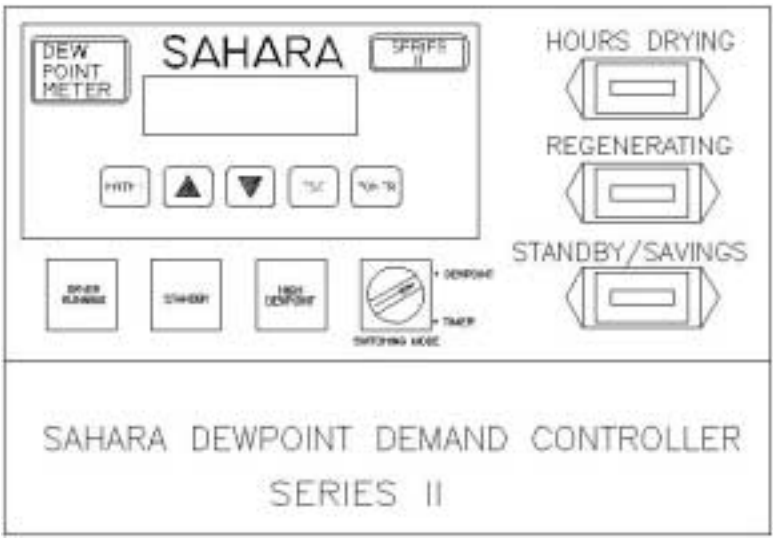
PATENTED

SAHARA
DEWPOINT DEMAND SYSTEM
SERIES II

Makes it possible to significantly reduce the operating cost of any dryer system by dewpoint regulation instead of a timer



Another Energy Saving Product From:

SAHARA
AIR PRODUCTS
HENDERSON

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CONVERT YOUR FIXED CYCLE DRYER TO A DEWPOINT DEMAND CYCLE

All regenerative dryers, whether they are regenerated by purging air or using heaters or blowers, consume energy during regeneration. The amount of energy required to operate a dryer may be very substantial. You can significantly reduce the energy consumption, and thus the operating cost of your regenerative dryer, by converting from a fixed time cycle to a dewpoint demand cycle.

Most dryers are normally designed to function at the maximum operating conditions: highest flow rate, highest temperature, and lowest pressure. Fixed cycle dryers are constantly switching towers and are regenerating based on the worst case load when your actual operating conditions may be quite less. In fact, your air system could be turned off, yet the dryer is "dumb"; it doesn't know this and keeps on regenerating, consuming energy, and wasting money.

The SAHARA Dewpoint Demand Controller converts a "dumb" dryer into a smart dryer that constantly matches the dryer's operations to the actual operating conditions. Air flow, pressure, temperature, and relative humidity are all variables that determine the actual amount of moisture that enters your dryer. With a fixed cycle dryer, the regeneration is constant and was designed for the maximum incoming water load, while in actual practice the operating conditions are constantly varying; reducing the average amount of moisture entering the dryer.

Fixed cycle dryers can not take advantage of a reduced water load; they keep on regenerating, purging your profits right down the drain. In most applications, the average water load into a dryer is about half of the maximum design load. This means that, on the average, you are only putting in half as much water as the dryer was designed to remove. By converting from a fixed cycle to a dewpoint demand cycle, you allow the dryer to utilize it's full capacity regardless of water load and actually cut your operating cost in half.

Not only are your operating conditions varying, but the actual capacity of the desiccant in the dryer is also changing with time. Most dryers are provided with about twice as much desiccant as is really required to dry your air at the worst operating conditions. The reason for this is the desiccant loses capacity over time. For example, activated alumina, the preferred desiccant for regenerative dryers, starts out with a 25% dynamic design capacity. In other words, 4 pounds of alumina will hold 1 pound of water. Unfortunately, alumina loses capacity due to thermal shock in heat reactivated dryers, pressure shock in heatless dryers, and if the dryer is used with a lubricated compressor, it will quickly become contaminated with oil. Alumina loses it's water holding capability fairly rapidly; usually during the first year of operation, the actual dynamic capacity is reduced by half.

Every time a fixed cycle dryer switches towers it slightly damages the desiccant, reducing it's useful life. In addition, all of the switching valves are experiencing increased wear with every tower shift. If you convert from a fixed cycle to a demand cycle, you would increase the effective life of your desiccant, as well as reduce the maintenance required on the dryer's switching valves. Energy savings, reduced maintenance, increased profitability; all benefits of the SAHARA Dewpoint Demand Controller.

An added benefit of the system is the ability to keep a permanent record of dryer performance. The dewpoint meter has a 4-20 mA output, which can be connected to a strip chart recorder. By constantly monitoring dryer performance, you will see any change in performance before it's too late. Without an accurate indication of your dryer's dewpoint, you wouldn't know if there was a failure until there was wet, contaminated air caused by an instrument failure downstream, and that's simply too late. The SAHARA Dewpoint Demand Controller assures you of optimum dryer performance; any possible failure activates a high dewpoint alarm, notifying you of high dewpoint conditions at the dryer, before wet air goes downstream.

Installation of the conversion is done by simply connecting five wires from the controller to your dryer's electrical enclosure. The system will work with most dryers made by other manufactures.

The Dewpoint Demand Controller utilizes a state-of-the-art dewpoint meter to accurately measure the actual dewpoint the dryer is delivering at all times. The instrument has a direct reading digital dewpoint indicator, which constantly keeps you informed of dryer performance. The instrument also has an adjustable set point, which allows you to set the precise dewpoint at which you want the dryer to switch towers. With an operating range of -148°F to +86°F (-100°C to +30°C), you can see exactly how well your dryer is performing and can set the unit to switch towers anywhere within this range.

