

Desiccant Dryers

TECHNOLOGY | PRODUCT RANGE



Heatless Regeneration Desiccant Dryers

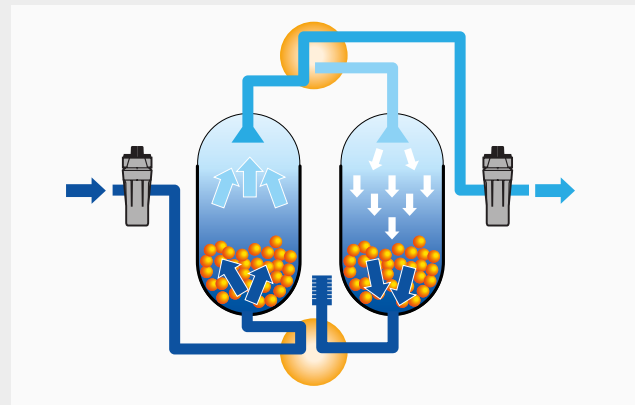
Desiccant Dryers are used wherever compressed air or gas needs to be dried to a pressure dew point of -20°C , -40°C or, optionally, -70°C . In addition to the specific application, the size of the Desiccant Dryer is primarily determined by the medium, flow rate, operating pressure, inlet temperature and the required pressure dew point.

Hankison heatless regenerative desiccant dryers are suitable for flow rates from $9\text{ m}^3/\text{h}$ to $9,300\text{ m}^3/\text{h}$.

All Hankison desiccant dryers in the DKC, HHL and HHS series use activated alumina as a desiccant, which adsorbs water without changing its form or properties. Molecules with higher polarity are particularly strongly adsorbed and since water has a very high polarity, activated alumina is excellently suited for use as a desiccant. Owing to its very good chemical stability, activated alumina is also resistant to liquid water.

The flow of compressed air enters the Desiccant Dryer from below. The adsorber removes the moisture contained in the compressed air, which then exits via the top of the tower.

Desiccant Dryers usually comprise two desiccant towers, one of which adsorbs moisture while the other regenerates.



THE BENEFITS ARE CLEAR:

- Low investment and maintenance costs
- Easy installation and operation
- Compact and space-saving
- Constant pressure dew point
- Guaranteed reliability

Desiccant Dryer DKC Series

FOR FLOW RATES FROM $9\text{ m}^3/\text{h}$ - $45\text{ m}^3/\text{h}$

The Hankison DKC Series Desiccant Dryer has a compact design, which makes it suitable for wall mounting and is very easy to operate. The upstream and downstream filters included in the package can also be equipped with optional filter monitors for differential pressure monitoring. Hankison recommends installing an electronic level-controlled X-DRAIN® Series condensate drain on the upstream filter.

The Desiccant Dryer can be operated in either a 10 minute cycle (for a pressure dew point of -40°C) or a 4 minute cycle (for a pressure dew point of -70°C).



Desiccant Dryer HHL/HHS Series

FOR FLOW RATES FROM 90 m³/h – 9,000 m³/h

The HHL series are heatless regenerated desiccant dryers equipped with level 1 control as standard and operate in a 10 minute cycle with a pressure dew point of -40 °C.

Hankison HHL Series desiccant dryers can be individually set to a specific pressure dew point.

- **4 minute cycle**
For a pressure dew point of -70° C, inlet temperature +35° C
- **10 minute cycle**
For a pressure dew point of -40° C, inlet temperature +35° C
- **16 minute cycle**
For a pressure dew point of -20° C, inlet temperature +35° C
- **24 minute cycle**
For a pressure dew point of +3° C, inlet temperature +35° C

KEY FEATURES OF THE HHL / HHS

- Space-saving, integrated pre-filter and dust filter are included in the delivery
- Compact design
- Extended contact between compressed air and desiccant for a guaranteed pressure dew point
- Particularly easy to service: desiccant can be active for an extremely long period (up to 5 years)
- Moisture indicator changes colour to signal an increase in the pressure dew point at the dryer outlet
- HHL Series comes with Level 1 controller as standard
- Optional Level 2 controller for energy savings
- Easy operation



