



PYRAMID Refrigerated Drying System

The Pinnacle of Performance



PYRAMID REFRIGERATED DRYING SYSTEM



PYRAMID Delivers Peak Performance

Since 1961, Deltech has delivered technologies engineered to efficiently remove contaminants from compressed air systems. PYRAMID drying systems provide superior protection to critical pneumatic operations. Peak performance is built-in with advanced heat transfer and filtration technology to deliver technically oil-free compressed air from 100 through 3,000 scfm.

Manufacturers benefit with greatly improved air quality that results in increased productivity and machine/process uptime. Maintenance costs are slashed as improved air quality extends pneumatically powered component life and reduces unscheduled equipment downtime. Process cleanliness is assured.

All-inclusive PYRAMID drying systems eliminate the added purchase costs and installation complexity required by separate filtration. No need to pipe extra filters into the air system and then pipe away the condensate - PYRAMID simply integrates it all into one clean package.




PYRAMID Drying Systems Include These Standard Features

- 316 stainless steel, brazed plate heat exchangers feature low, pressure drop and, unparalleled performance and reliability
- Integral Grade D Moisture Separator/Filter removes bulk liquid and solid particulates down to 3 micron
- Integral Grade B High Efficiency Oil Removal Filter removes oil at +35°F to ensure virtually no condensable hydrocarbons remain
- Fully automatic, demand operated Condensate Drains

PICK YOUR PYRAMID

Use the chart to the left to help identify the best PYRAMID drying technology based on your unique air demand profile.

Typical Plant Demands

Air Demand Profile	Deltech Solution
 <p>Fluctuating Demands (1 to 3 shifts)</p>	PES Series
 <p>Reduced Demands (1 to 3 shifts)</p>	PES Series or PYR Series in schedule mode
 <p>Peak Demands (1 to 3 shifts)</p>	PES Series or PYR Series in schedule mode

- Traditional PYRAMID dryers deliver continuous-duty operation and performance with non-cycling refrigeration compressors.
- Energy Saving PYRAMIDES models (800-3,000 scfm) are designed to match power consumption to the ever-changing air demands of today's manufacturers. Controller logic engages or disengages the compression process, controls the refrigerant flow and provides maximum energy efficiency across the full range of operating conditions. PYRAMIDES eliminates the wear and tear experienced by cycling dryers, and the need for complex control schemes present in variable motor speed dryers.

PYRAMID Quality Air

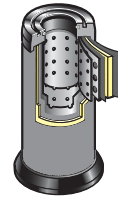
ISO 8573-1 Quality Class 1:4/5:1

Space-saving PYRAMID drying systems employ a three-part-process to arrive at technically oil-free compressed air from a single package.

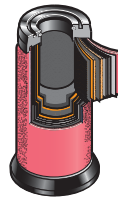
First, compressed air is chilled to a +35°F evaporator temperature using environmentally friendly R134a or R404a refrigerants. Cold liquid refrigerant and warm compressed air flow counter-current through a series of high-yield reciprocating passages crafted from 316ss plates. Nested in alternating layers, this delivers energy efficiency and thermal cooling for precise pressure dew point control.

Second, the chilled saturated air stream enters a Grade D Separator/Filter that removes the condensate and scrubs the air of all particulates 3 microns in diameter and larger. This two-stage filter is uniquely designed to provide consistent moisture removal at all flow rates.

Third, the cold scrubbed air stream enters a Grade B High Efficiency Oil Removal Filter that polishes the air stream thus, removing any remaining oil to 0.008 ppm w/w as it strips remaining particulates to 0.01 micron. PYRAMID delivers technically oil-free compressed air that contains virtually no condensable hydrocarbons to contaminate your operations and processes.

