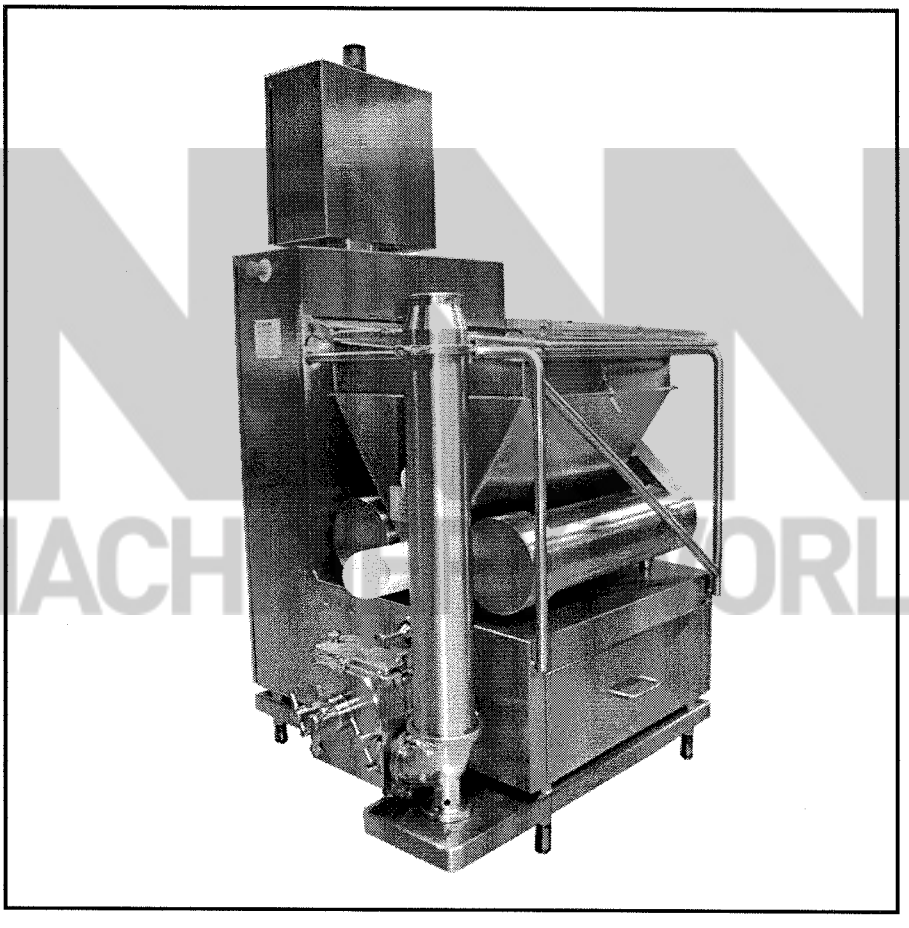
OM

Operation Manual

Hoyer Addus FF 4000-F

Z2013693



WARNING

Read and follow all safety precautions before working on or near this equipment.

Read all safety precautions throughout this manual and on safety signs attached to this equipment. Failure to follow all safety precautions could result in death or serious injury.

Tetra Pak

Doc. No. OM-z2013693-01en.book

The content of this manual is in accordance with the design and construction of the machine or equipment at the time of publishing. Tetra Pak reserves the right to introduce design modifications without prior notice.

This document was produced by:

Tetra Pak Hoyer A/S
Soren Nymarks Vej 13
DK 8270 Hojbjerg
Denmark

Additional copies can be ordered from Tetra Pak Parts or the nearest Tetra Pak office. When ordering additional copies, always provide the document number. This can be found in the machine specification document. It is also printed on the front cover and in the footer on each page of the manual.

Doc. No. OM-z2013693-01en.book

Issue 2008-01

This manual is valid for:

Series No./ Machine No. Sign.

OM

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A list of all optional equipment, optional kits, and rebuilding kits that this manual is valid for is found on the next page.

Doc. No. OM-z2013693-01en.book

Issue 2008-01

Tetra Pak

Tetra Pak Hoyer A/S

Valid for:

Update Log for Doc. No. OM-z2013693-01en.book

This table shows all changes made to this manual, such as kits installed and pages added or removed.

Date	Installed Kit	Added Pages (Doc. No.)	Removed Pages	Signature

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i Introduction

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i.1 About the introduction chapter

Risk of serious personal injury. To ensure maximum safety, always read the chapter "Safety precautions" before operating or servicing the machine or equipment.

This chapter contains basic information about this manual and related Tetra Pak equipment.

i.2 Document information

Tetra Pak recommends that delivered documentation should be studied carefully and always kept available to those who will operate the machine or equipment.

It is important to keep the manual for the life of the machine or equipment and pass the manual on to any subsequent holder or user.

Tetra Pak will not be held responsible for any damage to the machine or equipment caused by not following the instructions given in this manual.

i.2.1 Delivered documentation

The documents delivered with this machine or equipment include:

- Electrical Manual (EM)

  The purpose of this manual is to provide the service technicians and electricians with information required for service and maintenance
- Installation Manual (IM)

  The purpose of this manual is to provide installation personnel with the information required for installation
- Maintenance Manual (MM)

  The purpose of this manual is to provide the service technicians with information required for maintenance and service
- Operation Manual (OM)

  The purpose of this manual is to provide the operator with information on how to handle and operate the machine or equipment before, during, and after production
- Spare Parts Catalogue (SPC)

  The purpose of this manual is to provide necessary information for ordering spare parts from Tetra Pak
- Technical Manual (TEM)

  The purpose of this manual is to provide necessary information required for installation, service and maintenance

i.3 Machine Introduction

i.3.1 Intended use of the machine or equipment

The intended use of this Tetra Pak machine or equipment is to inject fruit pieces, nuts, candies and other free flowing granulates into ice cream or similar products.

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

i.3.2 Manufacturer

This Tetra Pak machine or equipment has been manufactured by:

Tetra Pak Hoyer Equipment A/S
Soeren Nymarksvej 13
DK-8270 Hoejbjerg
Denmark

i.3.3 Service

If problems are encountered when operating this machine or equipment, contact the nearest Tetra Pak centre or market company.

Contact this mail address, if you have any questions regarding the documentation:

ProductDocumentationBUIC@tetrapak.com

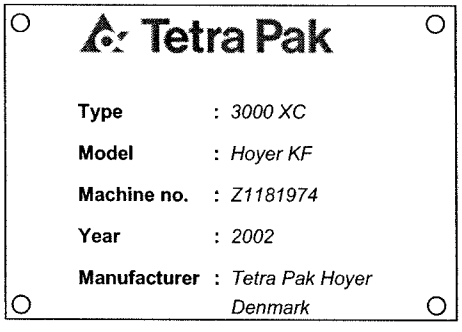
i.4 Identification

i.4.1 CE classification

This equipment complies with the basic health and safety regulations of the European Economic Area (EEA).

i.4.2 Machine plate

The below illustration shows an example of the machine plate and its location on the machine or equipment. The machine plate carries data needed when contacting Tetra Pak concerning this specific machine or equipment.



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i.5 Hygiene

Ice cream production, like other foodstuffs, requires high sanitary standards. That is why the strictest demands should be made on cleaning of devices and tools getting in touch with the ice cream, ingredients coating and packaging materials. In addition, the production area should be kept very clean.

Personal hygiene should also be considered as a part of the sanitary standards:

- Personal body hygiene
- Headgear
- Hygiene of work clothes
- Hygiene of footwear
- Hand hygiene

ALWAYS make sure that the detergents and disinfectants applied are approved by the local authorities.

NEVER use a detergent which chemical properties will damage the metals and alloys to be cleaned.

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ii Safety Precautions

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ii.1 Read the safety precautions

All persons operating, servicing, adjusting or otherwise working with or near this machine or equipment must carefully read and follow all safety instructions in this manual and warning signs on the machine or equipment itself. Failure to do so could result in death, serious injury, and damage to the machine or equipment.

Call for medical attention immediately in case of an accident.

ii.2 Hazard information

This is the "safety alert" symbol. It is used to alert about potential personal injury hazards. Obey all safety messages that follow this symbol to avoid death or injury.

The following safety alert symbols and "signal words" are used in this manual and on the machine or equipment itself to inform the user of hazards.

DANGER

indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

CAUTION

(without the safety alert symbol) indicates a potentially hazardous situation which, if not avoided, may result in property damage.

ii.3 Personnel requirements

Note! Personnel includes **all** persons performing work on or near the machine or equipment.

Only skilled or instructed persons are allowed to work with the machine or equipment.

ii.3.1 Skilled person

A skilled person must have relevant education and experience to enable him or her to identify hazards, analyze risks, and avoid hazards which electricity, mechanics, chemicals, and supply systems can create.

Skilled persons must meet local regulations, such as certifications and qualifications for working with electricity, mechanical systems, and so on.

ii.3.2 Instructed person

An instructed person must be adequately advised or supervised by a skilled person to enable him or her to identify hazards, analyze risks, and avoid hazards which electricity, mechanics, chemicals, and supply systems on the machine or equipment can create.

ii.4 Safety signs

WARNING

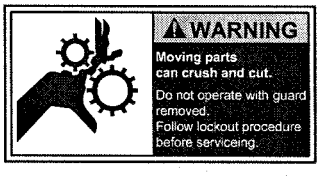
Hazards without safety signs drastically increase the risk of death or serious injury.

Replace all missing or damaged safety signs immediately.

There are two types of safety sign

- ISO signs are used in most markets
- ANSI signs are used in the US market only

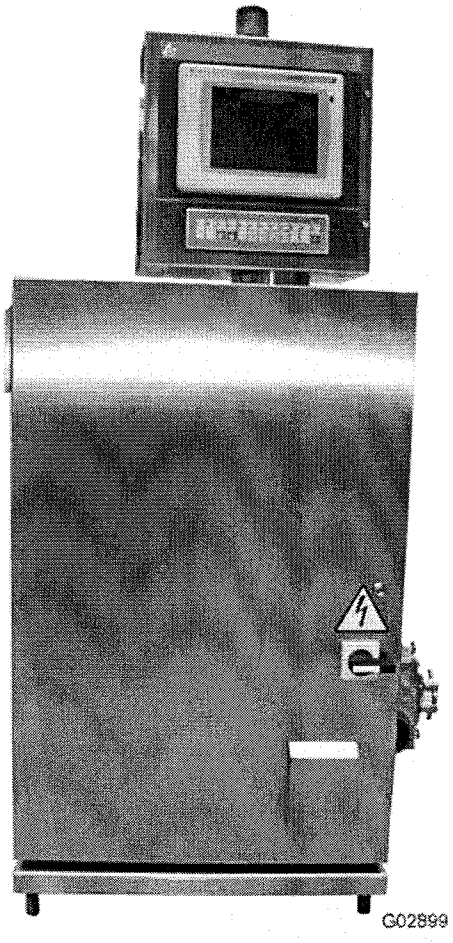
The table below shows all safety signs that are located on this machine/ equipment.

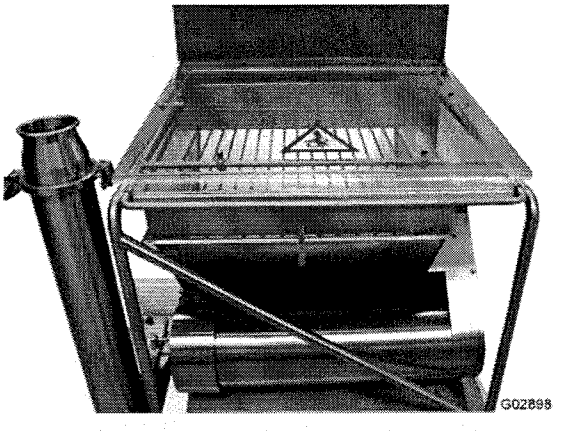
ISO sign	ANSI sign
 Hazardous voltage. Will cause death or serious injury. Disconnect power before servicing. Lockout machine.	
 Moving parts can crush and cut. Do not operate with guard removed. Follow lockout procedure before servicing.	

ii.5 Location of safety signs

Note! Always ensure that all safety signs on the machine or equipment are undamaged and in their correct position after installation and maintenance.

The illustration below indicates where the safety signs are located.





ii.6 Safety devices

DANGER

Unshielded hazards. Never inch or run the machine or equipment if any component of the safety system is inoperative. All inoperative components of the safety system must be changed immediately.

Note! Activating a safety device, such as an EMERGENCY STOP, or opening an interlocked safeguard does not switch off the power supply to the machine or equipment.

ii.6.1 Emergency Stop

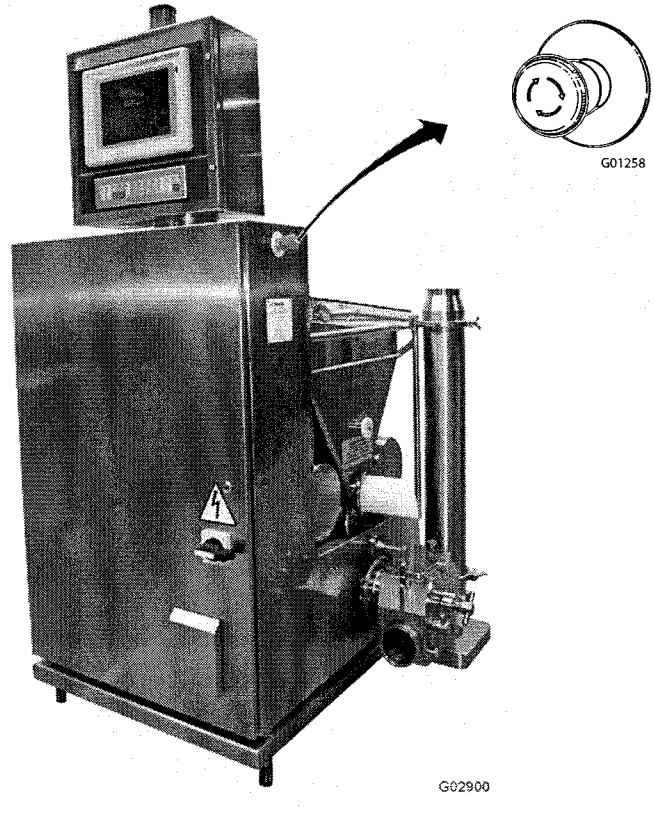
Learn the positions of the EMERGENCY STOP devices in order to stop the machine or equipment immediately in case of an emergency situation.

