benefits

robust heat exchangers built for industry

the nano R³ heat exchanger vessels unify the cooling and moisture separation processes in an integrated unit. This unique concept delivers operating efficiency plus energy conservation

the large volume air-to-air refrigerant heat exchangers provide ample time and space for cooling the inlet air as it flows through the generously sized heat transfer surface. Flow diffusers ensure passage of the air over the entire transfer surface

moisture condensed during the cooling process drops immediately into the collection chamber at the bottom of the heat exchanger, and a separation shield prevents any possibility of water re-entering the air stream

effective water separation

the collected water is discharged through drain lines from the integrated moisture separator. This insures direct draining and a constant outlet dew point regardless of air flow rate

low pressure drop

pressure differential in nano R³ dryers can average one-half to two-thirds less than other manufacturers. Savings from low pressure drop in nano R³ dryers contribute to operating economy throughout the long life of the dryer

optimum energy efficiency

lower electrical consumption from 0% to 100% duty cycle

no seasonal adjustments

controls self-adjust with the ambient conditions

built to last

compressor runs cooler and less often for a longer life

design approved for rebates

guaranteed reliability

extensive factory testing for quality assurance

nano F² filter packages

nano filters to improve compressed air quality and to ensure trouble-free operation

environmentally friendly

R404a refrigerant in all models

sizing & specifications

dryer model	power supply	inlet & outlet	rated flow (1)		compressor(s)		absorbed power		dryer dimensions (inches)			approx. weight
		flanged	scfm	Nm³/h	qty	hp	kW	amps	width	depth	height	lbs
CPD 2500	460V/3Ph/60Hz	4"	2,500	4,248	1	13	9.7	33	52	60	60	3,400
CPD 3000	460V/3Ph/60Hz	6"	3,000	5,097	1	15	12	36	52	60	60	3,600
CPD 3500	460V/3Ph/60Hz	6"	3,500	5,947	2	10	15	37	60	130	70	3,900
CPD 4000	460V/3Ph/60Hz	6"	4,000	6,796	2	10	15	45	60	130	70	4,200
CPD 5000	460V/3Ph/60Hz	8"	5,000	8,495	2	13	19	50	60	130	75	6,000
CPD 6000	460V/3Ph/60Hz	8"	6,000	10,194	3	10	22	50	70	130	75	7,200
CPD 7000	460V/3Ph/60Hz	8"	7,000	11,893	3	13	26	65	80	135	77	8,600
CPD 8000	460V/3Ph/60Hz	10"	8,000	13,592	4	10	30	71	82	140	80	9,800
CPD 9000	460V/3Ph/60Hz	10"	9,000	15,291	5	10	36	80	85	145	80	12,200
CPD 10000	460V/3Ph/60Hz	10"	10,000	16,990	1	50	38	91	85	145	80	12,500
CPD 12000	460V/3Ph/60Hz	12"	12,000	20,388	1	60	45	97	90	160	80	13,800
CPD 15000	460V/3Ph/60Hz	12"	15,000	25,485	2	40	60	138	90	180	85	17,000
CPD 20000	460V/3Ph/60Hz	14"	20,000	33,980	2	50	75	175	100	200	85	21,500
CPD 25000	460V/3Ph/60Hz	16"	25,000	42,475	1	120	93	186	120	210	87	23,000
CPD 30000	460V/3Ph/60Hz	18"	30,000	50,970	1	150	112	195	125	230	90	27,000

specifications	CPD 2500 to 9000	CPD 10000 to 30000
compressor type	scroll	semi-hermetic
heat exchanger type	stainless steel	shell & tube (ASME)
design operating pressure range	0 to 150 psig	
design inlet air temperature range	40 to 140°F	
design ambient temperature range	40 to 120°F	
condenser cooling options	water-cooled (standard) or air-cooled (CF)	
refrigerant type	R404a	
control panel enclosure	NEMA 12	
system pressure drop	3.5 to 4.5 psid	

pressure & dew point correction factors (3)

inlet air pressure (psig)	50	75	100	125	150	pressure dew point (°F)	38	41	45	50
correction factor	0.85	0.95	1	1.07	1.13	correction factor	1	1.12	1.17	1.22

temperature correction factors (3)

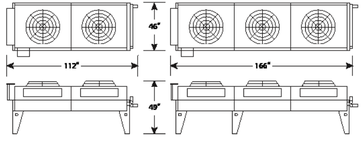
inlet air temperature (°F)	80	90	100	110	120	140	ambient temperature (°F)	70	100	110	115
correction factor	1.50	1.21	1	0.82	0.72	0.61	correction factor	1.10	1	0.94	0.65

(1) in compliance with CAGI (ADF 100): inlet temperature: 100°F, ambient temperature: 100°F, inlet pressure: 100 psig, pressure dew point: 33°F to 39°F, and pressure drop not to exceed 5 psid. For all other conditions refer to the correction factors above

(2) nominal absorbed power at rated operating conditions using 460/3/60 power supply (as applicable). For absorbed power at other voltages or conditions, contact support@n-psi.com

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

remote condensers



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nano

R³ cycling refrigerated process compressed air dryers

flow capacity: 2500 - 30000 scfm (4248 - 50970 Nm³/hr)

cycling refrigerated process compressed air dryers

R³

flow capacity: 2500 - 30000 scfm (4248 - 50970 Nm³/hr)

Leading edge technology and hundreds of 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 nano 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. nano realize that world-class customer **service** is the most important component to any successful business.

