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process control  
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## Cold Energy Saver

Thermal Mass Cycling Refrigerated Air Dryers  
(200 - 1000 scfm)



# Cold Energy Saver

## Thermal Mass Cycling Refrigerated 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.

These costly contamination problems can be avoided by installing a Cold Energy Saver Thermal Mass Cycling Refrigerated Air Dryer complete with Parker Airtek filtration. The combination of our thermal mass dryer 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.

Cold Energy Saver dryers perfectly and continuously adapt to the actual operating conditions, ensuring perfect dewpoint control together with the lowest operating costs. Over and above this extreme flexibility of use, Cold Energy Saver advanced technical solutions offer reliability, efficiency, energy savings, compact dimensions and low weight, making it the ideal solution for all industrial users.

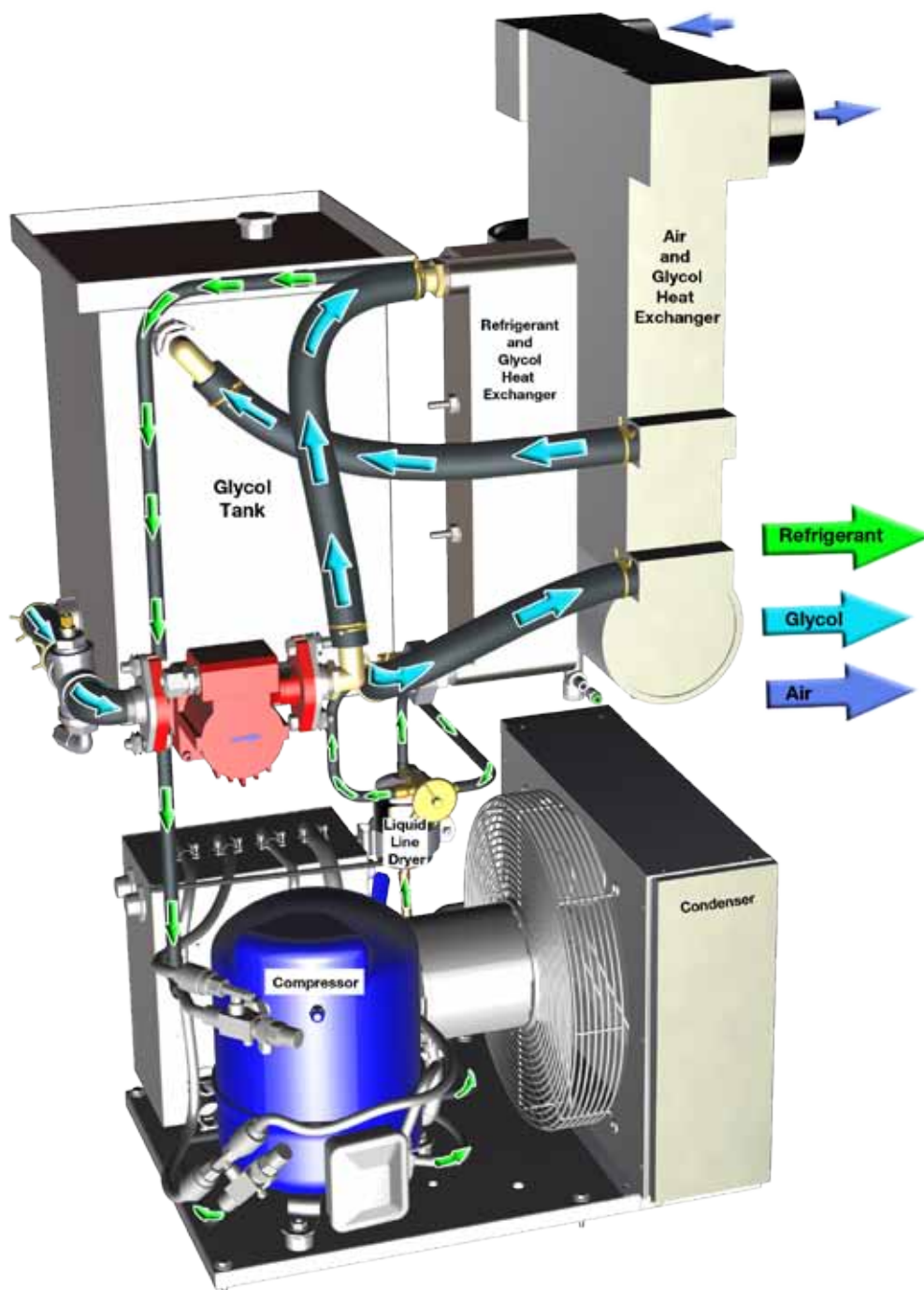
## Benefits:

