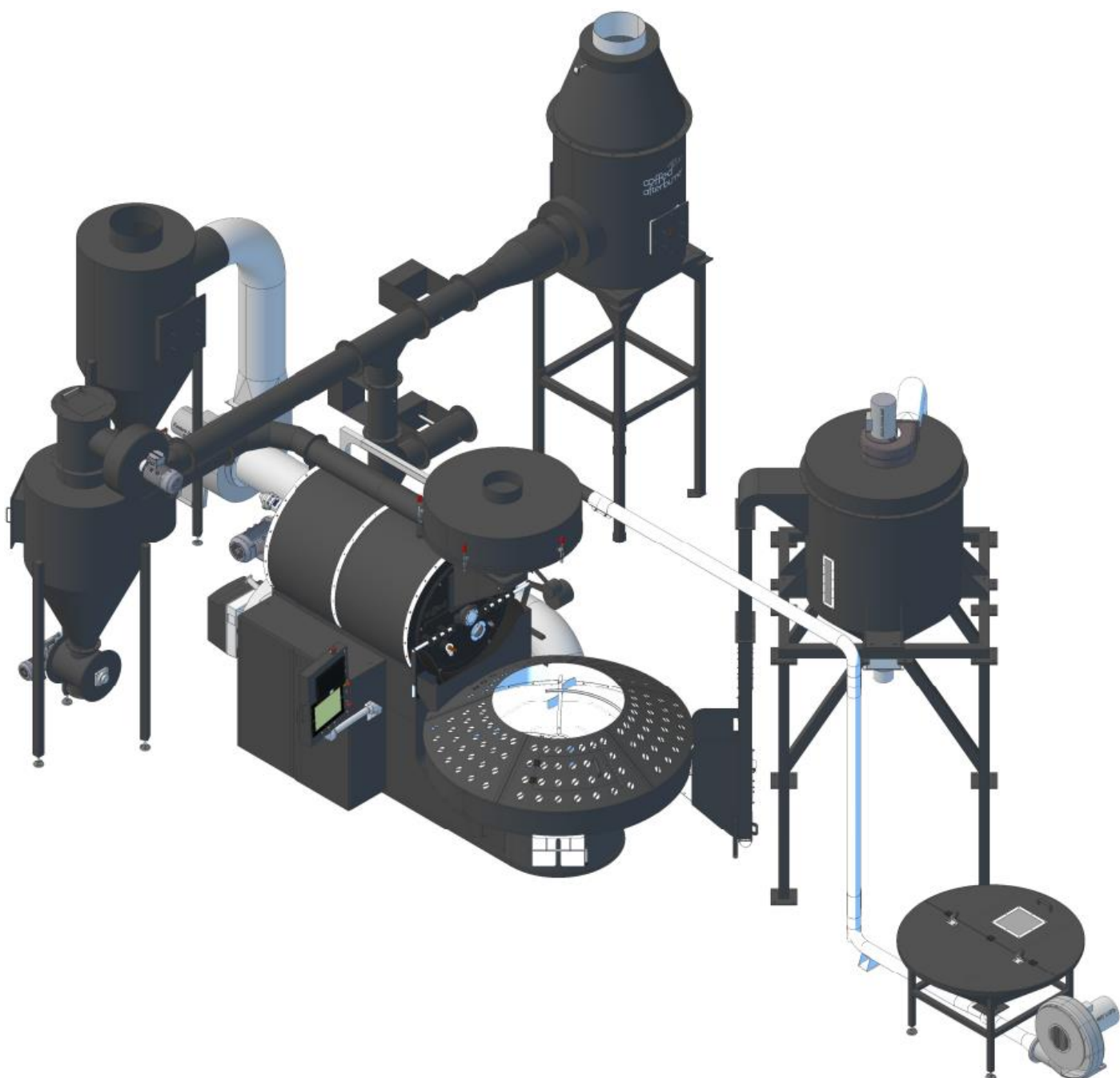




SR 120 Coffee roasting line

Operation Manual



CERTIFICATE OF MANUFACTURE CONFORMITY



Coffed Sp. z o. o., ul. Gliniana 2, 64-920 Piła PL

hereby confirms that the:

Coffee roasting line:

Type: SR120

is in conformity with the following European directives and standards::

- Machinery directive **MD 2006/42/EC**,
- Electromagnetic compatibility directive **EMC 2014/30 / EC**
- Gas Appliances Regulation **GAR 2016/426/UE**

What is equivalent with fulfilling the following standards:

1. PN-EN ISO 12100:2012
2. PN-EN 349+A1:2010
3. PN-EN 60204-1:2010
4. PN-EN 125:2012

And that it has been manufactured according to the technical documentation stored by Coffed Sp. z o. o..

Piła Poland, Coffed sp. z o.o.

A handwritten signature in blue ink that reads "Damian Elcessor". The signature is written in a cursive style.

.....
(Damian Elcessor – Coffed owner)

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1. GENERAL INFORMATION

1.1 Information about the operation manual

This manual is an integral part of the equipment and it needs to be stored in the place where the equipment is being used. The persons installing, providing maintenance, cleaning or using the equipment should have constant access to the manual. The manual should be used by qualified personnel only. The knowledge of and compliance with all safety and operating instructions is essential for safe and proper operation of the equipment. In addition, when using the equipment all the local regulations regarding health and safety precautions should be observed.

1.2 Liability and warranty

Personal injury or property damage liabilities and warranty claims are void if they occur as a result of:

- misuse of the equipment
- wrong installation, commissioning, start-up, maintenance or handling of the equipment
- use of the equipment with damaged or faulty functioning of the protective and safety appliances
- not abiding to the precautions in the manual
- making unauthorized changes (including construction changes) in the equipment
- installing additional parts that have not been tested and authorized by Coffed
- making changes in the gas burner that modify the burner manufacturers - set creation of the flame
- insufficient control of the elements, that can wear
- unprofessional repairs
- using the equipment despite being faulty
- using inappropriate fuel
- defects of the power cords that are not a part of the equipment
- using parts that are not original parts supplied by Coffed

1.3 Safety precautions while operating the equipment

The data referring to the safety of operation are in relation to European Union legislation that was in effect at the date of the equipment's production. If the equipment is used in industrial conditions, the user is obliged to check the accordance of the recommended safety measures with the current regulations and to comply to the newest rules.

If the equipment is used outside the European Union, the user should abide to the health and safety regulations of the place where the equipment is installed. The specific environmental guidelines also need to be respected.

Warning!

- **The equipment is not designed to be used by persons (including children) with manual, sensory or mental limitations and by persons without the necessary experience and knowledge.**
- **The equipment can be used by the above-mentioned persons only under supervision of a qualified and trained person that is responsible for their safety, and has given them all the necessary guidelines how to use the equipment.**
- **Children need to be under strict supervision, to ensure that they are not playing with the equipment**
- **This manual needs to be carefully stored. In an event of sharing the machine with other people, the manual needs also to be shared.**
- **All of the users must abide to the rules and information included in this manual and also to the occupational health and safety regulations.**
- **The equipment is designed to be used in closed spaces only.**

1.4 Intended use

The equipment is working safely only when it is used for its designed purpose.




The SR120 coffee roasting line is designed for coffee roasting only and it is forbidden to use it to process other products. During the roasting process green coffee beans are roasted, the final product are roasted coffee beans.

Warning!

- **Using the equipment to process products other than green coffee beans is prohibited and it will be recognized as using the equipment not for its designed purpose.**
- **Using the equipment not for its designed purpose excludes all the liability claims against the equipment manufacturer.**
- **The user is solely responsible for the damages and injuries that occurred during the use of the equipment not for its designed purpose.**

1.5 Hazard indication symbols on the machine

The following symbols are located on the device in the places where the hazard can occur:

N o	Symbol	Description
1		High voltage – it is prohibited to open the marked door without disconnecting the machine from electricity.
2		Hot surface – it is prohibited to touch the marked surface, when the machine is working and immediately after switching off the machine.
3		Automatic start – extreme caution is advised, as the marked elements might start to move without prior warning.

2. INSTALLATION AND COMMISSIONING

2.1. General characteristics of the equipment

The SR120 coffee roasting line has the following parameters:

Efficiency:	up to 480kg of green coffee per hour
Roasting time:	8 – 20 min per batch
Batch size:	60 - 120kg of green coffee

The line needs gas, electric and compressed air supplies in order to work properly, the requirements for the lines:

Fuel:	LPG/G-50 natural gas
Gas pressure:	20 – 50mbar (optimally 37)
Gas line diameter:	1 inch ??????????
Electric voltage:	3 x 400VAC 50Hz / 60Hz
Electric connection type:	3L+N+PE
Maximum power consumption:	32A
Compressed air requirement:	7,5bar of stable pressure

Compressed air line diameter:	10mm
Exhaust chimney diameter:	400mm
Total weight:	4000kg
Space required:	60 m²
Ceiling height:	5m

2.2 Technical description

The SR120 coffee roasting line consists of the following elements:

1. Coffee Roaster

1A. Cooling bin (integrated with the roaster)