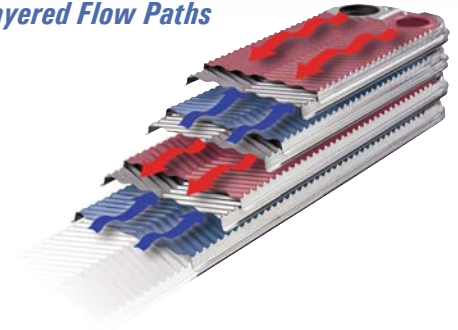


Grade D Element



Grade B Element

Layered Flow Paths



PYRAMID Series Eliminates More Lubricant

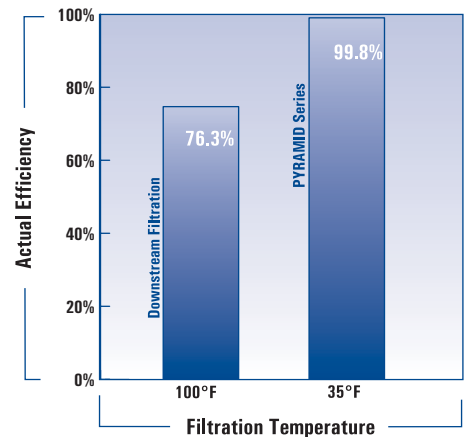
Oil removal filters installed downstream of a refrigerated dryer coalesce oil droplets at 100°F. By targeting the coldest point of the air stream, PYRAMID Series' cold-coalescer removes more lubricant aerosols to deliver 99.8% efficient hydrocarbon removal.

ISO 8573-1 Quality Classes

Class	Solid Particles			Humidity and Liquid Water		Oil	
	Particle Size, d (µm)			Pressure Dew Point		Total concentration, Aerosol, Liquid, and Vapor	
	0.10 < d ≤ 0.5	0.5 < d ≤ 1.0	1.0 < d ≤ 5.0	°C	°F	mg / m ³	ppm w/w
0	As Specified			As Specified		As Specified	
1	100	1	0	≤ -70	≤ -94	≤ 0.01	≤ 0.008
2	100,000	1,000	10	≤ -40	≤ -40	≤ 0.1	≤ 0.08
3	Not Specified	10,000	500	≤ -20	≤ -4	≤ 1	≤ 0.8
4	Not Specified	Not Specified	1,000	≤ +3	≤ +38	≤ 5	≤ 4
5	Not Specified	Not Specified	20,000	≤ +7	≤ +45		
6				≤ +10	≤ +50		
				Liquid Water Content, C _w g/m ³			
7				C _w ≤ 0.5			
8				0.5 < C _w ≤ 5			
9				5 < C _w ≤ 10			

Per ISO8573-1: 2001(E)

Hydrocarbon Removal



PYRAMID Non-cycling Drying Systems

PYR Series, 100 to 3000 scfm

Traditional PYRAMID drying systems deliver continuous-duty operation and performance with non-cycling refrigeration compressors. The three-part-drying and filtering process relies on advanced technology and durable construction to provide technically oil-free compressed air from a single package. Each PYRAMID is UL/CSA approved and wired to CE standards.

PYR Series Operation and Filtration

Models PYR100 to 150 with Basic Control

- On/off switch, Power-on light, and dew point temperature indicator alerts operator to overload condition or refrigeration system fault

Models PYR200 to 3000 with the PYRAMID emm™ Controller

- User friendly and advanced 24 volt control package saves energy, automates service intervals, and communicates in ten languages
- Shift compensating “schedule mode” allows one or two-shift operations to save energy by scheduling the dryer to turn on and off as needed
- Automatic service intervals (200 scfm and larger) can be set for predictive maintenance schedules: to ensure that the unit is maintained and advise when it is time to replace the Grade D and Grade B filter elements
- Operator interface with read-outs comes standard in ten languages (English, German, French, Spanish, Italian, Polish, Danish, Dutch, Norwegian and Finnish). Read-outs include current time, operating status such as manual or schedule running modes, hours to service, and total operating hours.
- Functionality features include a drain push-to-test button, power-on and compressor-on lights, an operator alert light which indicates that service is required or that there is a refrigeration system or drain fault, dew point temperature indicator
- Remote monitoring of the emm™, from your computer, possible through the RS-232 Communication Port
- Standard NO and NC voltage-free alarm contacts and RS-232 Communication Port
- Fault condition diagnostics with user-friendly text display



PYRAMIDES Energy Saving Drying Systems

PES Series, 800 to 3000 scfm

Energy Saving PYRAMIDES drying systems match power consumption to the ever-changing air demands of today's manufacturers. Controller logic engages or disengages the compression process to control the flow of refrigerant. This technology maintains stable dew point control and provides linear energy savings across the full operating range. PYRAMIDES offers premier quality compressed air and energy savings beyond traditional non-cycling, cycling, and variable speed designs.

