

OPERATING MANUAL
TRANSLATION

**ASCO DRY ICE PELLETIZER
P28i**

from SN 22-005-011
ascoco2.com



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THANK YOU!

Congratulations - you have acquired an
ASCO CARBON DIOXIDE LTD quality product.



NOTE

Please read these operating instructions carefully, especially the document "GENERAL INFORMATION and SAFETY INSTRUCTIONS" before installing and commissioning this product.

We will be happy to assist you with any questions you may have or if any clarification is required.

ASCO CARBON DIOXIDE LTD

PURPOSE OF DOCUMENT

This ASCO instruction manual assists you in the installation, setup and safe use of the ASCO quality product.

This operating manual contains important information for safe and correct installation, setup, connection and operation of the product. Before starting the device for the first time, you must have read and understood all instructions in this manual. As an ASCO product is normally operated together with other machines, we have included a number of general safety instructions.

ASCO reserves the right to make technical changes to its products without prior notice.

	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, incomplete or misleading information in this document.
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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 status (year/month)	Note
Version V1.0 (2024/09)	Adjustment of tightening torques Adjustment of pressure of safety valve Adjustment of oil and oil filter change

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 CO₂"
- Spare parts list
- Electrical circuit diagram
- EU Declaration of Conformity

1.2 DRAWING AND SYMBOLS

Many accidents on and with machines are caused by failure to observe the manufacturer's instructions and the safety notes. International signs and symbols draw attention to the hazard situations in the working environment. You will find the following symbols, among others, in the instruction manual of your ASCO product.

	 DANGER Indicates an immediate threat of danger. Failure to heed the information will result in death or severest bodily injury (invalidity).
	 WARNING Indicates a possibly dangerous situation. Failure to heed the information can result in death or severest bodily injury (invalidity).
	 CAUTION Indicates a possibly dangerous situation. Failure to heed the information can result in damage to property as well as minor or medium injuries to body.

Note on useful tips to avoid property damages:

	NOTE Indicates general information, user tips and suggested hints on work that, however, do not affect the safety and health of the personnel. ...emphasizes useful tips and suggestions as well as information for efficient and disturbance-free operation.
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Note on prevention of major property damages:

	 CAUTION Indicates a possibly dangerous situation. Failure to heed the information can result in damage to property. ... Indicates a possibly dangerous situation, which may result in damage to property if it is not avoided.
---	--

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
	Wear eye protection
	Wear hearing protection
	Wear hand protection
	Wear foot protection
	Disconnect main plug

1.2.2 Operator qualification

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

The operators must be instructed in the following points by an authorised person (industrial company or manufacturer):

- Safe handling of dry ice and/or liquid/gaseous CO₂
- Operation and maintenance of the ASCO system
- Safety measures / protective equipment
- Protective clothing

- Repair work may only be carried out by trained staff.

Trained engineers or technicians for:

- Mechanical Engineering
- Electrical Engineering
- Water Engineering
- Refrigeration Engineering

- The manufacturer is available for training, including repeat sessions. Please contact our Customer Service Department.

1.3 IMPORTANT SAFETY INSTRUCTIONS

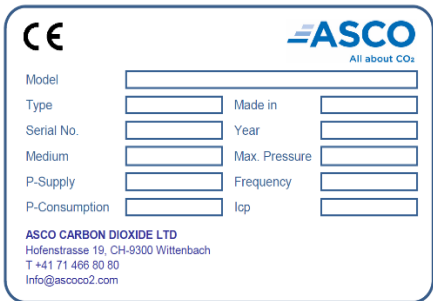
 	 DANGER Risk of injury from high carbon dioxide concentration! Risk of suffocation and damage to health through carbon dioxide! Low concentration (3-5 %) causes headaches and makes breathing difficult. High concentration (7-10 %) causes headaches and nausea and leads to unconsciousness. Even higher concentration leads to unconsciousness and death. The highest non-hazardous CO₂ concentration is 5000 ppm. A higher concentration is very dangerous to humans (German MAK Scale IV). ▪ Operate the device only in well-ventilated spaces. ▪ Installation of a CO₂ gas detector is recommended. Risk of injury from electrical energy! Unprotected electrical contacts, electrostatic processes, external effects on electrical systems for example. ▪ Only qualified specialists are allowed to carry out work on electrical installations.
	 WARNING ▪ Do not operate the device in a potentially explosive atmosphere.

Personal protective equipment

	⚠ WARNING Risk of injury from propelled parts! Due to the high CO₂ pressure, parts might be propelled at high speed. - When operating the pelletizer, always wear safety goggles. - All persons standing close to the pelletizer must wear suitable safety 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 standing close to the pelletizer must wear approved hearing protection.
	⚠ CAUTION Risk of injury to hands! Scrapes, cuts, crushing injuries, penetration wounds, etc. Burns and scalds from hot or cold mediums of parts. - 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 feet! - When operating the pelletizer, always wear suitable safety footwear. - All persons standing close to the pelletizer must wear suitable safety footwear.

Safety instructions attached to the machine

Nameplate



CE

ASCO
All about CO₂

Model:

Type: Made in:

Serial No.: Year:

Medium: Max. Pressure:

P-Supply: Frequency:

P-Consumption: Icp:

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Fig. 1

Safety instructions

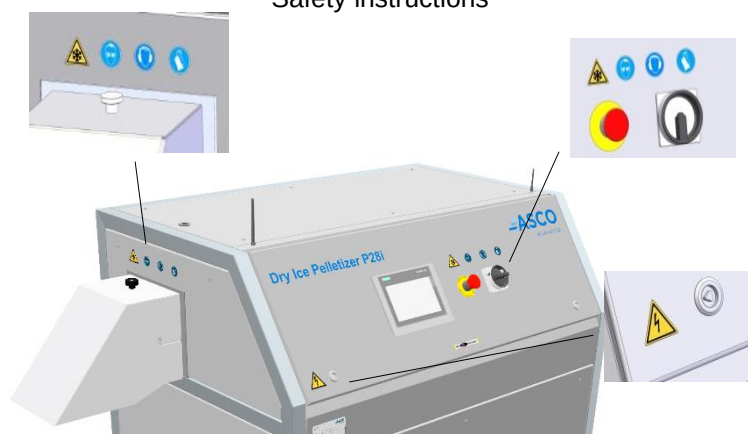


Fig. 2

Safe handling of dry ice

	 CAUTION
	Risk of frostbite from contact with dry ice! Solid carbon dioxide (dry ice) is at a temperature of about -79° C. Skin contact with dry ice can cause frostbite. The dry ice's low temperature results in icing of most of the parts of the pelletizer. ▪ Do not touch the dry ice or any of the iced machine components, unless you are wearing appropriate protective clothing. ▪ Prolonged contact with dry ice or iced components must be avoided, unless there is suitable insulation. ▪ Always read the supplier's safety data sheet and follow the instructions carefully.

1.4 SAFETY COMPONENTS

 	 DANGER
	Hazard 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. Hazard due to electrical energy! Exposed electrical contacts, electrostatic discharge, physical impact on electrical systems, etc. pose a high safety risk. ▪ All work on electrical installations must be performed by suitably qualified specialist technicians.

The machine is equipped with the following safety components:

- Main switch (EMERGENCY-STOP)
- Safety guards (fig. 3)
- Safety signs (fig. 4)
- CO₂ connection (fig. 5)
- Ejection dry ice pellets
- Safety valve



Fig. 3

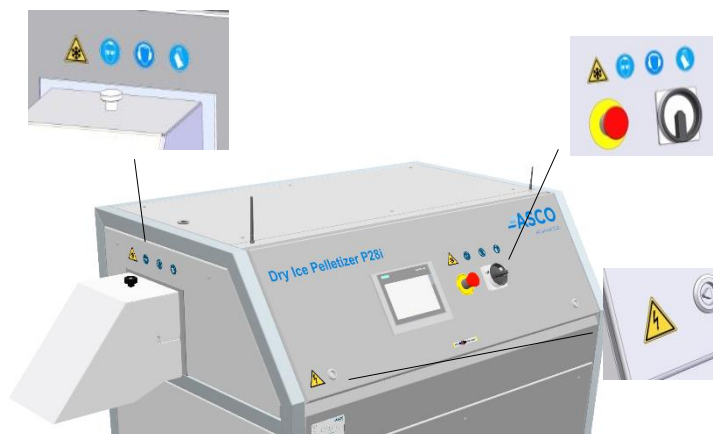


Fig. 4

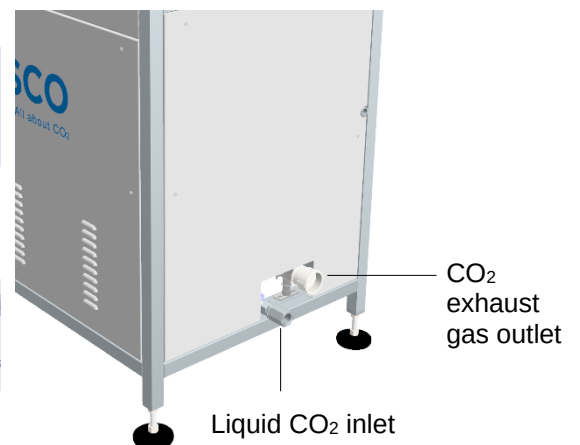


Fig. 5

1.5 INTENDED USE

Operation of the machine with liquid CO₂ at a working pressure of 16-20 bar for production of dry ice pellets and dry ice nuggets by extrusion through an extruder plate developed, manufactured and properly installed by the manufacturer and the corresponding discharge unit.

The exhaust gas must be discharged in safe manner to the atmosphere or transferred to another machine.

1.6 DECLARATION OF CONFORMITY

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

1.7 LIST OF SPARE PARTS / DRAWINGS / CIRCUIT DIAGRAMS

The spare parts list/drawings and circuit diagrams are enclosed within this operating manual as standalone documents.

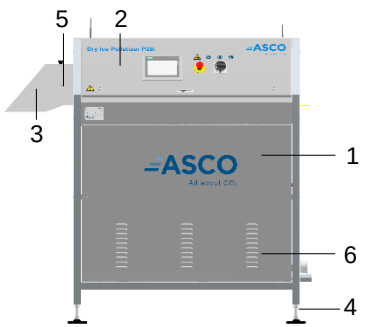
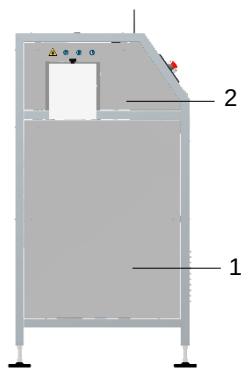
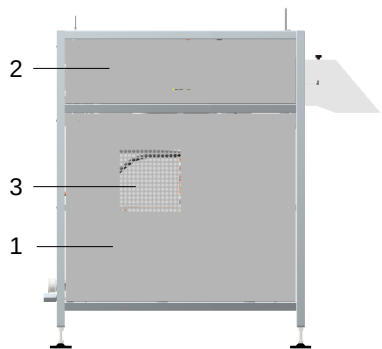
	 WARNING
	Hazard due to unsuitable spare parts! The use of unsuitable spare parts can lead to safety hazards. This applies for safety components in particular. ▪ Spare parts may only be replaced by original parts.

