



# CompAir

by Gardner Denver

## Hybrid Dryer

Innovative combined refrigeration/  
adsorption dryer technology



Energy efficient compressed air treatment

### CDT Series

# Highly efficient low energy dryers

## Energy saving dual drying technology

CompAir's innovative CDT Series of compressed air dryers from 2.5 to 34 m<sup>3</sup>/min combines refrigerant and adsorption dryer technology delivering high quality compressed air at low energy consumption levels.

## The energy saving solution

The unique technology combination of the CDT Series offers lower energy consumption compared to traditional heatless and heat regenerative adsorption dryer technology.



### Pressure range

2 to 16 bar g up to CDT040  
2 to 12 bar g from CDT060 to CTD140  
4 to 12 bar g from CDT260 to CTD340



### Temperature range

5°C to 50°C ambient  
5°C to 65°C inlet air



### Flow range

2.5 m<sup>3</sup>/min to 34 m<sup>3</sup>/min



### Dew points

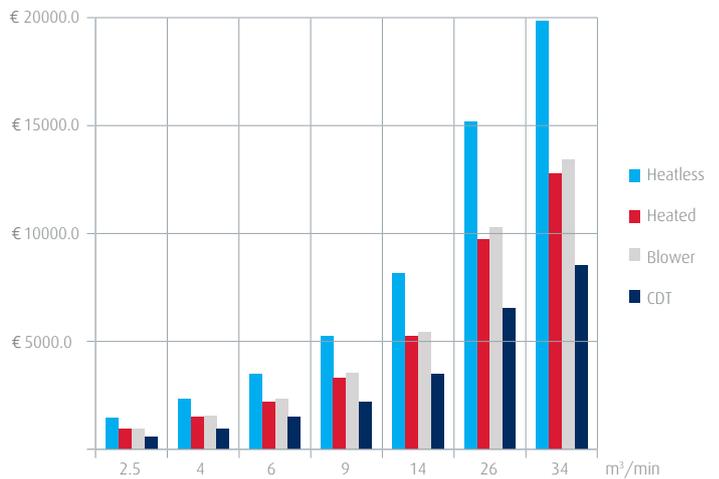
-40°C PDP standard  
Configurable from +3°C to -70°C



### ISO8573-1 classification

Class 2 water standard  
Configurable from Class 1 to 4

## Annual energy operating cost



Data assumes nominal conditions, 6000 operating hours per year, 0.12€/kWh utility rate, compressor generation efficiency of 5.5 kW/m<sup>3</sup>/min

“ Sophisticated drying technology for the most demanding industries ”



## Where high quality compressed air is key

Typical application areas are:

- Food & Beverage
- Pharmaceutical
- Chemical
- Automotive
- Petrochemical
- Electronics

The major advantage over other compressed air drying technologies is its contribution to energy-efficiency and overall running-cost reduction. Less overall power consumption, less purge-air consumption, constant and stable outlet pressure dew points and reduced operating and maintenance costs characterise this new CompAir dryer range.

## Installation system



# Dual Technology

## Two stage drying technology

The unique combination of refrigerant and adsorption drying technology enables high quality compressed air to be provided to the end-user at low energy consumption levels.

In this drying process untreated, humid compressed air is initially confronted by a pre-filter protecting a traditional, but modified refrigeration circuit. The majority of the water vapour is effectively removed from the incoming air in this first stage.

The second stage consists of a highly compact desiccant drying stage, protected before and after by high-performance oil/water aerosol and particle removal filters, which serves to further reduce the moisture content of the air to a standard dew point of  $-40^{\circ}\text{C}$ . Finally, clean, dry compressed air exits via the patented air/air heat-exchanger to be re-heated and delivered to the air distribution system.



