



A·C·I
Pharma

Secadores deseccantes

- ▶ En frío
- ▶ Por temperatura



NANO D1 D2 D3

nano

PURIFICATION SOLUTIONS



D-Series
ultra-high purity
compressed air dryers

flow capacity: 3 - 1110 scfm (5 - 1900 Nm³/hr)

D¹/D²/D³

D-Series ultra-high purity compressed air dryers

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D¹/D²/D³

Leading edge technology and more than 100 years of **experience**...nano-purification solutions, your world-class provider of state-of-the-art compressed air and gas solutions to industry.

Our commitment at n-psi is to work alongside our **customers** and provide unique solutions with the highest quality products to solve your specific challenges.

A wealth of experience and leading edge products are only part of the equation. n-psi realize that world-class customer **service** is the most important component to any successful business.

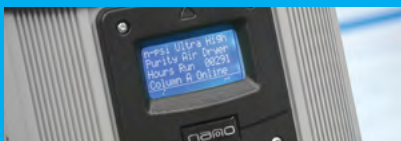
Experience. Customer. Service... **n-psi**



Clean and Dry

Clean and dry compressed air is essential in every efficient and profitable manufacturing and process operation worldwide. nano-purification solutions' vast experience includes food, beverage, chemical, laboratory, medical and natural gas applications.

n-psi understands your needs and has created the nano range of high-performance, energy-saving compressed air and gas purification products to provide clean and dry compressed air and gases at an affordable price with unrivaled reliability.



Design

Our experienced team of design engineers are world leading specialists in the design of new and unique industrial compressed air treatment products and compressed air dryers.



Research & Development

A core element of our capabilities - founded on cumulative decades of practical engineering expertise - our R&D team is continually looking for improved performance and reliability.



Manufacture

Ultra-high purity compressed air dryers are manufactured at our state of the art facility to the highest standards of build quality to ensure equipment reliability and high levels of performance.

nano D-Series compressed air dryers

Clean and dry compressed air is easily achieved with the nano D-Series ultra-high purity compressed air dryers.

D-Series dryers reliably give you:

- More for your money - everything needed for installation is in the box
- Moisture & particulate protection of your production process
- Lower life cycle costs - low energy costs and simplified maintenance
- Built in dewpoint monitoring (optional)
- Space saving - models up to 177 scfm can be easily wall mounted
- Safe and quiet operation
- Flows 3 - 1110 scfm at 100 psig operating pressure
- Peace of mind - The most reliable product of its kind

Designed for use in the compressor room, at the point of application or integrated into your original equipment, nano dryers are an effective solution to the problems caused by contaminated compressed air.



Reliability is built in... and backed by our 5 year* product warranty!

benefits - get more for your money

Guaranteed Performance

- The nano D-Series dryers have been 100% function and performance tested at the factory to ensure the highest standard of performance, delivering compressed air purity in accordance with ISO8573:1 – 2001, Class 2 dirt (1 micron) and Class 2 water (-40° F pressure dewpoint).

Reliable Operation

- High efficiency moisture removal and reliable operation with PLC controlled solenoid valves.
- Integral volumetric flow limiter prevents overflow ensuring consistent dewpoint performance.

Quiet Depressurization

- Unique exhaust air silencers significantly reduce noise levels.

Energy Saving Design

- Integrated outlet filtration eliminates the need for external after filter.
- Advanced design limits regeneration purge air usage to approximately 15%.
- Energy saving dewpoint monitoring option can save up to 60% during reduced inlet moisture loading.

PLC Controls and Digital Display

- A clear digital display provides a full view of PLC operation and monitoring data.

High Quality Construction

- 100% tested for leaks, proper operation and dewpoint performance.

Easy to Install Space Saving Design

- Easy to install & ready for use, the D1/D2 packages include a power cable and mounting brackets for either floor or wall mounting.
- The compact design of the D3 allows installation in spaces too small for a traditional dryer.

Easy to Maintain

- Patented, combined filter and desiccant cartridges (D1/D2) can be serviced in less than 15 minutes.
- Integrated filtration.
- Convenient service kits for easy and efficient maintenance.
- Integrated exhaust air silencers require no maintenance or replacement.

* Standard two year warranty extends to five years automatically with addition of the -ES (Energy Saving dewpoint control) option for all D-Series dryers.

