

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 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 10 SCFM (17 Nm³/hr) to 2,400 SCFM (4078 Nm³/hr)
- Inlet temperatures to 120°F (48.9°C)
- Wide ranges of operating pressures
- Indoor applications
- System with fluctuating conditions and demand



PRD10 - PRD250

- “Plug & play” design for easy installation and operation (PRD10 - PRD125)
- Small space saving design
- Oversized demister separator resulting in excellent liquid removal over all operating conditions
- Low pressure differential across the dryer (1.45 PSIG average)
- Oversized condenser to operate in ambients to 122°F (50°C)
- All models incorporate a dewpoint indicator

PRD325 - PRD2400

- Optimum dewpoint levels for highest system performance
- Advanced patented design solutions
- 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

PRD Series

Nominal Flow				Recommended filtration			
SCFM	Nm³/hr	Primary voltage	Part number	Pipe size	Bulk separator	Pre-filter (5µ particulate)	Post-filter (.01µ coalescing)
10	17	115V /1ph/60Hz	PRD10-115160	1/2" NPT-F	P3TFA94WCAN	P32FA94ESAN	P32FA94DSAN
15	26	115V/1ph/60Hz	PRD15-115160	1/2" NPT-F	P3TFA94WCAN	P32FA94ESAN	P32FA94DSAN
25	43	115V/1ph/60Hz	PRD25-115160	1/2" NPT-F	P3TFA94WCAN	P32FA94ESAN	P32FA94DSAN
35	60	115V/1ph/60Hz	PRD35-115160	1/2" NPT-F	P3TFA94WCAN	P32FA94ESAN	P32FA94DSAN
50	85	115V/1ph/60Hz	PRD50-115160	3/4" NPT-F	P3TFA96WDAN	P33FA96ESAN	P33FA96DSAN
75	127	115V/1ph/60Hz	PRD75-115160	3/4" NPT-F	P3TFA96WDAN	P33FA96ESAN	P33FA96DSAN
100	170	115V/1ph/60Hz	PRD100-115160	3/4" NPT-F	P3TFA96WDAN	P3NFA96ESA	P3NFA96DSA
125	212	115V/1ph/60Hz & 230V/1ph/60Hz	PRD125-115160 PRD125-230160	1-1/2" NPT-F	P3TFA9BWGAN	P3NFA9PESA	P3NFA9PDSA
150	255	115V/1ph/60Hz & 230V/1ph/60Hz	PRD150-115160 PRD150-230160	1-1/2" NPT-F	P3TFA9BWGAN	P3NFA9PESA	P3NFA9PDSA
175	297	230V/1ph/60Hz	PRD175-230160	1-1/2" NPT-F	P3TFA9BWGAN	35F77BAP	35F77EAP
200	425	230V/1ph/60Hz	PRD200-230160	1-1/2" NPT-F	P3TFA9BWGAN	35F77BAP	35F77EAP
250	425	230V/3ph/60Hz & 460V/3ph/60Hz	PRD250-230360 PRD250-460360	1-1/2" NPT-F	P3TFA9BWGAN	35F77BAP	35F77EAP
325	552	230V/3ph/60Hz & 460V/3ph/60Hz	PRD325-230360 PRD325-460360	2" NPT-F	P3TFA9CWHAN	35F87BAP	35F87EAP
400	680	230V/3ph/60Hz & 460V/3ph/60Hz	PRD400-230360 PRD400-460360	2" NPT-F	P3TFA9CWHAN	35F87BAP	35F87EAP
500	849	230V/3ph/60Hz & 460V/3ph/60Hz	PRD500-230360 PRD500-460360	2" NPT-F	P3TFA9CWHAN	35F87BAP	35F87EAP
700	1189	230V/3ph/60Hz & 460V/3ph/60Hz	PRD700-230360 PRD700-460360	3" NPT-M	P3TFA9EWKAN	43FN7BAP	43FN7EAP
800	1359	230V/3ph/60Hz & 460V/3ph/60Hz	PRD800-230360 PRD800-460360	3" NPT-M	P3TFA9EWKAN	43FN7BAP	43FN7EAP
1000	1700	460V/3ph/60Hz	PRD1000-460360	3" NPT-M	P3TFA9EWKAN	43FN7BAP	43FN7EAP
1200	2039	460V/3ph/60Hz	PRD1200-460360	3" NPT-M	P3TFA9EWKAN	43FN7BAP	43FN7EAP
1600	2718	460V/3ph/60Hz	PRD1600-460360	4" Flg.	P3TFAFFW2AN	P3TFAFFQ2AN*	P3TFAFFD2AN
2000	3400	460V/3ph/60Hz	PRD2000-460360	6" Flg.	P3TFAFGW3AN	P3TFAFGQ3AN*	P3TFAFGD3AN
2400	4078	460V/3ph/60Hz	PRD2400-460360	6" Flg.	P3TFAFGW3AN	P3TFAFGQ3AN*	P3TFAFGD3AN

Most popular.

