ASCO
All about CO_2

INSTRUCTION MANUAL
TRANSLATION

ASCO DRY ICE PELLETIZER P55 EVO

from 25-133-001
ascoco2.com

Retain for future use and keep accessible near the machine.

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THANK YOU VERY MUCH!

Congratulations - You have acquired a quality product from
ASCO CARBONDIOXIDE LTD

	NOTE
	Please read this instruction manual carefully before installing and commissioning this product, especially chapter "General Safety Instructions" and the separate document "General Information and Safety Instructions – Working with CO_2".

Should you have any questions, please do not hesitate to contact us.

ASCO CARBONDIOXIDE LTD

PURPOSE OF DOCUMENT

This instruction manual contains important information and instructions on the safe use of the P55 EVO dry ice pelletizer, its transport, installation, commissioning, adjustment, operation and disposal.

This instruction manual must be read and understood by all persons who carry out work with or on the pelletizer.

NOTE

This document has been drafted and edited with the greatest care and according to our best knowledge. The authors and publishers shall not be liable for damage arising from incorrect or incomplete information in this document.

If something is unclear, the German version of the operating manual is the reference document.

WARRANTY

The warranty terms below apply in all countries. Please find the conditions for repairs to your machine within the warranty period in our General Terms and Conditions, which you received together with our order confirmation. Please contact the closest authorised ASCO distributor or the ASCO Customer Service Department in the event of a warranty claim. Please submit proof of purchase, the serial number of your device and the operating hours completed to date.

Version of instruction manual

Version (year/month)	Note
Version V1.0 (2025/10)	First publication

1 GENERAL SAFETY INSTRUCTIONS

1.1 ACCOMPANYING DOCUMENTS

The following separate documents are an integrated part of this instruction manual.

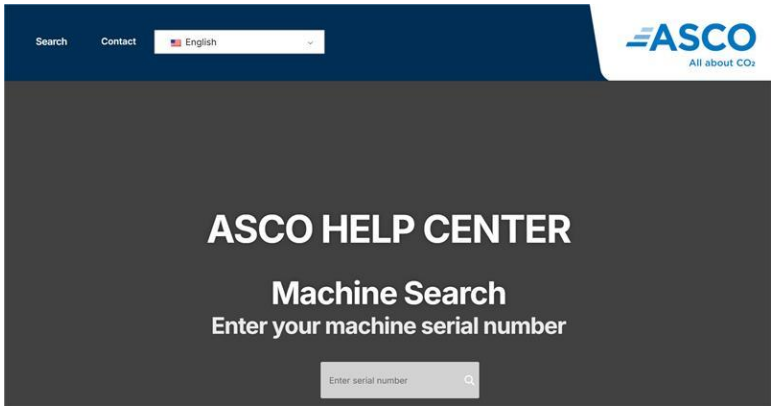
- Document "General Information and Safety Instructions – Working with CO_2"
- Spare parts list
- Electrical circuit diagram
- Hydraulic plan
- EU Declaration of Conformity

1.1.1 DIGITAL ACCESS DOCUMENTS

The digital documents are available under the following QR code and link.

ASCO Help Center

https://help.ascoco2.com/



After entering the serial number, digital access to documentation and other information is possible.

1.2 DRAWINGS AND SYMBOLS

Many accidents with devices are caused because operators ignore manufacturer instructions and safety instructions. In this document, internationally recognised symbols and signal words are used to highlight hazards and hazardous situations in the work environment.
Warnings are presented as follows:

DANGER

Describes a hazard with a high degree of risk.
If these instructions are not followed, this will result in death or serious injury (leading to disability).

WARNING

Describes a hazard with a medium degree of risk.
If these instructions are not followed, this may result in death or serious injury (leading to disability).

CAUTION

Describes a hazard with a low degree of risk.
If these instructions are not followed, this may result in slight or moderate injury.

Notice, user tips, minor material damage at the most:

NOTICE

Designates general instructions with subsequent action.
User tips and recommendations for work are given, which have
no effect on the health and safety of personnel, but
do require certain behaviour or action.

Highlights useful tips and recommendations plus information for efficient and fault-free operation.

NOTE

Describes general notes.
Practical user tips and work recommendations are given which do not, however, have any effect on the safety and health of staff.

...highlights useful tips and recommendations plus information for efficient and fault-free operation.

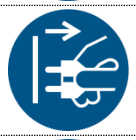
Instructions designed to prevent serious damage to property:

	**CAUTION**
	Describes a potentially damaging situation. If these instructions are not followed, material damage will result. … indicates a potentially damaging situation which may lead to material damage if these instructions are not followed.

1.2.1 Pictograms used in this document

Safety instructions in this manual where non-compliance poses a danger to persons and property, are highlighted with a general warning symbol.

	**General warning symbol**
	**Warning: electric voltage**
	**Warning: risk of suffocation**
	**Warning: low temperature**
	**Warning: risk of injury to hand**
	**Warning: hot surface**
	**Warning: sudden loud noise**
	**Warning: automatic machine start-up**
	**Warning: slipping hazard**
	**Warning: Forklift trucks and other industrial vehicles**
	**Warning: Overhead load**
	**Warning: Unauthorised switching on the machine**

	**Warning: Pressure**
	**Wear eye protection**
	**Wear hearing protection**
	**Wear hand protection**
	**Wear foot protection**
	**Use head protection**
	**Release before work**
	**Disconnect mains plug**
	**Follow instructions**

1.2.2 Operator qualification

- The machine may only be operated by authorised and instructed staff.

Operators must be trained by an authorized person (operator or manufacturer) in the following points:

- Safe handling of dry ice and/or liquid/gaseous CO_2
- See also document "General Information and Safety Instructions – Working with CO_2"
- Operation and maintenance of the ASCO system
- Safety measures / protective equipment
- Use of personal protection clothing

- Repair work must only be carried out by qualified skilled workers.

Trained engineers or technicians for:

- Mechanical engineering
- Electrical engineering
- Hydraulic engineering
- Refrigeration engineering

- The manufacturer offers staff training, including refresher sessions. For details, please contact our Customer Service Department.

1.3 IMPORTANT SAFETY INSTRUCTIONS

WARNING

Risk of damage or injury from unsupervised machine!

- Operation of the machine by a single worker is prohibited.
- The machine must be operated in the presence / under the supervision of multiple members of staff.

WARNING

Risk of damage or injury from malfunctioning CO_2 spray valve or leak in CO_2 line!

Check and replace solenoid valve and CO_2 lines regularly according to the servicing plan. In the event of leakage or malfunction of the solenoid valve (e.g. continued injection), proceed as follows:

- Stop the machine (EMERGENCY-STOP)
- Immediately close the manual CO_2 shut-off valve in the CO_2 liquid line
- De-pressurise the machine as described in chapter 5.2.10
- Switch off the machine as described in chapter 5.2.11
- Turn the main switch to OFF
- Arrange for repairs to be made

DANGER

Risk of injury from high carbon dioxide concentration!
Risk of suffocation and damage to health through carbon dioxide!
Low concentration (3-5%) causes headaches and makes breathing difficult.
High concentration (7-10%) causes headaches and nausea and leads to unconsciousness.
Even higher concentration leads to unconsciousness and death.
The highest non-hazardous CO_2 concentration is 5000 ppm.
A higher concentration is very dangerous to humans (German MAK Scale IV).

- Operate the device only in well-ventilated spaces.
- The area in which the machine is installed must be equipped with CO_2 gas detectors alarms.
- Observe the instructions in the separate document "General Information and Safety Instructions – Working with CO_2".

Risk of injury from electrical energy!
Exposed electrical contacts, electrostatic discharge, physical impact on electrical systems, etc. pose a high safety risk.

- All work on the electrical equipment must be performed by qualified specialist technicians.

WARNING

Danger of explosion!
- Do not operate the machine in a potentially explosive atmosphere.

Personal protective equipment

⚠ WARNING

Risk of injury from propelled parts!
Due to the high CO_2 pressure, parts might be propelled at high speed.
- When operating the pelletizer, always wear safety goggles.
- All persons near the pelletizer must always wear suitable protective goggles.

⚠ WARNING

Risk of injury from high sound level!
The noise level during dry ice production is very high.
- When operating the pelletizer, always wear hearing protection.
- All persons near the pelletizer must always wear approved hearing protection.

⚠ CAUTION

Risk of injury to the hands!
Scrapes, cuts, crushing injuries, penetration wounds, etc.
For example, burns, scalds and frostbite caused by hot or cold energy sources and/or the environment.
- When operating the pelletizer, always wear suitable protective gloves.
- All persons standing close to the pelletizer must wear suitable protective gloves.

⚠ CAUTION

Risk of injury to the feet!
- Always wear suitable foot protection when operating the pelletizer.
- All persons near the pelletizer must always wear suitable foot protection.

⚠ CAUTION

Risk of head injury!
- During work in connection with the transport, installation and commissioning of the pelletizer, wear suitable head protection.

Safety signs attached to the machine

Rating plate

Fig. 1

Safety instructions

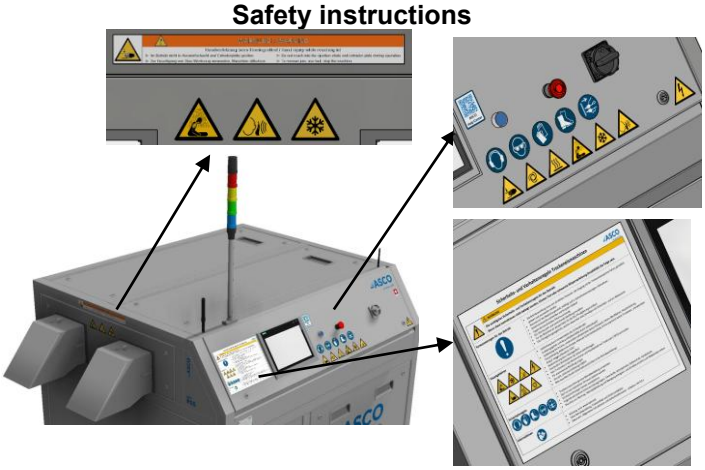


Fig. 2

Safe handling of dry ice

CAUTION

Risk of frostbite from contact with dry ice!
Solid carbon dioxide (dry ice) has a temperature of approximately -79°C (-110.2°F), which can cause frostbite injuries if it comes into contact with the skin.
The dry ice's low temperature results in icing of most of the parts of the pelletizer.

- Do not touch parts covered in dry ice without suitable protective clothing.
- Prevent prolonged contact with dry ice / iced components.
- Always read the supplier's safety sheet carefully and strictly follow the instructions.

WARNING

Risk of injury to hands when reaching into machine!

- During machine operation, never reach into the extruder plates.
- To remove jammed product, shut down the machine and use suitable tools.

1.4 SAFETY COMPONENTS

DANGER

Risk of injury or damage due to missing safety components!

- Only start the pelletizer after you have made sure that all safety components are properly installed and in working order.

Risk of injury from electrical energy!

Exposed electrical contacts, electrostatic discharge, physical impact on electrical systems, etc. pose a high safety risk.

- Work on electrical installations may only be carried out by trained and qualified personnel.

1.5 SAFETY INSTRUCTIONS FOR THE CONTROL SYSTEM

The pelletizer is equipped with the following safety functions:

Safety function	Category, PL/SIL
Mains disconnection device with EMERGENCY STOP function	Cat. 1, PL c/SIL 1
Temperature monitoring and switching off by hydraulic components	Cat. 1, PL c/SIL 1
Shutting off CO_2 inflow and outflow by solenoid valve	Cat. 1, PL c/SIL 1, limited service life

The machine is equipped with the following safety devices:

- Main switch
- EMERGENCY STOP
- Release button 
- Safety covers (fig. 3)
- Safety valve (fig. 4)
- Safety signs (fig. 5)
- CO_2 connection (fig. 6)
- Protective hood for ejecting dry ice pellets

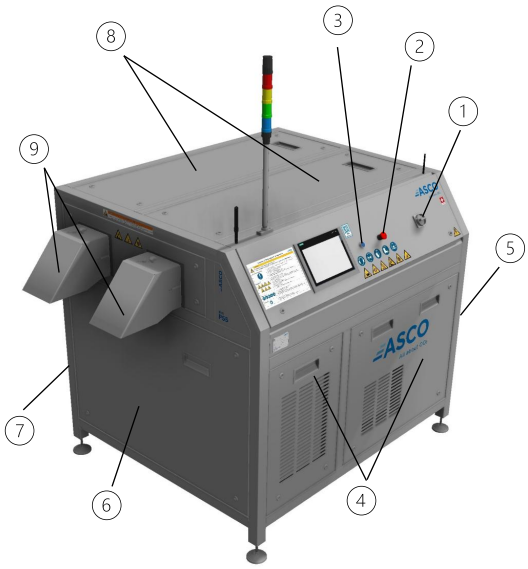


Fig. 3

1 Main switch
2 EMERGENCY STOP button
3 Release button
4 Guard covers front
5 Guard covers right (top and bottom)
6 Guard covers left (top and bottom)
7 Guard covers rear (top and bottom)
8 Guard covers top
9 Protective hoods for ejecting dry ice pellets

Fig. 4

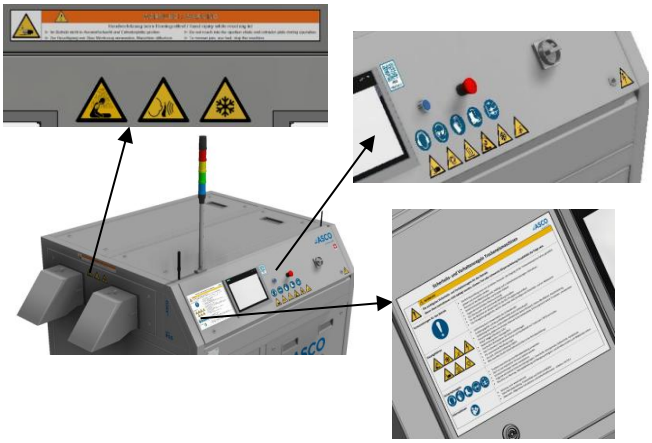


Fig. 5

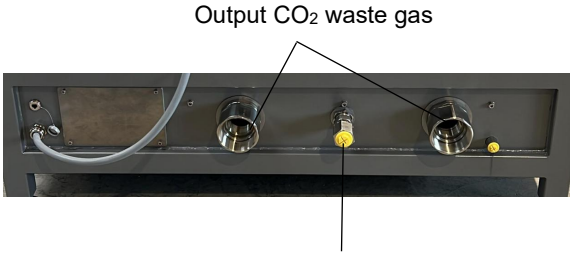


Fig. 6

	NOTE
	Pictograms, warning signs, other language versions Pictograms and warning signs are subject to wear and tear. These can also be ordered from the manufacturer in another language version.

	NOTE
	Connection of external EMERGENCY STOP The machine can be integrated into an external emergency stop circuit. The integrator is responsible for the integration of an external emergency stop or for integrating the machine into an external emergency stop. In any case, the emergency stop strategy and all associated standards must be observed. The integration may only be carried out by qualified personnel. A circuit example can be found in the machine's electrical documentation.

1.6 INTENDED USE

Production of dry ice pellets from liquid CO_2 using various standardized extruder plates. Only extruder plates approved by ASCO may be used.
The waste gas must be discharged in a safe manner to the atmosphere or transferred to another machine.

	WARNING
	Risk of damage or injury from unsupervised machine! ▪ Operation of the machine by a single worker is prohibited. ▪ The machine must be operated in the presence / under the supervision of multiple members of staff.

Intended use also includes observing the chapter "2.2 TECHNICAL DATA"

1.7 DECLARATION OF CONFORMITY

The EU Declaration of Conformity is included in the appendix to this instruction manual.

1.8 LIST OF SPARE PARTS/DRAWINGS/CIRCUIT DIAGRAMS

The spare parts list/drawings and circuit diagrams are attached to this manual.

⚠ WARNING

Risk of injury or damage due to unsuitable spare parts!
The use of unsuitable spare parts can lead to safety hazards.
This applies in particular to safety components.

- Only use original spare parts.

1.9 IT SECURITY VULNERABILITIES

⚠ WARNING

Risk of damage from IT security vulnerabilities!
Unless properly protected, the interface of the control for data exchange and external access might pose a security risk!

- Limit logical and physical access to the control system by external IT systems to what is absolutely necessary.
- Maintain current security measures on external IT systems that access the control system and install updates.
- Keep your external IT systems up to date.
- Implement authentication and access control mechanisms.

- Limit the access rights of individual users to what they really need.
- Shut down/disable external connections and services that are not in use.
- Keep user accounts up to date, update access rights (passwords).
- Respond to threat alerts indicating vulnerabilities of your IT system.

If you use remote maintenance and service:

- Make use of features that automatically terminate remote access sessions after a certain time has elapsed.
- Implement encryption for the initialisation and continued access for remote maintenance/service.

2 TECHNICAL SPECIFICATION

2.1 MACHINE ASSEMBLIES

1	Guard covers, front
2	Control panel
3	Pellet discharge units
4	Machine base
5	Extruder plate
6	Ventilation slots (for hydraulic unit cooling system)

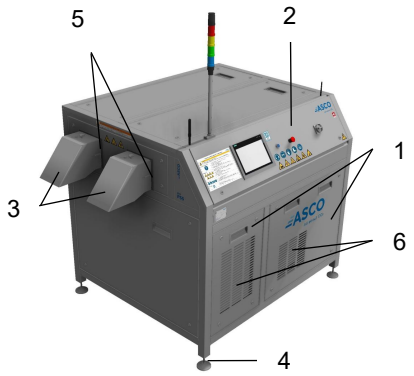


Fig. 7

1	Guard cover, left bottom
2	Guard cover, left top

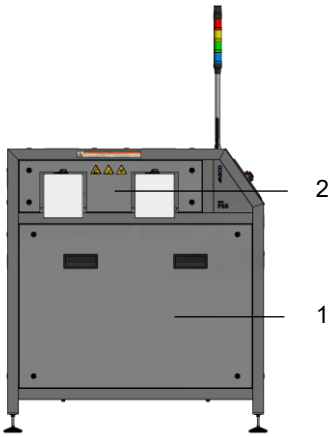


Fig. 8

1	Guard covers, rear bottom
2	Guard cover, rear top
3	Ventilation slots (for hydraulic unit cooling system)

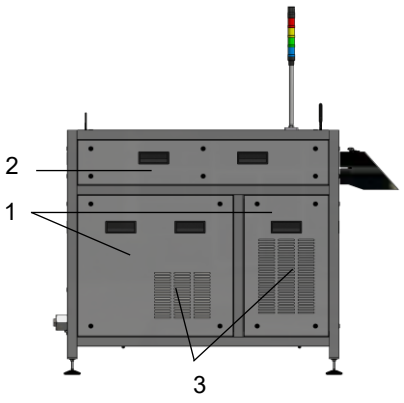


Fig. 9

1	Guard cover, right
2	Guard cover, right top
3	CO_2 waste gas connection
4	Liquid CO_2 connection
5	Condensate drain
6	Power cord
7	Network connection to Internet customer

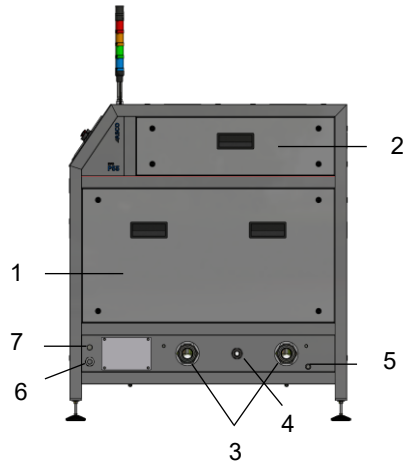


Fig. 10

1	**HMI**
2	EMERGENCY STOP
3	Main switch
4	Electrical cabinet lock
5	Release button
6	Signal column
7	WIFI antenna
8	4G antenna

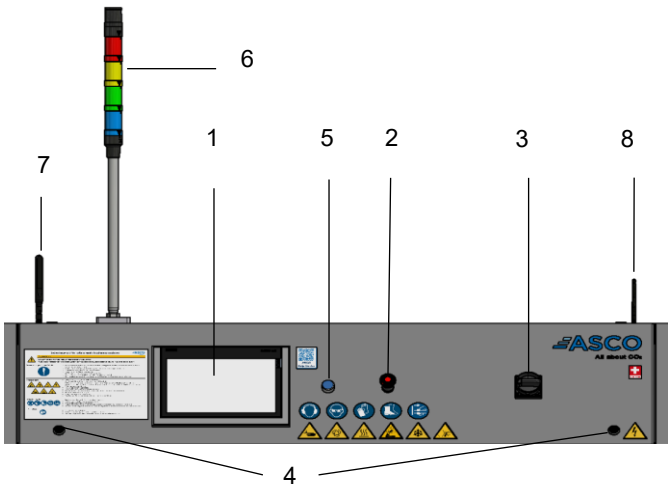


Fig. 11

2.2 TECHNICAL DATA

Capacity:	Depending on the extruder plate used: Pellet size 1.7 mm up to 400 kg/h ± 5 % (0.0669 in up to 881 lb/h ± 5%) Pellet size 3 mm: up to 550 kg/h ± 5% (0.1181 in up to 1212 lb/h ± 5%) Pellet size 10 mm: up to 550 kg/h ± 5% (0.3937 in up to 1212 lb/h ± 5%) Pellet size 16 mm: up to 550 kg/h ± 5% (0.6299 in up to 1212 lb/h ± 5%) Highly compressed dry ice pellets at a pressure of min. 17 bar (246 psi) (liquid CO_2) with a waste gas line of max. 3 m (9 ft).
Pellet size:	Cylindrical pellets Ø approx. 1.7 - 16 mm (0.0669 – 0.6299 in) Depending on installed extruder plate
Liquid CO_2 delivery pressure:	16-18 bar (232-261 psi) / Pressure fluctuation per 8h max. 1 bar (14.5 psi)
CO_2 liquid quantity reference:	Up to 1375 kg/h (3031 lb/h)
Liquid CO_2 purity:	min 99.9 % v/v Moisture content of liquid CO_2 5-60 ppm (v/v) or atmospheric dew point between -65° C (-85°F) and -47° C (-52.6°F) Free of oil, sugar, rust, steel particles and other contaminants
Liquid CO_2 temperature:	Adhere to these values in order to maintain the specified production rate: at 15 bar (217 psi) -> -28.5 °C (-19.3°F) at 17 bar (246 psi) -> -24.5 °C (-12.1°F) at 20 bar (290 psi) -> -19.5 °C (-3.1°F)
Liquid CO_2 supply line:	Inside Ø min. 28 mm; insulated, with as few elbow sections and fittings as possible. For supply lines longer than 20 m, contact ASCO for advice.
Insulation cable for liquid CO_2:	Elastomeric foam with low thermal conductivity (0.035 W/mk) of the type "K flex". Minimum thickness 50 mm (1.969 in). Recommendation: Protect the CO_2 liquid line with an aluminium sheath.
Liquid CO_2 supply fitting:	1" BSP internal thread
Waste gas back pressure:	CO_2 0.5 bar (7.25 psi)
Waste gas line fitting:	Rp 3", female thread
Waste gas in CO_2 waste gas line:	Up to 825 kg/h (1818 lb/h)
CO_2 leakage emissions:	To be determined on site by operating company
Dripping water after machine stop:	0.5 litres (0.13 gal)
Requirements Recovery system:	Please contact: ASCO CARBONDIOXIDE LTD
Sound pressure level:	Under normal operating conditions this is 70dBA When starting and in case of malfunction, ice layer breakage >88 dBA
Drive:	Hydraulic
Recommended fluid:	Mineral oil according to DIN 51524 part 2
Fluid grade:	16/13 according to ISO 4406
Fluid viscosity:	ISO VG 46

Maximum fluid volume:	250 litres (66 gal)
Electrical power supply (standard):	CE: 400V / 32A / 50Hz / 3 phases + earth US: 480V / 32A / 60Hz / 3 phases + earth
Short-circuit current Icp:	6 kA
Dimensions* (L x W x H):	Without electric signal tower: 1660 x 1400 x 1550 mm (65.35 x 55.12 x 61.02 in) With electric signal column: 1660 x 1400 x 2331 mm (61.42 x 55.12 x 91.77 in)
Weight* (net):	approx. 1235 kg (2723 lb)
Weight* (packed):	approx. 1471 kg (3243 lb)
Expected lifespan	15 years (assuming proper maintenance)

* All information refers to the machine without hydraulic oil

Permissible ambient conditions

Floor	Sealed, level industrial floor
Site protected against	▪ Water on the floor ▪ Oxygen deficiency, ventilation ▪ Dust, dirt, pollution and mist ▪ Electromagnetic interference ▪ Humidity (air humidity < 60%) ▪ Contaminants
Location of installation	Industrial hall Protected against adverse ambient conditions
Ambient temperature	Minimum ambient temperature +5 °C (+41 °F) to maximum + 40 °C (+104 °F)
Lighting	Adequate lighting of machine and adjacent areas

3 TRANSPORT

3.1 TRANSPORT BY PALLET TRUCK OR FORKLIFT TRUCK

All products that can be packaged are protected with suitable packaging. The packaging is designed to withstand normal stresses and impacts along the transport chain, including during transport by sea, land and air, as well as during correct handling and storage. High quality packaging does not relieve those involved in the logistic chain from their duty of care when handling the products. This applies to the time from the manufacture of the packaging and the packing of goods to be sent until the delivery of the shipment.

After delivery of the ASCO CO_2 pelletizer, the machine must be inspected for damage in transit. If there is damage, the commissioned shipping company must be contacted in order to record the damage.
Check whether the delivery is complete.

WARNING

Risk of injury or damage during on-site transport and installation work!
The centre of gravity of the machine is not in the middle of the machine. Use a fork lift truck for exact placement of the pelletizer.

- Transportation by crane or hoist is not allowed.

WARNING

Risk of injury due to improper transport work!
- The ASCO pelletizer is transported in an upright position on wood profiles with feet.
- Never transport the machine tipped forward or to the side!
- When transporting the pelletizer on a vehicle, secure it to the goods platform so that it cannot shift.

WARNING

Risk of injury or damage due to unqualified personnel!
All tasks in connection with the transport of the machine must be carried out by qualified and suitably trained skilled workers.

WARNING

Risk of head injury!
- During work in connection with the transport, installation and commissioning of the pelletizer, wear suitable head protection.

DANGER

Risk of injury due to improper transport!

- It is the responsibility of the transport and logistics company to carry out all transport procedures professionally, and according to best practice.
- The goods must be loaded, unloaded and put into storage for transport by a specialist company.
- The transport company must ensure that the country-specific requirements for safety and all statutory regulations are complied with, and that staff have the necessary qualifications and training.

CAUTION

Risk of injury or damage during on-site transport and installation work!

- Observe the instructions and regulation regulations for the transport and installation of the machine.
- The tasks described below must be performed by qualified and suitably trained skilled workers and while the machine is disconnected from the power supply.

3.2 UNPACKING OF AND ON-SITE TRANSPORTOF PELLETIZER

- Dispose of packaging material for recycling.

On-site transport of machine without pallet

- Lift the machine with a pallet truck (forklift truck)
- Position the pelletizer correctly on a level industrial floor; floor anchoring is not necessary

CAUTION

Risk of injury or damage from improper on-site transport!

- Note the centre of gravity of the machine, see Fig. 12 (centre of gravity not in the middle)
- For the exact placement of the pelletizer, use an industrial truck (forklift)
- Transport by crane or hoist is not permitted.