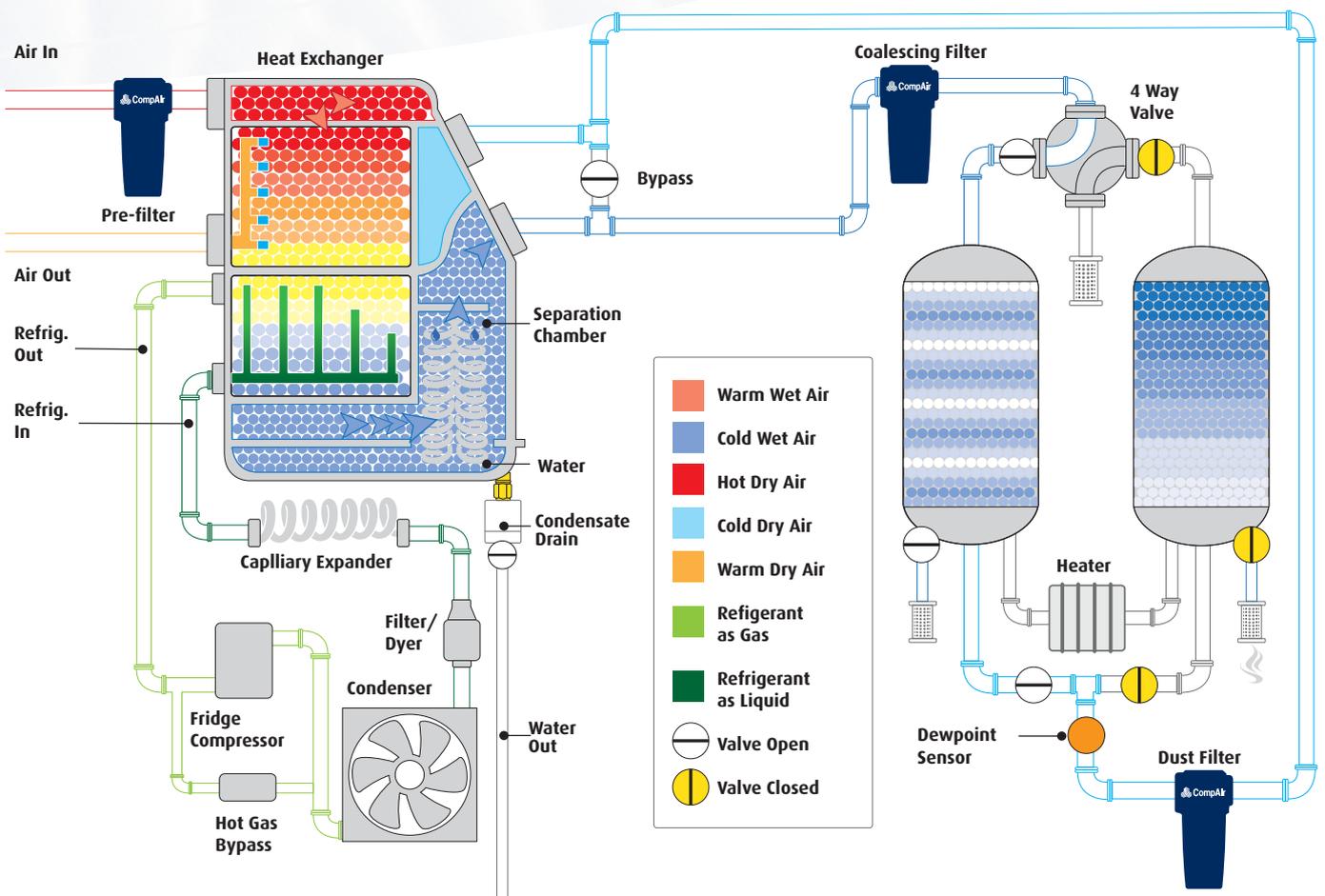
Technology exploiting both PSA (pressure swing adsorption) and TSA (temperature swing adsorption) brings together an effective and economical solution to meet the needs of the compressed air user. With the addition of a dew point dependent switching feature for periods of intermittent load, incorporated into the electronic controller of every CDT dryer, initial investment costs are quickly amortised and life-time costs minimised.

The CDT dryers can be equipped with an optional by-pass to meet the demands of seasonal variations of dew points requirements above zero in summer and below zero in winter. In such cases the dual technology can be operated solely as a refrigeration dryer or regularly in dual combination including adsorption stage.



## Refrigeration Stage

## Adsorption Stage



## Combined technology – combined benefits

The unique combined package of refrigeration and adsorption technology offers several advantages of which the most important one is the reduced overall power consumption.

- Lower operating costs versus traditional heatless and heat regenerative adsorption dryers (lower purge-air requirement and lower heater consumption)

- Reduced maintenance costs due to less desiccant-fill with extended life time
- Reliable pressure dew point without peaks above set-point
- Additional savings with seasonal by-pass option
- Additional savings at partial load (dew point dependent switching)
- Small footprint
- Innovative digital controller

# The smart dryer solution

## Dryer control systems

As a standard all CompAir CDT dryers are equipped with electronic controllers.

Down to CDT140 the dryers are optionally available with touch-screen controller.

### Digital controller functions

- Full control and display of dryer operations and regeneration phases
- Parameter configuration, alarms and alarm history
- Password protected service menu
- Potential free contact alarm, Remote On/Off, ModBus interface
- Dew point display



### Touch-screen option from model CDT140 to CDT340

- Drainage system controlled by the dryers electronic controller
- Time mode on all models
- Capacitive on CDT140 to CDT340



## The benefits at a glance

- ▶ **Small amount of regeneration purge air**  
Up to 60% lower power versus Twin Tower heatless regeneration dryers
- ▶ **Energy management system available**  
Delivered air quality dew point monitoring allows energy saving extension of drying cycle as appropriate
- ▶ **Desiccant by-pass option**  
Avoids using more energy when only positive dew point is required
- ▶ **Low temperature filtration**  
Better oil vapour filtration, better air quality downstream
- ▶ **No need to modify desiccant bed or change orifices**  
Flexible solution, fits for any working condition and performance required

## Hybrid Dryers CDT 025 - CDT 340

### Scope of supply

CompAir CTD Series dryers are supplied ready for installation.

