Jemaco™

PCM Air Dryer

Nomenclature

PCM Series

PCM [ ] J — [ ]

Model	Flow capacity (Nm^3/min)
2.8	2.8
4.6	4.6
7.5	7.5
14.0	14.0
16.5	16.5
25.0	25.0
37.4	37.4
46.8	46.8
62.4	62.4
93.6	93.6
140.4	140.4
187.2	187.2
234.0	234.0
280.8	280.8
327.6	327.6
374.4	374.4

Options	
T	Stainless steel 304 air inlet/outlet piping & separator
X	Common inlet /outlet air header with isolation valve

* Options 'T' is available on models PCM 25.0J and larger
* Options 'X' is available on models PCM 93.6J and larger

Industrial Technologies & Services Korea Co., Ltd.

Headquarters and factories
87, Jangansandan 9-ro, Jangan-eup, Gijang-gun, Busan, Republic of Korea
TEL. +82-51-728-5360, FAX. +82-51-728-5359

Seoul office
3F, 21, Gukhoe-daero 62-gil, Yeongdeungpo-gu, Seoul, Republic of Korea (Yeouido-dong, Dongseong Building)
TEL. +82-2-6297-4000, FAX. +82-2-783-0160

Contact Infomation:

jemacoair.com

Bulletin C.917E, Rev.E(09/23)

Jemaco™

Automatic and Energy Saving Solutions for Tropical Regions

PCM Air Dryer

jemacoair.com

Why Do Compressed Air Systems Need Drying?

IT&S provides compressed-air dryers and filters that remove oil, water, dirt, rust and pipe scale. Contaminants found in compressed air can adversely affect all components of an air distribution system, and can cause a malfunction of pneumatic control in the instrument air system.

Properly treated compressed air can improve work efficiency and reduce maintenance. Desiccant and refrigerated type compressed air dryers are used in the control air systems of power plants.

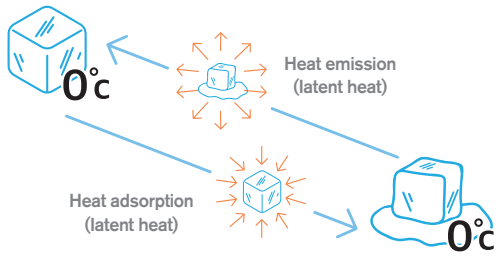
PCM Air Dryer

From 20HP to 3200HP and larger PCM Series is the ultimate solution providing perfect dehydration and enormous energy savings!

This PCM technology harnesses the latent heat occurs when PCM converts solid to liquid or liquid to solid, which automatically triggers the refrigeration compressor to switch On/Off according to varying compressed air heat loads.

Latent Heat

Latent heat is energy released or absorbed by a body or a thermodynamic system, during a constant temperature process that is specified in some way. For instance, when ice melts into water, it absorbs heat from its surroundings. Vice versa, when water freezes into ice, the same volume of the heat is released. As such, when heat flows in and out at constant temperature, we call this heat as latent heat.
In general, latent heat value is much higher than sensible heat value. For example, sensible heat value for water is 4.18KJ/kgC, but latent heat for changing water to ice at constant temperature of 0˚C is 334kJ/kg which is 80 times of sensible heat value.



Why Phase Change Material?

PCM is a substance with high latent heat which melts or solidifies at a certain temperature, thus being able to absorb or release large amounts of energy.
Taking advantage of the magnitude of latent heat (at change of phase) which is a multitude of times higher than sensible heat (at change of temperature), PCM air dryer provides sufficient cold storage with only a small amount of phase change material. As a result, PCM air dryer is in simple engineering design, compared to existing "Thermal Mass" air dryers which are available in the market.
Hence with PCM's cutting edge technology, IT&S has introduced the most cost-effective and efficient high performance air dryer in the industry.

IT&S Korea

Unique Product Design

- Adopted Phase change material PCM (Patented)
- Stainless steel brazed plate heat exchanger with PCM filled in
- Automatically triggers refrigeration compressor to switch On/Off according to varying compressed air heat loads

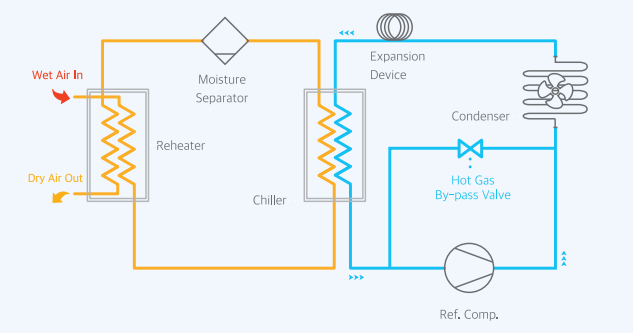
Zero Loss Drain

- Electrostatic capacity sensor
- Zero loss of compressed air when condensate water is discharged
- Automatically switch to timer mode at malfunction
- EDV (Models PCM18.9J and smaller)