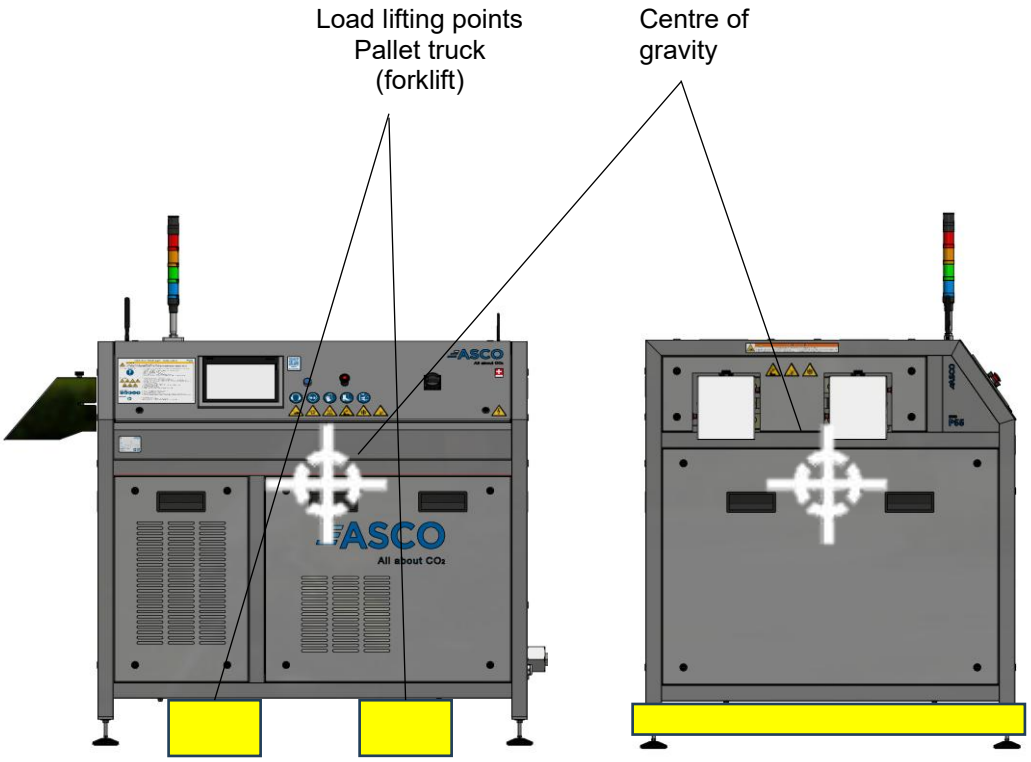


Fig. 12

	**CAUTION**
	The pelletizer was fully assembled and tested before delivery. Prior to shipping, the hydraulic fluid has been drained from the machine.

3.3 STORAGE

CAUTION

Damage due to insufficient protection of pelletizer!
- For prolonged storage, the pelletizer must be protected against external influences.

- Store the pelletizer in a dry place.
- Storage temperature between +10°C (+50 °F) and +40°C (+104 °F)
- Air humidity between 30% and 60%.
- Store the pelletizer so that it is protected against the elements (e.g. in a closed warehouse).
- Protect the pelletizer from external influences.
- The ASCO standard packaging is designed for storage up to maximum one year. For longer storage, replace the packaging with VCI foil. The foil must be protected from sunlight. "Volatile Corrosion Inhibitors" and the "BRANOROST Chip U".

4 INSTALLATION

NOTE

All work described in this section must be carried out by a qualified, trained and professional technician.
ASCO CARBONDIOXIDE LTD shall not be liable for damage caused by non-compliance with the instructions and recommendations in this chapter.

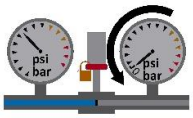
DANGER

Danger due to automatic start-up of the machine!
The machine can be started automatically externally (remote operation) without authorization from the operating personnel.

Before installation, commissioning, maintenance, cleaning and troubleshooting, please note the following points:

1. Before removing any cover from the machine or performing any work on the mechanics, hydraulics, control and CO_2 lines, proceed as follows:

- Deactivate all interfaces in the Interfaces Settings menu (see chapter 5.1.16)
- The main switch is set to “OFF” and secured with a padlock to prevent it from being switched on again
- De-pressurise the machine as described in chapter 5.2.10



- Switch off the machine as described in chapter 5.2.11
- Ensure that the machine is stopped, the main switch is turned to "OFF" and the power plug is pulled out!
- Ensure all local safety regulations are met!
- Covers can be removed.

2. Initiate work

3. Bring machine into a safe state

Risk of injury or damage due to missing safety components!
- Only start the machine after you have made sure that all safety components are correctly installed and in working and safe order.

Risk of injury from electrical energy!
- Exposed electrical contacts, electrostatic discharge, physical impact on electrical systems, etc. pose a high safety risk.
- Work on electrical installations may only be carried out by trained and qualified personnel.

WARNING

Protect the area around the pelletizer against influences from ambient conditions and processes performed in its vicinity!
See chapter « 2.2TECHNICAL DATA » (Permissible ambient conditions)

- The operating company is responsible for the safe and professional installation of the machine
- All work in connection with the installation of the machine performed by qualified and trained skilled workers

WARNING

Risk of head injury!
- During work in connection with the transport, installation and commissioning of the ASCO pelletizer, wear suitable head protection.

WARNING

Risk of injury or damage from damaged hoses and loose connections!
- Before connecting hoses and fittings, check the coupling elements for damage.
- Make sure that all hose and cable connections are correctly established and properly tightened!
- In the event of interruptions or damage due to incorrect installation, any warranty claim against ASCO CARBONDIOXIDE LTD will be void.

CAUTION

Risk of injury or damage due to missing oil!
The ASCO pelletizer was fully assembled and tested before delivery. Prior to shipping, the hydraulic fluid has been drained from the machine.

- Refill oil before switching on the machine

WARNING

Risk of injury or damage due to pressure!
- All pipe sections in which liquid CO_2 can be trapped must be equipped with a 25 bar (362.6 psi) safety valve.
- A shut-off valve and relief tap must be installed upstream of the machine.

WARNING

Before removing any guards of the pelletizer or carrying out any work on the pelletizer:
- Stop the pelletizer, set the main switch to "OFF" and disconnect the power plug!
- Depressurise the pelletizer!
- Observe all local safety regulations!

WARNING

Risk of suffocation!
Working in enclosed, unventilated spaces presents a suffocation hazard due to high carbon dioxide concentration!
- When working in enclosed spaces, ensure that there is adequate ventilation to keep the carbon dioxide concentration in the ambient air below a dangerous level.
- We strongly recommend installing CO_2 sensors.
- Observe document "General Information and Safety Instructions – Working with CO_2".

DANGER

Risk of injury or damage from CO_2!
- The operating company must and define the operational safety measures and precautions by means of a local risk analysis (HAZOP). This analysis must cover issues such as ventilation points, etc.
- CO_2 gas collects at the lowest point.
- The CO_2 escapes at high velocity and at a very high noise level.
- Loose parts or dirt particles are blown about by the escaping gas.
- Install the prescribed CO_2 warning equipment.
- All persons standing in the vicinity of CO_2 pipework or devices, must be equipped with personal CO_2 warning devices.
- Use personal protective equipment such as safety goggles, safety shoes with anti-slip soles, hearing protection, gloves and CO_2 warning devices.
- Processes upstream and downstream of the machine must be designed so that they work properly at all times, even in the event of power loss.
- See also separate document “General Information and Safety Information – Working with CO_2”.

CAUTION

Risk of injury due to insufficient lighting!
- It is the responsibility of the operating company to ensure that the machine and the adjacent areas are properly lit.

CAUTION

Risk of injury due to improper piping and welding!
- All welding work must be carried out by qualified specialist technicians. The local legal permissions are required for this.
- The welding technique must be performed according to best practices. All statutory welding regulations and rules must be adhered to.
- After welding, the pipelines must be professionally cleaned and flushed. Otherwise, fittings, valves, instruments and other components might become contaminated and/or damaged. This can result in serious damage to the machine.
- The pipeline must be tested for pressure resistance by trained specialist personnel and released for operation.

WARNING

Risk of injury or damage from pressurised machine!

- Prior to carrying out work on the machine, shut off the CO_2 supply.
- All installation must be carried out when the machine is depressurised. Depressurise the system.

WARNING

Risk of injury to persons due to unauthorised access to machine!

- Protect the pelletizer so that unauthorised persons cannot access or interfere with it.
- Prevent unauthorised access to the pelletizer (e.g. by installing a gate with lock).
- Secure the pelletizer against unintentional switching on (e.g. by attaching a padlock to the main switch).

CAUTION

Machine in operation without liquid CO_2 supply

If the machine is operated without liquid CO_2, the sealing ring heats up and can lead to damage to the sealing ring and other components.

If these instructions are not followed, material damage will result:

- Only operate the machine with liquid CO_2
- Operating the machine without liquid CO_2 is prohibited!
- During commissioning, operation, servicing, maintenance and troubleshooting, do not allow the machine to run for longer than 2 minutes without a supply of liquid CO_2

4.1 ELECTRICAL CONNECTION

DANGER

Risk of injury from electrical energy!

Exposed electrical contacts, electrostatic discharge, physical impact on electrical systems, etc. pose a high safety risk.

- All work on the electrical equipment must be performed by qualified specialist technicians and when the machine is de-energised. Risk of injury from electric power and loose screws!
- Protect all electrical cables so that they cannot become damaged.
- Use of high-performance cables sufficiently dimensioned for the current load.
- Test and inspect the electrical system prior to commissioning and at least every 1000 operating hours.
- Check cables before each use and repair them professionally if damaged. In the event of damage to a cable, it is forbidden to start the machine.
- Check the earth conductor and the power cables for damage and replace them, if necessary
- CO_2 pipeline segments Apply protective earthing

Before connecting the machine to the power mains, check the following:

- All safety components are properly installed and in working order.
- All cable connections are correctly tightened.
- All earthing connections and terminals are in place and securely connected.
- All screws are tightened.

For relevant connection data see chapter “2.2 TECHNICAL DATA” and circuit diagram.

4.1.1 Connecting the signal column

Fig. 13

Attach the stand to the appropriate location on the machine.
The M12 connector connection is located in the machine area.

4.2 INSTALLATION INSTRUCTIONS FOR LIQUID CO_2 SUPPLY AND WASTE GAS LINES

WARNING

Danger due to incorrect supply line!
ASCO recommends that no filter units are installed in the liquid CO_2 supply line to the pelletizer, as these could lead to pressure loss and the formation of snow. ASCO shall not be responsible for malfunction or damage resulting from the installation of such filters.
Please note the instructions below.

WARNING

Risk of damage or injury from malfunctioning CO_2 spray valve or leak in CO_2 line
Check and replace solenoid valve and CO_2 lines regularly according to the servicing plan.
In the event of leakage or malfunction of the solenoid valve (e.g. continued injection), proceed as follows:

- Stop the machine (EMERGENCY-STOP)
- Immediately close the manual CO_2 shut-off valve in the CO_2 liquid line
- De-pressurise the machine as described in chapter 5.2.10
- Switch off the machine as described in chapter 5.2.11
- Turn the main switch to OFF
- Arrange for repairs to be made

NOTE

For long pipelines, we recommend installing a degassing valve.

Liquid CO_2 line	Non-rusting metal; installation free of oil and grease; pipeline with as few elbow sections as possible; Radius min. 3 x Ø, working pressure 16-18 bar (232-261 psi).
Waste gas line	Polyethylene or galvanised steel; with as few elbow sections as possible; Radius min. 3 x Ø, working pressure approx. 0.5 bar (7.25 psi).
Insulation	Preferably made from synthetic rubber, e.g. Armaflex, Kaiflex. Insulation thickness min. 50 mm (1,97 in) on all sides.
Outdoor lines	Install insulation that provides protection against the elements.
Safety	All pipe sections where liquid CO_2 can be trapped must be equipped with a 25 bar (362.6 psi) safety valve. A shut-off valve and relief tap must be installed upstream of the machine.
Installation of pelletizer	Preferably at level of CO_2 tank. Maximum height 10 m (32,8 ft.) above tank level.

SUPPLY LINE	up to 20 m (65,61 ft) length	For larger lengths of connection of several P55 EVO
P55 EVO	Line DN25 – 1”	ASCO Customer Service Department

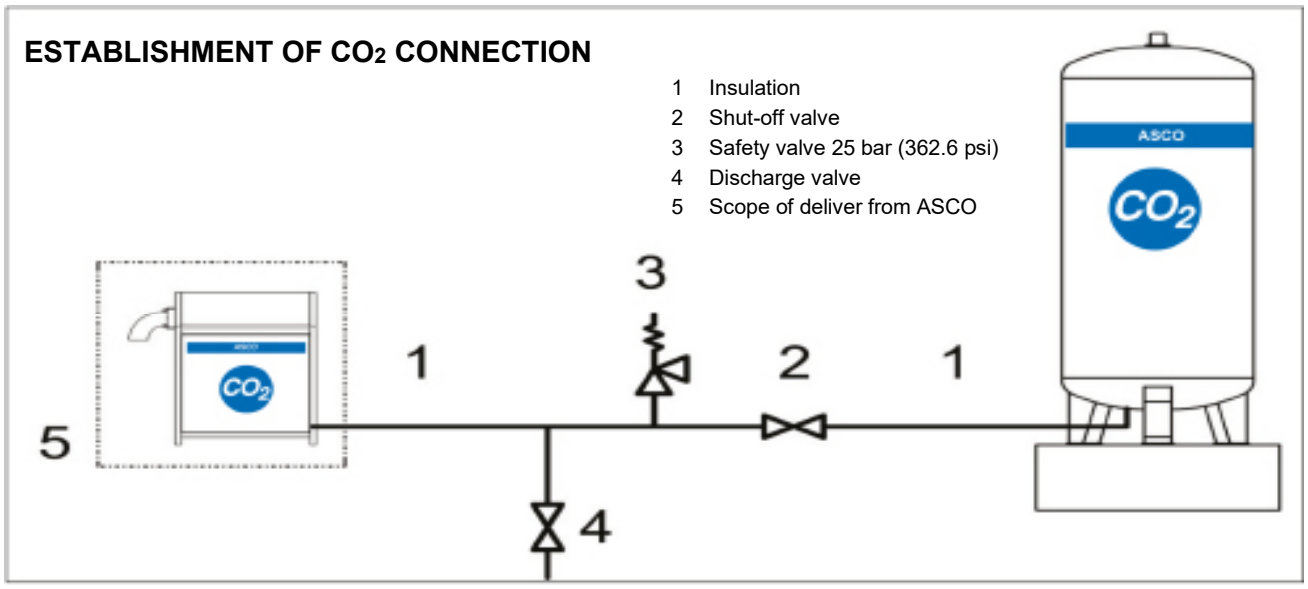


Fig. 14

Separated waste gas routing

WARNING

Risk of damage or injury due to icing of the CO_2 waste gas line and reformer chamber

If the machine is operated with only one reformer chamber, there is a possibility that the waste gas line of the other reformer chamber will ice up. This means that the second reformer chamber will not be able to be started during operation. If the second reformer chamber is started despite this, individual components may be damaged.

- Every reformer chamber must be provided with its own waste gas line and one shut-off valve each.
- The CO_2 waste gas shut-off valve for the reformer chamber that is not in operation must be closed!
- If the machine is not in operation, close the CO_2 waste gas shut-off valve(s)

NOTE

The waste gas line connections have 3" BSP internal thread

WASTE GAS LINE P55 EVO	up to 10 m (32,80 ft) length / ID	from 10 m (32,80 ft) length
Separated waste gas routing	2x D1= DN80 (3”) A = max. 10 m (32,80 ft)	Contact ASCO help desk.

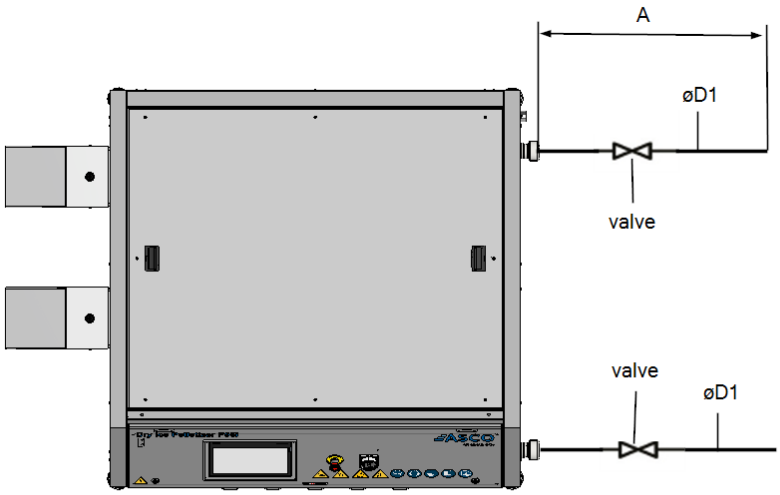


Fig. 15

Combined waste gas routing

WARNING

Risk of damage or injury due to icing of the CO_2 waste gas line and reformer chamber

If the machine is operated with only one reformer chamber, there is a possibility that the waste gas line of the other reformer chamber will ice up. This means that the second reformer chamber will not be able to be started during operation. If the second reformer chamber is started despite this, individual components may be damaged.

- Every reformer chamber must be provided with its own waste gas line and one shut-off valve each.
- The CO_2 waste gas shut-off valve for the reformer chamber that is not in operation must be closed!
- If the machine is not in operation, close the CO_2 waste gas shut-off valve(s)

NOTE

The waste gas line connections have 3" BSP internal thread

WASTE GAS LINE P55 EVO	up to 10 m (32,80 ft) length	from 10 m (32,80 ft) length
Combined waste gas routing	D1 = DN80 / (3”) A = 3 m – 5 m (9,84 – 16,40 ft) D2 = DN125 / (5”) B = min. 1 m (3,28 ft) C = max. 5 m (16,40 ft)	Contact ASCO Customer Service Department

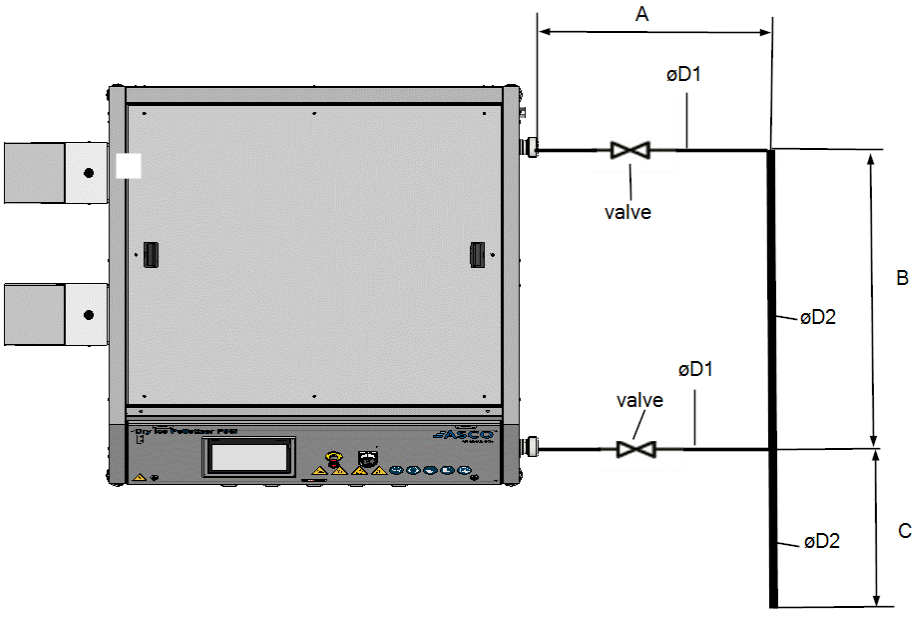


Fig. 16

CAUTION

Hazards from working under pressure and lack of testing!

- All connecting work must be performed by qualified skilled workers and when the machine is de-energised and depressurised. See chapter 5.2.10 and chapter 5.2.11.
- Test, inspect and service the CO_2 lines prior to commissioning and at least every 1000 operating hours or annually Observe all applicable national and international regulations and standards.

WARNING

Risk of injury or damage due to pressure and missing shut-off valves and relief taps!

- All pipeline sections where liquid CO_2 might become trapped must be equipped with a safety valve and relief tap.
- A shut-off valve and relief tap must be installed upstream of the machine.
- Drain lines for safety valves and relief taps might contain condensate/water. If there is back pressure and/or icing, they might not drain sufficiently.
- Proper layout of drainage lines, pipelines, safety valves, discharge valves, etc.

  Layout according to national/international standards and measures specified in the operating company's risk analysis (HAZOP).

DANGER

Risk of injury due to pressure, incorrect design or missing equipment!

- Install a safety valve wherever liquid CO_2 can be trapped.
- Maintain correct safety valve design (25 bar / 362.6 psi).
- The correct layout of the drainage line of the safety valve must be determined by a qualified specialist.
- The relief tap/ball valve must be installed by the operating company.
- The operating company must have the safety valves inspected and tested at the intervals prescribed by the manufacturer (see maintenance matrix) and according to the applicable statutory regulations. All performed tests must be documented.
- Recommendation: Test or replace the safety valves every 2 years.







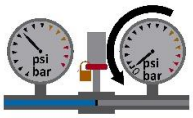
DANGER

Danger due to automatic start-up of the machine!
The machine can be started automatically externally (remote operation) without authorization from the operating personnel.

Before installation, commissioning, maintenance, cleaning and troubleshooting, please note the following points:

1. Before removing any cover from the machine or performing any work on the mechanics, hydraulics, control and CO_2 lines, proceed as follows:

- Deactivate all interfaces in the Interfaces Settings menu (see chapter 5.1.16)
- The main switch is set to “OFF” and secured with a padlock to prevent it from being switched on again
- De-pressurise the machine as described in chapter 5.2.10



- Switch off the machine as described in chapter 5.2.11
- Ensure that the machine is stopped, the main switch is turned to "OFF" and the power plug is pulled out!
- Ensure all local safety regulations are met!
- Covers can be removed.

2. Initiate work

3. Bring machine into a safe state

Risk of injury or damage due to missing safety components!

- Only start the machine after you have made sure that all safety components are correctly installed and in working and safe order.

Risk of injury from electrical energy!

- Exposed electrical contacts, electrostatic discharge, physical impact on electrical systems, etc. pose a high safety risk.
  - Work on electrical installations may only be carried out by trained and qualified personnel.

WARNING

Risk of suffocation!
Working in small, enclosed and unventilated spaces presents a suffocation hazard due to high CO_2 concentration!

- When working in enclosed spaces, ensure that there is adequate ventilation to keep the CO_2 concentration in the ambient air below a dangerous level.
- Use CO_2 sensors with warning devices.
- See separate document “General Information and Safety Information – Working with CO_2”.

NOTE

Damage from excessive working pressure
The operator must ensure that the maximum working pressure in the supply line is not exceeded. The maximum operating pressure is included in the technical specification of the pelletizer. The machine has no internal pressure regulation.

- Carefully remove the lid and side walls of the transport box.

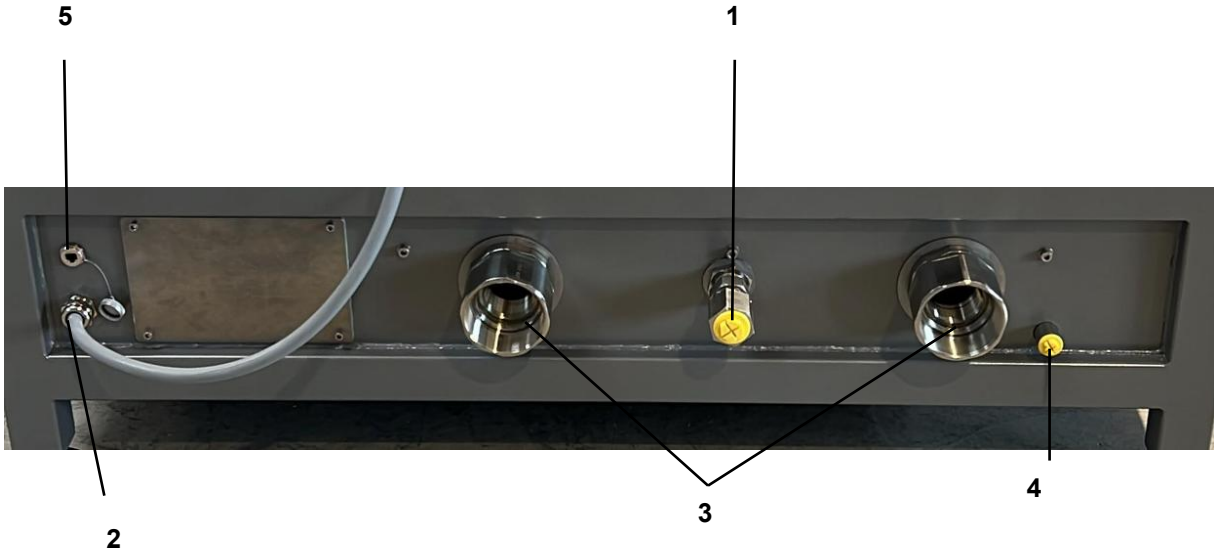
- Inspect the machine for signs of transport damage. Check all screws on the housing panels to make sure that they are properly tightened.
- Install the pelletizer as close as possible to the CO_2 storage tank, preferably at a distance of max. 3 m (9,843 ft). The pelletizer must be placed on a firm and level surface, protected from moisture and steam.

	CAUTION
	Damage from condensate Set the ejection-side levelling feet 15 mm (0.59 in) higher than the opposite ones. This allows any condensate that may form in the press chamber to drain away and prevent damage to the machine.

- Access area for operation and maintenance work must be at least 2 m (6,56 ft) on the operating side and 1 m (3,28 ft) on each of the other sides.

When connecting to the CO_2 tank, please note:

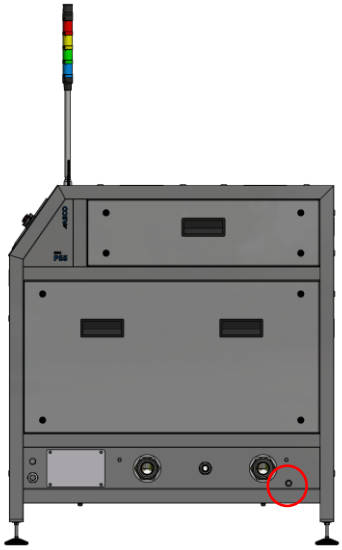
- Preferably use a flexible, insulated cable at the connection point.
- The connection to the pelletizer has a 1" female thread fitting (fig. 17, 1).
- The waste gas line has a 3" female thread fitting (fig. 17, 3).
- Run the other end of the line out of the building or connect it to a recovery system. The back pressure in the waste gas line must not exceed 0.5 bar (7.25 psi).



1 Liquid CO_2 inlet (1" BSP internal thread)
2 Mains connection
3 CO_2 waste gas outlet (3" BSP internal thread)
4 Wastewater
5 Network connector

Fig. 17

- The liquid CO_2 line must be insulated and have no branches, constrictions or valves that could impede the free flow of liquid CO_2.



Condensate drain

Fig. 18

- Attach a drain hose to the condensate drain outlet.
- Prior to assembly, ensure that the lines for the liquid CO_2 and for the CO_2 waste gas are free of cutting oil, burrs and other machining residue.
- Avoid laying these cold lines above electrical components as these could be damaged by dripping condensate.
- Before insulating the liquid CO_2 supply line, pressurise it to ensure that there are no leaks.

WARNING

Risk of injury or damage due to pressure!
Shut off CO_2 supply.
- Close the shut-off device (ball valve) of the CO_2 supply line.
- Start the machine to depressurise it.
- Residual pressure through the discharge valve in the supply line.

If you have any queries, please contact ASCO.