- Pressure indicator for tower pressure
- Front-mounted operator panel
- Fully assembled with the necessary pipes and electrical wiring – ready for use

ADVANTAGES OF THE HHS SERIES

- Level 2 controller included as standard to enable load-dependent control with direct energy savings.
- X-DRAIN® Series electronic level-controlled condensate drain as standard
- Filter monitors for differential pressure monitoring

THE LEVEL 2 CONTROLLER

The Level 2 controller enables a significant reduction in the purge air volume required at reduced loads. The level of purge air used is automatically reconciled with the system requirements, which results in very high energy savings.

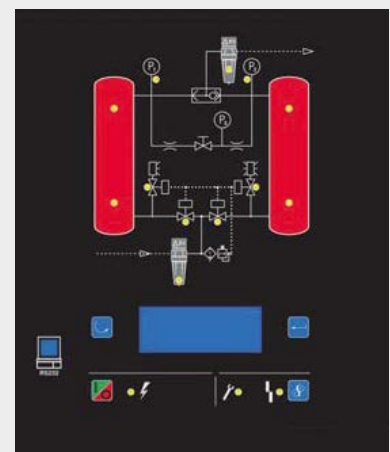
EASY TO USE

- Safe and reliable control of the adsorption and regeneration phases
- Electronic level-controlled X-DRAIN® condensate drain and filter monitor as standard

BENEFITS

- Measurement of temperature profile through the adsorption heat generated and control of the regeneration phases
- Selection of 4 operating modes / pressure dew points -70 °C, -40 °C, -20 °C, +3 °C
- Demand-driven SensaTherm operation for -40 °C, -20 °C and +3 °C
- Alarm and maintenance notifications with group error contact

- LEDs to indicate operating mode, tower status, valve status and vessel pressure
- Alarm LED for tower switching errors, condensate drain faults
- Electronic display provides information on energy savings, the regeneration process and upcoming maintenance intervals
- RS-232 interface as standard (optional for HHL)



Heat Regeneration Desiccant Dryers

Over 65 years of experience in the field of drying and filtration of compressed air have resulted in a most complete range of heat-regenerated desiccant dryers. The utilisation of compressed air for the regeneration of the saturated desiccant is a very expensive solution. Filtered and dried compressed air is a very expensive source of energy, which should possibly not be used for regeneration. Regeneration takes place easier and faster if the desiccant is warmed up. The regeneration air, warmed up to 180°C, desorbs the humidity out of the desiccant and transports it out of the dryer. The energy required is then less than half compared to the heatless regeneration.

The principle of heat regeneration can be divided in three groups:

- Internally-heated desiccant dryers, where heating elements are placed in the desiccant to warm it up.
- Externally-heated desiccant dryers, where air from the environment is aspirated and electrically warmed-up and blown through the saturated desiccant.
- Heat-of-compression systems, where the high temperature at the outlet of the compressor is used for regeneration.

Internally heated Desiccant Dryers HMW Series



HMW series desiccant dryers use electrical heaters inside of the desiccant bed for regeneration of the saturated desiccant. The direct contact of the finned heater tubes with the desiccant bed makes most efficient use of the regeneration energy.

A small part of the compressed air flow of only 2.2% removes the moisture and cools down the desiccant. No ambient pollution or moisture affects the regeneration process. A parallel drying phase during cycle change-over eliminates any temperature or dew point fluctuation. With the optional Energy Management System device EMS, the standard drying time per receiver of 4

hours can be prolonged to a maximum of 20 hours, resulting in energy savings of up to 80%.

ENERGY MANAGEMENT SYSTEM (EMS) FOR HEATLESS DESICCANT DRYERS

Desiccant Dryers have to cope with different operating conditions and are therefore selected for the most adverse conditions.

According to ISO 7183, the standard operating conditions are: working temperature 35°C and operating pressure 7 bar gauge.



