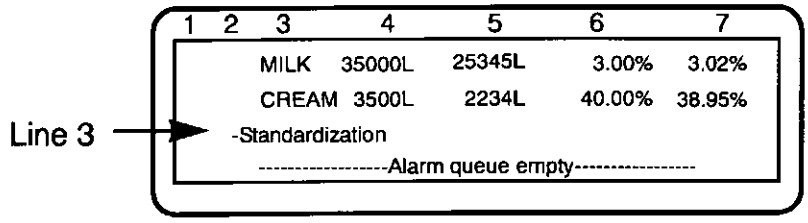
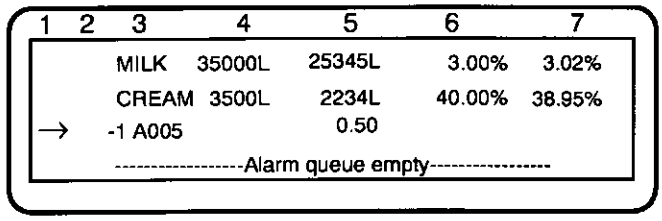


Line 3: is used to

- display production status
- to inspect/change parameter values
- initiate special functions (see list of available functions....)

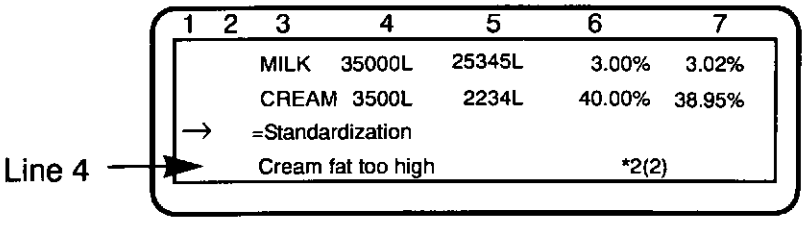
The following information is displayed:

- cascade control status (group 2)
- '-' = cascade control selected but not active
- '=' = cascade control selected and active
- production status (group 3).



During inspection/change of parameter values:

- access level, e.g. '1' (group 3)
- selected parameter name, e.g. A005 (group 3)
- value of selected parameter (group 5)



Line 4: is used to display alarm messages (see Supervision of faults).

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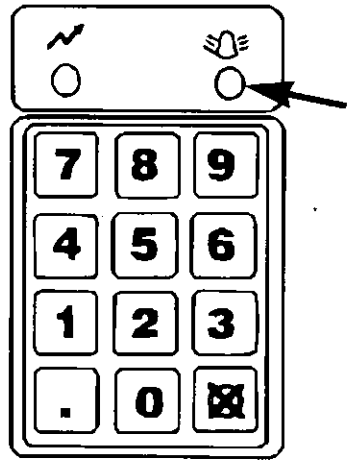
Supervision of faults



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Fault indication

When a fault occurs:

- the red LED on the operator module starts to flash
- an alarm text is displayed on the operator module, line 4
- an external alarm, if connected, is activated.

When the alarm is acknowledged:

- the red LED shows steady light if the fault remains
- the red LED is switched off if the fault has disappeared
- external alarm, if connected, is deactivated

1	2	3	4	5	6	7
		MILK	35000L	25345L	3.00%	3.02%
		CREAM	3500L	2234L	40.00%	45.95%
→		-Standardization				
		Cream fat too high			*2(2)	

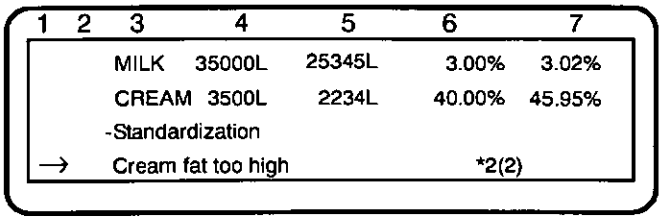
Information on which fault that has occurred is displayed on line 4 on the operator module.

The number of detected alarms is indicated to the right on line 4:

- 2(2) means that alarm number two out of two is displayed
- * means that the alarm is not acknowledged.

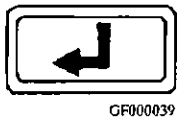
Display and acknowledge alarms

To display and acknowledge alarms, proceed as follows:



1 Press **Cursor** key to move the cursor to line 4

2 Press **Erase** key to acknowledge the alarm displayed on line 4



3 Press **Enter** to display next alarm.

4 Continue until all alarms have been displayed and acknowledged.

2.2 tf100759.en

Fault list

Faults will cause an alarm only. No corrective actions will be taken by the control system.

Please contact Tetra Pak for all persisting Component and Control module alarms.

Explanation of alarms(Sida 1 av 2)

Alarm text in display	Explanation
Process alarms	
Cream fat too high	Cream fat out of range
Cream fat too low	Cream fat out of range
Milk fat too high	Milk fat out of range
Milk fat too low	Milk fat out of range
Preselected cream volume processed	
Preselected milk volume processed	
Cascade control off	Cascade control outside preset limits
No flow through FT21	Flow should be present
No flow through FT41	Flow should be present
No flow through FT31/FT32	Flow should be present
Flow through FT21	Flow should not be present
Flow through FT41	Flow should not be present
Flow through FT31/32	Flow should not be present
CV21/CV22 in end position	Cream fat out of range
CV51/CV52 in end position	Milk fat out of range
Density outside limits	Cream density too high/low (DT21)
Temperature outside limits	Cream temperature too high/low (DT21)

2.2 tf100759.en

Explanation of alarms(Sida 2 av 2)

Alarm text in display	Explanation
Component alarms	
No answer 100 ohm	Temperature reading from DT11/DT21 not working
No answer 140 ohm	Temperature reading from DT11/DT21 not working
No answer temperature DT11	Temperature reading from DT11 not working
No answer temperature DT21	Temperature reading from DT21 not working
No answer density transm.11	Density transmitter DT11 not working
No answer density transm. 21	Density transmitter DT21 not working
	Note: DT11 Only Tetra Alfast 120/220
Control module alarms	
PROM ERROR (D95)	Contact Tetra Pak
PROM ERROR (D96)	Contact Tetra Pak
RAM ERROR	Contact Tetra Pak
BATTERY RAM ERROR (D97)	Contact Tetra Pak
EE-PROM ERROR	Contact Tetra Pak
ALFAST KEY MISSING OR WRONG	Contact Tetra Pak
EE-PROM MISSING	Contact Tetra Pak
Incorrect data in EE-PROM	Contact Tetra Pak
No link with control module	Contact Tetra Pak
No link with operator module	Contact Tetra Pak
Battery discharged (G1)	Contact Tetra Pak

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Preparation

a) Check that the downstream equipment (e.g. buffer tanks) is ready to receive product (milk, cream).

b) Check that the upstream equipment (e.g. buffer tanks) is ready to deliver product.

c) Check that the whole milk has rested in the buffer tanks for at least one hour

d) Check the equipment visually to ensure that it is ready to be started.

e) Check that no alarm texts are displayed on the operator module.

f) Check the supply of recorder paper.

g) Check that all hand/auto switches are in position **Auto**.

h) Check that correct whole milk fat content is updated in the control system parameters (see **Update input fat content**)

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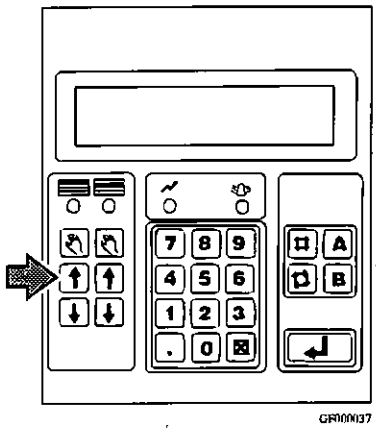

Update input fat content 1a

Press the left **Arrow-up** key to display sub-level 1 on line 1.

