Compressed Air Dryer

Industrial Ammonia Systems

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Parker

ENGINEERING YOUR SUCCESS.

The Green Solution for Compressed Air Treatment

Parker Hannifin Refrigerating Specialties, founded in 1916, is the company you rely on for refrigeration controls, new technology, lowering your costs and green solutions.

The $ADNH_3$ (Compressed Air Dryer) is a new innovation in industrial air dryers that allows the customer to take advantage of their current ammonia refrigeration system. This significantly reduces energy consumption by up to 55% and eliminates the need for a separate stand alone air drying system.

In addition, our new generation of products offers a simplified system design with fewer moving components, durability, reliability and a reduction in maintenance costs.

Compressed Air Dryer
Industrial Ammonia Systems

$ADNH_3$

1000 SCFM and up
200 psig (13.8 bar) Max Air Pressure

History: Many of today's food processing facilities use compressed air as their "fourth utility" for equipment, work stations, automated cells, cleanup operations, dewatering and de-ionizing.

Compressed air is the most costly utility. An inefficient system will cause major performance and reliability issues costing facilities money and production time.

The benefit of having compressed air as a utility is that it is generated in-house and can be controlled.

Introduction: $ADNH_3$ series refrigerated air dryers use existing facility ammonia to dry compressed air to a pressure dew point of 39ºF (4ºC). They deliver the required dew point at specified inlet air temperature, pressure and airflow while at the same time minimizing costs.

Drying Process: Hot untreated compressed air enters the $ADNH_3$ series air dryer and is cooled to the dew point by the air/glycol heat exchanger. Moisture is dropped out of the air using a two stage combination centrifugal separator with 3 micron cold coalescing filter, and then expelled from the system via a zero air loss type demand drain.

The glycol absorbs the heat from the hot compressed air and is then processed through a secondary ammonia/glycol heat exchanger. Throughout the air drying process, the supplied ammonia never comes in direct contact with the air side of the system.

