Bora
DHP 2400 - DHP 6000 AX / WX
Air cooled / water cooled
High Pressure Refrigeration Dryers

Air cooled version
DHP 2400 - DHP 6000 AX

Water cooled version
DHP 2400 - DHP 6000 WX

MAIN FEATURES & BENEFITS

- Refrigerated compressed air dryer for safe and economical compressed air drying for operating pressures up to 45 bar
- 5 sizes for nominal volume flows of 2.430 bis 6.060 m³/h allow an accurate selection of the appropiate refrigeration compressed air dryer to the respective operating volume flow
- Hot gas bypass control in conjunction with pressure and temperature monitoring for safe operation and constant pressure dew point under different load conditions
- Automatic condensate drain on the heat exchanger ensure reliable condensate drainage depending on the amount of condensate
- The electronic controller including a display and indication of the current pressure dewpoint, operating hours, service messages, alarm messages with multiple possible individual settings
- Compact und space-saving design with robust steel housing
- Scroll compressor In the cooling circuit ensures a reliable compression of the refrigerant at high running, low vibration and low noise operation

PRODUCT DESCRIPTION

Bora DHP 2400 - DHP 6000

The new Bora DHP refrigerators are now available for the energy-conscious user. These compressed air dryers are designed for operating pressures 45 bar and thus cover a wide range of applications in various industries. The dew point is controlled by a hot gas bypass, which ensures a constant dew point even under different load conditions. The electronic control system in conjunction with pressure and temperature sensors continuously monitors the operating conditions in the cooling circuit and indicates any alarm conditions on the control display or activates the potential-free alarm contact. Both the air cooled and the water cooled version are equipped with an automatic condensate drain on the heat exchanger, which ensures a safe condensate discharge.

INDUSTRIES

- Chemical and electrical industry

- Maschine building industry and plant engineering/ construction

- Automotive industry

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Technical alterations reserved (6/2018)

PRODUCT DESCRIPTION

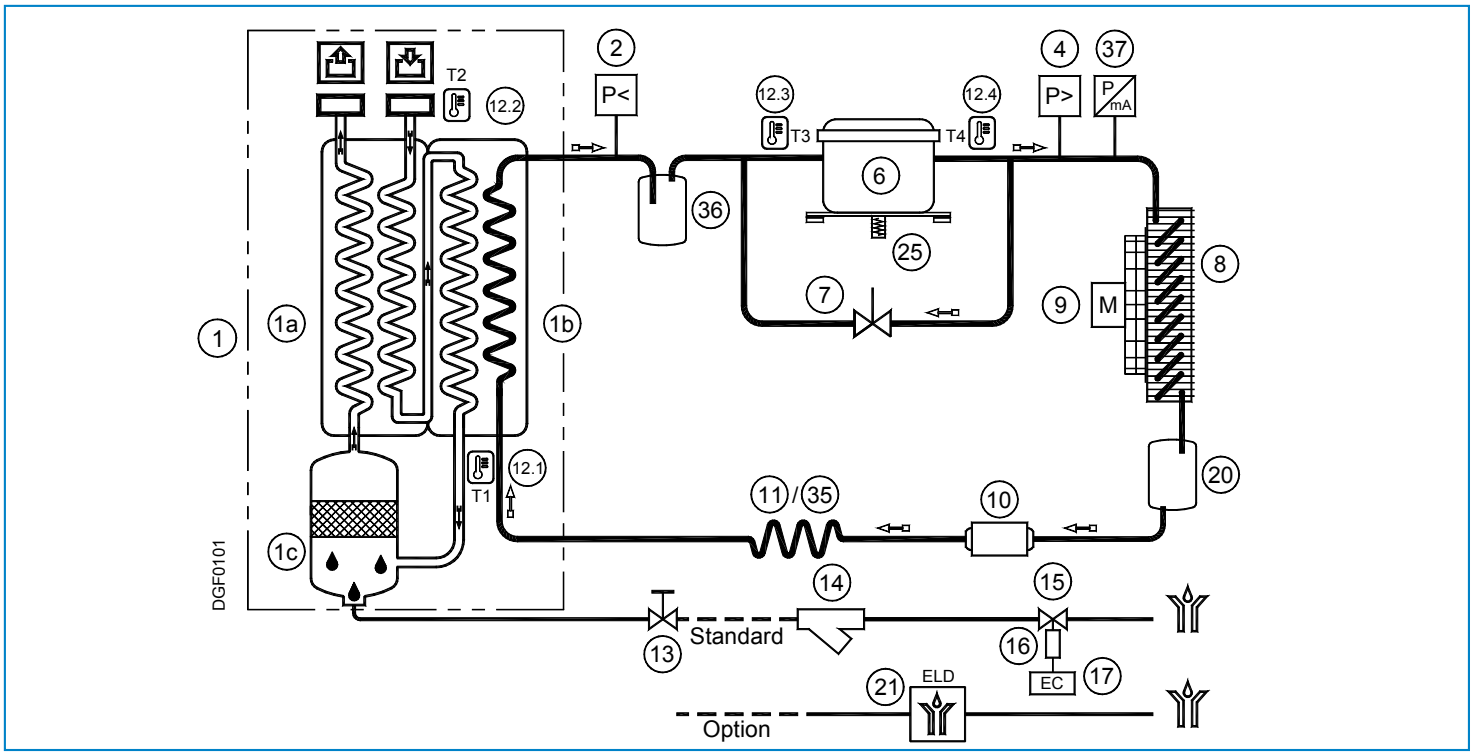
Function Description (air cooled version)

