

# Refrigerated Compressed Air Dryers

5-6,000 scfm

.14-170 m<sup>3</sup>/min



- Refrigerated Non-Cycling
- Refrigerated Cycling
- Refrigerated High Temperature

# Sullair Capabilities

## Sullair Leadership

Since 1965, Sullair has been recognized around the world as an innovator and a leader in rotary screw compression and vacuum technology. For more than 40 years, Sullair

has designed and manufactured its own rotors and air end assemblies at the corporate headquarters in Michigan City, Indiana.

The award-winning rotary screw design sets the industry standards and delivers the quality and reliability one expects from a leader.



products are known around the world for their universally applicable design, outstanding craftsmanship and superior quality.

## Sullair's Statistical Process Control

Sullair's Statistical Process Control (SPC) system monitors rotor quality standards to assure consistent compressor and vacuum performance.

## Sullair's Commitment to Innovation

Underlying Sullair's leadership is a dedication to excellence and a commitment to innovation. Sullair is constantly exploring new ideas and seeking new ways to meet industry's need for increasingly energy efficient compressed air and vacuum solutions.

## Sullair Technology

Utilizing the most modern technologies, equipment and advanced manufacturing techniques, Sullair designs, manufactures, assembles, and tests the most innovative compressed air and vacuum products in the industry. Sullair

## The Sullair Stationary Air Power System



### This System includes:

- rotary screw compressor
- wet storage
- refrigerated dryer
- filters to meet your requirement
- dry storage
- flow controller
- drains
- oil/water separator
- ethernet-based eConnect™ to monitor and control the entire system

# The Importance of Clean, Dry Compressed Air

## How much water is too much?

### Any amount of water is too much.

Water jeopardizes everything you want your compressed air system to do. It ruins product and fouls processes.

- Relative humidity is the amount of water vapor in air relative to what it could hold at a given temperature
- Moisture in compressed air remains in a vapor state through the compression cycle, so it is not a problem until it leaves the compressor
- Air discharged from a compressor is approximately 150°F to 450°F
- At 75°F and 75% relative humidity, a 75 hp compressor takes in 46 gallons of water vapor in 24 hours. When this air is cooled to approximately 35°F at 100 psig, the water vapor condenses into 46 gallons of liquid!



*Liquid remaining after the aftercooler: 14.7 gallons (32%)*



*Liquid remaining after a refrigerated dryer: 1.8 gallons (4%)*

## Refrigerated Dryers

Sullair offers these configurations of refrigerant dryers

- **RN – Refrigerated Non-Cycling**  
5 to 325 scfm
- **RD – Refrigerated Digital Cycling**  
400 to 6,000 scfm
- **RC – Refrigerated Cycling**  
150 to 3,000 scfm
- **RH – Refrigerated High Temperature**  
15 to 100 scfm



All Sullair refrigerated dryers have these advantages and features:

- Energy saving – true green product
  - 3-in-1 heat exchanger
  - High efficiency compressors
- Globally marketable refrigerant R-134a
- Standard electronic timer drains for 35 scfm and above
- Refrigerant analyzer indicator
- Fan cycle switch
- Easy removable side panels and parts
- Consistent dew point performance
- Low power consumption
- Low pressure drop
- Insulated heat exchanger
- Evaporator with multi-stage separator stainless steel demister
- High quality fan motors
- Oversized condenser

Max Inlet Temperature: 150°F  
(240°F High Temperature)  
Max Inlet Pressure: 230 psig  
Max Ambient Temperature 120°F



# Features of the Sullair Refrigerated Dryers



## Refrigerated Non-Cycling Dryers RN Series: 5-325 scfm

- No dew point swings
- Compact footprint
- Variable flow capacity from 10% to 100%
- High inlet temperature (up to 150°F)
- Counter-current, variable flow heat exchanger
- Non-velocity sensitive demister/separator
- Consistent dew point



## Refrigerated Digital Cycling Dryers RD Series: 400-6,000 scfm

- Optimum dew point levels for the highest system performance
- Cycling control for increased energy savings
- Energy efficient scroll compressor
- Low operating cost
- Optional communication package
- Consistent dew point



## Refrigerated Cycling Dryers RC Series: 150-3,000 scfm

- Stainless steel pump and cold storage tank
- Thermal expansion valve
- Programmable temperature controller
- Energy savings at low loads
- Intermittent compressor operation
- Simple refrigerant circuit
- Thermal mass storage medium
- Accurate dew point control

