

Instruction book

Heatless adsorption compressed air dryers

CD 10+, CD 15+, CD 20+, CD 30+, CD 40+, CD 55+,
CD 65+, CD 75+, CD 90+, CD 110+, CD 140+, CD 160+

Atlas Copco

Heatless adsorption compressed air dryers

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CD 65+, CD 75+, CD 90+, CD 110+, CD 140+, CD 160+

Instruction book

Original instructions

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1 Safety precautions

1.1 Safety icons



Danger: Indicates a hazard with a high level of risk, which, if not avoided, will result in death or serious injury and / or property damage.



Warning: Indicates a hazard with a medium level of risk, which, if not avoided, could result in death or serious injury.



Caution: Indicates a hazard with a low level of risk, which, if not avoided, could result in minor or moderate injury.



Notice: Indicates that a mandatory action shall be taken to avoid a hazard.

1.2 General safety precautions

General precautions



Warning: All responsibility for any damage or injury resulting from neglecting these precautions, or non-observance of the normal caution and care required for installation, operation, maintenance and repair, even if not expressly stated, will be disclaimed by the manufacturer.

1. The dryers are designed for normal indoor use.
2. The operator must employ safe working practices and observe all related work safety requirements and regulations.
3. If any of the following statements does not comply with the applicable legislation, the stricter of the two shall apply.
4. Installation, operation, maintenance and repair work must only be performed by authorized, trained, specialized personnel.
5. The dryer is not considered capable of producing air of breathing quality. To obtain air of breathing quality, the compressed air must be adequately purified according to the applicable legislation and standards.
6. Before any maintenance, repair work, adjustment or any other non-routine checks, stop the dryer, press the emergency stop button, switch off the voltage and depressurize the dryer. In addition, the power isolating switch must be opened and locked. For plug versions, remove the plug from the wall socket and secure it.
7. Never play with compressed air. Do not apply the air to your skin or direct an air stream at people. Never use the air to clean dirt from your clothes. When using the air to clean equipment, do so with extreme caution and wear eye protection.
8. The owner is responsible for maintaining the dryer in safe operating condition. Parts and accessories shall be replaced if unsuitable for safe operation.
9. It is not allowed to walk or stand on the dryer or its components.

1.3 Safety precautions during installation

Precautions during installation

1. The dryer must only be lifted using suitable equipment and in accordance with the applicable safety regulations. Loose or pivoting parts must be securely fastened before lifting. It is strictly forbidden to dwell or stay in the risk zone under a lifted load. Lifting acceleration and deceleration must be kept within safe limits. Wear a safety helmet when working in the area of overhead or lifting equipment.
2. Place the dryer where the ambient air is as cool and clean as possible. If necessary, install a suction duct. Never obstruct the air inlet. Care must be taken to minimize the entry of humidity in the inlet air.
3. Any blanking flanges, plugs, caps or desiccant bags must be removed before connecting the pipes.
4. Air hoses must be of correct size and suitable for the working pressure. Never use frayed, damaged or worn hoses. Distribution pipes and connections must be of the correct size and suitable for the working pressure.
5. The aspirated air must be free of flammable fumes, vapors and particles, e.g. paint solvents, that can lead to internal fire or explosion.
6. Arrange the air intake so that loose clothing worn by people cannot be sucked in.
7. Ensure that all piping is free to expand under heat and that it is not in contact with or close to flammable materials.
8. No external force may be exerted on the air outlet valve. The connected pipe must be free of strain.
9. If remote control is installed, the machine must bear a clear sign stating "Danger: This machine is remotely controlled and may start without warning"

The operator has to make sure that the machine is stopped and that the isolating switch is open and locked before any maintenance or repair. As a further safeguard, persons switching on remotely controlled machines shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the starting equipment.

10. Air-cooled machines must be installed in such a way that an adequate flow of cooling air is available and that the exhausted cooling air does not recirculate to the inlet.
11. The electrical connections must correspond to the applicable codes. The machines must be earthed and protected against short circuits by fuses in all phases. A lockable power isolating switch must be installed near the equipment.
12. On machines with automatic start-stop system or if the automatic restart function after voltage failure is activated, a sign stating "This machine may start without warning" must be affixed near the instrument panel.
13. Never remove or tamper with the safety devices, guards or insulation fitted on the machine. Every pressure vessel or auxiliary installed outside the machine to contain air above atmospheric pressure must be protected by a pressure-relieving device or devices as required.
14. Piping or other parts with a temperature in excess of 80°C (176°F) and which may be accidentally touched by personnel during normal operation must be guarded or insulated. Other high-temperature piping must be clearly marked.
15. For water-cooled machines, the cooling water system installed outside the machine has to be protected by a safety device with set pressure according to the maximum cooling water inlet pressure.

16. If no safety valve is present in the air net close to the desiccant dryer (e.g. safety valve of compressor), full flow safety valves must be installed on the dryer vessels.
17. If the maximum pressure of the compressor is higher than the design pressure of the dryer, a full flow safety valve must be installed between the compressor and the dryer in order to blow off the excessive pressure. This is done in case the safety valve of the dryer is out of order or blocked.
18. When unit is not permanently secured to the floor in the vertical position or mounted horizontally, access to electrical equipment is feasible through the unit base. In this case, additional barriers must be provided during installation. Tag with "Warning: High Voltage" symbol.

**Note:**

Also consult following safety precautions: Safety precautions during operation and Safety precautions during maintenance or repair.

These precautions apply to machinery processing or consuming air or inert gas. Processing of any other gas requires additional safety precautions typical to the application which are not included herein.

Some precautions are general and cover several machine types and equipment; hence some statements may not apply to your machine.

1.4 Safety precautions during operation

Precautions during operation

1. Always be careful when touching any piping or components of the dryer during operation. On dryers using heat to regenerate the desiccant, some parts will become very hot.
2. Use only the correct type and size of hose end fittings and connections. When blowing through a hose or air line, ensure that the open end is held securely. A free end will whip and may cause injury. Make sure that a hose is fully depressurized before disconnecting it.
3. Persons switching on remotely controlled machines shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the remote start equipment.
4. Never operate the machine when there is a possibility of taking in flammable or toxic fumes, vapors or particles.
5. Never operate the machine below or in excess of its limit ratings.
6. Keep all bodywork closed during operation. Bodywork should be opened for short periods only, e.g. to carry out routine checks. Wear ear protectors when removing a panel.
7. People staying in environments or rooms where the sound pressure level reaches or exceeds 90 dB(A) shall wear ear protectors.
8. Periodically check that:
 - All guards are in place and securely fastened
 - All hoses and/or pipes inside the machine are in good condition, secure and not rubbing
 - There are no leaks
 - All fasteners are tight
 - All electrical leads are secure and in good order
 - Safety valves and other pressure relief devices are not obstructed by dirt or paint
 - Air outlet valve and air net, i.e. pipes, couplings, manifolds, valves, hoses, etc. are in good condition, free of wear or abuse

9. If warm cooling air from dryers is used in air heating systems, e.g. to warm up a working area, take precautions against air pollution and possible contamination of the breathing air.
If warm cooling air from dryers is used in air heating systems, e.g. to warm up a working area, take precautions against air pollution and possible contamination of the breathing air.
10. Do not remove any of, or tamper with, the sound dampening material.
11. Never remove or tamper with the safety devices, guards or insulations fitted on the machine. Every pressure vessel or auxiliary installed outside the machine to contain air above atmospheric pressure shall be protected by a pressure relieving device or devices as required.
12. Yearly inspect the air receiver. Minimum wall thickness as specified in the instruction book must be respected. Local regulations remain applicable if they are more strict.

**Note:**

Also consult following safety precautions: Safety precautions during operation and Safety precautions during maintenance or repair.

These precautions apply to machinery processing or consuming air or inert gas. Processing of any other gas requires additional safety precautions typical to the application which are not included herein.

Some precautions are general and cover several machine types and equipment; hence some statements may not apply to your machine.

1.5 Safety precautions during maintenance or repair

Precautions during maintenance or repair

1. Always use the correct safety equipment (such as safety glasses, gloves, safety shoes, etc.)
2. Use only the correct tools for maintenance and repair work.
3. Use only genuine spare parts.
4. All maintenance work shall only be undertaken when the machine has cooled down.
5. A warning sign bearing a legend such as "Work in progress - do not start" shall be attached to the starting equipment.
6. Persons switching on remotely controlled machines shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the remote starting equipment.
7. Close the dryer air outlet valve before connecting or disconnecting a pipe.
8. Before removing any pressurized component, effectively isolate the machine from all sources of pressure and relieve the entire system of pressure.
9. Never use flammable solvents or carbon tetrachloride for cleaning parts. Take safety precautions against toxic vapours of cleaning liquids.
10. Scrupulously observe cleanliness during maintenance and repair. Keep dirt away by covering the parts and exposed openings with a clean cloth, paper or tape.
11. Never weld on, or in any way modify, pressure vessels.
12. Whenever there is an indication or any suspicion that an internal part of a machine is overheated, the machine shall be stopped but no inspection covers shall be opened before sufficient cooling time has elapsed; this to avoid the risk of spontaneous ignition of the oil vapor when air is admitted.
13. Never use a light source with open flame for inspecting the interior of a machine, pressure vessel, etc.
14. Make sure that no tools, loose parts or rags are left in or on the machine.

15. All regulating and safety devices shall be maintained with due care to ensure that they function properly. They may not be put out of action.
16. Before clearing the machine for use after maintenance or overhaul, check that operating pressures, temperatures and time settings are correct. Check that all control and shut-down devices are fitted and that they function correctly.
17. Protect the motor, electrical and regulating components, etc. to prevent moisture from entering them, e.g. when steam-cleaning.
18. Make sure that all sound-damping material and vibration dampers, e.g. damping material on the bodywork, is in good condition. If damaged, replace it by genuine material from the manufacturer to prevent the sound pressure level from increasing.
19. Never use caustic solvents which can damage materials of the air net, e.g. polycarbonate bowls.
20. **The following safety precautions are stressed when handling refrigerant:**
 - Never inhale refrigerant vapours. Check that the working area is adequately ventilated; if required, use breathing protection.
 - Always wear special gloves. In case of refrigerant contact with the skin, rinse the skin with water. If liquid refrigerant contacts the skin through clothing, never tear off or remove the latter; flush abundantly with fresh water over the clothing until all refrigerant is flushed away; then seek medical first aid.
21. **The following safety precautions are stressed when handling desiccant:**
 - Take precautions not to inhale desiccant dust.
 - Check that the working area is adequately ventilated; if required, use breathing protection.
 - Do not overfill the dryer when replacing desiccant.

**Note:**

Also consult following safety precautions: Safety precautions during operation and Safety precautions during maintenance or repair.

