



MOBILE GRAIN DRYER

INSTRUCTIONS FOR USE AND MAINTENANCE

*Before installing and using the grain dryers, read this manual carefully
and keep it together with the product.*

TRANSLATION OF THE ORIGINAL INSTRUCTIONS

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1 IDENTIFICATION OF THE MACHINE AND THE MANUFACTURER

1.1 MANUFACTURER'S DATA

Manufacturer: Strahl S.r.l.

Address: Via Roma, 139, 31020- Villorba (TV) Italy

Telephone: +39.0422 919178

Website: www.strahlgraindryers.com

Email: strahl@strahl.it

1.2 MACHINE IDENTIFICATION

Commercial name: Grain Dryer

Type/Model:

Power supply: ☐ PTO (Power Take-off) ☐ PTO+Electric ☐ Electric

Electrical panel: ☐ Standard ☐ SMART (with touch-screen)

Fuel: ☐ Diesel ☐ GPL ☐ Methane ☐ Other: _____

Discharge type: ☐ Manual ☐ Electric with auger

Serial number:

Year of construction:

1.3 RANGE OF DRYERS

TURBODRY	BIODRY
AS 400	ES 400
AS 500	ES 500
AS 600	ES 600
AS 900	ES 900
AS 1000	ES 1000
AS 1150	ES 1150
AS 1350	ES 1350
AS 1550 EVO	ES 1550
AS 1750 EVO	ES 1750
AS 2250	ES 2250
AS 2550	ES 2550
AS 2650	ES 2650
AS 3150	ES 3150
AS 3550	ES 3550
AS 3750	ES 3750
OP 120E	
OP 1200	
OP 2910	
OP 4810	

The **BIODRY (ES)** series comprises the range of dryers manufactured by Strahl S.r.l. that employ a heat exchanger to ensure the drying air remains clean and free from exhaust gases produced during burner combustion. These models utilize an indirect drying system, making them particularly suitable for grain intended for human consumption.

The **TURBODRY (AS)** series comprises the Strahl S.r.l. range of dryers that employ direct drying with heated air within a combustion chamber lined with refractory material, thereby maintaining constant temperatures and achieving high energy efficiency.

1.4 CE MARKING AND DECLARATION OF CONFORMITY

The machine designated as the Grain Dryer complies with the legislative provisions of the following Directives:

- Directive 2006/42 EC: Machinery Directive
- Directive 2014/30/EU: Electromagnetic Compatibility Directive
- Directive 2014/35/EU: Low Voltage Directive

The following harmonised standards have been applied:

- EN 12100:2010: General principles for design – Risk assessment and risk reduction
- EN 60204-1: Safety of machinery.

Each dryer model is fitted with an identification plate containing the machine's principal technical data and characteristics.

CE plate:



Figure 1.1 CE marking plate

The machine identification plate and CE marking are affixed to the left-hand side member of the drawbar. The plate shall remain unaltered over time and retain all of its original characteristics.

Do not remove, tamper with, or render illegible any identification plates.

Upon decommissioning of the production line, the identification plates shall be returned to the manufacturer together with confirmation that the line has been demolished.

2 GENERAL INFORMATION

2.1 OWNERSHIP OF INFORMATION

- This instruction manual has been prepared in accordance with the provisions of Directive 2006/42/EC and takes into account the correct use and reasonably foreseeable misuse of the machine.
- This manual contains proprietary information. All rights reserved.
- This manual shall not be reproduced or photocopied, in whole or in part, without the prior written consent of Strahl S.r.l.
- In the event that this manual is lost, a replacement copy may be requested from the manufacturer by quoting the identification data on the plate and at the beginning of this manual.
- Use of this documentation is permitted solely by the customer to whom the manual was supplied as an accessory, and only for the purposes of installation, operation, and maintenance of the machine to which the manual refers.
- Strahl S.r.l. declares that the information contained in this manual is consistent with the technical and safety specifications of the machine to which the manual refers.
- Strahl S.r.l. accepts no liability for direct or indirect damage to person, property, or animals resulting from the use of this documentation or the machine under conditions other than those intended.
- Strahl S.r.l. reserves the right to make modifications or improvements without prior notice to this documentation and to the machines, including machines of the same model as that referred to in this manual but bearing a different serial number.
- The illustrations shown in this manual may differ from the actual version of the machine.

2.2 TERMS, DEFINITIONS, AND SYMBOLS USED

To aid understanding of the topics addressed in this manual, the following is a list of the principal terms and definitions employed:

A

- **AUTHORISED PERSONNEL OR OPERATOR:** Qualified personnel appointed by the Customer or Manufacturer to carry out specified tasks.

C

- **CEREAL, PRODUCT, GRAIN:** Within this manual, these terms are used interchangeably to denote any cereal, oilseed, or legume that is approved for drying.

D

- **DANGER:** A source of potential injury or damage to health.
- **DRYING PERIOD:** The period of the year during which the dryer is in operation.

E

- **EMERGENCY STOP DEVICE:** A device that is activated by a single action and serves to prevent or reduce harm to person, machinery, property, or animals.
- **EXTRAORDINARY MAINTENANCE:** All repairs or replacements that enable the machine to continue operating under normal conditions. Replacement components shall be identical to the originals, i.e. equivalent in performance, dimensions, and other characteristics, in accordance with the specifications provided by the manufacturer.

F

- **FIXED GUARD:** A guard held in position (i.e. closed) either permanently (by welding, etc.) or by means of fasteners (screws, nuts, etc.) such that removal or opening is not possible without the use of tools.

H

- **HAZARDOUS AREA:** Any area within or near a machine in which the presence of a person constitutes a risk to their safety and health.
- **HAZARDOUS SITUATION:** Any situation in which an operator is exposed to one or more hazards.

I

- **INSTALLER OPERATOR:** The person responsible for the mechanical or electro-pneumatic installation of the machine.
- **INTENDED USE:** Use of the machine in accordance with the information provided in the operating instructions.
- **INTERLOCKED GUARD:** A device associated with a guard that is designed to prevent the operation of the machine's hazardous functions when the guard is not closed. Hazardous machine functions covered by the guard shall not commence until the guard is closed. If the guard is opened during the performance of hazardous functions, a stop command is issued. Closing the guard permits the execution of hazardous functions but does not initiate their start (a separate command is required).
- **INTERLOCKED GUARD WITH GUARD LOCKING:** The interlock is a device associated with a guard. It is required when moving parts possess hazardous inertia (long stopping time). The device maintains the guard in the closed and locked position until the risk of injury has ceased. Hazardous functions of the machinery covered by the guard shall not be carried out until the guard has been closed and locked. The guard remains closed and locked for as long as there is a risk from the hazardous functions of the machine. Closing and locking the guard permits the execution of hazardous functions but does not initiate their start.

M

- **MACHINE ADMINISTRATOR OR CUSTOMER:** The person responsible for the dryer; the person who purchased the machine or who manages and operates it (e.g. company, proprietor).
- **MACHINERY – MACHINE – PRODUCTION LINE:** The machine covered by this operating manual.
- **MACHINE STATUS:** The machine status comprises the operating mode (e.g. automatic operation, stop, unload) and the condition of the safety devices on the machine (e.g. machine in emergency stop due to the emergency button having been pressed).
- **MANUFACTURER:** A natural or legal person who designs and manufactures machinery or partly completed machinery covered by this Directive and who is responsible for ensuring that such machinery complies with this Directive for the purpose of placing it on the market under their own name or trademark, or for their own personal use.
- **MOVABLE GUARD:** A guard connected mechanically (e.g. by means of hinges or guides) to the machine structure or to an adjacent fixed element, which may be opened without the use of tools.

N

- **NUMBER OF OPERATORS:** The number of operators required to carry out the operation described in the optimal manner has been determined through careful analysis by the manufacturer. The use of a different number of operators may prevent the expected result from being achieved or may compromise the safety of the personnel involved.

O

- **OPERATOR OR QUALIFIED PERSONNEL (MECHANICAL OR ELECTRICAL MAINTENANCE TECHNICIAN):** Personnel with an in-depth knowledge of the machine's functionality, with a minimum of three years' experience in the maintenance of similar machines, capable of inspecting, adjusting, and repairing mechanical or electro-pneumatic components and of diagnosing anomalies and faults. Their knowledge, training, and experience of both the machine's functionality and the relevant accident prevention regulations enable them to perform more complex operations safely (e.g. electrical risk).
- **OPERATOR OR USER PERSONNEL:** Personnel responsible for the operation of the machine and routine maintenance in its simplest forms, such as basic adjustments, cleaning, greasing, and visual inspections.

- **ORDINARY MAINTENANCE:** A set of operations specified by the manufacturer and detailed in the instruction manual, carried out to maintain the machine and its components in efficient working order and to prevent the occurrence of failures or anomalies (e.g. cleaning, adjustment, lubrication, etc.).

P

- **PARTLY COMPLETED MACHINERY:** An assembly that almost constitutes a machine but which, on its own, cannot fulfil a well-defined application. Partly completed machinery is intended solely for incorporation or assembly with other machine(s) or apparatus to constitute machinery covered by the Directive in force.
- **PERSONAL PROTECTIVE EQUIPMENT (PPE):** Any equipment designed to be worn or held by the worker to protect them against one or more risks to their safety or health at work, together with any complement or accessory intended for this purpose.
- **PRODUCT CHANGE:** The process of filling the machine with a different type of grain, following emptying and cleaning of the previous grain.
- **PTO (Power Take-Off):** The mechanical device (present on tractors) that transfers engine power to an external attachment.

R

- **REASONABLY FORESEEABLE MISUSE:** Use of the machine in a manner other than that indicated in the operating instructions, but which may result from readily foreseeable human behaviour.
- **RISK:** The combination of probability and severity of possible injury or damage to health in a hazardous situation.

S

- **SERVICE CENTRE:** The technical assistance centre is the provider of repair, maintenance, and after-sales installation of spare parts and accessories for products, equipment, and systems, as authorised by the manufacturer. The service centre is required to use original spare parts and accessories and has access to specialised equipment and technical specifications provided by the manufacturer.
- **SUBSTANTIAL MODIFICATION:** Any intervention carried out on a machine to adapt its productivity to new requirements, or to enable it to operate following the replacement of a component with a non-equivalent part, thereby necessitating adaptations or interventions that involve a change in the methods of use, alterations to the performance envisaged by the manufacturer, or the introduction of additional risks.

For optimal use of this manual and, consequently, of the machine, it is advisable to acquire a thorough knowledge of the terms and typographical conventions employed in this documentation.

The following symbols are used in this manual to identify and distinguish the various types of hazard:

SYMBOL	DESCRIPTION
	DANGER: To indicate actions which, if not carried out correctly, may cause general accidents or may generate malfunctions or material damage to the appliance; they therefore require particular attention and adequate preparation.
	OBLIGATION: Indicates a necessary action or the use of protective devices (e.g. wearing a helmet)
	PROHIBITION: To indicate actions that MUST NOT be performed
	IMPORTANT NOTE/WARNING: important information for the correct functioning of the machine but which has nothing to do with safety.

For specific safety pictograms, refer to ISO 7010.

	READ THESE INSTRUCTIONS CAREFULLY BEFORE CARRYING OUT ANY OPERATION WITH THE DRYER; ANY USE OF THE DRYER IN A DIFFERENT WAY OR IN CONTRARY TO THESE INSTRUCTIONS MAY CAUSE DAMAGE TO PERSON OR PROPERTY.
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2.3 RESPONSIBILITY

The manual supplied with the machine reflects the experience and knowledge acquired by Strahl S.r.l. to date. It is current as of the date shown on the rear cover. The edition corresponds to the manual's revision number. Each new edition supersedes and cancels all previous editions.

The Manufacturer declines all responsibility for damage and malfunctions caused by:

- handling errors;
- failure to comply with the instructions contained in this manual;
- unforeseen and unauthorized structural modifications to the machine;
- repairs carried out using non-original spare parts and accessories, which may adversely affect the functioning of the system;
- damage caused by arbitrary modifications by the user or by unauthorized interventions;
- inadequate maintenance;
- power supply defects;
- improper use of the machine;
- exceptional and unforeseeable events;
- use of the machine by untrained personnel;
- failure to comply with workplace safety, hygiene, and health regulations.

The information in this manual does not relieve the machine administrator of the responsibility for carrying out a full assessment of the specific risks associated with the working environment.

The Customer is responsible for identifying and selecting the appropriate category of PPE (Personal Protective Equipment).

Strahl S.r.l. declines all responsibility for any inaccuracies in this manual, whether attributable to printing, translation, or transcription errors. Any supplements to the instruction manual that the manufacturer deems appropriate to issue to the Customer shall be retained with the manual, of which they form an integral part.

2.4 RECIPIENTS OF THE MANUAL

This manual is intended for:

- transport and handling personnel;
- personnel responsible for positioning, commissioning, and maintenance;
- the employer of the machine users and the person responsible for the workplace;
- operators responsible for the ordinary use of the machine;
- operators responsible for the storage, decommissioning, and disposal of the machine.

2.5 LIFE STAGES

The definitions of the machine life stages are described in the following table.

LIFE CYCLE STAGES	OPERATIONAL PHASES
TRANSPORT, ASSEMBLY AND POSITIONING	Lifting - Loading Packaging - Transport Unloading - Unpacking Machine positioning Connection to energy sources (electrical, mechanical) Connection to auxiliary fluid circuits (if applicable)
MOVEMENT	Disconnect all power sources Emptying the diesel tank when driving on the road
USE/PRELIMINARY CHECKS/STARTING AND LOADING	Adjustment and fine-tuning or verification of the machine's functional parameters (e.g. temperature) Loading of processing products Functional tests, checks Final product verification
USE/DRYING	Control/inspection Loading/unloading Small adjustments and setting of the machine's functional parameters (e.g. drying temperature, recipe) Operation of manual controls Starting the machine after a stop/interruption Monitoring Final product verification
MAINTENANCE	Cleaning Refilling the tank (if diesel) Checking electrical and mechanical components Lubrication and greasing Burner checks and adjustments (pump and damper) Routine maintenance Isolation and energy dissipation Replacement of components at the end of their life cycle Replacement of worn parts
TROUBLESHOOTING	Adjustments Dismantling of machine parts, components, devices Fault finding Isolation and energy dissipation Recovery after failure of control and protection devices Repair Replacement of machine parts, components, and devices Verification of machine parts, components, devices
STORAGE	Deactivation due to disconnection from energy sources Conservation with sheets Restart checks
DECOMMISSIONING AND DISPOSAL	Deactivation due to disconnection from energy sources Dismantling using lifting equipment Separation of parts by type Packaging – Transport to the disposal site

3 SAFETY INFORMATION

3.1 GENERAL SAFETY REGULATIONS

This manual provides information for the **CORRECT AND SAFE USE OF THE MACHINE**, designed to optimise performance and, above all, ensure the safety of all operators involved. The machine shall be used solely for the purpose intended by Strahl S.r.l. for which it was specifically designed and manufactured.

It is essential that this manual be **READ CAREFULLY BEFORE PROCEEDING WITH ANY OPERATIONS** throughout the machine's life cycle, in order to prevent incorrect operations that could compromise its integrity or endanger the safety of personnel.

Use and maintenance at every stage of the machine's life are permitted **ONLY BY QUALIFIED, TRAINED, AND AUTHORISED PERSONNEL**, based on their specific job description, possessing specific knowledge of the machine's operation and the position and function of the controls, as well as **TRAINED AND INFORMED ABOUT THE RISKS** associated with the use of the machine.

It is also important that **THE MANUAL BE KEPT AT THE LOCATION WHERE THE MACHINE IS USED** so that it may be consulted by personnel at any time as necessary. This manual is an integral part of the machine and shall always accompany it, even if it is transferred to another owner or user or relocated to another site. In the event of damage or loss, request a replacement copy from Strahl S.r.l., quoting the identification data found on the plate and at the beginning of this manual.

If, after reading this manual, any **DOUBTS OR UNCERTAINTIES PERSIST, CONTACT THE MANUFACTURER.**

The instructions in this manual do not replace but are supplementary to the **OBLIGATIONS REGARDING SAFETY, WORKPLACE HYGIENE, AND ENVIRONMENTAL PROTECTION MANDATORY IN THE COUNTRY OF USE.**

It is therefore the user's responsibility to ensure that the machine is operated and used only under optimal safety conditions for both person and property.

This appliance is not intended for use by person (including children) with reduced physical, sensory, or mental capabilities.

COMPLY WITH THE CONTROL PLAN set out in the machine's user manual. The machine user is required to make inspection and maintenance records for the preceding three years available to the supervisory authorities.

STORE THE FINAL TEST REPORT for the machine and retain it together with the inspection and maintenance records.

Strahl S.r.l. accepts no liability for any damage to person, domestic animals, or property resulting from failure to comply with the **ACTIONS FOR RESIDUAL RISK MANAGEMENT** prescribed, or from the failure to use the prescribed personal protective equipment.

3.2 PROHIBITIONS



- **IT IS STRICTLY FORBIDDEN TO ENTER THE DRYER BEFORE IT HAS BEEN COMPLETELY EMPTIED AND DISCONNECTED FROM ALL POWER SOURCES.**
- **IT IS FORBIDDEN TO MODIFY OR BYPASS THE SAFETY DEVICES.** In the event of troubleshooting, specific procedures shall be implemented to avoid hazardous situations. These procedures shall be performed exclusively by qualified, trained, and authorized personnel.
- **ACCESS TO THE MACHINERY IS PROHIBITED TO UNTRAINED AND UNAUTHORIZED PERSONNEL.** Access may only occur in accordance with the instructions in this manual and by strictly applying tested safety procedures.
- **IT IS FORBIDDEN TO CARRY OUT ANY OPERATION ALONE INSIDE THE DRYER.**
- **IT IS FORBIDDEN TO MAKE MECHANICAL OR ELECTRICAL CHANGES** not specified by the manufacturer or to **USE NON-ORIGINAL SPARE PARTS.**
- **ANY TECHNICAL OR CLEANING INTERVENTION IS PROHIBITED WITHOUT FIRST DISCONNECTING ALL POWER SOURCES,** setting the main switch to "0 – OFF", and implementing a **LOCK-OUT/TAG-OUT** procedure.
- **IT IS FORBIDDEN TO PULL, DISCONNECT, OR TWIST ELECTRICAL CABLES** protruding from the machine, even if it is disconnected from the electrical power supply, except during planned maintenance operations and using exclusively the access means provided or indicated in this manual.
- **DURING ELECTRICAL MAINTENANCE, IT IS PROHIBITED TO WORK IN DIRECT CONTACT WITH WET OR HIGHLY CONDUCTIVE SURFACES.**
- **IT IS FORBIDDEN TO CLIMB ON THE MACHINE WHILST IT IS IN OPERATION.**
- **IT IS FORBIDDEN TO CLIMB** the machine **USING MEANS OTHER THAN THOSE PROVIDED** by the manufacturer. It is also forbidden to construct walkways or other temporary structures over the machine.
- **IT IS FORBIDDEN TO WEAR LOOSE ACCESSORIES** (necklaces, etc.), **LOOSE SLEEVES** (without elasticated cuffs), **OR UNTIED HAIR** to avoid the risk of entanglement.
- **IT IS PROHIBITED TO CONSUME ALCOHOL OR MEDICINES** that may induce fatigue or drowsiness before or during use.
- **IT IS FORBIDDEN** to use the machine in the presence of **EXPLOSIVE SUBSTANCES** or of any combination of substances that could create such a risk.
- **IT IS FORBIDDEN** to operate within **ENCLOSED ENVIRONMENTS** or beneath roofs with insufficient ventilation.
- **IT IS FORBIDDEN** to position the machine near **OVERHEAD POWER LINES.**
- **IT IS FORBIDDEN TO THROW OBJECTS** of any kind:
 - inside the dryer;
 - inside the heat group;
 - inside the air duct.
- **IT IS FORBIDDEN TO:**
 - operate the central auger without product;
 - load the grain dryer using means other than those provided by the manufacturer;
 - load the grain dryer without the grid fitted to the inlet of the loading auger;

- obstruct the dryer's air vents in any manner;
- open the heat unit door whilst the dryer is in operation;
- open the inspection doors with the cylinder full of grain;
- remain near the unloading point whilst this phase is in progress;
- introduce body parts into hazardous areas, remove or bypass installed guards, or attempt to access moving mechanical components or energized systems.
- switch off the dryer and leave it full of grain;
- operate with the diesel level inspection valve on the tank in the open position;
- operate any part of the dryer if it is unstable;
- operate with the dryer on soft, unstable, or uneven ground that could cause it to overturn.
- **IT IS FORBIDDEN** to move the dryer with:
 - the drawbar not fully inserted into the towing hook of the prime mover;
 - a grain load;
 - the cardan shaft attached to the tractor;
 - the loading auger engaged;
 - the exhaust fitted;
 - the mobile telescopic lift extended;
 - flat or damaged tyres;
 - person remaining on the machine;
 - diesel fuel in the tank on a public road.
- **Smoking, the use of open flames, or the carrying out of welding operations near the machine are STRICTLY PROHIBITED.**



IT IS STRICTLY FORBIDDEN TO REMOVE THE ACCESS DOOR TO THE SILO CONE AND ANY PROTECTION WHILE THE MACHINE IS OPERATED OR WITH THE MACHINE CONNECTED TO THE POWER SOURCES (MAIN PTO SHAFT AND/OR ELECTRICITY MAINS).



Figure 3.1 Silo cone access door

3.3 OBLIGATIONS



- **IT IS MANDATORY** to comply strictly with the **PROVISIONS AND INSTRUCTIONS** issued by the manufacturer, the employer, the management, and all other person responsible for safety.
- **IT IS MANDATORY** to carry out **SCHEDULED MAINTENANCE**, with particular attention to machine cleaning operations.
- Prior to any maintenance intervention, **IT IS MANDATORY TO DISCONNECT THE ELECTRICAL POWER SUPPLY AND VERIFY, USING A MEASURING INSTRUMENT, THE ABSENCE OF VOLTAGE**. Also disconnect all other power sources (pneumatic, fuel line) as specified in Section 3.7 (refer to the Lock-Out/Tag-Out procedure).
- **IT IS MANDATORY TO VERIFY THE CORRECT OPERATION OF ALL SAFETY DEVICES** in accordance with the control and maintenance program.
- **IT IS MANDATORY TO REPORT** any **MALFUNCTION** of the machine, **DAMAGED PARTS, MISSING OR DAMAGED PROTECTIVE DEVICES**, and **ANY HAZARDOUS SITUATION**. Any use of the machine that differs from or is not provided for may constitute a danger to person, animals, and property.
- **IT IS MANDATORY** to use all prescribed **PPE**.
- **IT IS MANDATORY** to maintain the **WORKPLACE IN ORDERLY AND CLEAN CONDITION**, free of obstacles and with adequate lighting.
- **IT IS MANDATORY** to provide an **ACCESS ROUTE FOR RESCUE SERVICES** in the event of an emergency.
- **IT IS MANDATORY TO DEMARCATÉ THE WORK AREA** during positioning, assembly, adjustment, and general maintenance phases and to prohibit access to the area by unauthorized person.

