# DS500E & DS1000E

USER MANUAL


Original Instructions [English]

08-01-2025
Version 3

## CONTENT


Cold Jet
the force of nature

# INTRODUCTION

This manual should be kept with the machine and be readily accessible for operation and maintenance. This manual contains information about the safety, the operation, and the maintenance of the machine.
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 DS500E and DS1000E direct slice machines**
The DS500E and DS1000E direct slice machines from Cold Jet presents a state-of-the-art dry ice machine with features for easy operation, swift production shifts, and high-capacity performance.

The direct slice machines produce high-quality dry ice slices. These are made and prepared ready directly in the machine, placed on top of the conveyer. This means that no additional handling of the dry ice slices are needed.

The machine parts are protected by an enclosure, which reduces the noise level to a minimum (below 75 dB(a). The direct slice machines provide a direct slice system. The source of raw material for the production of slices is liquid carbon dioxide preserved at low temperatures in a storage tank.

The control system of both the DS500E and DS1000E are, based on Beckhoff Industrial PC and HMI system, that offers maximum functionality and a user-friendly interface.

## SYSTEM DESCRIPTION

This operator manual covers both the DS500E and the DS1000E operating instructions. The main parts are described in the machine controls section.

**Functional description**
The main function of the DS machines is to produce dry ice slices directly to a conveyer from liquid carbon dioxide. This is done by a sequence of operations executed by the Beckhoff IPC. The main steps during normal production are as follows and refer to PI diagram:

1. **Start-up**
2. **Production**
3. **Standby**
4. **Shut down**

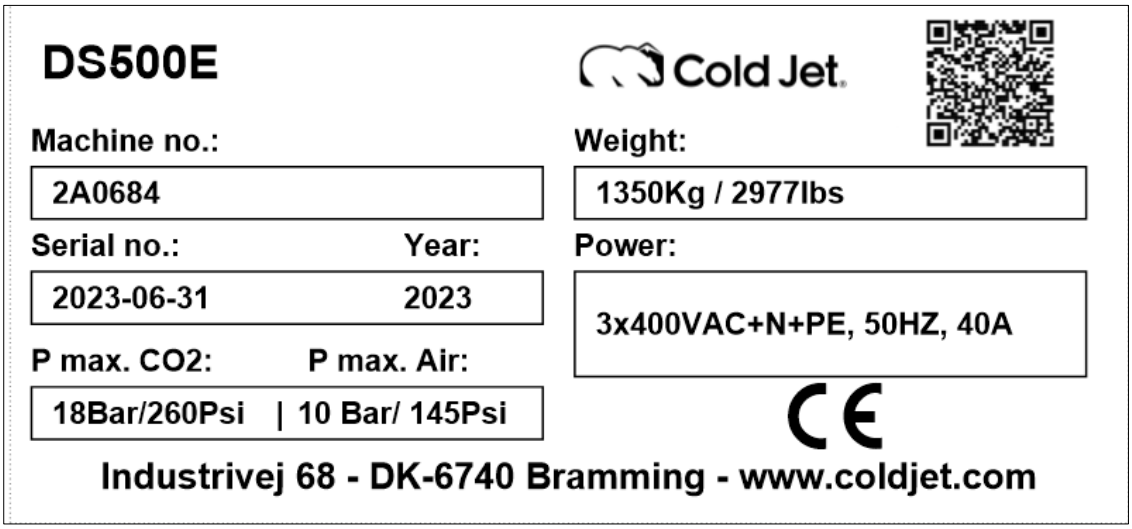
The DS machines produces a slice in the requested thickness. The thickness is determined by incoming CO2 ad adaptive learning about the thickness. This means that over time the program will adjust so the thickness is always right.
Slices are dropped from the production unit below the machine. Either the slices are dropped from the production unit when a sensor is activated, or an external input.

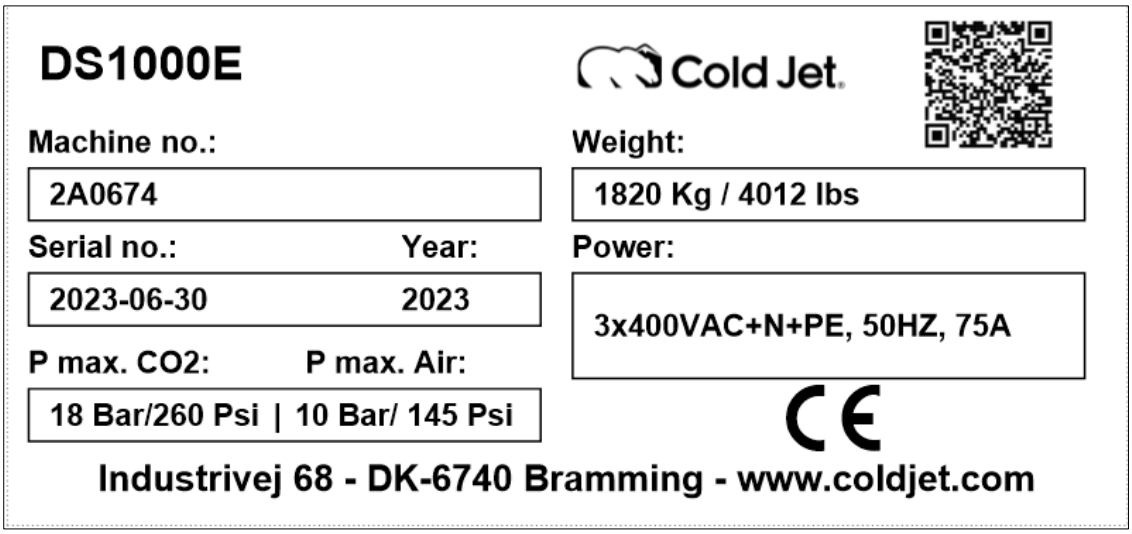
The machine is designed with dehumidifier to mitigate humidity inside the machine.

**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**
System is marked with:




**Supplier responsible for the equipment**

Cold Jet ApS
Industrivej 68
DK-6740 Bramming
Denmark
Phone: +45 75 56 15 00
Fax: +45 75 56 15 09
Homepage: www.coldjet.com

## Technical Data

**Rated output:**
DS500E: Up to 500 kg/hr (1,102 lb/hr)
DS1000E: Up to 1,000 kg/hr (2,204 lb/hr)

**Slice size:**
125 x 125 x 15 mm (5 x 5 x 0.5 in) to 125 x 125 x 60 mm (5 x 5 x 2.3 in)

**Inlet liquid $CO_2$ pressure:**

| Liquid $CO_2$ Supply System | DS500E | DS1000E |
|---|---|---|
| Supply Pressure (Min-Max) | 13-18 bar -30°C to -20°C (189-261 psi -22°F to -4°F )<br><br>Optimum performance range 15-16 bar -24°C to -26°C C (232-290 psi -11°F to -15°F) | |
| Supply Pressure Range | +/- 1.0 bar (14.5 psi) | |
| Supply Pressure (Recommended PBU Setting) | 16.5 bar (240 psi) | |
| Flow Rate - Minimum | 1000 kg/hr (1984 lb/hr) | 2200 kg/hr (4850 lb/hr) |
| Pelletizer Design Pressure / PRV setting | 27.6 bar (400 psi) | |
| Liquid $CO_2$ Line Size Recommended ID | 25 mm (0.98 in) | 25 mm (1.0 in) |
| Liquid $CO_2$ Connection at Pelletizer | EU: 3/4-inch BSP / US: 3/4-inch NPT | |
| Liquid $CO_2$ Line Insulation | Min. 75mm (3.0 in) Industrial Insulation - (Urethane Foam - PVC/Alu jacket) | |

**Liquid $CO_2$ dryness fraction:**
The water content should not exceed 35 ppm and should not be less than 5 ppm – or equivalent to a dewpoint temperature of -66°C to -51°C (-86.8°F to -59.8°F).

**NOTE:**
The liquid $CO_2$ supply must be completely free of oil and must have a minimal purity of 99.9%.

**Liquid $CO_2$ supply pipe:**
Internal diameter 20 mm (0.8 inch), very well insulated with a minimum number of bends and fittings.
**NOTE:** If over 20 m (65.6 feet) in length, use an internal diameter of 25 mm (1 inch).

**Power supply:**

The direct slice machine requires a three-phase power supply. The power source must be grounded:

- For machines in the US: use a Solidly Grounded WYE Source.
- For machines outside US: use a TN-S grounding acc. to IEC 60364.
- All phases must be balanced, and voltages must be within ±10%.

| Electrical Service & Supply | DS500E | DS1000E |
|---|---|---|
| Standards | EN 60204-1 & IEC 61439-2 | |
| Voltage AC/ Frequency (EU 50Hz) | 3 x 400 V AC + N + PE / 50Hz | |
| Number of phases | 3 | |
| Short Circuit Current, Min / Max | 0,5 kA / 10 kA | |
| Upstream Fuse Max | 50 A | 100 A |
| Rated Current (Imax) | 40 A | 75 A |

**Machine dimensions:**

| Weights and Dimensions | DS500E | DS1000E |
|---|---|---|
| Shipping Weight Transport (Includes Pallet/Crate) | 1340 kg (2954 lb.) | 1830 kg (4034 lb.) |
| Shipping Crate Dimensions (LxWxH) | 1640 x 1430 x 2650 mm (64.5 x 56.5 x 104 in) | 2200 x 1440 x 2650 mm (86.5 x 56.7 x 104 in) |
| Machine Weight | 1310 kg (2888 lb.) | 1800 kg (3968 lb.) |
| Machine Dimensions (LxWxH) | 1330 x 1330 x 2410 mm (52.5 x 52.5 x 95 in) | 1890 x 1330 x 2410 mm (74,5 x 52,5 x 95 in) |

**Noise level:** below 75 dB(a)


Cold Jet
the force of nature

## SAFETY REGULATIONS

**General measures**
The DS500E & DS1000E manual contains instructions for starting up, operating, and servicing the machine. The operator must follow all instructions in this manual. The owner must make sure that the operator understands the contents of this manual and follows its guidelines and safety regulations.

**Personnel qualifications**
Employees, who are in charge of installation, operation, service, and maintenance must be adequately trained to install and operate this machinery.

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 PR750H, fully understands the importance of studying the contents of this manual and comply 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 DS500E and DS1000E are 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.
It is important that the operator follows the safety signs posted on the machine and the safety regulations described in this manual and that the operator reads and understands the contents of this manual before starting up the machine.
Installation must be carried out according to the instruction" Pre-installation Guide DS500E and DS1000E".

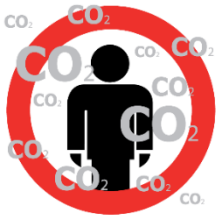
The machine may only be installed by authorized personnel with knowledge of the Council Directives BT 2014/35/EU and EMC 2014/30/EU (or similar directives in other parts of the world).

**Danger of suffocation**

Dry ice pellets are $CO_2$ in solid form. At ordinary atmospheric pressure, $CO_2$ can only exist in this solid form at temperatures of -79°C (-110°F) or lower. Therefore, during dry ice production, the $CO_2$ will immediately be heated and thus transform from solid form into gas form.

**Please note:**

Since the specific gravity of $CO_2$ is higher than that of ordinary atmospheric air, the air with its contents of oxygen will be replaced by $CO_2$ if the dry ice production is taking place in small or insufficiently ventilated rooms.



**Therefore, please note the following:**

1. Low $CO_2$ concentrations (3-5%) may cause headaches and rapid breathing.
2. $CO_2$ concentrations of (7-10%) may cause headaches and nausea and may result in unconsciousness.
3. Higher $CO_2$ concentrations will result in unconsciousness and suffocation.

High $CO_2$ concentrations may result in unconsciousness due to the displacement of oxygen. Therefore, always provide sufficient ventilation of the working area, and avoid producing dry ice in small rooms.

**Static electricity**

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

It is recommended to use a plastic shovel in the dry ice container.

**Danger of congelation**

$CO_2$ 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 plexiglass covers in front of the extruder plates are removed, the operator will be exposed to pinch point hazards.

**Wear protective gloves**

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

## SAFETY OPERATION

### Emergency stop

All equipment is connected to the general emergency system.
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:

- Extruder unit

In these areas, protective covers are in place.
The covers are provided with locking screws to deter removal.

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

There is a danger of congelation/frost bite by touching machine parts cooled down by dry ice.
To prevent congelation the entire machine enclosure is provided with locks that require special tools to open.

### Liquid CO2 leakage

If liquid $CO_2$ is leaking from any point of the $CO_2$ pipe system, the $CO_2$ supply must be stopped immediately. Localize the leakage and repair.