To stop production the normal way, see the *operation manual.*

ii.6.2 Emergency stop push buttons

Push one of the EMERGENCY STOP push buttons to stop the machine or equipment immediately.

The illustration below shows an emergency stop push button. Arrow(s) indicates where to find them on the machine or equipment.



ii.7 Personal protection

Note! Personal protection required when handling hazardous materials is specified for each substance, see the section "Hazardous materials".

ii.7.1 Hearing Protection

WARNING
Hazardous noise level. Risk of impaired hearing. Wear hearing protection.

CAUTION
Hazardous noise level. Risk of impaired hearing. Hearing protection is recommended.

ii.7.2 Jewellery

WARNING
Risk of entanglement. No jewellery such as rings, watches, bracelets, or necklaces may be worn when performing work on or near the machine or equipment.

ii.8 Hazardous materials

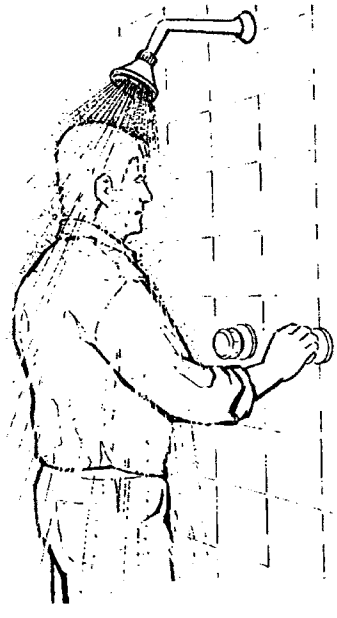
WARNING

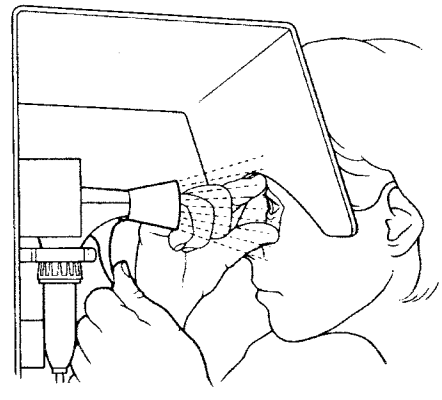
Contact with chemicals can cause injury and illnesses. Always follow the manufacturer's instructions when handling chemical products.

Always make sure that

- the showers work
- an eyewash device, movable or wall-mounted, is available and operational
- additional washing facilities are nearby

Note! Learn the positions of all washing facilities in order to act without delay in case of an accident.





ii.9 Supply systems

ii.9.1 Electrical cabinet

DANGER

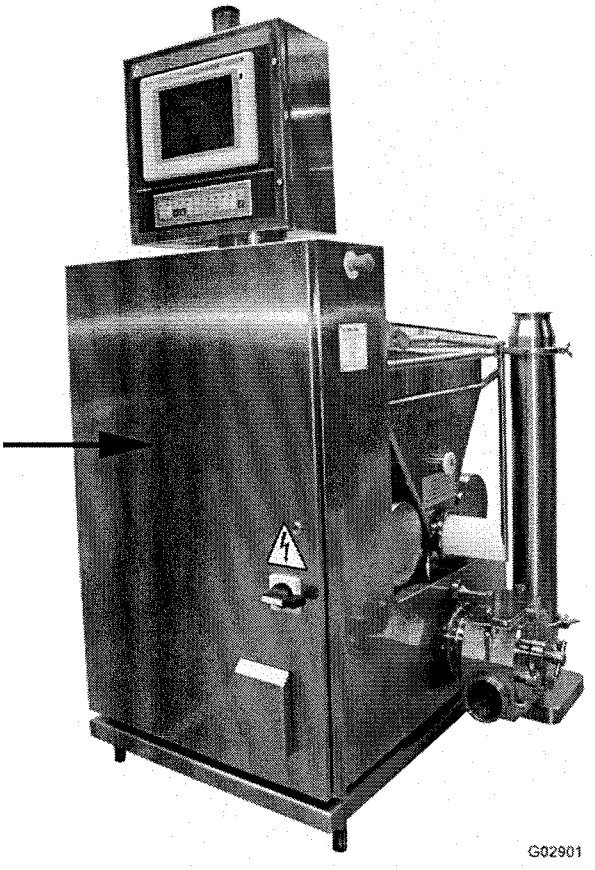
Hazardous voltage. Electric shock will cause death or serious injury.

The power supply disconnecting device must be turned OFF and secured with a lock before any service is carried out inside the electrical cabinet.

Note! The key to the lock must be removed by the service technician or the electrician, and retained in his/her possession until all work is completed.

Make sure that the electrical cabinet doors are locked after performing any work in the electrical cabinet.

An arrow in the illustration below indicates the location of an electrical cabinet.



ii.9.2 Power supply

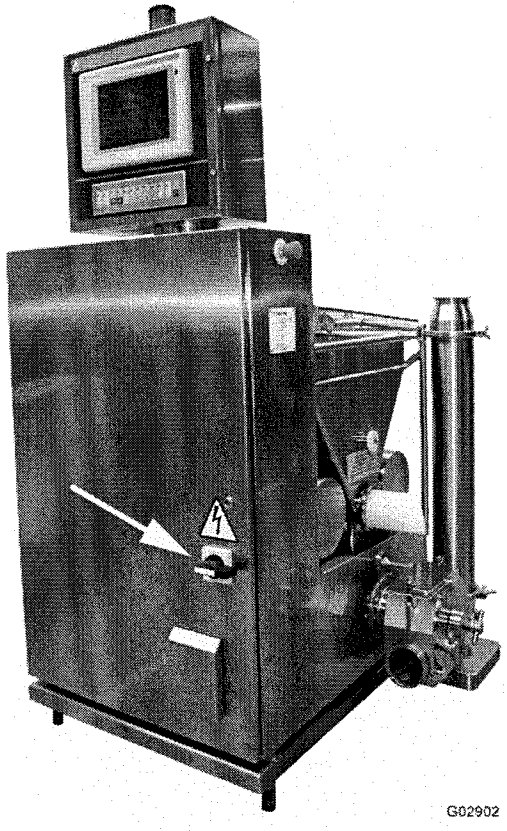
DANGER

Hazardous voltage and moving machinery. The power supply disconnecting device must be turned OFF and secured with a lock before any service is carried out.

Note! The key to the lock must be removed by the service technician or the electrician, and retained in his/her possession until all work is completed.

Certain maintenance procedures require supply systems to be turned on. These exceptions are clearly stated in the maintenance manual.

The illustration below shows the power supply disconnecting device and the arrow indicates its location.



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1 Operation

1.1 Functional description

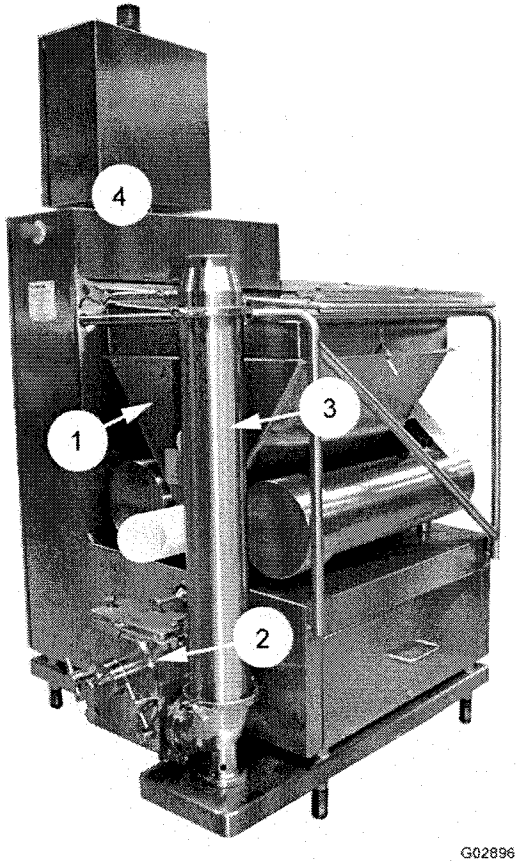
The Hoyer Addus FF 4000 automatic ingredient feeder is designed for the continuous and accurate injection of fruit pieces, nuts, candies and other free flowing granulates into ice cream or similar products.

The ingredient feeder is a self-contained unit ready to be connected to power and ice cream supply. From the hopper the ingredient is dosed by means of a helical dosing screw into the lamella pump, which gently delivers the ingredients into the ice cream stream. Further mixing is done in the inline mixer before the ice cream passes through the outlet of the feeder.

1.2 Main groups of equipment

The FF 4000 ingredient feeder consists of 3 main elements:

- A dosing unit for dosing of ingredients (1)
- A lamella feed pump for dosing of ingredients into ice cream (2)
- A mixer for mixing of ingredients dosed into the ice cream (3)
- An electrical cabinet with control panel (4)



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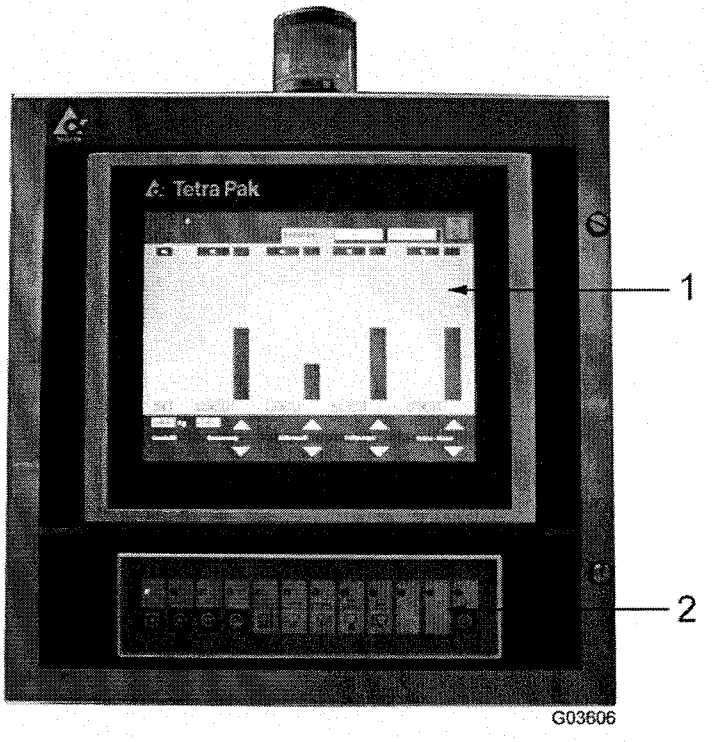
1 Dosing unit
2 Lamella feed pump
3 Mixer
4 Electrical cabinet with control panel

1.3 Control panel

The FF 4000 is equipped with a Siemens MP370 touch screen interface (1) and a foil keyboard (2).

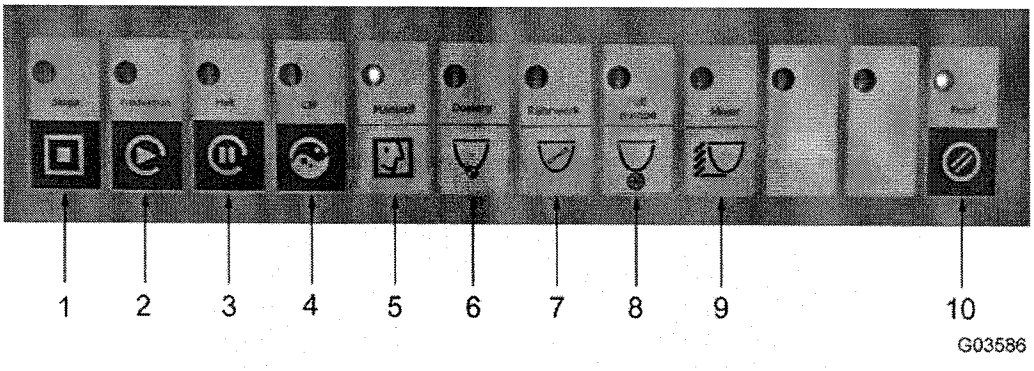


1 Touch screen
2 Foil keyboard

1.3.2 Foil keyboard

The keyboard is used for start and stop of various functions.

A light above the start/stop buttons indicates if a function has been started (green light) or stopped.



1 Stop
Stop production
2 Production
Stop production
3 Hold
During hold dosing screw and agitator are stopped, but feed pump and mixer will continue to run.
4 CIP
Start/stop of CIP program
5 Manual
Manual production
6 Dosing
Start/stop of dosing
7 Agitator
Start/stop of agitator
If dosing is stopped, the agitator also stops to prevent fragile ingredients to be damaged.
8 Feed pump
Start/stop of feed pump
9 Mixer
Start/stop of mixer
10 Reset
Resetting of alarm - a green light will flash, if resetting is needed.
Solid green: The machine is resetting and operation is blocked.

1.3.3 Touch screen

The user interface is equipped with **3 tabs, alarm button** at the top of the screen. The tabs are available on all screens and represent main menus. With the alarm button an alarm or alarm history can be called up.

Each main menu has some **submenus** placed as tabs at the bottom of the screen.

