



Energy Saving  
Cycling Dryers



Energy efficient compressed air treatment

**CDF-ES Series**  
Cycling Refrigeration Dryers

# Next Generation Refrigeration Dryers

## High efficiency air treatment

Quality and efficiency are just as important for compressed air treatment as they are for the generation of compressed air. As with CompAir compressors, the CDF-ES Series of cycling refrigeration dryers deliver consistently high performance with optimum energy efficiency for many industrial compressed air applications.

The high efficiency design and construction of these cycling dryers helps achieve better performance, at the same time reducing energy consumption – the high-efficiency heat exchanger combined with a thermal mass circuit delivers energy savings at any load, and is automatically deactivated when not needed.

## Investment protection through compressed air quality

Modern production systems and processes demand high quality compressed air, which is defined in the 6 classes outlined in international standard ISO 8573-1:2010 as illustrated below. These are only achievable with filtration, water separation and drying. Users in the food and pharmaceutical industry must adhere to stringent compressed air quality guidelines, as well as local legislation. Other industries may also follow specific advice regarding, the quality of compressed air they use to ensure the protection and efficiency of process equipment and finished product.

## Compressed air quality classes according to ISO 8573-1:2010

ISO 8573-1: 2010 Class	Solid Particulate			Mass Concentration [mg/m <sup>3</sup> ]	Water		Oil Total Oil (aerosol liquid and vapour) [mg/m <sup>3</sup> ]
	Maximum number of particles per m <sup>3</sup>				Vapour Pressure Dewpoint [°C]	Liquid [g/m <sup>3</sup> ]	
	0.1 - 0.5 µm	0.5 - 1 µm	1 - 5 µm				
0	As specified by the equipment user or supplier and more stringent than Class 1						
1	≤ 20,000	≤ 400	≤ 10	—	≤ -70	—	0.01
2	≤ 400,000	≤ 6,000	≤ 100	—	≤ -40	—	0.1
3	—	≤ 90,000	≤ 1,000	—	≤ -20	—	1
4	—	—	≤ 10,000	—	≤ +3	—	5
5	—	—	≤ 100,000	—	≤ +7	—	—
6	—	—	—	≤ 5	≤ +10	—	—



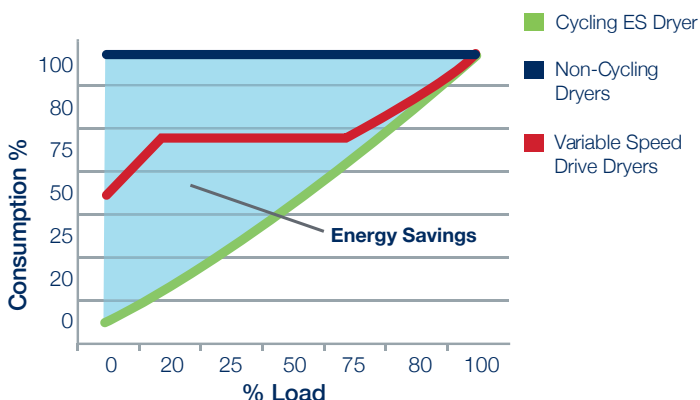
Achieve maximum energy savings, while ensuring a continuous supply of dry high-quality air and timely return on investment.



## Advanced Environmental Credentials

By shutting off the compressor during low loads, CompAir's cycling dryers dramatically reduce energy consumption. Using environmentally-friendly R513A and R407C refrigerants with the lowest Global Warming Potential, also contributes to reducing greenhouse gas emissions. High quality components provide longer lasting dryers that require fewer replacement parts, again minimising impact on the environment.

