

Ultracac Classic Heatless Adsorption Dryers



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Trust Donaldson to deliver a complete range of compressed air purification solutions that improve air quality throughout your plant — from compressor room to all points of use. With over 30 years of expertise in compressed air filtration and separation, Donaldson manufactures a complete line of refrigeration, adsorption and membrane compressed air dryers to help produce clean, dry air and comply with air purification requirements.

Efficient, Compact Design Ultrapac Classic dryers provide high drying efficiency in a wide range of flow capacities. Available in two model series, the compact design and preinstalled prefilters and afterfilters allow quick and easy installation with a very small footprint. Delivering the highest quality air to your compressor lines, these dryers are engineered for easy maintenance, reduced installation costs, maximum efficiency and increased energy savings.



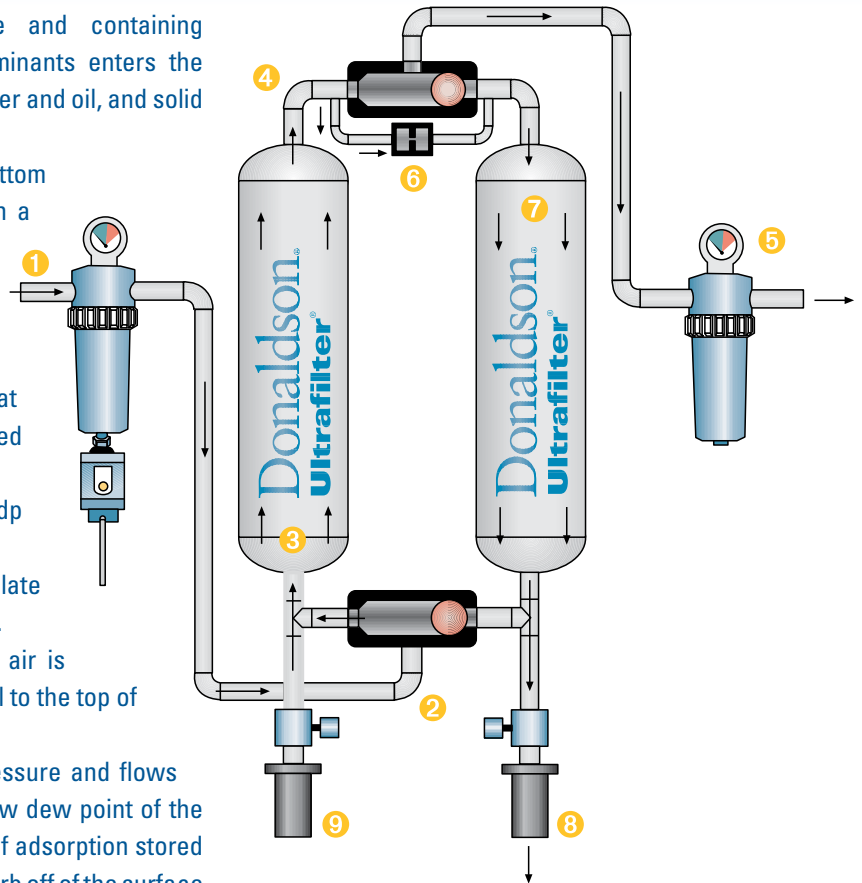
- 1 Adsorber
- 2 Pre filter
- 3 After filter
- 4 Automatic condensate drain UFM-T
- 5 Econometer differential pressure gauge
- 6 Shuttle valve
- 7 Solenoid valve with silencer
- 8 Panel-mounted controls and gauges

- Guaranteed dew point performance (-20°C, -40°C or -70°C)
- Full enclosure for quiet, clean operation with easy-to-remove panels (0005 - 1000)
- Preinstalled prefilters and afterfilters reduce installation costs
- Coalescing prefilter with Ultramat zero-loss condensate drains
- Low pressure drop for increased energy savings
- Compact design – smallest footprint in the industry
- Ideally-located inlet and outlet connections
- Panel mounted controller, vessel pressure gauges and zero-loss drain control eases operation and system monitoring
- Energy-efficient flow direction from bottom to top of dessicant bed