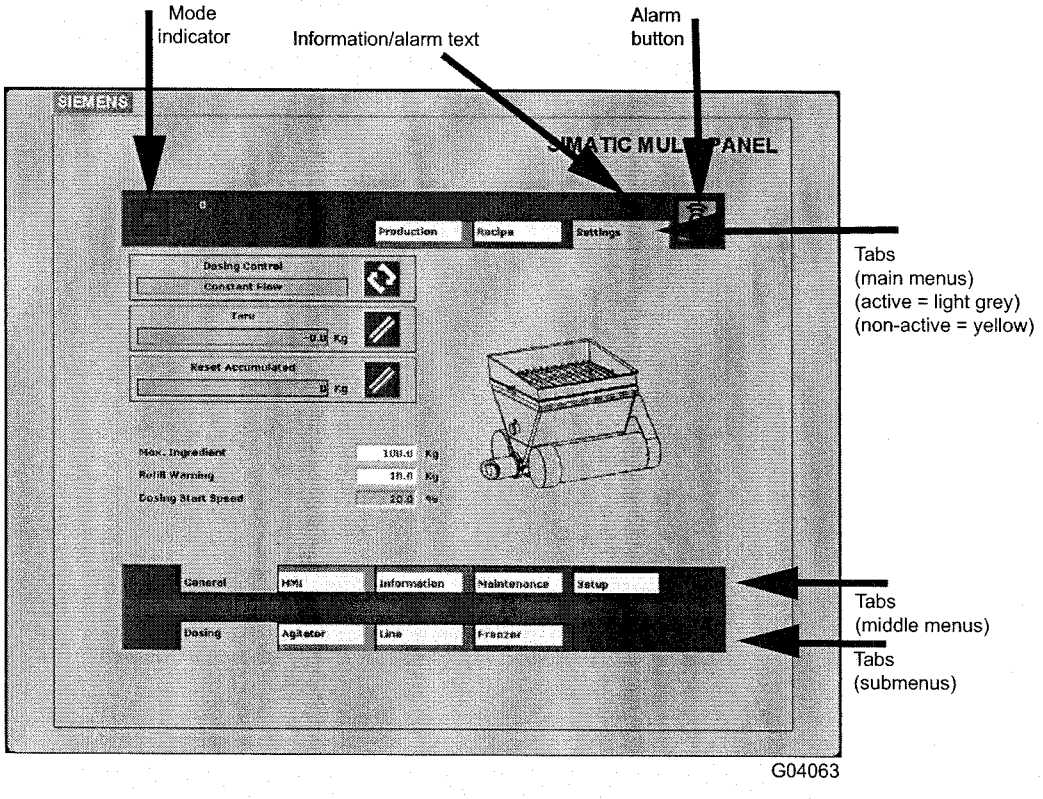
Active tabs are highlighted and have a **light grey colour**.

Non-active tabs are **yellow**. When activated the tab will turn light grey and another screen will be displayed. Activating a tab will never start a moving machine part. Only when pressing the foil keyboard moving machine parts will be activated.

A **mode indicator** is placed at the upper left corner of the screen. The icon changes picture and colour according to which mode the machine has been set to.

Icon	Colour	Mode
	Cyan	CIP
	Blue	Production
	Dark green	Held
	Bright red	Faulted
	Dark red	Stopped
	Yellow	Manual

An **information/alarm bar** is placed at the upper right corner of the screen. The info bar displays alarms, production messages and in stop mode also maintenance alarms. In case of more than one alarm/message at a time, the alarm/message will be displayed one after another for approx. 2 sec. each.



Warning lamp

The warning lamp (1) alerts the operator on distance that the ingredient feeder needs attention. There are two kinds of signals:

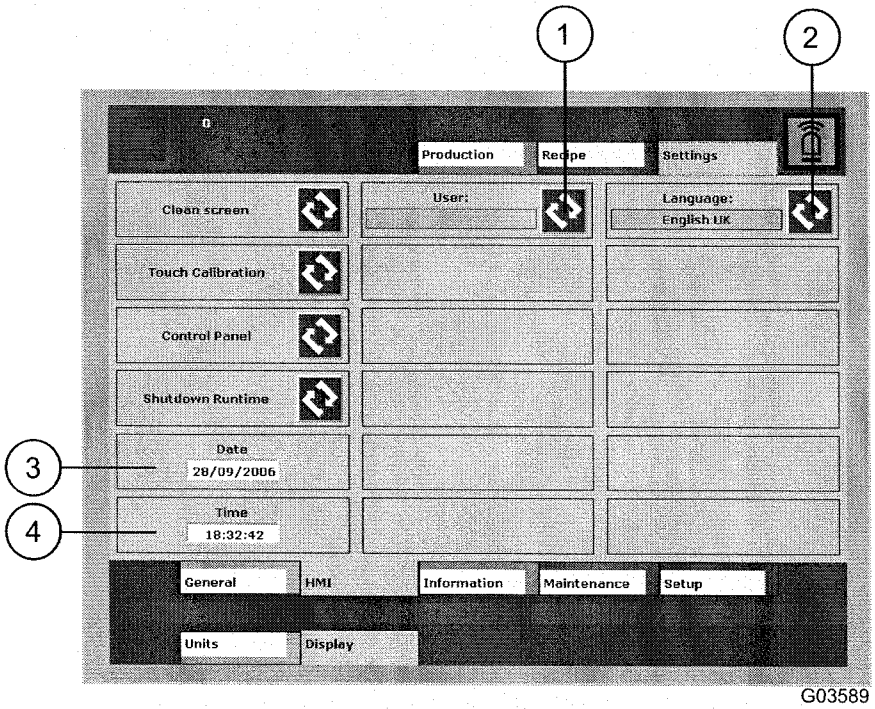
- **Flashing**. A production warning, used when the hopper needs refilling. Alternatively, other warnings that do not force the ingredient feeder to stop.
- **Constant**. A critical warning that forces all or some machine parts to stop. Production will be interrupted and some warning situations may require skilled personnel.

Safety switch alarms can be reset when the safety cover(s) are put back in place.

1 Warning lamp

1.3.4 Screen descriptions

1.3.4.1 HMI - display



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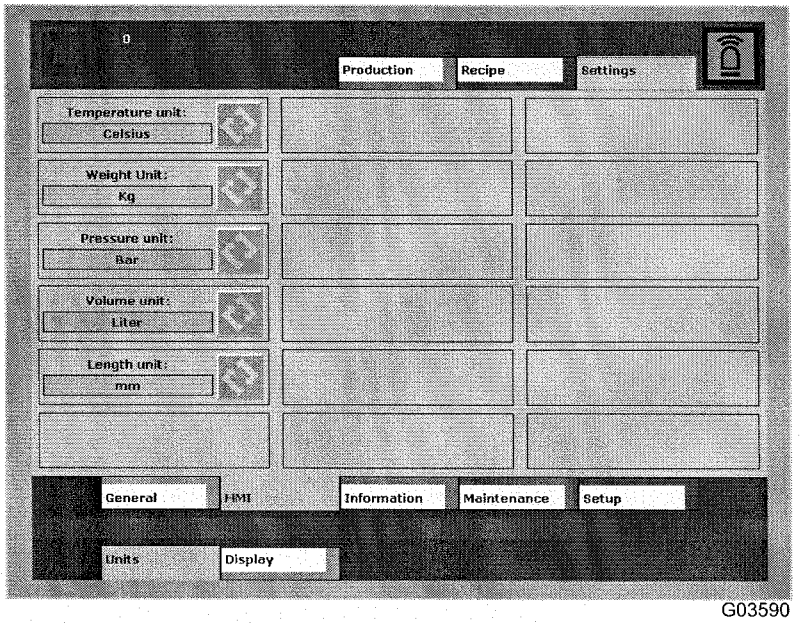
1 **Login button**
Write user ID and password. This will give access to the setup screens and to the panel configuration.
ID: HOYER
Password: 1111
Automatic logoff after 5 minutes.

2 **Change language**

3 **Date adjustment**

4 **Clock adjustment**

1.3.4.2 HMI - units

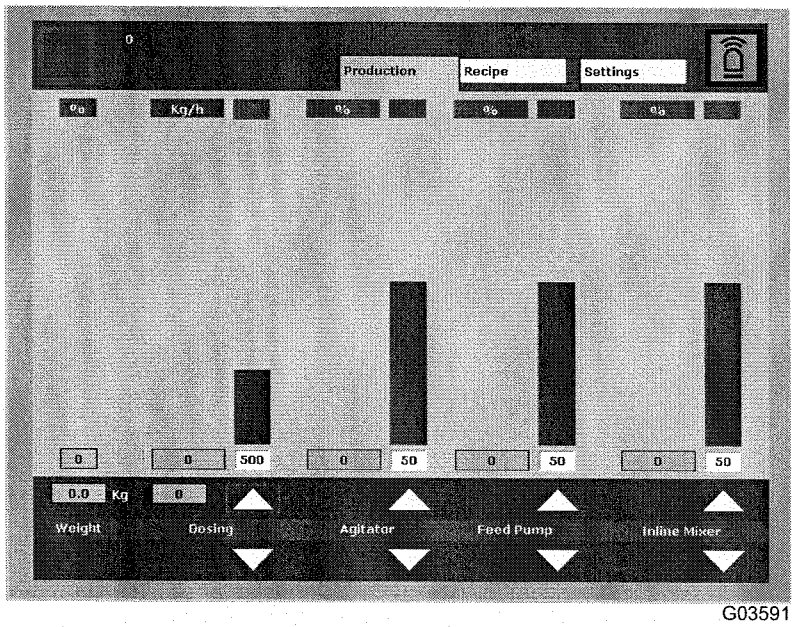


G03590

This screen gives the selection between US units and SI units.

1.3.4.3 Production mode

Dosing, agitator, feed pump and inline mixer can be started and stopped from any screen, while presets only can be set from the production screen. Below screen **Production** - from here it is possible to adjust production presets and see actual data.



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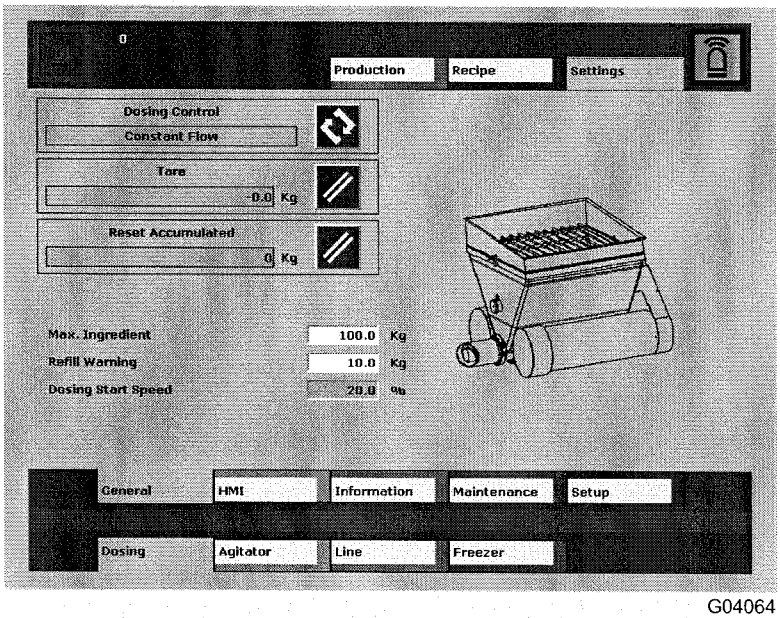
Below screen **Settings** - from here production parameters can be adjusted, for instance the selection between the dosing modes "constant speed", "constant flow" and "constant ratio".



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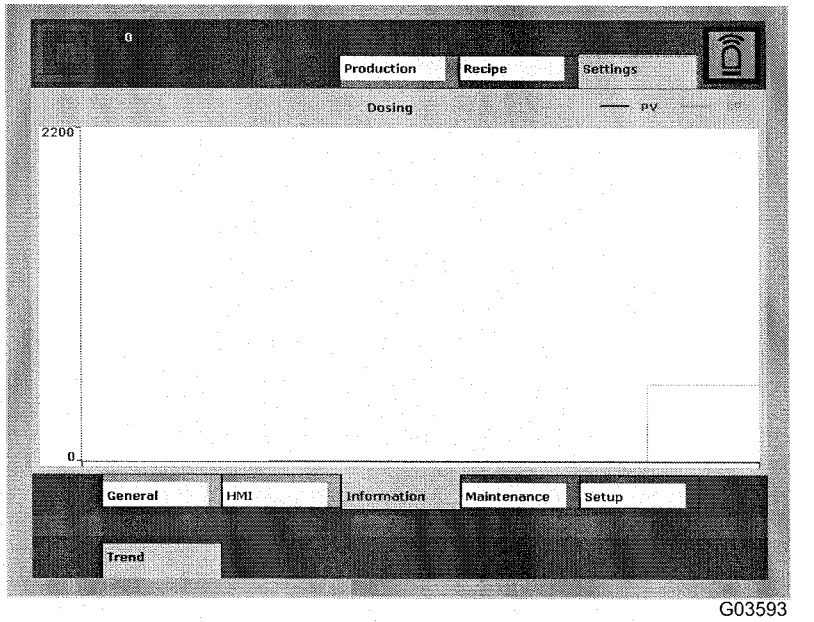
1.3.4.4 Info - trend



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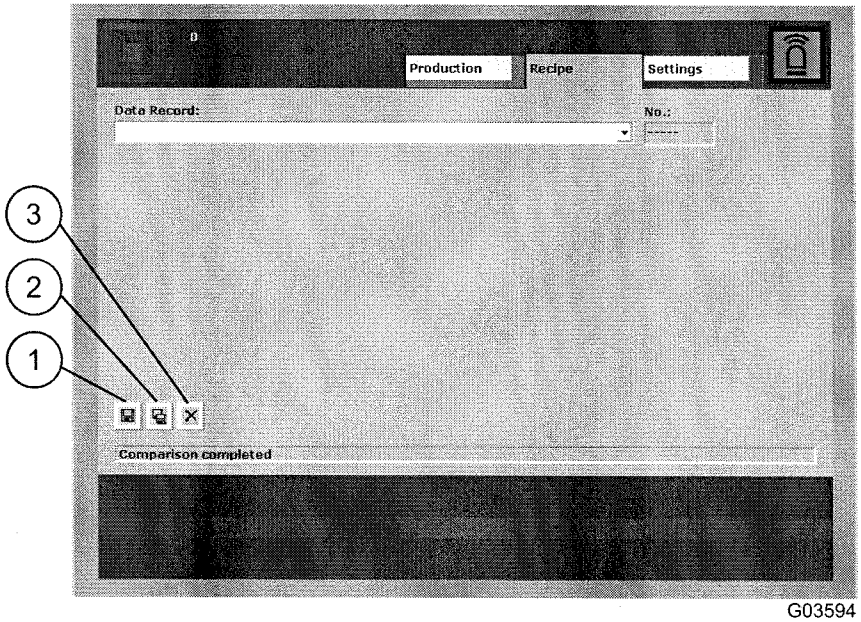
Shows the flow for the last half hour of production.

