Atlas Copco

Heatless adsorption compressed air dryers

CD 25+, CD 30+, CD 35+, CD 50+, CD 60+, CD 70+, CD 80+, CD 100+, CD 145+

Basic control and purge control version

Instruction book

Atlas Copco

Heatless adsorption compressed air dryers

CD 25+, CD 30+, CD 35+, CD 50+, CD 60+, CD 70+, CD 80+, CD 100+, CD 145+

Basic control and purge control version

From following serial No. onwards: API 089 000

Instruction book

Original instructions

Copyright notice

Any unauthorized use or copying of the contents or any part thereof is prohibited.

This applies in particular to trademarks, model denominations, part numbers and drawings.

This instruction book is valid for CE as well as non-CE labelled machines. It meets the requirements for instructions specified by the applicable European directives as identified in the Declaration of Conformity.

2010 - 05

No. 2920 7092 40

www.atlascopco.com

Table of contents

1 Safety precautions....4

1.1 Safety icons....4
1.2 Safety precautions, general....4
1.3 Safety precautions during installation....5
1.4 Safety precautions during operation....6
1.5 Safety precautions during maintenance or repair....7

2 General description....9

2.1 General description....9
2.2 Operation....10

3 Electric diagram....15

4 Installation....17

4.1 Dimension drawings....17
4.2 Installation proposal....22

5 Electrical connections....26

6 Operating instructions....30

7 Maintenance....32

7.1 Maintenance....32
7.2 Resetting the service counter....33
7.3 Disposal of used material....33

8 Problem solving....34

9 Technical data....35

9.1 Reference conditions....35

9.2 LIMITATIONS FOR OPERATION....35
9.3 TECHNICAL SPECIFICATIONS....35

10 Instructions for use....37

11 Guidelines for inspection....38

12 Pressure equipment directives....39

13 Declaration of conformity....40

1 Safety precautions

1.1 Safety icons

Explanation

	Danger for life
	Warning
	Important note

1.2 Safety precautions, general

General precautions

	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.
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 unit 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 moisture at 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, vapours 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, safety valves must be installed on the dryer vessels.

	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.
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, vapours 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.
10. Do not remove any of, or tamper with, the sound-damping 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.

	Also consult following safety precautions: Safety precautions during installation 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.

	Also consult following safety precautions: Safety precautions during installation and Safety precautions during operation. 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.

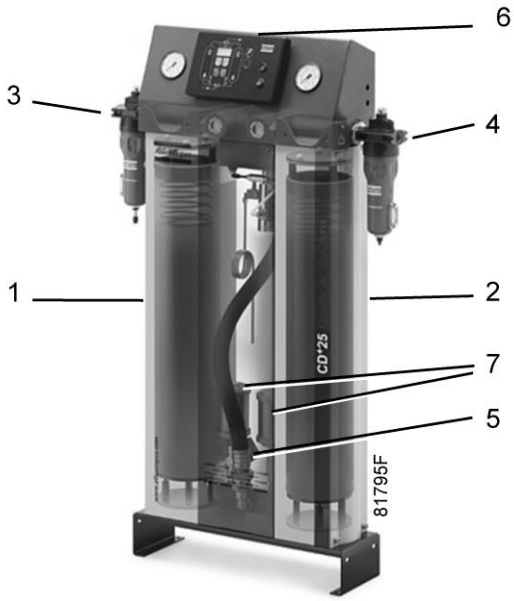
The standard version is intended to reach a pressure dew point of -40 ˚C (-40 ˚F). There is also a version available for a pressure dew point of -70˚C (-94 ˚F).

All units are designed for indoor use.

CD 25+ up to CD 145+, general view

Main parts

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

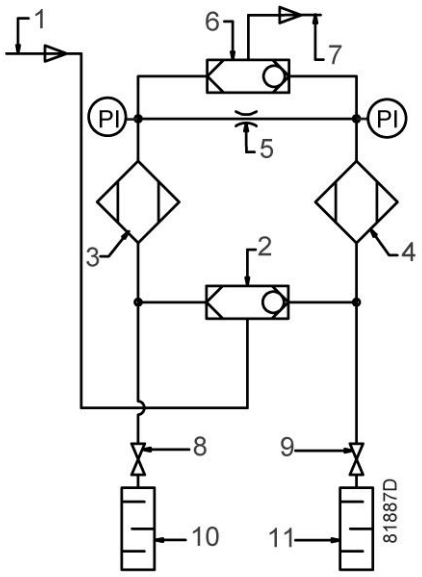


Reference	Description	Reference	Description
1	Tower A	5	Solenoid valve
2	Tower B	6	Control cubicle
3	Air inlet	7	Silencers
4	Air outlet		

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 vapour.



Flow diagram CD 25+ up to CD 50+

Reference	Designation	Reference	Designation
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

Operation principle basic control version

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 vapour and the compressed air is dried.

Once the top of the tower is reached, the air leaves the dryer via the outlet valve (= top selector 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, see section Technical data. 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 X3 (old denomination: P4 - freeze contact, see section Electric diagram) opens (by the freeze contact), the dryer will "freeze" the drying cycle: purge air flow stops, both solenoid valves are closed. When the contact, connected to connector X3 closes, the dryer will switch towers and 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, X3 can be connected to a voltage free contact of the compressor (contact open 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.

	Do not connect X3 when an air receiver is installed before the dryer. X3 should only be connected when the air receiver is installed downstream of the dryer.

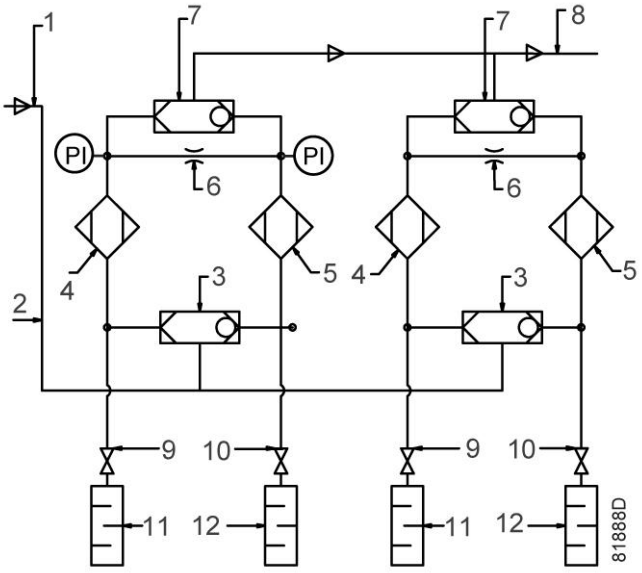
Purge control version

The dryer is equipped with a Pressure Dew Point sensor (PDP sensor), extending the drying time. The regeneration time is still timer controlled.

