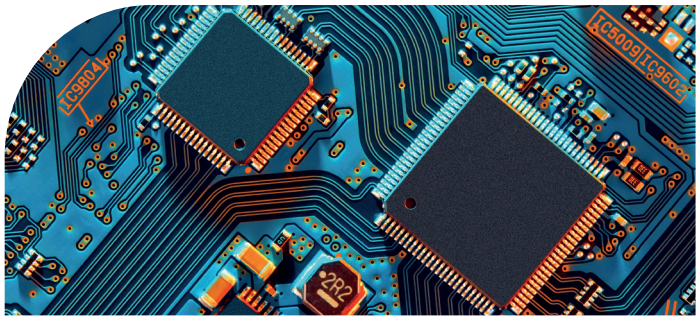
Twin Tower
Desiccant Air Dryers

HL Heatless: Flow Capacity: 1188 to 5040 Nm^3/h
EH Externally Heated: Flow Capacity: 1188 to 10,800 Nm^3/h
BP Blower Purge: Flow Capacity: 1188 to 10,800 Nm^3/h
BP Blower Zero Purge: Flow Capacity: 1188 to 10,800 Nm^3/h

Total Protection for your Applications

Clean, dry compressed air is vital across a wide range of industrial applications. To meet these demands, it must be delivered with reliability, energy efficiency, and cost-effectiveness. nano's desiccant dryers are engineered to protect your systems and processes, providing consistent performance you can trust. Built with a rugged, dependable design, they ensure a stable dew point under full load—and even during short-term overloads.



Electronics

- Precision electronics like chips and boards require dry, high-quality compressed air to remove fine particulate contamination.
- Prevents moisture-induced oxidation of micro-terminal strips.
- Consistent delivery of dry compressed air with dew points as low as -70°C.

Food & Beverage

- Steady and reliable dry compressed air for food and beverage preparation and processing.
- Removing moisture from compressed air ensures contamination-free processing, protects the quality and safety of food and beverages throughout production.

Oil & Gas

- High-quality dry compressed air is especially vital for offshore applications.
- Reliable protection to maintain ongoing production.
- Uninterrupted 24/7 dry compressed air supply with a stable low dew point.

Pharmaceuticals

- Maintaining a steady supply of dry compressed air is key to effective drug and medicine production.
- Eliminating moisture is crucial for pharmaceutical manufacturing because some materials are highly moisture-sensitive.

Reliability to Protect Your Operations and Reputation

Compressed air entering your system is always saturated with moisture, which can condense as it cools—leading to costly damage and downtime. nano desiccant dryers deliver ultra-dry compressed air with a pressure dew point as low as -70°C, ensuring peak system performance, protecting your products, and minimising expensive repairs.

Simple Setup with Extended Maintenance Intervals

Our dryers feature a small footprint and all-in-one design for quick installation and minimal downtime. With easy-to-access components and premium materials, maintenance is simple and service intervals extend beyond three years—ensuring efficient, hassle-free operation.

Unmatched Reliability

- A constant pressure dew point down to -70°C at 100% load conditions.
- Durable switching valves with a proven design enhance the dryer's operational life.
- Advanced controls and monitoring optimise your production process.

Optimal Energy Efficiency

nano's desiccant dryers combine energy-efficient design with smart controls to reduce your carbon footprint and cut energy costs. Featuring a low pressure drop under 0.2 bar, they operate efficiently while dew point sensing adjusts energy use to match actual demand. Plus, the adjustable PDP set point allows you to customize the dryer's performance to fit your needs perfectly.

How does a desiccant dryer work?

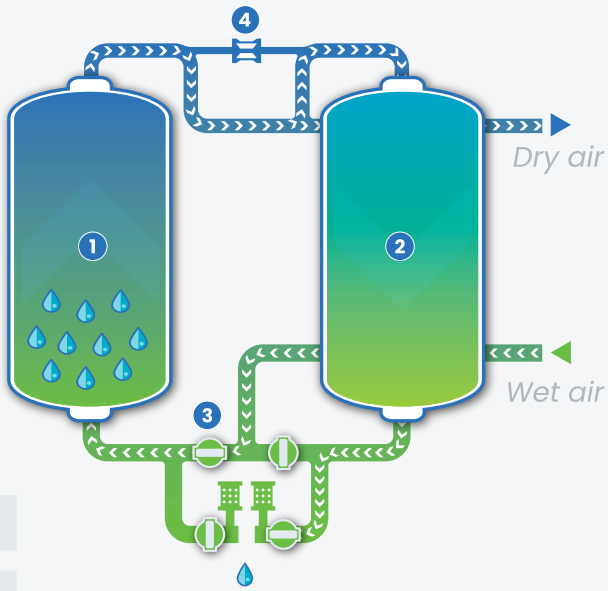
A desiccant dryer removes moisture from compressed air by passing it through a desiccant that adsorbs water vapour. The desiccant traps moisture, delivering dry air to the system. When saturated, the desiccant is regenerated—using heat or purge air to remove moisture—allowing continuous drying. How this happens depends on the type of desiccant dryer:

- **Heatless dryers use only compressed air as a purge.**
- **Heated purge dryers use a combination of compressed air as purge and heat.**
- **Blower dryers use a combination of air from an external blower and heat.**

The regeneration process

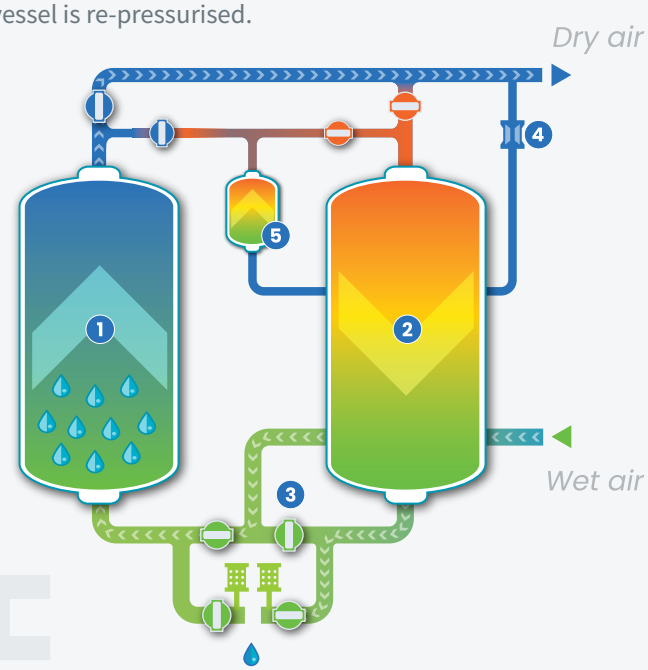
Heatless Desiccant Dryers:

- Dry air is expelled from the outlet of the drying tower and is then expanded to atmospheric pressure. After this, the air is directed through the saturated desiccant. This process effectively releases the moisture that has been adsorbed onto the desiccant material. (2) (4).
- After desorption, the blow-off valve is closed and the vessel is re-pressurized.



Heated Purge Desiccant Dryers:

- The air is drawn from the outlet of this tower and passed over an electric heater. Once the air is heated, it is expanded to atmospheric pressure and sent through the saturated desiccant, forcing the adsorbed moisture out (2) (4).
- After desorption, the blow-off valve is closed and the vessel is re-pressurised.



Wet Air Dry Air Regeneration Air

Blower Purge Desiccant Dryers

Purge cooling or zero purge cooling

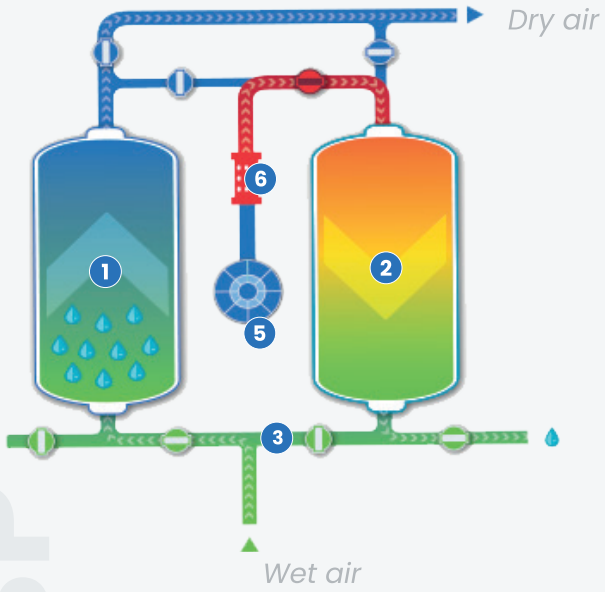
The blower (5) takes ambient air and blows it over the external heater (6). The heated air is then sent through the saturated desiccant (2), forcing the adsorbed moisture out, from top to bottom.