### Energy Savings by Technology



## Save energy with cycling refrigeration dryers

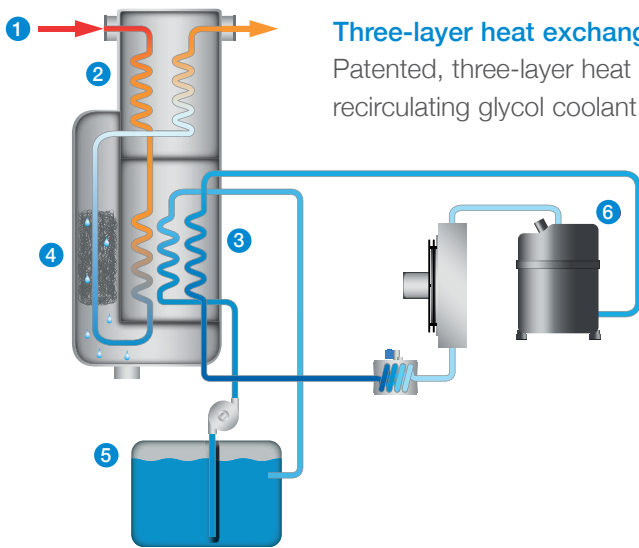
The cycling dryer is designed to deliver the lowest cost solution by focusing on all of the cost contributors. In a typical compressed air dryer, the refrigerant compressor runs continuously regardless of demand.

- Patented heat exchanger design achieves highest heat transfer efficiency in the industry, reducing compressor run time and therefore lowering energy costs
- Lowest pressure drop in the industry, averaging less than 0.2 bar g
- Thermal mass cold energy storage reduces dryer's compressor run time
- High quality air with ISO Class 4 dew point
- Smart drain - electronic no-loss drain eliminates compressed air loss
- R513A and R407C refrigerants also reduce energy consumption
- Advanced circuit design eliminates the need for thermal expansion valves and fan control switches
- True plug-and-play with single point connections for minimal installation costs

# Reliable, efficient & clean dry air

## How the cycling refrigeration dryers work

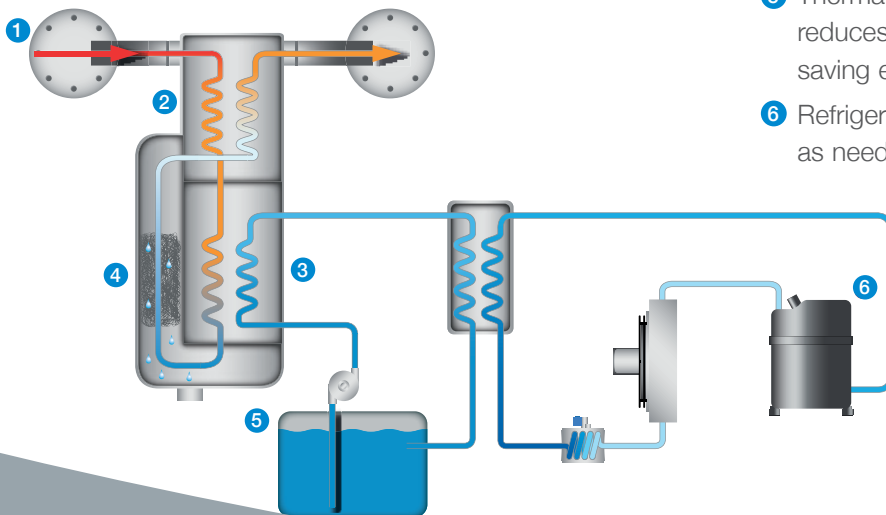
Most applications operate with varying degrees of compressed air usage. CompAir's cycling dryers match that by minimising operating time through the use of thermal mass, cold energy storage.



### Three-layer heat exchanger (CD9F-ES - CD160F-ES)

Patented, three-layer heat exchanger with no-loss Smart Drain and recirculating glycol coolant.

- 1 Compressed air enters the dryer through the heat exchanger
- 2 Air is cooled by cold outgoing air in the pre-cooler/re-heater
- 3 Circulating glycol cools the compressed air allowing the refrigerant compressor to turn-off during low demands
- 4 Stainless steel mesh removes the condensed liquid, which is purged from the dryer using no-loss Smart Drain
- 5 Thermal mass cold energy storage reduces compressor run time saving energy
- 6 Refrigerant compressor runs only as needed



### Two-layer heat exchanger (CD216F-ES - CD430F-ES)

Two-layer heat exchanger with no-loss Smart Drain and recirculating glycol coolant.