The warm, moisture-laden compressed air enters the air/ air heat exchanger and is precooled there by the incoming compressed air. The compressed air then flows into the air / refrigerant heat exchanger (**1b**). There, it is cooled to approx. 2°C, whereby water vapor is condensed and the liquid water is separated in the water separator and is discharged from the system via the electronically-controlled condensate drain (**21**). The cool, saturated compressed air then flows back through the air-to-air heat exchanger (**1a**) and is heated by the incoming compressed air and thus is under-saturated. The pressure dewpoint achieved depends on the design and operating conditions and is + 3°C at nominal operating conditions.

In the refrigeration circuit, the refrigerant is compressed in the refrigerant compressor (**6**) and then liquefied with the fan (**9**) in the condenser (**8**). Via a capillary tube (**11**) the liquid refrigerant is expanded and injected in the Air/ refrigerant heat exchanger (**1b**). The warm compressed air evaporates the refrigerant and the pressure is reduced and cooled by this phase change, which also cools the compressed air. The expanded and gaseous refrigerant is returned to the compressor.

Main Components

- Air/ air (**1a**) and air/ refrigerant heat exchanger (**1b**) with integrated water separator (**1c**)
- Electronic level-controlled condensate drain (**21**)
- Refrigerant compressor with switch on/ off control (**6**)
- Refrigerant condenser (**8**) with fan (**9**)
- Hotgas bypass control valve (**7**)
- Capillary tube (**11**)
- Dewpoint-temperature sensor (**12.1**)



Donaldson® Ultrafilter

PRODUCT SPECIFICATIONS

Features	Benefits
Intelligent over-all concept	Type range, integrated monitoring and control functions as well as automatic condensate drain adapted for the use in central compressed air applications. Available in air or water cooled versions
5 sizes for nominal volume flows of 2.430 to 6.060 m³/h	Accurate selection of the appropriate refrigeration compressed air dryer to the respective operating volume flow
Dew point control via hot gas bypass control	Robust and safe control of the dew point even under different load conditions
Automatic condensate drain on the heat exchanger	Safe condensate drainage depending on the amount of condensate
Compact and space-saving design with robust steel housing	Low space requirements at the installation site, low storage space requirement and low transport costs
Electronic controller including a display and indication of the current pressure dewpoint, operating hours, service messages, alarm messages with multiple possible individual settings.	Reliable monitoring of the operating status and timely display of required maintenance work
Scroll compressor in refrigeration circuit	Reliable compression of the refrigerant at high running, low vibration and low noise operation
Stainless steel heat exchanger	No corrosion inside the heat exchanger due to contact with moist compressed air; Good heat transfer properties at low weight

PRODUCT SPECIFICATIONS

Type	Volume flow m³/h	Volume flow m³/min.	Differential pressure mbar	Cooling air requirement m³/h	Cooling water requirement (15°C) m³/h	Power consumption kW	Power supply
Air cooled version							
DHP 2400 AX	2430	40,5	250	10800	—	4,3	3~/ 400V/ 50Hz (±10%)
DHP 3000 AX	3030	50,5	250	14400	—	4,8	3~/ 400V/ 50Hz (±10%)
DHP 4000 AX	4020	67	250	14400	—	5,6	3~/ 400V/ 50Hz (±10%)
DHP 5000 AX	5010	83,5	260	14800	—	6,4	3~/ 400V/ 50Hz (±10%)
DHP 6000 AX	6060	101	250	22200	—	8,4	3~/ 400V/ 50Hz (±10%)
Water cooled version							
DHP 2400 WX	2430	40,5	250	—	0,45	3,8	3~/ 400V/ 50Hz (±10%)
DHP 3000 WX	3030	50,5	250	—	0,47	3,9	3~/ 400V/ 50Hz (±10%)
DHP 3000 WX	4020	67	250	—	0,56	4,65	3~/ 400V/ 50Hz (±10%)
DHP 5000 WX	5010	83,5	260	—	0,67	5,5	3~/ 400V/ 50Hz (±10%)
DHP 6000 WX	6060	101	250	—	0,92	7,0	3~/ 400V/ 50Hz (±10%)

