AIR DRYERS

# DW 3 to 210

C O L D

P U R I T Y

Worthington Creyssensac

# Water contamination in compressed air

**Moisture vapour and other polluants naturally exist in the atmosphere. Water can be seen to separate from air as dew or rain when the atmospheric temperature or pressure falls. Other polluants can be seen in the form of damage to buildings and a fog or haze over many of our cities.**

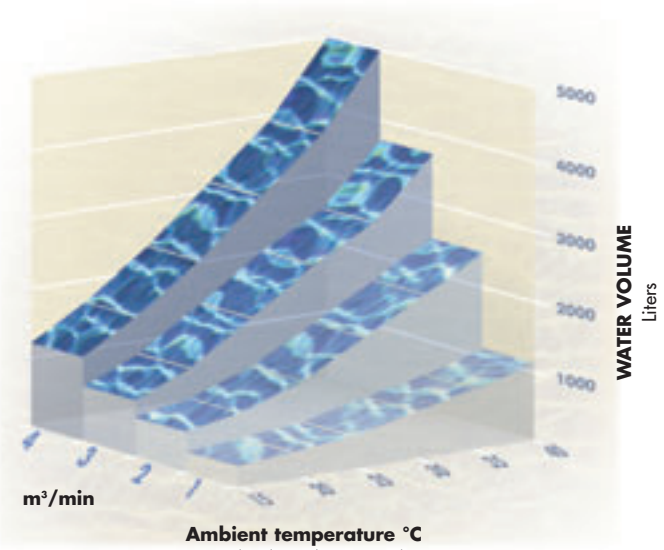
**This air borne contamination is intensified in the compression process resulting in highly polluted air entering your compressed air system.**

## Condensats generared when compressed

During compression the air temperature and pressure rise increasing its ability to retain moisture, but, as the air enters the compressed air system both temperature and pressure reduce causing moisture to separate from the air.

Compressed air from the compressor contains a large volume of water in the form of vapour. Approximately 70 % of this vapour is condensed by the air after coolers in a rotary screw compressor. But about 30 % still remains in the air network.

**Water carried into the air net**
after 2000 H running




**Ambient temperature °C**
100% load, 24 hours per day
25°C ambient temperature

## Water contamination risks

**- Corrosion in the network :**
Increasing pressure drop due to the deterioration of the air network with increasing pipe scale and rust. Damage to joints will cause air leaks significantly increasing the cost of air production.

**- Malfunction of pneumatic equipment :**
Malfunction of equipment and instrumentation, reduction of component life, increase in production loss and increasing manufacturing costs.

**- Product contamination :**
The efficiency of your production process can reduce with product spoilage caused by product contamination, fitting moisture separators improves air quality but also increases the cost of compressed air generation.

# DW dryers
# Air purity

For many companies in today's competitive global market, the treatment of compressed air is not an option, but a necessity to reduce operating costs and increase production efficiency.

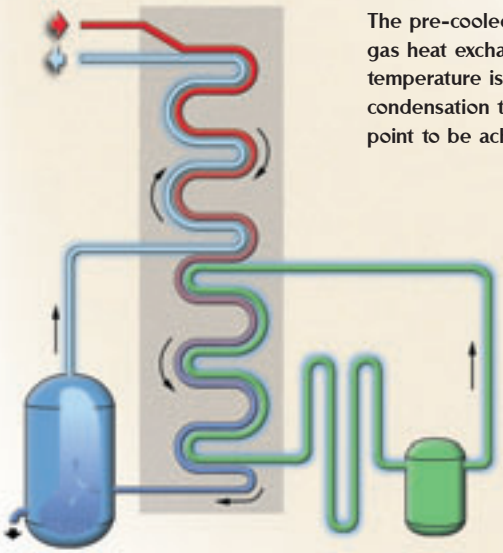
As an efficient and simple technology, the refrigeration type dryer is the preferred solution for the majority of these applications.

The Worthington Creyssensac DW dryers have been developed to supply dry compressed air for your production process, with a minimum power requirement and low pressure drop for optimum efficiency.

**Warm air entering the dryer is pre-cooled in an air to air heat exchanger by air that has been through the refrigeration circuit (except the DW 3 to DW 10 models)**

**The pre-cooled air enters the air/refrigerant gas heat exchanger where the compressed air temperature is reduced. This causes condensation to occur and the desired dew point to be achieved.**

**The cold air then passes through the air/air heat exchanger, being reheated, no condensation will appear on your pipework.**




**In an hermetic circuit, the refrigeration gas is compressed, condensed, expanded and is cooled to form a liquid which is approximately 0°C.**

**Cold air and water enter the condensate separator which separates the liquid water from the air, water is then removed from the dryer.**


Once treated the risk of corrosion to the air distribution system and damage to pneumatic tools and equipment is substantially reduced, resulting in a longer operational life for equipment, reduced air leaks, less product contamination and improved production efficiency.