1.3.4.5 Recipe



G03594

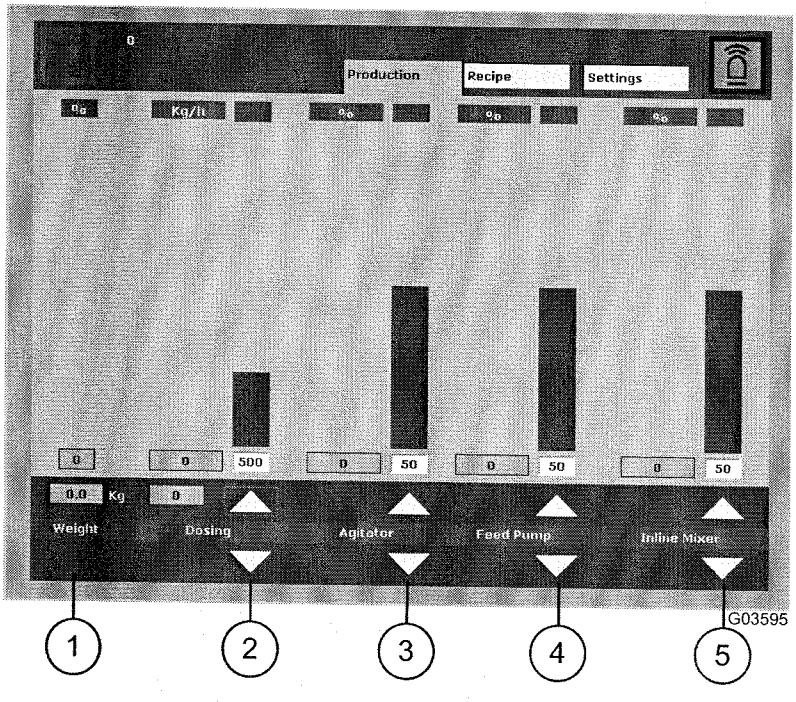
From the above **Recipe** screen it is possible to select a previously stored product. All presets, settings and production mode will be loaded, saving the adjustment time.

1 **Save**
Saves the current product in the current recipe.

2 **Save as**
Saves the current product in a new recipe.
The actual recipe will not change.

3 **Delete**
Deletes the current recipe.

1.3.4.6 Production



From the production screen the dosing, agitator, feed pump preset ingredient flow/amount/speed percentage can be adjusted by the arrow below the preset bars. The functions can be turned on/off by the start/stop buttons on the foil keyboard.

Actual ingredient flow/amount/speed percentage are shown as the wide blue bar.

1 **Weight**
The light blue bar indicates the relative weight between the "Max. ingredient" and the "Refill warning" of ingredient weight.
In order to get the best resolution, the "Refill warning" and "Max. ingredient" must be set on "Settings-General-Dosing" to fit the actual ingredient in the hopper.
When the bar drops below 0% (disappears) the alarm lamp will flash, and the info "Refill hopper" will indicate a warning to the operator that the ingredient level is low, and the hopper needs a refill.
The absolute weight is indicated at the bottom of the bar.

2 **Dosing**

Constant flow [Kg/h]
When "Production mode: constant flow" on "Settings-General-Dosing" is selected, the dosing flow is preset, and the FF will regulate the flow by means of the dosing screw speed.
The actual dosing screw speed percentage will be shown as a readout.

Constant ratio [g/l]
When "Production mode: constant ratio" is selected, the amount of ingredient vs. ice cream flow is preset, and the FF will regulate the ratio, by means of the dosing screw speed, according to actual ice cream flow, communicated from the ice cream freezer.
The actual auger speed percentage will be shown as a readout.
This production mode is only available if the FF is equipped with a communication link to the freezer(s), and the actual communication has been chosen in the machine setup.

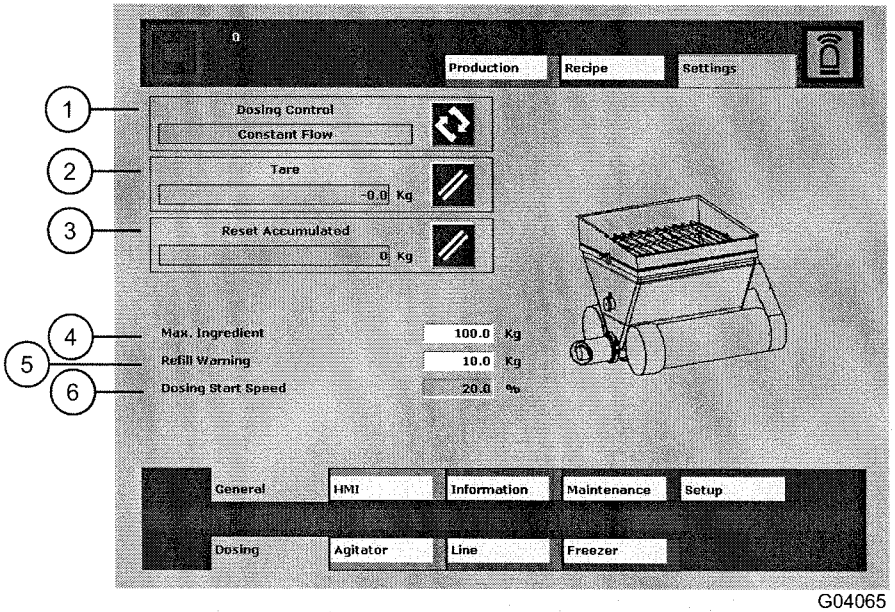
Constant speed [%]
When "Production mode: constant speed" is selected, the dosing screw speed is controlled directly by the operator, and no regulation is active, and the dosing screw speed is constant. The actual flow will be shown as a readout.

3 **Agitator**
The agitator speed is variable, and can be set between 0 and 100% relative, min. speed = 0%, max speed = 100%.
Only use the agitator if the product needs agitation, or a different product needs to be blended in the hopper. Also, it is recommended to use as low a speed as possible if the ingredient is fragile.
The agitator can be set to "intermitted" mode, and the "on" and "off" intervals can be set on agitator settings.

4 **Feedpump**
The feed pump speed is variable and can be set between 0 and 100% relative, min. speed = 0%, max. speed = 100%.
Adjusting the speed in order to fill the feed pump pockets will give the best distribution of ingredient in the ice cream.

5 **Inline mixer**
The mixer speed is variable and can be set between 0 and 100% relative, min. speed = 0%, max. speed = 100%.
Adjust the wanted blending in order to distribute the ingredients evenly in the ice cream.

1.3.4.7 General - dosing



G04065

1 **Dosing control**
The chosen dosing mode, the dosing preset value, will change according to the production mode chosen.

Constant flow: The preset is the ingredient flow/hour. The ingredient feeder automatically regulates the dosing screw speed, in order to minimise the difference between preset flow and actual flow.
Constant ratio: The preset is the amount of ingredient / ice cream unit. The ingredient feeder reads the ice cream flow and dynamically calculates the actual ingredient flow preset.
Constant ratio cannot be chosen unless the ingredient feeder is equipped and set up with a communication link to the ice cream freezer(s).
Constant speed: The dosing screw constant speed is set directly without the regulation active. This mode should only be used if it is impossible to run a difficult ingredient in constant flow or ratio, or during maintenance. The hopper level alarms are still active.

2 **Tare**
When changing the dosing screw, the dosing weight must be tared in order to have the right ingredient alarm levels. The tare is saved in the recipe so that tare needs only to be carried out the first time provided the same dosing screw is always used.
The tare must only be used on an empty hopper, equipped with dosing screw, agitator and hopper grill. It is only possible to activate tare, if the machine is empty and out of production.

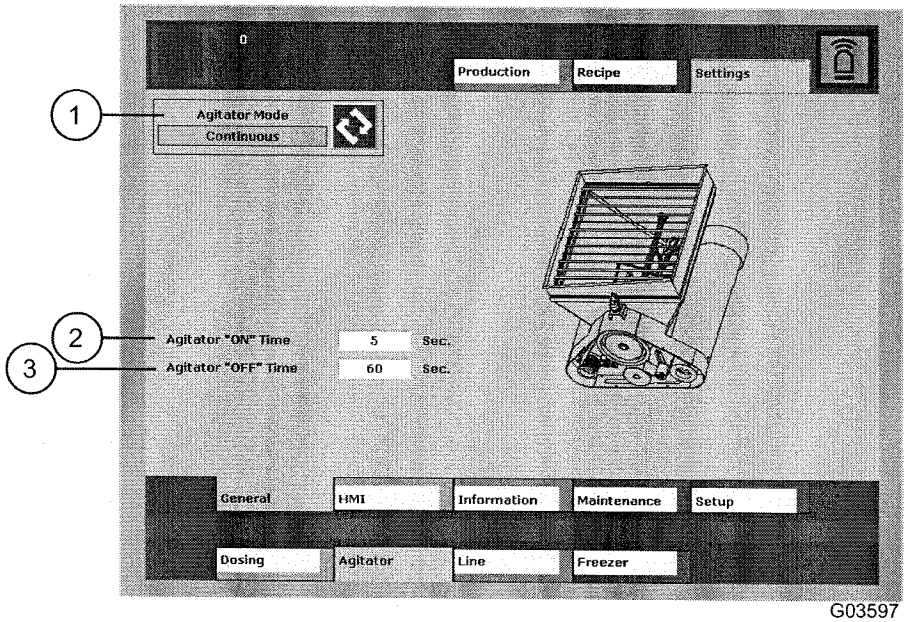
3 **Reset accumulated**
The accumulated flow is shown and can be reset. Please note that the count deviates to the actual, as the count is theoretically during refill.

4 **Max. ingredient**
Alarm limit for activating "Max. ingredient" can be used to inform the operator or an automatic refill system, that the hopper is filled.
The parameter also scales the "ingredient % bar" 100%.

5 **Refill warning**
Alarm limit for activating "Refill warning" and the alarm lamp. Informing the operator or an automatic refill system, that the hopper must be refilled.
The parameter also scales the "Ingredient % bar" 0%.

6 **Dosing start speed**
When the dosing is started, the ingredient feeder does not know the flow rate at a given speed, due to different ingredient mass volume and different dosing screws. If "Start speed adaption" is enabled, the start speed will automatically be adjusted to the last known stable flow.
For further details, see screen description "Regulation parameters".

1.3.4.8 General - agitator



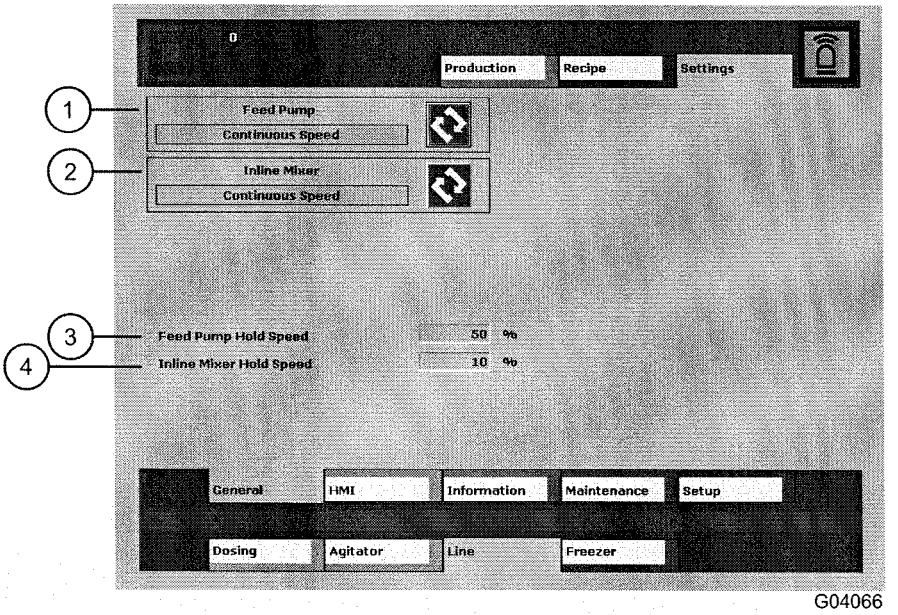
G03597

1 **Agitator mode**
Agitator working modes:
OFF: The agitator is always off.
Continuos: The agitator is always on.
Intermittent: The agitator starts and stops according to the ON and OFF intervals shown in the two next parameters. Can be used if the ingredient is very fragile but needs agitation.

2 **Agitator ON time**
The "on" interval, if "Agitator mode: intermittent"

3 **Agitator OFF time**
The "off" interval, if "Agitator mode: intermittent"

1.3.4.9 General - line



G04066

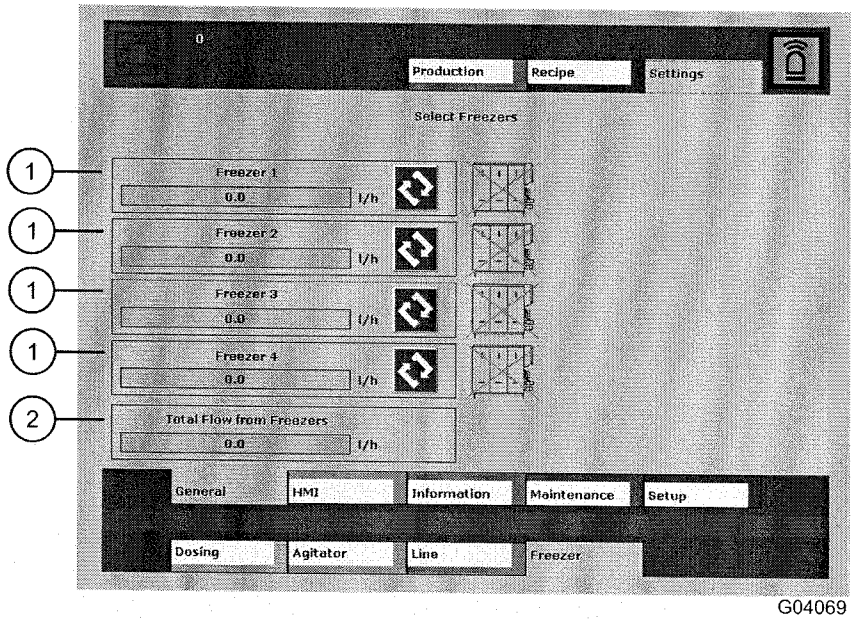
1 **Feed pump**
Feed pump hold mode.
Continuous speed: The feed pump keeps its actual speed.
Change speed: The feed pump changes to the “Feed pump hold speed”.

