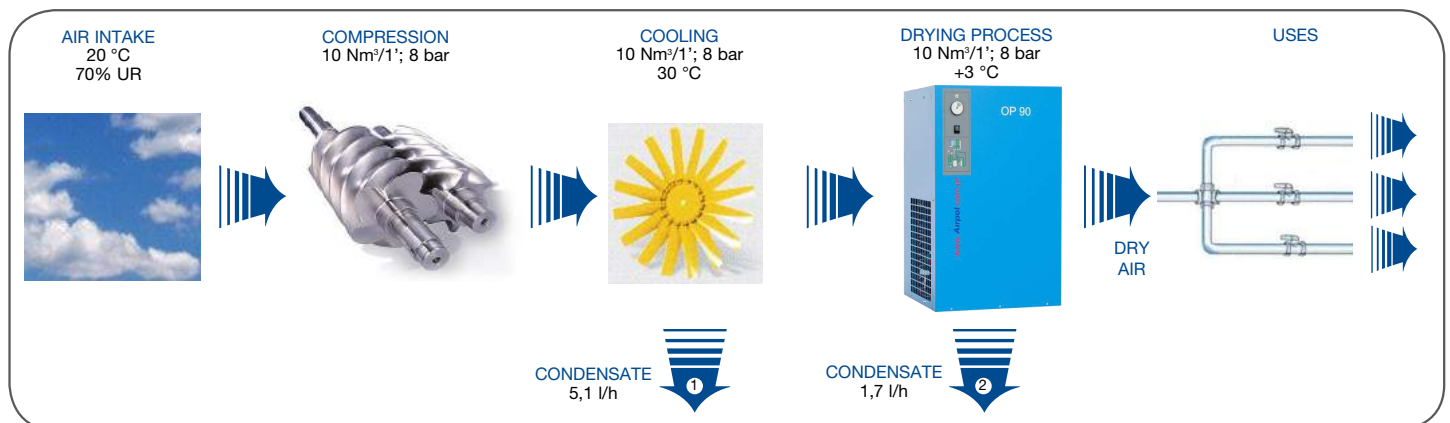


## It is worth using a compressed air dryer

Ambient air sucked by the compressor contains solid contaminants and water vapour. The compressor itself is also a source of contaminants (oil, wear products). Therefore, the air in the network after compression contains water vapour, dust and oil.

As heat is generated in the compression process, although being cooled the compressed air leaving the compressor is still so hot that when it contacts the external conditions the condensate causing corrosion and premature wear of pipelines and the installed equipment and tools is produced because of temperature difference. That results in disturbances and interruptions in operation and requires expensive maintenance and repair works that could be avoided by using the suitably selected additional compressed air treatment systems to obtain dry air free of contaminants.

The compressed air treatment involves its cooling, drying and removal of dust and oil. To achieve the above aims, there are used different solutions adapted to individual users' needs and based on the devices such as dryers, filters and separators. They ensure obtainment of the required compressed air quality - one of the most important energy carriers used in the technological processes.



For example, 5.1 l/h of condensate is separated from a compressor with an output capacity of 10 Nm<sup>3</sup>/min and an ambient intake air temperature of 20°C and 70% relative humidity, whilst operating at a delivery pressure of 8 bar(g) and cooling the air to 30°C.

If the compressed air is then dried further to a dewpoint of +3°C, an additional 1.7 l/h of condensate can be separated.

## COMPRESSED AIR REFRIGERATION DRYERS

The refrigerant dryers are designed to remove water, moisture and vapour, having destructive and corrosion influence on the networks and pneumatic tools, from compressed air.

