# Boreas
# DV 1260 - DV 21000 AVS / WVS
Air cooled / water cooled
Refrigeration Dryers


## PRODUCT DESCRIPTION

**Boreas DV 1260 - DV 21000**

For the energy-conscious user, the new Boreas DV refrigeration compressed air dryers are now available. This new range includes speed-controlled compressors, inverters for compressors and fans as well as level-controlled condensate drains.

The complete control of the DV dryers is carried out by the innovative electronic control system, which continuously monitors the pressure and operating temperature, calculates the thermal load and adjusts the speed of the compressor and the fans. This ensures an extremely stable dew point in all operating conditions and a power consumption proportional to the applied thermal load.

**Controller Display**

The large controller display provides an intuitive user interface. The current operating parameters are constantly provided with additional information such as data acquisition, planned maintenance, operating hours counter, energy saving and alarm memory.

An interface for the remote monitoring of the dryer is already included as well as alarm contacts for remote monitoring.

## MAIN FEATURES & BENEFITS

- Refrigeration compressed air dryers with intelligent, energy-saving capacity control for economical compressed air drying
- 17 sizes for nominal flow rates of up to 21,000 m³ / h allow an accurate selection of the appropriate refrigeration compressed air dryer to the respective operating volume flow
- Speed-controlled refrigerant compressor and condenser fan in conjunction with intelligent temperature and pressure control permanently adjust the energy consumption to the current operating conditions and at the same time ensure a constant pressure dew point
- Electronic level-controlled condensate drain on the heat exchanger ensure reliable condensate drainage depending on the amount of condensate without loss of compressed air. Includes function monitoring and alarm message
- Electronic controller including a large touch display shows the current operating parameters while additional functions such as data loggers, service messages, alarm history, operating hours counters and energy saving are easily accessible. Data exchange to higher-level controllers is possible via an integrated RS485 interface
- Compact und space-saving design with robust steel housing
- Flange connection for all sizes


Controller Display

## INDUSTRIES

- Chemical and electrical industry
- Maschine building industry and plant engineering/ construction
- Automotive industry

## PRODUCT DESCRIPTION

**Function Description (air cooled version)**

The warm, moisture-laden compressed air enters the air / air heat exchanger (**1a**) 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 (**1c**) 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.

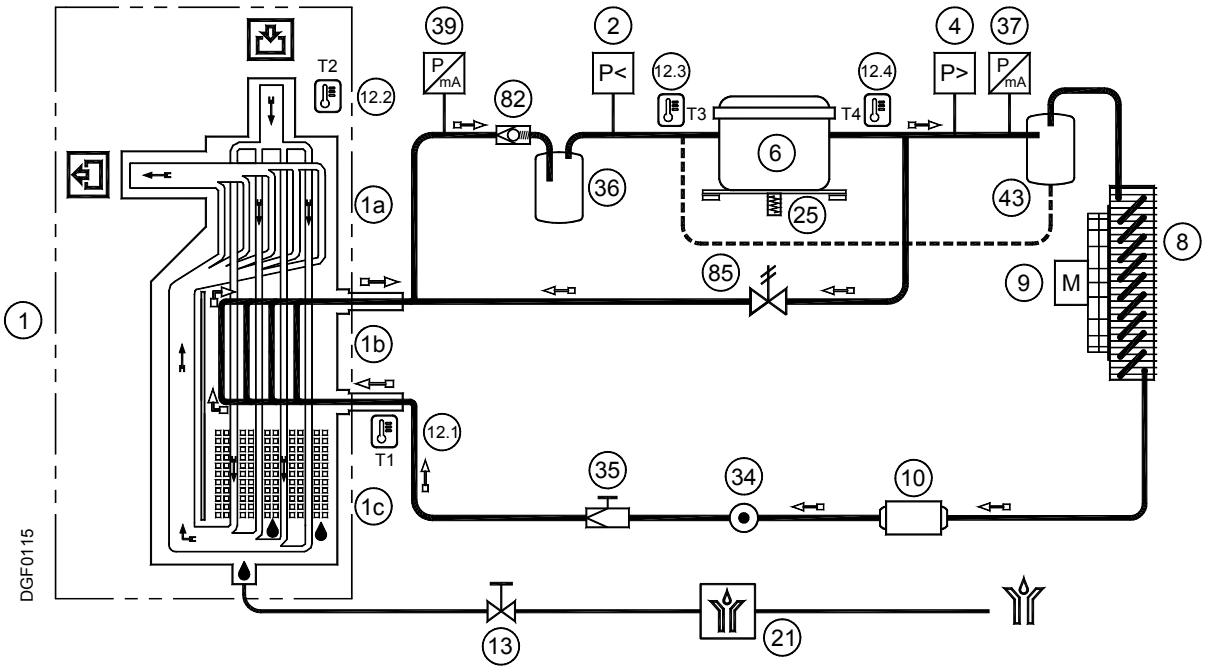
The pressure dewpoint achieved depends on the design and operating conditions and is + 3°C at nominal operating conditions.

