Drying | EVERDRY® HOC-P

Desorption in Partial Flow: the Heat Regenerating Adsorption Dryer EVERDRY® HOC-P

Irrespective of where oil-free compressed pressurised air has to be generated, the advantages of the EVERDRY® HOC series impress consistently. Their main benefit:
The heat, which is created during the compression process, is not - routed into the aftercooler as in conventional processes but, in this case, utilised for the desorption.

An adsorption dryer which utilises the heat from the compression process to create considerable energy savings is probably the most convincing argument when selecting the perfect product! Systems from the EVERDRY® HOC series function with operating pressure in all process stages. The loads and stresses on the components and drying agents, which are normally caused in conventional systems during pressure changes, do not occur in our systems. This therefore guarantees an extended service life for the system components. Systems with a volume flow of 100,000 m^3/h are also feasible when the customer requires them.

The desorption is executed in EVERDRY® HOC-P in partial flow by exploiting the compression heat and the cooling in the partial flow and utilising the cold pressurised air in the volume flow.
No pressurised air losses for regeneration (ZERO Purge).

Model:	HOC-F	HOC-P	HOC-R
Pressure dew point	Down to -40 °C	Down to -40 °C	Down to -70 °C
Quality Class	-.2.-	-.2.-	-.1.-

› Application Oriented Solutions
- › Added value by utilising comprehensive competence
- › Total concept instead of just individual components
- › Informative and user-friendly control systems
- › Easy to maintain

› Reliable Process Management
- › Safe function monitoring with sensor technology
- › High-quality high-temperature galvanising
- › Tried and tested, easy to maintain heat exchanger design
- › Optional stainless steel version

› Energy-optimised Concept
- › Utilisation of compression heat
- › No pressurised air losses for regeneration
- › Beneficial individual valves
- › Energy-efficient dew point control system

› Durable and Efficient
- › The systems function with operating pressure in every process stage
- › No loads and stresses on components and the drying agents during pressure changes

Better through Responsibility

BEKO

Heat Regenerating Adsorption Dryer:
In-house Engineering for Individual System Solutions

Profile
- Branch and application-specific requirements (e.g. pressurised air quality, volume flows, types of energy for regeneration air heating)
- Investment and operating costs, individual amortisation time
- Local acceptance provisions
- Climate zones, local assignment conditions, economical parameters

Concept
- Specifying the type of system design
- Following on with: Developing individual solutions

Presentation
- Presenting the solution concept

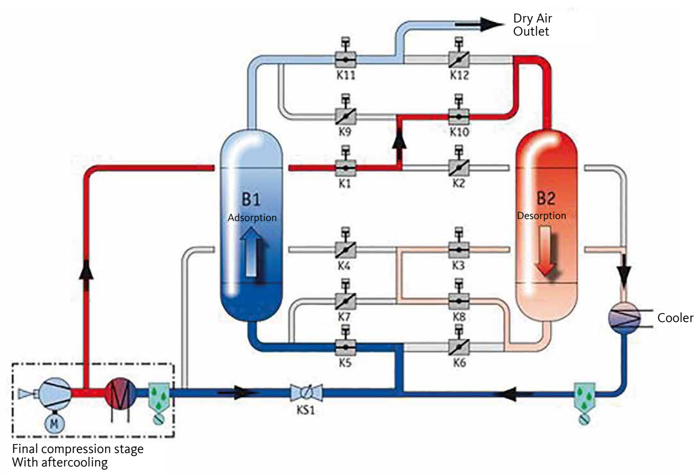
Implementation
- Implementing the project
- In-house engineering by our experienced, competent team of experts

Commissioning
- Installing the system on site
- Optimum setting up and adjustment for the local circumstances

Continuous exchange of information between the customer and our experts
Support / Consulting / Optimisation

Function Process for EVERDRY® HOC-P

The functional processes for systems of the HOC-P series can be fundamentally divided into three stages:
- **Adsorption / Desorption**
- **Adsorption / Cooling**
- **Adsorption / Standby**



The whole procedure is executed with operating pressure, not only in the adsorption stage but also in the desorption and cooling stages. This therefore enables the resulting compression heat to be utilised for desorption for oil-free compressors for pressurised air.

Adsorption B1 / Desorption B2

The hot compressed air partial flow exiting the compressor flows via the hot air inlet **K1**and the valve **K10** into the desorbing adsorption vessel **B2**. The moisture absorbed by the drying agents vaporises and is routed with the desorption air partial flow via the valves **K8** and **K3** to the cooler. The compressed air is cooled here to the required adsorption inlet temperature. Any resulting precipitation, which occurs during cooling, will be extracted from the compressed air system via the separator. The cooled desorption air partial flow then flows into the cold air partial flow from the compressor downstream of the throttle valve **KS1**.
The partial air flow needed for regeneration can be adjusted manually via the throttle valve **KS1**.

