

Nomenclature

PCM Series

PCM		D	—	
Model	Flow capacity (Nm ³ /min)	Options		
2.8	2.8	F1	Prefilter package for 5 years warranty on heat exchanger	
4.6	4.6	I	Smart monitoring kit	
7.5	7.5	T	Stainless steel 304 air inlet/outlet piping & separator	
14.0	14.0	U	Stainless steel 316 air inlet/outlet piping & separator	
16.5	16.5	X	Common inlet /outlet air header with isolation valve	
25.0	25.0	Y	PLC & Touch screen panel	
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' and 'U' are available on models PCM 25.0D and larger

* Options 'X' and 'Y' are available on models PCM 93.6D and larger

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SPX FLOW Technology 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

14, Yeoui-daero, Yeongdeungpo-gu, Seoul, Republic of Korea (Yeouido-dong, KT Building 11th floor)
TEL. +82-2-6297-4000, FAX. +82-2-783-0160

Contact Infomation:

www.spxflowkorea.com

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Why Do Compressed Air Systems Need Drying?

SPX FLOW 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 reduces maintenance. Desiccant and refrigerated type compressed air dryers are used in the control air systems of power plants.

About SPX FLOW

SPX FLOW, Inc. (NYSE:FLOW) is a leading manufacturer of innovative flow technologies, many of which help define the industry standard in the market segments they serve. From its headquarters in Charlotte, North Carolina, it operates a sales and support network, centers of manufacturing excellence, and advanced engineering facilities, throughout the world. Its cutting-edge flow components and process equipment portfolio includes a wide range of pumps, valves, heat exchangers, mixers, homogenizers, separators, filters, UHT, and drying technology that meet many application needs. Its expert engineering capability also makes it a premium supplier of customized solutions and complete, turn-key packages to meet the most exacting of installation demands.

www.spxflow.com

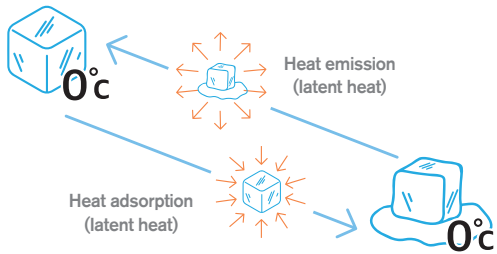
PCM Air Dryer

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, SPX FLOW has introduced the most cost-effective and efficient high performance air dryer in the industry.



- Unique Product Design**
- Adapted 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



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

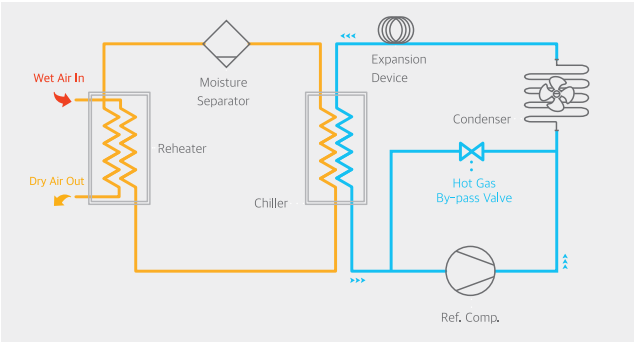


- Zero Loss Drain**
- Electrostatic capacity sensor
 - Zero loss of compressed air when condensate water is discharged
 - Automatically switch to timer mode at malfunction



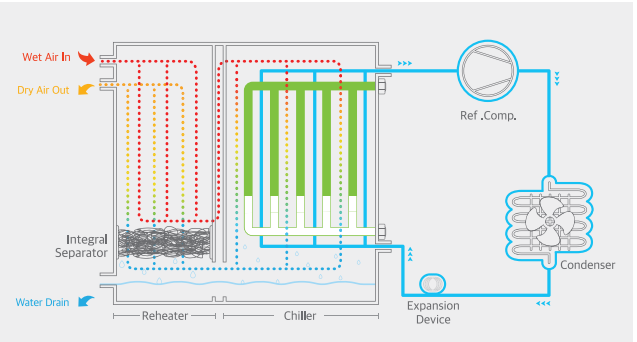
- Heat Exchanger 5-Year Warranty Program**
- When used with NGF filter installed upstream and filter element replacement had been in accordance with recommended maintenance
 - Heat exchanger replacement is confined to its leakage or blockage problem

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



* 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
- Upgrade firmware program through USB 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)

