



SET-UP, OPERATING and MAINTENANCE INSTRUCTIONS

AD-700, AD800, AD-1000 And AD-1200 Air Dryer

The system is designed to remove excess moisture from the compressed air stream. The AD 700, AD800, AD1000 and the AD 1200 Air Dryers are a skid-mounted system consisting of an air-cooled aftercooler or water-cooled aftercooler, air/water separator and a single tower air tank with a bed of desiccant tablets and a course afterfilter. The wet warm air enters the air-cooled aftercooler or the water-cooled aftercooler (whichever aftercooler system the customer chooses to use) where it is cooled to a temperature approaching ambient. Some of the moisture in the warm air stream is condensed out during this cooling process. The saturated air and liquid water proceed to the air/water separator where most of the liquid water is separated by gravity and settles out in the bottom of the collection bowl where it can be manually drained. The process air then enters the bottom of the single tower desiccant tank where it proceeds upward into desiccant tablets, which absorb the moisture from the air as it passes through the desiccant bed. The tablets dissolve gradually as they absorb the moisture. The solution, which consists of dissolved desiccant and water falls into the sump area in the bottom of the vessel. The vessel must be drained periodically of this accumulated solution. The vessel is equipped with a ball valve to manually drain the tank. As the desiccant dissolves it must be replenished to maintain performance. A course afterfilter is supplied to catch any residuals that may work their way downstream. The system is plumbed to allow the desiccant tank to be by-passed by opening and closing two ball valves in the piping stream. This allows the desiccant tank to be serviced without shutting down the airflow. While the unit is in the by-pass mode the air is not being processed through the desiccant tank thus eliminating the drying process.

Set-Up Procedure

1. Position the air dryer on a level surface as close to the work source as possible.
2. Position the air dryer in a location that allows access for service and forklift access.
3. Look into the site glass to insure that the desiccant level is full and up to the site glass level.
4. Place a collection bucket under the drain valve to collect the dissolved desiccant and water solution.
5. Check the lubricator to see that there is oil in the reservoir.
6. Connect the bull hose from the compressor to the inlet of the air dryer. If using the **air-cooled aftercooler** use the upper air inlet connection. If using the **water-cooled aftercooler** use the lower air inlet connection.
7. Connect the bull hose from the outlet of the air dryer to the equipment using the dry air.
8. Close the drain valves on the air/water separator, single tower desiccant tank and the afterfilter.
9. Inspect the hatch cover in the top of the vessel to insure it is closed and tight.
10. Open the large ball valve on the discharge of the air dryer.
11. Trace the air path through the system to insure that the unit is not in the by-pass mode and all the valves are in the correct position.
12. Start the compressor and set the pressure on the cooling fan at 65 PSI. Insure that the fan is turning and operating properly.
13. Check all connection for air leaks.
14. Drain the moisture accumulating in the tank every couple of hours during operation.
15. Check the desiccant level daily and add desiccant as needed.
16. The system is now operational.

During Operation

The simple design of the air dryer allows for easy operation and requires very little care during operation. The dryer requires only a few procedures to ensure peak performance.

1. Drain the air/water separator frequently.
2. Drain the accumulated desiccant and water solution from the single tower desiccant tank frequently.
3. Drain any accumulation from the afterfilter housing frequently.

Note: These manual drains should be opened at least every four hours of operation to drain any accumulation. The dryer may require draining on a more frequent basis on humid days.

Daily Shut Down Procedure

1. Shut down the air consuming operation requiring the dry processed air.
2. Shut down the air compressor or otherwise isolate the air dryer from the air source.
3. Exhaust any remaining air for the air dryer.
4. Drain any accumulated water and desiccant solution from the three drain valves mentioned above.
5. Look into the sight glass windows to see if the desiccant level needs to be replenished. Note: It is recommended that the vessel actually be opened periodically at the top access hatch to verify that the desiccant level is up to the sight glass level. Sometimes the visual inspection through the sight glass is not a true indicator of the actual desiccant level.
6. Check the oil level in the lubricator for the fan air motor. Add oil as needed. This takes air tool lubricating oil (10 weight oil).
7. Clean the air-cooler aftercooler core if needed. Dirt or other contaminants will greatly reduce the efficiency of the aftercooler.