### Stop production

1. The machine is stopped by pressing the "Start / Stop" button.

**NOTE:** This will activate the shutdown procedure.

2. The $CO_2$ valve on the machine inlet will automatically close. It is recommended to close the manual valve on the mounting kit before leaving the machine unused for a longer period of time.
3. Cut off the main electric supply.

**NOTE:**

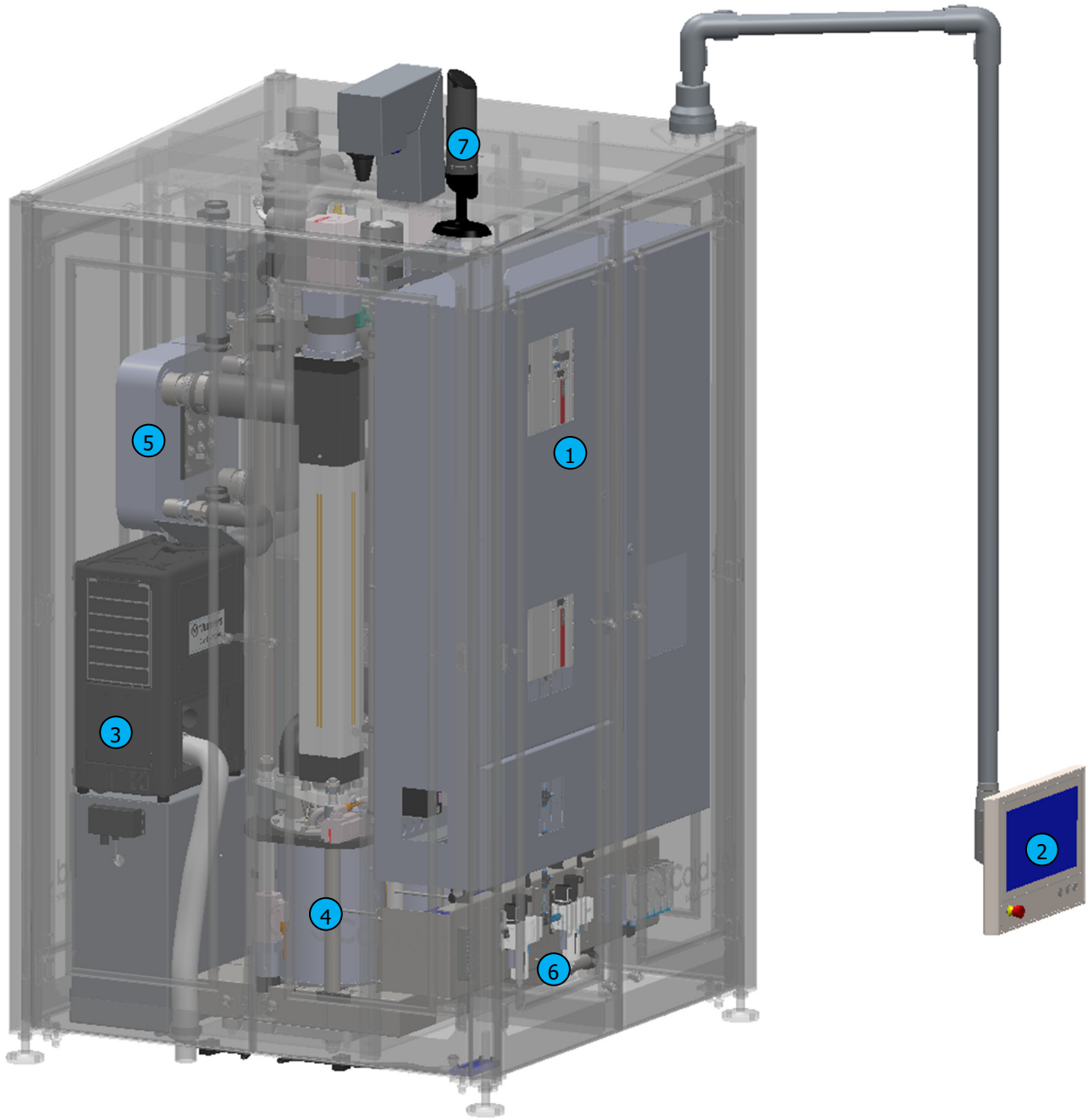
Do not shut off the main switch on the cabinet inside the machine before the inlet $CO_2$ pressure is ZERO. The $CO_2$ pressure can be checked on the "Process values" page.

### Daily checkup before start-up

1. Check the pipe system for leaks.
2. Check the operation time since last service.

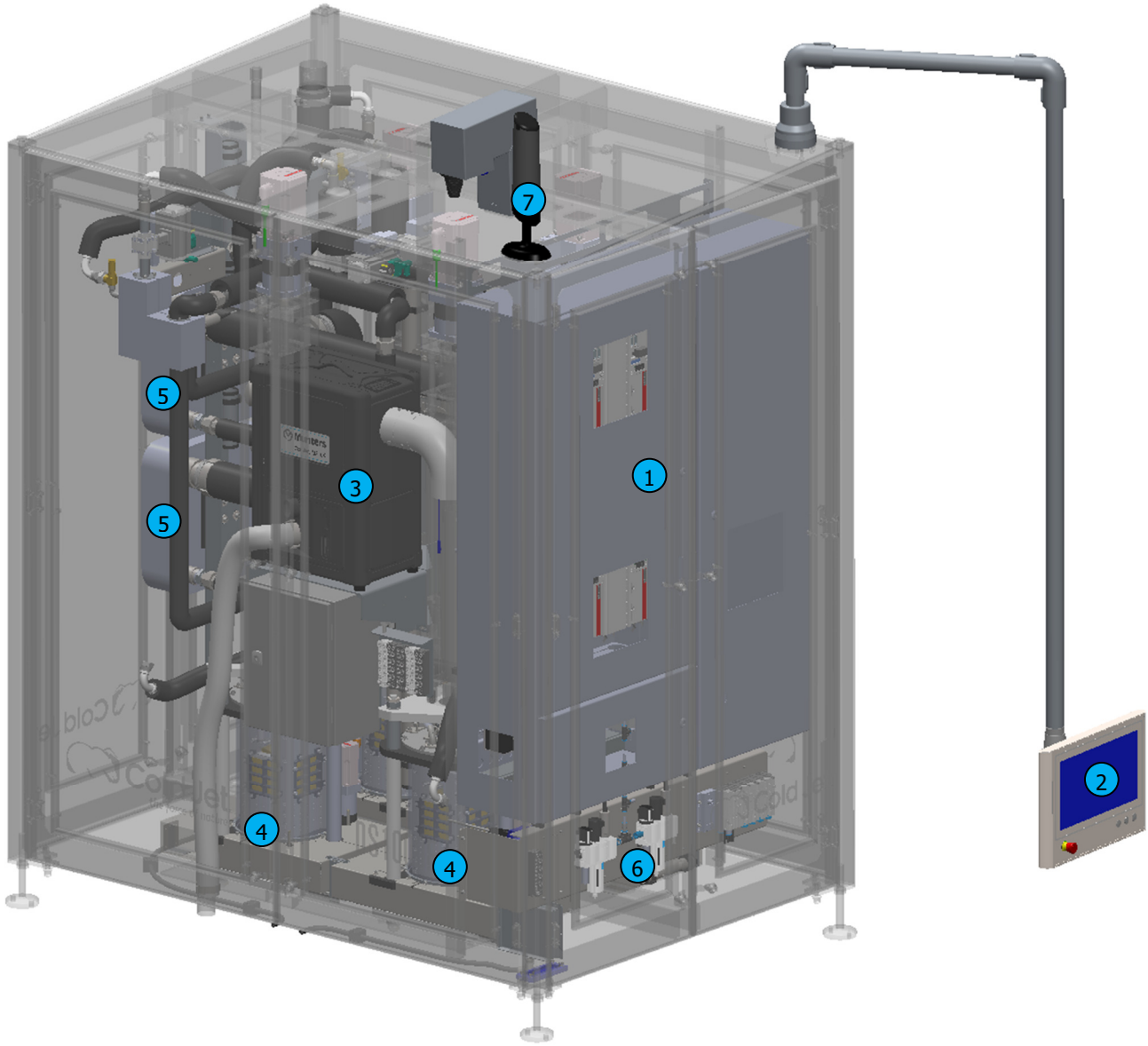
## MACHINE STRUCTURE

**DS500E**




1. Electrical cabinet
2. HMI screen
3. Dehumidifier
4. Processing units
5. Heat exchangers
6. Pneumatic
7. Light tower

**DS1000E**




1. Electrical cabinet
2. HMI screen
3. Dehumidifier
4. Processing units
5. Heat exchangers
6. Pneumatic
7. Light tower

## MACHINE CONTROLS

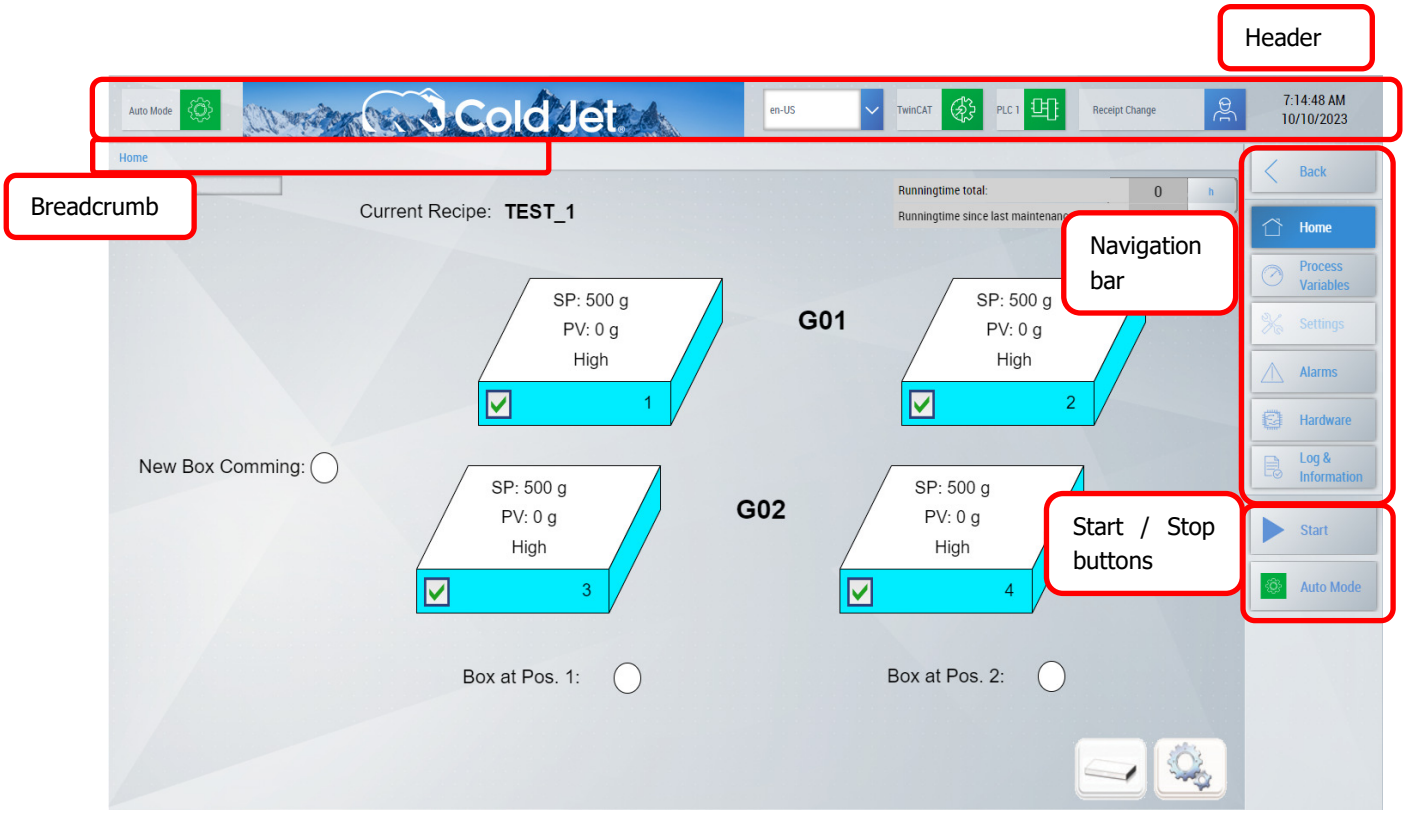
This section describes how the system is operated from the HMI.
This document can be used as a reference work with references to the various sections.

The numbers shown on the screen must not be taken as current setting values on the system.