Operating pressure:	max. 45 bar g
Operating temperature:	max. 65°C
Ambient temperature:	+1°C...+50°C

SIZING

Operating pressure (bar g)	15	16	20	25	30	35	40	45	50
Correcion factor fp	0,57	0,60	0,70	0,80	0,88	0,94	1,00	1,05	1,10

Compressed air inlet temperature (°C)	≤ 25	30	35	40	45	50	55	60	65
Correcion factor fte	1,20	1,12	1,00	0,83	0,69	0,59	0,50	0,44	0,39

Temperature of cooling air or cooling water (°C)	≤ 25	30	35	40	45	50
Correction factor ftu	1,00	0,96	0,90	0,82	0,72	0,60

Pressure dewpoint (°C)	3	5	7	10
Correction factor ftpd	1,00	1,09	1,19	1,37

Example:

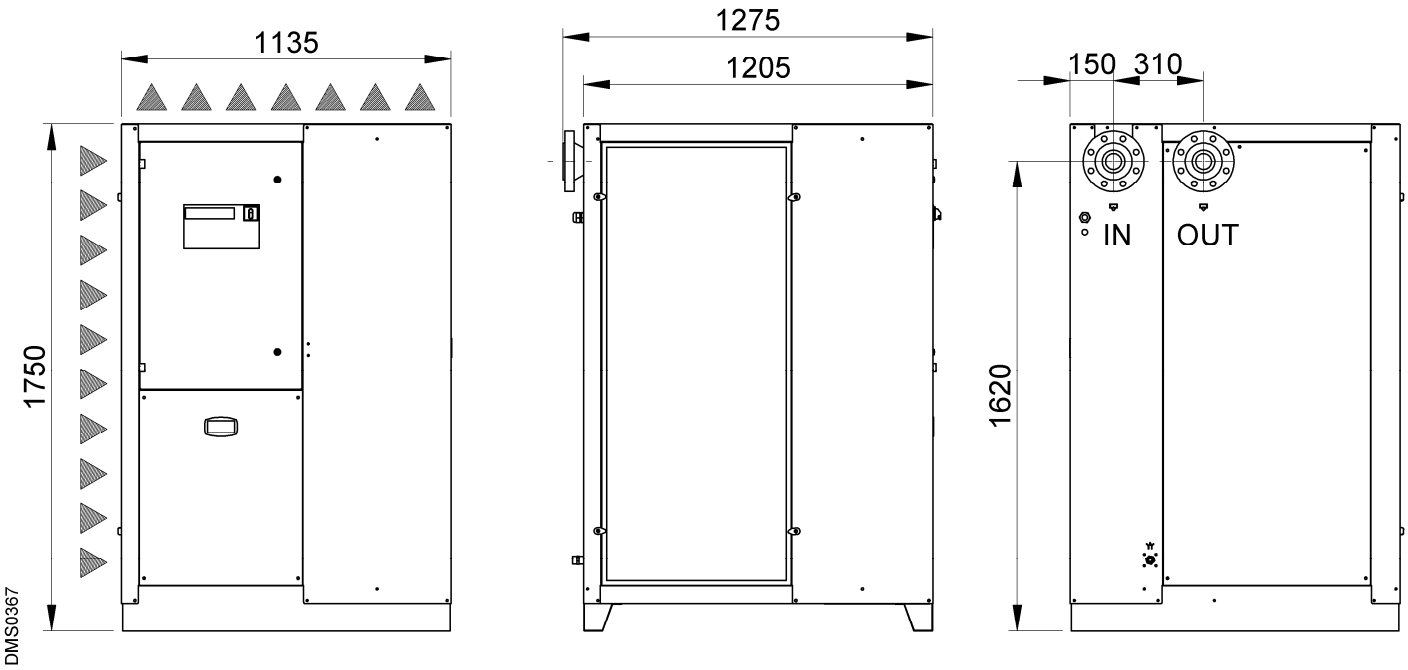
$\dot{V}_{nom}$ = 3500 m³/h (intake volume flow of the compressor), compressed air inlet temperature = 40°C, cooling water temperature = 35°C, operating pressure = 35 bar, pressure dewpoint = +3°C

$$\dot{V}_{korr} = \frac{\dot{V}_{nom}}{f} = \frac{3500\ m^3/h}{0{,}94 \times 0{,}83 \times 0{,}90 \times 1{,}00} = 4984\ m^3/h$$

