Tetra Pak

Manual
Quick Start
TPS Mixer
Almix B200-100V

Tetra Pak

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1.1

Tetra Pak

1. Quick start

This section contains a brief summary of the key points necessary for installing and operating the Scanima Pilot plant SPM-100. The quick start must not be regarded as a complete manual.

IMPORTANT: To ensure maximum safety carefully read the safety regulations in the main manual before carrying out any work on the unit.

1.1 Installing

1.1.1 Layout

The layout with main dimensions can be seen on the enclosed drawing in the back of this section.

1.1.2 Lifting

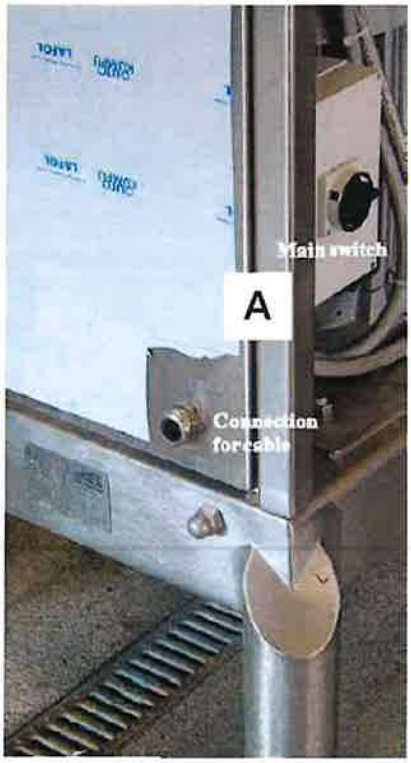
The weight of the Scanima pilot plant SPM-100 is 1300 kg. The unit is best lifted/transported with a forklift truck. Signs on the mixer indicate where to lift. The unit must be placed on a level floor.

1.1.3 Connections

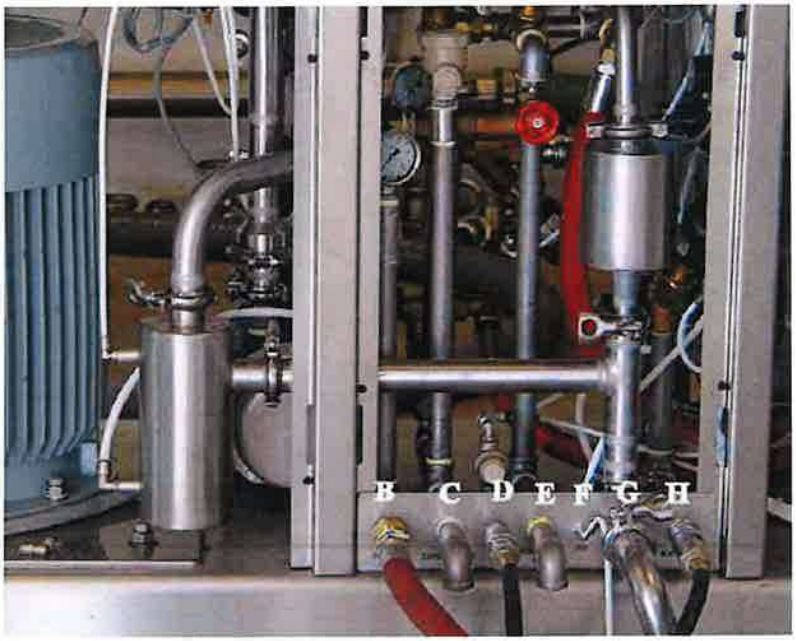
In order to use all features the unit need power, steam, water and Compressed air supply. On some models a separate connection for jacket cooling areavailable. Then brain, chilled water or other cooling agents can be used.

Supply type	Supply specification	Connection type	Location
Electrical supply	3x400V; 50Hz; Max 100A	Terminals or 64 Amp CE-plug	A
Steam supply:			
Direct steam injection	120 kg/h; max 4 bar(g)	} 1" BSP swivel nut	B
Indirect steam (jacket)	100 kg/h; Max 4 bar(g)		
Condense outlet		¾" BSP swivel nut	C
Water supply			
Service Water	150 kg/h, max. 5 bar	¾" BSP Socket	D
Service Water drain		Bend to the floor	G
Cooling water (jacket)	1500 kg/h, max. 5 bar	¾" BSP Socket	H
Cooling water drain		¾" BSP Male	E
Compressed air supply			
Compressed air	Max 6 bar	Quick coupling for Ø8 hose	F

The location of the connections is shown on pic. 1 and 2



Pic. 1

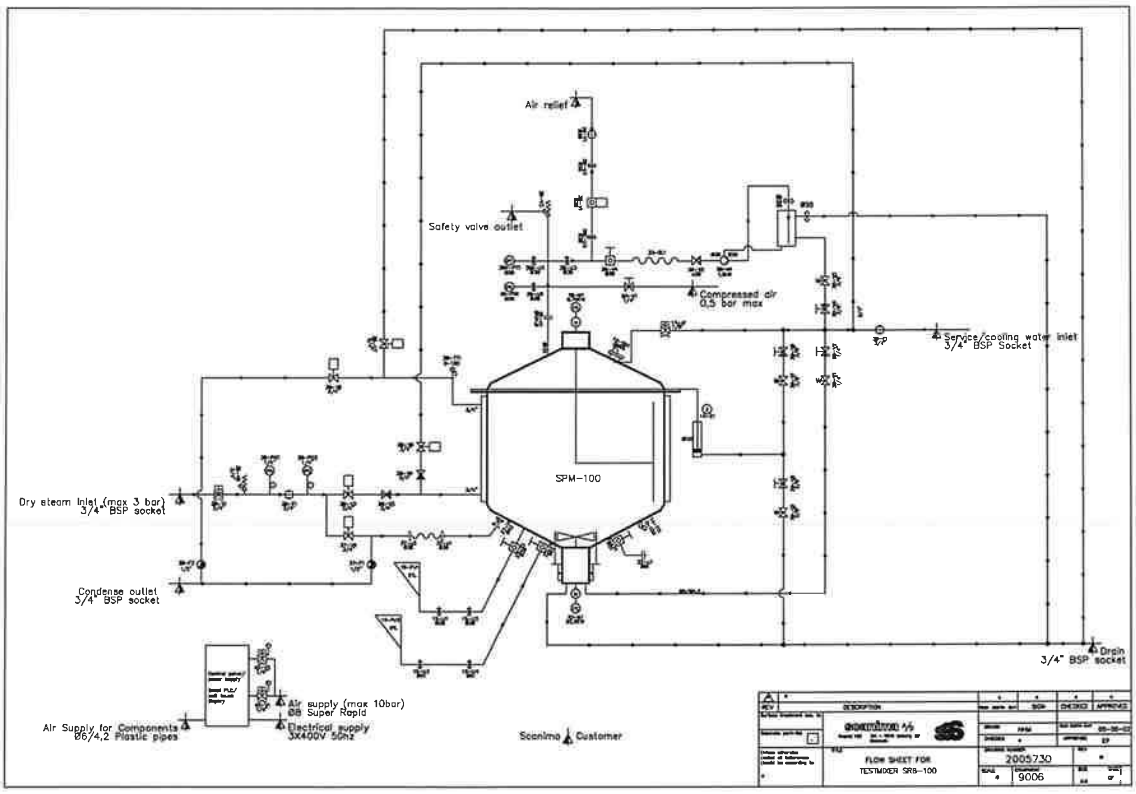


Pic. 2

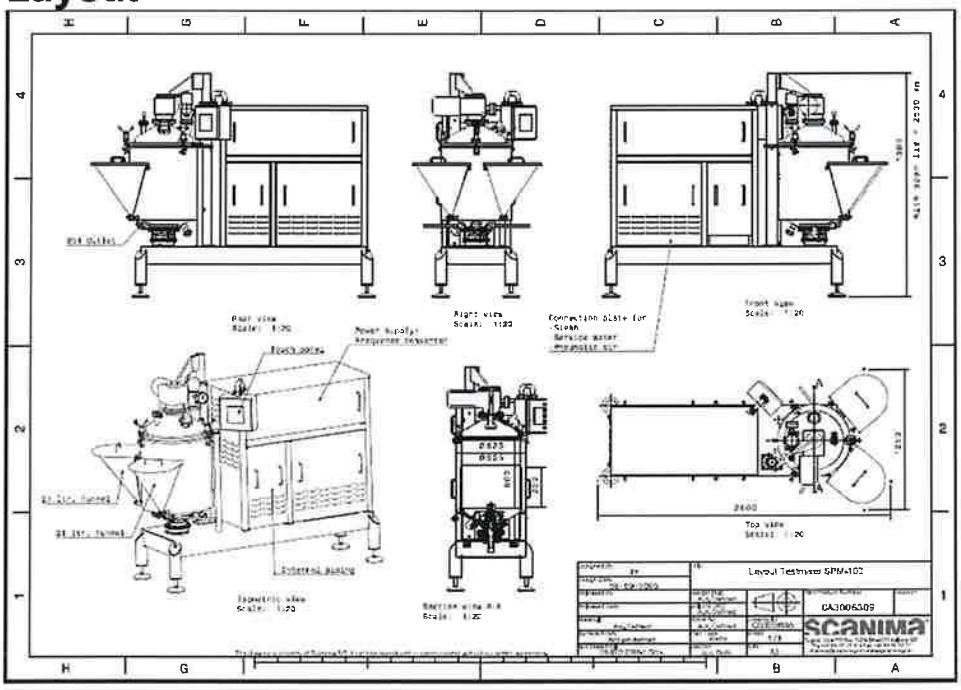
The complete flow-diagram of the pilot plant can be seen on the enclosed drawing in the back of this section.

Tetra Pak

Flow sheet



Layout



2.1

2. Operation

2.1 Setup

Pic.1

Steam inlet pressure regulation valve
Before using direct or indirect steam it is very important to check and if necessary adjust the steam inlet pressure. The steam inlet pressure must not exceed 4 bar(g). A manometer and regulation valve for the steam inlet pressure is located on the steam inlet line as shown on Pic. 1.

2.2 Manual operations

Following items/features are operated manually

Pic. 2.

Establish vacuum inside the vessel
The mixer is equipped with a vacuum pump there can suck vacuum in tank down to approximately –0,80 bar. This feature has two advantages:
Powder can be sucked into the vessel due to the vacuum in the vessel.
Product can be de-aerated, because air is sucked out of the product.

In order to establish vacuum inside the tank the man-way cover must be closed and the locking nut tightened. Likewise the outlet valve and powder inlet valves must be closed. Now the vacuum pump can be started from the control panel.

Opening of outlet and powder inlet valves
Outlet and powder inlet valves is manually operated. The location is shown on

2.2

Ventilating

In order to de-pressurize the tank the vacuum pump must be stoped and the tank is de-pressurize. To stop the vacuum se the chapter for "Mixer control".

Pic. 3

Setting the correct vacuum level:

The pressure/vacuum level inside the mixing vessel can be read on the manometer mounted on the unit or on the touch screen. To adjust the vacuum se the chapter for "Mixer control".

IMPORTANT: In order to suck in powder it is recommended to have a vacuum level between –0,4 bar and –0.8 bar. Too high vacuum can result in boiling/foaming of the product. Too little vacuum can result in liquid back-flush into the powder line.

Opening of outlet and powder inlet valves

Outlet and powder inlet valves is manually operated. The location is shown on figure

Ventilating

In order to de-pressurize the tank the ventilation valve must be opened. The location of the ventilation valve is shown on figure

2.3 Wiring diagram/Electrical documentation

See main manual

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Mixer control
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Scanima mixer:

This manual covers the control system of the Scanima mixer.

Main screen:

This is the main screen of the mixer control system. To select one of the sub screens, simply press one of the buttons on this main screen. To return to the main screen, press the button labelled "Ret".

