aerospace
climate control
electromechanical
filtration
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process control
sealing & shielding

ThermalStar Smart

Cycling Refrigerated Air Dryers (1250 - 3000 scfm)

ThermalStar Smart Variable Operation

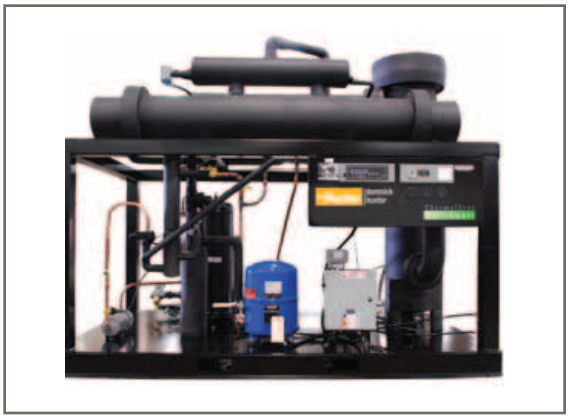
Cycling Refrigerated Air Dryers (4000 - 15000 scfm)

Parker domnick hunter

ENGINEERING YOUR SUCCESS.

Cycling Refrigerated Air Dryers

ThermalStar Smart and ThermalStar Smart Variable Operation



ThermalStar Smart

Flowrates from
1250 - 3000 scfm (2124 - 5097 m³/hr)

ThermalStar Smart Variable Operation

Flowrates from
4000 - 15000 scfm (6796 - 25,485 m³/hr)

Benefits:

Optimum dewpoint levels for highest system performance

Lowest operating costs

Continuously and automatically adjusts to actual working parameters

High reliability, easy to use and maintain

Integral zero air loss energy saving drain

Low pressure drop design

Microprocessor based energy management controller

Flood level control protects refrigerant circuit

Tube & shell heat exchanger

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.

These costly contamination problems can be avoided by installing a TM1250 - TM3000 or TM4000 - TM15000 Cycling Refrigerated Air Dryer package complete with Parker domnick hunter filtration. The combination of our refrigerated dryers and high quality filtration provides air quality to ISO 8573.1 Class 1.4.1.

A refrigerated dryer is typically selected to achieve its design performance at the user's most extreme working conditions (ie. a warm summer day with the air compressor operating at maximum load). This maximum condition, however, is very rarely achieved in everyday conditions. First, the air compressor load will vary significantly during a working day and will rarely be at full load, thereby significantly reducing the load on the dryer itself.

Furthermore, average temperatures are well below the maximum inlet and ambient temperatures for which the system has been sized. Reduced temperatures at colder moments during the day and overall temperature reductions during the mid-season and winter add a further reduction to the load on the dryer.

