GSA Air Dryers

HYD-N3 series
Refrigerated air dryers (Cycling)
Global Standard Air & Gas

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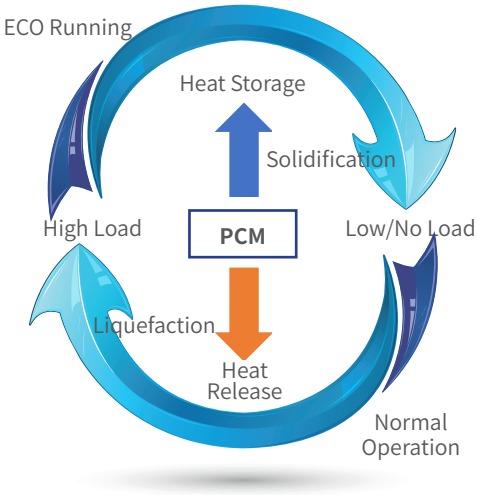
Reduction of Energy Consumption

Generation-III, Energy-saving Refrigerated Air Dryer

GSA's cycling refrigerated air dryer is a latest energy-saving model which stores cooling energy, using phase change materials (PCM) accumulated in a specially designed heat exchanger. It cools and freezes PCMs, using reserve cooling energy generated under no/low load and chills compressed air with accumulated latent heat. It reduces operating costs by stopping operation while such latent heat is burnt out and PCM temperature rises for a certain period of time.

Using a patented heat exchanger, the cycling refrigerated air dryer is able to store a huge amount of cooling energy, which cannot be done in regular refrigerated dryers. It can save energy in an innovative fashion. The heat exchanger of a standard refrigerated air dryer is comprised of an air-air heat exchanger and an air-refrigerant heat exchanger. However, the generation-III, cycling refrigerated dryer consists of three different parts: i) air-air heat exchanger, ii) air-PCM heat exchanger, iii) refrigerant-PCM heat exchanger. The above three heat exchangers in a PCM heat exchanger are connected to each other systematically. Made with the same material, they generate the best efficiency and performances. In addition, the cycling refrigerated air dryer has such high latent heat that it maximizes energy-saving efficiency, using high-purity alkane PCMs with which a large amount of cooling energy can be saved. With a refrigerant pressure transmitter, furthermore, it features various latest technologies and systems, optimizes the cooling system and enhances cooling efficiency, energy utility and user convenience.

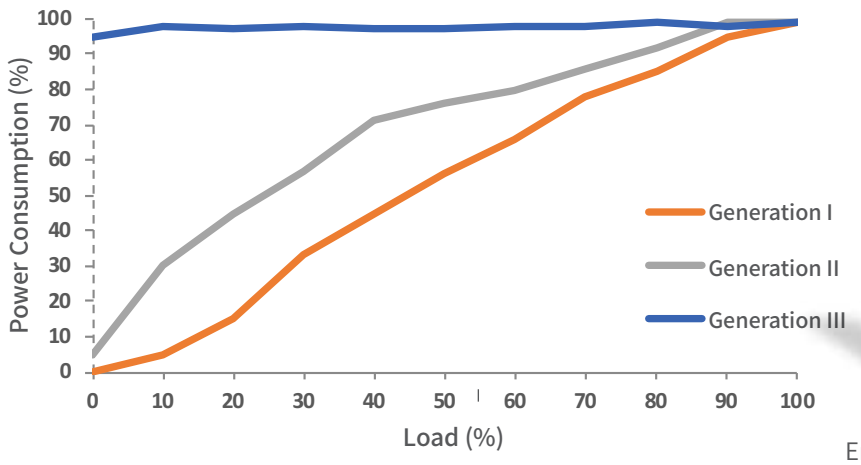


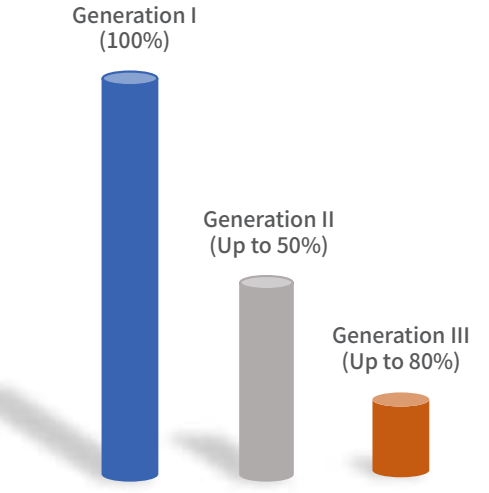
Accumulated Heat Amount

The heat exchanger in the cycling refrigerated air dryer is capable of keeping up to 240,000 J/kg latent heat, using high-purity alkane PCMs. In addition, it can store a large amount of cooling energy and save energy in an efficient and innovative fashion if cooling energy stored in the aluminum heat exchanger is included.

Heat Exchanger	Material	Specific Heat (J/kg)	Thermal Conductivity (kcal/mh°C)	PCM Latent Heat (J/kg)	Quantity of Heat (J/°C)	Heat Storage Ratio
Shell & Tube	Copper	389	332	N/A	3890	100%
Plate heat exchanger	Stainless	464	14	N/A	4640	120%
Aluminum Block	Aluminum	896	196	240000	8960	3300%

Energy Saving



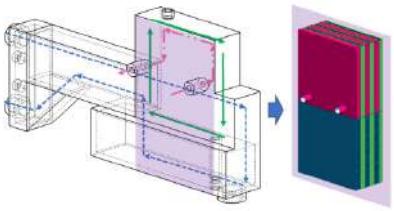


Energy-saving rates when both low-load and no-load conditions are considered

HYD-N3 Ref. Air Dryer Series

Highly reliable cycling Energy-saving Dryer developed with the Latest Technologies