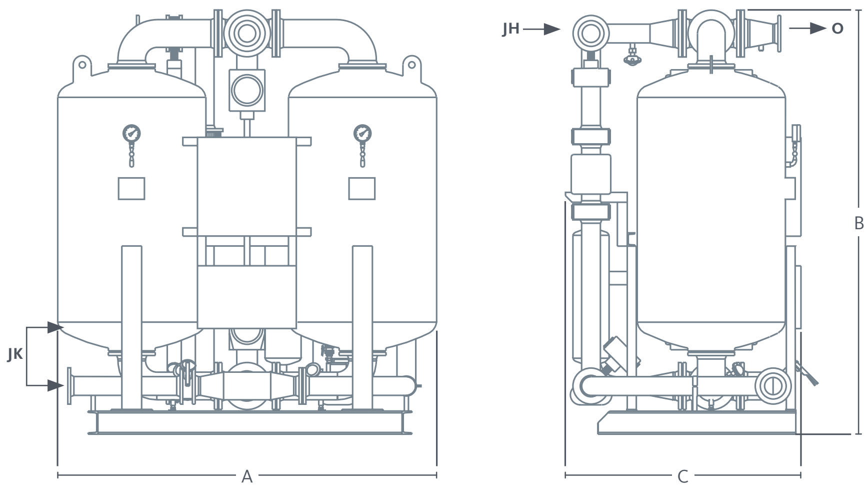
The volume flow now corresponds to that of the compressor's volume flow again. The entire compressed air flow is guided through the valve **K5** into the adsorption vessel **B1** which has been provided for adsorption process. The drying agent bed is flushed through from the bottom to the top during the adsorption process. The moisture will be absorbed by the desiccant during the through flow. The dried compressed air is then routed via the valve **K11** and the system outlet to the consumer positions.

The moisture level in the drying agent reduces with the desorption process. Decreasing moisture levels result in an increase of the outlet temperature of the desorption air flow.
The desorption process is concluded when the temperature of the desorption air flow at the adsorber outlet side (in this case **B2**) has reached the process-technical
required temperature.

EVERDRY® HOC-P

- Fully automated for continuous operation
- Desorption in a partial flow using the compression heat
- Cooling via the partial flow of the cold compressed air volume flow
- Hot and cold air from the compressor
- Designed for indoor installation
- Flow-optimised valves to minimise the pressure loss

ENERGYLESS



EVERDRY®	HOC-P 0750	HOC-P 1100	HOC-P 1700	HOC-P 2300
Volume flow rate (m³/h)	800	1300	1700	2300
Connection PN 16 DIN 2633: J – O	DN 50	DN 80	DN 80	DN 100
Connection PN 16 DIN 2633: Dj	DN 50	DN 80	DN 80	DN 80
Dimensions				
A (mm)	1430	1600	1800	2050
B (mm)	2140	2100	2260	2430
C (mm)	1050	1200	1350	1550
Weight (kg)	1100	1450	1850	2300

JH: hot air inlet
JK: cold air inlet
O: dry air outlet

Notice: the table only shows standardised installation sizes.
Systems up to 100,000 m³/h on request

Operating conditions*	
Medium	Compressed air
Volume flow (Vnom)	relative to 20 °C and 1 bar abs.
Operating pressure	7 bar [g]
Inlet temperature	35 °C
Inlet humidity	saturated
Pressure dew point	up to −40 °C
Cooling water	25 °C

Limits of use*	
Operating pressure	5 ... 10 bar [g]
Final compression temperature	140 ... 180 °C
Ambient temperature	5 ... 40 °C
Maximum cooling water temperature	32 °C

Electrical connection*	
Power supply	3 Ph. | 400 V | 50 Hz
Connected load	0.15 kW (control panel only)
Protection class	IP 54, according to IEC 529 (no explosion protection)
Version	according to VDE / IEC
Permissible voltage deviation	+/− 10 %