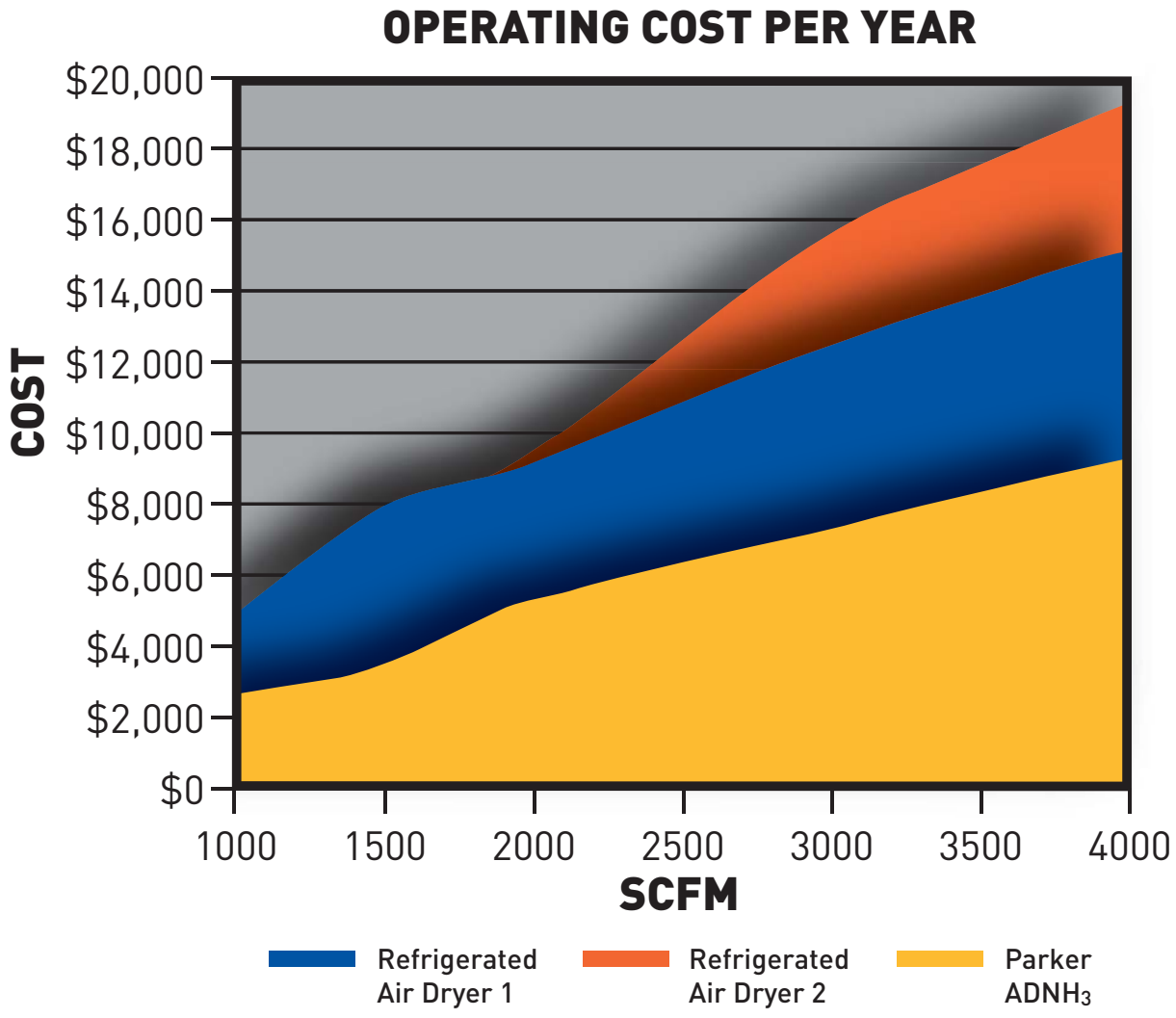
Delivered Value
Industrial Air Dryers

COST PER YEAR
@ $0.08/kW per hour
(24 hrs/day - 365 days)

Energy and Environment

- Environmentally friendly refrigerant-ammonia
- Reduced energy consumption
- Consistent pressure drop throughout the life of the dryer - listed pressure drop includes a 3 micron coalescing filter
- Every 1 psi of pressure drop in the system adds 0.5% more energy cost required to run the compressor

SCFM	OPERATING COST PER YEAR			POTENTIAL SAVINGS
	Refrigerated Air Dryer 1	Refrigerated Air Dryer 2	Parker ADNH$_3$	
1000	$4,927	$4,555	$2,747	**$2,180**
1500	$8,045	$7,919	$3,563	**$4,482**
2000	$9,237	$9,671	$5,416	**$4,255**
3000	$12,635	$15,838	$7,417	**$8,421**
4000	$15,256	$19,342	$9,463	**$9,879**