These precautions apply to machinery processing or consuming air or inert gas. Processing of any other gas requires additional safety precautions typical to the application which are not included herein.

Some precautions are general and cover several machine types and equipment; hence some statements may not apply to your machine.

2 General description

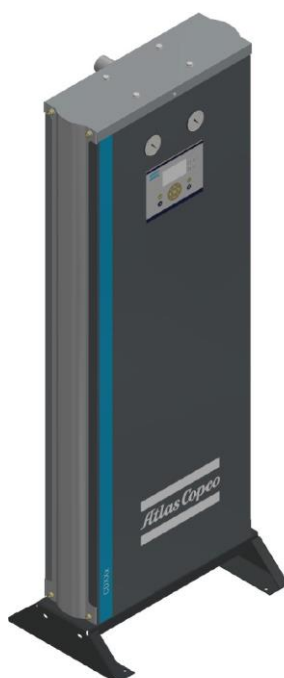
2.1 General description

Introduction

The air dryers described in this book are heatless adsorption dryers, built to remove moisture from compressed air for industrial purposes.

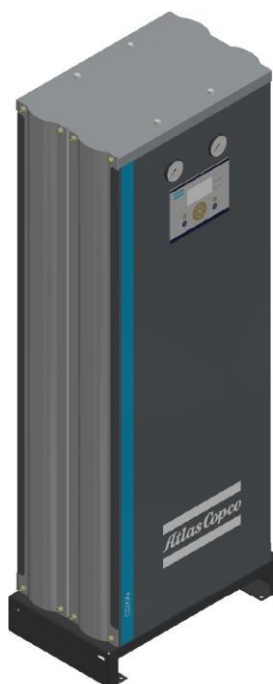
They are equipped with the basic regulation system and are intended to reach a pressure dew point of $-40\text{ }^{\circ}\text{C}$ ($-40\text{ }^{\circ}\text{F}$).

All units are designed for indoor use.



87228

Figure 1: General view, CD 10+ up to CD 65+, simplex version



87226

Figure 2: General view, CD 75+ up to CD 110+, duplex version

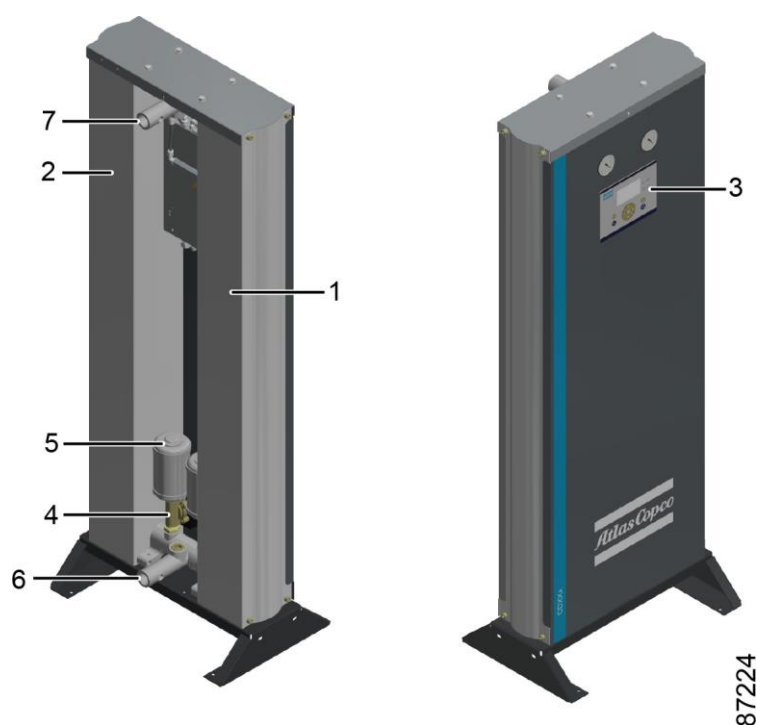


87227

Figure 3: General view, CD 140+ up to CD 160+, triplex version

Main parts

An overview of the main parts of the dryer is given in below figures:



Reference	Description	Reference	Description
1	Tower 1	5	Silencers
2	Tower 2	6	Air inlet
3	Control panel	7	Air outlet
4	Solenoid valve		

2.2 Operation

General

The construction of the air dryer is simple, reliable and easy to service. A dryer has basically two towers, containing the adsorption material or desiccant. This desiccant is a very porous grain material, able to adsorb large amounts of water vapor.

Operation principle (basic control)

The operation cycle of the dryer is repetitive and is controlled by a factory-set timer. While the desiccant in one tower dries the compressed air, the desiccant in the second tower is being regenerated. Regeneration of the desiccant is achieved by means of purge air from the drying tower.

The compressed air entering the dryer is led to one of the towers by means of the bottom selector valve. The position of the selector valve depends on the condition (activated or not) of the solenoid valves. As the air flows upwards through the tower, the desiccant adsorbs the water vapor and the compressed air is dried.

Once the top of the tower is reached, the air leaves the dryer via the check valve.

A small portion of the dried air passes a nozzle, expands to atmospheric pressure and flows downwards through the other tower, regenerating (drying) the desiccant. A nozzle for operation of the dryer at 7 bar is installed as standard. Alternative nozzles for use at other operating pressures are available as sales kit. Please consult the spare parts list for specific information. The regeneration air is released via the corresponding solenoid valve and the silencer. The solenoid valves are controlled by the timer.

After a pre-set period, the function of the towers is reversed. The fully regenerated tower will now dry the air, while the desiccant in the other tower will be regenerated.

By default, the regeneration timer will restart from the beginning of the cycle in case of a power failure during operation or in case the on/off switch was put in position 0.

However, in case the input of remote control connector X0 (freeze contact, see section *Electrical diagram*) is closed (short circuits), the dryer will "freeze" the drying cycle: purge air flow stops, both solenoid valves are closed. When the contact, connected to connector X0 opens, the dryer will continue normal operation. This feature can prevent loss of compressed air (purge air) when the compressor is not continuously running loaded. On compressors with load/unload regulation, X0 can be connected to a voltage free contact of the compressor (contact closed when the compressor runs unloaded). If no free contact is available, an additional voltage free contact should be installed on the load/unload contactor of the compressor to use this feature. See section *Electrical connections* for more details.



Note:

Do not connect X0 when an air receiver is installed before the dryer.

X0 should only be connected when the air receiver is installed downstream of the dryer.

(See section *Installation proposal*)

Flow diagrams

Depending on the dryer size, the dryer can be composed of a single dryer module (flow diagram: refer to simplex configuration), or of two or three dryer modules in parallel (refer to duplex and triplex configuration):

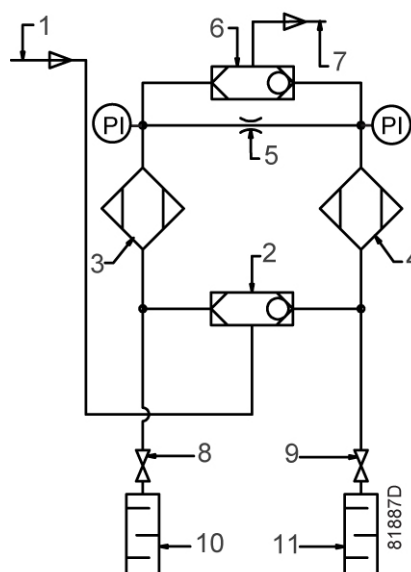


Figure 4: Flow diagram CD 10+ up to CD 65+ (simplex configuration)

Reference	Description	Reference	Description
1	Air inlet	7	Air outlet
2	Inlet selector valve	8	Left solenoid valve
3	Left desiccant tower	9	Right solenoid valve
4	Right desiccant tower	10	Silencer
5	Purge nozzle	11	Silencer
6	Outlet selector valve	PI	Pressure gauge

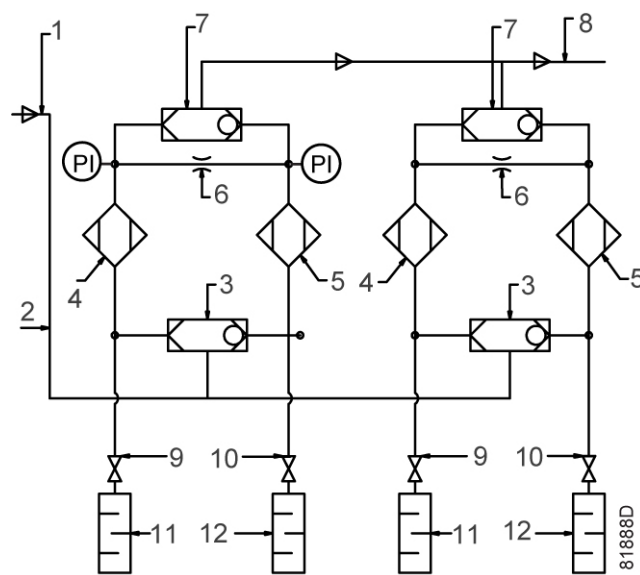


Figure 5: Flow diagram CD 75+ up to CD 110+ (duplex configuration)

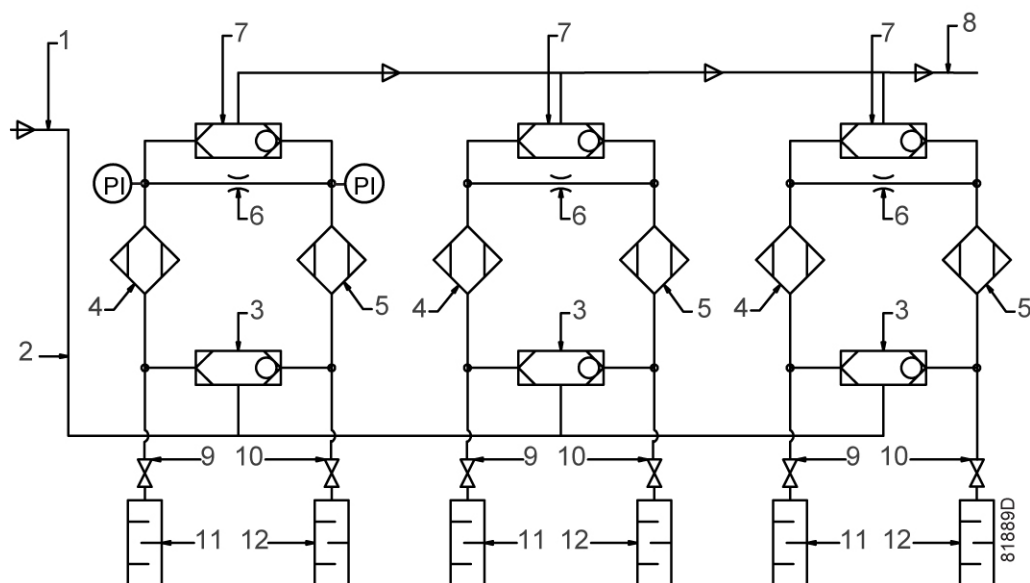


Figure 6: Flow diagram CD 140+, CD 160+ (triplex configuration)