Great Energy Efficiency

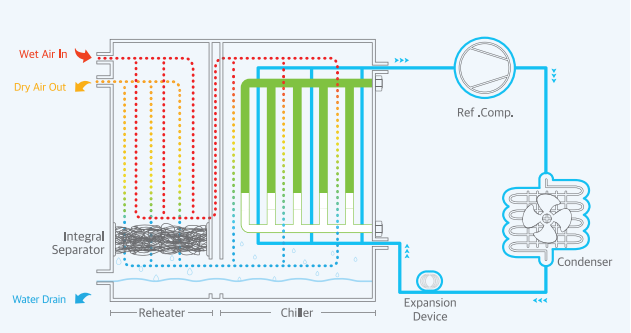
- Up to 99% energy saving with the lowest cost
- Shortest period of return of investment

Non-Cycling Air Dryer (Conventional)



- Hot gas by-pass valve
- Continuous running at fixed RPM
- Simple configuration
- Low price
- Low efficiency
- Unstable dew point

Cycling (PCM Air Dryer)



- Utilize latent heat of phase change material
- Load control by On/Off cycling
- Heat exchanger with no pump/valve/tank (Simplest design)
- Competitive price
- Highest energy efficiency with minimum heat loss
- Stable dew point

PCM Air Dryer

Features

PCM 2.8 ~ 16.5J PCM 25.0 ~ 62.4J * PCM 93.6 ~374.4J (Modular design)

*** Common Inlet / outlet header and valves to be supplied by customer**

Unique Product Design

Minimalist design but unparalleled energy savings

Advanced OPTi-Eco control panel

OPTi-Eco
Level 2 Controller

- Power On/Off
- Alarm status
- Air dryer running light
- Air dryer running time
- Ref. comp. running light
- Ref. comp. running time
- 485 Modbus communication port
- Energy saving %
- Energy saving graph
- Dew point indicator

High Durability

PCM contained in the stainless steel brazed plate heat exchanger

- Streamlined design with minimum components, dispense with glycol tank, pump, pipe, etc.
- High efficiency, performance, and stable dew point
- Anti-corrosive stainless steel material
- Helium leak tests (below 0.3g/year)

Heat Exchanger

PCM Storage, Re-heater, Chiller and Separator Combined into 4 in 1 Module (PCM 2.8~16.5J)

- Low pressure drop reduces operating costs
- Compact design saves floor space
- Simple structure, ease of maintenance

High efficiency condensing unit

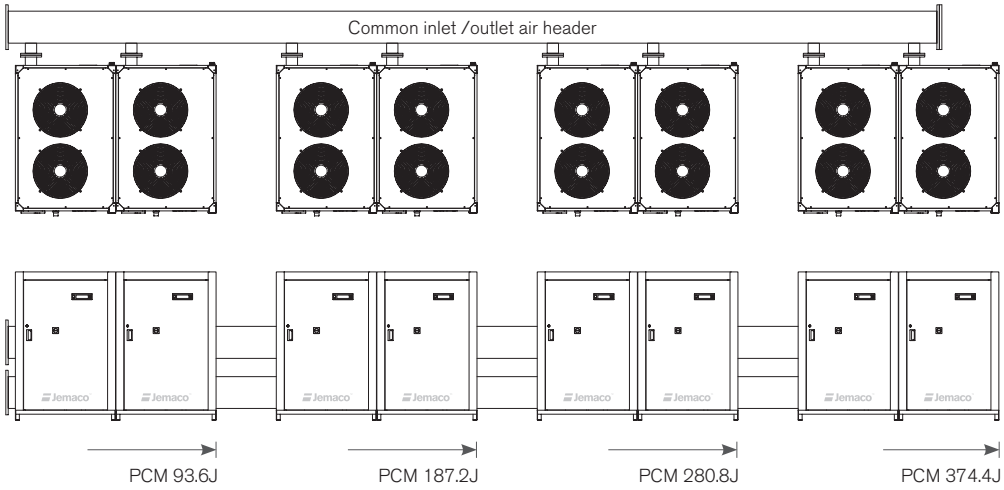
- Optimized efficiency and durability with brazed aluminum material
- Up-flow design of condenser exhaust vent, saves installation space

Eco-friendly refrigerant R-407C

Module Type

Modular design (Models PCM 93.6J and larger)

