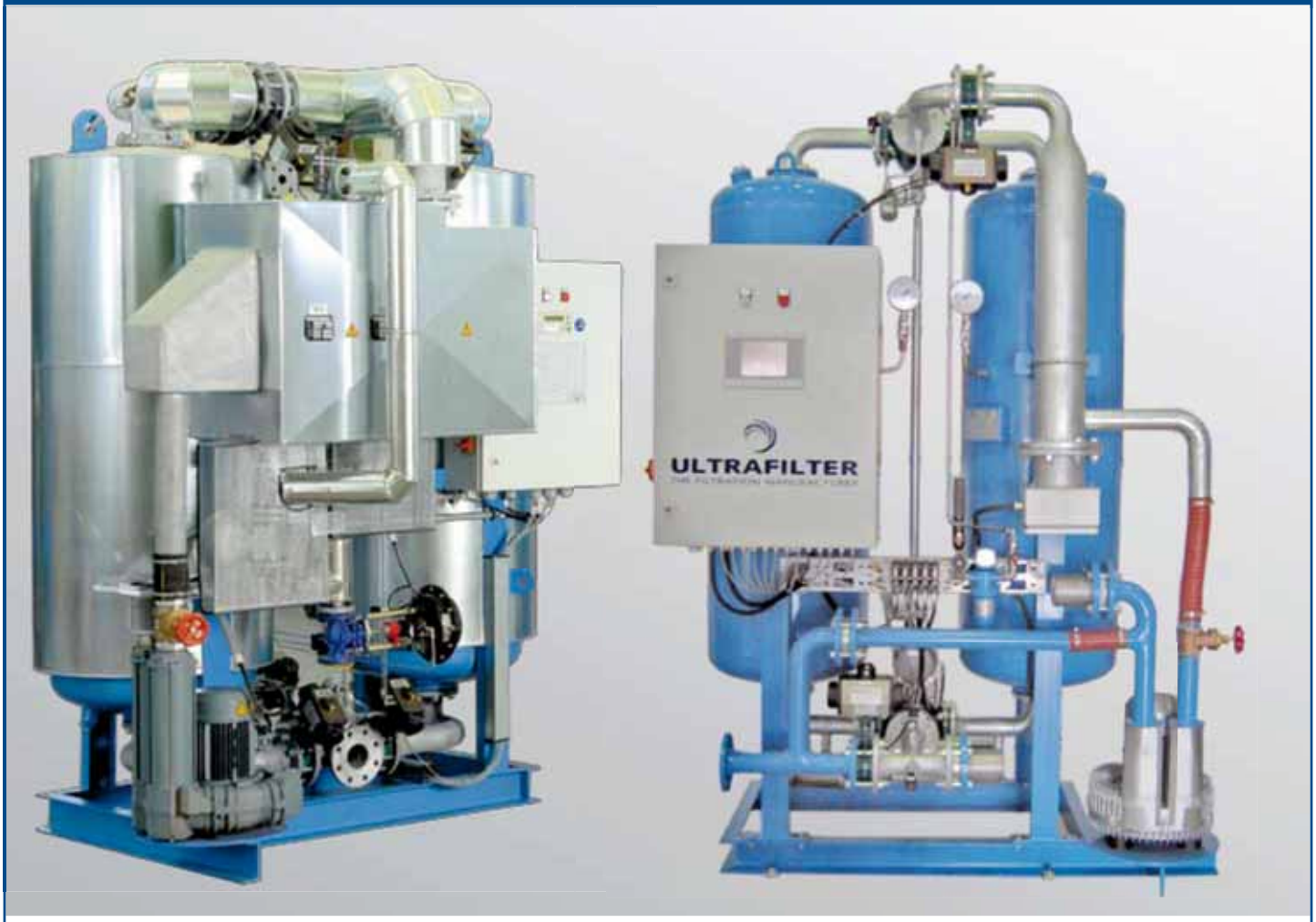
ultra.dry heat regenerated adsorption dryer



ULTRAFILTER
THE FILTRATION MANUFACTURER

Why drying compressed air?