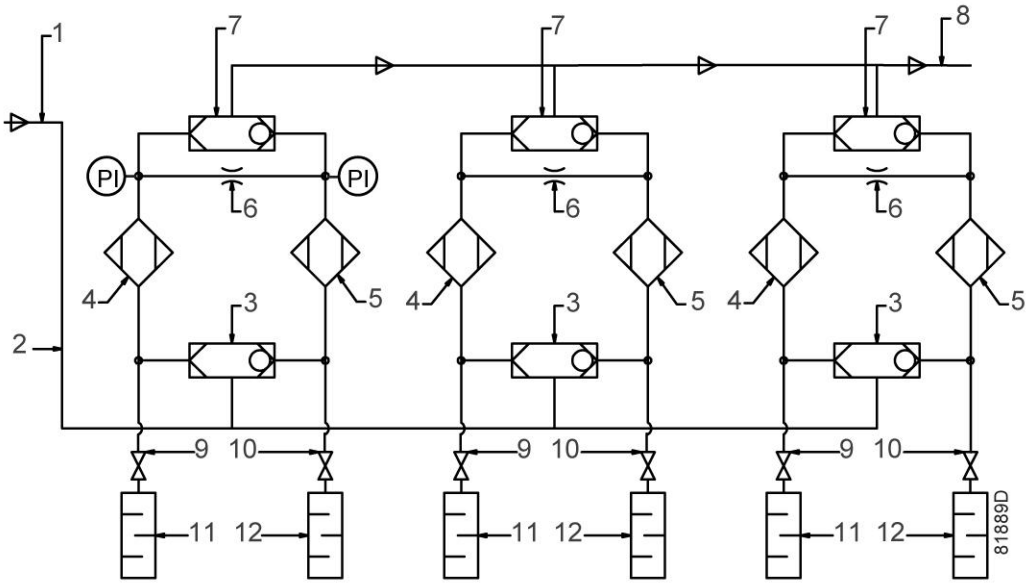
The PDP sensor constantly measures the pressure dew point (PDP) of the air leaving the drying tower. As long as the PDP temperature is below the set point (-40 °C or -70 °C), the drying tower will keep on drying, until the PDP temperature exceeds the set point. On that moment the regenerated tower will start drying the compressed air and the other tower will be regenerated. As long as the PDP temperature is below the set point, regeneration of the non-drying tower is stopped after the preset time interval of the timer has elapsed. As a result, reduction of purge air is achieved.

Flow diagrams

Depending on the dryer size, the dryer can be composed of a single dryer module (flow diagram: see above), or of two or three dryer modules in parallel (see below):



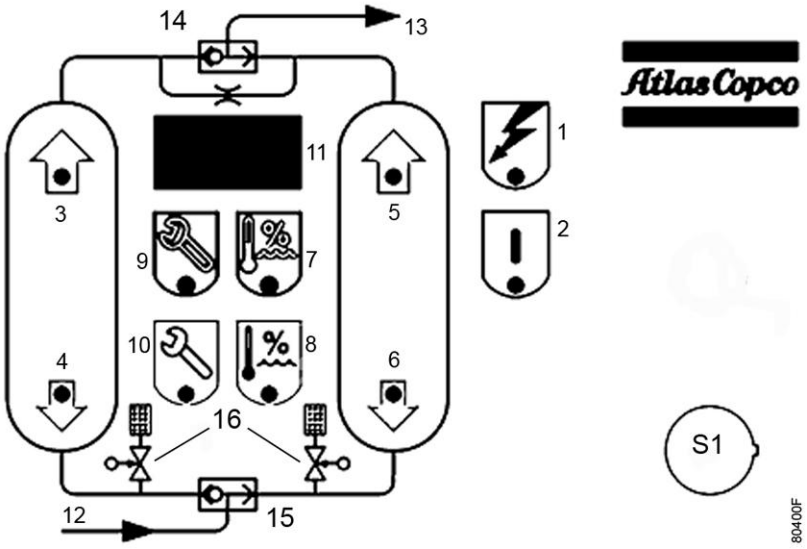
Flow diagram CD 60+ up to CD 100+



Flow diagram CD 145+

Reference	Designation	Reference	Designation
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		

Control panel

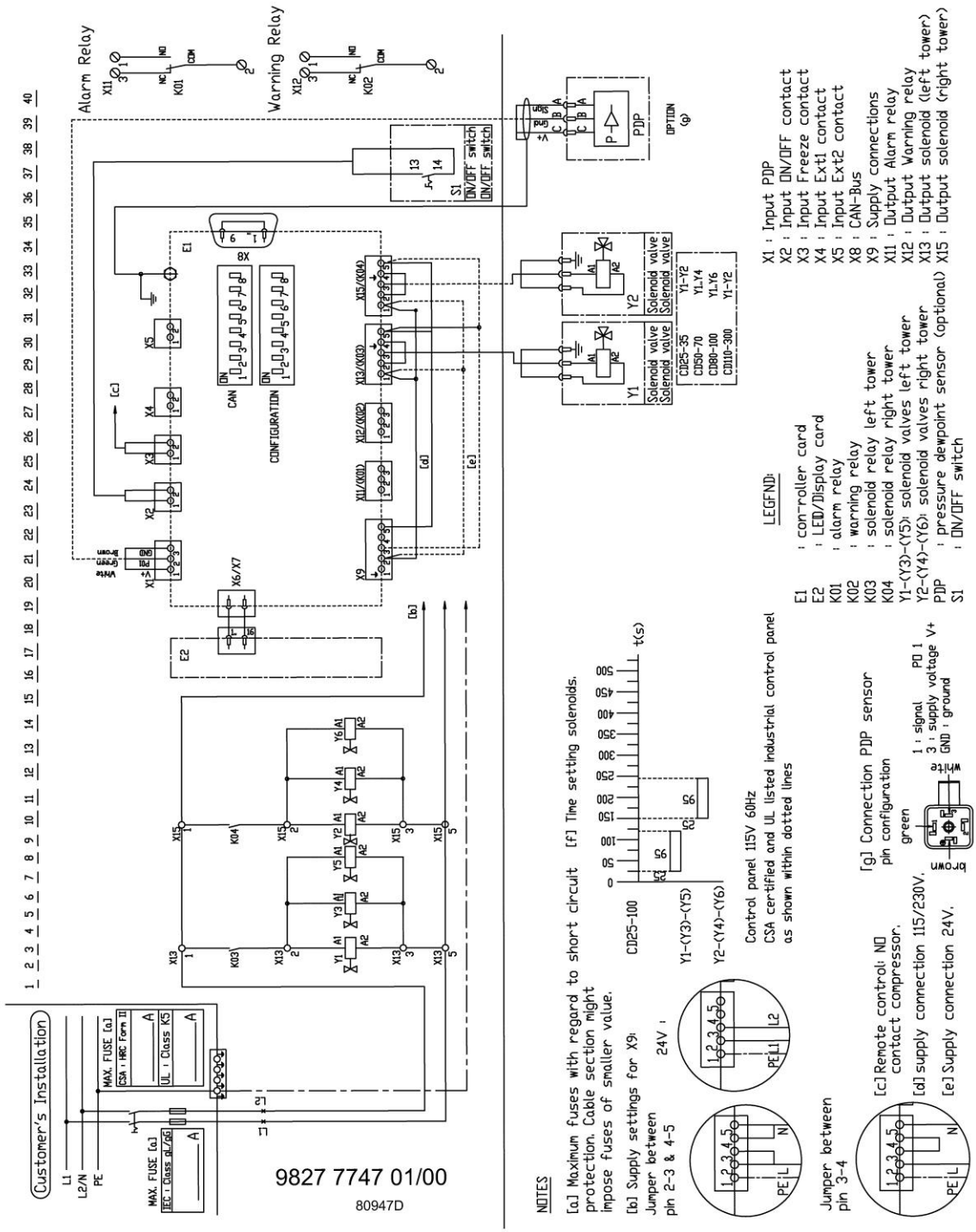


Control panel with flow diagram

S1	On/Off switch	9	LED <Service warning>
1	LED <Power On>	10	LED <Service alarm>
2	LED <In Operation>	11	Timer countdown (Indication of PDP in option)
3	LED < Left tower drying>	12	Air Inlet
4	LED <Left tower regenerating>	13	Air Outlet
5	LED <Right tower drying>	14	Outlet selector valve
6	LED <Right tower regenerating>	15	Inlet selector valve
7	LED <PDP warning> see note	16	Solenoid valves
8	LED <PDP alarm> see note		

Note: The LED indication of the dew point (PDP) (LED's 7 and 8) is only operational when the dryer is equipped with an electronic dew point indicator (available as option).