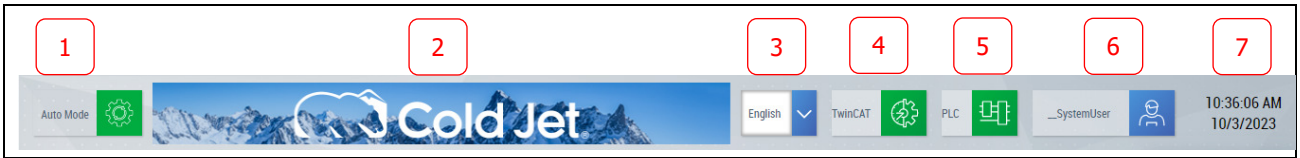
Symbol is used to make the user aware of some important information, or to warn the user about something.

The symbol is used to draw the user's attention to some information that may be useful to know.

### Navigating the HMI panel



**Header**

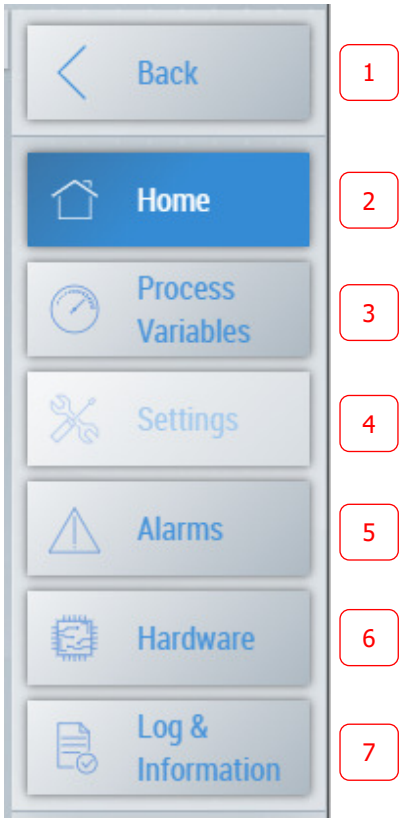



1. Auto- / Manual-mode (Here it is possible to see the state, and change the state, if logged in).
2. Cold Jet logo / Alarm banner. – If any alarms, they will also appear here.
3. Language change.
4. ADS State – Twincat.
5. ADS State – PLC program.
6. User login.
7. Date & time.

## ADS State

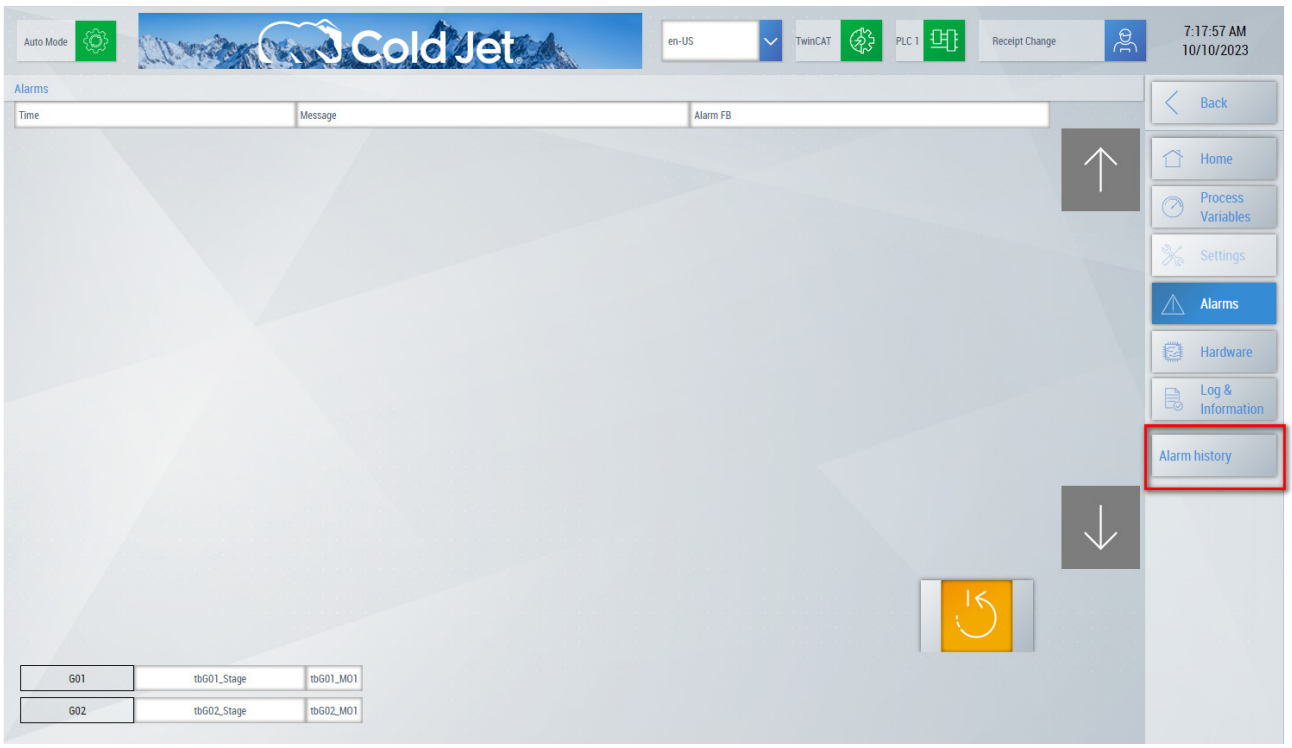
| Twincat | | PLC program | |
|---|---|---|---|
| | Unknown | | Unknown |
| | Run<br>(Twincat is in state run) | | Run<br>(program is in state run) |
| | Stop<br>(Twincat is in state Stop) | | Stop<br>(program is in state Stop) |
| | Config<br>(Twincat is in state config) | | Config |
| | Exception<br>(Twincat is in state exception - error) | | Exception |

**Navigation Bar**




1. Back – Will navigate the user back to the previous screen.
2. Home – Will navigate the user to the main screen.
3. Process Variables – Will guide the user to the PI screen, where all essential control modules are prominently displayed.
4. Settings – Requires login. Will Navigate the user to the settings page, consisting of different machine settings.
5. Alarms - Will Navigate the user to the alarm page, with current alarms.
6. Hardware - Will Navigate the user to a hardware overview/ topology, for everything connected on the EtherCat.
7. Log & Information – Will navigate the user to a "log" page, where various activities and information are recorded.

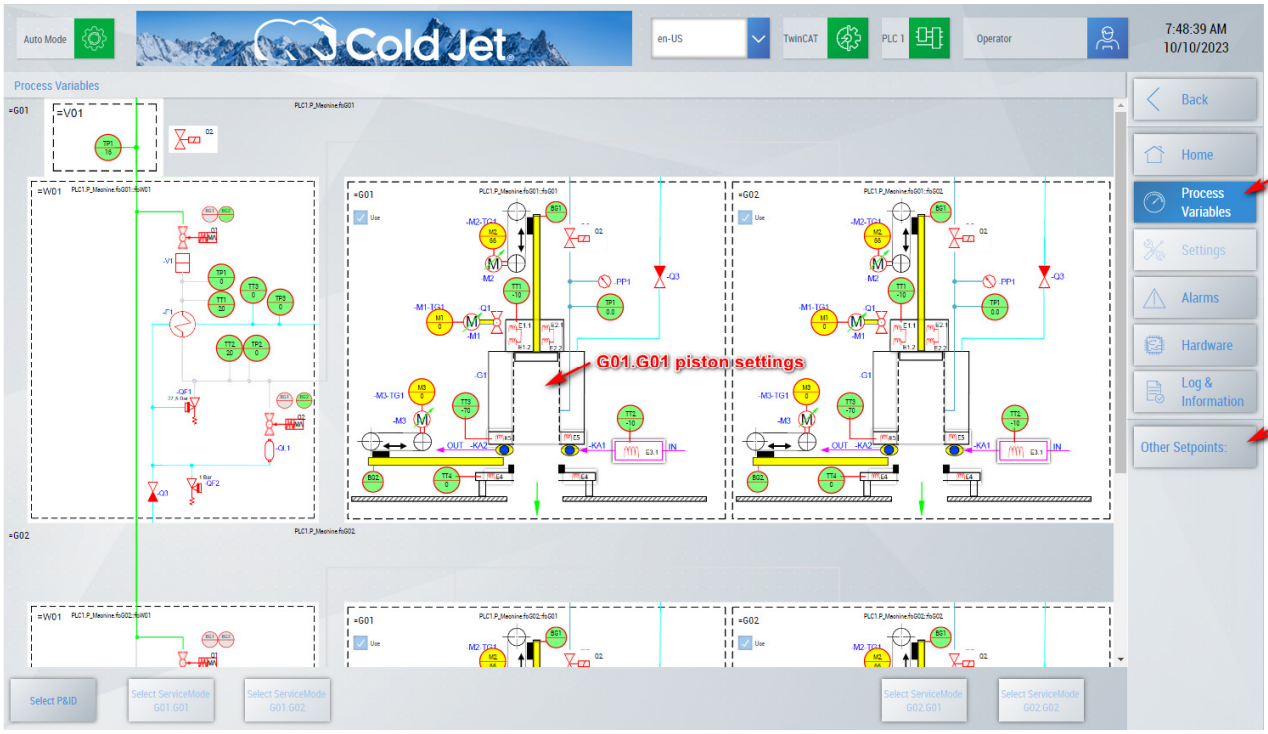
Certain navigation buttons feature sub-menus that will be displayed beneath the navigation bar, as exemplified below in the case of the alarm page.



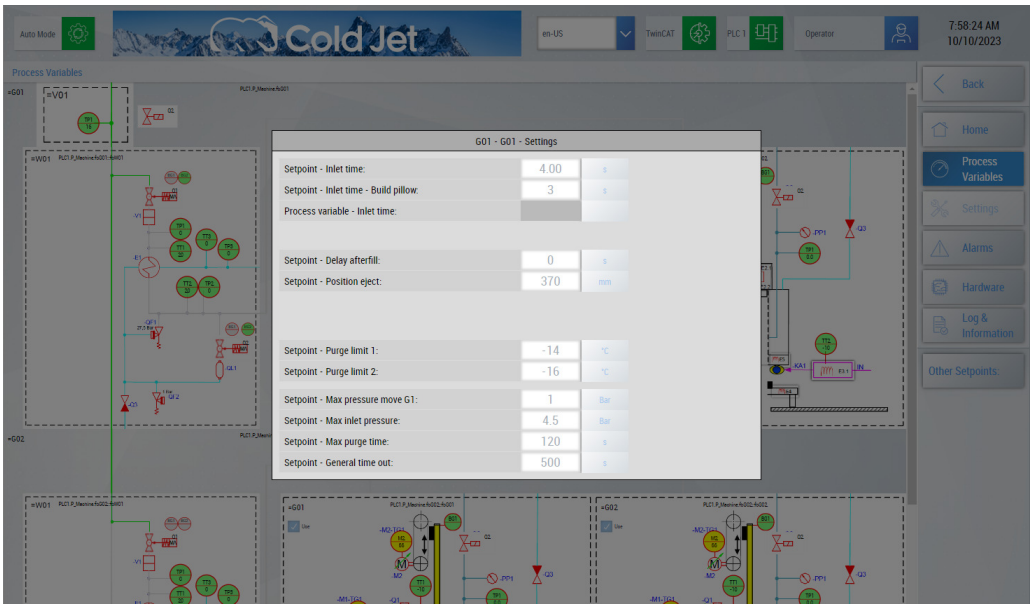
**Process variables page**

On the Process Variables page, you can view all relevant process variables such as temperature, pressure, and piston position. These variables are displayed in a dedicated PI diagram that aligns with the machine layout.

Please note that the dehumidifier and instrumental air settings can be found in the 'Other Setpoints' page, which is a sub-menu accessible from the Process Variables page.