2 **Online mixer**
Inline mixer hold mode.
Continuous speed: The inline mixer keeps its actual speed.
Change speed: The inline mixer changes to the “Feed pump hold speed”.

3 **Feed pump hold speed**
The hold speed of the feed pump, if “Feed pump: Change speed”.

4 **Inline mixer hold speed**
The hold speed of the inline mixer, if “Inline mixer: Change speed”.

1.3.4.10 General - freezer



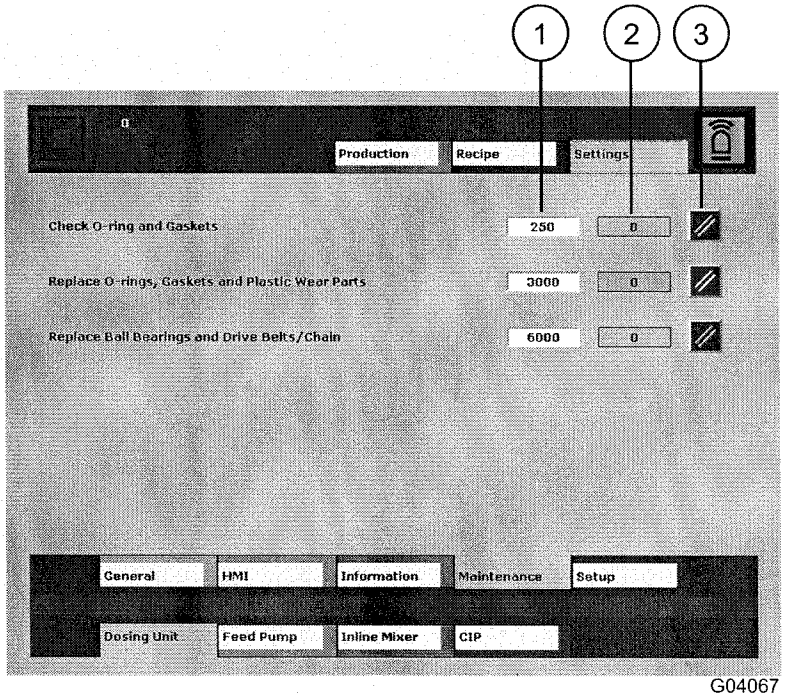
G04069

Analogue communication with freezers can be deselected after the customer's choice.

1 **Select freezers**
Toggle reading of freezer flow on/off.

2 **Total flow from freezers**
The total flow from all freezers.

1.3.4.11 Maintenance - dosing unit



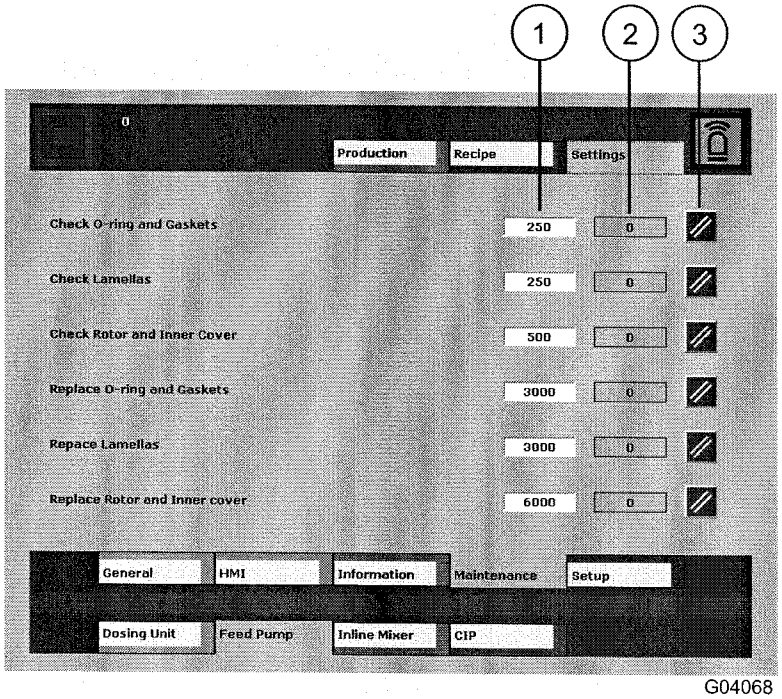
G04067

1 In this column the preset hour values are shown. The values are set from factory, but can be changed if requested.

2 In this column the actual values are shown.

3 In this column the actual values can be reset, when the subject in question has been checked.

1.3.4.12 Maintenance - feed pump



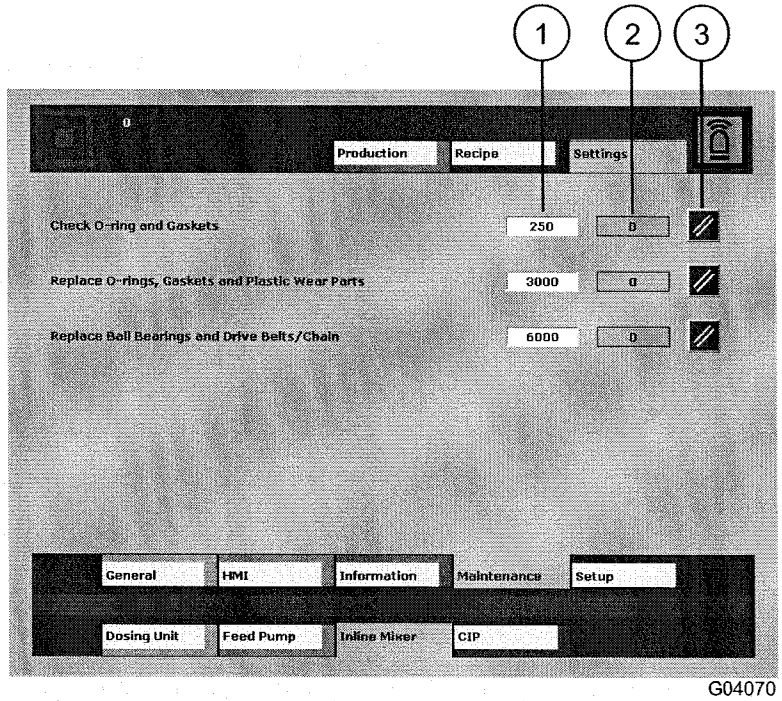
G04068

1 In this column the preset hour values are shown. The values are set from factory, but can be changed if requested.

2 In this column the actual values are shown.

3 In this column the actual values can be reset, when the subject in question has been checked.

1.3.4.13 Maintenance - mixer



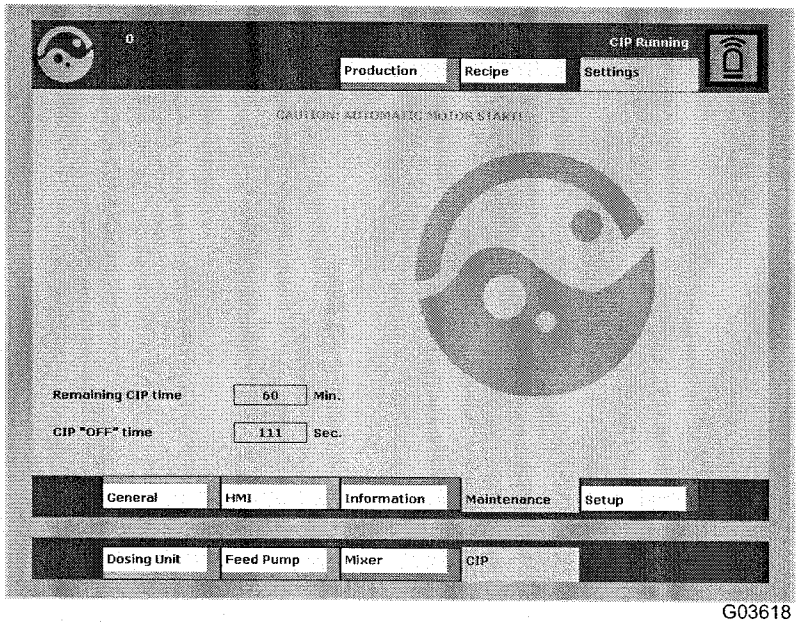
G04070

1 In this column the preset hour values are shown. The values are set from factory, but can be changed if requested.

2 In this column the actual values are shown.

3 In this column the actual values can be reset, when the subject in question has been checked.

1.3.4.14 CIP mode



G03618

When the "start CIP" button on the foil keyboard is pressed while in stop mode, the machine changes to CIP mode.

If CIP setting "CIP control" is set to "CIP control: Local" the CIP program starts immediately. If set to "CIP control: Remote" the program waits for an external "start CIP" signal.

Settings

CIP settings can be changed.

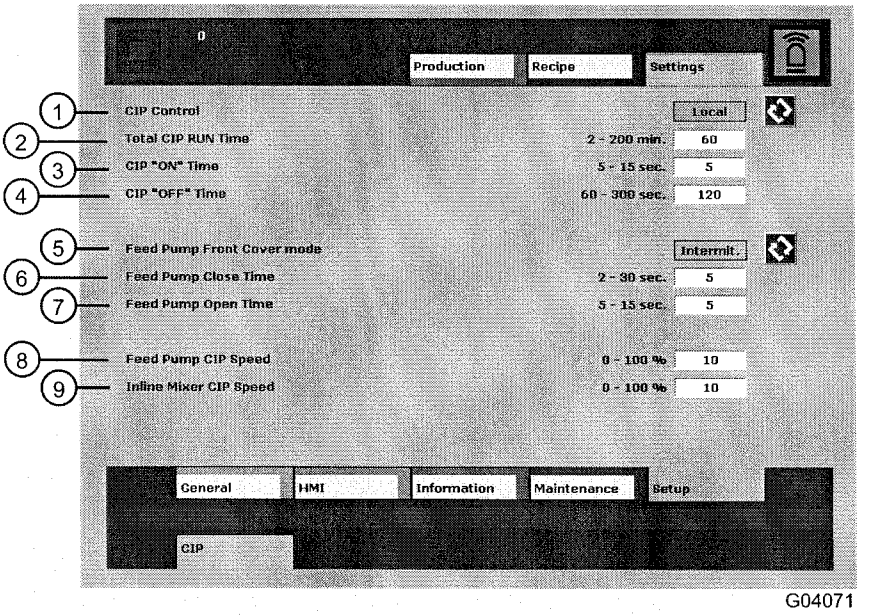
WARNING
If the ingredient feeder is equipped with a manual feed pump front cover, the pump must be opened before entering CIP mode. Mount the feed pump CIP cover, before entering CIP mode.

During CIP the feed pump and blender start in short intervals.

The remaining CIP run time and CIP off time are shown.

To exit the CIP program press "stop CIP" on the foil keyboard.

1.3.4.15 CIP settings



G04071

This screen contains settings related to the CIP program, and (if equipped with "automatic feed pump front cover") settings related to the operation of the cover.

1 **CIP control**
Start/stop of the CIP program on the machine or from a CIP plant.

Local:
The CIP program starts immediately when the CIP mode is selected and will run until stopped or when the run time is complete.
External:
The machine sets an external "CIP ready signal" to the CIP plant and waits until an external "Start CIP" signal returns.

2 **CIP run time**
The total program run time.

3 **CIP "on" time**
The interval in which the feed pump and inline mixer are started.

4 **CIP "off" time**
The interval in which the feedpump and inline mixer are stopped.

5 **Feed pump front cover mode**
Operation mode for the front cover applies only for the automatic front cover (option).

Intermittent: While the CIP is in its OFF interval, the front cover opens and closes in intervals. The cover is always open while CIP is in its ON interval.
Open: The front cover is always open during CIP.

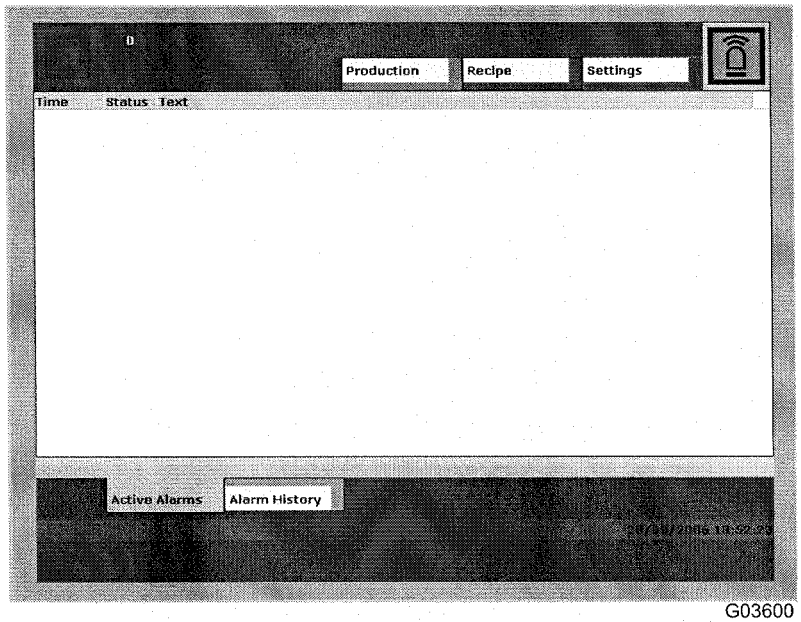
6 **Feed pump closed time**
Closed interval in "Feed pump front cover mode: intermittent".

7 **Feed pump open time**
Open interval in "Feed pump front cover mode: intermittent".

8 **Feed pump CIP speed**
The speed in percent [%] of the feed pump when running in CIP.

9 **Inline mixer CIP speed**
The speed in percent [%] of the inline mixer when running in CIP.