Note!
The LED above the hand must not be lit.

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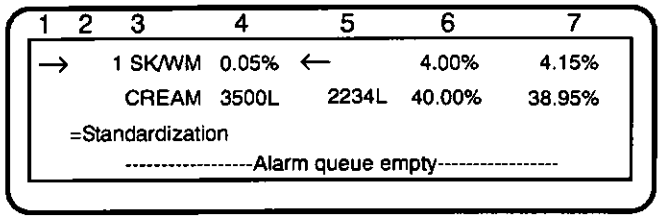
1b

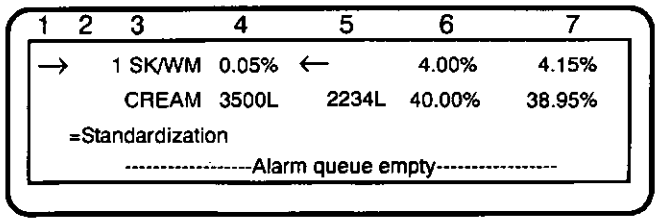
This picture is displayed.

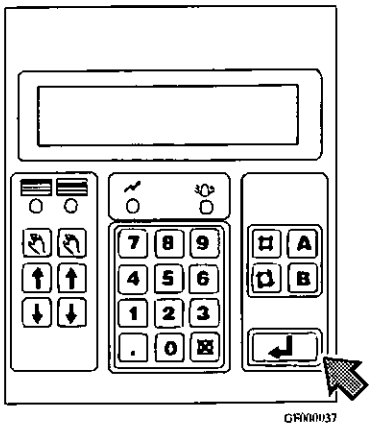


2

Press the **Cursor** key to position the auxiliary cursor '←' at the value to be changed:

- skim milk, group 4
- whole milk, group 6

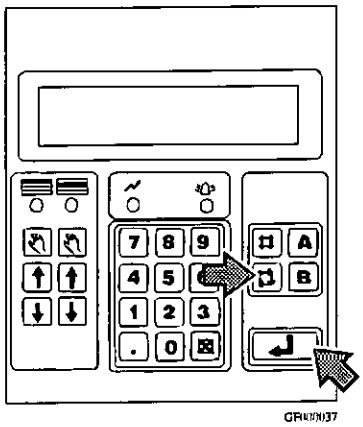




3

a) Key in the new value.

b) Press **Enter** to confirm.

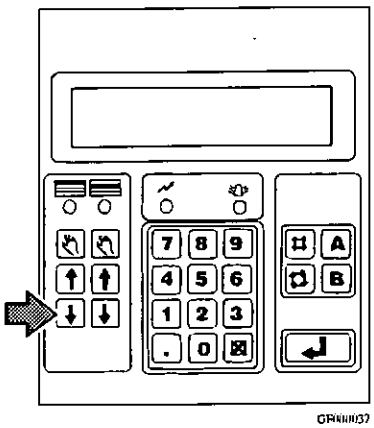


4

Press the **Cursor** key or **Enter** until the auxiliary cursor '←' is no longer displayed.

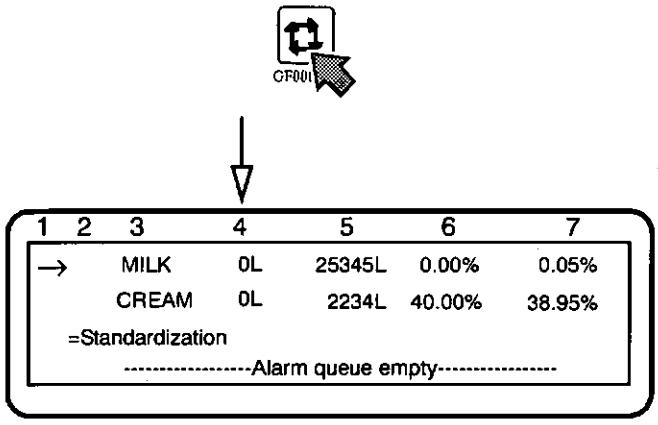
5

Press the left **Arrow-down** key to leave the sub level.



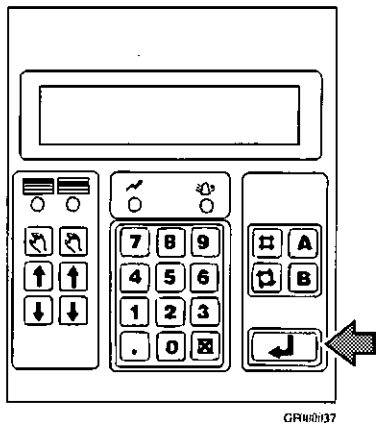
Cream/skimmilk preselect volume

An alarm is given when the preselected volume is reached/exceeded.



1

Press the **Cursor** key to position the cursor at line 1 (skimmilk) or line 2 (cream), group 4.



2

a) Key in the amount to be produced.

b) Press **Enter** to confirm.

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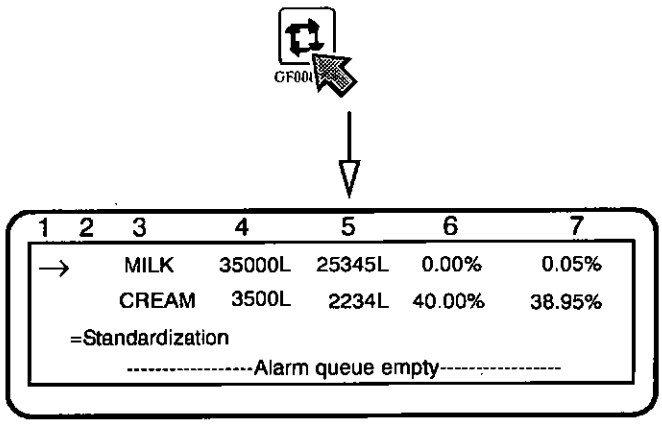
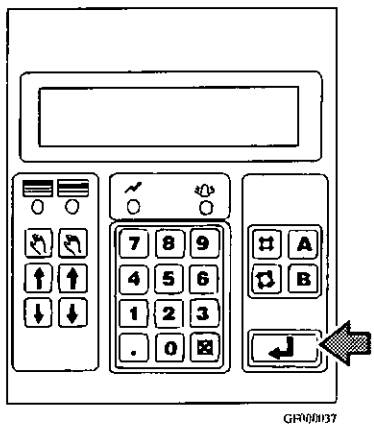
Cream/skimmilk reset of volume

To start registration of produced amount of standardised cream and skimmilk.