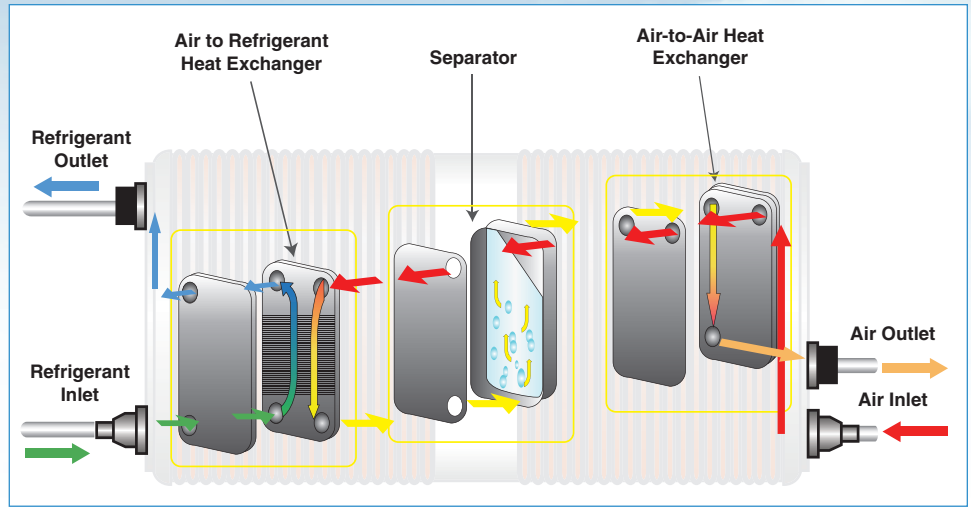


## High Temperature Dryers RH Series: 15-100 scfm

- Inlet temperature up to 240°F
- Independent air cooled after-cooler
- Moisture separator
- Two independent timer drains
- Easy removable panels and maintenance
- Rated at 50°F dew point

# How the Energy Saving 3-in-1 Heat Exchanger Works

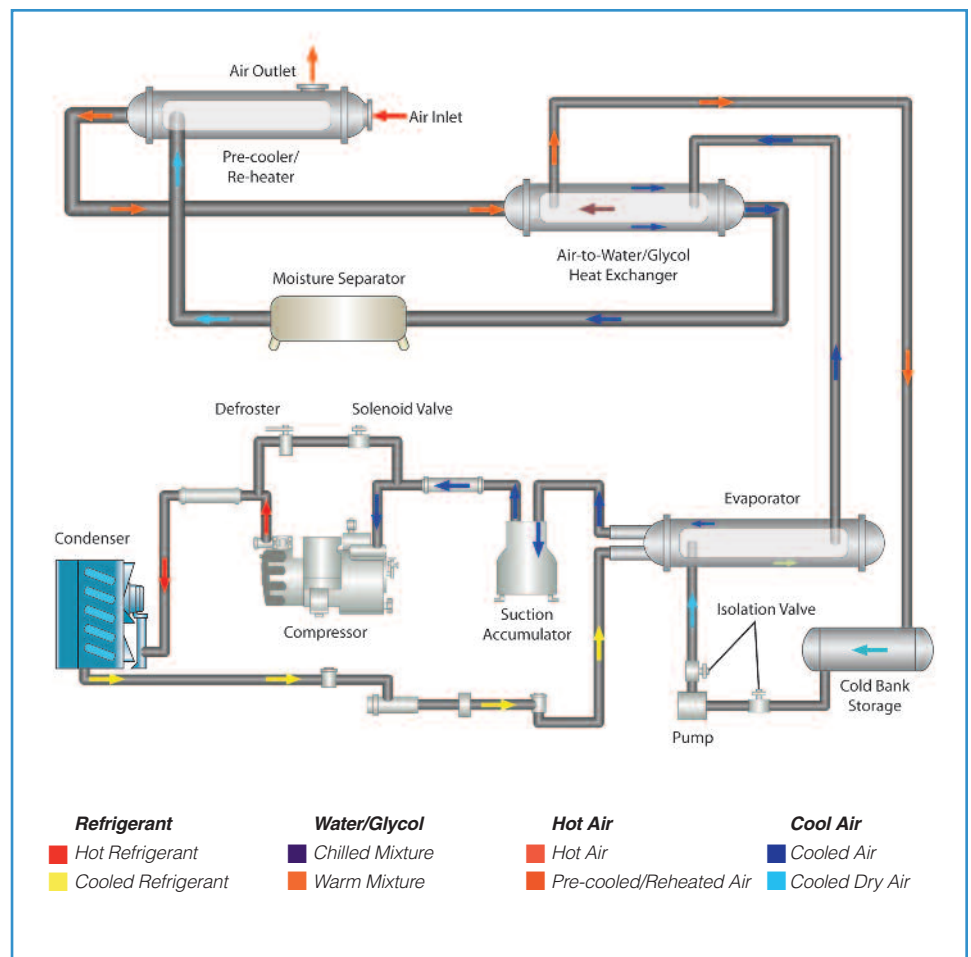
- Warm air enters the Air to Air Heat Exchanger and exchanges heat with the cooler air leaving.
- The air proceeds to the Dryer Section and is cooled using either mechanical refrigeration or liquid to a designated dew point.
- The mixture of cold air and moisture enters the separation chamber. The moisture condenses into liquid and is isolated from the air stream and is dispensed with a timer drain.
- The dry air then proceeds back through the Recuperation Section where it is heated by the incoming warm air.