D-Series nano dryers – D1 / D2 in detail

Patented combined filter & desiccant cartridges

- Water separation, inlet and outlet filtration and desiccant are all integrated into a single cartridge (eliminates up to 3 external filters and drains).*
- Built-in inlet filter improves flow distribution and lowers pressure drop.
- High density filled desiccant provides maximum adsorption capacity.
- Easy to replace cartridges simplify maintenance requirements.

PLC controlled operation

- The dryer is operated by a robust and reliable PLC control system offering valuable features including 'power on', 'hours run' and 'service required' indicators.
- Memory retention built into the PLC enables the controller to pick up where it left off in the drying cycle, ensuring consistently clean and dry air downstream.
- Compressor synchronization is a standard energy saving feature which starts and stops the dryer with a signal from the compressor or point-of-use equipment to eliminate purge loss when drying is not required.

Energy saving dewpoint control option

- With this option, a dewpoint sensor is incorporated into the dryer providing the ultimate in energy savings.
- The outlet dewpoint is constantly monitored allowing the cycle time to be adjusted depending on the actual moisture load - saving valuable purge air.
- Dewpoint is conveniently displayed on the PLC.
- The -ES option reduces valve actuation increasing service life and includes an extended 5-year valve warranty.



Floor or wall installation

- Can be floor or wall mounted - simply by rotating the feet 90°.

Optimum dewpoint performance

- D-Series dryers are provided as standard set for a -40°F dewpoint. Optional dewpoints from -4°F to -100°F are available.
- Air velocity and, therefore, air to desiccant contact time, is carefully controlled via a pressure maintaining device to ensure optimum dewpoint performance.

Constant flow and pressure

- Pressure is equalized before switching columns to ensure uninterrupted compressed air and consistent air pressure. Equalization also ensures long desiccant life due to minimized desiccant attrition.

Reliable high performance valves

- The NDL010 to 050 use ball valves and two pilot operated solenoid valves for proven performance and reliability.
- The NDL060 to 090 use four pilot operated solenoid valves.
- The NDL100 to 130 use two integrated coaxial flow valves for inlet air and two pilot operated solenoid valves for exhaust.

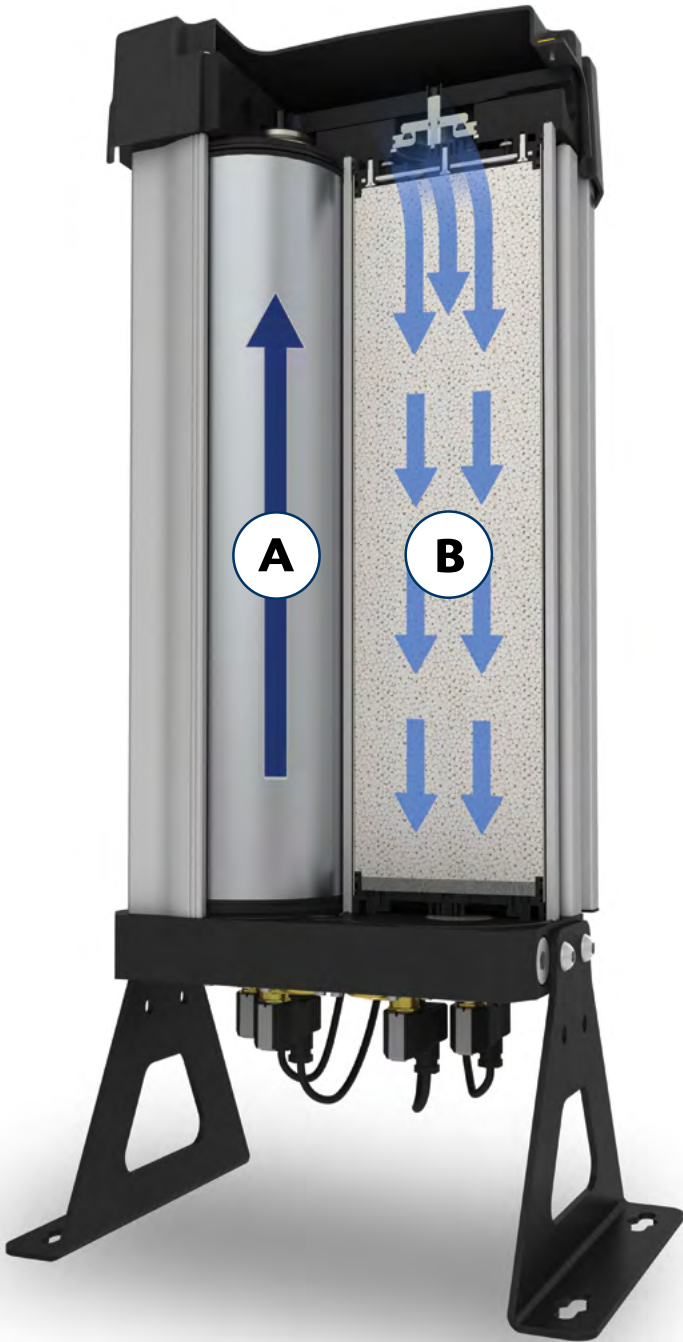
Maximum corrosion protection

- High tensile aluminum columns are alocromed then externally powder coated to provide maximum protection for corrosive environments.