On all of the sub screens, there is a label in the top left corner, which shows the name of the screen. If an alarm occurs, this label will start flashing. To jump directly to the alarm screen, press the label.

The recipe- and setup screens are password protected. To enter these screens the operator must log in to the system by pressing the login button in the right bottom of the screen and entering the correct
password. The password can be changed on the system page. When the correct password has been entered, the label of the button changes to a blinking "Logout" to remind the operator to log out again after use.

Automatic:

This screen should be used to control the mixer units automatically. The desired recipe for the batch is selected by pressing the recipe number in the bottom left of the screen. If a recipe has been changed (on the recipe screen) after it was loaded, press the reload button to update.

In the top right of the screen is the current batch number. The number consisting of first two digits will increase by 1 every time a new batch has ended and will be reset at midnight. A new starting number for the batch can be entered by pressing the number on this screen. The last six digits is the current date.
When a batch is started, an arrow will appear in the left side of the screen, indicating the top most of the recipe lines of the active step. The list of recipe lines will scroll automatically as the program advances, but it is also possible to manually scroll the recipe lines by means of the up- and down arrows in the right side of the screen.

Start:

To start a batch with the currently selected recipe, press the button "Start". After a few seconds the button will lit indicating that a batch is started.

Pause:

The current batch can be paused at any time by pressing this button. All units controlled by the PLC will stop or close (mixer, agitator, valves etc), but the air relief will stay in its actual position. If emergency stop is activated, this will also put the control program into pause mode. When the system
is in pause mode, the label "Pause" will light and to resume from pause mode, simply press the "Pause" button again.

Stop:

To stop a currently running batch, press the button "Stop". The operator is asked to acknowledge that the batch should be stopped. If a batch is stopped, the content of the mixer must be manually disposed before a new batch can be started. There is no way to restart a batch at the exact step

where it was stopped.

Arrow Right:
Pressing this button switches to the screen for viewing automatic status.

Automatic status:

On this screen, all important process values and status can be seen. It is a "view only" screen so the buttons cannot be activated and will only illustrate the current status of the system.

Arrow Left:
Pressing this button switches to the "Automatic" screen.

Information area:
In the bottom of the screen, an area shows important process values. They are the product temperature,
the jacket temperature, the pressure and the mixer and stirrer speeds in RPM.

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Manual:

This screen should be used to control the mixer units manually. To operate buttons and change setpoints, press on the desired operation on the screen. Please note that manual operations override automatic sequences.

Mixer:

The mixer speed should be between 10% and 100%. The position of the mixer stator (up or down) can be changed on the button to the right of the mixer speed.

Stirrer:

The stirrer speed should be between 10% and 100%. The stirrer can be made to alternate with different time intervals. Enter the times for clockwise and counter clockwise intervals. If one of the settings is "0", the stirrer will keep running in the opposite direction without alternating.

Vacuum:

The vacuum pump can be started and stopped.

Lid up and down:

The Lid can be opened by pressing the "On/Off" button.

Direct heat:

Enter a setpoint and press "On" to start a temperature control using direct heat. The control system will inject steam directly into the product until the setpoint is reached and will try to maintain the setpoint temperature by adding doses of steam. The setpoint can be between 0°C and 100°C. IMPORTANT: Direct heat cannot be started if jacket cooling is started.

Jacket heat:

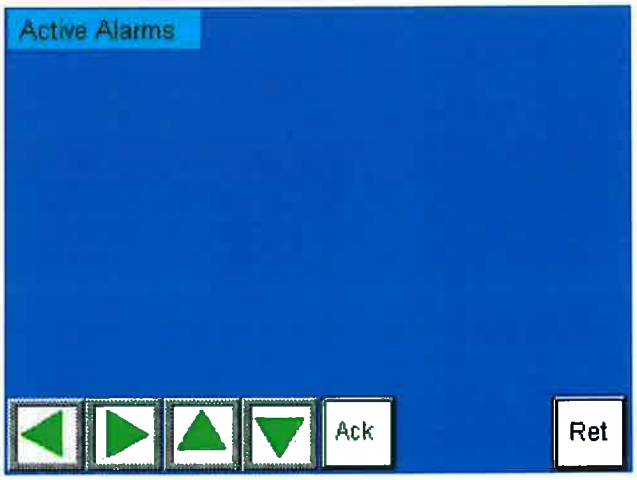
Enter a setpoint and press "On" to start a temperature control using jacket heat. The control system will inject steam into the jacket until the setpoint is reached and will try to maintain the setpoint temperature by adding doses of steam. The setpoint can be between 0°C and 150°C. IMPORTANT: Jacket heat cannot be started if jacket cooling is started. ALSO IMPORTANT: Steam injection in the jacket will NOT run if the product temperature is beyond the setpoint for direct heat EVEN THOUGH the jacket temperature is below the setpoint for jacket heat.

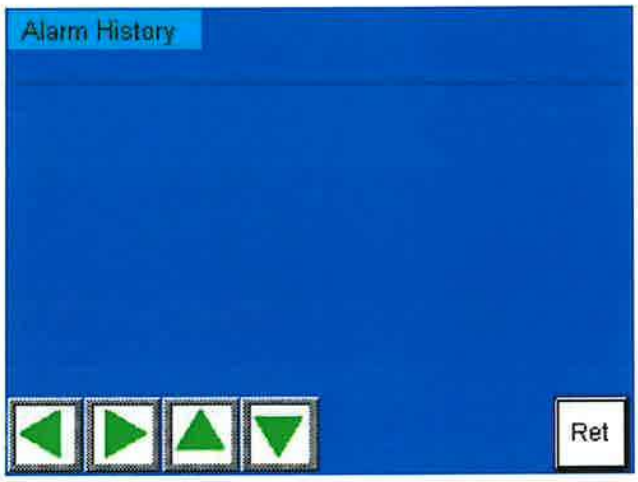
Jacket cooling
Enter a setpoint and press "On" to start a temperature control using jacket cooling. The control system will inject cold water into the jacket until the setpoint is reached and will try to maintain the setpoint temperature by adding doses of cold water. The setpoint can be between 0°C and 100°C.
IMPORTANT: Jacket cooling cannot be started if direct heat or jacket heat is started.

Information area:
In the bottom of the screen, an area shows important process values. They are the product temperature, the jacket temperature, the pressure and the mixer and stirrer speeds in RPM.

Alarms:

The alarm screen is selected by pressing the button "Alarm" on the main screen or by pressing one of the top left labels on the other screens.
The initial alarm screen shows currently active alarms, but by pressing left or right arrow, the screen changes to show historic (previous) alarms. To the right of the historic alarms will be shown the time when the alarm situation went away.
The mixer control system can detect 13 alarms:
1) Emergency stop
2) Thermo failure mixer
3) Thermo failure stirrer
4) Thermo failure vacuum pump
5) Error on product temperature sensor
6) Error on jacket temperature sensor
7) Error on pressure sensor
8) Timeout direct heat
9) Timeout jacket heat
10) Timeout jacket cool
11) Timeout vacuum
If an emergency stop alarms occur, all units started in manual mode will stop. In automatic mode, the first 7 alarms will cause the sequence to enter pause mode. The timeout alarms will be shown in the display but will not stop anything.
If an emergency stop occurs, the operator has to press "Ack" in order to reset the control. This will also be the case when the machine is powered up initially.
The "Up"- and "Down" arrows are used to scroll up and down in the alarm list.





Trend and Datalog:

There are two different trend screens in the control system, one with a time span of 30 minutes and one with a time span of 2 hours. Furthermore there is a screen on which data logging can started and stopped. The trend screens show the product and jacket temperatures and the pressure. To switch between the two trend screens and the datalog screen, press the left or right arrows in the button left of the screens.

Trend Screens:

Datalog screen:

Recipe:

On this page recipes are created and edited. Recipes consist of up to 60 lines, each with a step number, a command and corresponding parameters. On this display is shown the main setpoint and if ENS has been selected for the command. Recipes are numbered from 1 to 99 and recipes are selected by pressing the recipe number in the bottom left corner.

Each recipe can be given a name by pressing the name field just above the list of recipe lines. This will bring up an alphanumeric keyboard on which the name can be entered.

If more commands should be active at the same time, the recipe lines can be given the same step number.

On the left side of the list of commands is an arrow, which indicates the currently selected command line. This arrow can be moved up and down by means of the two arrows in the right side of the display.

Whenever changes have been made to a recipe, pressing the button "Save" can save these changes.

To insert new lines or delete lines, use the keys with those labels. When a line is inserted, the last line of the recipe (line 60) will be erased.

To edit a line, press the button labelled "Edit Line". This will bring up the edit screen, which corresponds to the selected command. To select another command, press the button labelled "Command". This will bring up the command selector where another command can be selected by pressing the up and down arrows. To accept the new command, press "Ok" or press "Canc." to cancel the command change.

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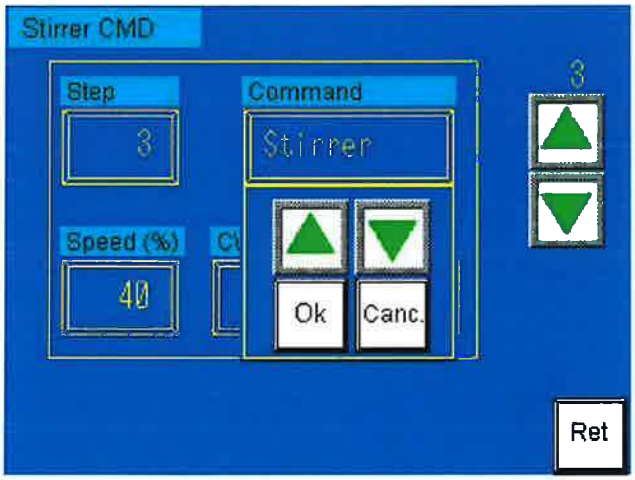

It is possible to change to the next or previous recipe lines by pressing the arrows in the left of the screen. Just above the arrows is the number of the currently selected recipe line.

Wait CMD

This command has two purposes: If a number of seconds is entered, the automatic program will wait this time until it goes on to the next recipe line. If "0" (Zero) seconds is entered, the automatic program will pop up a screen to ask the operator for an acknowledgement before it goes on to the next recipe line. The popup screen will also display the text entered under "operator prompt". If the program is in "Pause" mode, first press "Pause" before acknowledging.