2. Control panel

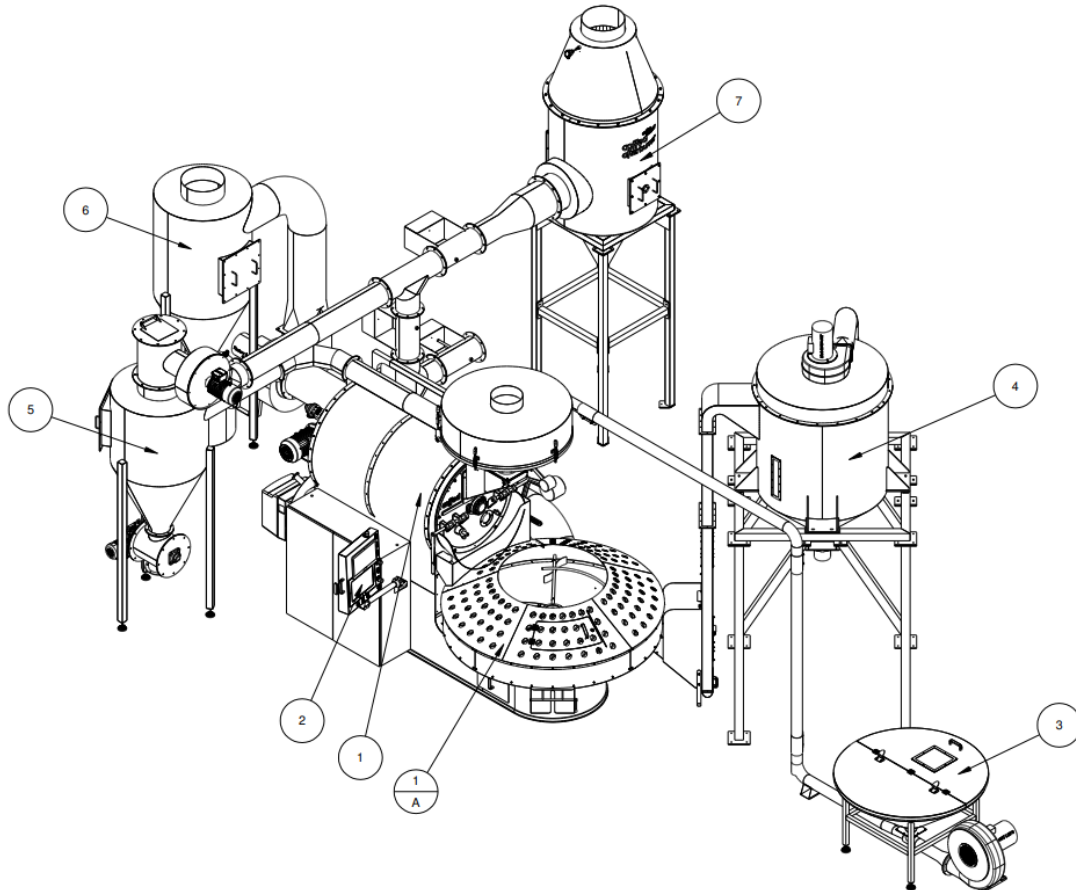
3. Pneumatic green coffee loader

4. Destoner

5. Hot air cyclone

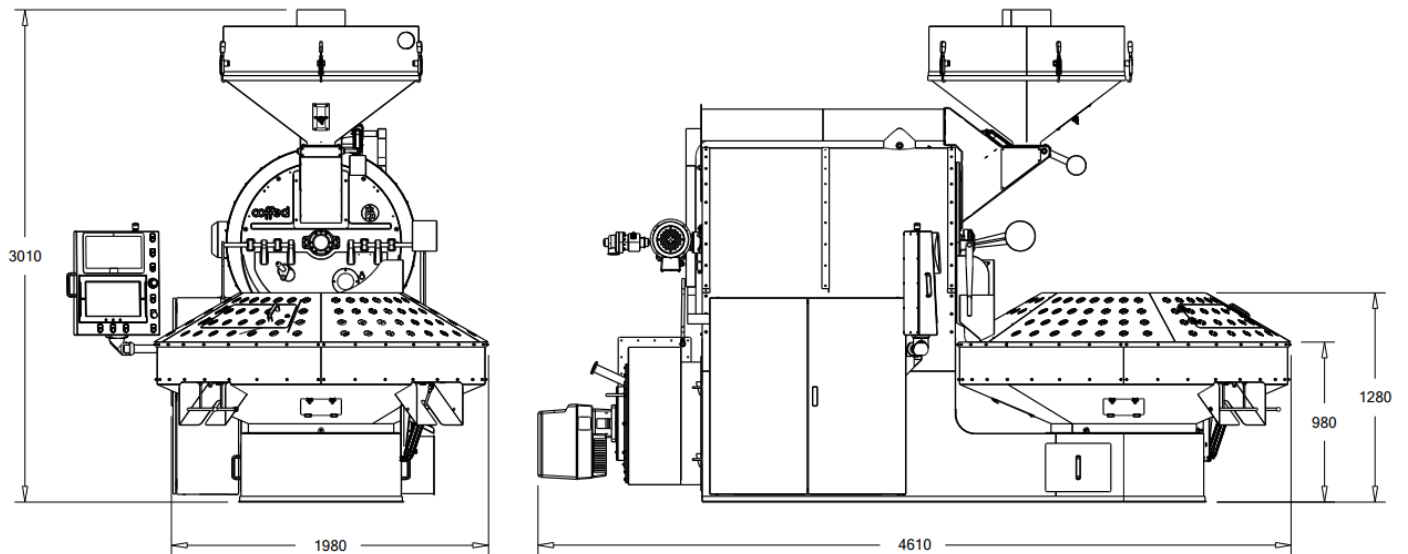
6. Cold air cyclone

7. Afterburner



Pic.1 SR120 coffee roasting line general overview

2.2.1 Roaster with cooling bin



Pic.2 Roaster with cooling bin overview

This is the main part of the SR120 coffee roasting line. Green (raw) coffee is processed inside of the roaster. The beans are poured into a metal drum revolving above a gas burner and heated to a certain temperature (ca. 200°C). In the result of the process roasted coffee beans are produced (the main product), a significant amount of coffee chaff is also released and drawn out of the drum through the exhaust system.

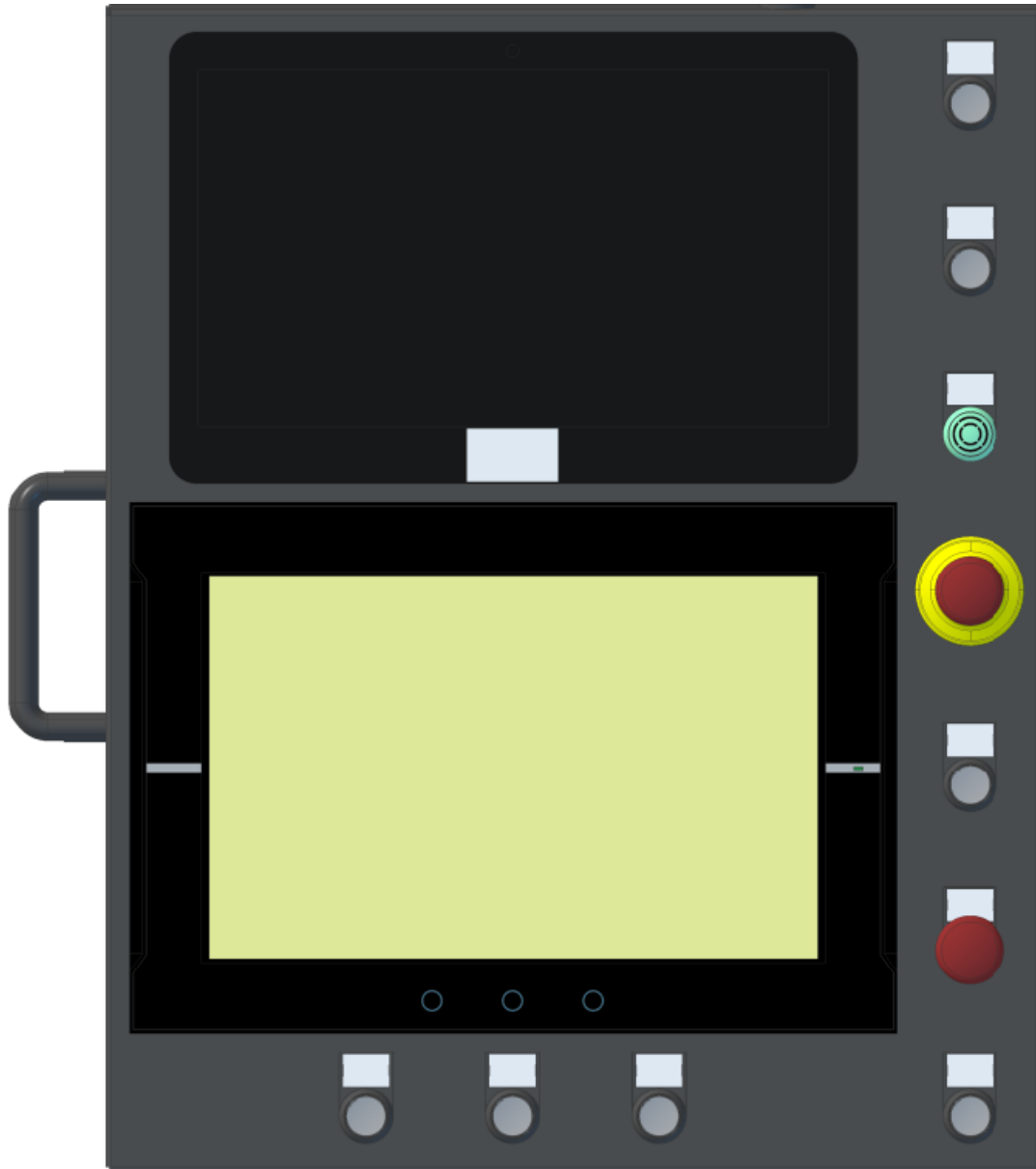
All the media connections (electricity, gas, compressed air) are located at the back of the roaster. The media need to be connected before starting to work with the machine.

The integrated cooling bin is used to rapidly cool down the coffee immediately after finishing the roasting process. The cooling bin is equipped with a separate fan to suck out the hot air and stirring arms, that ensure the coffee is evenly cooled.

Measurements:

Height: 3010mm
Width: 1980mm
Length: 4610mm
Weight: 4000kg

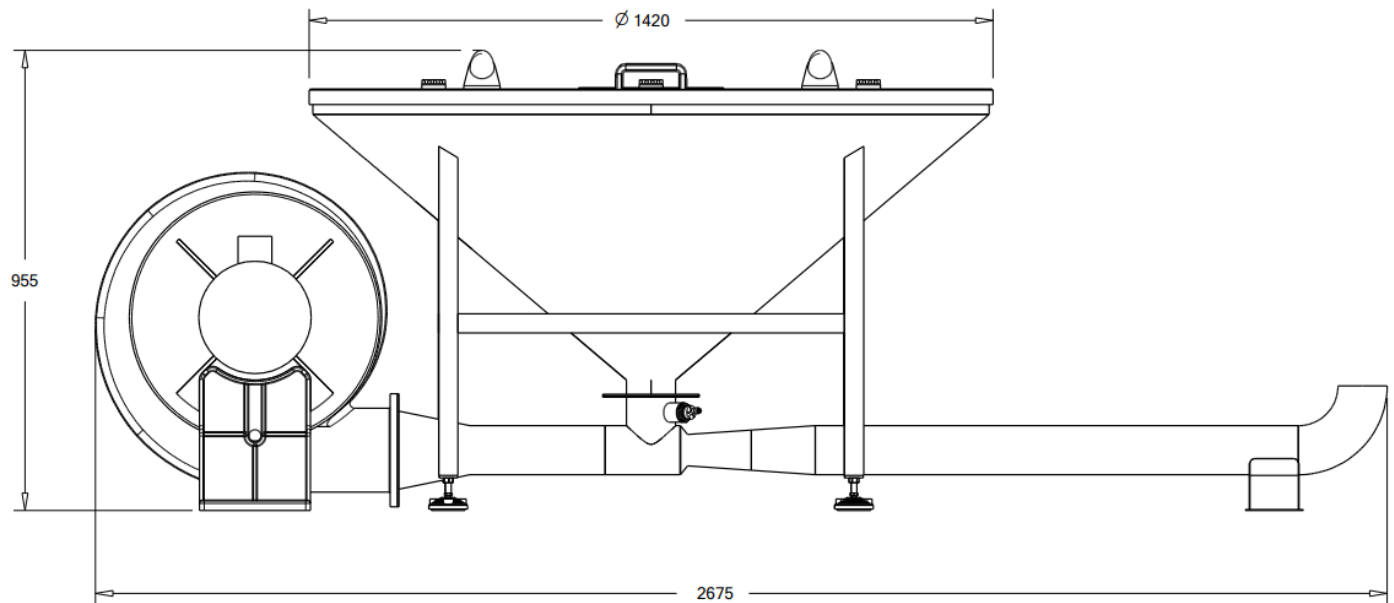
2.2.2. Control panel:



Pic.3 Control panel overview

The control panel is equipped with a 15 inch touchscreen and 15,6 inch computer, that enables the operator to control all the functions of the roasting line. The installed software and PLC enable automatic roasting mode, profiling and recipe storage