1

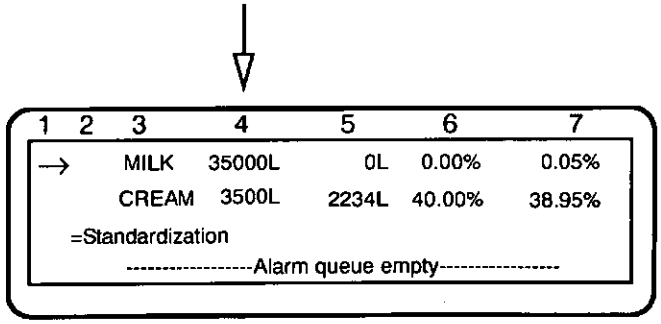
Press the **Cursor** key to position the cursor at line 1 (skimmilk) or line 2 (cream), group 5.



2

a) Key in 0 (zero).

b) Press **Enter** to confirm and start registration.



3

– The counter is reset and the cursor is moved to group 4.

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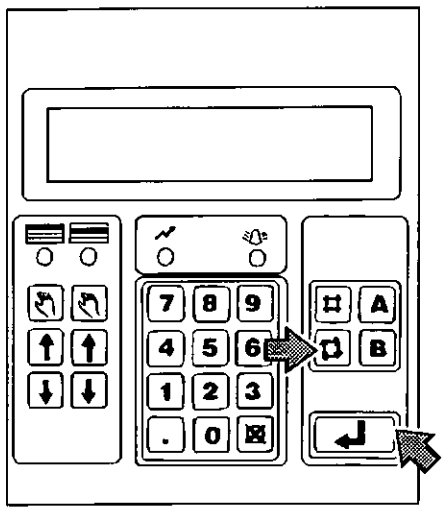
4

Press the **Cursor** key or **Enter** until the auxiliary cursor '←' is no longer displayed.



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Available quick choices:

#1-#14 Milk and cream fat contents
These choices include preset setpoints for cream fat contents. The setpoints can be changed by the operator.

#15 Skimming
Separation of skim milk and cream. No remixing will take place.

#16 Total remix
Remixing of all cream into the skim milk.

#17 Circulation
Used when the surrounding equipment e.g. a pasteurizer is not in production.

During circulation Tetra Alfast will:

- stop accumulating amounts of produced skimmilk/cream
- not give any fat content alarms
- stop the fat content recorder, if the cascade control is switched off

#18 Valve freeze/cascade freeze
Performs one of the following functions (selected via parameter):

- Maintaining a constant output signal to control valves for a period of time
- Maintaining the calculated value of whole milk fat content constant for a period of time

#19 Cleaning
This choice contains setpoints used to obtain good cleaning results.

#20 Keyboard locking
Used to avoid unintentional use of the operator module.

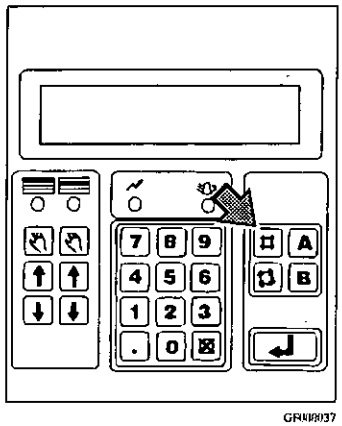
If an attempt is made to use the keyboard a message will be displayed stating that the keyboard is locked.

Select operation mode

Description valid for operation modes #1 - 14 and #15 - 20.

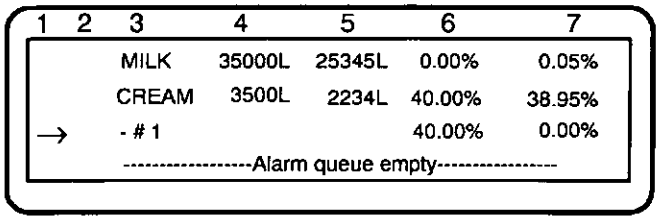
Selection of operation modes #1 - 5, #15 - 20 can also be made by external relay signals.

For a description of available operation modes, see chapter Process description.



1

Press the **Quick choice** key.

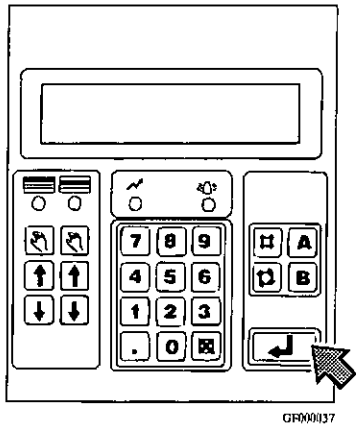


2

Key in desired choice number.

– Relevant preset setpoints are displayed on line 3.

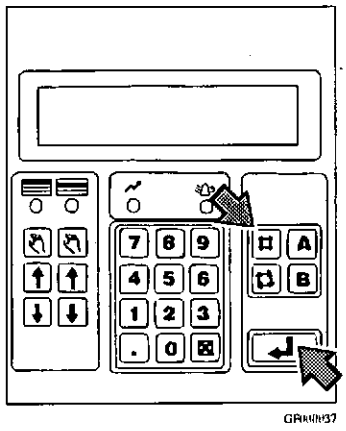
Note!
To redo the selection, press the Quick choice key.



3

Confirm by pressing **Enter**.

– Line 3 will now display the production mode.



To terminate function 20, **Keyboard locking,** proceed as follows:

a) Press the **Quick choice** key.

b) Key in 20.

c) Confirm by pressing **Enter**.

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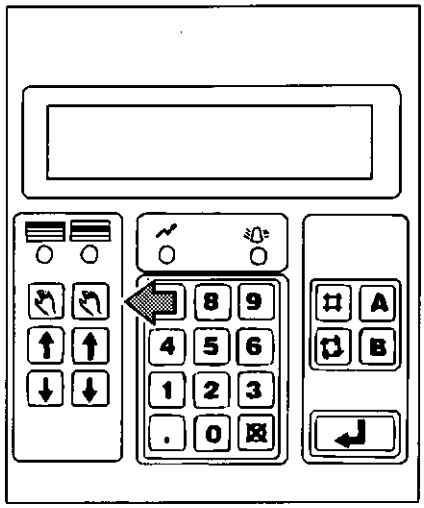
Fat content, manual control

This is achieved by manually controlling the position of the control valves.