Calculated dryer size:
DHP 5000 WX

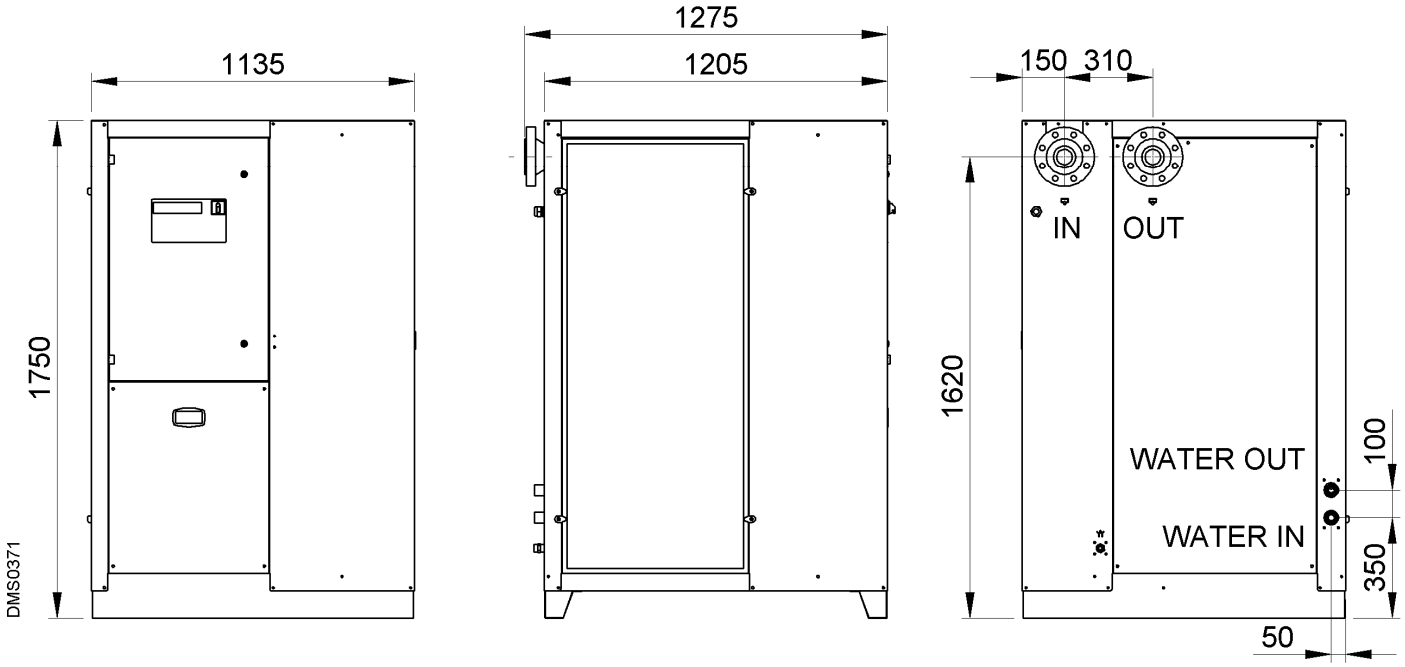
Donaldson® Ultrafilter

DIMENSIONS



Type	Weight kg	Air Connections ANSI	Condensate Connections BSP-F
DHP 2430 AX	444	3"	G 1/2"
DHP 3000 AX	461	3"	G 1/2"
DHP 4000 AX	486	3"	G 1/2"
DHP 5000 AX	552	3"	G 1/2"
DHP 6000 AX	754	3"	G 1/2"

DIMENSIONS



Type	Weight kg	Air Connections ANSI	Water Connections BSP-F	Condensate Connections BSP-F
DHP 2430 WX	435	3"	G 1"	G 1/2"
DHP 3000 WX	452	3"	G 1"	G 1/2"
DHP 4000 WX	480	3"	G 1"	G 1/2"
DHP 5000 WX	540	3"	G 1"	G 1/2"
DHP 6000 WX	740	3"	G 1 1/2"	G 1/2"