3 Electric diagram



Service diagram (typical)

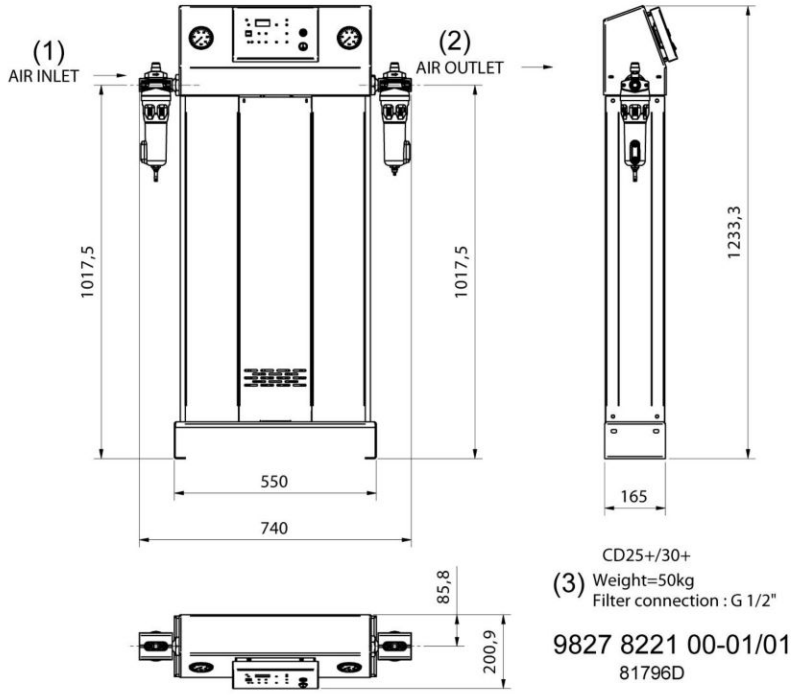
Reference	Explanation
(a)	Maximum fuses with regard to circuit protection. Cable section may impose fuses of smaller value
(b)	Supply settings for X9
(c)	Connection for remote control (X3): to NO contact of compressor

Reference	Explanation
(d)	Supply connection for 115 V and 230 V
(f)	Time setting solenoid valves
(g)	Connection PDP sensor

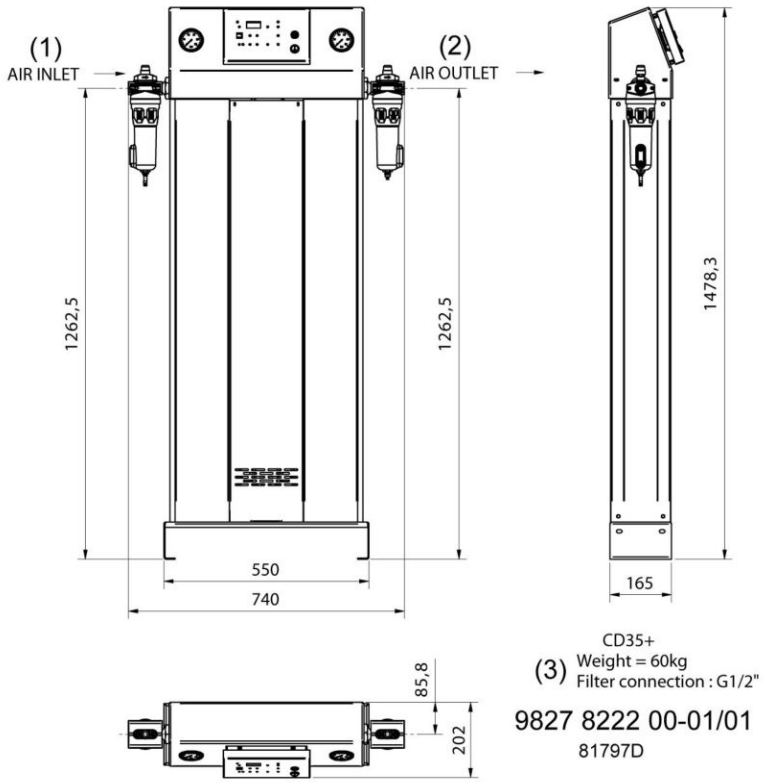
Reference	Designation	Reference	Designation
E1	Controller card	E2	LED/Display card
PDP	Pressure Dew Point sensor (optional)	X9	Supply connections
K03	Solenoid relay, left tower	K04	Solenoid relay, right tower
Y1-(Y3)-(Y5)	Solenoid valve(s) left tower	Y2-(Y4)-(Y6)	Solenoid valve(s) right tower
X1	Input PDP	X2	Input On/Off contact
X3	Input Freeze contact	S1	On/Off switch
X13	Output solenoid (left tower)	X15	Output solenoid (right tower)

4 Installation

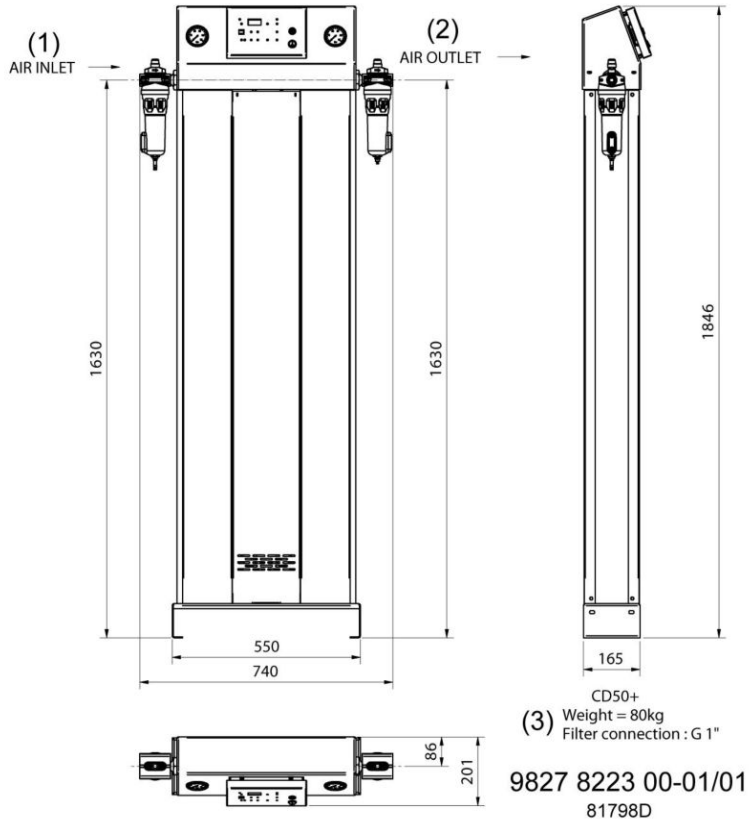
4.1 Dimension drawings



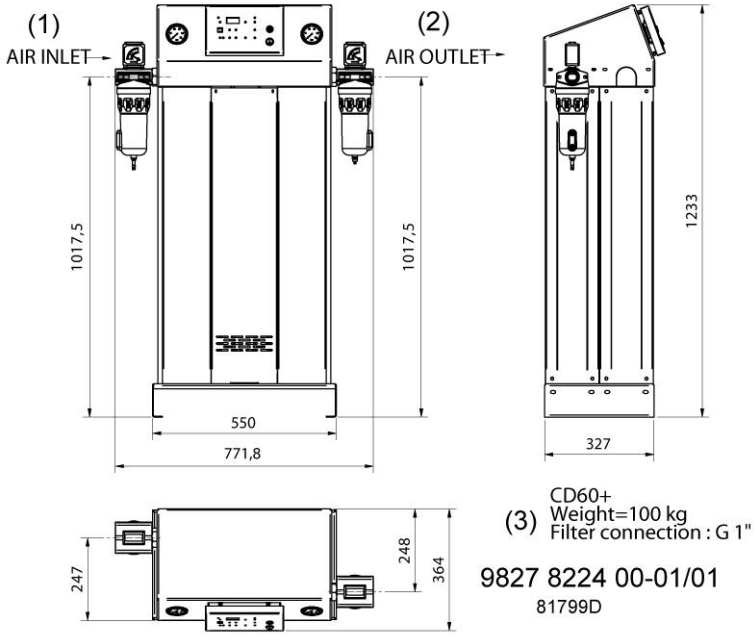
CD 25+ and CD 30+


(1)
AIR INLET
(2)
AIR OUTLET
1262,5
1262,5
1478,3
550
740
165
85,8
202
CD35+
(3) Weight = 60kg
Filter connection : G1/2"
9827 8222 00-01/01
81797D