4.3 COMMISSIONING AND INITIAL TESTING







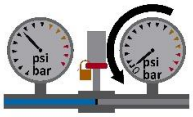
DANGER

Danger due to automatic start-up of the machine!
The machine can be started automatically externally (remote operation) without authorization from the operating personnel.

Before installation, commissioning, maintenance, cleaning and troubleshooting, please note the following points:

1. Before removing any cover from the machine or performing any work on the mechanics, hydraulics, control and CO_2 lines, proceed as follows:

- Deactivate all interfaces in the Interfaces Settings menu (see chapter 5.1.16)
- The main switch is set to “OFF” and secured with a padlock to prevent it from being switched on again
- De-pressurise the machine as described in chapter 5.2.10



- Switch off the machine as described in chapter 5.2.11
- Ensure that the machine is stopped, the main switch is turned to "OFF" and the power plug is pulled out!
- Ensure all local safety regulations are met!
- Covers can be removed.

2. Initiate work

3. Bring machine into a safe state

Risk of injury or damage due to missing safety components!

- Only start the machine after you have made sure that all safety components are correctly installed and in working and safe order.

Risk of injury from electrical energy!

- Exposed electrical contacts, electrostatic discharge, physical impact on electrical systems, etc. pose a high safety risk.
  - Work on electrical installations may only be carried out by trained and qualified personnel.

WARNING

Danger due to incorrect commissioning work!
- The chapter “Safety Instructions” must be read and understood
- All safety components must be present and functional
- Commissioning work may only be carried out in the presence of at least two specialists (one-man operation prohibited).

4.3.1 Inspection of the location of installation before commissioning

NOTE

Depressurize and de-energize the machine: see chapter 5.2.10 “Depressurising the machine” and chapter 5.2.11 "De-energising the machine".

WARNING

The operating company must ensure that there are no further potential hazards from adjacent work processes, environmental conditions, etc. at the place of installation of the pelletizer!
See chapter “2.2TECHNICAL DATA” (Permissible ambient conditions)

- The operating company is responsible for the safe and professional installation of the machine.
- All work in connection with commissioning must be performed by qualified skilled workers.

WARNING

Risk of injury to hands when reaching into machine!
- Do not reach into the extruder plates at the discharge side when the machine is in operation.
- Make sure the ejection cover is correctly installed.
- To remove jammed product, shut down the machine and use suitable tools.

4.3.2 Inspection of the CO_2 pipeline system and the warning devices

DANGER

Danger due to lack of risk assessment and definition of additional measures!

- Additional measures must be determined by the operator using a risk assessment (HAZOP), e.g. ventilation points, etc.
- During commissioning, the operating company must check whether all safety measures have been implemented correctly.
- CO_2 gas collects at the lowest point.
- Do not operate in closed spaces. Risk of suffocation.
- Caution, the CO_2 escapes at high speed and at a very high noise level.
- Loose parts or dirt particles are blown about by the escaping gas.
- CO_2 warning equipment is mandatory.
- All persons standing in the vicinity of CO_2 pipework or devices, must be equipped with personal CO_2 warning devices.
- Use prescribed personal protective equipment such as safety goggles, safety shoes with anti-slip soles, hearing protection, gloves and CO_2 warning devices.
- Processes upstream and downstream of the pelletizer must be designed so that a safe operating state is maintained at all times, even in the event of power failure.

DANGER

Risk of injury or damage due to pressure!

- Install a safety valve wherever liquid CO_2 can be trapped.
- Maintain correct safety valve design (25 bar / 362.6 psi).
- The correct layout of the drainage line of the safety valve must be calculated by a qualified specialist.
- The relief tap/ball valve must be installed by the operating company.
- The operating company must have the safety valves inspected and tested at the intervals prescribed by the manufacturer and according to the applicable statutory regulations.
- Asco recommends checking or replacing the safety valves every 2 years.

4.3.3 Inspection of the weld joints

CAUTION

Risk of injury due to improper piping and welding!

- All welding work must be carried out by qualified specialist technicians
- The local legal permissions are required for this.
- The welding technique must be performed according to best practices. All statutory welding regulations and rules must be adhered to.
- After welding, the pipelines must be professionally cleaned and flushed. Otherwise, fittings, valves, instruments and other components might become contaminated and/or damaged. This can result in serious damage to the machine.
- The pipeline must be inspected and approved for operation by a qualified specialist technician.

4.3.4 Inspection of the electrical installation

DANGER

Risk of injury due to electrical energy and loose screws!
All work on the electrical equipment must be performed by qualified specialist technicians.
Before connecting the machine to the power mains, check the following:

- Test protocols for the electrical installation in accordance with EN 60204-1, chapter 18 or the local regulations for the commissioning of electrical installations have been drawn up.
- All safety components are correctly installed and in a safe operating state.
- All cable connections are correctly tightened.
- All earthing terminals and connections are in place and securely connected.
- CO_2 pipeline segments Apply protective earthing
- All screws are tightened.
- No unprotected electrical contacts.
- Protection from external electrostatic phenomena.
- Sufficient protection from external influences on the electrical equipment.
- Use cable protection ducts.
- Use suitable, approved high-performance cables.
- Correct dimensioning of the connection cable.
- The cables must be inspected for damage before each use. If damage is discovered, have it professionally repaired. If there is damage to the cables, it is forbidden to operate the machine.

4.3.5 Checking the environment of the ASCO Pelletizer

WARNING

Danger due to missing protective devices!

- Before every start-up of the machine, make sure that all safety guards are closed and all other safety equipment is in place and working properly.
- Check whether the upstream installation is designed for the liquid CO_2 consumption of the machine and make sure that the prescribed ambient conditions are met. See chapter "Technical data".

CAUTION

Risk of slipping!

- Connect the drip tray to a drainage system.
- Check draining water regularly to ensure it drains away freely.
- Risk of slipping due to condensate on the floor.
- An additional drip tray can be avoided with an impermeable industrial floor

WARNING

Danger from contact with parts of high or low temperature

- All safety guards must be closed.

WARNING

Risk of injury to persons due to unauthorised access to machine!

- Protect the pelletizer so that unauthorised persons cannot access or interfere with it.
- Prevent unauthorised access to the pelletizer (e.g. by installing a gate with lock).
- Secure the pelletizer against unintentional switching on (e.g. by attaching a padlock to the main switch).

4.3.6 Inspection of the installation of the extruder plates

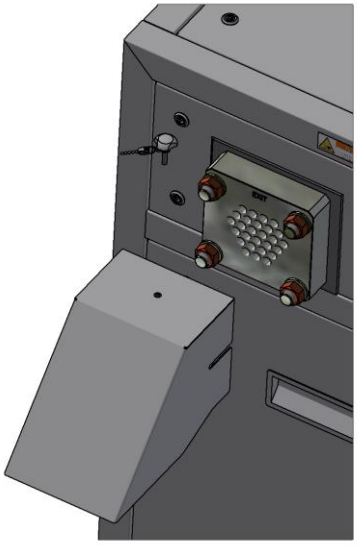


Fig. 19

- Mount the extruder plates and the pellet discharge units (fig. 19) to the pelletizer and tighten the M24 nuts. See torque specification chapter 6.3 “TIGHTENING TORQUES“.

4.3.7 Checking and filling the hydraulic unit

Fill the hydraulic unit with fluid. For filling quantities, see chapter “2.2 TECHNICAL DATA”

NOTE

Damage from dirty oil
To ensure that the fluid is clean, pass it through a filter unit with a mesh size of 10 µm or less when filling the machine
See also chapter 6.2 "CHANGING THE HYDRAULIC FLUID"

- Open the front cover of the machine. Switch on the hydraulic system in menu "Manual Operation" to check the direction of rotation of the electric motor (fig. 20). The motor must rotate in the direction of the arrow. After checking, switch off the motor.
- The direction of rotation of the oil cooler should also be checked. If the oil cooler rotates in the direction of the arrow, it can be switched off again.

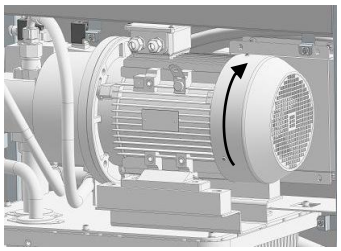


Fig. 20

WARNING

Risk of injury from electrical energy!
If the motor rotates in the opposite direction, exchange the two phases at the connection terminals.

CAUTION: Disconnect the mains plug!

4.3.8 Functional test

- Start production as described in chapter 5.2 “STARTING AND FINISHING PRODUCTION”
- After you have ensured that the main motor is turning correctly and no movement of the piston occurs, stop the machine immediately and follow chapter 4.3.9 “Restarting the hydraulic pump”.
- Perform a function test: if necessary, make adjustments and then run the test again.
- Stop the machine as follows:

WARNING

De-pressurise the machine!

1. Close the ball valve in the liquid CO_2 supply line.
2. Continue producing until the CO_2 pressure is at 0 bar.
   (Below 14 bar / 203 psi an alarm is displayed that the CO_2 pressure is not optimal)
3. Press the End button: 

.
4. Wait until the hydraulics have come to a standstill and then turn the main switch to "OFF".

WARNING

De-energise the machine!
- Turn the main switch to "OFF".
- Disconnect the pelletizer from the mains power supply.

- Commissioning and testing completed.

4.3.9 Restarting the hydraulic pump

	**DANGER** **Risk of injury from hydraulic oil!** The following risks exist: ▪ Hazardous machine movements ▪ Whipping hose lines ▪ Parts being thrown out ▪ Pressurised fluid escaping ▪ Slipping on leaks (oil leaks) ▪ Fire risk ▪ Skin and eye contact with pressurised liquids ▪ Inhalation of spray mist The following work must only be carried out by qualified hydraulic engineers!

- Disconnect the DN19 hydraulic hose on the hydraulic block from the left or right side, as required, to reinitialise it.
- Switch unit to ON quickly for about 2/3 seconds, until 1 to 2 litres of oil have filled the container, then immediately switch the machine off again.
- Mount the DN19 hydraulic hose onto the hydraulic block again.
- The unit is now ready for use.

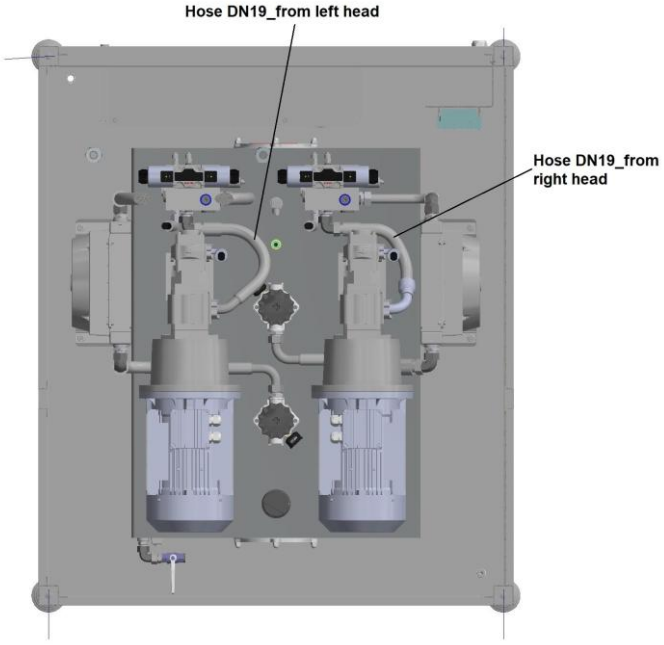


Fig. 21

5 MACHINE OPERATION

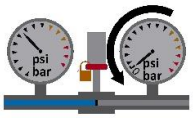
DANGER

Danger due to automatic start-up of the machine!
The machine can be started automatically externally (remote operation) without authorization from the operating personnel.

Before installation, commissioning, maintenance, cleaning and troubleshooting, please note the following points:

1. Before removing any cover from the machine or performing any work on the mechanics, hydraulics, control and CO_2 lines, proceed as follows:

- Deactivate all interfaces in the Interfaces Settings menu (see chapter 5.1.16)
- The main switch is set to “OFF” and secured with a padlock to prevent it from being switched on again
- De-pressurise the machine as described in chapter 5.2.10



- Switch off the machine as described in chapter 5.2.11
- Ensure that the machine is stopped, the main switch is turned to "OFF" and the power plug is pulled out!
- Ensure all local safety regulations are met!
- Covers can be removed.

2. Initiate work

3. Bring machine into a safe state

Risk of injury or damage due to missing safety components!

- Only start the machine after you have made sure that all safety components are correctly installed and in working and safe order.

Risk of injury from electrical energy!

- Exposed electrical contacts, electrostatic discharge, physical impact on electrical systems, etc. pose a high safety risk.
  - Work on electrical installations may only be carried out by trained and qualified personnel.

WARNING

Precondition for operation:

- All safety instructions have been read and understood, see chapter 1 "GENERAL SAFETY INSTRUCTIONS".
- The machine has been correctly installed.

WARNING

The operating company must ensure that there are no further potential hazards from adjacent work processes, environmental conditions, etc. at the place of installation of the pelletizer!
See chapter 2.2 “TECHNICAL DATA” (Permissible ambient conditions)

- The operating company is responsible for the safe and professional installation of the machine
- All work in connection with the installation of the machine performed by qualified skilled workers.

CAUTION

Risk of slipping!
- Connect the drip tray to a drainage system.
- An additional drip tray can be avoided with an impermeable industrial floor
- Check draining water regularly to ensure it drains away freely.
- Risk of slipping due to condensate on the floor.
- Wear safety shoes with anti-slip soles!

WARNING

Danger from unattended machine and operating personnel!
- Operation of the machine by a single worker is prohibited.
- Only operate the machine in the presence/supervision of several people.

WARNING

Risk of injury to persons due to unauthorised access to machine!
- Protect the pelletizer so that unauthorised persons cannot access or interfere with it.
- Prevent unauthorised access to the pelletizer (e.g. by installing a gate with lock).
- Secure the pelletizer against unintentional switching on (e.g. by attaching a padlock to the main switch).

WARNING

Risk of damage or injury from malfunctioning CO_2 spray valve or leak in CO_2 line!
Check and replace solenoid valve and CO_2 lines regularly according to the servicing plan.
In the event of leakage or malfunction of the solenoid valve (e.g. continued injection), proceed as follows:

- Stop the machine (EMERGENCY-STOP)
- Immediately close the manual CO_2 shut-off valve in the CO_2 liquid line
- De-pressurise the machine as described in chapter 5.2.10
- Switch off the machine as described in chapter 5.2.11
- Turn the main switch to OFF
- Arrange for repairs to be made

DANGER

Risk of injury or damage due to missing safety components!

- Only start the pelletizer after you have made sure that all safety components are properly installed and in working order.

Risk of injury from electrical energy!

Exposed electrical contacts, electrostatic discharge, physical impact on electrical systems, etc. pose a high safety risk.

- Work on electrical installations may only be carried out by trained and qualified personnel.

WARNING

Risk of injury due to swirling dry ice pellets!

- During machine operation, all persons not directly involved in its operation must keep clear of the machine.
- Cordon off the work area.
- During machine operation, never touch or reach into the discharge unit.
- At the end of the shift: Depressurize the system, turn the main switch to OFF.

WARNING

Risk of suffocation!

Working in enclosed, unventilated spaces presents a suffocation hazard due to high carbon dioxide concentration!

- When working in enclosed spaces, ensure that there is adequate ventilation to keep the carbon dioxide concentration in the ambient air below a dangerous level.
- Use CO_2 warning devices.

WARNING

Risk of injury to hands when reaching into machine!

- Do not reach into the extruder plates at the discharge side when the machine is in operation.
- Make sure the ejection cover is correctly installed.
- To remove jammed product, shut down the machine and use suitable tools.

WARNING

Danger from hot surfaces!

Burns and scalds from hot or cold mediums of parts.

- When operating the pelletizer, always wear suitable protective gloves.

⚠ WARNING

Danger from sudden loud noise!

- When operating the pelletizer, always wear hearing protection.
- All persons standing close to the pelletizer must wear approved hearing protection.

CAUTION

Machine in operation without liquid CO_2 supply

If the machine is operated without liquid CO_2, the sealing ring heats up and can lead to damage to the sealing ring and other components.

If these instructions are not followed, material damage will result:

- Only operate the machine with liquid CO_2
- Operating the machine without liquid CO_2 is prohibited!
- During commissioning, operation, servicing, maintenance and troubleshooting, do not allow the machine to run for longer than 2 minutes without a supply of liquid CO_2

Tests to be carried out before switching on:

- CO_2 warning device installed and in operation
- Ventilation installed and in operation
- Fan inlets and outlets must be free
- Liquid CO_2 lines must be open
- Pelletizer pressure must be on
- CO_2 waste gas line must be open
- Process at CO_2 outlet must be ready
- Condensate must freely drain off
- Check whether there is sufficient air supply

5.1 OPERATION OF MACHINE CONTROLS

NOTE

To activate certain functions, such as manually controlling the actuators, a login is required.
User: ASCO
Password: ASCO
Password-protected functions must only be used by trained and authorised workers.

5.1.1 Navigation page 1

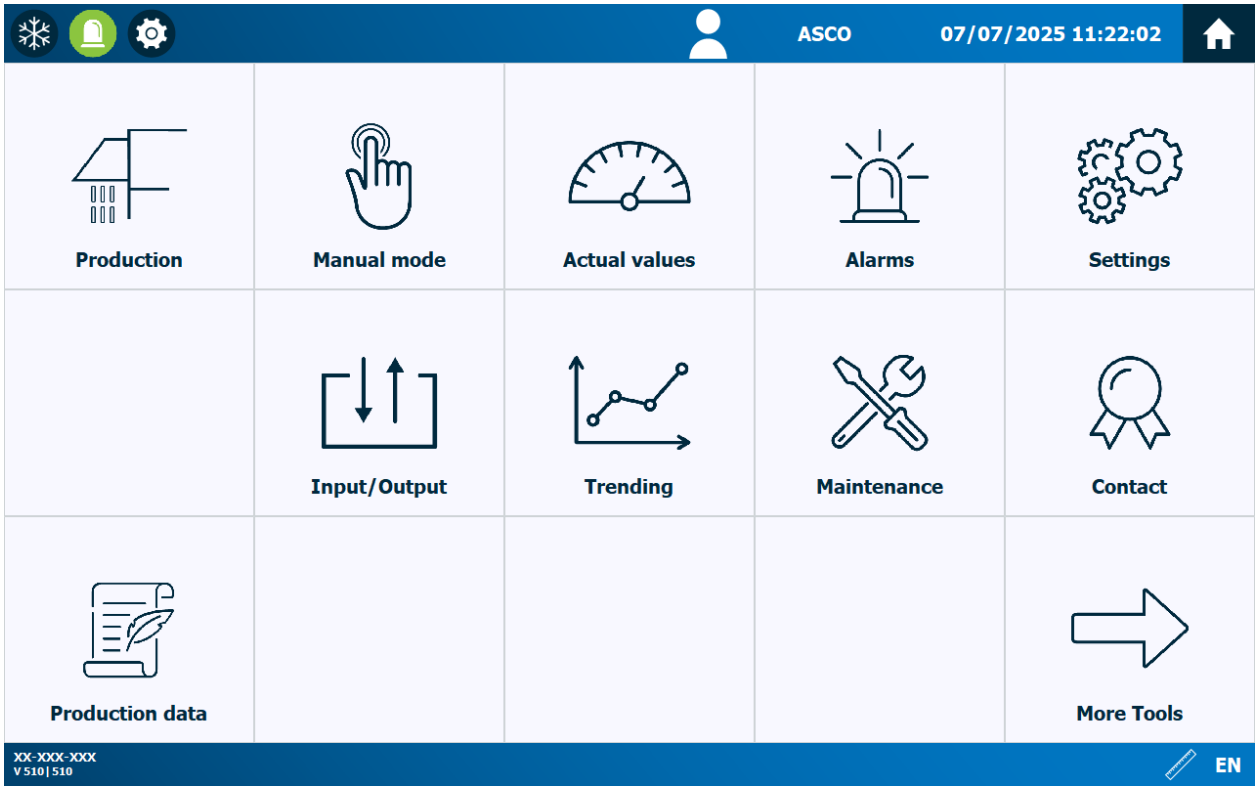
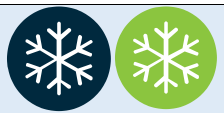
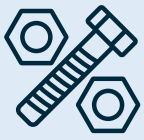
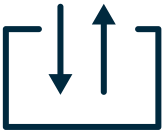


Fig. 22

	Indicates production status. Press to call up "Production" page. Blue: Dry ice production not running Green: Dry ice production running
	Alarms: Press to call up "Alarms" page. Green: No pending alarms Orange: At least 1 pending warning (no production blockage) Red: At least 1 pending alarm (production blockage)
	Press the Home button to call up the navigation page displayed above.
EN	Press to switch between different languages.
	This also results in a change from metric to imperial units.
	Press to call up the "Production" page.
	Press to call up the "Manual Operation" page.
	Press to call up the "Actual Values" page.
	Press to call up the "Alarms" page.
	Press to call up the "Settings" page.
	Press to call up the "Spare Parts" page.
	Press to call up the "Input/Output" page.
	Press to call up the "Trending" page.
	Press to call up the "Service" page.

	Press to call up the "Contact" page.
	Production queue
	Production data
	Press to open 5.1.2 Navigation page 2.

5.1.2 Navigation page 2

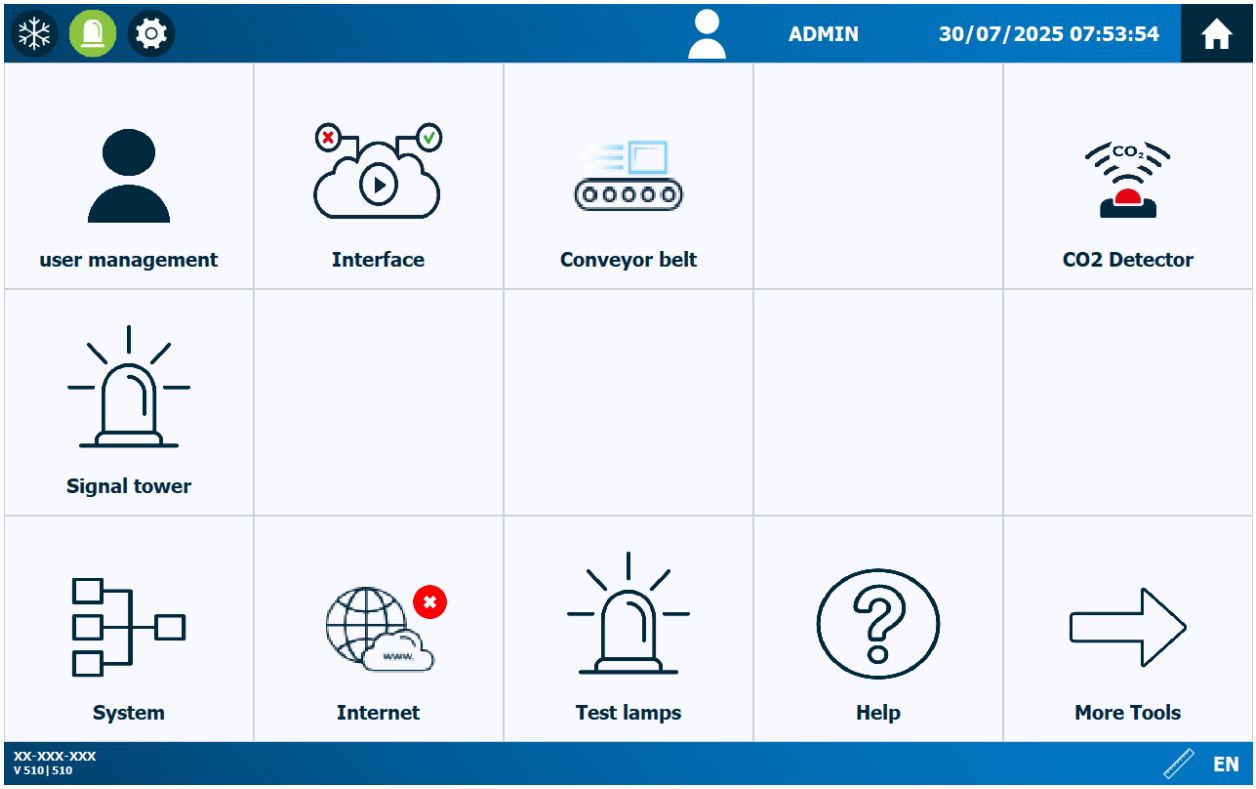


Fig. 23

	Press this button to call up the log-in dialog and user management page. Following successful logging in, the name of the logged-in user is displayed to the right. To log out, press this button again.
	Press for Interface Settings -> 5.1.16 Settings - Interface
	Press for Conveyor Belt Settings -> 5.1.19 Settings – Conveyor Belt
	Press for Queue Settings -> 5.1.8 Evaluating the production data
	Press for CO_2 Detector Settings -> 5.1.18 Settings - CO2 Detector
	Press for Signal Column Settings -> 5.1.20 Settings – Signal Column
	Press for System Settings -> 5.1.21 System Settings
	Press for Internet Settings -> 5.1.22 Internet Settings

	Lamp test By pressing the "Lamp test" button, all lamps will light up as long as the button is pressed. The following lamps are lit: - Release button - Emergency Stop button - Signal column (blue, green, yellow, red, buzzer)
	Press to open 5.1.1 “Navigation page 1”

5.1.3 Settings for production

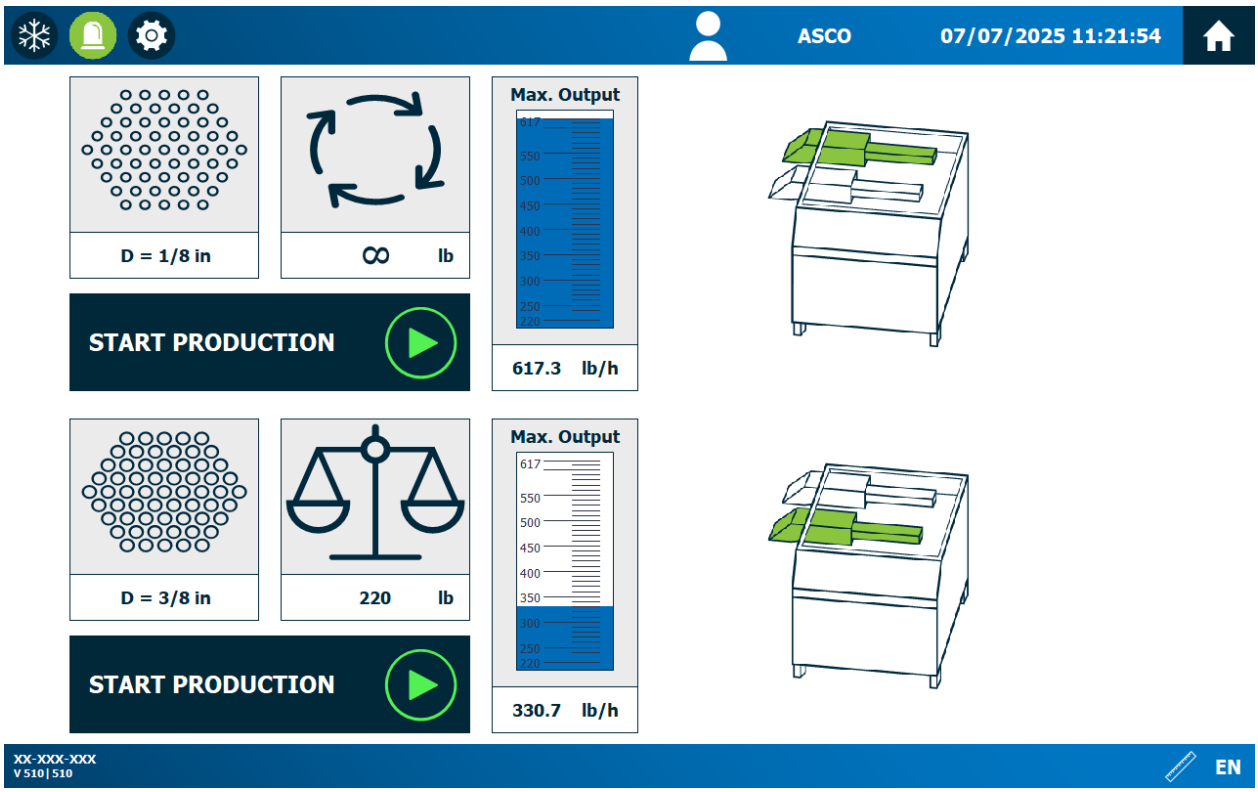
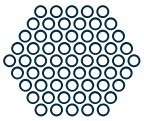
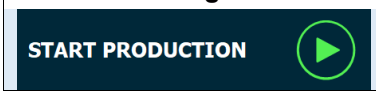