Adding Desiccant

1. Shut down the air system and open all the drain valves to allow the dryer to depressurize completely.
2. Loosen the nut(s) on the hatch cover.
3. Push in on the hatch cover. If the vessel is depressurized the cover will unseal. Once the seal is broken, tilt the hatch cover and remove it from the vessel.
4. Add the amount of desiccant tablets required to raise the supply to the maximum operating level. This level should be above the sight glass level on the vessel. Once the desiccant is added level off the desiccant bed.
5. Inspect the gasket surface on the hatch cover and vessel. Clean the gasket surfaces if needed.
6. Inspect the gasket and replace if needed.
7. Install the hatch cover and tighten the nut(s). Do not over tighten, this may damage the cover.
8. Restart the air dryer following the procedures above and check for air leaks.

PREPARATION OF EQUIPMENT FOR RETURN

1. Open all the manual drains and drain all the accumulation of water and desiccant from the system.
2. Secure and disconnect the compressed air from the air dryer.
3. Check the desiccant level and refill with desiccant to avoid additional charges when the equipment is returned.
4. Wash the exterior of the unit if it is dirty or muddy beyond normal conditions.
5. Clean the aftercooler core of any accumulated dirt or contaminants.
6. Close all the drain valves.
7. Check and secure the access hatch on the single tower desiccant vessel.
8. Gather and secure for transport all the accessories sent with the equipment (if any).
9. Properly secure the equipment on the truck or trailer using proper tie-down procedures. Use the lifting eyes and forklift tubes for attachment of the chains or straps. This will minimize the risk of causing damage to the unit during transport.
10. Make a note of any problems experienced during the operation of this equipment and a contact name and phone number so our technician can contact this person. Give this note to the delivery person returning the equipment.
11. We hope this equipment rental went well for you and we look forward to assisting your company in future projects. Thank you for your business.

FORM U-1A MANUFACTURERS' DATA REPORT FOR PRESSURE VESSELS
 (Alternate Form for Single Chamber, Completely Shop-Fabricated Vessels Only) D36
 As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1 10/81

1. Manufactured by Van Air Systems, Inc., 350 Mechanic St., Lake City, PA

2. Manufactured for ALCOA

3. Location of Installation 77-2-08

4. Type Vertical (Spec. No. 77-2-08) (Drawing No. E-325B-C) (Serial No. 28263) (Year Built) 1982

5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction, and workmanship conforms to ASME Rules, Section VIII, Division 1 1980, and Addenda to Summer 1981 and Code Case Nos. _____

Special Service per UG-120(f) _____

Manufacturers' Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report: _____

6. Shell: Matl. SA515-70 Norm. Thk. .250 in. Allow. 0 in. Diam. 36 in. Lpth. 38 in.

7. Seams: Long Double Butt (Spec. No., Grade) RT (Welded, Oil, Segl. Lap, Butt) (Spec. or Full) Efficiency 70 % H.T. Temp. _____ F Time _____ hr

8. Heads: (a) Material SA515-70 (Spec. No., Grade) (b) Material SA515-70 (Spec. No., Grade)

LOCATION (Spec. No., Grade)	Min. Thk.	Corr. Allow.	Allow. Radius	Flange Radius	Conc. Angle	Through Rods	Flat Diam.	Edg. to Pressure (Convex or Concave)
(a) Top	.1608	0	.3125		2:1			Concave
(b) Bottom	.1608	0	.3125		2:1			Concave

If removable, bolts used (describe other fastenings) _____

9. Constructed for max. allowable working pressure 125 psi at max. temp. 300 F. Min. temp. (when less than -20 F) _____ F. Hydrostatic, pneumatic, or other test pressure 188 psi.