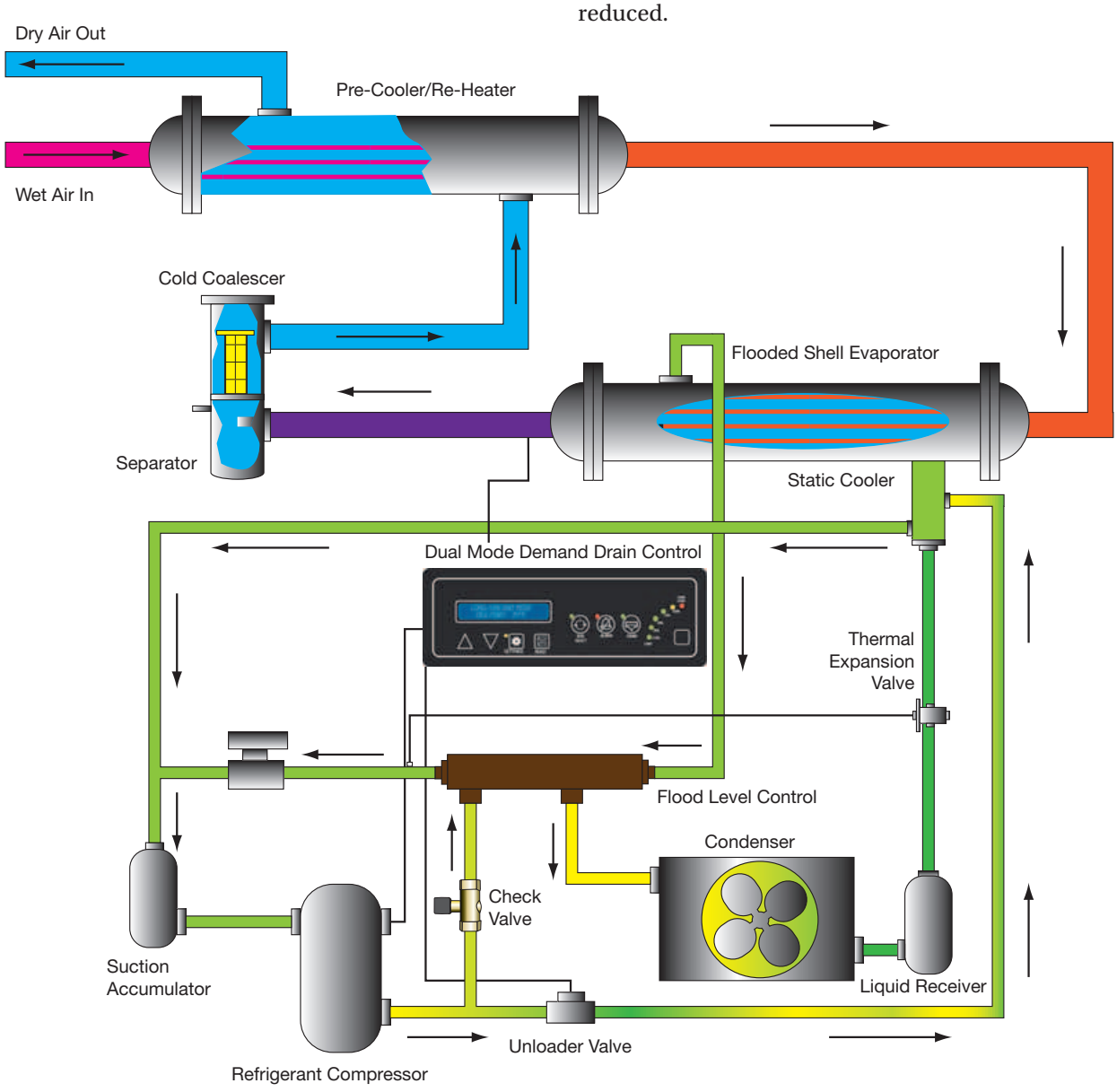
TM1250 - TM3000 and TM4000 - TM15000 dryers perfectly and continuously adapt to the actual operating conditions, ensuring dewpoint control together with the lowest operating costs. Over and above this extreme flexibility of use, ThermalStar Smart's advanced technical solutions offer reliability, efficiency, and energy savings, making it the ideal solution for all industrial users.

ThermalStar Smart (1250 - 3000 scfm) - How it works

The Next Generation - Full cycling mode results in dryer air than conventional dryers

The ThermalStar Smart TM1250 - TM3000 configuration combines the advantages of superior performance and energy savings with the oil removal efficiency of a built-in, multi-stage separator/cold coalescer.

By locating the coalescing filter at the coldest point in the air system, filtration efficiency is greatly enhanced, and because of a pre-separation of bulk contaminants prior to entering the element(s), pressure drop and operating costs are dramatically reduced.

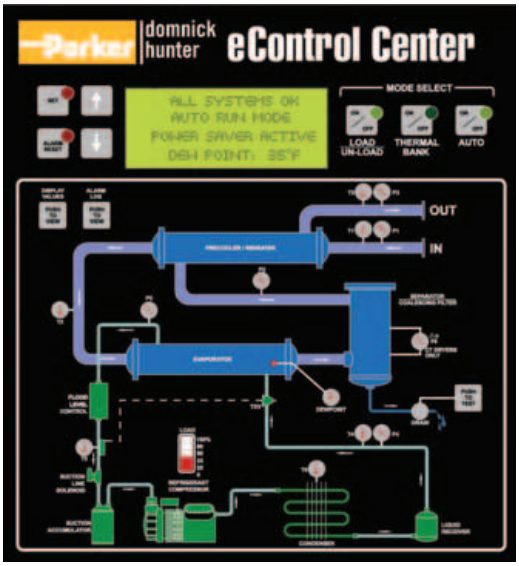


	Warm Wet Air
	Partially Cooled Air
	Cold Wet Air
	Dry Purified Air

	Liquid Refrigerant
	Cold Refrigerant Gas
	Hot Refrigerant Gas

ThermalStar Smart (1250 - 3000 scfm) - Key Features

- Best in class dewpoint performance
- Tri Mode Operation allows dryer to operate in cycling, non-cycling or auto mode.
- Unlimited cycling due to unloaded “soft start”
- Multi-stage separation and filtration
- Level actuated drain
- Diagnostic readouts indicate need for service
- Drain light
- Alarm light
- Displays in English or Metric
- Serial Port with MODBUS
- Digital readout air in temperature
- Digital readout ambient or water in temperature
- High inlet temperature warning
- High ambient or water in temperature warning
- Optional eControl Center