Payback on Investment

The PYRAMIDES provides payback on your investment:

- Energy savings to 91% in disengaged compression mode
- Precise matching of input kW power to average air load
- Qualifying for energy rebates offered by utility companies
- ISO 8573-1 Quality Class 1:4/5:1 Performance protects products and processes from airborne contaminant losses

PYRAMIDES Controller

The PYRAMIDES controller receives information from the sensory system that is used to engage and disengage the compression process and manage the flow of cold liquid refrigerant. For example, if the heat load coming into the system represents 70% of the design capacity, the compressor will remain engaged for 70% of the time. This delivers approximately 30% energy savings.

The PYRAMIDES controller automatically scrolls through five LCD screens that display:

- Date/Time/Operating Status
- Hours-to-Service
- Total Compressor Operating Hours
- Instantaneous Load¹
- Cumulative Energy Savings²

¹ "Instantaneous Load" is displayed in "real time" as a percentage of design capacity. In the example above, it would display 70% load.

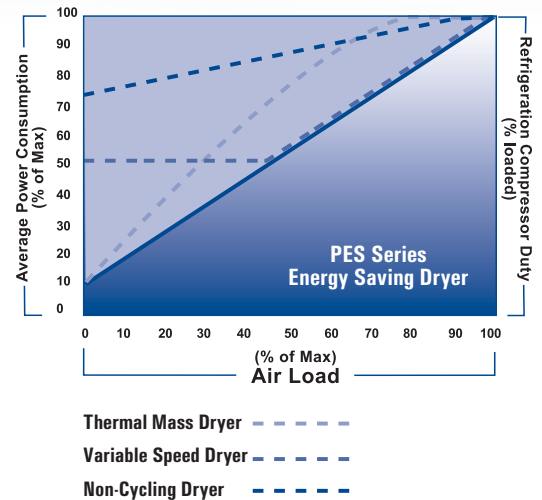
² "Cumulative Energy Savings" based on US Dollar or Euro energy cost input

In addition, the PYRAMIDES controller has all the same standard features as listed on the traditional PYRAMID controller, including the shift compensating "schedule mode" for automatic start-stop operation.

Axial Engagement Compression (AEC)



Innovative AEC scroll refrigeration compressors can operate fully loaded or unloaded. Axial engagement compression raises and lowers the fixed upper scroll to engage or disengage the orbiting lower scroll to manage refrigerant flow, stabilize dew point and save energy.



PYR Series Product Specifications

Model	Rated Flow ¹	Voltages	Power ²	Connection ³	Dimensions			Weight	Pyramid Refrigerated Drying System Total Pressure Drop with Integral Filtration		
					H	W	D		lbs.	psig	bar
						inches					
PYR100	100	100/1/50 115/1/60	0.93	1" NPT	38	29	20	251	5.0	0.34	
PYR125	125	208-230/1/60	1.28	1" NPT	38	29	20	273	5.4	0.37	
PYR150	150	220-240/1/50	1.30	1" NPT	38	29	20	279	6.3	0.43	
PYR200	200		1.26	1-1/2" NPT	39	34	32	425	5.1	0.35	
PYR250	250		1.96	1-1/2" NPT	39	34	32	463	6.6	0.46	
PYR300	300		2.00	1-1/2" NPT	46	35	32	527	6.6	0.46	
PYR400	400		2.03	2" NPT	46	35	32	571	5.1	0.35	
PYR500	500		2.68	2-1/2" NPT	58	32	42	684	6.0	0.41	
PYR600	600	208-230/3/60	2.91	2-1/2" NPT	58	32	42	691	6.6	0.46	
PYR750	750	460/3/60	4.12	2-1/2" NPT	58	32	42	734	8.1	0.56	
PYR1000	1000	380-420/3/50	5.83	4" ANSI Flg.	85	49	41	1146	6.9	0.48	
PYR1250	1250	575/3/60	6.73	4" ANSI Flg.	85	49	51	1521	8.0	0.55	
PYR1500	1500		7.52	4" ANSI Flg.	85	49	51	1547	10.0	0.69	
PYR1750	1750		8.89	6" ANSI Flg.	85	55	60	1940	6.5	0.45	
PYR2000	2000		10.70	6" ANSI Flg.	85	55	60	1986	7.9	0.54	
PYR2500	2500		12.91	6" ANSI Flg.	85	55	60	2315	7.9	0.54	
PYR3000	3000		16.92	6" ANSI Flg.	85	55	60	2646	10.3	0.71	