Reference	Description	Reference	Description
1	Air inlet	7	Outlet selector valve
2	Connecting tube	8	Air outlet
3	Inlet selector valve	9	Left solenoid valve
4	Left desiccant tower	10	Right solenoid valve
5	Right desiccant tower	11	Left silencer
6	Purge nozzle	12	Right silencer
PI	Pressure gauge		

2.3 Control panel

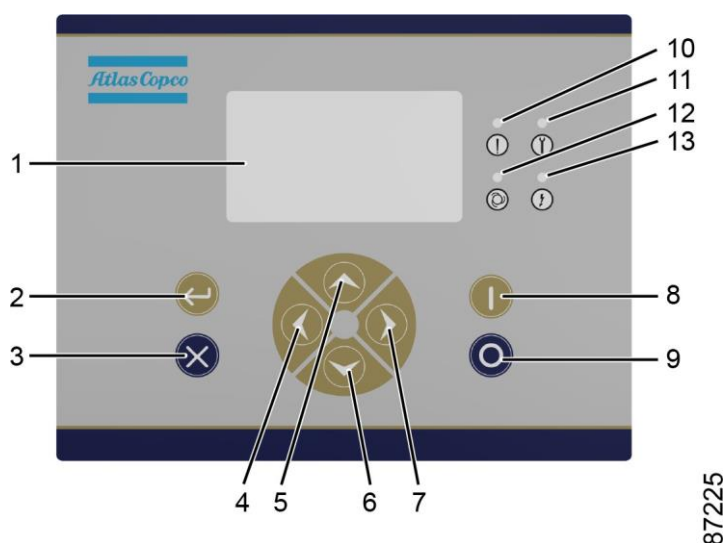


Figure 7: Control panel, basic version

Reference	Description	Reference	Description
1	Display	8	Start button
2	Confirm button	9	Stop button
3	Cancel button	10	Alarming
4	Left button	11	Maintenance
5	Upward button	12	Running
6	Downward button	13	Power
7	Right button		

Button function

Button	Description
Start	Start the dryer
Stop	Stop the dryer
Confirm	Confirm the current operation
Cancel	Cancel the current control operation and point to the next operation
Left	Move to left operation
Right	Move to right operation
Up	Move to up operation
Down	Move to down operation

LED function

Reference	Description	Function
Alarming	Red	Controller in alarm state
Maintenance	Red	Up to maintenance time
Running	Green	The dryer is running
Power	Yellow	Controller is on

Display

During operation, the main screen is displayed as follows:

```

LEFT STOPPED
RIGHT STOPPED
-40 °C      16 S
Alarm      Menu
87268

```

- The first line shows the working status of the left tower.
- The second line shows the working status of the right tower.
- If the pressure dew point (PDP) sensor is enabled, the first half of the third row shows the measured dew point value. If the sensor is found to be unconnected or faulty, the dew point value is not displayed (four dashes will replace the measured value).
- If the pressure dew point (PDP) sensor is not enabled, the first half of the third row is not displayed.
- The second half of the third row shows the countdown to the current work phase.
- Click on "Alarm" to jump to the "Alarm" screen.
- Click on "Menu" to jump to the "Menu" screen.