3.4 PERSONNEL TRAINING

The Customer shall ensure that all Authorized Personnel assigned to work on the machine for ordinary use, maintenance, and cleaning are adequately trained and instructed, demonstrate competence in performing their duties, and are able to assess situations and solutions to guarantee the safety of all person.

According to their assigned role and tasks, operators should be properly instructed on the machine's functionalities to ensure correct use and maintain its efficiency.

Personnel assigned to electrical and mechanical maintenance, beyond ordinary cleaning operations and basic adjustments, shall have acquired a minimum of three years' field experience on similar machines and shall possess a thorough knowledge of the machine's functional logic.

It is the responsibility of the purchaser/end user to ensure that the personnel assigned to operate the machine:

- have **READ AND FULLY UNDERSTOOD** this manual in all its sections;
- are **AWARE OF THE POTENTIAL RISKS** that exist whilst operating the machine;
- possess a thorough knowledge of **MACHINE OPERATION**;
- are fully familiar with all **SAFETY DEVICES, THEIR POSITION, AND THEIR OPERATION**.



STRAHL S.R.L. ASSUMES NO RESPONSIBILITY FOR ANY DAMAGE TO PEOPLE, PROPERTY OR PETS RESULTING FROM THE USE OF THE MACHINE BY UNQUALIFIED AND UNAUTHORIZED OPERATORS.

3.5 SAFETY DEVICES ON THE MACHINE

Whenever the guards are removed for any maintenance or cleaning, they shall be reassembled correctly in their original position before the dryer is returned to service.

Do not operate the dryer without all protective guards in place.

Altering the form, dimensions, or resistance characteristics of safety devices is strictly prohibited. The Manufacturer accepts no liability for damage to property and/or person resulting from use of the dryer without its safety devices.

3.5.1 EMERGENCY BUTTON

Emergency controls on the machine are operated by red mushroom-head push buttons.

Emergency stop button: 

Consents and conditions: Machine in Operator Stop condition.

Effect: When pressed, the button stops the machine immediately and maintains the emergency stop state until it is manually reset.

Reset Procedure:

- Eliminate the cause(s) of the emergency stop.
- Verify that the conditions necessary to restore the safety devices exist in the area where the safety device was triggered.
- Reset the emergency device.

To reset the mushroom-head push button after it has been activated, rotate the button in the direction indicated by the arrow marked on the top of the button head.

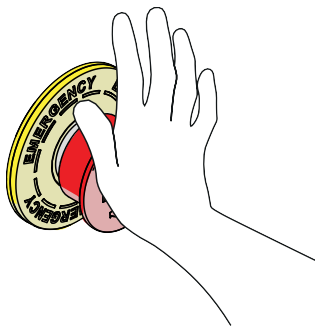


Figure 3.2 Emergency stop button



USE EMERGENCY DEVICES ONLY IN CASE OF REAL DANGER AND NOT FOR NORMAL SHUTDOWN OF OPERATIONS IN PROGRESS.

PERIODICALLY CHECK THE CORRECT FUNCTIONALITY OF THE EMERGENCY BUTTONS

3.5.2 MAIN SWITCH

Disconnecter Switch: 

Operation: manual.

Effect: in the "0" position (padlocked), it isolates the electrical supply.

Reset: Return the switch to the "I" position.⁷

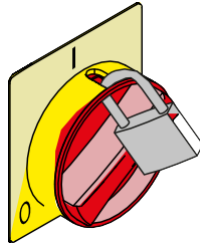


Figure 3.3 Main Switch

3.5.3 FIXED PROTECTIONS

Guards on the machine prevent any access, including accidental contact, to moving parts and hot surfaces of the burner unit.

The fixed rung ladder features a metal protective cage to prevent accidental falls outwards.

A safety grille on the loading auger prevents access to moving parts.

3.5.4 STAIRCASE ACCESS BLOCKING DEVICE

The dryer features a fixed service ladder intended exclusively for qualified operators to carry out inspection, maintenance, and height adjustment activities.

To prevent falls from height resulting from unauthorized access or untrained personnel, the ladder features a dedicated access blocking panel. This device consists of a robust physical barrier shielding the first rungs of the ladder, mechanically preventing users from gripping the rungs or placing their feet on them (see Figure 3.4).

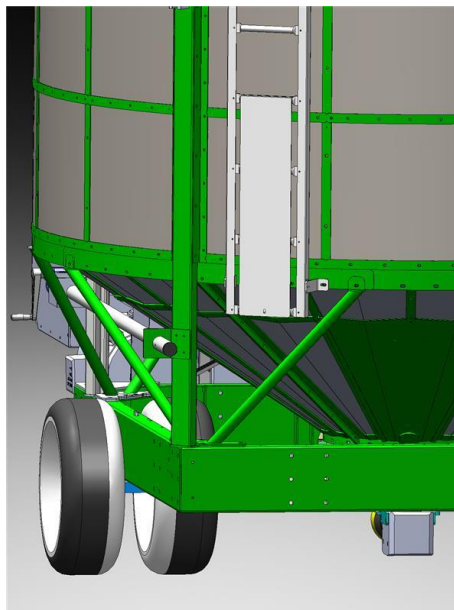


Figure 3.4 Ladder Lock

3.6 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Do not wear ties, necklaces, rings, or watches that could become entangled in the machine's moving parts.
The table below summarises the Personal Protective Equipment (PPE) required during the various phases of the line's life cycle.

PHASE	CLOTHING	FOOTWEAR	GLOVES	EYE PROTECTION	HELMET	DUST-MASK	HARNESS WITH FALL ARREST ROPE
							
Movement / Relocation	X	XX	XX	XX	XX	/	/
Assembly / Disassembly	XX	XX	XX	XX	XX	/	X
Ordinary use	X	X	XX	XX	X	XX	/
Adjustments	XX	XX	XX	XX	X	XX	/
Cleaning / Maintenance / Disassembly	XX	XX	XX	XX	XX	XX	X

LEGEND:

XX	PPE REQUIRED
X	PPE AVAILABLE OR TO BE USED IF NECESSARY
/	PPE NOT REQUIRED



PLEASE NOTE THAT FAILURE TO USE PERSONAL PROTECTIVE EQUIPMENT BY OPERATORS, SPECIALIZED TECHNICIANS OR ANYONE EMPLOYED IN USE OF THE EQUIPMENT MAY RESULT IN EXPOSURE TO RISK AND POSSIBLE DAMAGE TO HEALTH.

3.7 ISOLATION OF ENERGY SOURCES (LO-TO PROCEDURE)

A Lockout/Tagout (LOTO) safety procedure ensures that machinery is properly shut down and cannot restart accidentally.

LOCKOUT (Locking)

Lockout procedures consist of:

- Locking the fuel supply: For a burner supplied by a mains network (LPG, methane), lock the gas shut-off valve upstream of the gas train in the closed position using a suitable padlocking device.
- For a diesel burner, close the manual valve between the burner and the onboard tank, and attach a warning sign.
- Locking the electrical supply or PTO.
- Set the main isolator switch on the control panel to "0" and secure it with a padlock (see Section 3.5.2).
- For cardan shaft drive, disconnect the tractor's PTO shaft from the dryer.
- For an electrical supply, disconnect the main power cable from the panel and lock the plug using a suitable device.

TAGOUT (Labelling)

Tagout is a labelling process always used when locking is required.

Labelling a system involves posting or using an indicator (usually a standardized label) that includes the following information:

- The reason why lockout/tagout is necessary (repair, maintenance, etc.).
- The time the lock/tag was applied.
- The name of the authorized person who performed the locking procedure.
- Affix the tag to the system.

Once work is complete, all personnel must remove their own notices and personal locking devices.

3.8 RESIDUAL RISKS

The machine poses risks that design features or safety guards have not completely eliminated. However, this manual details these risks for the customer, specifying the PPE that operators must use.

Provide sufficient space during system installation to limit these risks. To maintain these conditions, always ensure the areas surrounding the system and access points to work areas are:

- kept free of obstacles;
- clean and dry;
- well lit.

For the customer's full information, the table below lists the residual risks that remain on the system during all phases of its life cycle.

COUPLING TO THE TRACTOR:

RISK		CONTROL MEASURES
Risk of crushing during coupling caused by machine instability		The machine must be installed in such a way as to avoid jolts or vibrations that could compromise the stability of the tractor-operator assembly. Provide appropriate support means. Wear the required PPE.
Hazards from hydraulic systems		• Oil outlets and quick couplings on machines must be marked with an identification code to prevent connection errors. • Hydraulic hoses must be protected to prevent fluid leaks in the event of a break. • Wear the required PPE.
Electrical system fault		• When the machine is not coupled to a self-propelled vehicle, it must be equipped with suitable devices to support hanging electrical cables. • Wear the required PPE.

CONNECTION TO THE TRANSMISSION OF THE MOTOR:

RISK		CONTROL MEASURES
Entanglement and drawing-in.	 	• Fit suitable covers and guards along the entire length of the shaft and universal joints. • The fasteners and guards must not show any breakages. • Ensure all guards prevent contact with moving parts. • Wear the required PPE.

USE OF THE MOBILE GRAIN DRYING PLANT:

RISK		CONTROL MEASURES
Entanglement and drawing-in	 	• Fit protective guards to all shafts, pulleys, belts, drive chains, and other transmission components. • The working parts of the machines and the associated operating areas must be protected, segregated, or equipped with a safety device. • Wear the required PPE.
Cutting and shearing	 	• Protect the moving parts of the fan using fixed guards or grilles if air passage is required or if you must perform frequent visual checks. • Wear the required PPE.
Falls from fixed or portable ladders		• Do not go up stairs with the machine running. • Alternatively, use leaning ladders equipped with non-slip devices at the feet and securing hooks at the top. • Wear the required PPE.
		•

RISK		CONTROL MEASURES
Lightning strikes.		• Do not use the machine in adverse weather conditions. • When located outdoors, the metal structure of the system, either by itself or by means of conductors and special earthing devices, must be electrically connected to earth in order to ensure the dispersion of atmospheric discharges. • Periodically inspect and test the lightning protection system. • Wear the required PPE.
Poisoning and burns		• Before allowing workers to enter the cylindrical chamber, ensure there are no hot parts. Ensure effective ventilation or other suitable measures. • Do not operate the dryer in potentially explosive atmospheres. Take all necessary measures to prevent fire and explosion risks: prohibit open flames, incandescent objects, sparking tools, and studded footwear; use safety lamps with a voltage not exceeding 25 V. • Wear the required PPE.
Harmful dust		• Equip the plant with systems to convey dust to disposal areas where it does not threaten public health or harm the environment. • Workers must be equipped with individual protective masks with dust filters.
Noise		• The noise emission data are expressed in paragraph 4.3.3 • In processes that produce noise, technically recommended measures must be adopted to reduce its intensity. • The employer must provide workers with personal protective equipment appropriate to the risks inherent in the work. • Wear the required PPE.
Burns.		• The external walls of the parts subject to heating by the hot air produced and used must be effectively covered with thermally insulating material or protected against accidental contact. • Wear the required PPE.
Fire		• Dry clean product • Do not leave damp products stagnating for long periods because it may not flow when restarted. • Respect the recommended drying temperatures. • Clean the dryer periodically, especially when changing the product in the case of sunflower and light seeds. • Make sure there is no fuel spilling into the firebox or combustion chamber around the burner or in the area in front of it. If the burner fails to ignite on the second attempt, see the FAULTS table. • If connected to a mains gas supply, close the main gas shut-off valve upstream of the dryer during fires, maintenance tasks, and at the end of each daily operating cycle. • Do not bypass temperature probe alarms. • Monitor the operation of the dryer continuously during use. • Remove all potentially flammable materials from the vicinity. • Do not use open flames, carry out work that generates sparks, or perform welding, particularly near the fuel tank or gas lines. • Wear the required PPE and ensure suitable fire-extinguishing equipment is readily available. • IN THE EVENT OF FIRE, ISOLATE ALL ELECTRICAL AND MECHANICAL POWER SOURCES. ATTEMPT TO EXTINGUISH THE FIRE USING AVAILABLE EXTINGUISHING EQUIPMENT AND, IF NECESSARY, IMMEDIATELY CALL THE FIRE BRIGADE.

ELECTRICAL EQUIPMENT OF THE MACHINE

RISK		CONTROL MEASURES
Accidental contact with live components		- Do not remove or modify the protective casings of the electrical elements to avoid altering their IP protection rating. - Wear the required PPE.
Indirect contact with exposed conductive parts that have become live due to a fault		- Electrical ground connection. - Installation of a differential protection switch. - Wear the required PPE.
Wear or damage to electrical conductors, presenting a risk of direct contact with live parts.		- Regularly check the integrity of the electrical cables. - Wear the required PPE.

ADJUSTMENTS, REFUELLING, CLEANING AND MAINTENANCE

RISK		CONTROL MEASURES
Crushing and shearing	 	- It is forbidden to intervene on moving mechanical parts. - Wear the required PPE.
Entrapment		- The access openings to the cylindrical chamber of the dryer are sufficiently sized to ensure safe entry. - Wear the required PPE.
Accidental contact with fluids		- Filling, draining and recovery of service fluids must take place under safe conditions. - Wear the required PPE.
Entanglement, drawing-in, and cutting	 	- Do not remove guards from transmission elements such as pulleys, shafts, gears, flywheels, fans, and even drive belts and chains. - The guards must be locked with systems that require the use of special tools to open. - Wear the required PPE.
Working at heights		Climb the ladder provided, wearing a harness and equipped with a fall arrest rope.

		
Prohibition on removing guards and protective devices	Prohibition on carrying out work on moving parts	No access for unauthorized person
		
Do not insert hands	Do not climb	No open flames
		
Do not wear loose clothing or dangling accessories		

3.9 INTENDED USE AND LIMITS OF USE



PLEASE NOTE THAT FAILURE TO USE PERSONAL PROTECTIVE EQUIPMENT BY OPERATORS, SPECIALIZED TECHNICIANS OR, IN ANY CASE, THOSE RESPONSIBLE FOR USING THE EQUIPMENT MAY RESULT IN EXPOSURE TO RISK AND POSSIBLE DAMAGE TO HEALTH.

- Only operate the machine if all guards and safety devices are intact and fully functional.
- Only trained and adequately informed operators may use the machine.
- The machine dries grains and oilseed products at the temperatures and moisture levels recommended in this manual. Contact the manufacturer for special cases.

3.10 PREDICTABLE MISUSE

- Strahl s.r.l. declines all liability and voids the warranty in the event of negligent machine use or failure to follow the instructions.
- Do not use the machine for purposes other than those intended. Any unauthorized use may pose a hazard, as essential built-in safety features may be absent.

Introducing dirty products with high moisture content (e.g. above 30% for corn) may compromise the correct operation of the machine.

4 DESCRIPTION

4.1 GENERAL DESCRIPTION AND CHARACTERISTICS

The machine dries various types of grain using hot air from the heating unit. The mixer and central auger keep the product in constant motion to ensure even and uniform drying.

- An auger loads the grain, drawing the correct quantity of product from the heap, or operators can pour it into the loading hopper;
- For dryers powered by a tractor PTO, connecting the cardan shaft to the PTO provides the mechanical energy for movement, whereas an electric motor supplies this power directly on electric models;
- The mains grid or a generator provides the electricity supply;
- The burner produces thermal energy and can run on various fuel types;
- The loading auger conveys the grain into the silo, where the central auger lifts it inside a tube to the top and drops it into the silo until the dryer is completely full;
- Once the silo is completely full, loading stops. The central auger continuously draws grain from the bottom of the silo, and the mixer circulates the product;
- Sensors control the burner, which produces the necessary heat inside the combustion chamber (AS version) or the heat exchanger (ES version). The fan blows the hot air through a duct to the internal cylinder of the silo;
- An extractor fan vents the dust produced by the process outside, collecting it from the top of the silo's central tube;
- Once the grain reaches the target moisture content, the burner turns off, ending the drying process, while the fan continues to blow air into the silo to cool the product.
- Once the cooling phase finishes, the unloading phase begins; a transverse screw or a discharge chute at the top of the silo discharges the product from the dryer.

4.2 COMPONENTS AND FUNCTIONAL DIAGRAM

TURBODRY VERSION (AS)

- 1 Exhaust
- 2 Central auger
- 3 Inner cylinder
- 4 Air duct
- 5 Fan
- 6 Combustion chamber
- 7 Worm gearbox
- 8 Mixer
- 9 Ejection Cleaner
- 10 Product Socket

11. Loading auger
12. Transmission group
13. Adjustable feet
14. Electrical Panel
15. Main Shaft
16. Burner
17. Dust suction fan
18. Dust collection cyclone

- ➡ Cold air flow
- ➡ Hot air flow
- ➡ Product Flow

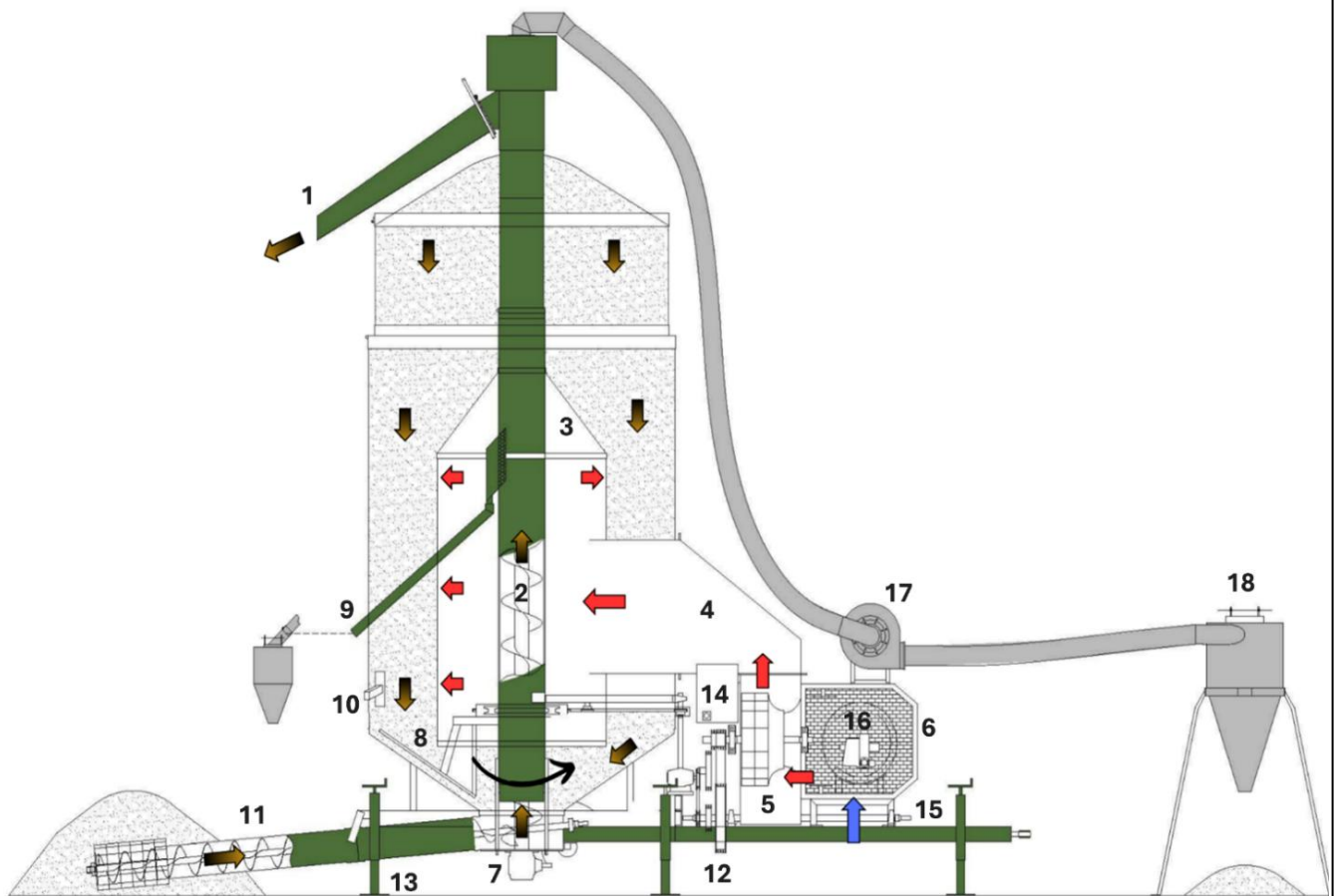


Figure 4.1 Components and functional diagram Turbodry version

BIODRY VERSION (ES)

- | | | |
|---|-----------------------------|--|
| 1. Exhaust | 11. Loading auger |  Cold air flow |
| 2. Central auger | 12. Transmission group |  Hot air flow |
| 3. Inner cylinder | 13. Adjustable feet |  Burnt air flow |
| 4. Air duct | 14. Electrical Panel |  Product Flow |
| 5. Fan | 15. Main Shaft | |
| 6. Combustion chamber with heat exchanger | 16. Burner | |
| 7. Worm gearbox | 17. Dust suction fan | |
| 8. Mixer | 18. Dust collection cyclone | |
| 9. Ejection Cleaner | | |
| 10. Product Socket | | |