- **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**
- **ColdPack 4-in-1 heat exchanger**
- **Integral zero air loss energy saving drain (400 -1000 scfm)**
- **Low pressure drop design**
- **Microprocessor based energy management controller**
- **Unique Thermal Mass ColdStorage reduces power consumption and improves temperature control.**



# Cold Energy Saver - How it works

There are three circuits: air, glycol, and refrigerant. The refrigerant cools the glycol and the glycol cools the air to improve efficiency. With these three circuits, there are two primary heat exchangers: the air and glycol and the glycol and refrigerant heat exchangers. Both insulated heat exchangers use counter flow to produce optimum heat transfer to the glycol cooling fluid.



# Smart technology: the benefits



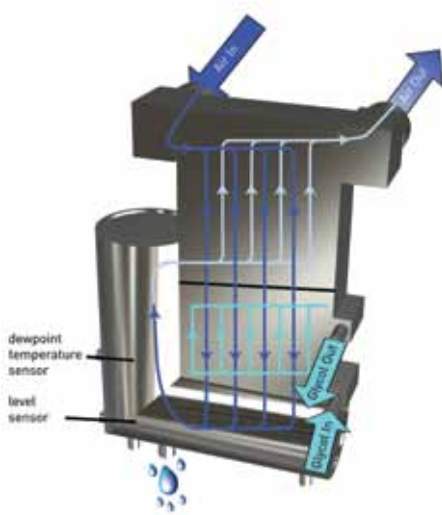
## Technology that adjusts energy consumption

Parker Airtek's technology automatically and precisely adjusts energy consumption in response to actual operating conditions (air variability and seasonal changes), avoiding unnecessary waste. This technology controls the dryer operation via multiple sensors guaranteeing maximum savings and avoiding dewpoint surges. Parker Airtek's ColdPack heat exchanger's all-in-one design and thermal insulation further enhance the overall energy savings.

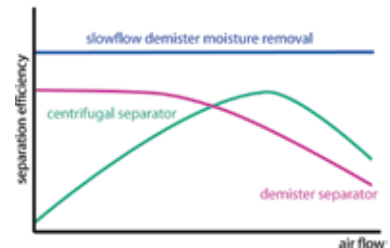
## Patented ColdPack 4-in-1 heat exchanger design

A 4-in-1 ColdPack heat exchanger features an extremely robust, all-in-one aluminum design, with no interconnecting piping.

ColdPack features the lowest pressure drop in the industry, notable energy savings and guaranteed dewpoint. Optimum dewpoint performance is ensured thanks to wide air channels leading to low air velocities, an oversized slowflow demister separator offering perfect condensate separation even at partial air flows and a dewpoint temperature sensor within the air flow for improved control. The generously sized air-to-air section and insulation contribute to a very low power consumption.



The 4-in-1 design promotes Continuous Active Separation. Separation occurs as soon as the condensate forms so most of the condensate is already removed before the air reaches the demister separator. This allows the demister to act as a final polisher - removing only the finest condensate droplets that have made it this far. The demister separator is unique in that it provides efficient separation at any air flow. Most competitors use centrifugal separators, which are designed to operate efficiently at 100% of their rated flow, but lose efficiency at higher or lower flows.