Benefits:

Lower dewpoint temperature achieved with ThermalStar Smart results in cleaner operation

Longer lasting components

Upstream malfunction that results in more severe inlet conditions can be readily handled without resulting in downstream problems

Lower operating costs, with no sacrifice in performance

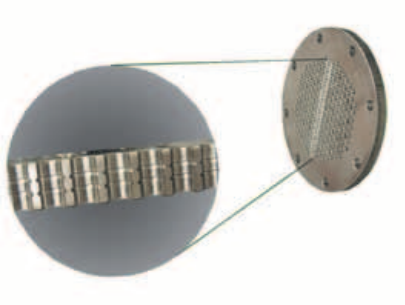
Dryer runs only as needed

Environmentally friendly refrigerant

Tube and shell heat exchanger with grooved tube sheets provide greatest mechanical strength and lowest pressure drop

Patented flood level control protects refrigeration circuit

Tube and Shell Heat Exchanger



Grooved Tubesheets

ThermalStar Smart Variable Operation (4000 - 15000 scfm) - How it works

TM4000 - TM15000 demand control reduces energy consumption and maintains a true and constant dewpoint by loading and unloading or by turning the refrigeration compressor on or off in direct response to the actual dewpoint temperature of the compressed air.

Air Circuit

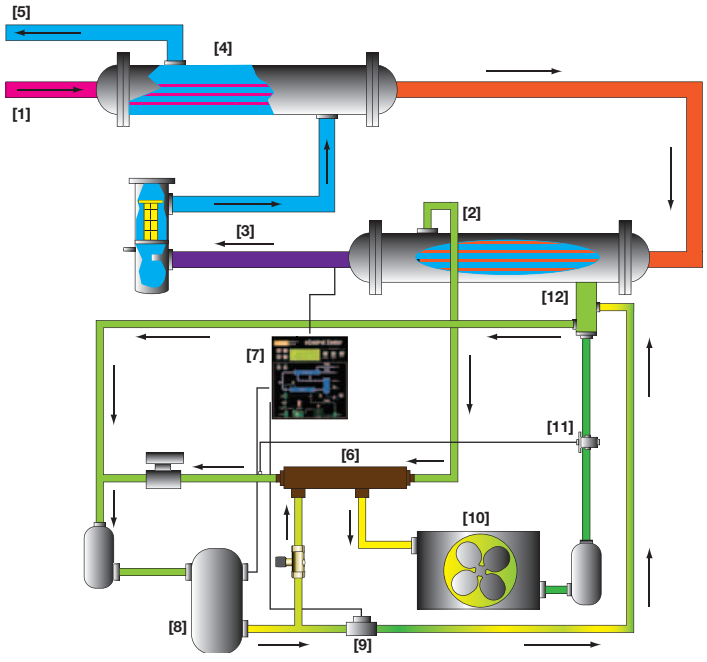
Saturated compressed air enters the tubes at the air to air heat exchanger [1] where it is precooled by the cold compressed air returning through the shell from the evaporator. After the compressed air has been precooled, it flows into the evaporator tubes [2] where the temperature is lowered to approximately 34°F (1.1°C). The temperature reduction forces water and oil vapors to condense. The mixture of cold compressed air and condensed liquid flows into the mechanical moisture separator [3] where the liquids are removed by impingement and centrifugal action. The compressed air then flows from the first stage moisture separator up through the second stage 3 micron filter element where it's further purified. The purified compressed air returns through the shell side of the air to air heat exchanger [4] where its volume is increased through reheating. The processed compressed air then enters the main distribution system [5] as a dry, clean and efficient utility.

Refrigeration Circuit

Parker domnick hunter's patented refrigeration system enables the use of a fully active flooded evaporator [2]. Compressed air flows through the submerged tubes in the flooded shell to ensure dewpoint integrity [6]. If any liquid refrigerant were present in the suction line, it would flash off to a vapor. An air temperature probe in the evaporator's air side tubing, reads the temperature and displays it on the eControl Center panel [7].