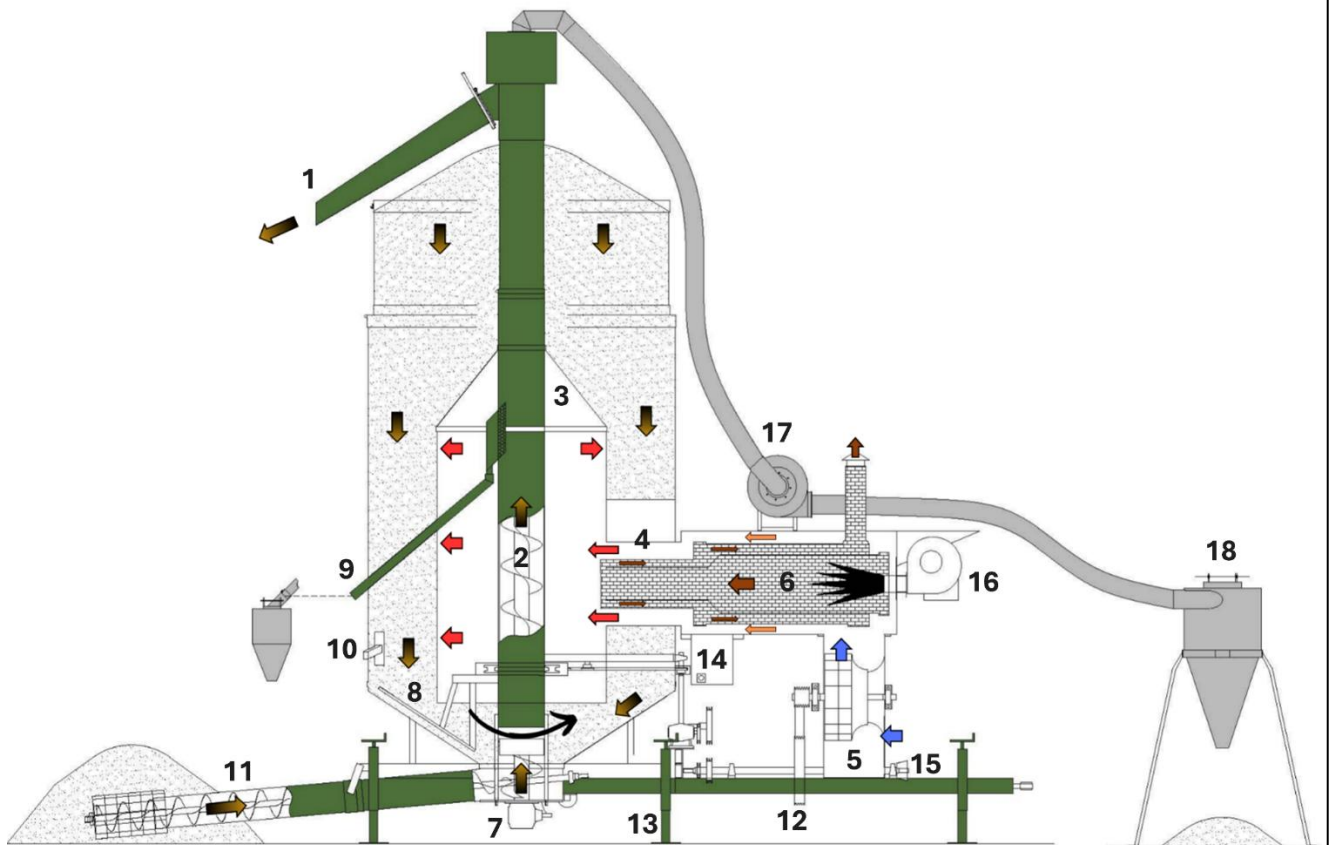


Figure 4.2 Components and functional diagram Biodry version

4.3 DIMENSIONS AND TECHNICAL DATA

4.3.1 TURBODRY VERSION

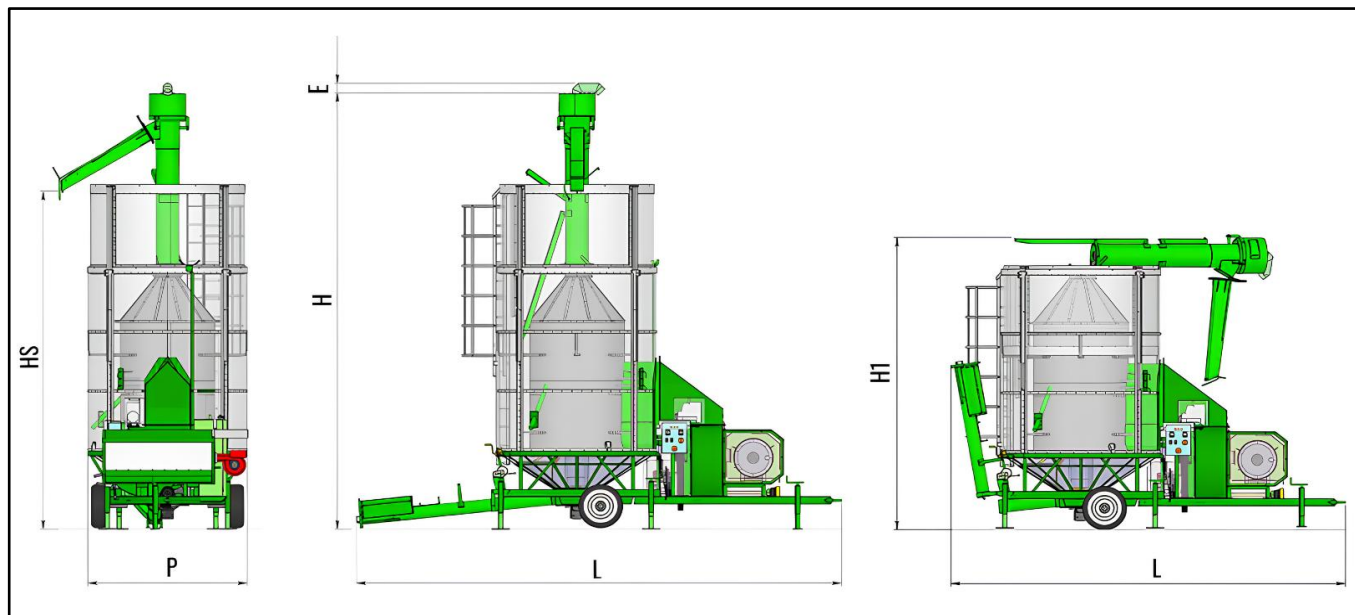


Figure 4.3 Turbodry version dimensions

Description		Unit:	AS 400	AS 500	AS 600	AS 900	AS 1000	AS 1150	AS 1350	AS 1550 EVO	AS 1750 EVO	AS 2250	AS 2550	AS 2650	AS 3150	AS 3550	AS 3750
Height	Open (H+E)	cm	480 +16	520 +16	561 +16	621 +16	667 +16	725 +16	647 +16	718 +16	768 +16	720 +16	840 +21	854 +21	971 +21	1107 +21	1300 +21
	Closed (H1)	cm	385	385	442	459	423	484	450	486	508	506	-	-	-	-	-
Length (L)	Open	cm	625	625	782	782	782	782	863	863	863	976	976	976	976	976	976
	Closed	cm	525	525	640	640	640	640	715	715	715	920	-	-	-	-	-
Silo diameter (P)		cm	225	225	254	254	254	254	320	320	320	400	400	400	400	400	400
Silo height (HS)		cm	340	380	370	454	430	434	450	440	457	445	635	695	805	952	1145
Weight (empty)		ton	2,3	2,45	3,2	3,4	3,6	3,8	4,3	4,5	4,9	5,75	6,18	6,38	9,7	9,8	11
Capacity		m ³	8	10	11,5	15	17	19	21	28,5	32	44	52	58	64	75	100
Absorbed electrical power		kW	17	17,5	21	25	27	31	37	39	42	54	55	57	85	85	85
Power required by the cardan shaft		HP	30	35	40	45	50	55	65	70	75	100	100	110	150	150	150
Max production 24h*	Corn (from 25% to 14%)	Ton/24h	36	45	52	68	77	86	95	128	144	198	220	235	252	293	338
	Rice (25% to 14%)	Ton/24h	10	12	14	18	20	23	25	34	38	53	62	70	73	85	120

Description		U.M	OP 120E	OP 1200	OP 2910	OP 4810
Height	Open (H+E)	cm	613 +16	662 +16	778 +21	951 +21
	Closed (H1)	cm	455	467	507	-
Length (L)	Open	cm	880	880	1070	1070
	Closed	cm	640	640	920	-
Silo diameter (P)		cm	254	254	400	400
Silo height (HS)		cm	454	507	445	805
Weight (empty)		ton	3,6	4,0	5,8	9,7
Capacity		m3	15	16	42	65
Absorbed electrical power		kW	25	30	54	85
24h production	Corn (from 25% to 14%)	Ton/24h	68	72	198	252

4.3.2 BIODRY VERSION

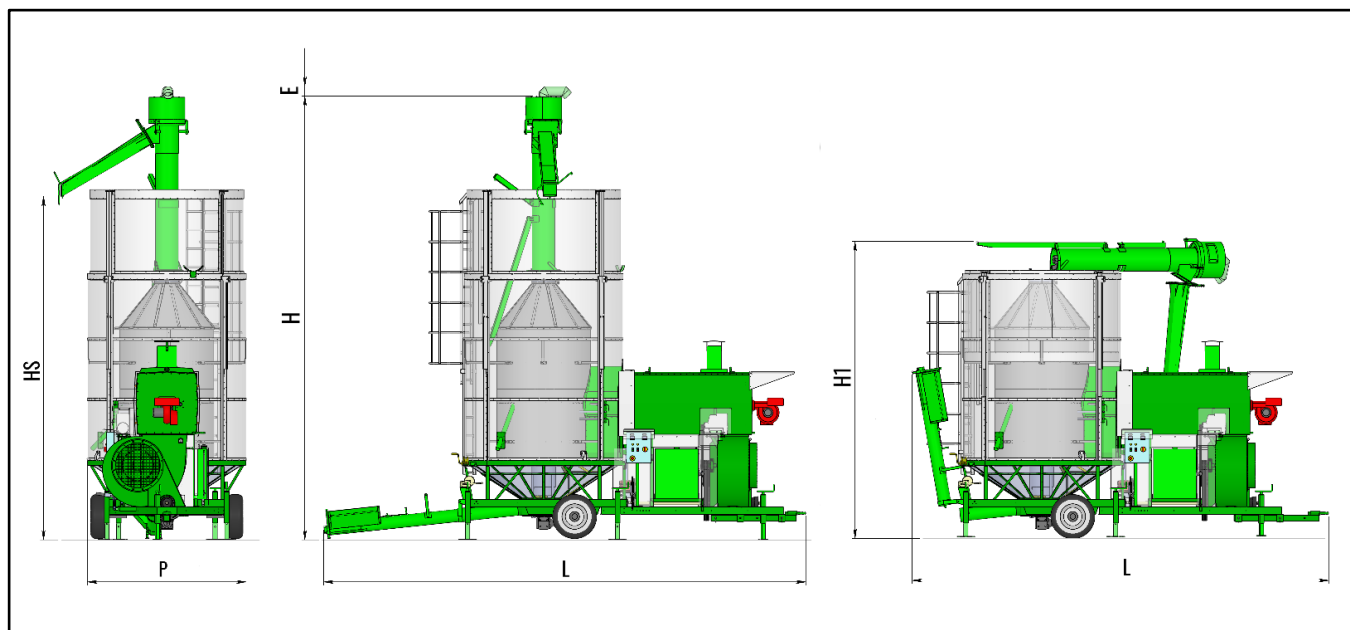


Figure 4.4 Biodry version size

Description		Unit:	ES 400	ES 500	ES 600	ES 900	ES 1000	ES 1150	ES 1350	ES 1550 EVO	ES 1750 EVO	ES 2250	ES 2550	ES 2650	ES 3150	ES 3550	ES 3750
Height	Open (H+E)	cm	480 +16	520 +16	561 +16	621 +16	667 +16	725 +16	647 +16	718 +16	768 +16	720 +16	840 +21	854 +21	971 +21	1107 +21	1300 +21
	Closed (H1)	cm	385	385	442	459	423	484	450	486	508	506	-	-	-	-	-
Length (L)	Open	cm	625	625	782	782	782	782	863	863	863	976	976	976	976	976	976
	Closed	cm	525	525	640	640	640	640	715	715	715	920	-	-	-	-	-
Silo diameter (P)		cm	225	225	255	255	255	255	320	320	320	400	400	400	400	400	400
Silo height (HS)		cm	340	380	370	454	430	434	450	440	457	445	635	695	805	952	1145
Weight (empty)		ton	2,3	2,45	3,2	3,4	3,6	3,8	4,3	4,5	4,9	5,75	6,18	6,38	9,7	9,8	11
Capacity		m ³	8	10	11,5	15	17	19	21	28,5	32	44	52	58	64	75	100
Absorbed electrical power		kW	17	17,5	21	25	27	31	37	39	42	54	55	57	85	85	85
Power required by the cardan shaft		HP	30	35	40	45	50	55	65	70	75	100	100	110	150	150	150
Max production 24h*	Corn (from 25% to 14%)	Ton/24h	33	41	47	62	70	78	86	116	131	179	200	214	229	266	307
	Paddy Rice (25% to 14%)	Ton/24h	10	12	14	18	20	23	25	34	38	53	62	70	73	85	120

All data are indicative and subject to change by the manufacturer without notice.

*Production data are indicative and calculated based on an ambient temperature of 20°C (68°F), a drying air temperature of 120°C (248°F) for corn and 50°C (122°F) for rice, and specific weights of 750 kg/m³ and 600 kg/m³ respectively. For corn and rice, these values can vary depending on quality characteristics, the level of impurities in the grain, and environmental conditions.



STRAHL S.R.L. DECLINES ALL RESPONSIBILITY FOR INCONVENIENCES, FAULTS OR MALFUNCTIONS THAT MAY OCCUR AS A RESULT OF FAILURE TO COMPLY WITH THE SUPPLIED POWER VALUES.

4.3.3 NOISE EMISSIONS

The following data relate to these conditions:

- The source operates under design conditions, with the fan(s) and burner(s) running;
- Operation with a full dryer.
- Operate the machine in accordance with the use and maintenance manual

The acoustic characteristics of the installation site (e.g. the presence and layout of surrounding buildings, terrain elevation, and other systems) and meteorological conditions can cause variations in the measured and reported sound pressure levels.

Based on the collected data and the criteria defined by the UNI EN ISO 11202:2021 and UNI EN ISO 4871:2009 standards, the noise emission values of the dryer, expressed as the "A-weighted" average sound pressure level at a distance of 150 cm from the source, are:

- **Measured sound pressure level (L) at a distance of 150 cm from the source:**

91,8 dB(A)

- **Associated uncertainty (K):**

3 dB(A)

4.4 CONTROL PANELS AND CONTROLS

4.4.1 PTO VERSION

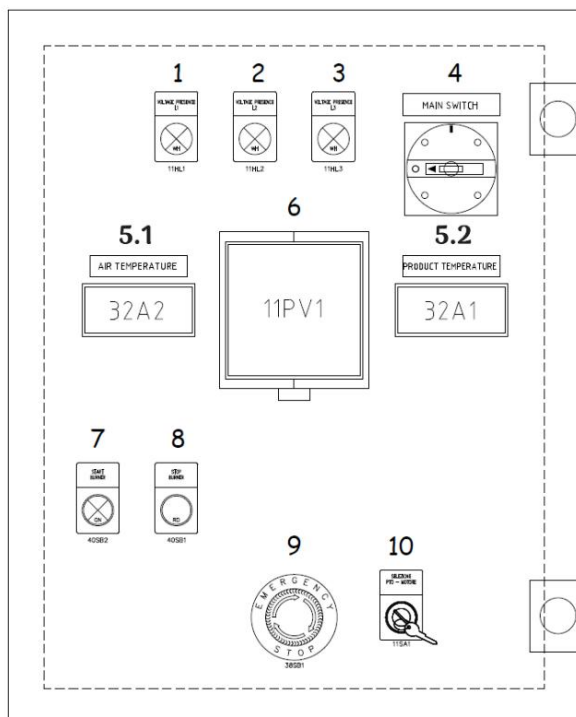


Figure 4.5 PTO version control panel

No.	Description
1	Power indicator
2	Power indicator
3	Power indicator
4	Main switch
5.1	Thermoregulator (air temperature)
5.2	Product temperature thermostat
6	Voltmeter
7	Burner start
8	Burner stop
9	Emergency stop
10	PTO or Motor Selection

4.4.2 PTO+EL VERSION

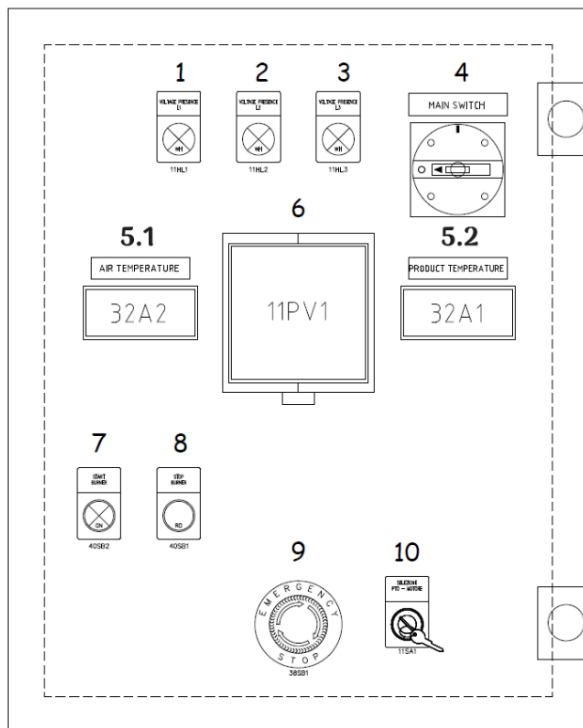


Figure 4.6 PTO + electric control panel

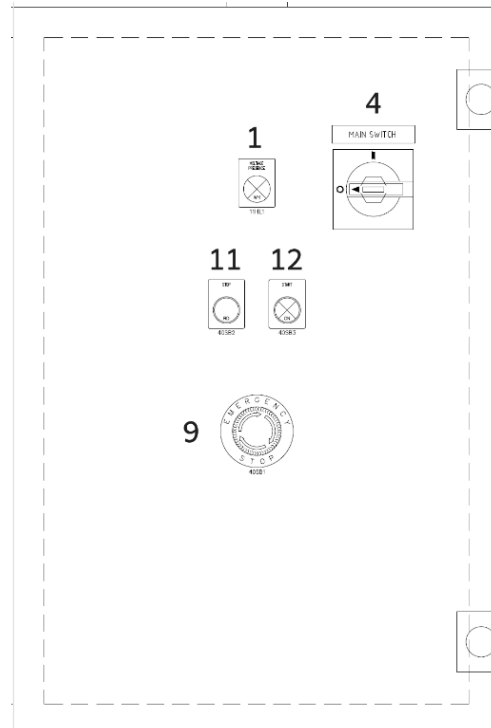


Figure 4.7 Electric motor control panel

No.	Description
1	Power indicator
2	Power indicator
3	Power indicator
4	Main switch
5.1	Thermoregulator (air temperature)
5.2	Product temperature thermostat
6	Voltmeter
7	Burner start
8	Burner stop
9	Emergency stop
10	PTO or Motor Selection
11	Stop electric motor
12	Electric motor start

4.4.3 ELECTRIC VERSION

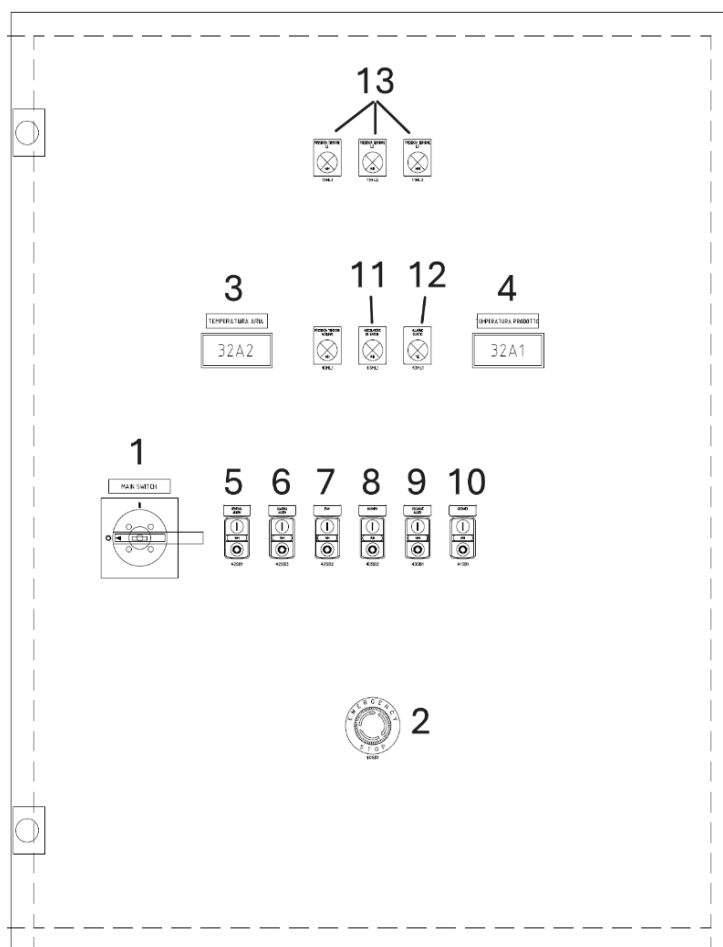


Figure 4.8 Control panel Electric version

No.	Description
1	Main switch
2	Emergency stop
3	Air temperature
4	Product temperature
5	Start/stop central auger
6	Start/stop loading auger
7	Start/stop fan
8	Start/stop burner
9	Start/stop unloading auger
10	Start/stop cleaner fan
11	Presence of mixer rotation
12	Presence of alarms
13	Presence of L1, L2 and L3 voltages