Fig. 24

START PRODUCTION	The machine starts production.
	Press this button to call up a pop-up dialog where you can configure the currently installed extruder plate. The settings should correspond to the currently installed extruder plate.
	Press this button to call up a pop-up dialog for switching between operating modes: - Fixed quantity: Production continues until the target quantity is reached (4 available setpoints). - Continuous production: Production continues until the machine is stopped manually.
70 kg ∞	If "Fixed quantity" is selected, the target quantity is displayed. If "Continuous production" is selected, the ∞ symbol is displayed
	Press to start production

5.1.4 Selecting quantity for production

Fig. 25

	Continuous production:
	User-defined quantity
	Pre-selection 100 kg dry ice box AT126 (quantity configurable)
	Pre-selection 188 kg dry ice box AT240W (quantity configurable)
	Pre-selection 344 kg dry ice box AT440 (quantity configurable)
X	Pressing closes the window

5.1.5 Selecting pellet size for production

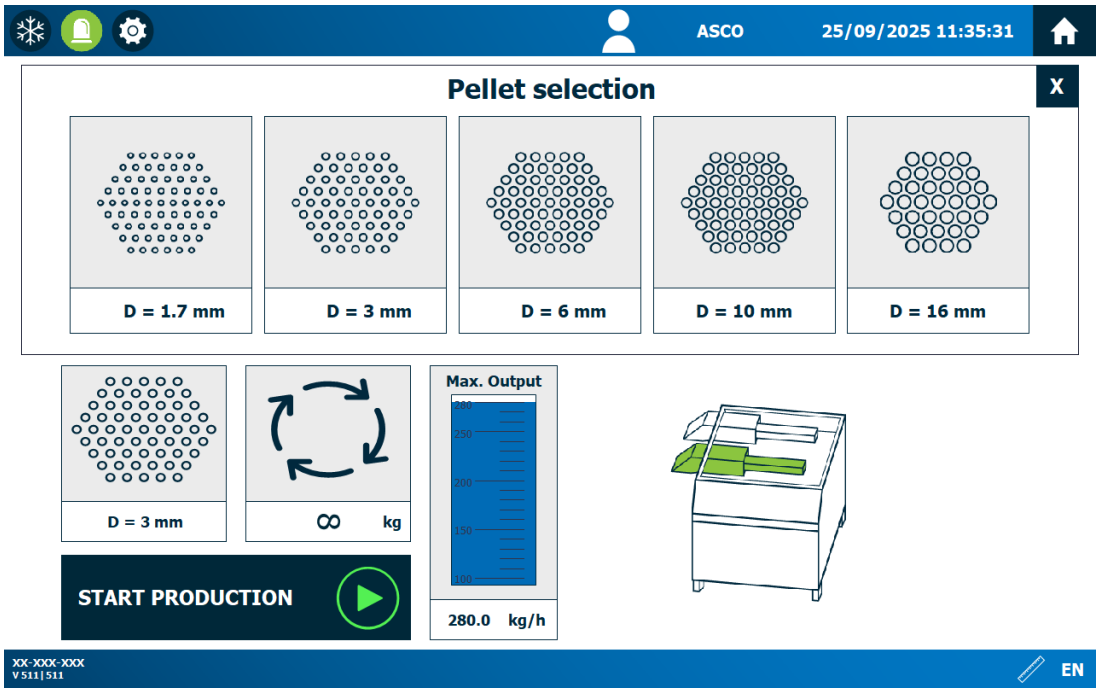
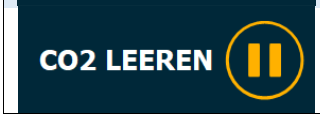


Fig. 26
Select installed extruder plate – 6mm on request

	1.7 mm pellets
	3 mm pellets
	6 mm pellets: on request
	10 mm pellets
	16 mm pellets
X	Press to close the page

5.1.6 Production is running (fixed quantity)

Fig. 27

	Current CO_2 pressure
	Current hydraulic pressure
0 %	Progress display
Target quantity	The quantity selected at the start of production
Open quantity	The quantity still to be produced
Time remaining	The time remaining until the target quantity has been produced.
	Press to end production.
	After pressing, the machine produces dry ice until a CO_2 pressure of zero bar is reached. When a CO_2 pressure of zero bar is reached, the machine stops production automatically.

5.1.7 Production is running (continuous production)

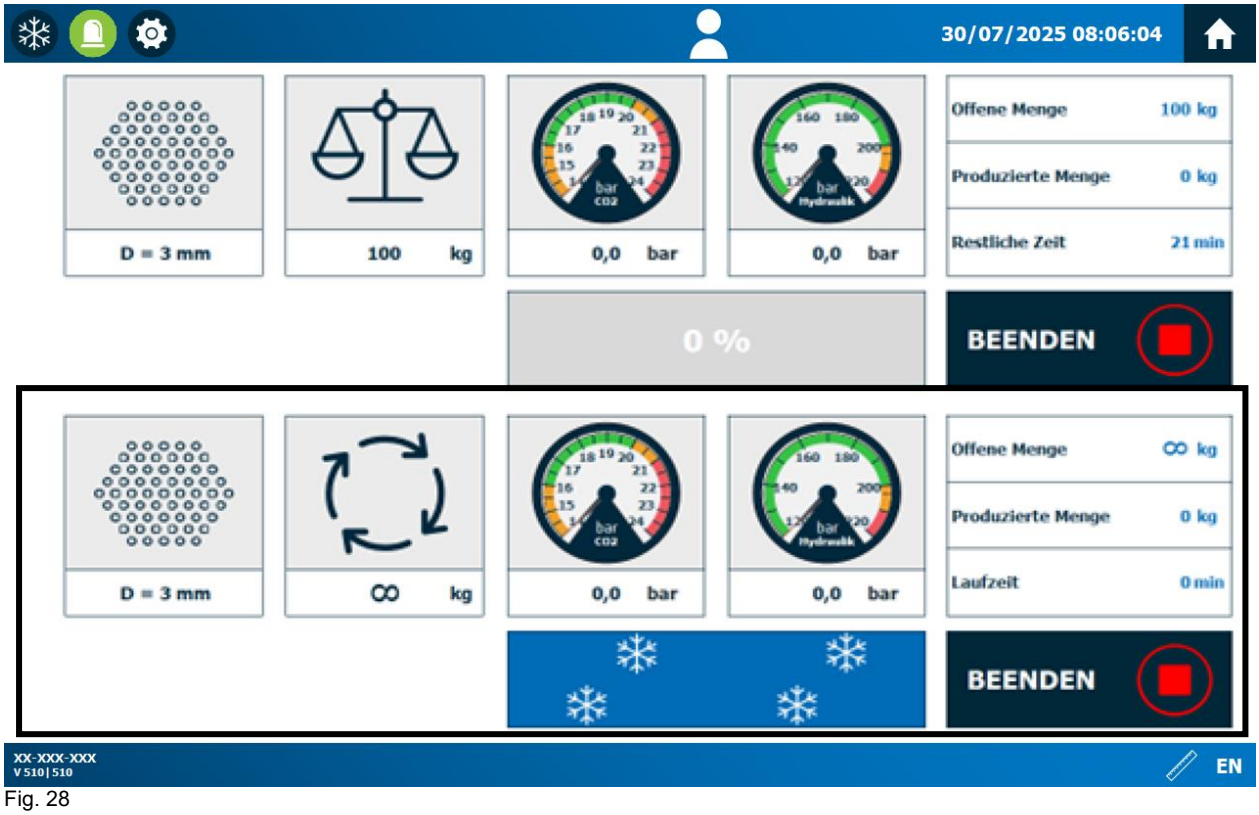


Fig. 28

	Current CO_2 pressure
	Current hydraulic pressure
	Animation
Target quantity	The quantity selected at the start of production. (here: Free production)
Quantity produced	The quantity produced since the start of production
Run time	The time elapsed since the start of production
	Press to end production.
	After pressing, the machine produces dry ice until a CO_2 pressure of zero bar is reached. When a CO_2 pressure of zero bar is reached, the machine stops production automatically.

5.1.8 Evaluating the production data

The machine stores data from the last production orders.

The data from the current production is stored in data set "0". Once production is complete, this data is moved to data set “1”.

Fig. 29

Fig. 30

Fig. 31

5.1.9 Machine manual mode

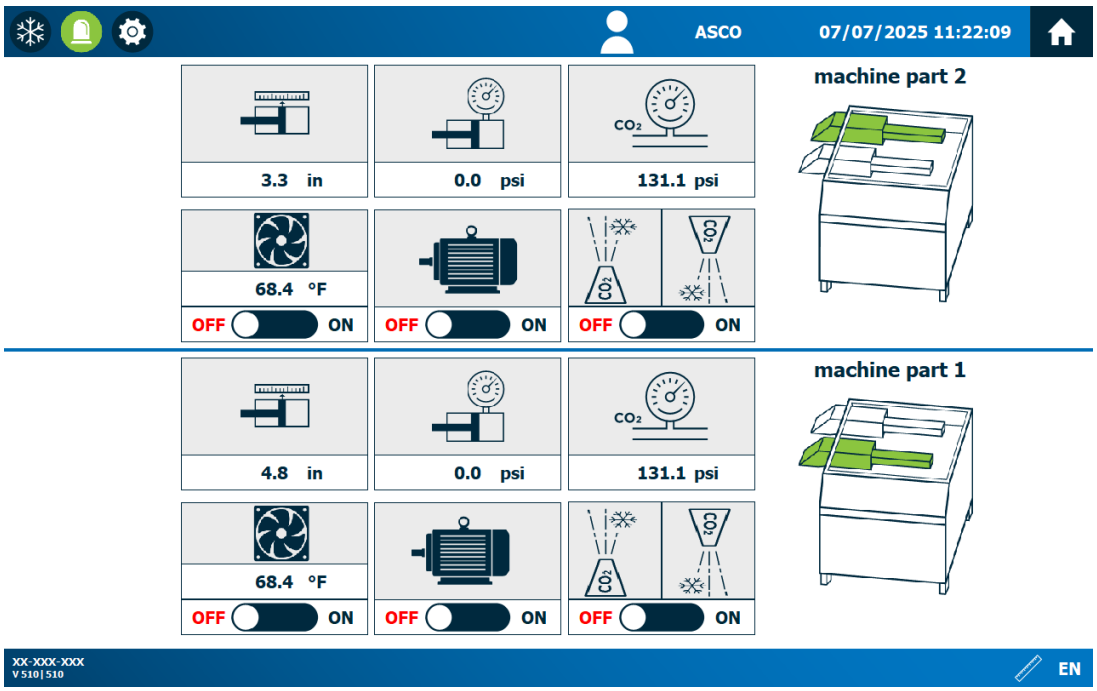
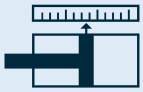
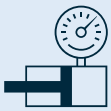
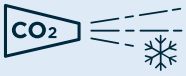


Fig. 32

	Current position of the piston, measured from the front. Discharge position = 0 mm
	Pressing makes it possible to move the piston forwards or backwards manually. (Buttons only visible when hydraulic motor is switched on)
	Current pressure in the piston.
	Current CO_2 pressure.
	Press to switch the fan on manually. The fan switches on automatically when the hydraulic oil needs to be cooled in manual mode.
	Press to make switch on the hydraulic motor manually. The hydraulic motor has a start-up time of approximately 4 seconds. The piston can only be moved after the start-up time has elapsed. A green check mark confirms that the hydraulic pump has started up completely. The fan is switched on automatically in manual mode when the current situation requires it. (Hydraulic motor ON and hydraulic temperature too high)
	Press to switch on the CO_2 valves manually (valves are open as long as button is pressed). The CO_2 valves can be switched individually or in combination. By pressing the “OFF – ON” button, both valves are switched.

5.1.10 Current values - Overview

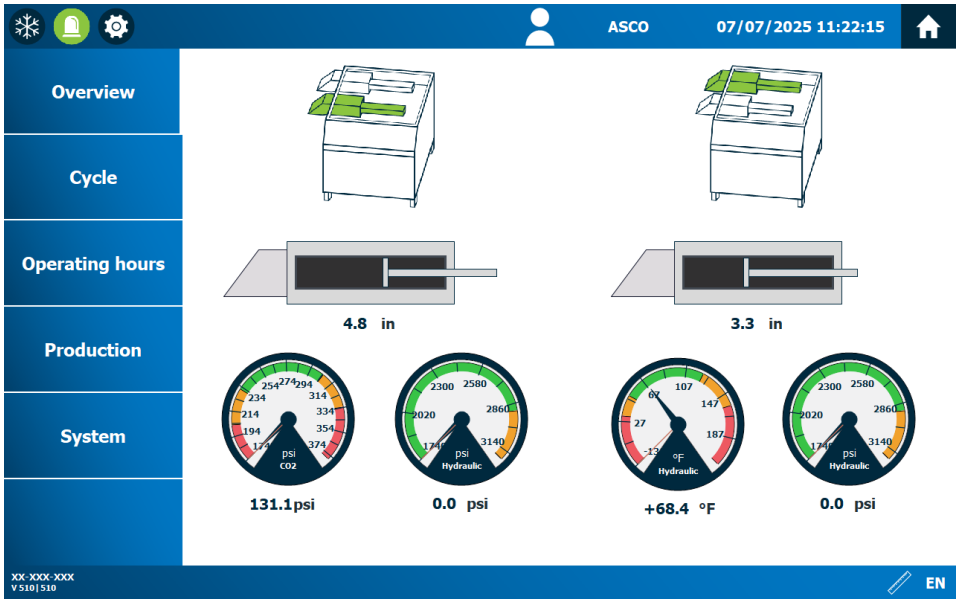
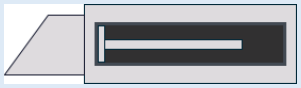
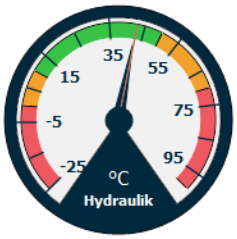


Fig. 33

	Current position of the piston, measured from the front. Discharge position = 0 mm
	Current CO_2 pressure
	Current pressure in the piston.
	Current temperature of the hydraulic oil

5.1.11 Current values - Cycle

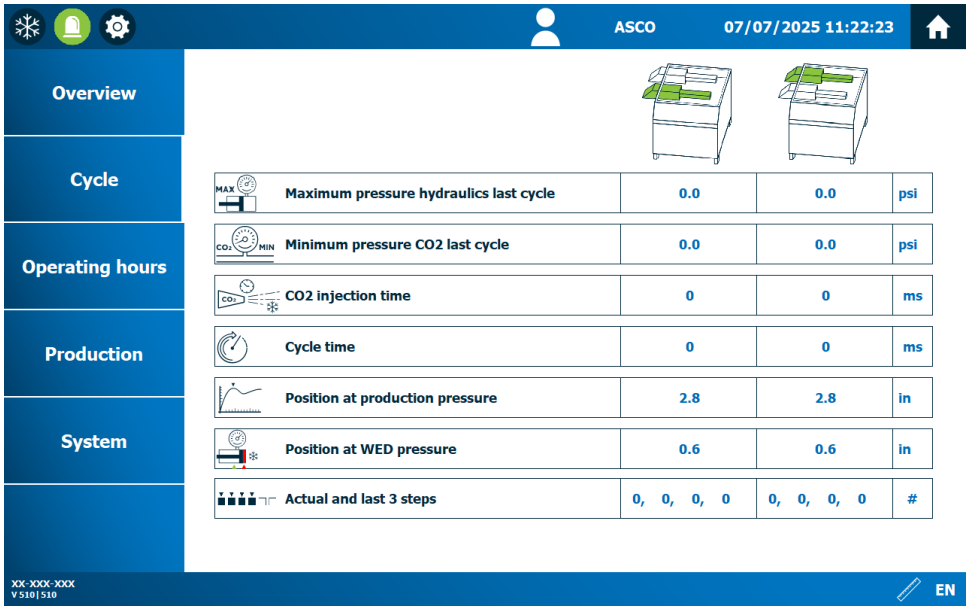
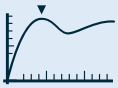


Fig. 34

	Display of the maximum hydraulic pressure of the last cycle
	Display of the minimum hydraulic pressure in last cycle
	Display of the currently calculated CO_2 injection time
	Cycle time
	Position when production pressure is reached
	Position when WED pressure is reached
	Current and last 2 steps

5.1.12 Current values - Operating hours

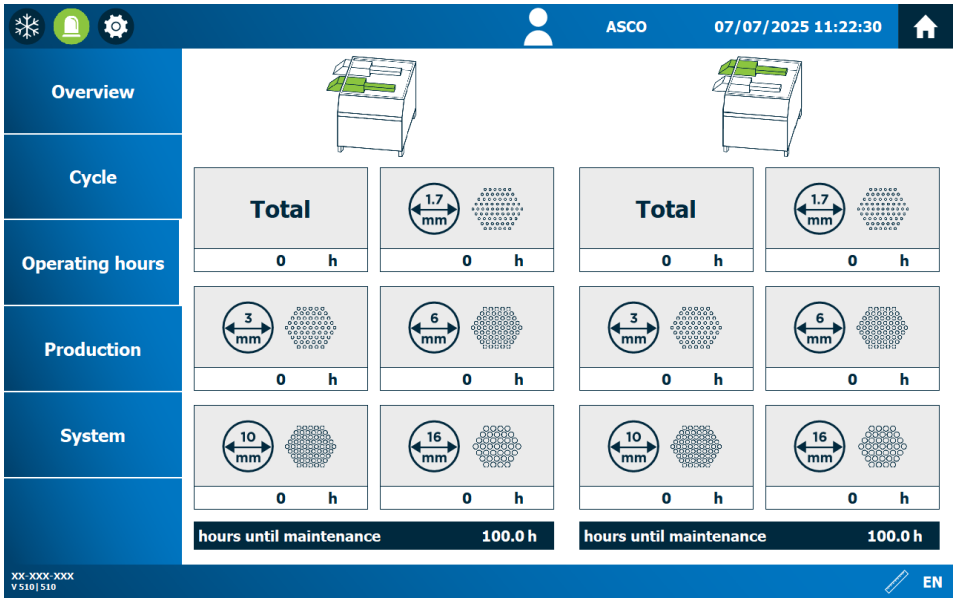


Fig. 35

TOTAL	Total operating hours of pelletizer
1.7 mm	Operating hours - 1.7 mm pellets
3 mm	Operating hours – 3 mm pellets
6 mm	Operating hours – 6 mm pellets (on request)
10 mm	Operating hours – 10 mm pellets
16 mm	Operating hours – 16 mm pellets
Hours until service	Operating hours until next service is due

5.1.13 Current values - Production

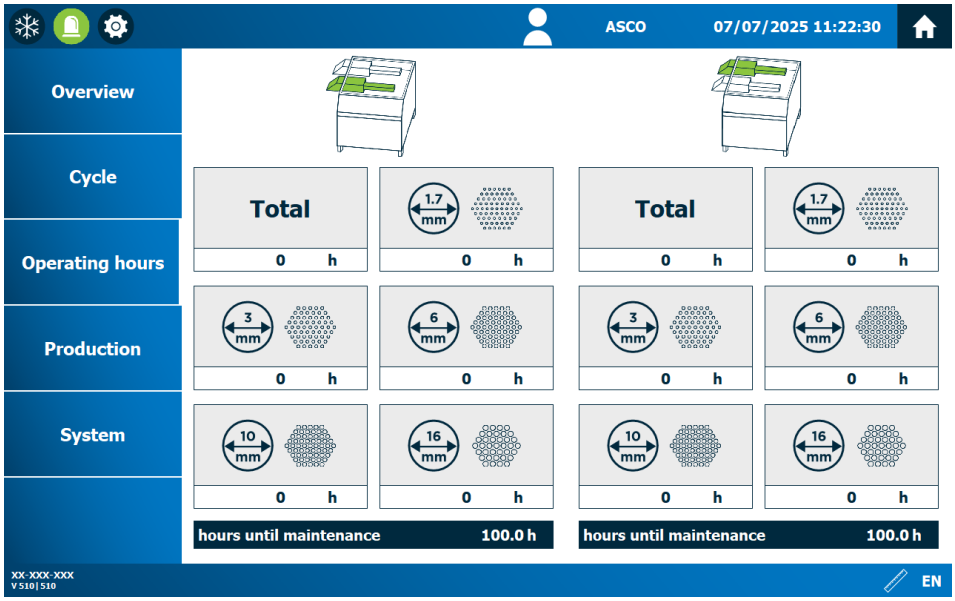


Fig. 36

TOTAL	Total quantity of pellets produced
1.7 mm	Quantity of 1.7 mm pellets produced
3 mm	Quantity of 3 mm pellets produced
6 mm	Quantity of 6 mm pellets produced (on request)
10 mm	Quantity of 10 mm pellets produced
16 mm	Quantity of 16 mm pellets produced

5.1.14 Current values - System

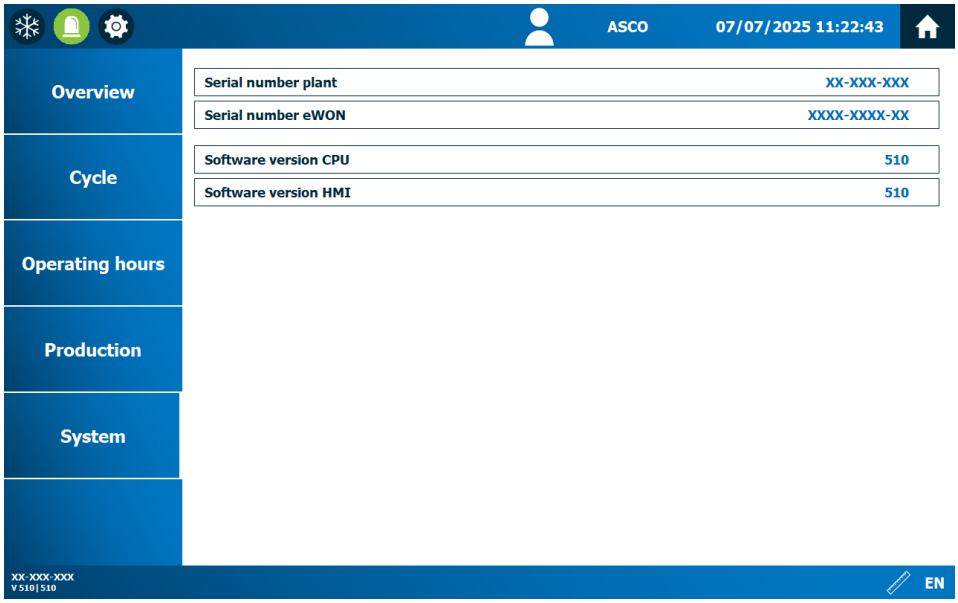


Fig. 37

System serial number	Serial number of system as recorded in ASCO system
eWON serial number	The serial number of the remote maintenance unit
Software version CPU	The software version of the PLC
Software version HMI	The software version of the HMI

5.1.15 Settings overview

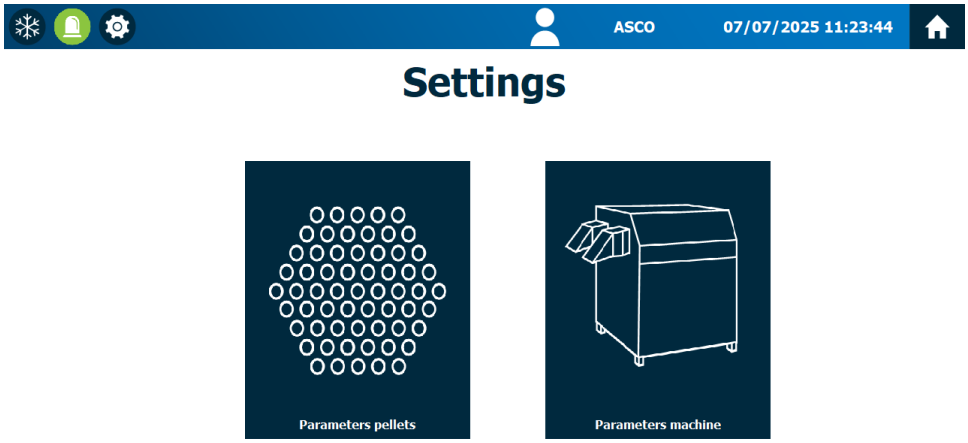
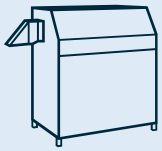


Fig. 38

	Press opens the Pellets Parameters page (Only for ASCO and certified bodies)
	Press opens the System Parameters page (Only for ASCO and certified bodies)

5.1.16 Settings - Interface

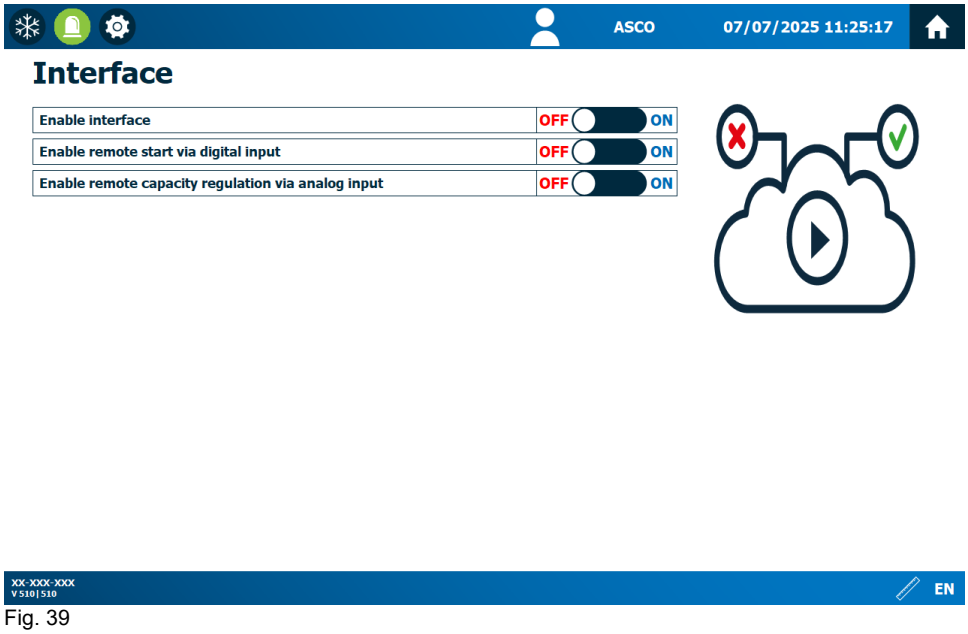


Fig. 39

The user "ASCO" is required to configure the interface settings.