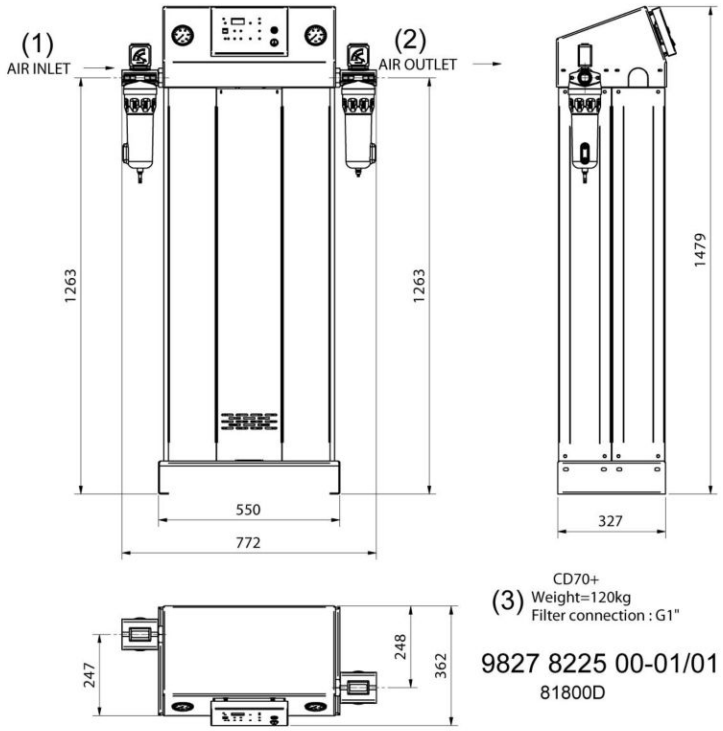
CD 35+


(1)
AIR INLET
(2)
AIR OUTLET
1630
1630
1846
550
740
165
CD50+
(3) Weight = 80kg
Filter connection : G 1"
86
201
9827 8223 00-01/01
81798D

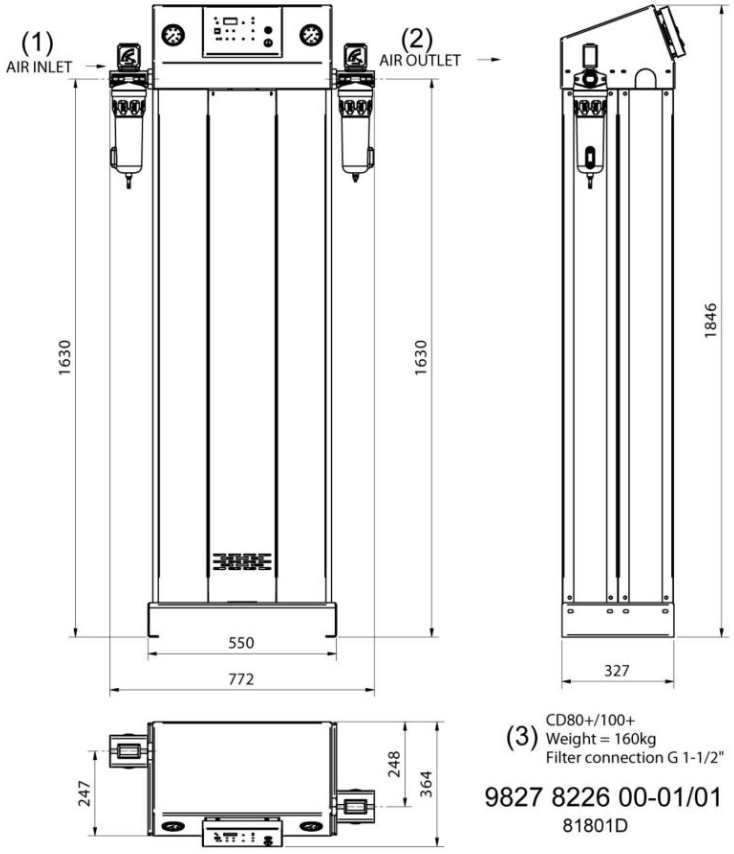
CD 50+


(1)
AIR INLET
(2)
AIR OUTLET
1017,5
1017,5
1233
550
771,8
327
CD60+
(3) Weight=100 kg
Filter connection : G 1"
248
364
247
9827 8224 00-01/01
81799D

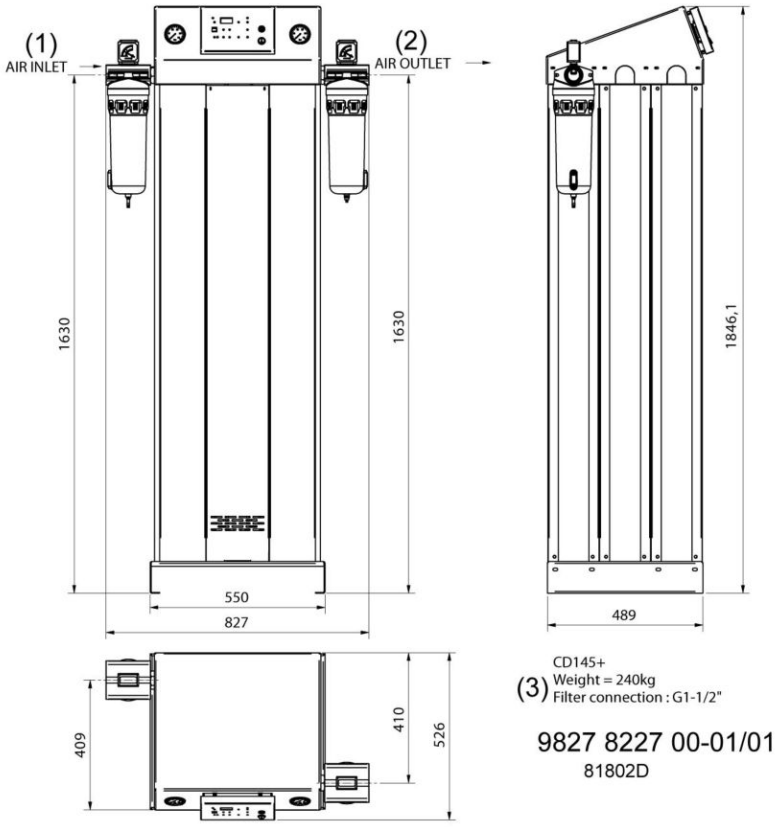
CD 60+


(1)
AIR INLET
(2)
AIR OUTLET
1263
1263
1479
550
772
327
247
248
362
CD70+
(3) Weight=120kg
Filter connection : G1"
9827 8225 00-01/01
81800D