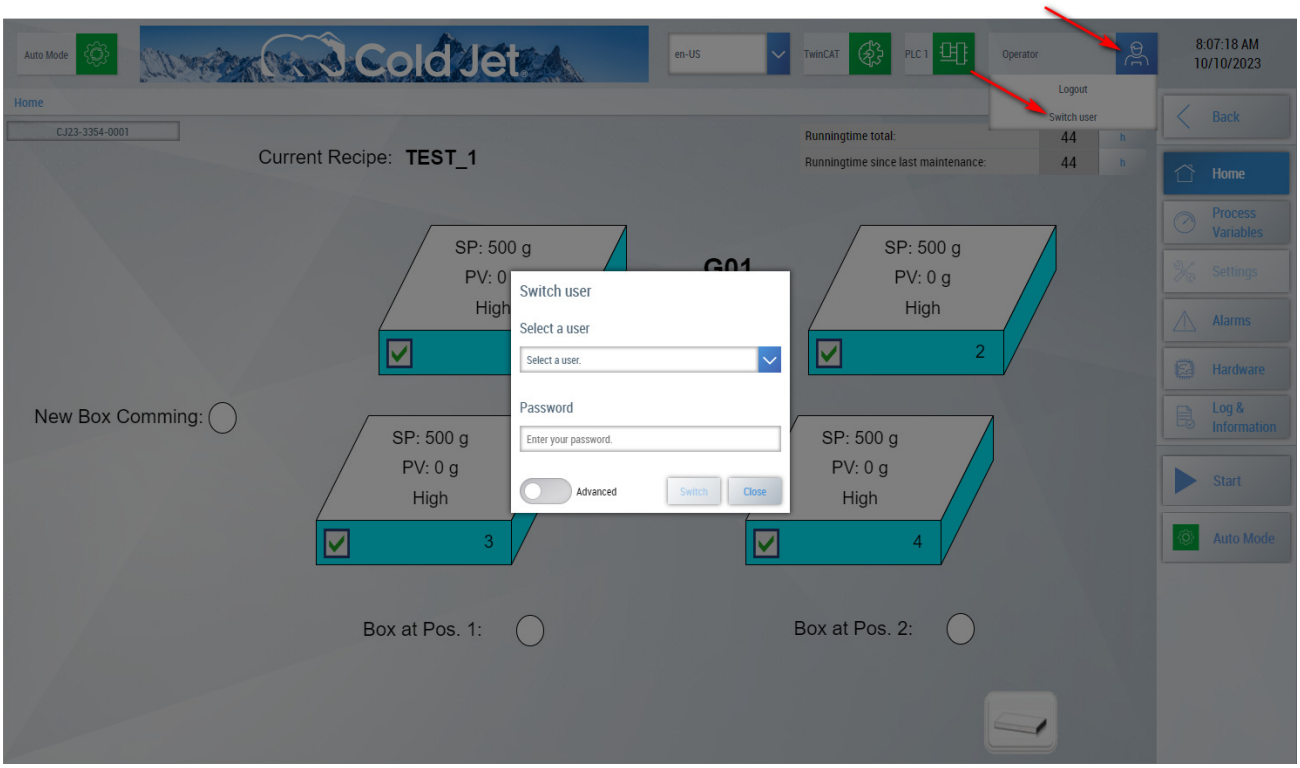

The Process Variables page is also where you can access all the different setpoints. Each setpoint is organized based on the respective process instrument it belongs to. For instance, to access the setpoints for the G01.G01 piston, you simply click on the G01.G01 piston itself.



**Login**

When you click the "User" button and then select "Switch User," a popup screen will appear.

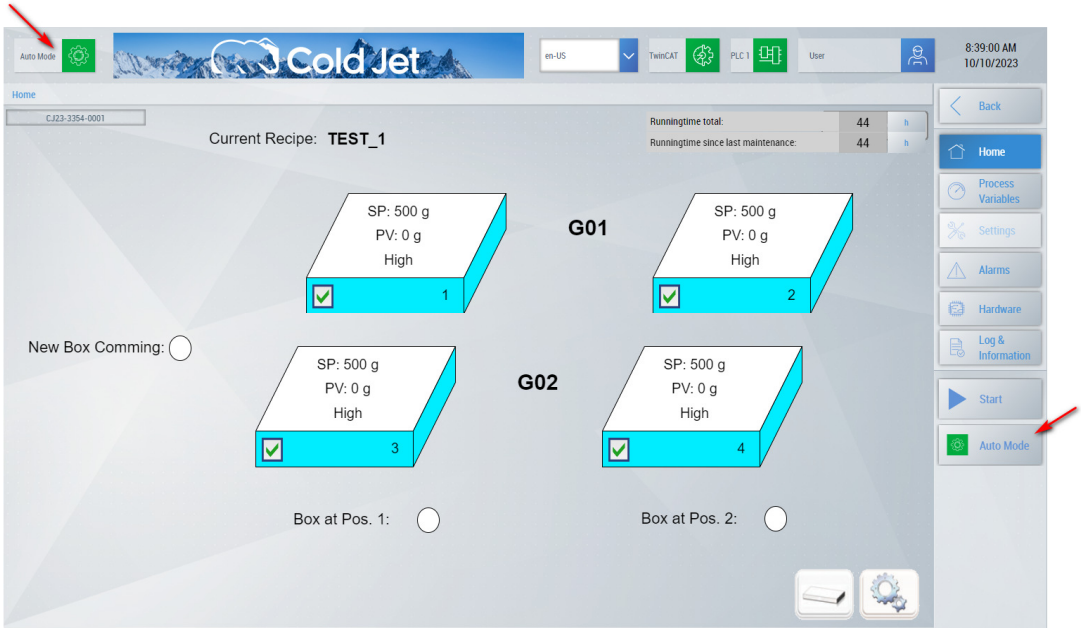
- On this screen, you can choose a user and enter the correct password.
- To log out, you can click the "User" button and then select "Logout."




| **User levels:** | **Permissions:** |
|---|---|
| **User: Operator** | Can view everything, start / stop the system, and choose between the different receipts. |
| **User: Recept Change** | Same as 'Operator' +<br>- Edit the receipts. |
| **User: User** | Same as 'User' +<br>- Run control modules in manual. |

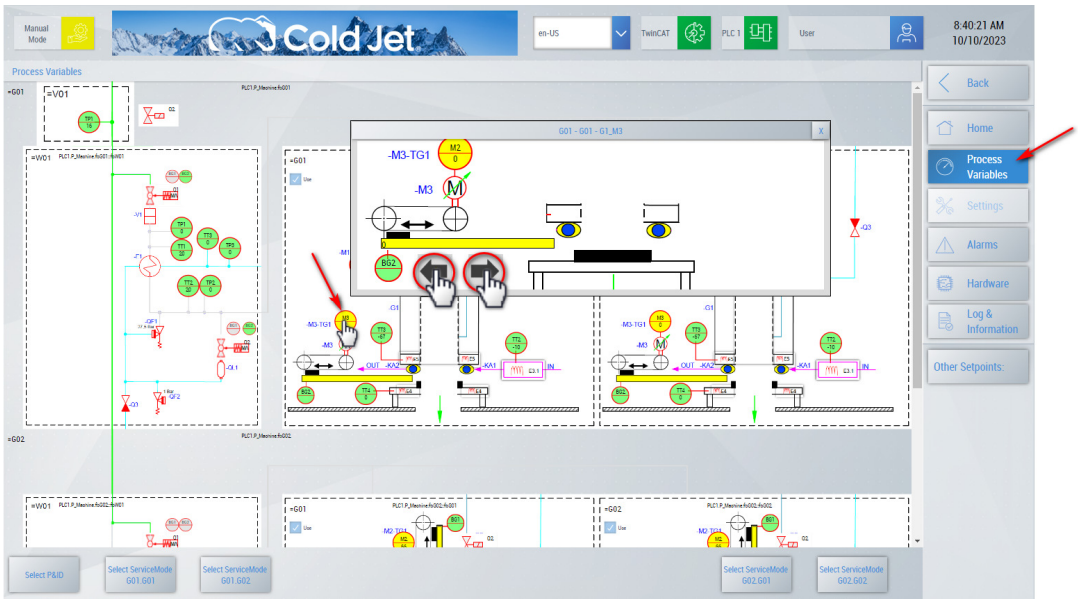
**Manual control**

To control a component manually, begin by logging in. Then, switch the entire system to manual mode, and after that, you can select the specific component, which will prompt a popup menu to appear.




*During manual operation, it is the operator's responsibility to ensure that the process and equipment are not damaged.*

Below, you can find examples of the menus that will appear when specific components are selected:

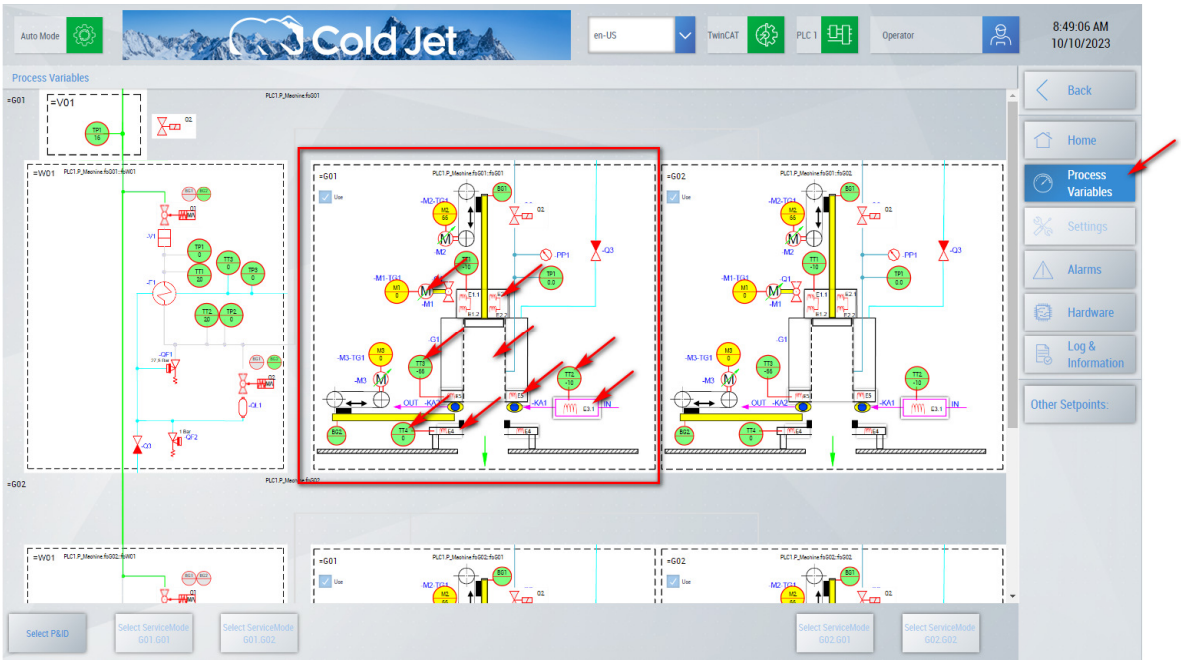


**Automatic control**

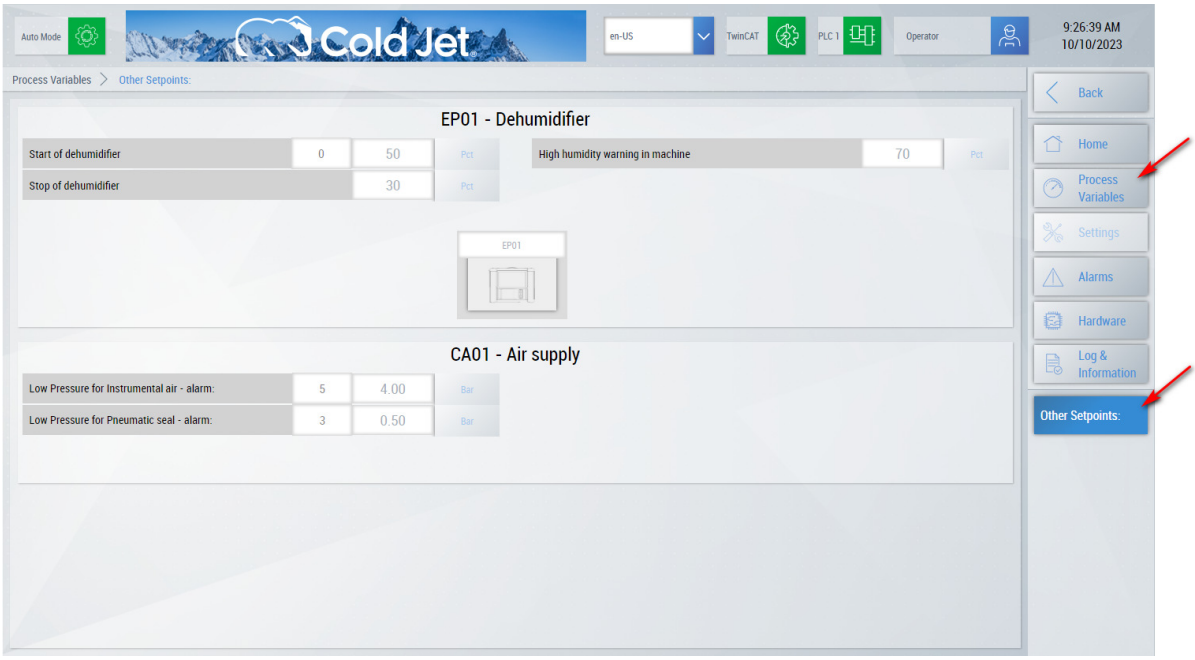
When pressing start the system will start as according to the setpoints and the automated behavior.

**Setpoints**

Within the Process Variables page, you'll find a range of setpoints. As previously mentioned, these setpoints are organized based on the specific process they are associated with. To access the setpoints for the piston, simply click on the piston. In the same way, you can access the setpoints for the injection valve by selecting it, and the various heating setpoints are accessible by clicking on each individual heating element.