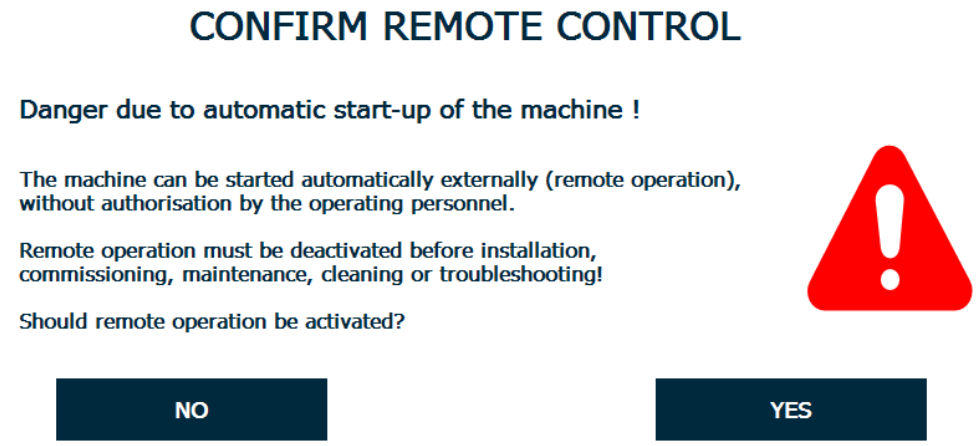
On this page, you can specify the interface for external machine start signals. If the switch is set to "OFF", external signals are ignored.

If the interface is activated, status signals from the machine are sent out.
If the parameters “Allow external start via digital input” are activated, the machine can be started by external signals.

If the parameter “Allow external power control via analog input” is set, the power setting is specified via the analog input.

5.1.16.1 Switching on the machine with remote

When the machine is switched on, the following field appears on the control panel if remote operation is activated.









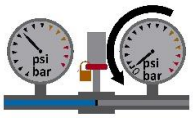
DANGER

Danger due to automatic start-up of the machine!
The machine can be started automatically externally (remote operation) without authorization from the operating personnel.

Before installation, commissioning, maintenance, cleaning and troubleshooting, please note the following points:

1. Before removing any cover from the machine or performing any work on the mechanics, hydraulics, control and CO_2 lines, proceed as follows:

- Deactivate all interfaces in the Interfaces Settings menu (see chapter 5.1.16)
- The main switch is set to “OFF” and secured with a padlock to prevent it from being switched on again
- De-pressurise the machine as described in chapter 5.2.10



- Switch off the machine as described in chapter 5.2.11
- Ensure that the machine is stopped, the main switch is turned to "OFF" and the power plug is pulled out!
- Ensure all local safety regulations are met!
- Covers can be removed.

2. Initiate work

3. Bring machine into a safe state

Risk of injury or damage due to missing safety components!

- Only start the machine after you have made sure that all safety components are correctly installed and in working and safe order.

Risk of injury from electrical energy!

- Exposed electrical contacts, electrostatic discharge, physical impact on electrical systems, etc. pose a high safety risk.
  - Work on electrical installations may only be carried out by trained and qualified personnel.

NOTE

For more detailed information on connecting the external interface, please refer to the electrical diagram.

5.1.17 Settings - User Management

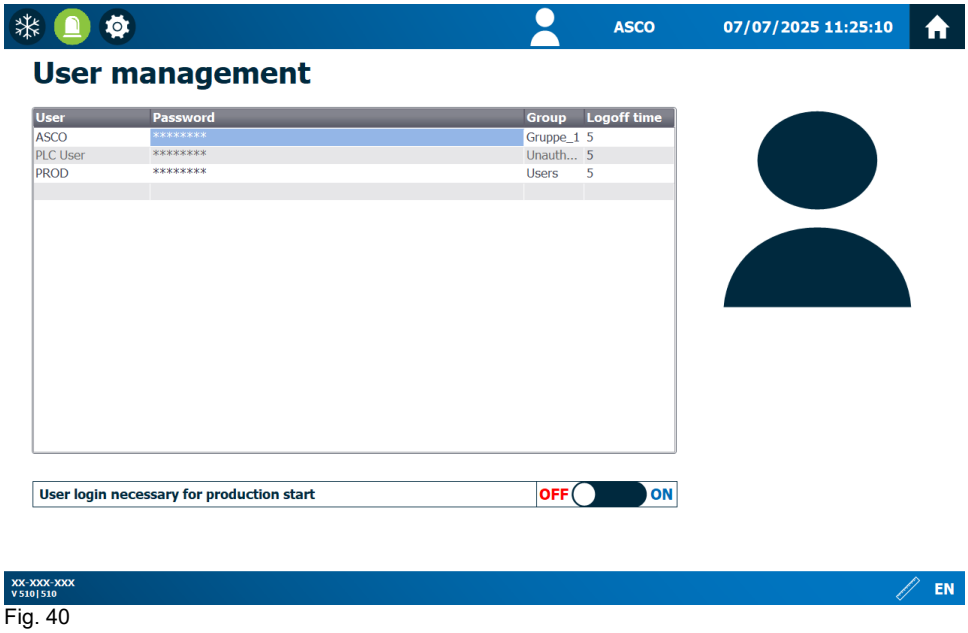


Fig. 40

The user “ASCO” is required to configure the user management settings.

You can create your own users in the user management. The new users can be assigned to predefined groups with different operating rights.

The user group Admin_Customer makes all settings available to the customer.
The Production_Customer user group only has access to production-relevant settings.

The user "PROD" is intended for normal operation of the machine. This includes starting and stopping production, as well as viewing production data.

The user “ASCO” is reserved for the shift manager. This user allows the configuration of the machine, as well as all functions of the user "PROD".

If the setting “User login required to start production” is enabled, login is required to start production.
This ensures that only authorized personnel can switch on this machine. Which logged in user started and ended production is recorded under the production data.

5.1.18 Settings - CO2 Detector (OPTION)

This machine interface is designed for a CO_2 detector distributed by ASCO.

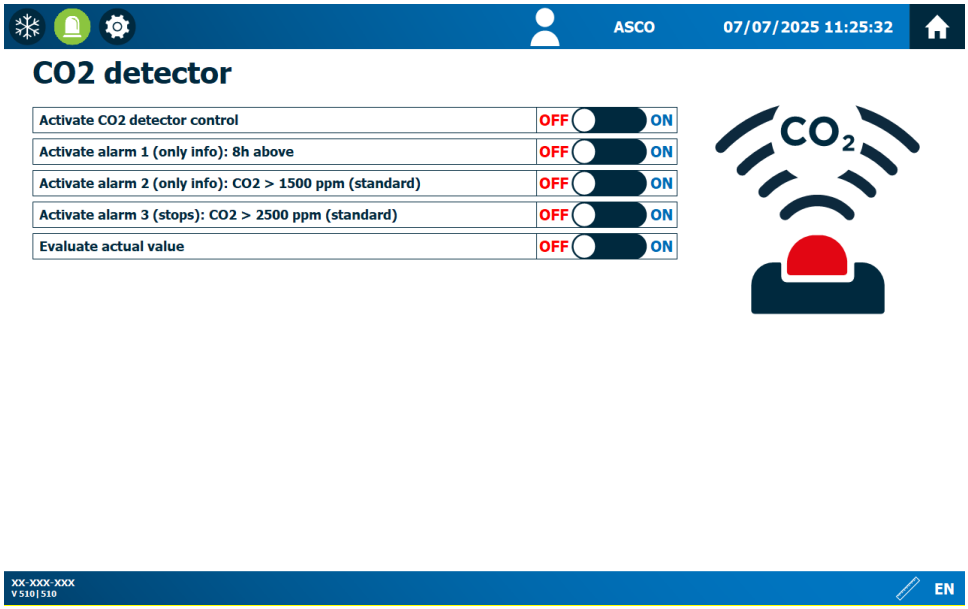


Fig. 41

To configure the CO_2 detector settings, the user "ASCO" is required.

The parameter “Activate CO_2 detector control” activates the evaluation of a CO_2 detector.

The parameter "Activate Alarm 1" activates the evaluation of the alarm "CO_2 Alarm 1: 8h over 0.5%" on the machine panel. This alarm is only a message and does not deactivate the machine. When this alarm is triggered cannot be configured on the CO_2 detector.

The parameter "Activate Alarm 2" activates the evaluation of the alarm "CO_2 Alarm 2: info only" on the machine panel. This alarm is only a message and does not deactivate the machine. When this alarm is triggered can be configured on the CO_2 detector.

The parameter "Activate Alarm 3" activates the evaluation of the alarm "CO_2 Alarm 3: Machine stops" on the machine panel. This alarm is only a message and does not deactivate the machine. When this alarm is triggered can be configured on the CO_2 detector.

	NOTE
	For detailed information on connecting the external interface, please refer to the electrical diagram.

5.1.19 Settings – Conveyor Belt (OPTION)

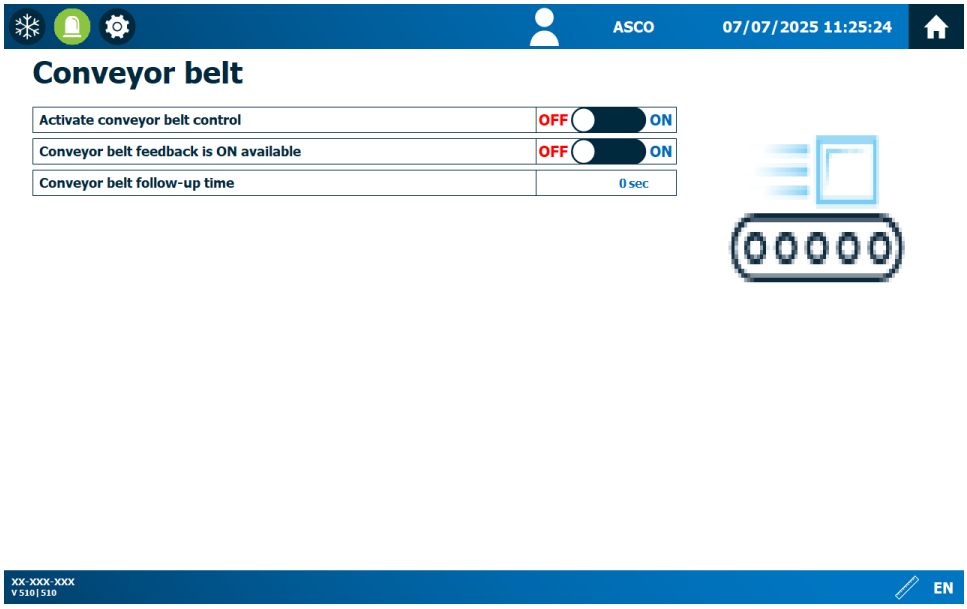


Fig. 42

To configure the conveyor belt settings, the user "ASCO" is required.

The parameter "Activate conveyor belt control" activates the control of a conveyor belt connected to the pelletizer.

The parameter “Feedback conveyor belt is ON present” evaluates the current status of the conveyor belt. If this parameter is activated, the alarm “Conveyor belt not ON” can be generated.

The parameter "Conveyor belt run-on time" allows the conveyor belt to run for the number of seconds after automatic operation has ended. This allows the conveyor belt to run empty. The run-on time is the time it takes for a pellet of dry ice to travel on the conveyor belt to the next machine.

	NOTE
	For detailed information on connecting the external interface, please refer to the electrical diagram.

5.1.20 Settings – Signal Column

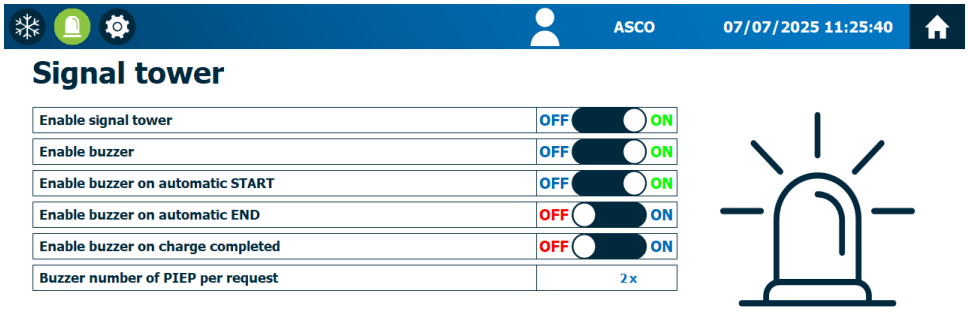


Fig. 43

To configure the signal tower settings, the user "ASCO" is required.

	Blue indicates that operator intervention is necessary
	Green indicates active production
	Yellow indicates a stationary machine
	Red indicates a fault on the machine
	Buzzer signals a change in state of the machine The buzzer can be configured in the signal tower settings.

5.1.21 System Settings

Fig. 44

	If the machine is connected to the Internet, the date and time are automatically obtained from the Internet according to the set time zone. If the machine is not connected to the Internet, the time can be set directly.
	Press to call up a page that is not touch-sensitive so that the screen can be cleaned (timeout 30 seconds)
	Press to call up a dialog for screen calibration
	Press to log out the currently logged-in user
	Press to end the runtime
	Press to switch between different languages
	Press to switch between unit systems (metric or imperial).

5.1.22 Internet Settings

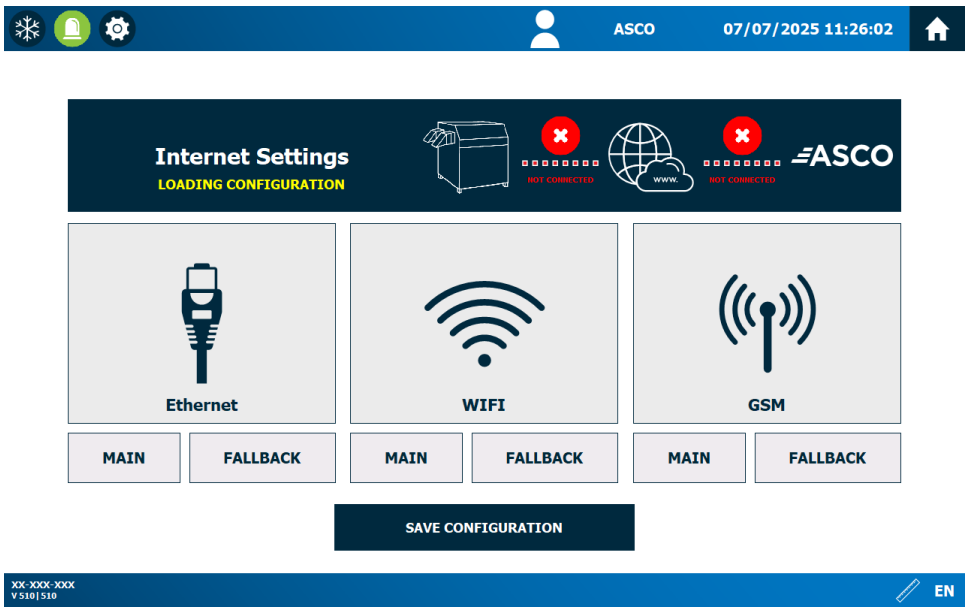
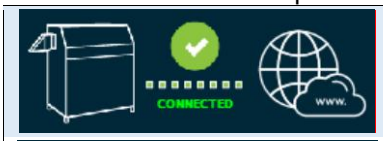


Fig. 45

With this ASCO pelletizer it is possible to select a main (MAIN) and a fallback solution (FALLBACK) for the Internet connection. It is possible to identify which type is selected for which scenario via the green frame.

	Display concerning whether the system is connected to the Internet. (Pressing updates status)
	Display concerning whether VPN connection is in order (Pressing updates status)
	Here you can make the Ethernet settings for the Internet connection. (Only for ASCO and certified bodies)
	Press to adjust WIFI settings for internet connection. (Only for ASCO and certified bodies)
	The GSM settings for the internet connection can be made here. (Only for ASCO and certified bodies)

5.1.23 Internet settings – Configure IP addresses

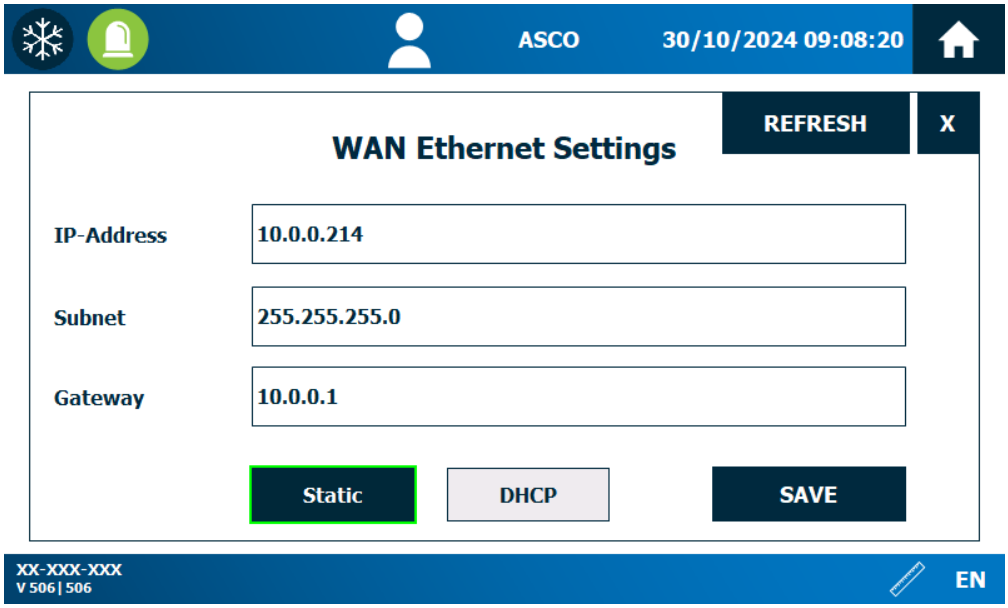


Fig. 46

Network settings for accessing your network can be entered here.

You can obtain the values for this configuration from your IT administrator.

If you do not know any specific settings, use “DHCP” as the first value.

WARNING

Risk of damage from IT security vulnerabilities!
Unauthorized access can lead to unintentional changes to control functions and hazards.
- Observe IT security measures, see chapter 1.9 “IT SECURITY VULNERABILITIES”

5.1.24 Internet settings – Configure WIFI

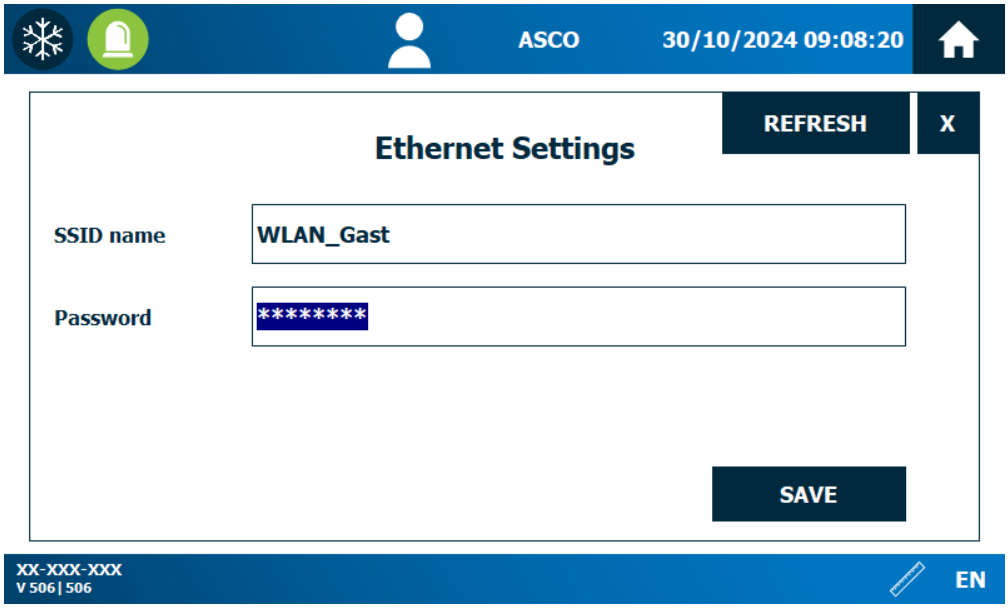


Fig. 47

Parameter name	Function
SSID name	Name of the WiFi network
Password	Password of the WiFi network

5.1.25 Internet settings – Configure GSM

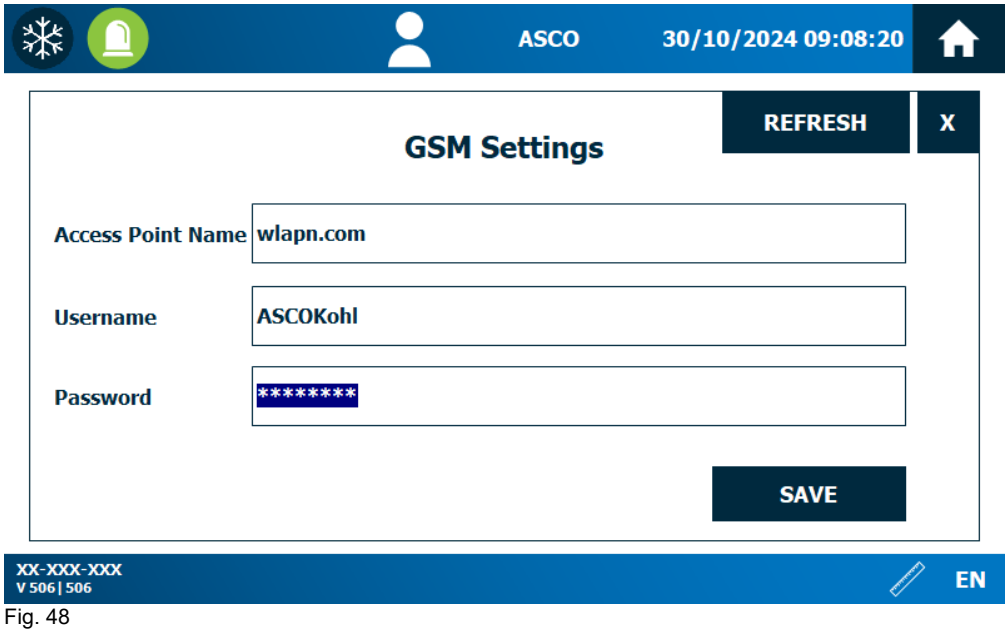


Fig. 48

If you use the SIM card provided by ASCO, no settings are necessary here.

If you use your own SIM card, you must enter the data provided by your Internet provider here so that an Internet connection can be established.

5.1.26 Input – Output - Overview

The input-output overview pages display the current status of the digital inputs and outputs.
By pressing any field, a description of the respective symbol is shown.

These pages are purely informative and provide support for troubleshooting or service.

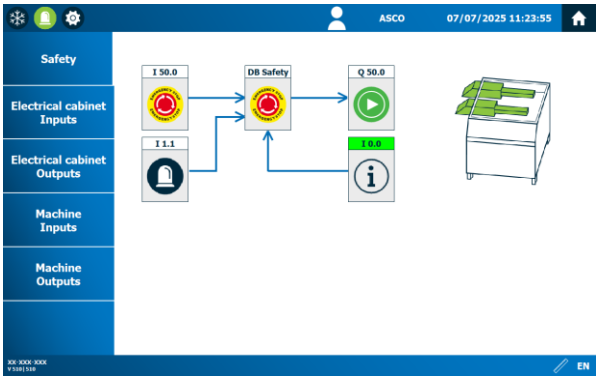


Fig. 49

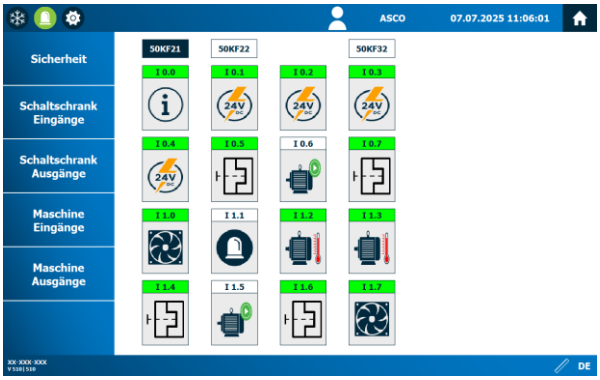


Fig. 50

	NOTE
	The address field represents the logical signal state. Green = logical 1 White = logical 0 If the field is green, an active 24V signal is received at the input. If the field is white, there is no active 24V signal at the input.

5.1.27 ASCO Help Center

Fig. 51

This QR code provides direct access to the ASCO Help Center.

