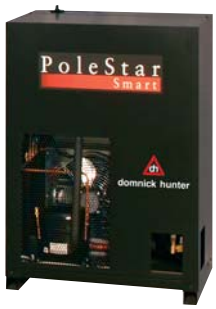

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PoleStar Smart®

Refrigeration Air Dryers

Parker

domnick hunter

ENGINEERING YOUR SUCCESS.

PoleStar Smart®

Refrigeration Air Dryers

The importance of compressed air as a provider of energy for modern industrial processes is widely known. What is often overlooked however is the need to provide quality treatment for this air.

In fact, the air entering the system contains condensate which, when cooled, will turn into liquid water, causing extensive damage not only to the compressed air network, but also to the finished product.

PoleStar Smart® refrigeration dryers actively remove this condensate to achieve extremely dry compressed air.

Our SmartPack heat exchanger offers minimal pressure drops and class leading performance, and significantly increases the efficiency of the whole compressed air treatment process. The innovative SmartControl function automatically and continuously adjusts dryer operation to the effective working conditions, minimizing operating costs and maximizing performances.

Compressed air purification equipment must deliver uncompromising performance and reliability while providing the right balance of air quality with the lowest cost of operation. Many manufacturers offer products for the filtration and purification of contaminated compressed air, which are often selected only upon their initial purchase cost, with little or no regard for the air quality they provide, the cost of operation throughout their life or their environmental impact. When purchasing purification equipment, delivered air quality, the overall cost of ownership and the equipment's environmental impact must always be considered.

The Parker domnick hunter Design Philosophy

Parker domnick hunter has been supplying industry with high efficiency filtration and purification products since 1963. Our philosophy 'Designed for Air Quality & Energy Efficiency' ensures products that not only provide the user with clean, high quality compressed air, but also with low lifetime costs and reduced CO_2 emissions.

Benefits:

- **Optimum dewpoint levels for highest system performance**
- **Advanced patented design solutions**
- **Environmental, lowest real operating costs**
- **High reliability, easy to use and maintain**
- **Unique 4-in-1 SmartPack heat exchanger**
- **Integral drain**
- **Extremely low pressure drop design**
- **SmartControl energy saving function**
- **Excellent dewpoint performances**
- **Advanced compliant scroll compressor**

What is refrigeration drying?

The use of refrigeration drying for compressed air treatment is tested and proven for many industrial applications. Dewpoints of 35˚F (1.7˚C) to 50˚F (10˚C) are suitable for many indoor applications where a general removal of bulk water and some vapor is sufficient for the end user's process.

Refrigeration dryers can be used at low pressures as well as high pressures and use no processed compressed air during the air treatment. Proper sizing factors must be used to determine the correct sized dryer for the application based on actual (or "worst case") flow, operating temperature and operating pressure.

Energy prices are a rising concern and a major cost to manufacturing facilities. Therefore, the refrigeration dryer has undergone many improvements to make them more energy efficient without sacrificing the quality of the air provided.

Refrigeration dryers use a set of heat exchangers or a single heat exchanger (with chambers) first to pre-cool the air; second, to refrigerate the air to condense out moisture vapor; and last, to re-heat the air to prevent pipe sweating downstream. Direct Expansion dryers are a type of dryer where the compressed air and the refrigerant come into direct contact via the heat exchanger. While reliable and simple to use, they generally require that the unit continue to run regardless of actual compressed air flow through the dryer. Cycling dryers utilize a thermal mass as the means to absorb the heat from the compressed air. By chilling a thermal mass, a refrigerant compressor may turn off in times of low demand thereby saving energy by shutting off the refrigerant compressor. There is, however, an additional heat transfer (the thermal mass), so a small amount of additional cost may or may not offset the amount of money saved by shutting off the compressor.