Alarm screen

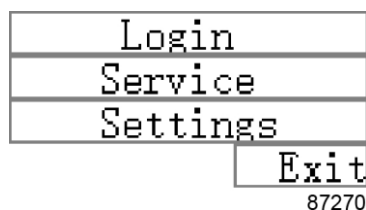
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PDP Unconnected
Exit
87269

```

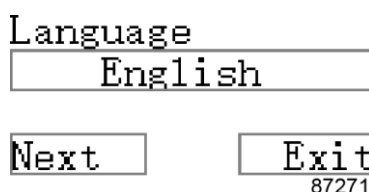
- If the PDP sensor is enabled and a PDP sensor fault is detected, the screen displays "PDP Unconnected".
- If the PDP sensor is enabled and high dew point is detected, the screen displays "high dew point".
- Click on "Back" to jump to the menu screen.

Menu screen



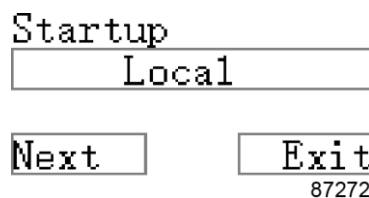
- Click on "Login" to jump to the "User Login" screen.
- Click on "Service" to jump to the "Service" screen.
- Click on "Settings" to jump to the "Parameter Settings" screen. This button is usually hidden. You need to enter the correct password on the "Login" screen. To obtain more than 1 level of permissions, this button is displayed.
- Click on "Exit" to jump to the menu screen.

Language screen



- The second line shows the option to switch the system language between "Chinese" and "English".
- Click on "Next" to jump to the "Start Method" screen.
- Click on "Exit" to jump to the menu screen.

"Start by" screen



- The "Toggle Start Mode" in the second line is used to switch between "Local" and "Remote".
- Click on "Next" to jump to the "Dew Point Sensor" screen.
- Click on "Exit" to jump to the menu screen.

"PDP sensor" screen

PDP enable
Off

Next Exit

87273

- In the second line, check whether PDP sensor is enabled.
- Click on "Next" to jump to the "PDP Settings" screen.
- Click on "Exit" to jump to the menu screen.

"PDP Settings" screen

PDP setpoint
-20°C

Next Exit

87274

- In the second line, internal values can be modified directly if the password is advanced.
- Click on "Next" to jump to the "Standby Time" screen.
- Click on "Exit" to jump to the menu screen.

"Standby Time" screen

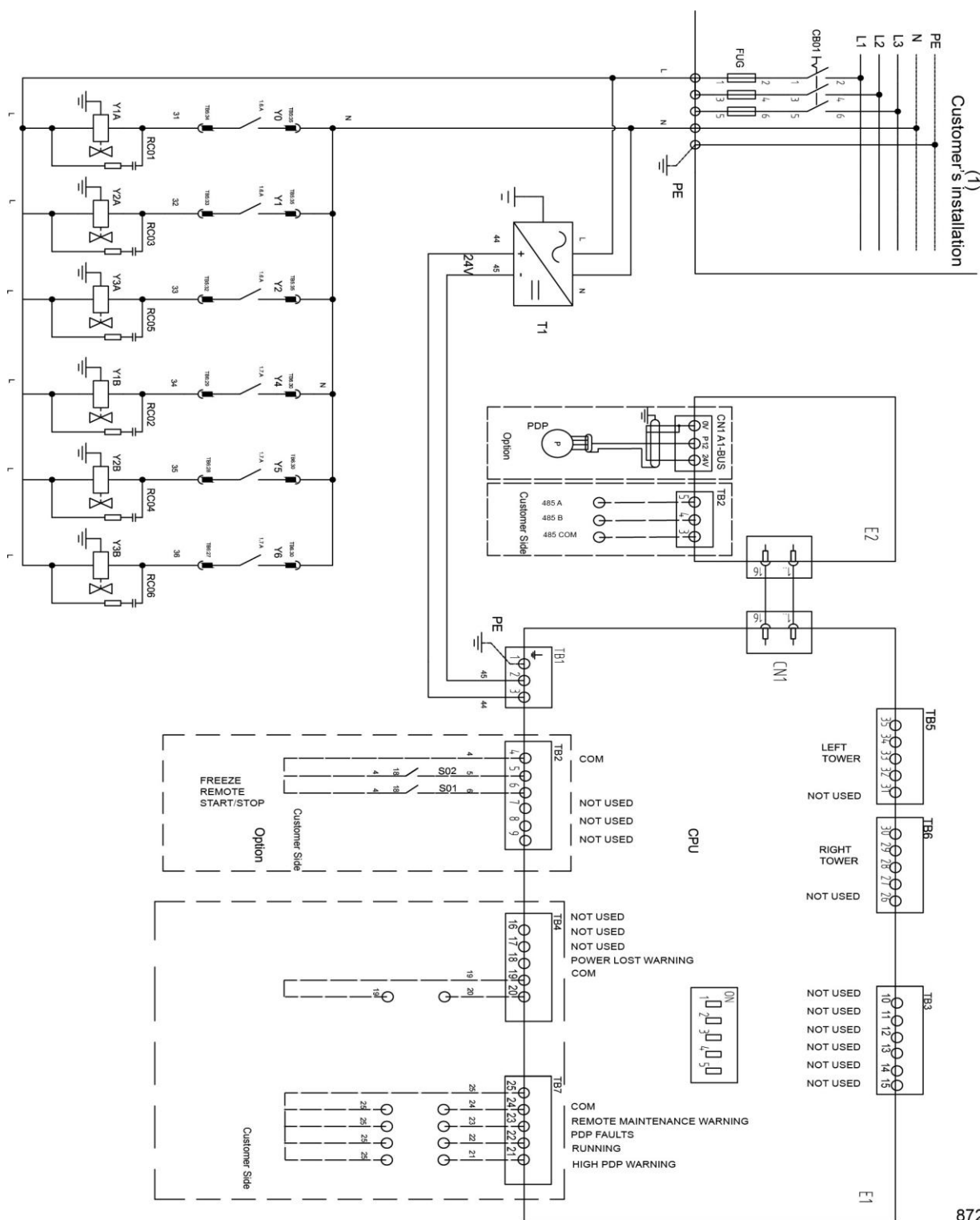
Standby Time
1 S

Next Exit

87275

- In the second line, set the standby time defaults to 120s. The time can be modified if you have advanced privileges.
- Click on "Next" to jump to the "Time Loop" screen.
- Click on "Exit" to jump to the menu screen.

3 Electrical diagram



Reference	Description
(1)	Customer's installation

4 Installation

4.1 Dimension drawings

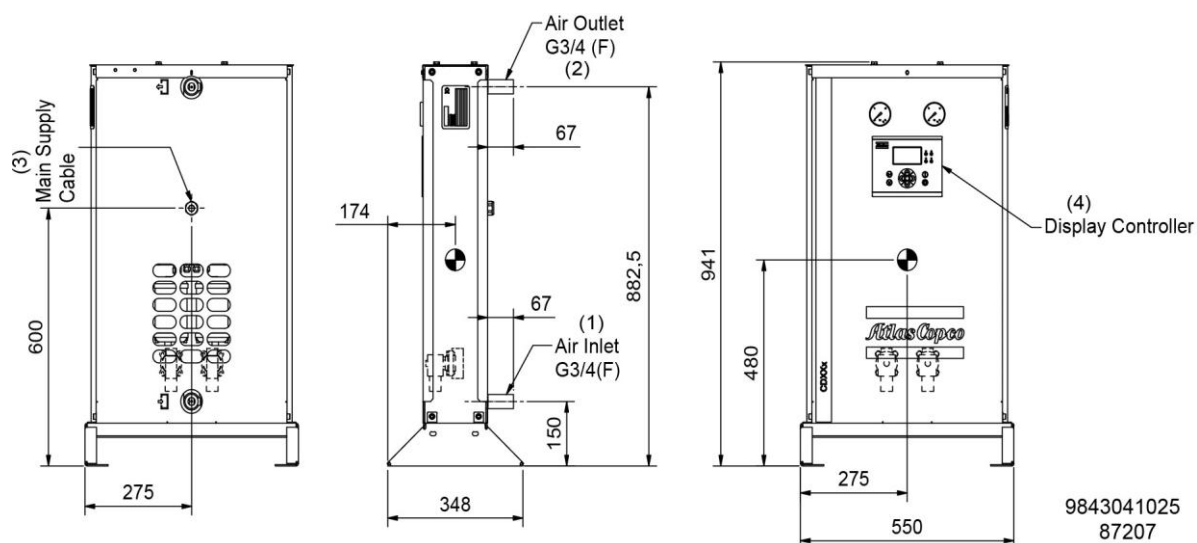


Figure 8: CD 10+ to CD 20+

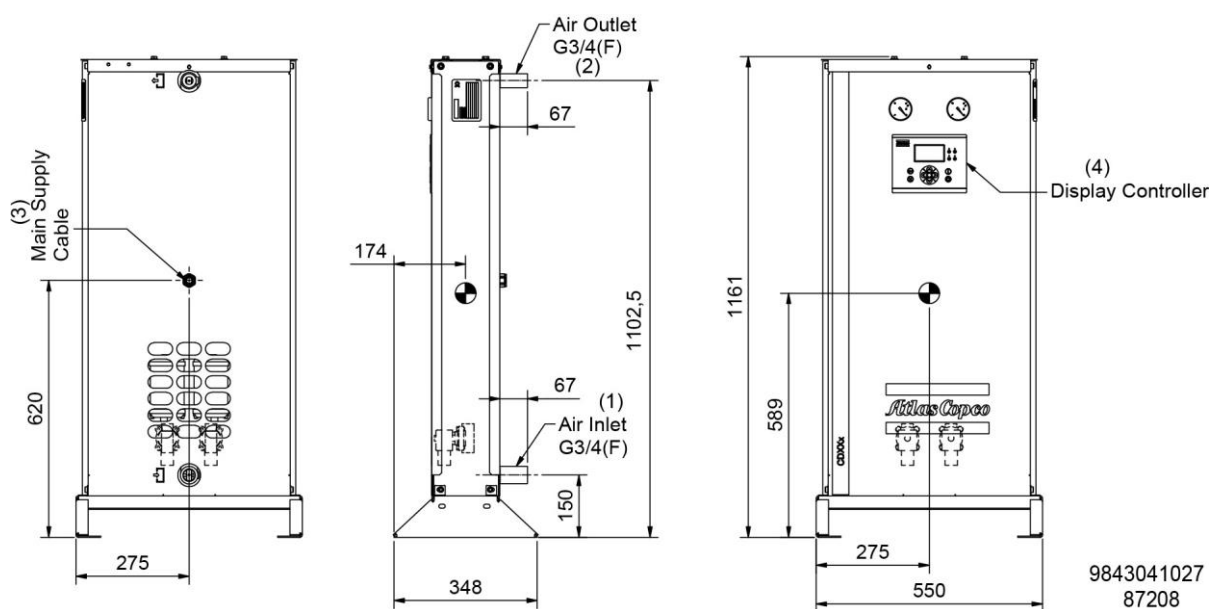


Figure 9: CD 30+

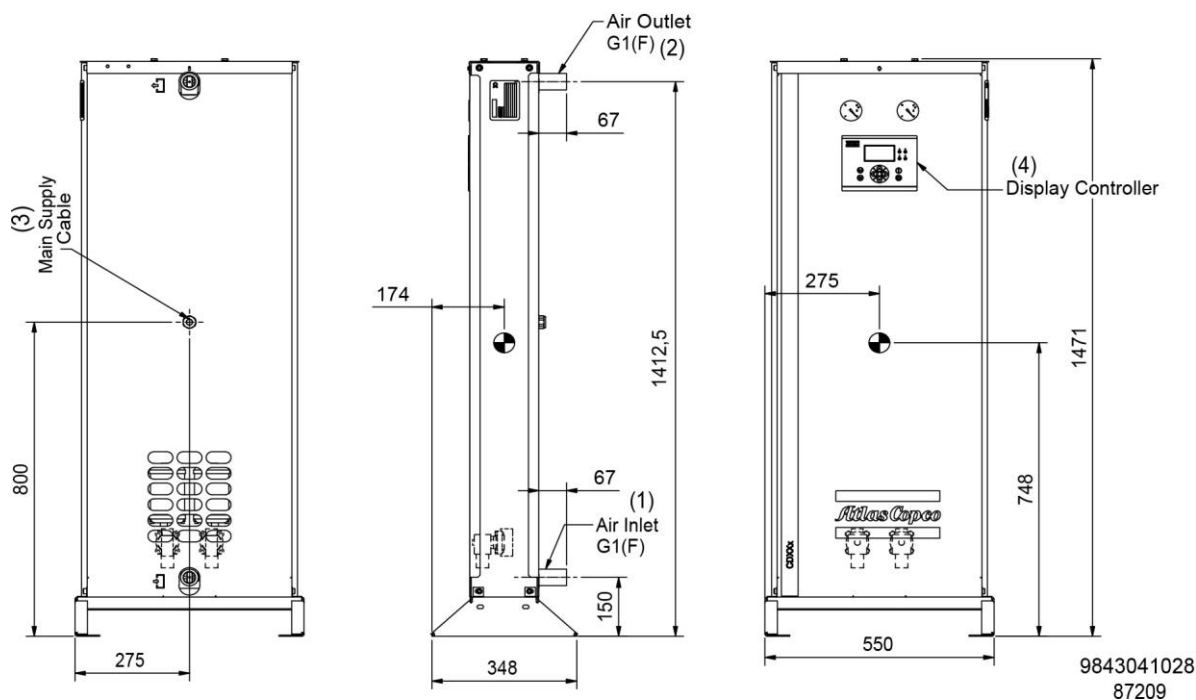


Figure 10: CD 40+

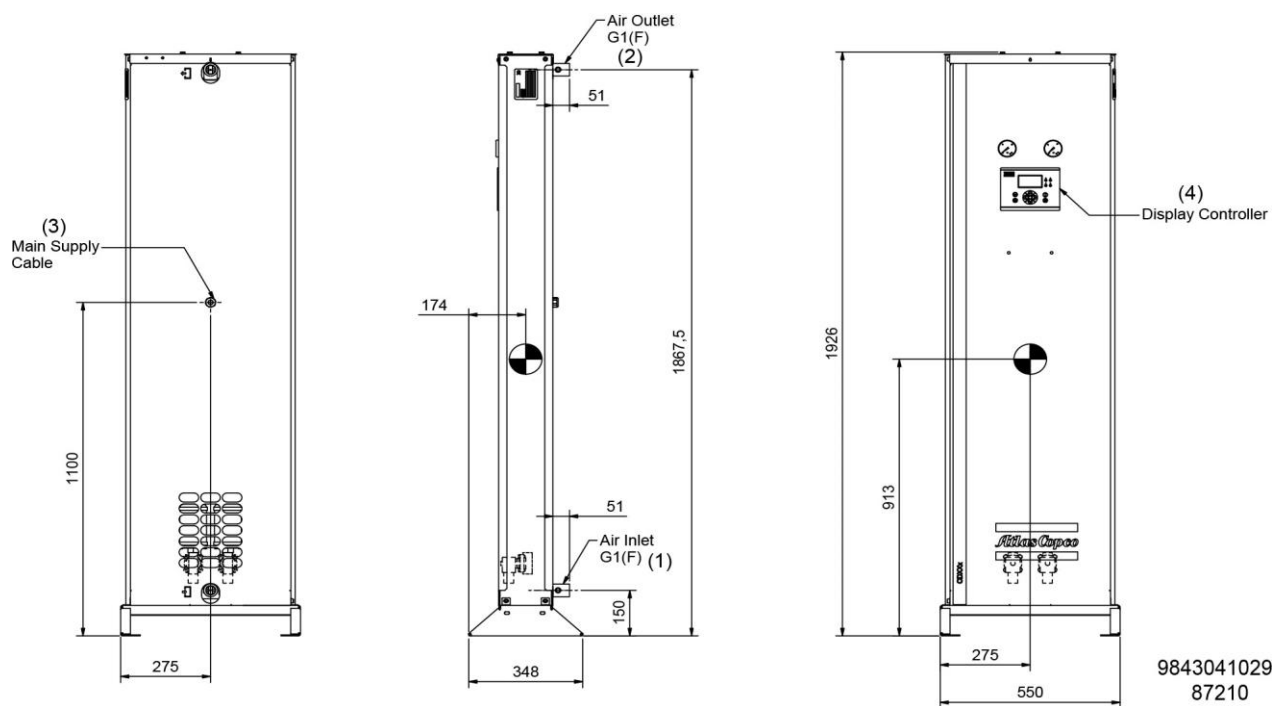


Figure 11: CD 55+ to CD 65+

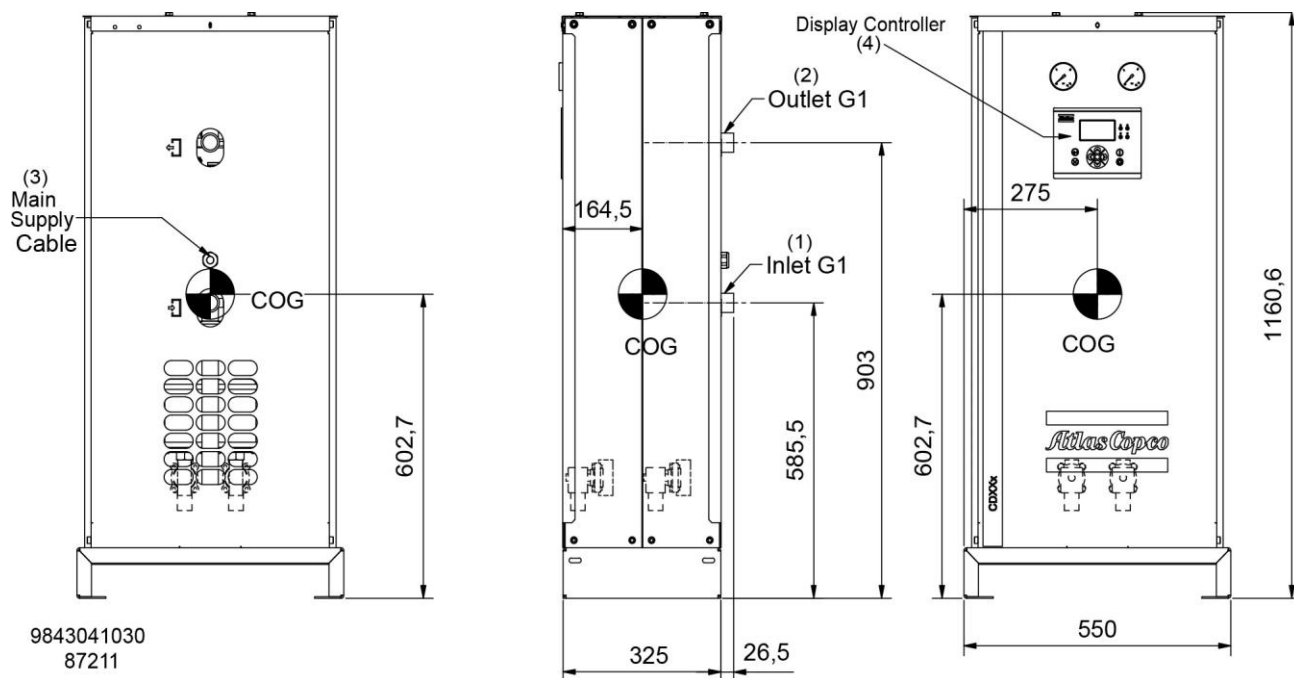


Figure 12: CD 75+

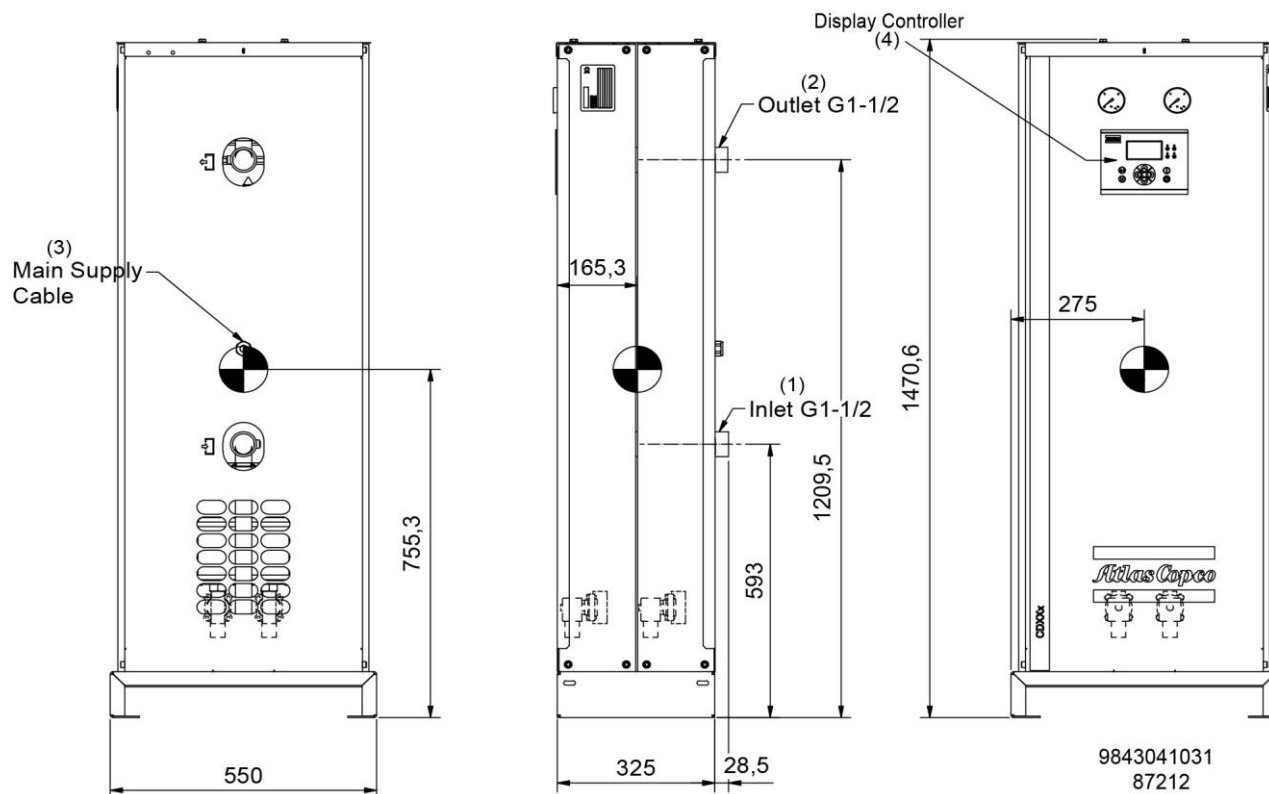


Figure 13: CD 90+

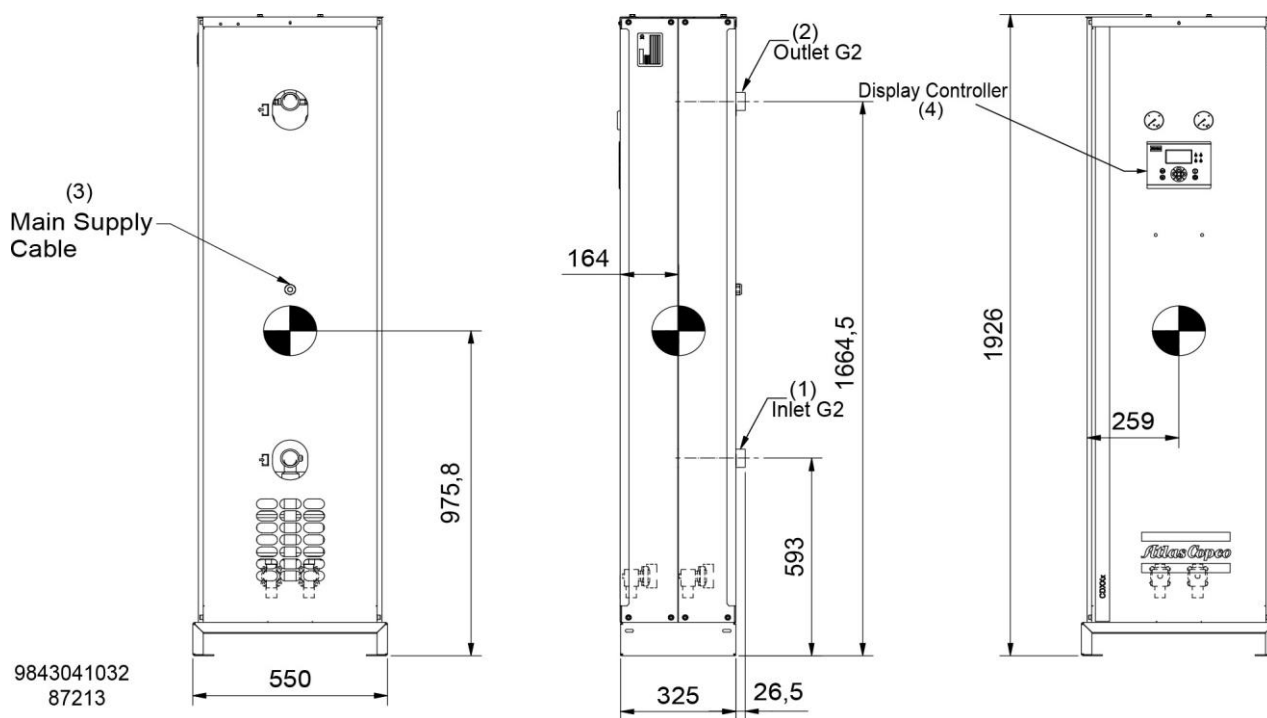


Figure 14: CD 110+

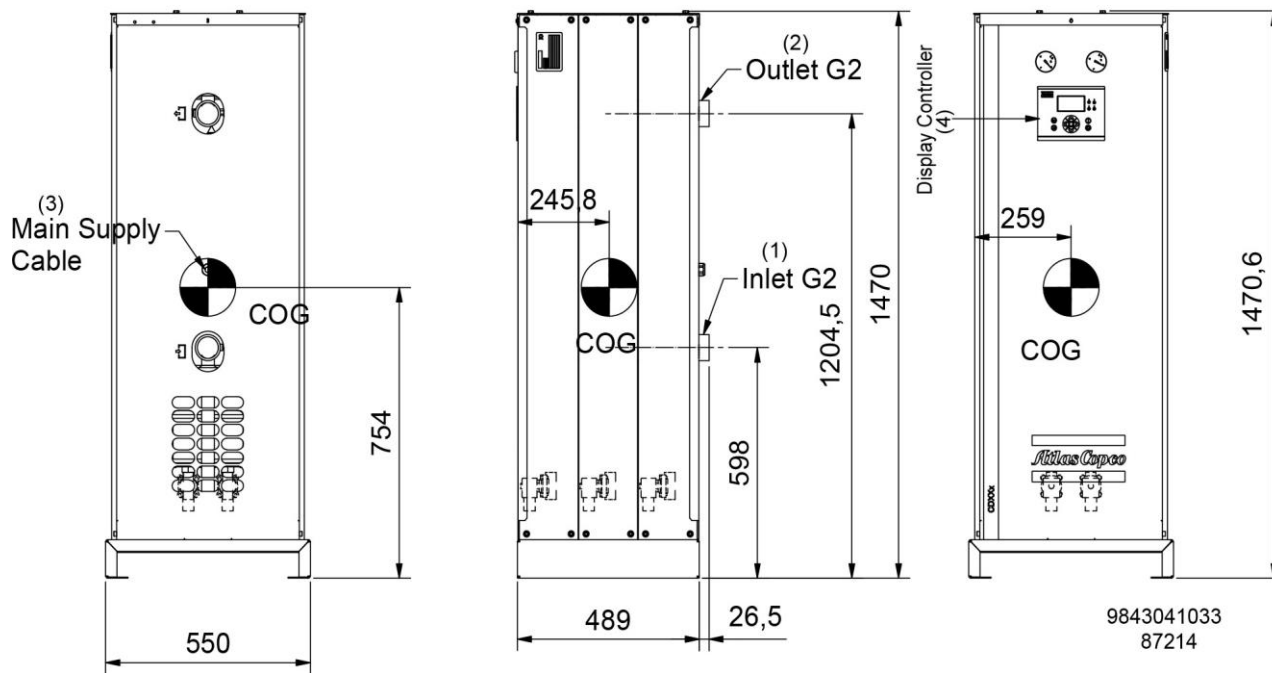


Figure 15: CD 140+

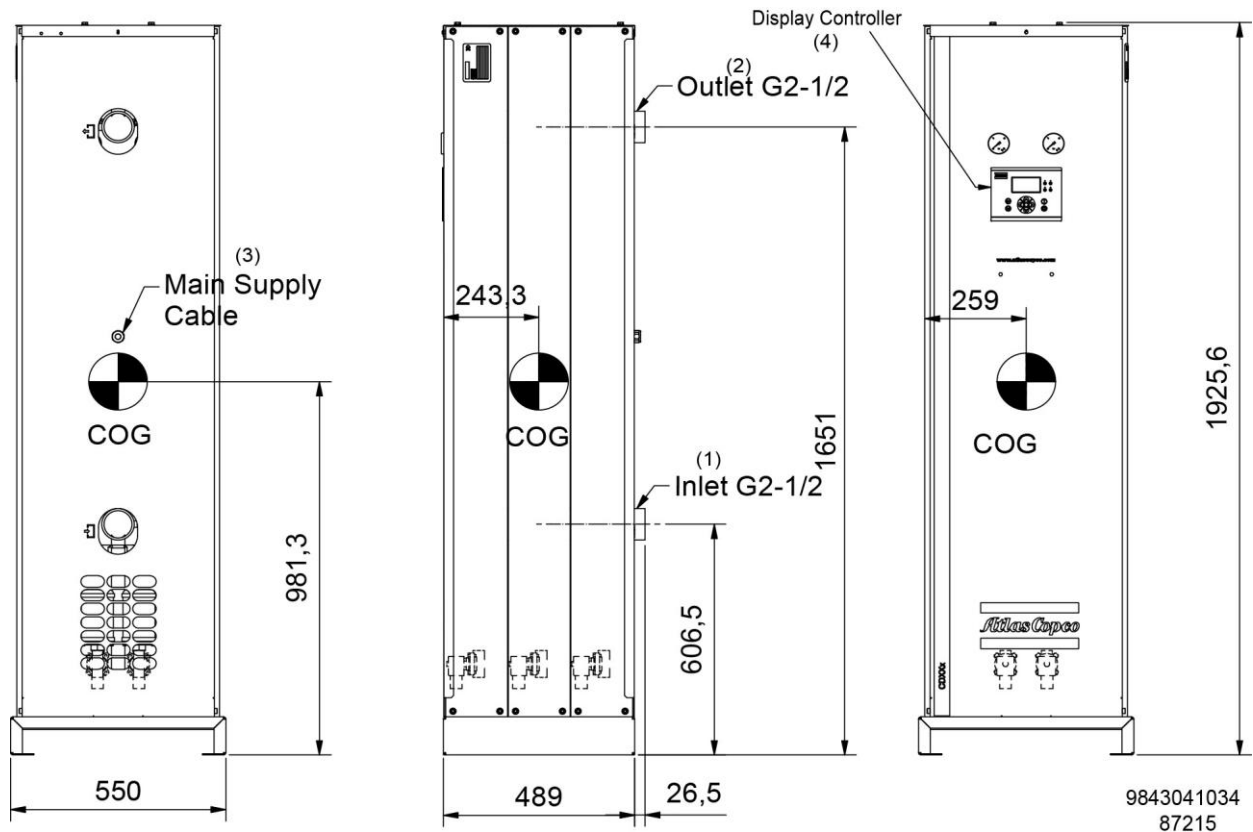


Figure 16: CD 160+

Reference	Description
(1)	Dryer inlet
(2)	Dryer outlet
(3)	Dryer main supply, One is a remote control harness (2-core cable) , another is a power harness (3-core cable)
(4)	Display controller

4.2 Installation proposal

Piping



Note:

Make sure that all pipes, filters, valves, etc. are clean and that they are installed correctly with or without bypass system.

Make sure that the piping is installed stress-free. For more information concerning air nets, cooling systems etc. refer to the compressor installation manual.

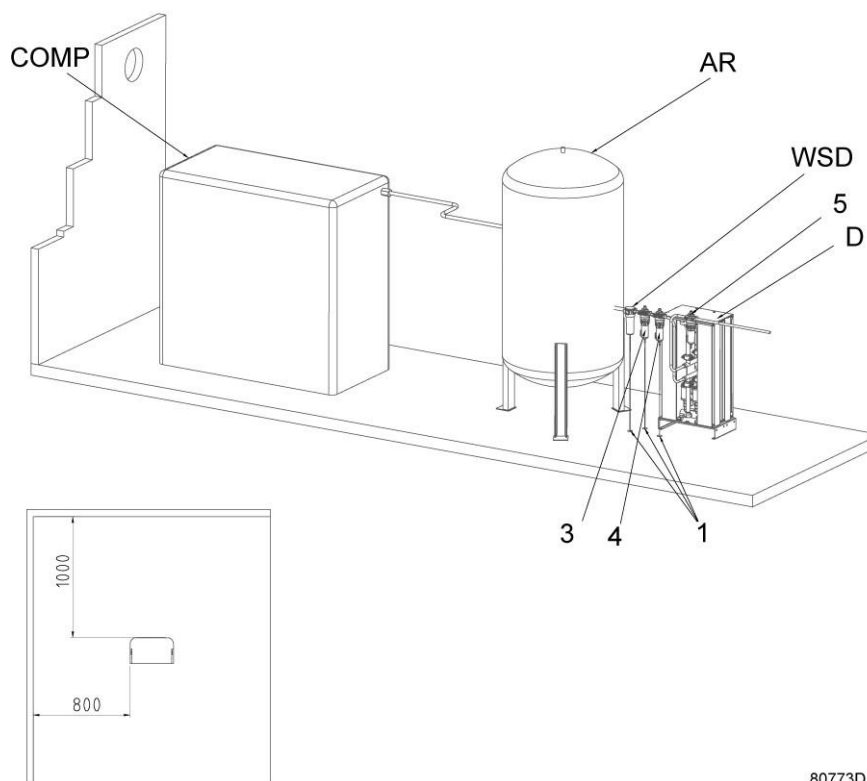
To ensure correct operation of the dryer, it has to be fitted properly into the compressed air circuit, consisting of the compressor, the dryer and the application.

Depending on the fact if the remote control connector X0 is used or not (see also section *Operation*), there are two possibilities:

Installation in case X0 is not used