* An upstream coalescing filter may be required in some applications.

system performance



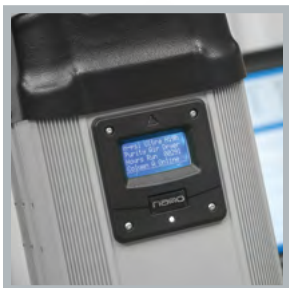
The advanced nano D-Series dryers use the pressure swing adsorption principle to efficiently dry compressed air. They use a heatless twin tower configuration (see diagram opposite) housed in a modular design. Each column contains a unique (and patented) desiccant cartridge which incorporates inlet and outlet filtration.

Wet air from the compressor aftercooler enters the dryer and is directed into column **A**. Bulk liquids (water) and particles are removed by the filtration/separation stage, which is located on the inlet to the cartridge. Water is retained within the dryer until the column is regenerated, when it will be vented to atmosphere as it is depressurized. Following the filtration stage, air passes through the desiccant bed where any remaining moisture is adsorbed. Finally, the dry air passes through a particle filter, which retains any remaining desiccant particles that may have been carried through the system (< 1 micron / ISO8573.1 class 2 for dust).

Simultaneously, a small amount of dry air is counter-flowed down through cartridge **B** and exhausted to atmosphere, removing the moisture and regenerating the desiccant.

The dryer is controlled by a PLC which periodically switches the solenoid valves, reversing the function of each column and therefore ensuring the continuous supply of dry air.

Scan this tag with your mobile device to download a technical paper describing the performance limitations of typical twin tower desiccant dryers and how the unique design of the nano D-Series overcomes them to provide effective and efficient dehydration of compressed air.



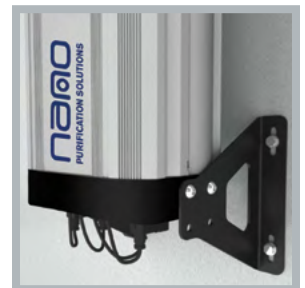
PLC controls with clear text display



Unique patented cartridge design



Flexible piping & installation options



Mount on the floor or wall

D-Series nano dryers – D3 in detail

Combined desiccant & after filter column

- High density filled desiccant columns provides maximum adsorption capacity
- Built in after filter ensures reliable downstream air quality

PLC controlled operation

- The dryer is operated by a robust and reliable PLC control system, offering valuable features including 'power on', 'hours run' and 'service required' indicators
- Memory retention built into the PLC enables the controller to pick up where it left off in the drying cycle, ensuring consistently clean and dry air downstream
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- The outlet dewpoint is constantly monitored allowing the cycle time to be adjusted depending on the actual moisture load - saving valuable purge air
- Dewpoint is conveniently displayed on the PLC
- The -ES option reduces valve actuation increasing service life and includes an extended 5-year valve warranty.



Optimum dewpoint performance

- D-Series dryers are provided as standard set for a -40°F dewpoint. Optional dewpoints from -4°F to -100°F are available