Generation-III Refrigerated Air Dryer with the Latest Innovative Technologies



High-efficiency Aluminum PCM Heat Exchanger

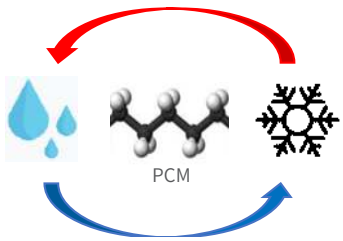
The patented GSA PCM heat exchanger is specially designed for efficient heat exchanging with compressed air, refrigerant and PCMs. With great cooling performances and efficiency, it reduces energy consumption innovatively. The high-efficiency aluminum heat exchanger has a larger heat-exchange area and greater performances than other types of heat exchangers such as shell & tube and plate ones. The internally accumulated high-purity PCM reveal great cooling performances with high latent heat and offer stable dew points with good energy-saving efficiency. Made with the same material, in addition, the GSA air dryer has no thermal resistance and is free from heat exchanger freeze-up or corrosion.

Smart Controller with Diverse Latest Technologies

A multifunctional controller featuring a 4.3” TFT color touch panel offers an intuitive interface through which users are able to check operation status and energy-saving status easily. In addition, if mobile communication features are added, it is possible to check operation status and diverse information and features through WIFI and BT. Users are also able to check the system near the system or in the distance through an Android app, using an intranet.

Highly Reliable Drain without Compressed Air Loss

As a separation space with demister inside the heat exchanger, it shows great condensate separation efficiency. The isolated condensate is discharged through the magnetic float-mounted auto drain. A zero-loss drain adopting either a magnetic float or level sensor depending on a product ensures great operating performances and minimizes performance drop or failure in the drain caused by oil, dirt and various contaminants.

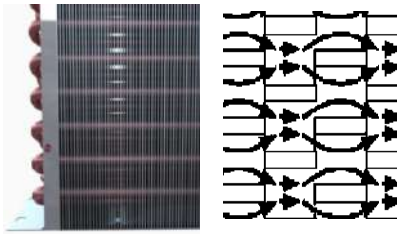


Maximization of Energy-saving Effects through High-purity/High-efficiency PCM

The PCM refrigerated dryer maximized energy efficiency, using high-purity alkane PCMs. Compared to others, the high-purity alkane PCMs are able to store more energy with high latent heat. In addition, they are durable and have a stable phase change cycle. In addition, they maximize the super cooling- and corrosion-free properties of an aluminum heat exchanger and ensure stable operation and performances.

Minimization of Compressed Air Loss with Low Differential Pressure

We minimized differential pressure with a large heat-transfer area and sufficient cross section for the passage of compressed air. We enhanced heat-exchange efficiency and reduced differential pressure by minimizing resistance, making it possible to operate the compressed air system more efficiently at lower costs.



Efficiency Maximization with High-efficiency Condenser

For stable performances even under unfavorable circumstances such as high temperature, grooved cooper tube and corrugated split fin were applied. Since they are expanded in a complete and uniform tube expansion, fin adhesion is high, applying condensate with a high coefficient of heat transfer. Therefore, it guarantees stable operations under diverse environments including hot temperature.

Technical Specification

Design Conditions

- Inlet Pressure: 7 barg
- Inlet Temperature: 38 °C
- Pressure Dew Point: 2 ~ 10 °C
- Design Pressure: 14 barg
- Design Temperature: 70 °C
- Ambient Temperature: 32 °C

References

- All models use either R-134a or R-22 refrigerant. Other models adopting different types of refrigerants are also available.
- The flow rate is based on 60Hz.
- Other electrical specifications are also available.
- A unit with 15barg or higher operating pressure is customizable.
- Large models bigger than those stated in the specifications are also customizable.
- The specifications are subject to changes without notice for product improvement.

Model		Connection	Air Compressor	Flow Rate	Minimum Electrical Energy	Power Supply	Dimensions (mm)			Weight
		A	HP	Nm³/min	kW	V / Ph / Hz	A	B	C	kg
HYD	30N3	PT 25A	30	3.9	0.45	220 / 1 / 50, 60	360	700	950	70
	50N3	PT 40A	50	6.7	0.7		410	710	1050	100
	100N3	PT 50A	100	14.2	1.17	380 / 3 / 50, 60	460	900	1250	140
	150N3	PT 65A	150	21	1.45		570	1050	1400	180
	200N3	FLG. 80A	200	30	2.09		750	1250	1460	260
	300N3	FLG. 100A	300	47	2.3		850	1350	1650	290
	400N3	FLG. 100A	400	56	4.85		1200	1500	1750	680
	500N3	FLG. 150A	500	66	6.52		1800	1750	1850	980
	600N3	FLG. 150A	600	85	7.72		1800	1750	1850	1120

- (The electrical energy stated above is calculated based on 50% load. Therefore, it can differ depending on operating situations.)

Correction Factors

Correction Factor by Inlet Air Temperature												
Inlet Air Temperature (°C)	28	33	38	43	48	53	58	63	68	70		
Correction Factor	1.46	1.20	1.00	0.85	0.73	0.63	0.55	0.48	0.42	0.40		
Correction Factor by Inlet Air Pressure												
Inlet Air Pressure (barg)	4	5	6	7	8	9	10	11	12	13	14	15
Correction Factor	0.84	0.90	0.95	1.00	1.03	1.06	1.09	1.11	1.13	1.15	1.17	1.18
Correction Factor by Ambient Temperature (Air-cooled type)												
Ambient Temperature (°C)	27	32	37	40	45	50						
Correction Factor	1.05	1.00	0.92	0.82	0.76	0.69						