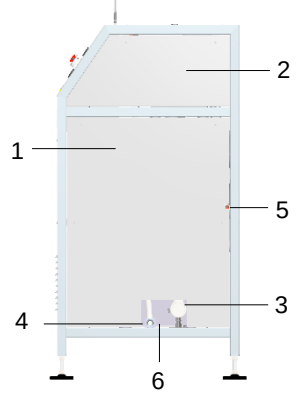
1.8 IT SECURITY VULNERABILITIES

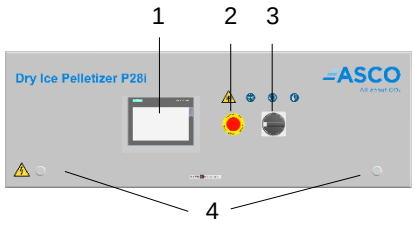
	 WARNING
	Risk of damage from IT security vulnerabilities! Unless properly protected, the interface of the control for data exchange and external access might pose a security risk! ▪ Limit logical and physical access to the control system by external IT systems to what is absolutely necessary. ▪ Take suitable precautions and update the relevant software regularly to keep them up to date at all times. ▪ 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, and regularly change the login details (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 CONTROL ELEMENTS

1	Guard cover, front	 Fig. 6
2	Control panel	
3	Discharge unit	
4	Machine base	
5	Extruder plate	
6	Ventilation slots (for hydraulic unit cooling system)	
1	Guard cover, left bottom	 Fig. 7
2	Guard cover, left top	
1	Guard cover, rear bottom	 Fig. 8
2	Guard cover, rear top	
3	Ventilation slots (for hydraulic unit cooling system)	

1	Guard cover, right	 Fig. 9
2	Guard cover, right top	
3	CO ₂ exhaust gas connection	
4	Liquid CO ₂ -connection	
5	Condensate drain	
6	Power cord	

1	HMI	 Fig. 10
2	EMERGENCY-STOP button	
3	Main switch	
4	Electric cabinet locks	

2.2 TECHNICAL DATA

Capacity	Pellet size 3 mm: up to 280 kg/h $\pm$ 5 % Pellet size 10 mm: up to 280 kg/h $\pm$ 5 % Pellet size 16 mm: up to 280 kg/h $\pm$ 5 % High-density dry ice pellets at a pressure of min. 17 bar (liquid CO ₂).
Pellet size	Cylindrical pellets diameter approx. 3 - 16 mm
Feed pressure liquid CO ₂	16-20 bar / pressure fluctuation over 8h max. 1 bar
Purity liquid CO ₂	Purity: minimum 99.9% v/v Liquid CO ₂ moisture content 5-60 ppm (v/v) equivalent of a dew point between -65° C and -47° C. Completely free of oil, sugar, rust, steel or other impurities.
Liquid CO ₂ temperature:	Adhere to these values in order to maintain the specified production rate: at 15 bar -> -28.5° C at 17 bar -> -24.5° C at 20 bar -> -19.5° C
Liquid CO ₂ supply line	Minimum 19 mm ID, insulated with as few elbows and connections as possible. With a line length of more than 3 m, use an ID of 25 mm. Please consult ASCO if you have a line length of more than 20 m.
Inlet fitting liquid CO ₂	1" BSP female thread
Waste gas line	50 mm ID
Waste gas back pressure	CO ₂ 1 bar
Waste gas line fitting	2" BSP female thread
Requirements Recovery system	Please contact: ASCO CARBON DIOXIDE LTD
Motor power	5.6 kW
Sound level	81-85 dB under normal operating conditions
Drive	Hydraulics
Recommended oil	Mineral oil according to DIN 51524 Part 2
Oil grade	16/13 to ISO 4406
Oil viscosity	ISO VG 32
Maximum oil quantity	60 litres
Power supply (standard)	400V /16A / 50Hz / 3 phases + earth
Dimensions* (L x W x H)	1560 x 800 x 1450 mm
Weight* (net)	440 kg
Weight* (packed)	approx. 550 kg

* All data refer to the standard P25i Dry Ice Pelletizer without hydraulic oil.

3 TRANSPORT

3.1 TRANSPORT WITH LIFT TRUCK OR FORKLIFT

On delivery, the machine must be inspected for transport damage. If necessary, please contact the shipping company to have the damage recorded.

	NOTE
	The centre of gravity of the machine is not in the middle of the machine. Use a forklift for precise placement of the pelletizer. Transport by crane or hoist is inadmissible.

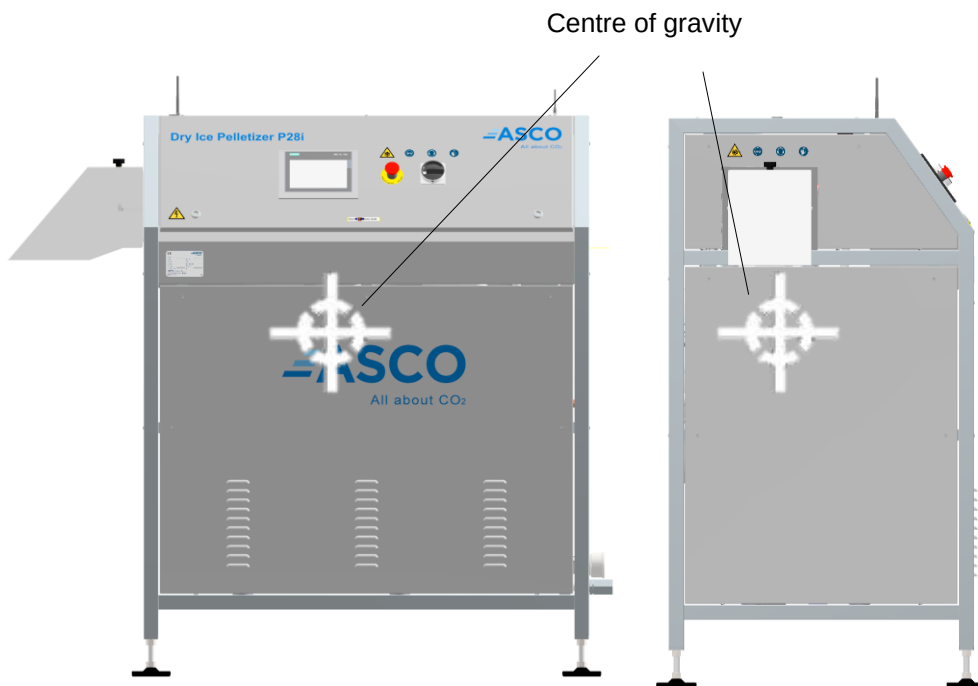


Fig. 11

Fig. 12

4 INSTALLATION

	⚠ WARNING Hazard due to damaged hoses and loose connections! ▪ Before making the connection, inspect the hoses and couplings for damage. ▪ Make sure that all hose and cable connections are properly tightened and check them regularly! ▪ Malfunctions and damage caused by incorrect installation are not covered by the ASCO warranty.
	⚠ CAUTION The ASCO Dry Ice Pelletizer has been fully assembled and tested before delivery. Prior to shipping, the oil has been drained from the machine.
	⚠ WARNING All pipeline sections where liquid CO₂ might become trapped must be equipped with a 25 bar safety valve. A shut-off valve and relief tap must be installed upstream of the machine.
	NOTE All work covered in this section must be carried out by a qualified and trained technician. ASCO CARBON DIOXIDE LTD shall not be liable for damage caused by non-compliance with the instructions and recommendations in this chapter.
	⚠ WARNING Before removing a cover of the dry ice pelletizer or carrying out work on the pelletizer, ensure that: ▪ The dry ice pelletizer has been stopped, the main switch is set to "OFF" and the main plug has been disconnected! ▪ The entire pelletizer is depressurized! ▪ All applicable safety regulations have been complied with!
	⚠ WARNING Hazard due to suffocation! Working in enclosed, unventilated spaces presents a suffocation risk 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 CO₂ sensors.

4.1 ELECTRICAL CONNECTION

	⚠ DANGER Hazard due to electrical energy! Unprotected electrical contacts, electrostatic processes, external effects on electrical systems for example. Only qualified specialists are allowed to carry out work on electrical installations.
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For connection date, please refer to the circuit diagram and chapter "Technical data".

4.2 INSTALLATION GUIDELINES SUPPLY OF LIQUID CO₂ AND EXHAUST GAS LINE

	⚠ WARNING ASCO recommends not installing any filter units within the liquid CO₂ line (feed line to pelletizer), as this may lead to loss of pressure and snow formation. ASCO is not liable for errors resulting from the installation of such filters.
---	---

CO ₂ liquid line	Non-corrosive material; installed free of oil and grease, with as few elbows as possible. Minimum radius 3 x Ø, working pressure 16-20 bar.
Exhaust gas line	Polyethylene or galvanized tube, as few elbows as possible. Minimum radius 3 x Ø, working pressure approx. 1 bar.
Insulation	Preferably with synthetic rubber, e.g. Armaflex, Kaiflex. Insulation thickness minimum 50 mm on each side.
Outside lines	Install outside lines with weather protection.
Safety	All pipe sections where liquid CO ₂ can be trapped must be equipped with a safety valve 25 bar. A shut-off and a drain cock must be installed in front of the unit. All liquid lines must be equipped with a safety and relief valve.
Installation of the pelletizer	Install preferably on the same level as the CO ₂ tank. Maximum height 10 m above the tank level.

CO ₂ Supply	Up to 3 m length /ID	Up to 20 m length /ID	Over 20 m length
P28i	min. 19 mm	min. 25 mm	call customer service

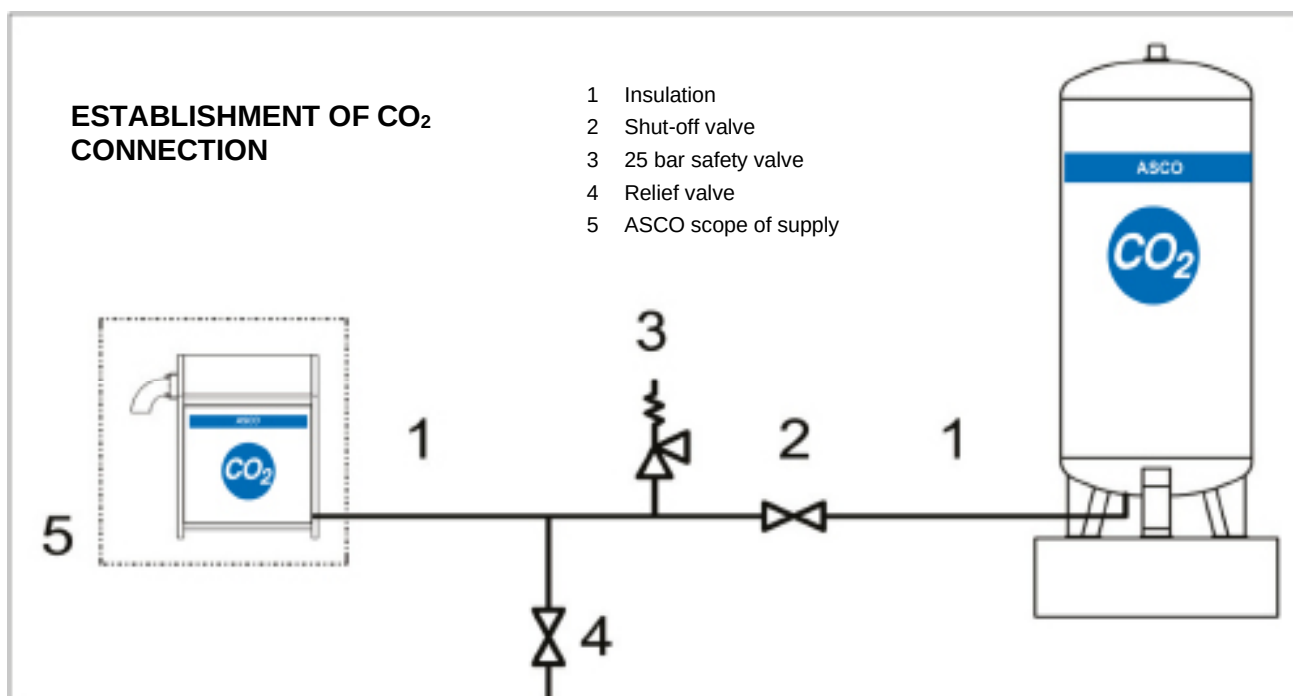


Fig. 13

Exhaust gas line	Up to 10 m length /ID	Up to 15 m length /ID	Over 15 m length
P28i	min. 50 mm	min. 50 mm	call customer service

CAUTION

The above task must be performed by qualified personnel and while the machine is disconnected from the main power supply.

- Carefully remove the crate lid and side walls.
- 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 CO₂ storage tank, preferably within a distance of max. 3 m. The pelletizer must be installed at a location where it is protected against moisture and wetness.

CAUTION

Adjust the feet at the discharge side so that they are 15 mm higher than those at the opposite side. Otherwise, there is a risk of damage to the machine.

- The access area for operation and maintenance must be at least 2 m on the operating side and 1 m on each of the other sides.

- If possible, use a flexible, insulated line for the connection to the CO₂ tank and to the connection point. The connection to the pelletizer has a 1" female thread (fig. 14, item 1). The waste gas line has a 2" female thread fitting (fig. 14, item 3). Lead the end of the line into the open air or connect it directly to a recovery plant. The pressure in the waste gas pipe must not exceed 0.1 bar.

