



## Heat Regenerated Adsorption Dryers



# Innovative System Solutions

## The importance of dry and clean compressed air

▶ In nearly all areas of the industry compressed air is one of the indispensable working medias. The application as working, conveying, measuring, control and regulating air is just as self-evident as the application in the process technology. The atmospheric inlet air of the compressor contains harmful substances and impurities. Moisture in the form of vapour is condensed out into the compressed air network. This causes expensive damages and a loss in quality. Therefore processing concepts consisting of filtration and drying are an integral part of every compressed air application.

▶ The drying method is determined by the application. Where very low residual moisture is a requirement respectively for pressure dew points below 0°, adsorption drying is applied.

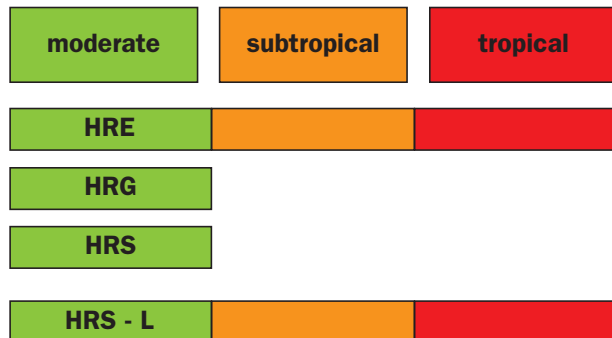
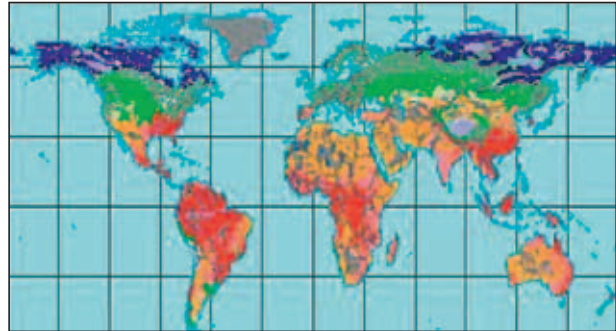
### Donaldson Adsorption Dryers stand for:

- ▶ reliability
- ▶ efficiency
- ▶ high reserve capacity
- ▶ easy maintenance
- ▶ easy operation
- ▶ models with no loss of compressed air

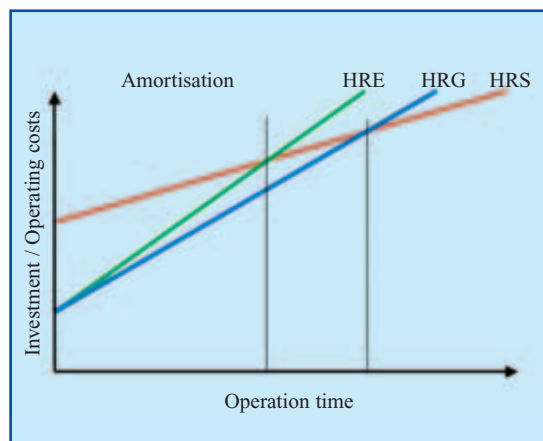


## The right choice = A guarantee for customer satisfaction

▶ worldwide ◀



▶ Donaldson designs, projects and produces complete solutions tailor-made to the individual customer requirements. This guarantees high reliability and simultaneously efficient operation.



# A guarantee for customer satisfaction

## Loop-cooling process

► Based on the standard HRS models, the **HRS-L** version is designed for processing requirements at tropical and subtropical ambient conditions. These conditions do not allow for cooling with fresh air. The characteristic feature of the HRS-L models is a closed loop cooling ( Loop-Version ). A water-cooled heat

exchanger cools the air stream heated by the desiccant. From there the cooling air is led back to the inlet port of the blower. Worldwide for all climate zones this version offers a pressure dew point of  $-70^{\circ}\text{C}$ .



