Reformer R1000H

USER MANUAL

Original instruction [English]

23.09.2024
Version 11

CONTENTS


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INTRODUCTION

This manual should be kept with the machine and be readily accessible to machine users. This manual contains information on the safety and operation. The graphics used in this manual may show machine details that may be different than the actual machine. Components of the machine may have been removed for illustrative purposes or the continuing improvement of the machine's design may cause changes that are not included in this publication.
The owner of this machine is responsible for verifying the operator of this machine is properly trained and understands the contents of this manual.

About the R1000H Reformer
Cold Jets's R1000H pellet-to-slice reformer is a fully automatic machine, with the flexibility to reform dry ice pellets or nuggets into robust dry ice slices in customer specific dimensions, with up to 1000 slice press cycles per hour. Designed to diversify dry ice production capabilities, the R1000H allows to produce from 0,25 kg slice up to 3,0 kg mini block maintaining the highest capacity of the machine.
Using the recipe program, slice thickness can be changed during production. Slice format is changed in less than 15 minutes by using the Quick-Change Press Head. During production slice thickness is constantly monitored and optimized. The R1000H is powered by a Beckhoff industrial PC with 15" touch panel for intelligent control. Using servo technology ensures fast and precise motion control. When connected to the internet, R1000H enables Cold Jet CONNECT™ for remote support and maintenance of uptime and performance.


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The operator manual covers the Reformer R1000H. The main parts are described in the machine structure section. Operating/User instruction for add-ons can be found in other materials not included in this manual.

Functional Description
The main function of the Reformer R1000H is to reform dry ice pellets or nuggets into robust dry ice slices in customer specific dimensions.
This is performed by a sequence of operations executed by the Beckhoff Panel PC. The Main steps in a normal application are as follows and refer to the P&I diagram 2A0610, which is available through the documentation packet or Cold Jet CONNECT.

1. **Start up**
2. **Production**
3. **Tool change**
4. **Standby**
5. **Shutdown**

The Reformer does not produce the pellets needed to make slices. The pellets are feed to the machine at the top. This is normally done by a conveyer either from a raised level or a z-conveyor. The pellets are then stored in a tank. When the level of dry ice pellets reaches a certain level, the reformer will start reforming the pellets into slices.

The shuttle is run back, allowing the camper to be filled with right number of pellets. The shuttle will then be extruded to the position where the pellets in the shuttle are just above the tool. The tool will then press the pellets into the die. the tool hydraulic piston will raise, and the shuttle will be send back. The shuttle will now be filled again with pellets for the next slice.

While the shuttle is being filled with pellets the produced slice will be raised from the die by a hydraulic piston below the die. when the shuttle is sent back it will push the produced slices out of the machine to the outfeed conveyor. The outfeed conveyor ensures the slices are transported to there they will be used.

Color detection of the lighthouse

Green:	Machine is ready and there are no alarms (error messages).
Yellow:	Machine has been paused.
Red:	Machine out of operation due to an alarm (error message).

SYSTEM IDENTIFICATION

The machine is double marked with EU and UL approval.

Data will vary depending on the specific setup of reformer.

Supplier Responsible for the Equipment

Cold Jet ApS
Industrivej 68
DK-6740 Bramming
Denmark
Phone: +45 75 56 15 00
Homepage: www.coldjet.com
Email: info@coldjet.com

TECHNICAL DATA

Rated Output:
125 x 125 x 22,2 mm (5" x 5" x 0,875")
Up to 2000 slices / hour
kg/h: 1140 kg / hour
lb./h: 2511 lb. / hour

125 x 125 x 50,8 mm (5" x 5" x 2")
up to 1000 slices / hour
kg/h: 1303 kg / hour (Thickness: 50,8 mm)
lb./h: 2870 lb. / hour (Thickness: 2")

Height mm (in)	**Single slice Weight, kg (lb.)**			**Dual slice Weight, kg (lb.)**		**Triple slice Weight, kg (lb.)**
	250 x 125 mm 10" x 5"	210 x 125 mm 8" x 5"	150 x 150 mm 6" x 6"	125 x 125 mm 5" x 5"	125 x 105 mm 5" x 4"	138 x 60 mm 5.4" x 2.4"
18 mm (0.7")	0.9 kg (2.0 lb.)	0.8 kg (1.7 lb.)	0.7 kg (1.4 lb.)	0.5 kg (1.0 lb.)	0.4 kg (0.8 lb.)	0.2 kg (0.5 lb.)
25 mm (1")	1.2 kg (2.6 lb.)	1.0 kg (2.2 lb.)	0.9 kg (1.9 lb.)	0.6 kg (1.3 lb.)	0.5 kg (1.1 lb.)	0.3 kg (0.7 lb.)
50 mm (2")	2.4 kg (5.3 lb.)	2.0 kg (4.4 lb.)	1.7 kg (3.8 lb.)	1.2 kg (2.6 lb.)	1.0 kg (2.2 lb.)	0.6 kg (1.4 lb.)
60 mm (2.4")	2.9 kg (6.3 lb.)	2.4 kg (5.3 lb.)	2.1 kg (4.6 lb.)	X	X	X
70 mm (2.8")	3.4 kg (7.4 lb.)	2.8 kg (6.2 lb.)	2.4 kg (5.3 lb.)	X	X	X
80 mm (3.1")	X	X	2.8 kg (6.1 lb.)	X	X	X
90 mm (3.5")	X	X	3.1 kg (6.9 lb.)	X	X	X

CE: Power Supply
Main control:
3 x 400 V AC + PE, 50Hz
Imax: 63 A
System earthing: TN-S
Heater control:
3 x 400 V AC + N + PE, 50Hz
Imax: 63 A
System earthing: TN-S

UL: Power Supply
Main control:
3 x 480 V AC + N + PE, 60Hz
Imax: 63 A
25kA rms symmetrical, 480V max.
Heater control:
3 x 480 V AC + N + PE, 60Hz
Imax: 63 A
25kA rms symmetrical,

Rated power:
17,3kW / 22,8 Hp @3 x 400V AC
20,0kW / 26,8 Hp @3 x 480V AC

Machine Dimensions (mm/inch):
Length: 1956 mm / 77 in
Width: 1500 mm / 59 in
Height: 2032 mm / 80 in
Weight: 2545 kg / 5610 lb.

Noise level:
Below 75 dB(A)


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SAFETY REGULATIONS

General Measures
The Cold Jet R1000H manual contains instructions on starting up, operating, and servicing the machine. The operator must follow the instructions in the manual. Moreover, it is important that the owner makes sure that the operator understands the contents of this manual and follows its guidelines and safety regulations.

Personnel Qualifications
Employees, who oversee mounting, operation, service, and maintenance must be adequately qualified to take care of such job functions.

If the employees do not possess sufficient knowledge, they must be instructed and trained properly. If necessary, this can be arranged in cooperation with the manufacturer of the machine.
The owner of the machine shall make sure that the operator, who is to work with the Cold Jet R1000H, fully understands the importance of studying the content of the manual and complying with the SAFETY REGULATIONS described on the following pages as well as those placed on the machine.

Contraindications
Cold Jet Machines are designed to operate for long periods of time. The machine is designed with an HMI that enables the operator to act upon errors that might occur during operation. The machine should only be operated with the doors closed.
Entering the machine, for service purposes etc. should be done in a way that allows the Contained CO2 to reach a safe level and the temperature to fall for certain areas.
Machines with moving parts inside can cause injury, therefore they are designed with door switches that disable the machines from running when opened/activated.

Security and Risk
The Cold Jet R1000H is designed to comply with the EC Declaration of Conformity for Machinery. Therefore, using the machine does not pose a risk to the operator when the instructions in this manual are followed carefully.
It is important that the operator carefully follows the safety signs on the machine and the safety regulations described later in this manual and that the operator reads and understands the content of this manual before starting up the machine. Installation must be carried out according to the instruction" Unpacking and preparations before installation".

The machine may only be installed by authorized personnel, that is electricians with knowledge of the Council Directives BT 2014/35/EU and EMC 2014/30/EU (or similar directives in other parts of the world).

Safety Labels

The symbols used on the machine were developed by the International Organization for Standardization (ISO) and are defined below. These symbols may include yellow warnings triangles, blue mandatory action circles, or red prohibited action circles.

Danger of Suffocation

Dry ice pellets are CO2 in solid form. At ordinary atmospheric pressure, CO2 can only exist in this solid form at temperatures of -79°C (-110°F) or lower. Therefore, during dry ice production, the CO2 will immediately be heated and thus transform from solid form into gas form.

Please note:

Since the specific gravity of CO2 is higher than that of ordinary atmospheric air, the air with its contents of oxygen will be replaced by CO2 if the dry ice production is taking place in small or insufficiently ventilated rooms.

Therefore, please note the following:

1. Low CO2 concentrations (3-5%) cause headaches and fast breathing.
2. CO2 concentrations of (7-10%) cause headaches and nausea and may result in unconsciousness.
3. Higher CO2 concentrations result in unconsciousness and at worst it may cause suffocation.

High CO2 concentrations may result in unconsciousness due to displacement of oxygen. Therefore, always make sure to provide sufficient ventilation of the working area, and always avoid producing dry ice in small rooms.

Static Electricity

Dry ice can cause electrostatic discharges. However, the equipment bonded to ground to minimize electrostatic discharge, and the warning sign is only meant to instruct the operator to avoid placing the equipment in rooms containing explosive gasses.

Also, it is recommended to use a plastic shovel in the dry ice container.

Danger of Congelation

CO2 in solid form has a temperature of -79°C /-110°F or lower at atmospheric pressure and can therefore cause serious congelation injuries.

IMPORTANT!

The dry ice is extremely cold; therefore, do not touch parts of the machine which are in direct contact with the dry ice without wearing appropriate protective clothing and gloves.

Pinch Point Hazard

If the covers on the Cold Jet R1000H is removed, the operator will be exposed to pinch point hazard.

Danger of burns

If the covers on the Cold Jet R1000H is removed, the operator will be exposed to very hot components.

It is recommended to monitor temperatures on the HMI and not remove covers before temperatures are at below +35°C / 95°F.

Wear Protective Gloves

During work with the conveyor system, the operator must wear protective gloves in order to avoid contact with the dry ice or with parts of the machine which are in direct contact with the dry ice.

How to Lift / Transport

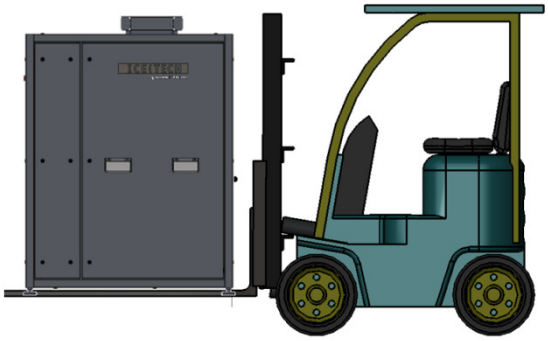
1. The R1000H is supplied with thread holes for lifting eyes. Always use lifting eyes to lift the R1000H.
2. Always lift the reformer according to the lifting Instruction in this manual.
3. Lifting over persons and animals is prohibited.
4. Always use a forklift truck to transport the reformer.
5. Pick up the reformer from the side as shown in the drawings.
6. Transport the reformer upright.
7. Make sure that the forks are sufficiently long to fully engage the reformer.
8. Always check that the forks are adjusted to maximum width.