The use of refrigeration dryers is preferred:

- in the capacity range of 5 scfm to 15000 scfm
- inlet temperatures to 120˚F (48.9˚C)
- wide ranges of operating pressures
- indoor applications
- system with fluctuating conditions and demand

Energy efficient and environmentally sound

PoleStar Smart® is designed not only to minimize the use of compressed air and electricity in their operation, but also to significantly reduce the operational costs of the compressor by minimizing pressure loss.

Minimal direct energy costs

The SmartSave control automatically and precisely adjusts energy consumption in response to actual operating conditions (air variability and seasonal changes), avoiding unnecessary waste. SmartControl controls the dryer operation via multiple sensors guaranteeing maximum savings and avoiding dewpoint surges. SmartPack's all-in-one design and thermal insulation further enhance the overall energy-savings.

Lowest full-load power consumption

The most energy efficient air dryer on the market, under all operating conditions. PoleStar Smart® leads the market with the lowest full-load power consumption due to its oversized heat exchanger, compliant scroll compressors, R407C environmentally friendly refrigerant and direct operation, avoiding the increased energy consumption of thermal mass-type dryers. PoleStar Smart® consumes less energy at full load and saves more energy at partial loads. Electrical consumption usually accounts for around 50% of the air dryer's total cost over a five-year period.

Reduced indirect costs

Electricity required by the compressor to compensate for pressure drops in the air dryer accounts for around 25% of its total cost over 5 years. PoleStar Smart® offers average pressure drops which are about one half those of conventional systems.
The air compressor requires additional energy to offset the drop in compressed air pressure caused by traditional condensate drains. SmartDrain, standard in the DRD models, automatically adjusts its drainage pattern to avoid compressed air loss thereby saving energy.

Lowest Differential Pressure

PoleStar Smart® dryers have an average of 2.0 psid versus the industry average of 5.0 psid.

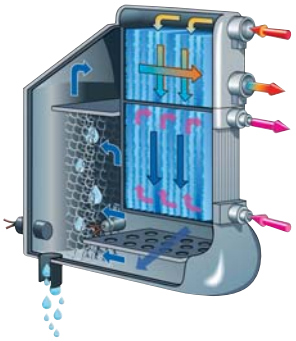
Example: 500 scfm dryer operating 8760 hours per year

Cost of Power	**Savings Realized**
$0.05 per KW =	$546 per year
$0.10 per KW =	$1091 per year
$0.15 per KW =	$1638 per year

Reduced CO_2 Emissions

Many countries worldwide are looking closely at their manufacturing industries in an effort to reduce the amount of harmful greenhouse gases released into the atmosphere. The use of electricity has a direct impact on the generation and release of CO_2. By significantly reducing the energy consumption of its products, Parker domnick hunter can help you reduce your carbon footprint and protect the environment.

Smart technology: the benefits



SmartPack Heat Exchanger provides less than 2 psi pressure drop

The SmartPack (patent pending) heat exchanger features an extremely robust, all-in-one aluminum design, with no interconnecting tubing.
The geometry of the heat exchanger has been designed in order to optimize its performances. In particular, large volumes allow low air velocity through the heat exchanger section, resulting in high exchange efficiency and low pressure drops. Pressure drops are further improved thanks to the absence of interconnecting pipes through the different sections of the heat exchanger and to a straight forward path of the compressed air flow with smooth and minimum changes of flow directions.

Smart BMS Interface

Simple BMS interface includes:

- RS485 serial card provides direct communication to Modbus. Requires no gateway or A.N.I.
- Provides visualization of dewpoint, alarm conditions and service indication.
- Provides remote control of the dryer including on/off and alarm reset (depending on actual alarm)

SmartDrain - Dual Mode Zero Air Loss Drain

The drainage chamber is integrated into the heat exchanger while the valve mechanism is fitted in an easily accessible drain niche. The SmartDrain continuously adjusts itself to the actual working conditions, ensuring zero air loss and a notable reduction in system power consumption.
An innovative control system continuously monitors for fault situations. If a fault does occur, an alarm is signaled and the drain switches to conventional timed solenoid drain operation. The dual mode circuitry ensures maximum reliability.