In the refrigeration circuit, the refrigerant is compressed in the refrigerant compressor (**6**) and then liquefied with the fan (**9**) in the condenser (**8**). The liquid refrigerant is expanded via a thermal expansion valve (**35**) and injected into 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.

The electrical control constantly monitors the evaporation pressure, the condensing pressure and the dew point temperature in the cooling circuit. The evaporation pressure is kept constant by the refrigerant compressor adjusting the compression pressure by frequency. The condensing pressure is also kept constant by the load, as the fan adjusts the amount of cooling air fed into the system.

### 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 frequency control (**6**)
- Refrigerant condenser (**8**) with frequency-controlled fan (**9**)
- Thermal expansion valve (**35**)
- Pressure compensation solenoid valve (**85**)



## 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.<br>Available in air or water cooled versions |
| 17 sizes for nominal volume flows up to 21.000 m³/h | Accurate selection of the appropriate refrigeration compressed air dryer to the respective operating volume flow |
| Intelligent, energy-saving capacity control based on speed-controlled refrigerant compressor and condensor fan in conjunction with temperature and pressure control | Permanently adjusting of the energy consumption to the current operating conditions for economical compressed air drying at a constantly low pressure dew point |
| Electronic level-controlled condensate drain on the heat exchanger | Safe condensate drainage depending on the amount of condensate, without loss of compressed air. Includes function monitoring and alarm meessage |
| Compact and space-saving design with robust steel housing | Low space requirements at the installation site,<br>low storage space requirement and low transport costs |
| Electronic controller including a large touch display shows the current operating parameters while additional functions such as data loggers, service messages, alarm history, operating hours counters and energy saving are easily accessible.<br>Data exchange to higher-level controllers is possible via an integrated RS485 interface | Reliable monitoring of the operating status and timely display of required maintenance work; Remote monitoring via potential-free fault message and RS485 interface possible |
| Scroll compressor in refrigeration circuit | Reliable compression of the refrigerant at high running, low vibration and low noise operation |
| Aluminium heat exchanger | No corrosion inside the heat exchanger due to contact with moist compressed air; Good heat transfer properties at low weight |
| Flange connections for all sizes | Easy and safe connection to the compressed air network |



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## PRODUCT SPECIFICATIONS

| Type | Volume flow m³/h | Volume flow m³/min. | Differential pressure mbar | Cooling air requirement * m³/h | Cooling water requirement ** m³/h | Power consumption kW* / kW** | Power supply |
|---|---|---|---|---|---|---|---|
| DV 1260 | 1260 | 21 | 210 | 5400 | 0,76 | 2,20 / 2,00 | 3~/ 400V/ 50Hz (±10%) |
| DV 1650 | 1650 | 28 | 160 | 7200 | 0,98 | 3,10 / 2,30 | 3~/ 400V/ 50Hz (±10%) |
| DV 1800 | 1800 | 30 | 180 | 7400 | 0,99 | 3,50 / 2,80 | 3~/ 400V/ 50Hz (±10%) |
| DV 2000 | 2000 | 33 | 210 | 7400 | 1,11 | 3,90 / 3,20 | 3~/ 400V/ 50Hz (±10%) |
| DV 2300 | 2300 | 38 | 200 | 14400 | 1,23 | 3,80 / 3,40 | 3~/ 400V/ 50Hz (±10%) |
| DV 2800 | 2800 | 47 | 120 | 14400 | 1,27 | 4,40 / 3,90 | 3~/ 400V/ 50Hz (±10%) |
| DV 3500 | 3500 | 58 | 190 | 14800 | 2,03 | 6,10 / 5,10 | 3~/ 400V/ 50Hz (±10%) |
| DV 4300 | 4300 | 71 | 250 | 14800 | 2,54 | 7,50 / 6,30 | 3~/ 400V/ 50Hz (±10%) |
| DV 5500 | 5500 | 92 | 210 | 21600 | 2,87 | 9,00 / 7,40 | 3~/ 400V/ 50Hz (±10%) |
| DV 6250 | 6250 | 104 | 230 | 22200 | 3,26 | 10,60 / 8,50 | 3~/ 400V/ 50Hz (±10%) |
| DV 7000 | 7000 | 117 | 190 | 28800 | 3,79 | 10,80 / 9,10 | 3~/ 400V/ 50Hz (±10%) |
| DV 8750 | 8750 | 146 | 260 | 29600 | 4,34 | 14,10 / 11,30 | 3~/ 400V/ 50Hz (±10%) |
| DV 10500 | 10500 | 175 | 210 | 44400 | 5,58 | 16,90 / 12,20 | 3~/ 400V/ 50Hz (±10%) |
| DV 12500 | 12500 | 208 | 230 | 44400 | 6,52 | 21,20 / 17,00 | 3~/ 400V/ 50Hz (±10%) |
| DV 14000 | 14000 | 233 | 190 | 57600 | 7,58 | 21,60 / 18,20 | 3~/ 400V/ 50Hz (±10%) |
| DV 17500 | 17500 | 292 | 260 | 59200 | 8,68 | 28,20 / 22,60 | 3~/ 400V/ 50Hz (±10%) |
| DV 21000 | 21000 | 350 | 210 | 88800 | 11,16 | 33,80 / 24,40 | 3~/ 400V/ 50Hz (±10%) |