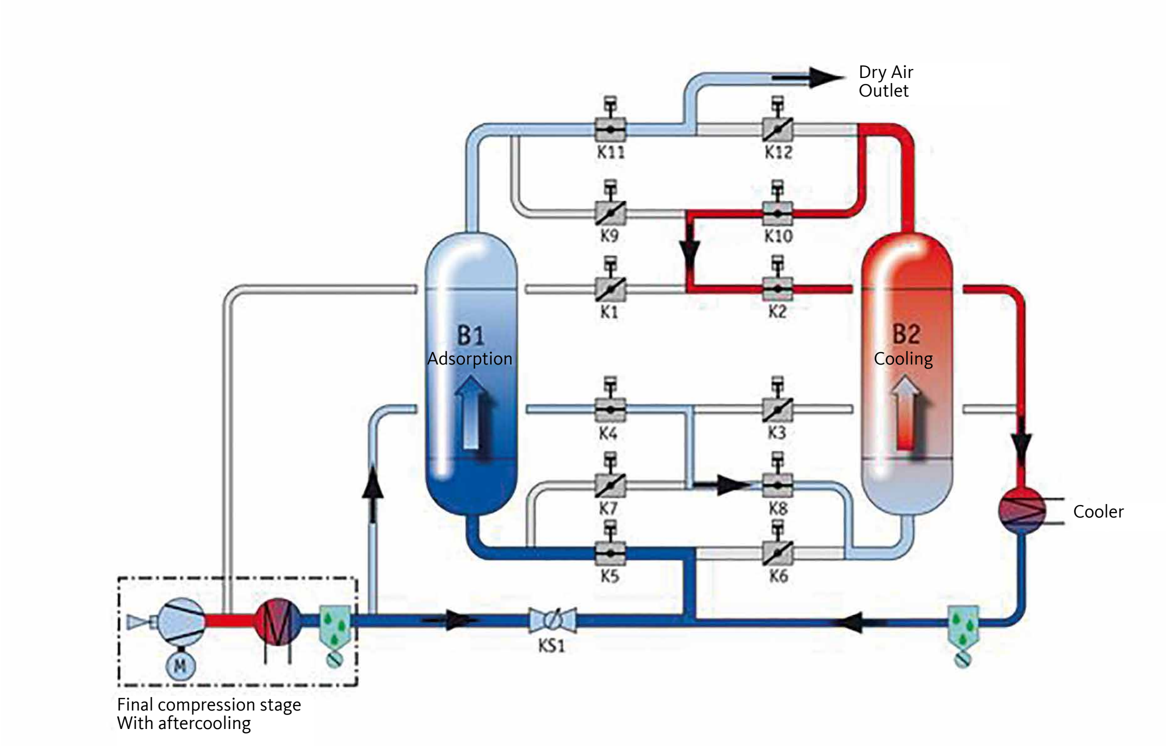
* Different conditions on request

EVERDRY®	HOC-P 2900	HOC-P 3400	HOC-P 4200	HOC-P 5000	HOC-P 6000
Volume flow rate (m³/h)	2900	3400	4150	5000	6000
Connection PN 16 DIN 2633: J – O	DN 100	DN 100	DN 150	DN 150	DN 150
Connection PN 16 DIN 2633: Dj	DN 80	DN 100	DN 100	DN 150	DN 150
Dimensions					
A (mm)	2050	2400	2500	2800	3000
B (mm)	2430	2500	2620	2700	2750
C (mm)	1700	1650	1800	1850	1950
Weight (kg)	2650	2900	3450	3900	4400

JH: hot air inlet
JK: cold air inlet
O: dry air outlet

Adsorption B1 / Cooling B2

To prevent temperature and dew point peaks after the switch over, the stored heat in the drying agents will be cooled by the cold compressed air partial flow after the desorption stage. The cold compressed air partial flow exiting the compressor will be routed via the valves **K4** and **K8** into the heated up drying agent bed. The cold compressed air partial flow absorbs the stored heat in the drying agents during the through flow process. The compressed air partial flow heated up by the desiccant flows to the cooler where it is cooled back down to the adsorption temperature. The cooled cooling air partial flow then flows into the cold air partial flow from the compressor downstream of the throttle valve **KS1**. The volume flow now corresponds to that of the compressor's volume flow again. The entire compressed air flow is guided through the valve **K5** into the adsorption vessel **B1** which has been provided for adsorption process.
The drying agent bed is flushed through from the bottom to the top during the adsorption process. The moisture is absorbed by the drying agents during the flow through.
The dried compressed air is then routed via **K11** and the system outlet to the consumer positions.



Adsorption B1 / Standby B2

When the adsorption stage is monitored via a dew point dependent control system (optional) and is then completed, then the duration of the standby stage is dependent on the loading status of the adsorption vessel (in this case **B1**).
The switch over process will be only be initiated when the drying agent break-down capacity has been reached (increase in the pressure condensation point). If the system is operated in the "Time-dependent switch over" mode, then the initiation of the switching over process will be executed when the set cycle time has expired.