Experience. Customer. Service...**nano**

clean and dry

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

nano understand your needs and has created the nano R¹ range of high-performance, energy-saving compressed air and gas purification products to provide clean and dry compressed air at an affordable price with unrivaled reliability.

design

Our experienced team of design engineers are always looking for new and unique technologies and products to bring you the highest level of performance and lowest overall operating cost.

research & development

Our R&D team endeavor to provide solutions that go beyond developing an existing product. They are continually researching new technologies which can provide unique advantages over competitive offerings.

manufacture

The reliable and energy saving nano R³ refrigerated air dryers are manufactured in a state of the art facility to the highest standards of build quality to ensure reliability and high levels of performance.

MEMBER OF CAGI Compressed Air & Gas Institute

how do R³ cycling process dryers save energy

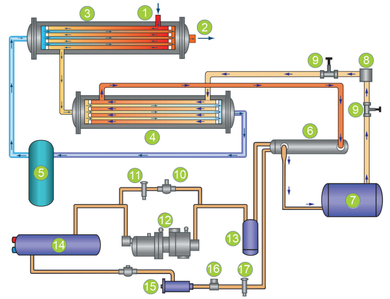
The advanced nano R³ cycling refrigeration air dryer combines the advantages of a direct thermal exchange with thermal storage. It's two dryers in one. By combining these two powerful energy saving technologies the R³ provides you with the lowest power consumption available in the market today. This cutting edge concept not only reduces your energy bill, it also offers steady dew point performance and reliable operation to ensure you have continuous, worry free, clean and dry compressed air.

With unique digital controls that automatically manage energy consumption and energy saving condensate drains that automatically adjust to demand - the R³ cycling dryer saves energy and eliminates seasonal adjustments. It is the ultimate solution to remove moisture from your compressed air system.

Refrigeration dryers must be sized to handle the worst case operating conditions they may encounter - the highest possible flow at the highest possible inlet temperature on the hottest day of the year. The power consumption needed to operate at these worst case conditions is far greater than otherwise needed. Traditional dryers operate at this higher power consumption all the time even though the actual demand on the dryer is normally much less.

Dryer demand is a function of both required air flow and ambient conditions. Unless both of these variables are at their maximums at the same time, there are energy savings to be had. The R³ takes advantage of this savings opportunity by significantly reducing power consumption to match actual demand.

how it works



1. air inlet
2. air outlet
3. pre-cooler/re-heater
4. air-to-air/glycol heat exchanger
5. moisture separator
6. evaporator
7. cold bank storage
8. pump
9. isolation valves
10. solenoid valve
11. defroster
12. compressor
13. suction accumulator
14. condenser
15. filter dryer
16. sight glass
17. thermostatic expansion valve

saves money

In most applications, the air flow varies significantly throughout the day reaching peak demand only for a very short time. Often times, demand can be close to zero overnight or during breaks. The R³ matches its power consumption to the air flow demand providing optimal energy savings. *(example shown to right)*

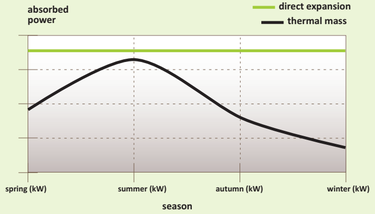
at 0.08 per kWh for a plant running 24/7, the CPD 5000 dryer saves the company nearly $10,600 annually in electrical costs

dryer used	electrical consumption	actual air flow
CPD	19 kW	5000 scfm
direct expansion	19 kW	5000 scfm

energy consumption according to the air flow variations during the day

working	duration	direct expansion	CPD
100%	0.5 hours	9.5 kWh	9.5 kWh
75%	1.5 hours	28.5 kWh	21.4 kWh
50%	5.0 hours	95 kWh	47.5 kWh
25%	3.0 hours	57 kWh	14.3 kWh
0%	14.0 hours	456 kWh	0.0 kWh
daily total	**24.0 hours**	**456 kWh**	**92.7 kWh**

saves energy



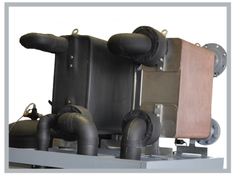
dryer model	consumption/year
CPD	33,836 kW
direct expansion	166,440 kW
energy savings	132,604 kW (79.7%)

note: in many factories, the dryers are used 8 hours/day but they continue to run 24/7. As a result, the difference in electrical consumption between nano's CPD and direct expansion dryers is dramatic

zero air loss condensate drains save you energy by saving valuable compressed air

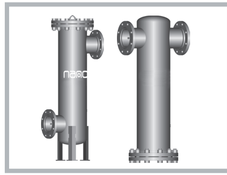
user friendly PLC controls with HMI interface in a UL certified panel

cycling dryer can provide up to 80% energy savings vs a traditional direct expansion dryer



water cooled condenser top mounted for ease of service

robust tube and shell heat exchanger provides consistent dew point, long service life and low pressure drop (models CPD 10000 - 30000)



performance validated F² filtration provides additional energy savings and improved air quality