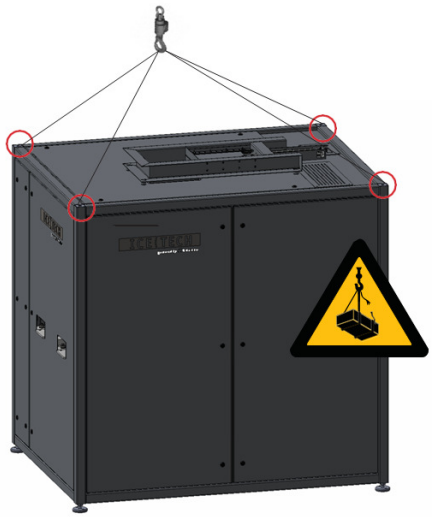
Always transport the machine in the upright position using a forklift. Pick up the machine from the side with the forks fully engaged and adjusted to the maximum width.

Forklift Requirements	**R1000H**
Load Capacity	3000 kg (6613 lb.)
Fork Length (Minimum)	1.7 m (67 in)

Always use lifting eyes to lift the machine. The weights and dimensions of the machine are described in the following table:

Weights and Dimensions	**R1000H**
Shipping Weight Transport	2400 kg (5292 lb.)
Shipping Crate Dimensions (LxWxH)	2105 x 1616 x 2348 mm (82.9 x 63.6 x 92.4 in)
Machine Weight (Incudes Hydraulic oil)	2545 kg (5610 lb.)
Machine Dimensions (LXWXH)	1956 x 1500 x 2032 mm (77 x 59 x 80 in)





SAFETY OPERATION

Emergency Stop
All equipment is connected to the general emergency system for the R1000H.
When an emergency-stop device is activated, all components located in the emergency zone will be disconnected from their power source.

Machine safety
There are machine safety measures in the following areas:

- Hydraulic press
- Shuttle
- Eject

The R1000H has safety door switches that will deactivate the machine if opened.

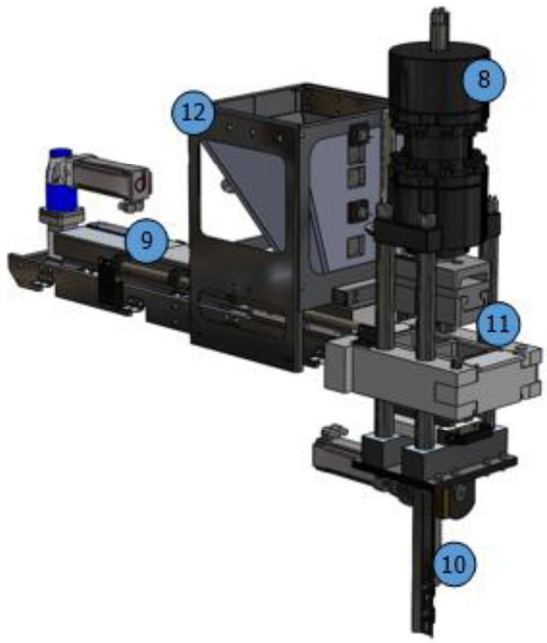
Required performance level PLr = c Implemented in category = Cat3.

There is danger of congelation / frost bites by touching machine parts cooled down by dry ice.
To prevent congelation, the entire machine enclosure is provided with locks and requires special tools to open.

MACHINE STRUCTURE

R1000H

1 Outlet
2 Process unit
3 Hydraulic unit
4 Touch panel
5 Control box
6 Shutter
7 Diverter



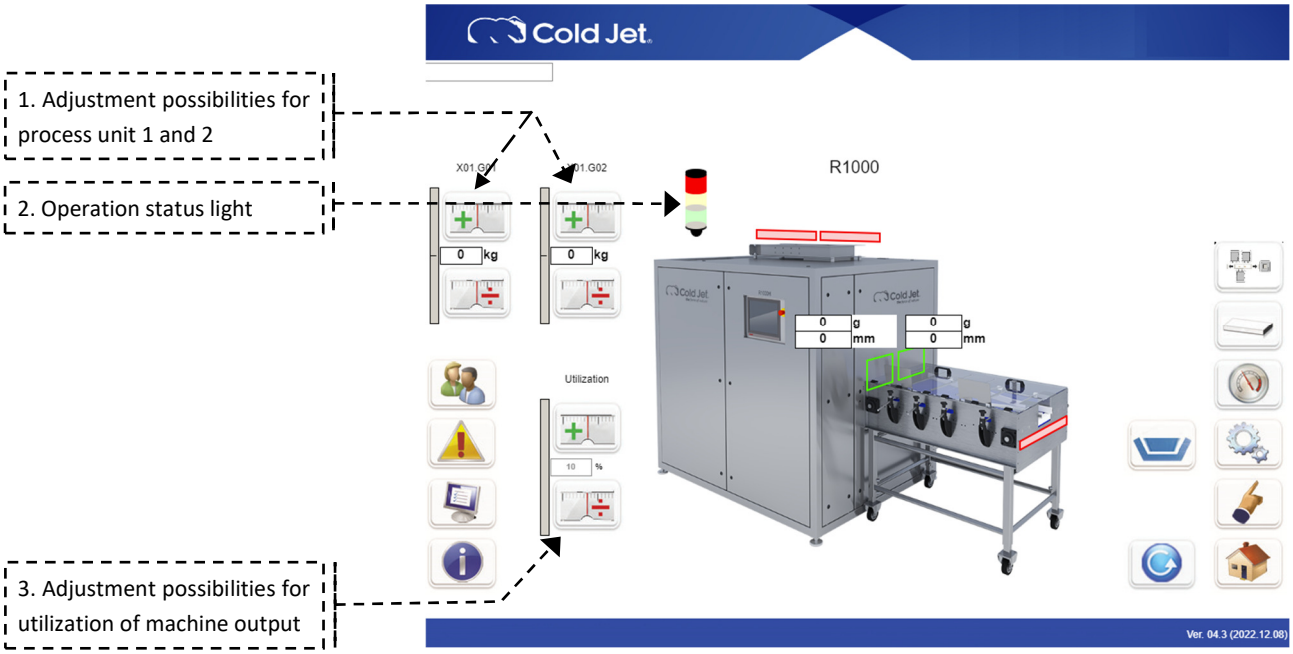
8 Hydraulic press
9 Shuttle
10 Eject
11 Press Tool
12 Hopper

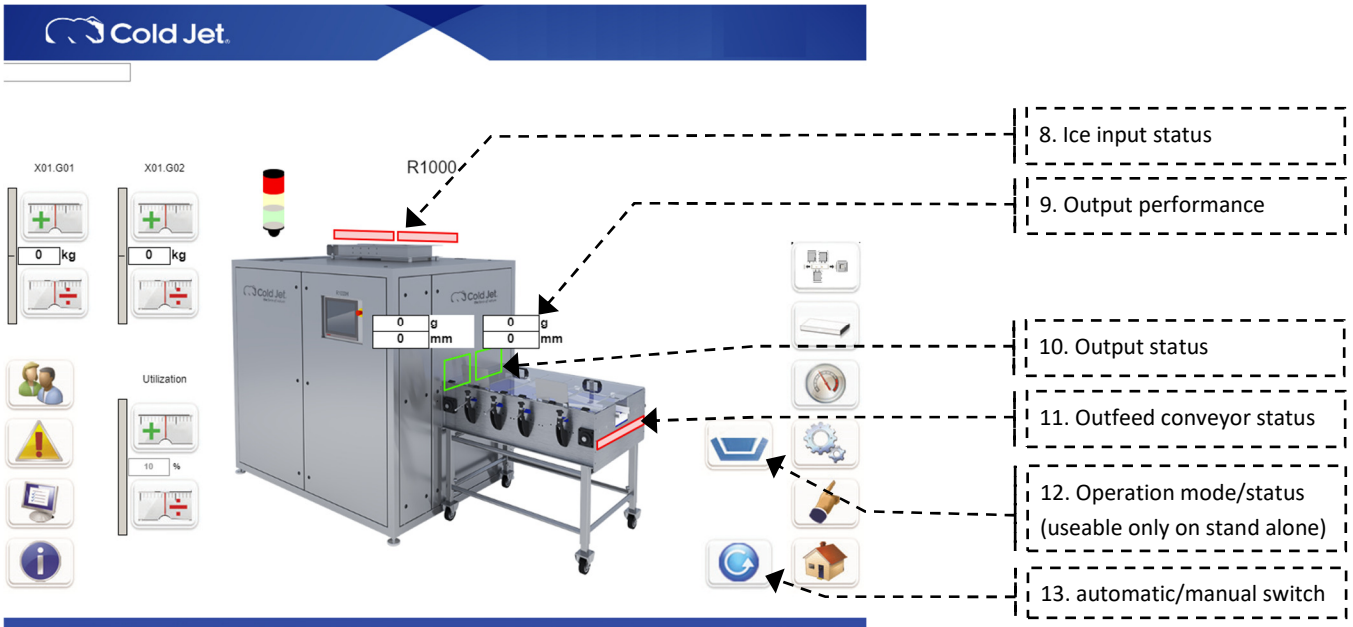
MACHINE CONTROL

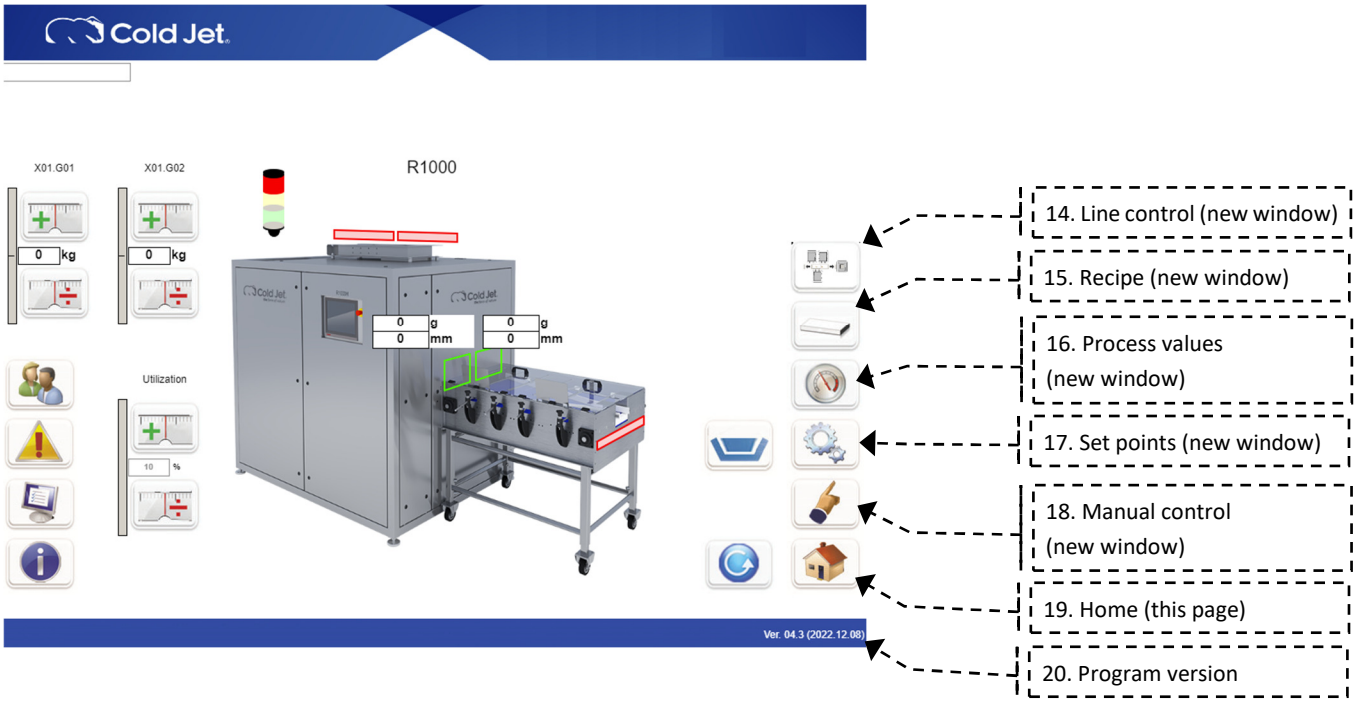
The R1000H is controlled through the HMI screen.