The PYRAMID emm™ controller is standard on models PYR200-3000

Refrigerants utilized on models PYR100-750 is R-134a, models PYR1000-3000 utilize R-404a

Models PYR100-150: standard internal mechanical demand drain (dryer MOP 232 (16 bar), optional electric timed drain (dryer MOP 200 psig (14 bar)

Models PYR200-3000: utilize electric demand drains as standard (dryer MOP 232 psig (16 bar).

Panel mounted disconnect switch standard on PYR1000 and larger.

Maximum inlet temperature: 120°F (49°C)

All models are certified to UL1995/CSA 22.2 No. 236-95.

¹Rated Flow Capacity - Conditions for rating dryers are in accordance with CAGI (Compressed Air and Gas Institute) Standard ADF100 working conditions: inlet air at 100 psig (7 bar) and 100°F (38°C) saturated, ambient air at 100°F (38°C), operating on 60 Hz power supply.)

²At 35°F (2°C) evaporator and 100°F (38°C) ambient

³BSP connections and DIN flanges available

PES Series Product Specifications

Model	Rated Flow ¹	Voltages	Power ²	Connection ³	Dimensions			Weight	Pyramid Refrigerated Drying System Total Pressure Drop with Integral Filtration		
					H	W	D		lbs.	psig	bar
						inches					
PES800	800		4.28	3" ANSI Flg.	85	49	41	1124	5.2	0.30	
PES1000	1000		4.68	3" ANSI Flg.	85	49	41	1146	6.9	0.48	
PES1250	1250	208-230/3/60	6.34	4" ANSI Flg.	85	49	51	1521	8.0	0.55	
PES1500	1500	460/3/60	8.68	4" ANSI Flg.	85	49	51	1563	10.0	0.69	
PES1750	1750	380-420/3/50	10.35	6" ANSI Flg.	85	55	60	1940	6.5	0.45	
PES2000	2000	575/3/60	11.72	6" ANSI Flg.	85	55	60	1997	7.9	0.54	
PES2500	2500		14.00	6" ANSI Flg.	85	55	60	2315	7.9	0.54	
PES3000	3000		18.33	6" ANSI Flg.	85	55	60	2646	10.3	0.71	

The PYRAMIDES controller is standard.

All models utilize R-404a refrigerant with AEC scroll compressors.

Models PES800-3000: utilize electric dedicated demand drains as standard (dryer MOP 232 psig (16 bar)).

Panel mounted disconnect switch standard

Maximum Operating Pressure 232 psig (16 bar), Maximum inlet temperature: 120°F (49°C).

All models are certified UL1995/CSA 22.2 No. 236-95.

¹Rated Flow Capacity - Conditions for rating dryers are in accordance with CAGI (Compressed Air and Gas Institute) Standard ADF100 working conditions: inlet air at 100 psig (7 bar) and 100°F (38°C) saturated, ambient air at 100°F (38°C), operating on 60 Hz power supply.

²At 35°F (2°C) evaporator and 100°F (38°C) ambient.

³BSP connections and DIN flanges available.

Product Features

Models	emm™ Control Panel Features:								Integral Filtration		Capacity Control		Refrigerant
	LED's: Power On, Compressor on, Alarm/Service	Dew Point Temp Indicator	Backlit LCD Alphanumeric Text Window	10 Language Display	Predictive Maintenance Scheduler	Scheduling: Timed Auto-Start and Stop	Push-To-Test Button for Electric Demand Drain	NO and NC Voltage-Free Alarm Contacts and RS232 Comm.	Integral 3 Micron Cold Filtration w/Electric Demand Drain	Integral 0.01 ppm Cold Coalescing Filtration w/Electric Demand Drain	Hot Gas Bypass & Thermal Expansion	Axial Engagement Compression	HFC - Environmentally Friendly
PES800 - 3000	S	S	S	S	S	S	S	S	S	S	-	S	S
PYR100 - 3000 ¹	S	S	S	S	S	S	S	S	S	S	S	-	S

S = Standard

¹ PYR100 - 150 Control panel includes on/off switch, power on light and temperature indicator.