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

- 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



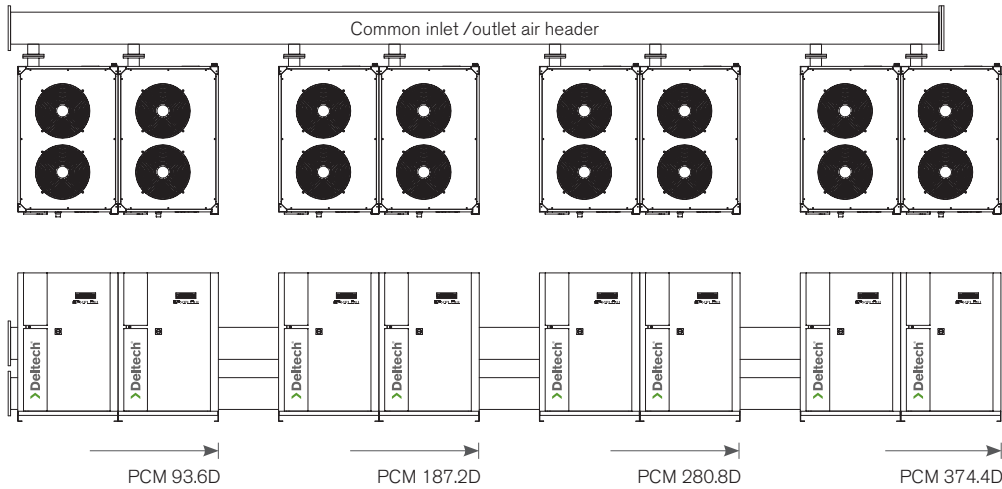
Heat Exchanger



Module Type

Modular design (Models PCM 93.6D 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 (Model larger than PCM93.6D)

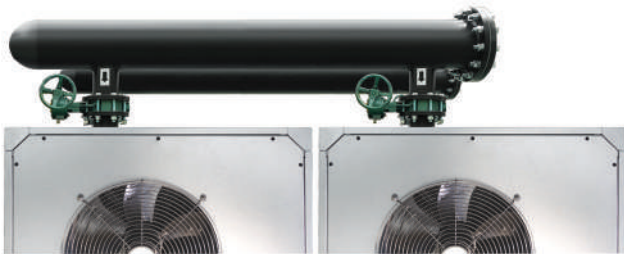
PLC & Touch screen panel (Level 4)

- Combined with master controller (PLC) and slave controllers (PCB)
- LED touch screen (HMI)
- Graphic UI (user interface)
- Energy saving and dew point level display
- HMI on/off control
- Air dryer and ref. compressor's operating hours display
- Dry contact for common alarm
- Upgrade firmware program through USB port
- Alarm history
- Filter element service hour display
- Alarm lamp for filter element replacement
- DCS communication feasibility (Optional)



Options

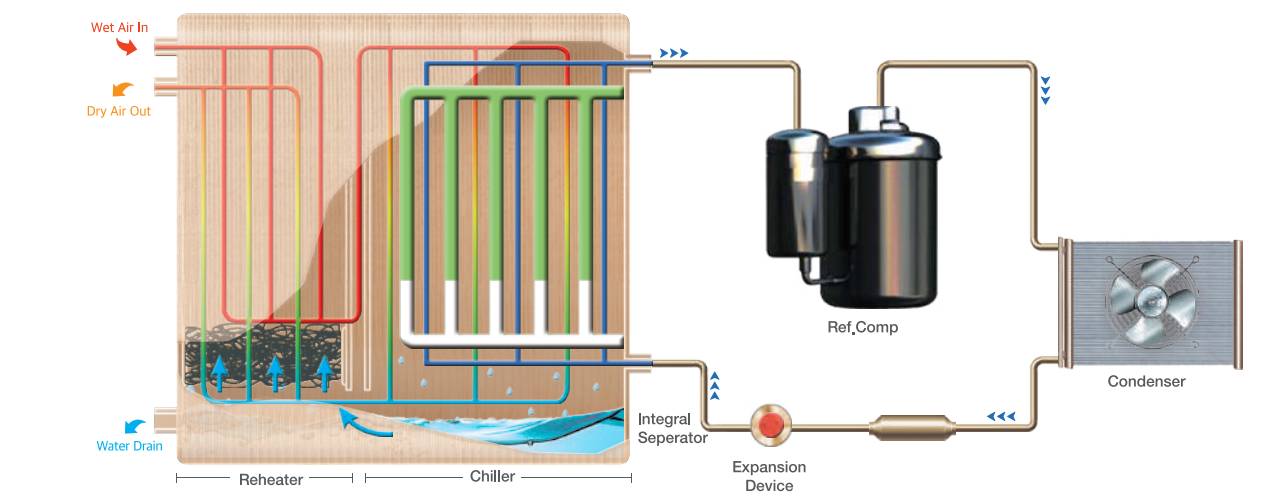
Common inlet /outlet air header with isolation valve (Models PCM 93.6D and larger)