Note: If the freeze contact X0 is not used, the correct order of installation is compressor - air receiver - dryer. For information on the <Freeze> contact, consult section *Electrical connections*.



80773D

Figure 17: Installation proposal if the “freeze” contact (X0) is not used

Reference	Description
COMP	Compressor
AR	Air receiver
D	Dryer
EIV	External inlet valve (not shown on the drawing) To cut off the air supply towards the dryer
EOV	External outlet valve (not shown on the drawing) To cut off the air supply towards the air consumer
BV	Bypass valves (not shown on the drawings) Together with the external inlet valve and the external outlet valve, the bypass valves allow the dryer and the filters to be serviced while non-dried air flows through the bypass system.
WSD	Water separator (optional) To prevent free water from entering the dryer.
1	The drain pipes to the drain collector must not dip into the water. For draining of pure condensate water, install an oil/water separator.
2	Minimum free area to be reserved for the dryer installation

Reference	Description
3	Compressed air prefilter DD: general purpose filtration, particle removal down to 1 micron, maximum oil carry-over 0.5 ppm This filter is not included in the scope of supply, but recommended to provide extra protection of the CD dryer and extend the lifetime of the PD filter cartridge.
4	PD filter: high efficiency filter, particle removal down to 0.01 micron, maximum oil carry-over 0.01 ppm To remove remaining impurities.
5	DDp filter: dust filter, particle removal down to 1 micron To remove dust particles originating from the desiccant. A QD Filter with active carbon, capable of absorbing odour can be installed downstream the DDp filter to remove undesired odours (not shown on the drawings).

Positioning in case X0 is used



Note: If the X0 connection is used, the correct order of installation is compressor - dryer - air receiver.

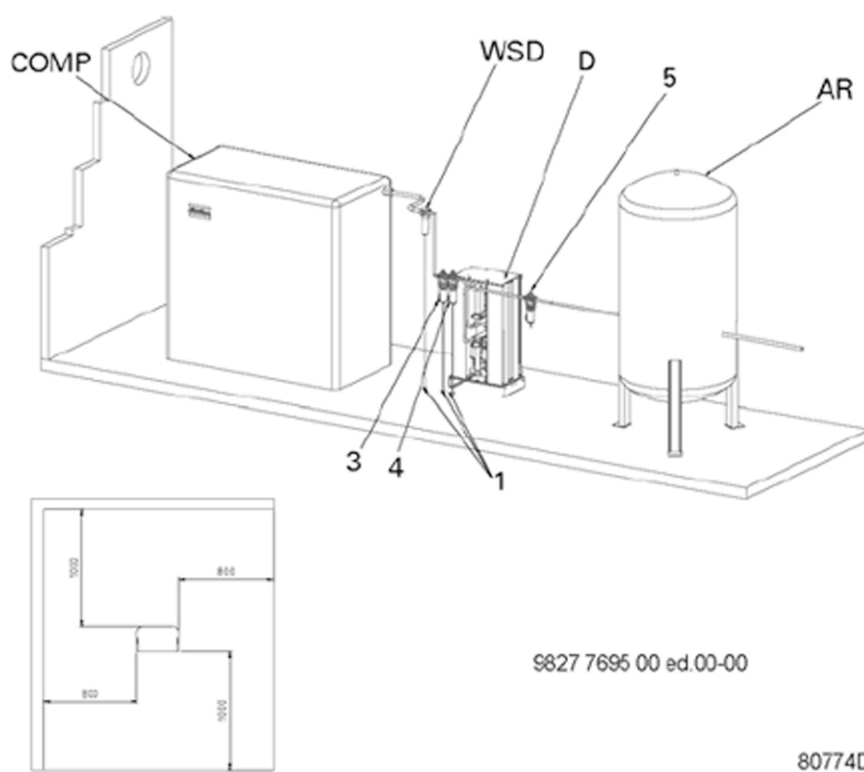


Figure 18: Installation with use of the X0 connection with the compressor

General recommendations

Keep the following in mind when installing the dryer:

- Place the dryer at a location where the temperature never exceeds the limits, see *Specific data*.
- The dryer does not require extra ventilation.

- Fix the dryer as level as possible to the floor. Make sure the fixating bolts are tightened firmly and that the floor is suitable for taking the weight of the dryer.
- Provide enough space around the unit to install and service the filter elements. A minimum free space of 800 to 1000 mm (approx. 2.6 to 3.2 ft) is recommended - see the installation proposal drawings.

Provide sufficient space under the filter elements in order to be able to replace the filter cartridges without the need having to disassemble the piping.

- Always install a high efficiency filter (4) at the inlet of the dryer. A prefilter (3) is recommended to extend the lifetime of the high efficiency filter. The drain pipes (1) of the water separator and the filters must not dip into the water. Use a dust filter (5) at the outlet of the dryer. Should oil vapor and odors be undesirable, a carbon filter can be installed downstream the dust filter.
- If the compressor has no built-in water separator, a water separator (WSD) has to be installed before the dryer in order to prevent free water from entering the dryer, as free water can damage the desiccant. If the condensate contains oil, install an oil/water separator for draining of pure condensate water.
- It is recommended to install bypass pipes with ball valves over the filters in order to isolate the filters during service operations without disturbing the compressed air delivery.
- It is required to install pressure relief valves on each vessel of the dryer when ball valves are installed at the inlet and the outlet of the dryer to isolate the dryer from the air net.