A higher temperature or a lower operating pressure requires a higher adsorption and regeneration capacity. On the other side, during phases of reduced operation (at night, during weekends or under winter conditions), where the maximum adsorption performance is not required, the regeneration performance should continually adapt to the changing conditions..

Externally heated Desiccant Dryers DB Series



This heat-regenerated Desiccant Dryer is the most commonly used in medium-sized to big-sized compressed air installations (from 350 to 13,000 m³/h). As opposed to the internally-heated dryers, the heaters used for regeneration are easy to control, simple to service and they can optionally be combined with steam heating.

In these dryers, the flow during the drying and during the regeneration are both from top to bottom. This principle offers the following advantages:

- An optimal utilisation of the regeneration energy and heat of adsorption
- No dewpoints peaks during changeover
- Protection against appearance of liquid water
- No loss of compressed air for the cooling process
- Protection of the desiccant at starting of the compressor and from pressure and flow fluctuations.

DB dryers do not make use of any compressed air and have a maximal pressure drop of 0.1 bar. This drying principle also offers the possibility of an Energy Management System with ample technical and economical advantages. A special option is the “closed-loop” cooling, which makes it possible to use the dryer with high ambient temperature or when a pressure dewpoint of -70°C is required. Also under such conditions, no compressed air is used for regeneration or cooling.

The DB series dryers are simple to operate and are equipped with a display showing current information and historical operating data. Extra communication modules for connection with higher-level process control systems are also available.

Desiccant Dryers with integrated Activated Carbon Tower, HHL-AK Series / Activated Carbon Tower AK Series



- HHL-AK: Desiccant Dryers with integrated Activated Carbon Tower
- Flow rate 70 – 9,300 m³/h
- AK : Activated Carbon Adsorber
- Flow rate from 70 – 3,600 m³/h
- Economical regeneration process
- No additional installation costs
- Energy saving by load-dependent control
- Mechanically stable, low-dusting desiccant

Breathing Air Treatment Station DKAK-P



Compressed air contains a variety of contaminations like condensate, oil fractions, solid particles, smell and flavor particles and other harmful impurities.

Compressed air that is used in medical applications must meet special requirements. These requirements are defined in the European Pharmacopeia.

Hankison breathing air treatment stations DKAK-P series are designed to reliably deliver breathing air by a series of treatment stages.

Max. values acc. to European Pharmacopeia		
Component	Max. value	DKAK-P value
Oil	0.1 mg/m ³	< 0.1 mg/m ³
CO ₂	500 ppm	< 100 ppm
SO ₂	1 ppm	< 0.5 – < 1 ppm
H ₂ S	1 ppm	< 1 ppm
NO _x	2 ppm	< 0.25 – < 0,5 ppm
CO	5 ppm	< 3 – < 5 ppm
Water	60 ppm	40-45 mg/m ³

VALIDATION

With a validation certificate Hankison confirms, that the maximum values according to the European Pharmacopeia are met or surpassed.

FUNCTIONALITY DKAK-P

Two Hankison® coalescent filters PF and HF at the inlet of the station remove all accumulated liquids and aerosols as well as particles down to 0.01 micron. This combination reduces the remaining oil vapor content down to 0.01 m³/h (considered at 20°C). Both filters have a filter monitor and a level-controlled electronic drain.

The saturated compressed air enters the heatless desiccant dryer. During the adsorption, the compressed air flows through the dryer from bottom to top, while the desiccant adsorbs the water vapor and guarantees a dew point of -40°C. Dry and clean compressed air leaves the desiccant dryer.

Parallel to the adsorption cycle, regeneration takes place. A part of the dried air flows through the other vessel from top to bottom. Here the water vapor adsorbed during the drying process is extracted from the desiccant. The wet purge air goes through a silencer into the atmosphere.

In a third stage, the activated carbon and catalyst bed in a third vessel remove odor and flavor agents, various gas contents and eliminates carbon monoxide.