| | |
|---|---|
| **Operating pressure:** | max. 14 bar g |
| **Operating temperature:** | max. 70°C |
| **Ambient temperature:** | +1°C...+50°C |

* only air cooled versions

** only water cooled versions

## SIZING

| Operating pressure (bar g) | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Correcion factor fp | 0,49 | 0,66 | 0,77 | 0,86 | 0,93 | 1,00 | 1,05 | 1,10 | 1,14 | 1,18 | 1,21 | 1,24 | 1,27 |

| Compressed air inlet temperature (°C) | ≤ 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 |
|---|---|---|---|---|---|---|---|---|---|---|
| Correcion factor fte | 1,20 | 1,12 | 1,00 | 0,83 | 0,69 | 0,59 | 0,50 | 0,44 | 0,39 | 0,37 |

| 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 |

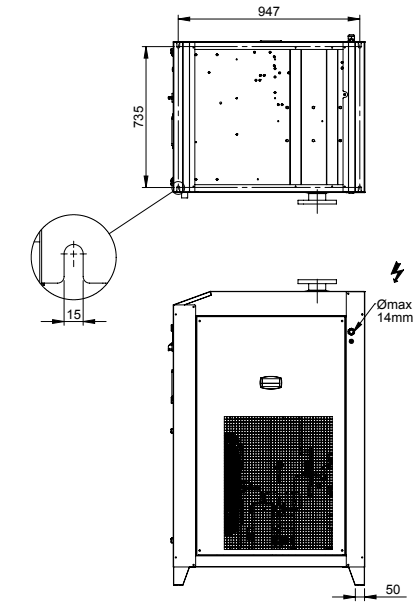
**Example:**

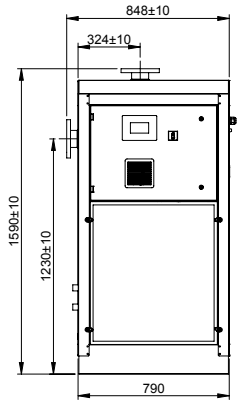
$\dot{V}_{nom}$ = 1800 m³/h (intake volume flow of the compressor), compressed air inlet temperature = 40°C, cooling water temperature = 35°C, operating pressure = 9 bar, pressure dewpoint = +3°C

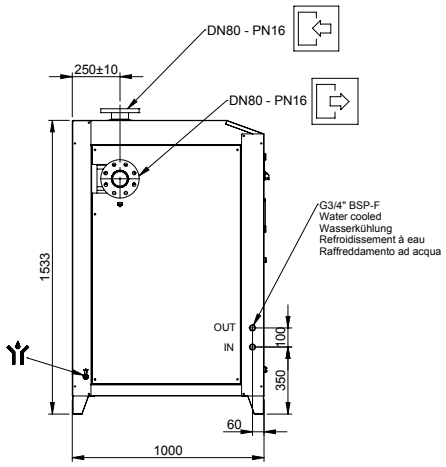
$$\dot{V}_{korr} = \frac{\dot{V}_{nom}}{f} = \frac{1800\ m^3/h}{1,06 \times 0,83 \times 0,90 \times 1,00} = 2273\ m^3/h$$