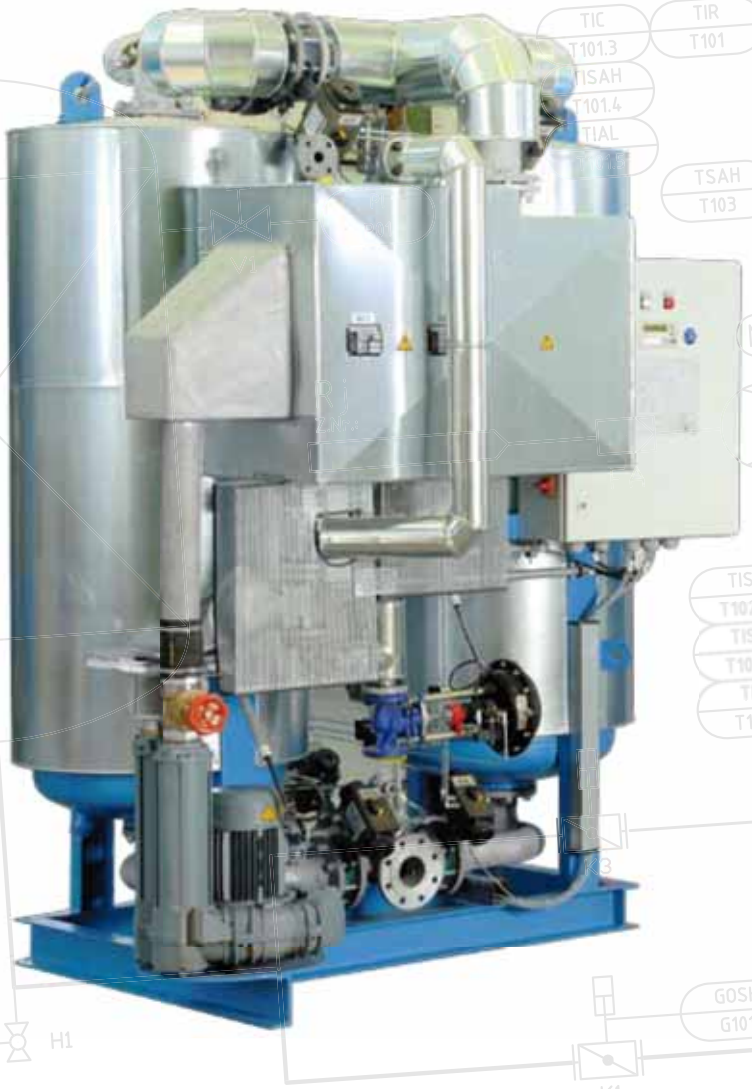
n Compressed air is used in almost all areas of industrial manufacturing as a source of energy or processing. Compressed air needs to be dry, oilfree and clean in order to prevent costly production downtimes and losses in the production quality. The atmospheric air drawn in contains harmful substances, dirt particles and moisture in the form of water vapour, which condenses out in compressed air pipes and can lead to considerable costs (corrosion, freezing etc.).

n Beneath compressed air fridge dryer, adsorption dryer represent the most common drying method for compressed air. Maximum efficiency and the highest operational safety, coupled with low operational costs are attributes that convey the advantages of the adsorption dryer. State-of-the-art technology and selected materials are the basis for high operational safety.

n Adsorption dryers are made of two - in some applications more - compressed air vessels filled with desiccant. Whilst one vessel is drying the incoming compressed air, the other vessel is regenerated.

n Within the range of adsorption dryers we differ between heatless regenerated dyers and heat regenerated dryers. The loaded desiccant of heatless dryers is regenerated by a partial flow of the dried compressed air. At an average 10 - 15 % of the dried compressed air is required for regeneration.

n Heat regenerated adsorption dryers are much more economical at larger volume flows as their energy requirements for regeneration is much lower then those of heatless regenerated adsorption dryers.



rated adsorption dryer

Quality products – made in Germany

n In order to produce heat regenerated dryers a considerable experience is required. ultrafilter GmbH looks back on a long-lasting experience in developping and producing heat-regenerated adsorption dryers for different applications.

n Only the best components that meet the high quality standards of production are used. The Quality Assurance system according to ISO 9001 means that all appliances receive the "Quality Product" certification.

n All ultrafilter purification components convince by their service- and maintenance-friendly construction. ultrafilter adsorption dryer ensure highest operational safety and reliability and ensure lowest possible total cost of ownership.

ultrafilter adsorption dryer stand for:

- n high energy efficiency
- n high reserve capacity
- n reliability
- n safe operation
- n easy to maintain
- n service-friendly operation

HRE - external heat-regenerated adsorption dryer

n 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.

n Because the cooling process is independent from the ambient conditions the HRE dryers can be used worldwide.