- If dryers are used in parallel make sure that all dryers can be bypassed through one of the other dryers, as shown in below figure:

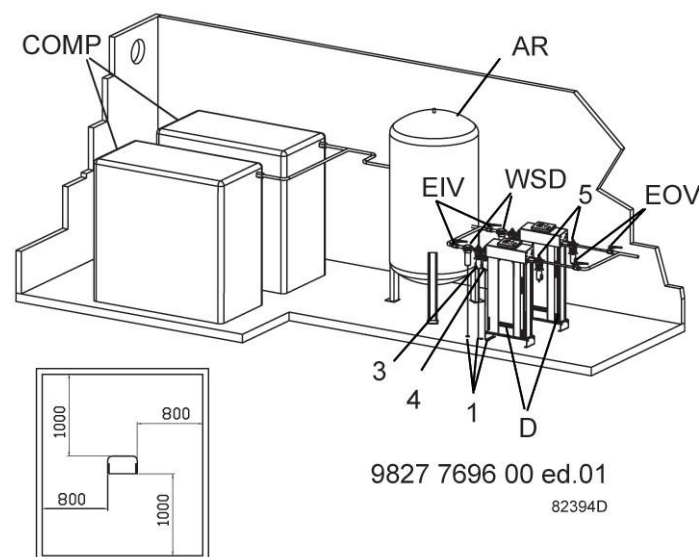


Figure 19: Parallel installation of desiccant dryers



Note: Never overload the dryer as a too high air speed will damage the desiccant. It may be recommended to install the air dryer upstream of the air receiver to prevent overload (e.g. after extending the dry air circuit). Consult your supplier if in doubt. See also section *Operating instructions* for the correct operation procedure.

5 Electrical connections



Note: The electrical wiring must comply with the local regulations. The air dryer must be earthed and protected by fuses against short-circuiting.

Electrical wiring

Below image shows the connection terminals of the timer card:

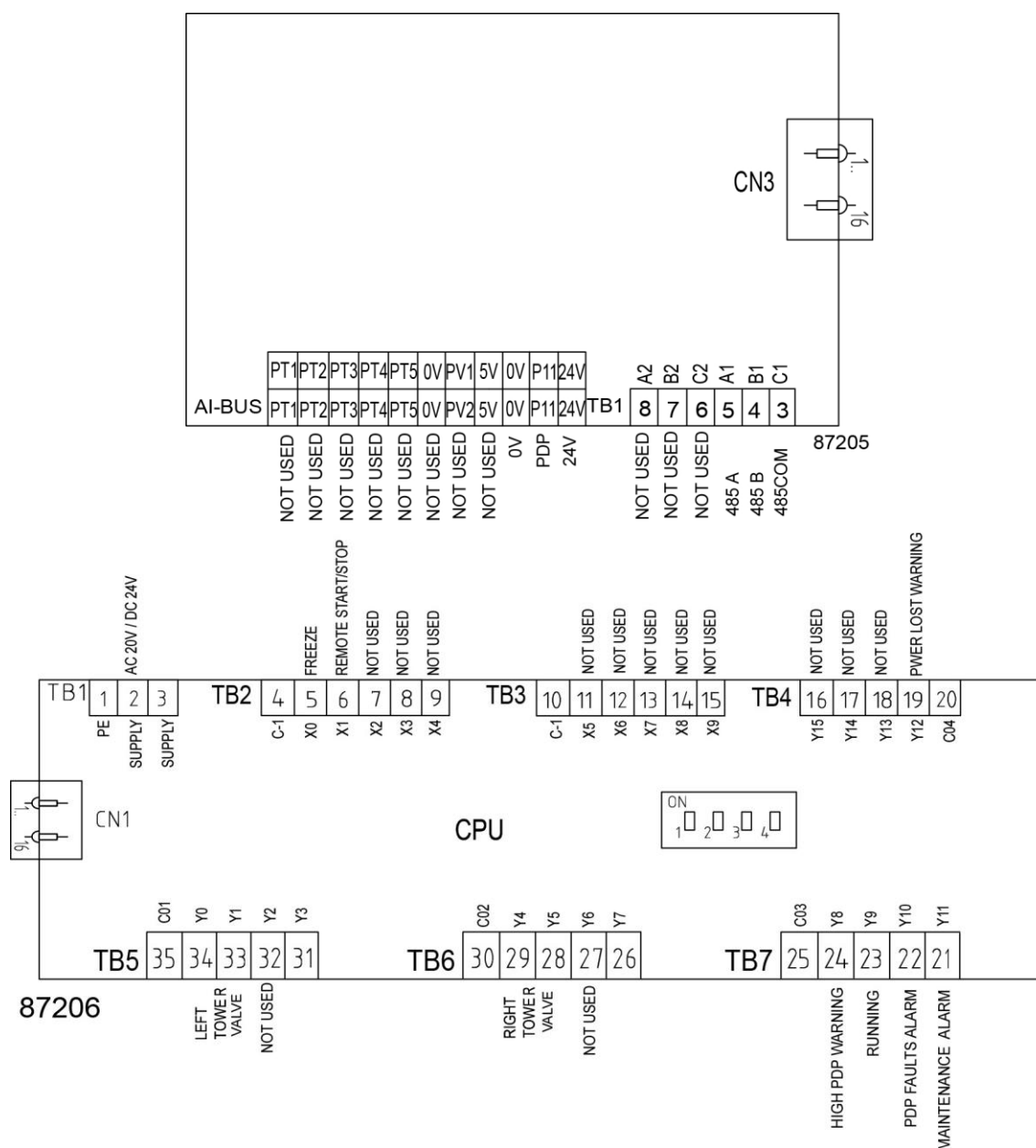


Figure 20: Timer card

- **X1 (Remote control)**

If remote control is required, this contact is required.

- **X0 (Freeze contact)**

If you want to use the feature to “freeze” the regeneration cycle when the compressor runs unloaded, connect pin 1 and 2 of connector X0 with the potential free contact of the compressor (contact closed = freeze).

6 Operation instructions

Safety



Warning: Always observe all relevant safety instructions.

Initial start-up

To start up the dryer for the first time or after a long period of standstill, proceed as follows:

1. If installed, open the bypass valves of the dryer.
2. Close off the air supply from the compressor towards the dryer by closing the external inlet valve (if installed).
3. If installed, close the outlet valve.
4. Remove the silencers to prevent the silencers from getting clogged by the desiccant and wear a dust mask, safety glasses and ear protection. (This is only required at initial start-up or after the desiccant was replaced).
5. Start the compressor and wait for pressure.
6. Slowly open the inlet valve.
7. Check the connections of the dryer for air leaks and remedy if necessary.
8. Switch the dryer on by plugging in the power cord.

Switch the dryer on in position I.

9. Let the dryer operate for several hours with the external outlet valve closed.
10. In case the silencers were removed, refit the silencers.
11. Gradually open the external outlet valve.
12. If applicable, close the bypass valves of the dryer.



Warning:

If the application allows air that is not completely dry, the valve towards the dry air consumer may be opened even before the optimal Pressure Dew Point (PDP) is reached. In this case however, it will take more time for the desiccant to dry completely.

At initial start-up, and specially when the dryer is loaded from the beginning, it can take a long time before the dew point is reached.

For a dew point of -40 °C (-40 °F), it can take up to more than 6 days before this value is reached.

It is therefore recommended to operate the dryer for a number of days with the outlet valve closed.

Normal start

If the dryer has not been used for more than 3 months, refer to section Initial start-up. In all other cases, proceed as follows:

1. Cut off the air supply from the compressor towards the dryer by closing the external inlet valve.
2. If installed, close the external outlet valve between the dryer and the dry air consumer.
3. Start the compressor and slowly open the external inlet valve.
4. Switch the dryer on by plugging in the power cord.

Switch the dryer on in position I.

5. Gradually open the air outlet valve.
6. If applicable, close the bypass valves of the dryer.



Warning: Close the external inlet valve in case the compressor needs to be restarted. The high air speed in the start-up phase of the compressor may damage the desiccant.

