

nano

-POROUS SOLUTIONS LTD



D-Series

ultra-high purity
compressed air dryers

Flow Capacity: 5-1900 Nm³/hr (3-1110 scfm)

D¹ D² D³

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nano-porous solutions limited is one of the world's leading companies specialising in the design and manufacture of industrial compressed air treatment products and dryers.

The business, which is based in the North East of England, has an extremely experienced team of product design and development engineers, led by Colin Billiet – the former Chief Executive of the domnick hunter group Plc.

Working with customers to determine their precise needs, applying our knowledge and experience, n-psl provides 'state of the art' high quality products with innovative features and benefits. Products are manufactured at our UK facility which is accredited to ISO9001:2008. This demonstrates our commitment to continual quality improvement and business excellence.



Clean and Dry

Clean and dry compressed air – an essential requirement in efficient and profitable manufacture and process operations throughout the food, beverage, chemical, laboratory, pharmaceutical, manufacturing, brewing and process industries.

nano-porous solutions limited understand your needs for this and have developed the nano range of ultra-high purity compressed air dryers to give you just that - clean and dry compressed air at an affordable price with unrivalled equipment reliability you can count on!



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 and 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 D¹ & D² - models can be easily wall mounted
- Safe and quiet operation
- Flows 5-1590 Nm³/hr at 7 barg 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° C 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 Operation

- Unique exhaust air silencers significantly reduce noise levels when Depressurising.

Energy Saving Design

- Clear PLC display
- Full operational and monitoring data on view

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



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

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°C dewpoint. Optional dewpoints from -20°C to -74°C 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

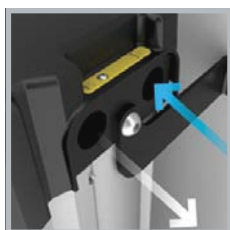
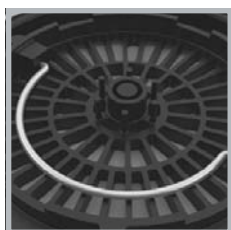
- Pressure is equalized before switching columns to ensure uninterrupted compressed air and consistent air pressure. Equalization also ensures long desiccant life due to minimized desiccant attrition

Reliable high performance valves

- The NDL-010 to 050 use ball valves and two pilot operated solenoid valves for proven performance and reliability
- The NDL-060 to 090 use four pilot operated solenoid valves
- The NDL-100 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 first alocromed and then externally powder coated to provide maximum protection for corrosive environments