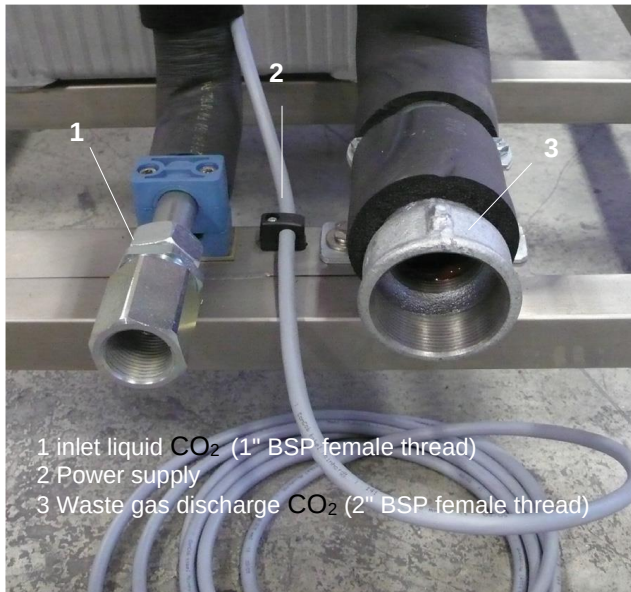


Fig. 14



Fig. 15

- Install the extruder plate and the discharge unit (fig. 15) on the pelletizer and tighten the M24 nuts.
- The line for the liquid CO₂ should be insulated and have no branches, constrictions or valves which could hinder the free flow of the liquid CO₂.

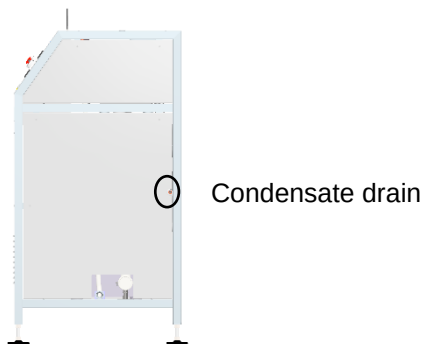


Fig. 16

- Connect a discharge hose.
- Before assembly, ensure that the liquid CO₂ and for the CO₂ waste gas lines have no residues of thread cutting oil, burrs and other machining residues.
- Avoid laying these cold lines above electric components as these could be damaged by dripping condensation.
- Before insulating, pressurize the supply line for liquid CO₂ to ensure that the line has no leaks.

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	 WARNING
	Hazard due to pressure Stop CO₂ supply. ▪ Close the shut-off device (ball valve) at the CO₂ supply. ▪ Reduce the pressure by starting the machine. ▪ Reduce the residual pressure through the relief valve in the supply line (fig. 13, item 4).

Please contact ASCO in the event of doubts or questions.

4.3 COMMISSIONING

- Fill the hydraulic generator set with oil. For filling quantities, see technical data sheet.

	NOTE
	To ensure that the fluid is clean, you must fill it using a filtering unit with a mesh size of 10 µm or less (See also chapter "Oil change").

- Connect the machine according to the circuit diagram to the main power supply.
- Open the front cover of the machine. Check the direction of rotation of the electric motor by switching on the hydraulics in the manual operation menu (Fig. 17). If the direction of rotation matches the direction of the arrow, the motor can be switched off again.
- The direction of rotation of the fan should also be checked. If the fan rotates in the direction of the arrow, it can be switched off again

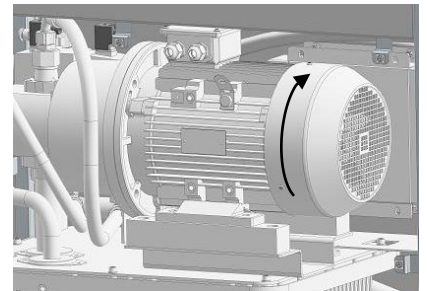


Fig. 17

	NOTE
	If the motor turns in the opposite direction, you must exchange the two phases at the connection terminals. CAUTION: Disconnect the main plug!

4.4 DEPRESSURISING THE MACHINE

If the pelletiser has been taken out of operation according to chapter 5.2.5, it is normally depressurised. However, if production has been interrupted according to chapter 5.2.3, the machine is pressurised at standstill and can be depressurised according to the following procedure.

	 WARNING
	Hazard due to pressure 1. Close the ball valve in the supply line for liquid CO₂. 2. Continue production until the CO₂ pressure shows 0 bar. (Below 14 bar, an alarm is displayed that the CO₂ pressure is not optimal) 3. Press the End button: . 4. Wait until the hydraulics switch off and turn the main switch to "OFF".

5 MACHINE OPERATION

 	 DANGER Hazard 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. Hazard due to electrical energy! Unprotected electrical contacts, electrostatic processes, external effects on electrical systems for example. - Only qualified specialists are allowed to carry out work on electrical installations.
	 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: Depressurise the system and set the main switch to "0".
	 WARNING Hazard due to suffocation! Working in enclosed, unventilated spaces presents a suffocation risk due to the concentration of carbon dioxide! 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.

5.1 OPERATION OF MACHINE CONTROLS

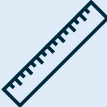
	NOTE   To enable certain functions, such as manual control of the actuators, a login is required. User: ASCO Password: ASCO
---	--

5.1.1 General navigation



Fig. 18

	Shows the production status. The “Production” page can be viewed following pressing. Blue: Dry ice production does not run Green: Dry ice production is running
	It is possible to check pending alarms here. The “Alarms” page can be viewed following pressing. Green: No pending alarms Orange: At least 1 pending warning (no blocking of production) Red: At least 1 alarm pending (blocking of production)
	The “Settings” page can be viewed following pressing.
	The Navigation page displayed above can be viewed by pressing the Home button.
	Pressing opens up the log-in dialogue of the user administration. Following successful logging in, the logged-in user is displayed to the right. If a user is logged in, this user is logged out following pressing.
EN	It is possible to switch between the languages German and English by pressing this button.

	It is possible to switch between the imperial and metric unit systems by pressing this button.
	Pressing opens the “Production” window.
	Pressing opens the “Manual Operation” window.
	Pressing opens the “Actual Values” window.
	Pressing opens the “Alarms” window.
	Pressing opens the “Settings” window.
	Pressing opens the “Spare Parts” window.
	Pressing opens the “Input/Output” window.
	Pressing opens the “Trending” window.
	Pressing opens the “Service” window.
	Pressing opens the “Contact” window.

5.1.2 Presettings production



Fig. 19

START PRODUCTION	The machine starts production.
	This button opens a pop-up in which the currently used extruder plate can be set. This should always match with the extruder plate currently being used.
	With this button, a pop-up opens and you can switch between: - Fixed quantity: Production occurs until the target quantity has been processed (4 different setpoints adjustable). - Continuous production: Production occurs until the machine is stopped manually.
70 kg ∞	If Fixed quantity is selected, the quantity to be produced is displayed here. If Continuous production is selected, the symbol ∞ will be visible.
START PRODUCTION 	Pressing starts production

5.1.3 Selection target quantity production



Fig. 20

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

5.1.4 Selection of pellet size production

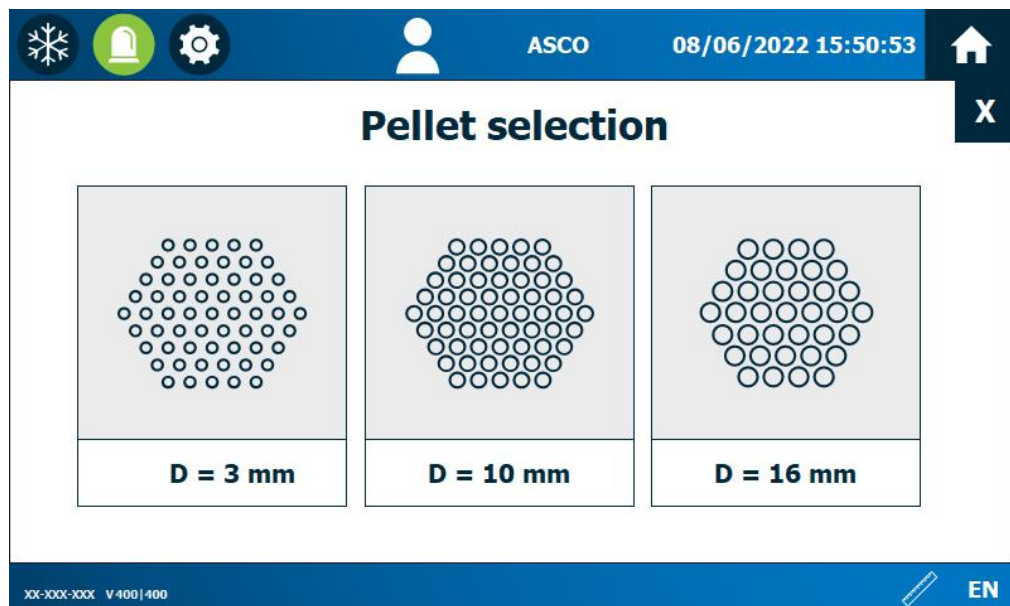
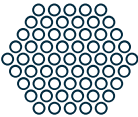


Fig. 21

	Selection of 3mm pellets
	Selection of 10mm pellets
	Selection of 16mm pellets
	Pressing closes the window

5.1.5 Production running (Fixed quantity)

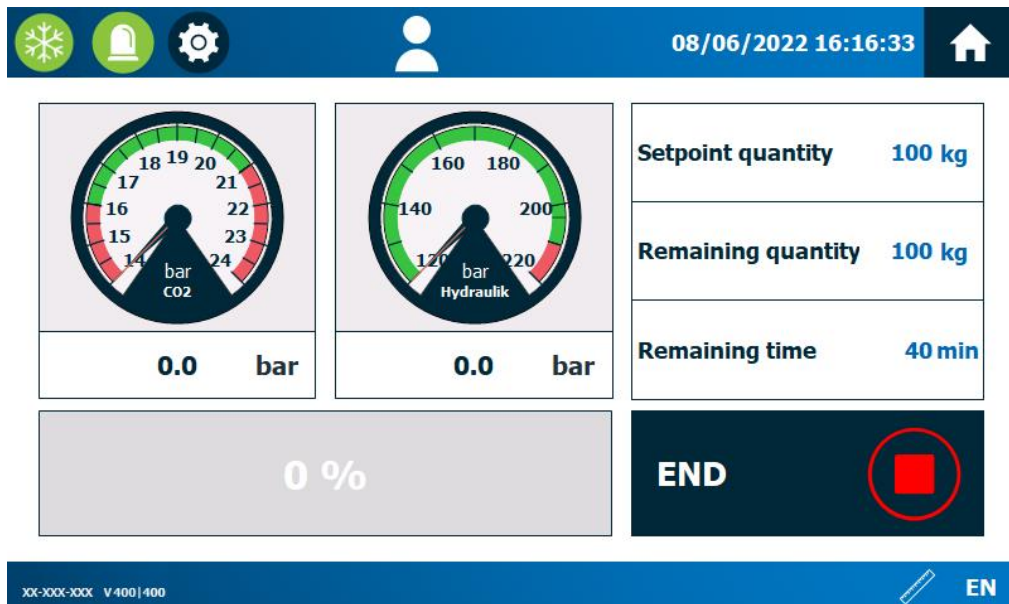
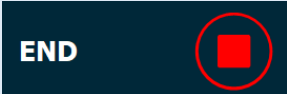


Fig. 22

	Display of the current CO ₂ pressure
	Display of the current hydraulic pressure
0%	Progress display
Setpoint quantity	The quantity selected at the start of production
Remaining quantity	The quantity still to be produced
Remaining time	The time remaining until the target quantity has been produced.
	Pressing ends production.

5.1.6 Production is running (continuous production)

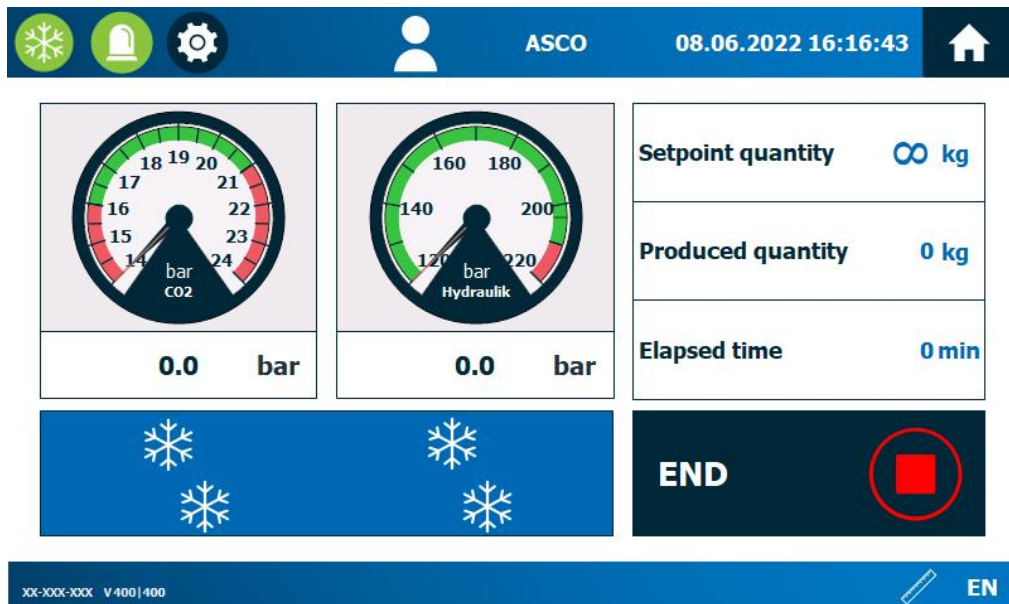


Fig. 23

	Display of the current CO ₂ pressure
	Display of the current hydraulic pressure
	Animation
Setpoint quantity	The quantity selected at the start of production. (Here: Free production)
Produced quantity	The quantity produced since the start of production
Elapsed time	The time elapsed since the start of production
END 	Pressing ends production.