CD 70+



CD 80+ and CD 100+



CD 145+

4.2 Installation proposal

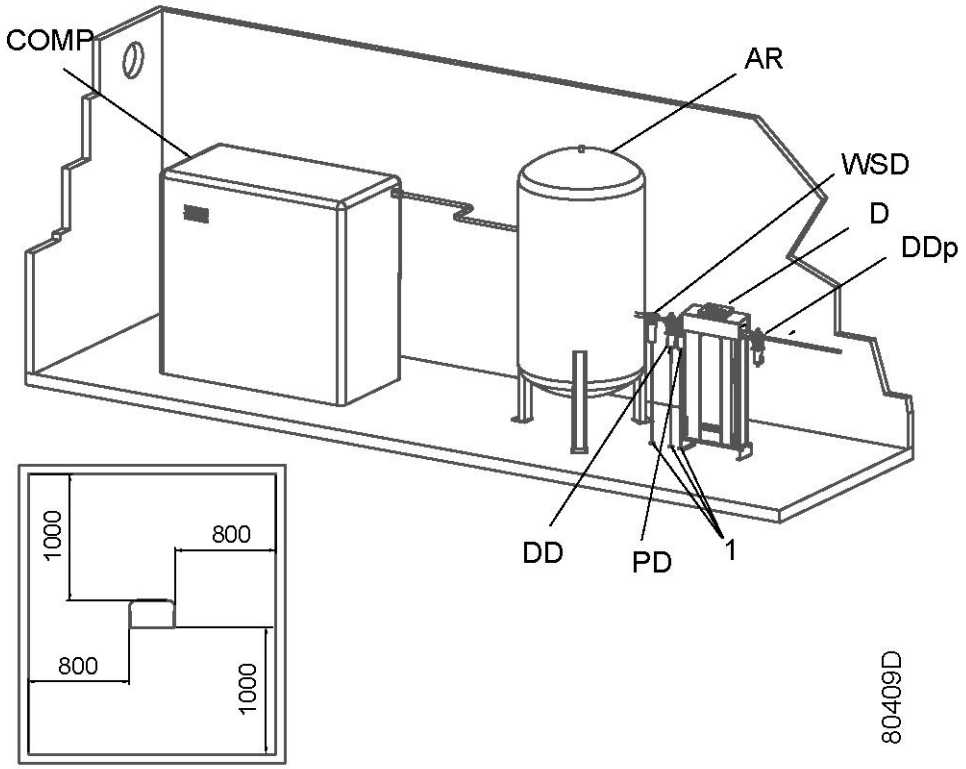
Piping

	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. Depending from the fact if the remote control connector X3 is used or not (see section Operation), there are two possibilities:

Installation in case X3 is not used

	If the X3 connection is not used, the correct installation sequence is compressor - air receiver - dryer.



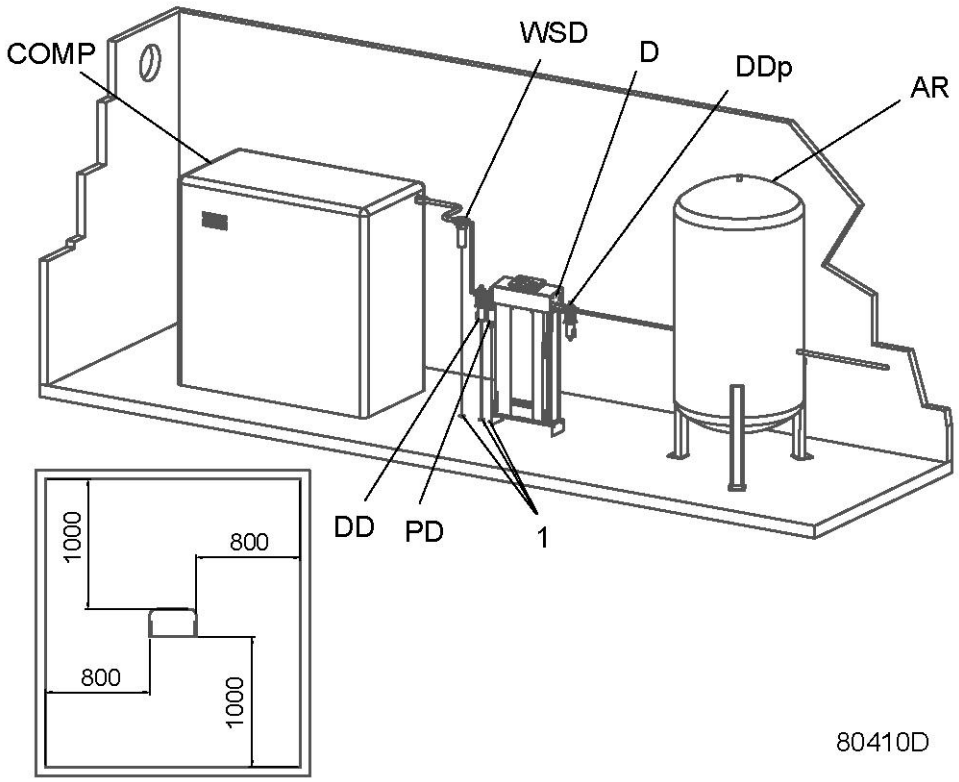
Installation without use of the X3 connection with the compressor

COMP	Compressor
AR	Air receiver
D	Dryer
EIV	External inlet valve To cut off the air supply towards the dryer
EOV	External Outlet Valve 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.
DD	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.
PD	PD filter: high efficiency filter, particle removal down to 0.01 micron, maximum oil carry-over 0.01 ppm To remove remaining impurities.
DDp	DDp filter: dust filter, particle removal down to 1 micron To remove possible dust particles coming from the desiccant.

QD	Filter with active carbon, capable of absorbing odour (not shown on the drawings). To be installed downstream of the DDp filter if desired.

Positioning in case X3 is used

	If the X3 connection is used, the correct installation sequence is compressor - dryer - air receiver.



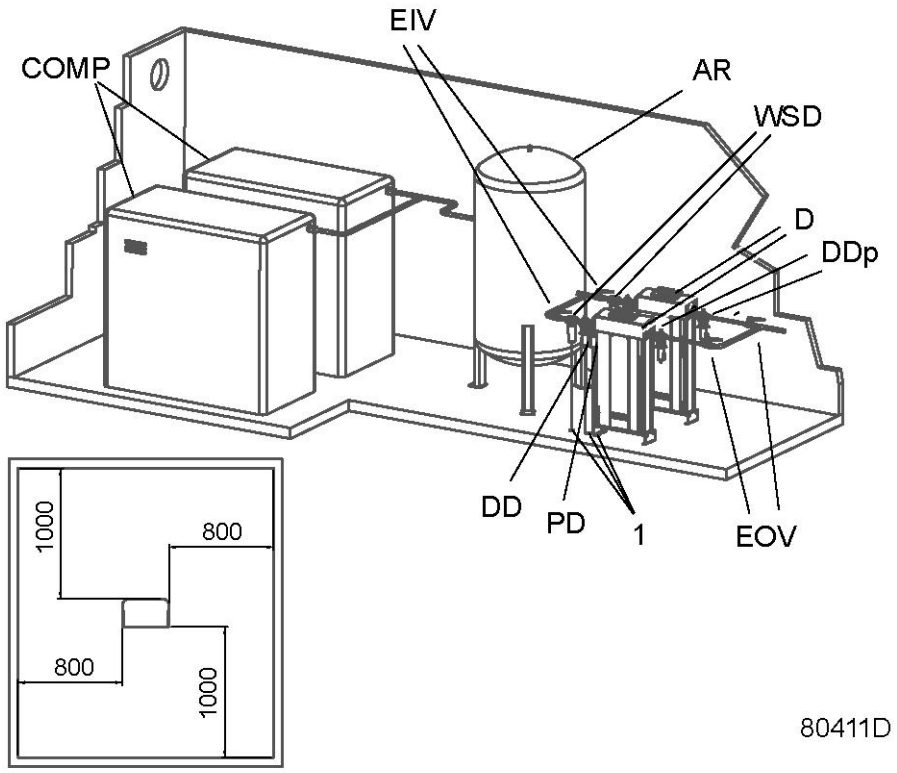
Installation in case the X3 connection with the compressor is used