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1

Press applicable **Hand** key (right for cream)

- The yellow **LED** above the **Hand** key will be lit.
- The control valve will remain in its current position.

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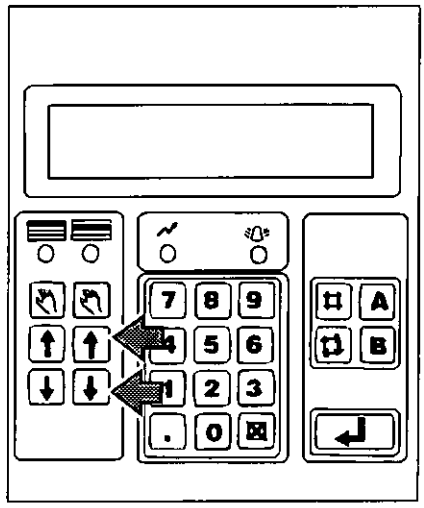

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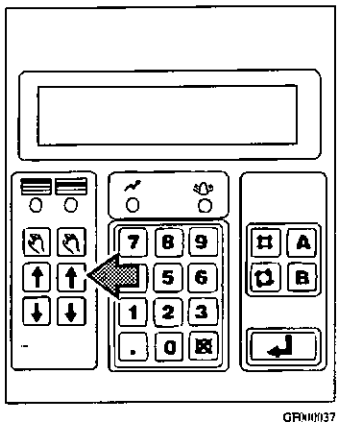
2

Press **Arrow-up** key to **increase** the fat content.

Press **Arrow-down** key to **decrease** the fat content.

Cascade control activate/deactivate



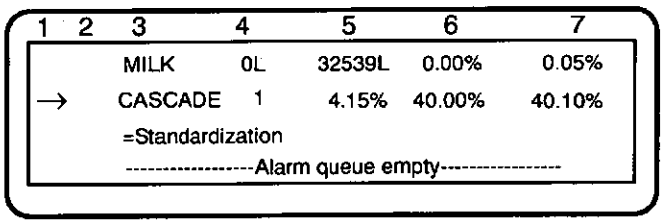
1a

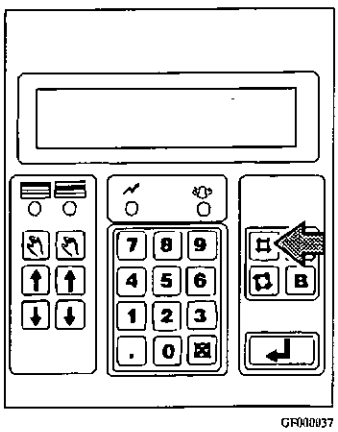
Press the right **Arrow-up** key to display sub-level 1 on line 2.

Note!
The LED above the hand must not be lit.

1b

– The following is displayed.





2

Press the **Cursor** key to position the auxiliary cursor '←' at group 4.

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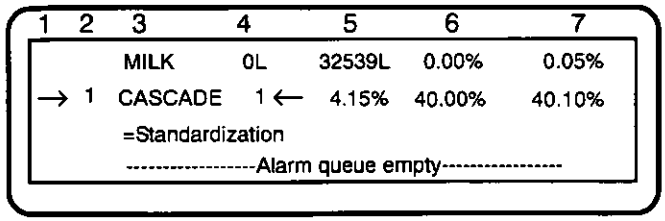
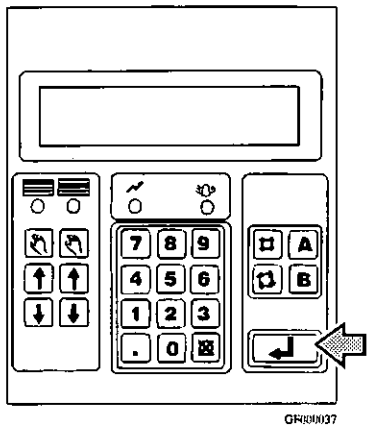


3

Key in:

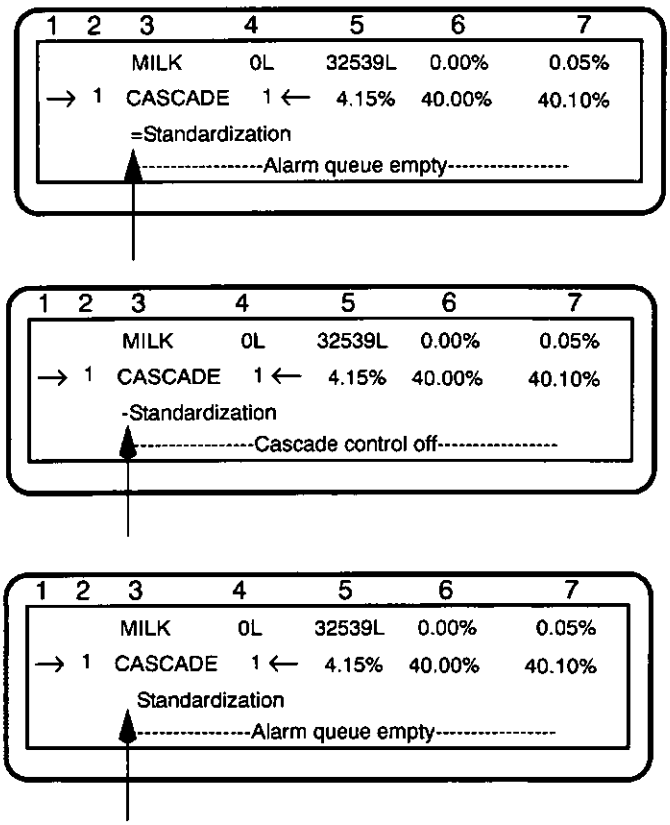
- **0** to **deselect** the cascade control
- **1** to **select** the cascade control



4a

Press **Enter** to confirm.

- The cursor is moved to line 1, group 6.



4b

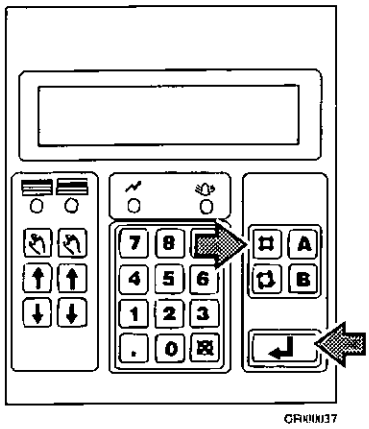
The following is displayed on line 3, group 2:

At selection:
'=' if cascade control is activated within limits)

'-' if cascade control is deactivated (outside limits)

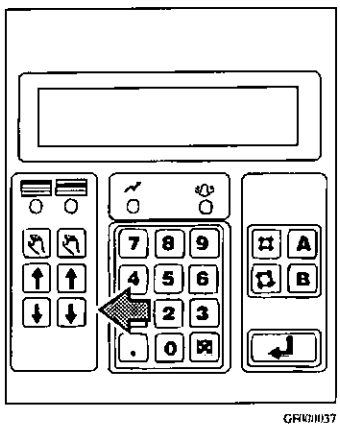
At deselection:

' ' (i.e. blank)



5

Press the **Cursor** key or **Enter** until the auxiliary cursor is no longer displayed.

