



Drying | EVERDRY® HOC-R

Desorption and cooling in reload: the Heat Regenerating Adsorption Dryer EVERDRY® HOC-R

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 produced during the compression process is not routed into the aftercooler - as in conventional processes - but is 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 m³/h are also feasible when the customer requires them.

In the EVERDRY® HOC-R, desorption takes place in the full flow using the compression heat. This is followed by a reload desorption as an option for low dew points. Cooling takes place with no loss of compressed air with a partial flow of the dried compressed air. 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

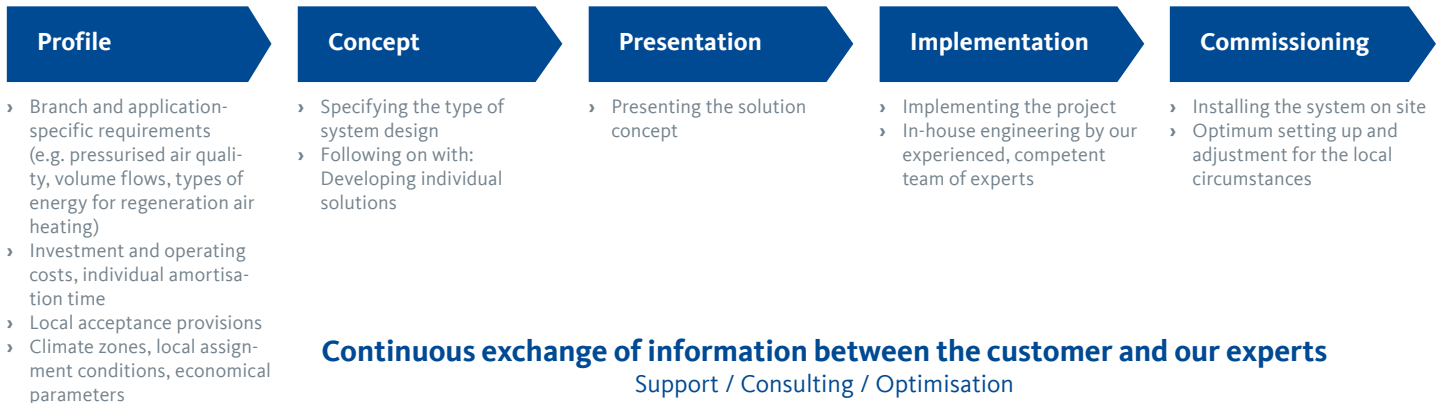
- › Utilisation of compression heat
- › No compressed air losses for regeneration
- › Beneficial individual valves
- › Energy-efficient dew point control system

› 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



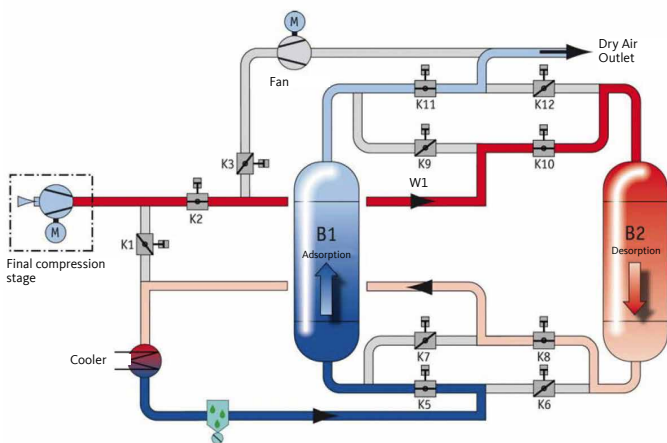
Heat Regenerating Adsorption Dryer: In-house Engineering for Individual System Solutions



Function Process for EVERDRY® HOC-R

The functional processes for systems of the HOC-R 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 exiting the compressor flows via the hot air inlet and the valves **K2** and **K10** into the desorbing adsorption vessel **B2**. The moisture absorbed by the desiccant vaporises and

is routed with the compressed air flow via the valve **K8** 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 down compressed air flow now flows via 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.

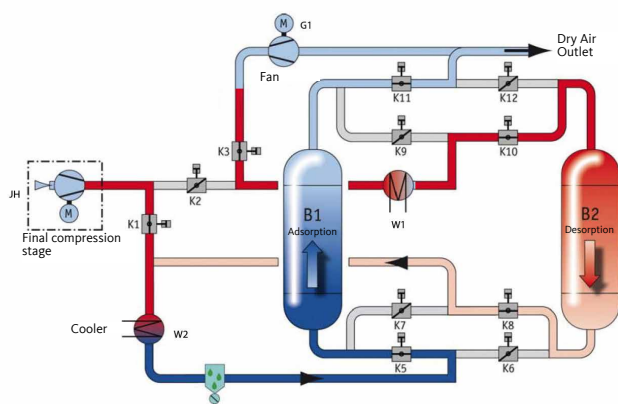
The dried compressed air is then routed via the valve **K11** and the system outlet to the consumer positions. The moisture level in the drying agent reduces with the desorption process. Decreasing moisture levels will result in an increase of the outlet temperature of the desorption air flow. The desorption 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.

Adsorption B1 / Reload - Desorption B2

Option for low dew points: To permanently lower the pressure dew point, reload desorption is executed with dried connection following the desorption stage with compression heat.

A pressure-resistant encapsulated fan **G1** conveys a partial flow of the dried compressed air in a cycle for this purpose. The partial flow passes from the system outlet **O** via the fan **G1** to the heater **W1** where it is heated up to the necessary desorption temperature. The hot, dry partial air flow then passes through the valve **K10** to the desorbing adsorption vessel **B2**. The use of dried compressed air leads to an after-desorption of the desiccant.