# How Refrigerated Cycling Dryers Work

Hot saturated air from the after-cooler enters the air-to-air heat exchanger, where the air is pre-cooled by the cold, dry air leaving the heat exchanger. The pre-cooled air then enters the air/glycol heat exchanger where it is cooled to its final dew point by chilled water/glycol, flowing in the counter-current direction through the shell. The chilled air passes through the moisture separator, which has a high efficiency of separation at different flow rates. Condensate is removed from the system using a timed drain valve. Finally, the cold, dry air is reheated in the air-to-air heat exchanger by the incoming hot air for maximum volumetric efficiency before exiting the dryer.

The water/glycol is chilled by a cycling refrigeration system and continuously pumped through the shell side of the air/glycol heat exchanger. The glycol flow rate remains constant, regardless of compressed air load. The refrigeration compressor unloads and/or cycles OFF when preset temperature is reached for water/glycol, thus minimizing electrical power consumption.



# Comprehensive Controls

## Advanced, User-Friendly Microprocessor Controls

Models RC-400, RD-400 and larger dryers include:

- Digital multi-functional display
- Digital dew point temperature read-out for an accurate indication of actual working conditions
- Multiple alarm safety with easy-to-understand coded messages
- Extensive programmability allows system to be personalized to individual user needs
- Status reports for quick reference to dryer operation
- Indicator to optimize preventive maintenance
- Volt-free alarm contact offers a remote status signal
- The controller has 8 temperature sensor inputs

## Models RN and RH dryers use simple analog indicators and controls.

- Off switch with light
- Dew point indicator



## The Thermal Mass RC dryers use a Electro-Mechanical controller.

- Remote Stop/Start
- Remote Alarm Contact - Normally Open



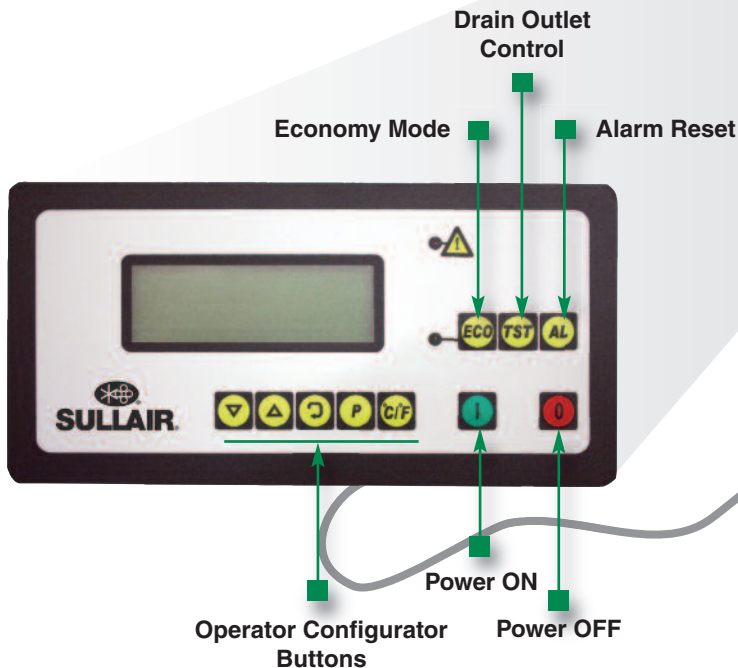
## Remote Monitoring Capabilities (Optional)