- A Protective attractive cabinet
- B Panel-mounted zero-loss drain control and test
- C Extremely small footprint
- D Guaranteed outlet dew point

Ultracac Process Flow

- 1 Compressed air saturated with moisture and containing concentrated particulates and other contaminants enters the coalescing prefilter, which removes liquid water and oil, and solid particles.
- 2 Prefiltered compressed air then enters the bottom of the on-line drying vessel, passing through a simple, pressure controlled shuttle valve.
- 3 As the air flows upward through the bed, water vapor is removed from the air as water molecules adsorb on to the surface of the desiccant beads. Energy, called the heat of adsorption, is released and stored in the bed to be used for regeneration in a later step.
- 4 Dry compressed air at -20°C , -40°C or -0°C pdp exits the top of the on-line drying vessel.
- 5 The dried air then passes through a particulate afterfilter before entering the plant air system.
- 6 A small volume of dried compressed purge air is redirected from the outlet of the on-line vessel to the top of the off-line regenerating vessel.
- 7 The purge air is reduced to atmospheric pressure and flows downward through the off-line vessel. The low dew point of the expanded purge air, combined with the heat of adsorption stored in the bed, causes the water molecules to desorb off of the surface of the desiccant beads, regenerating the bed.
- 8 Wet purge air exits through the exhaust muffler.
- 9 At the end of the drying cycle, the on-line bed depressurizes downward through the exhaust muffler, and then goes off-line for regeneration.



Options

- Ultraeconomy energy management system
- Pneumatic control
- Switch over control
- Dew point monitor and alarm
- Pressure controlled automatic start-up device
- Silicon-free components
- Bypass lines
- Safety relief valves

Adsorption drying - why?

- ▶ Only dry compressed air is also clean compressed air, because the moisture in the compressed air network conjoins dirt particles, which could lead to corrosion, production downtimes and losses in the production quality.
- ▶ Donaldson's high efficiency adsorption dryers remove moisture from the compressed air and therefore guarantee an efficient and secure production process. State-of-the-art technology and selected materials are the basis for high operational safety. The Ultrapac is equipped with the most modern control system, pre and after filter, condensate drain and silencer. Maximum efficiency and the highest operational safety, coupled with low operational costs are attributes that convey the advantages of the adsorption dryer. The areas of application are diverse and are matched to the exact requirements of the customer.