Constant flow and pressure

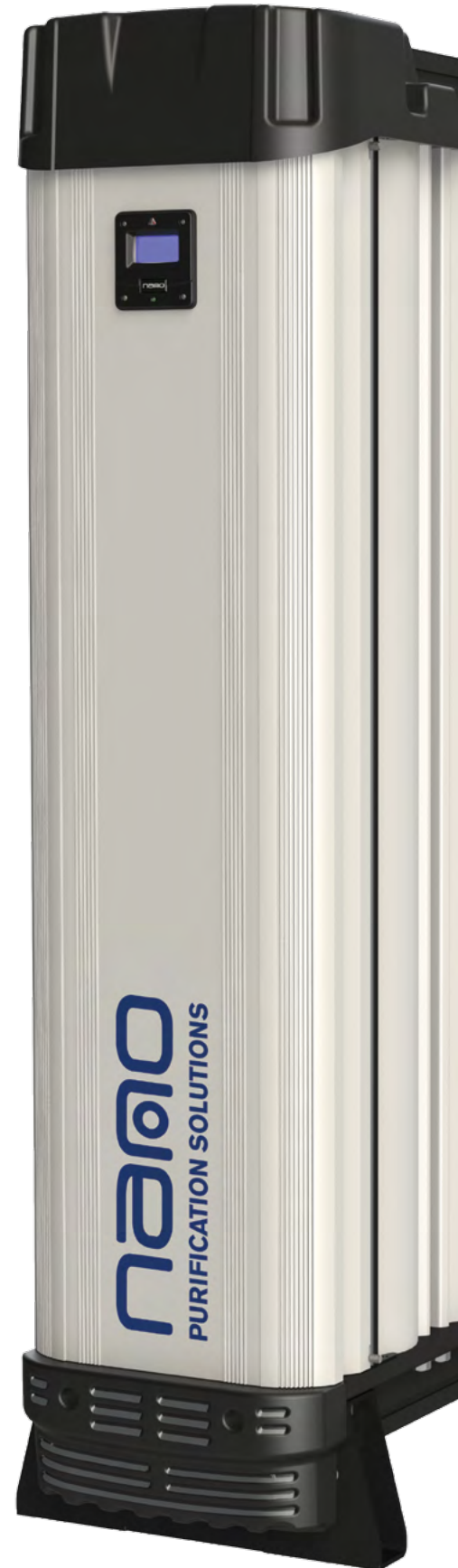
- Pressure is equalized before switching columns to ensure uninterrupted compressed air and consistent air pressure. Equalization also ensures long desiccant life due to minimized desiccant attrition

Two stage maintenance free silencer

- Exhaust air is directed into perforated chambers housed within the lower manifold eliminating external mufflers. The air is then directed under the dryer away from operators and traffic lanes in the compressor room

Maximum corrosion protection

- High tensile aluminum columns are first alocromed and then externally powder coated to provide maximum protection for corrosive environments



PLC controller with clear text display



High density filled desiccant columns



Flexibility is built right in

We've designed the D-Series³ with simplicity of service in mind. As standard, the columns are high density filled and include a built in after filter for reliable downstream air quality. For even greater ease of service, pre-filled and pre-assembled desiccant / after filter cartridges are available as a time saving option.



Reliable high performance valves

Inlet, exhaust and outlet air are controlled using coaxial flow valves integrated into the upper and lower manifolds. The valves provide unrestricted flow capacity and are designed for durability, ease of maintenance and long service life.

sizing & specifications

Model	Maximum Rated Flow		Inlet & Outlet Connections		Dimensions inches (mm)				Approximate Weight	Model with Energy Saving Dewpoint Sensor	Service Kit (Desiccant or Cartridges) ⁽³⁾
	Inlet ⁽¹⁾	Outlet ⁽²⁾	Size	Type	A	B	C	D	lbs (kg)		
	scfm (Nm ³ /hr)										

D-Series¹

NDL 010	3 (5.1)	2.4 (4.1)	3/8"	Push to Connect	17 (447)	9 (241)	6 (160)	10 (252)	18 (8.3)	NDL 010 ES	NDK 010
NDL 020	5 (8.5)	4 (6.8)			17 (447)	9 (241)	6 (160)	10 (252)	18 (8.3)	NDL 020 ES	NDK 020
NDL 030	10 (17)	8 (14)			25 (647)	9 (241)	6 (160)	10 (252)	28 (13)	NDL 030 ES	NDK 030
NDL 040	15 (26)	12 (20)			35 (897)	9 (241)	13 (330)	10 (252)	36 (16)	NDL 040 ES	NDK 040
NDL 050	24 (41)	19 (33)	1/2"		43 (1097)	9 (241)	13 (330)	10 (252)	43 (19)	NDL 050 ES	NDK 050