2.2.3. Pneumatic green coffee loader



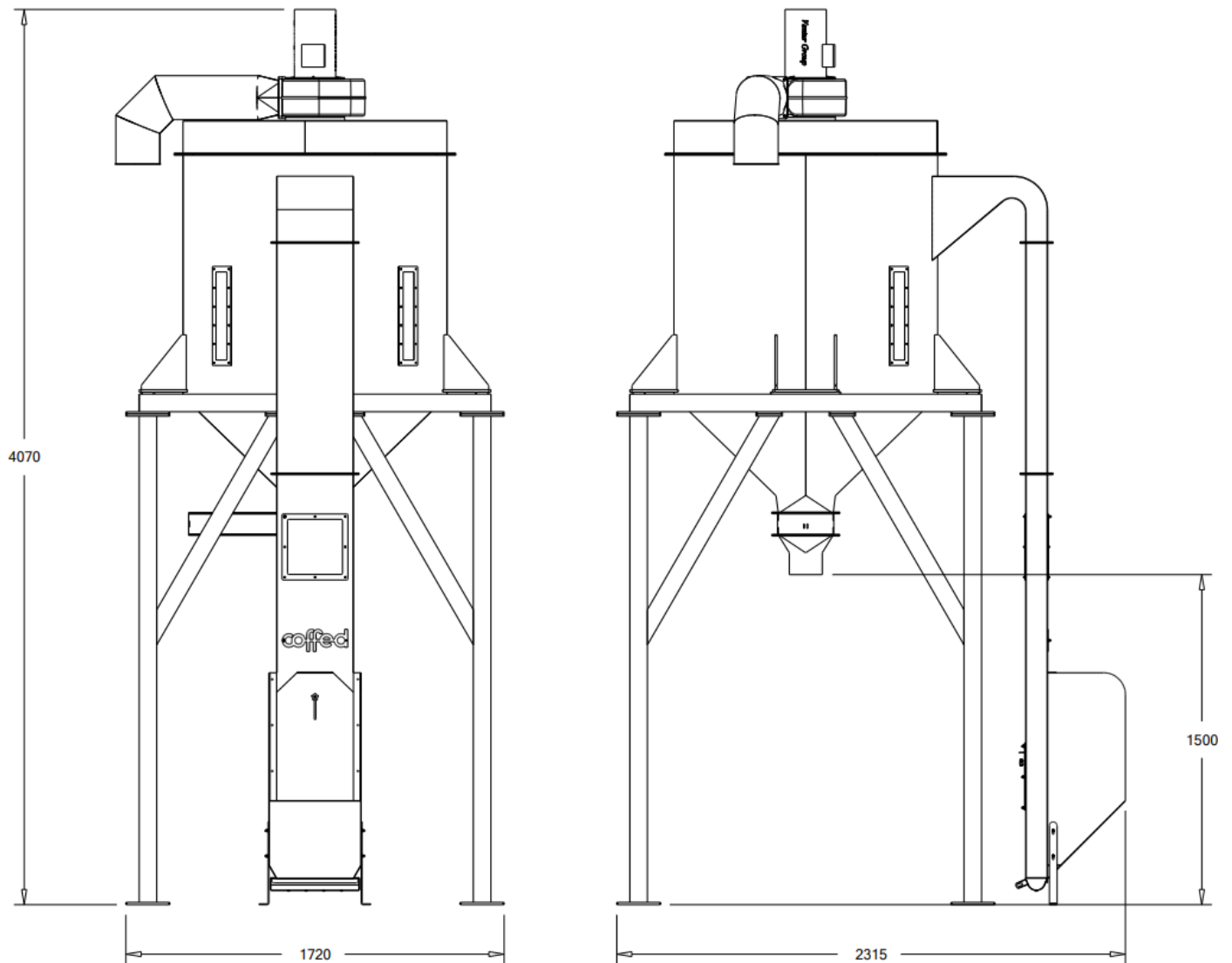
Pic.4 Pneumatic green coffee loader overview

The pneumatic green coffee loader is used to push coffee into the loading hopper located on the top of the roaster. It consists of a cone shaped hopper standing on the floor, a fan and stainless steel pipes that connect it to the top hopper.

Measurements:

Height: 955mm
Length: 2675mm
Weight: 150kg

2.2.4. Destoner



Pic.5 Destoner overview

The destoner gravitationally separates stones from the roasted coffee. Stones are present in the roasted coffee due to the green coffee production process. The appliance is made out of stainless steel. It consists of a roasted coffee hopper, under which is a basket used to collect stones and a roasted coffee silo. The coffee is sucked into the silo thanks to the drag induced by the top fan.

Measurements:

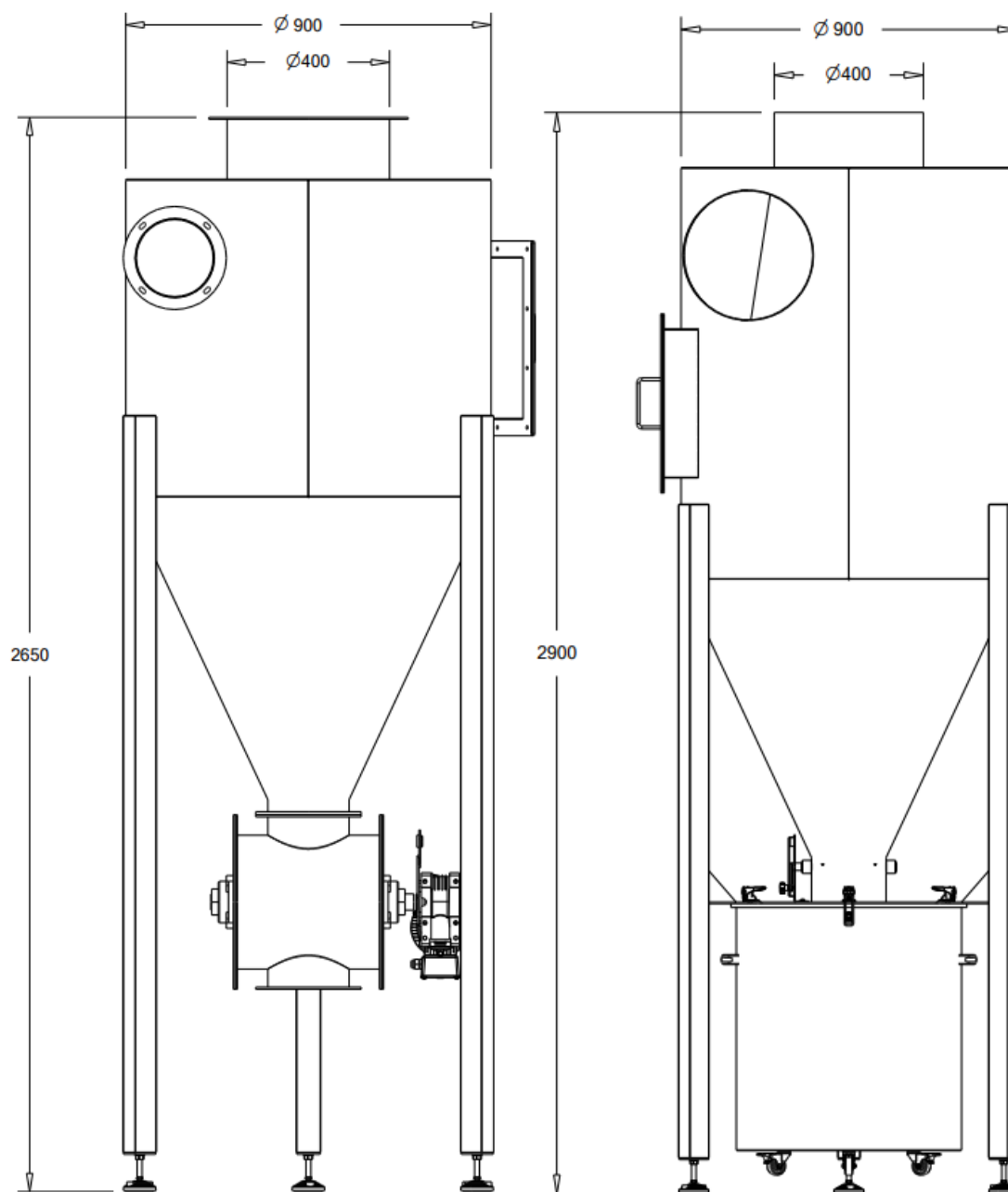
Height: 4070mm

Width: 1720mm

Length: 2315mm

Weight: 280kg

2.2.5. Chaff cyclones



Pic.6 Chaff hot and cold cyclones overview

The chaff cyclones which are connected with the roaster's exhaust system, separates the chaff from the exhaust fumes and collects it into a wheeled bin underneath it. The chaff can be then disposed of, and the fumes are directed into the chimney duct.

Measurements:

Height: 2650/2900mm

Width: 900/900mm

Weight: 200/200kg

2.3. Commissioning and connecting to the installations

The commissioning of the SR120 coffee roasting line usually takes place at the customer's premises, after COFFED technicians install and assemble the line. The coffee for the commissioning needs to be supplied by the final user, unless stated otherwise in the purchase agreement. The commissioning test encompasses a mechanic test (that checks all the mechanical parts and their controls) and a technological test. The technological test covers roasting one batch of green coffee under production conditions.

2.3.1. Electrical installation

The SR120 coffee roasting line is equipped with a five-wire main power cable (three phases, neutral and ground). The voltage is 400V, 50Hz / 60Hz, If the local regulations require electric measurements to be made, they need to be performed by authorized personnel with the necessary qualifications.

2.3.2. Gas installation

In order for the SR120 coffee roasting line to work properly, LPG or natural gas source needs to be connected. The gas train diameter is 1½ inch.

2.3.3. Exhaust installation

The final user is obliged to connect the SR120 coffee roasting line to an exhaust installation according to the guidelines provided by the line's manufacturer. An additional COx detector needs to be installed if the local regulations require that. The chimney diameter is 40cm.

2.3.4. Pneumatic installation

Compressed air needs to be connected to operate the SR120 coffee roasting line. The pneumatic installation should deliver at least 7.5 bar of constant, stable pressure. Quick fit connectors are used to connect the air, the diameter of the pipe is 10mm.

2.3.5. Start-up

After all the above media (points 2.3.1. – 2.3.4. are connected) the SR120 coffee roasting line can be started. The main power switch is located on the right side of the main electric cabinet.



Pic. 7 Main power switch

2.3.6. Drum gap setup

The delivered machine has the drum gap set up for roasting coffee.

A wrench used for setting up the gap between the drum and the front cast iron mold is delivered with the roaster (turning it right widens the gap, turning it left closes it). When the roaster is cold, and green coffee is poured into the drum, particles smaller than 2mm may fall underneath it. This should stop after the roaster is warmed up.

