

Nirvana

Cycling Refrigerated Dryers



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Ingersoll Rand's Nirvana Cycling Refrigerated Dryer provides reliability like no other dryer in its class: reliability that you can count on to protect your air system day in and day out; reliability built in by design.



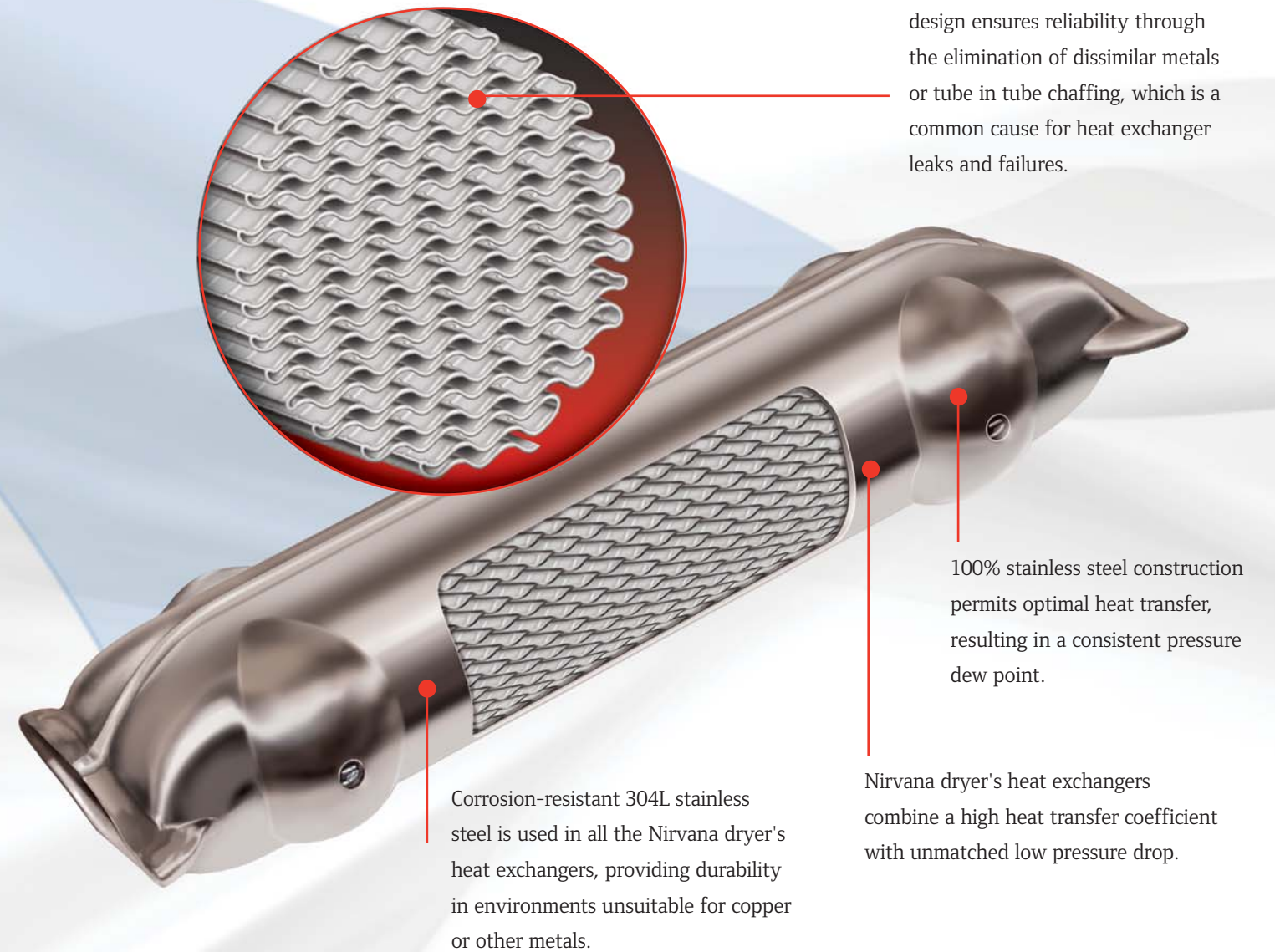
The Nirvana is a genuine cycling dryer, incorporating innovative features that make it not only the most reliable, but the most energy efficient, dryer in its class.