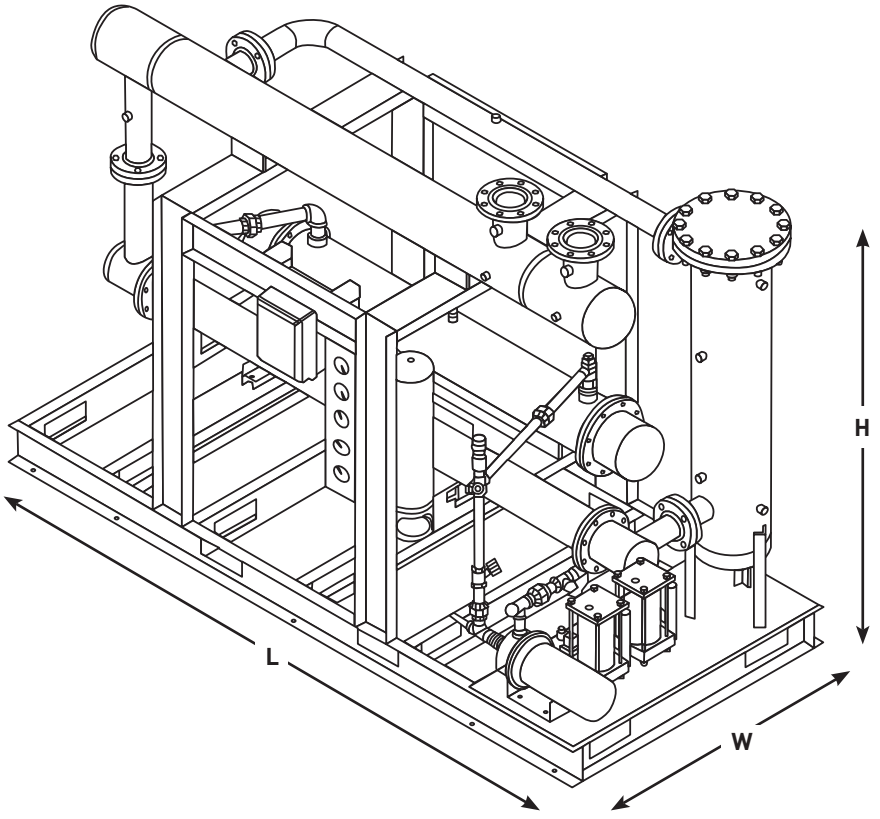


Product Features

$ADNH_3$

1000 SCFM and up
200 psig (13.8 bar) Max Air Pressure

- Utilizes the existing facility ammonia refrigeration system
- Energy efficient due to superior thermodynamic properties
- Reduced maintenance costs
- Few moving parts to wear out
- Digital dew point readout allows for constant indication of dryer performance
- Designed to produce a steady pressure dew point of 39°F (4°C)
- NEMA 1 electric built in accordance with NEC standards (NEMA 4 and 7 are also available)
- Outlet air quality conditions rated to NFPA Class H standards. All ammonia dryers come standard with 3 micron coalescing filters
- Standard models with airflow requirements from 1000 SCFM and up
- Ease of installation

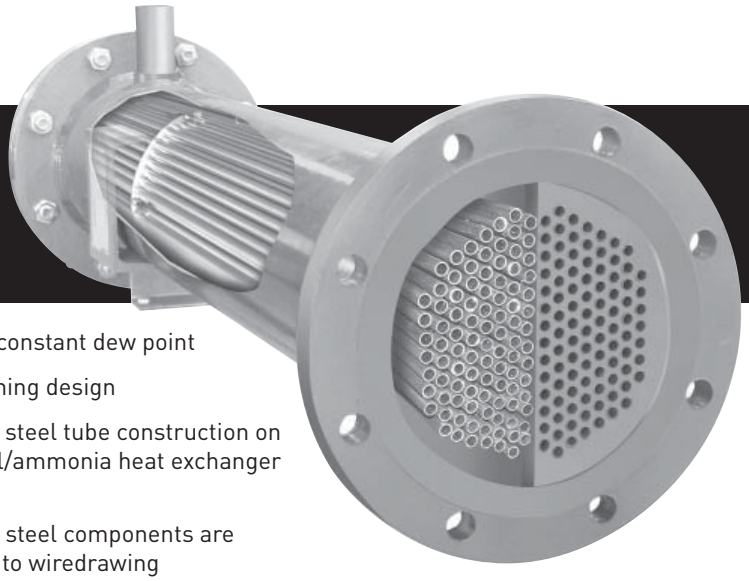


MODEL	NOMINAL CAPACITY (SCFM)	BTU/hr REQUIRED	PRESSURE DROP (psid)	PUMP HP	FLA	AIR IN/OUT	NH_3 IN/OUT	STANDARD VOLTAGE	MAX. AIR PRESSURE (psig)	APPROX. DIMENSIONS (inches)			WEIGHT
										L	W	H	LBS.
ADNH3-1000	1000	42,276	3.4	1	1.9	3" RF	1/2" - 1"	480V	200	108	48	72	2800
ADNH3-1500	1500	58,211	3.5	1	1.9	4" RF				108	48	72	3250
ADNH3-2000	2000	83,053	2.9	2	4.4	6" RF				108	48	72	3800
ADNH3-3000	3000	122,105	3.6	2	4.4	6" RF				116	60	91	4900
ADNH3-4000	4000	150,694	3.4	3	5.8	8" RF				144	72	91	5850

Assumed 30°F (-1°C) saturated suction in the evaporator exchanger to provide a 39°F (4°C) process air pressure dew point.