Home screen

The home screen of the reformer holds status indicators, adjustment parameters / bottoms, and bottoms to other windows. The bottoms to other windows appear on all windows and allow direct navigation without returning to home screen first. If the R1000H is a stand-alone machines, the machines start, pause and stop on the home screen or else the linecontrol will start, pause and stop the machines.




Cold Jet
X01.G01
X01.G02
R1000
Utilization
8. Ice input status
9. Output performance
10. Output status
11. Outfeed conveyor status
12. Operation mode/status
(useable only on stand alone)
13. automatic/manual switch
Ver. 04.3 (2022.12.08)


Cold Jet
X01.G01
X01.G02
R1000
Utilization
14. Line control (new window)
15. Recipe (new window)
16. Process values
(new window)
17. Set points (new window)
18. Manual control
(new window)
19. Home (this page)
20. Program version
Ver. 04.3 (2022.12.08)

Status indicators

Operation light (2) indicate the overall status of the reformer. If the light is green, it is running without issues. Yellows shows that it is not running and red shows that it is not running due to error. The error could be emergency stop.
Ice input status (8) shows if the reformer is ready to receive ice from the pelletizer. Green is ready red is not ready. If the reformer is supplied with ice so that only one of the sides of the reformer can be active, one will show red and one will show green.
Output performance (9) shows the average value of the slice created by the weight in gram and the height in mm.
Output status (10) shows if the reformer is ready to create slices.
Outfeed conveyor status (11) shows if the conveyor can receive new slices from the reformer. If this is red the reformer will not produce new slices.

Adjustment parameters / bottoms

1. Adjustment possibilities for process unit 1 and 2, this function enables the user to adjust the processing unit.

3. Adjustment possibilities for utilization of machine output, this function enables the user to adjust the general output in percentages. This value should be set so that it fits the amount of pellets coming in, and the amount of slices that can be handled by machines / operators after the reformer. The set value should not be frequently changed.

12. operation mode/status shows what the machine is doing right now. This bottom is only push able on standalone reformers. production  , cleanout  or heat modes 

13. automatic/manual switch, this bottom enables the user to change the reformer to manual mode where it can be operated manually. 

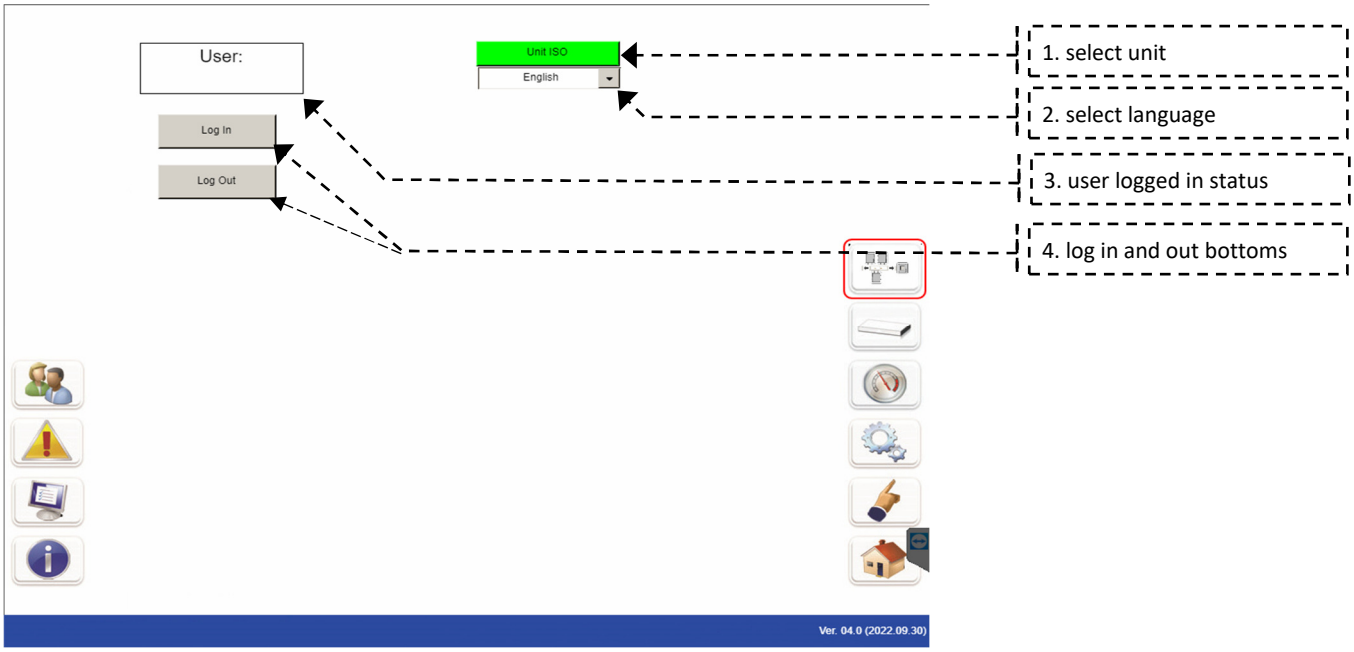
Bottoms to other windows

The bottoms that links to other windows will be listed. They will all be described in a dedicated section on the following pages.
One the different pages these icons will show. Most of these windows will have several tabs enabling more functions or displays.

- User setting (4), language and user login
- Alarm list (5), error messages from the machine
- Setup (6), setup of the machine
- Production Log (7), production operation log
- Line control (14), switch to the line control instead of the reformer – only available if a line controller is accessible from the reformer HMI.
- Recipe (15), select tool (recipe) that is active in the machine
- Process values (16), specific values from the machine
- Set points (17), detailed operation points
- Manual control (18), enable control of the manual
- Home (19), return to home screen described in this section

User setting

Window to change unit and user login.



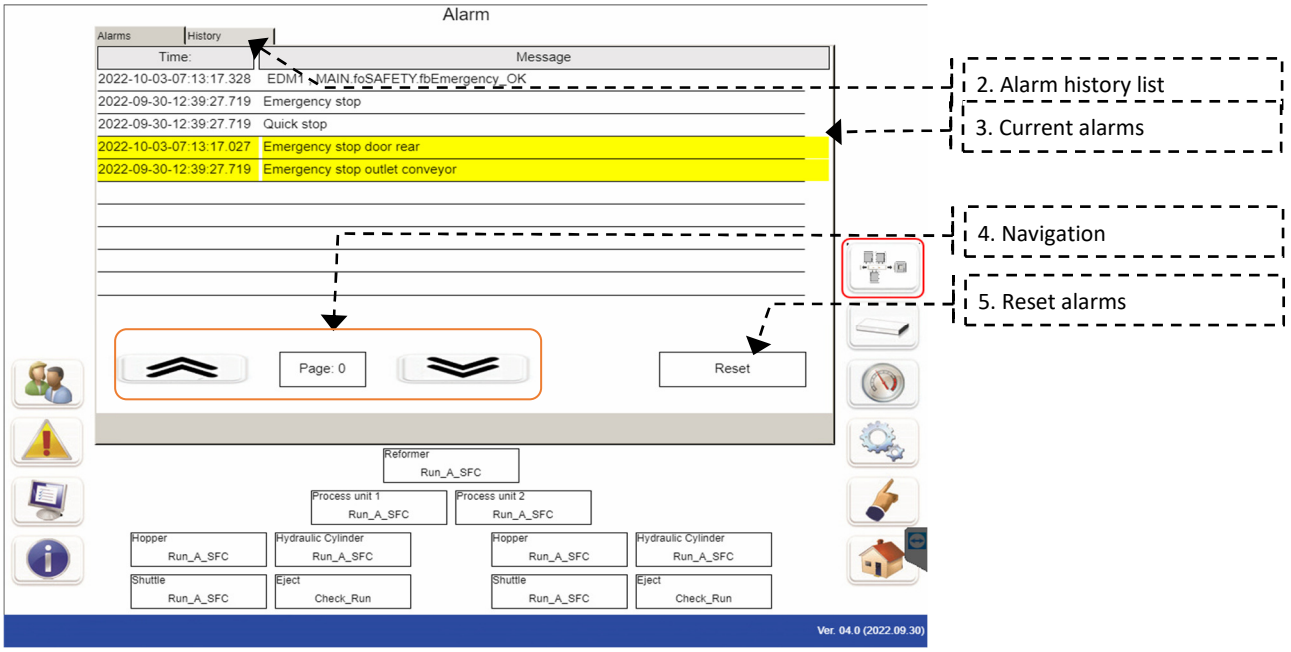
Units can be switched between ISO and ANSI, by select unit option (1). Select language (2) enables language change. The user logged in status is displayed in the user panel (3). To log in or out the two bottom below the display should be used (4).

Remember to log out if a user level that should not be available for others have been used.