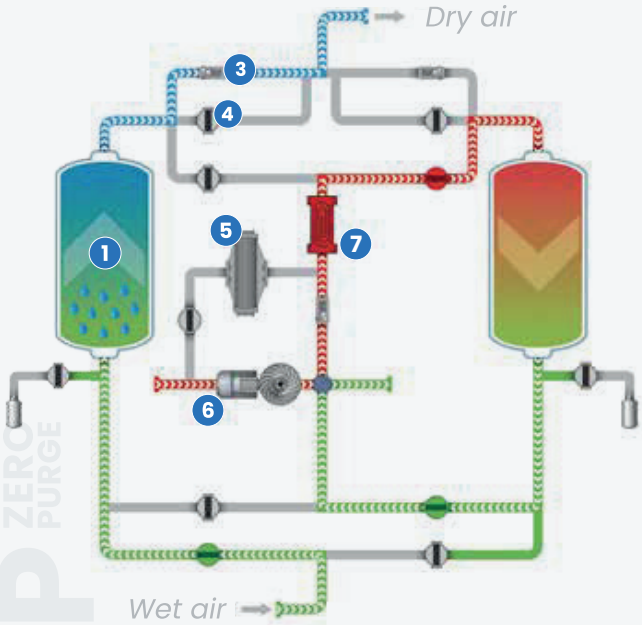
Purge cooling:

- Purge: Following heating, the hot desiccant in the tower is cooled by directing dry, compressed air from the adsorbing vessel over it in a top-to-bottom flow, effectively lowering its temperature for optimal moisture adsorption in subsequent cycles.

Zero purge cooling:

- Zero purge: After the heating process, the hot tower desiccant undergoes a cooling phase. This is achieved by circulating air from the hot vessel over a cooler and then returning it to the hot tower in a bottom-to-top direction.





1 Regeneration Vessel 2 Drying Vessel 3 Non return valve 4 Butterfly valve 5 Cooler 6 Blower 7 Heater

HL Heatless Twin Tower Desiccant Dryers

High-Quality Desiccant

- Pressure dew point of -40°C as standard (-70°C as option).
- Up to 30% more desiccant provides dependable operation in demanding environments such as elevated temperatures and brief overloads.

Stainless Steel Valves

- Fully stainless steel high-performance butterfly valves with actuators ensure long lifetime.

Up-Sized Silencers with Integrated Safety Valves

- Advanced mufflers prevent back-pressure, enhance purge efficiency, provide clog protection with an integrated safety valve, and lower noise during blow-off.

Galvanised Piping with Flanged Connections

- Flanged piping makes maintenance easier and reduces the risk of leaks.
- Optimised pipe sizing minimises pressure drop, leading to energy savings.

Optional Filters

- Pre-filter(s) prevent oil contamination, enhancing the durability of the desiccant.
- After filter prevents desiccant dust from contaminating the network, ensuring clean and reliable operation.
- Built for direct mounting on the dryer's inlet and outlet, ensuring minimal pressure drop.
- Simple to assemble and maintain, with no additional piping or filter connections needed.

Advanced Control & Monitoring System

- Protected within a real IP54 cubicle to simplify cabling and enhance safety.
- Monitors all key parameters for optimal installation reliability.

Dew Point Dependent Switching

- Real PDP monitoring (hygrometer)
- PDP display on controller (and alarm)
- Switching to the next tower occurs only after the desiccant is saturated, determined by the PDP reading.
- No purge air is consumed during this time.

Robust and Compact Design

- Standard frame featuring forklift slots and lifting eyes to simplify handling.
- Wide vessels ensure a low air speed and longer contact time.
- Flanges connecting vessels are integrated into the top and bottom shells, lowering the total unit height.