## Integral zero air loss drain with fail safe trigger (400 - 1000 scfm)

A truly unique part of ColdPack is the integral zero loss drain. The drainage chamber is integrated into the heat exchanger while the drain 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.



## Environmentally friendly

Montreal Protocol compliant R404A refrigerant allows for zero ozone depletion, low global warming potential and low refrigerant charge. Because R404A does not separate easily, it is more reliable for these designs and therefore the refrigerant of choice for cycling applications.

# Cold Energy Saver (CESM200 - CESM1000)



## Features

- 5 year warranty
- High operating limits
- Easy to remove panels with frontal access to all major components
- User friendly control panel
- Aluminum heat exchangers for maximum efficiency
- Environmentally friendly propylene glycol
- ETL listed complete unit
- ColdControl - UL listed
- Refrigerant compressor overload protection switch
- Rugged sheet metal enclosure with polyester-based powder coat finish withstands harsh environment.
- Automatic fan cycling controls on each fan (air-cooled models)
- Suction pressure gauge - Standard all models
- Remote board loop 4-20 mA - Optional
- Integral zero air loss drain valve (CESM400 - CESM1000)



CESM200 - CESM1000

### Microprocessor based Energy Management Controller - Standard

#### Display LEDs

- Dryer ON
- Common Alarm
- Drain Open
- Drain Alarm
- Power Save

#### Setting

- Degrees °F/°C
- Set Dewpoint

#### Digital Display Readouts

- Process control temperature
- Set auto drain off time (minutes)
- Factory dewpoint set at 39°F (4°C)

#### Adjustable Operating Parameters

- Adjustable dewpoint (36-50°F (2-10°C))
- Automatic drain close time
- Automatic drain test

#### Fault Alarm Warnings (W) and Shutdowns (S)

- High dewpoint (W)
- Low evaporative temperature alarm shutdown (S)
- Dryer overload alarm shutdown (S)
- Low refrigerant pressure alarm shut down (S)
- High refrigerant pressure alarm shut down (S)
- Low coolant temperature shutdown alarm (S)
- Drain fault alarm with back-up time drain mode (W)
- Sensor fault open dewpoint sensor alarm (S)
- Sensor fault shorted dewpoint sensor alarm (S)
- Sensor fault open thermal mass sensor alarm (S)
- Sensor fault shorted thermal mass sensor alarm (S)
- Service due indicator (W)
- Compressor protection anti short cycle warning ("CP") (W)
- Short cycle shutdown (S)

# Parker Airtek filtration, add to your savings

Any restriction to airflow within a filter housing and element will reduce the system pressure. To generate compressed air, large amounts of electrical energy are consumed, therefore any pressure lost within the system can be directly converted into a cost for wasted energy. The higher the pressure loss, the higher the energy costs. In order to build upon the low pressure drop of the Cold Energy Saver Series, not just any compressed air filter will do.

## Parker Airtek High Efficiency Filtration

- Maximum oil carryover 0.008 PPM w/ - ISO12500-1 tested at 40 PPM inlet challenge.
- ISO 8573-1 Class performance
- Elements are self sealing.
- Epoxy saturated borosilicate glass micro-fiber media with outer synthetic fabric dryer layer allowing swift removal of coalesced liquids.
- Includes DPI (Differential Pressure Indicator) providing visual assurance of performance.
- Includes float drain on JC Series filters
- Durable aluminum chromated heads and bowls with powder coated finish.
- Large sump capacity to handle condensate.
- Simple installation and easy maintenance.



International Standard ISO8573-1 has become the industry standard method for specifying compressed air cleanliness.

