aerospace climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Smart Cycle Plus

Cycling Refrigerated Air Dryers (1200 - 3000 scfm)

Magnum Series

Cycling Refrigerated Air Dryers (4000 - 15000 scfm)

Cycling Refrigerated Air Dryers

Smart Cycle Plus (SCP) and Magnum Series

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 Smart Cycle Plus or Magnum Cycling Refrigerated Air Dryer package complete with Parker Airtek filtration.

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.

Smart Cycle Plus and Magnum 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, Smart Cycle Plus and Magnum's advanced technical solutions offer reliability, efficiency, and energy savings, making it the ideal solution for all industrial users.

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 level actuated energy saving drain**
- **Low pressure drop design**
- **Microprocessor based energy management controller**
- **Flood level control protects refrigerant circuit**
- **Tube & shell heat exchanger**

SCP1200

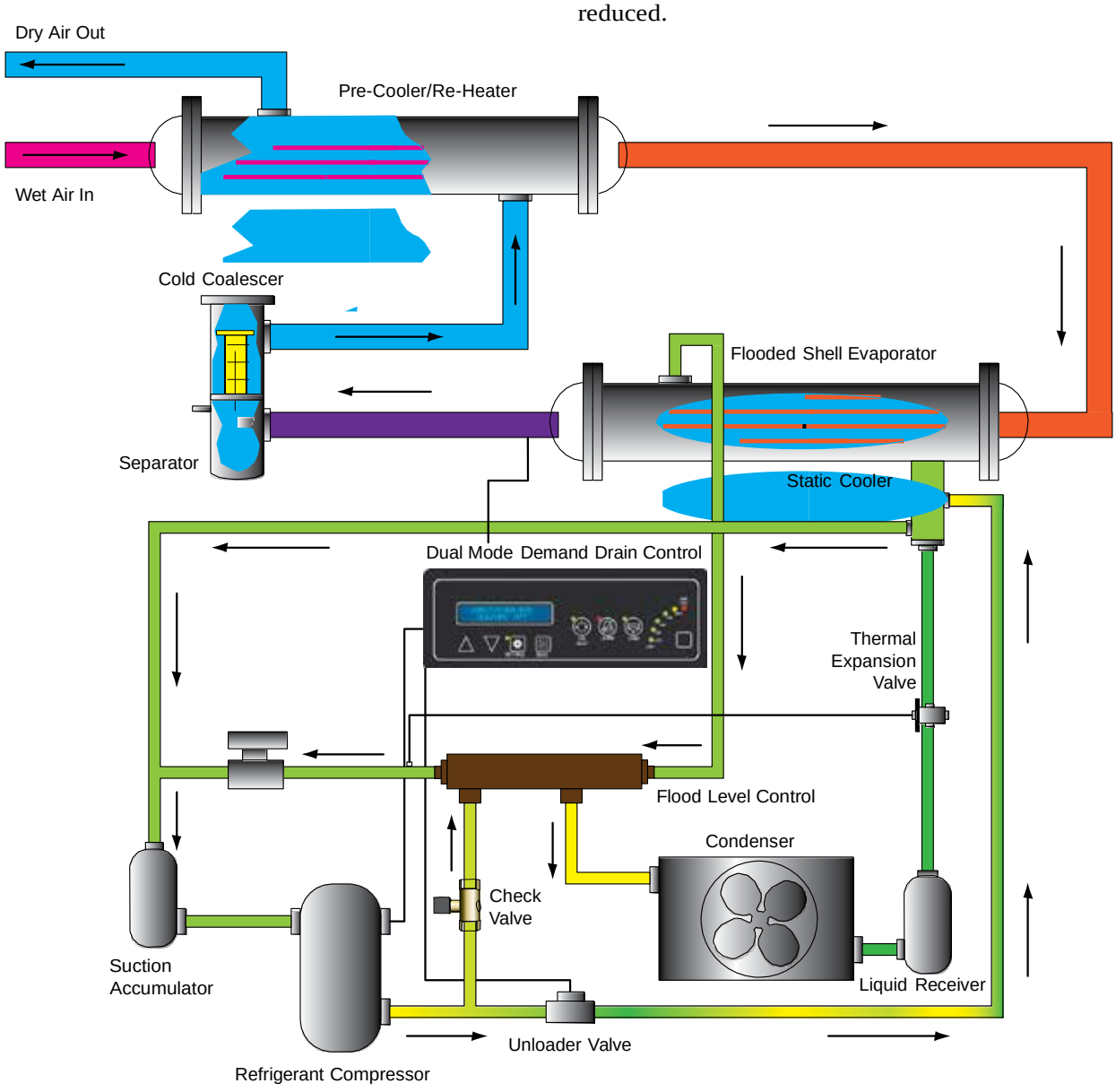
MSC6000

Smart Cycle Plus - How it works

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

The Smart Cycle Plus 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.