The residual moisture in the desiccant following the desorption stage with the moist, warm compressor air then evaporates and enters the hot air flow **JH** exiting the compressor with the partial air flow through the valve **K8**. The entire compressed air flow is cooled down to the necessary adsorption inlet temperature in the cooler **W2**.



Adsorption B1 / Reload - Cooling B2

To prevent temperature and dew point peaks after the switch over, the stored heat in the drying agents will be cooled by a cold partial flow of dried compressed air by the reload process.

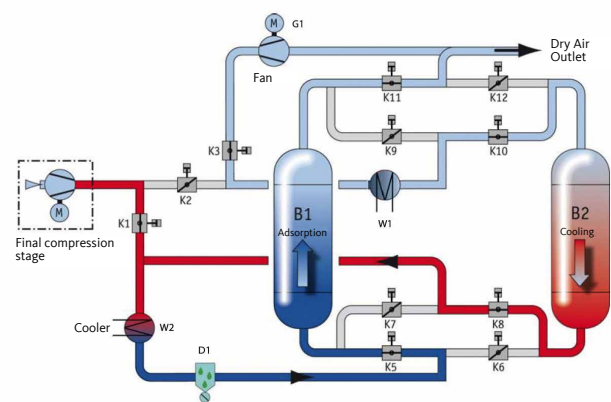
To this end, the fan **G1** circulates the compressed air in a loop. A partial flow of the dried compressed air passes from the system outlet through the valves **K3** and **K10** to the desorbing adsorption vessel **B2**. The cold partial air flow absorbs the stored heat in the desiccant during the through flow process. This then flows through the valve **K8** in the hot air flow exiting the compressor.

The entire compressed air flow is cooled down to the necessary adsorption inlet temperature in the cooler **W2**. Any resulting precipitation, which occurs during cooling, will be extracted from the compressed air system via the separator **D1**. The cooled down compressed air flow now flows via the valve **K5** into the adsorption vessel **B1** which has been provided for adsorption process and through the valve **K11** to the system outlet. The reload cooling process is concluded when the temperature of the cooling air flow at the adsorber outlet side (**in this case B2**) has reached the process-technical required temperature.

Any resulting precipitation, which occurs during cooling, will be extracted from the compressed air system via the separator **D1**.

The cooled down compressed air flow now flows via the valve **K5** into the adsorption vessel **B1** which has been provided for adsorption process and through the valve **K11** to the system outlet **O**.

The moisture in the desiccant is further reduced by the after-desorption process that occurs during the reload-desorption. Decreasing moisture levels will result in an increase of the outlet temperature of the desorption air flow. The reload 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.



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 desiccant 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.

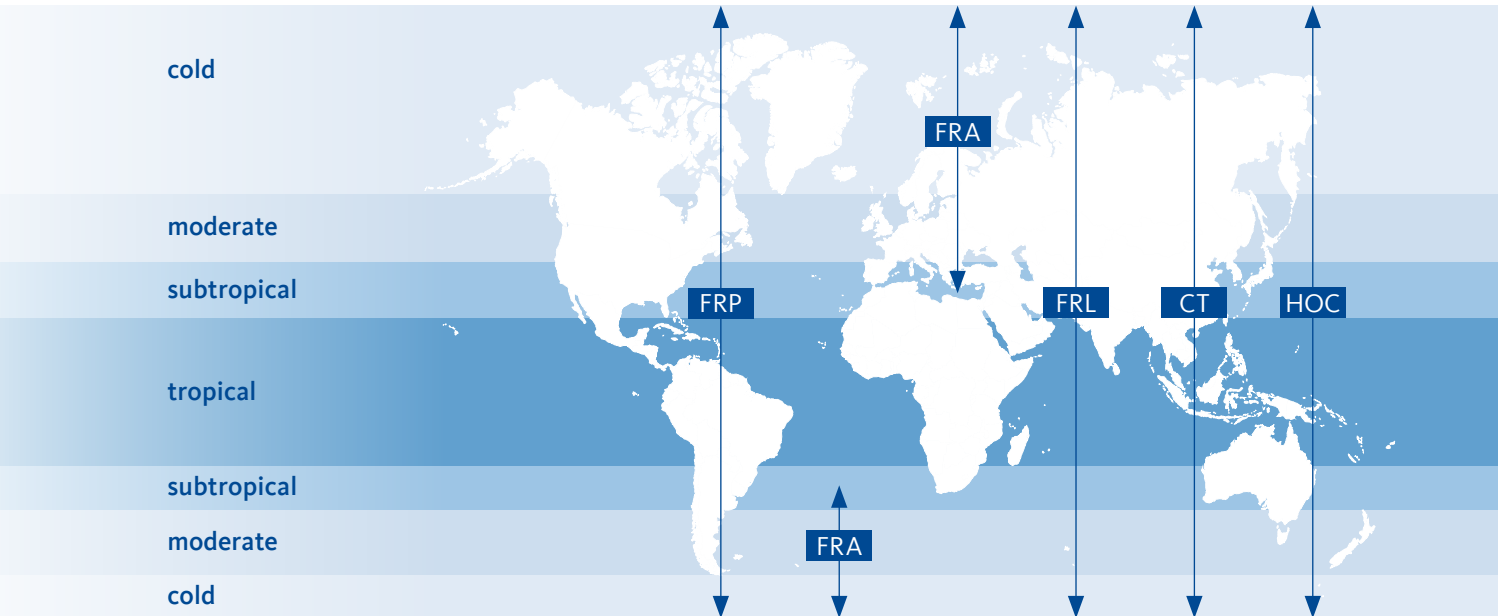
Parallel Stage

Before the switching over process is executed for the adsorption vessel (**in this case from B1 to B2**) this will be switched into parallel function by simultaneously opening the inlet valves **K5**, **K6**, **K11** and **K12**. 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.

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