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.

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.

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

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.

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.

Reliability Is Our Design

High Heat Transfer at Work

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

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.
Energy-Efficient Design

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.

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.

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.

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

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.

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.

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

Nirvana Refrigerated Dryer
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.

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.

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.

Centrifugal Air/Moisture Separator efficiently and effectively removes moisture for all applications even under partial load conditions.

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

<table>
<thead>
<tr>
<th>Model</th>
<th>Air Capacity (SCFM 38°F/3°C m3/min)</th>
<th>Pressure Drop (psig/bar)</th>
<th>Operating kW</th>
<th>Dimensions (in/mm)</th>
<th>Approx. Ship Wt. (lbs/kg)</th>
<th>Air In/Out (in)</th>
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<tbody>
<tr>
<td>NVC200</td>
<td>200/5.7</td>
<td>1.6/0.11</td>
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Correction Factors

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<tr>
<th>Inlet Air Temperature</th>
<th>Correction Factor</th>
<th>Inlet Air Pressure</th>
<th>Correction Factor</th>
<th>Ambient Temperature</th>
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<td>110°F</td>
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<td>225 psig</td>
<td>1.22</td>
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Inlet Correction

- Air Pressure Factor
  - 75 psig: 0.91
  - 100 psig: 1.00
  - 125 psig: 1.08
  - 150 psig: 1.16
  - 225 psig: 1.22

Inlet Correction

- Air Temperature Factor
  - 80ºF: 1.64
  - 90ºF: 1.27
  - 100ºF: 1.00
  - 110ºF: 0.81
  - 120ºF: 0.66

Ambient Correction

- Air Temperature Factor
  - 80ºF: 1.25
  - 90ºF: 1.12
  - 100ºF: 1.00
  - 110ºF: 0.86
  - 120ºF: 0.77

Performance data presented in accordance with CAGI standard ASG 100 under 100°F inlet temperature, 100°F ambient temperature and 100 psig conditions.

Maximum working pressure: NVC200 - 800, 230 psig; NVC300 - 800 SCFM, 220 psig.

Weights and dimensions shown for NVC200-400 air-cooled, NVC250 and larger in water-cooled.

Average kilowatts per hour of dryer operation at full rated capacity.

Standard NVC200-400 SCFM models CTS-certified, 1000-2400 models UL, cUL, listed, and many models, including NVC200-400, feature automatic pressure control and air-flow compensation.

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.
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