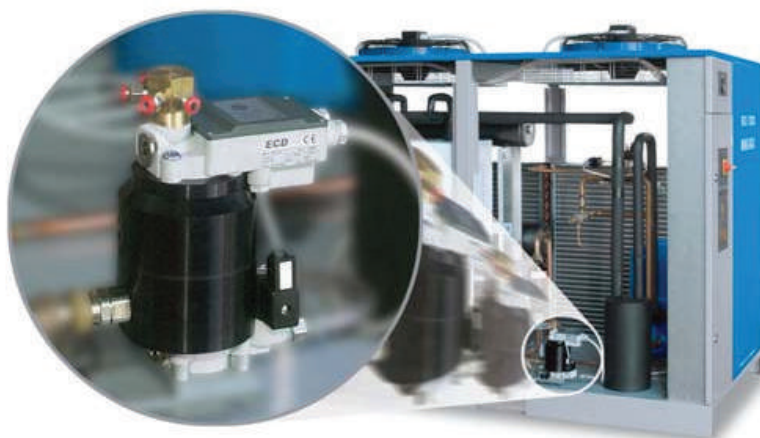
The compressed air at average temperature of  $+30^{\circ}\text{C} \div +45^{\circ}\text{C}$  supplied to the dryer, is initially cooled in the air to air heat to  $+14^{\circ}\text{C} \div +23^{\circ}\text{C}$ . Then the air is further cooled in the evaporator of the refrigerant circuit and achieves the set dew point of  $+3^{\circ}\text{C}$ , required to condensate water vapour existing in the compressed air circuit.

The use of dried compressed air makes it possible to limit the corrosion risk of tools, cylinders, pneumatic machines, air receivers, pipelines and also avoid damage of the final product e.g. paint coating.



### Microprocessor controller (in OP series dryers)

Clear information on the present condition of the refrigeration compressor, fan and the necessity to carry out maintenance work.



### Electronic drain valve, controlled by the level of condensate

Effective prevention of all compressed air loss.

Discharges only water, NOT compressed air = Energy savings

Noise-free, no acoustic impact = Environmental protection.

OPA series dryers are equipped with time controlled condensate drains.



## Air dryers OPA series

| Type   | Flow*             |                     | Power consumpt.<br>kW | Power supply<br>V/Hz/Ph | Connection | Overall dimensions |         |         | Weight<br>kg |
|--------|-------------------|---------------------|-----------------------|-------------------------|------------|--------------------|---------|---------|--------------|
|        | m <sup>3</sup> /h | m <sup>3</sup> /min |                       |                         |            | L<br>mm            | W<br>mm | H<br>mm |              |
| OPA 10 | 50                | 0.8                 | 0.26                  | 230/50/1                | Gw 1/2     | 372                | 404     | 380     | 25           |
| OPA 20 | 72                | 1.2                 | 0.28                  | 230/50/1                | Gw 1/2     | 372                | 424     | 380     | 30           |
| OPA 30 | 110               | 1.8                 | 0.32                  | 230/50/1                | Gw 1/2     | 372                | 424     | 446     | 34           |
| OPA 40 | 140               | 2.3                 | 0.42                  | 230/50/1                | Gw 5/4     | 460                | 440     | 500     | 43           |
| OPA 50 | 180               | 3.0                 | 0.44                  | 230/50/1                | Gw 5/4     | 520                | 540     | 550     | 52           |
| OPA 60 | 216               | 3.6                 | 0.78                  | 230/50/1                | Gw 5/4     | 470                | 510     | 810     | 63           |