4.4.4 SMART VERSION

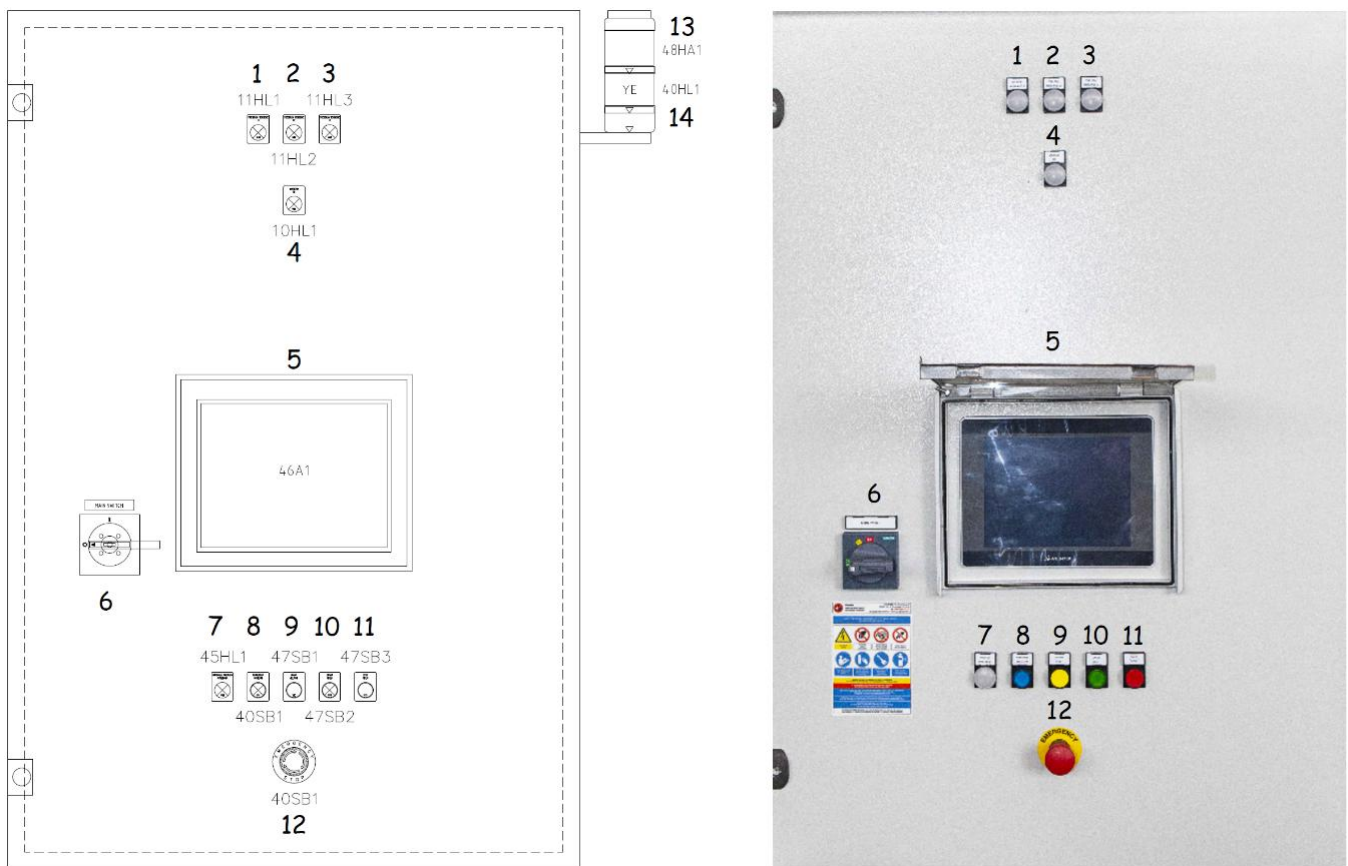


Figure 4.9 SMART version control panel

No.	Description
1	Presence of L1 voltage
2	Presence of L2 voltage
3	Presence of L3 voltage
4	Correct voltage
5	Touch screen
6	Main switch
7	Presence of auxiliary circuit voltage
8	Inserting auxiliaries
9	Reset alarms
10	Start cycle
11	Stop cycle
12	Emergency stop
13	Alarm light
14	Alarm siren

5 TRANSPORT, ASSEMBLY AND POSITIONING

- Only qualified personnel must conduct assembly and handling operations.
- Operators must wear work overalls, safety footwear, gloves, and a safety helmet.
- Do not modify the parts supplied with the machine. Replace any lost or damaged parts with identical, original components. Contact Strahl s.r.l. for assistance.
- All machines are tested and fine-tuned by the manufacturer before shipment and delivery to the user.

Following assembly, mounting, or reassembly operations, restore the conditions and settings established during testing.

- Before starting any maneuvers, ensure no people or animals are within the operating range.
- Upon delivery, check all mechanical parts (including bolt tightness) and electrical components for transit damage.
- Improper installation or maintenance can create hazards during machine operation and will void the warranty.
- Position the machine in a sufficiently ventilated area, away from flammable materials and potentially explosive mixtures (gas or dust).
- Do not position the machine near overhead power lines.
- Position the dryer to minimize the suction and recirculation of dust produced during operation.
- Maintain a minimum average illumination level of 300 lux in the installation environment;
- Use portable lighting devices when performing adjustments or maintenance in poorly lit areas.
- For PTO-driven models, position the tractor to allow the transmission shaft to function correctly.

Unless otherwise specified in the contract, the following are the responsibility of the customer:

- Ensuring the minimum space required to move equipment around the machine.
- Providing an adequate electrical power supply.
- Illuminating work areas with sufficient intensity and distribution in accordance with current legislation.
- Connecting the metal structure of the unit to the earthing system using an appropriately sized copper cable to protect operators from indirect electrical contact.

5.1 CONVEYOR DRYER

The operator can transport the dryer to the work area by towing it behind the tractor.

Ensure that all road safety equipment (such as lights, reflectors, and warning signs on road-approved models) functions correctly and remains clearly visible before driving on public highways.

- Before moving the unit, ensure the machine is securely coupled to the towing vehicle to prevent accidental decoupling during manoeuvres.
- Check the tyre pressures.

Once you reach the work area:

- Uncouple the tractor and unload the wheels of the leading axle.
- Extend the adjustable stabilizing feet to ensure ground stability and correct levelling of the machine.
- Place sturdy wooden boards between the feet and the ground to distribute the load and prevent the feet from sinking.

5.2 TRAILER DRYER

Operators can transport the dryer to the work area loaded onto a transport vehicle and assemble or partially

assemble it on site.

Once you reach the work area:

- unload the dryer from the transport vehicle.
- assemble the machine following the manufacturer's instructions.
- assemble the machine using suitable lifting equipment and auxiliary aids.
- Use adjustable stabilizing feet to ensure stability and proper machine levelling. If the ground is unstable, place sturdy wooden boards underneath to distribute the load.

5.3 ELECTRICAL CONNECTION

- The supply voltage must match the voltage specified in the technical data. Do not connect the machine to any other power source.
- Disconnect the power supply before performing any work on the machine.
- Only qualified electricians must perform electrical work.
- The customer's electrical installation must comply with local regulations and standards.
- Earth the machine's electrical system and all metal structures of the dryer. Only professionally qualified and authorized personnel wearing suitable personal protective equipment and using correct tools must perform these operations.

5.3.1 POWERED BY PTO

The onboard engine-alternator unit serves as the power source.

Electrical separation provides protection against indirect contact; residual current devices (RCDs) are not required.

- Do not connect the exposed conductive parts of the separated circuit to earth, to the conductive parts of other circuits, or to extraneous conductive parts.

5.3.2 POWER SUPPLY VIA EXTERNAL ELECTRICITY GRID

A competent electrician must perform the connection to the external mains grid.

Earth the machine via the main power cable, ensuring the cable has adequate mechanical protection.

- Protect the electrical power supply line against overcurrent using fuses or circuit breakers rated for the maximum expected current draw.

5.4 GAS MAINS CONNECTION

If the mobile dryer is configured to run on a gaseous fuel burner (LPG, natural gas/methane, or other gaseous fuels), connect it to an external gas distribution network or a stationary/mobile storage system.

Have a qualified technician verify that the supply pressure meets the burner requirements.

To ensure personnel and system safety during operation, maintenance, and emergency procedures, strictly observe the following requirements:

- **Main shut-off valve (upstream):** Install a manual gas shut-off valve in a fixed position upstream of the connection point to the dryer.
- **Accessibility and signaling:** Position this valve in a safe, visible, unobstructed, and easily accessible location. Clearly identify it with appropriate safety signs.
- **Connection and commissioning procedure:** Before opening the gas supply, check that all connections are sealed, the connecting pipes are intact, and no leaks are present.
- **Emergency isolation and shutdown:** In the event of a malfunction, gas odour, scheduled maintenance, or at the end of the daily work cycle, immediately close the upstream shut-off valve to isolate the dryer completely from the gas supply.

6 DISPLACEMENT

- The dryer can be moved by towing it with another suitable vehicle equipped with a tow hook.
- The machine can only be moved if it has no grain inside.
- Before starting handling operations, make sure that the area is free of obstacles and people and that there is enough space to move the machine and its accessories safely.
- Before starting to move the machine, check that all parts are securely fastened.
- In the case of a car approved for road traffic, respect the shapes and axle weights of the country's highway code. If in doubt, contact the competent authorities.
- To proceed with the move, in the case of a machine already connected to the electricity and fuel network, disconnect it from any power source.
- If the machine is approved for road traffic, in the case of diesel fuel, empty the tank.

6.1 PREPARATION FOR TRANSPORT

To minimize the machine's overall size, it is mandatory to prepare it for handling

1. Raise the **loading hopper** (1) to a vertical position using the appropriate winch (2) located on the silo frame, and secure it with the safety rope provided.
2. If the **upper part of the silo is telescopic**, lower it by removing the safety pins from the uprights and operating the appropriate winch (3) until it reaches the end of its travel.
3. Lower the top of the **central tube** with its discharge (4) until it rests on the appropriate support, by operating the winch (5) positioned on the front or rear of the dryer depending on the model (tipping the central tube backwards or forwards).
Check that the ropes are not twisted, secure any loose sections to the structure, and ensure that all cables, casings, panels, and other machine parts are perfectly secured;

To return the dryer to its working position, perform these operations in reverse order.

6.1.1 DRYER WITH BACKWARD TILTING

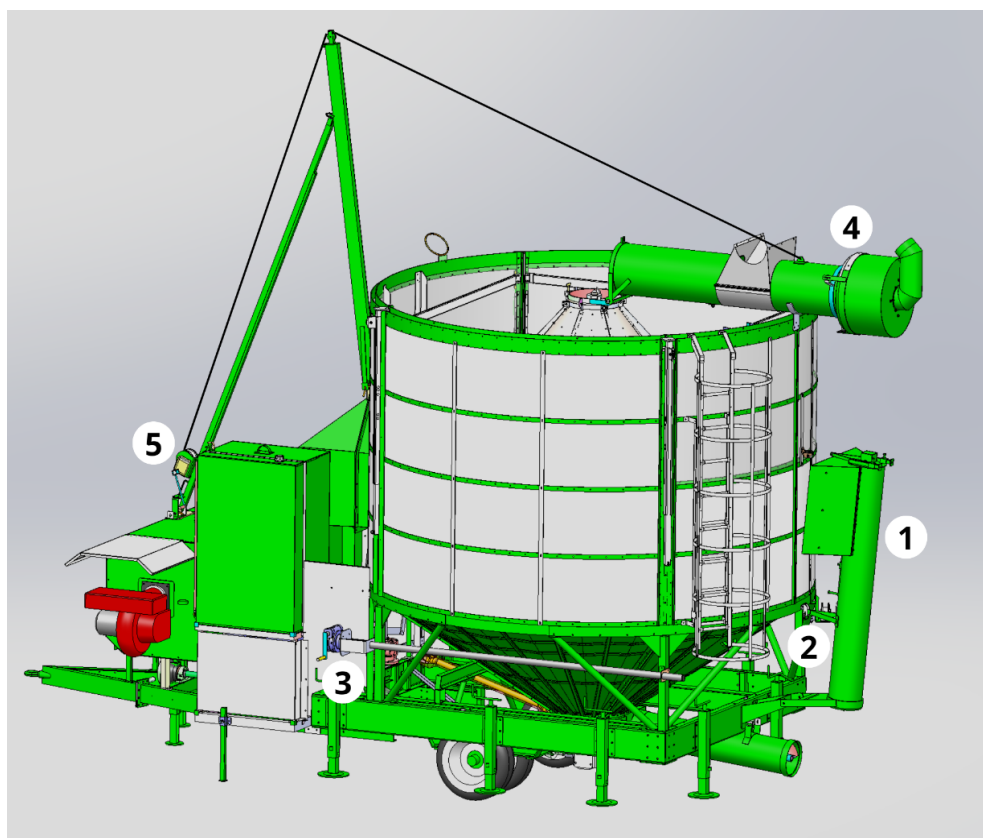


Figure 6.1 Backward Flip

6.1.2 FORWARD-TILT DRYER



Figure 6.2 Forward Flip

7 USE

Only professionally qualified and authorized personnel, wearing suitable personal protective equipment and using correct tools and aids, must perform these operations.

7.1 PRELIMINARY CHECKS AND COMMISSIONING

Perform preliminary checks before starting the machine.

- If you detect any anomalies, do not start the machine; consult the dedicated chapter.
- Personnel must promptly report any safety system malfunctions and detect hazardous conditions to their superior or supervisor.
- The operator must ensure no unauthorized personnel are nearby and give a signal before starting the dryer.
- The operator must check for foreign objects (e.g. tools, rags) inside the machine and near moving parts or air intakes.
- For checks at initial start-up, follow the '**START-UP CHECKLIST**' in Chapter 14.

7.1.1 ELECTRICAL AND FUEL CONTROLS

Before connecting the system to the power supply:

- Ensure the switch is in the OFF '0' stop position.
- Verify that all electrical connections are correct.
- ensure all utilities (accessories) are connected and in the correct position.
- Verify that the machine's earth connections are correct.
- Ensure the mains voltage and frequency comply with requirements; the supply voltage must match the technical specifications.
- When operating with diesel fuel at low temperatures, check that its characteristics are suitable.
- Verify that the supply network pressure is adequate when using gaseous fuel.

7.1.2 MECHANICAL PART CHECKS

Verify that:

- no components are damaged or incorrectly secured.
- check the integrity of the fan protection grille and replace it if necessary.
- check the oil level in the gearboxes and grease the required lubrication points.

For a PTO-driven dryer, the cardan shaft must:

- bear the CE mark and feature the relevant safety guards.
- be correctly secured to the PTO only when the tractor or generator is off; attach the anti-rotation safety chains to the PTO shaft guard.
- have the telescopic tubes overlapping by at least 1/3 of their length.



ON THE TRACTOR, SET THE PTO ROTATION SPEED SELECTOR TO 540 rpm.

THE STABILITY AND PRECISION OF THE CARDAN SHAFT ROTATION SPEED DETERMINE THE VOLTAGE PRODUCED BY THE ALTERNATOR, AS WELL AS THE CORRECT OPERATION OF THE BURNER AND SENSORS.

7.1.3 SELECTING THE CLEANER GRID

The dryer features a cleaning system on the central tube. To ensure effective impurity removal and prevent accidental grain loss, install a grid with the correct perforations for the type of grain processed.

Consult the table to select the correct grid based on the size of the product and processing requirements:

DRIED PRODUCT	RECOMMENDED GRILLE MODEL (Ø HOLE)
Rice, alfalfa seeds, or other seeds with size <1.5	Blind
Rapeseed	1.5 mm
Wheat, oats, barley and sorghum	3 mm o 1,5 mm
Soya, sunflower	3 mm
Corn	5 mm

Operating procedure:

1. Access the cleaner cassette area located below the inner cylinder cone on the central tube.
2. Loosen the cleaner cassette retaining bolt (indicated by the blue arrow).
3. Remove the bolt by securing the grid installed on the cleaner cassette (indicated by the red arrow).
4. Remove the grid by sliding it upwards and clean the area of any product residue or deposits.
5. Insert the selected grid, ensuring it is perfectly seated to prevent product leaks.
6. Tighten the fixing screw indicated in red.
7. Fasten the bolt indicated in blue to lock the cleaner cassette onto the central tube.

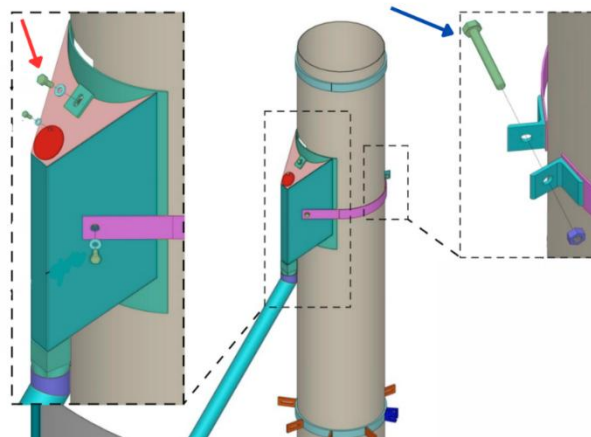


Figure 7.1 Fitting the cleaner cassette

7.2 STARTING AND LOADING

Follow the start-up and load sequence below according to the dryer version.

The inlet of the loading auger features a hopper for gradual grain loading. Do not fill the hopper while the loading auger is stationary.



IN THE ABSENCE OF A HOPPER, THE END OF THE AUGER CAN BE IMMERSSED DIRECTLY IN THE MIX. IN THIS CASE, APPROPRIATE PROTECTION MUST BE PROVIDED TO PROTECT THE AUGER FROM THE ENTRY OF MATERIAL OTHER THAN GRAIN AND TO PREVENT PEOPLE OR ANIMALS FROM TOUCHING THE MOVING AUGER.

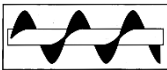
All dryers feature a central auger and a mixer that circulates the product within the internal cylinder.

7.2.1 PTO START-UP

- start the tractor and operate the clutch and accelerator to gradually engage the transmission.
- operate the fan using the lever indicated by the sticker in Figure 7.2 (Auger and fan operating levers), and secure it with the locking nut:



- gradually increase the tractor cardan shaft speed until the voltmeter on the panel reads 400 V;
- then switch on the control panel by setting the main switch to "I";
- verify that all voltage indicator lights are lit;
- engage the loading auger using the lever indicated by the sticker in Figure 7.2, and secure it with the locking wing nut:



- When grain completely covers the internal cylinder (approx $\frac{3}{4}$ full), start the burner using the button on the control panel. If ignition fails, refer to Chapter 10;
- Once the dryer is full, stop the loading auger;
- The central auger and the mixer circulate the product inside the cylinder.

7.2.2 STARTING VIA ELECTRICAL GRID

- remove the padlock from the main switch;
- switch on the control panel by setting the main switch to "I";
- verify that all voltage indicator lights are lit;
- start the central auger using the corresponding button on the panel;
- start the loading auger using the corresponding button on the panel;
- start the fan;
- When grain completely covers the internal cylinder (approximately $\frac{3}{4}$ full), start the burner using the button on the control panel. If ignition fails, refer to Chapter 10;
- once the dryer is full, stop the loading auger;
- the central auger and the mixer circulate the product inside the cylinder.

7.2.3 DRYERS POWERED BY PTO + ELECTRICITY

To start the dryer via PTO:

- ensure you have mechanically disconnected the electric motor from the central transmission using the threaded rods shown in Figure 7.3 (Threaded rods for disconnecting the electric motor);
- disconnect the main electrical supply from the dryer control panel;
- set the key selector on the control panel to “PTO”;
- follow the “PTO START-UP” procedure.

To start the dryer via the mains electricity supply:

- ensure you have decoupled the cardan shaft and mechanically connected the electric motor to the central transmission using the threaded rods shown in Figure 7.3 (Threaded rods for disconnecting the electric motor);
- set the key selector on the control panel to “EL”;
- follow the “STARTING VIA ELECTRICAL GRID” procedure.



Figure 7.2 Auger and fan drive levers



Figure 7.3 Threaded rods for electric motor disconnection.

7.3 DRYING

7.3.1 OPERATING TEMPERATURES BY GRAIN TYPE

The table below provides indicative maximum operating temperatures for the hot air produced by the heating unit (in degrees Celsius). Set these values on the control panel according to the type of cereal to be dried, atmospheric conditions, and the dryer model.

	RICE	SUNFLOWER	SOYBEANS	SORGHUM BARLEY WHEAT MILLET	CORN	RAPESEED	U.M.
Maximum Operating Temp. (T ambient = 20°C)	45*	50	70	100**	120**	75	°C
	113*	122	158	212	248	167	°F

*For rice, at ambient temperature < 10°C (50°F), the operating temperature can reach 70°C (158°F)

**For corn and all products with a drying temperature >90°C (194°F), it is recommended to initially set a drying air temperature of 80–90°C (176–194°F), until the product temperature reaches approximately 25–35°C (77–95°F). Subsequently, you can gradually increase the air temperature to the maximum value that can be set.

IMPORTANT!!

To ensure proper operation of the heat unit, do not exceed the following maximum air temperatures:
120 °C (248°F) for Turbodry models,
100 °C (212°F) for Biodry models

In general, the difference between the set operating temperature and the temperature of the outdoor environment should never exceed 110°C (198°F) to avoid burner malfunction.



IN THE CASE OF DRYING OIL SEEDS (SUNFLOWER, RAPESEED, ETC.), BEFORE LIGHTING THE BURNER, IT IS NECESSARY TO VENTILATE FOR APPROXIMATELY 15-20 MINUTES TO ALLOW ANY POSSIBLE FLAMMABLE GAS EMITTED BY THE PRODUCT TO BE DISMANTLED.

IN THE EVENT OF A FIRE BEGINNING (DUE TO AN INCORRECT SETTING OF THE OPERATING TEMPERATURES, A MALFUNCTIONING OF THE CONTROL INSTRUMENTS, ETC.), THE BURNER AND THE VENTILATION MUST BE STOP AS SOON AS POSSIBLE AND THE PRODUCT MUST BE UNLOADED.



AFTER SETTING THE RIGHT OPERATING TEMPERATURE FOR THE CEREAL TO BE DRYED, MONITOR THE CORRECT OPERATION OF THE DRYER AND THE TREND OF THE TEMPERATURES DETECTED.

IF YOU DRY PRODUCTS OTHER THAN THOSE IN THE TABLE, CONSULT THE MANUFACTURER.

7.3.2 DRYING TEMPERATURE ADJUSTMENT - STANDARD PANEL (WITHOUT PLC)

- Press the burner ignition button in short pulses for approximately 10 seconds until the flame ignites.
- If the burner fails to ignite, you must press the burner stop button immediately.
- The control panel features two temperature controllers: one for the process air temperature and one for the temperature of the product.
- The temperature controllers display the current detected temperatures.
- To view the set temperatures, press the “SET” button.
- To adjust the target temperatures, use the ▲▼ buttons.