Additionally, there are a few setpoints located on the 'Other Setpoints' page. Here, you can find setpoints for instrumental supply air and the dehumidifier.

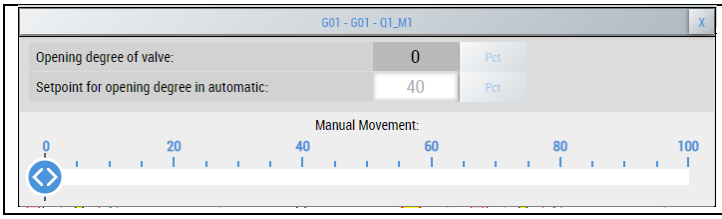



*For the functionality of the system, all setpoints require you to be logged in! Generally, changes to setpoints are at your own risk and may affect the functionality of the system!*

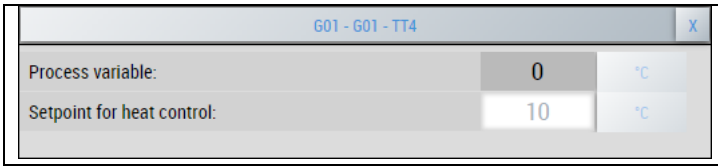
**Various setpoints**

Here you will find a description for various setpoints.

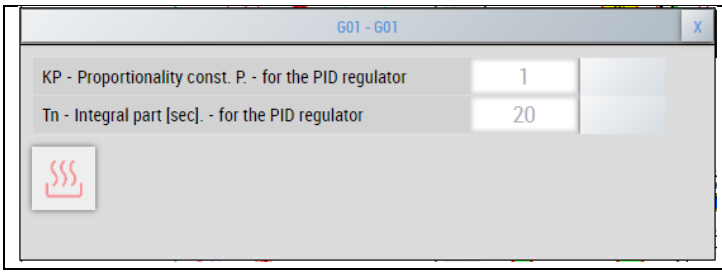

| **Name**: | **Explained**: |
|---|---|
| Setpoint – Inlet time: | Duration of injection time. |
| Setpoint – Inlet time – Build pillow: | Duration of building pillow at startup. |
| Setpoint – Delay afterfill: | Delay timer after filling is completed and before pressing slice. |
| Setpoint - Position eject: | Piston position for ejection. |
| Setpoint – Max pressure move G1: | Max pressure before we move piston M2 |
| Setpoint – Max Inlet pressure: | Max inlet pressure during making snow. If reached the process will continue even though 'Setpoint – Inlet time' was reached. |
| Setpoint – Max purge time: | If reached an alarm will occur. |
| Setpoint – General time out: | If reached an alarm will occur. |



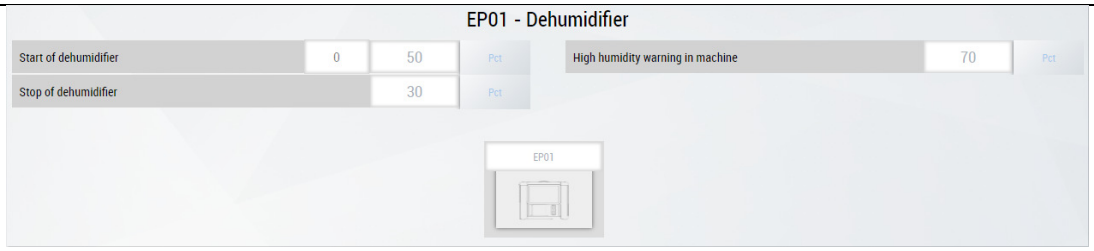

| **Name**: | **Explained**: |
|---|---|
| Setpoint for opening degree in automatic: | The opening degree of the snow valve M1 during injection. |




| **Name**: | **Explained**: |
|---|---|
| Setpoint for heat control: | The temperature setpoint for the heating elements associated with the temperature transmitter. |




| Name: | Explained: |
|---|---|
| Kp: | P (Proportional) gain in the PID regulator |
| Tn: | I (Integral) gain in the PID regulator |

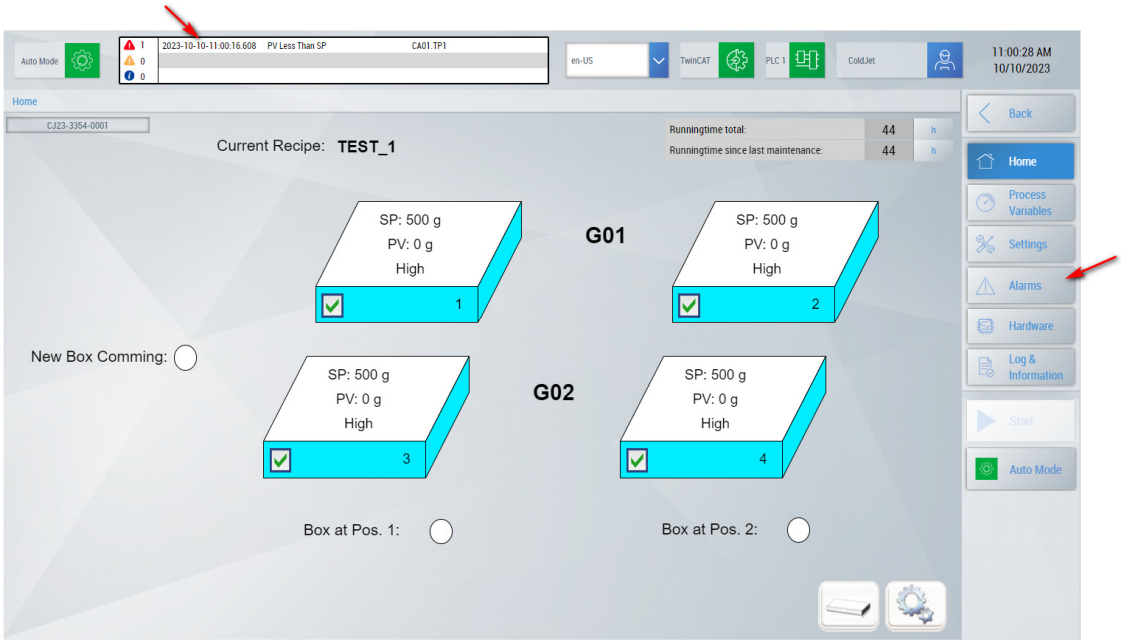



| Name: | Explained: |
|---|---|
| Start of dehumidifier | If the humidity in the machine reaches this value or exceeds this value, the dehumidifier will activate. |
| Start of dehumidifier | If the dehumidifier is activated and the machine's humidity level drops below this value, the dehumidifier will stop. |
| High humidity warning in machine | Humidity above this value will activate a warning. |


| Name: | Explained: |
|---|---|
| Low pressure for instrumental air – alarm: | If the pressure for the instrumental air drops below this value, an alarm will trigger, and the machine will stop. |
| Low pressure for pneumatic seal – alarm: | If the pressure for the pneumatic sela drops below this value, an alarm will trigger, and the machine will stop. |

## Alarms

When system alarms, warnings, or messages occur, the three most recent and critical ones are displayed in the screen header. To acknowledge an alarm, the user needs to access the alarm page, which can be done either through the navigation bar or by pressing on the displayed alarms in the header.

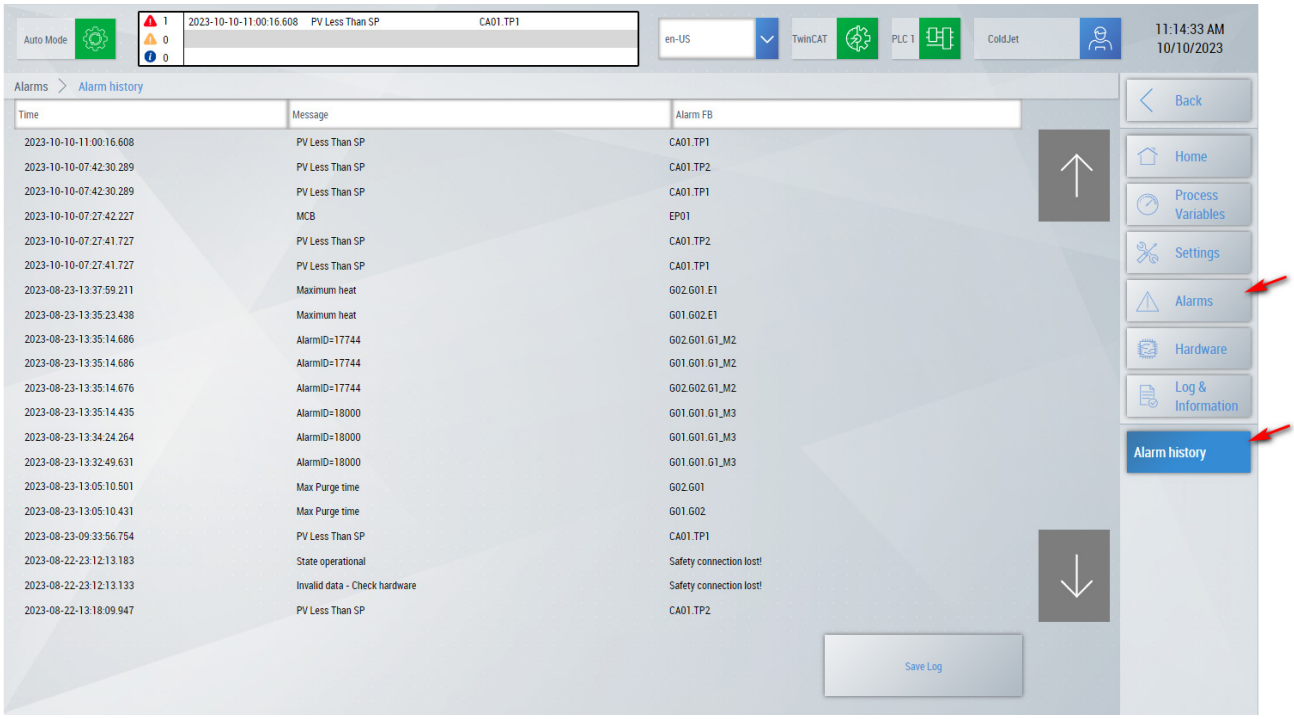



## Alarm page

The alarm page displays all currently active alarms, warnings, and messages. For each alarm, you can observe several key details: Time (1) indicating the time and date at which the alarm occurred, the alarm message (2) describing the nature of the alarm, and the alarm fb (3) indicating the origin within the program where the alarm occurred.
All alarms are acknowledged by pressing the button (4).

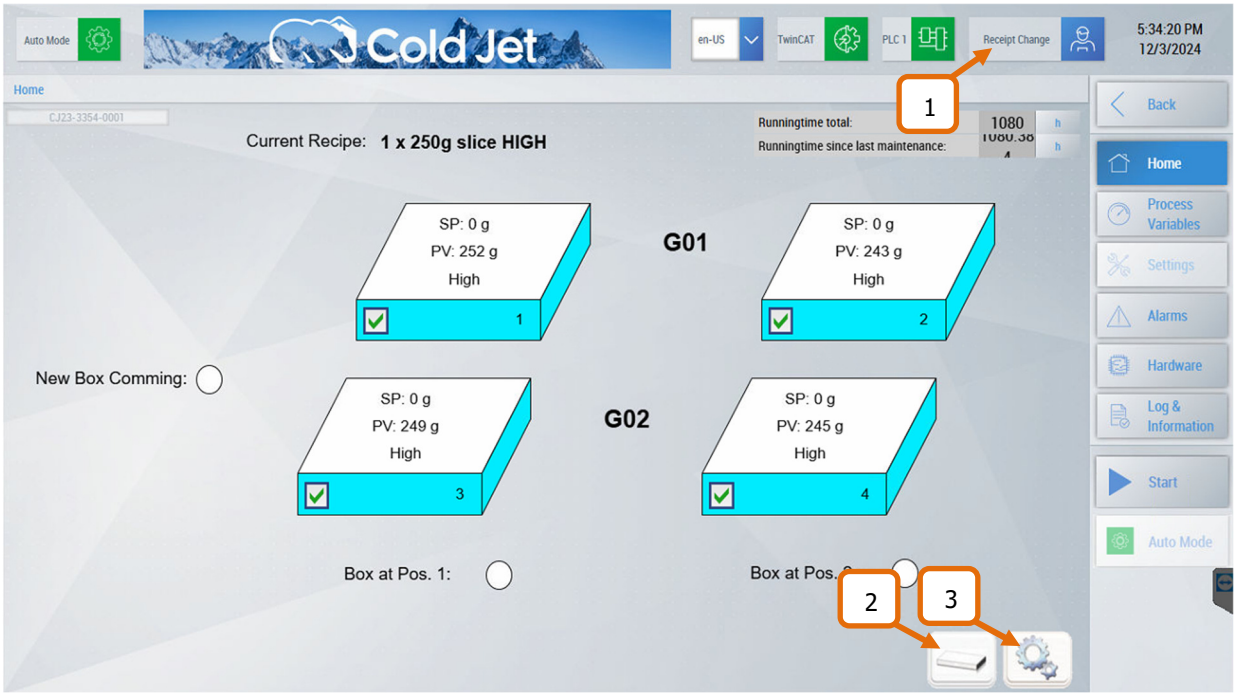
## Alarm history

Alarm log shows all alarms, warnings and messages which has occurred.