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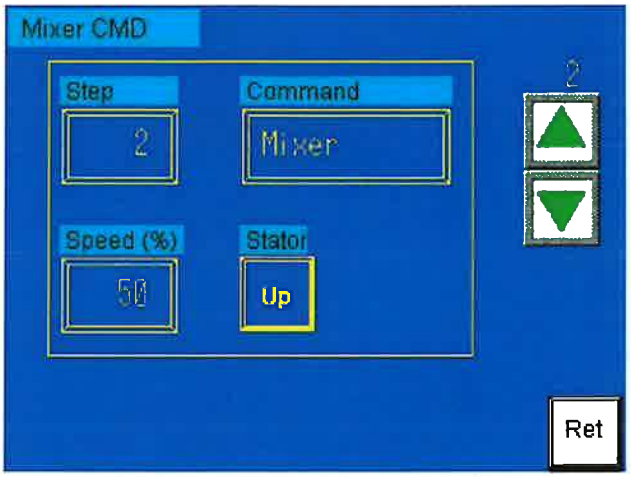
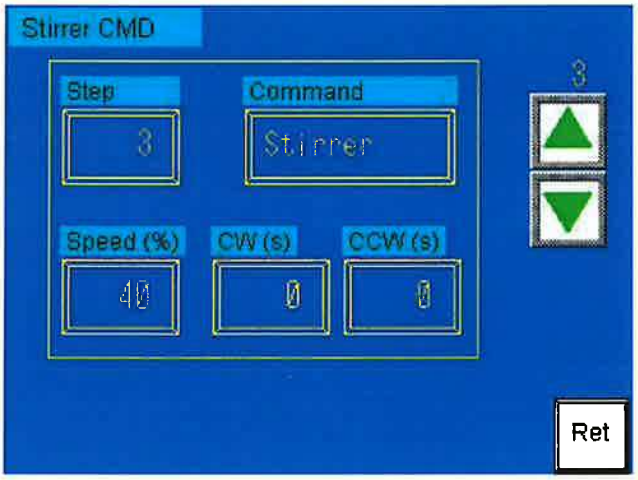
Mixer CMD



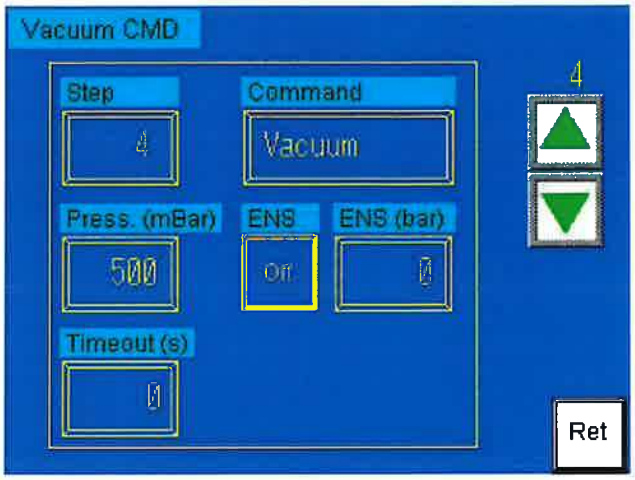
This command will start the mixer with the speed selected or stop the mixer if the speed is selected to "0" (Zero). The position of the stator is also selected.

Stirrer CMD



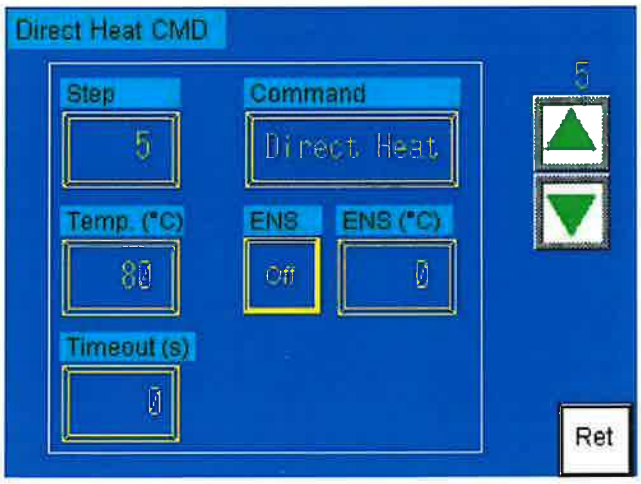
This command will start the stirrer with the speed selected or stop the stirrer if the speed is selected to "0" (Zero). The stirrer can be made to change direction during operation by entering times in seconds for ClockWise (CW) and CounterClockWise (CCW) directions. If Only CW operation is desired, enter 0 (Zero) for CCW, if only CCW operation is desired, enter 0 (Zero) for CW and any number for CCW.

Vacuum CMD



This command will start the vacuum pump with the vacuum setpoint selected or stop the vacuum pump if the setpoint is selected to "1000". If this command should pass control to the following lines in the recipe before the desired setpoint for the vacuum control has been reached, set "ENS" (Early Next Step) to "On" and enter a higher pressure for the ENS function. The vacuum control will try create as much vacuum as possible even if the setpoint has been reached until the command is stopped by executing is with a setpoint of 1000 mBar. This command will generate an alarm if the vacuum setpoint is not reached within the time specified under Timeout.

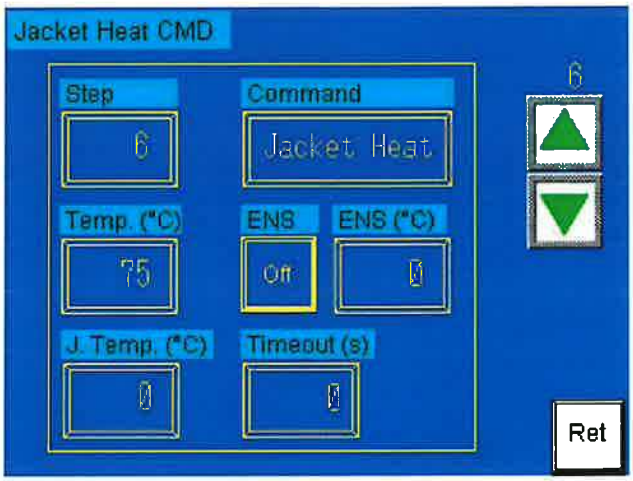
Direct Heat CMD



This command will start injection of steam directly into the product until the desired temperature has been reached or stop direct heat control if the setpoint is selected to "0" (Zero). If this command should pass control to the following lines in the recipe before the desired setpoint for the temperature
control has been reached, set "ENS" (Early Next Step) to "On" and enter a lower temperature for the ENS function. The direct heat control will try to keep the desired temperature until the command
is stopped by executing is with a setpoint of 0 °C. This command will generate an alarm if the

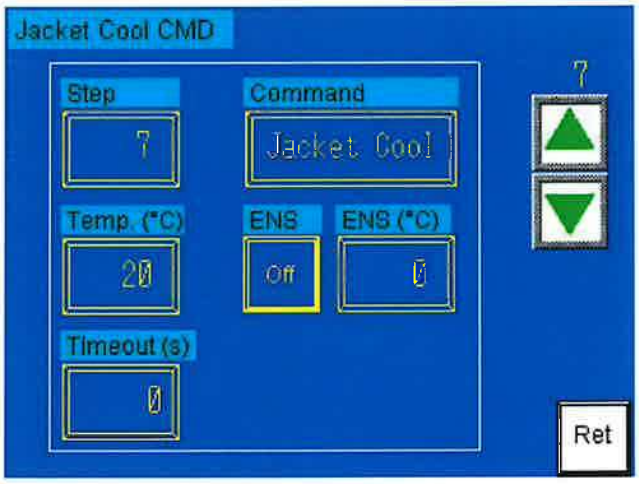
vacuum setpoint is not reached within the time specified under Timeout.

Jacket Heat CMD



This command will heat the product by means of hot water or steam injection into the mixer jacket. It will pass control to the next recipe step when the desired temperature has been reached or stop jacket heat control if the setpoint is selected to "0" (Zero). If this command should pass control to the following lines in the recipe before the desired setpoint for the temperature control has been reached, set "ENS" (Early Next Step) to "On" and enter a lower temperature for the ENS function. The jacket heat control will try to keep the desired temperature until the command is stopped by executing is with a setpoint of 0 °C. The setting "J. Temp" is a maximum for the jacket temperature – if the jacket temperature reaches this level, no heating will go on even if the product temperature is below its setpoint. This command will generate an alarm if the vacuum setpoint is not reached within the time specified under Timeout.

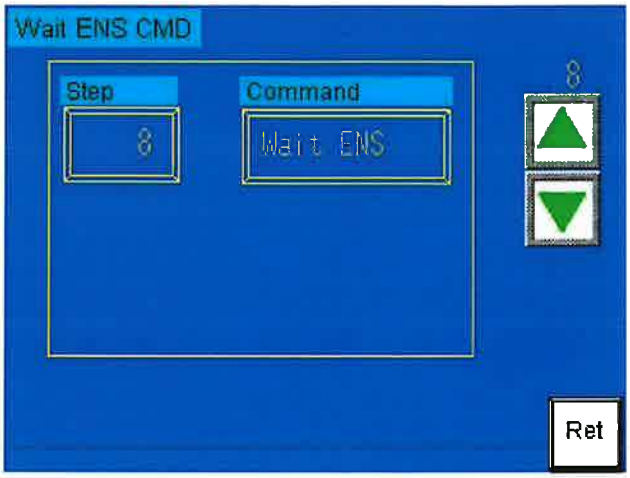
Jacket Cool CMD



This command will cool the product by means of cold water in the mixer jacket. It will pass control to the next recipe step when the desired temperature has been reached or stop jacket cool control if the setpoint is selected to "0" (Zero). If this command should pass control to the following lines in the recipe before the desired setpoint for the temperature control has been reached, set "ENS" (Early Next Step) to "On" and enter a higher temperature for the ENS function. The jacket cool control will try to keep the desired temperature until the command is stopped by executing is with a

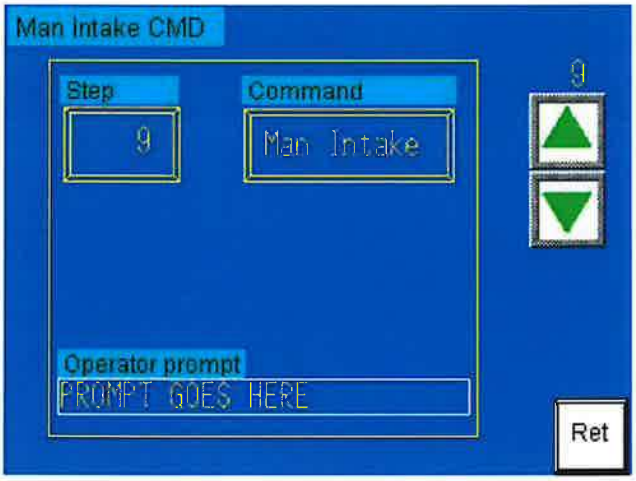
setpoint of 0 °C. This command will generate an alarm if the vacuum setpoint is not reached within the time specified under Timeout.

Wait ENS CMD



This command awaits that all previous commands executed with the ENS feature enabled will finish on their main setpoints.

Man Intake CMD



This command halts all currently started commands, including release of vacuum to allow the operator to open the manhole and put in ingredients manually. The automatic program will pop up a screen to ask the operator for an acknowledgement that manual intake is finished. The popup screen will also display the text entered under "operator prompt" After acknowledgement, all started commands will be reactivated. If the program is in "Pause" mode, first press "Pause" before acknowledging.

Setup:

Time
Since the control system logs alarms with the time of occurence, it is important that the system time is correct. To change the system time, type in the new time and press "Set time". This should be done at least once per month since the internal system clock is not very accurate.

Pressure Control
These are the PID parameters for the control of the pressure system. These are set at the values shown below at commissioning and they should not be changed afterwards.

R/M/%
On this screen various system parameters can be set. The number of revolutions per minute per percent
for the mixer and the stirrer is set upon delivery of the system and should not be changed. The settings affect the display of RPM for the on the manual screen.

Batch
This is the current batch running number, which will be increased every time a batch is finished. If the next batch should have another number than this, press the number and change it.

Password
The system password which grants access to the recipe and the system screen. It can be set to a number between 0 and 99999999. Setting the password to 0 (Zero) disables password protection.

Setup 2:

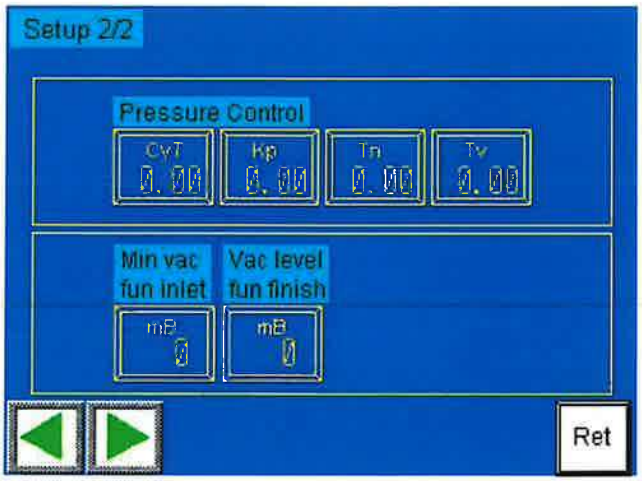
The PID parameters are set during commissioning of the system and should not be changed unless instructed so by technical staff from the supplier of the system. They are all used by the vacuum control system.