## Air dryers OP series

| Type   | Flow*             |                     | Power consumpt.<br>kW | Power supply<br>V/Hz/Ph | Connection | Overall dimensions |         |         | Weight<br>kg |
|--------|-------------------|---------------------|-----------------------|-------------------------|------------|--------------------|---------|---------|--------------|
|        | m <sup>3</sup> /h | m <sup>3</sup> /min |                       |                         |            | L<br>mm            | W<br>mm | H<br>mm |              |
| OP 10  | 50                | 0.8                 | 0.19                  | 230/50/1                | G 3/4      | 493                | 350     | 450     | 20           |
| OP 20  | 72                | 1.2                 | 0.26                  | 230/50/1                | G 3/4      | 493                | 350     | 450     | 25           |
| OP 30  | 110               | 1.8                 | 0.28                  | 230/50/1                | G 3/4      | 493                | 350     | 450     | 27           |
| OP 65  | 246               | 4.1                 | 0.71                  | 230/50/1                | G 1 1/2    | 460                | 575     | 789     | 60           |
| OP 70  | 312               | 5.2                 | 0.91                  | 230/50/1                | G 1 1/2    | 460                | 575     | 789     | 62           |
| OP 80  | 390               | 6.5                 | 0.97                  | 230/50/1                | G 1 1/2    | 580                | 587     | 900     | 82           |
| OP 90  | 462               | 7.7                 | 1.12                  | 230/50/1                | G 1 1/2    | 580                | 587     | 900     | 82           |
| OP 100 | 600               | 10                  | 1.54                  | 400/50/3                | G 2        | 805                | 1070    | 962     | 145          |
| OP 110 | 720               | 12                  | 1.98                  | 400/50/3                | G 2        | 805                | 1070    | 962     | 158          |
| OP 120 | 900               | 15                  | 2.01                  | 400/50/3                | G 2 1/2    | 805                | 1070    | 962     | 165          |
| OP 130 | 1080              | 18                  | 2.77                  | 400/50/3                | G 2 1/2    | 805                | 1070    | 962     | 164          |
| OP 140 | 1440              | 24                  | 3.50                  | 400/50/3                | G 3        | 1132               | 1005    | 1399    | 230          |
| OP 150 | 1800              | 30                  | 3.69                  | 400/50/3                | G 3        | 1271               | 1005    | 1596    | 325          |
| OP 160 | 2100              | 35                  | 4.55                  | 400/50/3                | G 3        | 1271               | 1005    | 1596    | 338          |
| OP 170 | 3000              | 50                  | 6.54                  | 400/50/3                | DN100      | 1652               | 1005    | 1826    | 462          |
| OP 180 | 4200              | 70                  | 7.29                  | 400/50/3                | DN100      | 1652               | 1005    | 1826    | 508          |
| OP 190 | 5040              | 84                  | 8.26                  | 400/50/3                | DN150      | 1979               | 1455    | 1826    | 810          |



**\*Reference conditions:**

|                            |                         |
|----------------------------|-------------------------|
| Operating pressure         | 7 bar                   |
| Compressed air temperature | 35°C                    |
| Ambient temperature        | 25°C                    |
| Pressure dew point         | +3°C +/- 1 at 100% load |

**Limit conditions:**

|                                       |  |
|---------------------------------------|--|
| Min/max operating pressure            | 5 bar/16 bar (OPA- series, OP10-OP30); 5 bar/14 bar (OP65-OP190) |
| Max compressed air temp. on the inlet | +55°C  |
| Min/max ambient temperature           | +5°C/+45°C   |

| Correction factors for operating conditions other than the declared reference conditions K=AxBxCxD |     |      |      |      |      |      |      |      |      |      |      |      |      |                      |
|--|-----|------|------|------|------|------|------|------|------|------|------|------|------|----------------------|
| Ambient temperature  | °C  | 25   | 30   | 35   | 40   | 45   | 50   |      |      |      |      |      |      |                      |
|  | A   | 1,00 | 0,92 | 0,84 | 0,80 | 0,74 |      |      |      |      |      |      |      | (OPA, OP 10 - OP 90) |
|  |     | 1,00 | 0,91 | 0,81 | 0,72 | 0,62 |      |      |      |      |      |      |      | (OP 100 - OP 190)    |
| Compressed air temperature   | °C  | 30   | 35   | 40   | 45   | 50   | 55   | 60   | 65   | 70   |      |      |      |                      |
|  | B   | 1,25 | 1,00 | 0,82 | 0,69 | 0,58 | 0,45 |      |      |      |      |      |      | (OPA, OP 10 - OP 90) |
|  |     | 1,00 | 1,00 | 0,82 | 0,69 | 0,58 | 0,49 |      |      |      |      |      |      | (OP 100 - OP 190)    |
| Operating pressure   | bar | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   |                      |
|  | C   | 0,90 | 0,96 | 1,00 | 1,03 | 1,06 | 1,08 | 1,10 | 1,12 | 1,13 | 1,15 | 1,16 | 1,17 | (OPA, OP 10 - OP 90) |
|  |     | 0,90 | 0,97 | 1,00 | 1,03 | 1,05 | 1,07 | 1,09 | 1,11 | 1,12 |      |      |      | (OP 100 - OP 190)    |
| Pressure dew point   | °C  | 3    | 5    | 7    | 10   |      |      |      |      |      |      |      |      |                      |
|  | D   | 1,00 | 1,12 | 1,24 | 1,36 |      |      |      |      |      |      |      |      |                      |

$$V_{\text{corr}} = \frac{V}{K}$$

$V$  compressor capacity  
 (air volume to be dried)  
 $V_{\text{corr}}$  appropriate dryer flow  
 $K = A \times B \times C \times D$