Figure 7.4 Temperature controller

When the product reaches the pre-set temperature, the burner automatically shuts down while the fan continues to run, cooling the grain.

To ensure correct storage and preserve product quality, cool the grain to ambient temperature, or a maximum of 5–10°C (9–18°F) above it.

7.4 DISCHARGE

Once the drying and cooling phases are complete, unload the product.

The discharge occurs via a device at the top of the central tube, available in two configurations:

- MANUAL: a guillotine valve operated by two ropes, which diverts the product flow towards a discharge chute.
- ELECTRIC: pressing a button on the control panel activates the horizontal unloading auger.

8 MAINTENANCE

8.1 GENERAL RULES

- File the machine's initial start-up report along with the inspection and maintenance logs.
- Maintenance depends on the type, quality and initial humidity of the grain and the frequency of use of the dryer



ANY OPERATION MUST BE CONDUCTED BY DISCONNECTING ANY POWER SOURCE, ADOPTING ALL NECESSARY MEASURES TO AVOID ACCIDENTAL START-UP OF THE SYSTEM (LOTO PROCEDURES, SEE CHAPTER 3.7)

ONCE MAINTENANCE IS COMPLETE, RESTORE ALL PROTECTIVE GUARDS IN THEIR DESIGNATED POSITIONS BEFORE RESTARTING THE MACHINE.

Thorough maintenance at the end of the working season is highly recommended, as it maintains machine efficiency and minimizes damage or malfunctions.

The customer must ensure that only professionally qualified or authorized personnel perform inspection, repair, and maintenance operations. They must possess:

- specific technical training and experience.
- knowledge of general safety regulations.
- the ability to recognize and avoid potential hazards.

To ensure correct maintenance:

- use only original spare parts, and tools that are suitable for the work and kept in good condition.
- respect the service intervals suggested in the manual.
- Observe the designated responsibilities for routine and extraordinary maintenance. Failure to comply with warnings can create risks for personnel.
- The person carrying out any unauthorized intervention assumes full liability for it. They must document a detailed description in the maintenance report.

The following chapters detail routine maintenance procedures. For extraordinary maintenance related to faults or anomalies, consult the troubleshooting table and, if necessary, contact the manufacturer.



IT IS STRICTLY FORBIDDEN TO REMOVE THE ACCESS DOOR TO THE SILO CONE AND ANY PROTECTION WHILE THE MACHINE IS OPERATED OR WITH THE MACHINE CONNECTED TO THE POWER SOURCES (MAIN PTO SHAFT AND/OR ELECTRICITY MAINS).

8.2 CLEANING

Always wear personal protective equipment (work clothing, non-slip footwear, gloves, and safety glasses) during cleaning. Check the safety data sheets of the cleaning products used for any specific PPE requirements.

Regular cleaning and maintenance are essential to ensure the longevity of the machine:

- We recommend thoroughly cleaning the machine at every shutdown (end of the season) and after every product change. After a prolonged shutdown, thoroughly clean the entire machine using suitable systems and products before resuming production.
- Clean all parts of the machine to remove product sediment, dust, liquids, and residues.
- Prevent electrical and electronic devices from meeting liquids, vapors, and dust;
- Ensure all filters (compressed air, water, etc.) are clean daily; otherwise, empty and clean them;
- Keep the fan impeller and the dust extractor fan clean;
- Keep the fan, air damper, burner deflector, and generator clean;
- Clean the perforated mesh of the internal cylinder as required;
- Clean the burner nozzles and filters;
- Empty and clean the box below the cone as required to remove stagnant grain hardened by dust and moisture; failure to do so will compromise grain circulation and create abnormal stress on the mixer and the loading auger.

In general, we recommend the following:

- Do not enter the dryer without isolating all power sources;
- Do not clean the machine immediately after shutdown while it is still hot;
- Do not use detergents containing aggressive, irritating, or non-biodegradable chemicals;
- Do not use water jets, steam, or pressure washers;
- Do not use wire brushes or abrasive tools;
- Wear appropriate PPE to protect against dust when using compressed air;
- High-pressure air jets can damage electrical components. Clean them using a dry cloth or vacuum cleaner.
- Do not allow plastic materials to encounter synthetic oils or thinners.
- Do not direct compressed air at yourself or others.

8.3 ELECTRICAL COMPONENT CHECKS

Periodically check electrical components, ensuring they do not contact hot objects, damp or oily surfaces, or sharp edges.

8.4 ELECTRICAL PANEL CHECKS

Inspect the electrical panel at the start of the season and every 6 months (test the emergency stop button function at least weekly).

ACTIVITIES (START OF SEASON AND EVERY 6 MONTHS)	DESCRIPTION
1. Safety Before the Intervention	Switchgear off
	Blocking and reporting applied
	Check for absence of voltage
	PPE used correctly
	Safe work area
2. General Visual Checks	Clean paintwork (dust, residue, moisture)
	No signs of overheating
	Absence of oxidation
	Degree of protection (IP) maintained
	Seals and closures intact
3. Mechanical Controls	Clean fans and filters
	Tightening screws and bolts
	Correct component fixing
	Working doors and locks
	Cable glands intact and tight
4. Electrical Controls (Disconnected Panel)	Cable glands intact and tight
	Tightening power terminals
	Tightening control terminals
	Cable and insulation condition
	Readable cable numbering
5. Power and Power Controls	Earth continuity verified. PE value measurement.
	Main switch status
	Circuit breakers/Intact motor protectors
	Correct and intact fuses
	Contactors in good condition
6. Automation and Control Controls	Thermal relays calibrated correctly
	Inverter / soft starter without historical alarms
	Stable 24 Vdc power supply
	PLC working properly
	Error-free I/O modules
7. Safety Checks (MUST BE CARRIED OUT AT LEAST EVERY WEEK)	Relay and timer status
	HMI / operator panel working
	Working emergency stops
	Efficient safety circuit
	Safety relay working
8. Tests with the panel powered on	Security reset successful
	Voltage and frequency compliant
	Current draw within normal limits
	Manual operation

ACTIVITIES (START OF SEASON AND EVERY 6 MONTHS)	DESCRIPTION
	Automatic operation
	Correct alarm reports
	Communications (bus / Ethernet) OK
9. Final Cleaning	Internal panel suction
	Cleaning filters and fans
	Residue removal
	Correct closing of the frame
10. Maintenance Outcome	Electrical panel in good working order
	Faults found
	Corrective actions required
	Description of anomalies/interventions

8.5 TRANSMISSION CONTROLS

- Periodically check the tension of the drive belts for the fan, generator, and other accessories, following the intervals and methods specified in the manufacturer's instruction manuals;
- Check gearbox lubricant levels and grease the bearings, following the intervals and methods specified in the manufacturer's instruction manuals.
- Periodically check the cardan shaft for secure fastening and wear.
- Periodically check the integrity of the cardan shaft guards and safety covers.

8.6 SAFETY COMPONENT CHECKS



THE CORRECT OPERATION OF SAFETY DEVICES (EMERGENCY STOP BUTTONS, ACCESS DOOR MICROSWITCHES) IS ESSENTIAL FOR PERSONAL HEALTH AND PROTECTION. IT IS NECESSARY TO CARRY OUT PERIODIC INTERVENTION TESTS ON THE DEVICES IN ORDER TO EXCLUDE ANY DEFECTS OR FAILURES IN THEM OR IN THE EQUIPMENT THAT COMPOSE THEM. TEST SAFETY DEVICES AT LEAST ONCE A WEEK AND VERIFY THE CORRECT OPERATION AND RELEASE OF ALL DEDICATED SAFETY EQUIPMENT.

8.7 BURNER CHECKS AND ADJUSTMENTS

Only qualified personnel must perform burner maintenance. For specific operations, consult the supplied burner manual.

Standard maintenance operations for a diesel burner comprise:

- adjusting the position of the ignition electrodes.
- adjusting the burner air damper.
- adjusting the pump: The pump requires no pre-setting. It leaves the factory calibrated at 12 bar; verify and adjust this pressure, if necessary, after igniting the burner.

For a gaseous fuel burner:

- have a qualified technician check the burner and gas line;
- check the tightness of the manual shut-off valve upstream of the dryer;
- check the efficiency of the pressure reduction system.

8.8 CONTROL AND REGULATION OF MAXIMUM TEMPERATURE THERMOSTATS

Operating principle

The dryers feature two safety thermostats installed in the electrical panel. These thermostats stop the machine immediately in the event of abnormal conditions:

Drying air thermostat: trips if the air temperature exceeds the safety limit.

Product safety thermostat (bulb sensor immersed in the grain mass): trips in the event of cereal overheating to prevent fire risk.

These safety devices do not replace operating thermostats; they function only if the standard control system fails or malfunctions.

Factory settings

The manufacturer calibrates the thermostats to standard safety values at the factory.

In principle, the user must not modify these settings.

Product-based adaptation

Operational experience shows that different crops (corn, rice, soya beans, wheat, etc.) require different thresholds. To ensure safe, optimal operation, we recommend the following:

Safety air thermostat: set the value to +10% above the operating temperature (for temperatures up to 100°C / 212°F). For operating temperatures above 100°C (212°F): set a fixed value of +10°C (+18°F) above the operating temperature.

Safety product thermostat: set the value to +10% to +15% above the final drying temperature measured during testing.

Practical examples:

Corn: If the operating temperature is 120°C (248°F), set the air thermostat to approximately 130°C (266°F).

Rice: If the operating temperature is 40°C (104°F), set the air thermostat to approximately 45°C (113°F).

Corn (product): If the product temperature at the end of the cycle is 60°C (140°F), set the thermostat to 65–70°C (149–158°F).

Operating procedure

Start the machine with the new product.

Monitor the drying process using moisture meters.

Record the air and product temperatures when the grain reaches the target moisture level.

Set the safety thermostats to the recommended values.

Warnings

Do not permit the operator to make frequent adjustments on the control panel; only qualified personnel must perform this operation.

When changing from one product to another, check and, if necessary, adjust the thermostat thresholds.

Failure to adapt may result in untimely shutdowns of the machine.

8.9 MECHANICAL PARTS CHECKS

Periodically check:

- the cleanliness and wear status of the fan blades and all metal components;
- the cleanliness and wear of the augers;
- the tightness of all fixing screws;

8.10 LUBRICATION

The dryer bearings are factory-filled with standard grease that ensures their entire service life under optimal operating conditions. However, due to the elevated temperatures and stresses typical of the system, you must perform periodic top-ups to compensate for thermal degradation of the lubricant.

Adjust the frequency of these maintenance operations based on machine usage. Since the bearings are sealed, you must use only minimal amounts of grease: excessive internal pressure will damage the seals, irreparably compromising bearing protection and efficiency.

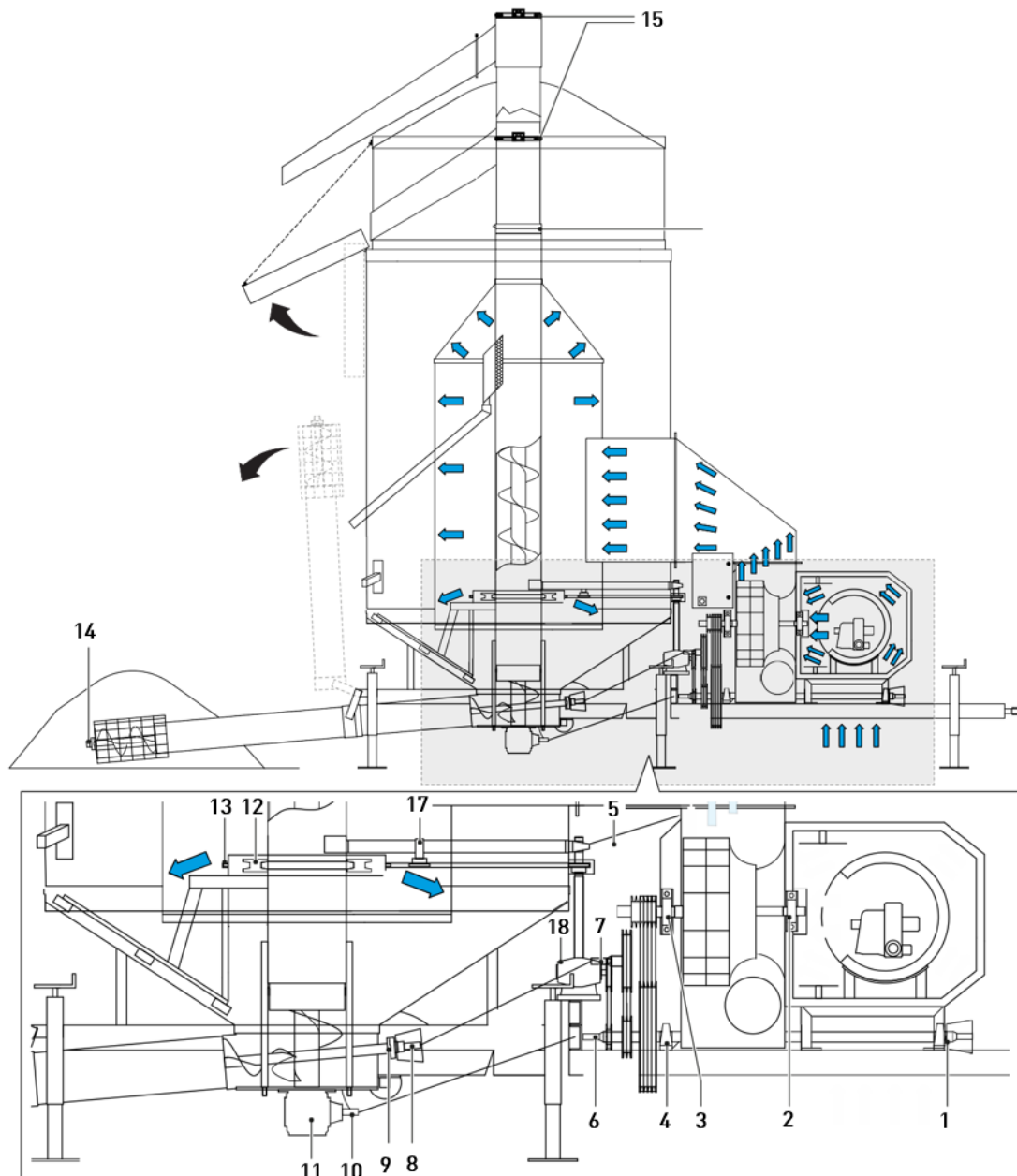


Figure 8.1 Lubrication / Greasing Points

No.	COMPONENT	OPERATION DESCRIPTION	FREQUENCY
1	'UK' type main shaft and fan bearings	Lubricate with standard grease in 5 gr doses	Approximately 240 hours
2	'UK' type main shaft and fan bearings	Lubricate with standard grease in 5 gr doses	Approximately 240 hours
3	'UK' type main shaft and fan bearings	Lubricate with standard grease in 5 gr doses	Approximately 240 hours
4	'UK' type main shaft and fan bearings	Lubricate with standard grease in 5 gr doses	Approximately 240 hours
5	Other bearings	Lubricate with standard grease in 5 gr doses	Approximately 300 hours
6	Cardan shafts	Get fat with common fat	8 hours in abundance
7	Cardan shafts	Get fat with common fat	8 hours in abundance
8	Cardan shafts	Get fat with common fat	8 hours in abundance
9	Other bearings	Lubricate with standard grease in 5 g doses	Approximately 300 hours
10	Cardan shafts*	Get fat with common fat	8 hours in abundance
11	Central auger reducer	Check oil	Approximately 300 hours
12	Fifth wheel rollers	Get fat with plenty of common fat	Approximately 500 hours
13	Drive chains	to oil and grease	end of season
14	Other bearings	gain weight with common fat in doses of 5g	Approximately 300 hours
15	Centre auger triangular support	Check the condition of the bearing and oil seal. Re-grease with standard grease during major maintenance. When changing the auger, replace the bearing.	end of season
16	Worm gear reducer of the mixer	Check oil seals and grease	for life
17	Chain Tensioner Sprocket	Get fat with common fat in doses of 2 g	Approximately 300 hours

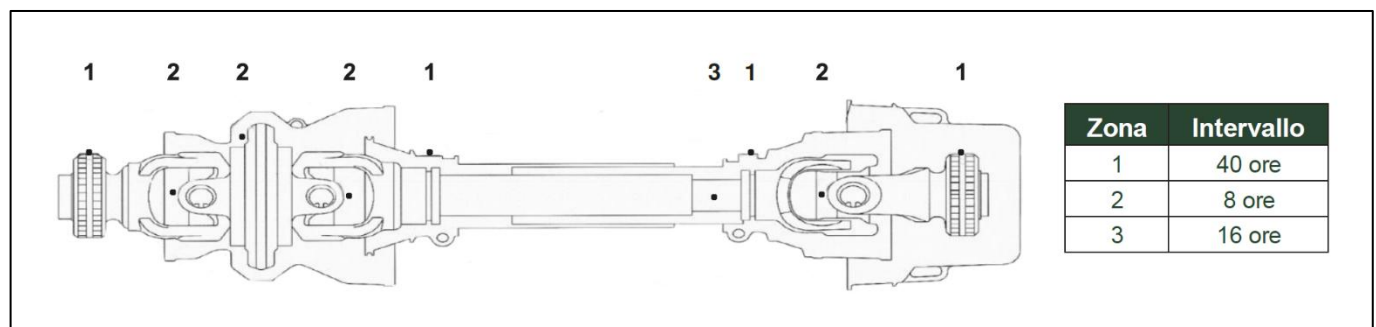


Figure 8.2 Cardan shaft lubrication*

8.11 PERIODIC MAINTENANCE SUMMARY TABLE

AREA/EQUIPMENT	INTERVENTION	FREQUENCY	PERFORMER
All electrical components	Check the integrity of all components and connections	At the start of the season	Qualified personnel
Electrical panel	Check integrity and functionality (see Section 8.4)	At the start of the season and every 6 months	Qualified personnel
Chain and chain tensioner	Check condition, integrity, and lubrication**	At the start of the season	Operator/User
V-belts	Check tension and condition	At the start of the season	Operator/User
Bearings and/or housings	Check condition, integrity, and lubrication**	At the start of the season	Operator/User
Reducers	Check the quality of the oil on the gearbox**	At the start of the season	Operator/User
Fan	Clean and check the integrity of the blades	At the start of the season	Operator/User
Burner*	Inspect and adjust	At the start of the season	Qualified personnel
Central auger and central tube.	Check the condition of wear	At the start of the season	Operator/User
Diesel tank.	Empty and verify integrity	At the end of the season	Operator/User
Combustion chamber	Check the status	At the start of the season	Qualified personnel
Ropes, swivels, and winches.	Check efficiency and integrity	At the start of the season	Operator/User
Cardan shafts and guards.	Check condition, integrity, and lubrication**	At the start of the season	Operator/User
General cleaning	Thorough cleaning of the dryer	At the end of the season and every product change	Operator/User
Mechanical components	Check the state of wear and tightening of screws	At the start of the season	Operator/User
Guard interlock devices and emergency button	Functional test (the machine stops upon activation and cannot be restarted)	At the beginning of the season and at least every week	Operator/User
Thermostats and temperature probes	Verify correct operation	At the start of the season	Qualified personnel

*For specific operations, consult the supplied burner manual.

**For periodic lubrication and greasing operations, refer to the dedicated chapter.

9 SPARE PARTS

Only authorized and competent personnel must perform replacements, documenting them in the maintenance register.

Request all spare parts in writing from the manufacturer, Strahl s.r.l.



IT IS MANDATORY TO USE ONLY ORIGINAL SPARE PARTS.

THE MANUFACTURER DECLINES ALL LIABILITY FOR DAMAGE TO PROPERTY, PEOPLE, AND ANIMALS, AND FOR OPERATIONAL FAULTS CAUSED BY REPAIRS CARRIED OUT WITH NON-ORIGINAL SPARE PARTS AND ACCESSORIES.

10 TROUBLESHOOTING

This chapter provides information on the most common problems to assist qualified technicians with troubleshooting.



THE INDICATIONS IN THE "ANOMALY TABLE" MUST BE IMPLEMENTED THROUGH SAFE AND CONSOLIDATED PROCEDURES

Carefully assess the machine's operating conditions at the time of shutdown, noting any errors or anomalies.

Check that:

- no tools or other foreign objects were accidentally left inside the machine during maintenance or changeover operations;
- no jams occurred or safety devices tripped in the minutes preceding the problem;
- no parts are deformed or broken;
- moving parts do not exhibit excessive play or irregular movement;
- drive belts comply with specifications and are not excessively worn or loose;
- all machine timing references are correct;
- the product and any accessory materials, if present, are in order;
- the product and/or material supply functions optimally;
- the various machine groups are adequately clean;
- all photocells and proximity sensors are properly positioned and clean;
- the supply voltage is correct;
- no abnormal odors are detected near the electrical cabinet;
- no protective elements (fuses, etc.) have tripped or blown;
- there are no out-of-service command or control elements (relays, microswitches, photocells, sensors, etc.);
- there are no loose connections on the equipment or terminal blocks, and all connectors are correctly inserted;
- If any alarm messages appear on the operator panel, note the alarm code and description, and report them to the manufacturer.



AFTER A STOP FOLLOWING AN ALARM/WARNING SITUATION, BEFORE RESTARTING THE MACHINE, VERIFY THAT ALL CAUSES OF ALARM HAVE BEEN ELIMINATED AND THAT ALL SAFETY CONDITIONS ARE RESTORED.

IN THE EVENT OF A SUDDEN STOP OF A MOVING PART, THE OPERATOR MUST STOP THE MACHINE AND INFORM THE MAINTENANCE MANAGERS.

Maintenance personnel may conduct the following troubleshooting, breakdown resolution, and component unblocking tasks.

Before conducting any maintenance or troubleshooting:

- Isolate the system from all power sources to prevent accidental restarting.
- Attach a clearly visible sign to the control panel indicating that the machine is undergoing maintenance.
- Verify that upstream and downstream machinery does not present any hazard or obstruction; shut them down in accordance with established procedures if necessary.
- Before restarting the machine, always ensure that no operators are carrying out maintenance work.
- Only entrust inspections and minor electrical repairs to qualified, authorized electricians.
- Contact the manufacturer directly for all mechanical repairs.
- Do not reset safety devices using automatic or external sequences without first identifying and resolving the cause of the shutdown.