HRS-L 2750



## Universal Use

▶ As with all externally heated adsorption dryers the desorption of the moisture adsorbed in the desiccant of the **HRE** models takes place with the heated blower air stream. The cooling of the desiccant is conducted with partial flow of the already dried compressed air. Because the cooling process is independent of the ambient conditions the HRE models can be used worldwide.

## No compressed air consumption

▶ The **HRG** models, designed according to the co-current concept, also belong to the family of blower air regenerated adsorption dryers. The ambient air drawn in by the blower cools the desiccant that was heated during the desorption phase. Thus, compressed air is not used during the desorption or cooling phase.



Model size 6000



Regeneration unit HRE / HRG



Regeneration unit HRS

# A guarantee for customer satisfaction

## Pressure-Vacuum-Regeneration ▶ patented ◀



HRS 2750

### Adsorption phase

▶ For units of the **HRS** the moisture containing compressed air flows via the inlet fitting through the desiccant bed. While passing the desiccant bed the water vapour is adsorbed by the hygroscopic adsorbent. The dried compressed air is now discharged into the compressed air network.

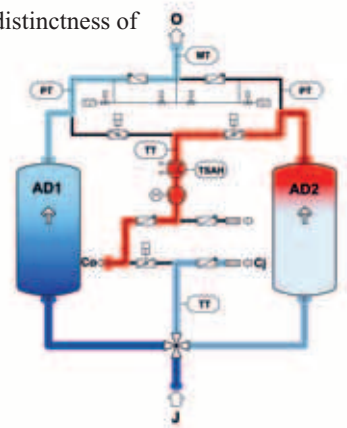
### Desorption phase without consuming compressed air

▶ Whilst the adsorption takes place in the one vessel, the other is regenerated. Before the regeneration starts the pressure in the vessel to be regenerated is slowly reduced down to atmospheric pressure. Desorption of the HRS system is conducted with inlet ambient air. A blower compresses the ambient air to regeneration pressure. The

**temperature increase** due to the compression has a positive effect on the energy requirement of the downstream heater. The heater heats up the blower air to the required desorption temperature. The blower air flows in **counter current** into the adsorber to be desorbed and evaporates the water contained in the desiccant.

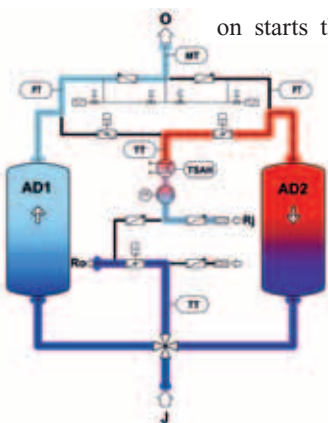
### Cooling phase without consuming compressed air

▶ The adjacent cooling of the heated desiccant takes place with ambient air. The distinctness of the HRS\* system variation is that after completion of the desorption phase, the blower switches over to **vacuum operation**. The cool ambient air takes up the heat from the desiccant and via the blower it is conveyed to the open air. The vacuum that occurs during the inlet operation causes a reduction of the desorption temperature. Therefore residual water content in the desiccant is reduced during the cooling phase.



▶ The advantage of the vacuum cooling is the improved regeneration of the desiccant. Consequently with the same energy consumption the **vacuum cooling** achieves a better quality, respectively at the same quality heat energy is saved.

*\*Describes process for standard models up to size 2750 and special models up to size 4000*



# Large and special systems for compressed air and gases



HRS 14.000 S

External heat-regenerated adsorption dryers for outdoor installation and processing of 14.000 Nm<sup>3</sup>/h of compressed air.

Special features : · Area for moistures air made of stainless steel  
· Combined electrical / steam heater

HRE – MSD 610 S

Process gas regenerated adsorption system for removing water, methanol and ammoniac from carbon dioxide.

Special features:  
· Installation in explosion protected Zone 1  
· Area for moistures gas made of stainless steel  
· Adherence to the emission limits according to BImSchG



## Donaldson. And everything just got better.

### Total Filtration Management

► Donaldson offers a wide variety of solutions to reduce your energy costs, improve your productivity, guarantee production quality and help protect the environment.

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