- Complete with ISO-12500 validated oil/water aerosol and particulate pre-filters, located prior to the refrigeration circuit, and pre and post the adsorption stage
- Dew point dependant switching as standard feature on all models
- Integral timed drain on all models
- Integral capacitance drain on models CDT140 to CDT340

### Optional:

- By-pass for seasonal operation (models CDT060 to CDT340)
- 7" colour touch-screen display (models CDT140 to CDT340)

### Electrical connections

<b>Mains Voltage</b>	230V, 1-phase, 50Hz on CDT025-090; 400V, 3-phase, 50Hz on CDT140-340
<b>Protection Class</b>	IP44

### Operating Range

<b>Site Selection</b>	Frost-free indoor installation in a non-hazardous environment
<b>Ambient Temperature</b>	5°C to 50°C
<b>Compressed Air Inlet Temperature</b>	5°C to 65°C
<b>Operating Pressure</b>	2 to 16 bar g up to CDT040 2 to 12 bar g from CDT060 to CDT140 4 to 12 bar g from CDT260 to CDT340
<b>Medium</b>	Compressed air and gaseous nitrogen

## Technical Data

Model	Airflow <sup>1</sup> Inlet - Outlet [m <sup>3</sup> /min]	Air Connections [BSPP-F]	Max Pressure [bar <sub>g</sub> ]	Effective Avg. Absorbed Power <sup>2</sup> [kW]	Purge Air Equivalent Absorbed Power <sup>3</sup> [kW]	Width [mm]	Height [mm]	Depth [mm]	Weight [kg]
CDT025	2.5 - 2.4	1"	16	0.94	0.42	706	1064	1246	180
CDT040	4 - 3.9	1"	16	1.30	0.68	706	1064	1246	200
CDT060	6 - 5.8	1½"	12	1.27	1.02	806	1214	1416	295
CDT090	9 - 8.7	1½"	12	1.94	1.53	806	1214	1416	335
CDT140	14 - 13.6	2"	12	2.01	2.37	1007	1586	1345	490
CDT260	26 - 25.2	2½"	12	4.02	4.41	1007	1720	2535	880
CDT340	34 - 32.9	2½"	12	5.17	5.76	1007	1720	2535	950

<sup>1</sup> Referring to 1 bara and 20°C at compressor suction capacity. Subsequently compressed to 7 bar<sub>g</sub> at 35°C inlet to the dryer, at 100% relative humidity, 25°C ambient, for -40°C pressure dew point. Outlet flow is the average net flow following subtraction of the average purge-air flow.

<sup>2</sup> Calculated throughout the entire cycle period - includes total refrigeration-circuit and desiccant heater absorbed power

<sup>3</sup> Purge-air flow throughout the entire cycle period, evaluated as an air compressor absorbed power at the rate of 5.5 kW/m<sup>3</sup>/min.

### Corrections factors for CDT model selection

Inlet Temperature [°C]	30	35	40	45	50	55	60	65
<b>Correction Factor</b>	1.22	1	0.81	0.69	0.59	0.52	0.46	0.4

Working Pressure [bar <sub>g</sub> ]	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>Correction Factor</b>	0.62	0.75	0.87	1	1.08	1.2	1.28	1.34	1.4	1.45	1.5	1.54	1.6

Factor to calculate the power consumption of an CDT model at pressure dew-point values which deviate from -40°C and/or at partial load.

Pressure Dew Point [°C]	Refrig. only	+3	0	-10	-20	-40	-70
<b>Correction Factor</b>	0.39	0.88	0.89	0.90	0.92	1	1.31

Partial load	25%	50%	75%	100%
<b>Correction Factor</b>	0.66	0.82	0.94	1
<b>Correction Factor Refrigeration-circuit only</b>	0.52	0.76	0.90	1

Example: CDT140 working at -20°C pdp and loaded with 50% of its nominal capacity

<sup>1</sup> Find the correction factor in the table above: -20°C pdp=0.92 : 50% load=0.82

<sup>2</sup> The total power at nominal conditions consumed by model CDT140 (see performance table) is: 2.01+2.37=4.38kW

<sup>3</sup> Apply the correction factor. The total power consumed at the new conditions is 4.38 x 0.92 x 0.82 = 3.3kW.

Example: CDT140 with seasonal "By-pass Option" (Refrigeration-circuit only active), unit loaded at 50%

<sup>1</sup> Find the correction factor in the table above: Refrigeration-circuit only = 0.39 : 50% load with refrigeration-circuit only = 0.76

<sup>2</sup> Apply the correction factor to the total power consumed by an CDT140. The new value is 4.38 x 0.39 x 0.76 = 1.3kW

# 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 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.

As part of the worldwide Gardner Denver operation, 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®

### 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

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

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