* 1µ coalescing



PlusPack heat exchanger (patent pending)

The revolutionary PlusPack features a 3-in-1 aluminum design with integral air connections. All models include an air-to-air freecooler, while the unique “slowflow” demister ensures perfect dewpoints whatever the operating conditions.

Demister separator

A high capacity demister separator is employed for the removal of condensed liquids. This lowers the air velocity which maximizes the condensate separation from the air, even when the dryer is not operating at maximum flow. This design also ensures the differential pressure across the dryer is kept to a minimum.

Refrigerant condenser

Oversized high efficiency air cooled condenser. Re-positioned to improve reliability and reduce the risk of dirt contamination.

Condensate drain niche

The PRD Refrigeration Dryer range comes standard with a level sensing automatic float drain. Other drains are available upon request. The positioning of the drain niche allows for easy access to the drain without the requirement of removing panels.

Refrigerant compressor

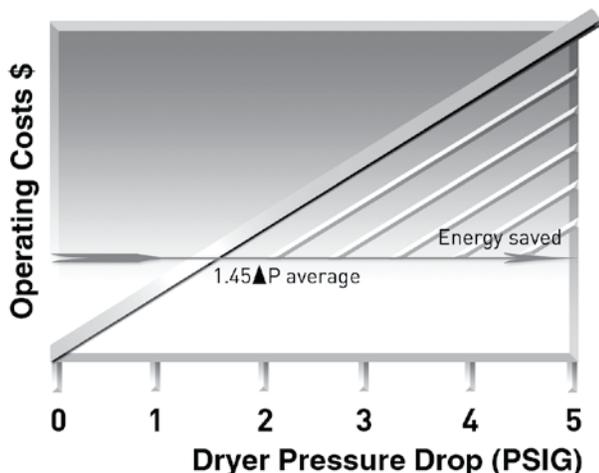
Maintenance free hermetically sealed refrigerant compressor. Low refrigerant charge eliminates the requirement for pre-heating on start up & prevents any liquid refrigerant returns.



Assured quality & performance

Every dryer undergoes sophisticated testing, including dewpoint tests with compressed air flow. Multiple helium leak testing, again on every dryer, ensures years of trouble-free operation.

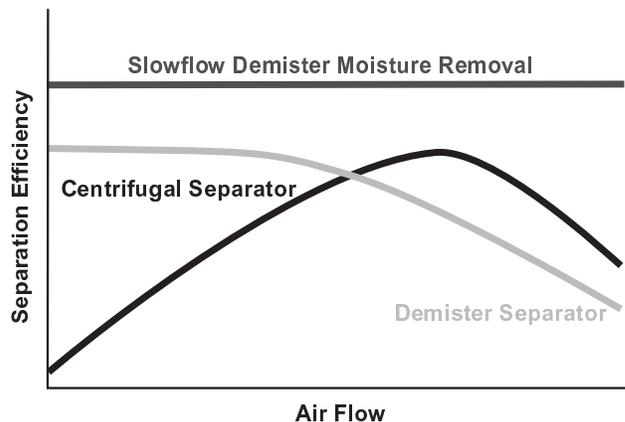
Energy efficiency



Poorly constructed heat exchangers and liquid separators create a high pressure differential across the dryer which leads to high operational costs and poor dewpoint performance.

The PRD dryer range utilizes advanced heat exchanger and demister separation technology and delivers uncompromising performance at the lowest cost of ownership.

Moisture separation technology



The oversized “slowflow” demister is non-velocity sensitive and therefore offers excellent liquid separation whatever the airflow.

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.

PRD 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.