HRG - without compressed air consumption

n The HRG models, designed according to the co-current concept, also belong to the family of blower air regenerated adsorption dryers.

n 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, HRG dryers ensure high energy savings.

HRS - Regeneration with pressure vacuum technology

n The HRS also consists of two adsorption vessels.

n The desorption of the loaded desiccant is made by drawn-in ambient air. A blower compresses the ambient air doen to the required regeneration pressure. The following heater ensures that the drawn in air achieves the required desorption temperature. The temperature increase due to the compression has a positive effect on the energy requirement of the downstream heater.

n The blower air flows in counter current into the adsorber and evaporates the the water contained in the desiccant.

n 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.

n 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.

rated adsorption dryer

HRS-L – with closed cooling circuit

n Based on the standard HRS-L models, the HRS-L version is designed for processing requirements at tropical and subtropical ambient conditions where cooling by ambient air is not approriate.

n The characteristic feature is the closed loop cooling. 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°C.

HRC – heat of compression

n The most economical and energy saving adsorption dryer is the HOC heat of compression without additional power consumption.

n It utilizes the hot air of the compressor for regeneration of the loaded desiccant. No additional power consumption is required for regeneration. HRC adsorption dryer are . HRC dryers are working most efficiently.

compresor type	no of stages	end temperature	achievable dewpoint
piston	2	130 °C	- 15 °C
screw	2	165 °C	- 30 °C
turbo	2	160 °C	- 27 °C
turbo	3	110 °C	- 3 °C
turbo	4	110 °C	- 3 °C

Technical data ultra.dry

type HRE/HRS/ HRG/HRC	volume flow at 7 bar g $m^3/h^{1)}$ nom.	connection DN	inst. power HRE in kW	inst. power HRS in kW	inst. power HRG in kW	inst. power HRC in kW*
0375	375	DN 50	7,6	7,6	10,6	< 1,0
0550	550	DN 50	11,2	11,2	11,2	< 1,0
0650	650	DN 50	11,2	11,2	11,2	< 1,0
0850	850	DN 50	14,2	14,2	14,2	< 1,0
1000	1000	DN 80	14,2	14,2	18,2	< 1,0
1350	1350	DN 80	20,0	20,0	20,0	< 1,0
1650	1650	DN 80	24,0	24,0	31,0	< 1,0
1950	1950	DN 100	32,5	32,5	38,0	< 1,0
2250	2250	DN 100	32,5	32,5	38,0	< 1,0
2750	2750	DN 100	41,0	38,0	42,5	< 1,0
3500	3500	DN 100	44,5	44,5	52,5	< 1,0
4000	4000	DN 150	52,5	52,5	67,5	< 1,0
5000	5000	DN 150	71,0	71,0	86,0	< 1,0
6000	6000	DN 150	86,0	86,0	86,0	< 1,0
7000	7000	DN 150	95,0	95,0	111,0	< 1,0
8750	8750	DN 200	115,0	115,0	135,0	< 1,0
10500	10500	DN 200	135,0	135,0	153,0	< 1,0
11500	11500	DN 200	153,0	153,0	174,0	< 1,0
13600	13600	DN 200	177,5	177,5	198,5	< 1,0

* HRC without power consumtion. Indicated power supply refers onyl the control system.

Correction factors HRE / HRG / HRS related to a dewpoint of -40 °C:

Inlet temperature	operating pressur bar g						
	4	5	6	7	8	9	10
30 °C	0,72	0,92	1,09	1,25	1,36	1,45	1,51
35 °C	0,55	0,70	0,86	1	1,12	1,25	1,37
40 °C	0,33	0,45	0,58	0,71	0,82	0,92	1,03

Technical alterations reserved.

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