PNEUMATECH®

Noncycling Refrigerated Air Dryers

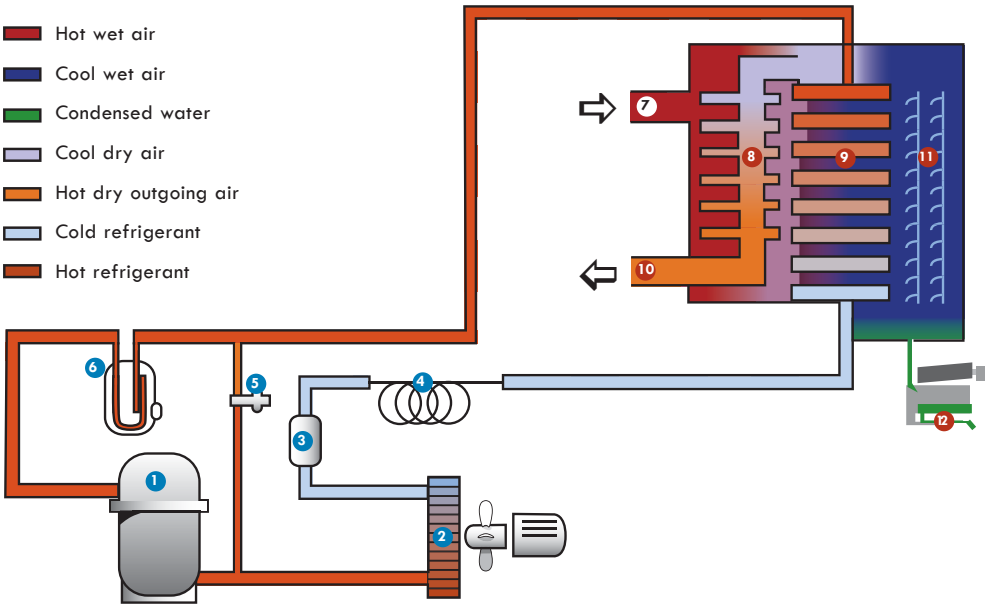
Range AD–10 to AD–4000

Section 10
Bulletin A-7

Pneumatech is proud to offer this range of reliable and innovative refrigerated air dryers. These dryers are a cost effective solution to remove all traces of condensation and the resultant corrosion from your compressed air system. They are tested to the stringent CAGI ADF-100 standards so you can be assured that you will get a dryer that performs for years to come.

FEATURES	BENEFITS
Integrated Air-to-Air heat exchanger on all models	Eliminates condensation on outside of pipes More efficient-lowers refrigeration kW at full load
Hot Gas Bypass valve on even the smallest units in the range	Precise dewpoint control across a wide range of flows
No-air-loss electronic drain on all models	No loss of expensive compressed air during drain discharge
Aluminum block HX w/integrated water separator (AD-75 to 2500) Brazed plate HX with centrifugal water separator (AD-10 to 50)	High performance & reliability in a compact design Reduces components Reduces pressure drop
Environmentally safe refrigerants—R-134a (AD-10 to 50) & R-404a (AD-75 to 4000)	Minimal ozone depletion potential— meets Montreal Protocol
UL and cUL listed	Units suitable for all municipalities and Canada
Inlet and outlet connections on the back of each unit	Ease of Installation
Lockable on/off switch	Can prevent unauthorized start-up as part of lockout/tagout routine
Reliable components	Minimal maintenance and long intervals between service calls
Service friendly design	Easy access to key components

F L O W D I A G R A M



Refrigerant Circuit

1. **Refrigerant Compressor**
   Takes refrigerant gas and compresses it to a high pressure and temperature.

2. **Condenser**
   Cools the refrigerant and changes it to liquid form. In this state, it will provide the BTU's necessary to cool the compressed air to the stated dewpoint.

3. **Refrigerant Filter**
   Protects the Thermal Expansion Device (4) from particulate matter.

4. **Thermal Expansion Device**
   Reduces the refrigerant pressure, lowering its temperature and increasing its ability to cool the compressed air in the Air-to-Refrigerant Heat Exchanger (9). The refrigerant is now almost all liquid. It will change back to the gaseous state as it cools the compressed air

5. **Hot Gas Bypass Valve**
   Adjusts the refrigerant suction pressure/temperature in the Air-to-Refrigerant Heat Exchanger (8), eliminating the chance of condensate freezing inside. Also helps ensure a stable pressure dewpoint.

6. **Accumulator (AD-300 and up)**
   The accumulator is designed to store and prevent oil and liquid refrigerant that may not have boiled off in the heat exchanger from getting into the compressor. Because liquids are not compressible, any liquid "slugging" could cause significant damage to the compressor.

Air Circuit

7. **Air Inlet**
   Hot saturated air enters the dryer from the compressor. This should be 100% saturated air with no residual liquid.