5.1.7 Manual Operation

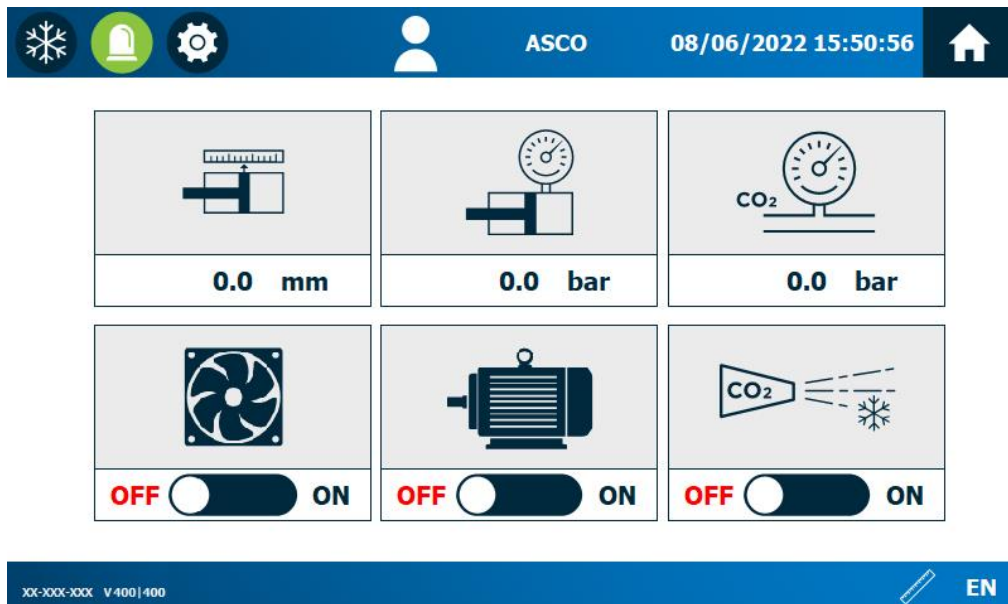
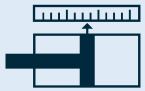
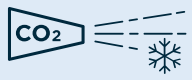


Fig. 24

	Current position of the ram measured from the front. Output position = 0 mm
	Pressing makes it possible to move the ram forwards or backwards manually. (Buttons only visible when hydraulic motor is switched on)
	Current pressure in the ram.
	Current CO ₂ pressure.
	Pressing makes it possible to switch the fan on manually.
	Pressing makes it possible to switch the hydraulic motor on manually.
	Pressing makes it possible to switch the CO ₂ valves on manually. (open, provided that the button is pressed)

5.1.8 Overview of actual values

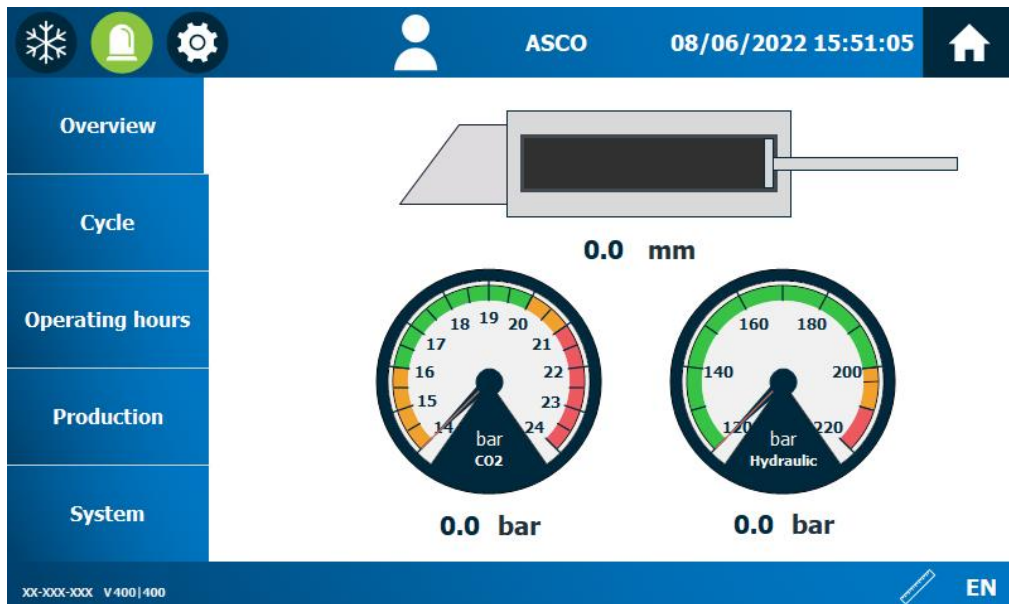


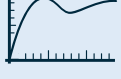
Fig. 25

	Current position of the ram measured from the front. Output position = 0 mm
	Current CO ₂ pressure.
	Current pressure in the ram.

5.1.9 Actual values cycle

    ASCO 08/06/2022 15:51:09 			
Overview		Maximum pressure hydraulics last cycle	0.0 bar
Cycle		Minimum pressure CO ₂ last cycle	0.0 bar
Operating hours		CO ₂ injection time	0 ms
Production		Cycle time	0 ms
Production		Position at production pressure	75.0 mm
		Position at WED pressure	17.0 mm
System		Actual and last 3 steps	0, 0, 0 #
XX-XXX-XXX V 400/400  EN			

Fig. 26

	Display of the maximum hydraulic pressure of the last cycle
	Display of the minimum CO ₂ pressure of the 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

5.1.10 Actual values operating hours



Fig. 27

TOTAL	Total number of operating hours of the pelletizer
	Number of operating hours of 1.7mm pellets
	Number of operating hours of 3mm pellets
	Number of operating hours of 6mm pellets
	Number of operating hours of 10mm pellets
	Number of operating hours of 16mm pellets
Operating hours until maintenance	Number of operating hours until a service is due

5.1.11 Actual values production



Fig. 28

TOTAL	Total quantity of pellets produced
	Quantity of 1.7mm pellets produced
	Quantity of 3mm pellets produced
	Quantity of 6mm pellets produced
	Quantity of 10mm pellets produced
	Quantity of 16mm pellets produced

5.1.12 Actual values system

    ASCO 08/06/2022 15:56:16 	
Overview	Serial number machine XX-XXX-XXX
	Serial number Ewon XXXX-XXXX-XX
Cycle	Software version CPU 400
Operating hours	Software version HMI 400
Production	Item number CPU 6ES7 212-1AE40-0XB0
	Item number AI-module 6ES7 231-4HD30-0XB0
System	Item number HMI 6AV2 124-0GC01-0AX0
XX-XXX-XXX V 400 400  EN	

Fig. 29

Serial number plant	The serial number of the system recorded in the ASCO system
Serial number eWON	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
Item number CPU	The article number of the PLC
Item number AI module	The article number of the analogue input module
Item number HMI	The article number of the HMI

5.1.13 Current alarms

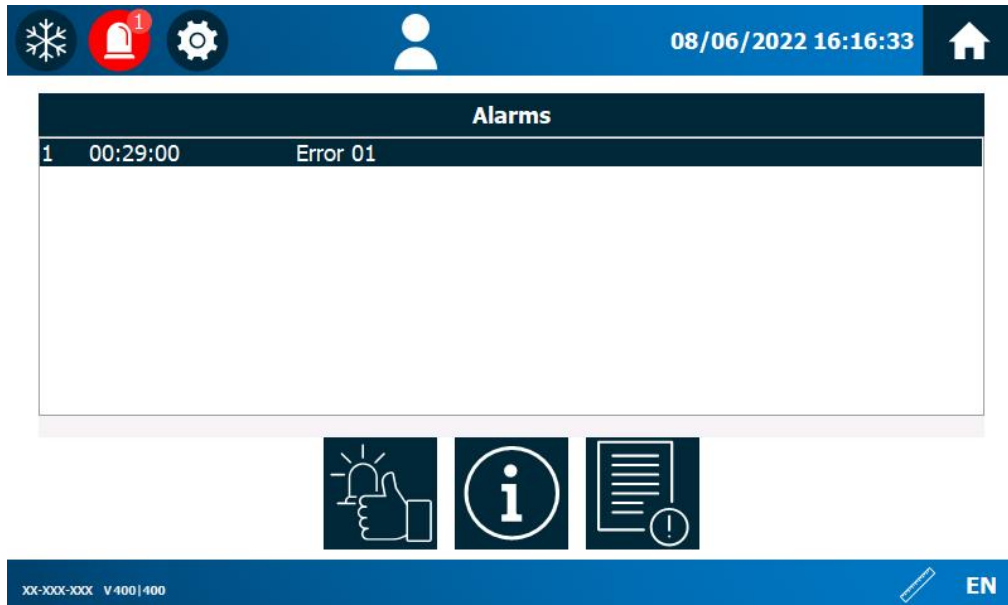
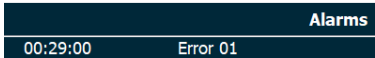


Fig. 30

	Current pending alarms which have not been acknowledged
	Pressing acknowledges the alarms which are no longer pending
	Pressing opens the page "Alarm Info"
	Pressing opens the page "Alarm History"

5.1.14 Alarm Info

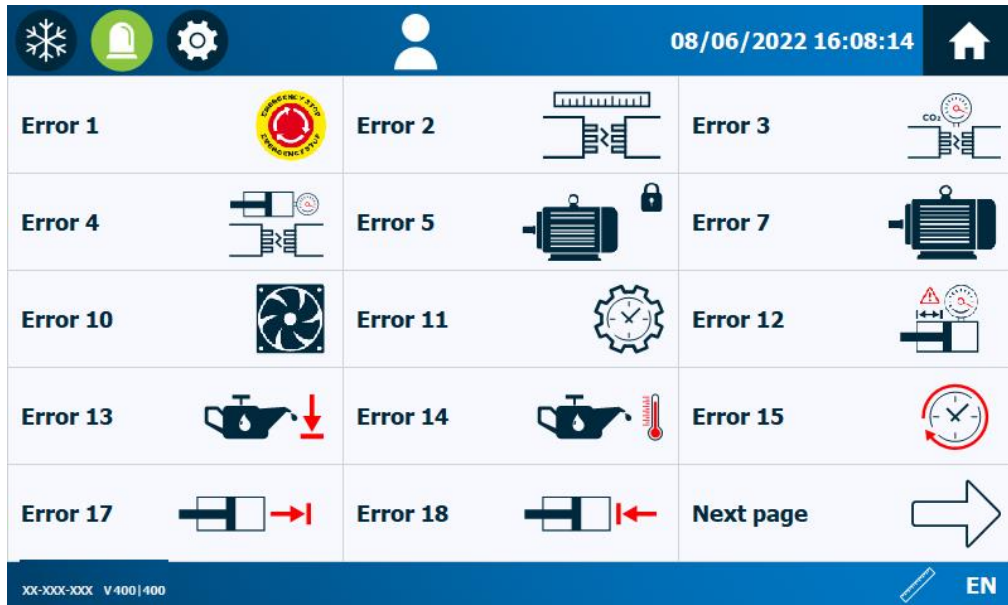


Fig. 31

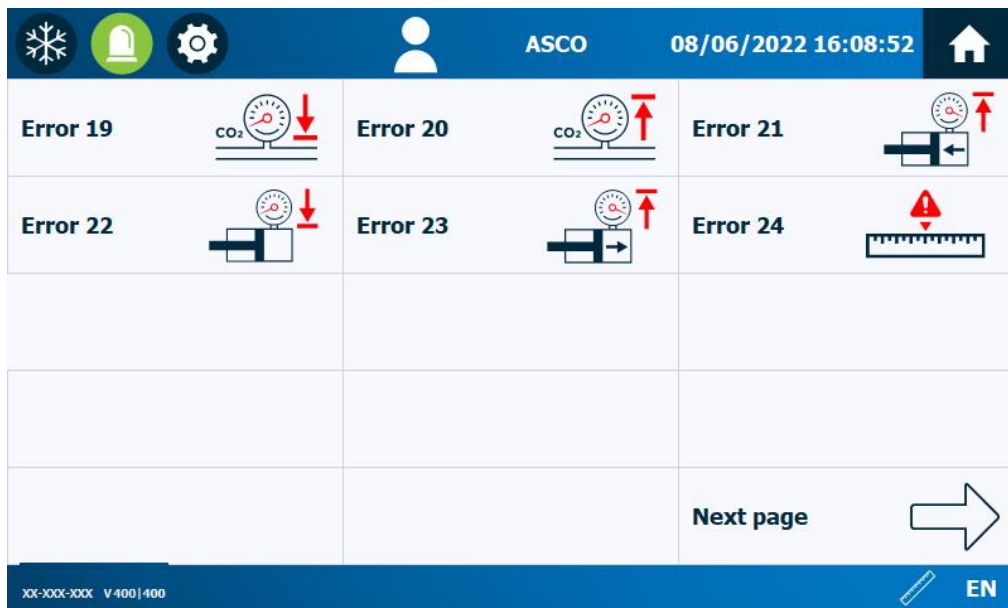


Fig. 32

A description of the errors and/or how they can be rectified can be found in Chapter 7.1.