EH Externally Heated Twin Tower Desiccant Dryers

Long-Life Silica Gel Desiccant

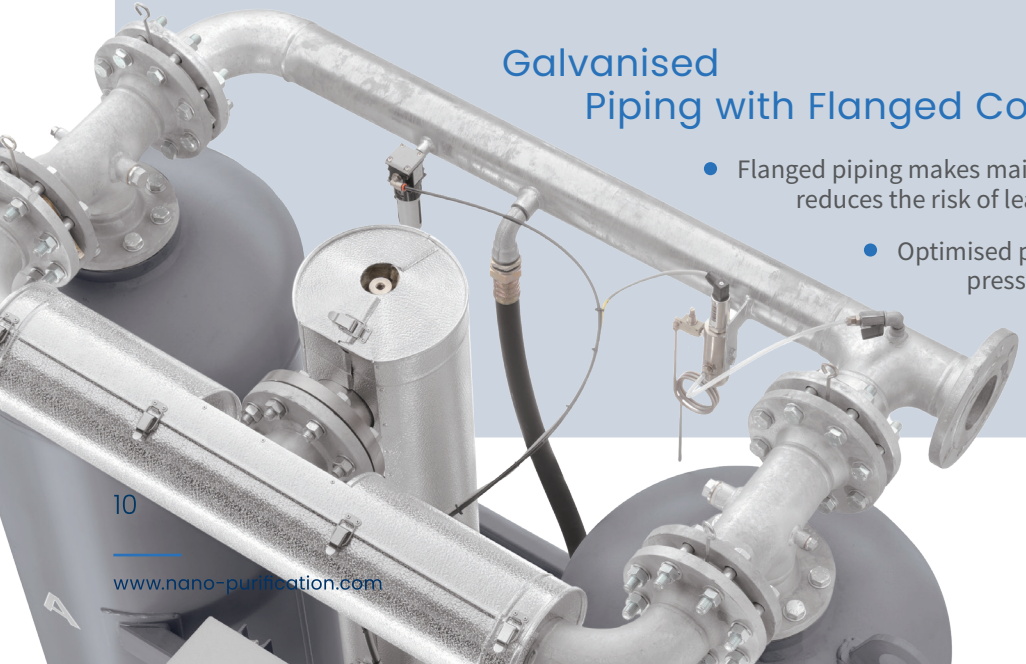
- High-adsorption silica gel desiccant operates with reduced reactivation energy versus other desiccants.
- Two-layer desiccant bed with a water-resistant bottom layer that safeguards the high-performance top layer.
- Pressure dew point of -40°C as standard (-70°C as option).
- Featuring up to 30% desiccant overfill to maintain reliable performance in demanding environments, including high heat and temporary overloads.

Stainless Steel Valves

- Durable stainless steel butterfly valves with actuators deliver long-lasting performance.
- Designed to withstand high regeneration air temperatures.

Low-Wattage Density Heater

- Durable stainless steel design provides extended lifetime.
- Nickel plating on the heater pipe prevents corrosion.
- Installed within an insulated heater pipe to ensure optimal energy efficiency.
- To further reduce heat loss and enhance efficiency, insulated vessels are optional for -40°C dryers and standard on the -70°C variant.



Galvanised Piping with Flanged Connections

- Flanged piping makes maintenance easier and reduces the risk of leaks.
- Optimised pipe sizing minimises pressure drop, leading to energy savings.

Optional Filters

- Pre-filter(s) prevent oil contamination, enhancing the durability of the desiccant.
- After filter prevents desiccant dust from contaminating the network, ensuring clean and reliable operation.
- Built for direct mounting on the dryer's inlet and outlet, ensuring minimal pressure drop.
- Simple to assemble and maintain, with no additional piping or filter connections needed.

Advanced Control & Monitoring System

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Dew Point Dependent Switching

- Real PDP monitoring (hygrometer)
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Robust and Compact Design

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Long-Life Silica Gel Desiccant

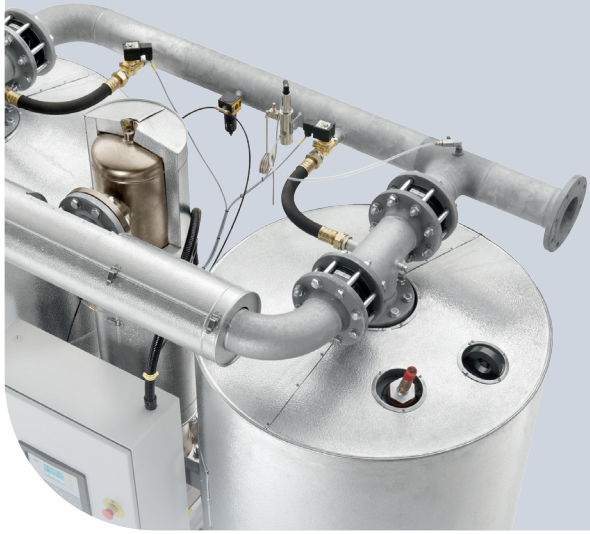
- High-adsorption silica gel desiccant operates with reduced reactivation energy versus other desiccants.
- Two-layer desiccant bed with a water-resistant bottom layer that safeguards the high-performance top layer.
- Pressure dew point of -40°C as standard (-70°C as option on Zero Purge only).
- Featuring up to 30% desiccant overfill to maintain reliable performance in demanding environments, including high heat and temporary overloads.