8. **Air-to-Air Heat Exchanger**
   As the air exits the dryer it cools the incoming air. There are two benefits. First, air exiting is re-warmed, so pipes downstream do not sweat. Second, the air entering the dryer is pre-cooled, which decreases the load on the refrigeration circuit.

9. **Air-to-Refrigerant Heat Exchanger**
   Allows for the cooling of the compressed air by the cold refrigerant liquid (changing the refrigerant to a gaseous state to be returned to the Compressor (1)), forcing water vapor in the compressed air stream to condense. The more effective this heat transfer, the cooler the air becomes, condensing more water vapor.

10. **Air Outlet**
    Where cooled compressed air (approximately 80°F / 26.7°C), with a pressure dewpoint of 39°F / 4°C, exits the dryer to the piping system.

11. **Water Separator**
    Separates the condensed water vapor from the cooled compressed air stream, where it will to be collected in the "silent zone" for removal. Efficient separation is critical to assure the pressure dewpoint is equal to the lowest temperature achieved in the Air-to-Refrigerant Heat Exchanger (9).

12. **No Air-loss Electronic Drain**
    Condensed water droplets are evacuated from the separator through an electronic demand drain without the loss of expensive compressed air from the system.

INSTRUMENT PANELS

AD-10 TO AD-250

Lockable On/Off Switch: Prevents unauthorized start-up.

Refrigeration Suction Pressure Gauge: Allows for easy servicing and monitoring of the operation of the dryer.

Power On Light: Illuminates when unit is turned on.

Hi-Temperature Alarm: Malfunction light will illuminate if the compressor shuts off.

AD-300 TO AD-600

Refrigeration Suction Pressure Gauge: Allows for easy servicing and monitoring of the operation of the dryer.

Lockable On/Off Switch: Prevents unauthorized start-up.

Power On Light: Illuminates when unit is turned on.

Hi-Temperature Alarm: Malfunction light will illuminate if the compressor shuts off.

AD-750 TO AD-2500

Dewpoint Indicator: Gauge to show dewpoint is in correct range.

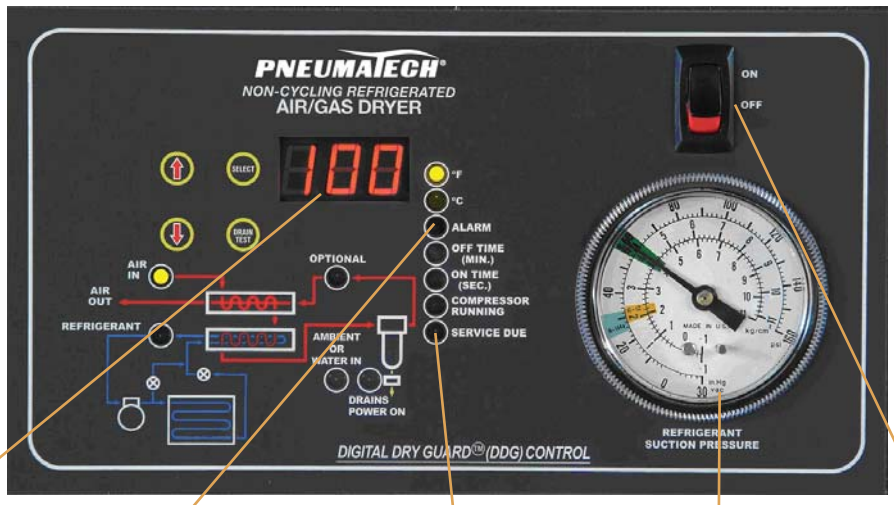
Lockable On/Off Switch: Prevents unauthorized start-up.

Power On Light (green): Illuminates when unit is turned on.

Alarm Indicator (red): Malfunction light will illuminate for condensate drain.

Alarm Indicator (red): Malfunction light will illuminate for high/low Pressure or fan motor protection.

AD-3200 TO AD-4000



Digital Display: Displays refrigerant suction temp., incoming air temp., ambient air temp., and optional dewpoint temp. in °F or °C.

Alarm Indicator: LED will illuminate for compressor overload, low refrig. suction pressure or high refrig. discharge pressure.

Service Due Indicator: Dryer is due for routine maintenance.

Refrigerant Suction Pressure Gauge: Allows for easy servicing and monitoring of the operation of the dryer.