Smart Control with SmartSave Cycling

The multifunction SmartControl provides a versatile platform for user interface and SmartSave Cycling (if enabled). The innovative SmartSave (patent pending) Cycling Control continuously monitors the demand placed on the dryer. At conditions of low demand the refrigerant compressor is cycled off to save energy. A sophisticated algorithm continuously adapts the operation of the dryer for optimum energy efficiency while minimizing the dewpoint spikes common to traditional thermal mass dryers.

Compliant Scroll Compressors

PoleStar Smart® features Compliant Scroll compressors, offering energy savings of 20 -30% when compared with piston compressors. The ability to tolerate liquid returns coupled with 50% less moving parts render them nearly indestructible and highly reliable. Low vibration levels increase overall refrigeration circuit longevity.

OIL-X EVOLUTION, add to your savings

Any restriction to airflow within a filter housing and element will reduce the system pressure. To generate compressed air, large amounts of electrical energy are consumed, therefore any pressure lost within the system can be directly converted into a cost for wasted energy. The higher the pressure loss, the higher the energy costs. In order to build upon the low pressure drop of PoleStar Smart®, not just any compressed air filter will do.

Providing an optimal flow path for the compressed air through the filter housing and element is key to reducing system operating costs.

Pressure loss in a compressed air filter is a combination of fixed pressure losses and incremental pressure losses.

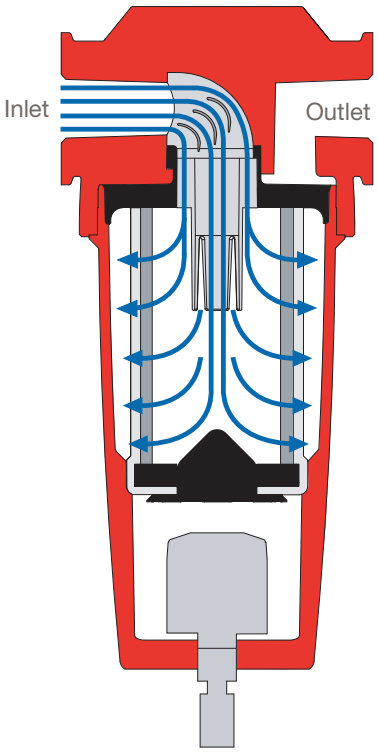
Fixed pressure losses are derived from the filter housing and the interface between the filter housing and filter element.

Incremental pressure losses are directly related to the filter element as it blocks up with contamination.

In most filters, high operational costs can be attributed to a poorly designed airflow path within the filter housing element and poorly selected filtration media.

In addition to this, the high differential pressure "change points" recommended by many filter manufacturers increase operational costs even further.

OIL-X EVOLUTION die-cast filters optimized flow path from patented Aerospace Flow Management System



"Bell mouth" housing inlet & full flow inlet conduit

Smooth 90° elbow & aerospace turning vanes

Flow distributor

Conical flow diffuser

Deep bed pleating

Deep bed pleating reduces the air flow velocity within the filtration media. This both improves filtration performance of the filter element and also reduces pressure losses.

Specialist media treatment

All OIL-X EVOLUTION coalescing and dust removal filter media includes a specialist treatment. This actively repels oil and water to ensure that coalesced liquid does not reduce the voids volume. Maintaining a high voids volume reduces the risk of premature blockage, system pressure losses and high energy consumption.

Technical specifications

DRD265 - DRD6000 capacities are based upon:

Ambient temperature:	100°F (38°C)
Inlet temperature:	100°F (38°C)
Inlet pressure:	100 psi g (7 bar g)

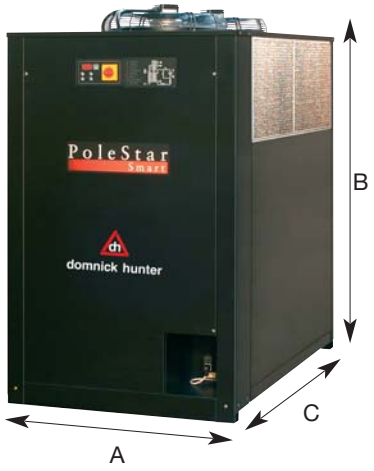
For flow rates at other conditions, please contact Parker domnick hunter for correct sizing.