General recommendations

Important: Keep the following in mind when installing the dryer:

- Place the dryer at a location where the temperature never exceeds the limits, see section Limitations for operation.
- The dryer does not require extra ventilation.
- Fix the dryer as level as possible to the wall or to the floor. For certain models, a wall mounting kit is available as option - see spare parts book for part numbers. Make sure the fixating screws are tightened firmly and that the wall or the floor is suitable for taking the weight of the dryer.
- Provide enough space around the dryer to install and service the filter elements. A minimum free space of 800 to 1000 mm is recommended - see the installation proposal drawings.
  If the filters are mounted directly onto the dryer, the dryer should eventually be positioned higher to enable servicing of the filter elements.

- Use a DD filter and a PD filter at the inlet of the dryer. Use a DDp filter at the outlet of the dryer. Should oil vapour and odours are undesirable, a QD carbon filter can be installed downstream the DDp filter.
- When the compressor has no built-in water separator or when the dryer is not located near the compressor, 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 (consult your supplier).
- The drain pipes (1) of the water separator and the filters must not dip into the 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 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:



Parallel installation of CD dryers

	Never overload the dryer as this 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 Atlas Copco if in doubt.

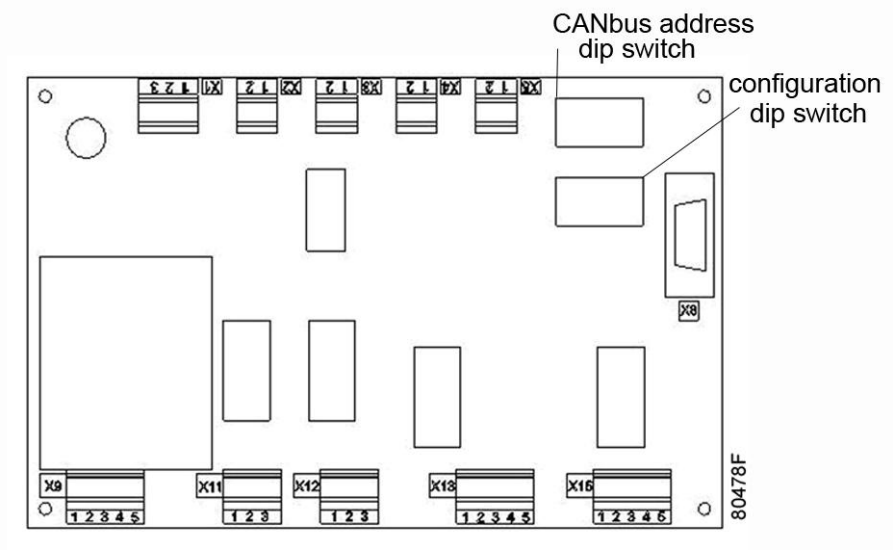
5 Electrical connections

General

	The electrical wiring must comply with the local regulations. The air dryer must be earthed and protected by fuses against short-circuiting. Consult the electric diagram delivered with the dryer. Before switching on the main power supply, check the voltage requirements in the technical specifications or on the dryer's data plate.

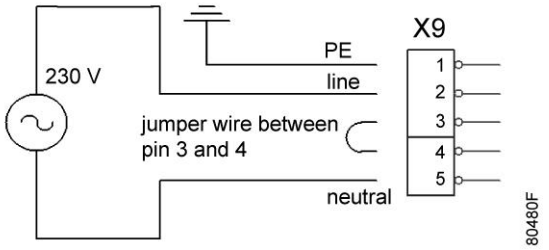
Timer card layout

Below figure shows the terminals of the timer card:

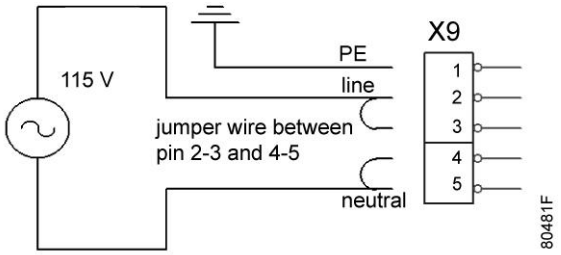


Timer card

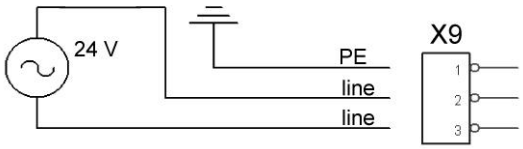
- **Supply connection (X9)**
  In most cases, the dryer only needs to be connected to the power supply. If not already done, the power cable must be connected to terminals X9 as shown below.
  Timer card 1900 0713 03 (cubicle 1900 5002 00 and 1900 5002 02) is suitable for supply voltages 115 V and 230 V.
  - For 230 V AC: connect the supply cable to terminals 2 (line) and 5 (neutral) and place a jumper wire between terminals 3 and 4:



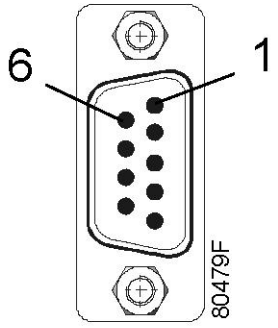
  - For 115 V AC: connect the supply cable to terminals 2 (line) and 5 (neutral) and place a jumper wire between terminals 2-3 and 4-5:



- For 24 V AC: connect the supply cable to terminals 2 and 3 (only applicable to timer card 1900 0713 07 (cubicle 1900 5002 01)):



- **X3 (freeze contact - P4)**
  If you want to use the feature to "freeze" the regeneration cycle when the compressor runs unloaded, connect pin 1 and 2 of connector X3 with the potential free contact of the compressor (contact closed = freeze).
- **CAN-Bus connection**
  The timer card can be interconnected in a LAN with other Elektronikon® controllers. Addressing and CAN protocol used are the same as for the Elektronikon regulators. Because the timer card has no programming features however, the exchanged information is pre-configured and cannot be redefined. Application: data communication between timer cards, MkIV Elektronikon regulators and service PC.



Pin	Function	Pin	Function	Pin	Function
1	reserved	4	reserved	7	CAN_HIGH
2	CAN_LOW	5	reserved	8	reserved
3	CAN_GND	6	CAN_GND	9	reserved

- **PDP sensor connector (X1)**
  A PDP sensor can be obtained as an option. With the PDP sensor, the Pressure Dew Point (PDP) can be read from the display and the warning LED and alarm LED become active if the PDP set point is not reached. The connections are as follows:

Pin	Label	Description
1	V^+	13.5 V out / 50 mA max
2	P01	4-20 mA input (40 mA max)
3	GND	Ground

- **Output alarm relay X11**
  These terminals are connected to a relay that switches at the same time as the alarm LED.
  Pin designations:

Pin	Label	Description
1	NO2	Alarm contact - Normally Open
2	COM2	Alarm contact - Common
3	NC2	Alarm contact - Normally Closed

- **Output warning relay - X12**
  These terminals are connected to a relay that switches at the same time as the warning LED.
  Pin designations:

Pin	Label	Description
1	NO1	Warning contact - Normally Open
2	COM1	Warning contact - Common
3	NC1	Warning contact - Normally Closed

- **Configuration dip switch settings**
  The dip switch settings are factory set and should not be altered unless the timer card is replaced or an option is fitted.