Stainless Steel Valves

- Durable stainless steel butterfly valves with actuators deliver long-lasting performance.
- Designed to withstand high regeneration air temperatures.

Regenerative Blower

- Utilises atmospheric air for regeneration.
- Easy maintenance and a rugged construction with optional air intake filter.



Galvanised Piping with Flanged Connections

- Flanged piping makes maintenance easier and reduces the risk of leaks.
- Optimised pipe sizing minimises pressure drop, leading to energy savings.

BP Blower Purge Twin Tower Desiccant Dryers

Optional Filters

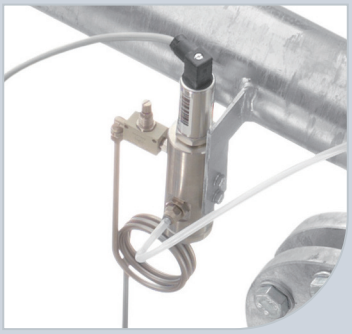
- Pre-filter(s) prevent oil contamination, enhancing the durability of the desiccant.
- After filter prevents desiccant dust from contaminating the network, ensuring clean and reliable operation.
- Built for direct mounting on the dryer's inlet and outlet, ensuring minimal pressure drop.
- Simple to assemble and maintain, with no additional piping or filter connections needed.

Advanced Control & Monitoring System

- Protected within a real IP54 cubicle to simplify cabling and enhance safety.
- Monitors all key parameters for optimal installation reliability.

Dew Point Dependent Switching

- Real PDP monitoring (hygrometer)
- PDP display on controller (and alarm)
- Switching to the next tower occurs only after the desiccant is saturated, determined by the PDP reading.
- No purge air is consumed during this time.



Robust and Compact Design

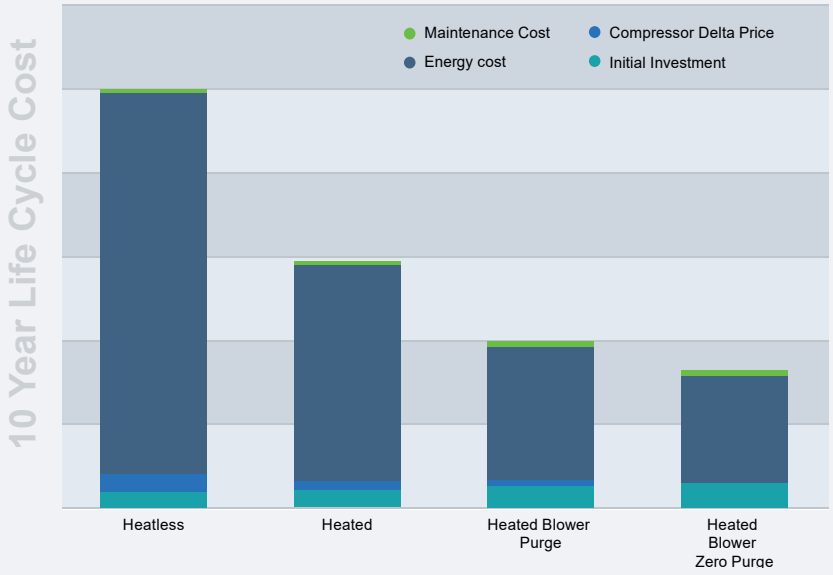
- Standard frame featuring forklift slots and lifting eyes to simplify handling.
- Wide vessels ensure a low air speed and longer contact time.
- Flanges connecting vessels are integrated into the top and bottom shells, lowering the total unit height.

Exceptional Energy-Efficiency

A dryer's energy use primarily stems from internal pressure drops and the regeneration process. Therefore, the key to designing desiccant dryers is minimising pressure drop and maximising regeneration efficiency. nano's dryers are engineered for exceptionally low internal pressure drop while delivering the most efficient regeneration available.