The key element central to the Nirvana's reliability and energy efficiency is its distinct, patented heat exchanger design. Providing high heat transfer with low pressure drop because of uniquely short flow length, the Nirvana heat exchanger presents a flow area three to five times that of an equivalent copper tubing exchanger, and it is self-cleaning, which greatly reduces the potential for fouling.

Reliability Is Our Design

High Heat Transfer at Work

The superior performance of the Nirvana dryer can be attributed to the effective heat transfer capabilities of the exchanger design, utilized throughout the package for each stage of heat removal. The dryer design includes a pre-cooling system with stainless steel heat exchangers to properly condition the air for drying. A re-heater section of the dryer's air side also uses these high performance heat exchangers to prepare the dried compressed air for re-entry into the air system. This prevents pipe sweating and readies the compressed air for use in process applications.



An innovative corrugated and folded stainless steel panel is stacked inside two stainless steel shells, then welded together to form a unitized heat exchanger. This design ensures reliability through the elimination of dissimilar metals or tube in tube chaffing, which is a common cause for heat exchanger leaks and failures.

Corrosion-resistant 304L stainless steel is used in all the Nirvana dryer's heat exchangers, providing durability in environments unsuitable for copper or other metals.

100% stainless steel construction permits optimal heat transfer, resulting in a consistent pressure dew point.

Nirvana dryer's heat exchangers combine a high heat transfer coefficient with unmatched low pressure drop.

Energy-Efficient Design

Nirvana

An advanced cycling dryer, the Nirvana provides significant savings because it does not waste energy costs through continuous operation of its refrigeration system, as do traditional non-cycling dryers. Each component of the Nirvana has been designed to provide not only durability, but maximum energy efficiency. This combination of system design and individual component design adds up to the most energy efficient cycling refrigerated dryer available.



Factors contributing to the Nirvana's energy efficiency:

- Design includes a refrigeration system combined with a thermal mass that efficiently stores cold energy.
- Refrigeration compressor cycles off during periods of reduced load, while dryer continues to remove moisture and contaminants from the compressed air.
- Unique centrifugal separator design provides effective moisture separation maintaining consistent dew point, regardless of partial load operation.

Electronic No Air Loss (ENL) Drain

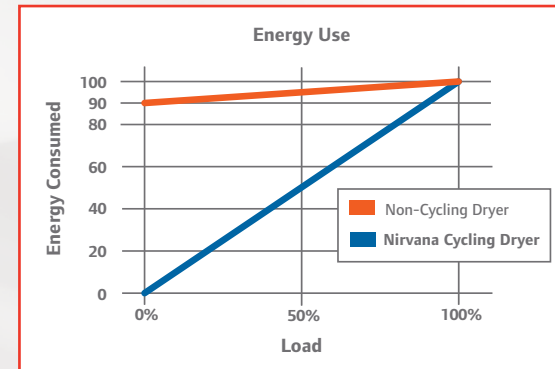
Nirvana cycling dryers up to 2,400 SCFM are equipped with ENL condensate drains, which eliminate venting of compressed air to the atmosphere and are more reliable than traditional float- or solenoid-type drains.



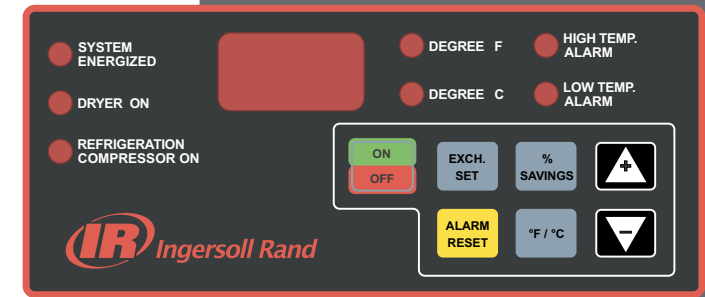
ENL Drain

Best in Class Design

The Nirvana cycling dryer uses centrifugal separation to remove moisture from the chilled air. Separation occurs at the coldest point in the system by means of centrifugal acceleration, then expands into an area of low velocity containing a sump, and change of air flow direction. The result is highly-efficient moisture removal, providing exceptionally dry, clean air under all operating conditions.



Nirvana cycling dryers are highly efficient, providing dry, clean air under any operating conditions.



Microprocessor LED Controller up to NVC800 features a NEMA 1 package protection standard with an optional NEMA 4 rating.