When the air temperature reaches its low set point, the compressor will either shut off, or unload, saving energy during periods of low load. When the dewpoint setting is reached, the compressor [8] will resume normal operation. When operating in the cycling mode, a virtually unlimited number of stops and starts is made possible by opening the ThermalStar Smart control unloader valve [9] prior to starting the compressor.

This allows an unloaded start each time the compressor comes on. When operating in the load/unload mode, the warm refrigerant gas bypasses the condenser [10] and expansion valve [11] , and flows through the Static Cooler [12]. This core of cold liquid refrigerant removes the heat from the discharge gas to prevent a high suction temperature as the gas returns to the inlet side of the compressor.

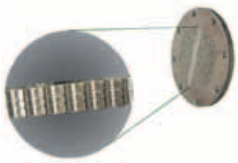


ThermalStar Smart (4000 - 15000 scfm) - Key Features

- Thermal Bank System
- Flood Level Control
- High Efficiency Tube and Shell Heat Exchangers
- Grooved Tube Sheets
- Reliable Demand Drain

Flood Level Control

Tube and Shell Heat Exchanger



Grooved Tubesheets

Demand Drain

Benefits:

Thermal Bank System delivers cleaner and drier compressed air

Easily serviced main heat exchanger

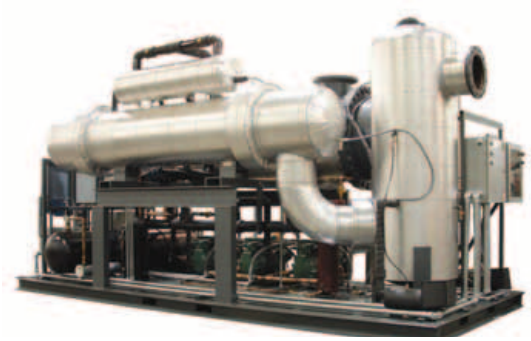
Precise timing and programming , no “freeze-up” conditions

Improved performance (2X main evaporator surface area)

Simple, reliable, and non-fouling

Leak-proof joints

Greater mechanical strength and precision milled grooves in tube sheets



Engineering Specifications

Product Selection

Model	Air Connections	Capacity (scfm) @ 100 psi g (Nm³/min @ 7 bar g)	Dimensions ins (mm)			Weight		Primary Voltages	Replacement Separator Element	Recommended Pre Filter	Recommended After Filter
			H	W	L	lbs	kg				
TM1250	3" Flg	1250 (35)	65 (1651)	74 (1880)	41 (1041)	1850	839	460V/3Ph/60Hz	JE1600-C10	AO-055JNFI	AA-055JNFI
TM1600	4" Flg	1600 (45)	72 (1829)	78 (1981)	48 (1219)	2200	998	460V/3Ph/60Hz	JE1600-C10	AO-2250ODFI	AA-2250ODFI
TM2050	6" Flg	2050 (58)	76 (1930)	102 (2591)	54 (1372)	3000	1361	460V/3Ph/60Hz	(3) JE1000-C10	AO-2250ODFI	AA-2250ODFI
TM2500	6" Flg	2500 (71)	76 (1930)	102 (2591)	54 (1372)	3370	1529	460V/3Ph/60Hz	(3) JE1000-C10	AO-2300ODFI	AA-2300ODFI
TM3000	6" Flg	3000 (85)	85 (2159)	108 (2743)	66 (1676)	4015	1821	460V/3Ph/60Hz	JE3000-C10	AO-2350PDFI	AA-2350PDFI

*Flow rates at the following climatic conditions - Ambient Temperature: 100°F (38°C), Inlet Temperature: 100°F (38°C), Inlet Pressure: 100 psi g (7 bar g).
Air-cooled & water-cooled available (TM1250 - TM3000)