10.1 TABLE OF ANOMALIES

- If the issue is not listed in the table, or if the proposed solutions do not resolve the problem, contact Strahl s.r.l. customer service.
- Before resuming normal production, maintenance personnel must check the integrity and functionality of all mechanical and electrical components, contacting the manufacturer if necessary.

FAULT (ALARM)	POSSIBLE CAUSE	ACTION (CHECKS AND RESOLUTION)
Burner fails to ignite	Lack of fuel (diesel or gas) in the dryer.	Check that there is fuel in the tank and that the shut-off valves are open.
Burner fails to ignite	Incorrect position of the valve on the filter (if using diesel).	Check and correct the position of the valve on the diesel filter.
Burner fails to ignite	Incorrect pressure on the burner pump (if using diesel).	Check and adjust the pressure on the burner pump.
Burner fails to ignite	Photoresistor or photocell dirty with soot or dust.	Check the integrity and carefully clean the photocell or photoresistor.
Burner fails to ignite	Incorrect position or dirt accumulation on the electrodes.	Adjust the gap between the ignition electrodes and clean the insulator to prevent tracking to earth.
Burner fails to ignite	Faulty ignition transformer.	Check ignition transformer, replace if burned out.
Burner fails to ignite	START button on the electrical panel faulty.	Check that the button is making proper contact and replace it if damaged.
Burner fails to ignite	Loose conductor connections or anchoring.	Tighten the conductor electrical connections in the panel.
Burner fails to ignite	Thermostat set to minimum or faulty.	Adjust the thermostat correctly or replace it if defective.
Burner fails to ignite	Emergency stop button engaged.	Reset and rearm the emergency button.
Burner fails to ignite	Dirty or damaged nozzle.	Clean the nozzle using petrol; NEVER use needles or pins to clear the orifice.
Burner fails to ignite	Diesel solenoid valve malfunction.	Check that the solenoid valve electrical circuit is working correctly.
Burner fails to ignite	Clogged fuel line filter.	Clean the line filter thoroughly.
Burner fails to ignite	Presence of air or dirt in the diesel intake pipes.	Tighten all gaskets, fittings, and seals to eliminate air infiltration. Inspect and clean the pipes.
Lack of diesel fuel at the nozzle	The nozzles or their internal filters are dirty.	Disassemble and clean the internal filters and nozzle bodies.
Lack of diesel fuel at the nozzle	The nozzle screw is loose.	Tighten the nozzle screw securely.
The burner emits smoke / dark flame	The conical pin inside the nozzle is dirty.	Thoroughly clean the conical pin inside the nozzle.
The burner emits smoke / dark flame	The burner deflector is dirty or displaced.	Clean the deflector and replace it in its correct position.
The burner emits smoke / dark flame	Insufficient combustion air in the flame.	Clean the burner fan and deflector and/or adjust the air damper.
The burner emits smoke / dark flame	The nozzles are broken or worn.	Replace damaged nozzles with new ones.
The burner goes out or does not heat	The filter on the diesel intake pipe is dirty.	Thoroughly clean the filter on the suction line.
The burner goes out or does not heat	The burner pump has low pressure.	Adjust and calibrate the burner pump to a pressure of 12-14 bar.

FAULT (ALARM)	POSSIBLE CAUSE	ACTION (CHECKS AND RESOLUTION)
The burner goes out or does not heat	The nozzles or their filters are dirty.	Thoroughly clean the nozzle filters and the nozzles themselves.
The burner exceeds the temperature	The air thermostat does not turn off the second flame.	Check the integrity and correct connection of the thermostat wires.
Uneven drying	The mixer is not working properly (transmission problems).	Check the efficiency of the mixer's transmission components (chains, reducer, rollers).
Sudden stoppage of central auger	Broken or faulty sensor on the central auger pulley.	Check the integrity, correct functioning, and positioning of the sensor on the pulley.
Sudden stoppage of central auger	Physical obstructions or product blockages in the central auger.	Remove any blockages or buildup of grain in the center auger.
Sudden stoppage of central auger	Broken belts on the central auger motor.	Check the condition of the drive belts and replace them if damaged.
Sudden stoppage of central auger	Breakage of the central auger cardan shaft.	Check the condition of the central auger cardan shaft and replace it if damaged.
Sudden stoppage of central auger	Breakage of the central auger gearbox.	Check the condition of the central auger reducer and replace it if damaged.
Sudden stoppage of central auger	Tripping of the circuit breaker or contactor of the central auger.	Check the electrical causes, reset the circuit breaker inside the panel and reset from the panel.
Dryer empty sensor fault	Failure to receive signal from vacuum sensor (sensor dirty or misaligned).	Check the integrity, positioning, and cleanliness of the empty dryer sensor.
Half load sensor fault	Failure to receive signal from half-load sensor.	Check the integrity, correct functioning, and positioning of the half-load sensor.
Air temperature probe anomaly	Failure to receive analog signal from the air temperature probe.	Check the integrity of the hot air probe and its wiring.
Product temperature probe fault	Failure to receive analogue signal from the product temperature probe.	Check the integrity and correct operation of the product probe (cereal).
Incomplete cycle	Unexpected termination of the current work cycle.	Press the emergency button on the electrical panel, reset it and press the "Total Reset" button.
Failure to start or stop the dryer	Activation of a safety device (emergency stop button, thermostats, main cone door).	Identify the triggered safety device, resolve the cause of the activation, and reset it.
Failure to start or stop the dryer	Incorrect auxiliary circuit supply voltage (no "Voltage OK" light).	Check on the voltmeter that the line voltage is stable between 390V and 400V.
Mixer sensor fault	Breakage of the mixer chain or transmission mechanism.	Check the integrity of the reducer, chain, rollers, mixer arm and chain tensioner.
Mixer sensor fault	Mixer sensor failure or misalignment.	Check the integrity and operation of the mixer sensor on the arm.
24VAC circuit breaker	Loss of power in the auxiliary circuit or reversal of the line phases.	Check the input circuits using the dryer's wiring diagram and verify the phases.

FAULT (ALARM)	POSSIBLE CAUSE	ACTION (CHECKS AND RESOLUTION)
Sudden burner shutdown	Burner motor protection tripped due to motor overload or short circuit in the burner circuit.	Consult the burner manual, reset the motor protection switch in the electrical panel and reset on the panel.
Sudden stop of the loading auger	Loading auger motor protection tripped due to obstructions or product blockages in the loading auger.	Check and remove any buildup or physical blockages inside the loading auger.
Sudden stop of the loading auger	Loading auger motor protection trip due to overload or overheating of the loading auger motor.	Check the electrical and mechanical condition of the motor, reset the motor protection switch, and reset.
Sudden stop of the discharging auger	The exhaust auger motor protection tripped due to obstructions or blockages in the exhaust auger.	Check the drain line, remove the blockage, reset the circuit breaker in the panel, and reset.
Sudden stop of the mixer	Mixer motor protection trip due to breakage or mechanical blockage of the internal mixer mechanism.	Inspect the mixer for structural damage, reset the motor protection switch, and reset.
Sudden stop of the dust extractor	Dust extractor motor protection trip due to clogging or mechanical blockage of the dust extraction fan.	Inspect and remove any blockages in the fan, reset the motor protection switch in the panel, and reset.
Sudden fan stoppage	Fan motor protection tripped due to overload or fault on the main fan motor.	Check the electrical condition of the fan motor, reset the motor protection switch in the panel and reset.
Fan motor protection trip	Fault in the electrical circuit of the fan in the main panel.	Check the fan wiring inside the electrical panel, reset the circuit breaker and reset.
Lack of fan airflow	Failure to activate the sensor on the fan lever (AS VERSION) or paddle sensor (ES VERSION)	Check the integrity, correct functioning and positioning of the sensor.
Lack of fan airflow	Fan belt breakage	Check the condition of the fan belts and replace them if damaged.
Sudden shutdown / burner failure to ignite	Fan air flow failure signal due to sensor failure on the fan body (ES VERSION).	Check the integrity, correct functioning and positioning of the sensor on the ventilator.
Sudden shutdown / burner failure to ignite	No airflow from the fan.	Check the integrity of the drive belts and the condition of all the fan components
Maximum air temperature exceeded	Incorrect burner calibration (exceeding 10% for more than 10 continuous minutes).	Recalibrate and calibrate the burner following the instructions provided in the burner's user manual.
Burner fails to ignite	Dryer intermediate sensor dirty, encrusted or damaged.	Thoroughly clean or replace the intermediate capacitive sensor in the dryer.
Failure to automatically turn on/off the loading phase	Dryer full sensor dirty, encrusted or damaged.	Thoroughly clean or replace the capacitive dryer full sensor.
Failure to automatically turn on/off the unloading auger	Dryer vacuum sensor dirty, covered in dust or damaged.	Thoroughly clean or replace the capacitive sensor of the empty dryer.

10.2 UNEXPECTED AND PROLONGED STOP OF THE CENTRAL AUGER

Leaving product stationary inside the dryer, particularly at high humidity, promotes grain sticking. This phenomenon drastically reduces grain flowability inside the loading box and between the flights of the central auger. The risk of sticking increases proportionally to the moisture level of the grain and the machine's downtime.

In the event of a sudden stop during any phase of the drying cycle, restart the central auger within 1 to 2 hours of the shutdown to prevent blockages.

If the central auger fails to rotate and the drive components lock when attempting to restart, the grain may have jammed.

In this case, abort the start-up sequence immediately and follow these instructions to clear the blockage.

1. Switch off the dryer completely at the control panel.
2. Isolate the power supply and ensure that all moving parts have come to a complete stop and are disengaged.

If the machine is equipped with the optional emergency discharge (Figure 10.1 Emergency discharge):

1. Open the guillotine shutter shown in the figure.
2. Allow the grain to drain freely under gravity from the door until the flow stops.
3. Reconnect the power supply and attempt to restart the central auger.

If the machine does not feature this option, or if the previous procedure fails to clear the auger:

1. Carefully open the inspection door by removing the screws indicated in Figure 10.2 Inspection door.
2. Wait for approximately 10 seconds, or until the gravity flow of grain stops completely.
3. Using only a spatula tool (never insert hands or limbs), remove the required amount of grain from inside the cone box to free the flights and clear the central auger.
4. Refit and secure the door correctly.
5. Reconnect the power supply and attempt to restart the machine.

If, after performing the procedures described above, the transmission parts are still blocked, do not force the system any further.

It is necessary to proceed with the complete emptying of the dryer on an extraordinary basis. This operation must be carried out by carefully opening the rear door of the machine to drain and remove all the product stored inside, before normal operation can be restored.

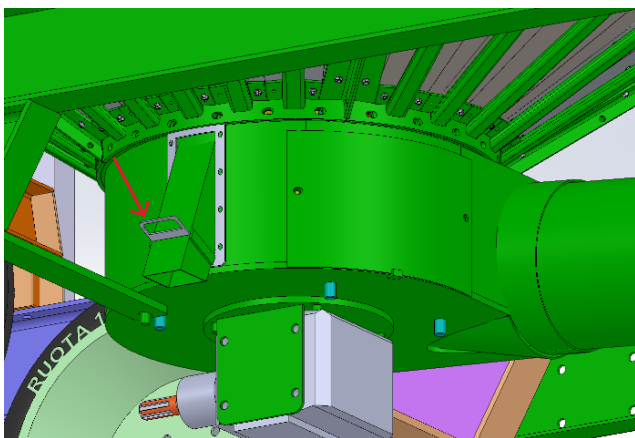


Figure 10.1 Emergency discharge

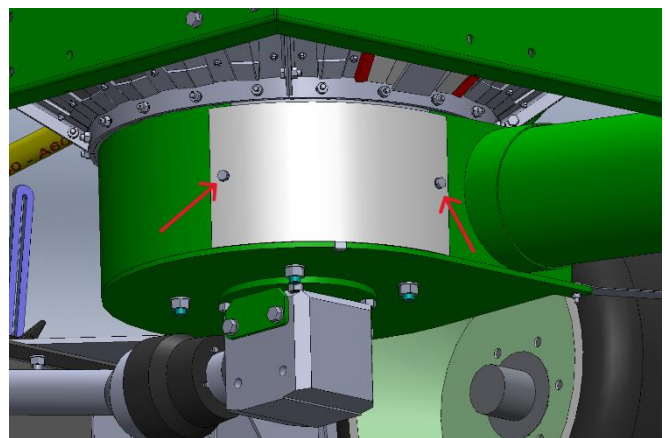


Figure 10.2 Inspection hatch

11 STORAGE

Follow the instructions in this section when storing the machine temporarily or transferring it to another location.

11.1 DEACTIVATION

- Empty and clean the machine.
- Disconnect all power sources.
- Loosen the drive belts.
- If the burner is diesel-powered, drain the tank.

11.2 CONSERVATION

Cover the most sensitive components, such as the burner and the electrical panel, with plastic sheeting.

- Store in a dry location protected from dust and weather conditions, preferably at a temperature between 0°C and +35°C (32-95°F).
- Raise the machine onto its support feet to unload the tyres.

11.3 RESTART

Before restarting the machine after a lengthy period of inactivity, check that:

- all protective covers (sheeting, plastic film, etc.) have been removed.
- the condition of the machine and its mechanical and electrical equipment is satisfactory;
- all excess protective grease has been thoroughly removed from the machine;
- all energy sources are correctly restored;
- all lubricants and lubrication points across the entire machine are checked;
- the drive belts are adjusted;
- A complete extraordinary cycle of inspections, checks, and controls is carried out before resuming operation.

12 DECOMMISSIONING AND DISPOSAL

Deactivate the machine once it reaches the end of its technical and operational life.

Before starting disposal:

- Isolate the machine from the electrical supply and from the fuel mains, if connected.
- Drain the fuel tank and fuel supply lines to the burner or disconnect the gas lines. Collect liquid fuel in suitable containers.

Consult the authority responsible for reporting and certifying the decommissioning and demolition of the machine, in accordance with the laws in force in the country where the machine is installed.

- Disassemble the machine and separate its various units.
- Sort and dispose of the components by material type in accordance with the instructions of your local waste disposal center and the environmental regulations in force at the site of decommissioning.

12.1 CLASSIFICATION OF WASTE AND MATERIALS FOR RECYCLING

For disposal, sort the machine components into the categories established by law. The owner is responsible for delivering these materials to authorized waste collection centers.

12.1.1 NON-HAZARDOUS SPECIAL WASTE (MATERIALS FOR RECYCLING)

This category includes materials suitable for recovery or recycling:

- **Steel and Metals:** all structural steelwork, the drying column, the loading/unloading augers, the drive chains, the wheel rims, and all metallic mechanical components.
- **Tyres:** remove the tyres from the rims and dispose of them separately at specialist collection centers (End-of-Life Tyres - ELT).
- **Insulating Materials:** any insulation panels in the structure (provided they do not contain hazardous substances).
- **Plastic and Rubber:** non-hydraulic pipes, gaskets, and other polymer components.

12.1.2 SPECIAL HAZARDOUS WASTE (POLLUTING SUBSTANCES)

This category includes components requiring strict disposal procedures to prevent environmental damage:

- **Oils, Greases, and Fluids:** used oil and grease from gearboxes, variators, and transfer cases; hydraulic oil and brake fluid (where present). Recover all fluids without discharging them onto the ground or into sewers.
- **Fuel Residues:** residual diesel in the tank and in the burner fuel lines.
- **Combustion Residues:** soot and deposits inside the burner and the hot air generator.
- **Waste Electrical and Electronic Equipment (WEEE):** electric motors, control panels, electrical cables, temperature and humidity sensors, and the burner. Dispose of these items in accordance with current regulations and the waste collection and treatment schemes defined by the component manufacturers.
- **Batteries:** any batteries used for starting auxiliary engines or control units.

12.1.3 RESPONSIBILITY AND OBLIGATIONS FOR DISPOSAL

Responsibility: disposal is the responsibility of the holder, who must use authorized companies and complete the Waste Identification Form (FIR).

Strahl s.r.l. accepts no liability for damage to person, pets, or property resulting from the reuse of individual machine components for applications other than their original intended use.

Obligations:

- **Specialist personnel:** authorized and qualified personnel must conduct the dismantling and disposal of the machine.
- **Sorting:** do not mix waste of various categories (e.g. do not mix hydraulic oil with residual diesel fuel).
- **Cleaning:** before scraping steelwork/metalwork, ensure all tanks and lines are completely drained and cleaned of polluting residues.
- **Documentation:** track all disposal activities using the waste identification forms (FIR) provided by the competent authorities.
- **No dumping:** it is prohibited to discharge or discard components or fluids into the environment.

You may contact the manufacturer's technical department at any time for assistance with decommissioning, dismantling, demolition, or scrapping the machine.

13 USER MANUAL FOR AUTOMATIC MOBILE DRYERS

This section applies only to dryers equipped with the SMART automatic control system.

13.1 GENERAL INFORMATION

The CE plate is affixed inside the electrical panel and details the order specifications, as shown in the example below.

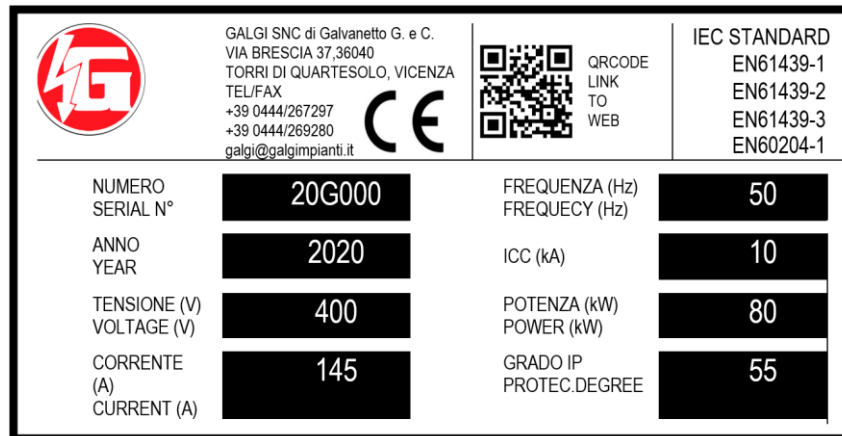


Figure 13.1 Electrical panel nameplate

When requesting information regarding the electrical panel, please provide the order serial number (for example, 20G000).

The CE nameplate displays nominal electrical data.

The electrical panel requires a three-phase supply line (3P+N+Earth) with a nominal voltage of 400V at 50Hz, sourced from the mains grid or a generator set (genset).

To operate using mains power, ensure the contracted power supply matches the requirements indicated on the CE nameplate (for example, 80 kW).

When operating with a genset, use a unit with an active power (kW) at least double the value indicated on the CE nameplate (for example, $80 \text{ kW} \times 2 = 160 \text{ kW}$, corresponding to 200 kVA). This oversizing is required to handle the inrush currents of the machine. A genset with an active power (kW) less than double the nominal rated power of the machine cannot guarantee correct operation, which may result in undervoltage faults during motor start-up.

Note that genset capacity is normally expressed as apparent power (kVA), which is always greater than active power (kW). Refer to the table below:

kVA	kW (ACTIVE POWER)
130	104
150	120
170	136
200	160
250	200
275	220
300	240

Determine the cross-section of the power supply line from the delivery point (mains grid or genset) based on the nominal current of the electrical panel indicated on the CE nameplate (for example, 145 A).

The power cables must feature double insulation of the FG16R16 0.6-1kV type, whilst the protective conductor must have single insulation of the FS17 450-750V type and be yellow/green in colour.

The cable current-carrying capacity must be greater than or equal to the nominal current indicated on the CE nameplate (for example, 145 A), as shown in the table below:

ROPE SECTION FG16R16 (mm ²)	RECOMMENDED CAPACITY (A)
25	80
35	100
50	130
70	150
95	200
120	240
150	300

The recommended cross-sections are indicative for cable lengths up to approximately 30 meters.

For longer runs, we recommend selecting the next largest cable cross-section.

The neutral and protective (earth) conductors may have a cross-section equal to half that of the phase conductor (for example, if the selected phase conductors have a cross-section of 70 mm², the neutral and earth conductors can have a cross-section of 35 mm²).

13.2 FIRST START-UP

Connect the power cables (3P + N) to the terminals below the main switch inside the electrical panel (see Figure 13.3).

Connect the protective conductor (Earth/T) to the copper bar located below the terminal block (see).

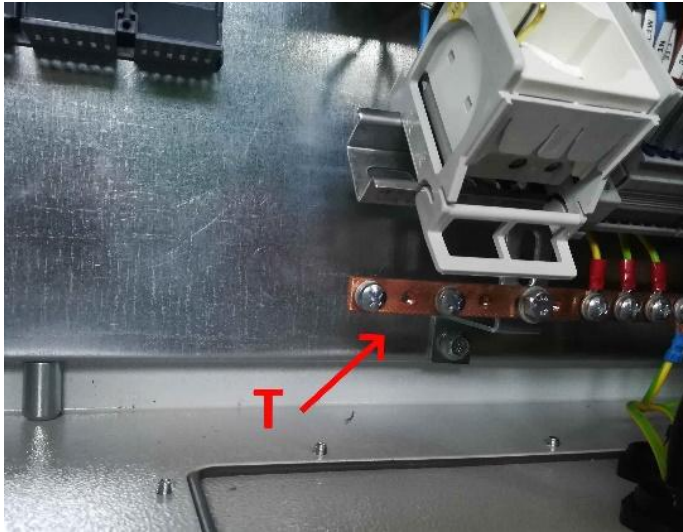


Figure 13.2 Earthing conductor in the electrical panel

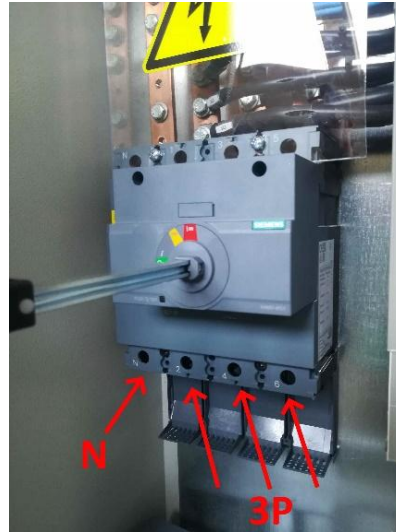


Figure 13.3 N+3P cable connection in the electrical panel

Close the electrical panel door and turn the main switch to the 'I' / 'ON' position (see Figure 13.4).