The heart of the system is the SAHARA Dewpoint Meter. This computer controlled instrument uses a thin film aluminum oxide probe; a rugged, highly accurate device that will deliver years of trouble-free service. The probe typically requires an annual recalibration. The probe is supplied with a sample cell. You can connect air to the sample cell from pilot air tubing, any tap from the outlet side of your dryer, or you can install the probe directly to the outlet line. There is a six foot cable supplied with the probe that connects it to the dewpoint meter.

The SAHARA Dewpoint Demand System includes indicating lights, which show dryer regenerating, standby, and high dewpoint. It includes a switch that allows the system to revert back to timer operated control. It has three hourmeters, which indicate total operating time, total regenerating time, and total standby/savings time. These hourmeters provide you with valuable information. The operating time tells you system utilization. Regenerating time can be used as a maintenance barometer. The savings time can be used to justify purchase of the controller.

KNOW YOUR SAVINGS
BEFORE YOU BUY!

The Series II total savings hourmeter takes all of the guesswork out of decision making. Questions like "how much will the controller save us?" are easily answered. You can easily calculate how much your timer operated dryer costs to operate (the formula can be found on the back of this brochure), or you can use this rule of thumb:

At .05¢/kwh, a 1000 SCFM heatless dryer costs nearly $20,000/year to operate, a heat reactivated dryer (exhaust purge) costs $12,000, and a blower purge dryer costs $10,000 (costs based on 8760 hours/year).

You can break these costs down to an hourly operating cost:

Thus, 1000 SCFM for heatless costs $2.28/hour, exhaust purge costs $1.37/hour, and blower purge costs $1.14/hour.

The savings hourmeter on the Series II actually allows you to accurately measure your payback. With many products, it is difficult to be sure of the payback. The Series II eliminates all questions. You can see exactly how much money you're saving and, after only a month's time, can make an accurate informed decision. The Series II gives you the benefit of accurately measuring real savings.

BENEFITS OF INSTALLING

SAHARA
DEWPOINT DEMAND SYSTEM
SERIES II

ON YOUR EXISTING AIR DRYER

- Greatly reduces compressor and/or heater run time costs. This saves 50% or more in electricity costs.
- Constant knowledge of dryer outlet dewpoint.
- Extends cycle time; therefore reducing dewpoint spikes on heat reactivated units.
- Advance warning of any malfunction which effects dewpoint.
- Reduces wear on component parts, such as switching valves, and can also extend the life of desiccant.
- Recorder output allows permanent record of dryer performance. Change in trends can be easily seen.

SPECIFICATIONS

Standard Dewpoint	-148°F to +86°F (-100°C to +30°C)
Power	120VAC
Storage Temperature	-29°F to +158°F
Warm Up Time	Three minutes
Output	4-20mA
Indicator	Digital LCD reading °F or °C
1 Alarm & 1 Fault	SPDT relay, 3A 120VAC adjustable from front
Enclosure	NEMA 4X
Dimensions	8" W x 11" L x 7" H
Weight	7 lbs.

SAHARA DEWPOINT DEMAND CONTROLLER
SAVINGS CALCULATIONS

The SAHARA Dewpoint Demand Controller will substantially reduce the operating cost of any regenerative dryer. By using the following formulas, you can calculate your savings. Typically, by using the SAHARA Dewpoint Demand Controller, you will reduce the energy consumption and operating cost of your dryer by 50%.

I. Dryer Design Characteristics: Dryer Model	Example	Yours
(1) Air Flow, SCFM	700	_____
(2) Air Temperature, °F	100	_____
(3) Air Pressure, PSIG	100	_____

II Design Conditions (Maximum)

(9) Design water load (air to the dryer): *See Table A and Temperature (2)*

$$\frac{lbs.}{hr.} = \frac{grains}{ft.} \times (1) \times \frac{14.7}{(3)+14.7} \times \frac{(2)+460}{530} \times \frac{1\,lb.}{7000\,grains} \times \frac{60\,mins.}{1\,hr.} = \quad 16.66$$

III. Average Conditions

(13) Estimated average flow, SCFM	500	_____
(14) Estimated average temperature, °F	90	_____
(15) Estimated average pressure, PSIG	100	_____

(16) Average water load (air to the dryer): *See Table A*

$$\frac{lbs.}{hr.} = \frac{grains}{ft.} \times (13) \times \frac{14.7}{(15)+14.7} \times \frac{(14)+460}{530} \times \frac{1\,lb.}{7000\,grains} \times \frac{60\,mins.}{1\,hr.} = 8.55$$

$$\frac{(17)\ Average\ Water\ Load}{Design\ Water\ Load} \quad \frac{(16)}{(9)} = \frac{8.55}{16.66} = \quad .513$$

Table A

Air Temperature (°F)	65	70	75	80	85	90	95	100	105	110	115	120
Moisture Content (GR/FT)	6.8	8.0	9.4	11.0	12.7	15.0	17.4	20.5	23.7	27.6	32.2	37.0

HEATLESS	EXHAUST PURGE	BLOWER PURGE
TOTAL COST* $19,710	TOTAL COST* $11,169	TOTAL COST* $9,198
Annual Savings $9,855	***Annual Savings $5,584***	***Annual Savings $4,599***

**Costs based on 1000 SCFM dryer operating around the clock 365 days. Purge air at $.25/1000 SCF; electricity at $.05/KWH. Does not include maintenance costs.*

Average 1000 SCFM dryer cost total amount. Installation of SAHARA DDC typically reduces average operating cost by 50%.

Energy savings, reduced maintenance costs, knowledge of dryer performance; the benefits you receive with every SAHARA Dewpoint Demand Controller. In a global economy that rewards the efficient, can you afford not to use the SAHARA Dewpoint Demand Controller?

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