ISO8573-1.2010 Class	Solid Particulate			Mass Concentration mg/ m <sup>3</sup>	Vapor Pressure Dewpoint	Water	Oil
	Maximum number of particles per m <sup>3</sup>					Liquid g/ m <sup>3</sup>	Total Oil (liq & vapor) mg/ m <sup>3</sup>
	0.1 - 0.5 micron	0.5 - 1 micron	1 - 5 micron				
0	As specified by the equipment taker or supplier and more stringent than Class 1.						
1	< 20,000	< 400	< 10	-	< -100°F (-70°C)	-	0.01
2	410,000	15,000	100	-	-40°F (-40°C)	-	0.1
3		< 90,000	< 1000		< 4°F (20°C)		1
4			< 10,000		< 37.4°F (3°C)		5
5	-	-	< 100,000	-	< 44.6°F (7°C)	-	-
6	-	-	-	< 5	< 50°F (10°C)	-	-
7	-	-	-	5 - 10	-	< 0.5	-
8	-	-	-	-	-	0.5 - 5	-
9				>10		5 - 10	
X						>10	>10

# Technical (CESM200 - CESM1000)

## Air-Cooled Units

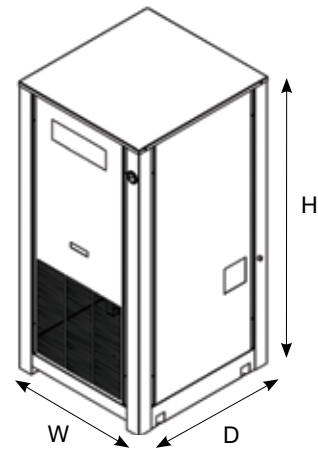
Model	Nominal Capacity (scfm)	Air Connection	Dimensions ins (mm)			Weight lbs (kg)	Electrical Supply	Recommended Pre Filter	Recommended After Filter
			H	W	D				
CESM200	200	2" FPT	58 (1473.2)	28 (711.2)	30 (762.0)	446 (202)	230V/1Ph/60Hz	JC0250-C10	JC0250-C
CESM250	250	2" FPT	58 (1473.2)	28 (711.2)	30 (762.0)	492 (223)	230V/1Ph/60Hz 230V/3Ph/60Hz 460V/3Ph/60Hz	JC0250-C10	JC0250-C
CESM325	325	2" FPT	58 (1473.2)	28 (711.2)	30 (762.0)	508 (230)	230V/1Ph/60Hz 230V/3Ph/60Hz 460V/3Ph/60Hz	JC0350-C10	JC0350-C
CESM400	400	2" FPT	61 (1549.4)	41 (1041.4)	36 (914.4)	702 (318)	230V/3Ph/60Hz 460V/3Ph/60Hz	JC0450-C10	JC0450-C
CESM500	500	2" FPT	61 (1549.4)	41 (1041.4)	36 (914.4)	712 (323)	230V/3Ph/60Hz 460V/3Ph/60Hz	JC0625-C10	JC0625-C
CESM700	700	3" FPT	76 (1930.4)	60 (1524.0)	48 (1219.2)	1022 (464)	230V/3Ph/60Hz 460V/3Ph/60Hz	JC0800-C10	JC0800-C
CESM850	850	3" FPT	76 (1930.4)	60 (1524.0)	48 (1219.2)	1047 (475)	230V/3Ph/60Hz 460V/3Ph/60Hz	JC1000-C10	JC1000-C
CESM1000	1000	3" FPT	76 (1930.4)	60 (1524.0)	48 (1219.2)	1174 (533)	230V/3Ph/60Hz 460V/3Ph/60Hz	JC1000-C10	JC1000-C

575V/3Ph/60Hz available (CESM250 - CESM1000)

Air-cooled - Standard. Water-cooled available (CESM250 - CESM1000)

## Technical data

Maximum ambient temperature:	115°F (46°C)
Maximum inlet temperature:	140°F (60°C)
Minimum ambient temperature:	41°F (5°C)
Maximum Pressure:	200 psi g (13.8 bar g)
Refrigerant:	R404A