(Top view)

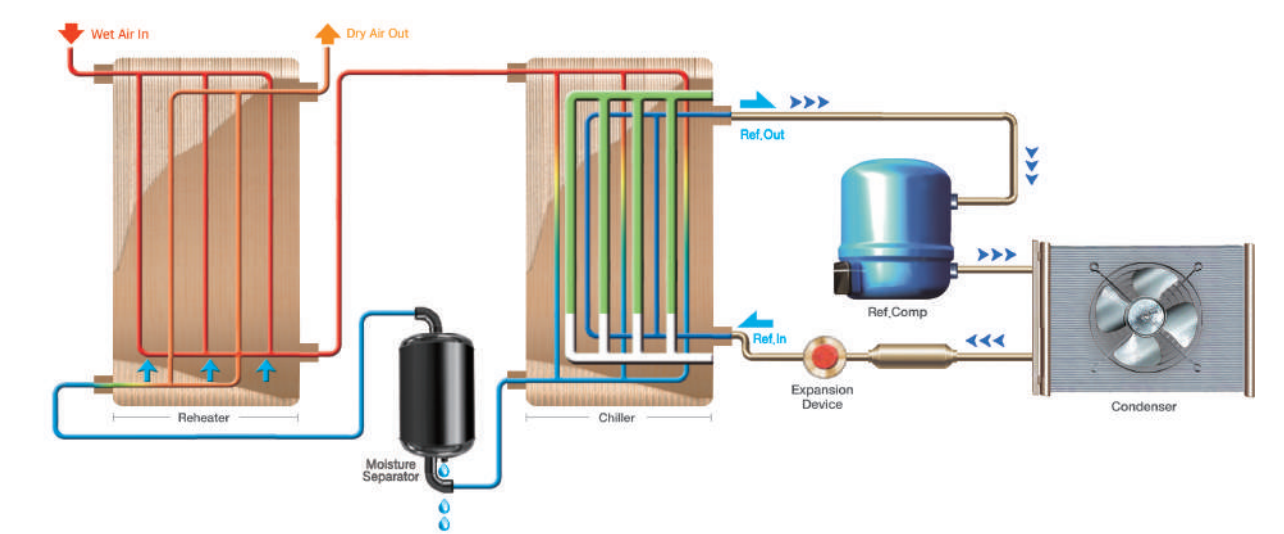
Flow Diagram

PCM2.8~16.5D



- 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.

PCM25.0~374.4D



- 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
PCM2.8D	2.8	0.68	220~240/ 1/50	PT 1"	72	712 x 363 x 782	R-407C
PCM4.6D	4.6	1.16		PT 2"	98	762 x 443 x 962	
PCM7.5D	7.5	1.90			147	912 x 494 x 1,112	
PCM14.0D	14.0	3.70	190		1,032 x 494 x 1,203		
PCM16.5D	16.5	3.90	211		1,032 x 544 x 1,303		
PCM25.0D	25.0	6.1	FLG 3"		490	1,488 x 800 x 1,494	
PCM37.4D	37.4	10.3	FLG 4"	759	1,488 x 1,000 x 1,572		
PCM46.8D	46.8	13.4		849	1,488 x 1,000 x 1,572		
PCM62.4D	62.4	14.2		962	1,488 x 1,000 x 1,742		
PCM93.6D	93.6	26.8	FLG 6"	1,698	1,488 x 2,053 x 1,915		
PCM140.4D	140.4	40.2		2,547	1,488 x 3,703 x 2,039		
PCM187.2D	187.2	53.6	FLG 10"	3,396	1,488 x 4,706 x 2,039		
PCM234.0D	234.0	67.0		4,245	1,488 x 6,306 x 2,122		
PCM280.8D	280.8	80.4	FLG 12"	5,094	1,488 x 7,309 x 2,122		
PCM327.6D	327.6	93.8		5,943	1,488 x 8,909 x 2,122		
PCM374.4D	374.4	107.2		6,792	1,488 x 9,912 x 2,122		

- * PDP 10°C Condition : 50°C inlet air temperature, 35°C ambient air temperature, 7barG inlet pressure, 100% relative humidity
- * PDP 3°C Condition : 40°C inlet air temperature, 30°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 93.6D and larger : Modular design where Common Inlet / outlet header and valves to be supplied by customer
- 5. ** Models 25.0D and larger : ANSI 150# for flange connection standard
- 6. *** Models 93.6D and larger : Common inlet/outlet air header with isolation valve is included in dimensions

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