Life cycle cost

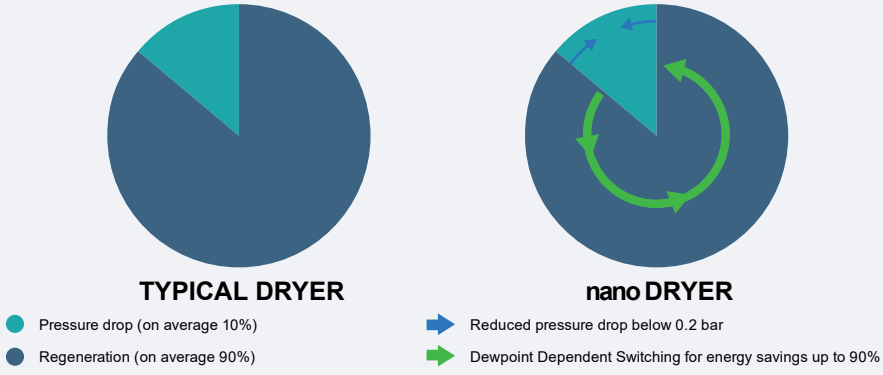
When selecting a desiccant dryer, it is important to consider not only the required dew points but also the energy costs associated with operating the dryer, rather than focusing solely on the initial capital cost. The energy expenses are significantly influenced by the method used to regenerate the desiccant. The illustration compares the life cycle costs of six types of desiccant dryers, all designed to dry 550 liters per second of compressed air at 7 bar. Among these, the heatless desiccant dryer is the most expensive to operate due to the substantial amount of compressed air consumed for purging during the regeneration cycle. Typically, around 15% of the rated flow capacity of a heatless dryer is used as purge air. Despite its high operating costs, the heatless dryer is frequently chosen for its simplicity and reliability.



Efficient regeneration due to Dew Point Dependent Switching

nano's HL, EH, BP, and BP Zero Purge desiccant dryers feature advanced energy management controls with built-in Dew Point Dependent Switching. This technology enhances the dryers' efficiency, resulting in energy savings of up to 90%, depending on installation and usage.

The concept is straightforward. While the regeneration time remains constant, the delay before switching from one drying tower to the other is managed by the PDP (partial dew point) sensor. This sensor is connected to a hygrometer that accurately measures the remaining humidity in the outlet compressed air. Once the target partial dew point is reached, the dryer cycle that was on hold will resume by switching to the dry tower. This delay in cycles leads to significant energy savings, especially when operating conditions are below the reference level or when the flow fluctuates below the maximum nominal load.



Optimise Your System

Scope of Supply

Air circuit	Stainless steel butterfly valves
	Galvanised in- and outlet piping
	In- and outlet air flanges
	Insulated heater pipe and connection pipe to vessels*
Connections	DIN-flanges
Electrical components	Pre-mounted electrical cubicle
	Elektronikon control and monitoring system
	IP54 protected
	Voltage free contacts for remote alarm and warning signals
	Pressure dew point sensor and control
Framework	Base frame with forklift slots
	Lifting holes
Mechanical approval	ASME approval
	AS1210 approval
	MHLW approval
	ML approval
	MOM approval

Additional Features & Options

	HL 330 to HL 1400	EH 330 to EH3000	BP 330 to BP 3000 Purge	BP 330 - BP 3000 Zero Purge
Pre- and after filter package	●	●	●	●
Dryer tower insulation	-	●	●	●
ANSI connection	●	●	●	●
-70°C pressure dew point	●	●	-	●
2nd PDP read out	●	●	●	●
Pressure relief valves	●	●	●	✓
High inlet temperature variant	●	●	●	●
Maximum working pressure 14.5 bar(e)	●	●	●	●
Blower inlet filter	-	-	●	●
Pneumatic control	●	-	-	-

** Cannot be combined with high inlet temperature variant*

- : Not available ✓: Standard ● : Option

Product Specifications

Heatless Desiccant Dryers

MODEL	INLET FLOW FAD 7bar(e) (1)	PRESSURE DROP (EXCLUDING FILTERS)	INLET/OUTLET CONNECTIONS	DIMENSIONS (mm)			WEIGHT
	Nm^3/h	bar	50 HZ: G/PN16	L	W	H	kg
HL 330	1188	0.1	80	1088	1776	2537	950
HL 400	1440	0.1	80	1088	1776	2537	1030
HL 550	1980	0.1	80	1091	1884	2592	102
HL 850	3060	0.1	100	1259	2359	2655	104.5
HL 1100	3960	0.1	100	1259	2472	2637	103.8
HL 1400	5040	0.11	125	1428	2693	2576	101.4