5.1.15 Alarm History

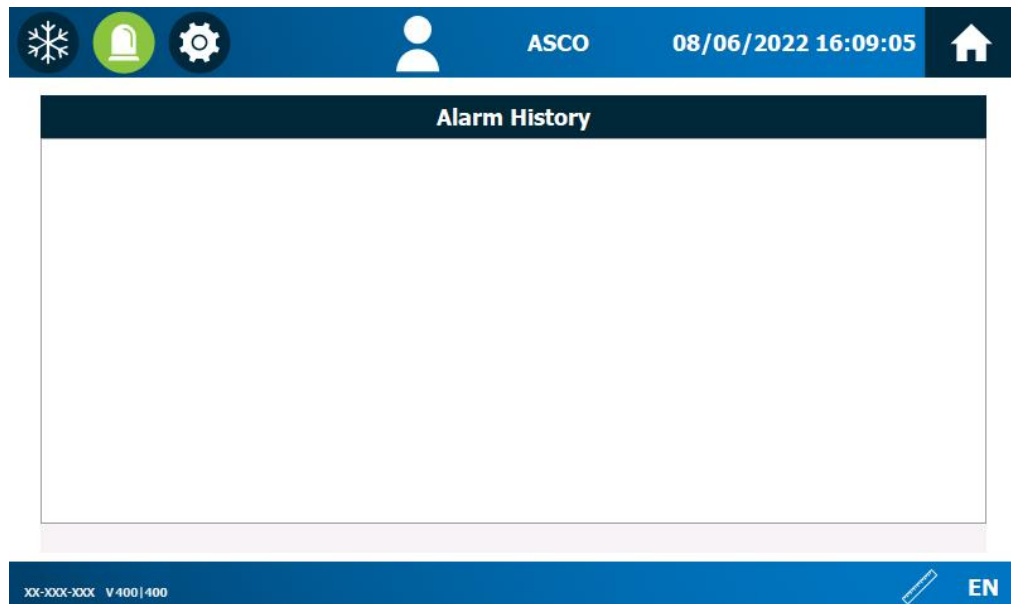


Fig. 33

Here it is possible to check all alarms and messages which have occurred since the last time the system was switched on.

5.1.16 Overview of settings

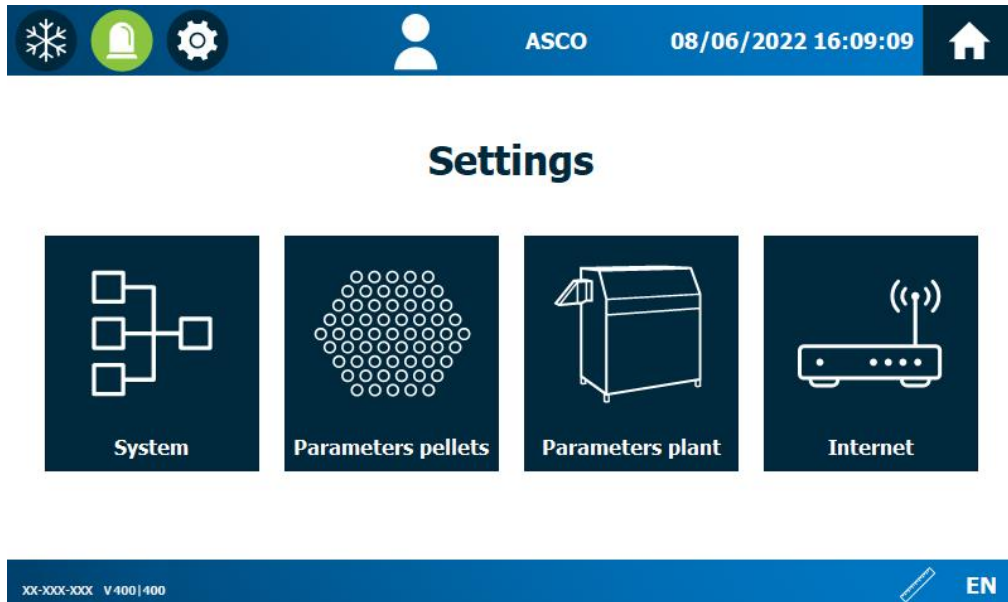


Fig. 34

	Pressing opens the System Settings page
	Pressing opens the Parameter Pellets page (Only for ASCO and certified bodies)
	Pressing opens the Parameters plant page (Only for ASCO and certified bodies)
	Pressing opens the Internet setting page

5.1.17 System Settings

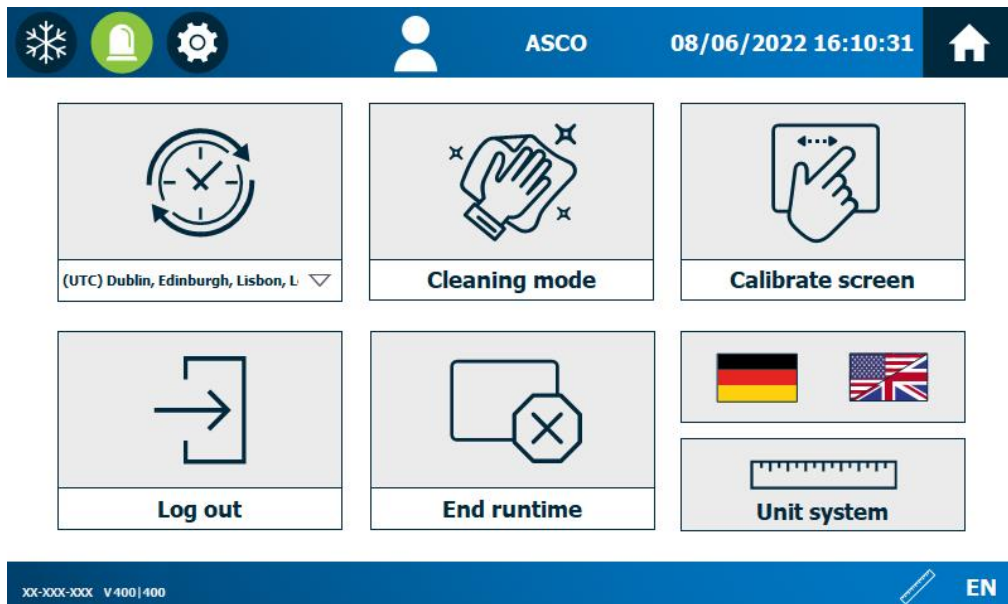


Fig. 35

	Time switch iSeries: Selection of the time zone as connected with NTP time server non iSeries: Setting of the date and time directly
	Pressing opens a window which does not accept any entries for 30 seconds so that the screen can be cleaned
	Pressing opens a dialogue window so that the screen can be calibrated
	Pressing logs the currently logged-in user out
	Pressing ends the run time
	Pressing makes it possible to select the display language (German or English)
	Pressing makes it possible to switch between the unit systems (metric or imperial)

5.1.18 Internet Settings

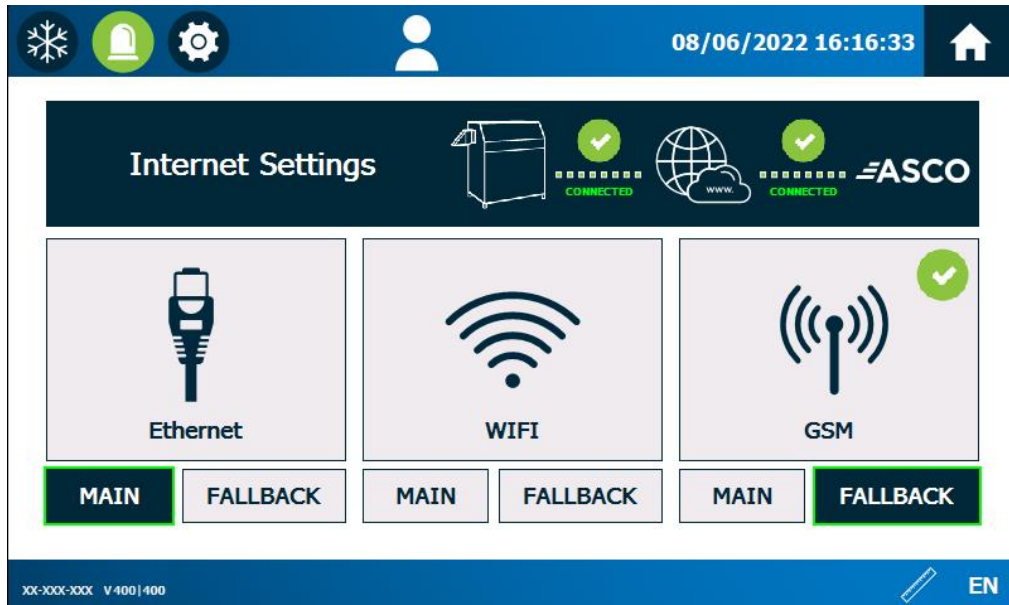


Fig. 36

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 it is possible to make the Ethernet settings for the Internet connection (Only for ASCO and certified bodies).
	Here it is possible to make the WIFI settings for the Internet connection (Only for ASCO and certified bodies).
	Here it is possible to make the GSM settings for the Internet connection (Only for ASCO and certified bodies).

5.1.19 Spareparts



Fig. 37

It is possible to access the ASCO spare parts shop directly via the QR code displayed above.

5.1.20 Interface: Input



Fig. 38

		Currently displayed page: Inputs
I 0.0		Emergency stop
I 0.1		External start signal
I 0.2		Oil level in order
I 0.3		Oil temperature high warning
I 0.4		Oil temperature high alarm
I 0.5		Motor
I 0.6		Motor circuit breaker
I 0.7		Fan

5.1.21 Interface: Output

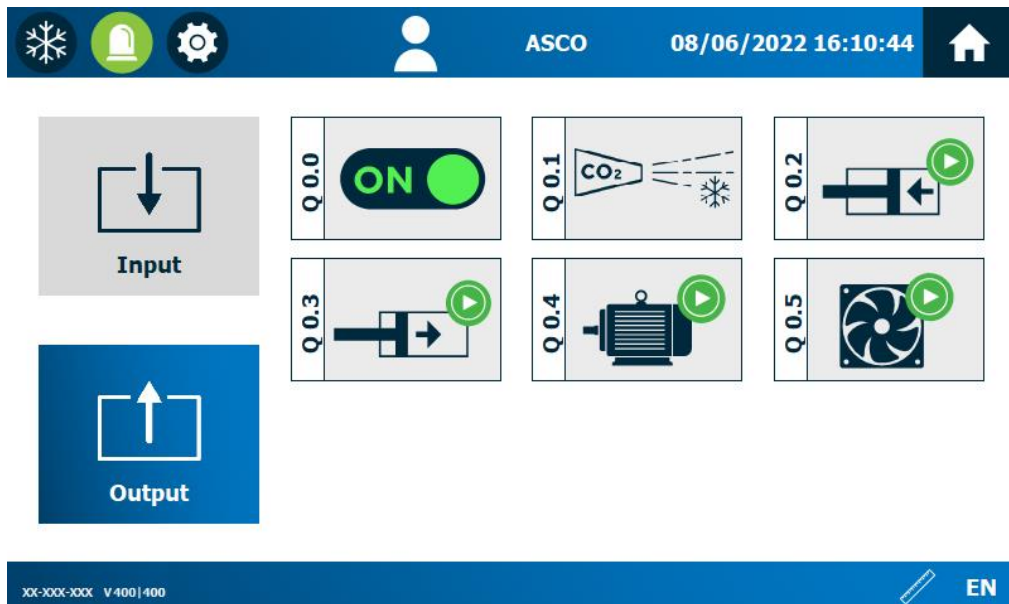
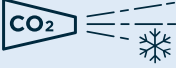