Once the panel is powered, the voltage indicator lights at the top and the auxiliary voltage indicator light at the bottom of the front panel will illuminate.

The phase connection sequence is correct if the 'Voltage OK' indicator illuminates when the main switch is turned on (see Figure 13.4).

The operator panel starts up and displays the main 'HOME' page, which allows you to monitor machine operation and access the various settings pages.

During initial start-up, check the rotation direction of the motors in manual mode as described below. If the rotation direction is incorrect, reverse any two phases of the 400V power supply.

The front of the electrical panel features buttons and indicator lights (see Figure 13.4).

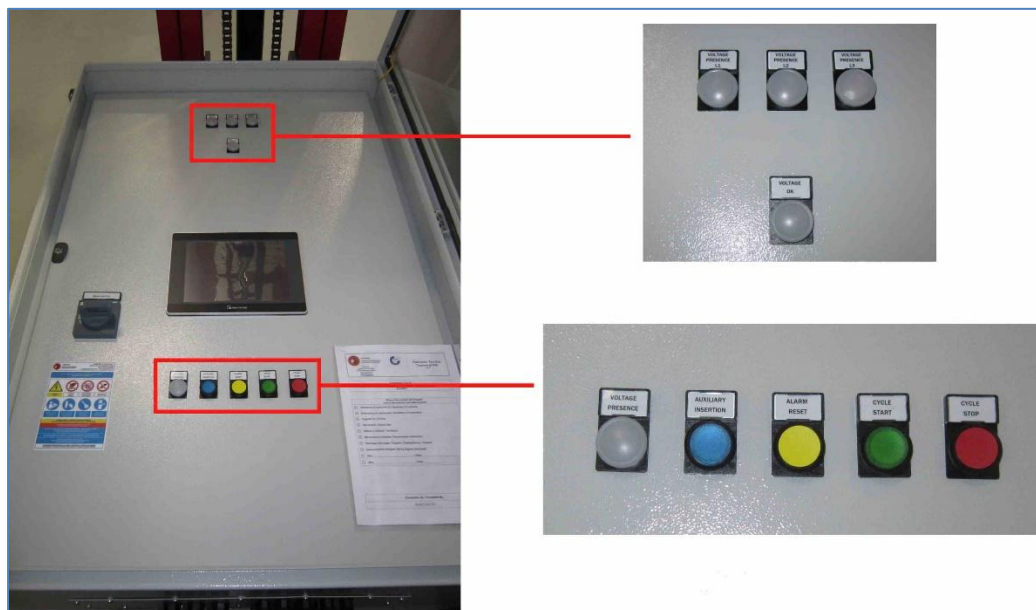


Figure 13.4 Control panel view

Once the electrical panel is powered, the blue indicator on the AUXILIARY ENGAGEMENT button illuminates. To operate the machine, press the blue AUXILIARY ENGAGEMENT button (the light indicator will extinguish if successful). If the button light remains illuminated, verify that the emergency stop button is released, the door limit switch is activated, and the safety thermostats have not tripped.

After engaging the auxiliaries, press the yellow ALARM RESET button; if no alarms are active, the yellow alarm indicator light will go out (any active alarms can be identified on the operator panel, as described below).

The machine can operate in both automatic and manual modes.

To select the operating mode, access the CUSTOMER SETTINGS page on the operator panel, as described below.

IMPORTANT:

WHEN OPERATED IN 'MANUAL' MODE, THE MACHINE PERFORMS OPERATIONS THAT REQUIRE THE CONSTANT PRESENCE OF THE OPERATOR.

THE OPERATOR ASSUMES SOLE RESPONSIBILITY FOR ALL OPERATIONS PERFORMED WITH THE MACHINE.

WHEN OPERATING IN 'AUTOMATIC' MODE, THE MACHINE RUNS A CYCLE THAT DOES NOT REQUIRE THE PRESENCE OF AN OPERATOR. HOWEVER, THE MATERIAL TO BE PROCESSED MUST BE AVAILABLE TO COMPLETE LOADING, AND SAFE UNLOADING CONDITIONS MUST BE ENSURED.

IF UNLOADING CANNOT BE CONDUCTED SAFELY, PAUSE THE AUTOMATIC UNLOADING FUNCTION ON THE HOME PAGE AFTER STARTING THE CYCLE. THE MACHINE WILL STOP AT THE END OF THE COOLING CYCLE AND SWITCH OFF THE FAN BUT WILL KEEP THE CENTRE AUGER AND MIXER RUNNING UNTIL THE OPERATOR ARRIVES TO UNLOAD. THE SYSTEM WILL NOT OUTPUT 'END OF AUTOMATIC CYCLE' SIGNALS UNTIL UNLOADING IS COMPLETE.

13.3 OPERATOR PANEL

At the bottom of each page, buttons allow navigation between screens: the button for the active page is green, whilst the others are grey.

Only the manufacturer can access the 'MANUFACTURER SETTINGS' page, which requires a password via the 'LOGIN' button.

13.3.1 HOMEPAGE

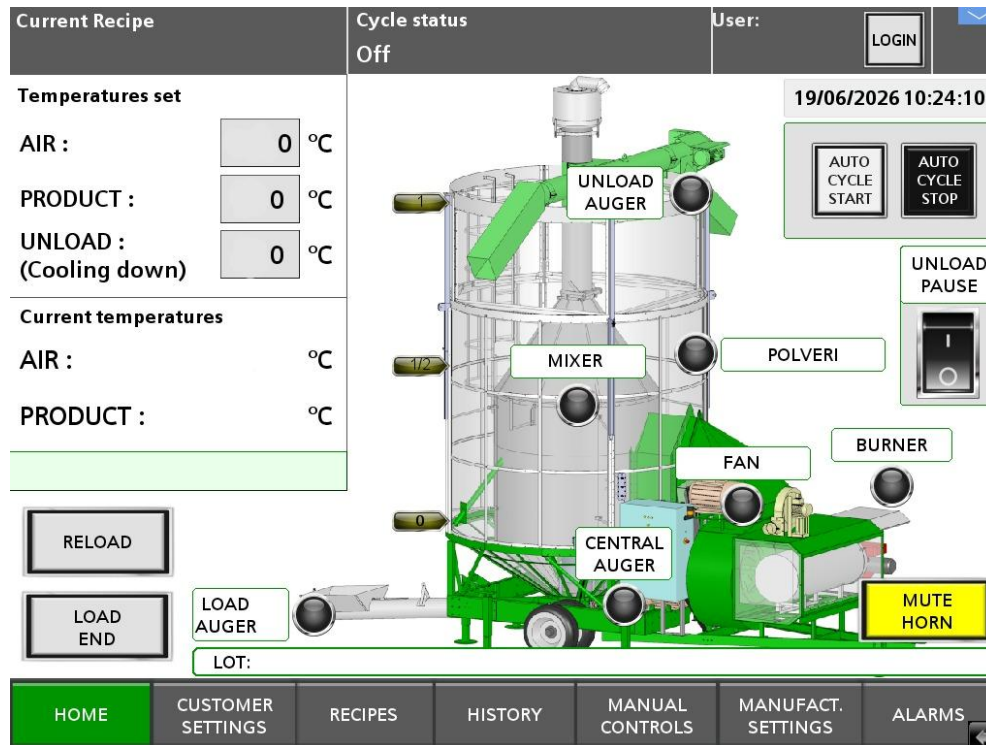


Figure 13.5 Synoptic panel for AS version

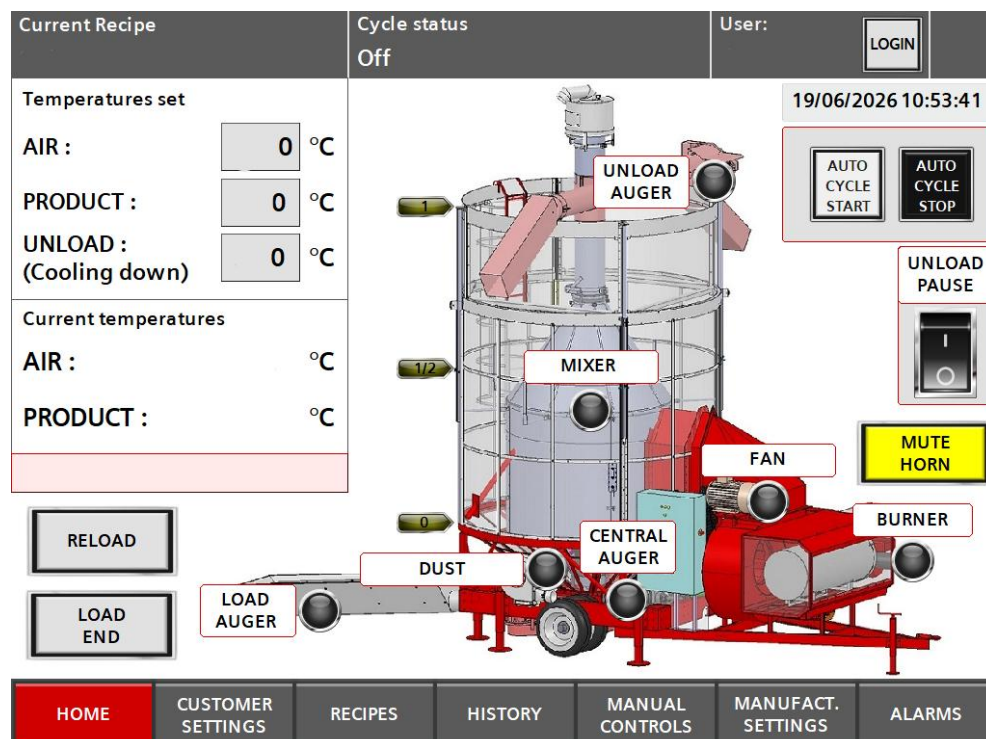


Figure 13.6 Synoptic panel for OP version

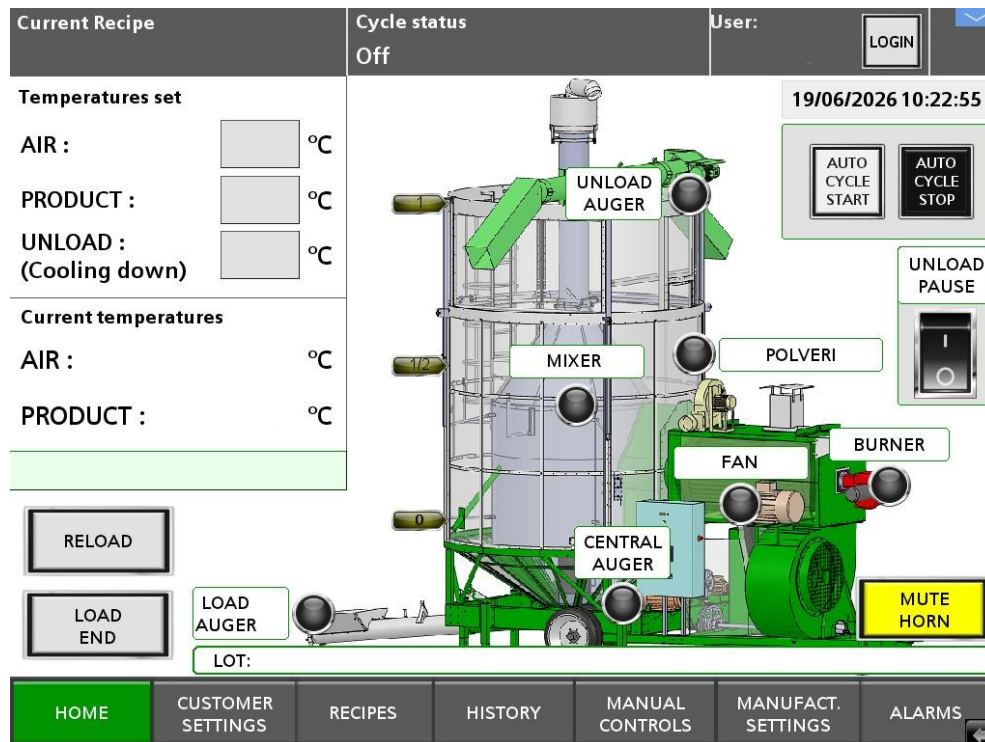


Figure 13.7 Synoptic panel for ES version

The main page displays the status of the dryer and provides real-time data on the current process.

The active recipe is displayed at the top left, alongside its configured operating temperatures: air temperature, product temperature, and cooling temperature. The burner operates according to these values during the automatic cycle. Below these, the screen displays the actual measured temperatures for the process air and product.

The REFILL button, located below the temperatures, allows material top-ups. This function is available automatically only during the drying phase and when the dryer is not full.

A switch on the right side of the screen allows the operator to pause the unloading phase.

The user login box at the top right allows access to the manufacturer settings.

The centre of the screen displays the machine mimic diagram, which updates as the various components are activated or deactivated.

To the left of the dryer mimic diagram, three dark green indicators (labelled '0', '½', and '1') show the status of the product level sensors inside the dryer: empty ('0'), half-full ('½'), and full ('1'). When the product covers a sensor, its indicator turns yellow.

When moving parts are active, the mimic diagram displays graphics with indicators changing from black (STOPPED) to green (RUNNING) – indicating, for example, that the loading auger is feeding or that the burner is operating.

The same indication applies to the fan, the centre auger, the mixer, and the discharge auger.

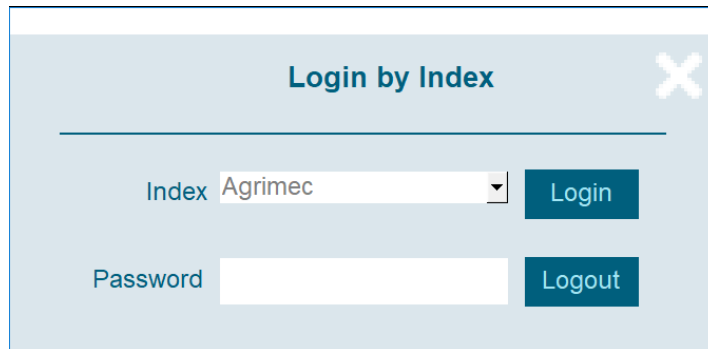
If an alarm is triggered, a flashing yellow warning triangle appears in the top right corner. The beacon on the electrical panel flashes and the alarm sounder sounds until you press the 'siren silence' button.

If the automatic cycle is stopped manually (by pressing the stop button) or due to an alarm while the burner is active during drying, the fan will run for a fixed period of approximately 15 minutes to cool the combustion chamber and burner before the machine shuts down completely.

To indicate that the combustion chamber is cooling down and that the active cycle has not finished, 'Cooling' is displayed on the cycle status bar.

13.3.2 BUILDER SETTINGS

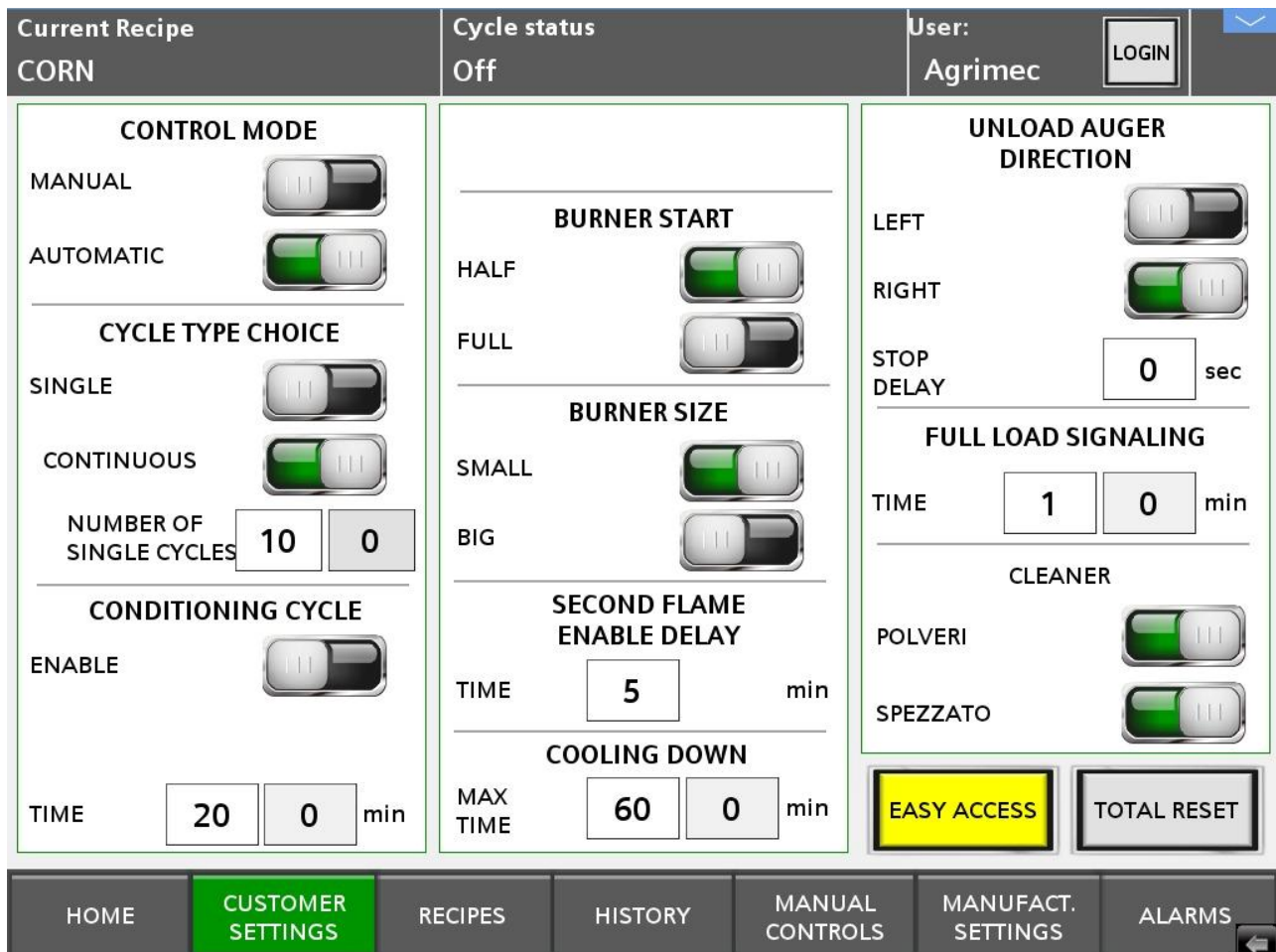
Only the manufacturer is authorized to log in from the main HOME page to modify the MANUFACTURER SETTINGS. Press the button at the top right to display the screen shown below.



The login screen is titled "Login by Index" and features a close button (X) in the top right corner. It contains two input fields: "Index" with a dropdown menu showing "Agrimec" and "Login" button, and "Password" with a text input field and "Logout" button.

Figure 13.10 Login screen

13.3.3 CUSTOMER SETTINGS



The Customer Settings screen displays various configuration options for the grain dryer. At the top, it shows the current recipe (CORN), cycle status (Off), and user (Agrimec) with a LOGIN button. The settings are organized into several sections:

- CONTROL MODE:** MANUAL (off) and AUTOMATIC (on).
- CYCLE TYPE CHOICE:** SINGLE (off) and CONTINUOUS (on).
- NUMBER OF SINGLE CYCLES:** 10 and 0.
- CONDITIONING CYCLE:** ENABLE (off).
- TIME:** 20 and 0 min.
- BURNER START:** HALF (on) and FULL (off).
- BURNER SIZE:** SMALL (on) and BIG (off).
- SECOND FLAME ENABLE DELAY:** 5 min.
- COOLING DOWN:** MAX TIME 60 and 0 min.
- UNLOAD AUGER DIRECTION:** LEFT (off) and RIGHT (on).
- STOP DELAY:** 0 sec.
- FULL LOAD SIGNALING:** TIME 1 and 0 min.
- CLEANER:** POLVERI (on) and SPEZZATO (on).
- EASY ACCESS:** A yellow button.
- TOTAL RESET:** A button.

At the bottom, there is a navigation bar with buttons: HOME, CUSTOMER SETTINGS (highlighted), RECIPES, HISTORY, MANUAL CONTROLS, MANUFACT. SETTINGS, and ALARMS.

Figure 13.11 Customer Settings Screen

This page contains the general settings of the machine and allows selection of the recipe to be loaded. THESE SETTINGS MAY BE MODIFIED DURING AN ACTIVE CYCLE, WITH THE EXCEPTION OF RECIPE SETTINGS AND THE REGENERATION CYCLE, WHICH REQUIRE THE CYCLE TO BE STOPPED.

- In the 'OPERATION MODE' section, select either MANUAL or AUTOMATIC mode. You must select one of these operating modes.
- In the 'BURNER IGNITION' section, choose whether to ignite the burner when the product reaches the intermediate sensor (HALF) or when loading is complete (FULL).
- In the 'DRAIN AUGER DIRECTION' section, select the discharge direction (if a bidirectional auger is fitted).
- In the 'CHOOSE CYCLE TYPE' section, select either a continuous or single cycle. If you select a single cycle, the target number of cycles is displayed below (in white) next to the number of completed cycles (in grey). To set the active cycle as the final cycle when switching from continuous to single, set the number of single cycles to 0 or 1. If you configure a single cycle while the machine is stopped, set the desired number of cycles before starting the cycle.
- In the 'BURNER SIZE' section, enable the appropriate burner size if the machine is equipped with multiple burners.
- In the 'COOLING' section, set the maximum cooling duration (displayed in white) next to the elapsed cooling time (in grey). This duration marks the end of the cooling phase if the product temperature does not fall to the end-of-cooling setpoint (for example, if the setpoint is lower than the ambient temperature).
- The 'TOTAL RESET' button at the bottom resets the cycle and returns the machine to its initial state, allowing a new automatic cycle to be started. Always perform this operation before starting a new automatic cycle (even after the machine has been switched off for a long period), as the system retains the settings from the last completed cycle. This function does not reset recipe temperatures or system settings configured by the manufacturer or customer, such as times and options.
- In the 'REGENERATION CYCLE' section, enable the regeneration cycle using the toggle switch and set the duration in minutes. The regeneration cycle runs the active recipe for the specified duration: once started, the burner raises the air temperature to the recipe setpoint and maintains it for the set time, regardless of the product temperature.