- Easy to increase flow capacity by adding additional unit
- Stable dew point even when trouble occurs (independent unit operation)
- Multi-unit integrated control with master controller (Optional)



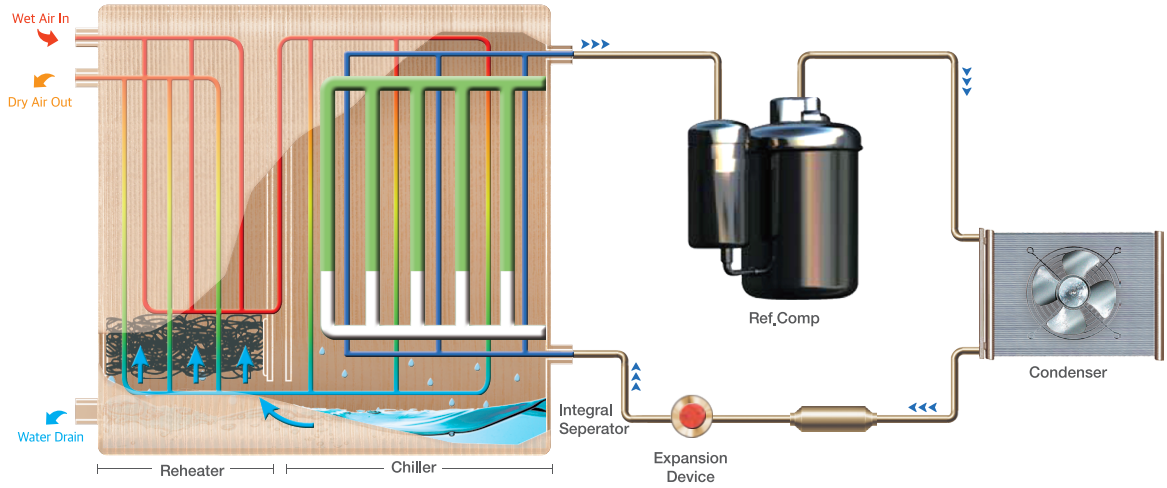
Options

Common inlet /outlet air header with isolation valve (Models PCM 93.6J and larger)

(Top view)

Flow Diagram

PCM2.8~16.5J

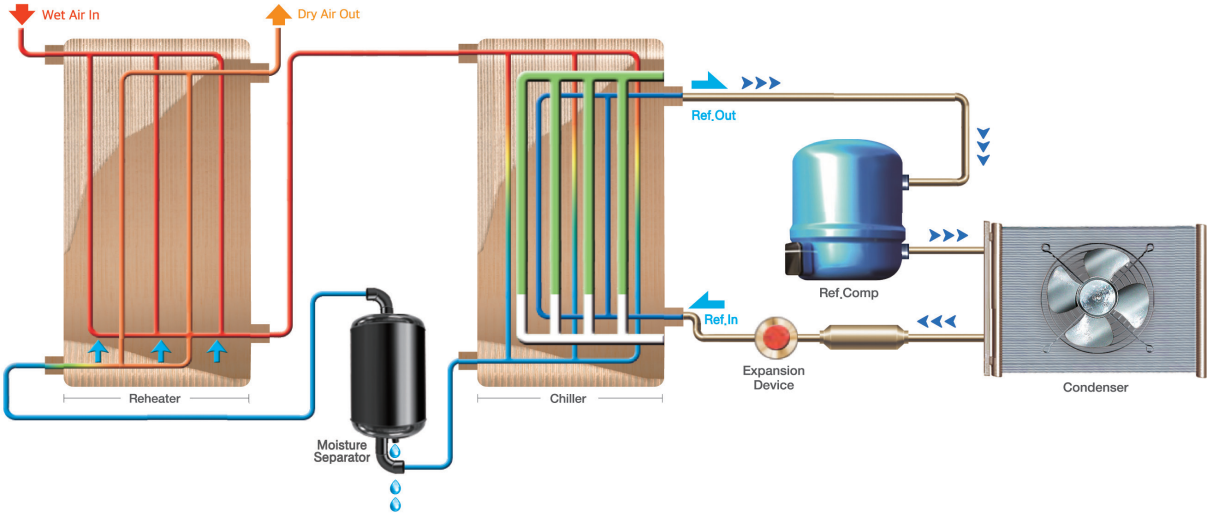


① Compressed air saturated with water vapor enters the stainless steel brazed plate air-to-air heat exchanger, is pre-cooled by the outgoing chilled air, and then directed to the stainless steel brazed plate PCM-to-air heat exchanger (evaporator) where it is further cooled by the Phase Change Material (PCM).