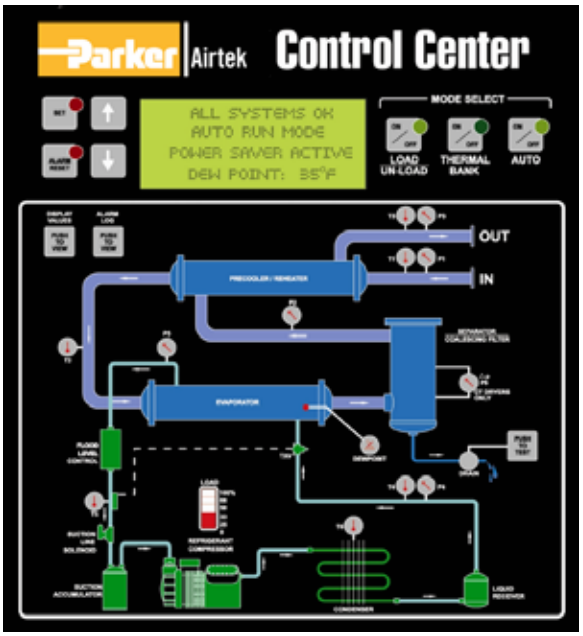


	Warm Wet Air
	Partially Cooled Air
	Cold Wet Air
	Dry Purified Air

	Liquid Refrigerant
	Cold Refrigerant Gas
	Hot Refrigerant Gas

Smart Cycle Plus - Features

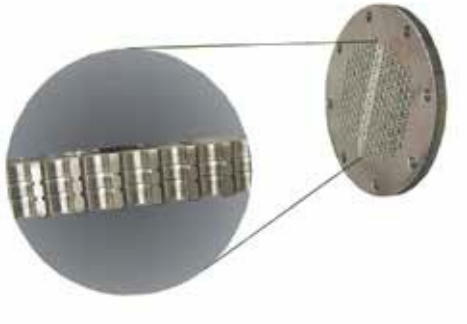
- Best in class dewpoint performance
- Tri Mode Operation allows dryer to operate in cycling, non-cycling or auto mode.
- Unlimited cycling due to unloaded “soft start”
- Multi-stage separation and filtration
- Level actuated drain
- Diagnostic readouts indicate need for service
- Drain light
- Alarm 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 Control Center



Benefits

- Lower dewpoint temperature achieved with Smart Cycle Plus 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

Magnum Series - How it works

Parker Airtek's demand control with cylinder head unloading reduces energy consumption and maintains a true and constant dewpoint by turning the refrigeration compressor on or off in direct response to the actual dewpoint temperature of the compressed air.

Air Circuit

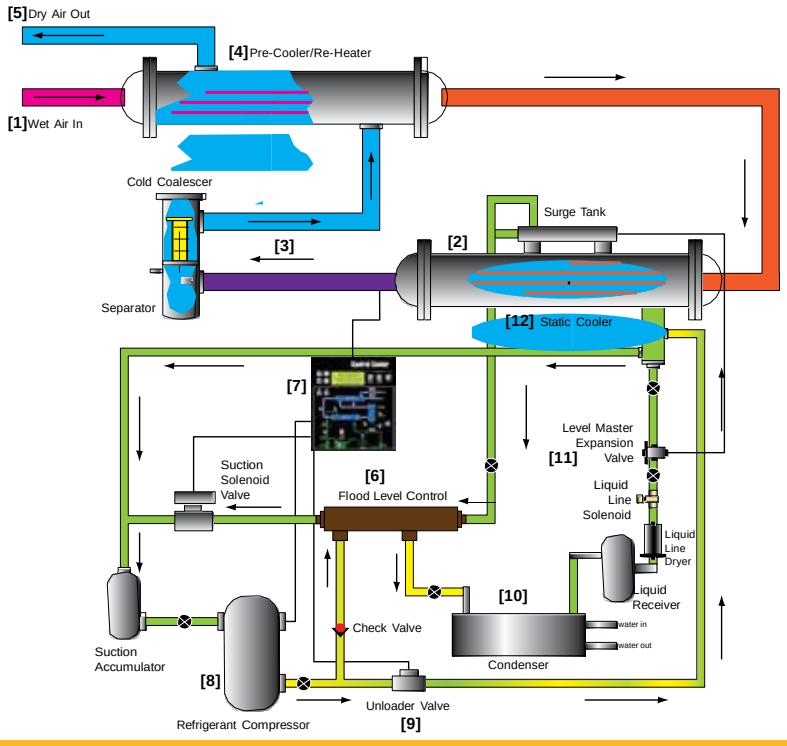
Saturated compressed air enters the tubes at the air to air heat exchanger [1] where it is precooled by the cold compressed air returning through the shell from the evaporator. After the compressed air has been precooled, it flows into the evaporator tubes [2] where the temperature is lowered to approximately 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 Airtek's 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 control center panel [7].