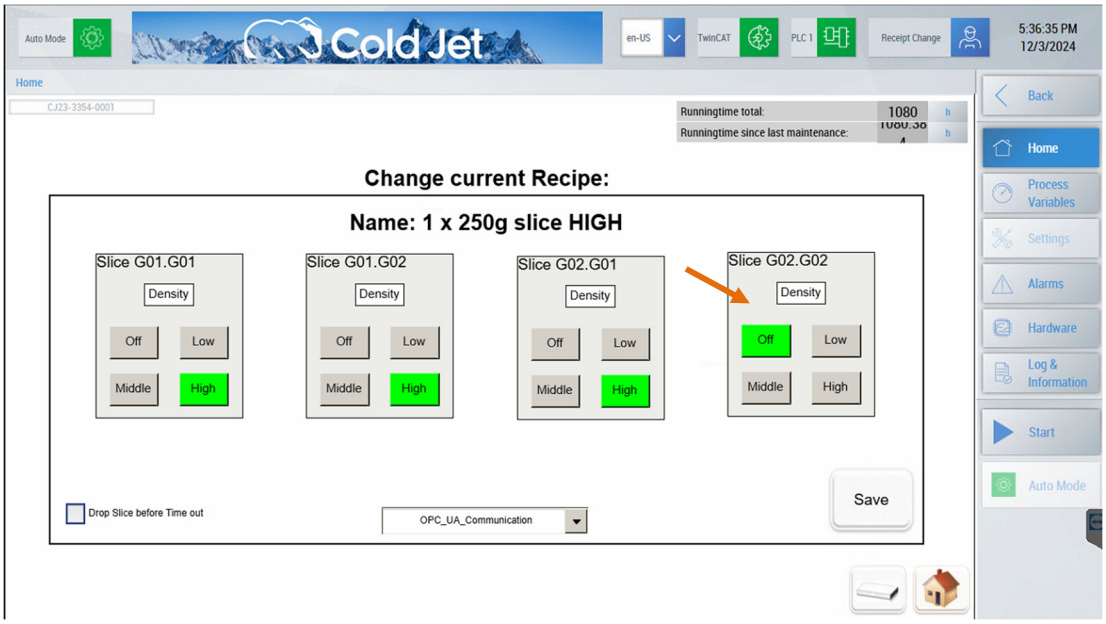


**Receipt change and deactivation of process units**

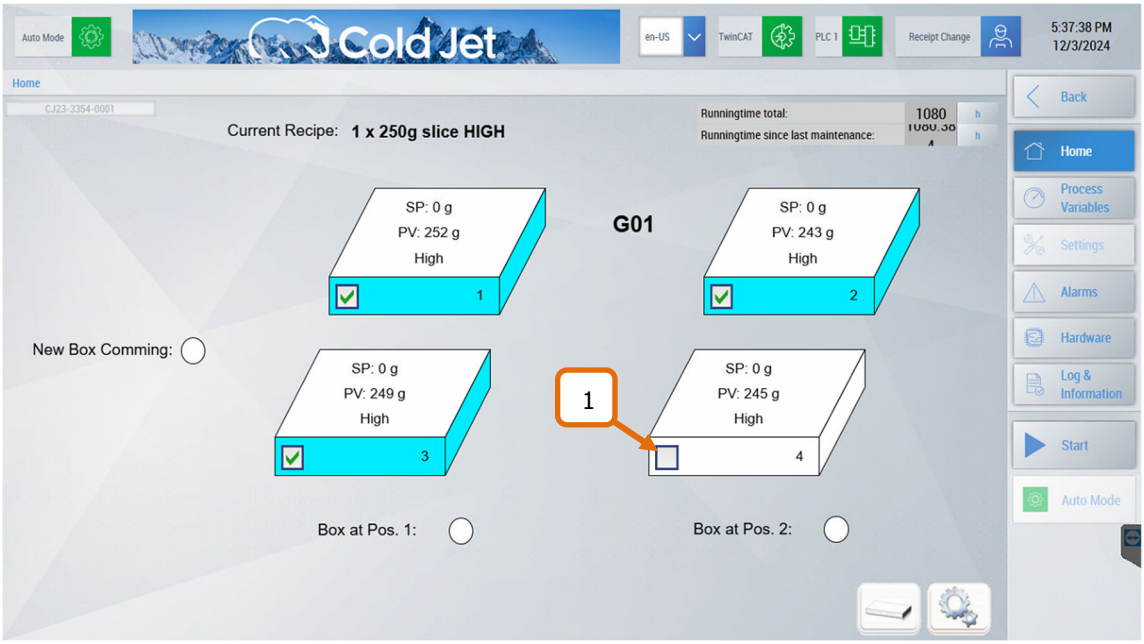
To perform a receipt change or deactivate a cylinder, first login as Receipt change or higher (1).
To perform a receipt change, press the slice bottom at the bottom of the screen (2).
To deactivate a process unit, press the gear bottom at the bottom of the screen (3).
From both bottoms, you will go to a page where receipt change can be performed and process units can be deactivated.



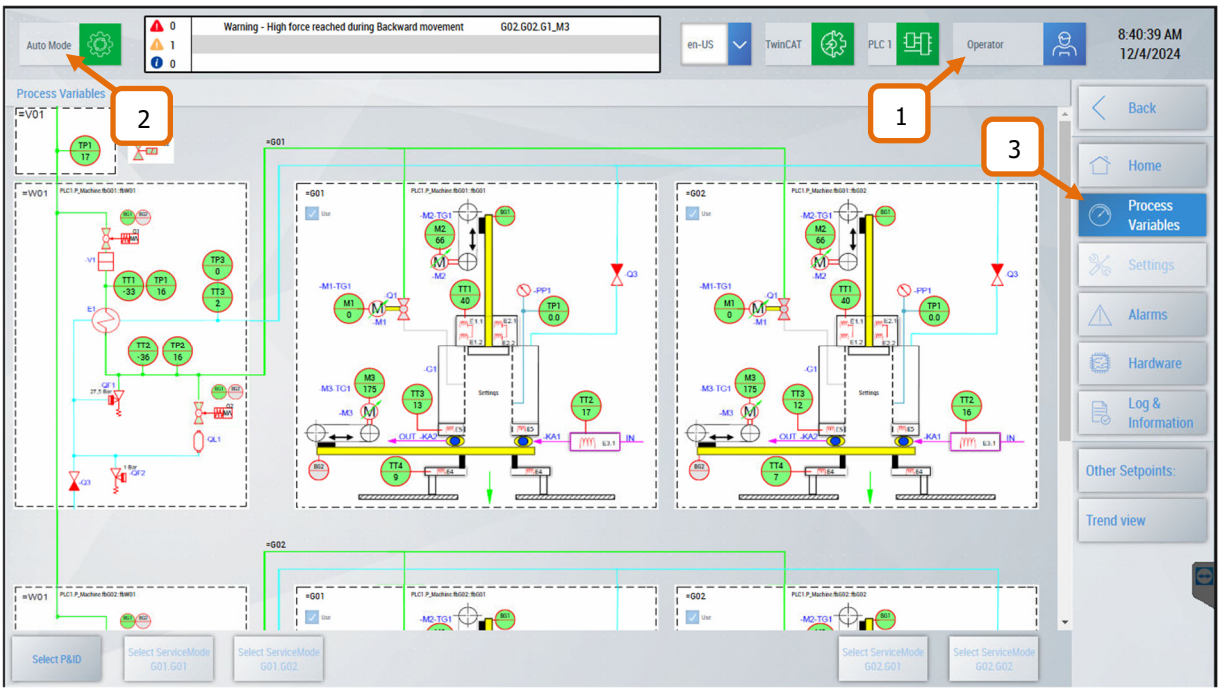

At the receipt change page, the density can be selected. The density can be set to low, middle or high.
It is also a process unit that can be set to off.



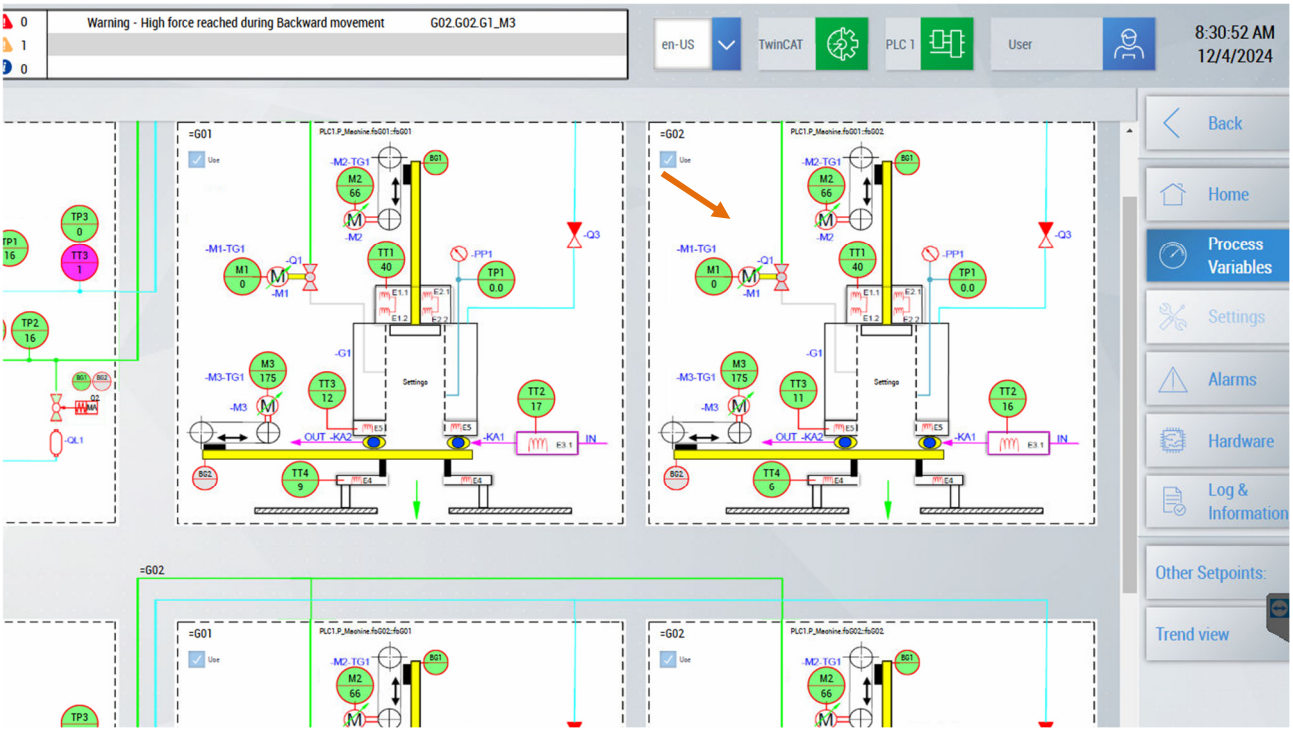
If off is selected at the page before, when going to "Home" the selected process unit will not be active, showing by not be ticked in the box (1).