Heat Exchangers

Precooler/Reheater Exchanger
Cooler Exchanger
Evaporator Exchanger



The $ADNH_3$ Air Dryer contains three heat exchangers:

Precooler/Reheater Exchanger will pre-cool and reheat the compressed air supply by exchanging hot, untreated air with cold air exiting the cooler discharge. The Precooler/Reheater Exchanger reduces the heat load entering the cooler. It provides an exiting air temperature to dew point split,
reducing system relative humidity.

The **Cooler Exchanger** reduces the compressed air temperature to the design dew point by using a water/glycol solution in the shell side of the exchanger.

The water/glycol solution is chilled using the customer supplied ammonia in the **Evaporator Exchanger**. The ammonia supply is never in direct contact with the air exchangers.

- Ensures constant dew point
- Self cleaning design
- Stainless steel tube construction on the glycol/ammonia heat exchanger side
- Stainless steel components are resistant to wiredrawing
- Highly conductive copper tube construction on air/glycol heat exchanger side
- All shell and tube heat exchangers are also available in stainless steel construction
- Easy flow design eliminates flow restrictions to yield a more consistent pressure drop throughout the life of the dryer
- Minimal pressure drop
- All heat exchangers have grooved tube sheets for leak free design
- Shell and tube heat exchanger design eliminates evaporator hot spots
- Requires minimal maintenance
- Life cycle is two times that of a self contained refrigerated dryer

NORMAL OPERATING RANGES	
Parameter	**Range**
Air Inlet Temperature	90-110°F
Air Outlet Temperature	70-90°F
Air Pressure Difference	3-4 psid
Air Dew Point Temperature	33°F
Air Inlet Pressure	80-200 psig

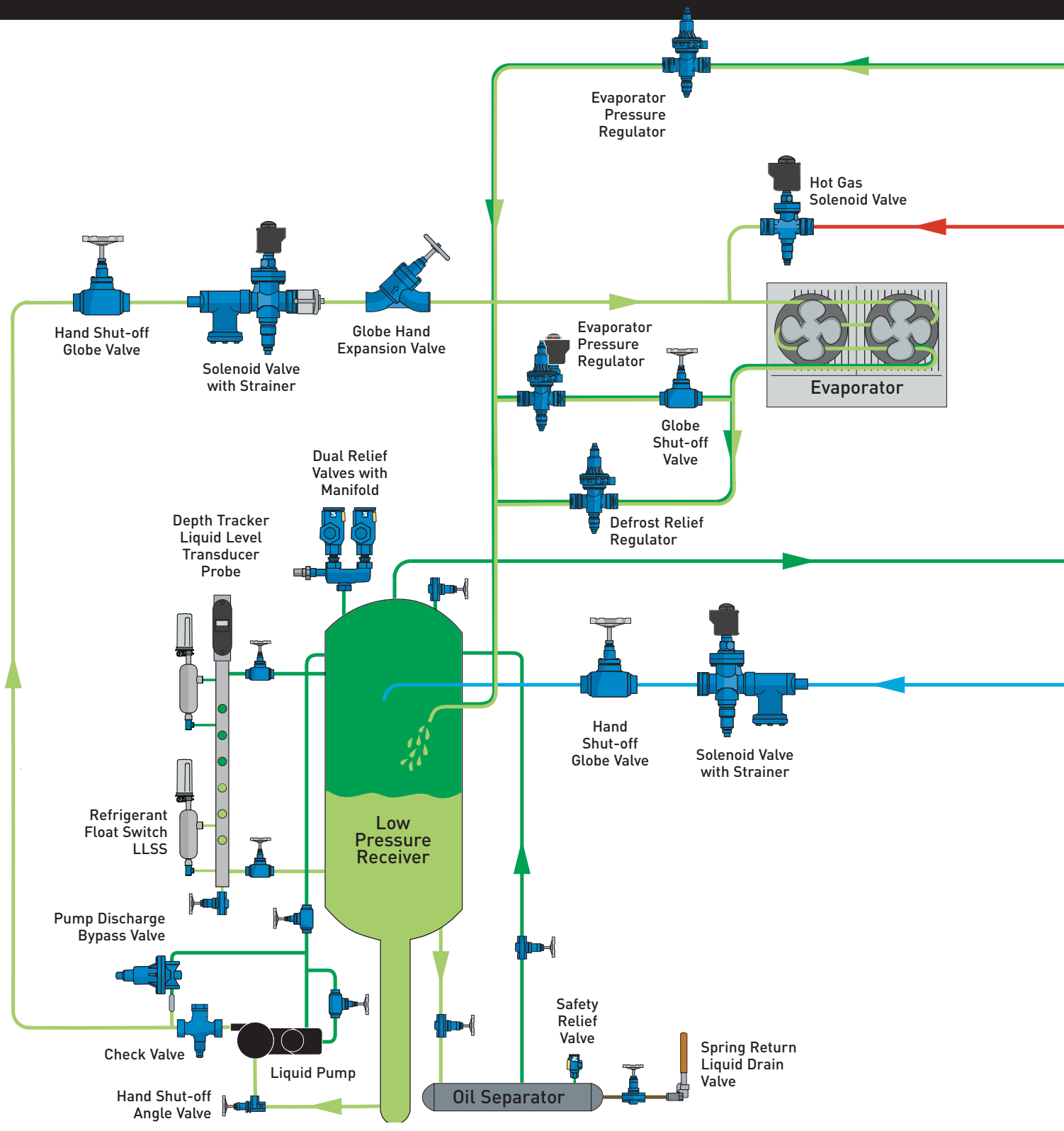
Maximum Reliability Drain
$ADNH_3$ Dryers