Fig. 39

		Currently displayed page: Outputs
Q0.0		Machine is running
Q0.1		CO ₂ injection
Q0.2		Cylinder back
Q0.3		Cylinder forwards
Q0.4		Motor on
Q0.5		Fan on

5.1.22 Trending



Fig. 40

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

- - Hydraulic pressure (black)
- - Piston position (red)
- - CO₂ pressure (green)
- - CO₂ injection time (purple)

5.1.23 Overview of service

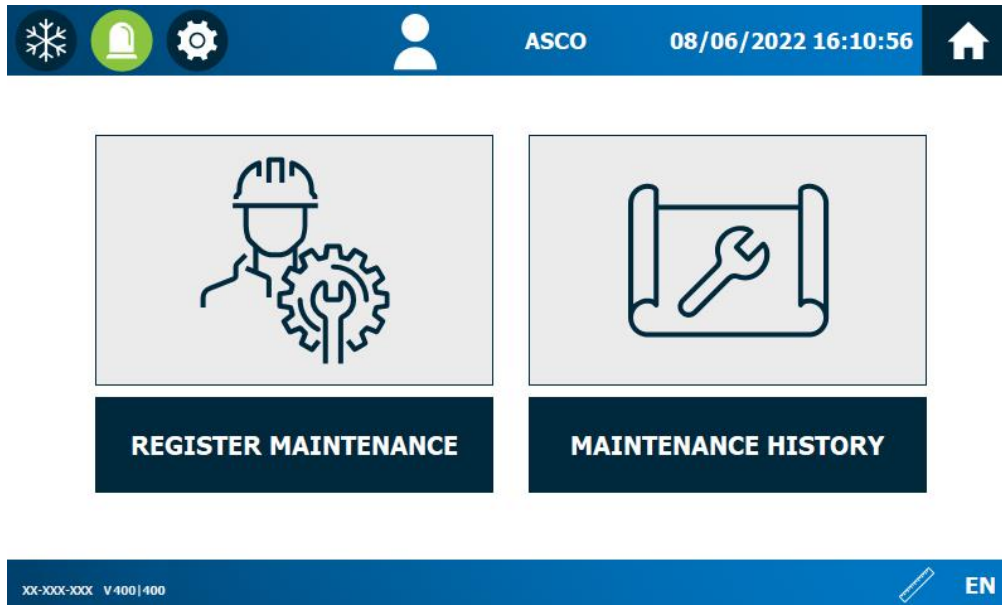
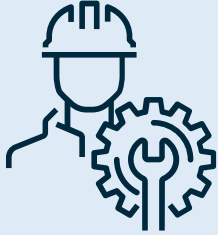


Fig. 41

	Pressing opens the page "Register Maintenance"
	Pressing opens the page "Maintenance History"

5.1.24 Service Registration

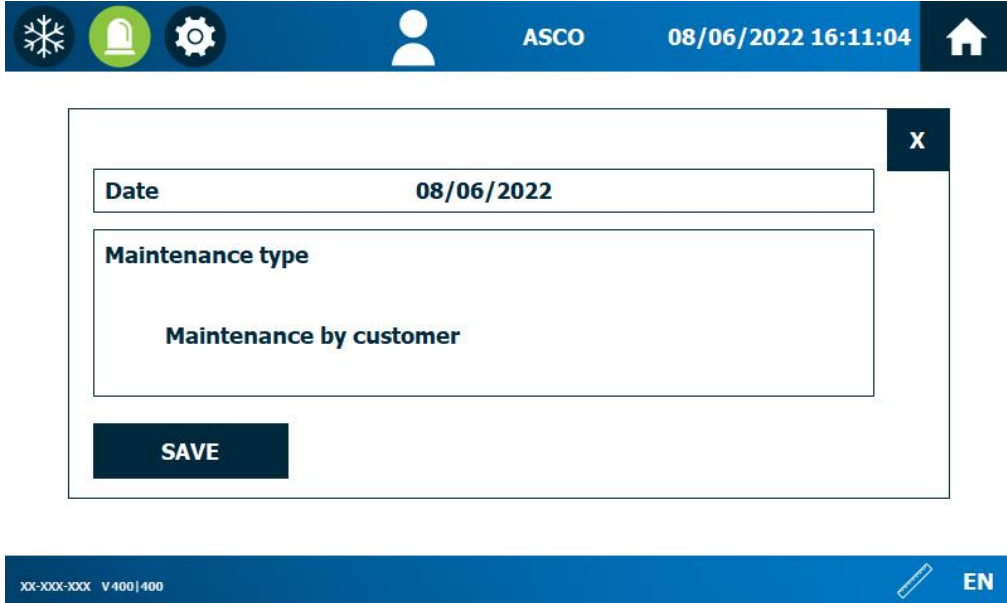


Fig. 42

Here it is possible for the user of the system to 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! An independent service does not in any way replace a service carried out by ASCO.

5.1.25 Service History

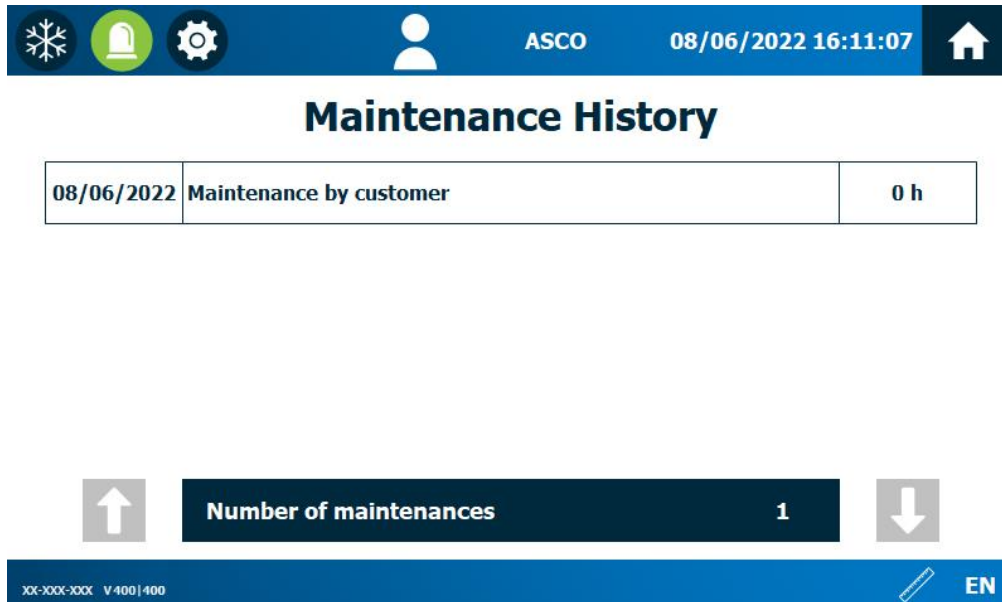


Fig. 43

Here it is possible for the user of the system to 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.

5.1.26 Contact

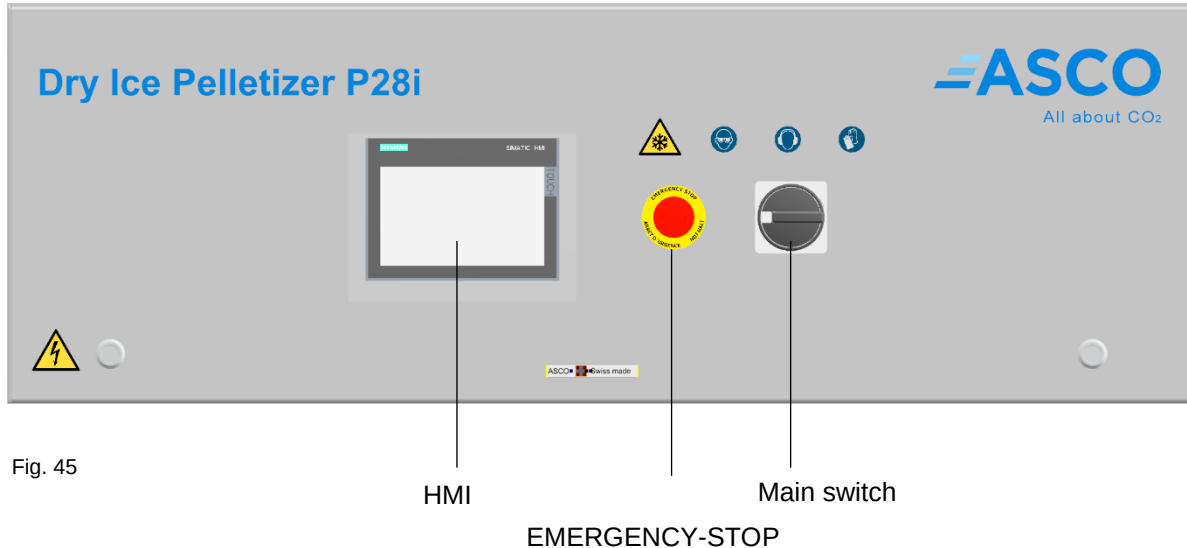


Fig. 44

5.2 STARTING PRODUCTION

 	⚠ DANGER Hazard 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. Hazard due to electrical energy! Unprotected electrical contacts, electrostatic processes, external effects on electrical systems for example. - Only qualified specialists are allowed to carry out work on electrical installations.
	⚠ WARNING Risk of injury from propelled dry ice pellets! No third parties may be in the immediate vicinity during operation. Cordon off the work area. During machine operation, never touch or reach into the discharge unit. Once work is complete: Depressurise the system and set the main switch to "0".
	⚠ WARNING Hazard due to suffocation! Working in enclosed, unventilated spaces presents a suffocation risk due to the concentration of carbon dioxide! 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 Pre-requisite for operation: - All safety instructions (chapter 1) have been read and understood. - The machine has been properly installed (chapter 4).

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



- Never block the ventilation slots (fig. 6 and 8).
- Check the power cord for visible damage.
- Check the liquid CO₂ line and the CO₂ exhaust gas line for damage.
- The exhaust gas line must be unobstructed, with a back pressure of less than 0.1 bar.
- 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.
- Set the main switch to "I".
- If necessary, release the EMERGENCY-STOP button.
- Slowly open the shut-off valve in the liquid CO₂ supply line upstream of the machine.

	CAUTION
	If the shut-off valve is opened too quickly, the liquid CO₂ supply line might become blocked.

5.2.1 Starting free production

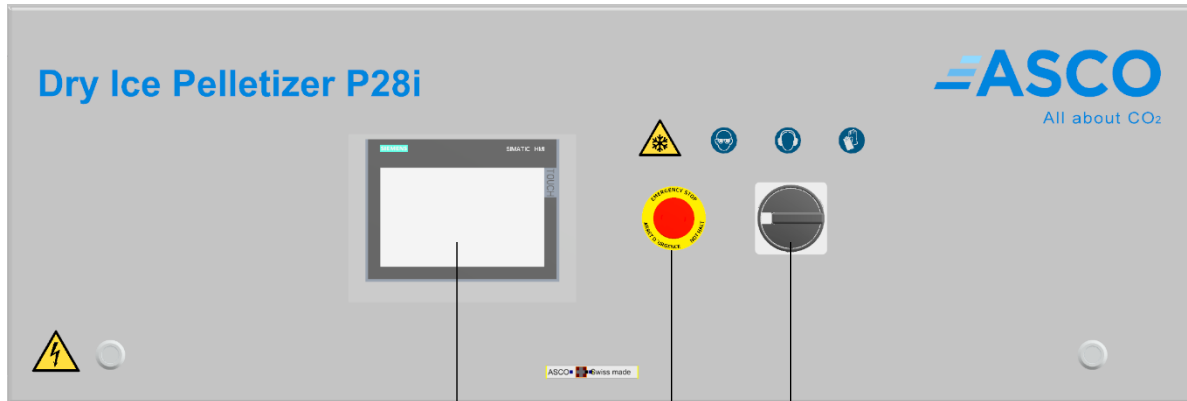


Fig. 46

HMI
EMERGENCY-STOP
Main switch

- On the touch screen page *Production pre-selection*, select operating mode .
- Press the button *Start production* .
- The machine initialises the system.
- CO₂ 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, productions starts automatically.

