

# **Gardner Denver**

NON-CYCLING REFRIGERATED AIR DRYERS

## **GSRN Series**



# Why Dry Compressed Air?

Compressed air has long been described as the fourth utility after electricity, natural gas and water. It is often the perfect energy resource for many industrial, commercial and instrument applications. During the act of compressing air, moisture naturally forms. Removing this moisture is vital to avoid costly equipment failure, product contamination and distribution system breakdown.

- Keep lubricants from being washed away from downstream components extending product life.
- Reduce product contamination in applications such as mixing, conveying, cooling and product blow down.
- Reduce compressed air system corrosion which would increase pressure drop and operational costs.

## What Compressed Air Quality Do I Need?

Answering the “Do I need a dryer?” question is typically easy. Pretty much every compressed air system needs a dryer. The question of “Which dryer do I need?” is more complex. The answer starts by knowing the ISO air quality classes and where in the spectrum your needs fall. The below chart lays out the acceptable contamination levels at the different classes. Your needs will be determined by your equipment and processes that utilize compressed air.

### STANDARDS PER ISO 8573.1

QUALITY CLASSES	SOLID CONTAMINANTS (MAXIMUM PARTICLE SIZE IN MICRONS)	MAXIMUM PRESSURE DEW POINTS		MAXIMUM OIL CONTENT (DROPLETS, AEROSOLS, & VAPOR PPM)	
		° F	° C	W/W	MG/M <sup>3</sup>
0	as specified	as specified		as specified	
1	0.1	-94	-70	0.008	0,01
2	1	-40	-40	0.08	0,1
3	5	-4	-20	0.8	1
4	15	38	3	4	5
5	40	45	7	21	25
6	-	50	10	-	-

# Superior Reliability & Total Energy Efficiency

## Why Design Simplicity?

Mark Twain once said “I didn’t have time to write a short letter, so I wrote a long one instead.” That same line of thought also rings true when it comes to refrigerated air dryers. It’s easy to source a bunch of low-quality components and place them somewhere inside a box and call it a dryer. It takes time, effort and an attention to detail to make a simplified refrigerated dryer.

Time, effort and attention to detail is exactly what went into the design of the Gardner Denver GSRN. The GSRN design has its components laid out in a way that minimizes the footprint of the dryer as well as the interconnecting tubing inside the dryer. When implemented into your compressed air system, the benefits of a simplified design are increased reliability and better efficiency.

Simple to Make Complex.  
Complex to Make Simple.



Every Component  
in a GSRN Dryer is  
Carefully Selected

## Why the Best Componentry?

Quality dryers start with quality components. Through years of research and experience, Gardner Denver knows what it takes to build the best dryers on the market. Every component of the GSRN dryer has been tested and proven to be worthy of being associated with the Gardner Denver name.

# Design Simplicity Means Total Performance

## Simple Reliability

The GSRN design has a long history of performing above and beyond expectations. If you put a GSRN unit into your compressed air system, you will experience the reliability that thousands of customers have experienced prior to you. It doesn't get any simpler than that.

## American Made

Every GSRN unit is American Made in southeast Michigan. In addition to guaranteeing a quality product, this location ensures a quick turnaround for any non-stocked dryer orders. The GSRN is also supported out of American locations. Therefore, wherever you are located in North America, you will have superior availability for maintenance and replacement items.



## 5-Year Warranty to Match the Reliability

We don't just say that the GSRN is a quality machine, we back up the claim with an industry-leading five year standard warranty. Unlike competitive warranties that only cover certain components or prorate the warranty coverage as the dryer ages, this bumper-to-bumper warranty covers the entire dryer for the entire five years. There is no registration process and no ongoing maintenance requirements to ensure warranty coverage.

See warranty statement for details.

# Simple Energy Efficiency

Simply put, the less money you spend operating your business, the better. The design and componentry used in the GSRN equates to less energy consumed by your dryer, which equates to a lower spend on electricity. The next two pages break down the quality components of the GSRN and how they help reduce energy consumption. Before we dive into the components, let's take a look at pressure drop.

## Low Pressure Drops

Pressure drop in a compressed air system can significantly increase the power consumption of the system and increase your operating costs. Every 2 PSI of realized pressure drop equates to a 1% increase in horsepower consumed. All GSRN refrigerated dryers are designed to have pressure drops ranging from 1.2 to 3.6 PSID. When compared to competitive units that experience pressure drops up to 6.5 PSID, it starts to become apparent that GSRN dryers can significantly reduce your utility bill.

## Savings Example

Let's walk through some examples. Let's assume your operation uses a 50 HP compressor, runs 8,000 hours per year and realizes an electricity cost of \$0.08 per kW/hr. This chart shows the cost impact of a 4, 8 and 12 PSI pressure drop.