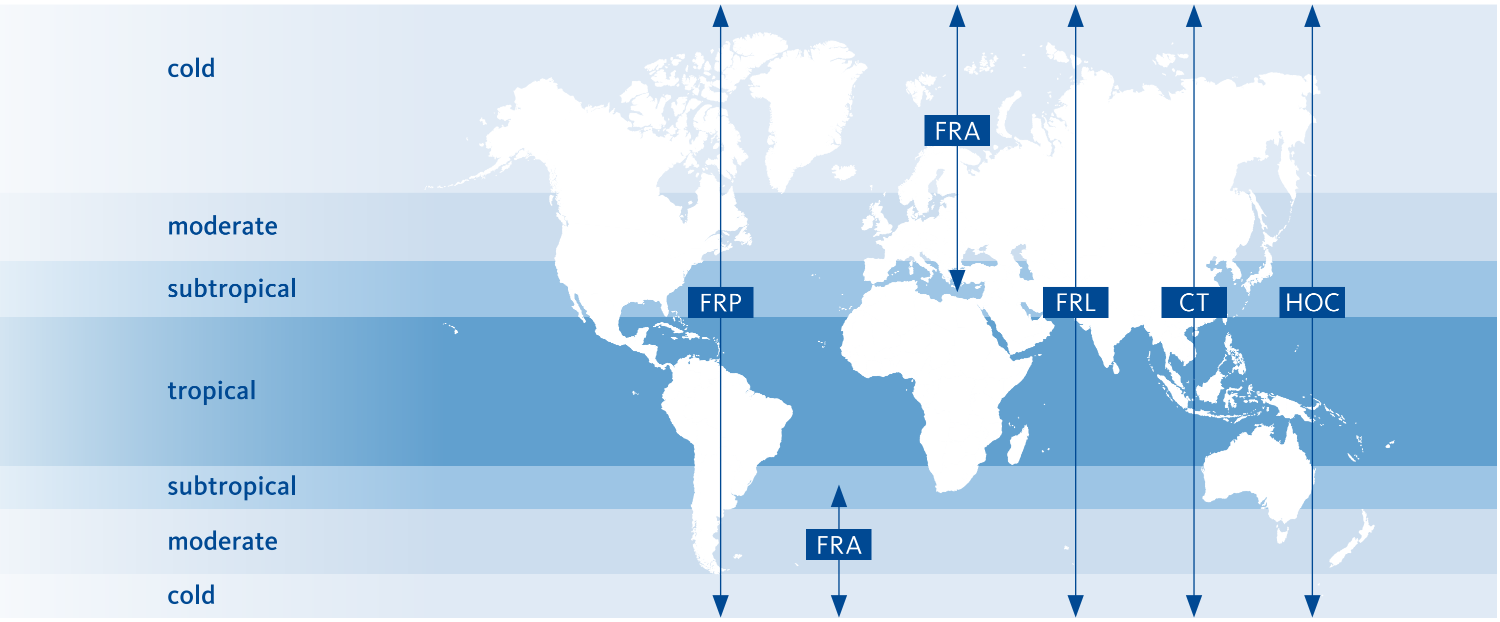
Parallel Stage

Before the switching over process is executed for the adsorption vessel (in this case **B1** to **B2**), this will be switched into parallel function by simultaneously opening the inlet valves **K5**, **K6**, **K11** and **K12** accordingly.
The pressurised air flows over both adsorption vessels for approx. 5 – 15 minutes (can be set individually).

Switching Over Procedure

The switch over for the adsorption to the regenerating vessel (in this case **B2**) is executed after completion of the standby stage. The vessel saturated with moisture **B1** is now in the desorption stage while the adsorption vessel **B2** is responsible for drying the compressed air.

The Heat Regenerating Adsorption Dryer:
At home throughout the world.



Do you have questions about the best way of processing your compressed air?

We have the answers! We offer efficient solutions for any type of processing chain. Please contact us with your queries. We would be delighted to tell you more about our condensate treatment, filtration, drying, measuring and process technology, and our comprehensive services.

Visit us at

BEKO TECHNOLOGIES Ltd
Unit 11-12 Moons Park
Burnt Meadow Road
North Moons Moat
Redditch, B98 9PA

Phone +44 (0) 1527 575778
info@beko-technologies.co.uk
www.beko-technologies.co.uk

78-00323