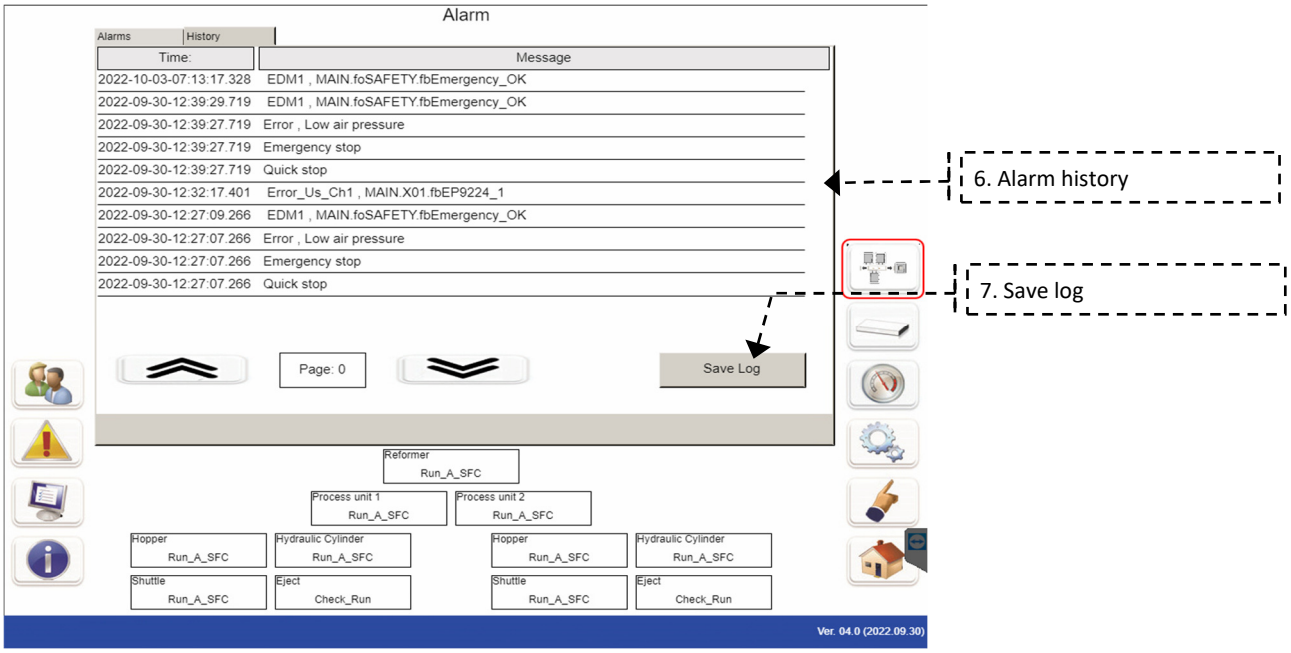
Alarm list

List of machine alarms.

Alarms:



History:



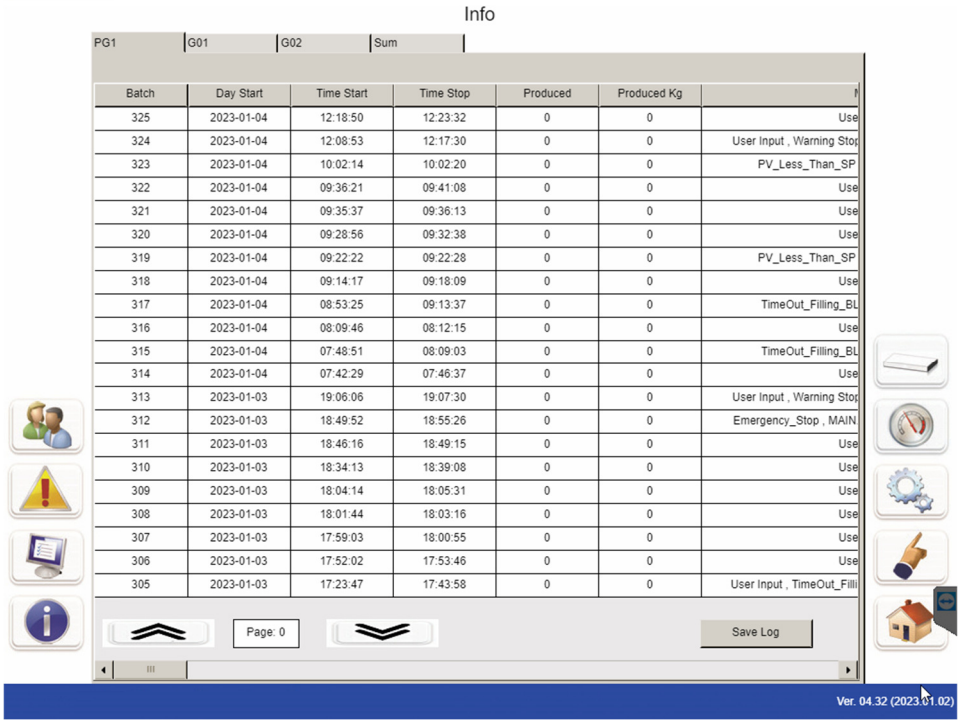
The Alarm list (1) shows all alarms that the reformer currently has (3). In the alarm list manual specific instructions on how to handle the different alarms can be found. The list can be navigated by use of the up and down arrow, if the page number indicates more pages (4). In order to reset alarms, the reset alarm bottom should be used (5).

The second tab is called history (2) and shows alarm history in a list form (6). Here a log of all the alarms can be saved (7).

Setup

The setup window is for service and Cold Jet operation only. Therefore, the images from the screen are not displayed in this manual.

Production log



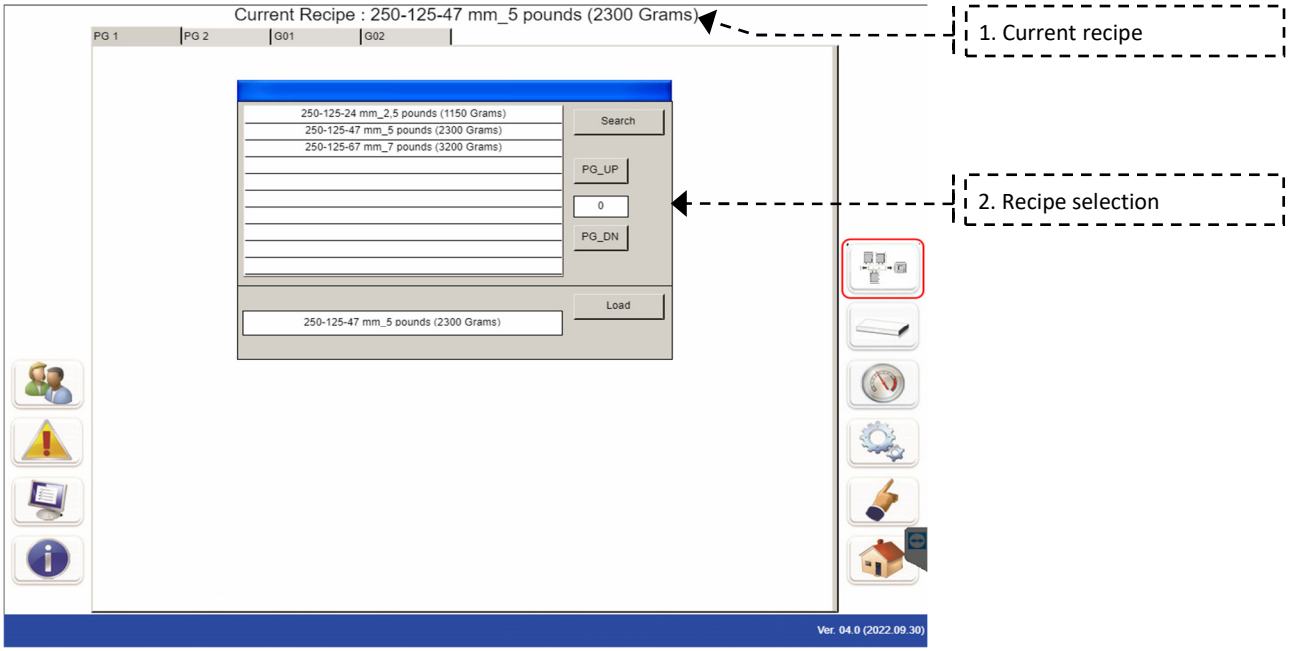
Line control

Line control is an option available if the reformer has the line control build in. Line control will not be covered by the reformer manual.

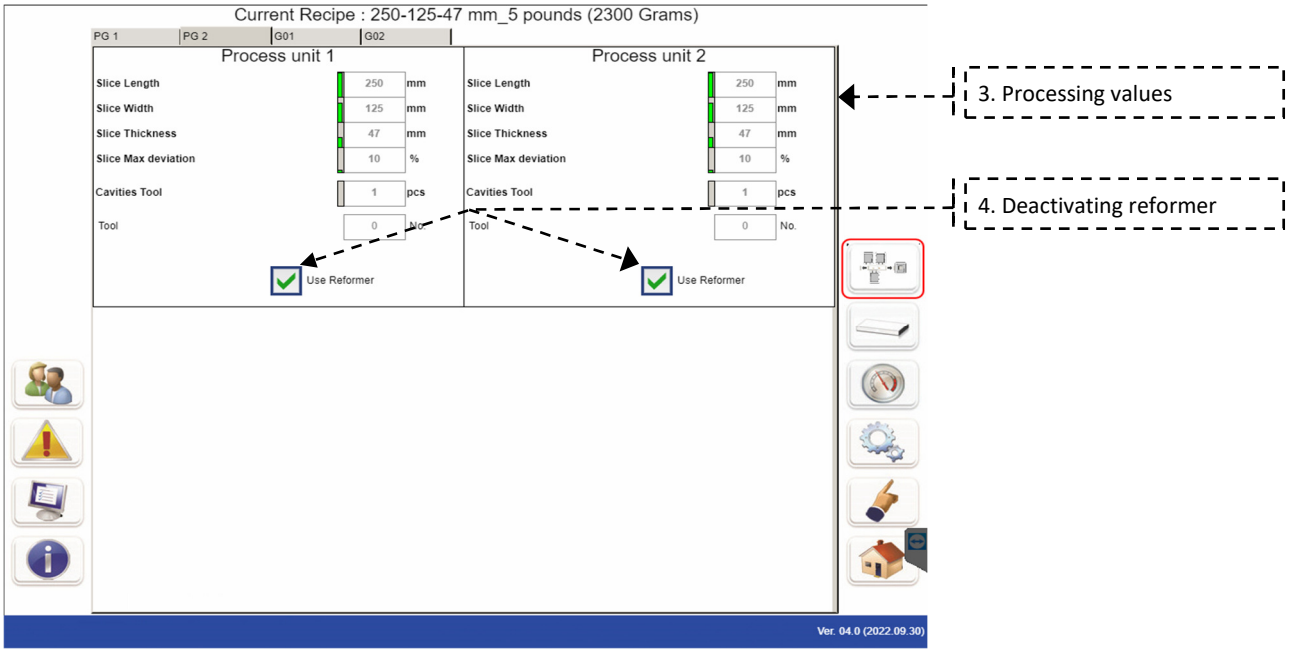
Recipe

This is where the recipe is selected when the recipe / tooling has been physically changed in the machine.