CyT
Cycle time of PID controller

Kp
Gain part of the PID controller

Tn
Integral part of the PID controller

Tv
Derivative part of the PID controller



Min vac fun inlet
This is the minimum vacuum level at which the funnels will open when running a recipe. If the operator wishes to open a funnel during a batch, the achieved vacuum by an issued vacuum command, must be lower than this parameter. The settings at time of installation were: CyT=0.1, Kp=3.0, Tn=2.85 and Tv=1.5.

Vac level fun finished
When a funnel command is active (ie. the funnel is open), and the vacuum level rises above this level, the funnel command finishes and the funnel valve closes.

3. Trouble-shooting

3.1 Turbo unit principle

Effect	Cause	Elimination
The mixer unit fails to start	An alarm is on	Reset the alarm
	The emergency stop is on	Release the emergency stop and reset alarm
	A fuse has blown	Find the defective fuse and replace it.
	The thermal relay has switched off	Find the error and press it in again.
	Motor is failing	Examine the motor.
	Missing control impulse	Follow the wiring diagram and use a pole device to find the missing impulse
No or to slow heating	No steam or to small pressure to the vessel	Correct the error at the steam supply
	The steam supply is OK, but only little steam reaches the vessel.	The filter or strainer is clogged up. Water discharge is defective, or steam quality too wet due to priming in the boiler or missing water separation before the place of consumption
	Temperature control device is not working	Check if the control valve is blocked or defective, check if the control unit is operated wrongly (the set-points keyed in is not what was intended etc.). Check if the temperature transmitter is working correct
Foaming	Air bleeds into mixer below product level	Eliminate leakage
	Pressure to low	Increase pressure (bleed air into mixer above product level)
	Air in powder	Vibrate the powder to avoid rat holes
Back flush in powder convey line	Free flow is obstructed in powder convey line.	Check powder convey line for blocks. Remove unnecessary valves.
	Powder convey line is too long	Keep down the distance between mixer and powder silo
	Vacuum level to low	Stop adding powder before this happens

Nordland Automatic

User manual for
Mixer
Case no. 05114

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Scanima mixer:

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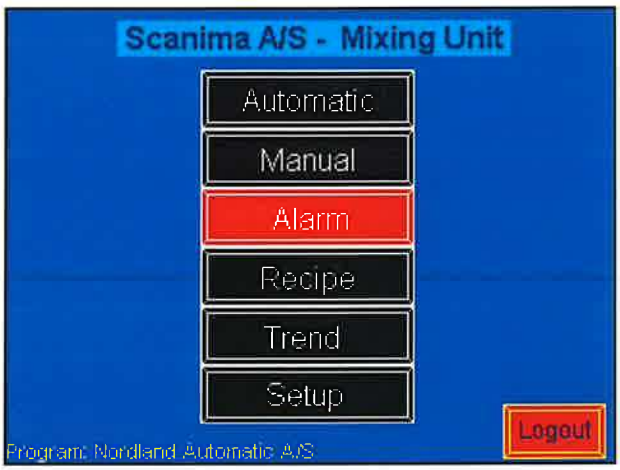
This is the main screen of the mixer control system. To select one of the sub screens, simply press one of the buttons on this main screen. To return to the main screen, press the button labelled "Ret".

On all of the sub screens, there is a label in the top left corner, which shows the name of the screen. If an alarm occurs, this label will start flashing. To jump directly to the alarm screen, press the label.



The recipe- and setup screens are password protected. To enter these screens the operator must log in to the system by pressing the login button in the right bottom of the screen and entering the correct password. The password can be changed on the system page. When the correct password has been entered, the label of the button changes to a blinking "Logout" to remind the operator to log out again after use.

Automatic:

This screen should be used to control the mixer units automatically. The desired recipe for the batch is selected by pressing the recipe number in the bottom left of the screen. If a recipe has been changed (on the recipe screen) after it was loaded, press the reload button to update.

In the top right of the screen is the current batch number. The number consisting of first two digits will increase by 1 every time a new batch has ended and will be reset at midnight. A new starting number for the batch can be entered by pressing the number on this screen. The last six digits is the current date.

When a batch is started, an arrow will appear in the left side of the screen, indicating the top most of the recipe lines of the active step. The list of recipe lines will scroll automatically as the program advances, but it is also possible to manually scroll the recipe lines by means of the up- and down arrows in the right side of the screen.

Start:

To start a batch with the currently selected recipe, press the button "Start". After a few seconds the button will lit indicating that a batch is started.

Pause:

The current batch can be paused at any time by pressing this button. All units controlled by the PLC will stop or close (mixer, agitator, valves etc), but the air relief will stay in its actual position. If emergency stop is activated, this will also put the control program into pause mode. When the system is in pause mode, the label "Pause" will light and to resume from pause mode, simply press the "Pause" button again.

Stop:

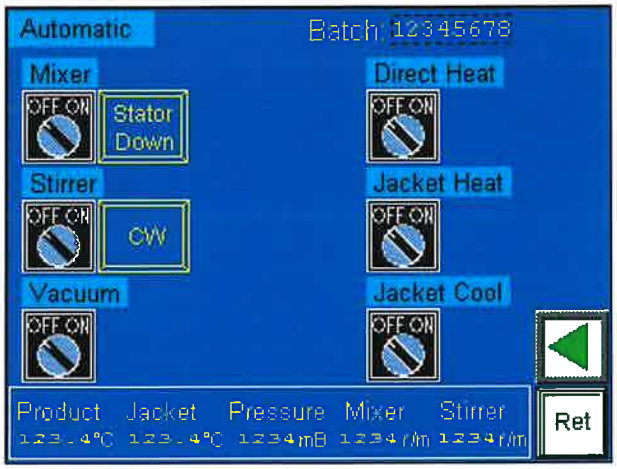
To stop a currently running batch, press the button "Stop". The operator is asked to acknowledge that the batch should be stopped. If a batch is stopped, the content of the mixer must be manually disposed before a new batch can be started. There is no way to restart a batch at the exact step where it was stopped.

Arrow Right:

Pressing this button switches to the screen for viewing automatic status.

Automatic status:

On this screen, all important process values and status can be seen. It is a "view only" screen so the buttons cannot be activated and will only illustrate the current status of the system.



Arrow Left:

Pressing this button switches to the "Automatic" screen.

Information area:

In the bottom of the screen, an area shows important process values. They are the product temperature, the jacket temperature, the pressure and the mixer and stirrer speeds in RPM.

Manual:

This screen should be used to control the mixer units manually. To operate buttons and change setpoints, press on the desired operation on the screen. Please note that manual operations override automatic sequences.

Mixer:

The mixer speed should be between 10% and 100%. The position of the mixer stator (up or down) can be changed on the button to the right of the mixer speed.

Stirrer:

The stirrer speed should be between 10% and 100%. The stirrer can be made to alternate with different time intervals. Enter the times for clockwise and counter clockwise intervals. If one of the settings is "0", the stirrer will keep running in the opposite direction without alternating.

Vacuum:

The vacuum pump can be started and stopped.

Lid up and down:

The Lid can be opened by pressing the "On/Off" button.

Direct heat:

Enter a setpoint and press "On" to start a temperature control using direct heat. The control system will inject steam directly into the product until the setpoint is reached and will try to maintain the setpoint temperature by adding doses of steam. The setpoint can be between 0°C and 100°C. IMPORTANT: Direct heat cannot be started if jacket cooling is started.

Jacket heat:

Enter a setpoint and press "On" to start a temperature control using jacket heat. The control system will inject steam into the jacket until the setpoint is reached and will try to maintain the setpoint temperature by adding doses of steam. The setpoint can be between 0°C and 150°C. IMPORTANT: Jacket heat cannot be started if jacket cooling is started. ALSO IMPORTANT: Steam injection in the jacket will NOT run if

the product temperature is beyond the setpoint for direct heat EVEN THOUGH the jacket temperature is below the setpoint for jacket heat.

Jacket cooling

Enter a setpoint and press "On" to start a temperature control using jacket cooling. The control system will inject cold water into the jacket until the setpoint is reached and will try to maintain the setpoint temperature by adding doses of cold water. The setpoint can be between 0°C and 100°C. IMPORTANT: Jacket cooling cannot be started if direct heat or jacket heat is started.

Information area:

In the bottom of the screen, an area shows important process values. They are the product temperature, the jacket temperature, the pressure and the mixer and stirrer speeds in RPM.

Alarms:

The alarm screen is selected by pressing the button "Alarm" on the main screen or by pressing one of the top left labels on the other screens.

The initial alarm screen shows currently active alarms, but by pressing left or right arrow, the screen changes to show historic (previous) alarms. To the right of the historic alarms will be shown the time when the alarm situation went away.

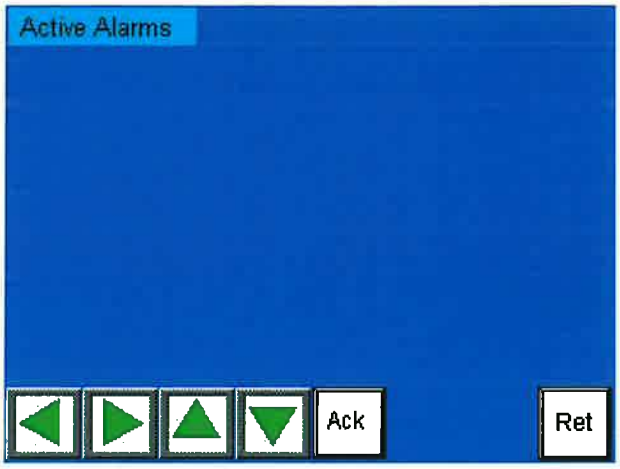
The mixer control system can detect 13 alarms:

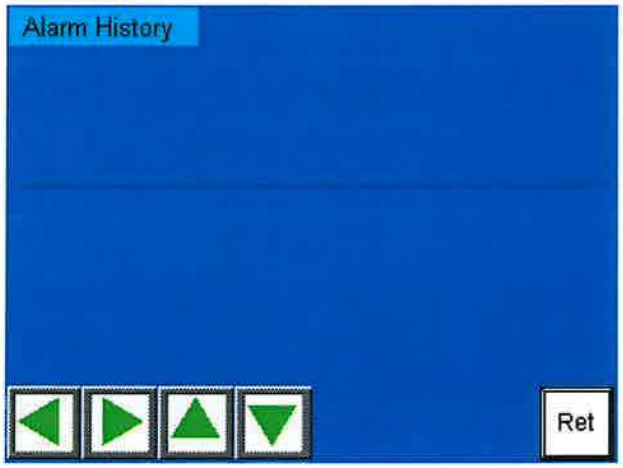
1) Emergency stop
2) Thermo failure mixer
3) Thermo failure stirrer
4) Thermo failure vacuum pump
5) Error on product temperature sensor
6) Error on jacket temperature sensor
7) Error on pressure sensor
8) Timeout direct heat
9) Timeout jacket heat
10) Timeout jacket cool
11) Timeout vacuum

If an emergency stop alarms occur, all units started in manual mode will stop. In automatic mode, the first 7 alarms will cause the sequence to enter pause mode. The timeout alarms will be shown in the display but will not stop anything.

If an emergency stop occurs, the operator has to press "Ack" in order to reset the control. This will also be the case when the machine is powered up initially.

The "Up"- and "Down" arrows are used to scroll up and down in the alarm list.