Microprocessor Controller

The easy-to-use controller automatically manages dryer operation for optimum air treatment and for maximum energy efficiency.

- Simple and easily read interface with LED indication
- Digital display of chiller temperature available at a glance to ensure optimal dryer performance
- Percent of energy savings available at the touch of a button
- Automatic dryer restart in the event of a sudden loss of power
- Adjustable chiller temperature set point to further reduce energy expense
- Microprocessor control constantly monitors dryer functions including thermal mass temperature and provide alarms to minimize dryer downtime

Large Capacity from 3,200 to 8,000 SCFM

*Modular design for exceptional reliability
and energy efficiency*

Nirvana large capacity cycling refrigerated compressed air dryers consist of multiple, independent air treatment modules, each with its own controls and refrigeration system, sharing a central thermal mass cold storage medium. Compressed air is cooled as it passes through the large capacity Nirvana dryer, causing moisture and contaminants to condense so they can be removed from the air in multiple high-efficiency centrifugal separators.

The moisture and contaminants are then automatically discharged from the system through pneumatic no air loss condensate drains to eliminate wasting valuable compressed air.

Clean, dry compressed air is warmed as it exits the dryer to prevent pipe sweating and to condition it for application. The refrigeration system in each module automatically cycles as needed to maintain cold stored energy, while active circulation of the thermal mass cold storage media contributes to the dryer's overall efficiency.



Water-cooled Large Capacity Dryer

Expandable Large Capacity Dryers feature a modular design and individual controllers that provide redundancy for models starting at 3,250 SCFM.

Redundant Design for Reliability

The multiple air treatment modules of each Nirvana large capacity dryer are integrated to make a single dryer with air treatment capacities from 3,250 to 8,000 SCFM. (Larger dryer sizes upon request.) Modules share a single inlet header and a single outlet header, each with dual connection capability for installation versatility. Each module includes 304L stainless steel heat exchangers and a high-efficiency centrifugal separator.

Because Nirvana large capacity dryers employ a shared, continuously-circulating thermal mass cold storage medium and integrated drying modules with individual electrical disconnects, the dryer can continue to operate and provide compressed air treatment even if a module must be isolated for maintenance or repair.

Dryer operation is coordinated through digital controls, fully adjustable to meet application requirements. The operation of individual modules can also be adjusted to make optimum use of the benefits associated with cycling refrigeration systems.

Large Capacity Nirvana Cycling Refrigerated Dryers are also available in an air-cooled design.



Controller for NVC1000 and larger

Microprocessor Controller

- Backlit LCD with integrated keypad allows viewing of dryer parameters regardless of environmental lighting
- MODBUS compatible via RS232/485-remote communication - ready connection port
- Remote alarm contact available and remote start/stop ready
- Advanced diagnostic memory with failure code storage
- Percentage of energy savings available at the touch of a button