The Sullair controller has a communications interface that can be used for remotely monitoring. Modbus RTU protocol is used for communication. The user can remotely start the dryer, stop the dryer, reset any alarm and monitor:

- Evaporator temperature
- Inlet air temperature
- Ambient temperature
- Refrigerant gas high and low temperature
- Fan, compressor and condenser working conditions
- Dew point
- Drain function
- Working hours

## Operator Interface

Closeup of panel shows its many features.



The front panel view of the controller contains a four line 20 character LCD display, 9 buttons and one alarm indicator LED.



# Intelligent Integral Zero-Loss Drain

## The condensate drain is one of the most important components

All refrigerated dryers come standard with a high quality timer drain. A truly unique zero loss drain is offered as an option. With the zero loss drain, condensate is collected in a chamber, segregated from the air flow. As condensate builds, it activates a drain level sensor built into the chamber. This opens an external solenoid valve to evacuate the condensate, closing the valve again before any air escapes. The drain cycle continually adjusts itself to working conditions.



Self-diagnostic software avoids fault situations. And should an error occur, an alarm will be signaled and the drain will continue to operate on a pre-programmed timed drain cycle. The controls for the drain are part of the microprocessor's fully integrated control and alarm system. Sullair offers a drain alcove on all its standard dryers. This simple solution is a major benefit to the user. The drain is one of the most important components within the dryer. If it doesn't work properly the dryer's whole operation is compromised.

## R-134a Refrigerant: Environmentally Considerate and Efficient

All Sullair refrigerant dryers use R-134a refrigerant

### Why R-134a?

Features of R-134a:

- Does not deplete ozone
- Thermodynamic properties similar to R-12 (dichlorodifluoromethane)
- 100% chlorine free
- Environmentally considerate
- Completely inert
- High and low temperature refrigerant
- Operates at nearly half the pressure of other refrigerants, so the compressor life span will increase.
- R-134a makes the refrigerated dryer much more tolerant to adverse conditions such as high ambient temperature.

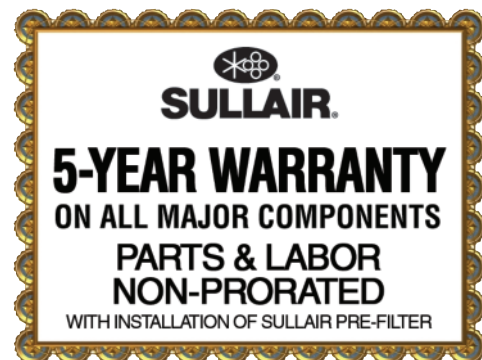
## The Sullair Warranty

### All Inclusive "Peace of Mind" Warranty

Sullair backs our commitment to quality with an unparalleled, non-prorated 5-year warranty (*parts and labor*) on the major components. No other manufacturer offers a warranty that is as all inclusive. (Note: a Sullair pre-filter must be installed upstream of the dryer as a prerequisite for this warranty.)

### Quality is Third Party Certified and Guaranteed.

Dryers are manufactured in an ISO 9001 environment.