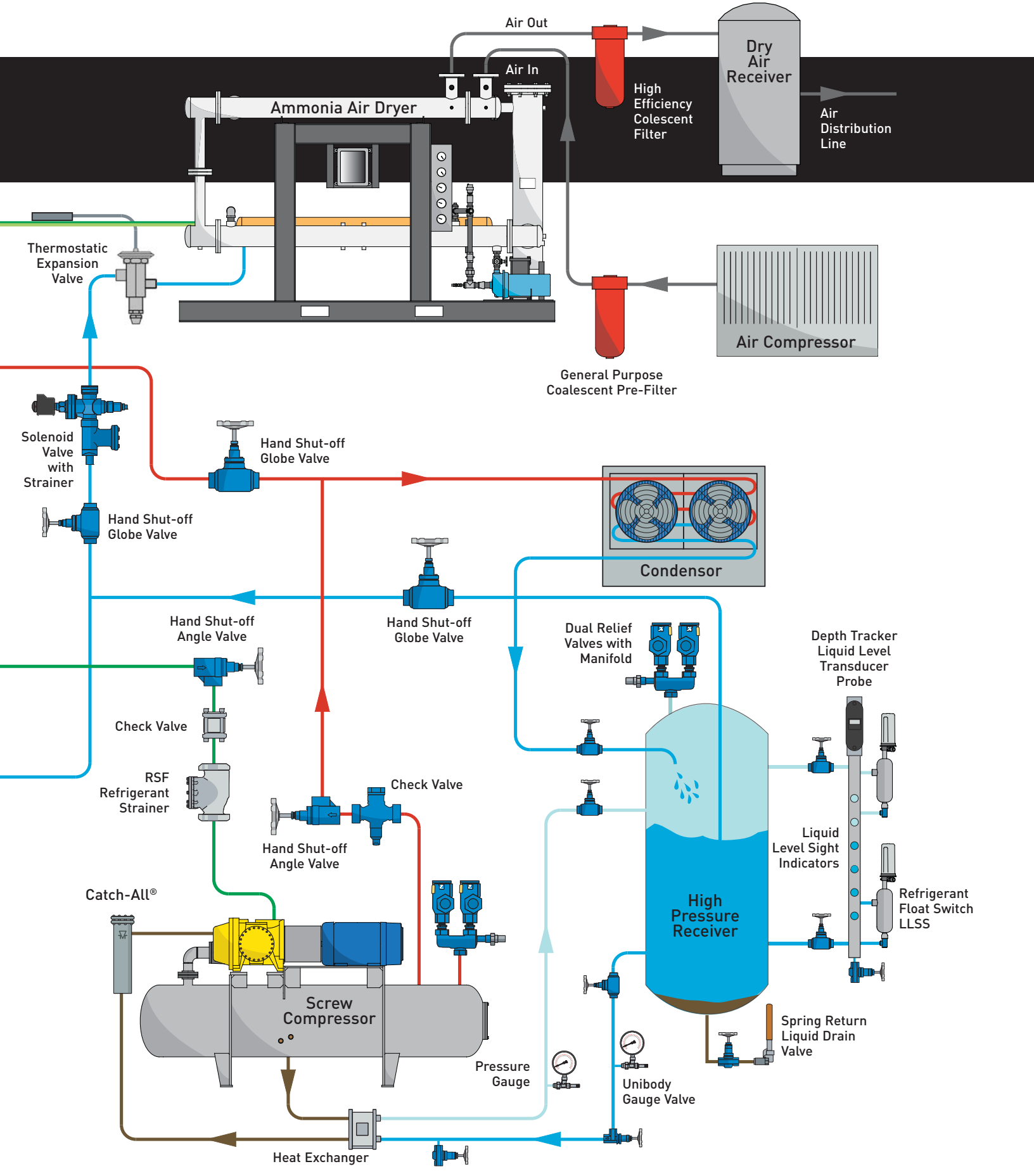
The Maximum Reliability Drain (MRD) is designed to reliably discharge condensate while preventing the loss of valuable compressed air. Rising condensate in the sump actuates a mechanical float switch operating the drain valve. The drain valve remains open until the sump is empty. The MRD only discharges condensate so compressed air is not wasted. Positive pressure from the compressed air system forces the condensate out of the drain sump. The mechanical float is time proven, reliable and non-fouling. The sealed switch is designed so that contaminants settle out below the drain valve to prevent fouling. The MRD is virtually trouble free, energy efficient and easy to operate.