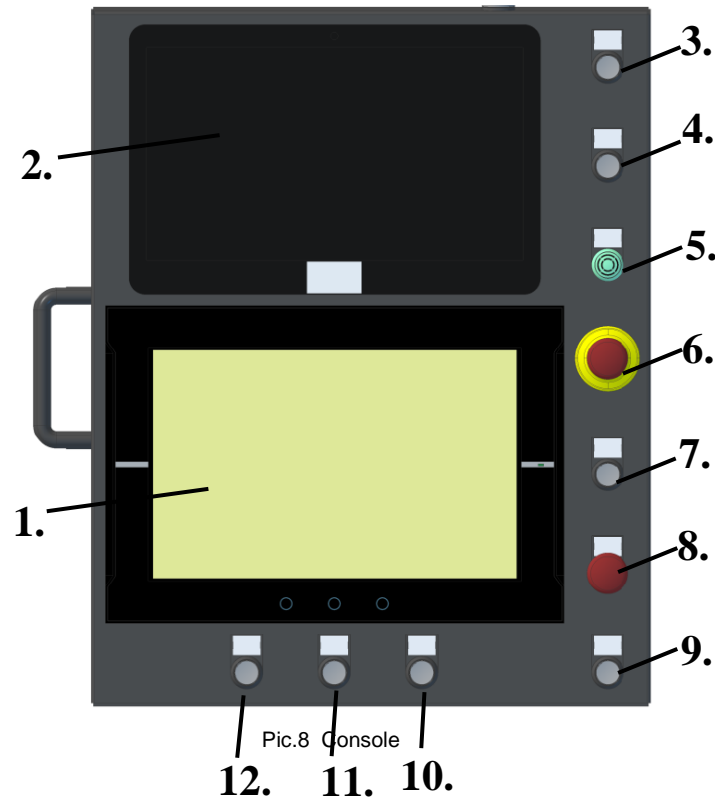
Warning!

The gap should not be smaller than 2mm when the roaster is cold, as it may result in damaging the transmission.

3. WORKFLOW DESCRIPTION

3.1. Control panel screens

The SR120 coffee roasting line is controlled via a control panel (pic.3). All of the control elements are located on the console (pic. 9). The functions and information regarding the operation and workflow of the machine are displayed on the 15 inch touch panel display using respective screens.



LEGEND:

1. TOUCH PANEL DISPLAY
2. PC
3. EMERGENCY DRUM OPENING
4. ERROR RESET
5. BUZZER
6. MAIN EMERGENCY SWITCH
7. SAFETY CIRCUIT RESET
8. COOLING BIN EMERGENCY SWITCH
9. WATER
10. STEER/DESTONER FLAP
11. DRUM OPEN
12. INLET FLAP

3.1.1. Start screen

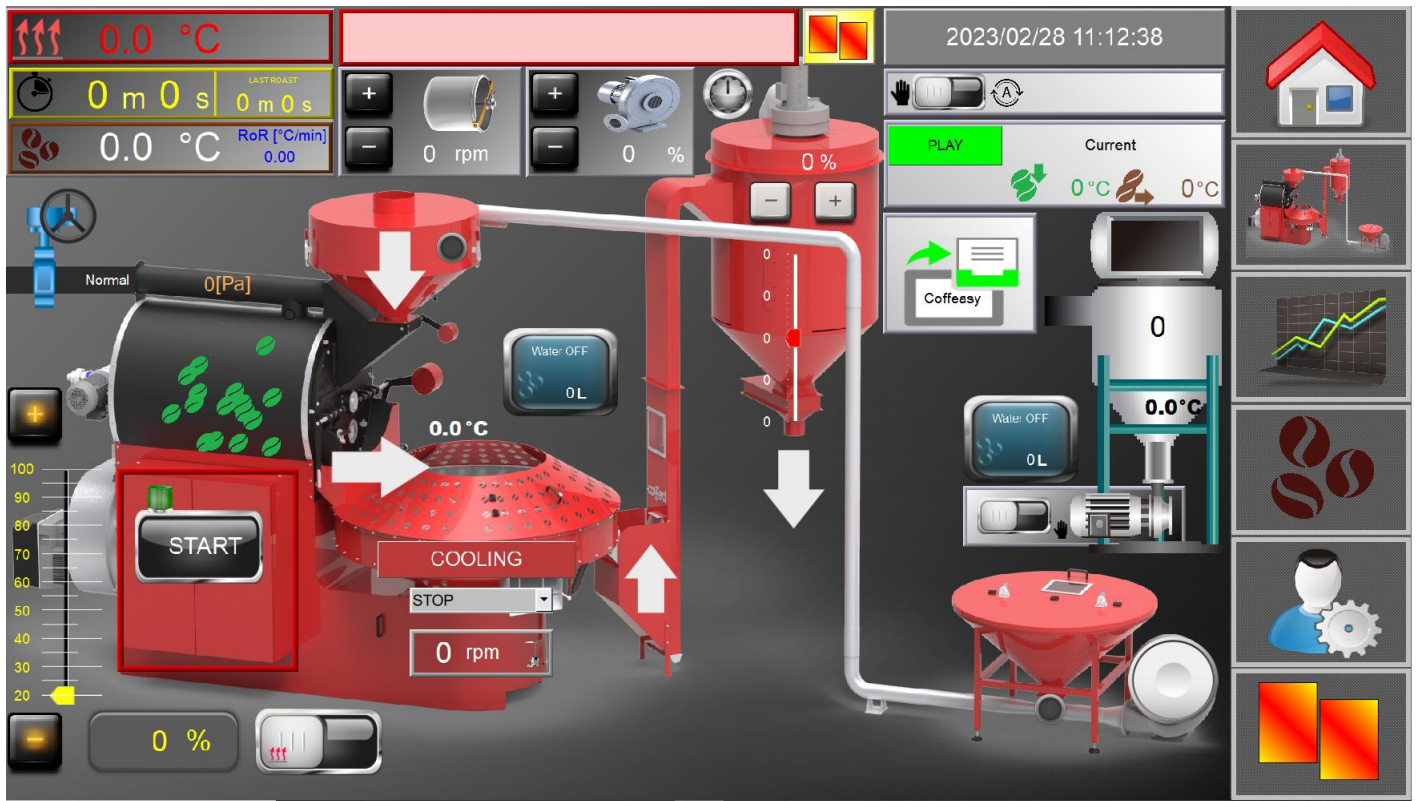


Pic.9 Start screen

The start screen is visible after turning the machine on. Description of the buttons:

- 1) Open page „Start page”
- 2) Open page „Roaster page”
- 3) Open page „Trends menu”
- 4) Open page „Recipes menu”
- 5) Open page “Main menu”
- 6) Open page „Errors”

3.1.2. Main page - roasting screen




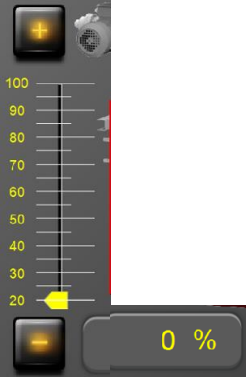







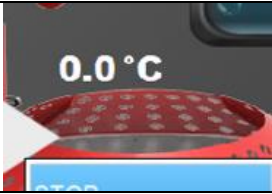


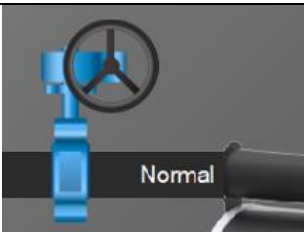

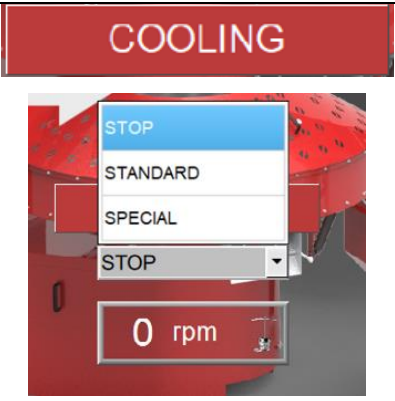

Pic.11 Roasting screen

The roasting screen allows the operator to control all the functions of the SR120 coffee roasting line in order to do the coffee roasting process. The displayed information include the status of the burner, motors, flaps and the work mode (manual automatic). The full roasting process can be carried out using this screen only.

The displayed information:

No.	Icon	Description / function
1.		Roasting mode selection. User can choose between manual or automatic mode.
2.		Exhaust temperature. Change from C to F by pressing the temperature unit.
3.		Coffee temperature. Change from C to F by pressing the temperature unit. Display place for RoR.
4.		Current and last roast time

5.		Recent errors with button for delete
6.		Drum motor speed adjustment
7.		Exhaust motor speed adjustment.
8.		Burner power controls. Power range 20%-100%. User can change the power with the + and - buttons
9.		Burner ON/OFF switch
10.		Inlet flap open/close + green coffee sensor
11.		Pressure in the exhaust
12.		Green coffee inside the drum

13.		Drum door open/closed
14.		Cooling bean temperature. Change from C to F by pressing the temperature unit
15.		Blinking arrow means that drum motor started work
16.		Pressure in the exhaust
17.		Control flap system. Tap valve for open control system for each exhaust flaps
18.		Tap water power button. The current value of the amount of water supplied to the drum
19.		<p>Cooling bin arms ON/OFF. Cooling bin arms revolutions per minute 7-12</p> <p>Choice of arms and cooling fan operation.</p> <p>STOP - the cooling fan does not start</p> <p>START - the cooling fan starts with the arm motor</p> <p>SPECIAL - the cooling fan starts, the arm motor works in intermittent mode</p>
20.		Start / stop switch. Drum and exhaust motor start simultaneously