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CompAir's cycling refrigeration dryers deliver the very best combination of high efficiency, low pressure drop and small footprint.

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## Features are your benefits

### Reliable and Simplistic Design

Microprocessor control and no-loss Smart Drain increase reliability, while dryer self-regulation, plug-and-play installation and readily available parts make for simple and easy maintenance.

### Innovative Control Panel

With all the main functions you would expect to control and monitor the unit:

- Anti freeze mode – shuts dryer off to avoid icing
- Alarm display: Dew Point, high/low temperature, High ambient temperature
- Remote ON/OFF optional up to CD160F-ES, standard from CD216F-ES
- Alarm history
- Condensate drain management
- Ready for Industrial IOT with adoption of iConn, remote monitoring, preventive maintenance, free cloud portal

### New 3-layer Heat Exchangers

Designed and developed in our laboratories to deliver the highest levels of performance with the lowest pressure drop. The adoption of the new CompAir heat exchanger has enabled the removal of the inlet and outlet headers.

### Glycol Pumps

Provides a constant circulation of glycol with the compressor on or off.

### Innovative No-loss Smart Drain

Fitted as standard, a sensor is installed directly in the moisture separator and control logic is managed by the main Control Panel.



# Reliable efficient design



## No-loss Smart Drain

The powerful no-loss electronic Smart Drain is standard on all units and eliminates the need for pre-setting the unit. It uses state-of-the-art software combined with a special transducer interface to measure the presence of condensate so that it is released only when needed. Continuous monitoring ensures fast and effective discharge of the condensate with no deficit of compressed air.

## Correction Factors

Correction Factors for working pressure														
bar	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FC1	0.7	0.78	0.85	0.93	1	1.06	1.11	1.15	1.18	1.2	1.22	1.24	1.25	1.26

Correction Factors for inlet air temperature							
°C	30	35	40	45	50	55	60
FC2	1.2	1	0.85	0.71	0.58	0.49	0.42

Correction Factors for dew point temperature								
°C	3	4	5	6	7	8	9	10
FC3	1	1.04	1.09	1.14	1.18	1.25	1.3	1.33

Correction Factors for ambient temperature (for air cooled)							
°C	25	30	35	40	42	45	50*
FC4	1	0.96	0.92	0.88	0.85	0.8	0.7

\*units up to, and including CD160F

Correction Factors for different water inlet temperature (for water cooled version)								
°C	15	20	25	29.4	30	35	38	40
FC4	1.08	1.06	1.03	1	0.99	0.95	0.91	0.88

Calculation for correct Dryer Air flow = Nominal Dryer Air Flow x FC1 x FC2 x FC3

# CompAir Cycling Refrigeration Dryer - Technical Data

CompAir Dryers from 3240 to 184080 m<sup>3</sup>/min

Model	Air Flow-Rate	Absorbed Power	Power Supply	Dew Point	Max Pressure	Air Connection	Refrigerant	Dimensions	Weight	Recommended Filter**
	3°C							WxDxH		
	m <sup>3</sup> /min	kW	V/Ph/Hz	ISO Class	bar g	BSP	[mm]	[kg]		
CD9F-ES	0.90	0.24	230/1/50	4	16	½"	R513A	386 x 500 x 651	39	CF013
CD12F-ES	1.20	0.32	230/1/50	4	16	½"	R513A	386 x 500 x 651	43	CF013
CD18F-ES	1.80	0.45	230/1/50	4	16	¾"	R513A	386 x 500 x 651	48	CF018
CD24F-ES	2.40	0.51	230/1/50	4	16	¾"	R513A	386 x 500 x 651	51	CF025
CD30F-ES	3.00	0.54	230/1/50	4	16	1"	R513A	423 x 567 x 771	67	CF032
CD40F-ES	4.00	0.64	230/1/50	4	16	1"	R407C	423 x 567 x 771	71	CF067
CD50F-ES	5.00	0.79	230/1/50	4	16	1½"	R407C	500 x 718 x 980	105	CF067
CD60F-ES	6.00	0.94	230/1/50	4	16	1½"	R407C	500 x 718 x 980	108	CF067
CD80F-ES	8.00	1.03	230/1/50	4	16	1½"	R407C	500 x 718 x 980	120	CF0100
CD100F-ES	10.00	1.28	230/1/50	4	16	2"	R407C	779 x 720 x 1360	186	CF0100
CD130F-ES	13.00	1.80	400/3/50	4	13	2"	R407C	779 x 720 x 1360	227	CF0133
CD160F-ES	15.83	2.18	400/3/50	4	13	2"	R407C	779 x 720 x 1360	237	CF0167
CD216F-ES	21.67	2.14	400/3/50	4	14	3'	R407C	806 x 1012 x 1539	394	CF0260
CD250F-ES	25.00	2.45	400/3/50	4	14	3'	R407C	806 x 1012 x 1539	394	CF0260
CD300F-ES	30.00	2.92	400/3/50	4	14	3'	R407C	806 x 1012 x 1539	394	CF0305
CD375F-ES	37.50	3.68	400/3/50	4	14	3'	R407C	806 x 1012 x 1539	399	CF0383
CD430F-ES	43.33	4.67	400/3/50	4	14	3'	R407C	806 x 1012 x 1539	399	CF0450