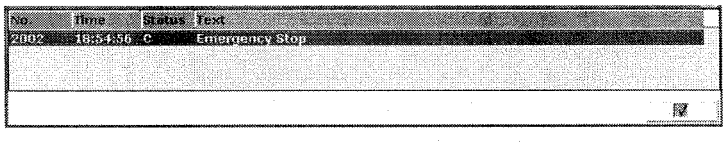
1.3.4.16 Alarm - active



G03600

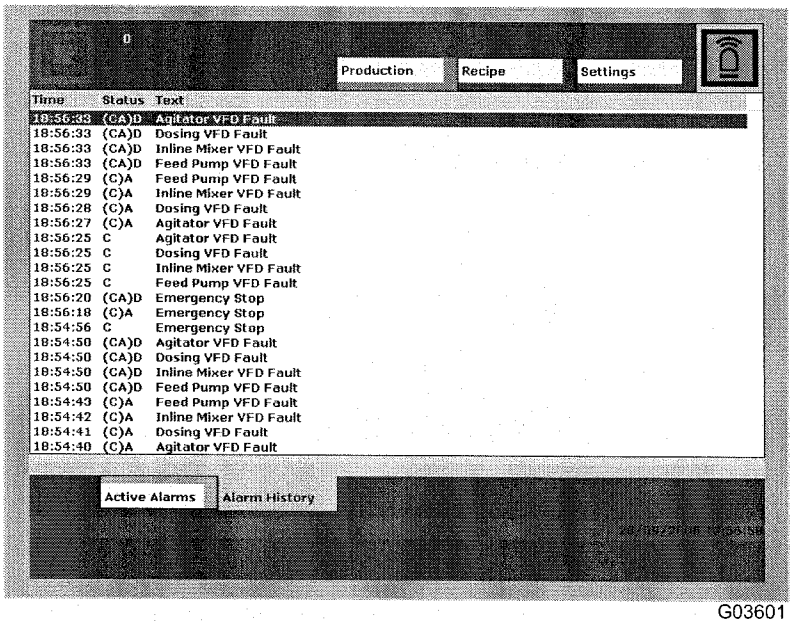
On this screen all active alarms are shown.

The alarm is shown on a banner and can appear on all screens.



To remove the banner, push the **Ack** button (acknowledge) on the banner. Then push the **Reset** button on the push button panel.

1.3.4.17 Alarm - historic

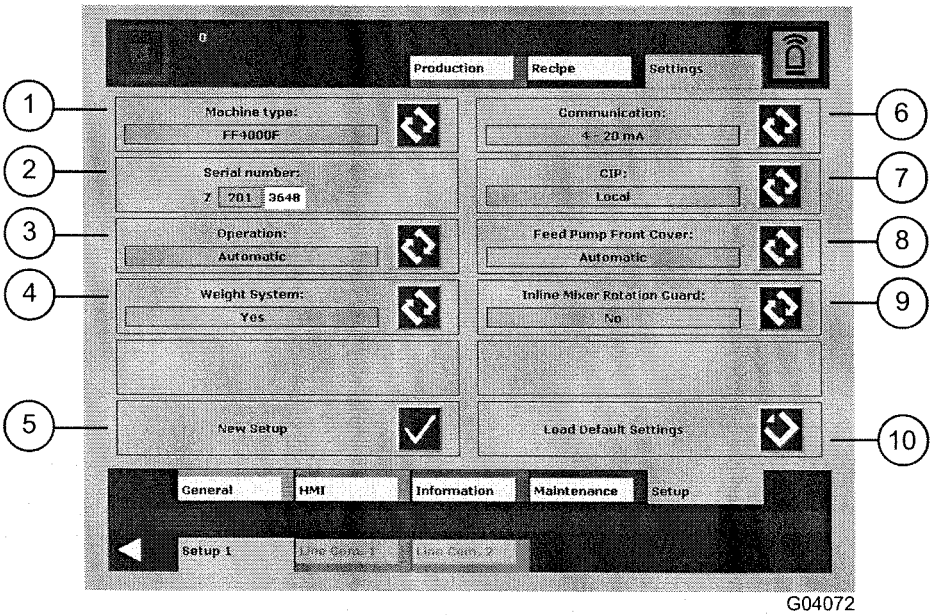


G03601

On this screen the history of all alarms is shown.

To scroll between the different alarm histories, use the up/down arrows.

1.3.4.18 Setup - machine



G04072

All setup screens are password protected. Login is done under Settings-HMI-Display.

1 **Type**
Here you determine the identity of the machine.

2 **Serial number**
The first 3 numbers are determined by the type, the last 4 have to be entered according to the number on the machine.

3 **Operation**
Manual is for FF 2000 and Automatic is for FF 4000.

4 **Weight system**
If the machine has a weighing system, select YES. If a problem occurs on the weighing system it can be deselected here.

5 **New setup**
Only to be used on very first start-up or if setup screen turns out to be blank.
NOTE! On new setup you must tara the weighing system again, if the machine type is changed.

6 **Communication**
Select communication type.

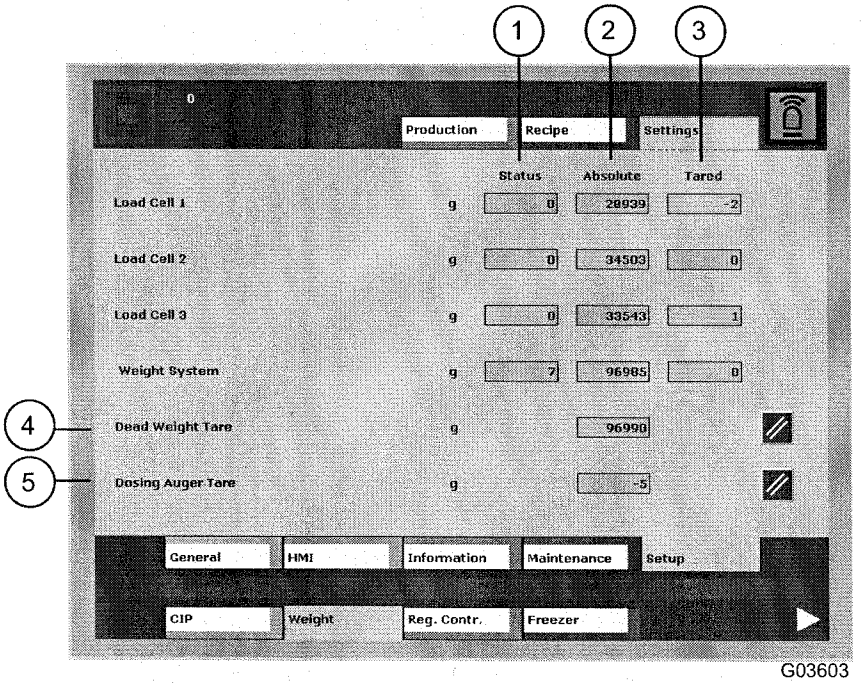
7 **CIP**
No, local or external. Select external, if CIP is controlled by costumer CIP plant.

8 **Feed pump front cover**
Optional. The CIP front cover is manual or automatic.

9 **Inline mixer rotation guard**
Optional. If the inline mixer has a rotation guard choose YES.

10 **Load default settings**
Factory settings are loaded.
NOTE! You must tara the weighing system again.

1.3.4.19 Setup - weighing system



G03603

This screen shows status on each load cell.

1 **Status**
Status for each load cell has to show 0 or 32 to be okay.
Weighing system has to be 7 to be okay.

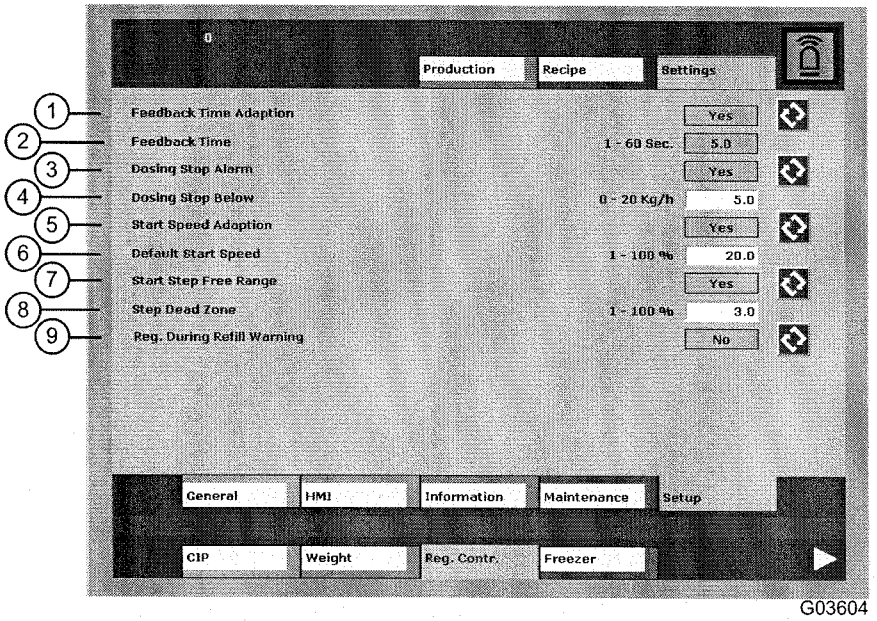
2 **Absolute**
Shows the total weight of a single load cell including weight of the hopper.

3 **Tared**
Weight without the hopper.

4 **Dead weight tare**
Only to be used with empty hopper and also without dosing auger.

5 **Dosing screw tare**
Only to be used with empty hopper including dosing auger.

1.3.4.20 Setup - regulation control



G03604

All regulation parameters are used with the "Loss In Weight" automatic dosing regulation, active when parameter "Dosing Control" on screen Settings-General-Dosing is set to "Constant flow" or "Constant ratio". If set to "Constant speed" the dosing regulator will be idle.

The "Speed" described refers to the "Dosing auger speed"

Note! These settings should in most cases be left to factory default, and may be different to the ones shown on the screen. Only to be adjusted by qualified personnel.

Default factory settings can be seen in the electrical diagrams, or can be restored by pressing "Load default settings" on screen "Settings-Setup-Machine".

1 **Feedback time adaptation**
Automatic adjustment of the Feedback time in order to give the fastest stable feedback to the regulator.
[YES] The feedback time is automatically adjusted (default).
[NO] The feedback time will be a fixed value, which can be manually adjusted.

2 **Feedback time**
The feedback filter sample time. The higher value the more stable but slower response. The parameter is set in seconds.
If "Feedback Time Adaptation" is set to YES, this value will be adapted automatically and the parameter is only readout of the actual feedback time.

3 **Dosing stop alarm**
Stops the dosing and change hold. Only activated if dosing has been active and the dosing has been less than the parameter "Dosing stop below" in a speed dependent time. Used to detect if the hopper runs dry or the funnel is blocked.
[YES] The function is activated (default).
[NO] The function is deactivated.

4 **Dosing stop below**
The threshold dosing flow "Dosing stop alarm" uses when detecting if there is a dosing stop or not. The parameter should be set so high that it does not see the dosing screw vibrations as a false ingredient flow.
The parameter is set as dosing flow in kg/h and can only be adjusted if the "Dosing stop alarm" is set to YES.

5 **Start speed adaptation:**
When the regulator starts it has to sample an amount of ingredient dosing in order to find the flow rate at a known dosing screw speed. When the regulator have run a hopper batch, it will try to adapt that speed, so it can be saved in the recipes and give a correct start speed the next time the product is run.
[YES] The start speed will be adapted at each hopper batch (default). If the dosing preset is changed with more than 10%, the start speed will be set to the value in "Default start speed" parameter.
[NO] The start speed will be a fixed value that can manually be set in the parameter "Dosing start speed" on screen "Settings-General-Dosing".

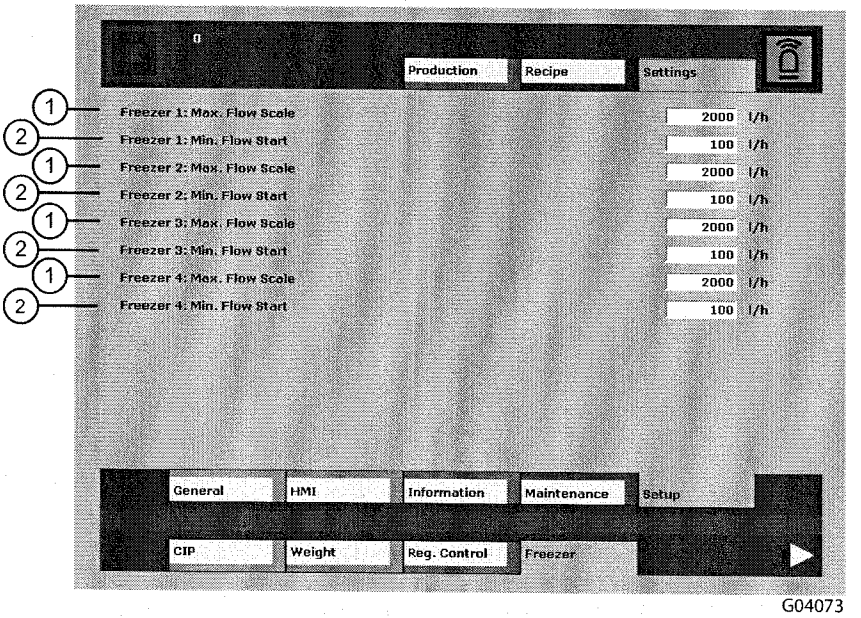
6 **Default start speed**
This parameter is only active if "Start speed adaptation" is set to [YES].
If the dosing preset is changed with more than 10%, the "Dosing start speed" will be set to this value.

7 **Start step free range**
When the regulator has found the flow rate at the start speed, it will calculate the needed speed preset and step to this.
[YES] The regulator can make an initial start step within the speed range (10 - 90%) (default).
[NO] The regulator is limited to step within a relative step limit table.

8 **Step dead zone**
The regulator will make speed steps in the "feedback time" + 1 sec. intervals, if the relative deviation between the set point and the actual dosing value is higher than the dead-zone percentage. If the deviation is within the "Step dead zone", the regulator will track the speed to the setpoint.
The parameter is set in relative percentage (%).

9 **Regulation during refill warning**
When the level in the hopper is low, the flow feedback can become uneven, causing an unstable regulator output. To avoid this situation the regulation can be suspended when the ingredient level is below the "Refill warning". (Set on the dosing setting screen).
[YES] The regulator will be running when refill warning.
[NO] The regulator will be held when refill warnings have appeared (default).