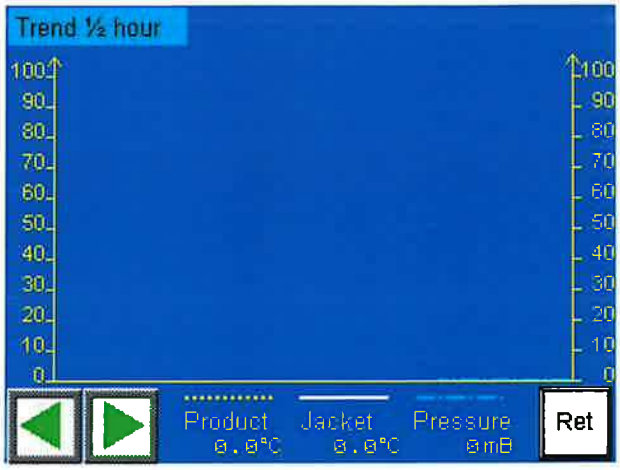




Trend and Datalog:

There are two different trend screens in the control system, one with a time span of 30 minutes and one with a time span of 2 hours. Furthermore there is a screen on which data logging can started and stopped. The trend screens show the product and jacket temperatures and the pressure. To switch between the two trend screens and the datalog screen, press the left or right arrows in the button left of the screens.

Trend Screens:



Datalog screen:

Recipe:

On this page recipes are created and edited. Recipes consist of up to 60 lines, each with a step number, a command and corresponding parameters. On this display is shown the main setpoint and if ENS has been selected for the command. Recipes are numbered from 1 to 99 and recipes are selected by pressing the recipe number in the bottom left corner.

Each recipe can be given a name by pressing the name field just above the list of recipe lines. This will bring up an alphanumeric keyboard on which the name can be entered.

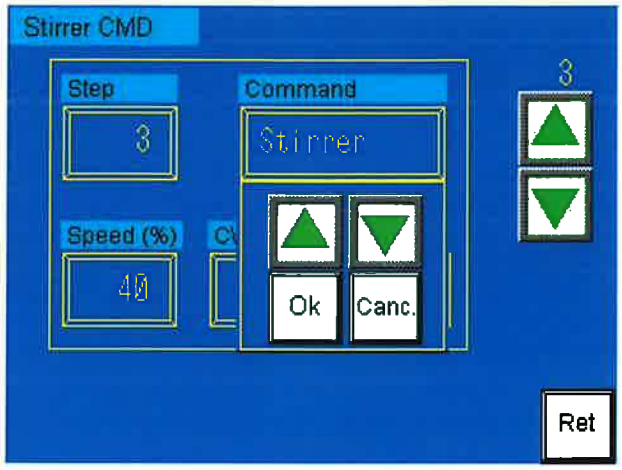
If more commands should be active at the same time, the recipe lines can be given the same step number.

On the left side of the list of commands is an arrow, which indicates the currently selected command line. This arrow can be moved up and down by means of the two arrows in the right side of the display.

Whenever changes have been made to a recipe, pressing the button "Save" can save these changes.

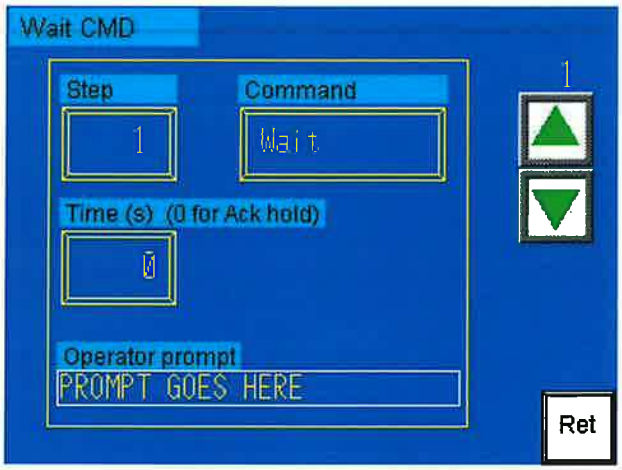
To insert new lines or delete lines, use the keys with those labels. When a line is inserted, the last line of the recipe (line 60) will be erased.

To edit a line, press the button labelled "Edit Line". This will bring up the edit screen, which corresponds to the selected command. To select another command, press the button labelled "Command". This will bring up the command selector where another command can be selected by pressing the up and down arrows. To accept the new command, press "Ok" or press "Canc." to cancel the command change.



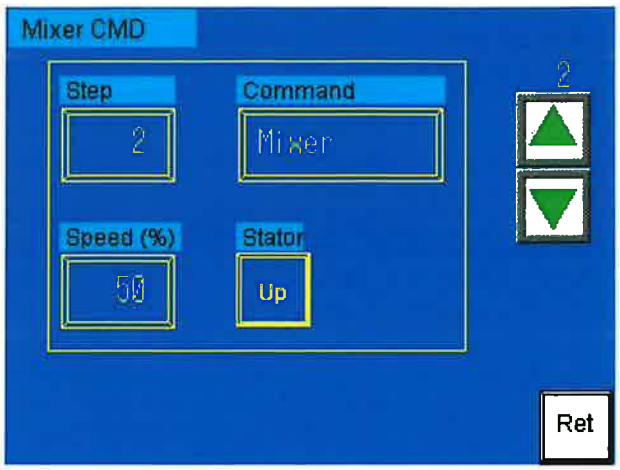
It is possible to change to the next or previous recipe lines by pressing the arrows in the left of the screen. Just above the arrows is the number of the currently selected recipe line.

Wait CMD



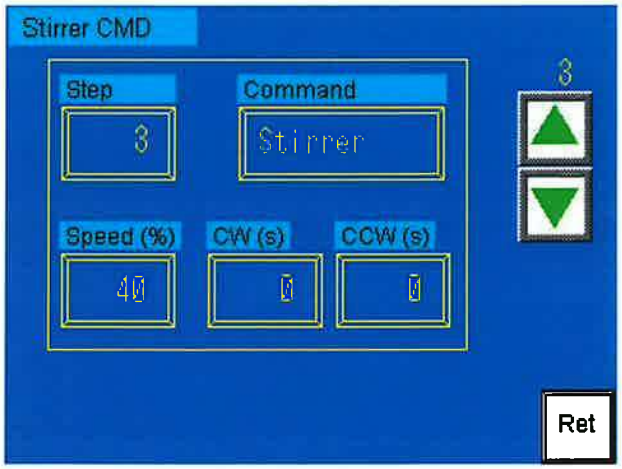
This command has two purposes: If a number of seconds is entered, the automatic program will wait this time until it goes on to the next recipe line. If "0" (Zero) seconds is entered, the automatic program will pop up a screen to ask the operator for an acknowledgement before it goes on to the next recipe line. The popup screen will also display the text entered under "operator prompt". If the program is in "Pause" mode, first press "Pause" before acknowledging.

Mixer CMD



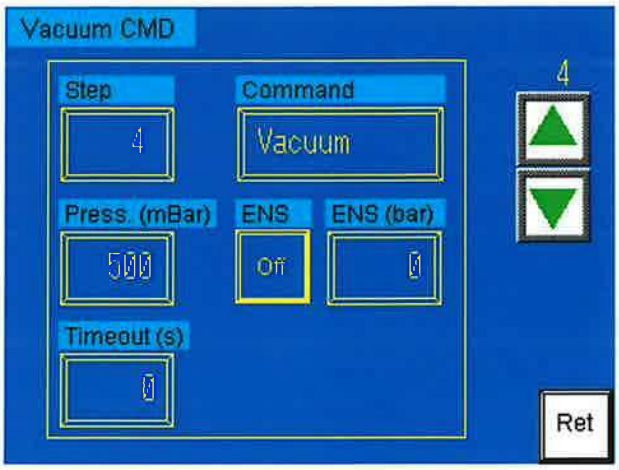
This command will start the mixer with the speed selected or stop the mixer if the speed is selected to "0" (Zero). The position of the stator is also selected.

Stirrer CMD



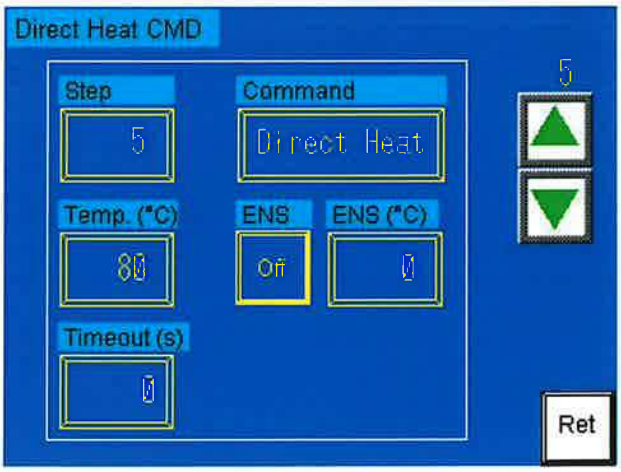
This command will start the stirrer with the speed selected or stop the stirrer if the speed is selected to "0" (Zero). The stirrer can be made to change direction during operation by entering times in seconds for ClockWise (CW) and CounterClockWise (CCW) directions. If Only CW operation is desired, enter 0 (Zero) for CCW, if only CCW operation is desired, enter 0 (Zero) for CW and any number for CCW.

Vacuum CMD



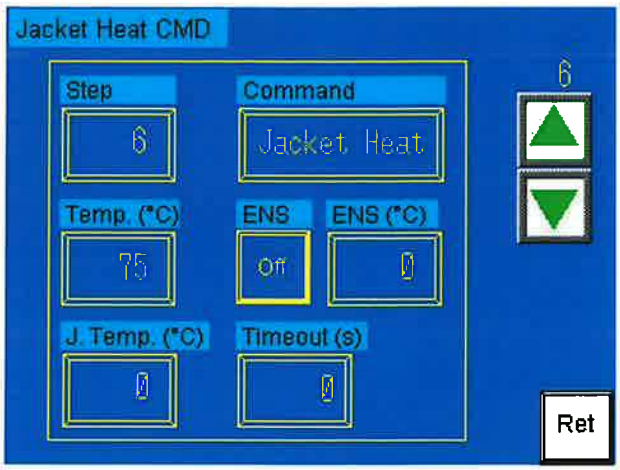
This command will start the vacuum pump with the vacuum setpoint selected or stop the vacuum pump if the setpoint is selected to "1000". If this command should pass control to the following lines in the recipe before the desired setpoint for the vacuum control has been reached, set "ENS" (Early Next Step) to "On" and enter a higher pressure for the ENS function. The vacuum control will try create as much vacuum as possible even if the setpoint has been reached until the command is stopped by executing is with a setpoint of 1000 mBar. This command will generate an alarm if the vacuum setpoint is not reached within the time specified under Timeout.

Direct Heat CMD



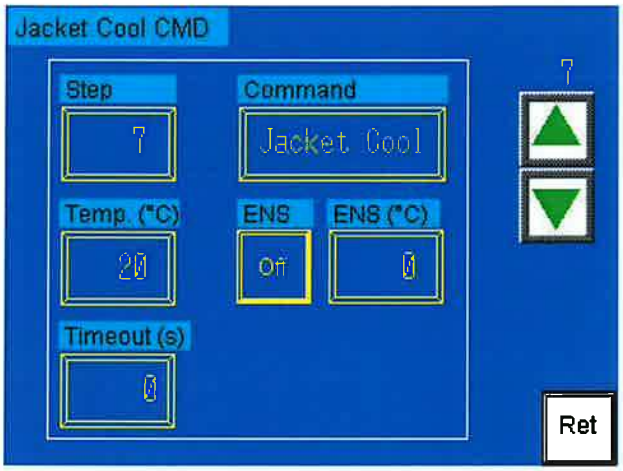
This command will start injection of steam directly into the product until the desired temperature has been reached or stop direct heat control if the setpoint is selected to "0" (Zero). If this command should pass control to the following lines in the recipe before the desired setpoint for the temperature control has been reached, set "ENS" (Early Next Step) to "On" and enter a lower temperature for the ENS function. The direct heat control will try to keep the desired temperature until the command is stopped by executing is with a setpoint of 0 °C. This command will generate an alarm if the vacuum setpoint is not reached within the time specified under Timeout.