10. Safety Valve Outlet: Number 3 Size 3" NB Location Welded head(s)

11. Nipples and Inspection Openings:

Spec. No., Grade	Size	Type	Matl.	Thk.	Notes	Inspection
	4"	pipe	SA53-B	.237		(1) welded each head
	1"	pipe	SA53-B	XH		welded head(b)
	1 1/2"	3 x 3/8	SA675-55	.750		welded head(a)
	2"	2 x 3/4	SA106-C	.6875		welded head(b)
	2"	pipe	SA-105	XH		welded shell
	1 1/2"	pipe	SA-105	XH		welded head(b)
	1 1/4"	pipe	SA53-B	XH		welded shell
	1 1/2"	pipe	SA53-B	XH		welded shell

12. Inspection Date 9/23/82 (Date) 2 (No.) 3 (Other) _____ (Inspector)

13. Inspector Commissioned AIP _____ (Inspector)

CERTIFICATE OF COMPLIANCE

The contents of this report are correct and that all details of design, material, construction, and workmanship conform to the ASME Code for Pressure Vessels, Section VIII, Division 1.

Date JUL 29 1982 Signed Van Air Systems Inc. by [Signature] (Inspector)

at Lake City, PA expires September 26, 1983

CERTIFICATE OF SHOP INSPECTION

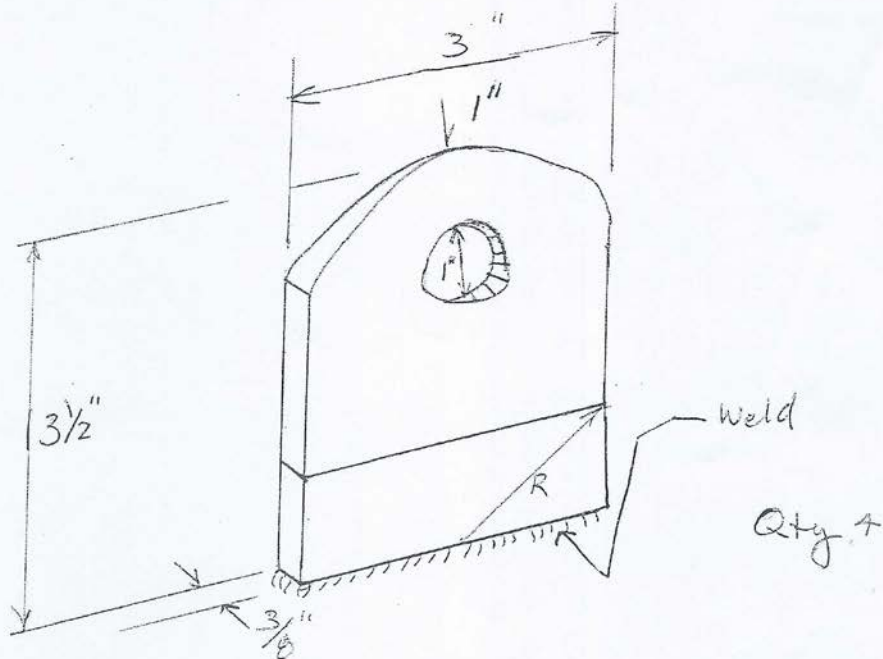
Manufactured by Van Air Systems Inc. at Lake City, PA

A valid commission issued by the Board of Boiler and Pressure Vessel Inspectors of the State of Penn. and employed by _____ has inspected this pressure vessel described in the Manufacturers' Data Report as JUL 29 1982 and after examination of the design and build, the Manufacturer has constructed this pressure vessel in accordance with the ASME Code, Section VIII, Division 1. By signing this certificate, the Inspector has inspected and makes no warranty, expressed or implied, concerning the pressure vessel described in the Manufacturers' Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or loss of any kind resulting from the use of this inspection.

Date 7-29-82 Commission NE05605701637

(Date) (Inspector) (Data Report, Spec. No., Grade)

9-20-10
 Lifting Eye Calculations
 SAFE Systems Model AD1000



Material SA 36
 $F_y = 36000$
 $F_y = 0.4 F_y = 14400$

$$P = 2(e - d/2)t \times F_y = 2(1.5 - 1/2)0.375 \times 14400$$

$$P = 10,800$$

Each lug is good to 10,800

$$\text{total is } 10,800 \times 4 \text{ Lugs} = 43,200$$

Unit weighs 4200 total

$$\frac{43,200}{4,200} = 10.2 \text{ +1 Safety Factor}$$

welds OK Passes