



COMPRESSED AIR ADSORPTION DRYER

with activated carbon purifier

COMPRESSED AIR ADSORPTION DRYER C-HDADN SERIES

The Problem

In various fields of application, class 1 compressed air which, according to DIN ISO 8573-1, is technically oil-free, is not clean enough. In accordance with this guide-value classification, the maximum oil content (including oil vapor) must not exceed 0.01 mg/m^3 compressed air. This is on such a small scale that it can hardly be detected. But for many compressed-air applications, this amount is still completely unacceptable, for example for medical engineering, pharmaceuticals, measurement technology, food processing, and for the packaging of food and medicine, or the provision of certain breathing gases. In these fields, absolutely oil-free compressed air with a residual-oil content of partially less than 0.003 mg/m^3 is required.

The Solution

C-HDADN series of heatless adsorption dryers with mounted activated carbon purifier are designed to dry compressed air efficient down to a pressure dew point of -70°C and remain a residual oil content of 0.003 mg/m^3 . The compact design allows the usage at the point where the dry technically oil free air is needed. It comes with installed pre- and afterfilter, desiccant fill and a reliable PCB controller with indication lights.

How does the AFE C-HDADN Desiccant Dryer work?

Two vessels connected in parallel are required for the continuous operation of drying via the adsorption process. Each vessel is filled with desiccants which act as the drying medium. AFE desiccant dryers use high performance desiccants which have a long service life at high input temperatures, resulting in very low pressure dew points.

Stage 1:

The drying of compressed air takes place in vessel A and simultaneously, desorption (re-generation of the desiccant) occurs in vessel B. The desorption process in vessel B occurs in a counter flow direction by using a small flow of dry compressed air channeled from the outlet of vessel A. The mode of operation of pressure change desorption corresponds to almost isothermal desorption through partial pressure drop in the adsorbing component by means of pure purge gas. After drying the compressed air enters the activated carbon purifier where the oil vapor and odor removal takes place before it then enters the final filter for particle removal.

Stage 2:

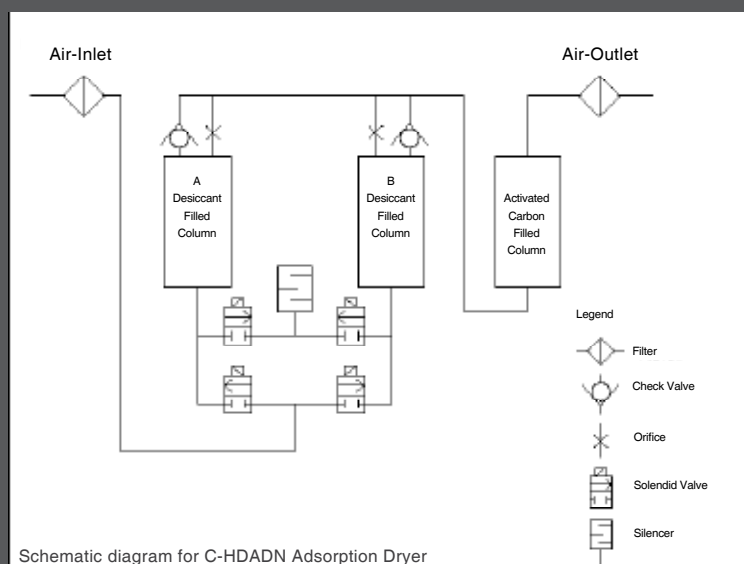
Upon completion of the re-generation cycle, re-pressurization takes place in vessel B until both vessels equalize in pressure. At this stage, the vessels are ready to switch over.

Stage 3:

The air from vessel A will purge out and the drying cycle switches to vessel B. Vessel A will now undergo the desorption cycle to re-generate the desiccants.

The entire process will repeat itself to continuously dry the compressed air.

All AFE dryers are installed with coalescing pre-filters and particle after-filters to provide clean and dry compressed air (CDA).



Schematic diagram for C-HDADN Adsorption Dryer

AFE manufactured dessiccant dryers are fully tested and are produced in accordance to the ISO 9001 quality system.



Benefits of the C-HDADN Series:

- Point of use application:
Air quality at the point where it's needed.
- Simple installation:
Only air in/air out and power to be connected.
- Compact design:
Specially designed for point of use applications, small footprints.
- Easy maintenance:
Designed for quick parts change with standard components.



Applications

C-HDADN dryers will benefit users with a demand for clean dry air directly at their application point.

- Critical Instrumentation
- Dental Air
- Medical Air
- Food Packaging
- Pre-Filtration for Gas Separation Membranes
- Breathing Air not requiring CO or CO2 Removal
- Paint Spraying



TECHNICAL DATA C-HDADN SERIES

Model Number	Volume Flow Rate ¹				Dimensions (mm)					Conn.	Weight
	l/s	m ³ /min	m ³ /h	cfm	H	W1	W2	D1	D2	Zoll	kg
C-HDADN002	2.30	0.14	8.20	4.80	422	515	388	226	106	G 1/4"	22
C-HDADN004	4.40	0.26	15.50	9.11	672	515	388	226	106	G 1/4"	30
C-HDADN007	7.05	0.42	25.40	14.95	922	515	388	226	106	G 1/4"	38
C-HDADN010	9.75	0.58	35.10	20.65	1122	515	388	226	106	G 1/4"	44
C-HDADN015	15.64	0.94	56.30	33.12	995	773	590	273	160	G 1/2"	77
C-HDADN020	20.00	1.20	72.00	42.35	1245	773	590	273	160	G 1/2"	92
C-HDADN030	30.00	1.80	108.00	63.50	1037	1050	780	338	220	G 1"	145
C-HDADN045	45.00	2.70	162.00	95.30	1387	1050	780	338	220	G 1"	178

1. Based on -40°C pressure dew point with inlet conditions of 7 bar g and 35°C.
Systems for lower pressure dew points are available upon request.

TECHNICAL DATA C-HDADN SERIES

Pressure bar g	Inlet Temperature C°					
	25	30	35	40	45	50
4	0.66	0.64	0.62	0.59	0.55	0.50
5	0.80	0.77	0.75	0.71	0.67	0.63
6	0.94	0.90	0.87	0.84	0.79	0.76
7	1.07	1.03	1.00	0.96	0.92	0.87
8	1.16	1.14	1.11	1.08	1.04	1.00
9	1.23	1.21	1.18	1.14	1.10	1.07
10	1.32	1.30	1.27	1.24	1.20	1.16

Example	
Flow rate	16.9 m ³ /h
Pressure	6 bar
Inlet temperature	40°
Pressure dew point	-40°

Dryer capacity = $16,9/0,84 = 20.12 \text{ m}^3$
Therefore, selected dryer model:
C-HDADN 007

