

EVERDRY® - Adsorption Dryers HOC- P

Tailor made to suit your Compressed Air Treatment

Functional Description



ENERGYLESS



- Fully automatic for continuous operation
- Desorption by utilizing the heat of compression in partial stream operation
- Cooling by means of the partial stream of cold compressed air
- No compressed air loss for regeneration
- Flow beneficial butterfly valves for low pressure drop

Functional Sequence

The functional sequence for the HOC-R dryer type can generally be subdivided into three phases:

1. Adsorption / desorption
2. Adsorption / cooling
3. Adsorption / stand by

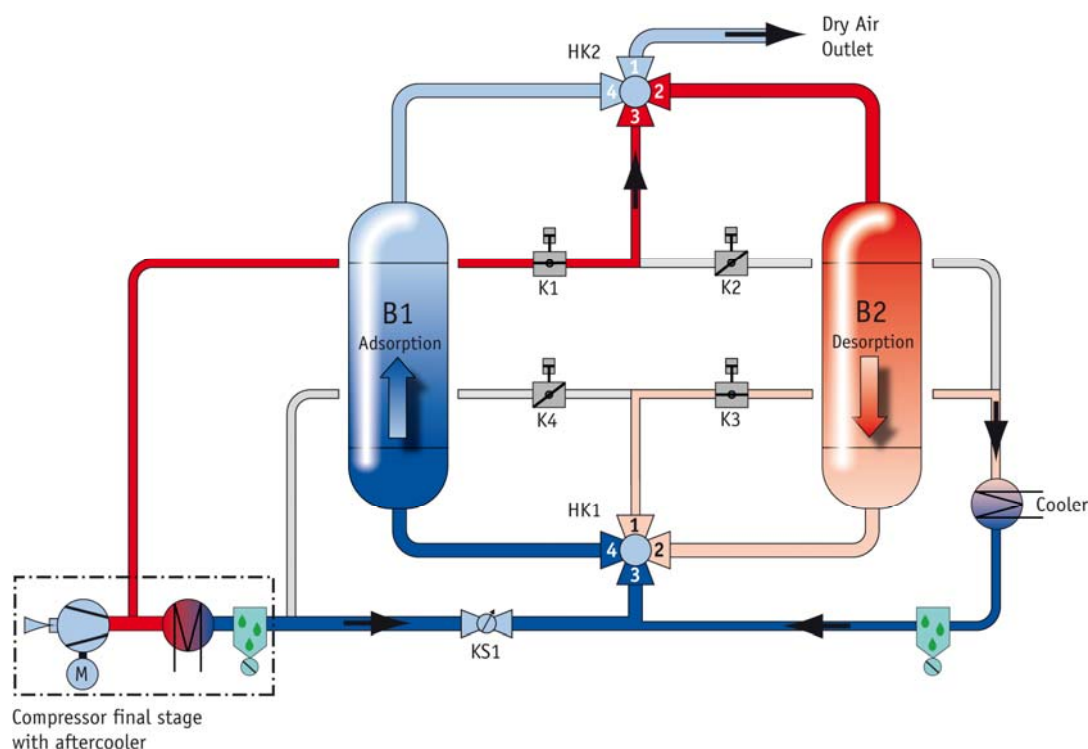
The entire process takes place at operating pressure in the adsorption, desorption and in the cooling phase. Thereby, the accumulated compression heat of oil-free compressed air can be used for desorption. – **ENERGY-SAVING** –

Adsorption B1 / Desorption B2

The partial stream of hot compressed air coming from the compressor flows via the hot air-inlet, valve **K1** and the **HK2** 4/2-way valve (connection 3/2) into desiccant vessel **B2**, which is in the desorption phase. The humidity adsorbed from the desiccant evaporates. The vapour is supplied to the cooler by the compressed-air partial stream, via the **HK1** 4/2-way valve (connection 2/1) and valve **K3**.

Here, the compressed air is cooled down to the required adsorption inlet temperature. The condensate produced during the cooling process will be drained from the compressed-air system via a downstream condensate separator. Subsequently, downstream of throttle valve **KS1**, the cooled desorption partial air stream flows into the cool air partial stream coming from the compressor.

The partial air stream required for regeneration can be adjusted manually by means of throttle valve **KS1**.



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Now the volume flow is again equivalent to the flow rate of the compressor. The complete compressed-air stream is supplied via the **HK1** 4/2-way valve (connection 3/4) to the vessel which is in the adsorption phase (**B1**). During this phase, the air flows bottom-up through the desiccant bed and the desiccant adsorbs the humidity. The dried compressed air flows via the **HK2** 4/2-way valve (connection 4/1) and the dryer outlet to the point of use.