# Specifications: RN Non-Cycling Models

60Hz Motor Frequency Model	Electrical	AC / WC	Capacity		Inlet-Outlet Connection	Drain	Width		Depth		Height		Weight	
			scfm	m <sup>3</sup> /min			in	mm	in	mm	in	mm	lbs	kg
RN-5	115-1-60	AC	5	.14	1/2" NPT	3/8"	14	355	14	355	24	609	85	38
RN-10	115-1-60	AC	10	.28	1/2" NPT	3/8"	14	355	14	355	24	609	85	38
RN-15	115-1-60	AC	15	.42	1/2" NPT	3/8"	14	355	14	355	24	609	85	38
RN-25	115-1-60	AC	25	.70	1/2" NPT	3/8"	16	406	14	355	24	609	95	43
RN-25	230-1-60	AC	25	.70	1/2" NPT	3/8"	16	406	14	355	24	609	95	43
RN-35	115-1-60	AC	35	.99	1/2" NPT	3/8"	16	406	18	457	24	609	109	49
RN-35	230-1-60	AC	35	.99	1/2" NPT	3/8"	16	406	18	457	24	609	109	49
RN-50	115-1-60	AC	50	1.4	3/4" NPT	3/8"	16	406	18	457	24	609	109	49
RN-50	230-1-60	AC	50	1.4	3/4" NPT	3/8"	16	406	18	457	24	609	109	49
RN-75	115-1-60	AC	75	2.1	3/4" NPT	3/8"	16	406	18	457	29	736	143	65
RN-75	230-1-60	AC	75	2.1	3/4" NPT	3/8"	16	406	18	457	29	736	143	65
RN-100	115-1-60	AC	100	2.8	3/4" NPT	3/8"	16	406	18	457	29	736	165	75
RN-100	230-1-60	AC	100	2.8	3/4" NPT	3/8"	16	406	18	457	29	736	165	75
RN-125	115-1-60	AC	125	3.5	1-1/2" NPT	3/8"	18	457	22	546	32	813	197	89
RN-125	230-1-60	AC	125	3.5	1-1/2" NPT	3/8"	18	457	22	546	32	813	197	89
RN-150	115-1-60	AC	150	4.2	1-1/2" NPT	3/8"	18	457	24	609	32	813	215	97
RN-150	230-1-60	AC	150	4.2	1-1/2" NPT	3/8"	18	457	24	609	32	813	215	97
RN-175	230-1-60	AC	175	4.9	1-1/2" NPT	3/8"	22	546	24	609	35	889	243	110
RN-200	230-1-60	AC	200	5.6	1-1/2" NPT	3/8"	22	546	24	609	35	889	243	110
RN-250	230-1-60	AC	250	7.0	1-1/2" NPT	3/4"	28	559	24	609	50	1270	465	210
RN-250	230-3-60	AC	250	7.0	1-1/2" NPT	3/4"	28	559	24	609	50	1270	465	210
RN-250	460-3-60	AC	250	7.0	1-1/2" NPT	3/4"	28	559	24	609	50	1270	465	210
RN-250	575-3-60	AC	250	7.0	1-1/2" NPT	3/4"	28	559	24	609	50	1270	465	210
RN-325	230-3-60	AC	325	9.2	2" NPT	3/4"	28	559	24	609	50	1270	494	224
RN-325	460-3-60	AC	325	9.2	2" NPT	3/4"	28	559	24	609	50	1270	494	224
RN-325	575-3-60	AC	325	9.2	2" NPT	3/4"	28	559	24	609	50	1270	494	224

50Hz Motor Frequency Model	Electrical	AC / WC	Capacity		Inlet-Outlet Connection	Drain	Width		Depth		Height		Weight	
			scfm	m <sup>3</sup> /min			in	mm	in	mm	in	mm	lbs	kg
RN-15	220-1-50	AC	15	.42	1/2" NPT	3/8"	13.8	351	13.8	351	24	610	71	32
RN-25	220-1-50	AC	25	.70	1/2" NPT	3/8"	15.5	396	13.8	351	24	610	75	34
RN-35	220-1-50	AC	35	.99	1/2" NPT	3/8"	15.5	396	17.7	450	23.2	592	95	43
RN-50	220-1-50	AC	50	1.4	3/4" NPT	3/8"	15.5	396	17.7	450	23.2	592	95	43
RN-75	220-1-50	AC	75	2.1	3/4" NPT	3/8"	15.5	396	17.5	445	28.7	729	125	57
RN-125	220-1-50	AC	125	3.5	1-1/2" NPT	3/8"	17.5	445	21.4	546	31.6	805	176	80
RN-175	220-1-50	AC	175	4.9	1-1/2" NPT	3/8"	21.4	546	23.3	594	34.2	871	218	99
RN-200	220-1-50	AC	200	5.6	1-1/2" NPT	3/8"	21.4	546	23.3	594	34.2	871	218	99
RN-250	220-1-50	AC	250	7.0	1-1/2" NPT	3/4"	27.9	711	23.3	594	49.8	1265	309	140
RN-325	220-1-50	AC	325	9.2	2" NPT	3/4"	27.9	711	23.3	594	49.8	1265	309	140