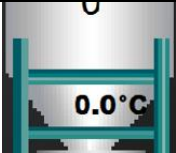

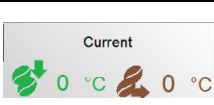



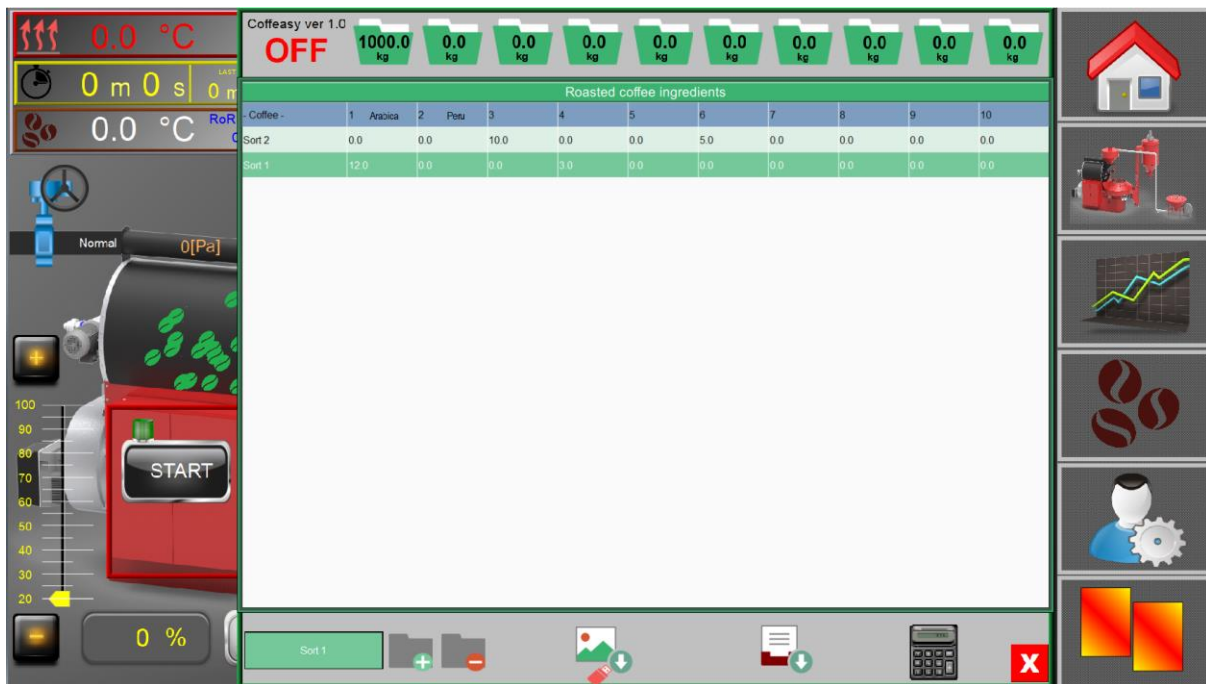
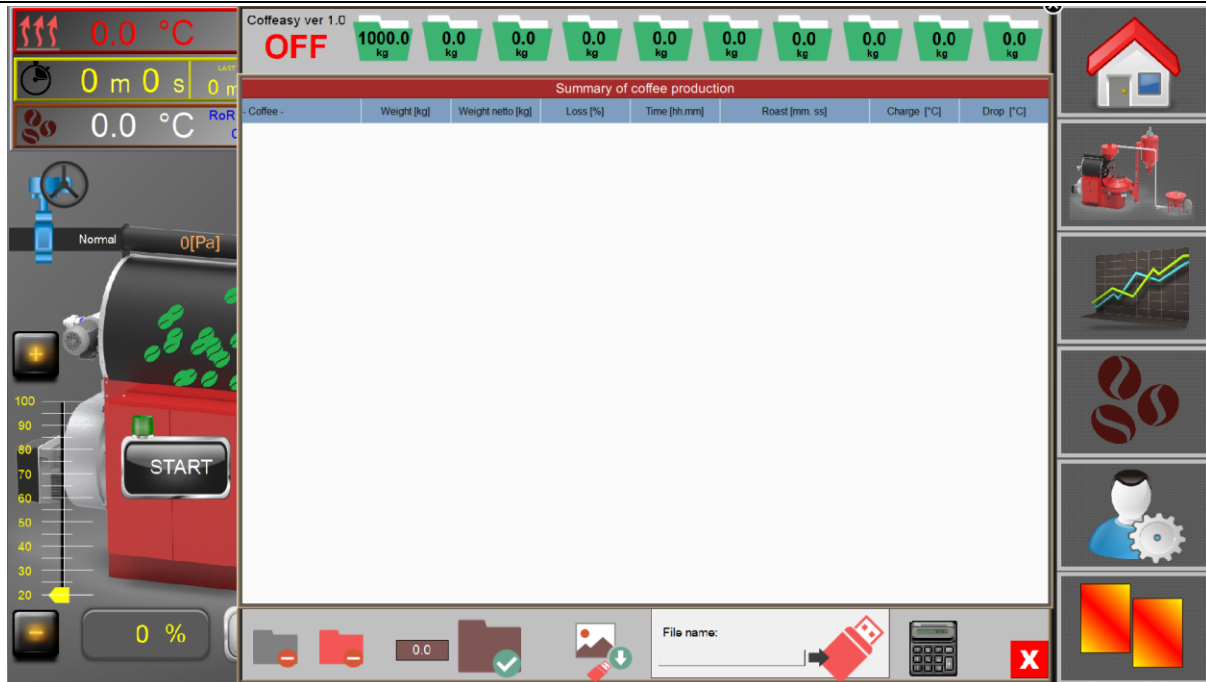
21.		Destoner on/off, cooling bin flap open/closed. Pulsating arrow indicates that the destoner is starting
22.		Destoner fan power controls. You can change the power with the + and - buttons
23.		Turn on/off lamp
24.		Turn on/off green coffee loader. Sensor show green if green coffee is in the loader
25.		Current date and hour
26.		Quantities of fillings in the cyclone. If the value is 0, then nothing will happen. On the data side of the values and when it is exceeded, the button and the lamp on the cyclone flash (values on the service screen)
27.		Temperature in the cyclon inside. Change from C to F by pressing the temperature unit.
28.		Recipe Recording / Recipe Playback
29.		Current selected recipe. 100C – example value of the temperature of the coffee pouring 150C - an example value of the temperature of coffee spout and opening of the drum flap
30.		Coffeeasy – coffee storage system. Explains below
31.		Cyclone water feed button. Current value of the water supplied to the cyclone.
32.		Chaff collecting valve

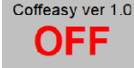
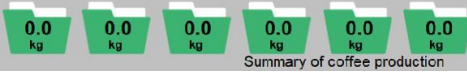








Table.1 Roaster controls functions list

COFFEASY

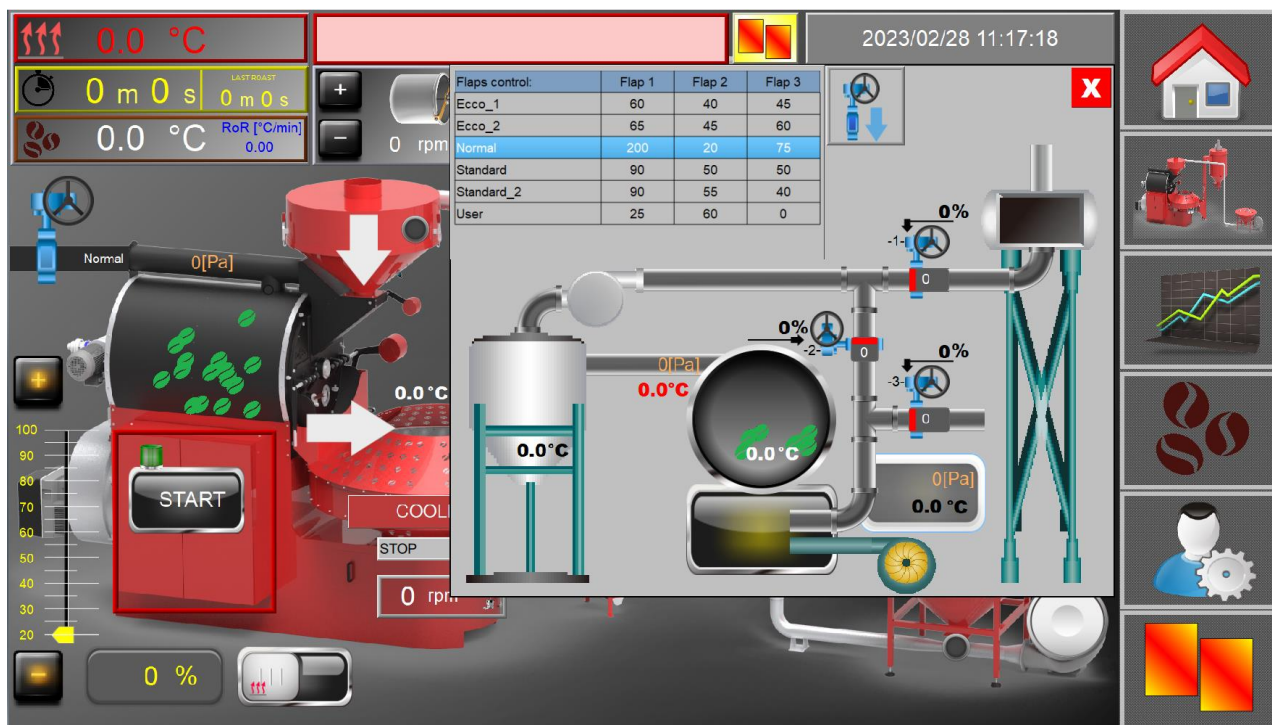


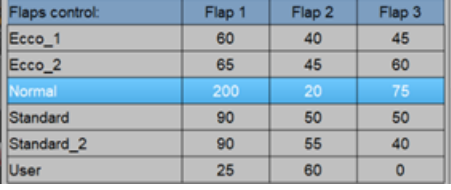
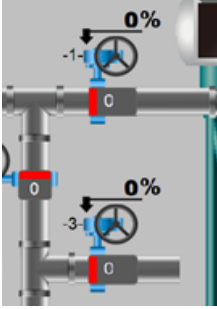

1.		On/off Coffeeasy storage system
2.		Green coffee storage values with individual bean names
3.		Roasted coffee ingredients
4.		Name of the new/selected list
5.		Add or Delete list
6.		Export raport to flash disk as a printscreen
7.		Go to summary of coffee production
8.		Calculator
9.		Exit



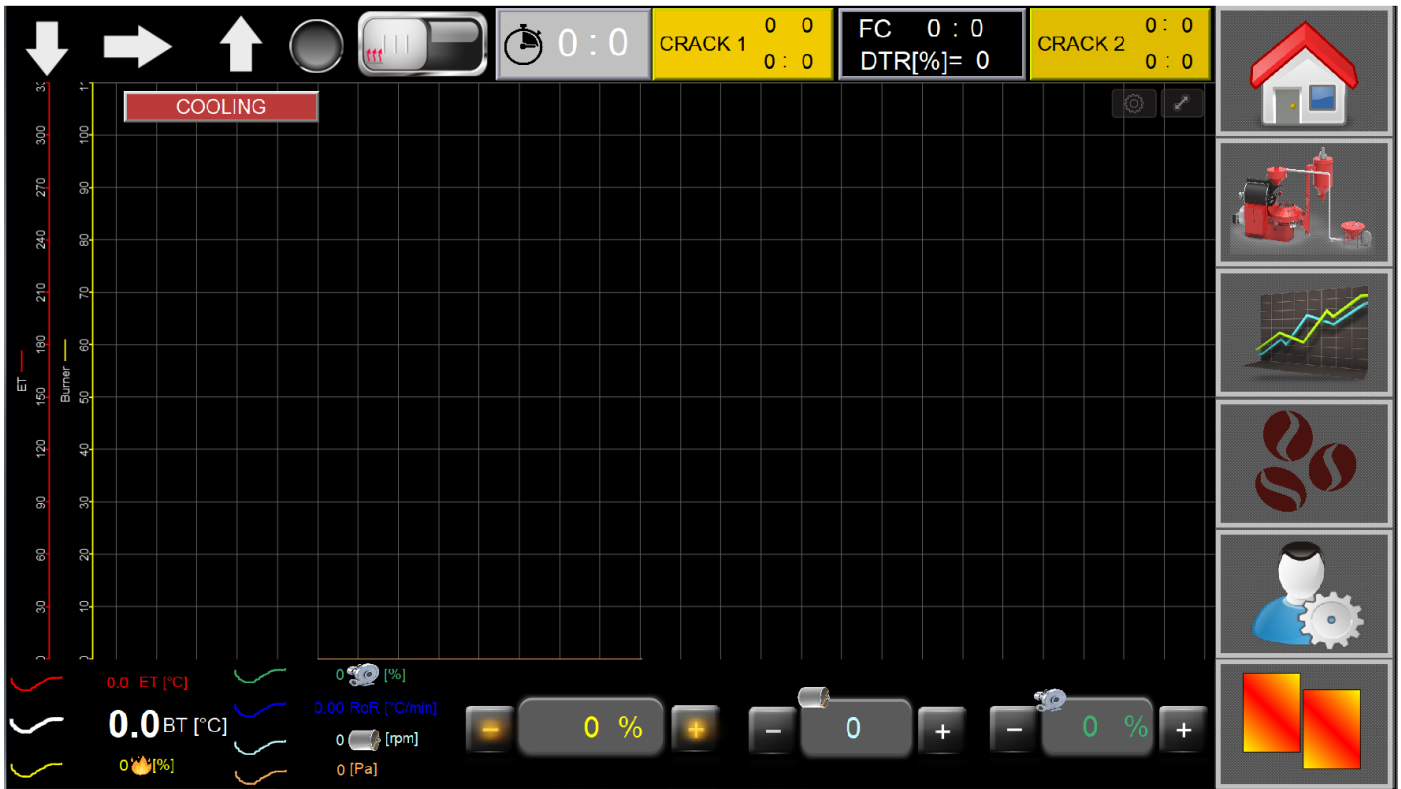
1.		On/off Coffeeasy storage system
2.		Green coffee storage values with individual bean names
3.		Reports from production
4.		Delete chosen report
5.		Delete whole reports
6.		Export report to flash disk as a printscreen
7.		Value of net weight coffee on chosen report. Accept for apply to the list
8.		Calculator
9.		Exit
10.		Export to excel format. Add to new name “.xlsx”