The 'EASY ACCESS' settings configure remote communication and are set during programming.

×

EasyAccess2.0

Setting

Start

Stop

MAC

AAAAAAAAAAAA

Command

Stop

State

Not running

Error code

Success

###

Session ID

AAAAAAAAAA

Password

AAAA

Hardware key

AAAAAAAAAAAAAAAAAAAA

AAAAAAAAAAAAAAAAAAAA

MQTT state

Stop

MQTT error code

####

Figure 13.12 Remote communication settings screen

13.3.4 RECIPES

Current Recipe CORN		Cycle status Off		User: Agrimec		LOGIN	▼
-------------------------------	--	----------------------------	--	-------------------------	--	--------------------------------------	----------------------------------

CORN	WHEAT BARLEY SORGHUM	RICE	RAPE SEEDS	SUNFLOWER	SOYBEAN
AIR TEMPERATURE °C	AIR TEMPERATURE °C	AIR TEMPERATURE °C	AIR TEMPERATURE °C	AIR TEMPERATURE °C	AIR TEMPERATURE °C
PRODUCT TEMPERATURE °C	PRODUCT TEMPERATURE °C	PRODUCT TEMPERATURE °C	PRODUCT TEMPERATURE °C	PRODUCT TEMPERATURE °C	PRODUCT TEMPERATURE °C
UNLOAD START TEMPERATURE °C	UNLOAD START TEMPERATURE °C	UNLOAD START TEMPERATURE °C	UNLOAD START TEMPERATURE °C	UNLOAD START TEMPERATURE °C	UNLOAD START TEMPERATURE °C
PRE VENTILATION TIME min	PRE VENTILATION TIME min	PRE VENTILATION TIME min	PRE VENTILATION TIME min	PRE VENTILATION TIME min	PRE VENTILATION TIME min
SET	SET	SET	SET	SET	SET

HOME	CUSTOMER SETTINGS	RECIPES	HISTORY	MANUAL CONTROLS	MANUFACT. SETTINGS	ALARMS
------	-------------------	---------	---------	-----------------	--------------------	--------

Figure 13.13 Recipe Selector Screen

On the recipes page, configure the target air, product, and end-of-cooling (start-of-unloading) temperatures for each recipe.

The system automatically saves all modified settings.

The system does not accept temperatures higher than 140°C (284°F).

If the product temperature setpoint is higher than the air temperature setpoint, the cycle will not start and the corresponding alarm will trigger.

THESE SETTINGS MAY ALSO BE MODIFIED DURING AN ACTIVE CYCLE, TAKING EFFECT IMMEDIATELY.

13.3.5 HISTORY

Current Recipe CORN		Cycle status Off		User: Agrimec		LOGIN	
-------------------------------	--	----------------------------	--	-------------------------	--	--------------	--

PARTIAL HISTORY

MACHINE HOURS	0	hours	0	min	RESET
CYCLES PERFORMED	0				RESET
BURNER	0	hours	0	min	RESET

TOTAL HISTORY

MACHINE HOURS	0	hours	0	min	RESET
CYCLES PERFORMED	0				RESET
BURNER	0	hours	0	min	RESET

HOME	CUSTOMER SETTINGS	RECIPES	HISTORY	MANUAL CONTROLS	MANUFACT. SETTINGS	ALARMS
------	-------------------	---------	----------------	-----------------	--------------------	--------

Figure 13.14 Counters Screen

The totalizers page is divided into two sections: partial totalizers at the top (which the customer can reset) and total/lifetime totalizers at the bottom (which only the manufacturer can reset).

The screen displays three totalizers:

- 'MACHINE HOURS' shows the total operating hours of the automatic cycle (active when the green 'start' light is illuminated);
- 'CYCLES EXECUTED' shows the number of completed cycles;
- 'BURNER' shows the operating hours of the burner.

13.3.6 MANUAL MOVEMENTS

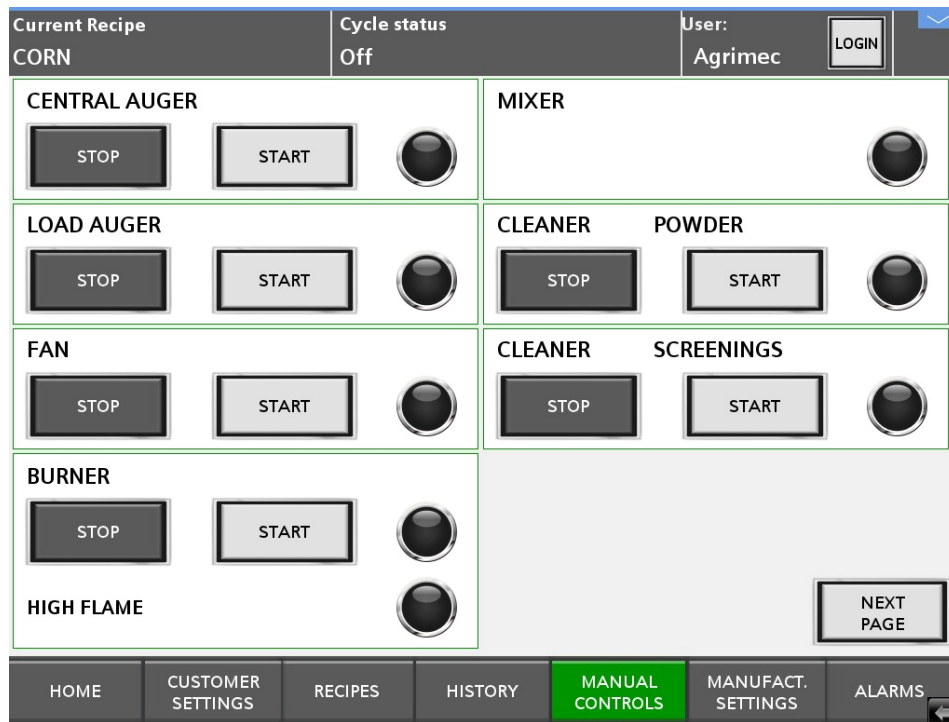


Figure 13.15 Screen 1 Manual Movements

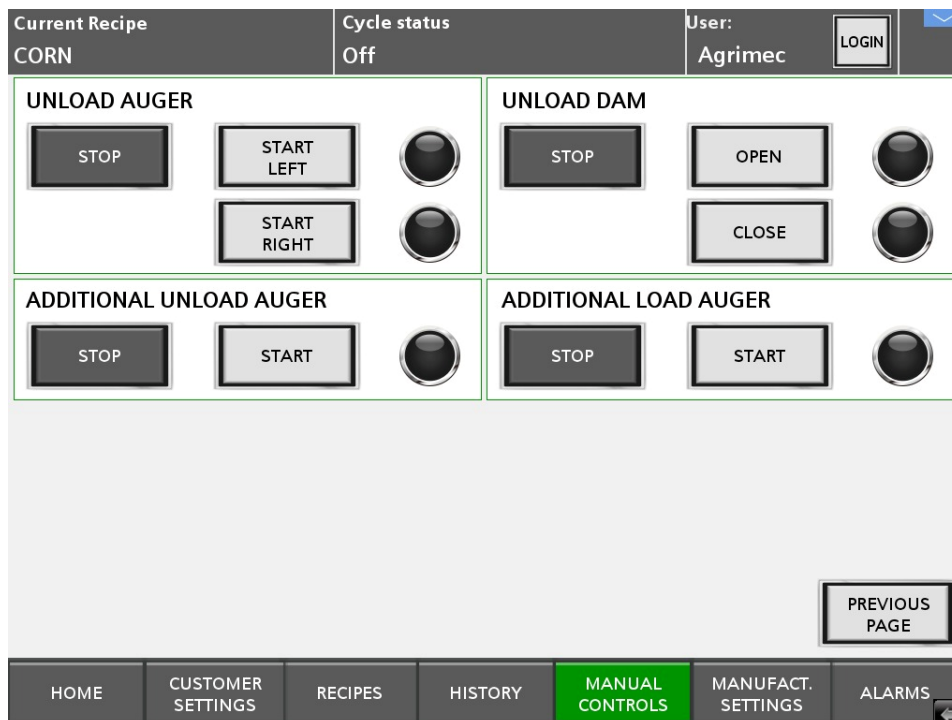


Figure 13.16 Screen 2 Manual Movements

The manual movements page is accessible only when the cycle is stopped.

Use this page to test the various motors or run them individually.

The boxes display motor status: the indicators are dark grey when the motor is stopped and turn green when it is running.

The start-up of certain motors depends on the operation of others. This interlocking rule also applies in manual mode. For example, the burner cannot start unless the fan and centre auger are running.

Similarly, the loading auger and the mixer cannot start unless the centre auger is running, and they cannot operate simultaneously.

13.3.7 ALARMS AND ALARM HISTORY

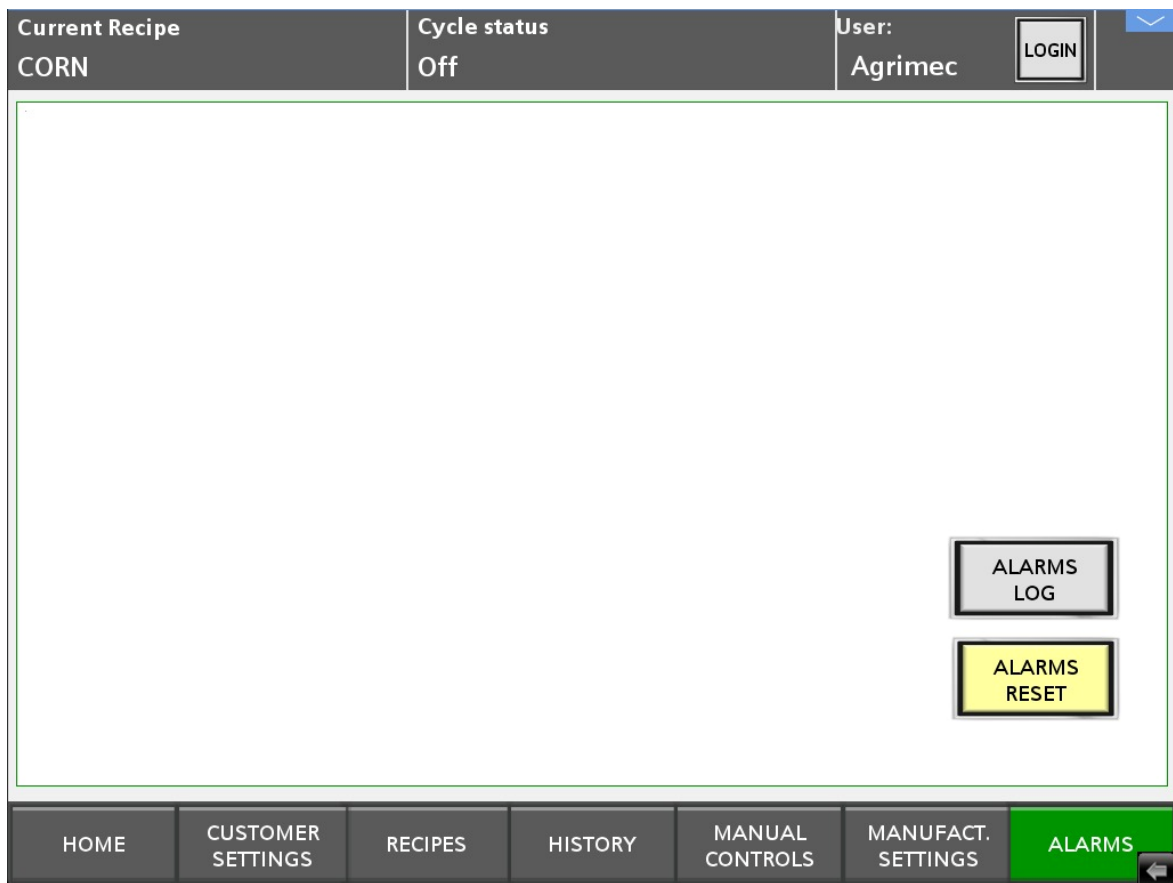


Figure 13.17 Alarms Screen

The alarms page displays the text of any active alarms in red, along with their timestamp.

The 'ALARM HISTORY' button on the right opens a page showing the log of alarms triggered over the last 7 days.

To reset alarms once the cause has been resolved, press the yellow RESET ALARMS button on the front control panel.

13.4 OPERATING CYCLES

13.4.1 MANUAL CYCLE

When MANUAL mode is selected on the CUSTOMER SETTINGS page, use the MANUAL MOVEMENTS page to activate the motors. Note that the following safety interlocks remain active in manual mode:

- the central auger must be running; otherwise, no other motor will start;
- the mixer always operates in conjunction with the central auger and only switches off when the loading auger starts;
- the burner cannot start unless the fan is running;
- the burner switches off upon reaching the SET PRODUCT T° and regulates the second flame or modulation according to the SET PRODUCT T°;
- the loading auger stops when the full sensor detects that the machine is full;
- The discharge auger stops when the empty (vacuum) sensor detects that the machine is empty.

13.4.2 AUTOMATIC CYCLE

- Enable AUTOMATIC operation on the CUSTOMER SETTINGS page.
- Select the desired recipe on the RECIPES page, then return to the main HOME page.
- Verify the selected recipe and target temperatures on the left side of the operator panel.
- Press the START CYCLE button. The button indicator starts flashing, and the operator panel prompts you to confirm the recipe. Once confirmed, the loading cycle starts and the green START CYCLE button indicator remains illuminated.

You can access the RECIPES page at any time to modify the operating temperatures of the active recipe.

- Stop the cycle at any time by pressing the red STOP CYCLE button. The machine automatically performs a shutdown sequence appropriate to the current cycle status. Once the machine stops, you can resume the cycle from the point of interruption by pressing the START CYCLE button (the system retains the current processing status).
- To reset the cycle completely and start again (for example, with a different recipe), access the CUSTOMER SETTINGS page and press TOTAL RESET. This clears the active configuration, allowing you to configure new settings and restart the automatic cycle.

13.5 REMOTE CONNECTION GUIDE

This guide explains how to access and use the remote connection for the control panel installed on the smart dryer. To use this feature, you must have access to credentials, which Strahl s.r.l. will provide.

APPLICATIONS TO DOWNLOAD:

- Easy Access 2.0
For Windows devices:
Download and install from the following link:
www.weintek.com/globalw/Software/EasyAccess.aspx
- For Android or Apple devices:
Easy Access 2.0 is available from Google Play or the Apple App Store.
- RealVNC
<https://www.realvnc.com/en/connect/download/viewer>
- cMTViewer:
<https://www.weintek.com/globalw/Download/Download.aspx#>
The application is free of charge but requires registration.



REALVNC



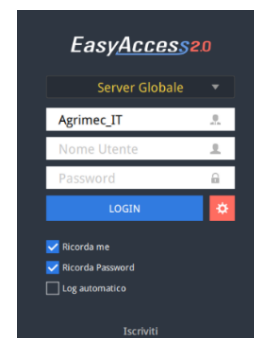
cMT Viewer (PC)



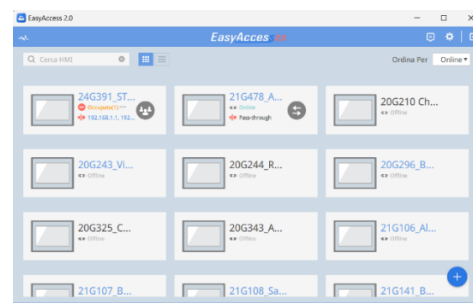
ACCESS PROCEDURE:

- Open the Easy Access 2.0 application.
Under the 'Global Server' field, enter:
Agrimec_IT
Username
Password.

*Depending on your software version, Strahl will specify the correct application to download during setup.



- The Easy Access 2.0 application displays all available dryers. The control panel number, machine model, and serial number form the name of the human-machine interface (HMI).



- When the dryer is online, the connection icon is displayed. Press the icon to connect to the machine:



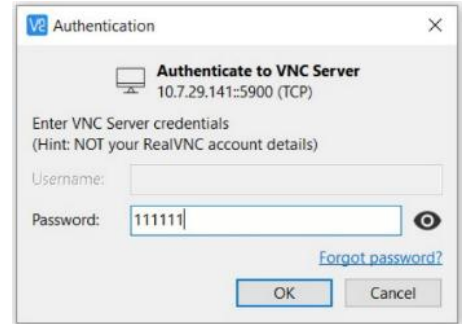
- Once established, the connection icon changes colour:



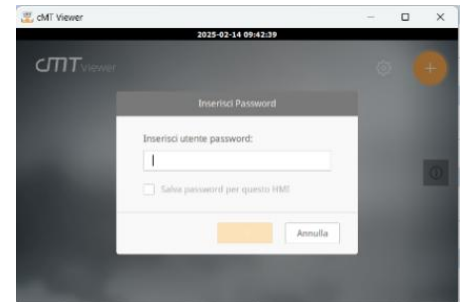
- If the software recognizes the remote viewing application, the following icons appear next to it (for VNC and cMT respectively):



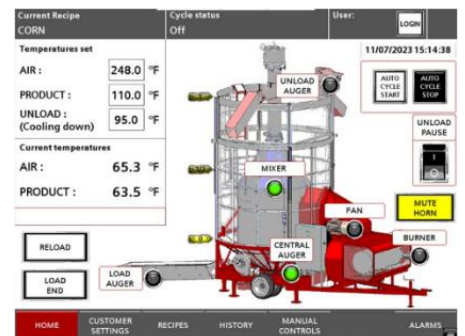
- You can control the machine directly using the VNC Viewer or RealVNC Viewer applications.



- The cMT Viewer application allows you to monitor and control your dryer remotely and completely independently. You can view and manage any screen on your device without affecting the page currently displayed on the machine panel.



- The remote HMI display enables full remote monitoring and control of all machine operations.



14 START-UP CHECKLIST

START-UP CHECKLIST FOR MOBILE DRYER

DRYER MODEL:	SERIAL NUMBER (read on the nameplate):
OPERATOR:	PLACE:
DATE:	NOTE:

PRELIMINARY CHECKS

ID	Description	Check ✓	Initials
1	Check all the documentation, use and maintenance manual, wiring diagram, dryer C.E., burner manual. (see documentation delivery sheet).	☐	
2	Make sure that the inside of the dryer is completely empty and free of foreign objects.	☐	
3	Absence of equipment or anything else inside.	☐	
4	Check that the cleaner grid is correct for the product to be dried or receive instructions from the customer on which one to use.	☐	
5	Check the presence of fuel: if Diesel the tank needs to be filled, if Gas check with the burner that the line pressure arriving at the ramp corresponds to that declared in the manual.	☐	
6	Make sure that the dryer is level, correctly positioned and that the support feet are correctly adjusted.	☐	
7	Check that all casings and guards are correctly fitted.	☐	
8	Check that there is a main power source: if PTO the tractor is adequate, if Electric voltage correct as per diagram.	☐	
9	Check that there are no misalignments in the coupling between the mobile loading hopper and its fixed part at the time of positioning and that the product does not come out.	☐	
10	Check if the dryer is equipped with a riser so that the safety pins are correctly inserted.	☐	
11	Check if the dryer is equipped with a roof and dust net so that they are installed correctly.	☐	

SEQUENCE OF START-UPS

ID	Description	Check ✓	Initials
1	Check that all cardans are correctly fastened to the dryer shafts and that they are tied with the safety chain on the appropriate guards.	☐	
2	Start the tractor and turn the voltmeter to 400v and check that the three voltage indicator lights are on. In the case of an electric machine, check that the voltage and the warning lights are on in the same way when the main switch is closed.	☐	
3	Check safety devices (test red emergency buttons, safety thermostats and magnetic cone door sensor).	☐	
4	Check the direction of rotation of all motors.	☐	
5	Check the correct direction of rotation of the mixer.	☐	
6	In the case of options such as auxiliary electric loading and unloading augers, make sure that the start-up sequences are correct with respect to the dryer.	☐	
	Description: Check correct operation of electrical signals:		
7	Higher level sensor (full load).	☐	
8	Intermediate level sensor (half load).	☐	
9	Lower level (empty) sensor.	☐	
10	Fan safety sensor.	☐	
11	Check all optional sensors and their correct operation (e.g. lever sensor for full load, mixer sensor)	☐	

TEST SEQUENCE

ID	Description	Check ✓	Initials
	Check correct operation and correct installation as per the manual of the probes of:		
12	Air temperature.	☐	
13	Product temperature.	☐	
14	Safety thermostats.	☐	
	Adjustments and start-up:		
15	Start the vacuum dryer and switch on the fan and burner.	☐	
16	Adjust the temperature of the burner according to the product to be dried.	☐	
17	Adjust the temperature of the product at the end of the cycle, keeping it as close as possible to the final set point provided for the product to be dried. (to be kept checked even during testing).	☐	
18	Test the burner at low flame and check the control and management signals for correctness.	☐	
19	Turn off the burner and start loading operations	☐	
20	Start the dryer with the central auger and the loading auger, turn on the fan and burner according to the correct filling level. (the inner bell must be covered)	☐	
21	Detect the absorption of the motors and verify that the measured current is less than or equal to the setting value set on the relative circuit breaker	☐	
22	Once the ideal end-of-cycle temperature and the necessary humidity have been reached, allow the dryer to cool down for the set time during the cooling phase. (consider the loss of 1-2 points in the cooling phase in the cereal).	☐	
23	Once the cooling phase is over, start the product unloading phase.	☐	

NOTES AND CONCLUSIONS

THE MACHINE IS SUITABLE FOR THE FUNCTION ☐

MACHINE DOWNTIME ☐

OTHER (specify below) ☐

NOTES:

[illegible]

DATE:

15 ATTACHMENTS

The following attachments accompany this manual:

WIRING DIAGRAMS

DECLARATION OF CONFORMITY OF THE DRYER

DECLARATION OF CONFORMITY OF THE ELECTRICAL PANEL

BURNER USE AND MAINTENANCE MANUAL



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STATIONARY GRAIN DRYER PRODUCTION PLANT**
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MOBILE GRAIN DRYER PRODUCTION PLANT
Via 1° Maggio, 13 – 36026 Pojana Maggiore (VI) – Italy

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