



Donaldson
FILTRATION SOLUTIONS

Dryer Systems

Heat Regenerating Adsorption Dryers

Ultradryer HRE tropical 0375 - 13600

MAIN FEATURES & BENEFITS

- 19 sizes available, matching to the compressor flow capacities
- Energy-efficient regeneration (desorption) in counter-current flow
- Excellent for application in tropical environment, cooling of the desiccant by partial current flow of the dry air
- Inlet temperatures up to 45°C permitted
- Pressure dewpoint of -40°C as standard
- Robust design with welded steel vessels and flanged pipelines
- Service-friendly design of butterfly valves and pressure reducing valves for fast replacement of wearing parts
- Robust, efficient programmable controller of the latest generation, for which service and support are guaranteed beyond the next decade
- Touch Panel with a high operational comfort; The main menu shows a system overview with the operational data such as pressure, temperature, cycle of the vessels etc.
- Comprehensive option package: dewpoint dependent capacity control, start-up-device, free of silicone and parting agents, bypass line, filter extension etc.
- Suitable high-efficiency filters as pre- and afterfilter (option) ensure a low differential pressure for the complete unit and thus small operating costs



HRE tropical 2750

INDUSTRIES



- Chemical and electrical industry



- Machine building industry and plant engineering / construction



- Automotive industry

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Donaldson®
Ultrafilter

PRODUCT DESCRIPTION

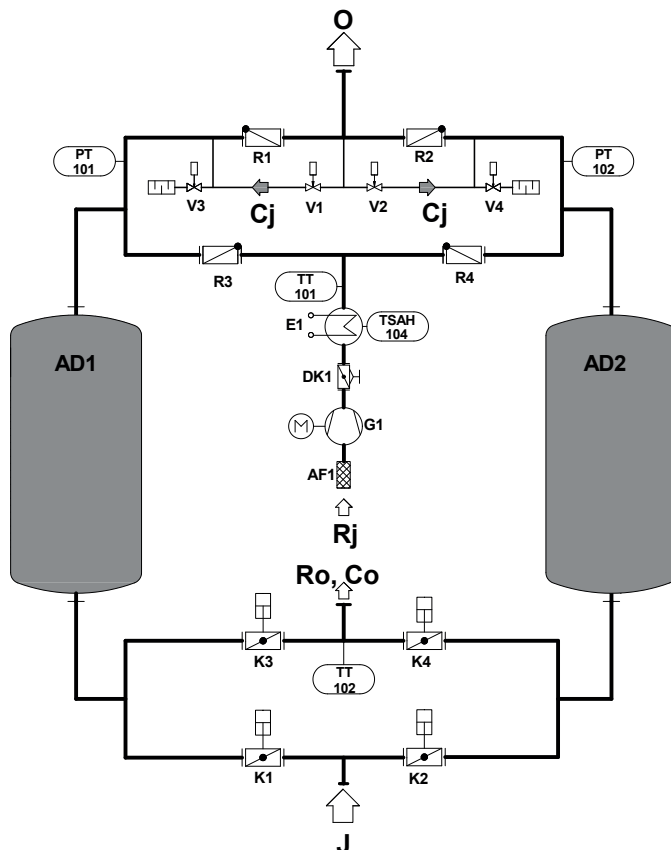
The externally heat regenerated adsorption dryers HRE tropical 0375-13600 work according to the dynamic adsorption principle. Wet compressed air streams through a desiccant bed. While streaming through, moisture is drawn out of the compressed air. Since the adsorption capacity of the desiccant is limited, the flow direction has to be changed before the desiccant is completely saturated. Using two parallel adsorption vessels (adsorbers **AD1 + AD2**) with alternating function, the permanent supply of dried air for consumers is guaranteed.