How They Work

Submerged Evaporator Thermal Mass

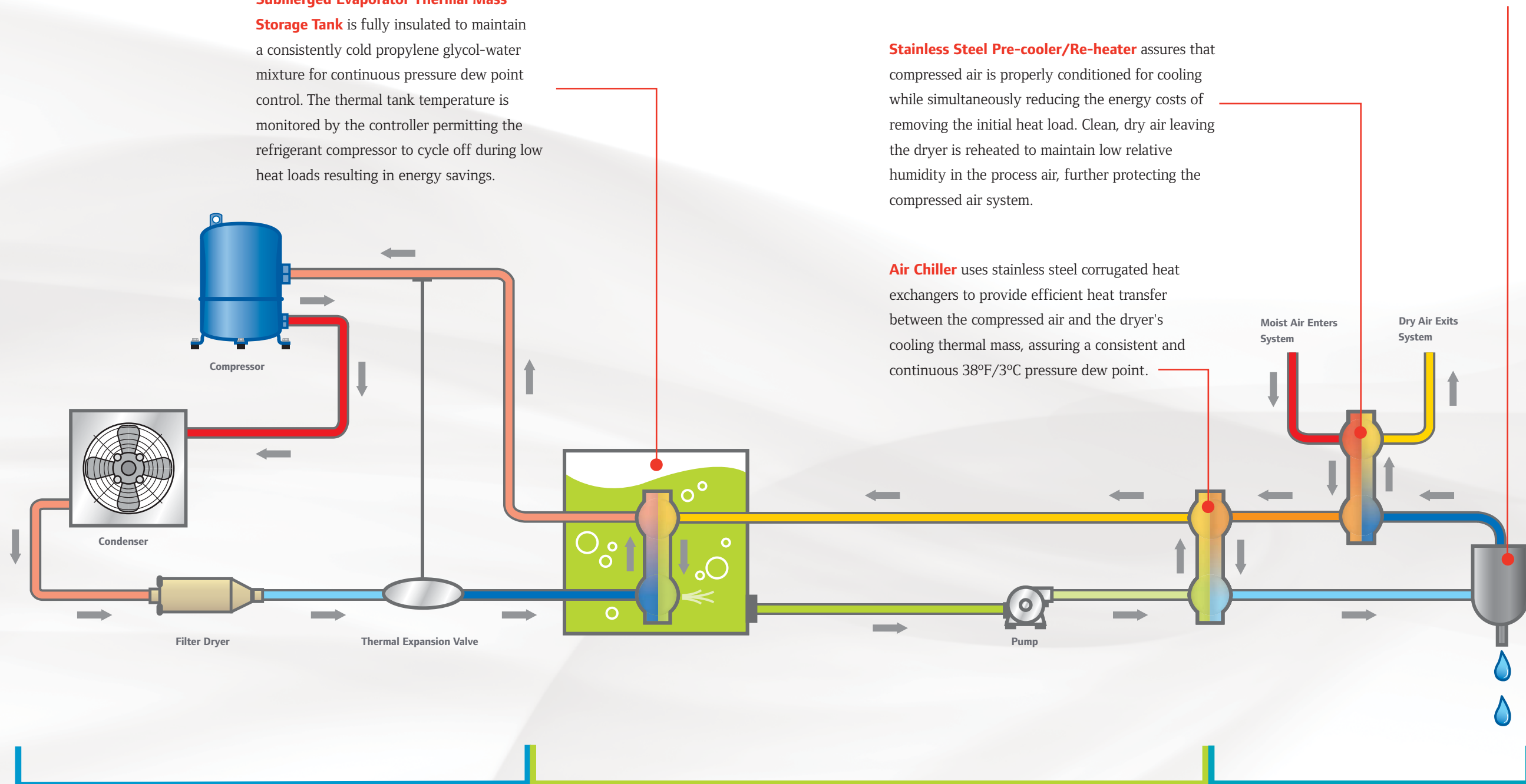
Storage Tank is fully insulated to maintain a consistently cold propylene glycol-water mixture for continuous pressure dew point control. The thermal tank temperature is monitored by the controller permitting the refrigerant compressor to cycle off during low heat loads resulting in energy savings.

Stainless Steel Pre-cooler/Re-heater assures that compressed air is properly conditioned for cooling while simultaneously reducing the energy costs of removing the initial heat load. Clean, dry air leaving the dryer is reheated to maintain low relative humidity in the process air, further protecting the compressed air system.

Air Chiller uses stainless steel corrugated heat exchangers to provide efficient heat transfer between the compressed air and the dryer's cooling thermal mass, assuring a consistent and continuous 38°F/3°C pressure dew point.

Centrifugal Air/Moisture Separator

efficiently and effectively removes moisture for all applications even under partial load conditions.



Refrigeration System employs a reliable, time-proven hermetic reciprocating compressor.

Thermal Mass Cooling System circulates the thermal mass fluid to provide a continuous cold medium for heat transfer.

Compressed Air Side System pre-cools the inlet air, chills the air to 38°F/3°C, removes moisture through the centrifugal separator and is re-heated for process use.

Global Reach

Unsurpassed Local Customer Support

Ingersoll Rand provides its products and services directly or through distributors to customers in close to 200 countries. We focus on providing innovation to increase your productivity and profitability. Expect more with Ingersoll Rand. We are your total solutions provider.

Long-term Value

There is more to value than simply price. The commitment of many thousands of dedicated compressed air specialists, either directly employed or members of a select market channel partnership, mean that friendly Ingersoll Rand support is close at hand. In addition to parts availability, qualified on-site service is available globally.



Preventative Maintenance and Warranty

Factory training and certified Ingersoll Rand technicians can protect your investment by providing high-quality preventative maintenance. In addition, we can offer a comprehensive seven-year parts and labor warranty.