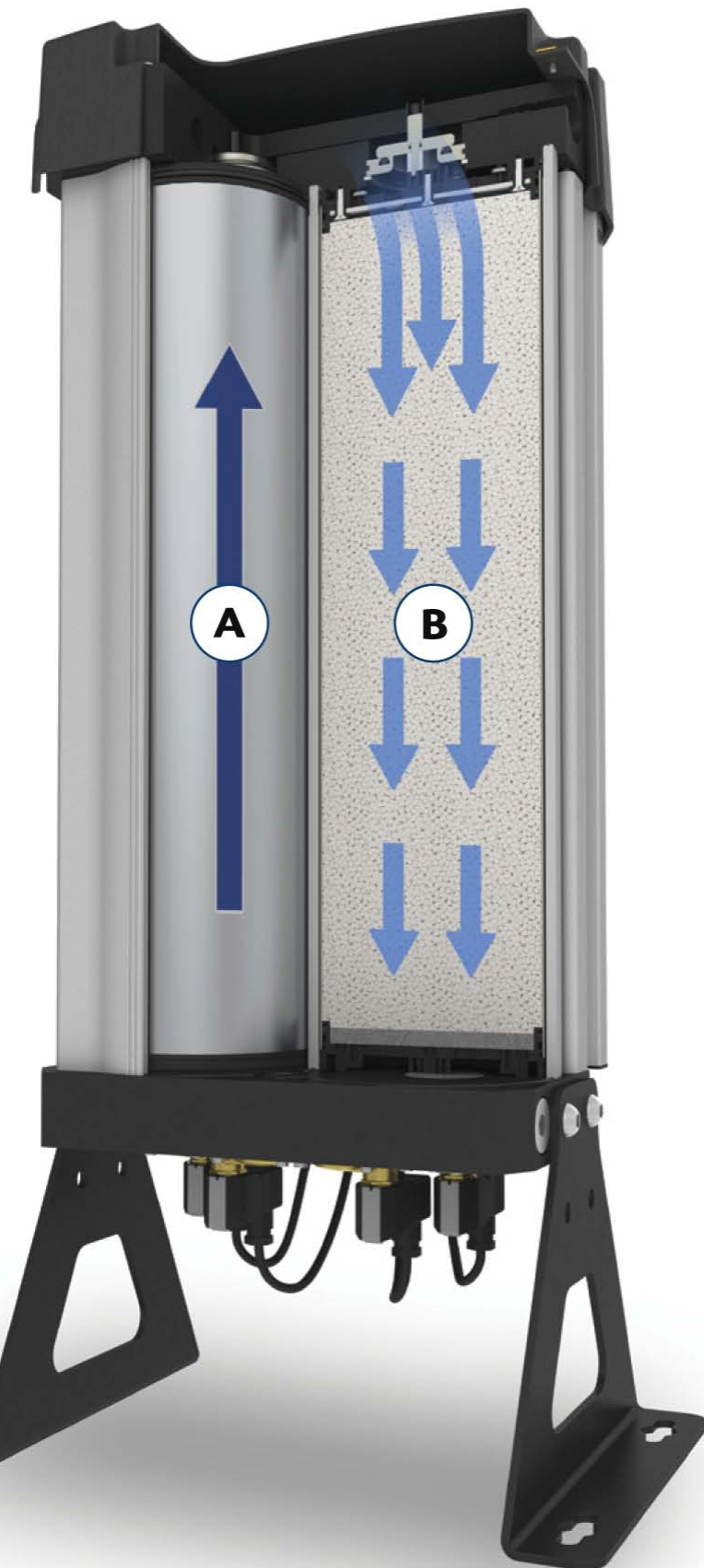


Unique patented cartridge design

Flexible piping & installation options

Mount on the floor or wall

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



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 controller with clear text display

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
- 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

Optimum dewpoint performance

- D-Series dryers are provided as standard set for a -40°C dewpoint. Optional dewpoints from -20°C to -74°C 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 ⁽¹⁾		Inlet & Outlet Connections	Dimensions mm (inches)				Approximate Weight	Model with Energy Saving Dewpoint Sensor	Service Kit (Desiccant or Cartridges) ⁽²⁾
	Inlet	Outlet		A	B	C	D	Kg (Lbs)		
	Nm ³ /hr (scfm)									

D-Series¹

NDL-010	5.1 (3)	4.1 (2.4)	8mm 5/16" Push fit	447 (17)	241 (9)	160 (6)	252 (10)	8.3 (18)	NDL-010 ES	NDK-010
NDL-020	8.5 (5)	6.8 (4)		447 (17)	241 (9)	160 (6)	252 (10)	8.3 (18)	NDL-020 ES	NDK-020
NDL-030	17 (10)	13.6 (8)		647 (25)	241 (9)	160 (6)	252 (10)	13 (28)	NDL-030 ES	NDK-030
NDL-040	26 (15)	20 (12)		897 (35)	241 (9)	330 (13)	252 (10)	16 (36)	NDL-040 ES	NDK-040
NDL-050	41 (24)	33 (19)		1097 (43)	241 (9)	330 (13)	252 (10)	19 (43)	NDL-050 ES	NDK-050