1.3.4.21 Setup - freezer



G04073

1 **Max. flow scale**
This parameter will determine what the maximum analogue signal is in flow - liter.

2 **Min. flow start**
Minimum flow before the FF starts calculating a dosing flow.

1.4 Alarms and troubleshooting

Alarms are divided into two categories "Warnings" and "Alarms".

- "*Warnings*" are production/maintenance information to the operator. The warning does not interrupt the operation of the machine (except "weight sys. timeout"). Some warnings in need of immediate operator response will cause the alarm lamp to flash.
- "*Alarms*" will cause all or part of the machine to stop and will interrupt the production. The alarm lamp will remain yellow.

1.4.1 Warnings

Warning	Cause	Remedy
<<STOPPED>>	Machine is not running.	Ready to start.
<<RESETTING>>	Machine is resetting.	Wait until reset.
<<READY IN CONSTANT FLOW MODE>>	Ready for production in constant flow mode.	Push start buttons.
<<READY IN CONSTANT RATIO MODE>>	Ready for production in constant ratio mode.	Push start buttons.
<<READY IN CONSTANT SPEED MODE>>	Ready for production in constant speed mode.	Push start buttons.
<<CONSTANT FLOW PRODUCTION>>	Machine is running production in constant flow mode.	Push stop buttons to stop production.
<<CONSTANT RATIO PRODUCTION>>	Machine is running production in constant ratio mode.	Push stop buttons to stop production.
<<CONSTANT SPEED PRODUCTION>>	Machine is running production in constant speed mode.	Push stop buttons to stop production.
<<STOPPED BY FAULT>>	The machine has stopped by fault. All moving parts of the machine will be stopped and cannot be operated.	Refer to alarm banner or alarm historic on display for troubleshooting.
<<CIP READY>>	The machine is waiting for external CIP signal.	Turn on CIP system.
<<CIP RUNNING>>	The machine is running CIP cycle.	Wait until finished or push stop to end.
<<CIP FINISHED>>	The CIP cycle has finished.	Push stop to get to stop mode and from there back to production.
<<MAX INGREDIENT WEIGHT>>	Max. ingredient weight has been exceeded according to max. level on dosing settings screen.	Change max. level or do not overfill the hopper.
<<REFILL HOPPER>>	The ingredient level is below alarm level on dosing settings screen.	Refill the hopper.

Warning	Cause	Remedy
<<LOW SPEED RANGE>>	If actual screw speed is below 10%.	Change screw or gear ratio on dosing screw.
<<HIGH SPEED RANGE>>	If actual screw speed is above 90%.	Change screw or gear ratio on dosing screw.
<<DOSING SCREW TARING>>	Dosing screw is not tared.	Must be done each time the screw is changed. Refer to manual.
<<INLINE MIXER NOT STARTED>>	Dosing and feed pump running and inline mixer not started.	Start inline mixer.
<<DOSING MIN.>>	Dosing speed is 0.1%.	Change screw or gear ratio on dosing screw.
<<DOSING MAX.>>	Dosing speed is 100%.	Change screw or gear ratio on dosing screw.
<<HOLD (FAULT)>>	The machine has been put on hold by fault. Dosing and agitation will be forced to stop. The feed pump and blender will continue to run.	Refer to alarm banner or alarm historic on display for troubleshooting.
<<HOLD (OPERATOR)>>	The machine is put on hold by the operator.	Push start.
<<HOLD (EXTERNAL)>>	(Optional). The machine is put on hold by external signal.	Restart is possible locally/externally.
<<HOLD (ICE CREAM MIN.)>>	(Optional). The machine is put on hold due to low flow from freezers only active in constant ratio mode.	
<<HOLD (DOSING STOP)>>	The machine is put on hold due to stop of the dosing screw.	If no weight loss has been detected for X sec. (according to speed). Refill hopper or clean funnel for obsticals.

1.4.2 Alarms

Refer to the electrical drawings for component position numbers.

Common for all the alarms:

- The alarm lamp will flash constantly.
- After the fault has been removed, the reset button must be pressed to remove the alarm.
- The light next to the reset button will flash when a reset is needed.

WARNING

Only trained maintenance personnel must carry out all alarms that cannot be reset without opening the electrical cabinet.

Alarm	Cause	Remedy
<<EMERGENCY STOP>>	The emergency stop button has been pressed or power has been removed from the machine. The machine will be forced into stop mode and cannot be operated until the alarm has been reset.	Release the emergency stop (if pressed).
<<DOSING UNIT OVERLOAD>>	The circuit breaker for the dosing unit has tripped. Dosing and agitation will be forced to stop - the feed pump and blender can still be operated.	Open the electrical cabinet and turn on the circuit breaker. Close the electrical cabinet and turn on the machine.
<<HOPPER SAFETY SWITCH>>	The hopper grill has been detected removed while not in stop mode. Dosing and agitation will be forced to stop - the feed pump and blender can still be operated.	Put the hopper grill back in place.
<<DOSING MOTOR TOO HOT>>	The internal thermal motor protection has detected motor overheat. Dosing and agitation will be forced to stop - the feed pump and blender can still be operated.	Wait until the motor cools down and the alarm can be reset.

Alarm	Cause	Remedy
<<DOSING DRIVE FAULT>>	The variable motor drive has detected a fault. Dosing and agitation will be forced to stop - the feed pump and blender can still be operated.	Open the electrical cabinet. Connect the machine and enter production mode. When the drive is connected, the display will be flashing. Press "stop/reset" on the drive, followed by "start". Close the electrical cabinet.
<<AGITATOR MOTOR TOO HOT>>	The internal thermal motor protection has detected motor overheat. Agitation will be forced to stop the dosing, feed pump and blender can still be operated.	Wait until the motor cools down and the alarm can be reset.
<<AGITATOR DRIVE FAULT>>	The variable motor drive has detected a fault. Agitation will be forced to stop the dosing - feed pump and blender can still be operated.	Open the electrical cabinet. Connect the machine and enter production mode. When the drive is installed, the display will flash. Press "stop/ reset" on the drive, followed by "start". Close the electrical cabinet.
<<FEEDPUMP SAFETY SWITCH>>	The feed pump funnel or CIP cover has been removed while not in stop mode. All moving parts of the machine will be stopped, and cannot be operated.	Put the funnel or CIP cover back into place.
<<FEEDPUMP MOTOR OVERLOAD>>	The circuit breaker for the feed pump has tripped. All moving parts of the machine will be stopped and cannot be operated.	Open the electrical cabinet and turn on the circuit breaker. Close the electrical cabinet and turn on the machine.
<<FEEDPUMP DRIVE FAULT>>	The variable motor drive has detected a fault. All moving parts of the machine will be stopped and cannot be operated.	Open the electrical cabinet. Turn on the machine and enter production mode. When the drive is installed, the display will flash. Press "stop/ reset" on the drive, followed by "start". Close the electrical cabinet.

Alarm	Cause	Remedy
<<INLINE MIXER OVERLOAD>>	The circuit breaker for the feed pump has tripped. The blender motor will be forced to stop; all other machine parts can still be operated.	Open the electrical cabinet and turn on the circuit breaker. Close the electrical cabinet and turn on the machine.
<<INLINE MIXER DRIVE FAULT>>	The variable motor drive has detected a fault. The mixer motor will be forced to stop; all other machine parts can still be operated.	Open the electrical cabinet. Turn on the machine and enter production mode. When the drive is installed, the display will flash. Press "stop/ reset" on the drive, followed by "start". Close the electrical cabinet.
<<MACHINE IS NOT SET UP>>	The machine is not set up and will not be able to run.	Go to the screen “Machine setup” and put in the parameters from the Hoyer drawings and then make a new setup.
<<PLC HAS BEEN IN STOP>>	The PLC has been in stop or power has been switched off.	Push Reset.
<<LOW BATTERY IN PLC>>	Battery backup in the CPU is low. The machine can run as normal, but if main power is switched off, the CPU will loose its program.	Change battery.
<<GENERAL DEVICE NET ERROR>>	The device net is down and the machine will not be able to run.	Look on the device net scanner for troubleshooting information code.
<<DOSING DEVICE NET ERROR>>	The device net scanner has detected a problem on the dosing drive. Dosing and agitation will be forced to stop. The feed pump and blender can still be operated.	Look on the device net scanner for troubleshooting information code.
<<AGITATOR DEVICE NET ERROR>>	The device net scanner has detected a problem on the agitator drive. Agitation will be forced to stop. Dosing, feed pump and blender can still be operated.	Look on the device net scanner for troubleshooting information code.

Alarm	Cause	Remedy
<<INLINE MIXER DEVICE NET ERROR>>	The device net scanner has detected a problem on the inline mixer drive. Inline mixer will be forced to stop. Dosing, feed pump and agitator can still be operated.	Look on the device net scanner for troubleshooting information code.
<<FEED PUMP DEVICE NET ERROR>>	The device net scanner has detected a problem on the feed pump drive. Inline mixer will be forced to stop. All moving parts of the machine will be stopped and cannot be operated.	Look on the device net scanner for troubleshooting information code.
<<WEIGHING UNIT DEVICE NET ERROR>>	The device net scanner has detected a problem on the weighing unit. The machine will be able to operate in constant speed mode.	Look on the device net scanner for troubleshooting information code. Disable the weighing system to continue production in constant speed mode.
<<LOAD CELL 1 ERROR>>	The weighing system has detected a fault on the load cell.	Change the load cell. Until then disable the weighing system to continue production in constant speed mode.
<<LOAD CELL 2 ERROR>>	The weighing system has detected a fault on the load cell.	Change the load cell. Until then disable the weighing system to continue production in constant speed mode.
<<LOAD CELL 3 ERROR>>	The weighing system has detected a fault on the load cell.	Change the load cell. Until then disable the weighing system to continue production in constant speed mode.
<<WEIGHT SYSTEM FAULT>>	There is a fault on the weighing transmitter.	Change the weighing transmitter. Until then disable the weighing system to continue production in constant speed mode.
<<DEAD WEIGHT TARING>>	The hopper is not tared.	Refer to the manual.
<<DOSING STOP>>	The dosing screw has stopped.	If no weight loss has been detected for X sec., (according to speed). Refill hopper or funnel for obsticals.
<<INLINE MIXER ROTATION FAULT>>	(Optional). Inline mixer not running.	Check drive belt.

1.5 Preparation

The FF ingredient feeder is designed for dosing and mixing solid or high viscous ingredients.

Certain ingredients tend to agglutinate at a high relative humidity or high temperatures. This may result in uneven dosing.

The following precautions may improve such dosing conditions:

- Cool down the ingredients.
- Only fill the hopper partially.
- Use another type of dosing screw.

WARNING
The access doors must always be correctly fitted when the ingredient feeder is in operation.

WARNING
Never place fingers/other body parts in the ingredients hopper, when the ingredient feeder is connected to mains.

1.6 Start

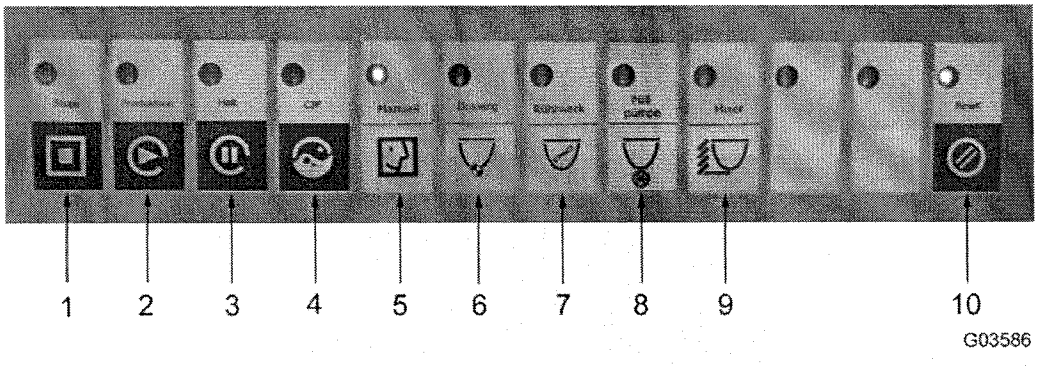
a) When ice cream enters the lamella feed pump, start the feed pump by pressing (5) and then the inline mixer by pressing (6).

CAUTION

The lamella feed pump must never run dry. Ice cream or water must be present inside the pump.

b) Start dosing by pressing (6).

c) If agitation is needed, start the agitator by pressing (7).

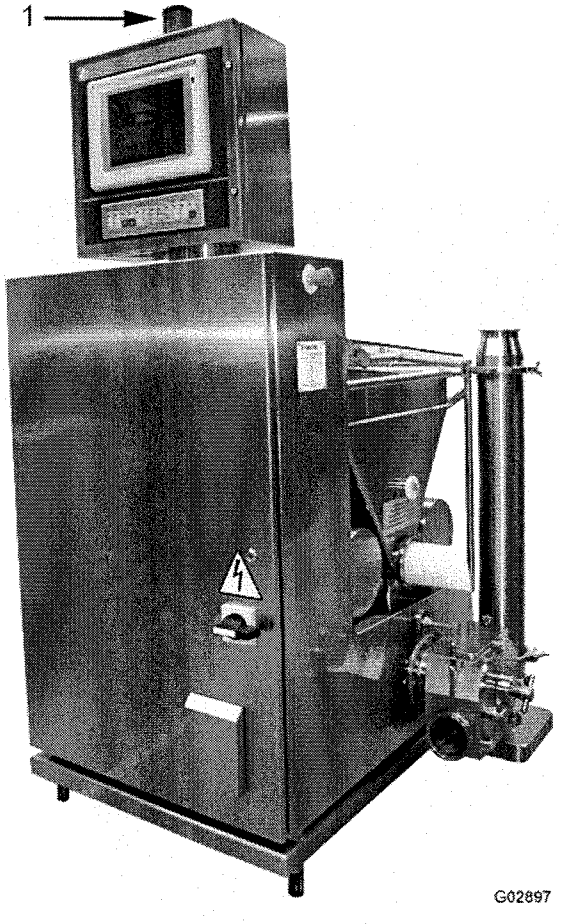


1 Stop
2 Production
3 Hold
4 CIP
5 Manual
6 Dosing
7 Agitator
8 Feed pump
9 Mixer
10 Reset

1.7 Checks

1.7.1 Refilling of ingredients

The FF 4000 is provided with a refill warning lamp (1). In case the warning is activated, refill ingredients.