Replacement Parts Made Easy

Ensure that you have all the right parts on hand with our simplified ordering. Ingersoll Rand's reputation for dryer parts availability is second to none.



The best overall value is getting the most out of your investment. Ingersoll Rand customer support teams will help you protect your investment.

Specifications

Model	Air Capacity		Operating kW		Dimensions (in/mm)			Approx. Ship Wt. (lbs /kg)	Air In/Out (in)
	(SCFM 38°F/3°C m3/min)	Pressure Drop (psig/barg)	Air Cooled	Water Cooled	W	D	H		
NVC200	200/5.7	1.6/0.11	1.66	1.06	28/711	33/838	58/1473	620/282	1.5 NPT
NVC300	300/8.5	2.1/0.14	2.54	1.65	28/711	33/838	58/1473	735/334	2 NPT
NVC400	400/11.3	2.9/0.20	3.24	2.19	28/711	33/838	58/1473	745/339	2 NPT
NVC500	500/14.1	2.9/0.20	4.65	4.28	42/1067	40/1016	62/1575	1250/570	3 NPT
NVC600	600/17.0	3.0/0.21	4.82	3.14	42/1067	40/1016	62/1575	1275/580	3 NPT
NVC700	700/19.8	2.7/0.19	5.79	3.58	42/1067	40/1016	62/1575	1320/600	3 NPT
NVC800	800/22.7	2.9/0.20	6.50	4.16	42/1067	40/1016	62/1575	1415/643	3 NPT
NVC1000	1000/28.3	2.4/0.17	7.03	4.48	32/813	76/1930	69/1753	2315/1052	4 FLG
NVC1200	1200/34.0	3.1/0.21	8.72	5.48	32/813	76/1930	69/1753	2435/1107	4 FLG
NVC1600	1600/45.3	3.3/0.23	11.48	7.34	32/813	76/1930	69/1753	2785/1266	4 FLG
NVC2000	2000/56.7	3.5/0.24	13.18	9.09	34/864	91/2311	91/2311	4070/1850	6 FLG
NVC2400	2400/68.0	3.5/0.24	14.29	9.59	34/864	91/2311	91/2311	4150/1886	6 FLG
NVC3250	3250/92.1	3.0/0.21	18.03	14.77	75/1905	96/2438	100/2540	6330/2877	8 FLG
NVC4000	4000/113.3	3.0/0.21	21.77	15.26	75/1905	100/2540	96/2438	7060/3029	8 FLG
NVC4800	4800/136.0	3.0/0.21	28.72	19.32	75/1905	100/2540	96/2438	7200/3273	8 FLG
NVC6000	6000/170.0	3.0/0.21	32.65	22.89	110/2794	98/2489	101/2565	9870/4486	10 FLG
NVC8000	8000/226.6	3.0/0.21	43.54	30.52	143/3632	99/2515	102/2591	12575/5716	12 FLG

Performance data presented in accordance with CAGI standard ADF 100 under 100°F inlet temperature, 100°F ambient temperature and 100 psig conditions.
 Maximum working pressure: NVC200 - 800, 230 psig; NVC1000 - 8000 SCFM, 220 psig.
 Weights and dimension shown for NVC200-2400 air-cooled, NVC3250 and larger in water-cooled.
 Average kilowatts per hour of dryer operation at full rated capacity.
 Standard NVC200-800 SCFM models ETL-certified, 1000-2400 models UL 508 panels.
 Available voltages 460-3-60, 575-3-60, 380-3-50. NVC200-400 available in 230-3-60 and 220-3-50. NVC200 available in 230-1-60.
 Pressure drop ± 0.5 psig.

Correction Factors

	Inlet Air Temperature	Correction Factor	Inlet Air Pressure	Correction Factor	Ambient Air Temperature	Correction Factor
Dryer Selection Example:	80°F	1.64	75 psig	0.91	80°F	1.25
	90°F	1.27	100 psig	1.00	90°F	1.12
500 SCFM	100°F	1.00	→ 125 psig	1.08	→ 100°F	1.00
110°F inlet	→ 110°F	0.81	150 psig	1.16	110°F	0.86
125 psig			225 psig	1.22	120°F	0.77
100°F ambient	120°F	0.66				
Calculation:	Dryer Size = 500 / (0.81 x 1.08 x 1.00) = 572 SCFM = NVC600					



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