D-Series²

NDL 060	34 (58)	27 (46)	1"	NPT	30 (734)	17 (440)	12 (295)	13 (335)	88 (40)	NDL 060 ES	NDK 060
NDL 070	41 (70)	33 (56)			30 (734)	17 (440)	12 (295)	13 (335)	88 (40)	NDL 070 ES	NDK 070
NDL 080	53 (90)	42 (71)			36 (914)	17 (440)	12 (295)	13 (335)	119 (54)	NDL 080 ES	NDK 080
NDL 090	66 (112)	53 (90)			36 (914)	17 (440)	12 (295)	13 (335)	119 (54)	NDL 090 ES	NDK 090
NDL 100	88 (150)	70 (119)			43 (1089)	17 (440)	12 (295)	13 (335)	141 (64)	NDL 100 ES	NDK 100
NDL 110	106 (180)	85 (144)			49 (1239)	17 (440)	12 (295)	13 (335)	172 (78)	NDL 110 ES	NDK 110
NDL 120	132 (224)	106 (180)			59 (1489)	17 (440)	12 (295)	13 (335)	209 (95)	NDL 120 ES	NDK 120
NDL 130	177 (301)	142 (241)			72 (1839)	17 (440)	12 (295)	13 (335)	262 (119)	NDL 130 ES	NDK 130

D-Series³

NDL 2110	212 (360)	170 (289)	2"	NPT	47 (1186)	12 (295)	25 (625)	-	366 (166)	NDL 2110 ES	NDK 2110
NDL 2120	276 (469)	221 (375)			57 (1435)	12 (295)	25 (625)	-	441 (200)	NDL 2120 ES	NDK 2120
NDL 2130	400 (680)	320 (544)			70 (1786)	12 (295)	25 (625)	-	547 (248)	NDL 2130 ES	NDK 2130
NDL 3130	560 (951)	448 (761)			70 (1786)	12 (295)	31 (792)	-	778 (353)	NDL 3130 ES	NDK 3130
NDL 4130	750 (1274)	600 (1019)	2-1/2"	NPT	70 (1786)	12 (295)	38 (960)	-	1010 (458)	NDL 4130 ES	NDK 4130
NDL 6120	828 (1407)	662 (1125)			57 (1435)	12 (295)	51 (1295)	-	1155 (524)	NDL 6120 ES	NDK 6120
NDL 6130	1110 (1886)	888 (1509)			70 (1786)	12 (295)	51 (1295)	-	1473 (668)	NDL 6130 ES	NDK 6130

If dryer is to be installed downstream of an oil lubricated compressor, install a nano F1 M01 (0.01 micron) coalescing filter immediately upstream. To order with a pre-filter add "-F" to the model number (i.e. NDL 120-F). See Price List or contact support@n-psi.com for recommended filtration.

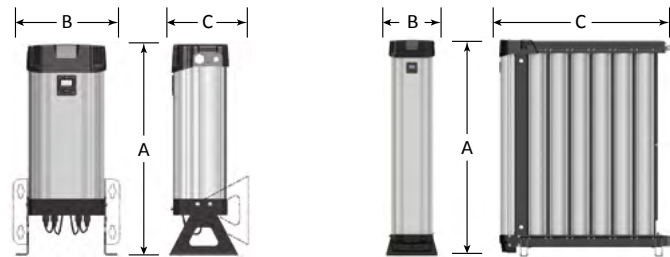
- (1) Maximum Rated Inlet Flow assumes an inlet air pressure of 100 psig (7.0 barg) and temperature of 100°F (37.7°C).
- (2) Outlet flow is inlet flow minus average purge & depressurization loss over time.
- (3) NDL 010 to 130 service kit includes desiccant cartridges with built in after filter. NDL 2110 to 6130 service kit includes desiccant and after filter.

Correction factors	To calculate the maximum rated flow for any model at operating conditions other than those above: Rated Flow (from table above) x K1 x K2 x K3 (from tables below) = Rated Flow at new conditions ⁽⁴⁾												
	Inlet air pressure (psig)	60	75	90	100	115	130	145	160	175	190	205	220
K1	0.63	0.75	0.88	1	1.13	1.25	1.38	1.50	1.63	1.75	1.88	2.00	2.13
Inlet air temperature (°F)	75	100	104	113	122	Pressure dewpoint (°F)					-4	-40	-100
K2	1	1	0.97	0.88	0.73	K3					1.10	1	0.70

(4) To be used as a rough guide only. All applications should be confirmed by n-psi. Contact support@n-psi.com for sizing assistance.

Specifications		
ISO8573 – 1: 2001 Quality Classes	Dirt	Class 2 (1 micron)
	Water	Class 2 (-40°F / -40°C Pressure Dewpoint) ⁽⁵⁾
Allowable working pressure	58 to 232 psig (4 to 16 barg)	
Allowable inlet temperature	34.7 to 122°F (1.5 to 50°C)	
Power supply	100 – 240VAC / 50 – 60Hz	

(5) See Price List for -4°F and -100°F pressure dew point applications.



NDL 010 to 130

NDL 2110 to 6130

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