One adsorber is always available for drying the compressed air. The second adsorber is regenerated at the same time. The activation time respectively the regeneration time is always shorter than the loading time of the working adsorber. The regeneration of the saturated desiccant is realized in two steps:

1. Desorption in counter-current flow to the adsorption direction with externally heated blower air
2. Cooling of the heated desiccant with a partial stream of dried compressed air

Typical applications for the adsorption dryers HRE tropical are:

- **Central compressed air purification**
Generation of dry, oil-free and particulate-free compressed air (with option pre- and afterfilter)
- **Point-of-use applications**
Drying and purification of control and instrument and process air
- **Automotive industry**
Purification of compressed air for painting applications



- J: Wet air - inlet
- O: Dry air - outlet
- Rj: Desorption air - inlet
- Ro: Desorption air - outlet
- Cj: Cooling air - inlet
- Co: Cooling air - outlet

PRODUCT SPECIFICATIONS

Features:	Benefits:
19 sizes available, matched to the compressor flow capacities	Custom made solutions possible, matching exactly customer's requirements; no oversizing of compressors necessary, due to lowest possible regeneration air requirements
Energy-efficient regeneration (desorption) in counter-current flow	Low desorption temperature, less energy consumption
Cooling of the heated desiccant by small partial current flow of the dry air	Independent of ambient temperature and humidity, applicable in tropical environment
Welded steel vessels and flanged pipelines	Robust service-friendly design
Easy accessibility of all components. Service-friendly design of pressure reducing valves and butterfly valves (two-piece housings)	Fast replacement of wearing parts ensure low service and maintenance cost and reduced downtime
Programmable logic controller Simatic S7-1200	Robust, efficient controller of the latest generation, custom made solutions possible
Touch Panel KTP700	High operational comfort due to self-explaining menu. All operational data on one view. Indication of current dewpoint (option) and function status as well as alarm and service messages on the main menu ensures high operating safety of the adsorption dryer
Comprehensive option package: Dewpoint depending control, start-up device, free of silicone and parting agents, bypass, filter extension etc.	Flexibility in application, well thought option package for economic operation and safe system installation in the compressed air network
Suitable high-efficiency filters as pre- and afterfilter available (option)	Low differential pressure of the complete unit and thus small operating costs
Ultraconomy version including dewpoint dependent capacity control (option)	Saving of energy and operational costs due to adaption of the adsorption cycle to the current operating conditions

Technical Data	
Adsorption vessel	
Material:	Carbon steel
Design data:	11 bar (g), 230°C for 0375 - 2250 10 bar (g), 200°C for 2750 - 13600
Design, manufacturing and testing:	acc. to AD 2000
Approval:	acc. to PED 2014/ 68/ EU
Gas distributor:	Stainless steel
Piping	
Nominal pressure:	PN 16
Material:	Carbon steel
Design, manufacturing and testing:	acc. to AD 2000
Approval:	acc. to PED 2014/ 68/ EU

PRODUCT SPECIFICATIONS

Standard conditions		
Pressure dewpoint:	-40°C	Selection at different operating conditions by correction factor f according to table "sizing"
Operating pressure:	7 bar (g)	
Inlet temperature:	+35°C	
Inlet humidity:	saturated	
Average cooling air consumption:	ca. 3% related to \dot{V}_{nom}	
Operating limits		
Media:	Compressed air/ Nitrogen	Design for operating conditions beyond specified application limits on request
Operating pressure:	4 - 10 bar (g)	
Inlet temperature:	5 - 45°C	
Ambient temperature:	5 - 40°C	
Max. blower inlet:	35°C/ 80% r. h. to 40°C/ 60% r. h.	
Installation:	indoor	
Controller (standard version)		
Design:	acc. to VDE/ IEC	Special versions on request
Power supply:	3 Phases / 400V - 50 Hz	
Control voltage:	24 VDC / 230 VAC - 50 Hz	
PLC:	Siemens S7-1200 with CPU 1214C	
Text display:	Siemens KTP 700	
Protection class:	IP 54, acc. to IEC 529	
Control box:	C-steel sheet, powder coated, RAL 7035	
Potential free common alarm contact:	incl.	
Main switch:	incl.	

SIZING

Type	Pressure Dewpoint (PDP)	Inlet temperature	Operating pressure (bar)						
			4	5	6	7	8	9	10
HRE tropical	-40°C	30°C	1,00	1,20	1,30	1,38	1,42	1,51	1,59
		35°C	0,58	0,92	1,09	1,25	1,36	1,45	1,51
		40°C	0,52	0,67	0,86	1,00	1,12	1,25	1,37
		43°C	0,36*	0,47*	0,60*	0,73	0,85	0,98	1,13
		45°C	---	---	0,45*	0,58*	0,68*	0,77*	0,89
* min. dewpoint -20°C		Correction factors (f)							