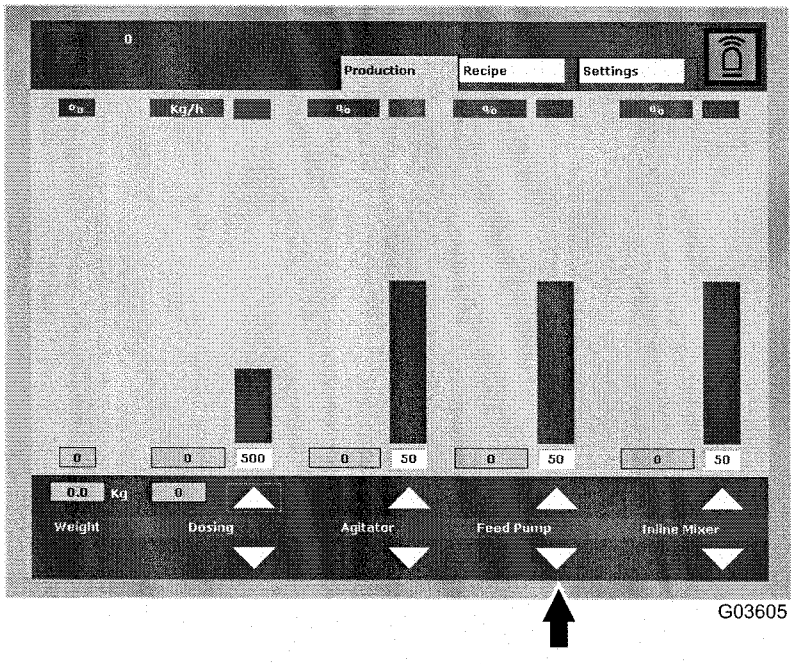
1 Warning lamp

1.7.2 Speed of feed pump

Check the speed of the feed pump. The speed is adjusted manually on the control panel.

The speed of the pump must be set so high that ingredients do not build up in the inlet funnel.

The speed, however, must not be set so high that unnecessary air is incorporated into the ice cream.



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1.7.3 Ingredient build-up

During production some types of ingredients may build up in the dosing unit and the inlet funnel.

- Loosen the build up ingredients in the dosing unit by turning on the agitator.
- Loosen the build up ingredients in the inlet funnel with a stick.
- Check the speed of the lamella pump (see above section "Speed of lamella pump").

1.8 Change of product

It is recommended that the FF 4000 is cleaned in connection with change of ingredient.

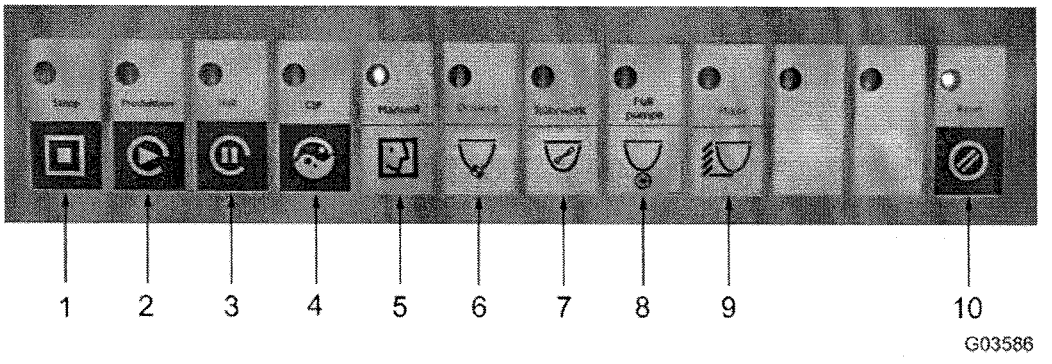
Remember to mount a suitable dosing screw.

1.9 Stop

a) Stop dosing by pressing (6).

b) If the agitator is on, stop the agitator by pressing (7).

c) When no ice cream flow is left, stop the mixer by pressing (9) and the pump by pressing (8).



1 Stop
2 Production
3 Hold
4 CIP
5 Manual
6 Dosing
7 Agitator
8 Feed pump
9 Mixer
10 Reset

1.10 Cleaning

WARNING
Disconnect the mains supply before preparing for cleaning: Turn main switch to position "0" and then lock the switch with a padlock.

WARNING
High temperatures. During cleaning or operation with media warmer than 50°C there is a risk of burning, if the lamella feed pump, mixer outlet or mixer inlet pipes are touched.

WARNING
CIP program. On ingredient feeders equipped with an automatic CIP program, the mixer and feed pump will start automatically and without any warning.

CAUTION
The lamella feed pump must never run dry. Ice cream or water must be present inside the pump.

1.10.1 CIP procedure

a) Prerinse with water.

b) Alkaline cleaning with a suitable detergent with wetting agents.

c) Intermediate rinse with water.

d) Disinfection either with hot water (85°C - 15 minutes) or with a neutral disinfectant.

e) Final rinse with potable water.

Note! Lamella pump and mixer have to be checked after CIP cleaning. If necessary a manual cleaning procedure has to be applied.

1.10.2 Manual cleaning procedure

a) Prerinse with warm water.

b) Manual cleaning with brush and sponge by using a suitable detergent.

c) Final rinse with potable water.

Note! After each cleaning and disinfection a final rinse with potable water is required (legal demands).

1.10.3 Exterior cleaning

To keep a shiny surface a sporadic acidic foam cleaning is required.

a) Prerinse with water.

b) Acid foam cleaning.

c) Final rinse with water.

1.10.4 Deposits

Once or twice every season deposits of calcium salts should be removed.

a) Disassemble mixer and lamella pump.

b) Wash the individual parts with weak acids (for instance acetic acid or citric acid, pH 3.0 - 4.5, max. 100 ppm).

c) Rinse immediately and thoroughly with cold water.

d) Dry parts.

1.10.5 Dosing unit

Remove the agitator and dosing screw from the dosing unit and clean all the parts manually.

1.10.6 Lamella feed pump and mixer

The lamella feed pump and mixer may form part of the CIP circuit of the production line, when the following preparations have been made.

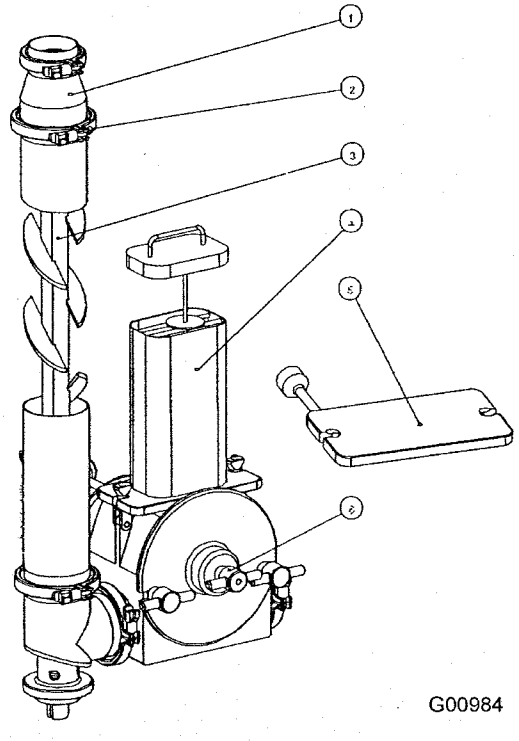
1.10.6.1 Lamella feed pump

a) Disconnect the mains supply before preparing for cleaning. Turn main switch to position "0" and then lock the switch with a padlock.

b) Fit the CIP cap (5) instead of the lamella feed pump chute (4).

c) Unscrew the inner cover of the feed pump case by turning the screw (6) of the front cover counterclockwise to the extreme position (CIP position).

d) Connect the mains supply.
   - Unlock the padlock.
   - Turn the main switch to position "I".
   - Press the reset button.



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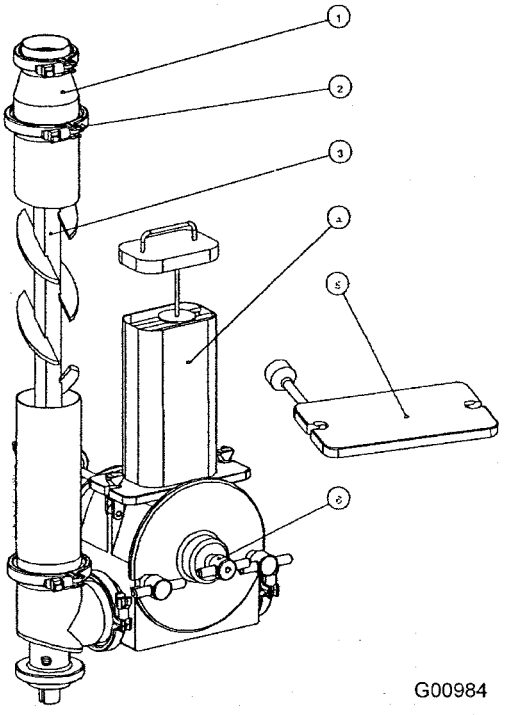
1 Cone
2 Clamp ring
3 Rotor
4 Lamella feed pump chute
5 CIP cap
6 Screw

1.10.6.2 Mixer

If necessary remove the mixer rotor for manual cleaning.

a) Dismantle cone (1) by opening the clamp ring (2).
b) Pull out rotor (3) of the mixer case.
c) Remount the cone by means of the clamp ring (2).



G00984

1 Cone
2 Clamp ring
3 Rotor
4 Lamella feed pump chute
5 CIP cap
6 Screw

The mixer is now ready for CIP cleaning (i.e. without rotor fitted).

During CIP cleaning the mixer and the lamella feed pump must be started for brief periods of intermittent operation (approx. 50% of maximum speed).

This procedure will often be sufficient to ensure acceptable cleaning. However, when non-water soluble ingredients are used in the production, it may be necessary to dismantle the unit for inspection and possible additional manual cleaning.

1.10.7 Cleaning detergents

The below table contains examples of detergents to be used when cleaning the machine with water.

CAUTION
Do not use acids or chlorine containing detergents apart from the exceptions described below. Chlorine exposes the rotor, beater and scraper blades to pitting corrosion and rusting; it also exposes the chrome layer to pitting corrosion. Acid attacks chrome layer and nickel/nickel bronze.

Addus FF 4000 ingredient feeder					
Area / Equipment	**P3-Product**	**Product characteristics**	**Application**		
			conc. [%]	**temp. [°C]**	**time [min.]**
ECOLAB	P3-tresolin ST	manual cleaning, neutral cleaner with disinfecting properties	1.0 - 2.0	30 - 50	10 - 30
	P3-topax 12	low alkaline manual cleaning	1.0 - 2.0	30 - 50	10 - 30
	P3-topax 52	acid foam cleaner	2.0 - 3.0	30 - 50	10 - 15
JohnsonDiversey Clean is just the beginning	Quadet SU 133	manual cleaning, low alkaline cleaner with disinfecting properties	1.0 - 2.0	30 - 50	10 - 30
	Sanol SU 120	neutral manual cleaning	1.0 - 2.0	30 - 50	10 - 30
	Acigel SU 631	acid foamgel cleaner	2.0 - 3.0	30 - 50	10 - 15

Hand cleaning and disinfection. Shoes/boots disinfection					
Area / Equipment	P3-Product	Product characteristics	Application		
			conc. [%]	temp. [°C]	time [min.]
ECOLAB	Mansoft	hand cleaner	100 (3 ml)	room temp.	0.5
	Manodes	hand disinfectant	100 (3 ml)	room temp.	0.5
	P3-triquart*)	neutral disinfectant, bath application	2.0 - 3.0	room temp.	10 - 15
JohnsonDiversey Clean is just the beginning	Leverline Bac	hand cleaner	100 (3 ml)	room temp.	0.5
	Leverline Med	hand disinfectant	100 (3 ml)	room temp.	0.5
	Divosan QC*)	neutral disinfectant, bath application	0.5 - 2.0	room temp.	

*) There may be authorities which do not permit the use of quaternary ammonium compounds.

CAUTION

Caution when P3-triquart is applied in connection with production of cultured products such as frozen yogurt.

The detergents should not be applied until the material safety data sheets and product data sheets have been read and understood. These documents can be requested from the local Ecolab or JohnsonDiversey agent respectively.

The local agent can be identified by contacting one of the following offices:

ECOLAB

Ecolab GmbH & Co. OHG
Reisholzer Werfstr. 38-42
40589 Düsseldorf
Germany
Tel: +49 211 98930

Ecolab Center
370 N. Wabasha St.
St. Paul
Minnesota 55102
USA
Tel: +1 612 293 2233

Ecolab Ltd.
15/F, Lu Plaza
2 Wing Yip Street
Kwun Tong, Kowloon
Hong Kong
Tel: +852 2341 4202

JohnsonDiversey
Clean is just the beginning

JohnsonDiversey F&B
R&D
Mallaustrasse 50-56
68219 Mannheim
Germany
Tel: +49 621 87570

JohnsonDiversey
WTB Amsterdam
Airport/Tower B, 8th floor
1118 BH Luchthaven
Schiphol
Netherlands
Tel: +31 20 3164500

JohnsonDiversey R&D
3630 East Kemper Road
Sharonville
Cincinnati
Ohio
USA
Tel: +1 516 8296918

1.10.8 Hygiene

Ice cream production, like other foodstuffs, requires high sanitary standards. That is why the strictest demands should be made on cleaning of devices and tools getting in touch with the ice cream, ingredients coating and packaging materials. In addition, the production area should be kept very clean.

Personal hygiene should also be considered as a part of the sanitary standards:

- Personal body hygiene
- Headgear
- Hygiene of work clothes
- Hygiene of footwear
- Hand hygiene

ALWAYS make sure that the detergents and disinfectants applied are approved by the local authorities.

NEVER use a detergent which chemical properties will damage the metals and alloys to be cleaned.


Tetra Pak