Jacket Heat CMD



This command will heat the product by means of hot water or steam injection into the mixer jacket. It will pass control to the next recipe step when the desired temperature has been reached or stop jacket heat control if the setpoint is selected to "0" (Zero). If this command should pass control to the following lines in the recipe before the desired setpoint for the temperature control has been reached, set "ENS" (Early Next Step) to "On" and enter a lower temperature for the ENS function. The jacket heat control will try to keep the desired temperature until the command is stopped by executing is with a setpoint of 0 °C. The setting "J. Temp" is a maximum for the jacket temperature – if the jacket temperature reaches this level, no heating will go on even if the product temperature is below its setpoint. This command will generate an alarm if the vacuum setpoint is not reached within the time specified under Timeout.

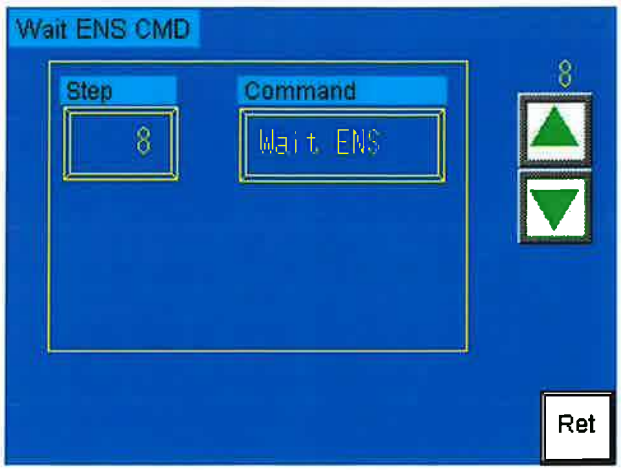
Jacket Cool CMD



This command will cool the product by means of cold water in the mixer jacket. It will pass control to the next recipe step when the desired temperature has been reached or stop jacket cool control if the setpoint is selected to "0" (Zero). If this command should pass control to the following lines in the recipe before the desired setpoint for the temperature control has been reached, set "ENS" (Early Next Step) to "On" and enter a higher temperature for the ENS function. The jacket cool control will try to keep the desired tem-

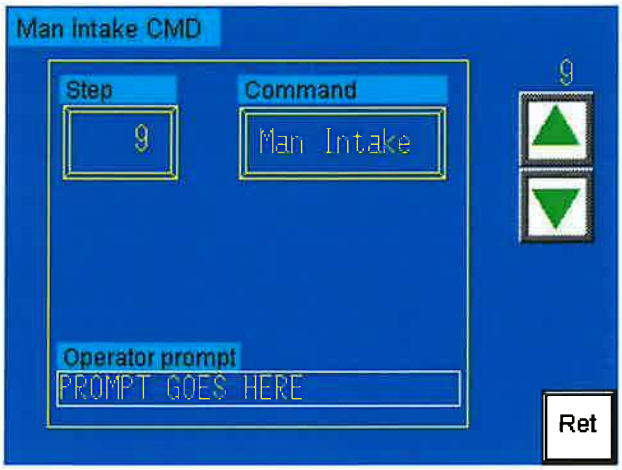
perature until the command is stopped by executing is with a setpoint of 0 °C. This command will generate an alarm if the vacuum setpoint is not reached within the time specified under Timeout.

Wait ENS CMD



This command awaits that all previous commands executed with the ENS feature enabled will finish on their main setpoints.

Man Intake CMD



This command halts all currently started commands, including release of vacuum to allow the operator to open the manhole and put in ingredients manually. The automatic program will pop up a screen to ask the operator for an acknowledgement that manual intake is finished. The popup screen will also display the text entered under "operator prompt" After acknowledgement, all started commands will be reactivated. If the program is in "Pause" mode, first press "Pause" before acknowledging.

Setup:

Time

Since the control system logs alarms with the time of occurence, it is important that the system time is correct. To change the system time, type in the new time and press "Set time". This should be done at least once per month since the internal system clock is not very accurate.

Pressure Control

These are the PID parameters for the control of the pressure system. These are set at the values shown below at commissioning and they should not be changed afterwards.

R/M/%

On this screen various system parameters can be set. The number of revolutions per minute per percent for the mixer and the stirrer is set upon delivery of the system and should not be changed. The settings affect the display of RPM for the on the manual screen.

Batch

This is the current batch running number, which will be increased every time a batch is finished. If the next batch should have another number than this, press the number and change it.

Password

The system password which grants access to the recipe and the system screen. It can be set to a number between 0 and 99999999. Setting the password to 0 (Zero) disables password protection.

Setup 2:

The PID parameters are set during commissioning of the system and should not be changed unless instructed so by technical staff from the supplier of the system. They are all used by the vacuum control system.

CyT

Cycle time of PID controller

Kp

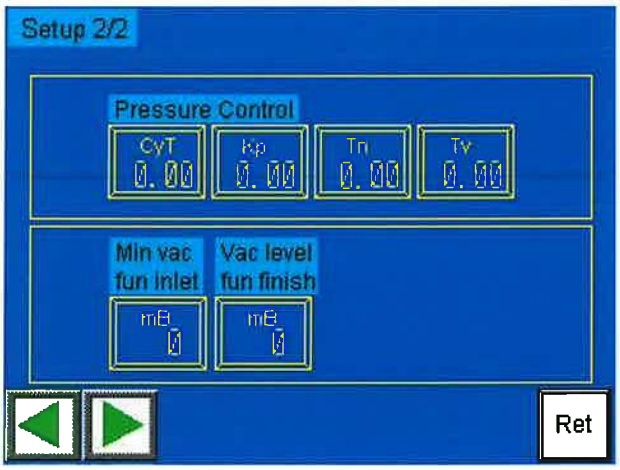
Gain part of the PID controller

Tn

Integral part of the PID controller

Tv

Derivative part of the PID controller



Min vac fun inlet

This is the minimum vacuum level at which the funnels will open when running a recipe. If the operator wishes to open a funnel during a batch, the achieved vacuum by an issued vacuum command, must be lower than this parameter. The settings at time of installation were: CyT=0.1, Kp=3.0, Tn=2.85 and Tv=1.5.

Vac level fun finished

When a funnel command is active (ie. the funnel is open), and the vacuum level rises above this level, the funnel command finishes and the funnel valve closes.

Tetra Pak

OPERATIONS AND MAINTENANCE MANUAL

CHAPTER 3: SAFETY PRECAUTIONS

3. Safety Precautions *3-3*

3.1 Notification **3-3**

3.2 General safety precautions **3-3**

3.2.1 Spots of danger 3-5

3.2.2 General safety measures 3-9

3.3 Caution concerning use of the facility **3-9**

3.4 Safety precaution concerning the operator **3-10**

3.4.1 Cleaning 3-10

3.5 Safety precaution concerning maintenance **3-10**

3.5.1 Maintenance 3-10

3. SAFETY PRECAUTIONS

3.1 NOTIFICATION

The responsible owner/user of this mixer unit must choose one person as accountable, that any person who is occupied around the mixer unit has the necessary qualification.

The responsible owner/user of the facility must ensure that this manual is properly updated during any modifications of the mixer unit.

This manual must be found in the immediate vicinity of the mixer unit. If this is not possible, it must clearly be indicated on the mixer unit where this manual is stored.

Below table can be filled to ensure responsible persons are appointed.

	Name	*Date*	*Name*	*Date*
Owner				
Selected responsible				
Selected responsible				

3.2 GENERAL SAFETY PRECAUTIONS

The mixer unit should not be operated before it is installed and all safety devices are connected, and the complete machinery is declared to be in conformity with applicable standards.

It is not permitted to modify the construction, operation, capacity, electric installation, etc. on the mixer unit.

Only trained personnel are allowed to operate the equipment.

If the safety precautions are not followed, risk of personal injury may be present.

It is not allowed to interrupt the safety switch.

Be careful not to drop any hard objects of metal, plastic etc. into the equipment.

Do not place any objects underneath the machine since the V-belt drive is located here and could be damaged. When lifting, be careful to lift under both rims of the motor foundation and not between.

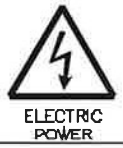
Always regard all electrical equipment as live and regard all pipes and vessels as hot.

Do not enter the Mixer before the tank is ventilated, there might be some gas left in the tank.

It is recommendable that there are made a measuring of the gas in the mixer before entering the tank.

It is recommendable that there are made some kind of surveillance to detect if there is running gas out in the operator room. The gas can be dangerous and can cost live.

3.2.1 SPOTS OF DANGER

Heading	*Symbol*	*Description*
Vacuum system		Do not get near any inlets/outlets when operating the mixer with vacuum. Take care not to interfere with vacuum when sucking in powder or regulating the vacuum level. Please see layout and flow sheet in chapter 9 for location of vacuum inlets/outlets
Steam system		Do not touch the steam equipment during operation. It may cause severe burns. Do not ever disassemble the steam equipment, unless the main steam supply valve is turned off and the entire system is depressurised and cool. With the steam system in operation, hot steam may be released throughout the air regulation valve, the safety valve
C.I.P. system		Risk of exposure is present if the piping system fails during the C.I.P sequence. If this happens please follow safety precautions concerning the operator described in section 3.4
Mixing vessel		The mixing vessel must be considered hot when operating with steam. Some vessels are equipped with a steam jacket and in these cases, the vessel must be considered hot especially in the top and in the bottom. Risk of burns must be considered
Turbo unit with adjustable stator		If the turbo unit is equipped with an adjustable stator, a risk of fingers getting caught must be considered. Therefore do not get near the turbo unit during operation
High voltage components		Always consider high voltage components as live and dangerous. Do not perform any modifications during operation
V-belt		The V-belt drive is located underneath the machine and protected with some shielding. There is no safety device attached to the shielding and therefore it is possible to operate the machine without shielding. However, it is recommended not to operate the machine without the shielding properly installed. Do not place any objects underneath the machine since the V-belt drive is located here, even though it is properly shielded

The facility is not equipped with warning signs. All personnel must observe the warnings indicated in Figure 3.1 – 3.4. Above table gives explanation for all sports of danger on the equipment. Please notice, that your mixer may not have all sports of danger. This depends on the mixer is equipped.

Other

- Agitator - Beware of agitator if man way or lid is opened.
- Automatic man way - Beware of the man way lid when opening and closing the man way. Also take care when opening the funnel, if any.