5.1.28 Trending

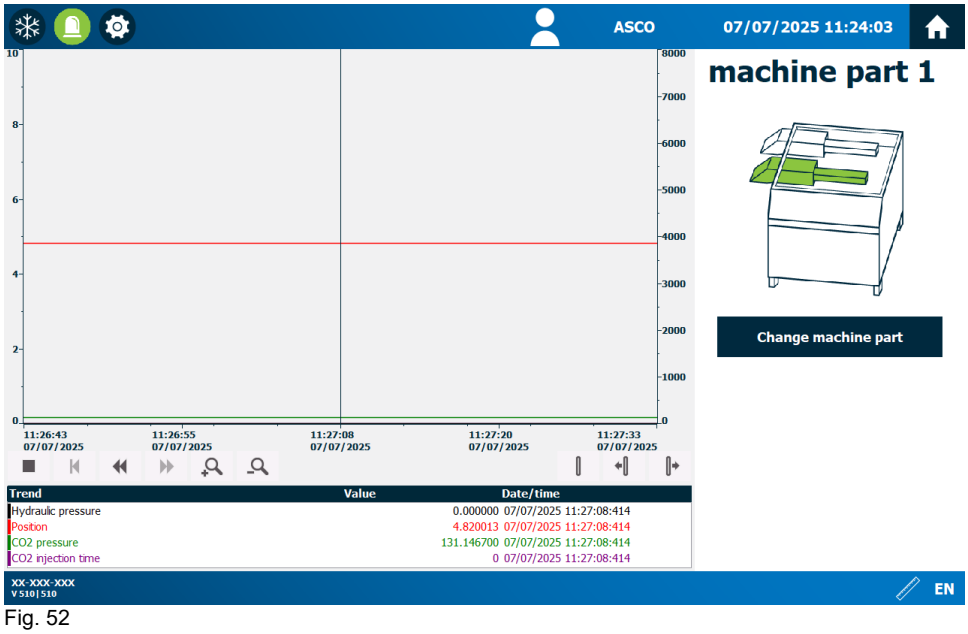


Fig. 52

In this view, the following values can be observed live in trend curve format:

- Hydraulic pressure (black)
- Piston position (red)
- CO_2 pressure (green)
- CO_2 injection time (violet)

5.1.29 Overview of service

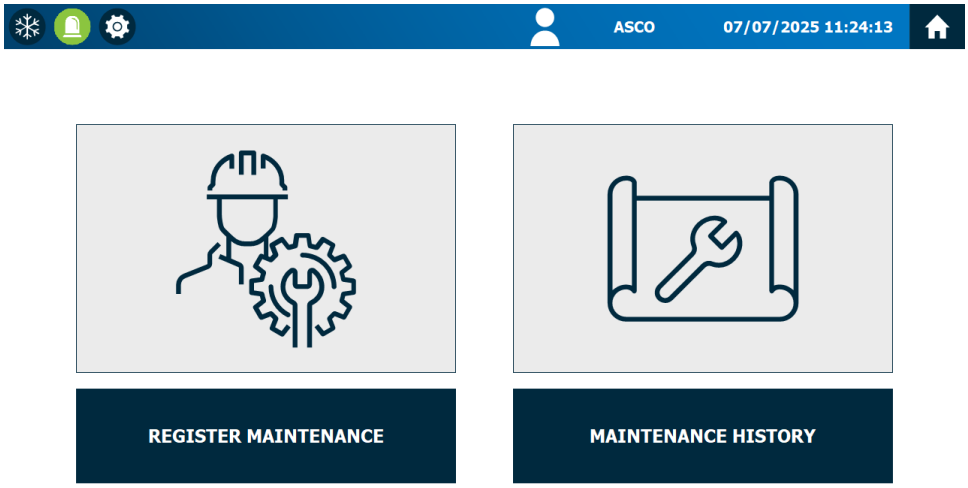
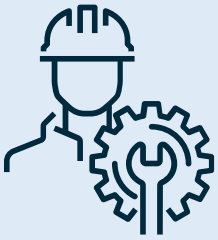


Fig. 53

	Pressing opens the page “Alarm History”
	Pressing opens the page “Service History”

5.1.30 Service Registration

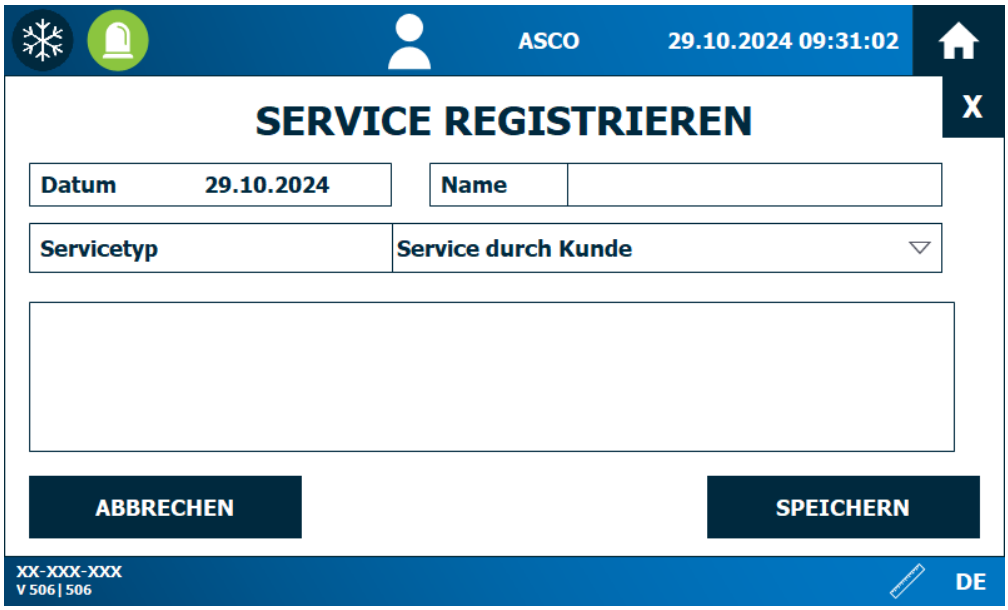


Fig. 54

Here a user of the system can register a service provided that he/she is logged in. The service type recorded in Service History at a later stage is “Service by customer”. This enables the user to reset the alarm 11 and the “Hours to service”. Caution! A service performed by the customer in no way replaces a service performed by ASCO.

5.1.31 Service History

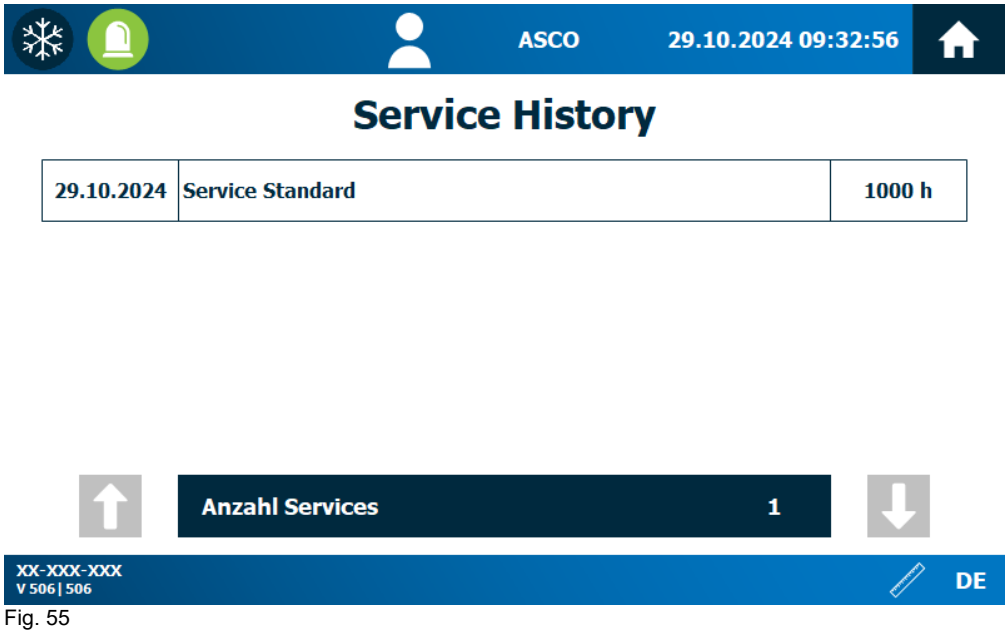


Fig. 55

Here a user of the system can check the service operations carried out provided that he/she is logged in. The date, service type and number of operating hours to carrying out the service can be checked for a service operation.

5.1.32 Alarms

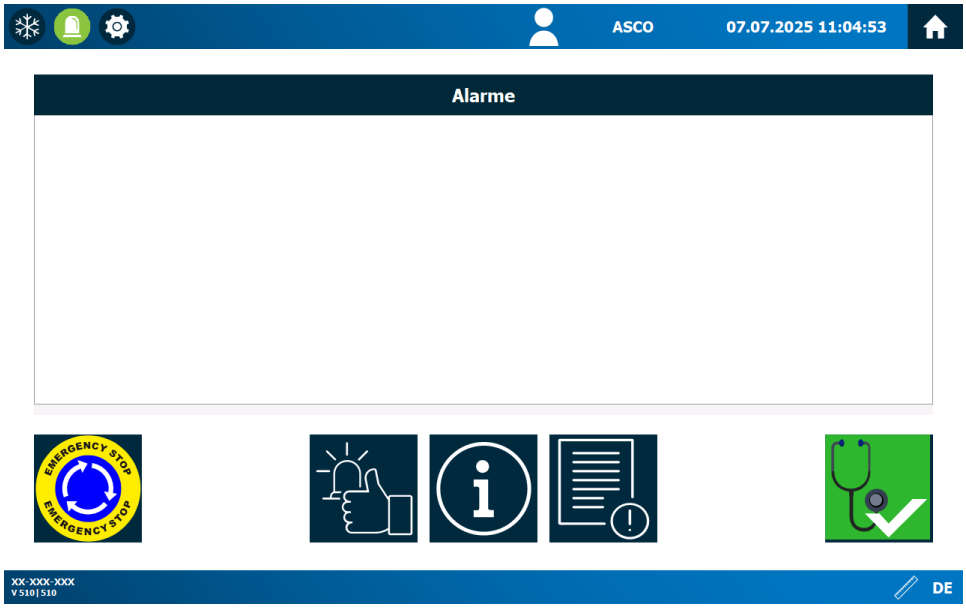


Fig. 56

All pending alarms are listed here.

Detailed descriptions of the alarms can be found under the chapter “7 TROUBLESHOOTING".

	Press to acknowledge the emergency stop. This function requires confirmation by the release button. The emergency stop can only be acknowledged by the user "ASCO".
	Pressing will acknowledge all pending errors. Alarms that have not been resolved are listed again immediately.
	Opens the menu “ Alarms – Detailed information“5.1.33 Alarms – Detailed information” Active pending alarms are marked “RED”.
	Opens the alarm history

5.1.33 Alarms – Detailed information

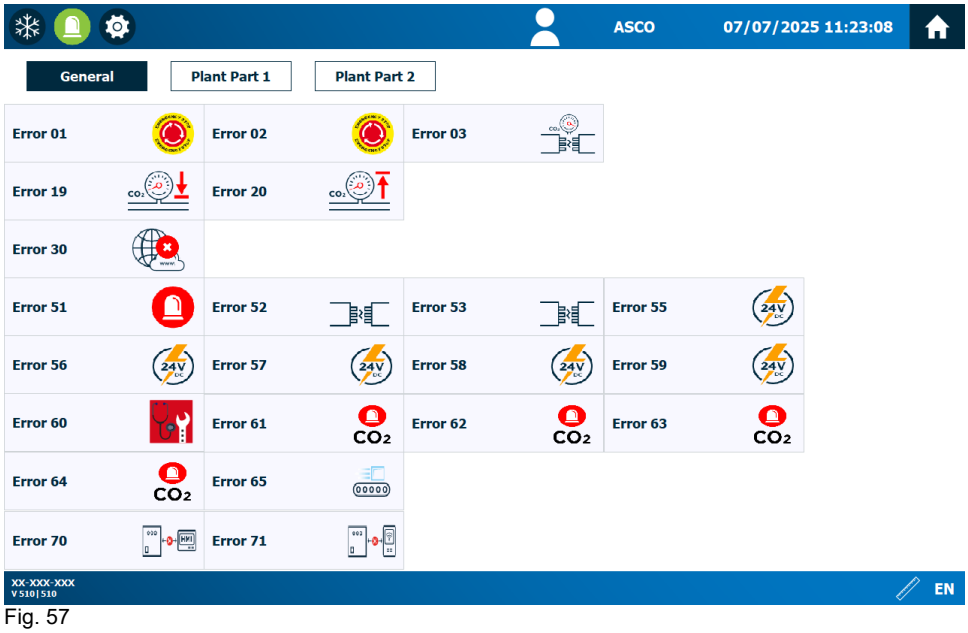


Fig. 57

Active alarms are marked red.

By pressing the respective alarm field, further information about the cause and remedy of the error is displayed.

Further information at “5.1.34 Alarms – Error description".

Detailed descriptions of the alarms can be found under “7 TROUBLESHOOTING".

5.1.34 Alarms – Error description (example)

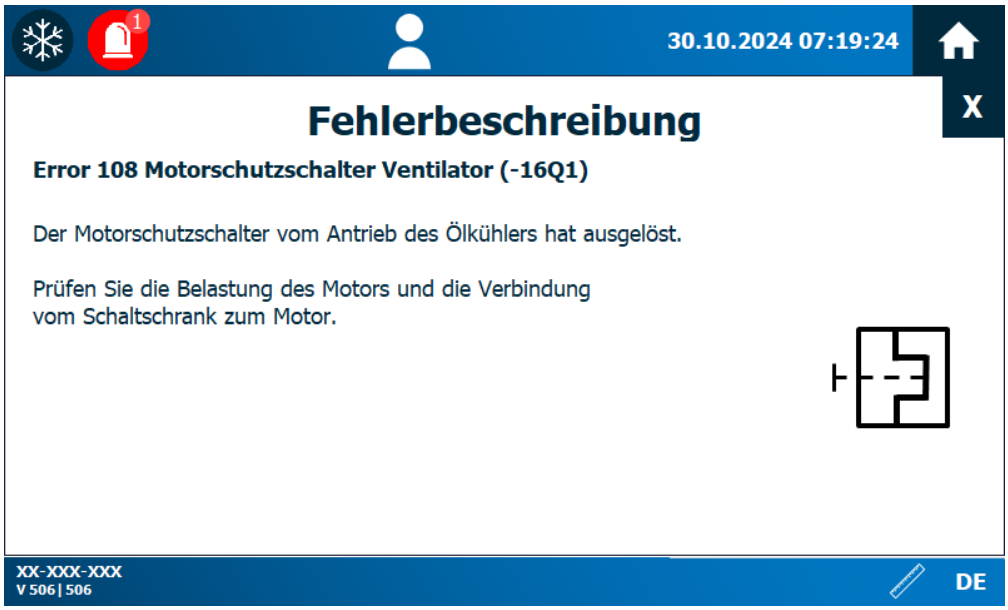


Fig. 58

Detailed information about the cause of the error and how to resolve it is displayed here.

Detailed descriptions of the alarms can be found under “7 TROUBLESHOOTING".

5.1.35 Contact

Fig. 59

5.2 STARTING AND FINISHING PRODUCTION

DANGER

Risk of injury or damage due to missing safety components!

- Only start the pelletizer after you have made sure that all safety components are properly installed and in working order.
- Extruder plate(s) must be installed

Risk of injury from electrical energy!

Exposed electrical contacts, electrostatic discharge, physical impact on electrical systems, etc. pose a high safety risk.

- All work on electrical equipment must be performed by suitably qualified specialist technicians.

WARNING

Risk of injury from propelled dry ice pellets!

- During machine operation, all persons not directly involved in its operation must keep clear of the machine.
- Cordon off the work area.
- During machine operation, never touch or reach into the discharge unit.
- At the end of the shift: Depressurize the system, turn the main switch to “OFF”.

WARNING

Risk of suffocation!

Working in enclosed, unventilated spaces presents a suffocation hazard due to high carbon dioxide concentration!

- When working in enclosed spaces, ensure that there is adequate ventilation to keep the carbon dioxide concentration in the ambient air below a dangerous level.

WARNING

Risk of injury to hands when reaching into machine!

- During machine operation, never reach into the extruder plates.
- To remove jammed product, shut down the machine and use suitable tools.

WARNING

Precondition for operation:

- All safety instructions have been read and understood.
- The machine has been correctly installed

WARNING

Danger of machine damage due to icing up, blocking the reformer chamber!
Before the start of production, the reformer chamber(s) must be clean and dry, and at ambient temperature.
If this is not the case, carry out the following points:

- Move the press piston manually to the rearmost position as described in chapter 5.1.9
- De-pressurise the machine as described in chapter 5.2.10
- Switch off the machine as described in chapter 5.2.11
- Disassemble the extruder plate
- Blow out the pelletizer chamber with oil-free compressed air and dry it with a cloth.
- Mounting the extruder plate
- Turn the main switch to "ON"
- Move the press piston manually to the front position as described in chapter 5.1.9
- Switch off the machine 5.2.11 "De-energising the machine"

CAUTION

Machine in operation without liquid CO_2 supply
If the machine is operated without liquid CO_2, the sealing ring heats up and can lead to damage to the sealing ring and other components.

If these instructions are not followed, material damage will result:

- Only operate the machine with liquid CO_2
- Operating the machine without liquid CO_2 is prohibited!
- During commissioning, operation, servicing, maintenance and troubleshooting, do not allow the machine to run for longer than 2 minutes without a supply of liquid CO_2

Once the machine has been connected properly, observe the following instructions for safe handling:

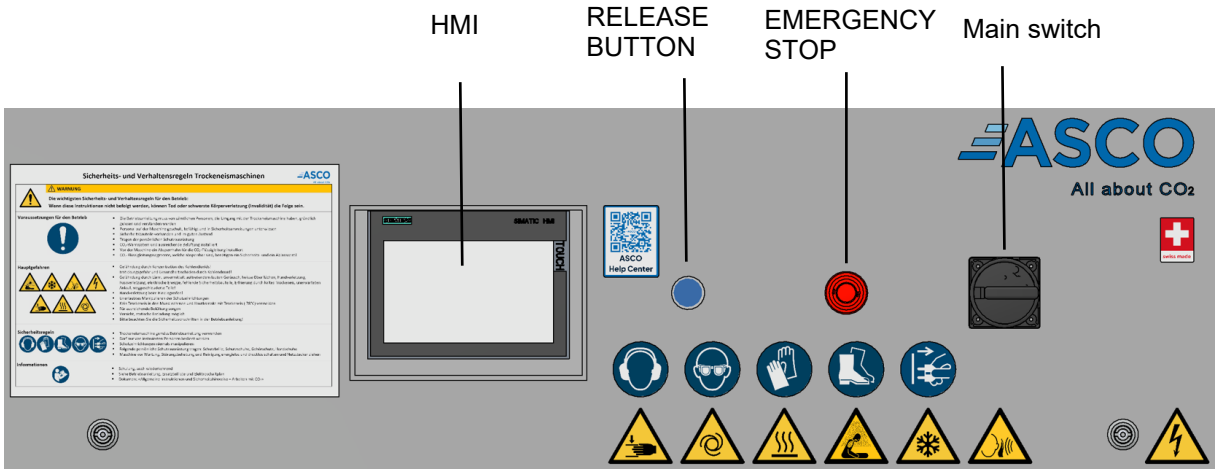


Fig. 60

The following points must be checked before switching on:

- Never block the ventilation slots (fig. 7 and 9).
- Check the power cord for visible damage.
- Check the liquid CO_2 line and the CO_2 waste gas line for damage.
- Waste gas line must be free, back pressure must be below 0.1 bar (1.45 psi).
- Check the collecting tray and the condensate drain for blockage.
- The pelletizer chamber and the extruder plate must be clean and dry.
- Check the oil level in the hydraulic system.
- Mount the extruder plate and the discharge unit.
- Position a dry ice box or container under the discharge unit.
- Turn the main switch to "I".
- If necessary, release the EMERGENCY-STOP button.
- Slowly open the shut-off valve in the liquid CO_2 supply line upstream of the machine.
- Open shut-off valve/valves for the waste gas CO2 line(s) upstream of the machine for the reformer chamber(s) intended for the production.
-  The CO_2 waste gas shut-off valve for the reformer chamber that is not in operation must be closed!

WARNING

Risk of damage or injury due to icing of the CO_2 waste gas line and reformer chamber

If the machine is operated with only one reformer chamber, there is a possibility that the waste gas line of the other reformer chamber will ice up. This means that the second reformer chamber will not be able to be started during operation. If the second reformer chamber is started despite this, individual components may be damaged.

- Every reformer chamber must be provided with its own waste gas line and one shut-off valve each.
- The CO_2 waste gas shut-off valve for the reformer chamber that is not in operation must be closed!
- If the machine is not in operation, close the CO_2 waste gas shut-off valve(s)

CAUTION

If the shut-off valve is opened too quickly, the liquid CO_2 supply line might become blocked.

5.2.1 Select production type

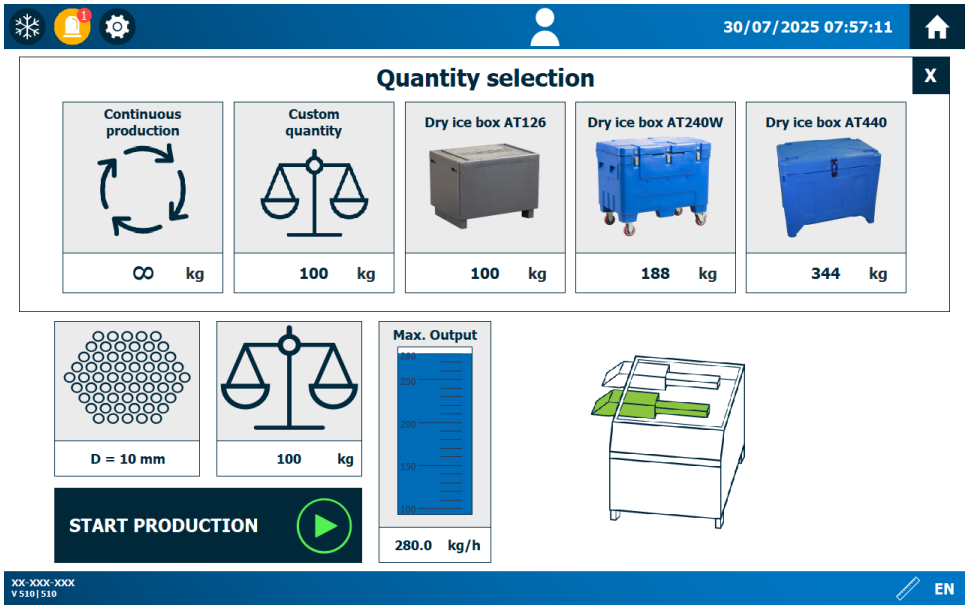


Fig. 61

Before the production can start, the appropriate type of production must be selected.

If you have dry ice boxes that correspond to the displayed variants, the capacity can be preselected there directly.

Before production, also select the pellet size corresponding to the mounted die.

5.2.2 Starting continuous production

WARNING

Danger of machine damage due to icing up, blocking the reformer chamber!
Before the start of production, the reformer chamber(s) must be clean and dry, and at ambient temperature.
If this is not the case, carry out the following points:

- Move the press piston manually to the rearmost position as described in chapter 5.1.9
- De-pressurise the machine as described in chapter 5.2.10
- Switch off the machine as described in chapter 5.2.11
- Disassemble the extruder plate
- Blow out the pelletizer chamber with oil-free compressed air and dry it with a cloth.
- Mounting the extruder plate
- Turn the main switch to "ON"
- Move the press piston manually to the front position as described in chapter 5.1.9
- Switch off the machine 5.2.11 "De-energising the machine"

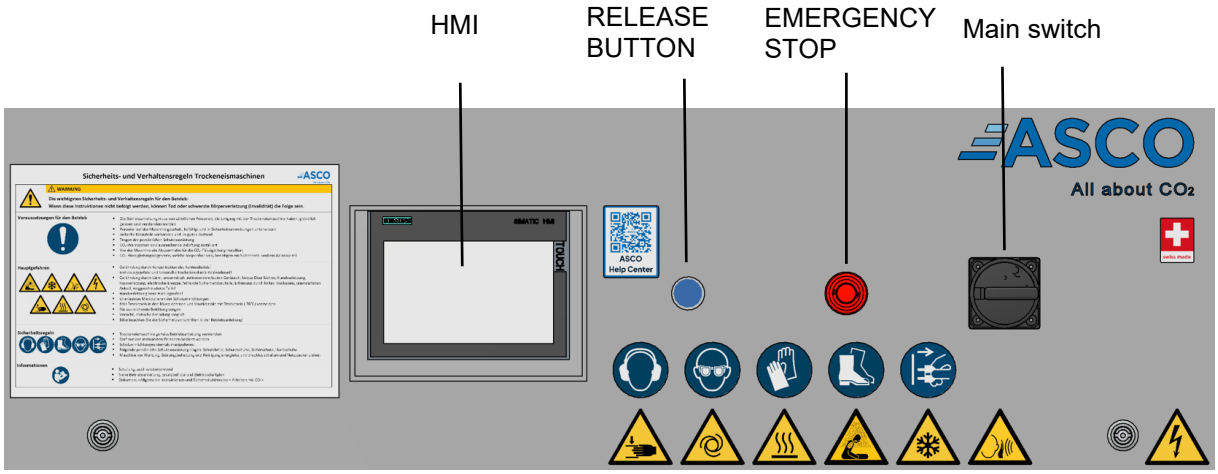


Fig. 62

- On the touch screen page *Production pre-selection*, select operating mode .
- Press the button *Start production* START PRODUCTION
- The machine initialises the system.
- CO_2 is injected into the machine.
- The machine performs a number of cycles to build up an ice layer (WED) on the extruder plate (pressure side).
- When this ice layer is in place, production starts automatically.

5.2.3 Starting fixed quantity production

WARNING

Danger of machine damage due to icing up, blocking the reformer chamber!
Before the start of production, the reformer chamber(s) must be clean and dry, and at ambient temperature.
If this is not the case, carry out the following points:

- Move the press piston manually to the rearmost position as described in chapter 5.1.9
- De-pressurise the machine as described in chapter 5.2.10
- Switch off the machine as described in chapter 5.2.11
- Disassemble the extruder plate
- Blow out the pelletizer chamber with oil-free compressed air and dry it with a cloth.
- Mounting the extruder plate
- Turn the main switch to "ON"
- Move the press piston manually to the front position as described in chapter 5.1.9
- Switch off the machine 5.2.11 "De-energising the machine"

- On the touch screen page *Production pre-selection*, select operating mode .
- Enter the dry ice quantity you wish to produce.
- Press the button *Start production* START PRODUCTION
- The machine initialises the system.
- CO_2 is injected into the machine.

- The machine performs a number of cycles to build up an ice layer (WED) on the extruder plate (pressure side).
- When this ice layer is in place, production starts automatically.
- The machine stops automatically when the entered quantity has been produced, and resets the counter to the entered value.

5.2.4 Stop machine for production change

WARNING

Danger of machine damage due to icing up, blocking the reformer chamber!
Before the start of production, the reformer chamber(s) must be clean and dry, and at ambient temperature.
If this is not the case, carry out the following points:

- Move the press piston manually to the rearmost position as described in chapter 5.1.9
- De-pressurise the machine as described in chapter 5.2.10
- Switch off the machine as described in chapter 5.2.11
- Disassemble the extruder plate
- Blow out the pelletizer chamber with oil-free compressed air and dry it with a cloth.
- Mounting the extruder plate
- Turn the main switch to "ON"
- Move the press piston manually to the front position as described in chapter 5.1.9
- Switch off the machine 5.2.11 "De-energising the machine"

- Press the End button: 

.
- The machine piston moves to the front end position and production stops.
- Depressurize and de-energize the machine as described in chapter 5.2.10 and 5.2.11
- The extruder plate can be changed as soon as the hydraulics are switched off. / Install extruder plate
- Turn the main switch to “ON”.
- Slowly open the shut-off valve for CO_2 waste gas in front of the machine
- Slowly open the shut-off valve in the liquid CO_2 supply line upstream of the machine

5.2.5 Fastening the nuts on the extruder plate

	CAUTION
	Danger from ⚠ frostbite! ▪ When changing the extruder plate, it must be ensured that the parts are not in a deep cold state. ▪ Wait for warming time

- Remove/install the extruder plates together with the O-rings

Fig. 63

- Mount the ejection bracket
- Tighten nuts lightly with 60 Nm (44 ft lb)

	CAUTION
	Regularly grease the M24 nuts (e.g. with Molykote) Art. No. 4047334

- Mount the hopper

5.2.6 Stop machine for end of production , normal shutdown

WARNING

Risk of injury or damage due to pressure

1. Close the ball valve in the liquid CO_2 supply line.
2. Continue producing until the CO_2 pressure is at 0 bar.
   Below 14 bar (203 psi) an alarm is displayed that the CO_2 pressure is not optimal
3. Press the End button: 

.
4. Wait until the hydraulics have come to a standstill and then turn the main switch to "OFF".
5. Close the shut-off valve for CO_2 waste gas line downstream of the machine

WARNING

If the vehicle is left idle for too long, there is a risk of icing
If this is not done, condensate upstream of the extruder plate might freeze when the machine is switched on, causing

- Move the press piston manually to the rearmost position as described in chapter 5.1.9
- De-pressurise the machine as described in chapter 5.2.10
- Switch off the machine as described in chapter 5.2.11
- Disassemble the extruder plate
- Blow out the pelletizer chamber with oil-free compressed air and dry it with a cloth.
- Mounting the extruder plate
- Turn the main switch to "ON"
- Move the press piston manually to the front position as described in chapter 5.1.9
- Switch off the machine 5.2.11 "De-energising the machine"

5.2.7 Interrupt operation briefly, normal short-term shutdown

- Press the End button: 

.
- To resume production, press the *"Start production*" button 

WARNING

If the vehicle is left idle for too long, there is a risk of icing
If this is not done, condensate upstream of the extruder plate might freeze when the machine is switched on, causing damage.

- Move the press piston manually to the rearmost position as described in chapter 5.1.9
- De-pressurise the machine as described in chapter 5.2.10
- Switch off the machine as described in chapter 5.2.11
- Disassemble the extruder plate
- Blow out the pelletizer chamber with oil-free compressed air and dry it with a cloth.
- Mounting the extruder plate
- Turn the main switch to "ON"
- Move the press piston manually to the front position as described in chapter 5.1.9
- Slowly open the shut-off valve for CO_2 waste gas in front of the machine
- Slowly open the shut-off valve in the liquid CO_2 supply line upstream of the machine

5.2.8 Emergency shutdown

- Press the EMERGENCY STOP button.