Model	Air Connections	Capacity (scfm) @ 100 psi g (Nm³/min @ 7 bar g)	Dimensions ins (mm)			Weight		Primary Voltages	Replacement Separator Element	Recommended Pre Filter	Recommended After Filter
			H	W	L	lbs	kg				
TM4000	8" Flg	4000 (113)	95 (2413)	108 (2743)	68 (1727)	5680	2576	460V/3Ph/60Hz	(2) JE-C1600-30	AO-2350PDFI	AA-2350PDFI
TM5000	8" Flg	5000 (142)	95 (2413)	108 (2743)	68 (1727)	6415	2910	460V/3Ph/60Hz	(2) JE-C1600-30	AO-2400QDFI	AA-2400QDFI
TM6000	8" Flg	6000 (170)	95 (2413)	146 (3708)	76 (1930)	7725	3504	460V/3Ph/60Hz	(3) JE-C1600-30	AO-2400QDFI	AA-2400QDFI
TM8000	10" Flg	8000 (226)	95 (2413)	146 (3708)	76 (1930)	9610	4359	460V/3Ph/60Hz	(4) JE-C1600-30	AO-2450RDFI	AA-2450RDFI
TM10000	10" Flg	10000 (283)	95 (2413)	161 (4089)	83 (2108)	11020	4999	460V/3Ph/60Hz	(3) JE-C2000-30	AO-2450RDFI	AA-2450RDFI
TM12500	12" Flg	12500 (354)	111 (2819)	160 (4064)	94 (2388)	13250	6010	460V/3Ph/60Hz	(4) JE-C2000-30	AO-2500SDFI	AA-2500SDFI
TM15000	12" Flg	15000 (425)	120 (3048)	150 (3810)	100 (2540)	14600	6623	460V/3Ph/60Hz	(3) JE-C3000-30	AO-2500SDFI	AA-2500SDFI

Dryer Models	Max Inlet Pressure		Max Inlet Temperature		Max Ambient Temperature		Min Ambient Temperature		Refrigerant
	psi g	bar g	°F	°C	°F	°C	°F	°C	
TM1250 - TM1600	200	13.7	131	55	115	46	41	5	R404A
TM2050 - TM3000	150	10.3	131	55	115	46	41	5	R404A
TM4000 - TM15000	150	10.3	131	55	115	46	41	5	R404A

Correction Factors

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

Temperature Correction Factor CFT (Ambient Temperature (C1))								
Ambient Temperature	**°F**	80	90	95	100	105	110	115
	°C	27	32	35	38	41	43	46
	CFT	1.12	1.08	1.05	1.00	0.95	0.90	0.84

Temperature Correction Factor CFT (Inlet Temperature (C2))												
Inlet Temperature	**°F**	80	85	90	95	100	105	110	115	120	130	140
	°C	27	29	32	35	38	41	43	46	49	54	60
	CFT	1.22	1.22	1.22	1.10	1.00	0.92	0.83	0.76	0.69	0.56	0.46

Pressure Correction Factor CFP (Inlet Pressure (C3))												
Inlet Pressure	**psi g**	50	60	75	80	90	100	110	125	130	140	150
	bar g	3.5	4.1	5.2	5.5	6.2	6.9	7.6	8.6	9.0	9.7	10.3
	CFP	0.80	0.84	0.90	0.92	0.96	1.00	1.01	1.02	1.03	1.04	1.05

Worldwide Filtration Manufacturing Locations

North America

Compressed Air Treatment

Filtration & Separation/Balston
Haverhill, MA
978 858 0505
www.parker.com/balston

Finite Airtek Filtration
Airtek/domnick hunter/Zander
Lancaster, NY
716 686 6400
www.parker.com/faf

Finite Airtek Filtration/Finite
Oxford, MI
248 628 6400
www.parker.com/finitefilter

Engine Filtration & Water Purification

Racor
Modesto, CA
209 521 7860
www.parker.com/racor

Racor
Holly Springs, MS
662 252 2656
www.parker.com/racor

Racor
Beaufort, SC
843 846 3200
www.parker.com/racor

Racor – Village Marine Tec.
Gardena, CA
310 516 9911
desalination.parker.com

Hydraulic Filtration

Hydraulic Filter
Metamora, OH
419 644 4311
www.parker.com/hydraulicfilter

Process Filtration

domnick hunter Process Filtration
Oxnard, CA
805 604 3400
www.parker.com/processfiltration

Europe

Compressed Air Treatment

domnick hunter Filtration & Separation
Gateshead, England
+44 (0) 191 402 9000
www.parker.com/dhfns

Parker Gas Separations
Etten-Leur, Netherlands
+31 76 508 5300
www.parker.com/dhfns

Hiross Zander
Padova Business Unit
Padova, Italy
+39 049 9712 111
www.parker.com/hzd

Hiross Zander
Essen Business Unit
Essen, Germany
+49 2054 9340
www.parker.com/hzd

Engine Filtration & Water Purification

Racor
Dewsbury, England
+44 (0) 1924 487 000
www.parker.com/rfde

Racor Research & Development
Stuttgart, Germany
+49 (0)711 7071 290-10
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Hydraulic Filtration

Hydraulic Filter
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Condition Monitoring Center
Norfolk, England
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