On/Off Switch

AD-10 to 50

AD-75

AD-100 & 125

AD-150 to 250

AD-300 to 600

AD-750 to 1250

AD-1600 to 2500

CAPACITY CALCULATION

Inlet Pressure						
psig (bar)	85 (6)	**100 (7)**	115 (8)	145 (10)	188 (13)	232 (16)
C1	0.97	**1**	1.03	1.07	1.12	1.16
Inlet Temperature						
°F (°C)	75-95 (24-35)	**100 (38)**	105 (40)	115 (46)	122 (50)	131 (55)
C2	1.06	**1**	0.95	0.79	0.67	0.57
Ambient Temperature						
°F (°C)	95 (35)	**100 (38)**	105 (40)	115 (46)		
C3	1.03	**1**	0.95	0.93		

Example: **Which dryer will handle the following conditions for a PDP of +39°F/+3°C:**

Actual Flow	**85 SCFM (144.4NM^3/hr.)**
Inlet Pressure	**145 PSIG (10 bar)**
Inlet Temperature	**115°F (46°C)**
Ambient Temperature	**100°F (38°C)**

1) Correction factors for the table: C1 = 1.07, C2 = 0.79, C3 = 1

2) Calculate the actual flow conditions: $\text{Nominal Flow} = \frac{\text{Actual Flow}}{\text{C1 x C2 x C3}} = \frac{85}{1.07 \times 0.79 \times 1} = 100.5$

3) Select an AD – 100 for this application

SPECIFICATIONS

Model	39±2°F SCFM*	Elect. kW Input*	In/Out Conn. Size	Pressure Drop (PSID)	Max. Working Pressure (PSIG)	Refrigerant Type	Dimensions LxWxH (in)	Approx. Ship Weight (lbs.)	Elect. Power Supply
AD-10	10	0.152	0.5" NPT (M)	1.45	230	R-134a	22 x 16 x 25	57	115-1-60
AD-15	15	0.188	0.5" NPT (M)	2.18	230	R-134a	22 x 16 x 25	59	
AD-25	25	0.258	0.5" NPT (M)	2.9	230	R-134a	22 x 16 x 25	70	
AD-35	35	0.318	0.5" NPT (M)	2.9	230	R-134a	22 x 16 x 25	75	
AD-50	50	0.359	0.5" NPT (M)	2.9	230	R-134a	22 x 16 x 25	75	
AD-75	75	0.734	1" NPT (F)	2.9	230	R-404a	23 x 17 x 37	112	115-1-60 or 208/230-1-60
AD-100	100	0.854	1.5" NPT (F)	2.18	200	R-404a	26 x 20 x 38	134	
AD-125	125	1.031	1.5" NPT (F)	2.9	200	R-404a	26 x 20 x 38	150	
AD-150	150	1.49	1.5" NPT (F)	1.45	200	R-404a	27 x 25 x 42	198	208/230-1-60
AD-200	200	1.629	1.5" NPT (F)	2.9	200	R-404a	27 x 25 x 42	198	
AD-250	250	1.877	1.5" NPT (F)	3.6	200	R-404a	27 x 25 x 42	198	208/230-1-60 or 460-3-60
AD-300	300	2.287	2" NPT (F)	3.6	188	R-410a	29 x 35 x 40	282	460-3-60 or 208/230-3-60
AD-360	360	2.637	2" NPT (F)	4.35	188	R-410a	29 x 35 x 40	322	
AD-500	500	3.176	2" NPT (F)	4.35	188	R-410a	29 x 35 x 40	348	
AD-600	600	4.3	2" NPT (F)	4.35	188	R-410a	29 x 35 x 40	364	
AD-750	750	5.36	3" NPT (F)	3.6	188	R-404a	40 x 43 x 61	717	460-3-60
AD-1000	1000	5.82	3" NPT (F)	4.3	188	R-404a	40 x 43 x 61	739	
AD-1250	1250	7.26	3" NPT (F)	5	188	R-404a	40 x 43 x 61	772	
AD-1600	1600	9.6	6" Flange	4.3	188	R-404a	40 x 83 x 61	1213	
AD-1800	1800	9.6	6" Flange	4.3	188	R-404a	40 x 83 x 61	1235	
AD-2200	2200	12.5	6" Flange	3.6	188	R-404a	40 x 83 x 61	1323	
AD-2500	2500	12.5	6" Flange	3.6	188	R-404a	40 x 83 x 61	1323	
AD-3200	3200	15.75	6" Flange	4.5	150	R-404a	113 x 60 x 99	4200	460-3-60 or 208/230-3-60
AD-4000	4000	18.2	8" Flange	4.5	150	R-404a	150 x 80 x 116.5	6500	

* Capacity and kW ratings are at full load at CAGI ADF-100 standard conditions of 100°F (38°C) ambient, 100°F (38°C) inlet and 100 psig (7 bar) delivering a pressure dewpoint of 39°F (3.9°C) ± 2°F (1.1°C).

Operating Specifications

Max. Inlet Temp: 131°F (55°C)

Max. Ambient Temp: 115°F (46°C)

Watercooled units available only in 3200 and 4000 SCFM

- Elec. kW Input:
  - ADW-3200: 14.4
  - ADW-4000: 16.8
- Water Usage GPM:
  - ADW-3200: 42
  - ADW-4000: 50

AD-3200 & 4000 are open frame design.

PNEUMATECH®

Pneumatech
4909 70th Avenue
Kenosha, Wisconsin U.S.A. 53144
(262) 658-4300 Fax: (262) 658-1945

www.pneumatech.com

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