Energy Saving Dryers

Dry Air Technology
by Arrow Pneumatics

"C" SERIES CYCLING DRYER

Arrow Model Numbers 3514C through 3560C

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Features

- Significant energy savings
- Longer compressor life because of reduced cycling wear
- Semi-hermetic compressors have a 3 times longer life than hermetic compressors
- More BTU's/HR capacity per KW with Semi-Hermetic Compressor
- No Dew Point spikes that occur with cycling type dryers
- Superior heat exchanger design with spiral fin tube construction

THE BEST COMBINATION IN THE REFRIGERATED AIR DRYER BUSINESS

SEMI HERMETIC COMPRESSORS

- *Long Life Compressors (3 Times Longer than Hermetic Design)*
- *High Flow Oil Pump*
- *Much More Cooling Capacity (BTU/HR) than Hermetic Design*
- *Head Unloaders Provide for Greater Energy Savings at Less than Full Load Conditions*
- *Environmentally Friendly R-22 Refrigerant (R134A Refrigerant Available)*
- *Field Repairable and Rebuildable*
- *High Efficiency Motors*

ARROW PNEUMATICS SPIRAL FIN TUBE HEAT EXCHANGER DESIGN

- *100% Copper Tube within a Tube Design*
- *Exclusive Spiral Fin Tube in Evaporator Elimintates Laminar Flow and Acts as a Cold Mechanical Separator to Eliminate Fog and Mist*
- *Large Inlet and Outlet Manifolds Assures EvenAir Flow Through Tubes*
- *Refrigerant Feeder Assembly Delivers Precise Amounts of Refrigerant to Each Tube*
- *Most Efficient Separator Design on the Market*

Why specify a semi-hermetic compressor with head unloaders for a refrigerated air dryer?

Refrigerated air dryers rarely handle the same amount of compressed air at the same inlet temperature for any extended period of time. The BTU's/Hr. load on the dryer is constantly changing because the demand for compressed air in most plants varies from one minute to the next and from one shift to the next. Not only does the CFM requirements constantly change but the inlet temperature to the dryer varies dramatically depending on ambient temperatures. When sizing an air dryer, it is necessary to know all the conditions of the application, like the maximum pressures and temperatures the dryer will encounter. Knowing this information is most important to the performance and reliability of the dryer which is selected.

Refrigerated air dryers per industry standards are rated at a given CFM at 100°F inlet air temperature, 100°F ambient temperature and 100 PSIG operating pressure. The chart below shows how the performance of the dryer changes as the above design conditions change.

	Design Conditions	Actual Conditions	Affect on Performance
Air Flow %	**100%**	**50%**	**Reduces Load 50%**
Inlet Air Temperature	**100°F**	**75°F**	**Reduces Load 44%**
Ambient Air Temperature	**100°F**	**80°F**	**Reduces Load 14%**

As you can see knowing the actual operating conditions for the application, a properly sized "C" SERIES dryer can be selected to reduce the customers operating costs.

HERE'S HOW IT WORKS!

An Arrow "C" Series Refrigerated Air Dryer equipped with a semi-hermetic compressor and head unloaders will reduce the KW input to the dryer and save electricity at times when the dryer is operating at less than fully loaded conditions. Dryers equipped with four cylinder compressors can be unloaded to 1/2 of their full rated capacity and dryers equipped with six cylinder compressors can be unloaded to 2/3rds and 1/3rd of their full rated capacity. A typical plant operating 6000 hours per year could expect significant savings with the combination of an efficient semi-hermetic compressor and head unloaders. The semi-hermetic compressor is more efficient and at full load uses less power than a regular hermetic compressor.

An average plant operating 6000 hours per year will, realistically, operate the dryer 1/3rd of the time fully loaded, 1/3rd of the time 2/3rds loaded, and 1/3rd of the time 1/3rd loaded.

The **cost to operate** a 1500 CFM dryer fully loaded without head unloaders for 6000 hours would be:

6000 HRS X 8.11 KW X .10 KWH = $4,866

To operate the same dryer fully loaded on the 1st shift, 2/3rds loaded on the 2nd shift and 1/3rd loaded on the 3rd shift would be:

2000 hours X 8.11 KW X $.10 KWH = $1,622

2000 hours X 6.75 KW X $.10 KWH = $1,166

2000 hours X 4.12 KW X $.10 KWH = $714

The total electrical cost would be $3,502 compared to $4,866 or **a savings of $1,364 per year.**

Semi-Hermetic Compressor Performance
R-22 Refrigerant

Model	Flow Capacity SCFM	# of Cylinders	HP	In/Outlet Connections	Step Unloaders	Full Load KW	1st Step Unloader KW	Energy Savings	2nd Step Unloader KW	Energy Savings
3514-*C	500	4	3	3" NPT	1 Step	4.07	2.32	43%	N/A	
3514W-*C	500	4	3	3" NPT	1 Step	3.20	1.82	43%	N/A	
3515-*C	625	4	3	3" NPT	1 Step	4.07	2.32	43%	N/A	
3515W-*C	625	4	3	3" NPT	1 Step	3.20	1.82	43%	N/A	
3516-*C	750	4	5	3" NPT	1 Step	5.04	2.87	43%	N/A	
3516W-*C	750	4	5	3" NPT	1 Step	4.17	2.38	43%	N/A	
3517-*C	1000	4	5	4" FLG	1 Step	6.51	3.71	43%	N/A	
3517W-*C	1000	4	5	4" FLG	1 Step	5.25	2.99	43%	N/A	
3518-*C	1200	4	5	4" FLG	1 Step	7.13	4.06	43%	N/A	
3518W-*C	1200	4	5	4" FLG	1 Step	5.87	3.35	43%	N/A	
3519-*C	1600	6	6.5	6" FLG	2 Step	9.37	6.75	28%	4.12	56%
3519W-*C	1600	6	6.5	6" FLG	2 Step	8.11	5.84	28%	3.57	56%
3521-*C	2000	6	7.5	6" FLG	2 Step	14.56	10.48	28%	6.41	56%
3521W-*C	2000	6	7.5	6" FLG	2 Step	13.30	9.58	28%	5.85	56%
3548W-*C	2300	6	10	6" FLG	2 Step	13.30	9.58	28%	5.85	56%
3522-*C	2500	6	10	6" FLG	2 Step	14.81	10.48	28%	6.41	56%
3523-*C	3000	4	15	6" FLG	1 Step	18.06	10.29	43%	N/A	0%
3549W-*C	3000	6	10	6" FLG	2 Step	13.30	9.58	28%	5.85	56%
3524-*C	3750	4	15	6" FLG	1 Step	19.57	11.10	43%	N/A	0%
3550-*C	4000	6	25	6" FLG	2 Step	18.90	14.45	28%	10.00	56%
3550W-*C	4000	4	15	6" FLG	1 Step	16.55	9.43	43%	N/A	0%
3560-*C	5000	6	25	8" FLG	2 Step	27.02	20.93	28%	14.55	56%
3560W-*C	5000	4	20	8" FLG	1 Step	16.55	9.43	43%	N/A	0%

All capacities above are based on design conditions of 100°F inlet, 100 PSIG and 100°F ambient.

* - Voltage Code
- -3 - 208/3/60 or 200-240/3/50
- -4 - 460/3/60 or 380/3/50
- -5 - 575/3/60

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