Flap control system



1.		On/off Coffeeasy storage system
2.		Control flap system for exhaust flow
3.		Temperatures on coffee roaster line

3.1.3. Roast charts screen



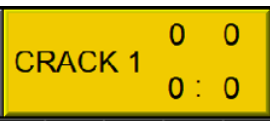
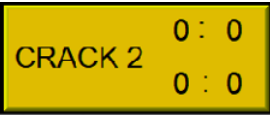
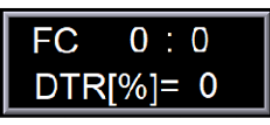

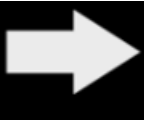





Pic.12 Roast charts screen

This screens enables to monitor the different parameters of the roasting process. The following data about the current roast is displayed in relation to the time that has passed since putting the green coffee into the drum:

No.	Line color	Parameter
1.	~~~~~	ET [C] Exhaust temperature
2.	~~~~~	BT [C] Coffee temperature
3.	~~~~~	Burner power [%]
4.	~~~~~	RoR [C/min]
5.	~~~~~	Exhaust fan power [%]
6.	~~~~~	Drum rotation [rpm]
7.	~~~~~	Air pressure [Pa]

Table.2 Roast chart parameters list

The following buttons, that allow to control the roasting proces are also on this screen

No.	Icon	Description / function
1.		Pressing this button for the first time, allows to indicate the start of the “first crack” phase on the chart, pressing it for the second time indicates the end of this phase.
2.		Pressing this button for the first time, allows to indicate the start of the “second crack” phase on the chart, pressing it for the second time indicates the end of this phase.
3.		Current FC and DTR value [%]
4.		Open/close hopper
5.		Open/close drum flap
6.		Start/stop destoner work
7.		Green coffee loader start/stop
8.		Burner on/off
9.		Current roast time
10.		Start/Stop cooler

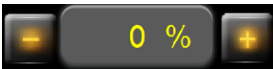
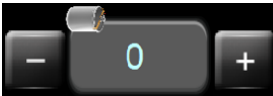


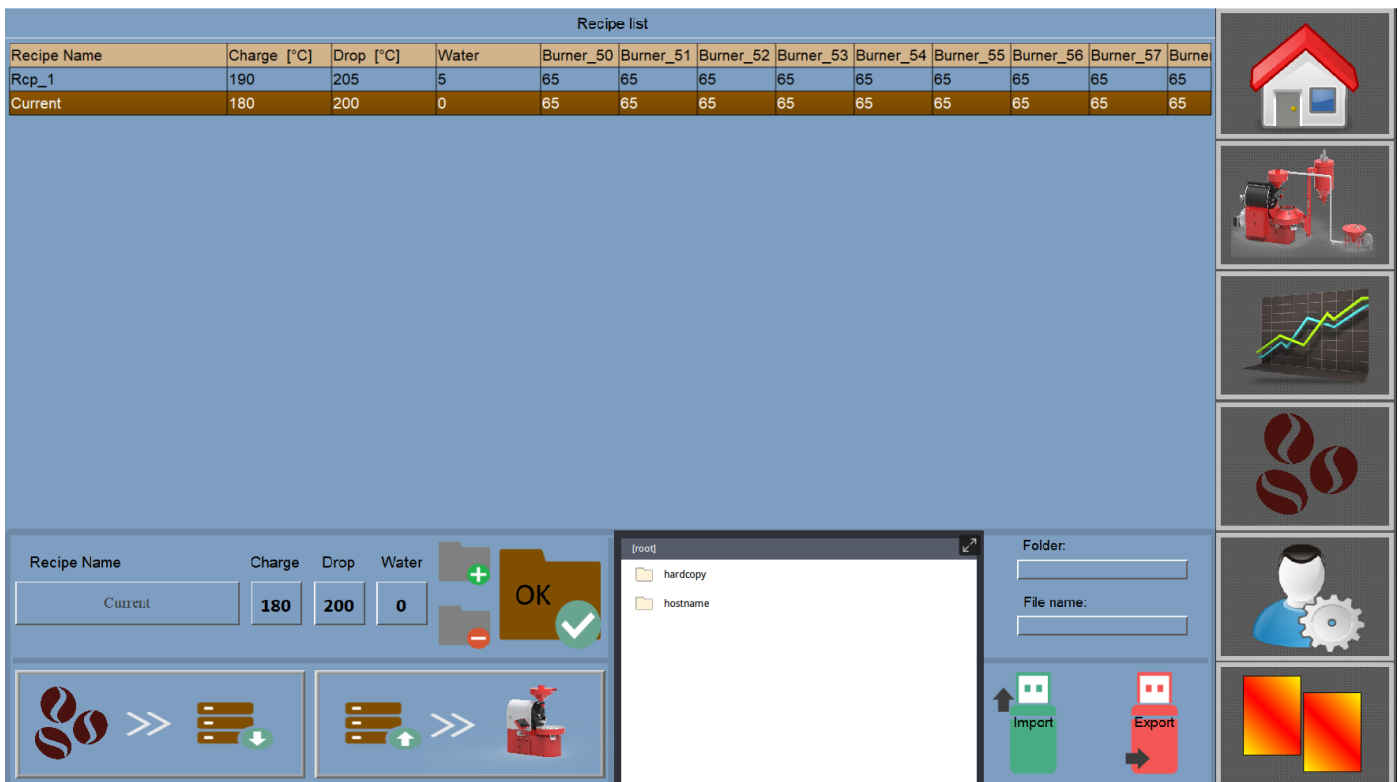
11.		<p>Burner power controls: Pressing the „+” increases the power by 1%, pressing the „-” decreases it by 1%</p>
12.		<p>Drum rotation controls: Pressing the „+” increases the power by 1%, pressing the „-” decreases it by 1%</p>
13.		<p>Exhaust fan power controls: Pressing the „+” increases the power by 1%, pressing the „-” decreases it by 1%</p>
14.		<p>Options for trends</p>

Table 3. Roast chart screen buttons list

3.1.4. Recipe selection and edition screen





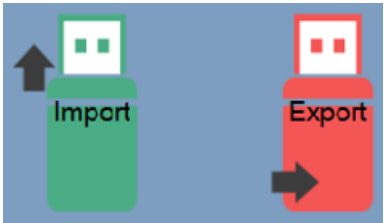

Pic.13 Recipe selection screen

The recipe selection screen allows the operator to select and view one of the previously saved recipes for the automatic roasting mode. The recipes are saved on the flash drive that needs to be connected to the control panel. The "Current_recipe" recipe cannot be deleted from the machine. This is

the recipe for which the current furnace settings are saved. Each recipe contains several parameters that are saved during operation:

- Recipe_name: editable recipe name which is displayed .
- Inlet: Value of the temperature of the coffee pouring into the drum.
- Outlet: The value of the temperature when the coffee is discharged from the drum, the drum lid opens.
- Water: The amount of water fed at the end of the roasting process.
- Spare1: Not used.
- BT_50C_Burner: Value of the burner power setting for 50C coffee temperature BT [C]. The coffee temperature changes every 1C up to 250C.
- BT_50C_Exhaust: Value of the exhaust fan power setting for 50C coffee temperature BT [C]. The coffee temperature changes every 1C up to 250C.
- BT_50C_Drum: Value of the drum speed setting for 50C coffee temperature BT [C]. The coffee temperature changes every 1C up to 250C.

The following buttons are on the screen:

No.	Icon	Description / function
1.		Save the current recipe "Current_recipe" under the given name in the Recipe field
2.		Uploading settings from the "Current_recipe" recipe to the roasting machine.
3.		<p>Export: Recording of recipes to a USB stick, Excel format.</p> <p>Import: Loading recipes from a USB stick into the machine.</p>
4.		Name of to chosen/new recipe

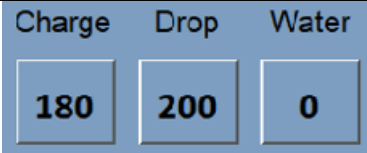


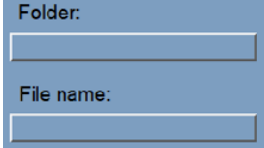
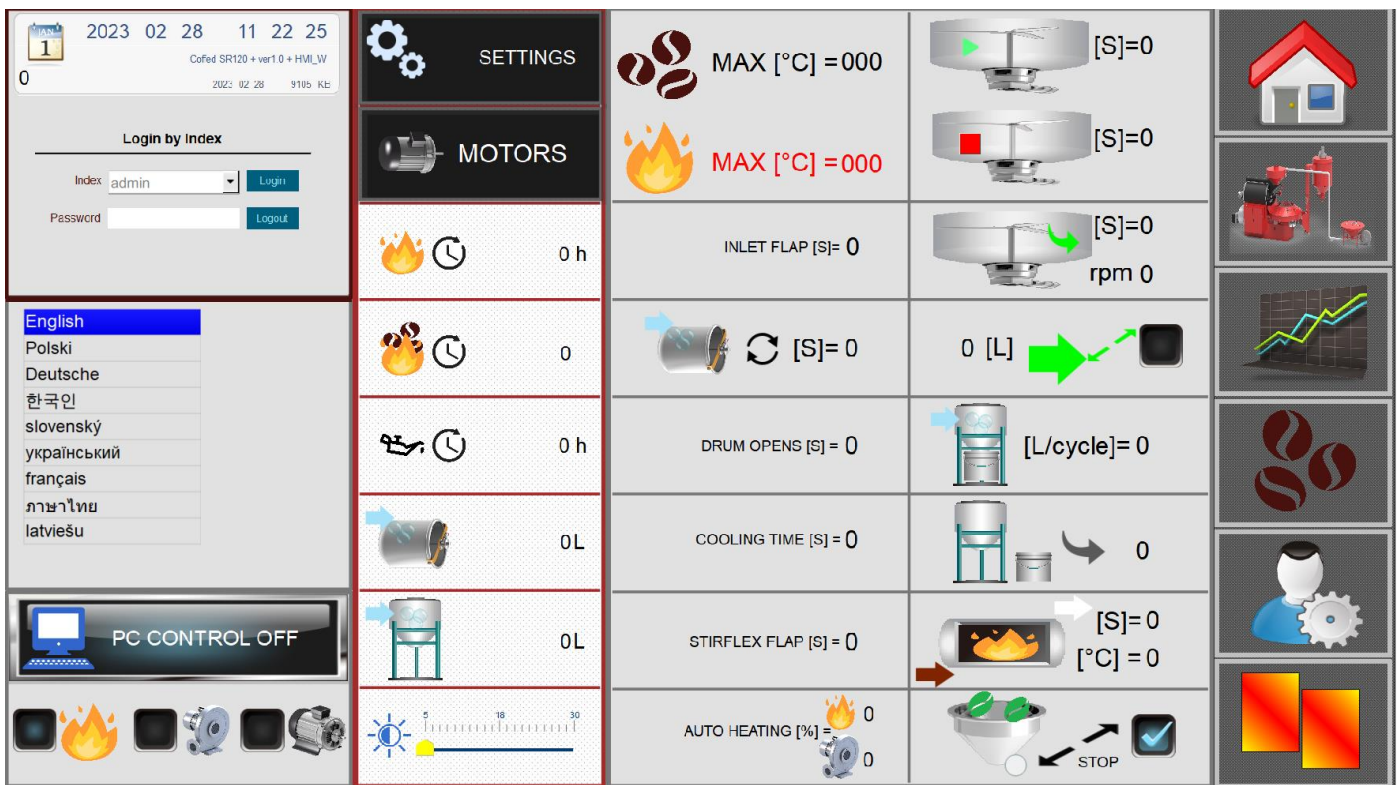
5.		Main parameters of recipe
6.		Add, delete and apply recipe
7.		Files on the USB flash disk
8.		Add new folder with file name on USB flash disk