D-Series²

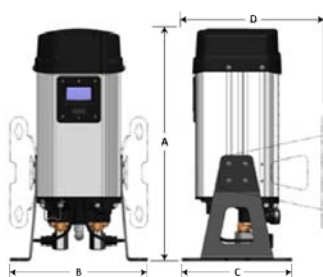
NDL-060	58 (34)	47 (28)	G1" BSPP	734 (30)	440 (17)	295 (17)	335 (13)	40 (88)	NDL-060 ES	NDK-060
NDL-070	70 (41)	58 (34)		734 (30)	440 (17)	295 (17)	335 (13)	40 (88)	NDL-070 ES	NDK-070
NDL-080	90 (53)	73 (43)		914 (36)	440 (17)	295 (17)	335 (13)	54 (119)	NDL-080 ES	NDK-080
NDL-090	112 (66)	92 (54)		914 (36)	440 (17)	295 (17)	335 (13)	54 (119)	NDL-090 ES	NDK-090
NDL-100	150 (88)	122 (72)		1089 (43)	440 (17)	295 (17)	335 (13)	64 (141)	NDL-100 ES	NDK-100
NDL-110	180 (106)	146 (86)		1239 (49)	440 (17)	295 (17)	335 (13)	78 (172)	NDL-110 ES	NDK-110
NDL-120	224 (132)	183 (108)		1489 (59)	440 (17)	295 (17)	335 (13)	95 (209)	NDL-120 ES	NDK-120
NDL-130	301 (177)	245 (144)		1839 (72)	440 (17)	295 (17)	335 (13)	119 (262)	NDL-130 ES	NDK-130

D-Series³

NDL-2110	360 (212)	306 (180)	G2" BSPP/NPT	1186 (47)	295 (12)	625 (25)	-	166 (366)	NDL-2110 ES	NDK-2110
NDL-2120	469 (276)	400 (235)		1435 (57)	295 (12)	625 (25)	-	200 (441)	NDL-2120 ES	NDK-2120
NDL-2130	680 (400)	578 (340)		1786 (70)	295 (12)	625 (25)	-	248 (547)	NDL-2130 ES	NDK-2130
NDL-3130	951 (560)	809 (476)		1786 (70)	295 (12)	792 (31)	-	353 (778)	NDL-3130 ES	NDK-3130
NDL-4130	1274 (750)	1084 (638)	G2 1/2" BSPP/NPT	1786 (70)	295 (12)	960 (38)	-	458 (1010)	NDL-4130 ES	NDK-4130
NDL-6120	1407 (828)	1197 (704)		1435 (57)	295 (12)	1295 (51)	-	524 (1155)	NDL-6120 ES	NDK-6120
NDL-6130	1886 (1110)	1590 (935)		1786 (70)	295 (12)	1295 (51)	-	668 (1473)	NDL-6130 ES	NDK-6130

(1) Maximum Rated Inlet Flow assumes an inlet air pressure of 7.0 barg (100 psig) and temperature of 37.7°C (100°F).

(2) 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.



< NDL-010 to 130

NDL-2110 to 6130 >



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 ⁽³⁾												
Inlet Air Pressure barg (psig)	4 (60)	5 (75)	6 (90)	7 (100)	8 (115)	9 (130)	10 (145)	11 (160)	12 (175)	13 (190)	14 (205)	15 (220)	16 (232)
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 °C (°F)	25 (77)	35 (95)	40 (104)	45 (113)	50 (122)	Pressure Dewpoint °C (°F)				-20 (-4)	-40 (-40)	-74 (-100)	
K2	1	1	0.97	0.88	0.73	K3				1.10	1	0.70	

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

Specifications

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

D

Ultra High Purity Compressed Air Desiccant Dryers

Clean and dry compressed air is easily achieved with the range of ultra high purity heatless desiccant compressed air dryers. They offer unprecedented equipment reliability and high levels of performance.

D-Series

C

CO₂ Adsorption Dryers

The nano C-Series of CO₂ Adsorption Dryers purify compressed air to deliver a continuous supply of clean, dry (-70°C pdp) and CO₂ free (<1 ppm) purge gas.

C-Series

N

Nitrogen Generators

The nano N-Series range of Nitrogen generators use regular compressed air to deliver a continuous supply of high purity Nitrogen whilst offering a cost effective, reliable and safe alternative to the use of bottled gases. Nitrogen Purity from 97% to 99.999%.

N-Series

AMT

AMT Products [Adsorbent Media Tubes]

With Applications in Drying Compressed Air and Gases, CO₂ Recovery and Contaminant Removal from air and gases, there are many and varied types of product options available for Adsorbent Media Tube (AMT) technology.

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