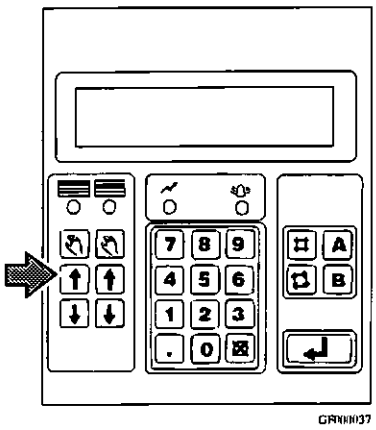


6

Press the right **Arrow-down** key to leave the sub-level.

Display DT11 values

Note!
Only Tetra Alfast 220

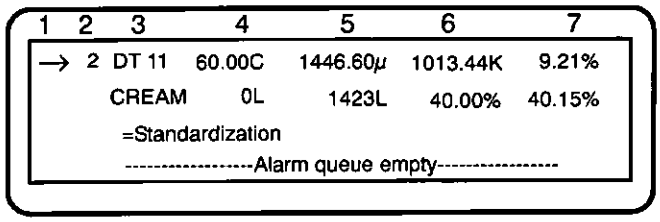


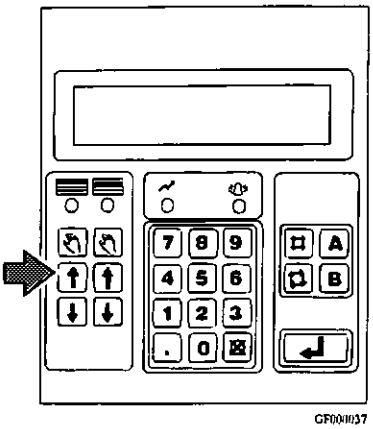
1a

Press the right **Arrow-up** key **twice** to display sub-level 2 on line 1.

1b

– The following is displayed.

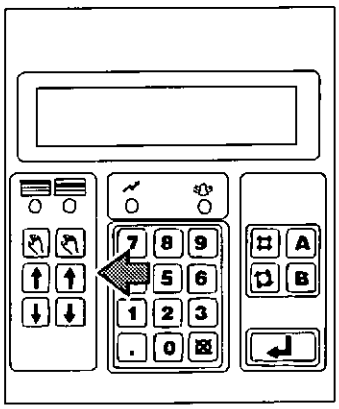




2

Press the right **Arrow-up** key **once** to leave the sub-level.

Display DT21 values

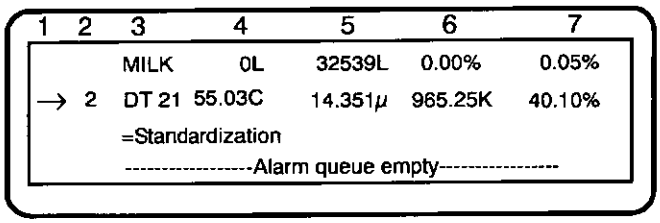


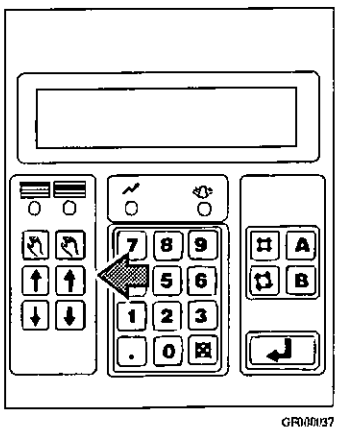
1a

Press the right **Arrow-up** key **twice** to display sub-level 2 on line 3.

1b

– The following is displayed.





2

Press the right **Arrow-up** key **once** to leave the sub-level.

Operation, remote control

During remote control, the Tetra Alfast receives/sends signals from/to an external Master control system.

The communication is made by either:

- relays or
- computer communication

Relay communication

The following communication is supported:

- selection of quick choice 1 - 5 and 17 - 19

Computer communication

The following communication is supported:

- selection of quick choice 1 - 20
- updating of all parameters that do not require access code.

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Back-up operation

When normal operation is not possible, Tetra Alfast supports the following back-up operations:

- manually via the **hand keys** on the operator module
- manually via **switches and potentiometers** in the control cabinet
- automatically from the **control module**

For serious faults, contact Tetra Pak.

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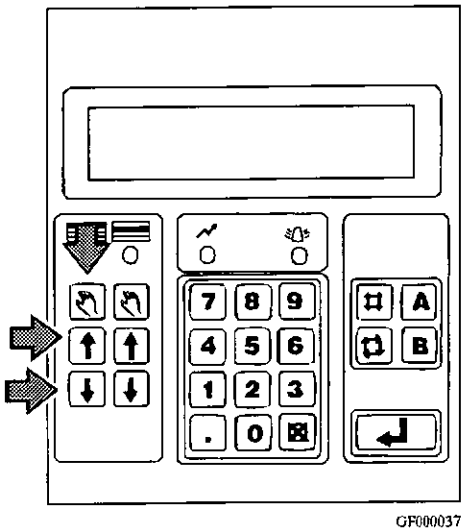

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Hand keys

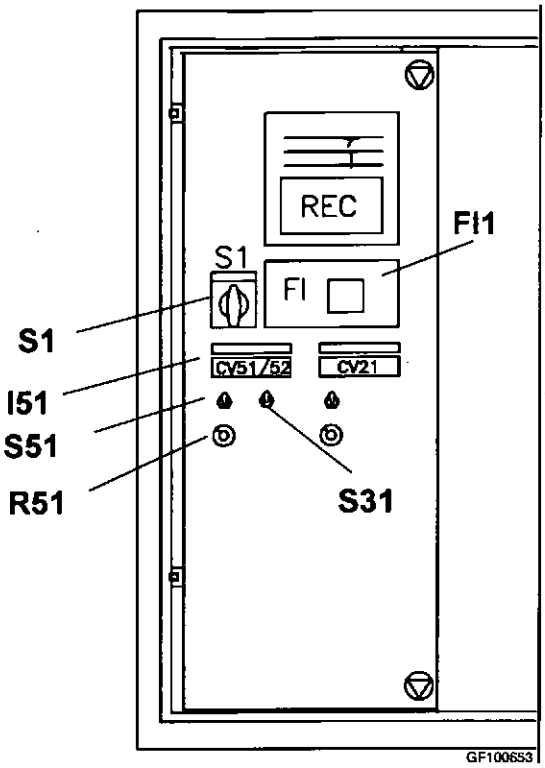
Use this back-up operation when there e.g. are major process disturbances.

a) Press the **Hand key** to deselect the automatic fat content control.

b) Adjust the fat content by pressing the **Arrow up** or the **Arrow down** keys.