PRESSURE DROP	INCREASED POWER CONSUMPTION	INCREASED ENERGY COSTS
4 PSI	2.0%	\$477
8 PSI	4.0%	\$954
12 PSI	6.0%	\$1,432



# Quality Components Make the Difference

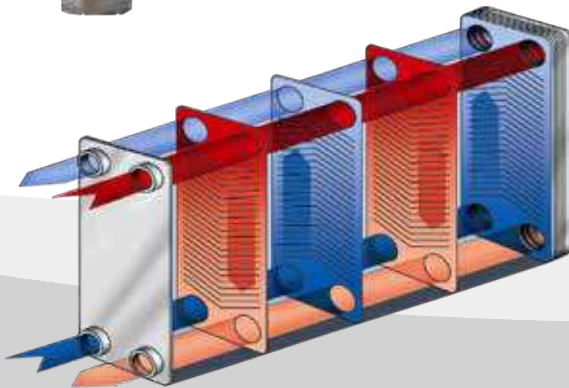
When it comes to building world-class equipment, quality components are a must. Before offering a five year standard warranty, every component of our GSRN has been tested and proven to be superior.

## Stainless Steel Thermostatic Expansion Valve

As opposed to a capillary tube system that will change refrigerant flow on ambient conditions with no regard to system load, our thermostatic expansion valves modulate refrigerant flow in fluctuating ambient temperatures and compressed air loads. Without perfect operating conditions, a capillary tube system can and will cause premature refrigeration compressor failure.

## Stainless Steel Heat Exchanger

The low pressure drop realized by GSRN dryers is due in large part to the stainless steel heat exchanger. In addition to low pressure drop, the large chevron pattern of the heat exchanger reduces the chance of fouling.



## Diaphragm Non-Fouling Solenoid Drain Valves

All timed condensate drains featured in the GSRN use diaphragm-type solenoid valves. Diaphragm valves keep the contaminant-laden condensate away from the internal moveable piston. If contaminant in the condensate stream fouls and restricts movement of the piston, the valve will fail.



## Full Suction & Discharge Service Ports

In order to make maintenance and field service as easy as possible, Gardner Denver equips each GSRN dryer with full suction and discharge refrigeration service valves.

## Stainless Steel Gauge with No-Leak Sweat Connection

Panel-mounted gauges are often a refrigerant leak point for dryers. With this in mind, the GSRN utilizes gauges with braised connections and coiled vibration eliminators.



Quality Components  
Are a Must

# Plug-&-Play Simplicity— Unmatched Quality

## GSRN Non-Cycling Refrigerated Dryer

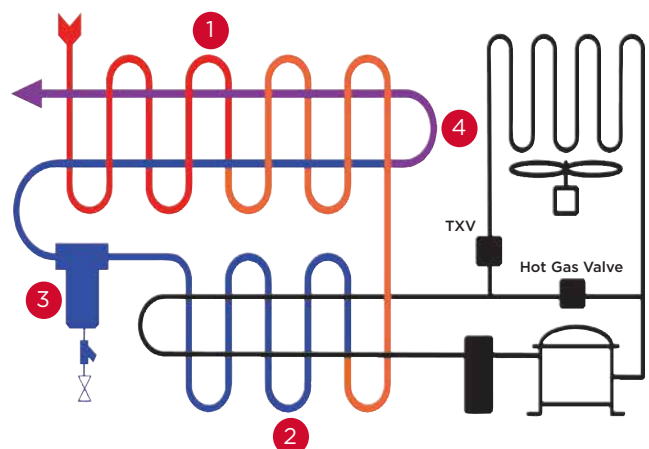
If your operation experiences steady compressed air demand, the tried and true design of the GSRN is where your dryer search should start. With decades of proven experience in the market, the GSRN design has proven to be a reliable workhorse in any industry.

- Flows from 10 to 2,250 CFM
- Delivers a 35–39° F pressure dew point
- Air-cooled and water-cooled packages
- Voltage options to match your needs
- Ambient condition, instrumentation, alarm, pressure and many more options available
- 5-year standard warranty



## GSRN Non-Cycling Refrigerated Air Dryer Operation

- 1 Warm saturated air from the air compressor flows in to the GSRN dryer where it is pre-cooled in the air-to-air heat exchanger by the dry outgoing air.
- 2 The air then passes through the air-refrigerant heat exchanger where it is further cooled to a specified dewpoint in which moisture condenses.
- 3 This condensed liquid is separated from the air stream by the separator and drained from the dryer by a diaphragm-type solenoid valve.
- 4 The cool, dry air is then reheated as it pre-cools the inlet air via the air-to-air heat exchanger which increases volume and prevents the compressed air piping from sweating.