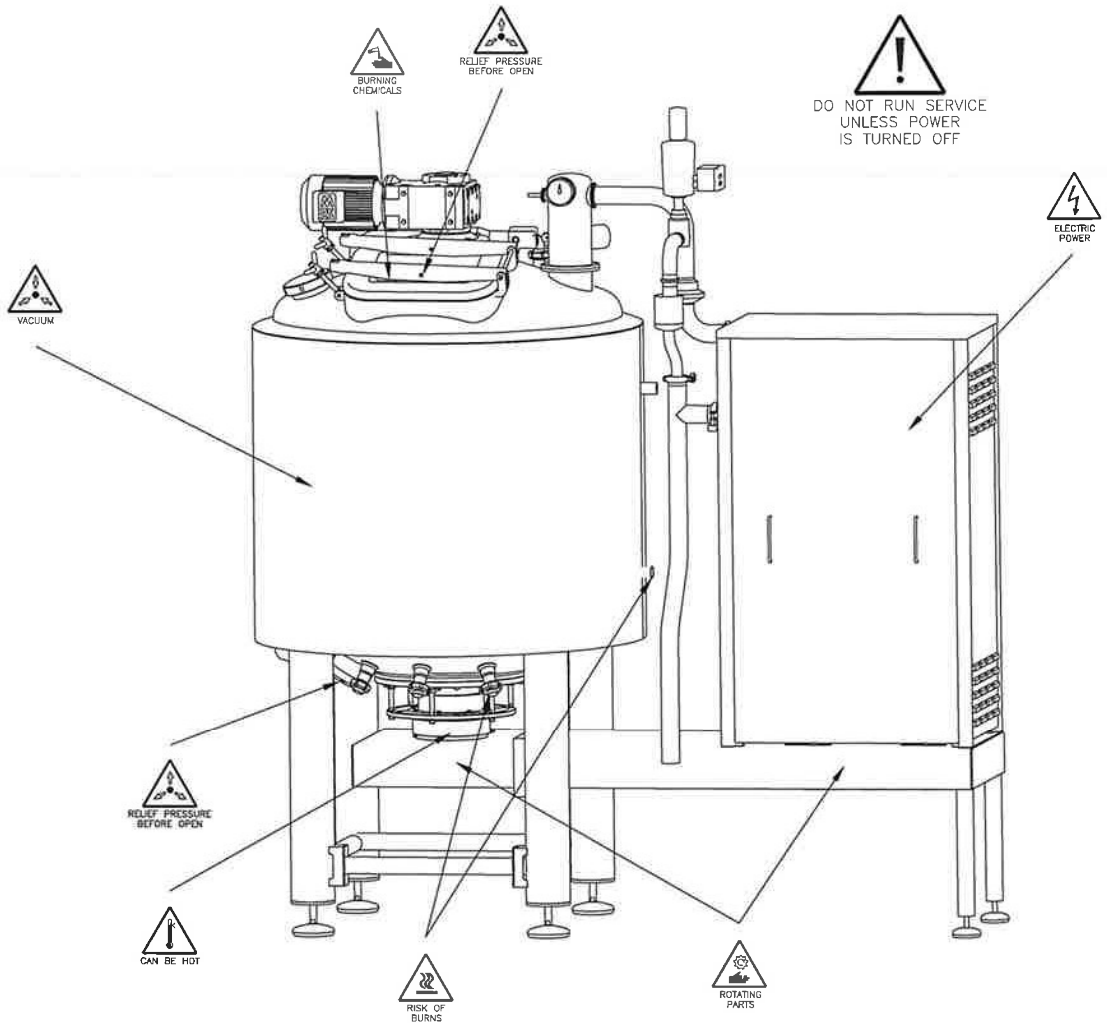


Figure 3.1: Safety precautions

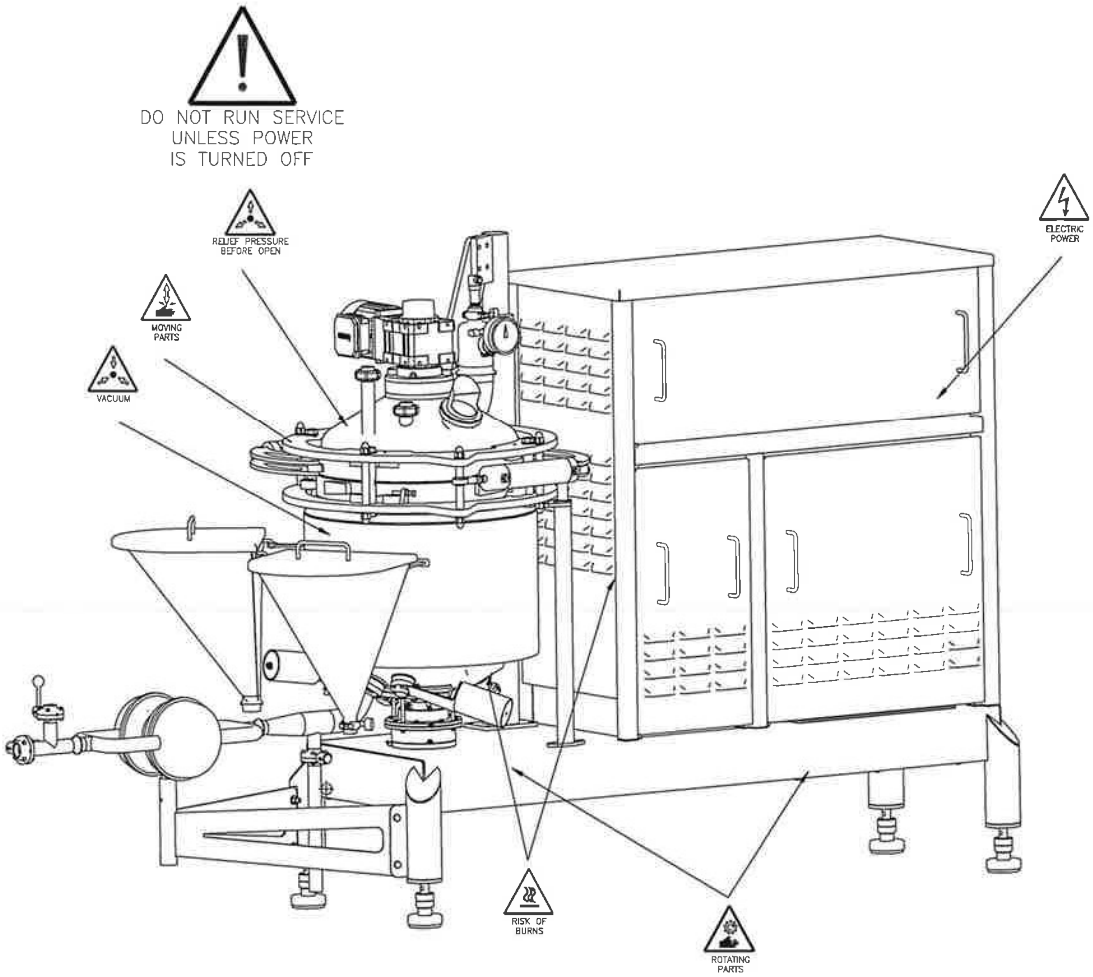


Figure 3.2: Safety precautions

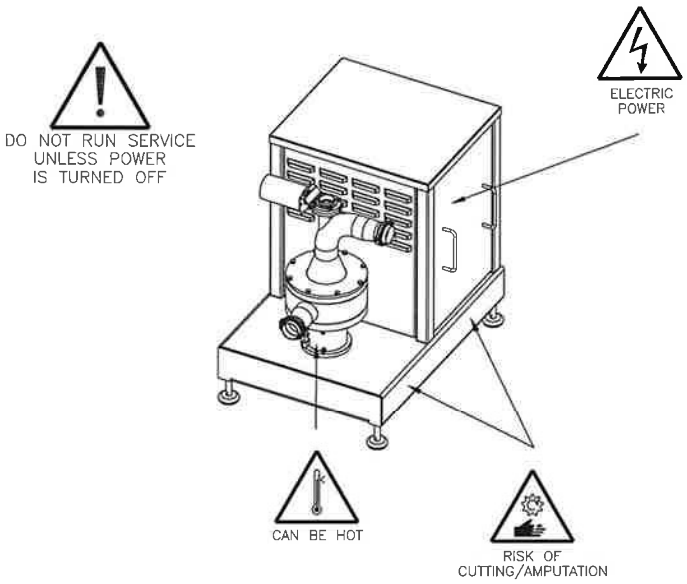


Figure 3.3: Safety precautions

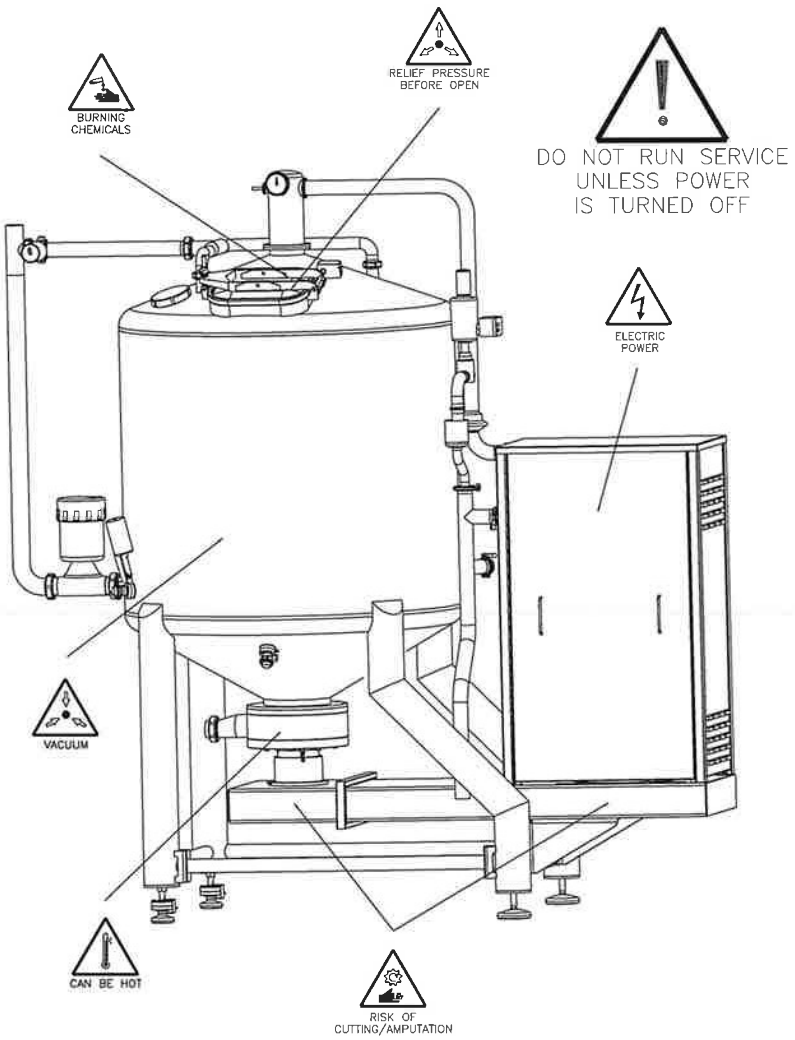


Figure 3.4: Safety precautions

3.2.2 GENERAL SAFETY MEASURES

Other rules and regulations established by national- or by other authorities or by the company itself must be followed.

Safety measures stated elsewhere in this manual or stated by other local regulating authority, that the use of personal protective devices (i.e. hearing protection, helmet, shoes, protective gloves, etc.) must be followed.

3.3 CAUTION CONCERNING USE OF THE FACILITY

The mixer is intended for use, according to the specifications stated in this manual and related document.

Use of the equipment for inflammable or dangerous products is not allowed.

TP Scanima will not be held responsible for injury or damage if the equipment is manipulated or used for any other purpose than the function designed for.

3.4 SAFETY PRECAUTION CONCERNING THE OPERATOR

This manual must be read before any use of the facility.

All operators and other personnel operating this facility must go through this manual before any operation with the facility begins. The word "operator" is defined as all personnel working around the facility, ordinary operators as well as any other employee working the vicinity, i.e. loading materials, cleaning, maintenance etc. Only personnel operating the facility are allowed entrance near the facility.

If access for unauthorized personnel is necessary (i.e. during repairs, visits or demonstrations), must this take place according to predetermined security measures. The responsible personnel of the facility's operation must be informed of the presence of any unauthorised persons.

No person under the age of 16 is allowed entrance near the facility.

3.4.1 CLEANING

The cleaning solution normally contains caustic soda (NaOH) or nitric acid (HNO3). This chemical may cause severe 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, PE plastic or rubber.
- Apron

If exposed - wash with water as soon as possible with as much water as possible. Seek medical assistance.

3.5 SAFETY PRECAUTION CONCERNING MAINTENANCE

Cleaning of the mixer after stoppage caused by error or malfunction (i.e. blockage etc.), the mixer must be disconnected.

Then the following measures must be taken:

- That any start-up of the facility is not possible before all repairs are complete, and all personnel are placed at a safe distance.
- That no accumulation of pressure, heat or other materials with the ability of injury to personnel will take place, even with the machine turned off.
- Cleaning or removing of objects during operation is not allowed

3.5.1 MAINTENANCE

All service and maintenance must be carried out according to specifications stated in chapter 8. TP Scanima will not be held responsible if the operator does not follow these standards or for the use of non-original spare parts.