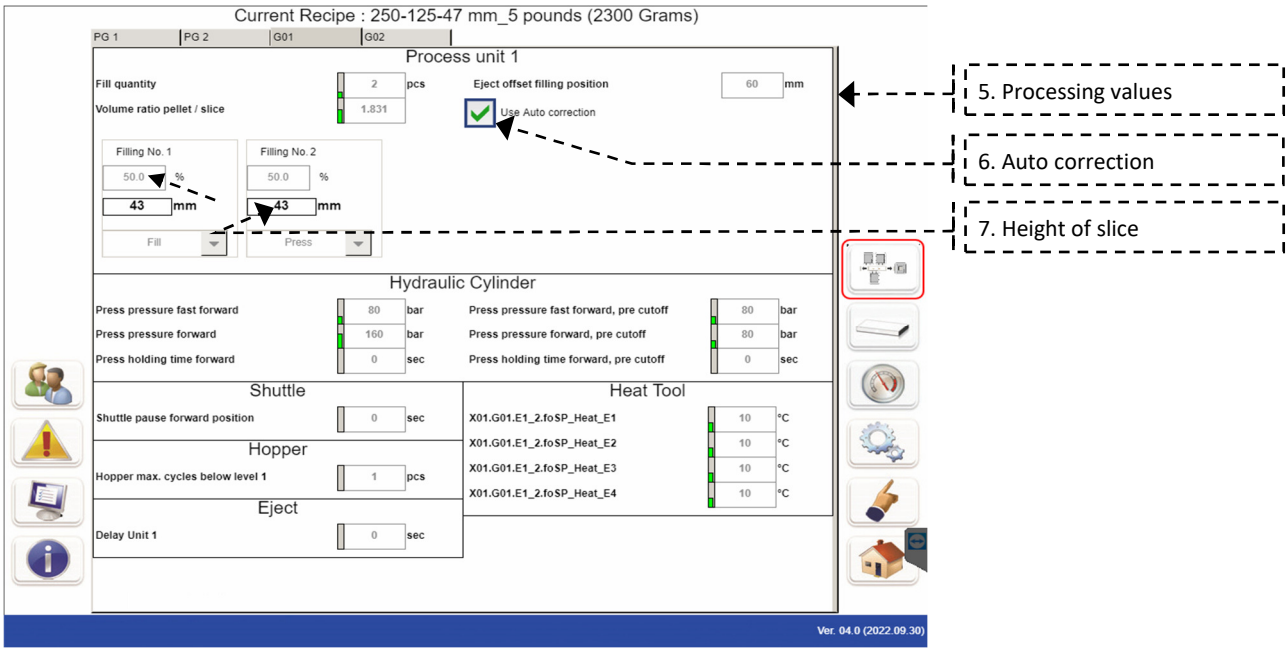
PG1:



PG2:



G01:



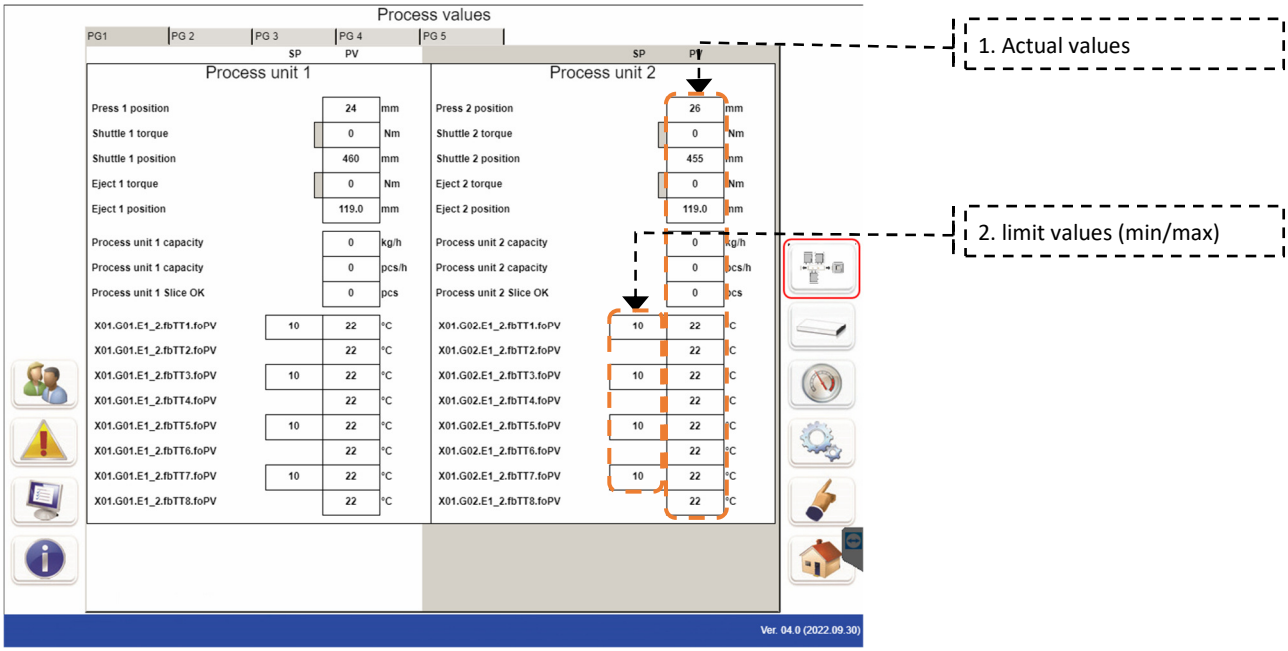
Recipe are the screen used primarily to change recipe when the tooling has been changed in the machine. The current recipe are shown as headline (1) and should at all time match the physical recipe in the machine. The recipe are changed on PG1 tab press search in the recipe selection box (2). Select the recipe. On PG2 tab the specific dimensions and deviations for the output for the current selected recipe can be seen (3). Each reformer can be deactivated (4).

G01 and G02 are HMI screens for the processing unit 1 and 2 and show the same processing data for each unit (5). Auto correction (6) allows the reformer over time to adjust so that the slices produced are according to inputs given. The height of the slices can be adjusted (7).

Process values

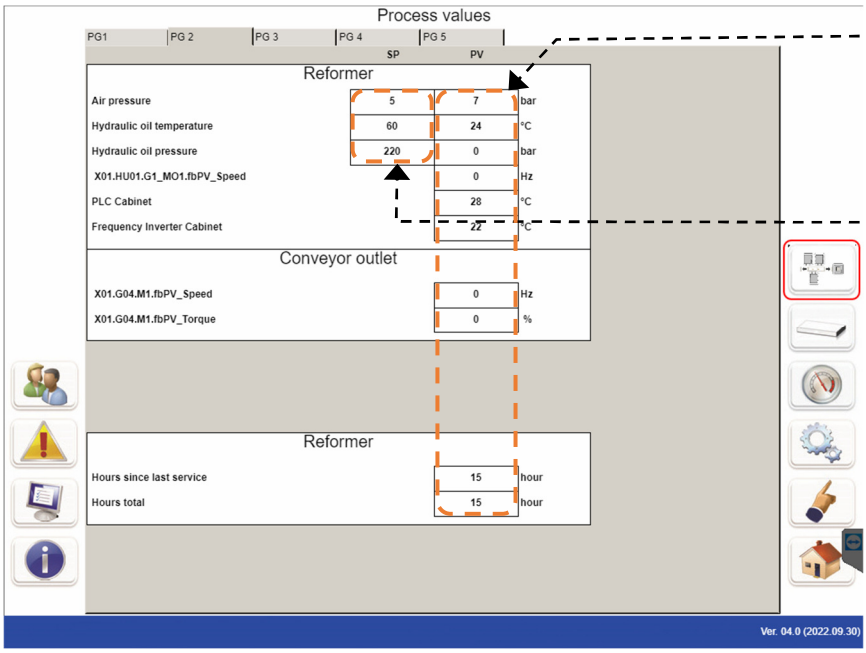
This window allows the operator to see how the machine is performing.

PG1:



The HMI display screen show the same parameters for both process unit 1 and 2.

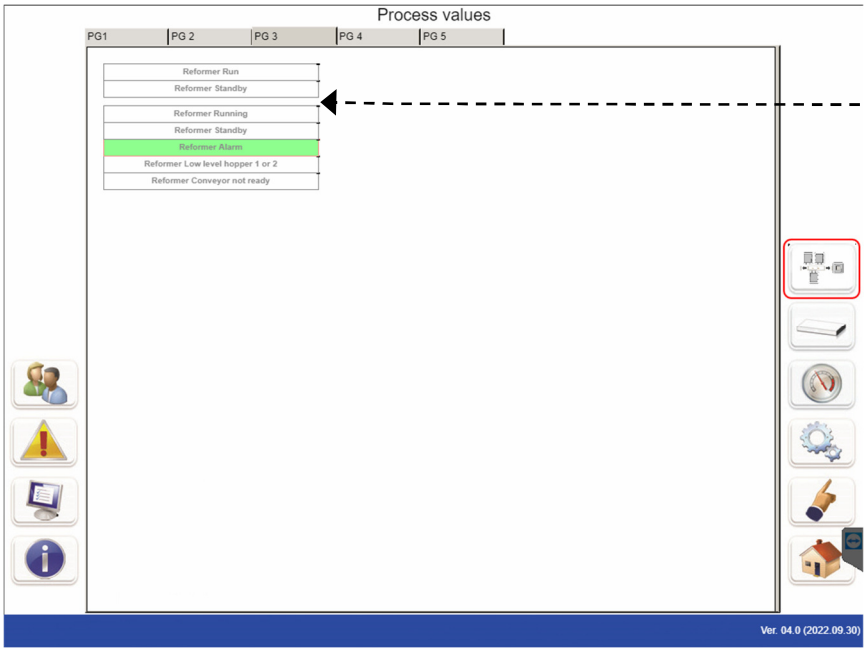
PG2:



3. Actual values

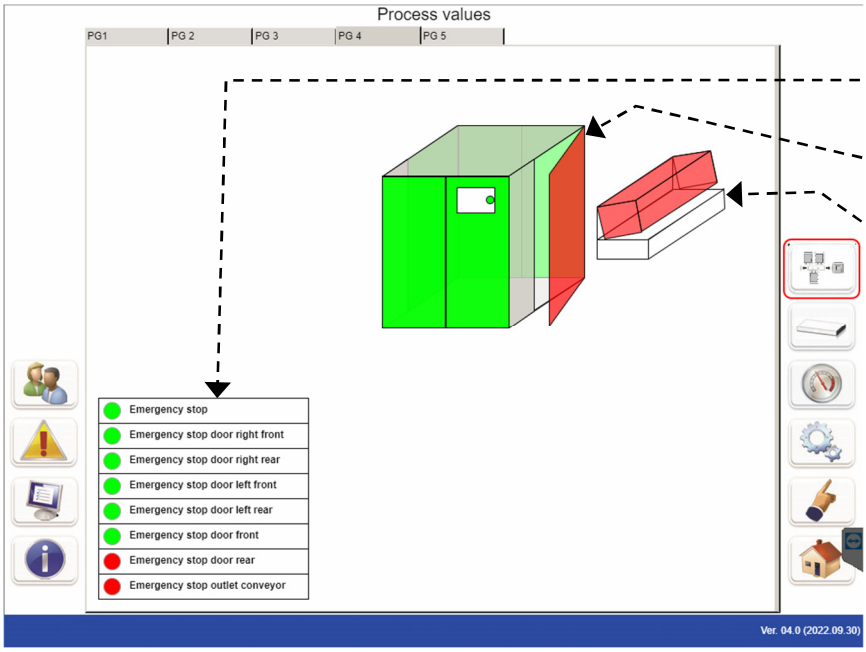
4. limit values (min/max)

PG3:

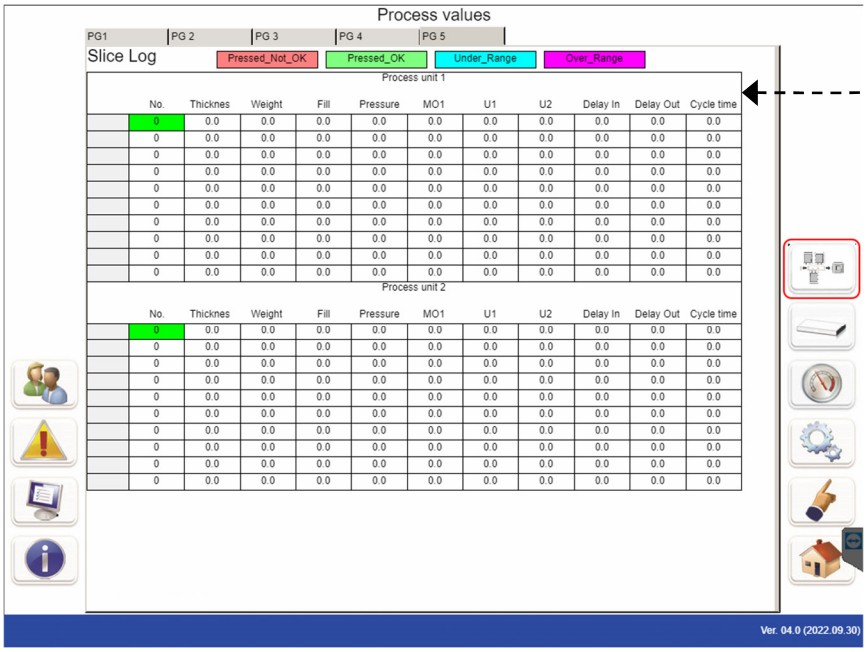


5. Summarized status

PG4:



PG5:

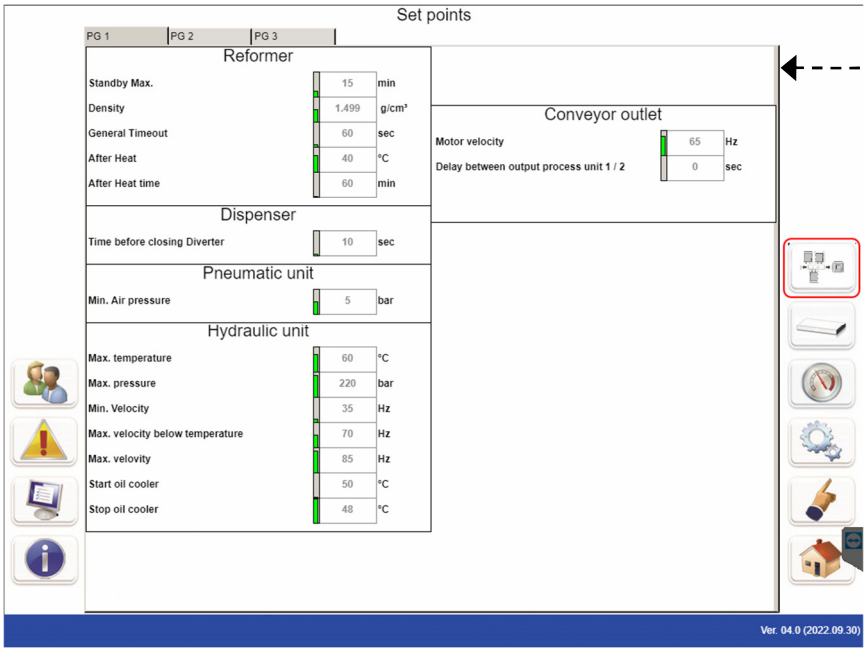


The tabs PG1 and PG2 shows actual data (1)(3) on how the reformer is performing, and for some of the parameters, it also shows limiting values (2)(4). PG 3 and PG 4 are alarm status overviews, with PG3 showing an overall list of alarms (5) and PG4 showing emergency stop both in a list (6) and in a graphical display (7)(8). PG5 shows a slice log (9) with the data from the slices produced.

Set points

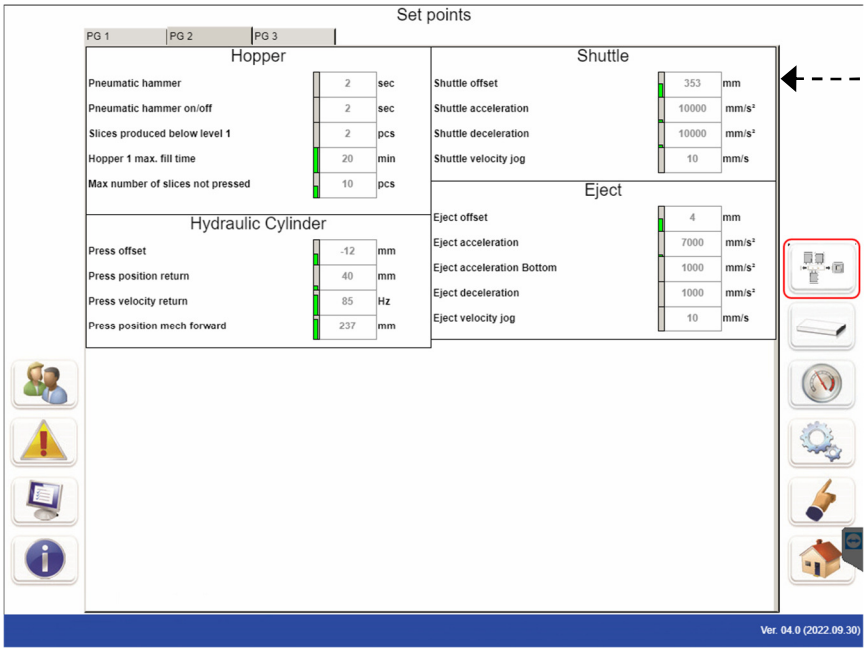
The window set points display the values set for the machine.

PG1:



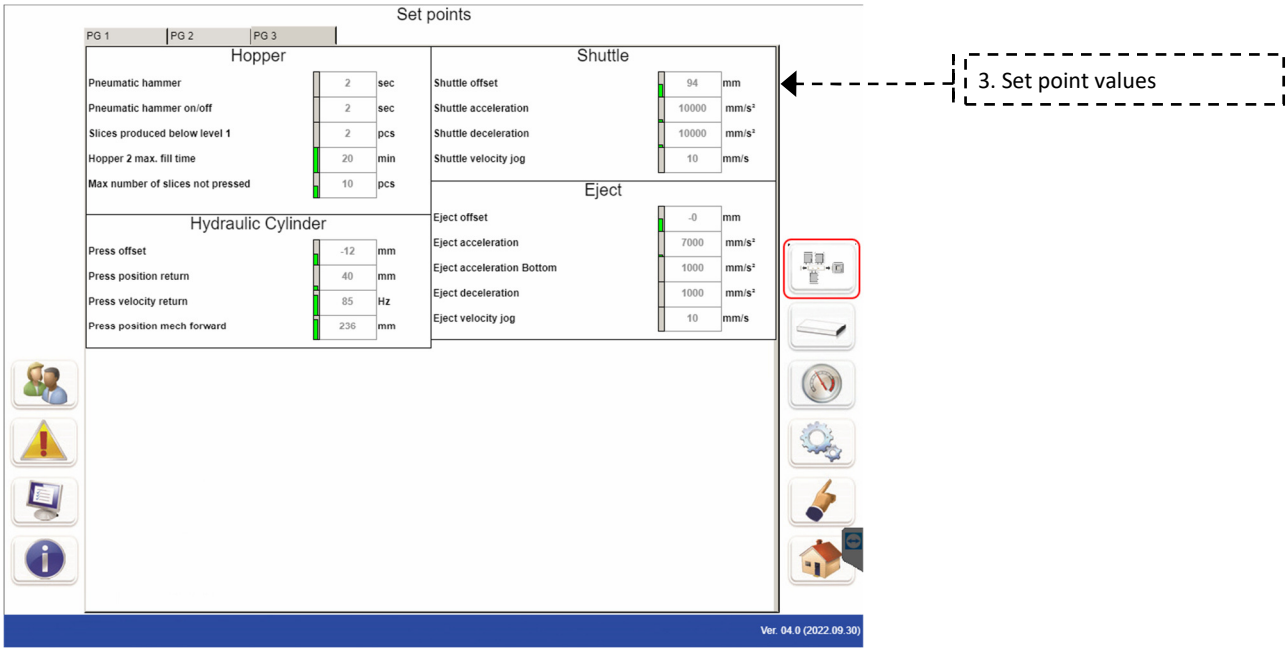
1. Set point values

PG2:



2. Set point values

PG3:

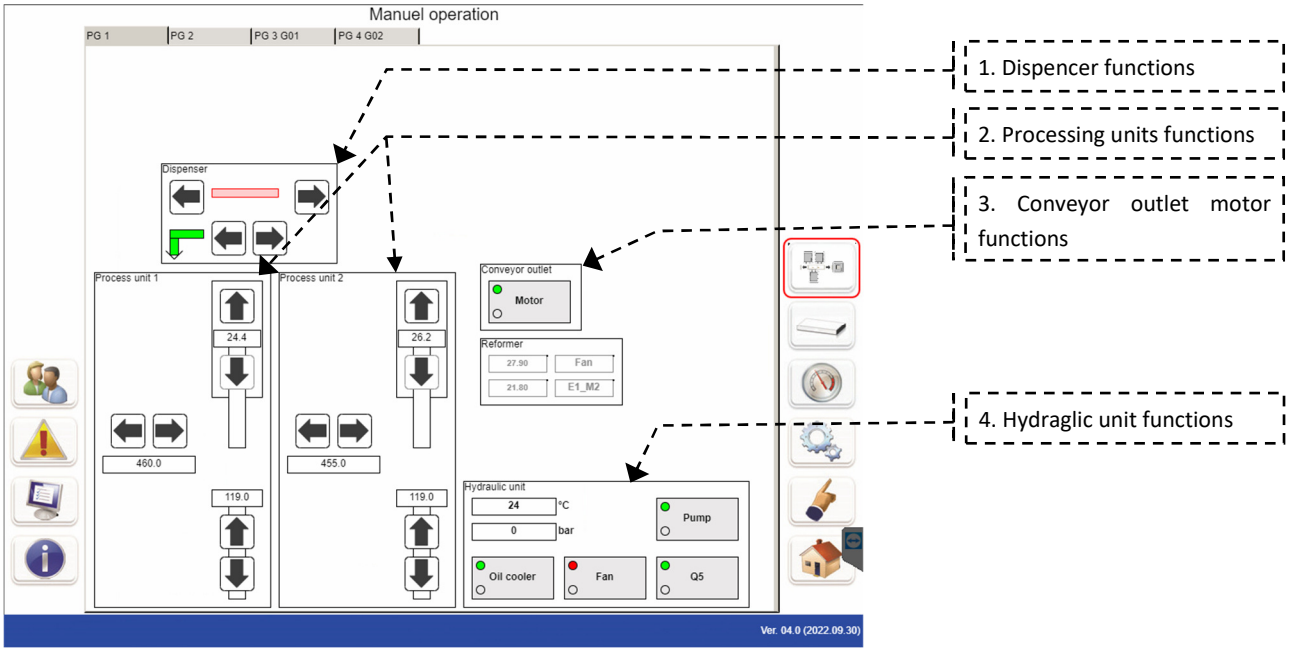


The tabs PG1, PG2, and PG3 displays values (1)(2)(3) for the machine. These are set values that the machine should operate accordingly to. The values can only be changed by Cold Jet service technician.