Features	CD9F-ES – CD40F-ES	CD50F-ES – CD80F-ES	CD100F-ES – CD160F-ES	CD216F-ES – CD430F-ES
Dew Point Indication	•	•	•	•
On/Off Switch	• 1]	•	•	•
Terminal for Remote Alarm Signal	•	•	•	•
High Pressure Switch			• 3]	•
Fan Pressure Switch			• 3]	•
Alarm History (Last Entries)	10	10	10	50
Heat Exchange Layers	1 x 3	1 x 3	1 x 3	2 x 2
Anti-Freezing Protection	•	•	•	•
No-loss Smart Drain	•	•	•	•
Glycol Circulator	•	•	•	•
Aluminium Heat Exchanger with Anti-Corrosion Manifold	•	•	•	•
% Energy Saving Display	•	•	•	•
Number of Probes*	2	2	2	4
Quick Restart Function			•	•

• Standard Feature "blank" not applicable

\* 2 probes = glycol control and frigorific circuit, 4 probes = glycol control, refrigerant suction, compressor oil, air inlet + 1 thermal switch contact on refrigerant discharge line

\*\* We recommend the installation of additional pre and post filters depending on air quality requirements

1] Only on CD40F-ES 2] Only on CD100F-ES 3] Only on CD130F-ES & CD160F-ES

# Global experience – truly local service

With over 200 years of engineering excellence, the CompAir brand offers an extensive range of highly reliable, energy efficient compressors, dryers and accessories to suit all applications.

An extensive network of dedicated CompAir sales companies and distributors across all continents provide global expertise with a truly local service, ensuring our advanced technology is backed up with the right support.

CompAir has consistently been at the forefront of compressed air systems development, culminating in some of the most energy efficient and low environmental impact compressors on the market today, helping customers achieve or surpass their sustainability targets.



## CompAir compressed air product range

### Advanced Compressor Technology Lubricated

- Rotary Screw
  - > Fixed and Regulated Speed
- Piston
- Portable

### Oil-Free

- Water Injected Screw
  - > Fixed and Regulated Speed
- Two Stage Screw
  - > Fixed and Regulated Speed
- Piston
- High Speed Centrifugal - Quantima®
- Rotary Scroll

### Complete Air Treatment Range

- Filter
- Refrigerant and Desiccant Dryer
- Condensate Management
- Heat of Compression Dryer
- Nitrogen Generator

### Modern Control Systems

- CompAir DELCOS Controllers
- SmartAir Master Sequencer
- iConn - Smart Flow Management

CompAir policy is one of continuous improvement and we therefore reserve the right to alter specifications and prices without prior notice. All products are sold subject to the Company's conditions of sale.

### Value Added Services

- Professional Air Audit
- Performance Reporting
- Leak Detection

### Leading Customer Support

- Custom Engineered Solutions
- Local Service Centres
- Genuine CompAir Parts and Lubricants