Table 4. List of the recipe selection screen

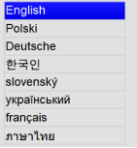





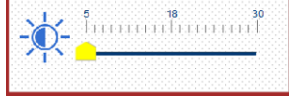


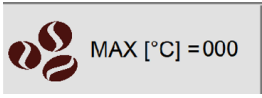



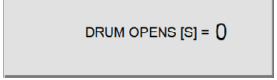
3.1.5. Maintenance screen



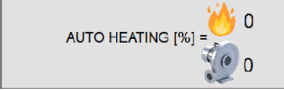




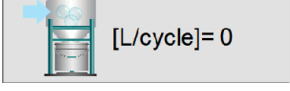





Pic.14 Maintenance screen

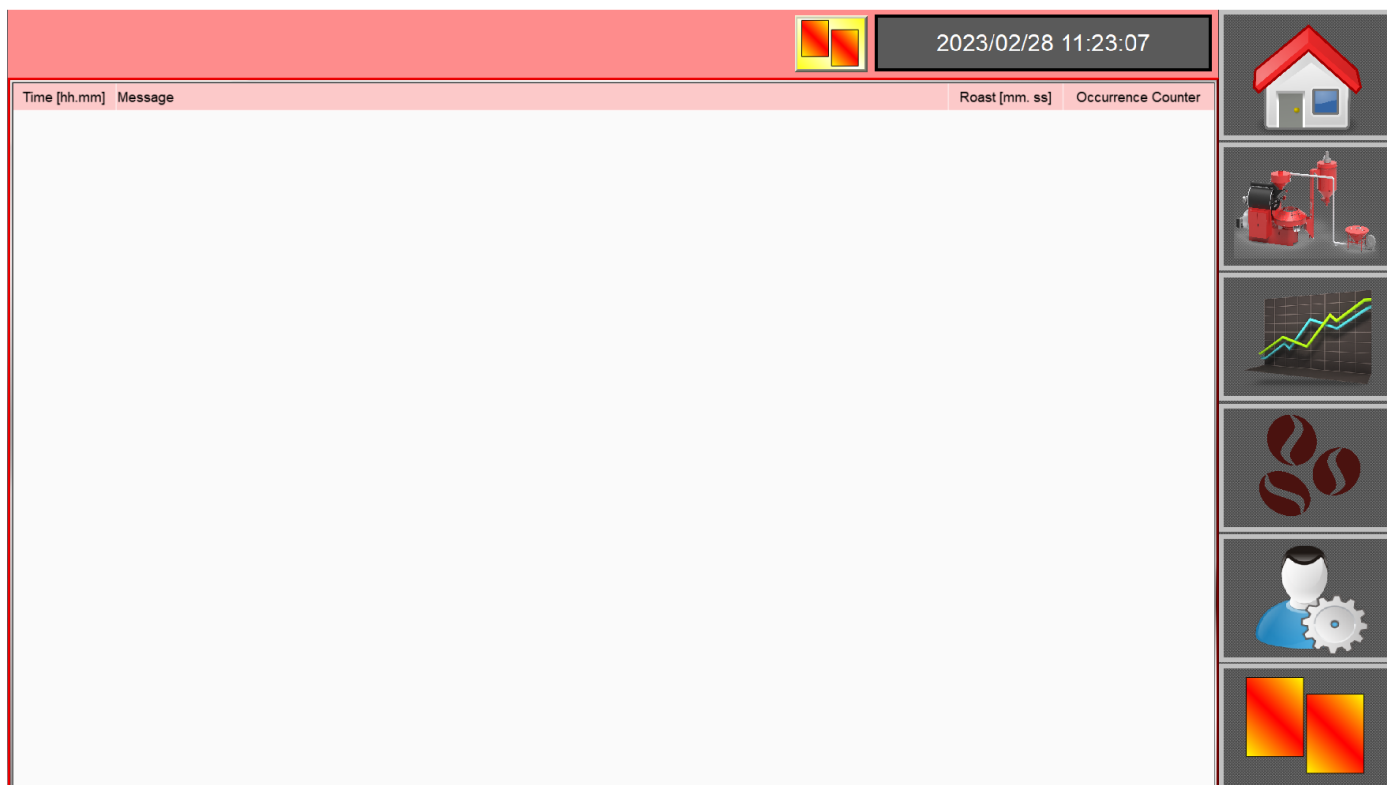
The maintenance screen allows the operator to use the following functions:

No	Icon	Description / function
1.		Logging in to the machine's settings and adjustment system.
2.		Current time (possible to change) and software version
3.		Button to access the machine's basic settings page. The button is active after providing the appropriate password.
4.		Call the machine engines preview. You can view the motor current, motor run time and motor drive temperature.

5.		Chose the language for software
6.		Gas burner operating hours counter
7.		Roasting operate cycles
8.		Machine operation time since the last technical inspection. By default, the interval between reviews is 150 hours.
9.		Counter of the amount of water fed to the drum.
10.		Counter of the amount of water fed to the cyclone.
11.		Touch screen backlight adjustment.
12.		Turn on/off the option for control from PC software
13.		Control for external software like Artisan or Cropster – burner power, exhaust power, drum power
14.		Maximum safe coffee temperature that the beans can reach in the drum. Exceeding this value will shut down the burner in an emergency and display an appropriate message. Take special care when the temperature is exceeded. Do not pour coffee on the cooler and leave it in the drum. Pour water into the drum.
15.		Maximum exhaust gas temperature at the machine outlet. Exceeding the temperature automatically reduces the burner output to zero.
16.		Charging flap opening time in automatic mode
17.		The delay time of opening the discharge flap from the machine after the water supply in the final stage of work.
18.		Drum flap opening time in automatic mode. After opening the damper

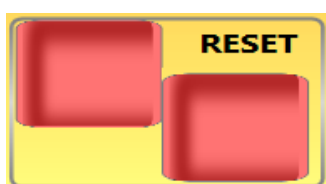
		the drum revolutions will be automatically lowered.
19.		Coffee cooling time after which the discharge flap will open.
20.		The time of opening the discharge flap from the cooler in automatic mode.
21.		Burner and exhaust fan power settings in automatic mode
22.		Working time of the cooling arms in special mode
23.		Cooler arms downtime in special mode
24.		Slowdown of the cooler while opening the flap – user define time and rpm
25.		Add the set water value before opening the drum flap. On/off
26.		The amount of water fed to the cyclone in one roasting cycle.
27.		Quantities of fillings in the cyclone. If the value is 0, then nothing will happen. On the data side of the values and when it is exceeded, the button and the lamp on the cyclone flash (values on the service screen)
28.		The threshold for switching on the afterburner, determined by the temperature of the coffee in the drum.
29.		The choice of how to turn the green coffee charging fan on and off. Position of the button to the left: switching on and off of the charge only by the button on the screen. Position of the button to the right: turning the hopper on with the button on the screen, it will turn off automatically by the coffee sensor.

3.1.6. Faults and errors screen




Pic..15 Faults and errors screen

The Faults and errors screen shows messages related with faults and errors, that cause the SR120 coffee roasting line to work incorrectly. On the screen there are the following buttons:



- reset the message after the fault or error has been removed

Code	Message	Solution
F00	Emergency stop!	Check the emergency switch. Press the safety circuit reset button
F01	Drum not rotating!	Check the 4M1 motor.

<p>F02</p>	<p>Temperature too high! Check monitoring relays.</p>	<p>Check the 10A1 or 10A2 relay.</p>  <p>In the event of the surpassing the exhaust fumes temperature, the relay needs to be reset by the indicated button</p>
<p>F03</p>	<p>Low airflow - exhaust blower!</p>	<p>Low flue gas flow in the chimney.</p>
<p>F04</p>	<p>External stop active!</p>	<p>Check the external appliances</p>
<p>F05</p>	<p>Burner failure!</p>	<p>Check the 11F1 fuse or control of burner. Check spark in the burner.</p>
<p>F06</p>	<p>Air pressure to low!</p>	<p>Check the air pressure.</p>
<p>F07</p>	<p>Stirflex emergency stop!</p>	<p>Check the stirflex emergency stop on the control panel.</p>
<p>F10</p>	<p>Temepature coffee or exhaust too high!</p>	<p>Check the temperature monitoring relays.</p>
<p>F11</p>	<p>Destoner blower fault!</p>	<p>Check the 7U1 inverter and the 7F1 fuse.</p>

F12	Exhaust blower failure!	Check the 5U1 inverter and the 5F1 fuse.
F13	Cooling motor failure!	Check the 8Q1 fuse.
F14	Drum motor failure!	Check the 4U1 inverter and the 4F1 fuse.
F15	Cooling arms motor failure!	Check the 6U1 inverter and the 6F1 fuse.
F16	Inlet blower failure!	Check the 8Q2 fuse.
F17	Stirflex flaps failure!	Check the stirflex flap actuator position.
F20	Exhaust flap failure!	Check the exhaust flap actuator position.
F21	Inlet flap failure!	Check the inlet flap actuator position.
F22	Drum flap failure!	Check the drum flap actuator position.
F23	Stirflex flap failure!	Check the stirflex flap actuator position.