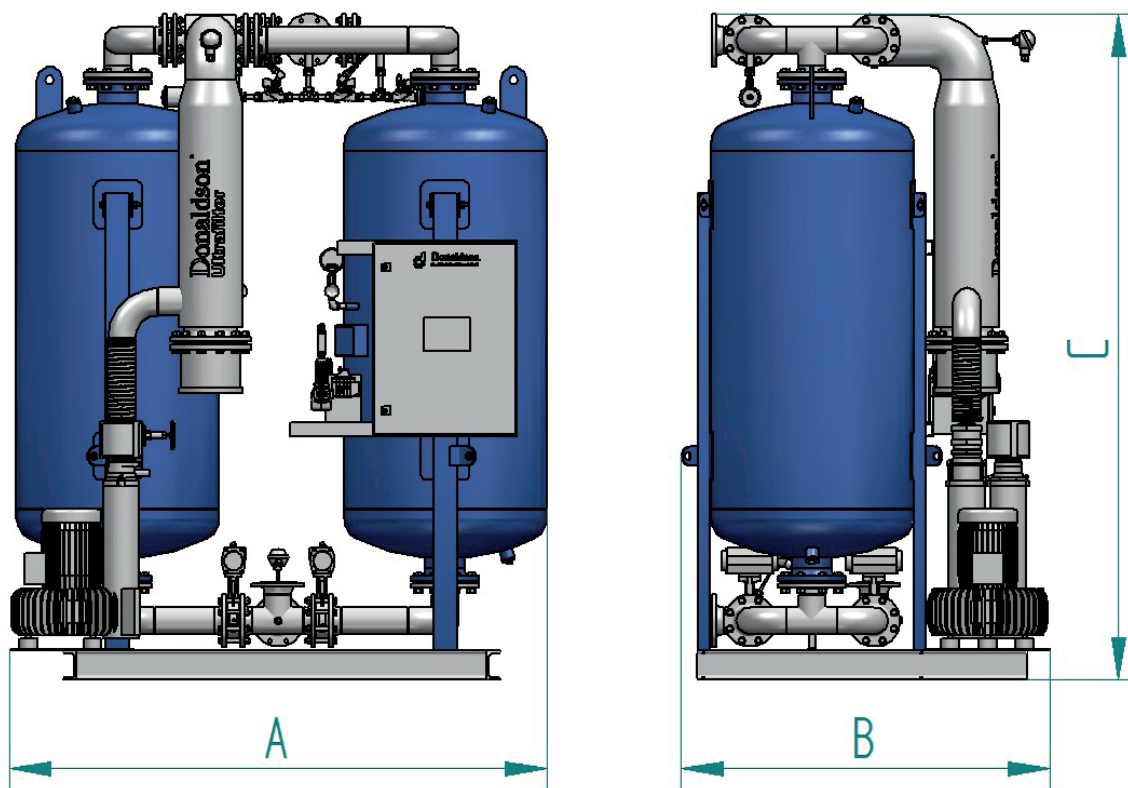
Example:

$\dot{V}_{nom} = 3850 \text{ m}^3/\text{h}$, inlet temperature = 43°C, operating pressure = 6 bar (g), PDP = -20°C

$$\dot{V}_{korr} = \frac{\dot{V}_{nom}}{f} = \frac{3850 \text{ m}^3/\text{h}}{0,60} = 6417 \text{ m}^3/\text{h}$$

