

CD+ 110-300

ATLAS COPCO QUALITY AIR SOLUTIONS

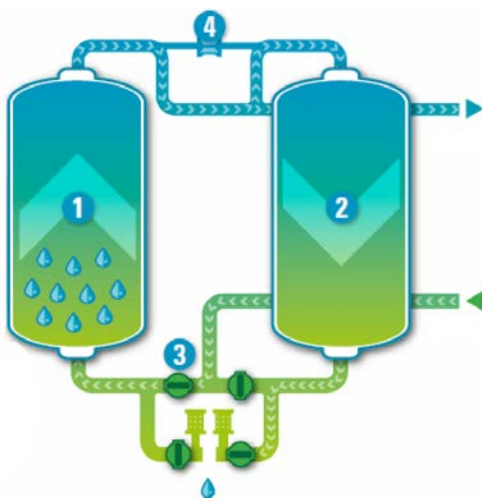
General Description

The CD+ heatless desiccant air dryer removes moisture from compressed air by adsorption. The unit will provide a constant pressure dew point (PDP) of -40°F at full load, once sized appropriately based on inlet temperature and pressure. -100°F variant is also available (can also be used as an HIT variant).

The CD+ adsorption dryer is a twin tower heatless regenerative desiccant dryer. The dryer is completely wired and equipped with all interconnecting pipe work and fittings. All equipment mounted on a single common frame ready to operate. All units come with ASME approved vessels and safety valves as standard.



Working Principle



The general working principle of adsorption dryers is simple. Moist air flows over hygroscopic material (typical materials are silica gel, molecular sieves, activated alumina) and is thereby dried. The exchange of the water vapor in the moist compressed air into the hygroscopic material or “desiccant” to gradually be saturated with adsorbed water. Therefore, the desiccant needs to be regenerated regularly to regain its drying capacity, Adsorption dryers are typically built with two drying vessels for that purpose. Each tower switches the tasks when the other one is completely regenerated. Typical Pressure Dew Point (PDP) that can be achieved is -40C, which makes these dryers, suitable for providing very dry air for more critical applications.

CD is a purge regenerated adsorption dryers. The regeneration process takes place with the help of expanded compressed air and requires approximately 15-20% of the dryers nominal capacity at 7 bar € working pressure.

1. Drying Vessel
2. Regenerating Vessel
3. Purge
4. Control Valves

Scope of Supply

AIR CIRCUIT



The air circuit consists of:

A DD+ general-purpose filter and a PD+ high efficiency filter provide full protection for the desiccant bed. Two ASME approved air receivers filled with either activated alumina desiccant. A stainless steel strainer is included at the top and bottom of each vessel to keep the desiccant in place and to distribute the incoming airflow. The design of the vessels and the grade of the desiccant used results in a desiccant life of 40,000 running hours. Two safety valves, one on each vessel, sized as per the ASME code. Two highly reliable butterfly valves direct the air into the appropriate vessel. The valve has a service interval of 40,000 running hours and is fully stainless steel, reducing wear and preventing corrosion. A non-return valve at the outlet of each

tower to avoid back flow of the outlet air. These valves also have a service interval of 40,000 running hours and stainless steel internals. A nozzle in the purge line to allow 18% average (for -40°F variant) of the dry air to enter the other receiver for regeneration. Two exhaust valves, one for each receiver, to release the pressure in the receiver, alternating every half cycle. At least one exhaust mufflers connected to each exhaust valve, to reduce the noise during blow-off. Each muffler has an integrated safety valve so that in the event of a blockage the dryer can continue to operate. Interconnecting piping, painted and flanged, such that dismantling and re-assembly times are kept to minimum. A DDp⁺ outlet filter to remove the desiccant dust from the dried air. Note: Pressure drop across the dryer, excluding the filters, is typically 3psi.

REGULATING SYSTEM

The CD⁺ dryer has been designed for fully automatic operation.

The standard CD⁺ machine comes complete with a timer card controller, which essentially provides two functions: Control of the unit based on timer cycle Annunciation of the unit's status

Control of the unit is based on a timed cycle. There is a fixed time to depressurize the regenerating tower, dry the desiccant using purge air and then re-pressurize the tower ready for use. At the end of the regeneration cycle the towers automatically switch over. In order to save energy the dryer includes a "Purge Saver contact", feature that pauses

The dryer whenever the compressors unload or stop, thereby eliminating purge air during periods of no load. In order to activate this function a signal from the compressor is required to indicate when it is either unloaded or stopped. This signal has to be connected to the dedicated digital input contact inside the control panel.

The CD⁺ Elektronikon variant comes complete with the Elektronikon Graphic microprocessor controller, which essentially provides 4 functions: Control of the unit in conjunction with the sensors listed in section 3. Monitoring of the unit, resulting in alarms/warnings when necessary Protection of the unit, resulting in shutdowns when necessary Annunciation of the unit's status

Control of the unit is partly dynamic and partly based on a timed cycle. There is a fixed time to depressurize the regenerating tower, dry the desiccant using purge air and then re-pressurize the tower ready for use. However, tower switchover is dynamic and solely related to the measured outlet PDP. Only when the delivered PDP starts to approach the limit set by the user on the Elektronikon, do the towers switch over. This means that average purge consumption is reduced when the dryer is running partially loaded.

In the event that the PDP sensor fails, the dryer will automatically switch back to a fully time based cycle, preventing any degradation on air quality.

SENSORS



- Pressure sensor for each tower.
- Temperature sensor for the inlet air.
- Pressure dew point sensor for the outlet air
(For Elektronikon variant, or timer unit with purge control option)

ELECTRICAL SYSTEM

The dryer is 115V 60Hz single-phase and the electrical system consisting of Elektronikon Graphic microprocessor controller (for Elektronikon variant), or timer card (for standard model). All necessary inputs and outputs, Fuses, Transformer, Solenoid valves. The electrical components are UL approved and housed in a NEMA 4 cubicle.

INSTRUMENTATION



- Indicator LED – Voltage on
- Indicator LED – In operation
- Indicator LED – Warning/shutdown
- Elektronikon variant also features:
- Working mode of the dryer
- Status of the dryer, including:
 - Cycle and tower status
 - Measured PDP at the outlet
 - Vessel pressure
 - Inlet temperature
 - Running hours
 - Service requirements

- Warning and shutdown status, triggered on:
 - Failure to switch
 - Exhaust valve failure A/B
 - Low inlet pressure
 - High dew point
 - Failure to blow-off
 - High inlet temperature
 - Elevated back pressure during regeneration
 - Failure to pressurize
 - Service required

REMOTE MONITORING AND CONTROL CAPABILITIES

(Elektronikon variant only)

- General warning - volt free contact
- Service required - volt free contact
- Pressure Dew Point (optional) – 4-20mA analogue signal
- Dryer start/stop - volt free contact
- Prefab's
- Modbus
- Status and warning updates via text message and e-mail
- Full monitoring and logging via internet

Features & Benefits

Energy Savings

- Pressure drop below 0.2bar/ 2.9psi
 - Drives down energy cost
- Dew point sensing and control
 - Adapts the energy consumption to real load of the dryer

Reliable operation

- Proven durable Valves
 - Design for multiple switching, that improves dryer lifetime
- Guaranteed dew point
 - -Robust and accurate pressure dew point sensors.

Easy set-up and use

- Ease of installation
 - Single point installation
 - Fork lift slots
- Low maintenance
 - All internal components are easily accessible
 - Excellent control and monitoring system
 - High grade desiccants and
 - Durable valve