Due to the desorption process, the humidity content of the desiccant is reduced. Simultaneously, the temperature of the desorption air at the adsorber outlet (here **B2**) rises. The desorption process is terminated as soon as the required process temperature is reached.

Adsorption B1 / Cooling B2

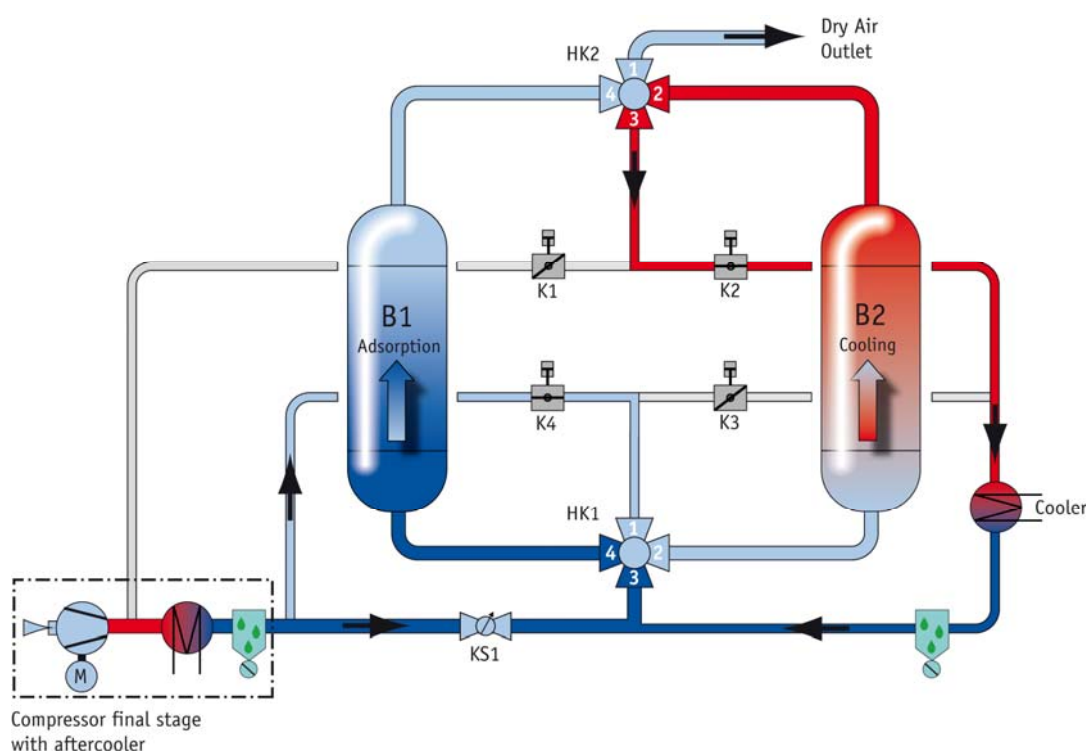
In order to avoid temperature and dew point peaks after the change-over, the heat stored in the desiccant (after desorption) is transported by means of the cold partial air stream.

The cold compressed-air partial stream from the compressor flows via valve **K4** and the **HK1** 4/2-way valve (connection 1/2) into the heated desiccant vessel.

While the flow passes through desiccant vessel **B2**, the cold compressed-air partial stream takes up (adsorbs) the stored heat. The compressed-air partial stream heated by the desiccant flows to the cooler and is cooled down to adsorption temperature. Subsequently, downstream of throttle valve **KS1**, the cooled-down partial air flows into the cool air partial stream coming from the compressor.

Now the volume flow is again equivalent to the flow rate of the compressor. The complete compressed air is supplied via the **HK1** 4/2-way valve (connection 3/4) to the desiccant vessel intended for adsorption (**B1**). During the adsorption phase, the air **flows** bottom-up through the desiccant bed and the humidity is adsorbed by the desiccant.

The dried compressed air flows via the **HK2** 4/2-way valve (connection 4/1) and the dryer outlet to the point of use.





Adsorption B1 / Standby B2

If the adsorption phase is controlled and terminated by a dew point-dependent control (optional), the duration of the standby phase depends on the load condition of the adsorption vessel (here **B1**). Only when the drying capacity of the desiccant is reached (increase of the pressure dew point) will the switch-over process be initialised.

In the event that the plant is operated in the "time-dependent switch-over" mode, the switch-over process is initialised after the pre-set cycle time has ended.

Switch-over Procedure

After the standby phase is terminated, adsorption is switched-over to the regenerated vessel (here **B2**) by reversing the 4/2-way-valves **HK1** and **HK2** to the corresponding position. Now, vessel **B1**, saturated with moisture, is in the desorption phase, while adsorption vessel **B2** takes over the drying of the compressed air.

Overview of the functional Sequence