5.2.9 Restart after EMERGENCY STOP

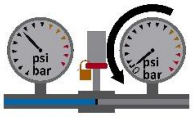
DANGER

Danger due to automatic start-up of the machine!
The machine can be started automatically externally (remote operation) without authorization from the operating personnel.

Before installation, commissioning, maintenance, cleaning and troubleshooting, please note the following points:

1. Before removing any cover from the machine or performing any work on the mechanics, hydraulics, control and CO_2 lines, proceed as follows:

- Deactivate all interfaces in the Interfaces Settings menu (see chapter 5.1.16)
- The main switch is set to “OFF” and secured with a padlock to prevent it from being switched on again
- De-pressurise the machine as described in chapter 5.2.10



- Switch off the machine as described in chapter 5.2.11
- Ensure that the machine is stopped, the main switch is turned to "OFF" and the power plug is pulled out!
- Ensure all local safety regulations are met!
- Covers can be removed.

2. Initiate work

3. Bring machine into a safe state

Risk of injury or damage due to missing safety components!

- Only start the machine after you have made sure that all safety components are correctly installed and in working and safe order.

Risk of injury from electrical energy!

- Exposed electrical contacts, electrostatic discharge, physical impact on electrical systems, etc. pose a high safety risk.
  - Work on electrical installations may only be carried out by trained and qualified personnel.

- For reasons for the emergency stop and troubleshooting, see chapter 7 "TROUBLESHOOTING".
- Bring machine into a safe state
- Acknowledge the error message.
- Before switching on, check according to chapter 5.2 STARTING AND FINISHING PRODUCTION
- The machine is now again ready for production.

5.2.10 Depressurising the machine

WARNING

De-pressurise the machine!
Shut off CO_2 supply.

- Close the shut-off valve (liquid CO_2 line) upstream of the pelletizer. Close the shut-off valve (gas CO_2 line) downstream of the pelletizer.
- Release the pressure upstream and downstream of the pelletizer by opening the discharge valve.
- Secure the shut-off valves against unintentional opening and label them, if necessary.

5.2.11 De-energising the machine

WARNING

Do not leave the machine running unattended!
After production has ended and the machine's CO_2 lines have been emptied:

- Turn the main switch to "OFF".
- Disconnect the pelletizer from the mains power supply.

6 MAINTENANCE, SERVICING, CLEANING

The ASCO pelletizer has been designed according to best engineering practice for user-friendliness, it requires only minimum maintenance.

However, the ASCO pelletizer must be inspected for damage before it is started. This enhances its operational safety and extends its service life.







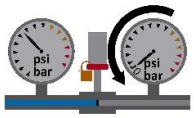
DANGER

Danger due to automatic start-up of the machine!
The machine can be started automatically externally (remote operation) without authorization from the operating personnel.

Before installation, commissioning, maintenance, cleaning and troubleshooting, please note the following points:

1. Before removing any cover from the machine or performing any work on the mechanics, hydraulics, control and CO_2 lines, proceed as follows:

- Deactivate all interfaces in the Interfaces Settings menu (see chapter 5.1.16)
- The main switch is set to “OFF” and secured with a padlock to prevent it from being switched on again
- De-pressurise the machine as described in chapter 5.2.10



- Switch off the machine as described in chapter 5.2.11
- Ensure that the machine is stopped, the main switch is turned to "OFF" and the power plug is pulled out!
- Ensure all local safety regulations are met!
- Covers can be removed.

2. Initiate work

3. Bring machine into a safe state

Risk of injury or damage due to missing safety components!

- Only start the machine after you have made sure that all safety components are correctly installed and in working and safe order.

Risk of injury from electrical energy!

- Exposed electrical contacts, electrostatic discharge, physical impact on electrical systems, etc. pose a high safety risk.
  - Work on electrical installations may only be carried out by trained and qualified personnel.

WARNING

Securing machine prior to maintenance work
- The main switch is set to “OFF”.
- All applicable safety regulations must be complied with!
- De-pressurise and de-energise the machine as described in chapter 5.2.10 and 5.2.11

NOTE

Inspection of the electrical system
The electrical system must be inspected prior to commissioning, and then at least every 1000 operating hours. Before every machine start, the operator must perform a visual inspection for damage to cables, exposed electrical components and mechanical parts.

NOTE

Check direction of rotation of oil cooler and hydraulic pump
When working on electrical connections on the engine and the electrical control system, the direction of rotation of the oil cooler and the hydraulic pump must be checked.
See chapter 4.3.7 “Checking and filling the hydraulic unit”
If the motor rotates in the opposite direction, exchange the two phases at the connection terminals.

WARNING

Risk of injury of damage from improper maintenance and servicing!
- All service and maintenance work must be carried out by trained and qualified skilled workers using approved tools and devices.
- Heavy loads must be handled with suitable lifting equipment

WARNING

Risk of damage or injury from malfunctioning CO_2 spray valve or leak in CO_2 line!
Check and replace solenoid valve and CO_2 lines regularly according to the servicing plan.
In the event of leakage or malfunction of the solenoid valve (e.g. continued injection), proceed as follows:

- Stop the machine (EMERGENCY-STOP)
- Immediately close the manual CO_2 shut-off valve in the CO_2 liquid line
- De-pressurise the machine as described in chapter 5.2.10
- Switch off the machine as described in chapter 5.2.11
- Turn the main switch to OFF
- Arrange for repairs to be made

WARNING

Risk of injury from hot hydraulic fluid when changing fluid!
- Hydraulic fluid tends to remain hot for some time after the machine has been switched off.
- To top up hydraulic fluid, use a filter unit with a mesh size of max. 10 µm
- Incorrect handling of hot fluid can cause serious injury from scaling and even lead to blindness, if it comes into contact with the eyes!
- Collect and dispose of the waste fluid according to the applicable statutory regulations.

CAUTION

Risk of injury or damage from damaged or leaking hoses!

- Replace damaged or leaking hydraulic hoses without delay!
- Never operate the machine with damaged or leaking lines.
- Hydraulic fluid escaping under high pressure can result in serious injury and damage to property and the environment!

CAUTION

Risk of injury or damage from improper maintenance!

- Never clean the reformer chambers and associated parts with a solvent or detergent.
- When handing cold parts, wear protective gloves.
- Only ever use original ASCO spare parts.

WARNING

Risk of injury or damage from inadvertent operation of hydraulic cylinder and CO_2 injection

- Set the 24V DC fuse correctly according to the electrical diagram, otherwise the machine may be damaged.
- The hydraulic cylinder could be actuated unintentionally and possibly activated.
- the injection valves must switch in an uncontrolled manner.

WARNING

Danger from sudden loud noise!

- When operating the pelletizer, always wear hearing protection.
- All persons standing close to the pelletizer must wear approved hearing protection.

WARNING

Danger from hot surfaces!

Burns and scalds from hot or cold mediums of parts.

- When operating the pelletizer, always wear suitable protective gloves.

CAUTION

Machine in operation without liquid CO_2 supply
If the machine is operated without liquid CO_2, the sealing ring heats up and can lead to damage to the sealing ring and other components.

If these instructions are not followed, material damage will result:

- Only operate the machine with liquid CO_2
- Operating the machine without liquid CO_2 is prohibited!
- During commissioning, operation, servicing, maintenance and troubleshooting, do not allow the machine to run for longer than 2 minutes without a supply of liquid CO_2

6.1 INSPECTIONS OF OPERATING EQUIPMENT AND WEAR PARTS

WARNING

Risk of injury due to improper maintenance!
When performing maintenance on the pelletizer, please note the following points:

- Unplug the mains plug to prevent unexpected movements of the reformer piston!
- Shut off the liquid CO_2 supply and depressurise the machine!
- All work on the electrical equipment of the machine must be carried out by specialists with electrical engineering qualifications.

NOTE

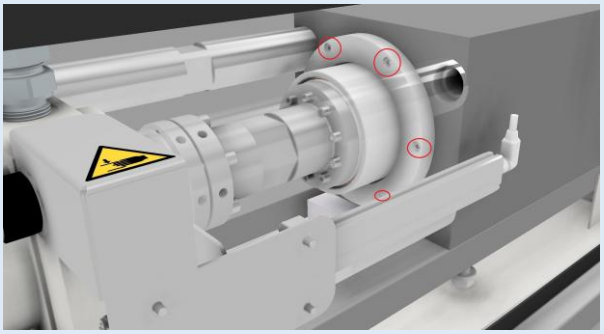
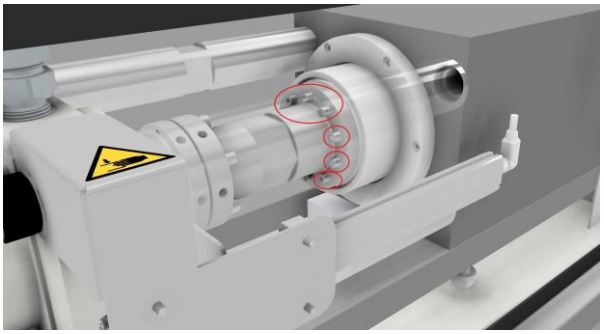
Storage of wear parts
It is recommended to keep wear parts in stock. To avoid a longer machine downtime due to a missing spare part.

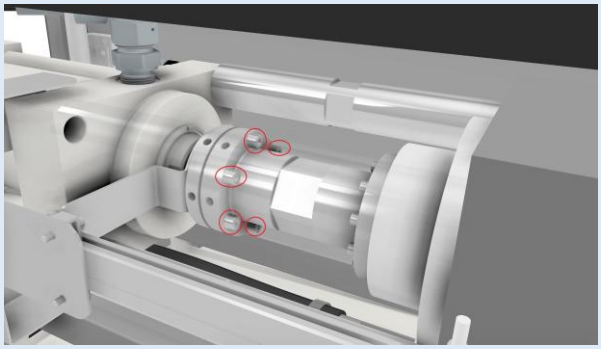
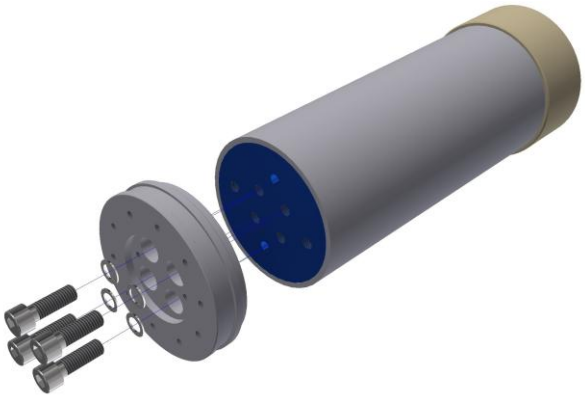
- Wear parts are included in the maintenance chapter
- Contact ASCO customer service or if available directly via QR code HMI

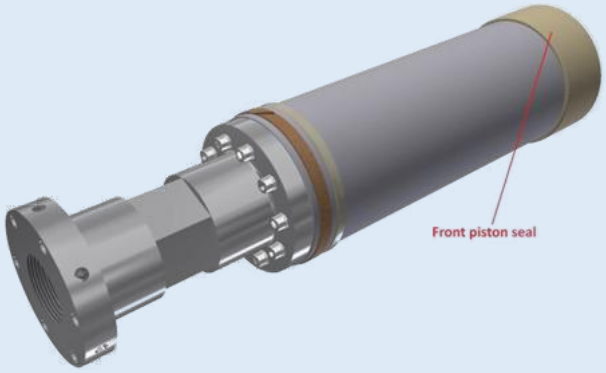
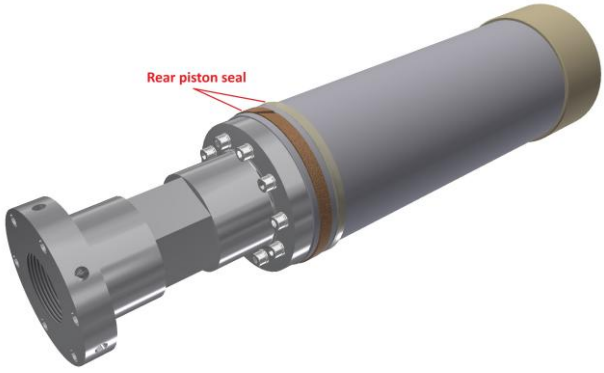
Contact ASCO CARBON DIOXIDE LTD customer service every five years or every 8000 hours of operation (whichever comes first) to have the hydraulic cylinder seal replaced.

Component	Task	before every operation	every 40 h or 1 month***	every 100 h or 3 months***	every 1000 h or 6 months***	every 2000 h or 1 year***	every 3000 h or 2 years***	every 10000 h or 10 years***
Safety devices	▪ Visual inspection of all safety devices. Missing or defective safety devices (guards/signs) must be replaced without delay.	X	X	X	X	X	X	X
Release button EMERGENCY STOP Signal column	▪ Lamp control	X**	X					
CO_2 liquid and waste gas lines	▪ Inspect for damage and leakage; seal and re-tighten fittings and connections, if necessary.	X	X	X	X	X	X	X
Liquid CO_2 line safety valve	▪ Visual inspection				X	X	X	X
	▪ Replace safety valve						X	X
Condensate tray and line	▪ Inspect for damage and leakage; seal and re-tighten fittings and connections, if necessary.	X	X	X	X	X	X	X
Power cable and plug	▪ Check for damage.	X	X	X	X	X	X	X
Pelletizer	▪ Clean the inside and outside of the dry ice pelletizer, as oil and dust residue can cause failure.		X	X	X	X	X	X
Fluid cooler	▪ Perform a function test.		X	X	X	X	X	X
Solenoid valves	▪ Perform a function test.		X	X	X	X	X	X
	▪ Replace solenoid valves				X	X	X	X

Component	Task	before every operation	every 40 h or 1 month***	every 100 h or 3 months***	every 1000 h or 6 months***	every 2000 h or 1 year***	every 3000 h or 2 years***	every 10000 h or 10 years***
EMERGENCY STOP	▪ Perform a function test of the EMERGENCY-STOP button.		X	X	X	X	X	X
Degassing bushing	▪ Maximum inner diameter = 115.6 mm (4.55 in) must not be exceeded ▪ (if extruder plates are removed, fully retract the pelletizer piston)  Fig. 64  Fig. 65		X	X	X	X	X	X
	▪ Replace degassing bushing.				X	X	X	X
Torque screws front guide bushing	 Fig. 66 ▪ Check torque (9 N/m, 7 ft lb) of screws on the front guide bushing		X	X	X	X	X	X

Component	Task	before every operation	every 40 h or 1 month***	every 100 h or 3 months***	every 1000 h or 6 months***	every 2000 h or 1 year***	every 3000 h or 2 years***	every 10000 h or 10 years***
Torque screws rear guide bushing	 Fig. 67 ▪ Check torque (9 N/m, 7 ft lb) of screws on the front guide bushing		X	X	X	X	X	X
Torque screws to fix the piston	 Fig. 68 ▪ Check torque (9 N/m, 7 ft lb) of screws on the mounting piston		X	X	X	X	X	X

Component	Task	before every operation	every 40 h or 1 month***	every 100 h or 3 months***	every 1000 h or 6 months***	every 2000 h or 1 year***	every 3000 h or 2 years***	every 10000 h or 10 years***
Torque screws to mount the support piston	 Fig. 69 ▪ Check torque (19 N/m, 14 ft lb) of screws on the mounting piston of the bracket.			X	X	X	X	X
Torque screws mounting bracket Sealing piston	 Fig. 70 ▪ Check torque (30 N/m, 22 ft lb) of screws on the seal of the support mounting piston				X	X	X	X
Connecting elements	▪ Check all screws and connections for proper fixture. If necessary, re-tighten carefully.			X	X	X	X	X

Component	Task	before every operation	every 40 h or 1 month***	every 100 h or 3 months***	every 1000 h or 6 months***	every 2000 h or 1 year***	every 3000 h or 2 years***	every 10000 h or 10 years***
Front piston seal	 Fig. 71 ▪ Replace front piston seal				X	X	X	X
Rear piston seal	 Fig. 72 ▪ Replace rear piston seal							
Electrical components	▪ Have all electrical installations inspected by a qualified electrician. Only by qualified plant maintenance personnel!					X	X	X

Component	Task	before every operation	every 40 h or 1 month***	every 100 h or 3 months***	every 1000 h or 6 months***	every 2000 h or 1 year***	every 3000 h or 2 years***	every 10000 h or 10 years***
Hydraulic unit	▪ Check oil level.	X	X	X	X	X	X	X
	▪ Inspect all hydraulic lines, hoses and connections for leakage. Repair all leaks without delay.		X	X	X	X	X	X
	▪ Replace the oil filter in the hydraulic unit.			X *	X	X	X	X
	▪ Change fluid			X *	X	X	X	X
	▪ Inspect all hydraulic hoses and replace them, if necessary.						X	X
	▪ Replace the coupling between the motor and the hydraulic pump.					X	X	X
	▪ Replace the hydraulic hoses.							X
	▪ Replace the hydraulic pump and the hydraulic cylinders.							X

* valid only for the first time the number of hours is reached, no longer applicable thereafter
** before commissioning and weekly thereafter
*** whichever arrives first

6.2 CHANGING THE HYDRAULIC FLUID

As the fluid plays an important role for smooth and continuous operation of the pelletizer, it is extremely important that the fluid volume and the fluid state are regularly checked as described in this operating manual.

WARNING

Danger due to improper oil changes!

- All service and maintenance work must be carried out by trained and qualified skilled workers.
- Only change the oil when the oil has cooled down.
- The pelletizer must be depressurized and de-energized, main switch to "0/OFF".
- When handing hot fluid, proceed with extra caution, as there is a risk of serious injury from scaling and even of blindness, if the fluid comes into contact with the eyes!
- Caution! Risk of scalding!
- Collect and dispose of the waste fluid according to the applicable statutory disposal regulations!

NOTE

Damage due to missing oil

The hydraulic unit is delivered without oil.
Fill the fluid through a filter with a mesh size of max. 10µm.
Recommended hydraulic oil: ISO VG46

6.2.1 Changing the hydraulic fluid by means of fluid change device

- Keep a suitable container ready near the hydraulic unit.
- Loosen the cap on the filler neck (Fig. 73). Insert the suction tube of the oil changer and hang the drain line in the corresponding oil collecting container.

Fig. 73

- Start the oil change device and empty the hydraulic tank.
- Replace the fluid filter at the top of the hydraulic unit.
- Insert the suction tube into the drum with fresh fluid and place the drain line into the tank of the hydraulic unit.
- Start the fluid change process. Fill the hydraulic unit to the appropriate fluid level mark.
- Close the lid of the filler neck. Start the pelletizer and check the fluid level through the sight glass (fig. 74). Top up fluid, if required.

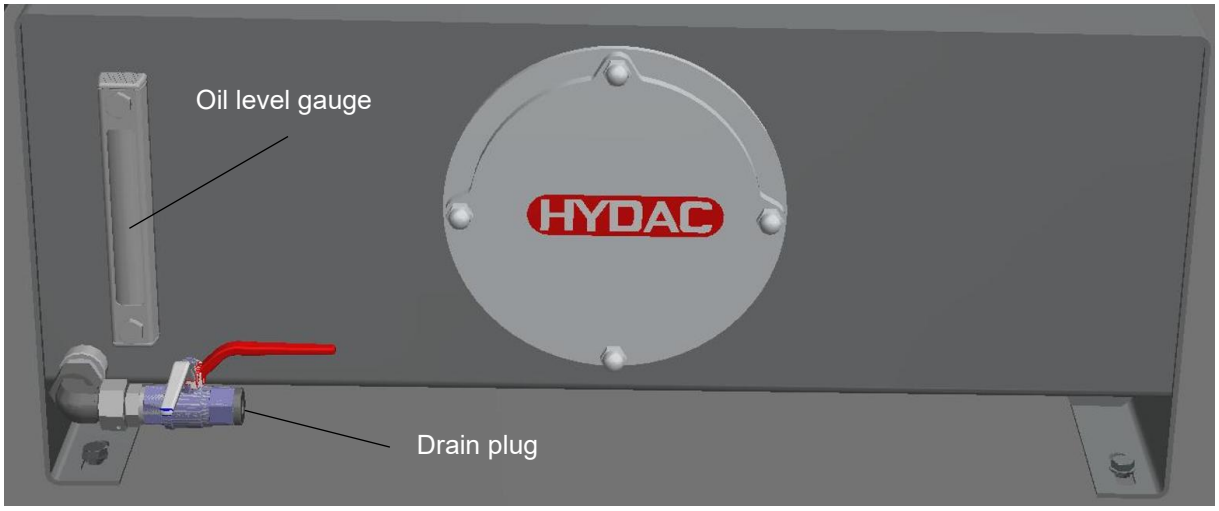


Fig. 74

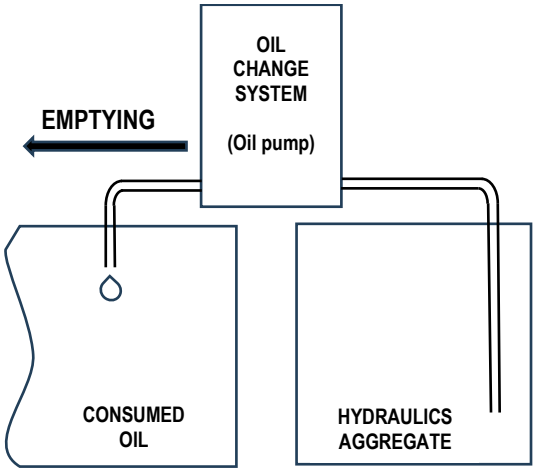

EMPTYING
OIL
CHANGE
SYSTEM
(Oil pump)
CONSUMED
OIL
HYDRAULICS
AGGREGATE

Fig. 75

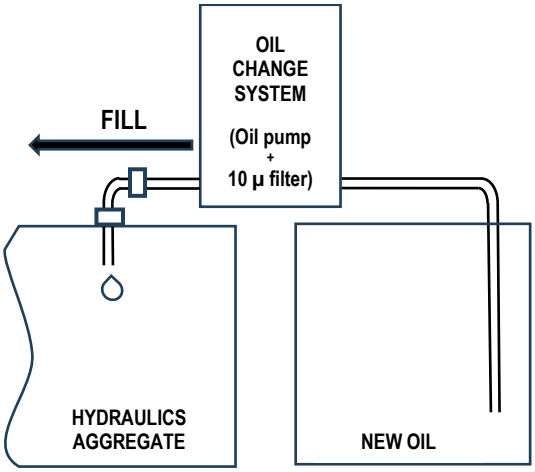
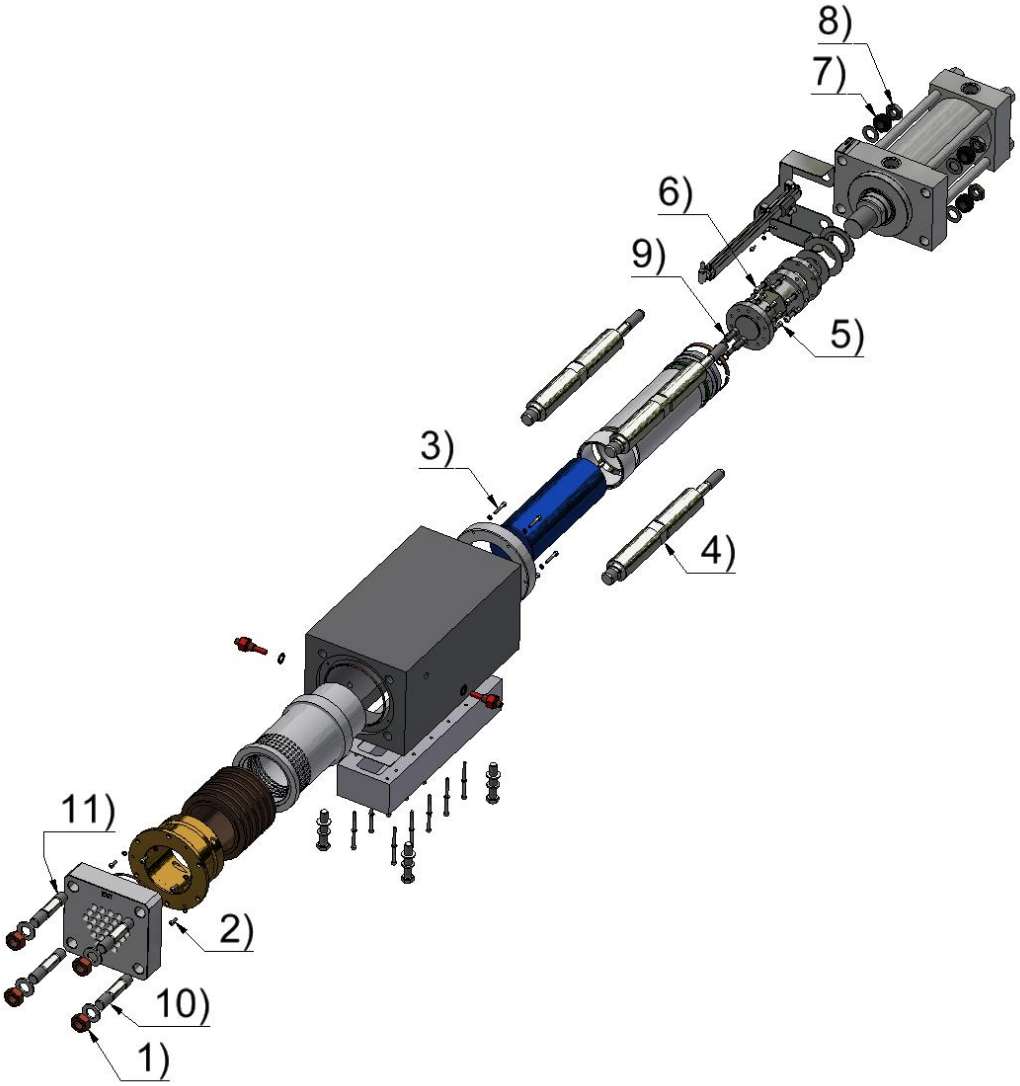

FILL
OIL
CHANGE
SYSTEM
(Oil pump
+
10 µ filter)
HYDRAULICS
AGGREGATE
NEW OIL

Fig. 76

6.3 TIGHTENING TORQUES

With the exception of the tightening torques specified in fig. 77, there are no specific tightening torques for screws of ASCO products.



Item	Nm / ft lb	Remarks
1	60 / 44	-
2	9 / 7	-
3	9 / 7	Use Loctite 243
4	300 / 221	-
5	9 / 7	Use Loctite 243
6	19 / 14	-
7	180 / 133	-
8	50 / 37	Use Loctite 243
9	30 / 22	Use Loctite 243
10	-	Use low-temperature silicone grease
11	-	Use Loctite 243

Fig. 77

6.4 CLEANING







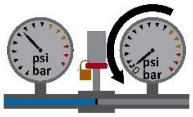
DANGER

Danger due to automatic start-up of the machine!
The machine can be started automatically externally (remote operation) without authorization from the operating personnel.

Before installation, commissioning, maintenance, cleaning and troubleshooting, please note the following points:

1. Before removing any cover from the machine or performing any work on the mechanics, hydraulics, control and CO_2 lines, proceed as follows:

- Deactivate all interfaces in the Interfaces Settings menu (see chapter 5.1.16)
- The main switch is set to “OFF” and secured with a padlock to prevent it from being switched on again
- De-pressurise the machine as described in chapter 5.2.10



- Switch off the machine as described in chapter 5.2.11
- Ensure that the machine is stopped, the main switch is turned to "OFF" and the power plug is pulled out!
- Ensure all local safety regulations are met!
- Covers can be removed.