5.2.2 Starting fixed quantity production

- 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* .
- The machine initialises the system.
- CO₂ 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, productions starts automatically.
- The machine stops automatically when the entered quantity has been produced and resets the remaining quantity to the entered value.

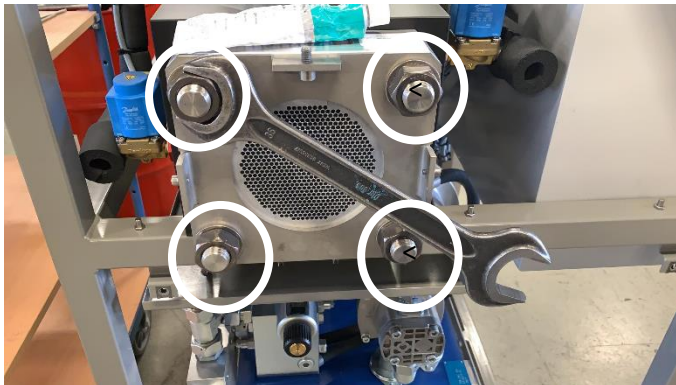
5.2.3 Stopping machine for production mode change

- Pressing the End button: .
- The machine piston moves to the front-end position and stops the production run.
- As soon as the hydraulics have come to a standstill, you can exchange the extruder plate.

5.2.4 Fixing the nuts at the extruder plate

	CAUTION
When changing the extruder plate, it must be ensured that the parts are not in cryogenic condition.	

- Assemble/disassemble extruder plate with O-ring

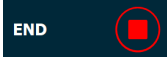


- Mounting the ejector bracket
- Tighten nuts slightly to 60 Nm

	CAUTION
Grease nuts M24 regularly. (e.g. with Molykote)	
	

- Mounting the funnel

5.2.5 Stopping machine to terminate production

- Close the ball valve in the liquid CO₂ supply line.
- Continue producing until the CO₂ pressure is at 0 bar. If pressure is below 14 bar, an alarm is displayed, indicating that the CO₂ pressure is not optimal.
- Pressing the End button: .
- Wait until the hydraulics have come to a standstill and then turn the main switch to "OFF".

5.2.6 Interrupting operation briefly

- Pressing the End button: .
- When restarting, press the button *Start production* .

	 WARNING
	▪ If the machine is not in operation for some time, it might ice up → shut down the machine. ▪ Blow out the pelletizer chamber with oil-free compressed air and dry it with a cloth.

5.2.7 Shutting down machine

- Actuate the EMERGENCY-STOP button.

5.2.8 Restart after an emergency stop

- Identify the cause of the emergency stop and eliminate it.
- Acknowledge the error message.
- The machine is now again ready for operation.

6 MAINTENANCE

	 WARNING Maintenance and repair work must be performed by trained and qualified persons.
	 WARNING Before removing an engine cover, ensure that: ▪ The power switch is set to "OFF". ▪ All local safety regulations have been met! ▪ The machine is definitely disconnected from the main power supply.
	 WARNING When changing oil, please note that: ▪ The oil is still warm. Only change the oil once it has cooled down. ▪ Fill the oil through a filtering unit with a mesh size of 10 µm or less. ▪ Handling hot oil can cause severe burns and blindness. ▪ The oil must be collected and disposed of in accordance with the local regulations!
	 CAUTION ▪ Replace damaged or leaking hydraulic hoses immediately! ▪ 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 No solvents or cleaning agents may be used for the pelletizer chamber and all associated parts.
	 CAUTION Wear protective gloves when working on cold parts.
	 CAUTION Only use original ASCO spare parts.

	 WARNING
	Danger due to unintentional movement of the hydraulic cylinder and CO₂ injection. ▪ Set the 24V DC fuse correctly according to the electrical diagram, otherwise the machine may be damaged. ▪ The hydraulic cylinder could be actuated inadvertently and thus possibly activated. ▪ Injection valves switch uncontrolled, no matter where the cylinder is.

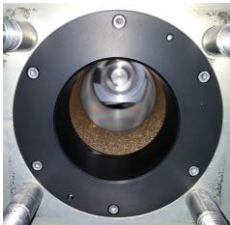
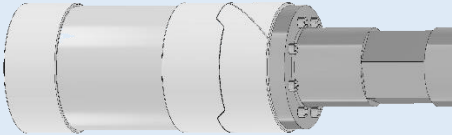
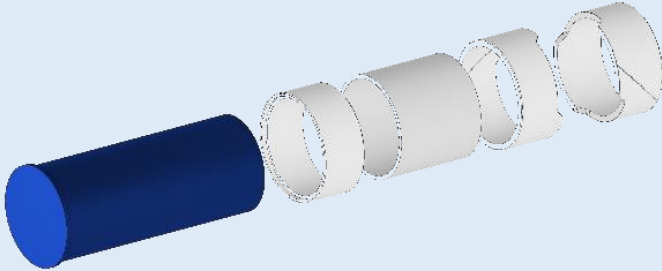
6.1 SERVICE INTERVALS AND ROUTINE CHECKS

  	 WARNING
	Hazard due to improper maintenance! When carrying out maintenance work on the pelletizer, observe the following: ▪ Unplug the main plug to prevent unexpected movements of the pelletizer piston! ▪ Shut off the liquid CO₂ supply and depressurize the machine! ▪ All work on the electrical equipment of the machine must be carried out by specialists with electrical engineering qualifications.

6.2 INSPECTIONS AND CHECKS - PROCESS CHEMICALS AND WEAR PARTS

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

Component	Task	Before each startup	40 h or 1 month	100 h or 3 months	1000 h or 6 months	2000 h or 1 year	3000 h or 2 years	10000 h or 10 years
Safety devices	Visual inspection of all safety devices. Missing or defective safety devices (guards / signs) must be replaced immediately.	X	X	X	X	X	X	X
Liquid CO ₂ and exhaust gas line	Inspect for damage and leakage; seal and retighten fittings and connections, if necessary.	X	X	X	X	X	X	X
Safety valve CO ₂ liquid line	Check for damage and leaks, if necessary replaced or after hours of operation.	At the latest every 5 years						
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
Oil cooler	Perform a function test.		X	X	X	X	X	X
Solenoid valves	Perform a function test.		X	X	X	X	X	X
	Inspect solenoid valves; replace, if necessary.				X	X	X	X
EMERGENCY-STOP button	Perform a function test of the EMERGENCY-STOP button.		X	X	X	X	X	X

Degassing bushing	Max. inside diameter = 115.6 mm must not be exceeded (after removing extruder plate, fully retract the pelletizer piston)   Fig. 47 Fig. 48			X	X	X	X	X	X
	Replace degassing bushing.				X	X	X	X	
Connecting elements	Check all screws and connections for proper fixture. If necessary, re-tighten carefully.			X	X	X	X	X	
Pressure switching valve	Replace hydraulic pressure switching valve (V4).				X	X	X	X	
Piston slide ring	Replace the piston slide rings  Fig. 49  Fig. 50				X	X	X	X	
Electrical components	Have all electrical installations inspected by a qualified electrician.					X	X	X	

Hydraulic unit	▪ Check oil level.	X	X	X	X	X	X	X
	▪ Inspect all hydraulic lines, hoses and connections for oil leaks. Repair all leaks without delay.		X	X	X	X	X	X
	▪ Replace oil filter in hydraulic unit.			X*	X	X	X	X
	▪ Change oil.			X*	X	X	X	X
	▪ Inspect all hydraulic hoses and replace them, if necessary.						X	X
	▪ Replace coupling between motor and hydraulic pump.						X	X
	▪ Replace the hydraulic hoses.							X
	▪ Replace the hydraulic pump and the hydraulic cylinders.							X

*Only applicable the first time the number of hours is reached - no longer applicable thereafter

6.3 OIL CHANGE

As the oil is important for smooth and continuous operation of the pelletizer, it is essential to monitor the amount and condition of the oil as described in this manual.

	 WARNING
	▪ Maintenance and repair work must be performed by trained and qualified persons. ▪ Only change the oil once it has cooled down. The pelletizer must be depressurised and the main switch turned off. ▪ Take care with handling hot oil, as it can cause burns and blindness upon contact with eyes! ▪ Caution! Risk of burns! ▪ The oil must be collected and disposed of in accordance with the local regulations!

- The hydraulic power unit is delivered without oil. We recommend changing the oil with a charger unit (10µm filter). If no oil change device is present, proceed as described under "Oil change without oil change device". If using an oil change device, proceed as follows:

6.3.1 Oil change with oil changer unit

- Place a suitable container nearby of the hydraulic power unit.
- Loosen the cap on the filler neck (fig. 51). Insert the suction tube of the oil changer and hang the drain line in the corresponding collecting container.
- Start the oil changer unit and empty the hydraulic tank.
- Replace the oil filter on the top of the hydraulic power unit.
- Insert the suction tube into the oil barrel with new oil and place the drain line into the tank.

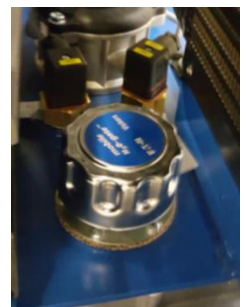


Fig. 51

- Start the changer unit. Fill the hydraulic power unit up to the oil mark.
- Close filler neck cap. Start the pelletizer and monitor the oil level at the sight glass (fig. 52). Refill if necessary.

6.3.2 Oil change without oil changer unit

- Position a suitable container to collect the old oil under the drain plug of the hydraulic power unit.
- Loosen the drain plug (fig. 52) and drain the oil into the container.
- Insert the drain plug again and tighten correctly.
- Replace the oil filter.



NOTE

To ensure that the fluid is clean, you must fill it using a filtering unit with a mesh size of 10 µm or less.

- Fill the hydraulic power unit up to the oil mark.
- Close filler neck cap.
- Start the pelletizer and check the oil level through the sight glass (fig. 52). If necessary, add oil through a filtering unit with a mesh size of 10 µm or less.