F24	„Escape „ active	"Escape" button pressed
F25	Inverter fault!	One of the machine's inverters has failed. Remove the cause of the inverter stoppage, overload or power failure. Perform error reset and keep working.
F26	Low water pressure!	Check the pressure of the water connected to the machine.
F27	Motor breaker active!	The protection in the machine cabinet has tripped.
F30	230VAC curcuit protection tripped!	The 230VAC circuit protection has tripped.
F31	Circuit protection +24VDC triggered!	The + 24VDC protection tripped.
F32	Too high temperaturę in the cyclone!	Maximum temperature in the cyclone exceeded. Give water to the cyclone.
F33	Detected fire!	The control circuit has detected a fire on the machine. The water solenoid valves for drum and cyclone will open automatically.
F34	Overfilled coffee inlet onto the destoner or faulty	

	sensor operation!	Clean the destoner inlet. Adjust the coffee sensor and the destoner inlet.
F35	Clogged hopper for green coffee loader!	Clean the green coffee loader. Adjust the coffee sensor.
F36	Open guard on the stirflex!	Close the guard.
F37	Too much difference in burner output in relation to the setpoint!	Not used!
F40	Antifire button pressed!	The fire button has been pressed! The automation circuit will activate the water solenoid valves.
F41	Bypass flap failure!	Check the bypass flap actuator position.
INFO1	Warning: Lubricate the bearings!	Perform a technical inspection of the machine.
F43	Faulty operation of the coffee sensor at the upper fill!	Adjust the coffee sensor.
F44	The burner has been automatically switched off, pour out the coffee from the upper hopper!	Coffee stored in the upper hopper for too long. Automatic gas burner switch off to eliminate coffee ignition.
F45	Low gas pressure on the burner!	Check the pressure of the gas connected to the burner.

Table 4. List of faults and errors

3.2. Manual roasting mode


The SR120 coffee roasting line is operated using the the control panel.

All the control elements are located on the Console (Pic11).


The following steps need to be undertaken in order to produce roasted coffee in manual mode:

1. Switch on the power by turning the main power switch into the “I” position.




2. Switch the roaster's drum and exhaust fan by pressing the  button.




3. Start the burner by pressing the  button.


4. Heat up the roaster to the desired temperature of ca. 180 °C – the temperature of the drum is showed on the Manual roasting screen. In order to speed up this process, the exhaust fan speed needs to be lowered.

5. Weigh the desired amount of green coffee (60-120kg) and pour it into the green coffee loader hopper (the hopper needs to be closed).

6. Transport the coffee using the green coffee loader to the top hopper on the roaster. First press the  button in order to switch the fan on, after the fan is working manually move the lever on the hopper into the open position. The loading time is ca. 3-5 minutes.


7. When the temperature inside of the drum reaches the desired level press the  button to open the inlet flap and release the green coffee into the roaster's drum.


8. Roast the coffee, the speed of the process is related with the burner power, drum speed and the exhaust fan speed – adjust them accordingly. The target temperature of the coffee should be ca. 190-210 °C depending on the green coffee beans type and the desired color level/taste of the coffee. During the roasting phase the next batch of green coffee can be already transported to the top hopper (as in points 5-6).

9. When the coffee is close to the desired roast outcome, switch the cooling bin arms and fan on by pressing the  button.

10. Dump the coffee into the cooling bin by pressing the  button.

11. The cooling of the coffee takes up ca. 5 minutes. During the cooling phase the next batch can be put inside of the roaster's drum to be roasted (as in points 7-8).

12 After the roasted coffee beans cool down, they need to be released into the destoner using the  button.

13. When all of the coffee is transported into the destoner, switch it off by pressing the  button.

14. Prepare a container and open the destoner in order to release the roasted coffee from the destoner.

4. SERVICE AND MAINTENANCE

The following service and maintenance steps need to be undertaken, in order to ensure a fault free workflow of the SR120 coffee roasting line.

Every 80 hours

Checking the transmission elements

Checking if the flaps and other moving elements are working properly

Cleaning and greasing the moving elements

Check and clean the burner: check the spark plug, clean the filter and the combustion surface.

Every 160 hours

Checking that the emergency stop buttons work properly

Controlling the temperature indication elements

Checking and cleaning the green coffee loader

Visual control of the electrical cabinet

Check and clean the burner: check the spark plug, clean the filter and the combustion surface. **Check the gas circuit for leaks.**

Installation check

Activities performed by persons with the required qualifications and if the regulations do not specify exactly the time period, not less often than once a year

Electrical installation - checking the short circuit loop and insulation resistance of the power cord

Gas installation - checking the gas system's tightness and correct functioning of the flame control and ignition system

Lubrication of moving parts

Main bearing should be greased with special temperature resistant grease. After removing the front cover of the bearing the operator should grease the bearing and then put the cover back in its place.

5. TROUBLESHOOTING

The SR120 coffee roasting line will not work due to the emergency switch being pressed, a defect or inappropriate regulation.

The machine has stopped

The safety devices included are two EMERGENCY STOP buttons and a MAIN SWITCH. Each of them allows the machine to be shut down at any time during operation.

If the machine has stopped, check if the EMERGENCY STOP button has not been pressed or that the power supply has not been interrupted.

Stopping of one of the motors and / or lack of response to the control system

After determining which motor has stopped or cannot be switched on, check the safety devices. They are located in the electrical cabinet.

Check whether any of the overcurrent switches (Q) and / or the thermal triggers have tripped. If you have not noticed any problems with the above mentioned electrical devices, check the control system and diagnose the cause of the fault.

WARNING!

All work carried out on components powered by 400V AC must be performed by a qualified person.

The burner does not ignite

Check if the gas flows into the system and then whether the ignition system is working properly or not.

The burner flame keeps fading

This can be a sign of gas interruptions, insufficient pressure or malfunction of the flame control system. First check the gas supply of the burner.

Perceptible gas smell

As soon as the personnel handling the appliance smells the gas, immediately switch off the appliance with a main switch and ventilate the room. In the event that these actions do not work, close the main gas valve on the power supply of the device and call the person having the required authority and equipment to check the gas system tightness.

Abnormal sounds in the mechanical system

Determine where the sounds come from during operation, and then check that there are no malfunctions requiring immediate intervention.

6. REPAIRS

Before any interference in the device, turn off the power. Repairs should be carried out by personnel of the appropriate knowledge and, if required authorisations. When replacing used items, new parts must be used. It is permissible to use alternatives of other manufacturers, where they are identical parts in principle of operation and dimensions.

WARNING!

It is unacceptable to perform any modifications on the SR120 coffee roasting line.

Any modification of the device will result in the loss of warranty and liability of Coffed Sp. z o. o..

7. DISPOSAL AND NEUTRALIZATION

At the end of its service life, the old appliance must be disposed of in accordance with the applicable national regulations. We recommend contacting a specialist company or contacting the disposal unit in the municipality.

WARNING!

To prevent possible misuse and related hazards, ensure that the SR120 coffee roasting line can be used again before disposal. To do this, disconnect the device from the power supply and cut off the power cord.

TIP!

When disposing of the device, follow the appropriate national or regional regulations

8. BURNER MAINTENANCE

8.1 Warnings

Before any maintenance operation on the system, operators are requested to make sure that the installation is in the following configuration:

- Upstream Gas Supply gas valve is closed and locked out.
- Electrical power is off.

8.2 Permanent survey

The user, or any person in charge of monitoring the production line, has to permanently keep an eye on the processing.

8.3 Maintenance of a metal fiber burner

It is important that during transportation, assembly of the burner into your equipment and maintenance the burner deck and the welding of the burner deck to the burner housing are not damaged!

A burner with holes in its deck or with a torn deck can not work properly.

The burner deck should not be in contact with anything else e.g. supporting pieces, etc.

The best way to fix the burner is by clamping on the inlet duct.

8.4 Cleaning of electrodes

A bad ignition or a bad detection can be caused by a fouling or a deterioration of electrodes. A cleaning or a replacement is thus necessary by proceeding as follows:

- Upstream Gas Supply gas valve is closed and locked out.
- Electrical power is off.
- Clean electrodes by means of an abrasive paper.
- Replace possibly electrodes:
 - . Disconnect cables
 - . Loosen electrodes
 - . Replace electrodes (take care on the position)

On the other hand, if an electrode contacts the Metal Fiber, the circuit controls is then in the earth, any detection becomes impossible. In this case it is necessary to push aside the concerned electrodes.

8.5 Cleaning of the air filters

To clean the filter to proceed as follows.

- Stop the fan.
- Loosen the filtering element.
- Outside, blow against the current the filter.
- Replace the filter or replace it by a new.

8.6 Cleaning of the gas filter

To clean the gas filter to proceed as follows.

- Close the manual valve gas.
- Open the lid of the gas filter.
- Remove the cartridge and proceed to its cleaning by blowing in the compressed air.
- Replace the cartridge.
- Close the lid by being careful in the seal.

8.7. System hibernation

Whenever the burner infrared system is not operated for a period of three or more days, operators and/or maintenance staff are requested to put the installation in the following configuration:

- Upstream Gas Supply gas valve is closed and locked out.
- Electrical power is off.

Prior to re-tart the burner infrared system after a long outage period, the following must be undertaken:

- Verify all gas lines for rust or particles of metal (Especially if piping or valves have been replaced).

Proceed with thorough gas leak detection.

- Verify that the piping is free of water. During long shutdowns in cold countries, condensates can appear in the ductwork between the fans and the hoods. This could damage the fan wheels and lead to water dripping on the process.

- Turn on the electric power.
- Open the main manual gas valves.
- Proceed with ignition. Several trials might be needed since the gas lines have to be flushed and the burner surface can be wet.

9. INCIDENTS AND FAILURES - BURNER

9.1 Trouble shooting procedures

9.1.1 Safety loop failure (“General failure”)

- Low Air/Gas pressure failure
- Check the gas supply
- Check gas filter and replace as necessary
- Reset failure and re-start the IR
- Gas/Air Combustion failure
- Check the failure with the “failure reset” and restart the installation
- If the failures occur again within 10 seconds, check:
 - . The motor starters, fuses, relays, switches, thermal relays,
 - . Electrical circuits of the Air Pressure Switch,

- . Check the good working of the Air Pressure Switch (Dirtied filter or fiber burner),

9.1.2 Other malfunctions

- Flame is detected before ignition
- When the flame control detects a flame before ignition it will not be possible to start the burners.
- Flame failure
- When the flame detection is lost during normal production and no other failure is displayed:
 - . Clean or replace the electrode
 - . Check air/gas mixing blocks
 - . Check or replace the automatic burner control unit

10. PERIODIC MAINTENANCE -BURNER

10.1 Monthly maintenance

- Verify the combustion homogeneity of radiant
- Clean if possible the dirtied (dusts) fibers parts
- Verify the electrodes (ignition and detection) and verify the indications given by the automatic burner control box

10.2 Quarterly maintenance

- Clean the electrodes
- Visual examination of the cables (ignition, detection...). So necessary restoration.
- Clean the gas filter
- Clean the air combustion filter
- Verify air/gas system of the dark radiant
- Verify the correct functioning of the emergency stop: select the burners and zones and press the Emergency Stop. The system has to stop.

10.3 Biannual maintenance

- Verify the connecting flexible hoses between air/gas system and air header

pipe

- Blow in the compressed air the carcasses of the motor air fans

10.4 Annual maintenance

- Change the cartridges of gas filters
- Change the combustion air filters (if they have more than year of age)
- Replace electrodes
- Clean the control cabinet by sucking up
- Check and tighten if necessary the electric connections, including motor control cabinet...

11. FIRE FIGHTING ACTIVITIES

11.1 During ignition of grain in the drum should be:

- **Turn off the roaster and gas,**
- **Turn off cooler, do not spill coffee out,**
- **Turn on the water valves on roasting screen**
- **Do not open drum door,**
- **Use manual valves for fill water to the drum**
- **Turn off the electrics,**
- **If possible, pour water through the sampler,**
- **Turn around the drum time to time with using the crank.**