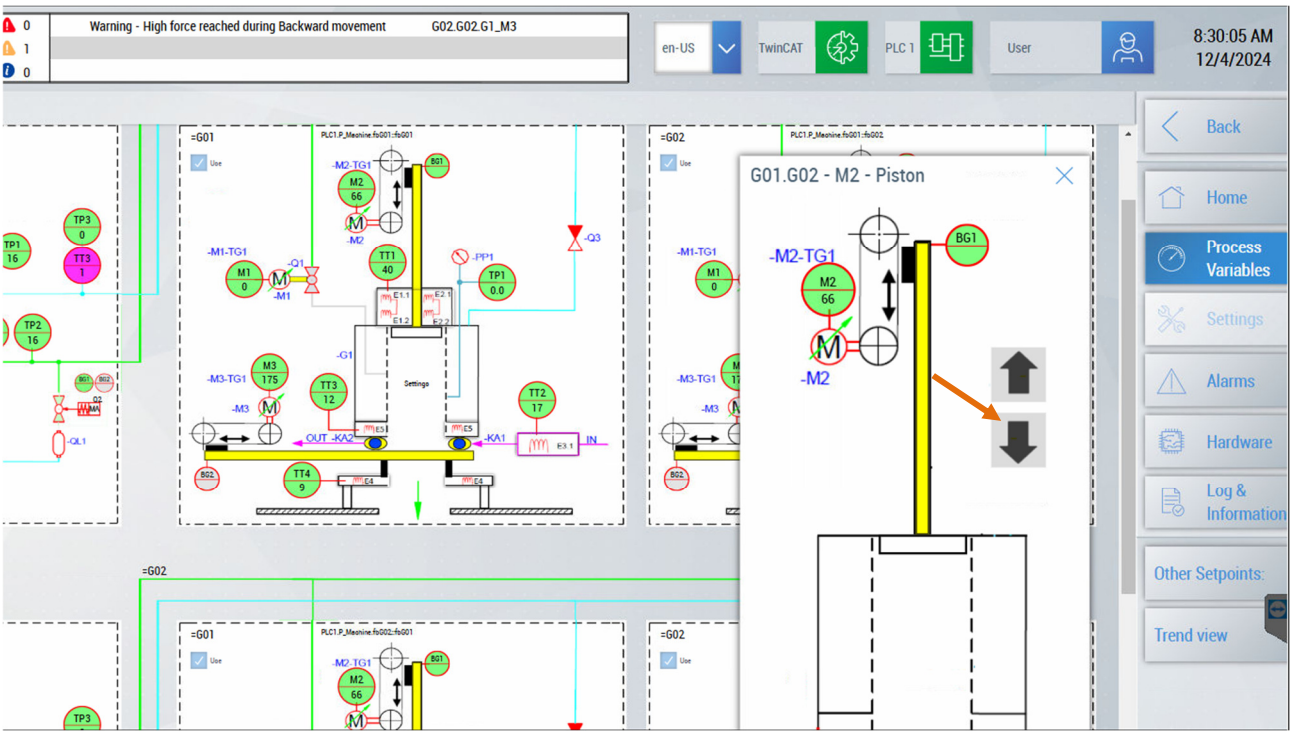

Logging in as userlevel 'user' (1), press the bottom 'automode' to change it to 'manual' mode (2).
In order to run with the individual motors, press the bottom 'process variables' (3).



Select the servo motor that should be operated manually.



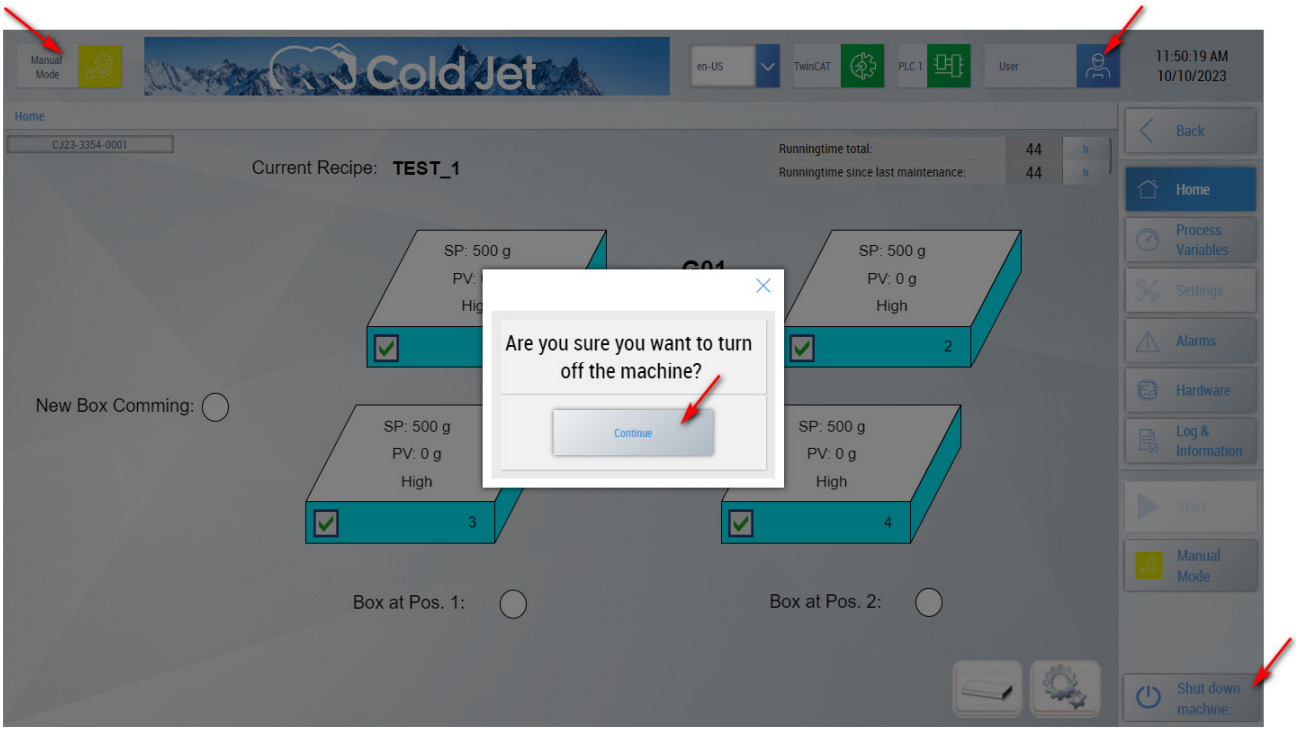

Press the process unit and use the arrows in the zoomed in screen. The arrows will move the servo motor.



**Shut down**

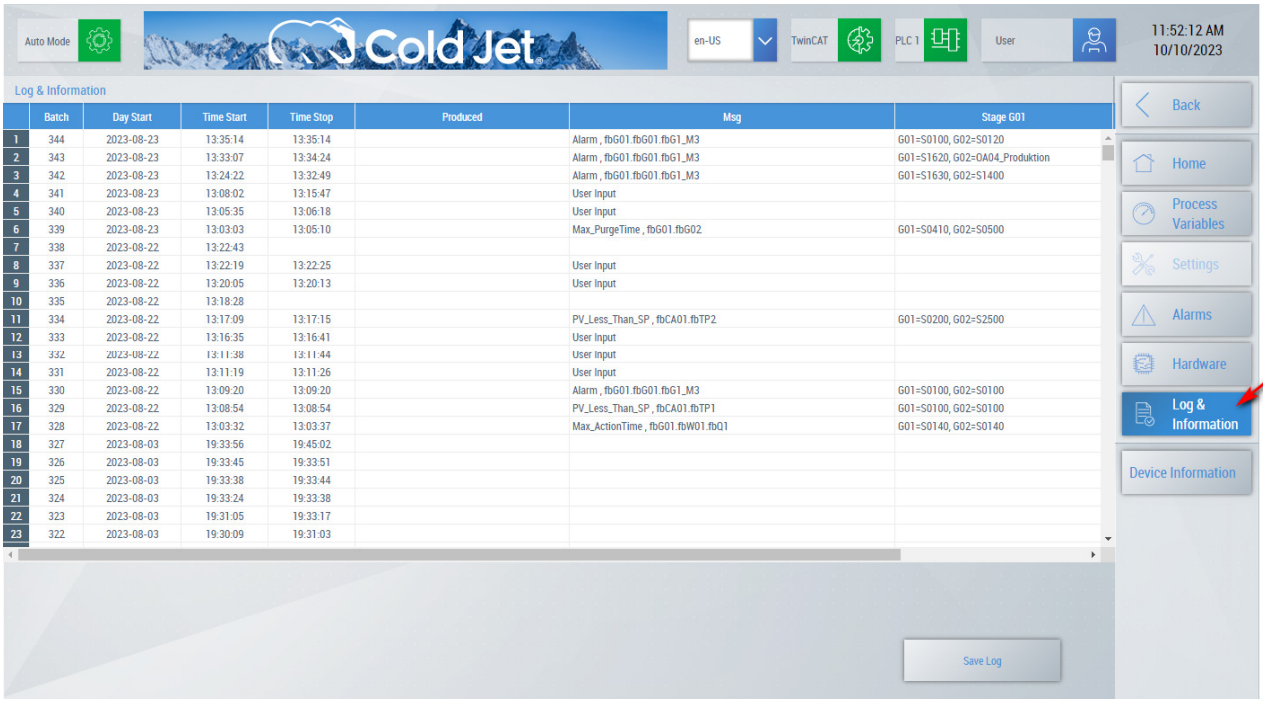
To safely shut down the system, follow these steps:

1. Log in with a 'User' or higher privilege.
2. Switch the system to 'Manual mode.'
3. Afterward, a 'Shut down machine' button will appear in the lower right corner.
4. By clicking 'Continue,' the CPU will power off in 10 seconds.



## Log and Information

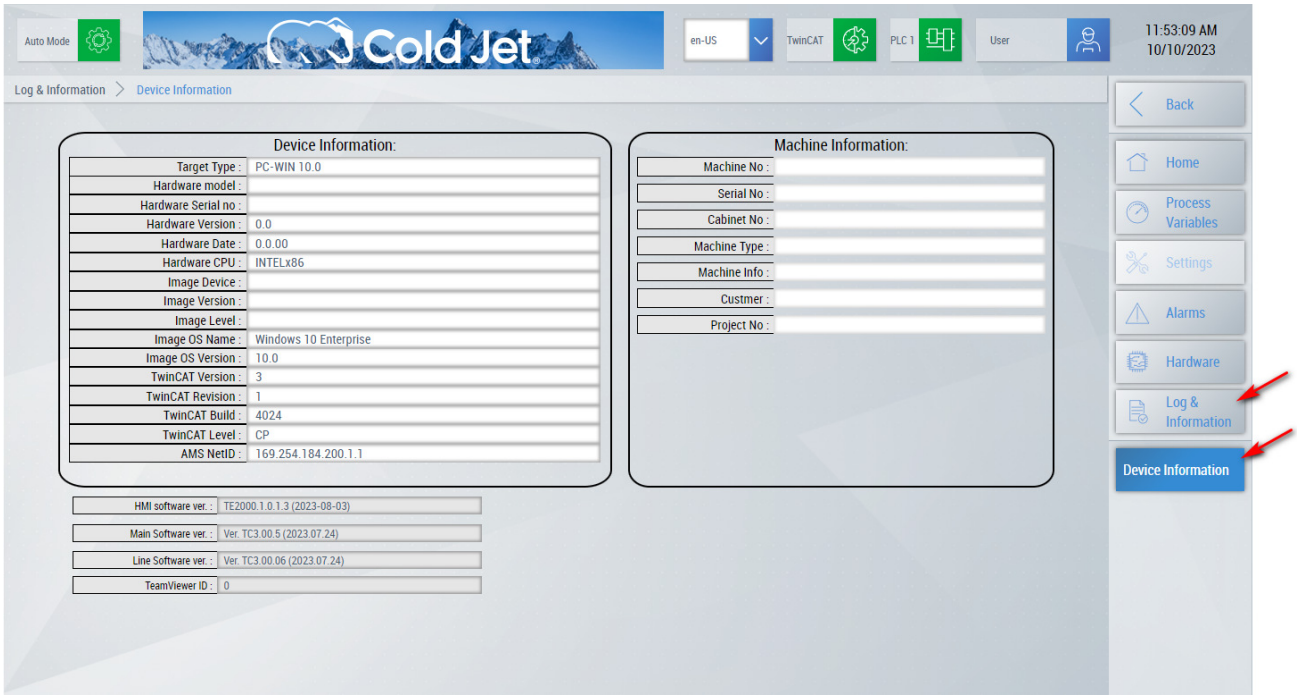
On the log page, users can access information about the system's start and stop times, as well as other messages.