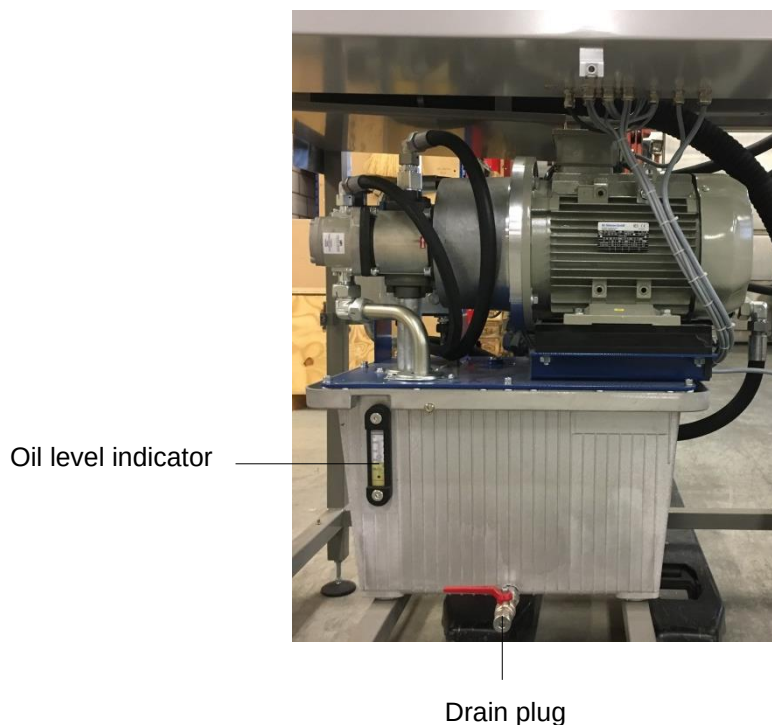


Fig. 52

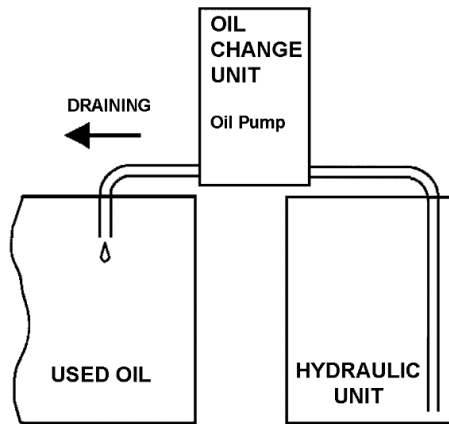


Fig. 53

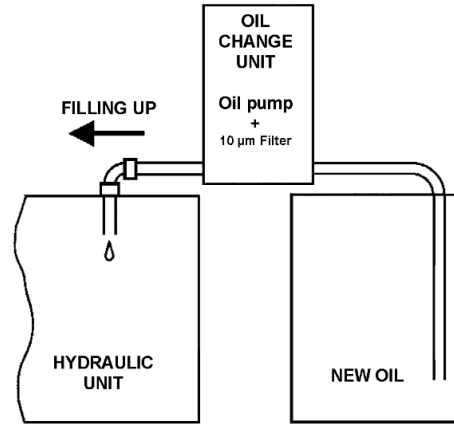
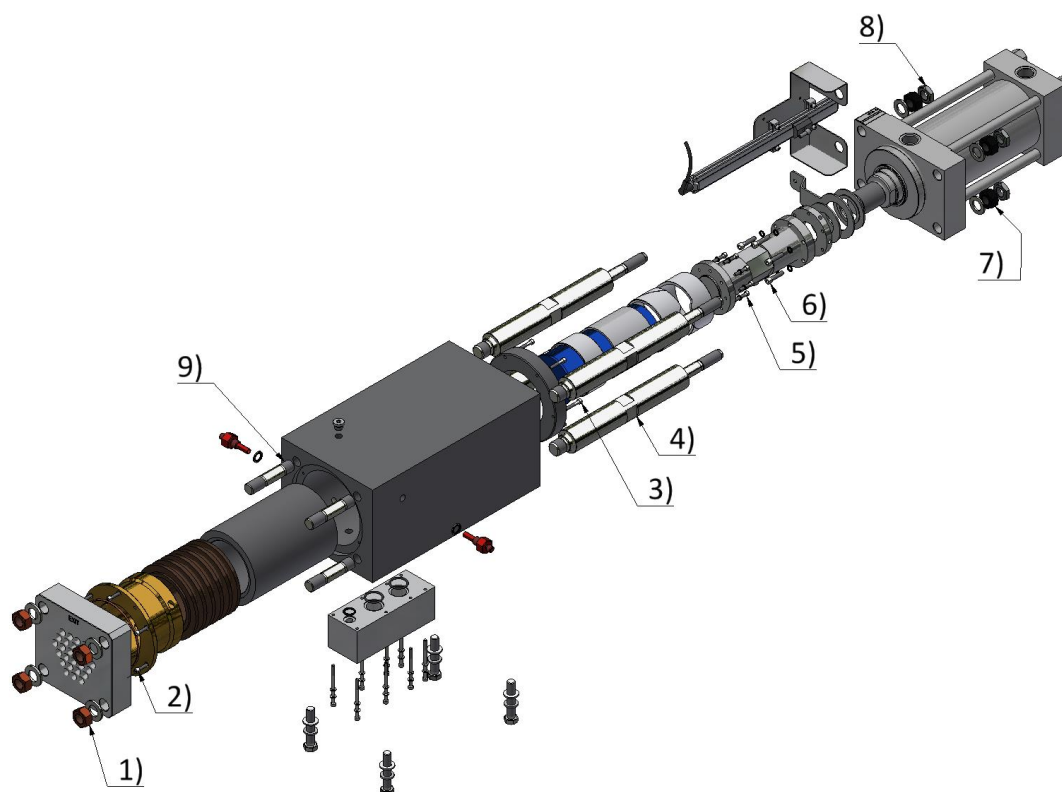


Fig. 54

6.4 TORQUE SETTINGS

With the exception of the tightening torques specified in (fig. 55), there are no specific tightening torques for screws of ASCO products.



Pos.	Nm	Notes
1	60	Apply Silicone
2	9	-
3	9	Apply Loctite 243
4	300	-
5	9	-
6	19	-
7	180	-
8	50	Apply Loctite 243
9	-	Apply Loctite 243

Fig. 55

6.5 CLEANING

	WARNING Before removing a cover of the dry ice pelletizer or carrying out work on the pelletizer, ensure that: ▪ The dry ice pelletizer has stopped and the main switch is turned to "0/OFF". ▪ The entire pelletizer is depressurised! ▪ All applicable safety regulations have been complied with! ▪ The main plug has been disconnected!
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Pelletizer chamber and extruder plate

- The pelletizer chamber and the extruder plate should be cleaned at least once a week.
- Before cleaning, ensure that all the parts have warmed to ambient temperature.
- Switch on the pelletizer and move the piston manually to the rearmost position.
- Turn the main switch to "0/OFF" and ensure that the machine is fully shut down.
- Wipe out and dry the pelletizer chamber with a clean cloth. There must be no residue in the pelletizer chamber.
- Blow out and dry the extruder plate 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.

	CAUTION ▪ Do not use solvents or cleaning agents to clean the pelletizer chamber and all associated parts. ▪ When working on cold parts, wear protective gloves.
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7 TROUBLESHOOTING

	WARNING
All work described in this section may only be performed by trained and qualified persons. Ensure that all safety instructions are known and observed.	

Fault	Possible cause	Remedy	Who
No dry ice snow is produced	Tank pressure too low, CO ₂ supply rate too low, or excessive pipe resistance in supply line	Increase tank pressure, increase feed rate and modify supply line according to instructions.	Customer service
	Gas in liquid CO ₂ line	Wait until CO ₂ is fed to system.	Operator
	Liquid CO ₂ solenoid valves not working	Check whether the two solenoid valves are working correctly.	Operator
	Solenoid valves 1 and 2 fail to 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.	Customer service
	Solenoid valves blocked	Check solenoid valves and replace, if necessary.	Customer service
Too much snow in the recovery line	Check sintered bush for damage.	Replace defective sintered bush.	Customer service
	Liquid CO ₂ solenoid valves not working	Check whether the solenoid valves are blocked (open).	Customer service
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 properly.	Check whether the two solenoid valves are working correctly.	Operator
	Solenoid valves 1 and 2 fail to 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.	Customer service

7.1 SOFTWARE ERROR / ALARM

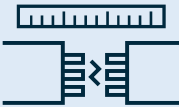
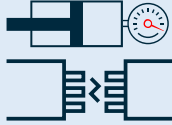
	NOTE Before contacting ASCO Customer Service, please have the following information ready: - Serial number of the machine - Operating hours of the machine
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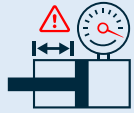
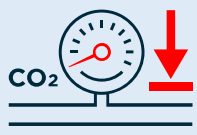
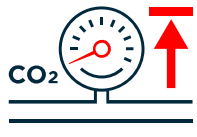
  				ASCO	08.06.2022 15:57:01	
Error 01		Error 02		Error 03		
Error 04		Error 05		Error 07		
Error 10		Error 11		Error 12		
Error 13		Error 14		Error 15		
Error 17		Error 18		Nächste Seite		
XX-XXX-XXX V 400 400			 DE			

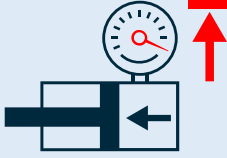
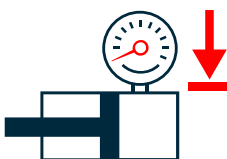
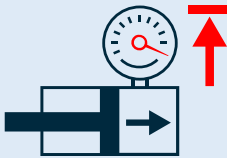
Fig. 56

  				ASCO	08.06.2022 16:08:56	
Error 19		Error 20		Error 21		
Error 22		Error 23		Error 24		
				Nächste Seite		
XX-XXX-XXX V 400 400			 DE			

Fig. 57

Nr.	Error text	Measures
Error 01	Emergency stop 	- Reset Emergency Stop switch. - Restart machine. - Contact ASCO Helpdesk.
Error 02	Wire break linear measuring system 	- Check wiring of length measuring device. - Check length measuring device. - Restart the machine and production. - Contact ASCO Helpdesk.
Error 03	Wire breakage pressure sensor CO ₂ 	- Check CO₂ pressure sensor wiring. - Check CO₂ pressure sensor. - Restart the machine and production. - Contact ASCO Helpdesk.
Error 04	Wire breakage pressure sensor hydraulics 	- Check hydraulic pressure sensor wiring. - Check hydraulic pressure sensor. - Restart the machine and production. - Contact ASCO Helpdesk.
Error 05	Motor protection switch hydraulic motor 	- Reset motor protection switch of hydraulic system, start production again. - Contact ASCO Helpdesk.
Error 07	Contactor hydraulic motor 	- Check motor function and power supply. - Restart the machine and production. - Contact ASCO Helpdesk.
Error 10	Contactor fan 	- Check fan function, clean fins. - Check hydraulic oil level. - Contact ASCO Helpdesk.
Error 11	Service time reached 	- Service due. - Contact ASCO Helpdesk.

Error 12	Maximum pressure protection zone 	- Remove extruder plate and empty pelletizer chamber. - Completely reassemble machine. - Restart the machine and production. - Contact ASCO Helpdesk.
Error 13	Hydraulic oil level low 	- Inspect hydraulics for leaks. - Top up hydraulic oil. - Restart machine. - Contact ASCO Helpdesk.
Error 14	Temperature hydraulic oil high 	- Check electrical fuses. - Remove extruder plate and empty pelletizer chamber. - Inspect pelletizer chamber and ram for wear. - Completely reassemble machine. - Restart the machine and production. - Contact ASCO Helpdesk.
Error 15	Maximum cycle time exceeded 	- Remove extruder plate and empty pelletizer chamber. - Inspect pelletizer chamber and ram for wear. - Test hydraulic function manually. - Restart the machine and production. - Contact ASCO Helpdesk.
Error 17	Front end position not reached 	- Remove extruder plate and empty pelletizer chamber. - Inspect pelletizer chamber and ram for wear. - Check wiring of length measuring device. - Check the length measuring device. - Restart the machine and production. - Contact ASCO Helpdesk.
Error 18	Rear end position not reached 	- Remove extruder plate and empty pelletizer chamber. - Inspect pelletizer chamber and ram for wear. - Check wiring of length measuring device. - Check the length measuring device. - Restart the machine and production. - Contact ASCO Helpdesk.
Error 19	Minimum pressure CO₂ not reached 	- Check CO₂ tank pressure. - Check CO₂ supply line. - Check CO₂ pressure sensor wiring. - Check CO₂ pressure sensor. - Restart the machine and production. - Contact ASCO Helpdesk.
Error 20	Maximum pressure CO₂ exceeded 	- Check CO₂ tank pressure. - Check CO₂ supply line. - Check CO₂ pressure sensor wiring. - Check CO₂ pressure sensor. - Restart the machine and production. - Contact ASCO Helpdesk.

Error 21	Maximum pressure hydraulics exceeded (backwards) 	- Remove extruder plate and empty pelletizer chamber. - Inspect pelletizer chamber and ram for wear. - Check hydraulic pressure sensor wiring. - Check hydraulic pressure sensor. - Completely reassemble machine. - Restart the machine and production. - Contact ASCO Helpdesk
Error 22	Hydraulic pressure too low 	- Remove extruder plate and empty pelletizer chamber. - Inspect pelletizer chamber and ram for wear. - Check hydraulic pressure sensor wiring. - Check hydraulic pressure sensor. - Completely reassemble machine. - Restart the machine and production. - Contact ASCO Helpdesk.
Error 23	Maximum pressure hydraulics exceeded (forward) 	- Remove extruder plate and empty pelletizer chamber. - Inspect pelletizer chamber and ram for wear. - Check hydraulic pressure sensor wiring. - Check hydraulic pressure sensor. - Completely reassemble machine. - Restart the machine and production. - Contact ASCO Helpdesk.
Error 24	Reference run invalid 	- Check the attachment of the linear measuring system and realign if necessary. - Contact ASCO Helpdesk.

7.2 AUTOMATIC SAFETY SHUTDOWN



Fig. 58

Function	If the hydraulic pressure in the degassing socket area is above the 80 bar, the machine is stopped and the Safety Zone function is started.
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 a defective injection valve can cause problems, first close the CO₂ supply line. ▪ Remove the discharge unit and extruder plate. ▪ Switch on the hydraulic system. ▪ Move the cylinder forward to empty the entire pelletizer chamber. ▪ Switch off the hydraulic system. ▪ Clean and remount the discharge unit and extruder plate. ▪ The machine is now ready for operation. ▪ If the safety zone monitoring is reactivated after a short time, ASCO Customer Service should be consulted.

8 DECOMMISSIONING / DISMANTLING / DISPOSAL

	WARNING All decommissioning, dismantling and disposal work must be carried out by trained and qualified persons. Ensure that all safety instructions are known and observed.
	NOTE ASCO machines have been designed according to ecological design principles and contain high-quality materials. Ensure that all materials are recycled and disposed of in accordance with the current ecological guidelines and local regulations.