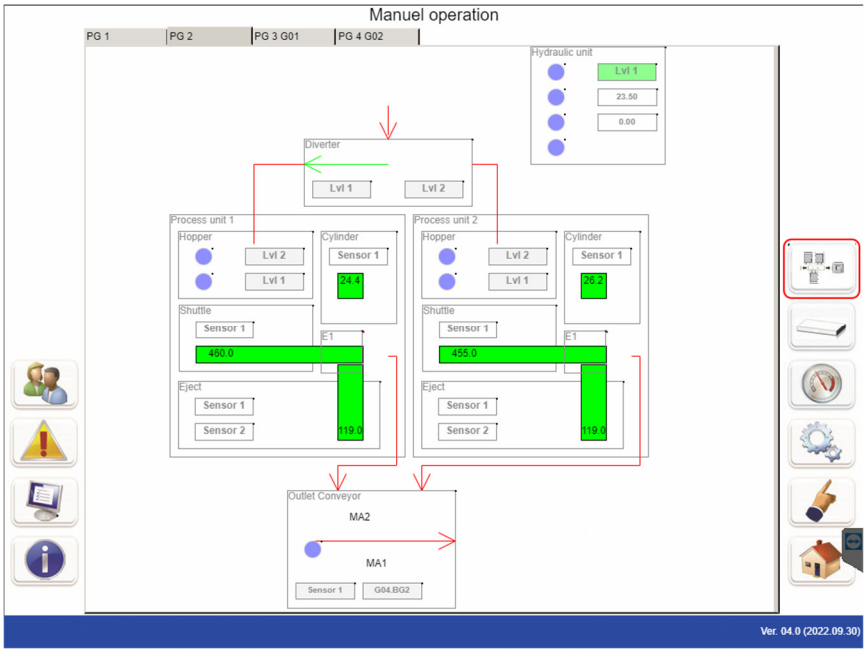
Manual control

Manual control allow to operate the machine manually. The functions requires operator login before enabling the functions. Operating the machine in manual mode can cause damage to the machine, and therefore this should never be done by untrained personnel.

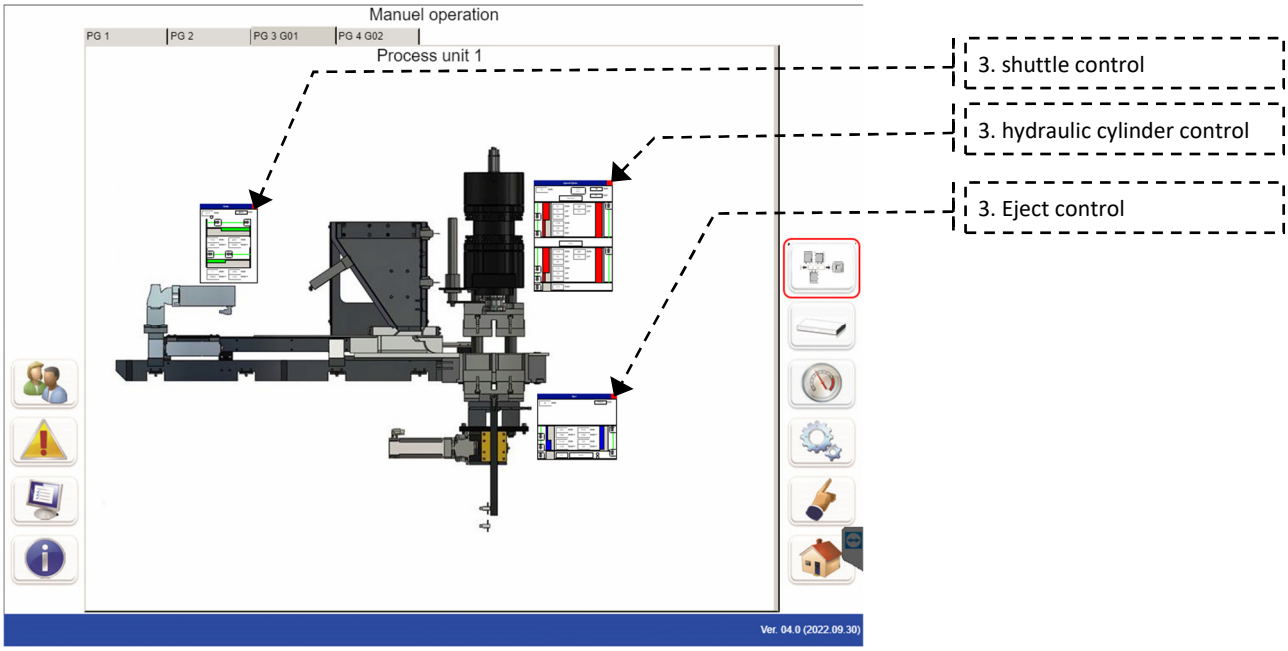
PG1:



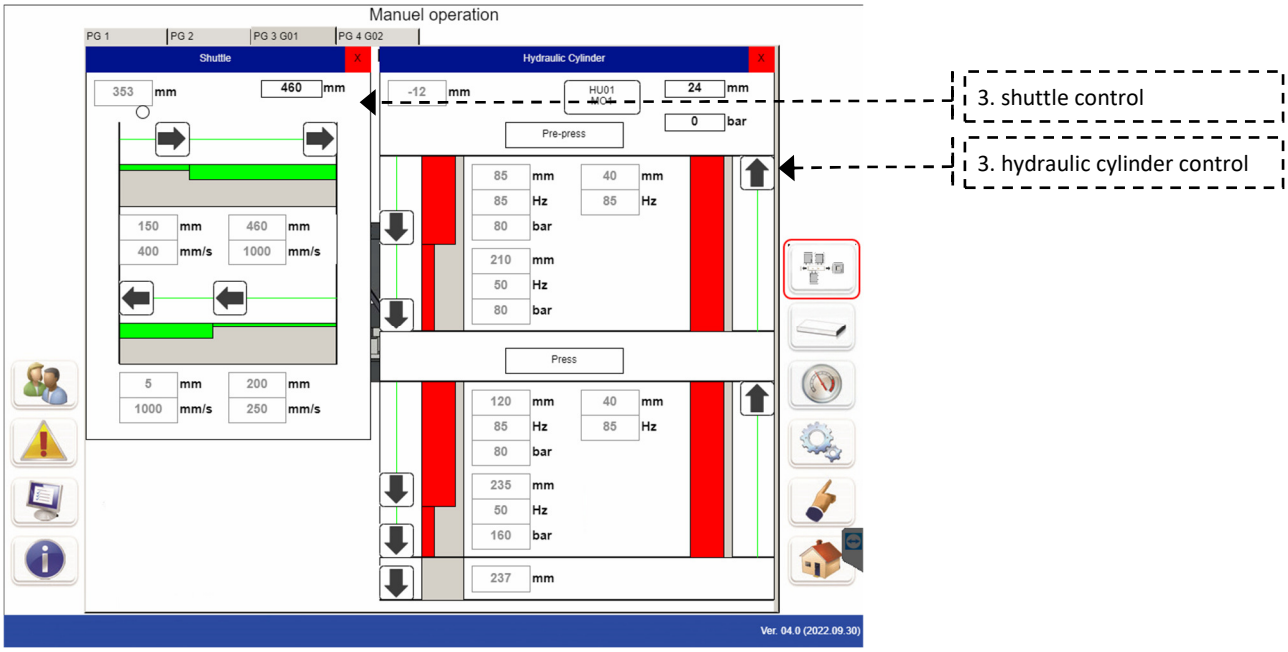
PG2:



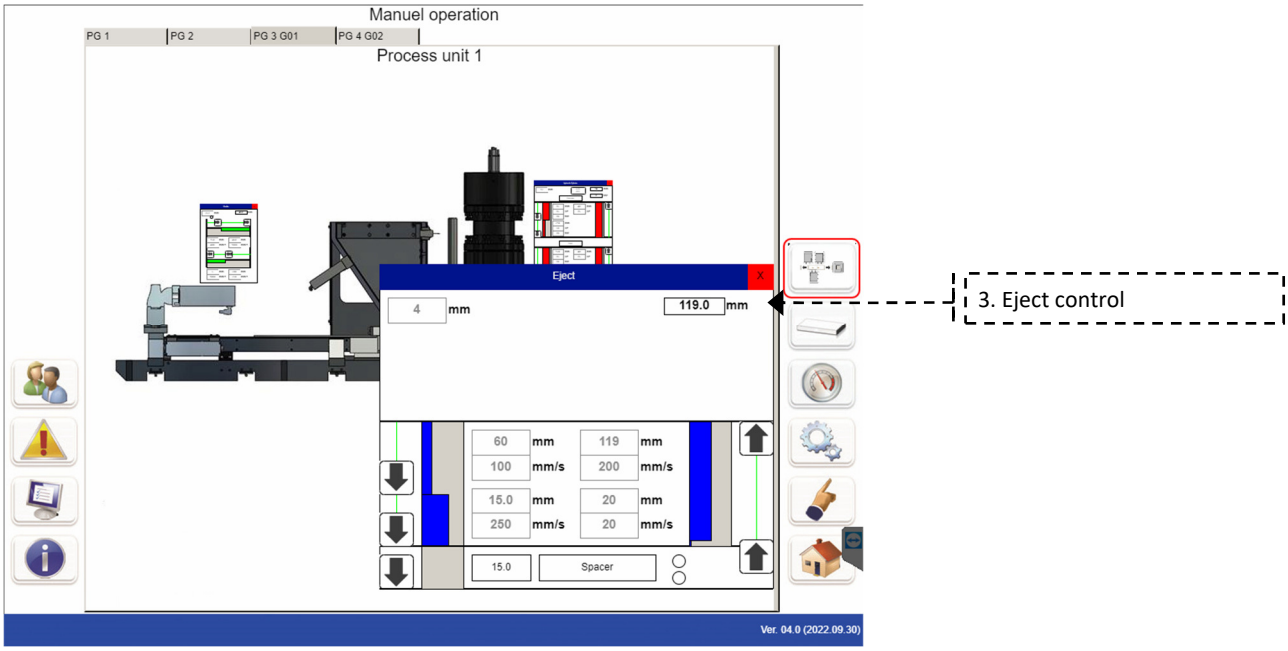
PG3 G01:



PG3 G01, shuttle and hydraulic cylinder control:



PG3 G01, eject control:



PG3 G01 and PG4 G02 has the same control functions, PG3 G01 is for the processing unit 1 and PG4 G02 is for the processing unit 2.

PG1 allows operation of the machine on an overall level, by operating the dispencer (1), the processing units (2) and outlet conveyor (3) and the hydraulic oil (4).

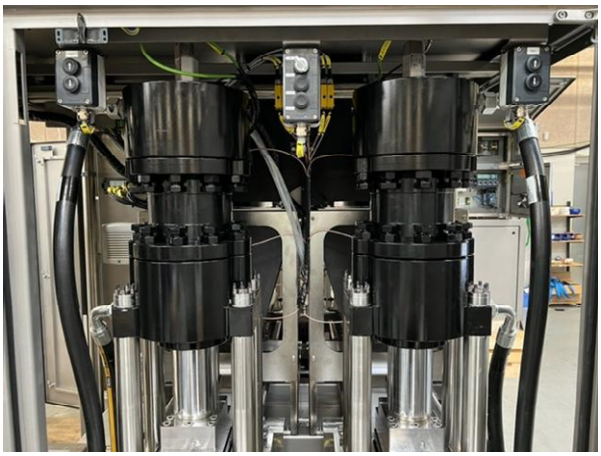
TOOL CHANGE

Instruction on how to perform tool change on reformer R1000H. This procedure is possible on all reformers manufactured after Sept. 2022 and on older reformers that have been upgraded by Cold Jet.

