Compressed air treatment Refrigerated Air Dryer with Cold Coalescing Filter 2in1
The new **MDR Energy** dryer incorporates many technological and performance **firsts**. It combines unmatched air purification efficiency with maximum oil removal through cold coalescing as a standard feature, enhancing dewpoint performance.

All this along with increased durability and reliability and the total elimination of corrosion of the heat exchangers. Additional features such as ease of access for maintenance, extremely small footprint, and environment friendly refrigerants make this an unbeatable investment at a very competitive price.

*How it Works*

All **MDR Energy** dryer/purification systems cool the compressed air in **two stages**, resulting in a dew point of 33-38°F at which point the liquid condensate is efficiently removed.

In the first stage, a highly efficient, 100% copper recuperator (**air/air heat exchanger**) creates a heat transfer between the hot compressed air entering the dryer at up to 100°F and the treated compressed air leaving the dryer at 33-38°F, equalizing both airstreams at approximately 70°F.

The incoming pre-cooled compressed air then flows to the evaporator (**air/refrigerant exchanger**), where a refrigeration circuit completes the cooling process. The air temperature is further reduced between 33-38°F. A hot gas by pass valve precisely modulates the dryer to avoid the risk of freezing the condensate, even down at very low air flows.

Finally, a high efficiency **cold coalescing filter**, positioned at the point of the lowest air temperature (the point at which maximum condensation has occurred), removes 99.9999% of all water and oil condensate down to 0.001 ppmw, as well as all dirt contamination down to 0.01 micron (see facing page for details.)

A fully automatic **electronic drain with adjustable timer** removes all liquid condensate from the system.

**Quality** of compressed air exceeds ISO 8573-class 1.4.1 Specifications:
- Dew point = 38°F
- Oil residual = 0.001 ppmw
- Particulates residual = 0.01 micron

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Internal Cold Coalescing filter: the heart of energy savings and efficient oil removal.

FACT: the formation of condensate in a dryer depends solely on the reduction of the compressed air temperature.

Only at the point of lowest air temperature in the dryer (33-38°F) is the largest quantity of liquid condensate formed.

This condensate is in the form of droplets of various sizes, from large ones down to microscopic sizes.

Out of the total condensate, approximately 30% are drops so small that they are called aerosols. According to ISO 8573, these aerosols are so small and of irrelevant mass that they have a dropping speed lower or equal to 1 fps, and therefore remain airborne in the airstream. It is for this reason that they cannot be removed by the traditional methods of condensate separation, (demister pad centrifugal or inertial impaction) most commonly used by most drying systems sold today. These inexpensive solutions to condensate separation are totally inefficient and actually get worse as the air flow velocities drop further during reduced air system demands!

If these aerosols are not removed by a more efficient method and at the point of lowest air temperature, they will be re-entrained in the outgoing, reheated air as it passes through the air-to-air heat exchanger, where the ability of the air to hold these aerosols increases.

It is impossible to remove these contaminates with a coalescing filter at the outlet of the dryer, the most common but totally inefficient method of oil and water removal.

The graph on the right shows the efficiency of condensate separation with different types of separation systems commonly used in dryers today. All methods have a high efficiency rating in the area of large condensate mass, which represents only about 70% of the total condensate.

Notice however that in the area of aerosols, only the MDR Energy high efficiency coalescing filter maintains its performance. All other systems have inadequate separation efficiencies.

Lowest cost: Calculate the expense of a conventional dryer with the additional cost of a coalescing after-filter, increased piping and higher pressure drop compared with the value of the MDR dryer with the internal cold coalescing filter, installed at the coldest point where oil removal is maximized several folds, resulting in technically oil-free air downstream.

The savings and performance are significant.

Only MDR Energy dryers employ high quality coalescing filters with borosilicate microfibers and highest efficiency ratings. It is not sufficient to use just any filter for this application. The quality and the efficiency of design and quality of materials used make a very significant difference in overall performance and insure quality air purification.
ANALOG CONTROLLER
- System flowchart
- Filter element change out Indicator
- System Power On Indicator
- Electronic drain functions

ENERGY CONTROLLER
All the functions of the analog panel, plus:
- Digital readout of all-important system parameters
- Monitors dryer operation and provides critical operating data such as: Energy Savings Mode, Filter Change Out Requirement, High and Low Refrigerant Pressure, High Air Inlet Temperature, System Overload and Low Oil Pressure.
- Provides for Remote Start/Stop with indication of the dryer status

The energy consumption of the MDR dryer is well below that of conventional dryers, as the coalescing filter is directly connected to the heat exchanger. Traditional piping and connections which increase pressure losses are eliminated. The savings are as high as 26% of total energy used.

Latest heat exchanger technology has resulted in a compact design with a 100% copper air-to-air heat exchanger and evaporator assembled as a monobloc. This offers a better thermal transfer efficiency and total resistance to corrosion.

Access to cold coalescing filter change-out through side panel opening. Less maintenance costs.

Vertical design results in a footprint of 50% or smaller, allowing for better space utilization and lower installation cost.

The MDR dryer uses only EPA approved refrigerant gases, R22, R134a and R404. Electronic leak detection during production guarantees zero leaks.

Hot gas bypass and Thermal expansion valves insure a balanced refrigeration system under all loads, resulting in constant low dew points while protecting the system from freeze-ups.

Technology which Simplifies

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity scfm</th>
<th>Conn. NPT/Flanged</th>
<th>Weight LBS</th>
<th>Dimensions L x W x H</th>
<th>Power Consumption Watts</th>
<th>Voltage</th>
<th>Condenser</th>
<th>Controller</th>
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<td>79</td>
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1. Design inlet temperature: 100°F • Max. inlet temperature: 120°F • Design ambient temperature: 100°F • Max. ambient temperature: 110°F
Do not exceed maximum values. Dryer capacity should be corrected if operating conditions are different than rated.
2. Water-cooled models: water flow requirement for all water cooled units = 2.2 gal/min for each 400 cfm of compressed airflow. See specifications sheet or check website for exact details.
3. Design inlet pressure of 100 psig • Max. inlet pressure = 180 psig

High pressure dryers available to 600 psig. Contact NewGate Technologies, Inc.

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