Dip switch number	Function
1,2	cycle time selection Sw 1,2=Off, Off: T1=95 s, T2=25 s
3	Off=PDP sensor not configured / disabled On=PDP sensor enabled (optional)
4	Off=PDP -40˚C version enabled On=PDP -70˚C version enabled Do not change the settings without change of desiccant!
5	Off=PDP temperature indication in ˚C On=PDP temperature indication in ˚F
6,7	Control mode selection Sw 6,7=Off,Off: local control enabled Sw 6,7=On,Off: external input control enabled Sw 6,7=Off,On: LAN control enabled Sw 6,7=On,On: not valid
8	not used

- **CAN Bus address dip switch**

Dip switch number	Function
1,2,3	(reserved) Normally Off used for diagnostic purposes
4,5,6,7,8	Binary address selector (valid values= 1 to 31) bit 4, bit 3, bit 2, bit 1, bit 0) On = 1, Off = 0

Example of address selection:
For CAN Bus node address 1, the dip switch configuration is:

Dip Switch number	1	2	3	4	5	6	7	8
ON								x
OFF	x	x	x	x	x	x	x	

80356F

	Before switching on the main power supply, check the voltage requirements in the technical specifications or on the dryer's data plate.

6 Operating instructions

	In your own safety interest, 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 the air supply towards the PDP sensor (dryers with PDP sensor).
3. Close off the air supply from the compressor towards the dryer by closing the external inlet valve (if installed).
4. If installed, close the external outlet valve.
5. 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).
6. Start the compressor and wait for pressure.
7. Slowly open the external inlet valve.
8. Check the connections of the dryer for air leaks and remedy if necessary.
9. Switch the dryer on by putting main switch S1 in position I.
10. Let the dryer operate for several hours with the external outlet valve closed.
11. Refit the silencers.
12. Gradually open the external outlet valve.
13. If applicable, close the bypass valves of the dryer.
14. Open the air supply towards the PDP sensor (dryers with PDP sensor).

	If the application allows air that is not dried optimally, the valve towards the air consumer may be opened even before the optimal 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 -70 ˚C (-94 ˚F), it can take up to more than 10 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. Close the air supply towards the PDP sensor (dryers with PDP sensor).
3. If installed, close the external outlet valve between the dryer and the dry air consumer.
4. Start compressor and slowly open the external inlet valve.
5. Switch the dryer on by putting main switch S1 in position I.
6. Gradually open the air outlet valve.
7. If applicable, close the bypass valves of the dryer.
8. Open the air supply towards the PDP sensor (dryers with PDP sensor).

	Close the external inlet valve in case the compressor needs to be restarted. The 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. If the warning/alarm LED is alight, consult the section Trouble shooting.

If the dryer is equipped with a PDP temperature display, check the PDP temperature regularly. If the PDP temperature is too high, let the dryer regenerate by closing the outlet valve.

	The LED's for PDP warning and PDP alarm are only functional if the dryer is equipped with a PDP sensor!

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 by putting main switch S1 to position 0.

	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 Atlas Copco 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.

	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. Information on the pressure dewpoint (PDP) and service messages can be found here.
Every 6 months or every 4000 hours of operation (1)	A	• Check for damaged wiring or loose connections. • Check for air leaks. • Replace the in- and outlet filter cartridges. • Replace the silencers.
Every year or every 8000 hours of operation (1)	B	• Service plan A • Exchange the dew point sensor. The certificate is valid only one year. Contact the supplier of your equipment for re-calibration of the PDP sensor. Consult ECB AII 0298 .
Every five years or every 40000 hours (1)	C	• Service plan B • Replace desiccant Always replace all o-rings, seals and nylon washers that come free when executing the scheduled maintenance.

(1) whichever comes first

In normal working conditions, the lifetime of the desiccant is approximately 5 years.

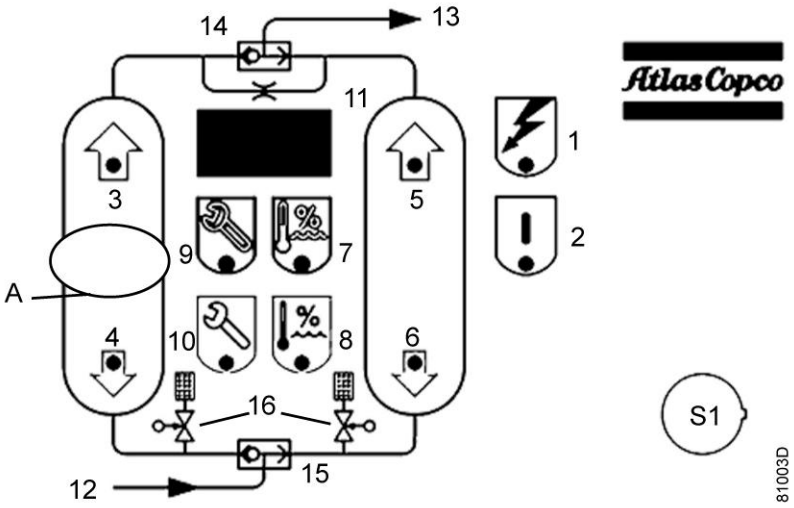
It is recommended to have the desiccant replaced by a qualified Atlas Copco service technician.

After each 8000 hours service interval, the timer card needs to be reset with a magnetic key, 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

Timer card resetting procedure



To reset the timer card, continue as follows:

- Close off the dryer as described in the stopping procedure, see section Operating instructions.
- Switch off the dryer by putting switch S1 to ‘Off’ position. LED (2, Dryer operating) will extinguish. Perform the service plan as scheduled.
- If the service warning LED (9) is already alight, go directly to the next step.
  If maintenance is being carried out before the service alarm appears (every 8000 hrs), the reset procedure needs to be activated before the service counter can be reset to 0. This can be done by placing the service magnet during 3 seconds over the indicated area (A) of the control panel, in the middle of the left tower. As an indication that the reset procedure is activated, the service warning LED (9) will light up.
- Reset the timer card by putting the service magnet over the indicated area (A) of the control panel during 5 s. The service alarm LED extinguishes. The service counter has now been reset to 0.
  Also the counter to switch towers will be reset to 0 (only visible in case of timer control).
- Restart the dryer by switching switch S1 to ‘On’. The counter will restart, the dryer operating LED (2) is alight, and the drying and regeneration LED’s indicate the cycling of the dryer.

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 hrs.

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 environmentally friendly and safe manner, and in line with the local recommendations and environmental legislation.

8 Problem solving

Symptom	Possible cause	Corrective action
LED PDP warning/PDP alarm is alight. 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.	Both LED’s are timer-controlled and will light up after a certain time (orange LED (warning) after 7750 hours, red LED (alarm) after 8000 hours).	Contact Atlas Copco for maintenance. Reset the timer after maintenance.