| | Batch | Day Start | Time Start | Time Stop | Produced | Msg | Stage G01 |
|---|---|---|---|---|---|---|---|
| 1 | 344 | 2023-08-23 | 13:35:14 | 13:35:14 | | Alarm , fbG01.fbG01.fbG1_M3 | G01=S0100, G02=S0120 |
| 2 | 343 | 2023-08-23 | 13:33:07 | 13:34:24 | | Alarm , fbG01.fbG01.fbG1_M3 | G01=S1620, G02=OA04_Produktion |
| 3 | 342 | 2023-08-23 | 13:24:22 | 13:32:49 | | Alarm , fbG01.fbG01.fbG1_M3 | G01=S1630, G02=S1400 |
| 4 | 341 | 2023-08-23 | 13:08:02 | 13:15:47 | | User Input | |
| 5 | 340 | 2023-08-23 | 13:05:35 | 13:06:18 | | User Input | |
| 6 | 339 | 2023-08-23 | 13:03:03 | 13:05:10 | | Max_PurgeTime , fbG01.fbG02 | G01=S0410, G02=S0500 |
| 7 | 338 | 2023-08-22 | 13:22:43 | | | | |
| 8 | 337 | 2023-08-22 | 13:22:19 | 13:22:25 | | User Input | |
| 9 | 336 | 2023-08-22 | 13:20:05 | 13:20:13 | | User Input | |
| 10 | 335 | 2023-08-22 | 13:18:28 | | | | |
| 11 | 334 | 2023-08-22 | 13:17:09 | 13:17:15 | | PV_Less_Than_SP , fbCA01.fbTP2 | G01=S0200, G02=S2500 |
| 12 | 333 | 2023-08-22 | 13:16:35 | 13:16:41 | | User Input | |
| 13 | 332 | 2023-08-22 | 13:11:38 | 13:11:44 | | User Input | |
| 14 | 331 | 2023-08-22 | 13:11:19 | 13:11:26 | | User Input | |
| 15 | 330 | 2023-08-22 | 13:09:20 | 13:09:20 | | Alarm , fbG01.fbG01.fbG1_M3 | G01=S0100, G02=S0100 |
| 16 | 329 | 2023-08-22 | 13:08:54 | 13:08:54 | | PV_Less_Than_SP , fbCA01.fbTP1 | G01=S0100, G02=S0100 |
| 17 | 328 | 2023-08-22 | 13:03:32 | 13:03:37 | | Max_ActionTime , fbG01.fbW01.fbQ1 | G01=S0140, G02=S0140 |
| 18 | 327 | 2023-08-03 | 19:33:56 | 19:45:02 | | | |
| 19 | 326 | 2023-08-03 | 19:33:45 | 19:33:51 | | | |
| 20 | 325 | 2023-08-03 | 19:33:38 | 19:33:44 | | | |
| 21 | 324 | 2023-08-03 | 19:33:24 | 19:33:38 | | | |
| 22 | 323 | 2023-08-03 | 19:31:05 | 19:33:17 | | | |
| 23 | 322 | 2023-08-03 | 19:30:09 | 19:31:03 | | | |

## Device Information

On the Device Information page, users can access various details about the device/ CPU, and machine information. Additionally, the Teamviewer ID is also displayed and software versions.



## REPAIR AND WARRANTY

**Repair**
The repair/replacement of the following parts must be made by qualified personnel:

- Filter for the liquid $CO_2$.
- Degassing filter.
- Processing unit.

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

## MAINTENANCE

Inspections to be carried out weekly:

**Degassing system:**
Check the degassing system. Check the degassing for snow particles at the CO2 outlet (can only be done when dry ice is being produced)
Snow particles at the CO2 outlet indicate that the degassing filter is damaged. Replace the filter and gasket as described under in this manual.
Inspections to be carried out every 400 hours / 3 months.

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

**TERMS 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 their disposal.

The liability of the manufacturer under the terms of the CE endorsement as regards to 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.

**Cleaning the machine**

The following steps are necessary when the DS500E or DS1000E needs to be cleaned.

- Disconnect the power.
- Protect all electronic equipment.
- Protect the holes at the bottom of the machine.

All surfaces can be cleaned with a degreaser and acid-free oil. If the bottom of the machine contains water this can be swiped up.

If cleaing with high pressure measures should be taken to ensure that components does not take damage, with lower pressure, distance to the machine or other preventive measures.


Cold Jet
the force of nature

## INSTRUCTION – UNPACKING AND PREPARATIONS BEFORE INSTALLATION

Your new machine has been assembled as one unit. In order to avoid damages during transport, the machine has been bolted onto the transport pallet.

**Unpacking and Examination for Transport Damages**

1. Examine the shipping container for any damages that may have occurred during transport.
2. Remove the machine, box(es) that contain accessories, and discard packing material, braces, and ties.
3. Examine the machine for any external damage that may have occurred during transport.
4. Open the cabinet doors of the machine and examine the machine for any internal damage that may have occurred during transport.
5. Open the front cabinet door and locate the box on the machine floor containing user documentation, optional spare parts kit(s), and other accessories.

**Requirements on the Environment Surrounding the direct slice machines**

- The DS500E and DS1000E must be sheltered from wind and weather.
- The ambient temperature must be min. +5°C (+41°F).

**How to Lift/Transport the PR750H**

Drawing no. A1

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 (refer to "Figure 1: Transporting and Lifting the Machine."). please give extra attention to the bottom part of the machine, as the truck can damage the machine if the forklifts fork hit the tube or the pressure unit output.

- Always lift the PR750H according to the lifting Instructions in this manual.
- Lifting over people and animals is prohibited.
- Always use a forklift truck to transport the DS500E or DS1000E.
- Transport the machine upright.
- Make sure that the forks are long enough to fully engage the DS500E or the DS1000E.
- Always check that the forks are adjusted to proper width to not hit the tube or the pressure units below when lifting.

**Floor Characteristics and Minimum Clear Distances**

Drawing no. A2

- The DS500E or the DS1000E must be placed on a horizontal concrete floor with an adequate load-carrying capacity, free from crack formation and suitable for bolting the DS500E or the DS1000E to it.
- The minimum clear distances must be observed to provide sufficient space for opening the cabinet doors and servicing.

**Preinstallation**

Before the pelletizer can be installed, the owner/operator must prepare the site for installation and operation. It is the owner's responsibility to verify that all the necessary preparations have been made for the installation site and meet the specifications and guidelines detailed in the appendix: Pre-Installation Guidelines & Checklist. This may include but is not limited to:

- Providing an indoor space with standard industrial flooring.
- Installing a liquid CO2 tank and supply pipeline system up to the connection point at the pelletizer.
- Installing a gaseous CO2 exhaust pipeline from the pelletizer to vent at a safe position.
- Installing a power supply that is sufficient and up to code.
- Providing proper room ventilation and other CO2 safety measures.
- Determine which options and other manufacturing accessories to add/prepare for maximizing production performance and capabilities.

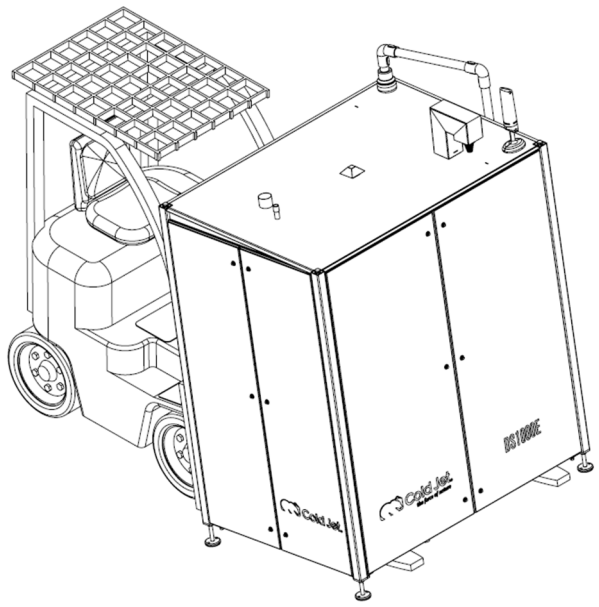
The owner is responsible for transmitting the specifications in this publication to other third-party contractors involved in pre-installation preparations of the site. Failure to properly prepare the site may delay the installation and/or optimal performance of the pelletizer. The graphics used in this manual may show pelletizer details and installation components that may be different than what is actually used. Components may have been removed for illustrative purposes or the continuing improvement of the pelletizer's design may cause changes that are not included in this publication.

**Installation of the machine**

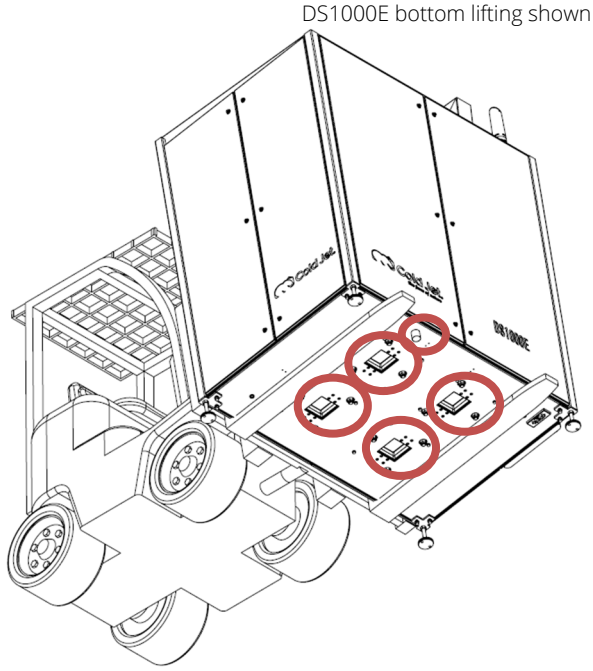
The installation of the DS500E or DS1000E must be carried out by a Cold Jet service technician, or by a technician approved by Cold Jet. In most cases integration is needed to properly function with the conveyer below the machine.

**DRAWING No. A1**

DS1000E shown



DS1000E bottom lifting shown

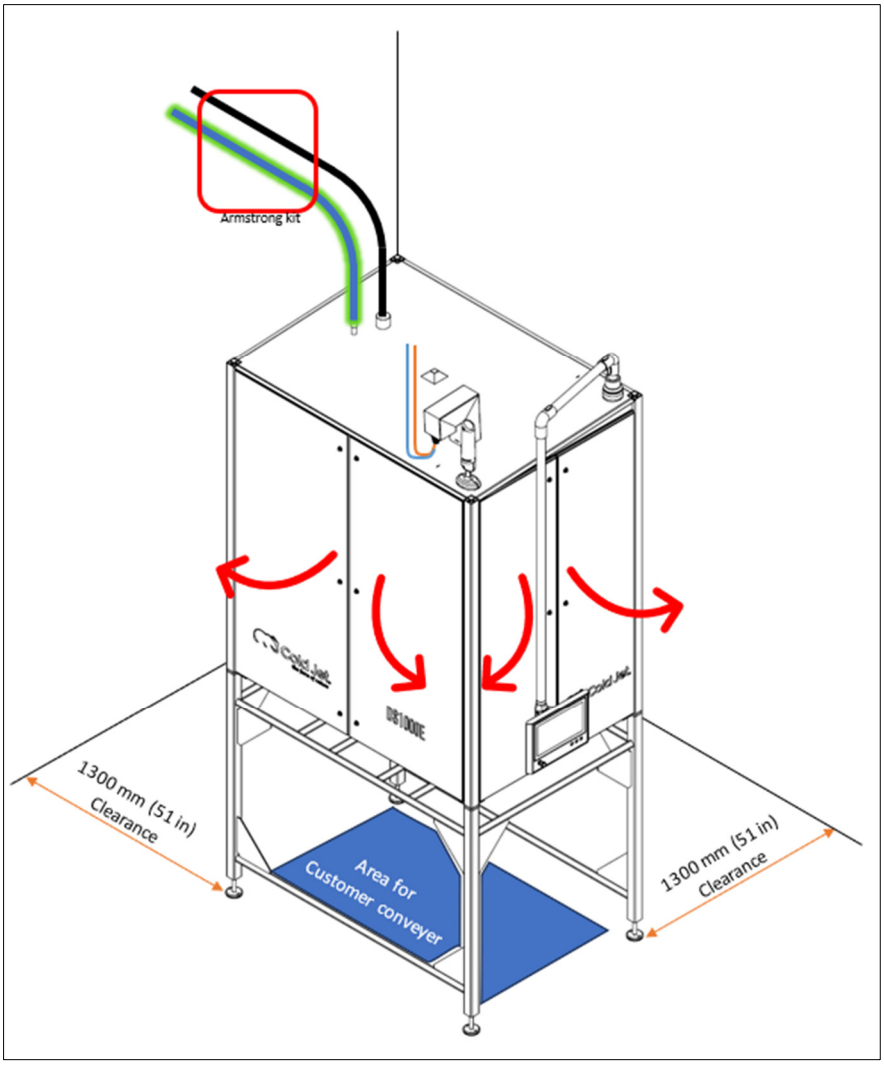


**Correct Handling of a DS500E or DS1000E**

| Forklift Requirements | DS500E | DS1000E |
|---|---|---|
| Load Capacity | 2000 kg (4409 lb.) | 2500 kg (5512 lb.) |
| Fork Length (Minimum) | 2 m (79 in) | 2 m (79 in) |

Use a forklift to move the DS machines. Beaware of the output holes below, as the forklift should NOT lift on these spots. On DRAWING No. A1 these are maked with red.

**DRAWING No. A2**




**End of life for the machine**

When the DS500E or DS1000E is at the end of its life, the following steps are required.

- Disconnect the power
- Disconnect the $CO^2$ in
- Disconnect the remaining connections

The materials must be disposed of according to the jurisdictional rules and regulations for proper disposal.