Ultraconomy Energy Management System

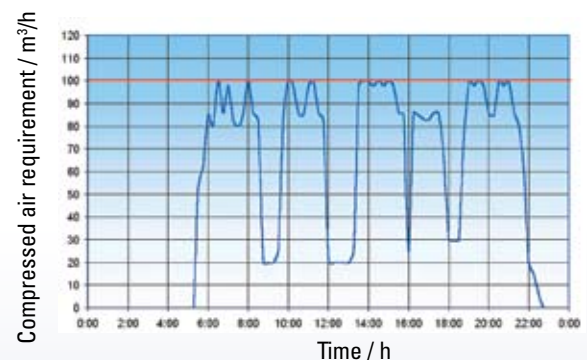
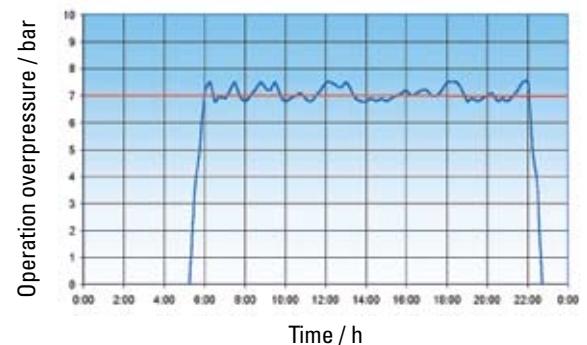
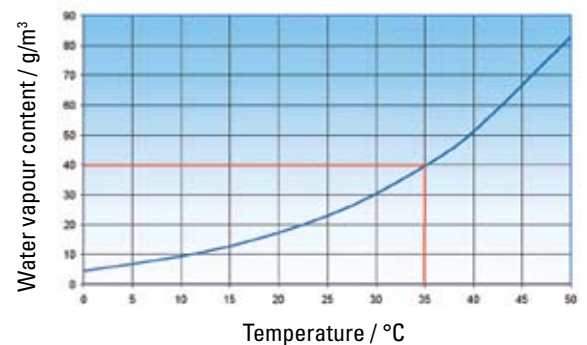
- ▶ The time-controlled adsorption dryer without capacity control operates with a predetermined cycle time for which the dryers is designed, irrespective whether the desiccant might be loaded to the maximum. The dryer's requirement for regeneration air (energy consumption of compressed air) therewith remains constant.
- ▶ The water load of the dryer depends on the actual operational conditions. If the inlet conditions, airflow, pressure or ambient temperatures vary, the quantity of the water loading will also vary.
- ▶ With a continual dewpoint measurement at the outlet of the dryer, the newly developed "Ultraconomy" control will determine the actual amount of moisture that enters the dryer and will assess the optimum time when the dryer requires regenerating whilst maintaining a constant selected dew point.



- ▶ This leads to considerable savings in regeneration air. An example exemplifies this: a dryer designed for 100 m³/h, 35°C inlet temperature and 7 bar (g) operational pressure uses approx. 15m³/h regeneration air during a fixed cycle. At an

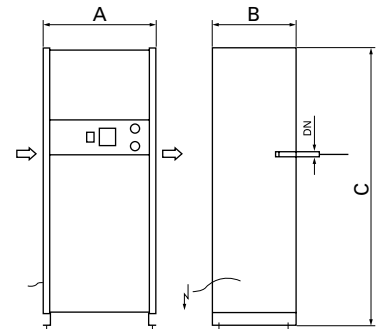
average compressed air requirement of 60%, an average inlet temperature of 30°C and average pressure of 7.2 bar the water load only still amounts to approx. 45% of the original value. On average the dryer is now only using 6.75 m³/h and is therewith saving 8.25 m³ per hour. According to compressor type and condition this is equivalent to a power consumption of up to 1 kW.

- ▶ At a full cost price of 2 cents per m³ of generated compressed air and 8,000 operating hours per year the saving amounts to US\$1.617.



Technical Data Ultracac Classic

Ultracac HED/ALD/MSD	Nominal inlet flow m ³ /h (1 bar, 20°C)*	Average reg. air flow m ³ /h (1 bar, 20°C)			Connection G (") DN (mm)	Dimensions		
		HED	ALD	MSD		Width (A) mm	Depth (B) mm	Height (C) mm
0005	5	0.7	0.8	1	G 3/8	470	340	700
0010	10	1.4	1.5	2	G 3/8	470	340	700
0015	15	2.1	2.3	3	G 3/8	470	340	1060
0025	25	3.5	3.8	5	G 1/2	470	340	1060
0035	35	4.9	5.3	7	G 1/2	470	340	1060
0050	50	7.0	7.5	10	G 1/2	670	450	1610
0080	80	11.2	12.0	16	G 3/4	670	450	1610
0100	100	14.0	15.0	20	G 1	670	450	1610
0150	150	21.0	23.0	30	G 1	770	600	1980
0175	175	24.5	26.3	35	G 1	770	600	1980
0225	225	31.5	34.0	45	G 1 1/2	770	600	1980
0300	300	42.0	45.0	60	G 1 1/2	770	600	1980
0375	375	52.5	56.0	75	G 1 1/2	950	700	2190
0550	550	77.0	83.0	110	G 2	950	700	2190
0650	650	91.0	98.0	130	G 2	950	700	2190
0850	850	119.0	128.0	170	G 2	1100	800	2350
1000	1000	140.0	150.0	200	G 2 1/2	1100	800	2350



Explanation:

* Related to the intake of the compressor +20°C, 1 bar abs., at a compressed air inlet temperature of +35°C and 7 bar g operating pressure.