9 Technical data

9.1 Reference conditions

Compressed air effective inlet pressure	bar	7
Compressed air effective inlet pressure	psi	101.5
Compressed air inlet temperature	˚C	35
Compressed air inlet temperature	˚F	95
Relative humidity of the air at inlet	%	100
Pressure dew point (standard version)	˚C	-40
Pressure dew point (standard version)	˚F	-40
Pressure dew point (optional version)	˚C	-70
Pressure dew point (optional version)	˚F	-94

9.2 Limitations for operation

Maximum compressed air effective inlet pressure	bar	14.5
Maximum compressed air effective inlet pressure	psi	210
Minimum compressed air effective inlet pressure	bar	4
Minimum compressed air effective inlet pressure	psi	58
Maximum ambient air temperature	˚C	45
Maximum ambient air temperature	˚F	113
Minimum ambient air temperature	˚C	1
Minimum ambient air temperature	˚F	34
Maximum compressed air inlet temperature	˚C	50
Maximum compressed air inlet temperature	˚F	122
Minimum compressed air inlet temperature	˚C	1
Minimum compressed air inlet temperature	˚F	34

9.3 Technical specifications

Data for standard version (PDP -40 ˚C)

Desiccant type: activated alumina (Al_2O_3)

		CD 25+	CD 30+	CD 35+	CD 50+	CD 60+	CD 70+	CD 80+	CD 100+	CD 145+
Max. volume flow at dryer inlet	l/s	25	30	35	50	60	70	80	100	145
Max. volume flow at dryer inlet	cfm	53	64	74	106	127	148	169	212	307

		CD 25+	CD 30+	CD 35+	CD 50+	CD 60+	CD 70+	CD 80+	CD 100+	CD 145+
Regeneration air consumption average at max. flow	%	18	18	18	19	18	18	18	19	19
Total amount of desiccant	kg	16.4	16.4	24	30.6	32.8	48	61.2	61.2	92.4
Total amount of desiccant	lb	36.1	36.1	52.9	67.5	72.3	105.8	136.2	136.2	203.7
Recommended filter size PD/DDp...		32	32	32	60	60	60	120	120	150
Mass	kg	50	50	60	80	100	120	160	160	240
Mass	lb	110	110	132	177	220	265	353	353	529
Installed power	VA	36	36	36	36	60	60	60	60	82
Time of half a cycle	s	120	120	120	120	120	120	120	120	120
Regeneration time	s	95	95	95	95	95	95	95	95	95

Data for special version (PDP -70 ˚C)

Desiccant type: molecular sieves

		CD 25+	CD 30+	CD 35+	CD 50+	CD 60+	CD 70+	CD 80+	CD 100+	CD 145+
Max. volume flow at dryer inlet	l/s	17.5	21	24.5	35	42	49	56	70	101.5
Max. volume flow at dryer inlet	cfm	37.	44.5	52	74	89	104	119	148	215
Regeneration air consumption average at max. flow	%	26	26	26	27	26	26	26	27	27
Total amount of desiccant	kg	15.5	15.5	21.5	29	31	43	58	58	87
Total amount of desiccant	lb	34	34	47	64	68.5	95	128	128	192
Recommended filter size PD/DDp ...		32	32	32	32	60	60	60	120	120
Mass	kg	50	50	60	80	100	120	160	160	240
Mass	lb	110	110	132	177	220	265	363	363	529
Installed power	VA	36	36	36	36	60	60	60	60	82
Time of half a cycle	s	120	120	120	120	120	120	120	120	120
Regeneration time	s	95	95	95	95	95	95	95	95	95

10 Instructions for use

Instructions

1	The dryer can contain pressurised air. This can be potentially dangerous if the equipment is misused.
3	No alterations must be made to this vessel by welding, drilling or other mechanical methods without the written permission of the manufacturer.
4	The design pressure and temperature of this pressure bearing part must be clearly indicated on the data label.
5	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.
6	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

11 Guidelines for inspection

Guidelines

On the Declaration of Conformity / Declaration by the Manufacturer, the harmonised and/or other standards that have been used for the design are shown and/or referred to.

The Declaration of Conformity / Declaration by the Manufacturer is part of the documentation that is supplied with this air dryer.

Local legal requirements and/or use outside the limits and/or conditions as specified by Atlas Copco may require other inspection periods as mentioned below.

12 Pressure equipment directives

Components subject to 97/23/EC Pressure Equipment Directive

The drying towers, consisting of extruded profiles, are the only pressure bearing parts of category I. The category according to 97/23/EC of the pressure assembly, as well as the volume, is indicated in Table A (see below).

Parts of article 3.3 of 97/23/EC are subject to good engineering practice.

Parts of category I according to 97/23/EC are integrated into the machine and fall under the exclusion of article I, section 3.6.

Parts subject to the Simple Pressure Vessel Directive 87/404/EEC are excluded from 97/23/EC according to article I, section 3.3.

The following table contains the necessary information for the inspection of all pressure equipment according to the Pressure Equipment Directive 97/23/EC.

Design criteria for pressure equipment:

Table A

Dryer type	Tube drawing p.n.	Design pressure bar(e)	Design tem-perature °C	PED category	Tube wall thickness mm	Tube diameter mm	Tube internal volume l
CD 25+, CD 30+, CD 60+	1624 0939 00	16	-10 to +80	I	6	150	15.7
CD 35+, CD 70+	1624 0940 00	16	-10 to +80	I	6	150	20.0
CD 50+, CD 80+, CD 100+, CD 145+	1624 0974 00	16	-10 to +80	I	6	150	26.5

Recommendation of the manufacturer for the re-inspection time

Following actions are to be executed by authorised service personnel, unless stated differently in the applicable legislation. The stated time interval has as reference the day of start-up of the unit.

- Every 6 months: visual check of tube (tower) material on the outside (exposed) for traces of strong corrosion. Consult the service department of your supplier if necessary.
- Every 5 years: when replacing the desiccant, following inspections are to be carried out:
  - Inspection of outside and inside of the material for excessive and local corrosion,
  - Inspection of outside and inside of the material for fissures, leaks, damage.

  Consult the service department of your supplier if necessary.
- Every 10 years: hydrostatic test according to the Pressure Equipment Directive 97/23/EC. Consult the service department of your supplier if necessary.

13 Declaration of conformity

1

EC DECLARATION OF CONFORMITY

2 We, (1) ….., declare under our sole responsibility, that the product
3 Machine name
4 Machine type
5 Serial number

6 Which falls under the provisions of article 12.2 of the EC Directive 2006/42/EC on the approximation of the laws of the Member States relating to machinery, is in conformity with the relevant Essential Health and Safety Requirements of this directive.

The machinery complies also with the requirements of the following directives and their amendments as indicated.

7

	Directive on the approximation of laws of the Member States relating to		Harmonized and/or Technical Standards used	Att' mnt
a.	Pressure equipment	97/23/EC		
b.	Machinery safety	2006/42/EC	EN ISO 12100 – 1 EN ISO 12100 – 2 EN 1012 – 1	
c.	Simple pressure vessel	87/404/EEC		
d.	Electromagnetic compatibility	2004/108/EC	EN 61000-6-2 EN 61000-6-4	
e.	Low voltage equipment	2006/95/EC	EN 60034 EN 60204-1 EN 60439	
f.	Outdoor noise emission	2000/14/EC		
g.	Equipment and protective systems in potentially explosive atmospheres	94/9/EC		
h.	Medical devices General	93/42/EEC	EN ISO 13845 EN ISO 14971 EN 737-3	
i.				

8.a The harmonized and the technical standards used are identified in the attachments hereafter

8.b *(Product company)* is authorized to compile the technical file.

9
10

	Conformity of the specification to the directives	Conformity of the product to the specification and by implication to the directives
11 12 Issued by	Product engineering	Manufacturing
13 14 Name		
15 Signature		
16 Date		

81679D

Typical example of a Declaration of Conformity document

(1): Contact address:

Atlas Copco Airpower n.v.

P.O. Box 100

B-2610 Wilrijk (Antwerp)

Belgium

In order to be First in Mind-First in Choice® for all your quality compressed air needs, Atlas Copco delivers the products and services that help to increase your business' efficiency and profitability.

Atlas Copco's pursuit of innovation never ceases, driven by our need for reliability and efficiency. Always working with you, we are committed to providing you the customized quality air solution that is the driving force behind your business.

No. 2920 7092 40 / 2010 - 05 - Printed in Belgium

www.atlascopco.com