2. Initiate work

3. Bring machine into a safe state

Risk of injury or damage due to missing safety components!

- Only start the machine after you have made sure that all safety components are correctly installed and in working and safe order.

Risk of injury from electrical energy!

- Exposed electrical contacts, electrostatic discharge, physical impact on electrical systems, etc. pose a high safety risk.
  - Work on electrical installations may only be carried out by trained and qualified personnel.


WARNING

Risk of injury or damage from improper cleaning!
Before carrying out any cleaning task, ensure the following:

- The dry ice pelletizer is stopped, switch off the power, see chapter 5.2.11 "De-energising the machine ", the main switch is set to "OFF" and the power plug is pulled out!
- The entire pelletizer is depressurised! See chapter 5.2.10 “Depressurising the machine”
- All applicable safety regulations must be complied with!
- It is now safe to remove the cover guards and to carry out cleaning work.

CAUTION

Risk of injury due to failure to use personal protective equipment!

- Wear safety glasses, hearing protection and suitable gloves for cleaning work.

Pelletizer chamber and extruder plate

CAUTION

Risk of injury or damage from use of unsuitable cleaning agent!

- Never clean the reformer chambers and associated parts with a solvent or detergent.
- Wear suitable gloves when working on cold parts.

- The pelletizer chambers and the extruder plates should be cleaned at least once a week.
- Before cleaning, ensure that all the parts have reached ambient temperature.
- Switch on the pelletizer and move the piston manually to the rearmost position.
- Switch off the machine, set the main switch to “0/OFF”, and unplug the power cord.
- Wipe and dry the pelletizer chambers with a clean cloth. There must be no residue in the pelletizer chamber.
- Blow out and dry the extruder plates with dry, oil-free compressed air. In the process, check the parts for damage.

Rest of the machine (monthly)

- Clean the inside and outside of the machine, using a conventional industrial detergent.

7 TROUBLESHOOTING

⚠ WARNING

Risk of injury or damage due to unqualified personnel!
All the tasks described in this chapter must only ever be carried out by trained and qualified personnel.
- Ensure that all safety instructions are known and fulfilled.

⚠ WARNING

Risk of injury or damage from CO_2 under pressure!
Shut off CO_2 supply.
- Close the shut-off valve (liquid CO_2 line) upstream of the pelletizer. Close the shut-off valve (gas CO_2 line) downstream of the pelletizer.
- Release the pressure upstream and downstream of the pelletizer by opening the discharge valve.
- Secure the shut-off valves against unintentional opening and label them, if necessary.







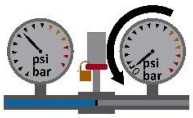
DANGER

Danger due to automatic start-up of the machine!
The machine can be started automatically externally (remote operation) without authorization from the operating personnel.

Before installation, commissioning, maintenance, cleaning and troubleshooting, please note the following points:

1. Before removing any cover from the machine or performing any work on the mechanics, hydraulics, control and CO_2 lines, proceed as follows:

- Deactivate all interfaces in the Interfaces Settings menu (see chapter 5.1.16)
- The main switch is set to “OFF” and secured with a padlock to prevent it from being switched on again
- De-pressurise the machine as described in chapter 5.2.10



- Switch off the machine as described in chapter 5.2.11
- Ensure that the machine is stopped, the main switch is turned to "OFF" and the power plug is pulled out!
- Ensure all local safety regulations are met!
- Covers can be removed.

2. Initiate work

3. Bring machine into a safe state

Risk of injury or damage due to missing safety components!

- Only start the machine after you have made sure that all safety components are correctly installed and in working and safe order.

Risk of injury from electrical energy!

- Exposed electrical contacts, electrostatic discharge, physical impact on electrical systems, etc. pose a high safety risk.
  - Work on electrical installations may only be carried out by trained and qualified personnel.

WARNING

Risk of injury to hands when reaching into machine!
- During machine operation, never reach into the extruder plates.
- To remove jammed product, shut down the machine and use suitable tools.

WARNING

Risk of injury due to use of unsuitable spare parts!
- Only use original spare parts.

CAUTION

Machine in operation without liquid CO_2 supply
If the machine is operated without liquid CO_2, the sealing ring heats up and can lead to damage to the sealing ring and other components.

If these instructions are not followed, material damage will result:

- Only operate the machine with liquid CO_2
- Operating the machine without liquid CO_2 is prohibited!
- During commissioning, operation, servicing, maintenance and troubleshooting, do not allow the machine to run for longer than 2 minutes without a supply of liquid CO_2

The “WHO” column describes who is allowed to carry out the work: Operator or qualified personnel, if necessary ASCO customer service

Fault	Possible cause	Remedy	Who
No dry ice snow is produced	Tank pressure too low, CO_2 supply rate too low, or excessive pipeline resistance in supply line	Increase tank pressure, increase feed rate and modify supply line according to instructions.	Specialist
	Gas in liquid CO_2 line	Wait until liquid CO_2 is fed to system.	Operator
	Solenoid valves in the liquid CO_2 line are not working properly	Check whether the two solenoid valves are working correctly.	Operator
	Solenoid valves in the liquid CO_2 line are not switching	Are solenoid valves 1 and 2 working properly? If so, you should hear a clicking sound. If there is no clicking sound, the pelletizer controller may not be sending a signal to the valves. Inspect the connecting cables for damage.	Specialist
	Solenoid valves in the liquid CO_2 line are blocked.	Check solenoid valves and replace, if necessary.	Specialist
Too much snow in the recovery line	Check the sintered bush for damage.	Replace defective sintered bush.	Specialist
	Liquid CO_2 solenoid valves not working	Check whether the solenoid valves are blocked (open).	Specialist
Overflow at condensate trap	Condensate trap drain blocked or clogged	Clean drain and condensate trap.	Operator
	Drain line is blocked	Clean drain line. (intended use)	Operator
Cylinder fails to move or is stuck at stop	Hydraulic solenoid valves do not work.	Check whether the two solenoid valves are working correctly.	Operator
	Hydraulic solenoid valves do not switch	Are solenoid valves 1 and 2 working properly? If so, you should hear a clicking sound. If there is no clicking sound, the pelletizer controller may not be sending a signal to the valves. Inspect the connecting cables for damage.	Operator
	Solenoid valves blocked	Check solenoid valves and replace, if necessary.	Specialist
CO_2 solenoid valve remains open	Malfunction due to short circuit or damage	Replace the solenoid valves. Inspect the connecting cables for damage.	Specialist

7.1 SOFTWARE ERRORS / ALARMS

NOTE

When contacting the ASCO Customer Service Department, keep the following details to hand:

- Serial number of machine
- For machine operating hours, see chapter 5.1.12 "Current values - Operating hours"
- Software version of the machine see chapter 5.1.14 "Current values - System"

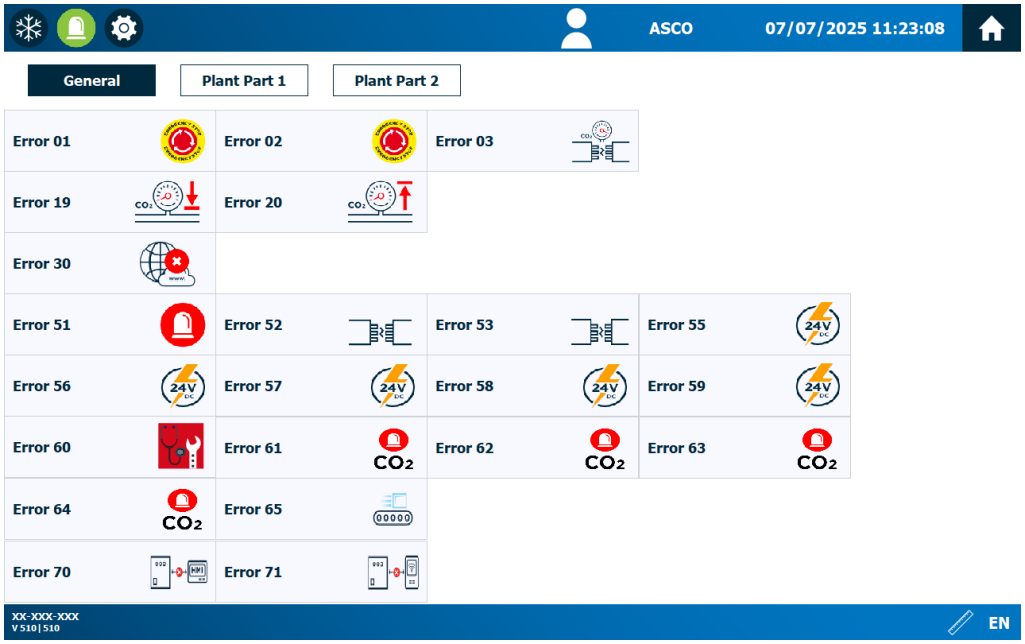


Fig. 78

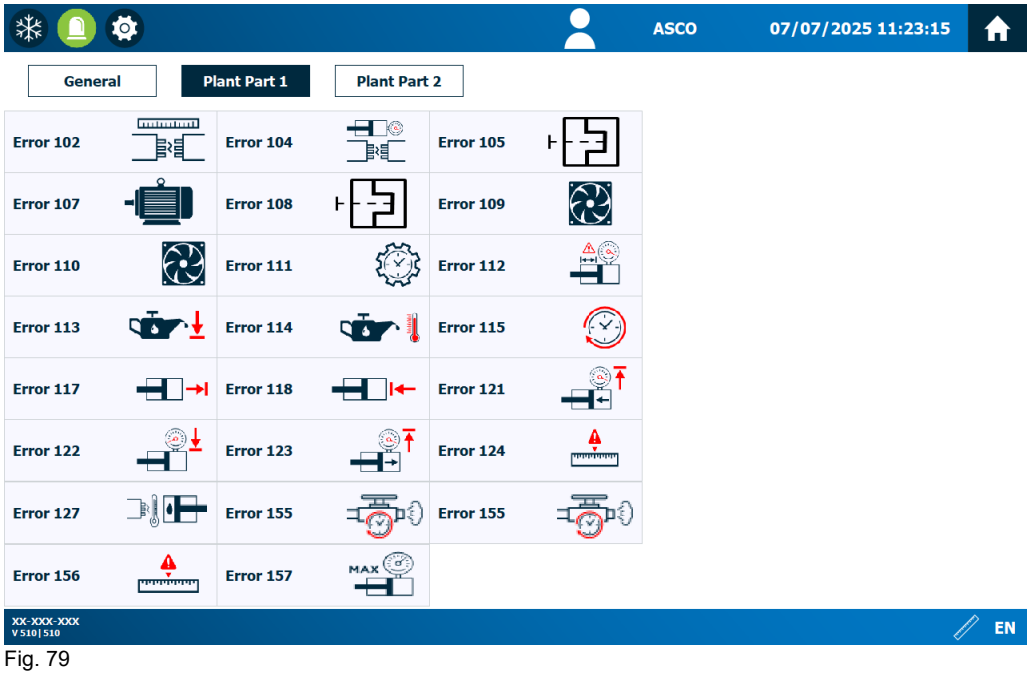


Fig. 79

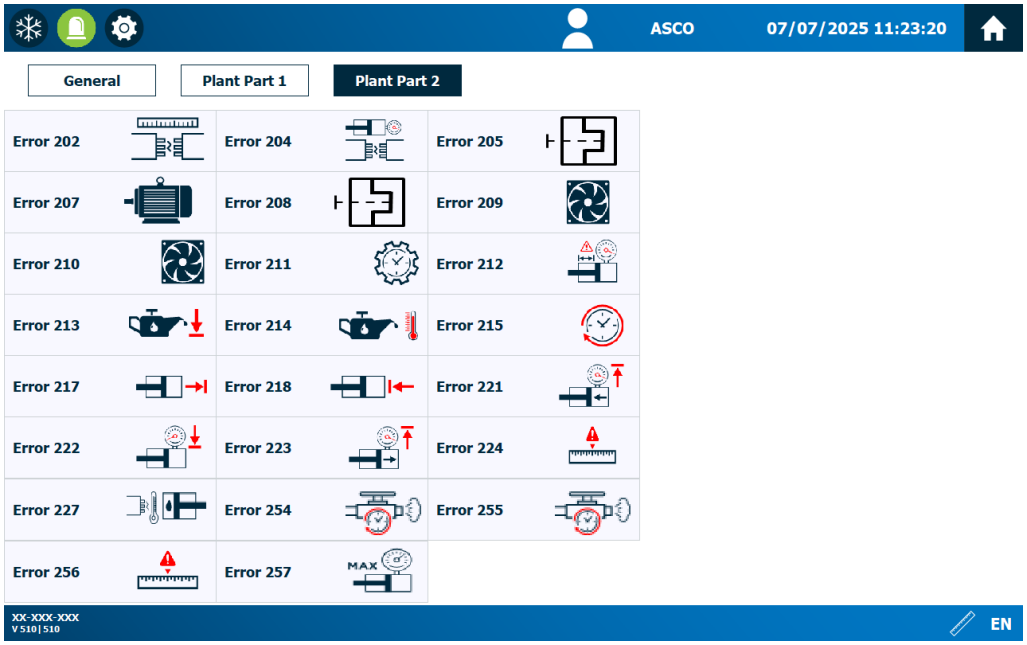

ASCO
07/07/2025 11:23:20
General
Plant Part 1
Plant Part 2
Error 202
Error 204
Error 205
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Fig. 80

7.2 ALARM LIST

ID	Error, alarm	Cause of error	Troubleshooting
01	EMERGENCY STOP	The machine's emergency stop was triggered.	▪ Check the safety of the machine ▪ When using the interface, also pay attention to the surrounding machines. ▪ After successfully eliminating all hazards, reset the emergency stop.
02	Emergency stop feedback	The feedback from the emergency stop contactors does not match the current expected signals.	▪ Contact ASCO customer support!
03	Wire break CO_2 pressure sensor (-120B7)	No measured values are received from the sensor.	▪ Check the sensor and the connection from the controller to the sensor for interruption or damage.
06	Excessive temperature hydraulic motor	The hydraulic pump drive is too hot.	▪ Check motor and connection for damage. ▪ Check the drive load. ▪ Check the environment and compare it with the data in the operating instructions. ▪ Check the hydraulic oil used and compare it with the operating instructions.
19	Minimum CO_2 pressure not reached	The minimum recommended CO_2 pressure was exceeded for a longer period of time.	▪ To achieve maximum production capacity, increase CO_2 pressure.
20	Maximum CO_2 pressure exceeded	The maximum CO_2 pressure was exceeded.	▪ Reduce CO_2 pressure to avoid damaging the internal components of the machine.
30	Maximum time without internet exceeded	Machine without internet connection for too long.	This rental machine has been disconnected from the internet for too long. ▪ Connect machine to the Internet. ▪ Contact ASCO Customer Support
51	Machine locked	Machine locked by the interface.	▪ Check signals on the previous or following machine or deactivate the interface if it is not needed.

ID	Error name	Cause of error	Troubleshooting
52	Wire break power control	Wire break in the power control detected.	▪ Check the cabling and interface settings.
53	Hydraulic oil temperature measurement equivalence error (110B3)	Signal position of the hydraulic oil temperature switch provides incorrect values.	▪ Check oil temperature, sensor and switch wiring.
56	24V power supply faulty (40G1)	The control voltage power supply is faulty.	▪ Contact ASCO Customer Support.
57	24V general fuse triggered (41F3)	The 24V control voltage fuse has blown.	▪ Check wiring and switch fuse back on. ▪ If the problem occurs repeatedly, contact ASCO Customer Support.
58	24V emergency stop fuse triggered (41F5)	The 24V control voltage fuse has blown.	▪ Check wiring and switch fuse back on. ▪ If the problem occurs repeatedly, contact ASCO Customer Support.
59	24V interface 1 fuse triggered (41F7)	The 24V control voltage fuse has blown.	▪ Check wiring and switch fuse back on. ▪ If the problem occurs repeatedly, contact ASCO Customer Support.
60	F-PM module error -> contact ASCO	Error in the security module.	▪ Restart machine. ▪ Press the emergency stop button and acknowledge the emergency stop message. ▪ Contact ASCO Customer Support.
61	CO_2 alarm 1: 8h over 0.5%	CO_2 detector alarm 1 is active.	▪ Stop production and ventilate
62	CO_2 alarm 2: Only information	CO_2 detector alarm 2 is active.	▪ Stop production and ventilate
63	CO_2 alarm 3: Machine stops	CO_2 detector alarm 3 is active.	▪ Escape
64	CO_2 detector: Wire break	No measured values are received from the sensor.	▪ Check the sensor and the connection from the controller to the sensor for open circuits or damage.
56	Conveyor belt not ON	The conveyor belt was started by the machine, but there was no feedback.	▪ Check the wiring and settings of the machine.

ID	Error name	Cause of error	Troubleshooting
70	Connection monitoring PLC <-> HMI	Network connection between PLC and HMI is disconnected.	▪ Check the network cabling and power supply of the affected components. ▪ Contact ASCO Customer Support.
71	Connection monitoring PLC <-> EWON	Network connection between PLC and EWON is disconnected.	▪ Check the network cabling and power supply of the affected components. ▪ Contact ASCO Customer Support.
102 202	Wire break linear measurement system (120B1)	No measured values are received from the sensor.	▪ Check the sensor and the connection from the controller to the sensor for open circuits or damage.
104 204	Wire break hydraulic pressure sensor (-120B9)	No measured values are received from the sensor.	▪ Check the sensor and the connection from the controller to the sensor for open circuits or damage.
105 205	Motor protection switch hydraulic motor (- 15Q1)	The motor protection switch of the hydraulic pump drive has tripped.	▪ Check the load on the motor and the connection from the control cabinet to the motor. ▪ Check that the correct hydraulic oil is used for your environment.
107 207	Contactor hydraulic motor(- 15Q2)	The feedback from the soft starter of the hydraulic pump motor does not match the currently required feedback.	▪ Check the wiring and functionality of the soft starter.
108 208	Motor protection switch fan (- 16Q1)	The motor protection switch of the oil cooler drive has tripped.	▪ Check the load on the motor and the connection from the control cabinet to the motor.
109 209	Excessive temperature fan (-16M1)	The oil cooler drive has too high a temperature.	▪ Check motor and connection for damage. ▪ Check the drive load. ▪ Check your environment and compare it with the data in the operating instructions. ▪ Check the hydraulic oil used and compare it with the operating instructions.

ID	Error name	Cause of error	Troubleshooting
110 210	Contactor fan (- 16Q5)	The feedback from the motor contactor from the oil cooler does not match the currently required feedback.	▪ Check wiring and contactor functionality.
111 211	Service due		▪ Contact ASCO customer support and schedule a service appointment. ▪ Alternatively, carry out service yourself according to the instructions in the operating instructions.
112 212	Maximum pressure in safety zone	Hydraulic pressure exceeded within the protection zone.	▪ Follow instructions to relieve overpressure within the protection zone. 1. Disassemble the extruder plate 2. Press ice block with plunger 3. Mounting the extruder plate See chapter 5.2.5 "Fastening the nuts on the extruder plate"
113 213	Hydraulic fluid level low	Hydraulic oil level below the limit.	▪ Check the hydraulic system for leaks and fill the tank with hydraulic oil according to the instructions in the operating manual.
114 214	Hydraulic oil temperature high (-120B9)		▪ Check the ambient temperature of the machine. ▪ Check the cooler airflow in manual mode. ▪ Contact ASCO Customer Support.
115 215	Max. permissible cycle time exceeded	The cycle time of a production cycle has been exceeded.	▪ Contact ASCO Customer Support.
117 217	Front end position not reached		▪ Check the position sensor setting in manual mode. ▪ Check that the press piston moves freely. ▪ Contact ASCO Customer Support.
118 218	Rear end position not reached		▪ Check the position sensor setting in the operating instructions. ▪ Check that the press piston moves freely. ▪ Contact ASCO Customer Support.

ID	Error name	Cause of error	Troubleshooting
121 221	Maximum hydraulic pressure exceeded (rear motion)	During the backward movement of the piston the hydraulic pressure was exceeded.	▪ Check the sintered bushing and press chamber for damage. ▪ Contact ASCO Customer Support.
122 222	Hydraulic pressure too low	The hydraulic pressure during the process is too low.	▪ Check hydraulic pressure in manual mode and adjust pressure relief valve if necessary. ▪ Contact ASCO Customer Support.
123 223	Maximum hydraulic pressure exceeded (forward motion)	During the forward movement of the piston the hydraulic pressure was exceeded.	▪ Check hydraulic pressure in manual mode and adjust pressure relief valve if necessary. ▪ Check the sintered bushing and press chamber for damage. ▪ Contact ASCO Customer Support.
124 224	Reference run invalid (120B1)	Measured reference position out of tolerance.	▪ Check the fastening of the linear sensor. ▪ Adjust the linear sensor to the correct position if necessary. ▪ Contact ASCO Customer Support.
127 227	Wire break hydraulic temperature sensor (-120B9)	No measured values are received from the sensor.	▪ Check the sensor and the connection from the controller to the sensor for open circuits or damage.
153 253	Equivalence error hydraulic oil temperature (-120B9)	The hydraulic oil temperature sensor is providing incorrect values.	▪ Check the hydraulic oil temperature at the tank and the sensor wiring. ▪ Contact ASCO Customer Support.
154 254	CO_2 valve 1 opened too long (-130Y1)	CO_2 valve was open for too long. The valve was closed automatically.	▪ Check tank pressure and restart machine.
155 255	CO_2 valve 2 opened too long (-130Y3)	CO_2 valve was open for too long. The valve was closed automatically.	▪ Check tank pressure and restart machine.
156 256	Piston position inaccurate (-120B1)	▪ The piston does not reach the end position. ▪ The referenced end positions deviate too much from the current positions.	▪ Check the installation of the position sensor and magnetic encoder. ▪ Restart production.
157 257	Unexpected hydraulic pressure	The hydraulic pressure does not match the currently expected value.	▪ Check the current status of the hydraulic unit and the displayed hydraulic pressure. ▪ Check the function of the hydraulic pressure sensor.

7.3 AUTOMATIC SAFETY SHUTDOWN

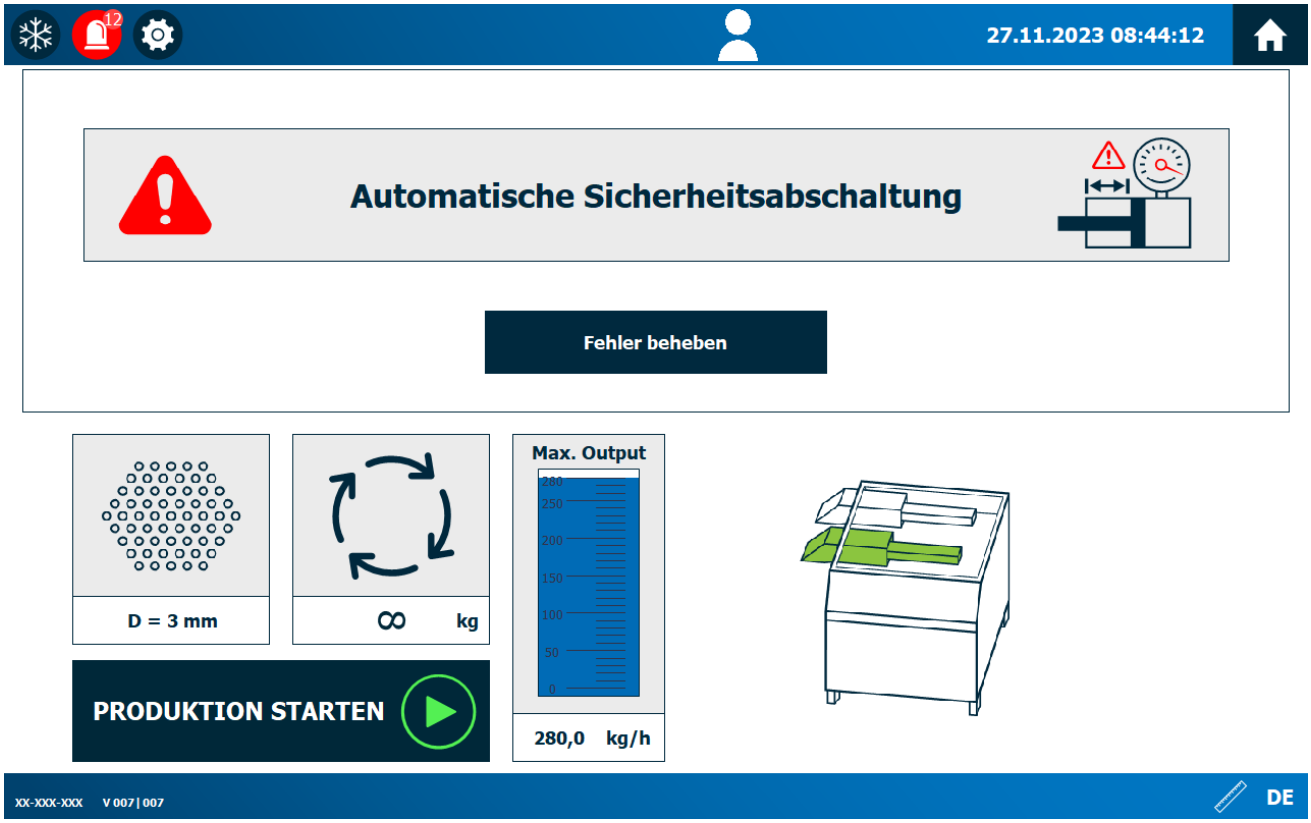

Fig. 81

5. Fenster schliessen

Function	If the hydraulic pressure near the degassing bushings exceeds a certain value, the machine is stopped, error X12 is triggered and the safety range function is initiated.
Procedure in the event of a safety shutdown	After a safety shutdown, the pelletizer chamber is normally filled with dry ice snow. To prevent this, the operator is given detailed instructions on the screen on how to proceed to make the machine again ready for operation. ▪ As defective injection valves can cause problems, first shut off the CO_2 supply line. ▪ Remove the discharge unit and the extruder plate. ▪ Switch on the hydraulic system. ▪ Move the cylinder forward to empty the entire pelletizer chamber. ▪ ⚠ Do not reach into the pelletizer chamber. ▪ Switch off the hydraulic system. ▪ Clean the discharge unit and the extruder plate and reattach them. ▪ The machine is ready for operation. ▪ If the safety range monitoring system is triggered repeatedly at short intervals, contact the ASCO Customer Service Department.

8 DECOMMISSIONING, DISMANTLING, DISPOSAL

WARNING

Risk of injury due to improper disassembly work!

- All of the work in connection with decommissioning, dismantling, and disposal must be carried out by trained and qualified skilled workers.
- Only use suitable tools and devices.
- Heavy loads must be handled with suitable lifting equipment

Have the machine parts recycled by a specialist waste disposal contractor.

NOTE

Environmental hazard due to improper and unlawful disposal!

ASCO machines are designed based on the key principles of ecological design and contain high-quality materials (metals, plastics, electrical components, electrical cables, etc.), which can be recycled at the end of their service life.

Ensure that all materials are recycled and, if necessary, disposed of in accordance with the current environmental directives and local regulations for safe waste disposal.

9 APPENDICES

9.1 DOCUMENT "GENERAL INFORMATION AND SAFETY INSTRUCTIONS – WORKING WITH CO_2"

9.2 SPARE PARTS LIST

9.3 ELECTRICAL CIRCUIT DIAGRAM

9.4 HYDRAULIC PLAN

9.5 EU DECLARATION OF CONFORMITY