During operation

At regular intervals, check the status of the LED's on the control panel. Refer to the section *Problem solving*.

Stopping

To stop the dryer, proceed as follows:

1. If installed and if necessary, open the bypass valves of the dryer so that the application will still receive compressed air.
2. Close the external inlet valve between the compressor and the dryer and the external outlet valve between the dryer and the dry air consumer.
3. Let the dryer operate for a period without consumption, to depressurize the vessels.
4. Switch off the dryer to position 0.



Note:

If the dryer is stopped for a longer period, keep the external inlet and outlet valve closed to avoid moisture from entering the dryer.

Under no circumstances must compressed air be allowed to flow through the dryer when the electrical power is switched off. This will result in terminal failure of the desiccant material, causing regeneration will no longer be possible.

7 Maintenance

7.1 Maintenance

General recommendations and precautions

The dryer does not need any specific maintenance. Nevertheless, before carrying out any maintenance or corrective activity, read the following recommendations and safety precautions and act accordingly:

- Pull out the power cord or put the on/off switch S1 in position 0 (whichever is applicable).
- Disconnect all pressure sources and vent the internal pressure of the system before dismantling any pressurized component.
- Use genuine manufacturer spare parts only. Consult the Spare Parts List for part numbers. For preventive maintenance, dedicated Service kits are available.
- Check for correct operation after maintenance.



Note: Filters and valves installed between the compressor, the dryer and the air consumer may need other maintenance activities than those mentioned below (e.g. draining the filters and replacing the filter elements). Refer to the appropriate manual for more information.

Preventive maintenance schedule

Frequency	Service plan	Activity
Daily		Check the display panel. Service messages can be found here.
Every 6 months or every 4000 hours of operation (1)	A	<ul style="list-style-type: none"> • Check for damaged wiring or loose connections. • Check for air leaks. • Replace the silencers.
Every 3 years or every 24000 hours (1)	D	<ul style="list-style-type: none"> • Replace desiccant • Replace shuttle valves • Replace solenoid valve <p>Always replace all o-rings, seals and nylon washers that come free when executing the scheduled maintenance.</p>

(1) whichever comes first

In normal working conditions, the lifetime of the desiccant is approximately 3 years.

It is recommended to have the desiccant replaced by a qualified service technician, authorized by the manufacturer.

After each 8000 hours service interval, see section *Resetting the service counter* or the instruction delivered with the service kits.

All spare parts required for scheduled maintenance are included in specific service kits. Consult the spare parts list for part number information.

7.2 Resetting the service counter

Resetting procedure for basic control version

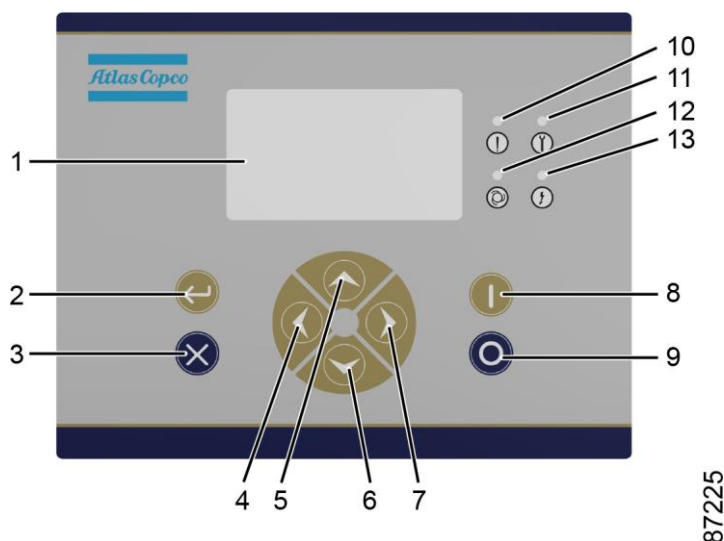


Figure 21: Control panel, basic version

To reset the timer card, proceed as follows:

1. Close off the dryer as described in the stopping procedure, see section *Operating instructions*.
2. Switch off the dryer by putting Switch 9 to 'Off' position. LED (12) (dryer operating) will extinguish. Perform the service plan as scheduled.
3. If you use an advanced password, you can enter the service cycle reset screen.
4. Click on "Reset" to clear the maintenance timer (requires advanced privileges).
5. Click on "Previous" to jump to the "Services" screen.
6. Click on "Exit" to jump to the menu screen.