CESM200 - CESM1000

## Flow correction factors

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

### Ambient Temperature (C1) air-cooled only

°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	140
°C	27	29	32	35	38	41	43	46	49	54	60
Factor	1.22	1.22	1.22	1.10	1.00	0.92	0.83	0.76	0.69	0.56	0.46

### Inlet 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

# Worldwide Filtration Manufacturing Locations

## North America

### Compressed Air Treatment Filtration & Separation/Balston

Haverhill, MA  
978 858 0505  
[www.parker.com/balston](http://www.parker.com/balston)

### Finite Airtek Filtration Airtek/domnick hunter/Zander

Lancaster, NY  
716 686 6400  
[www.parker.com/faf](http://www.parker.com/faf)

### Finite Airtek Filtration/Finite

Oxford, MI  
248 628 6400  
[www.parker.com/finitefilter](http://www.parker.com/finitefilter)

### Engine Filtration & Water Purification Racor

Modesto, CA  
209 521 7860  
[www.parker.com/racor](http://www.parker.com/racor)

### Racor

Holly Springs, MS  
662 252 2656  
[www.parker.com/racor](http://www.parker.com/racor)

### Racor

Beaufort, SC  
843 846 3200  
[www.parker.com/racor](http://www.parker.com/racor)

### Racor – Village Marine Tec.

Gardena, CA  
310 516 9911  
[desalination.parker.com](http://desalination.parker.com)

### Hydraulic Filtration

#### Hydraulic Filter

Metamora, OH  
419 644 4311  
[www.parker.com/hydraulicfilter](http://www.parker.com/hydraulicfilter)

### Process Filtration

#### domnick hunter Process Filtration

Oxnard, CA  
805 604 3400  
[www.parker.com/processfiltration](http://www.parker.com/processfiltration)

## Europe

### Compressed Air Treatment domnick hunter Filtration & Separation

Gateshead, England  
+44 (0) 191 402 9000  
[www.parker.com/dhfn](http://www.parker.com/dhfn)

### Parker Gas Separations

Etten-Leur, Netherlands  
+31 76 508 5300  
[www.parker.com/dhfn](http://www.parker.com/dhfn)

### Hiross Zander

Padova Business Unit  
Padova, Italy  
+39 049 9712 111  
[www.parker.com/hzd](http://www.parker.com/hzd)

### Hiross Zander

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Essen, Germany  
+49 2054 9340  
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### Engine Filtration & Water Purification

#### Racor

Dewsbury, England  
+44 (0) 1924 487 000  
[www.parker.com/rfde](http://www.parker.com/rfde)

### Racor Research & Development

Stuttgart, Germany  
+49 (0)711 7071 290-10  
[www.parker.com/rfde](http://www.parker.com/rfde)

### Hydraulic Filtration

#### Hydraulic Filter

Arnhem, Holland  
+31 26 3760376  
[www.parker.com/hfde](http://www.parker.com/hfde)

### Urjala Operation

Urjala, Finland  
+358 20 753 2500  
[www.parker.com/hfde](http://www.parker.com/hfde)

### Condition Monitoring Center

Norfolk, England  
+44 1842 763 299  
[www.parker.com/hfde](http://www.parker.com/hfde)

### Process Filtration

#### domnick hunter Process Filtration

Birtley, England  
+44 (0) 191 410 5121  
[www.parker.com/processfiltration](http://www.parker.com/processfiltration)

## Asia Pacific

### Australia

Castle Hill, Australia  
+61 2 9634 7777  
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+86 21 5031 2525  
[www.parker.com/china](http://www.parker.com/china)

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+91 22 651 370 8185  
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+81 45 870 1522  
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+82 31 359 0852  
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+65 6887 6300  
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Bangkok, Thailand  
+66 2 186 7000  
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## Latin America

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+55 12 4009 3500  
[www.parker.com/br](http://www.parker.com/br)

### Pan American Division

Miami, FL  
305 470 8800  
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## Africa

Aeroporto Kempton Park, South Africa  
+27 11 9610700  
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