Before service or maintenance of the equipment is carried out, inform relevant personnel and put warning signs on prominent places. Switch the main power off and lock it with a padlock.

Depressurize and allow the equipment to cool and make sure that it is completely empty before maintenance.

Only use original spare parts.

Date 2014-11-18

Declaration of Compliance

"We confirm that process unit Tetra Almix B200-100V, with serial number SIP0000012, supplied by Tetra Pak, was at the time of delivery in compliance with relevant legislative demands;

- *Regulation (EC) No. 1935/2004 on materials and articles intended to come into contact with food* including underlying directives for specific materials and
- *Regulation (EU) No. 10/2011 and its amendments on plastic materials and articles intended to come into contact with food* where applicable.

  We also confirm compliance to
- *Regulation No. (EU) 2023/2006 on Good Manufacturing Practice on materials and articles intended to come into contact with food.*

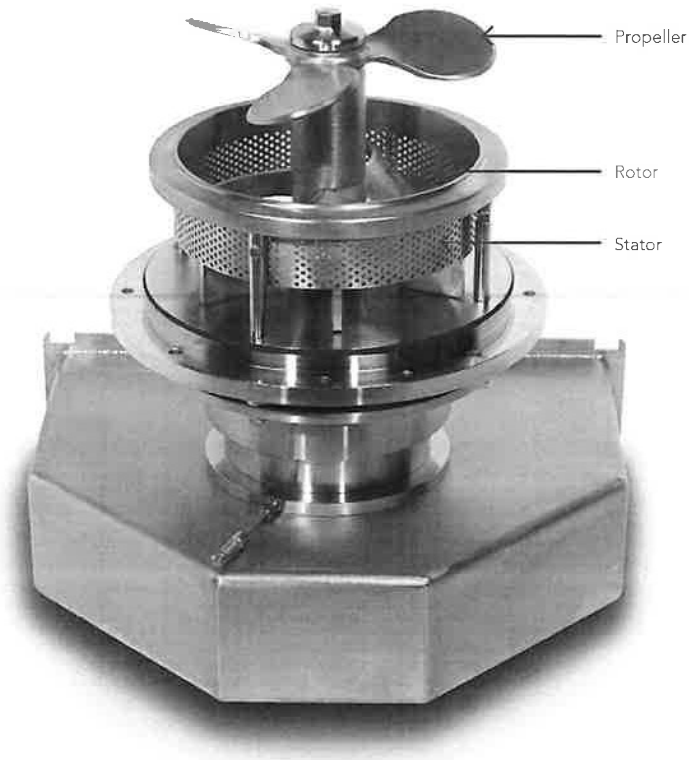
We also confirm that for the purpose of this equipment, all spare parts and spare part kits of components intended for food contact currently delivered by Tetra Pak are in compliance with *Regulation (EC) No. 1935/2004* including underlying directives for specific materials and *Regulation (EU) No. 10/2011* where applicable".

Yours faithfully,

Stefan Åkesson
Manager, Food Safety & Equipment Safety

Tetra Almix

Turbo Mixer/Dynamic Stator suitable for Tetra Almix Batch Mixers



The stator in lowered position.
High shear mixing.

The stator in upper position.
Low shear mixing.

Tetra Almix Turbo Mixer

The Turbo mixing systems can process up to 25.000 litres per batch – or typically 10.000 to 70.000 litres per hour when used In Line for continuous mixing.

As a result, liquid/liquid, liquid/powder or liquid/solid ingredients can be mixed, dispersed, homogenised and emulsified within minutes or seconds, depending on the formulation.

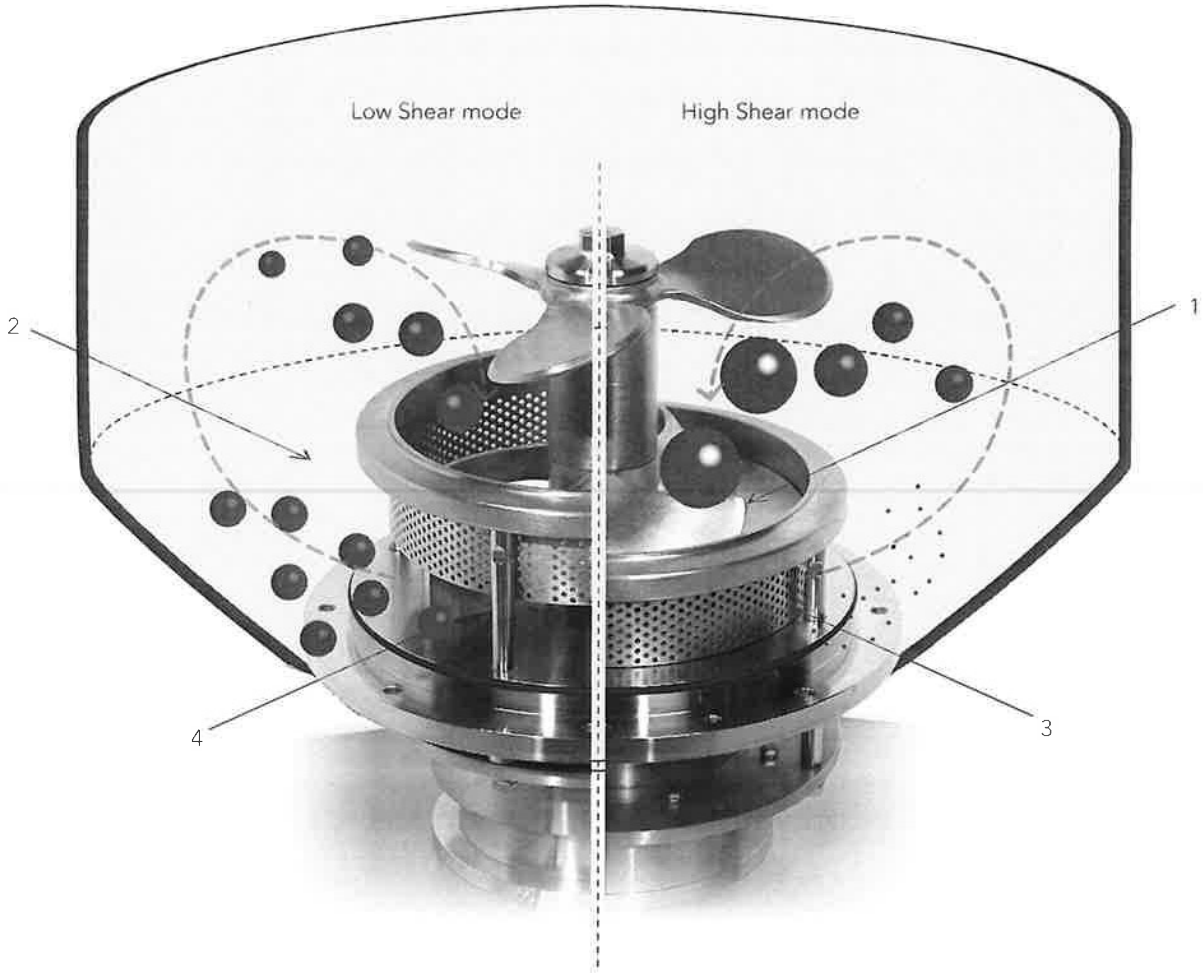
Application

The Tetra Pak Scanima Turbo Mixer is applicable within the categories: Prepared food, beverage, ice cream, dairy and cheese.

The revolutionary Dynamic stator system now allows the same machine to be used for high/low shear mixing and blending by raising/lowering the stator. Powders and liquids can be mixed in seconds using high shear; the mixture can then be powerfully circulated using no shear. This innovation further enhances the superior all-in-one-process system.

Dynamic stator

The unique dynamic stator system in the Turbo Unit can be pneumatically lowered to allow high shear mixing. When raised, the stator enables blending without shear for the addition of larger particles. Also, easy foaming powders can be added even under vacuum with minimum raising of foam.The functions of the all-in-one process can be operated manually or managed by computerised control systems with multi-recipe functionality and reporting. All Tetra Pak Scanima mixing systems are designed and built to the highest sanitary standards.



Working principle

1) The product is drawn into the turbo wheel by powerful centrifugal forces.

2) The speed across the tank wall generated by the turbo wheel gives optimum heat transfer when using the jacket or heating, especially when the stator is lifted due to higher flow.

3) High shear mode: The stator is lowered and all product flow is forced through the stator holes to break down particles and provide a homogenous mix/product. The shear level is determined by the hole size in the stator. The speed of the turbo wheel is regulated by an inverter drive.

4) Low shear/blending mode: The stator is raised and the product flow is fast but gentle. This mode allows the addition of particulates/solids to be blended into the product homogenously (with little or no damage) or chopped using one of our special knife attachments.

Tetra Pak Scanima A/S
Gugvej 152B, DK-9210 Aalborg SØ Telephone: +45 96 33 10 00 Fax: +45 96 33 10 11 www.tetrapakscanima.com V.A.T. no 31877288

Tetra Pak

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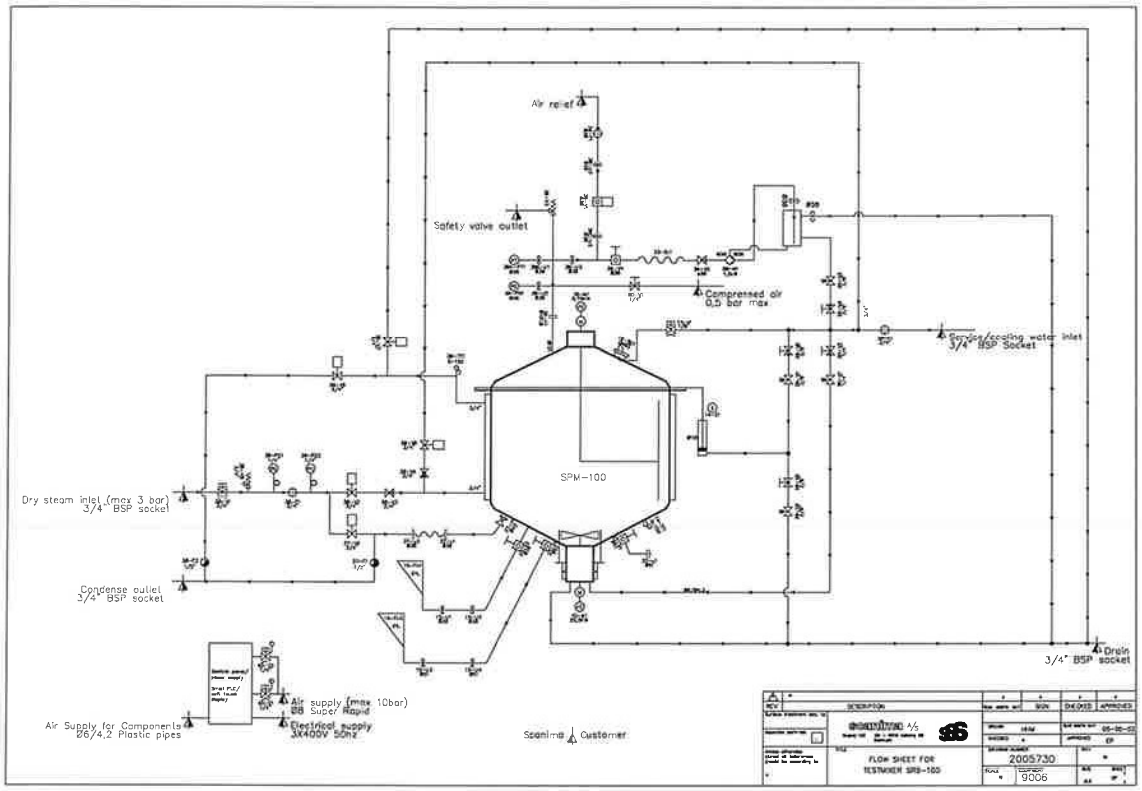
Flow sheet



Layout