Use the display and the fat content recorder to see the effect of your changes.

For more information, see the **Process data list**, included in the **Technical manual**.



Switches and potentiometers

Use this back-up operation when the control module is out of order

Use the equipment located on the Dutch door in the Alfast panel.

Milk fat content

a) Set switch:
- **S51** to position **MAN**
- **S31** to position **MAN**
- **S1** to position **FT31**

b) Check:
- the flow on indicator **FI1**
- control valve position on **I51**
- the fat content on the display unit in the control module

c) Adjust the fat content with potentiometer **R51** until the correct value is achieved. See the **Process data list**.

d) Take a fat content sample and re-adjust the fat content if necessary.

To end the back-up operation:

e) Set switch:
- **S51** to position **AUT**
- **S31** to position **AUT**
- **S1** to position **AUT**

Note!
The Indicators for valve position are marked from 0 to 1. This corresponds to 0 - 20 mA. The signals to the control valves are 4-20 mA. This means that for a 4 mA signal the indicator will show 2.

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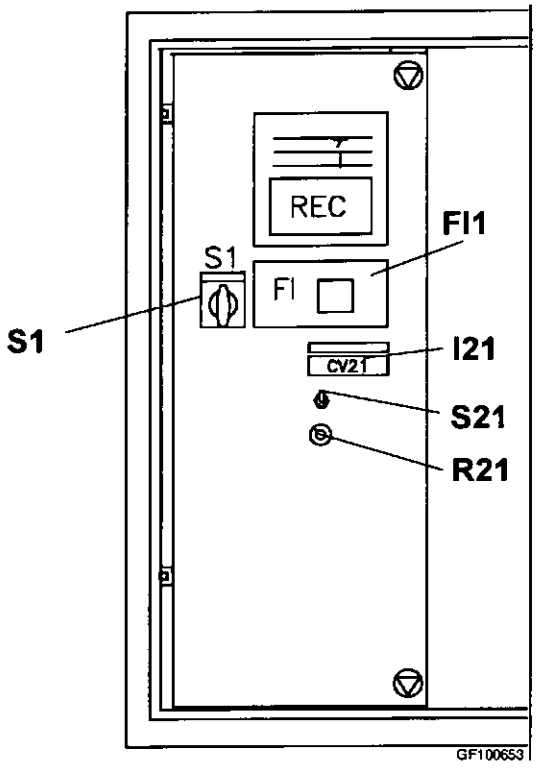

Cream fat content

a) Set switch:
- **S21** to position **MAN**
- **S1** to position **FT21**

b) Check:
- the flow on indicator **FI 1**
- control valve position on **121**
- the fat content on the display unit in the control module

c) Adjust the fat content with potentiometer **R21** until the correct value is achieved.

d) Take a fat content sample and re-adjust the fat content if necessary.

To end the back-up operation:

e) Set switch:
- **S21** to position **AUT**
- **S1** to position **AUT**

Note!
The Indicators for valve position are marked from 0 to 1. This corresponds to 0 - 20 mA. The signals to the control valves are 4-20 mA. This means that for a 4 mA signal the indicator will show 2.

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Control module

For detailed information, see the appendix **Component instructions, Tetra Alfast control module.**

Use this back-up operation when:

- the communication between operator module and control module is out of order
- the operator module is out of order

All functions available on the operator module can be performed from the control module.

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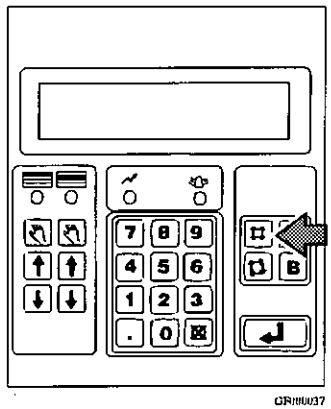
Cleaning

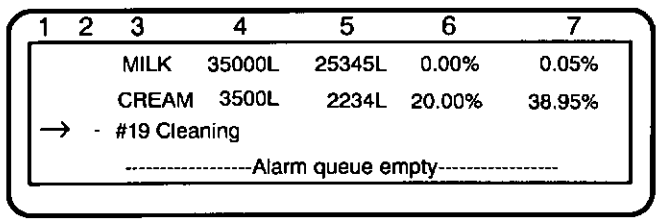
Tetra Alfast is to be cleaned in-line together with the surrounding equipment.

This section describes how to set up the Tetra Alfast for cleaning.



1

Press the **Quick choice** key.



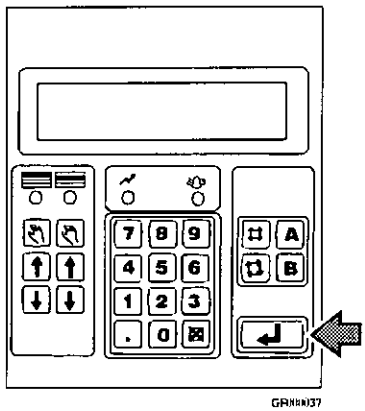
2

Key in the number **19**.

- The cursor moves to line 3 and the following is displayed.

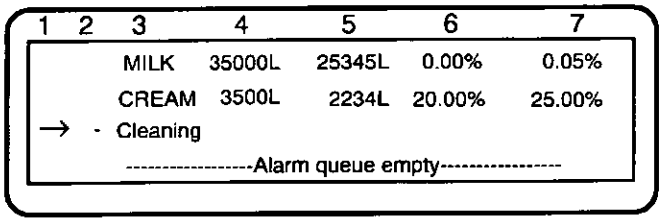
Line 3 indicates preset value used during cleaning for:

- cleaning 'cream fat content'
- cleaning 'milk fat content' (Only Tetra Alfast 200)



3

Press **Enter**.



4

– The setpoint are moved to corresponding lines and are used for control.

The Tetra Alfast is now in cleaning mode of operation.

This following is displayed.

5

Start cleaning of surrounding equipment.

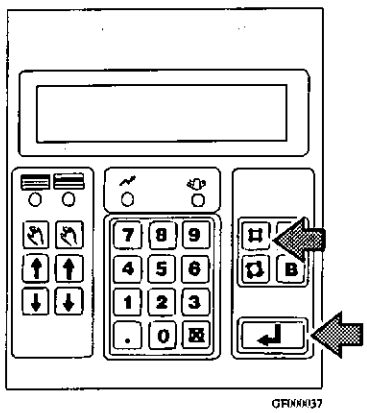
After cleaning is completed:

a) Press the **Quick choice** key.

b) Key in the number **19**.

c) Press **Enter**.

The Tetra Alfast is now in normal operation mode.