MRD TECHNICAL DATA	
Model	MRD4085
Outlet Connection	1/2"
Inlet Connection	3/4" NPT
Drain Orifice Size	7/16"
Cycle Time	On Demand
Open Time	On Demand
Operating Temperature	35°F - 105°F (0°C - 65°C)
Condensate Holding Capacity	0.66 gallons
Electrical	120V 50/60 Hz
Enclosure	NEMA 4x
Dimensions (L x W x H)	17" x 6" x 6"

OPERATING PRESSURE (psig)	MODEL MRD4085 DRAIN CAPACITY (gpm)
10	5.0
25	7.8
50	11.2
75	14.0
100	16.2
125	17.9
150	19.6

Industrial Air Dryer System Schematic




Air Out
Air In
Ammonia Air Dryer
High Efficiency Colescent Filter
Dry Air Receiver
Air Distribution Line
Thermostatic Expansion Valve
Air Compressor
General Purpose Coalescent Pre-Filter
Solenoid Valve with Strainer
Hand Shut-off Globe Valve
Hand Shut-off Globe Valve
Condensor
Hand Shut-off Globe Valve
Hand Shut-off Angle Valve
Dual Relief Valves with Manifold
Depth Tracker Liquid Level Transducer Probe
Check Valve
RSF Refrigerant Strainer
Check Valve
Hand Shut-off Angle Valve
Liquid Level Sight Indicators
Refrigerant Float Switch LLSS
Catch-All®
High Pressure Receiver
Screw Compressor
Spring Return Liquid Drain Valve
Pressure Gauge
Unibody Gauge Valve
Heat Exchanger

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