## Correction Factors for Models RN and RD

### Inlet Pressure

psig	50	60	75	100	115	125	150	175	200
bar	3.5	4.1	5	7	7.9	8.5	10	12	14
Factor Pressure: F1*	0.75	0.77	0.85	1.00	1.06	1.10	1.16	1.25	1.30

### Inlet Temperature

°F	85	90	95	100	110	120	130	140	150
°C	29	32	35	38	43	49	54	60	65
Factor Inlet: F2*	1.20	1.14	1.08	1.00	0.75	0.60	0.50	0.45	0.35

### \*Flow Correction Factors

Capacity correction to be used when operating conditions differ from those shown above. To obtain dryer capacity at new conditions, multiply nominal capacity x F1 x F2 x F3.

### Ambient Temperature

°F	60	80	90	100	105	110	115	120
°C	16	26	32	38	40	43	46	49
Factor Ambient: F3*	1.12	1.08	1.06	1.00	0.96	0.90	0.80	0.65

### Performance Data Based On:

Ambient temperature	100°F	25°C
Inlet temperature	100°F	35°C
Inlet pressure	100 psig	7 bar

For flow rates at other conditions, please contact Sullair for correct sizing.

Performance data obtained and presented in accordance with CAGI Standard No. ADF 100, "Refrigerated Compressed Air Dryers – Methods for Testing and Rating."



# Specifications: RH High Temperature Models

60Hz Motor Frequency Model	Electrical	AC / WC	Capacity		Inlet-Outlet Connection		Drain		Width		Depth		Height		Weight	
			scfm	m <sup>3</sup> /min					in	mm	in	mm	in	mm	lbs	kg
RH-15	115-1-60	AC	15	.42	1/2" NPT	3/8"	18	457	18	457	38	965	159	72		
RH-25	115-1-60	AC	25	.70	1/2" NPT	3/8"	18	457	18	457	38	965	159	72		
RH-35	115-1-60	AC	35	.99	1/2" NPT	3/8"	18	457	18	457	38	965	161	73		
RH-50	115-1-60	AC	50	1.4	1/2" NPT	3/8"	18	457	18	457	38	965	163	74		
RH-75	115-1-60	AC	75	2.1	3/4" NPT	3/8"	25	635	20	508	36	914	217	94		
RH-100	115-1-60	AC	100	2.8	3/4" NPT	3/8"	25	635	20	508	36	914	238	108		

## Inlet Pressure Correction Factor for RH Models

psig	60	75	90	100	115	125	145	160	175	190	200
bar	4.1	5	6	7	7.9	8.5	10	11	12	13	14
Factor Pressure: F1*	0.70	0.75	0.80	0.83	0.86	0.90	0.93	0.96	1.00	1.10	1.12

## Inlet Temperature Correction Factor for RH Models

°F	90	100	150	180	200	210	220
°C	32	38	65	82	93	98	104
Factor Inlet: F2*	1.30	1.27	1.06	1.00	0.85	0.78	0.75

## Ambient Temperature Correction Factor for RH Models

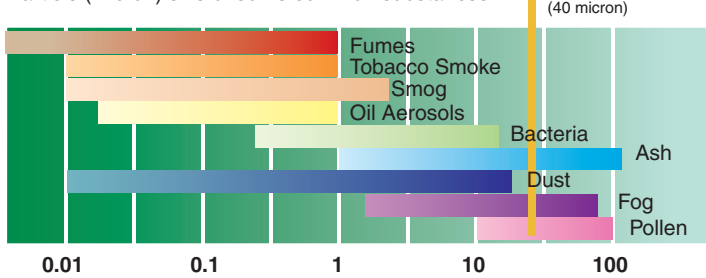
°F	75	85	95	100	105	115	120
°C	24	29	35	38	40	46	49
Factor Ambient: F3*	1.10	1.07	1.03	1.00	0.96	0.82	0.55