Model	Air Connections	Nominal Capacity	Dimension ins (mm)			Weight		Primary Voltages	Recommended Filtration
			A	B	C	lbs	kg		
DRD265	2” NPT - F	265	28 (711)	42 (1067)	41 (1041)	320	145	230V/3Ph/60Hz & 460V/3Ph/60Hz	-035GNFI
DRD325	2” NPT - F	325	28 (711)	42 (1067)	41 (1041)	320	145	230V/3Ph/60Hz & 460V/3Ph/60Hz	-035GNFI
DRD400	2" NPT - F	400	28 (711)	42 (1067)	41 (1041)	320	145	230V/3Ph/60Hz & 460V/3Ph/60Hz	-040HNFI
DRD500	2" NPT - F	500	28 (711)	42 (1067)	41 (1041)	342	155	230V/3Ph/60Hz & 460V/3Ph/60Hz	-045HNFI
DRD700	3" NPT - M	700	32 (813)	52 (1321)	46 (1168)	529	240	230V/3Ph/60Hz & 460V/3Ph/60Hz	-050JNFI
DRD800	3” NPT - M	800	32 (813)	52 (1321)	46 (1168)	529	240	230V/3Ph/60Hz & 460V/3Ph/60Hz	-050JNFI
DRD1000	3” NPT - M	1000	32 (813)	52 (1321)	46 (1168)	551	250	460V/3Ph/60Hz	-055JNFI
DRD1200	3” NPT - M	1200	40 (1016)	67 (1702)	43 (1092)	816	370	460V/3Ph/60Hz	-055JNFI
DRD1600	4” Flg	1600	40 (1016)	68 (1727)	71 (1803)	1279	580	460V/3Ph/60Hz	-2250ODFI
DRD2000	6” Flg	2000	40 (1016)	68 (1727)	71 (1803)	1477	670	460V/3Ph/60Hz	-2250ODFI
DRD2400	6” Flg	2400	40 (1016)	68 (1727)	71 (1803)	1521	690	460V/3Ph/60Hz	-2300ODFI
DRD3000	6” Flg	3000	40 (1016)	81 (2057)	71 (1803)	1609	730	460V/3Ph/60Hz	-2350PDFI
DRD3800	6” Flg	3800	40 (1016)	81 (2057)	71 (1803)	1830	818	460V/3Ph/60Hz	-2350PDFI
DRD5000	8” Flg	5000	40 (1016)	87 (2210)	89 (2261)	2425	1100	460V/3Ph/60Hz	-2400QDFI
DRD6000	8” Flg	6000	40 (1016)	87 (2210)	89 (2261)	2624	1190	460V/3Ph/60Hz	-2400QDFI

575V/3Ph/60Hz available upon request, please contact factory.

Technical data

Maximum ambient temperature:	122°F (50°C)
Maximum inlet temperature:	140°F (60°C)
Minimum ambient temperature:	41°F (5°C)
Maximum Pressure:	203 psi g (14 bar g)
Refrigerant:	R407C



Flow correction factors

To obtain dryer capacity at new conditions, multiply nominal capacity x C1 x C2 x C3

Ambient Temperature (C1)

°F	90	100	110	120	122
°C	32	38	43	49	50
Correction Factor	1.05	1.00	0.94	0.79	0.71

Inlet Temperature (C2)

°F	90	100	110	120	130	140
°C	32	38	43	49	54	60
Correction Factor	1.22	1.00	0.82	0.68	0.56	0.46

Inlet Pressure (C3)

Pressure psi g	50	80	100	125	150	174	203
Pressure bar g	3	6	7	9	10	12	14
Correction Factor	0.77	0.93	1.00	1.07	1.12	1.15	1.18

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