# DW dryers
# Controlled quality

## Environmentally friendly

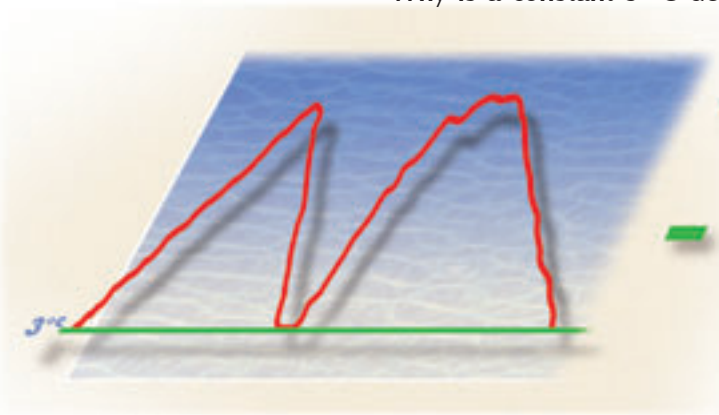
As an environmentally conscious company Worthington Creyssensac designs products to help reduce the environmental impact of your production process.

Improved energy efficiency from reduced pressure drop, means a reduction in power generation, reducing wastage of natural resources.

Environmentally friendly gases R134A & R404A for reduced ozone depletion.

Recyclable materials where possible, resulting in less contamination of the environment at the end of component life.

### Why is a constant 3 °C dew point required ?




**With some thermal mass type air dryers dew point fluctuation occurs which depending on ambient temperatures could cause moisture separation to occur.**

**The DW Direct expansion technology keeps dew point fluctuation to a minimum. A hot gas by pass valve is fitted to all DW dryers to ensure a consistent dew point in your compressed air system, regardless of the air flow required.**

## Oversized heat exchangers

Developed without compromise, the large transfer surface of the heat exchanger ensures a maximum thermal exchange with the refrigerant gas and compressed air. By maintaining a 3°C temperature dew point, the residual water contained in your compressed air is significantly reduced.

## Energy efficient

As a result of the generous size of the heat exchanger and their effective heat insulation, the DW range offers an extremely low pressure drop through the dryer from 0,1 to 0,3 bar dependent on model size, this low pressure drop increases the operating efficiency of your compressed air system by keeping the cost of pressure generation to an absolute minimum.


**ROLLAIR** ROTARY COMPRESSOR | AIR RECEIVER | FILTERS | REFRIGERANT DRYER | OIL-WATER SEPARATOR

## Compact construction

DW dryers can be fitted to most types of air compressor, they are designed for quick and easy installation, with a minimum space requirement and low maintenance schedule.

The DW is a long term investment product to provide a quality compressed air supply for your system.

*To ensure operational reliability of the DW dryer range, we recommend the fitting of a Worthington Creyssensac pre filter before the dryer, and high efficiency oil removal filter after the dryer to protect your air system from oil contamination.*

# DW dryers
# Selection guide

When selecting a refrigeration type air dryer, it is important to consider the operating conditions of the compressed air system.

Several operating parameters can have a significant influence on the capacity, performance, and reliability of this type of air dryer.

The following conversion tables will help in the selection of the most suitable dryer to meet your individual requirements.

Example :

**6,50 m³/min**

Your requirement :

## Working Pressure (bar)

The dryer capacity increases with pressure. This is why a dryer is preferably installed where the compressed air is at the highest pressure.

*Select the minimum working pressure of your dryer :*

| 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|
| 0,88 | 0,9 | 0,96 | **1,00** | 1,03 | 1,06 | 1,08 | 1,10 | 1,12 | 1,13 |

6,50 / 0,96 =

**6,77 m³/min**

## Ambient temperature (°C)

Dryer capacity increases while ambient temperature decreases.
This is why the dryer has to be installed in the coolest ambient condition.

*Select the maximum ambient temperature corresponding to dryer running conditions :*

| 10 | 15 | 20 | 25 | 30 | 35 | 40 |
|---|---|---|---|---|---|---|
| 1,2 | 1,16 | 1,08 | **1,00** | 0,92 | 0,84 | 0,82 |

6,77 / 0,92 =

**7,36 m³/min**

## Inlet temperature (°C)

Most compressors fitted with after coolers supply air at 10 °C above ambient temperature, If the dryer is fitted at a point of use application, the inlet temperature will be lower and performance will increase.

*Select rthe maximum inlet compressd air temperature in the dryer :*

| 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|
| 2,1 | 1,57 | 1,24 | **1,00** | 0,82 | 0,69 | 0,58 |

7,36 / 1,0 =

**7,36 m³/min**

## Dryer selection :

*Sized the dryer according to the capacity corrected. The dryer capacity should be above the value calculated.*

| | DW3 | DW5 | DW7 | DW10 | DW13 | DW17 | DW21 | DW31 | DW39 | DW46 | DW61 | DW72 | DW84 | DW120 | DW144 | DW170 | DW210 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| m³/min | 0,57 | 0,77 | 1,08 | 1,67 | 2,27 | 2,88 | 3,52 | 5,23 | 6,50 | 7,70 | 10,20 | 12,00 | 14,03 | 20,03 | 24,07 | 28,33 | 35,00 |