Type 0005 to 1000 in cabinet, including pre- and afterfilter

1350	1350	189	202.5	270	DN 80	1500	950	2555
1650	1650	231	247.5	330	DN 80	1700	1050	2365
1950	1950	273	292.5	390	DN 100	1800	1163	2585
2250	2250	315	337.5	450	DN 100	1900	1290	2605
2750	2750	385	412.5	550	DN 100	2000	1340	2695
3500	3500	490	525	700	DN 100	2200	1490	2680
4000	4000	560	600	800	DN 150	2400	1630	2980
5000	5000	700	750	1000	DN 150	2600	1715	3030
6000	6000	840	900	1200	DN 150	2800	1815	3070
7000	7000	980	1050	1400	DN 150	3000	1915	3080
8750	8750	1225	1312.5	1750	DN 200	3400	2290	3280

Type 1350 to 8750, including pre- and afterfilter

Type	Pressure dew point	Inlet temperature	Operating Overpressure (bar)												
			4	5	6	7	8	9	10	11	12	13	14	15	16
HED / ALD	-20°C / -40°C	25°C	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25	2.40	2.55
		30°C	0.69	0.83	0.96	1.10	1.24	1.38	1.51	1.65	1.79	1.93	2.06	2.20	2.34
		35°C	0.63	0.75	0.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88	2.00	2.13
MSD	-70°C	25°C													
		30°C	0.63	0.75	0.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88	2.00	2.13
		35°C													
	-65°C	40°C	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70
	-60°C	45°C	0.44	0.53	0.61	0.70	0.79	0.88	0.96	1.05	1.14	1.23	1.31	1.40	1.49
-55°C	50°C	0.31	0.38	0.44	0.50	0.56	0.63	0.69	0.75	0.81	0.88	0.94	1.00	1.06	

Example:

V_{nom} = 200m³/h, Inlet temperature = 30°C, Operating pressure = 10 bar, Pressure dewpoint = -40°C

Calculated dryer size: **Ultracac ALD 0150**

$$V_{korr} = \frac{V_{nom}}{f} = \frac{200m^3/h}{1.51} = 132.5m^3/h$$

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

PRODUCTS

- Activated carbon filters
- Adsorption dryers
- Breathing-air units
- Cartridge filters
- Chillers
- Condensate drains
- Coolers
- Cyclone separators
- Demisters
- Disposable filters
- Elements
- Emulsion separators
- Filters
- Fine filters
- Filter housing
- High-performance filters
- High-pressure filters
- Maintenance units
- Medical vacuum filters
- Membrane dryers
- Micro filters
- Oil/vapour absorbers
- Oil/water separators
- Oil/water separation systems
- Pocket filters
- Pre-filters
- Pre-separators
- Process filter elements
- Process filter housing
- Processing plants
- Pure gas filters
- Refrigeration compressed air dryers
- Silicon-free filters
- Steam filters
- Sterile air-conditioning plants
- Sterile filters
- Sub-micro filters
- Systems engineering
- System solution
- Vacuum filters
- Vent filters

SERVICES

- Air Audit – Detailed analysis with optimisation action plan
- Air flow measurement
- Air Performance – Optimisation of compressed air networks
- Air Survey – Analysis of compressed air systems
- Condensate sampling
- Dew point measurement
- Differential pressure measurement
- Integrity tests
- Leak localisation
- Maintenance agreement
- Oil-aerosol measurement
- Service agreement



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