SPXFLOW

PCM SERIES

2.8 to 16.5Nm³/min

SPXFLOW

Refrigerated Compressed Air Dryers PCM Air Dryer - Automatic and Energy Saving Solutions

Selection

14.0

16.5

14.0

16.5

9.3

11.3

PCM Series





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Some specifications in this bulletin may change without notice. Bulletin C918E, Rev.A (05/18) Copyright©2018 SPX Flow Technology Korea Co., Ltd. 2.8 to 16.5Nm³/min







Sustainable Energy Saving Solutions

SPX FLOW is a place where innovation is constant, and the real world needs of our customers are understood. We transform market inspired ideas into actioned solutions enabling our global customers to meet their sustainability goals, and thrive in a complex, ever-changing marketplace.

Utilizing the latest advancements in heat transfer technology, PCM refrigerated air dryers offer an innovative approach to efficiently remove liquid contamination from compressed air.

THE PCM AIR DRYER ADVANTAGE

PCM air dryers are designed with 4 in 1 heat exchangers (patented) and a phase change material (PCM) encapsulated between the refrigeration and compressed air circuits, serving as a highly effective reservoir for thermal storage.

The PCM possesses high latent heat properties which enables it to melt or freeze at a constant temperature. The phase change material will absorb heat from warm, moisture laden compressed air without a significant rise in temperature.

The phase change material stays colder for longer periods of time, cycling the refrigerant compressor less often than conventional energy saving designs.



Energy Saving Sustainability

The PCM air dryer lowers air system power costs and improves productivity by matching power consumption to compressed air demand.

In a typical manufacturing facility, up to 30% of electricity consumed is for generating and treating compressed air. To reduce total cost of operation and qualify for utility company incentive programs, proper air treatment equipment selection and application is required.

LOAD MATCHING PERFORMANCE

Compressed air load profiles in most manufacturing facilities fluctuate. The PCM air dryer provides cost-effective energy savings by matching electrical power consumed in direct proportion to air demand. Linear load matching is achieved from 0% up to 100% demand.

Non-cycling dryers operate with the refrigeration compressor running continuously, regardless of inlet load conditions. Minimal energy savings are realized from 100% down to 0% inlet air load.

LINEAR ENERGY SAVINGS

PCM air dryer automatically cycle (on /off) the refrigeration compressor in response to inlet load conditions. As the inlet air load is reduced, the power requirement to dry the air is matched in proportion to the demand. For example, at 60% inlet air load, a noncycling dryer consumes 96% of the full load power consumption, a 4% energy savings. By comparison, at 60% inlet air load, the PCM air dryer consumes only 60 % of the full load power, a 40% energy savings.

ENERGY SAVINGS COMPARISON



Dryers are rated in a accordance to ISO 7183 standard rating conditions A2. 38°C * Power consumption for PCM air dryer also shown at 15°C

Note : The power consumption data set forth above for non cycling dryers and variable speed dryers was obtained from an article titled "Cycling Refrigerated Dryers - Are Savings Significant?" published in Compressed Air Best Practices in November 2011. The power consumption data set forth above for the PCM air dryer is based on laboratory testing performed on a PCM4.6H model dryer. We expect that power consumption data between non cycling, variable speed and the PCM air dryer would be consistent regardless of the size of the dryer.

Better by Design

PCM AIR DRYER 2.8 to 16.5Nm³/min

The PCM air dryer is the ideal solution to reliably and economically dry compressed air. The innovative technology does not require a recirculating pump and associated piping. This results in a simpler, more energy efficient design.