Externally Heated Desiccant Dryers

MODEL	INLET FLOW FAD 7bar(e) (1)	PRESSURE DROP (EXCLUDING FILTERS)	INLET/OUTLET CONNECTIONS	DIMENSIONS (mm)			WEIGHT
	Nm^3/h	bar	50 HZ: G/PN16	L	W	H	kg
EH 330	1188	0.18	80	1764	930	2558	1130
EH 400	1440	0.18	80	1764	930	2558	1130
EH 550	1980	0.18	80	1884	930	2612	1410
EH 850	3060	0.18	100	2359	1085	2702	2280
EH 1100	3960	0.18	100	2472	1085	2684	2750
EH 1400	5040	0.18	150	2693	1823	2479	3560
EH 1800	6480	0.18	150	2793	1832	2540	4700
EH 2200	7920	0.18	150	2993	2033	2651	5650
EH 3000	10800	0.18	200	3350	2103	2893	7700

(1) FAD at reference conditions: Ambient air temperature: 35°C, Ambient relative humidity: 60%, Compressed air effective inlet pressure: 7 bar, Compressed air inlet temperature: 20°C, Inlet relative humidity of compressed air: 100%, Cooling water temperature: 26.7°C
(2) The above dimensions are only an indication.
(3) Before calculating the space needed for installation, please always refer to the official dimension drawings.
(4) Technical specifications subject to change without notice. Direct inquiries to support.asia@nano-purification.com.

Blower Purge Desiccant Dryers

MODEL	INLET FLOW FAD 7bar(e) (1)	AVERAGE POWER CONSUMPTION	PRESSURE DROP (EXCLUDING FILTERS)	INLET/OUTLET CONNECTIONS	DIMENSIONS (mm)			WEIGHT
	Nm^3/h	kW	bar	50 HZ: G/PN16	L	W	H	kg
BP 330	1188	9.3	0.12	80	1764	930	2558	1190
BP 400	1440	10.2	0.12	80	1764	930	2558	1300
BP 550	1980	12	0.12	80	1884	930	2612	1620
BP 850	3060	17.1	0.12	100	2359	1085	2702	2600
BP 1100	3960	24.2	0.12	100	2472	1085	2684	3040
BP 1400	5040	33	0.1	150	2693	1823	2479	4100
BP 1800	6480	39	0.16	150	2793	1832	2540	4700
BP 2200	7920	55	0.22	150	2993	2199	2548	5600
BP 3000	10800	69	0.18	150	3350	2417	2893	7600

Blower Zero Purge Desiccant Dryers

MODEL	INLET FLOW FAD 7bar(e) (1)	AVERAGE POWER CONSUMPTION	PRESSURE DROP (EXCLUDING FILTERS)	INLET/OUTLET CONNECTIONS	DIMENSIONS (mm)			WEIGHT
	Nm^3/h	kW	bar	50 HZ: G/PN16	L	W	H	kg
BP 330 ZP	1188	8.6	0.12	80	1764	930	2558	1190
BP 400 ZP	1440	10.7	0.12	80	1764	930	2558	1300
BP 550 ZP	1980	13.2	0.12	80	1884	930	2612	1620
BP 850 ZP	3060	23.4	0.12	100	2359	1085	2702	2600
BP 1100 ZP	3960	32.4	0.12	100	2472	1085	2684	3040
BP 1400 ZP	5040	37	0.1	150	2693	1823	2479	4100
BP 1800 ZP	6480	45	0.16	150	2793	1832	2540	4700
BP 2200 ZP	7920	62	0.22	150	2993	2199	2548	5600
BP 3000 ZP	10800	79	0.18	150	3350	2417	2893	7600

(1) FAD at reference conditions: Ambient air temperature: 35°C, Ambient relative humidity: 60%, Compressed air effective inlet pressure: 7 bar, Compressed air inlet temperature: 20°C, Inlet relative humidity of compressed air: 100%, Cooling water temperature: 26.7°C
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Publication Reference: DesiccantAirDryer-SG-EN-Version-000 | ©2025 Air & Gas Solutions LLC