## Dew Point Correction Factor for RH Models

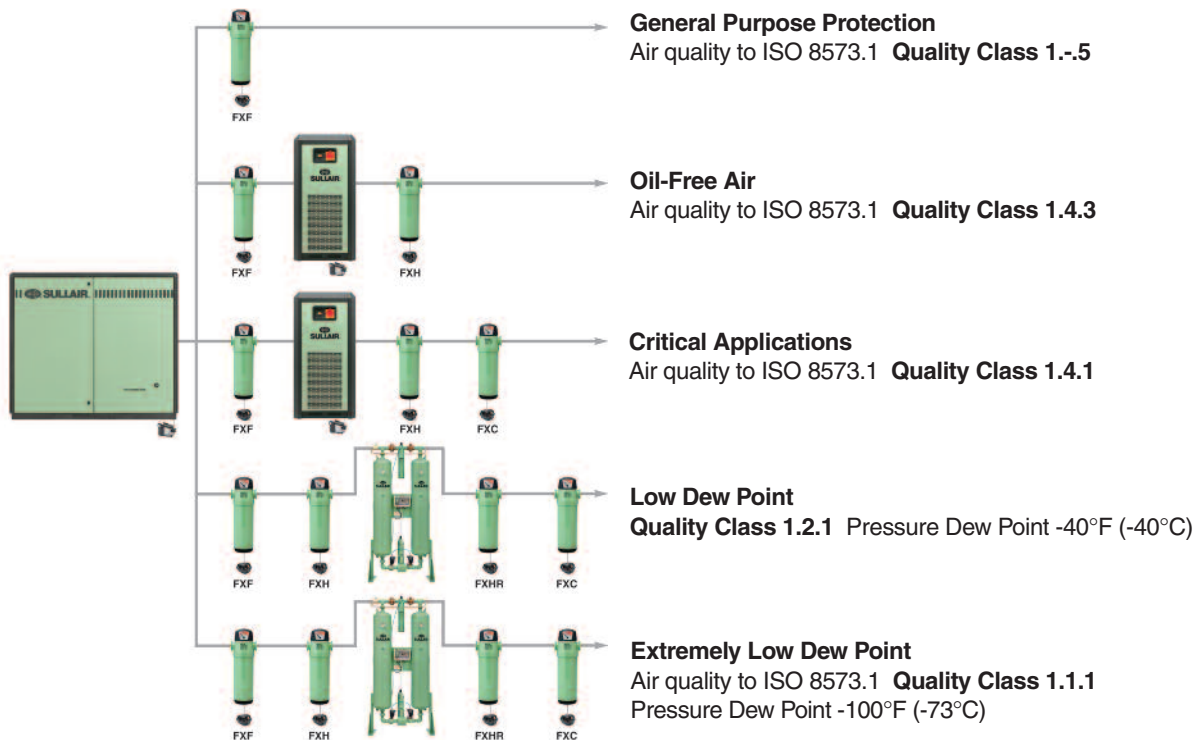
°F	38	41	45	50	55	60
°C	3.3	5.0	7.2	10.0	12.8	15.5
Factor Dew Point: F4*	0.65	0.73	0.80	1.00	1.10	1.22

# Air Quality Standards ISO 8573.1 Classes

Particle (micron) size of some common substances.

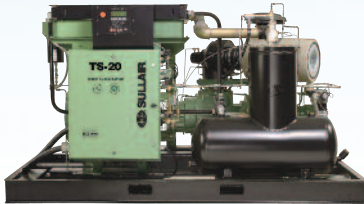


Class	Solid Particle Maximum number of particles per m <sup>3</sup>			Pressure Dew Point		Oil (incl. vapor) mg/m <sup>3</sup>
	0.1-0.5 micron	0.5-1 micron	1.0-5 micron	°F	°C	
1	100	1	0	-94	-70	0.01
2	100,000	1,000	10	-40	-40	0.1
3	-	10,000	500	-4	-20	1.0
4	-	-	1,000	37	3	5.0
5	-	-	20,000	45	7	-
6	-	-	-	50	10	-



# Sullair's Compressed Air Products

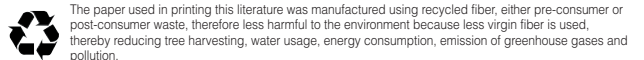
www.sullair.com



Fundamental to Sullair's leadership is a dedication to reduce not only the amount of natural resources consumed to create energy, but to minimize environmental impact, in both the manufacture and use of all our products. We are constantly exploring new ideas and seeking new technologies to meet the ever-increasing need for high quality, energy-efficient compressed air products and environmental sustainability.



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