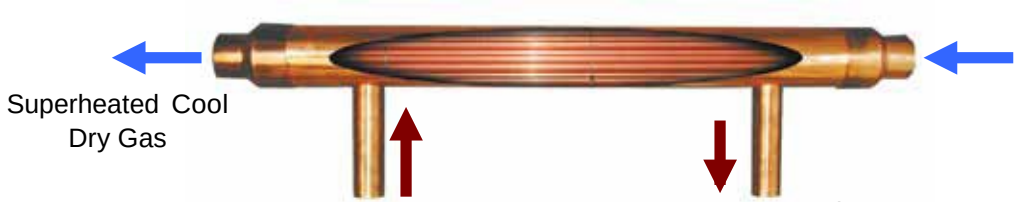
When the air temperature reaches its low set point, the compressor will either shut off, or unload, saving energy during periods of low load. When the dewpoint setting is reached, the compressor [8] will resume normal operation. When operating in the cycling mode, a virtually unlimited number of stops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



Magnum Series - 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

Smart Cycle Plus Series (SCP1200 - SCP3000)

Model	Capacity (scfm) @ 100 psi g (Nm^3/min @ 7 bar g)	Air Connection	Dimensions			Approx. Weight lbs. (kg)	Electrical Supply	Replacement Coalescing Element	Pre Filter	After Filter
			H in (mm)	W in (mm)	L in (mm)					
SCP1200	1250 (36)	3” Flg	65 (1651)	74 (1880)	41 (1041)	1850 (839)	460V/3Ph/60Hz	JE1600-C10	JL1250-C	JL1250-F
SCP1500	1600 (45)	4” Flg	72 (1829)	78 (1981)	48 (1219)	2200 (998)	460V/3Ph/60Hz	JE1600-C10	JL1600-C	JL1600-F
SCP2000	2050 (58)	6” Flg	76 (1930)	102 (2591)	54 (1372)	3000 (1361)	460V/3Ph/60Hz	(3) JE1000-C10	JL2000-C	JL2000-F
SCP2500	2500 (71)	6” Flg	76 (1930)	102 (2591)	54 (1372)	3370 (1529)	460V/3Ph/60Hz	(3) JE1000-C10	JL2600-C	JL2600-F
SCP3000	3000 (85)	6” Flg	85 (2159)	108 (2743)	66 (1676)	4015 (1821)	460V/3Ph/60Hz	JE3000-C10	JL3000-C	JL3000-F

*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 (SCP1200-SCP3000)

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	
SCP1200 - SCP1500	200	13.7	131	55	115	46	41	5	R404A
SCP2000 - SCP3000	150	10.3	131	55	115	46	41	5	R404A

Magnum MSC Series

Model	Capacity (scfm) @ 100 psi g (Nm^3/min @ 7 bar g)	Refrig. (hp)	Refrig.	Oper. (kW)	Electrical Supply
MSC4000	4000 (113)	20	R-404A	14.9	460V/3Ph/60Hz
MSC5000	5000 (142)	25	R-404A	18.2	460V/3Ph/60Hz
MSC6000	6000 (170)	30	R-404A	21.1	460V/3Ph/60Hz

Magnum MSC Series

Model	Capacity (scfm) @ 100 psi g (Nm^3/min @ 7 bar g)	Refrig. (hp)	Refrig.	Oper. (kW)	Electrical Supply
MSC8000	8000 (226)	40	R-404A	31.9	460V/3Ph/60Hz
MSC10000	10000 (283)	50	R-404A	39.9	460V/3Ph/60Hz
MSC12500	12500 (354)	40	R-404A	31.9	460V/3Ph/60Hz
MSC15000	15000 (425)	50	R-404A	39.9	460V/3Ph/60Hz

Notes:
(1) Cold Coalescing Element Standard
(2) Pressure dewpoint is based on CAGI ADF 100 Standard for rating and testing compressed air dryers. 100 psi g (7 bar g) inlet air pressure, 100°F (38°C) inlet air temperature, 100°F (38°C) ambient temperature.
(3) Factory Supervised Startup - (standard in Continental US only)
(4) Larger Sizes Available - Consult Factory
(5) Dryer needs to be fully protected from nature's elements (i.e. rain, wind, snow, etc.)

Correction Factors

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

Ambient Temperature (C1)

°F	80	90	95	100	105	110	115
°C	27	32	35	38	41	43	46
Factor	1.12	1.08	1.05	1.00	0.95	0.90	0.84

Inlet Temperature (C2)

°F	80	85	90	95	100	105	110	115	120	130
°C	27	29	32	35	38	41	43	46	49	54
Factor	1.22	1.22	1.22	1.10	1.00	0.92	0.83	0.76	0.69	0.56

Working Pressure (C3)

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
Factor	0.80	0.84	0.90	0.92	0.96	1.00	1.01	1.02	1.03	1.04	1.05