**Calculated dryer size:
Type HRE tropical 7000**

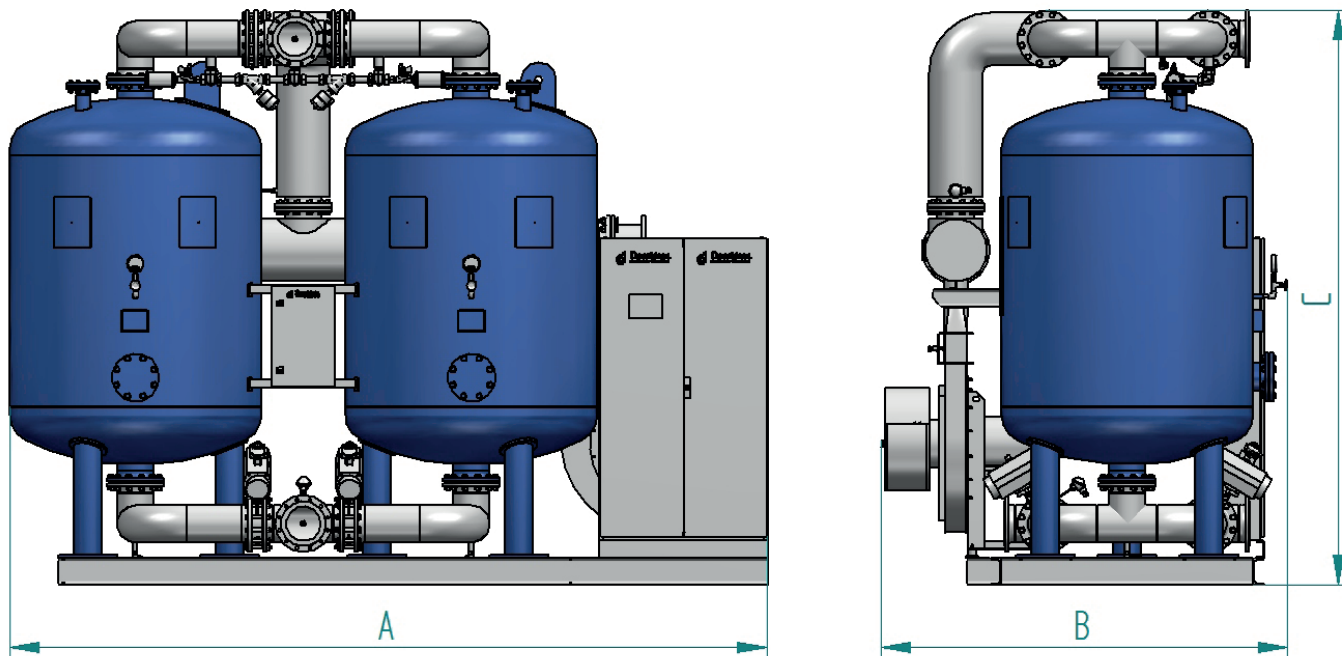
DIMENSIONS



Type	\dot{V}_{nom} at 7 bar (g)		Connections PN 16, DIN EN 1092	Installed Power kW	Dimensions			Weight kg
	m ³ /h	cfm			A mm	B mm	C mm	
0375	375	220	DN 50	10,6	1460	990	2140	780
0550	550	325	DN 50	11,2	1520	1120	2340	960
0650	650	385	DN 50	16,0	1550	1140	2260	1120
0850	850	500	DN 80	20,0	1650	1320	2340	1380
1000	1000	590	DN 80	20,0	1780	1240	2460	1460
1350	1350	800	DN 80	25,5	1810	1410	2630	1750
1650	1650	975	DN 100	32,5	2030	1450	2720	2000
1950	1950	1150	DN 100	38,0	2100	1480	2740	2280
2250	2250	1330	DN 100	45,5	2280	1530	2780	2680
2750	2750	1620	DN 100	53,5	2620	1680	2920	3350

\dot{V}_{nom} in m³/h related to compressor inlet at 20°C and 1 bar (a), an operating pressure of 7 bar (g) and a compressed air inlet temperature of +35°C (saturated).

DIMENSIONS



Type	\dot{V}_{nom} at 7 bar (g)		Connections PN 16, DIN EN 1092	Installed Power kW	Dimensions			Weight kg
	m ³ /h	cfm			A mm	B mm	C mm	
3500	3500	2065	DN 100	71,0	3740	1810	2980	3990
4000	4000	2360	DN 150	71,5	3790	1920	3110	5000
5000	5000	2945	DN 150	90,0	3890	2020	3150	6200
6000	6000	3535	DN 150	115,0	4180	2140	3270	6700
7000	7000	4125	DN 150	118,5	4430	2230	3530	8150
8750	8750	5155	DN 200	138,5	4490	2280	3560	8570
10500	10500	6185	DN 200	198,5	4930	2690	3290	11400
11500	11500	6770	DN 200	198,5	5030	2760	3350	12400
13600	13600	8010	DN 200	232,0	5280	3090	3380	14600

\dot{V}_{nom} in m³/h related to compressor inlet at 20°C and 1 bar (a), an operating pressure of 7 bar (g) and a compressed air inlet temperature of +35°C (saturated).