② As the air is cooled, water vapor condenses into liquid droplets which are then removed by high efficiency integral moisture separator with No Loss Drain.

③ Chilled air returns through air-to-air heat exchanger (reheater) where it is reheated before exiting the air dryer. This is to prevent external sweating of piping when clean and dry compressed air travels to point of use.

PCM25.0~374.4J



① Compressed air saturated with water vapor enters the stainless steel brazed plate air-to-air heat exchanger, is pre-cooled by the outgoing chilled air, and then directed to the stainless steel brazed plate PCM-to-air heat exchanger (evaporator) where it is further cooled by the Phase Change Material (PCM).

② As the air is cooled, water vapor condenses into liquid droplets which are then removed by high efficiency external moisture separator with No Loss Drain.

③ Chilled air returns through air-to-air heat exchanger (reheater) where it is reheated before exiting the air dryer. This is to prevent external sweating of piping when clean and dry compressed air travels to point of use.

Phase Change in PCM Air Dryer

① When refrigeration compressor and condenser fan are running, the cold refrigerant in the chiller (evaporator) cools the liquid Phase Change Material (PCM) and it gradually freezes.

② When PCM is sufficiently cooled and frozen, the refrigeration compressor and condenser fan stop.

③ The compressed air is continuously cooled by PCM while the refrigeration compressor is inactive. No power is consumed during this period.

④ The PCM gradually melts as it adsorbs heat from the compressed air, and when fully melted, the refrigeration compressor and condenser fan resume to cool down the PCM.

Specification

Model	Flow Capacity * (Nm³ / min)	Installed Power (kW)	Power Supply (V/Ph/Hz)	Inlet/Outlet ** Connections	Weight (kg)	Dimensions *** (H x W x D mm)	Refrigerants
PCM2.8J	2.8	0.68	220~240/ 1/50	PT 1"	72	712 x 363 x 772	R-407C
PCM4.6J	4.6	1.16		PT 2"	98	762 x 443 x 952	
PCM7.5J	7.5	1.90			147	912 x 494 x 1,102	
PCM14.0J	14.0	3.70	380~415/ 3/50		190	1,032 x 494 x 1,193	
PCM16.5J	16.5	3.90			211	1,032 x 544 x 1,293	
PCM25.0J	25.0	6.1		FLG 3"	490	1,488 x 800 x 1,494	
PCM37.4J	37.4	10.3		FLG 4"	759	1,488 x 1,000 x 1,572	
PCM46.8J	46.8	13.4			849	1,488 x 1,000 x 1,572	
PCM62.4J	62.4	14.2			962	1,488 x 1,000 x 1,742	
PCM93.6J	93.6	26.8		FLG 6"	1,698	1,488 x 2,003 x 1,572	
PCM140.4J	140.4	40.2			2,547	1,488 x 3,603 x 1,572	
PCM187.2J	187.2	53.6		FLG 10"	3,396	1,488 x 4,606 x 1,572	
PCM234.0J	234.0	67.0			4,245	1,488 x 6,206 x 1,572	
PCM280.8J	280.8	80.4		FLG 12"	5,094	1,488 x 7,209 x 1,572	
PCM327.6J	327.6	93.8			5,943	1,488 x 8,809 x 1,572	
PCM374.4J	374.4	107.2			6,792	1,488 x 9,812 x 1,572	

*** PDP 10˚C Condition :** 50˚C inlet air temperature, 35˚C ambient air temperature, 7barG inlet pressure, 100% relative humidity

1. Max. / Min. Inlet Air Temperature : 65˚C / 4˚C
2. Max. / Min. Ambient Air Temperature : 50˚C / 4˚C
3. Max. / Min. Inlet Pressure : 16barG / 3barG
4. ** Models 93.6J and larger : Modular design where Common Inlet / outlet header and valves to be supplied by customer
5. ** Models 25.0J and larger : ANSI 150# for flange connection standard

Capacity Correction Factors

Inlet Air Pressure (barG)

barG	4	5	6	7	8	9	10	13	16
Factor	0.75	0.84	0.92	1.00	1.03	1.07	1.09	1.18	1.23

Inlet Air Temperature (˚C)

˚C	35	40	45	50	55	60	65
Factor for 10˚C PDP	1.2	1.15	1.08	1.00	0.83	0.7	0.6
Factor for 3˚C PDP	1.04	1.00	0.94	0.87	0.72	0.61	0.52

Ambient Air Temperature (˚C)

˚C	25	30	35	40	43	50
Factor for 10˚C PDP	1.2	1.06	1.00	0.75	0.6	0.45
Factor for 3˚C PDP	1.13	1.00	0.94	0.71	0.57	0.42