**FINAL SELECTION : DW 46**

## Pressure drop

| | DW3 | DW5 | DW7 | DW10 | DW13 | DW17 | DW21 | DW31 | DW39 | DW46 | DW61 | DW72 | DW84 | DW120 | DW144 | DW170 | DW210 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| bar | 0,15 | 0,3 | 0,35 | 0,3 | 0,3 | 0,15 | 0,15 | 0,3 | 0,15 | 0,2 | 0,2 | 0,25 | 0,35 | 0,18 | 0,25 | 0,18 | 0,25 |

# Technical specifications

| Types | | | DW3 | DW5 | DW7 | DW10 | DW13 | DW17 | DW21 | DW31 | DW39 | DW46 | DW61 | DW72 | DW84 | DW120 | DW144 | DW170 | DW210 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flow treated *according to temperature of compressed air input* | 35°C | $m^3$/min | 0,57 | 0,77 | 1,08 | 1,67 | 2,27 | 2,88 | 3,52 | 5,23 | 6,50 | 7,70 | 10,20 | 12,00 | 14,03 | 20,03 | 24,07 | 28,33 | 35,00 |
| | | Cfm | 20 | 27 | 38 | 59 | 80 | 102 | 124 | 185 | 230 | 272 | 360 | 424 | 496 | 708 | 850 | 1 001 | 1 237 |
| | 40°C | $m^3$/min | 0,47 | 0,63 | 0,88 | 1,37 | 1,87 | 2,37 | 2,88 | 4,30 | 5,33 | 6,32 | 8,40 | 9,80 | 11,50 | 16,42 | 19,73 | 23,23 | 28,70 |
| | | Cfm | 16 | 22 | 31 | 48 | 66 | 84 | 102 | 152 | 188 | 223 | 295 | 347 | 406 | 580 | 697 | 821 | 1 014 |
| | 45°C | $m^3$/min | 0,39 | 0,53 | 0,75 | 1,15 | 1,57 | 1,98 | 2,43 | 3,62 | 4,48 | 5,32 | 7,03 | 8,30 | 9,70 | 13,82 | 16,60 | 19,55 | 24,15 |
| | | Cfm | 14 | 19 | 26 | 41 | 55 | 70 | 86 | 127 | 158 | 188 | 248 | 293 | 342 | 488 | 587 | 691 | 853 |
| Nominal electrical power (1) | | kW | 0,24 | 0,28 | 0,47 | 0,68 | 0,47 | 0,75 | 0,75 | 1,11 | 1,22 | 1,47 | 1,87 | 1,94 | 2,34 | 3,79 | 4,29 | 5,29 | 5,89 |
| Max. electrical power (2) | | kW | 0,31 | 0,39 | 0,64 | 0,9 | 0,64 | 0,99 | 0,99 | 1,52 | 1,54 | 1,94 | 2,39 | 2,44 | 2,74 | 4,7 | 5,2 | 6,2 | 7,5 |
| Power supply voltage | | V/F/Hz | 230 - 240 / 1/50 | | | | | | | | | | | | 400/3/50 | | | | |
| Max. operating pressure | | bar | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| Refrigerating fluide | | | R134A | R134A | R134A | R134A | R134A | R134A | R134A | R134A | R404A | R404A | R404A | R404A | R404A | R404A | R404A | R404A | R404A |
| Air connections | | BSP F | 3/8" | 3/8" | 1/2" | 1/2" | 1" | 1" 1/2 | 1" 1/2 | 1" 1/2 | 1" 1/2 | 1" 1/2 | 2" 1/2 | 2" 1/2 | 2" 1/2 | 3" | 3" | 3" | 3" |
| Weight | | kg | 33 | 36 | 41 | 43 | 63 | 93 | 93 | 98 | 163 | 168 | 173 | 178 | 183 | 303 | 303 | 345 | 345 |

Reference conditions : ambiant temperature : 25°C,compressed air input temperature : 35°C, service pressure : 7 bar, dew point under pressure : 3°C, dew point at atmospheric pressure : -21°C, characteristics complaint with ISO 7183.
Operating limits: max. ambient temperature : 40°C, minimum ambient temperature : 5°C, compressed air input temperature : 45°C, maximum service pressure : 16 bar.

(1) *Power input at reference operating conditions.*
(2) *Power input at operating condition limits.*

## SPACE REQUIREMENT


| | A | B | C |
|---|---|---|---|
| DW 3 to DW 10 | 375 | 530 | 480 |
| DW 13 | 375 | 735 | 615 |
| DW 17 to DW 31 | 465 | 735 | 730 |

Dimensions in mm

| | A | B | C |
|---|---|---|---|
| DW 39 to DW 46 | 795 | 925 | 965 |
| DW 61 to DW 84 | 795 | 925 | 975 |
| DW 120 to DW 210 | 950 | 1 295 | 1 215 |

Dimensions in mm


**Worthington-Creyssensac**
Zone Industrielle 4 rue Emile Zola B.P. 80419 60114 Méru Cedex FRANCE

Your Distributor :

**Worthington - Creyssensac**
**http://www.airwco.com**