

CD⁺ 25-260

ATLAS COPCO HEATLESS ADSORPTION DRYER

General Description



The CD⁺ dryers are heatless adsorption dryers, designed to remove moisture from compressed air for industrial applications. Their working principle is based on the PSA (Pressure Swing Adsorption) process.

The CD⁺ dryers are available in versions to reach pressure dew points down to:

- -20°C / -5°F / ISO* Class [-:3:-]
- -40°C / -40°F / ISO* Class [-:2:-]
- -70°C / -100°F / ISO* Class [-:1:-]

*Classification acc. ISO8573-1:2010

They are by default equipped with a DC1 electronic controller. An Elektronikon controller with graphical display, including a PDP sensor (pressure dew point sensor) to lower the energy consumption, is available as option. The dryers are designed for automatic & continuous operation, for indoor use and altitude operation up to 2000 m (6560 ft.). Inlet air pressures are allowed up to 14bar.

The CD⁺ dryers with optional PDP sensor offer a tailor made pressure dew point for the application. In both the DC1 as the Elektronikon, the PDP can easily be set upwards from the standard dew point setting of -40°C (-40°F) or -20°C (-5°F), to a set point that perfectly matches your application.

Their fully enclosed canopy design, and the use of durable aluminum extrusions which serve as pressure vessels, makes them very robust units that can withstand tough ambient conditions. The enclosed canopy design also helps to limit the noise level during operation, especially during blow-off phase.

A uniquely designed valve manifold in combination with a special silencer system ensures not only high reliability, also the very low pressure drop of this combination contributes to having an absolute minimum regeneration air consumption.

Working Principle

The CD⁺ dryers are by default equipped with a highly efficient UD⁺ inlet filter, to protect the dryer and adsorption material from impurities.

DRYING

The air is lead through the 2" bottom manifold which is controlled by 3/2 solenoid valves. Those valves are guaranteeing a smooth switch over even at heavy pressure fluctuations. Afterwards the wet air is getting distributed evenly over all desiccant material by using our specially designed swirl, not just by a market standard strainer which is only feeding the center of the desiccant material with the wet air.



Fig 1: bottom valve manifold with specially designed swirl

Reaching the top of the extruded vessel, the main dry airflow is getting released directly via a large dimensioned top manifold to the air outlet. Next, it passes the highly efficient DDP⁺ after filter, which is protecting the downstream equipment from the fine desiccant dusts the air could have been collecting while passing through the adsorbent.

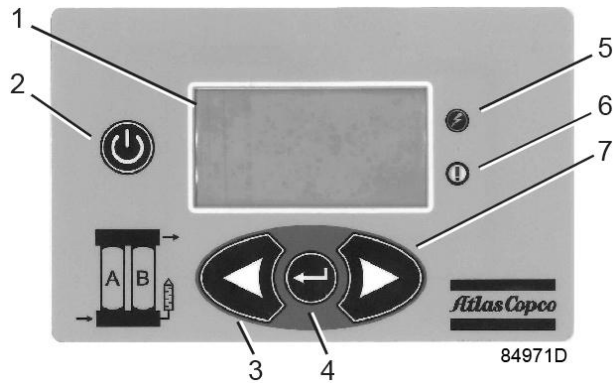
REGENERATION

Part of the dry air outlet flow is taken into the regeneration tower through a pressure nozzle. With this expanded dry air amount, for which the flow is determined by the used nozzle size, we can regenerate the moist desiccant in the tower. By default the standard nozzle for inlet pressures of 7bar is installed, but 7 additional nozzles are delivered as loose items and are available to install on the unit. The numerous variants allow you to select the nozzle which is spot on or very close to your operational pressure, this will drastically drive the used purge air consumption thus energy costs down.

By using an oversized silencing system not only the noise level is very low, also the energy efficiency increases by having a lower pressure drop on the outlet system.

After regenerating the vessel, the wet air is released via the blow off valve, which is integrated into the largely designed bottom valve manifold. After blow-off, the dryer will switch towers and the inlet compressed air flow will pass through the freshly regenerated dryer tower.

Controller



By default, the CD⁺ dryers are equipped with the DC1. This controller ensures smooth and fully automatic operation of the dryer.