1 Stainless steel brazed plate 4 in 1 heat exchanger (patented), with phase change material reservoir

- The PCM thermal reservoir operates at a precise temperature to deliver a stable pressure dew point.
- Smooth, non-fouling stainless steel surfaces promote low resistance to flow, optimizing air system efficiency

2 No-air-loss, demand drain efficiently removes condensate without loss of compressed air

- · Condensate drain lines terminate at discharge connections conveniently located on the side of the dryer
- Failure to discharge alarm on the operator interface enhances system reliability

B High efficiency, up-flow aluminum air-cooled condenser

- Pulls ambient air through the condenser and releases out the top of the dryer condenser
- Provides cooler condensing air and greater efficiency

4 Reliable, semi-hermetic refrigerant compressors

- Environmentally friendly, globally accepted refrigerants
- Rugged design, for long-term operation

O Controllers, with LCD display provide ease of monitoring and operating status

- Energy saving (%), dryer operating time, refrigeration compressor operating time, active fault message dew point status, and
- USB connection port to download operating data and upgrade firmware
- Remote monitoring capability- RS485 communications port





International Air Quality Class Standards

ISO 8573-1 AIR QUALITY STANDARD

ISO 8573-1, the international standard for compressed air quality, defines the amount of contamination permissible in compressed air.

The ISO standard identifies three primary forms of contamination in compressed air systems – solid particles, water and oil. Contaminants are classified and assigned a quality class, ranging from Class 0, the highest purity level, to Class 6, the most relaxed.

As an extra measure of protection, Hankison will provide additional coverage beyond the standard 1-year warranty. Purchase PCM air dryer with Filtration Package and receive an additional years of protection, parts and labor, a total of 5 years for stainless steel brazed plate heat exchanger only.

PCM refrigerated air dryers offer the perfect balance between technology and simplicity to dry compressed air systems to ISO 8573-1 Air Quality Class 4-5 pressure dew points.



OPTION PRE-FILTRATION

NGF series – P grade filtration – removes solid and oil contaminants from the air stream before entering the dryer.

ISO Air Quality Class:

- Solids Class 2
- Remaining oil Class 4
- Removes solids 1.0 micron and larger
- Remaining oil content 2.0. mg/m³



OPTION AFTER-FILTRATION

NGF series – H grade filtration – provides high efficiency oil removal protecting downstream equipment.

ISO Air Quality Class:

- Solids Class 1
- Remaining oil Class 1
- Removes 99.999+% of solids \geq 0.01 micron
- Remaining oil content < 0.01 mg/m³

How It Works



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.
- O 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.

HOW IT WORKS

- ① Compressed air saturated with water vapour enters the stainless steel brazed plate air-to-air heat exchanger to be pre-cooled by the outgoing chilled air. And then directed to the stainless steel brazed plate PCM-to-air heat exchanger (chiller) where it is further cooled by the Phase Change Material (PCM).
- ② As the air is cooled, water vapour 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 dryer. This is to prevent external sweating of piping when clean and dry compressed air travels to point of use.

NON-CYCLING REFRIGERATED AIR DRYER



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

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

Product Specifications

Model	Flow Capacity (Nm³ / min)*		Power Consumption	Power Supply	Inlet/Outlet	Weight	Dimensions	Refrigerants	
	PDP 10°C	PDP3°C	(kW)	(V/Ph/Hz)	Connections	(Kg)	(H x W x D mm)		
PCM2.8H	2.8	2.5	0.68	220~240/ 1/50	PT 1"	72	752 x 363 x 603		
PCM4.6H	4.6	3.7	1.16		220~240/ 1/50 380/3/50	- PT 2"	98	762 x 443 x 962	R-407C
PCM7.5H	7.5	5.5	1.90				147	912 x 494 x 1,100	
PCM14.0H	14.0	9.3	3.70	380/3/50 415/3/50			190	1,032 x 494 x 1,203	
PCM16.5H	16.5	11.3	3.90			211	1,032 x 544 x 1,203		

1.* Standard Rated Conditions : 50°C inlet air temperature, 35°C ambient air temperature, 7.0barG inlet pressure, 100% relative humidity

2. Max. / Min. Inlet Air Temperature : 65°C / 4°C

3. Max. / Min. Ambient Air Temperature : 50°C / 4°C

4. Max. / Min. Inlet Pressure : 16barG / 3barG

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	1.20	1.15	1.08	1.00	0.83	0.7	0.6

Ambient Air Temperature (°C)

°C	25	30	35	40	43	50
Factor	1.20	1.06	1.00	0.75	0.6	0.45