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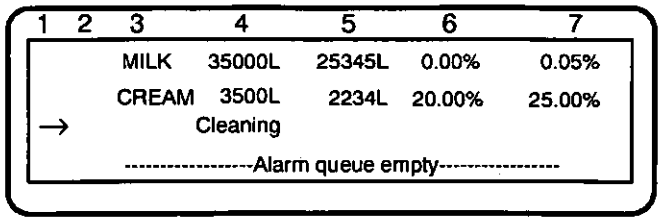
Cleaning, remote control

Selection of cleaning is made by an external control system:

- by using communication link or
- by using external relay signals.

After an external selection of cleaning, the Tetra Alfast is in cleaning mode of operation.



During external selection of cleaning, the following is displayed.

After cleaning is completed

The Tetra ALFAST will automatically return to normal operation mode, by means of:

- communication link signal or
- relay signal

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Sampling of product

Sampling of product is part of calibration of parameters used by the control module.

For information about the complete calibration procedure, see the Technical Manual, tag Maintenance, section Calibration of parameters.

Conditions for sampling and analysis for calibration purposes

- To avoid disturbances during sampling, separate the process line where the samples are taken from other process lines.
- Do not sample during, or within 15 minutes after, a change in process such as
  start, circulation, separator discharge, change of separation temperature, change of product, change of delivery or receiving storage tank etc.
- Whole milk should be of good quality with the fat content within the range that the system is designed for.
- Whole milk to be well agitated in the milk storage tank(s) to obtain even fat distribution
- Whole milk must be stored in the whole milk storage tank(s) for at least one hour prior to sampling, in order to be properly deaerated.

Samples are to be taken in:

- the process line or
- the product tanks, when the fat content is close to the setpoint

Sample point are:

- raw milk - balance tank
- skim milk - skim milk line after separator
- cream - cream line after separator
- standardised milk - PHE/ after milk cooler (Only Tetra Alfast 200)

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In the process line

1

Open the sample tap.

Note!
Open the tap slowly to avoid pressure drop in the product line.

2

Take a sample of at least 150 ml.

Note!
Take the sample during a period of 90 seconds. This is to level out fluctuations induced by the control system.

In the product tanks

If the fat content is close to the setpoint, i.e.:

- within ±0.05% units of the milk fat content (Only Tetra Alfast 200)
- within ±0.5% units of the cream fat content

Take the samples in the product tanks. Take samples from several tanks.

Parameters are divided into two types:

A - system parameters containing preset values used for system configuration and as setpoints for e.g. fat contents and flows. Setpoint values can be changed by the operator.

B - process parameters containing in- and output signals from/to the process, as well as calculated values. All values are momentary.These parameters can not be changed by the operator.

Standardization method

(Only Tetra Alfast 220)

Standardization of milk fat content can be done in three ways:

- Normal fat standardization (F)
- Fat in solids non fat (F/SNF)
- Fat in total dry matter (F/TS)

In parameter **A125** a selection of standardization methods is available.

The numbers 0 - 5 corresponds with the standardization methods in the table.

Ex. 1: Quick choice 1 will standardize to 3% fat and 40% cream.

Parameter	Value
A005	3
A006	40
A900	0
A920	0

Ex. 2: Quick choice 2 will standardize to 33% fat in solids non fat and 40% cream.

Parameter	Value
A009	0
A010	40
A901	0
A921	33

Ex. 2: Quick choice 3 will standardize to 25% fat in total solids and 40% cream.

Parameter	Value
A013	0
A014	40
A902	25
A922	0

Setpoints quick choice parameters

#1-#14 Milk and cream fat contents

These choices include preset setpoints for cream and milk fat contents.

Each quick choice contains 4 parameters:

- Set point, milk fat content (%F)
- Set point, cream fat content (%F)
- Set point, milk fat content in total solids (%F/TS) **Only Tetra Alfast 220**
- Set point, milk fat content in solids non fat (%F/SNF) **Only Tetra Alfast 220**

Note!
There is always a value in the parameter cream fat content and in one of the parameters for milk fat content.

If the two other parameter requires no values they must be set to 0.

Note!
Parameters A900, A920, A901, A921, A902 and A922 Only Tetra Alfast 220

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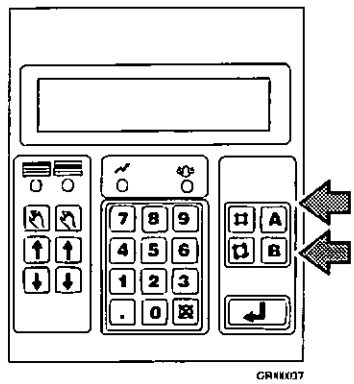
Display of parameters



1a

Press relevant parameter key **A** or **B**.

Key in relevant parameter number (always 3 digits).

1b

– The parameter and its current value are displayed on line 3.

1	2	3	4	5	6	7
		MILK	35000L	25345L	0.00%	0.05%
		CREAM	3500L	2234L	40.00%	38.95%
→	-	A006		40.00		
		----------Alarm queue empty----------				

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Change of parameter values

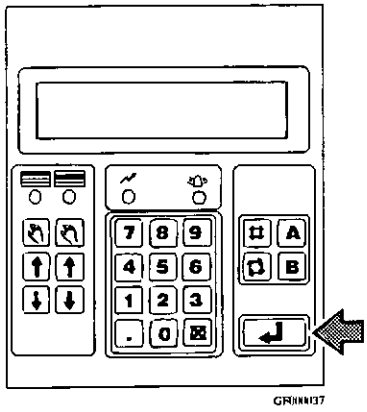
If changing the parameter requires an access code, start on step 2, otherwise start on step 5.

1	2	3	4	5	6	7
		MILK	35000L	25345L	0.00%	0.05%
		CREAM	3500L	2234L	40.00%	38.95%
		Cannot be alerted without key code				
		----------Alarm queue empty----------				

2

Display the parameter **A252**.

1	2	3	4	5	6	7
		MILK	35000L	25345L	0.00%	0.05%
		CREAM	3500L	2234L	40.00%	38.95%
→		A252		####		
		----------Alarm queue empty----------				



3

a) Key in the access code.

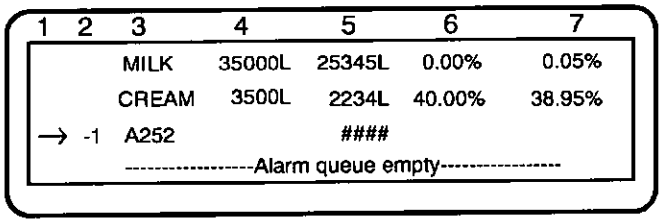
b) Press **Enter** to confirm.

Note!

At delivery the access code is set at 111.

4

If the code is correct, '1' is displayed on line 3.



Note!

Access is lost a preset time following the last operation on the operator module.