With the DC1, it is possible to:

- Consult current working phase with animated icon
- Show countdown timer explaining when the next phase will start
- Consult current pressure dew point (option PDP sensor required)
- Adjust PDP set point for tailor made PDP (option PDP sensor required)
- Display alarms, counters
- Display service information
- Adjust dryer parameters
- Set synchronization with compressor (freeze function)
- Select either one of the 23 languages
- Change the measurement units (e.g. °C/°F)

Purge nozzle set

The CD⁺ dryers come by default with a full nozzle kit, containing nozzles for all inlet pressures in the range of 4 to 14 bar (7 pcs + standard fitted nozzle for 7 bar). That way an ideal nozzle selection is always possible, contributing to a low purge loss and energy consumption.

Optional Equipment

1. Upgrade Elektronikon MKV (incl. PDP sensor, IP65)
2. PDP sensor
3. IP65/NEMA4
4. High Inlet Temperature (HIT)
5. Wall mounting kit (only for simplex variants)

Option 1: Upgrade Elektronikon MKV (incl. PDP sensor, IP65)



Description

Upgrade the DC1 to the MKV controller, offering all the advantages of the MKV, such as:

- Graphical, colored, animated screen
- Various connectivity possibilities (CAN, Ethernet, ...)
- Pressure sensor read out for remote monitoring
- Alarm relay for every type of alarm
- Week timer
- Remote filter monitoring
- ...

This option always includes the PDP sensor option, and the IP65 option.

Scope changes

DC1 gets replaced with the Elektronikon MKV Graphic
Installation of PDP sensor
Execution as per IP65

Option 2: PDP sensor

Description

This option can drastically reduce the purge air consumption, by extending the cycle time of the dryer when there is no full load.

In case the dryer is not fully loaded, the pressure dew point might become better (lower) than required for the application, because the adsorption material never gets saturated. This is an opportunity where we can reduce the regeneration air consumption by extending the cycle time of the dryer. That way we also keep the pressure dew point stable for the application.

The reduced regeneration air consumption will directly translate into a compressed air energy saving.

Option 3: IP65 / NEMA4

Description

Use the IP65 / NEMA4 option if the dryer is located in more rough conditions (dusty environment, outside under shelter, etc.)

When this option is selected, the dryer will be executed with a metal box that protects the controller and the wiring.

Option 4: High Inlet Temperature (HIT)

Description

On locations with high ambient temperatures, typically also the compressed air temperature at the inlet of the dryer will be higher. By default, our dryer can withstand a maximum inlet air temperature of 50°C / 122°F. With the HIT option, we can up to 60°C / 140°F.

Option 5: Wall mounting kit (only for simplex variants)

Description

The wall mounting kit helps to save space. It can be used in the compressor room, but is also perfectly suited to use with dryer that are operating at the point of use. The metal L-shaped brackets are designed for the weight of the dryer, and make sure service on the dryer remains possible.

This option is only available for dryers with one set of extrusions. Not available for duplex, triplex and quadruplex variants.

Features and Benefits

High-efficiency operation

- To perform at continuous operation or 100% airflow
- Constant pressure dew point of -20% °C/-5 °F, -40°C/-40 °F, -70°C/-100°F as standard.

Advanced energy savings

- Low pressure drop (-25%)
- Purge air reduction (-15%)
- Optional Dew point Dependent Switch

Unique manifold/valve design

- Large pipe diameter minimizes pressure drop for advanced energy savings
- Electronically operated 3/2 valve reduces risk of breakdowns and offers reliable control during airflow fluctuations.
- Service openings
- Clever strainer design minimizes pressure drop, regeneration times and energy consumption

New silencing design

- Large front silencer
- Minimal pressure drop

Advanced control and monitoring system

- 4-line display in 23 languages
- Service alarms and general alarm relay
- Monitors all parameters to ensure maximum reliability
- Allows for synchronization with the compressor
- Service indications
- Optional pressure dew point sensor for Dew point Dependent Switching

Service and maintenance-friendly desiccant bags

- Allow quick replacement without spilling adsorbent material
- A spring covers the bags to prevent damage by desiccant moving due to pressure pulsations
- Accessible service panels

Integrated filters

- A highly efficient UD⁺ pre-filter prevents oil contamination to increase desiccant lifetime.
- A durable DDP⁺ after –filter protects the airnet from desiccant dust and network contamination.
- Mounted directly on the inlet and outlet of the dryer for low pressure drop
- Easy to assemble and maintain

Nozzle purge set

- Offers flexibility in optimizing regeneration pressure.

Advanced options

- Advanced Elektronikon® control and monitoring system
- Pressure dew point sensor
- High inlet temperature version with molecular sieve desiccant
- IP 65
- Wall mounting kit