Air Preparation Systems PRD325-2400 Series



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

These units feature 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

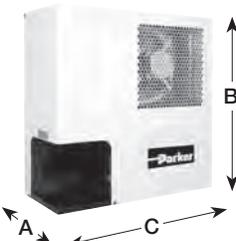
Operating information		PRD10-PRD175	PRD200-PRD250	PRD325-PRD2400
Temperature	Ambient (maximum)	122°F (50°C)	122°F (50°C)	122°F (50°C)
	Ambient (minimum)	41°F (5°C)	41°F (5°C)	41°F (5°C)
	Inlet (maximum)	149°F (65°C)	140°F (60°C)	140°F (60°C)
Pressure (maximum)		232 PSIG (16 bar)	203 PSIG (14 bar)	203 PSIG (14 bar)
Refrigerant		R134a	R407C	R407C

Flow correction factors Capacities are based upon:
 Ambient temperature - 100°F (38°C); Inlet temperature - 100°F (38°C);
 and Working pressure - 100 PSIG (7 bar g).

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

	PRD10 - PRD175								PRD200 - PRD250							PRD325 - PRD2400							
Ambient temperature (C1)																							
°F	60	70	80	89	100	110	120		70	80	90	100	110	120	122		90	100	110	120	122		
°C	16	21	27	32	38	43	49		21	27	32	38	43	49	50		32	38	43	49	50		
Factor	1.34	1.26	1.17	1.09	1.00	0.91	0.82		1.22	1.15	1.05	1.00	0.94	0.79	0.71		1.05	1.00	0.94	0.79	0.71		
Inlet temperature (C2)																							
°F	90	100	110	120	140	149			90	100	110	120	130	140			90	100	110	120	130	140	
°C	32	38	43	49	60	65			32	38	43	49	54	60			32	38	43	49	54	60	
Factor	1.24	1.00	0.81	0.67	0.45	0.43			1.24	1.00	0.82	0.68	0.56	0.40			1.22	1.00	0.82	0.68	0.56	0.46	
Inlet pressure (C3)																							
PSIG	60	80	100	125	150	175	200	230	50	80	100	125	150	174	203		50	80	100	125	150	174	203
bar	4	6	7	9	10	12	14	16	3	6	7	9	10	12	14		3	6	7	9	10	12	14
Factor	0.83	0.93	1.00	1.07	1.12	1.16	1.19	1.22	0.77	0.93	1.00	1.07	1.12	1.15	1.18		0.77	0.93	1.00	1.07	1.12	1.15	1.18

Dimensions

	Model number	A	B	C	Weight (kg)
	PRD10-PRD250				
	PRD10	8.3 (210)	17 (430)	17.7 (450)	42 (19)
	PRD15	8.3 (210)	17 (430)	17.7 (450)	42 (19)
	PRD25	8.3 (210)	19.9 (505)	19.7 (500)	52 (24)
	PRD35	8.3 (210)	19.9 (505)	19.7 (500)	52 (24)
	PRD50	8.9 (225)	22.3 (565)	20.5 (520)	58 (27)
	PRD75	8.9 (225)	22.3 (565)	20.5 (520)	68 (31)
	PRD100	8.9 (225)	22.3 (565)	20.5 (520)	77 (35)
	PRD125	16.7 (425)	23.8 (605)	21.8 (555)	115 (52)
	PRD150	16.7 (425)	23.8 (605)	21.8 (555)	128 (58)
	PRD175	16.7 (425)	23.8 (605)	21.8 (555)	132 (60)
		PRD325-PRD2400			
PRD200		28.0 (711)	37.0 (940)	22.0 (559)	183 (83)
PRD250		28.0 (711)	42.0 (1067)	41.0 (1041)	287 (130)
PRD325		28.0 (711)	42.0 (1067)	41.0 (1041)	320 (145)
PRD400		28.0 (711)	42.0 (1067)	41.0 (1041)	320 (145)
PRD500		28.0 (711)	42.0 (1067)	41.0 (1041)	342 (155)
PRD700		32.0 (813)	52.0 (1321)	46.0 (1168)	529 (240)
PRD800		32.0 (813)	52.0 (1321)	46.0 (1168)	529 (240)
PRD1000		32.0 (813)	52.0 (1321)	46.0 (1168)	551 (250)
PRD1200		40.0 (1016)	67.0 (1702)	43.0 (1092)	816 (370)
PRD1600		40.0 (1016)	68.0 (1727)	71.0 (1803)	1279 (580)
PRD2000		40.0 (1016)	68.0 (1727)	71.0 (1803)	1477 (670)
PRD2400	40.0 (1016)	68.0 (1727)	71.0 (1803)	1521 (690)	

Inches (mm)

 Most popular.