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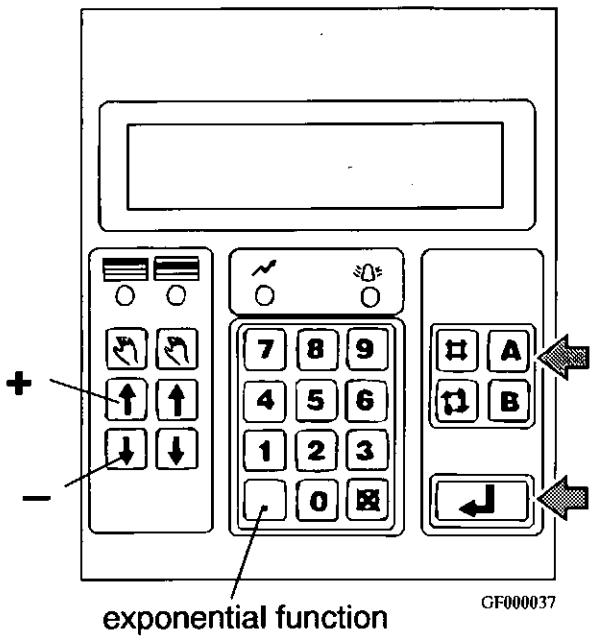

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5

a) Press the parameter key A.

b) Key in relevant parameter number.

c) Key in the new value.

d) Press **Enter** to confirm the new value.

- The new value of the parameter is now stored and will be used during operation.

Example: to key in -1.234567E+8 proceed as follows:

1) Press ↓ (for minus)

2) Press 1.234567

3) Press. (to start key in exponents)

4) Press ↑ (for plus)

5) Press 08

6) Press **Enter** to confirm.

- Use key ↑ **Arrow up** for sign +
  Use key ↓ **Arrow down** for sign -
- Use key. (decimal point) for e (exponential function)

Par. No.	Parameter description	Unit	Preset value	New value	Note
001	Current fat content setpoint, Standardised milk	%F			
002	Current fat content setpoint, Standardised cream	%F			
003	Fat content setpoint, Milk	%F/SNF			
004	Fat content setpoint, Milk	%F/TS			
005	Quick choice 1, milk fat setpoint	%F			relay selection A
006	Quick choice 1, cream fat setpoint	%F			
009	Quick choice 2, milk fat setpoint	%F			relay selection B
010	Quick choice 2, cream fat setpoint	%F			
013	Quick choice 3, milk fat setpoint	%F			relay selection C
014	Quick choice 3, cream fat setpoint	%F			
017	Quick choice 4, milk fat setpoint	%F			relay selection D
018	Quick choice 4, cream fat setpoint	%F			
021	Quick choice 5, milk fat setpoint	%F			relay selection E
022	Quick choice 5, cream fat setpoint	%F			
025	Quick choice 6, milk fat setpoint	%F			
026	Quick choice 6, cream fat setpoint	%F			
029	Quick choice 7, milk fat setpoint	%F			
030	Quick choice 7, cream fat setpoint	%F			
033	Quick choice 8, milk fat setpoint	%F			
034	Quick choice 8, cream fat setpoint	%F			
037	Quick choice 9, milk fat setpoint	%F			
038	Quick choice 9, cream fat setpoint	%F			
041	Quick choice 10, milk fat setpoint	%F			
042	Quick choice 10, cream fat setpoint	%F			

Par. No.	Parameter description	Unit	Preset value	New value	Note
045	Quick choice 11, milk fat setpoint	%F			
046	Quick choice 11, cream fat setpoint	%F			
049	Quick choice 12, milk fat setpoint	%F			
050	Quick choice 12, cream fat setpoint	%F			
053	Quick choice 13, milk fat setpoint	%F			
054	Quick choice 13, cream fat setpoint	%F			
057	Quick choice 14, milk fat setpoint	%F			
058	Quick choice 14, cream fat setpoint	%F			
062	Function 15, skimming	-	0		relay selection
066	Function 16, total remix	-	0		relay selection
069	Function 17, circulation	-	0		relay selection
070	Function 17, circulation	-	0		
073	Function 18, valve or cascade freeze	-	1		relay selection
074	Function 18, valve or cascade freeze duration	s	120		
077	Function 19, cleaning, milk fat setpoint	%F	2.00		relay selection
078	Function 19, cleaning, cream fat setpoint	%F	20.00		
081	Function 20, keyboard lock	-	0		
082	Function 20, keyboard lock	-	0		
095	Milk quantity, preselection	L	0		
096	Cream quantity, preselection	L	0		
097	Skim milk fat content, initial value	%F	0.05		
098	Whole milk fat content, initial value	%F	4.00		
118	Cascade control selection	-	1		1= on, 0=off
124	Milk fat, internal setpoint	%F			F/SNF or F/TS

Par. No.	Parameter description	Unit	Preset value	New value	Note
252	Used to give access code	-	111		
Only Tetra Alfast 220					
125	Type of standardization				
= 0	Normal fat standardization				
= 1	Ratio, F/SNF				A003
= 2	Ratio, F/TS				A004
3-4	Not used				
= 5	Normal fat standardization or ratio F/SNF or F/TS				current set points A001, A003 or A004
6-9	Not used				
900	Quick choice 1, milk fat setpoint	%F/TS			
901	Quick choice 2, milk fat setpoint	%F/TS			
902	Quick choice 3, milk fat setpoint	%F/TS			
903	Quick choice 4, milk fat setpoint	%F/TS			
904	Quick choice 5, milk fat setpoint	%F/TS			
905	Quick choice 6, milk fat setpoint	%F/TS			
906	Quick choice 7, milk fat setpoint	%F/TS			
907	Quick choice 8, milk fat setpoint	%F/TS			
908	Quick choice 9, milk fat setpoint	%F/TS			
909	Quick choice 10, milk fat setpoint	%F/TS			
910	Quick choice 11, milk fat setpoint	%F/TS			
911	Quick choice 12, milk fat setpoint	%F/TS			
912	Quick choice 13, milk fat setpoint	%F/TS			
913	Quick choice 14, milk fat setpoint	%F/TS			
920	Quick choice 1, milk fat setpoint	-%F/SNF			
921	Quick choice 2, milk fat setpoint	-%F/SNF			

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Par. No.	Parameter description	Unit	Preset value	New value	Note
922	Quick choice 3, milk fat setpoint	-%F/SNF			
923	Quick choice 4, milk fat setpoint	-%F/SNF			
924	Quick choice 5, milk fat setpoint	-%F/SNF			
925	Quick choice 6, milk fat setpoint	-%F/SNF			
926	Quick choice 7, milk fat setpoint	-%F/SNF			
927	Quick choice 8, milk fat setpoint	-%F/SNF			
928	Quick choice 9, milk fat setpoint	-%F/SNF			
929	Quick choice 10, milk fat setpoint	-%F/SNF			
930	Quick choice 11, milk fat setpoint	-%F/SNF			
931	Quick choice 12, milk fat setpoint	-%F/SNF			
932	Quick choice 13, milk fat setpoint	-%F/SNF			
933	Quick choice 14, milk fat setpoint	-%F/SNF			

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