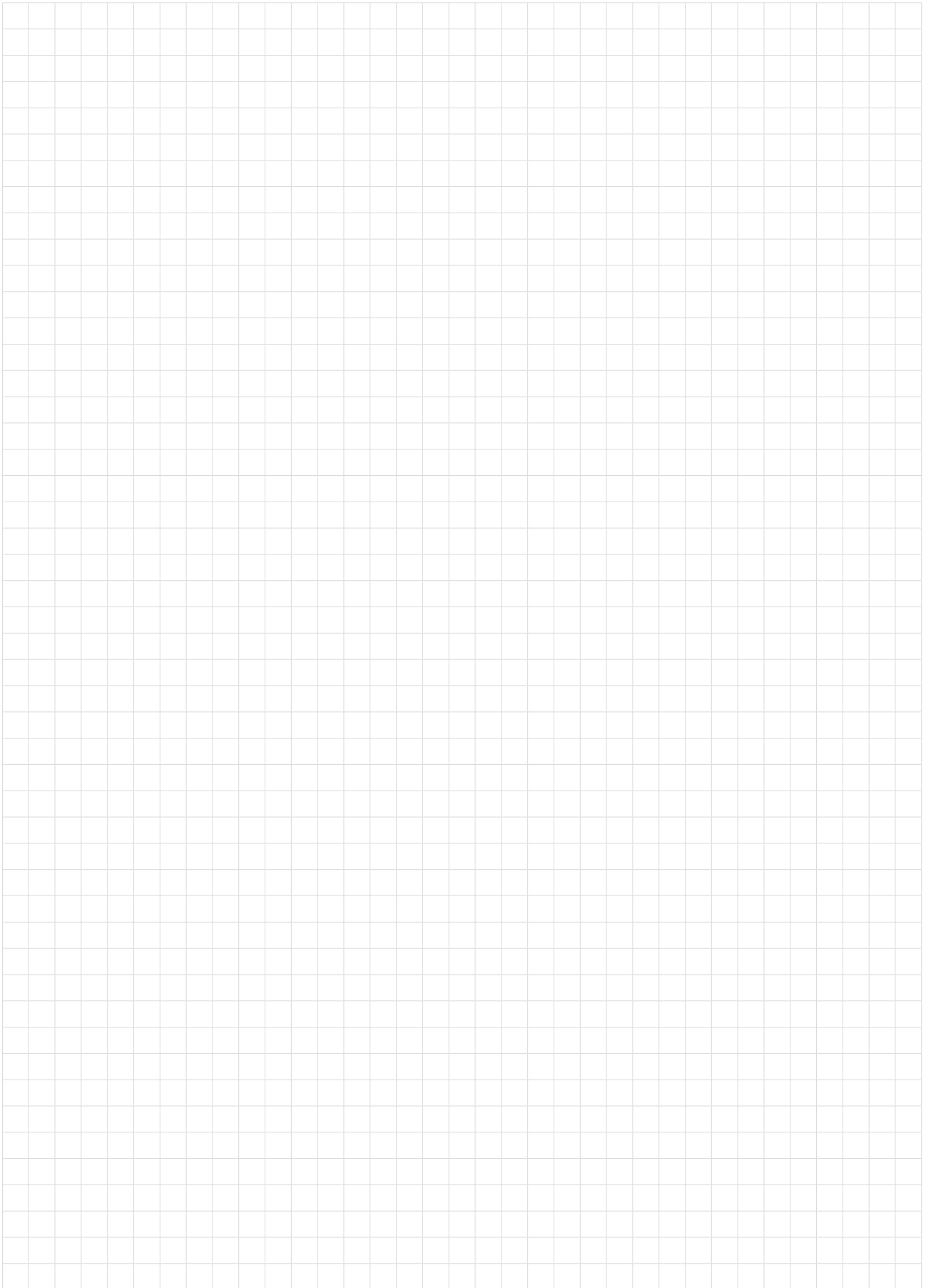
A Hankison® dust filter PF removes desiccant particles down to 1 micron.

Reliable service: Keeping your production running.

ACCESSORIES, SPARE PARTS & SERVICE KITS



- Selection of suitable equipment by our expert team
- Full-service
- Accessories, spare parts & service-kits



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