```

Next service
Type          A
Hours         4000
Next          Exit
  
```

87276

The timer card has now been reset and normal operation continues. The service counter has been reset to 0 and will appear again after 8000 hours.

7.3 Disposal of used material

Used filters or any other used material (e.g. desiccant, lubricants, cleaning rags, machine parts, etc.) must be disposed of in an environmental friendly and safe manner and in line with the local recommendations and environmental legislation.

8 Problem solving

Overview

Symptom	Possible cause	Corrective action
PDP temperature too high	The dryer has not had the time to regenerate completely.	Close the valve installed between the dryer and the application (if permitted) and have the desiccant regenerated.
	The silencers are clogged.	Replace the silencers.
	The drain is not working correctly.	Check the drain valve of the filter.
	The air flow through the dryer is too high.	Check for correct application.
	The outlet pressure is too low.	Check whether the compressor provides enough air for the application.
	The inlet temperature is too high.	Check the compressor aftercooler.
	Free water in the dryer.	Check the water separator (WSD) and the drain valve of the filters upstream of the dryer.
The dryer produces a lot of noise.	Check the silencer and its fixation to the unit.	Replace the silencer if necessary or correct its fixation.
Insufficient air leaves the dryer.	Too much purge air escapes.	Check the condition of the solenoid valve and replace it if necessary. Check if the correct nozzle is installed (standard nozzle supplied is for 7 bar, alternative nozzles are supplied as loose parts).
Both silencers are blowing off.	The shuttle valve is stuck.	Dismantle the bottom, remove the nipple and detach the shuttle.
LED Service warning / Service alarm is alight.	The LED is timer-controlled and will light up after a certain time (red LED (alarm) after 8000 hours).	Contact your supplier for maintenance. Reset the timer after maintenance.

9 Technical data

9.1 Reference conditions

Conditions	Unit	CD 10+	CD 15+	CD 20+	CD 30+	CD 40+	CD 55+	CD 65+	CD 75+	CD 90+	CD 110 +	CD 140 +	CD 160 +
Compressed air effective inlet pressure	bar	7	7	7	7	7	7	7	7	7	7	7	7
	psi	101.5	101.5	101.5	101.5	101.5	101.5	101.5	101.5	101.5	101.5	101.5	101.5
Compressed air inlet temperature	°C	35	35	35	35	35	35	35	35	35	35	35	35
	°F	95	95	95	95	95	95	95	95	95	95	95	95
Relative humidity of the air at inlet	%	100	100	100	100	100	100	100	100	100	100	100	100
Pressure dew point (standard version)	°C	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40
	°F	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40
Ambient pressure	bar	1.013	1.013	1.013	1.013	1.013	1.013	1.013	1.013	1.013	1.013	1.013	1.013
	psi	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69
Ambient air temperature	°C	25	25	25	25	25	25	25	25	25	25	25	25
	°F	77	77	77	77	77	77	77	77	77	77	77	77

9.2 Limitations for operation

Limitation	Unit	CD 10+	CD 15+	CD 20+	CD 30+	CD 40+	CD 55+	CD 65+	CD 75+	CD 90+	CD 110 +	CD 140 +	CD 160 +
Maximum compressed air inlet pressure	bar	10	10	10	10	10	10	10	10	10	10	10	10
	psi	145	145	145	145	145	145	145	145	145	145	145	145
Minimum compressed air inlet pressure	bar	4	4	4	4	4	4	4	4	4	4	4	4
	psi	58	58	58	58	58	58	58	58	58	58	58	58
Maximum ambient air temperature	°C	46	46	46	46	46	46	46	46	46	46	46	46
	°F	115	115	115	115	115	115	115	115	115	115	115	115
Minimum ambient air temperature	°C	2	2	2	2	2	2	2	2	2	2	2	2
	°F	35.6	35.6	35.6	35.6	35.6	35.6	35.6	35.6	35.6	35.6	35.6	35.6
Maximum compressed air inlet temperature	°C	50	50	50	50	50	50	50	50	50	50	50	50
	°F	122	122	122	122	122	122	122	122	122	122	122	122

Limitation	Unit	CD 10+	CD 15+	CD 20+	CD 30+	CD 40+	CD 55+	CD 65+	CD 75+	CD 90+	CD 110 +	CD 140 +	CD 160 +
Minimum compressed air inlet temperature	°C	2	2	2	2	2	2	2	2	2	2	2	2
	°F	35.6	35.6	35.6	35.6	35.6	35.6	35.6	35.6	35.6	35.6	35.6	35.6
Minimum volume flow at inlet	l/s	3	4.5	6	9	12	16.5	19.5	22.5	27	33	42	48
	cfm	6.35	9.53	12.71	19.06	25.42	34.96	41.31	47.67	57.20	69.92	88.99	101.7

1) There are high-pressure units, please check the working pressure on the nameplate.

9.3 Dryer data

Performance data

Characteristic	Unit	CD 10+	CD 15+	CD 20+	CD 30+	CD 40+	CD 55+	CD 65+	CD 75+	CD 90+	CD 110 +	CD 140 +	CD 160 +
Volume flow at dryer inlet	l/s	10	15	20	30	40	55	65	75	90	110	140	160
Pressure drop at maximum flow (Excl. Pre-filters)	bar	0.04	0.04	0.04	0.14	0.18	0.25	0.29	0.14	0.18	0.29	0.25	0.29
Time of half a cycle	h	0.04	0.04	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024
Regeneration time	s	115	115	65	65	65	65	65	65	65	65	65	65
Pressurisation time	s	35	35	20	20	20	20	20	20	20	20	20	20
Regeneration air consumption average	%	18	18	18	18	18	18	18	18	18	18	18	18
Installed power	W	36	36	36	36	36	36	36	60	60	60	82	82

Design data

Characteristic	Unit	CD 10+	CD 15+	CD 20+	CD 30+	CD 40+	CD 55+	CD 65+	CD 75+	CD 90+	CD 110 +	CD 140 +	CD 160 +
Length	mm	550	550	550	550	550	550	550	550	550	550	550	550
Width	mm	350	350	350	350	350	350	350	330	330	330	490	490
Height	mm	950	950	950	1170	1480	1935	1935	1170	1480	1935	1480	1935
Mass	kg	90	90	90	100	115	135	135	170	195	280	350	400
Connection inlet/outlet		G 3/4	G 3/4	G 3/4	G 3/4	G 1	G 1	G 1	G 1 1/2	G 1 1/2	G 1 1/2	G 2	G 2 1/2

Data on dataplate

Characteristic	Unit	CD 10+	CD 15+	CD 20+	CD 30+	CD 40+	CD 55+	CD 65+	CD 75+	CD 90+	CD 110 +	CD 140 +	CD 160 +
Pressure dewpoint	°C	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40
Minimum air inlet temperature	°C	2	2	2	2	2	2	2	2	2	2	2	2
	°F	35. 6	35. 6	35. 6	35. 6	35. 6	35. 6	35. 6	35. 6	35. 6	35. 6	35. 6	35. 6
Maximum air inlet temperature	°C	50	50	50	50	50	50	50	50	50	50	50	50
	°F	122	122	122	122	122	122	122	122	122	122	122	122
Maximum effective working pressure	bar	10	10	10	10	10	10	10	10	10	10	10	10
	psi	145	145	145	145	145	145	145	145	145	145	145	145

10 Instructions for use

Instructions

- The dryers can contain pressurized air. This can be potentially dangerous if the equipment is misused.
- The towers of the dryer consist of an extruded profile, which must only be used as a vessel and must be operated within the limits specified.
- No alterations shall be made to the vessels by welding, drilling or other mechanical methods without the written permission of the manufacturer.
- The design pressure and temperature of this pressure bearing part must be clearly indicated on the data label.
- If installed, the safety valve must correspond with pressure surges of 1.1 times the maximum allowable operating pressure. This should guarantee that the pressure will not permanently exceed the maximum allowable operating pressure of the vessel.
- Original bolts have to be used after opening for inspection. The maximum torque has to be taken into consideration (see table below).

Maximum bolt torque

Thread size	Tightening torque (Nm)	Allowed deviation (Nm)
M3	1	0.3
M4	2.4	0.6
M5	5	1.2
M6	8	2.1
M8	20	5
M10	41	10
M12	73	18
M14	115	29
M16	185	46
M18	238	60
M20	335	84