Tool Change enables the operator to safely perform tool change by operating the reformer manually, while the front cover is open. The operation is related to risk, and shall only be performed by persons trained by Cold Jet.

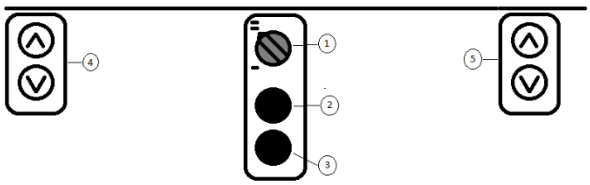
Controls

The controls used to operate the machine are located behind the cover at the top. There are three panels. On each side there are two, two button panels (4,5) that are used for the adjustment up and down. In the center there are two buttons and a rotary knob panel. The rotary knob (1) is used when switching between "tool change" and "operation" mode. The buttons (2,3) are used during tool change to operate either "Piston" (2) or "Eject" (3).



Overview of the R1000H Tool Change panels

Side and center panels



Schematics of panels, buttons, and rotary knob

Tool change mode

Roll the outlet conveyer away from R1000H.
Open the R1000 front cover.
Turn the rotary knob (1) from "off" to "on".
Close the R1000H front cover.
Reset the alarm from opening the R1000H front cover on the HMI Screen.
Restart the R1000H on the HMI Screen.
The R1000H is changing the tool settings to allow tool change.
The R1000H starts with a clear mark that it is in "tool change" mode on the HMI Screen.

Outlet Conveyor rolling away from R1000H

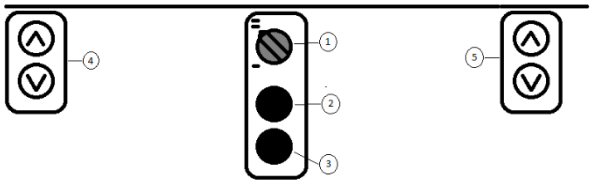
Picture of HMI in tool change

Operating tool change mode

Open the R1000H front cover.
Press and hold either bottom (2) or bottom (3) with one hand and operate either panel (4) or (5) with the other hand by pressing and holding either the up or down button.
Bottom (2) is 'press cylinder', and bottom (3) is 'eject cylinder'.
The R1000H is operated by the buttons to enable tool change.
Change tool and receipt.

This step should be performed for both cylinders. Only one side can be operated at the same time.

Tool changing on left cylinder



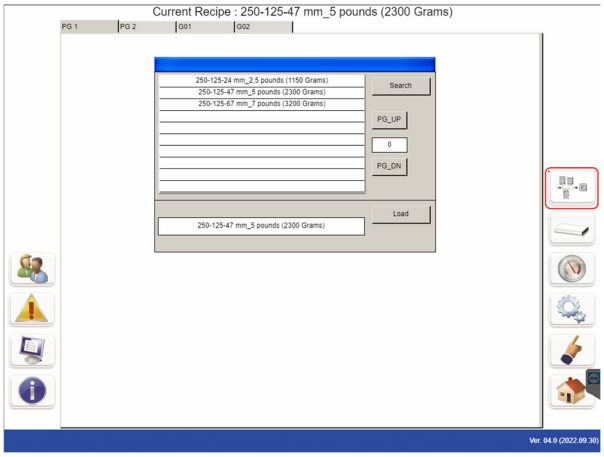
Schematics of panels, buttons, and rotary knob

Reactivating the machine

Turn rotary knob (1) from "tool change" back to "operation"
Close and lock the R1000H front cover.
Roll the outlet conveyer back in front of the R1000H.
Restart the R1000H on the HMI screen.
On the HMI screen select a recipe that has been inserted in the R1000H.
It is not possible to choose Tooling.
Machine can now be operated with the new tool.

Safety

It is highly important that the operator is trained in the procedure by Cold Jet, as any mistake in this operation can cause injuries, death or damage to the machine significantly.
The machine is operated by using both hands, as forces from the machines are high and can cause injuries.



HMI screen when selecting Recipe

MECHANICAL MAINTENANCE

Procedures for maintenance and repair

This table includes all the procedures for maintenance and repair. It is based on 8 hours production pr. Day and 20 production days pr. Month. This is equal to 1000 hours pr. 6 months and 2000 hours pr. 12 months. The repair/replacement of the following parts can be made by the owner's qualified personnel:

No.	Procedure	Service interval
1	Procedure for replacement of hydraulic oil filter and pressure filter	2.000 hr.
2	Procedure for Replacement of gaskets in Ø150 hydraulic cylinder	6.000 hr.
3	Procedures for tool set replacement	2.000 hr.
4	Procedures for replacement of wear plates on Press- and eject pistons	2.000 hr.
5	Procedure for replacement of Ø150 hydraulic cylinder	20.000 hr.
6	Procedure for changing air filter	2.000 hr.
7	Procedure for changing hydraulic pump Rexroth	10.000 hr.
8	Procedure for changing hydraulic oil hydraulic station	2.000 hr.
9	Procedure for hopper clean out and machine thaw up	24-48 hr.
10	Procedure for replacing diverter cylinder	2.000 hr.
11	Procedure for replacing hammer on hopper	2.000 hr.

Safety device replacement intervals

The expected lifetime is 20 years or 100,000 couplings on electromechanical components (contactors and relays) whichever is the grater.

When making repairs/replacements, use only original Cold Jet spare parts.

TREMS OF WARRANTY

In order to comply with the terms of the warranty, and for safety reasons, repairs other than those stated above require relevant tools and equipment and therefore must always be made either by a Cold Jet technician or by the owner's qualified personnel who has been trained by Cold Jet in the repair and maintenance of Cold Jet dry ice blasting and dry ice production machines and accessories. Beyond the necessary knowledge, the person concerned must have appropriate tools and equipment, as well as the auxiliary materials required, at his disposal.

The liability of the manufacturer under the terms of the CE endorsement as regards safety may become **invalid:**

- If repairs are made using non-Cold Jet spare parts.
- If repairs are made by unqualified personnel.
- If repairs are unsatisfactory due to lack of relevant tools and equipment.

In such cases, the liability of the manufacturer will be solely confined to any manufacturing faults/errors made prior to the machine being delivered and before repairs/replacements have been made.

LOCK-OUT/TAG-OUT SEQUENCE

Identify all devices and power sources that must be disconnected.

Electrical Cabinet. Cut the power using the input disconnecting switch.

Add sign on machine prohibiting reconnection. After ensuring that no one is exposed and to check that the power sources disconnection was made correctly, press the activation buttons that control the operation of the isolated section to make sure that the disconnection was efficient. After this check then active e-stop. After performing the above operations, the machine will be in lock-out/tag-out and the work may be performed without risk of an unexpected start-up.

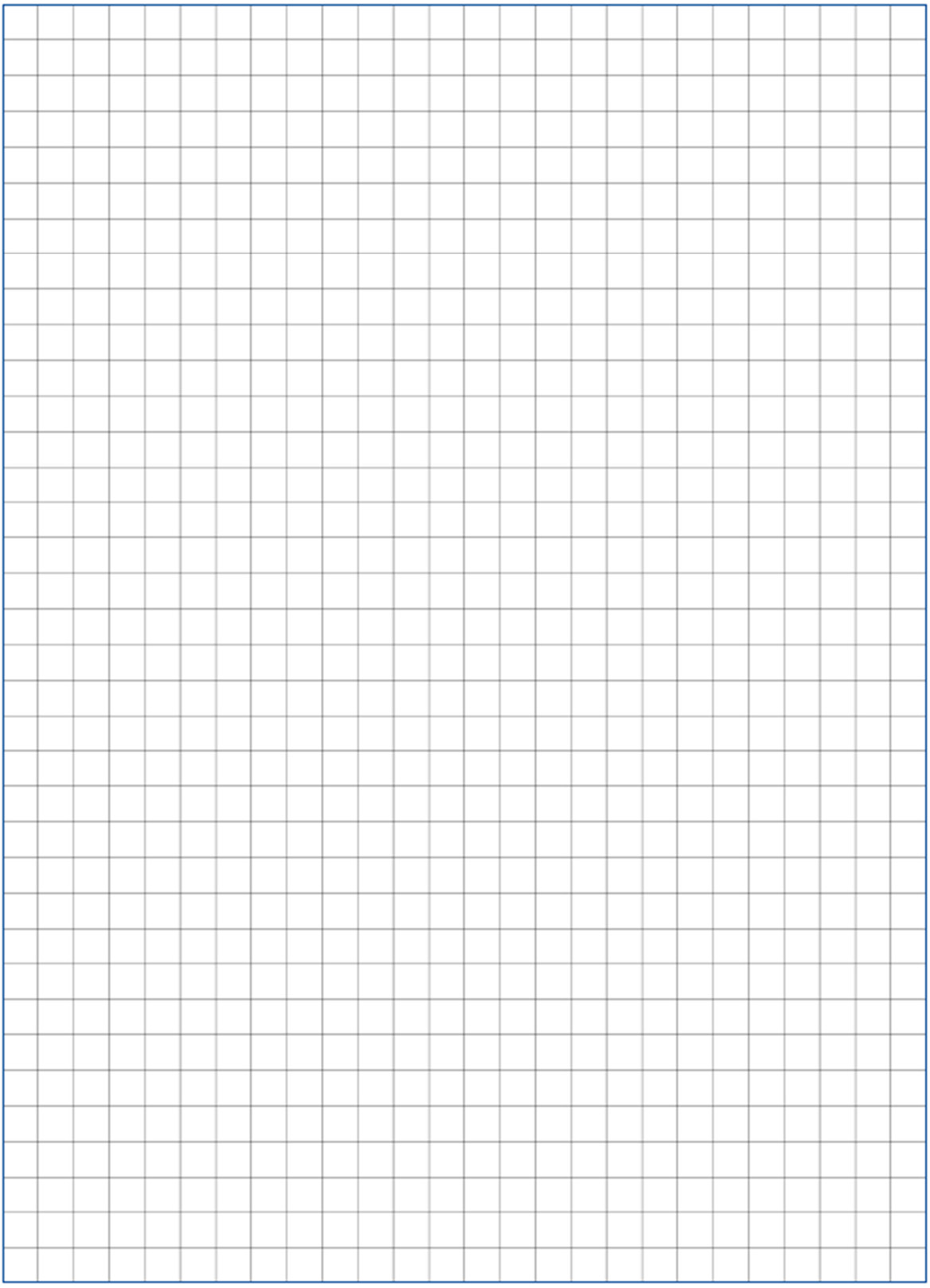
If the process involves more than one person

In the steps shown in the above sections, if there is more than one person involved, each person involved will lock-out and tag-out the power-cutting devices. No one may remove it, except the person adding the lock-out and tag-out. The equipment will not be connected while there is a lock-out and/or tag-out.

Return the machine to its normal operating condition

Reconnection may be made after performing the repair, maintenance, connection or other operations and once the equipment is prepared for use.
Inspect the work area and rest of the machine affected by the lock-out/tag-out, to ensure that no one is exposed. Remove additional protections, if any. Remove all tag-outs and other lock-outs. Reconnect all switches that were disconnected and reset the e-stop. The machine is now in service again for normal production

NOTES



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