Table 1 - Correction Factors (multipliers) for Inlet Air Temperature and Pressure

Inlet Pressure (psig)	Inlet Temperature				
	80°F (27°C)	90°F (32°C)	100°F (38°C)	110°F (43°C)	120°F (49°C)
50	1.35	1.05	0.84	0.69	0.56
80	1.50	1.17	0.95	0.79	0.66
100	1.55	1.23	1.00	0.82	0.70
125	1.63	1.31	1.07	0.91	0.74
150	1.70	1.37	1.13	0.95	0.80
175	1.75	1.42	1.18	0.99	0.84
200	1.80	1.47	1.22	1.03	0.89

To adjust dryer capacity for conditions other than rated, use Correction Factors (multipliers) from Tables 1 and 2.

Example: What is the capacity of a model PES1000 when the compressed air at the inlet to the dryer is at 150 psig and 100°F (38°C), the ambient temperature is 90°F (32°C)?

Answer: 1,000 scfm (rated flow from Specifications Table) x 1.13 (correction factor for inlet temperature and pressure from Table 1) x 1.06 (correction factor for ambient temperature from Table 2) = 1,198 scfm

Table 2 - Correction Factors for Ambient Temperature*

Ambient Temperature	80°F (27°C)	90°F (32°C)	100°F (38°C)	110°F (43°C)
Multiplier	1.12	1.06	1.00	0.94

*Air-cooled models only. For water-cooled use a 1.15 multiplier if cooling water is less than 95°F (35°C).

Performance Integrity Certification

The Compressed Air & Gas Institute (CAGI) of North America has developed a voluntary certification program to ensure you get the performance you pay for. Participating manufacturers reference these standards to generate test results and then display the performance data on their web site from which one can make a fair comparison and an informed buying decision.

Deltech is proud to support the CAGI Refrigerated Dryer Performance Verification Program. Visit www.deltech.com for the most current performance data on high-performance Deltech refrigerated dryers.



Canonsburg, Pennsylvania

Excellence in Customer Support, and Research and Development Leadership



Deltech Customer Service and Technical Support functions are supported from SPX Dehydration & Process Filtration's Canonsburg Facility. In concert with our dedicated network

of Authorized Deltech Distributors, our staff of factory trained professionals are prepared to meet your needs.

Our Research & Development team continues to set the standard for compressed air treatment. Our dedicated staff of certified engineers and laboratory technicians utilize cutting-edge technology in our state-of-the-art testing facilities. Today's advancements become tomorrow's compressed air treatment solutions at SPX Dehydration & Process Filtration.

Newport, North Carolina

World Class Producer of Refrigerated Dryers and Filtration products



Deltech cabinet-style refrigerated air dryers are delivered from SPX Dehydration & Process Filtration's Newport Facility. Every year, Newport delivers 36,000 refrigerated air dryers from a state-of-the-art facility that far exceeds the quality requirements for ISO 9001 certification. Consistent quality delivers product excellence to eliminate wet problematic

compressed air around the globe. With 130,000 square feet (12,077 m²) of manufacturing and warehousing dedicated to high quality refrigerated dryers and coalescing filters, Newport is the largest refrigerated air dryer factory in the world.

Deltech Filtration products are produced and inventoried at Newport. Several hundred thousand multi-stage coalescing filters and filter elements are shipped every year. Count on quality Deltech Filters to protect your processes and products as they remove harmful contaminants from your compressed air stream.

Ocala, Florida

The Technology Center for Desiccant Dryers



Deltech desiccant drying technologies are delivered from SPX Dehydration & Process Filtration's Ocala Facility. Every year, Ocala delivers thousands of standard and custom-engineered low dew point control systems for a variety of gases. This state-of-the-art facility far exceeds the quality requirements for ISO 9001 certification.

Heatless pressure-swing, heat of compression, internally heated, and vacuum and steam heated blower purge dryers are examples of the many custom technologies available. With 175,000 square feet (16,300 m²) of manufacturing and warehousing dedicated to delivering engineered desiccant products and coalescing filters, Ocala is the largest desiccant technologies factory in the world.

SPX DELTECH

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*Improvements and research are continuous at SPX Deltech.
Specifications may change without notice.*

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