## GSRN SERIES SPECIFICATIONS

MODEL	FLOWS SCFM @		MAXIMUM PRESSURE PSIG	AVAILABLE VOLTAGES	IN/OUT CONNECTIONS NPT	DIMENSIONS INCHES			WEIGHT (LBS)
	100 PSIG	120 PSIG				HEIGHT	WIDTH	DEPTH	
GSRN10	10	11	230	120/1/60	3/8" Tbe	10	15	13	59
GSRN20	20	23			1/2"	20	13	17	103
GSRN25	25	29			1/2"	20	13	17	114
GSRN40	40	47			1/2"	20	13	17	114
GSRN50	50	58			3/4"	23	23	18	126
GSRN75	75	88			3/4"	23	23	18	144
GSRN100	100	115		120/1/60 208-230/1/60	1"	42	22	30	246
GSRN125	125	145			1"	42	22	30	257
GSRN150	150	175			1 1/4"	42	22	30	266
GSRN200	200	235		208-230/1/60 208-230/3/60 460/3/60	208-230/1/60 Volt is 1 1/4" Others are 1 1/2"	42	22	30	326
GSRN250	250	295			208-230/1/60 208-230/3/60 460/3/60 575/3/60	1 1/2"	49	34	36
GSRN300	300	350		208-230/3/60 460/3/60 575/3/60	2"	49	34	36	520
GSRN400	400	470			2"	49	34	36	570
GSRN500	500	580			2"	49	34	46	647
GSRN650	650	760			2"	49	34	46	657
GSRN800	800	940			3"	60	37	62	995
GSRN1000	1000	1175	3"		60	37	62	1236	
GSRN1200	1200	1400	3"		60	37	62	1245	
GSRN1500	1500	1760	4" Flange		69	43	68	2400	
GSRN1750	1750	2055	4" Flange		69	43	68	2600	
GSRN2000	2000	2350	4" Flange		69	43	68	2800	
GSRN2250	2250	2650	4" Flange	69	43	68	3000		

Capacity reflects a maximum 100°F inlet temperature and 100°F ambient. Dimensions and specifications are subject to change without notice.

## NON STANDARD CONDITION CAPACITY CORRECTION

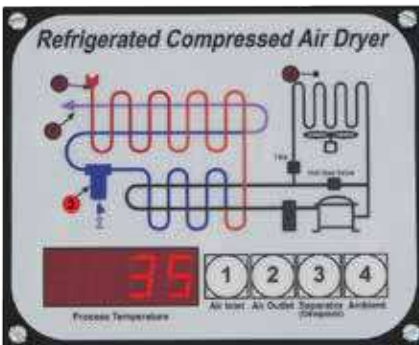
INLET TEMPERATURE °F	90			100			110			120			
	90	100	110	90	100	110	90	100	110	90	100	110	
INLET AIR PRESSURE	70 psig	1.00	0.92	0.84	0.8	0.73	0.67	0.66	0.6	0.55	0.5	0.45	0.41
	80 psig	1.12	1.03	0.94	0.9	0.82	0.75	0.73	0.67	0.61	0.55	0.51	0.46
	90 psig	1.24	1.14	1.04	0.99	0.91	0.83	0.81	0.75	0.68	0.61	0.56	0.51
	100 psig	1.36	1.25	1.13	1.09	1.00	0.91	0.89	0.82	0.74	0.67	0.62	0.56
	110 psig	1.48	1.36	1.23	1.18	1.08	0.99	0.97	0.89	0.81	0.73	0.67	0.61
	120 psig	1.6	1.46	1.33	1.28	1.17	1.06	1.04	0.96	0.87	0.79	0.72	0.66
	130 psig	1.72	1.57	1.43	1.37	1.26	1.14	1.12	1.03	0.94	0.85	0.78	0.71
	140 psig	1.83	1.68	1.53	1.47	1.35	1.22	1.2	1.10	1.00	0.91	0.83	0.76
	150 psig	1.95	1.79	1.63	1.56	1.43	1.3	1.28	1.17	1.07	0.97	0.89	0.81

To obtain flow capacities at conditions other than standard (SCFM @ 100 PSIG, 100°F Inlet & 100°F Ambient), locate the multiplier at the interception of actual operating conditions. Multiply the rated capacity of the selected dryer by the selected multiplier. The result is the corrected flow capacity of that dryer under corrected conditions. Flow rates in excess of design due to capacity correction can result in increased pressure drop.

# The Options You Need

In addition to the main cooling, voltage and flow options, GSRN refrigerated dryers have a wide-range of available options. Below is a sampling of these options. If your operation demands an option that isn't included in this list, please contact your local Gardner Denver distributor. If you need it, we can supply it.

- NEMA 4 watertight electronics
- High pressure options up to 600 PSIG
- Stainless steel components
- Low ambient temperature packages
- Additional gauges, power switches and alarm options
- Many more. Just ask.



## Optional Refrigeration Digital System Monitor

In keeping with our goal of designing simple-to-use dryers, most GSRN units feature a gauge or set of gauges as a user interface. If the user wishes to receive additional feedback from their dryer, the GSRN models above 20 CFM have an optional digital system monitor available.

- Monitors air inlet temperature, air outlet temperature and separation (dewpoint) temperature
- 4-20 mA output for data-logging and/or remote system monitoring

This is a digital monitor only, not a controller. Whereas a controller is integrated into the system, and could cause a dryer shutdown due to electronic failure, this digital system monitor is simply monitoring the performance of the dryer.

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**Gardner Denver, Inc.**

1800 Gardner Expressway  
Quincy, IL 62305  
866-440-6241

[www.gardnerdenver.com/gdproducts](http://www.gardnerdenver.com/gdproducts)



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