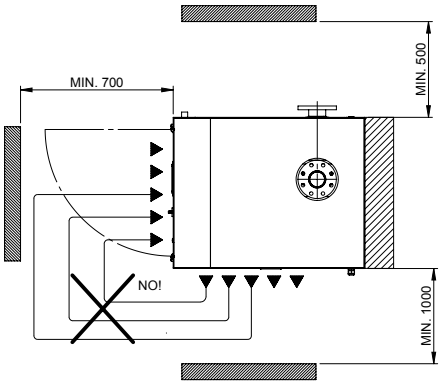
**Calculated dryer size:**
**DV 2300**

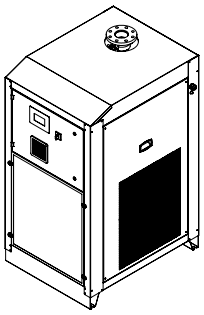
## DIMENSIONS



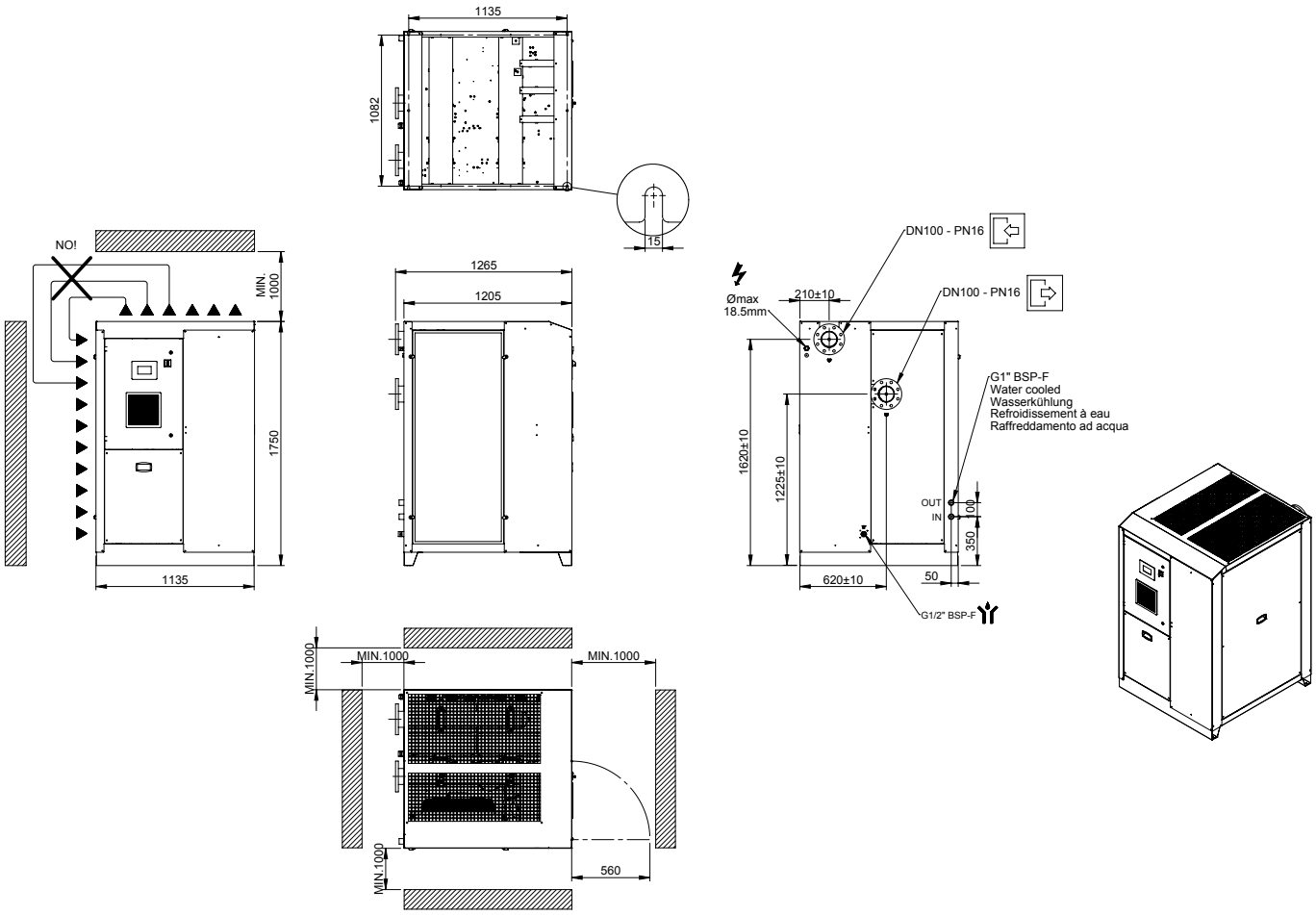



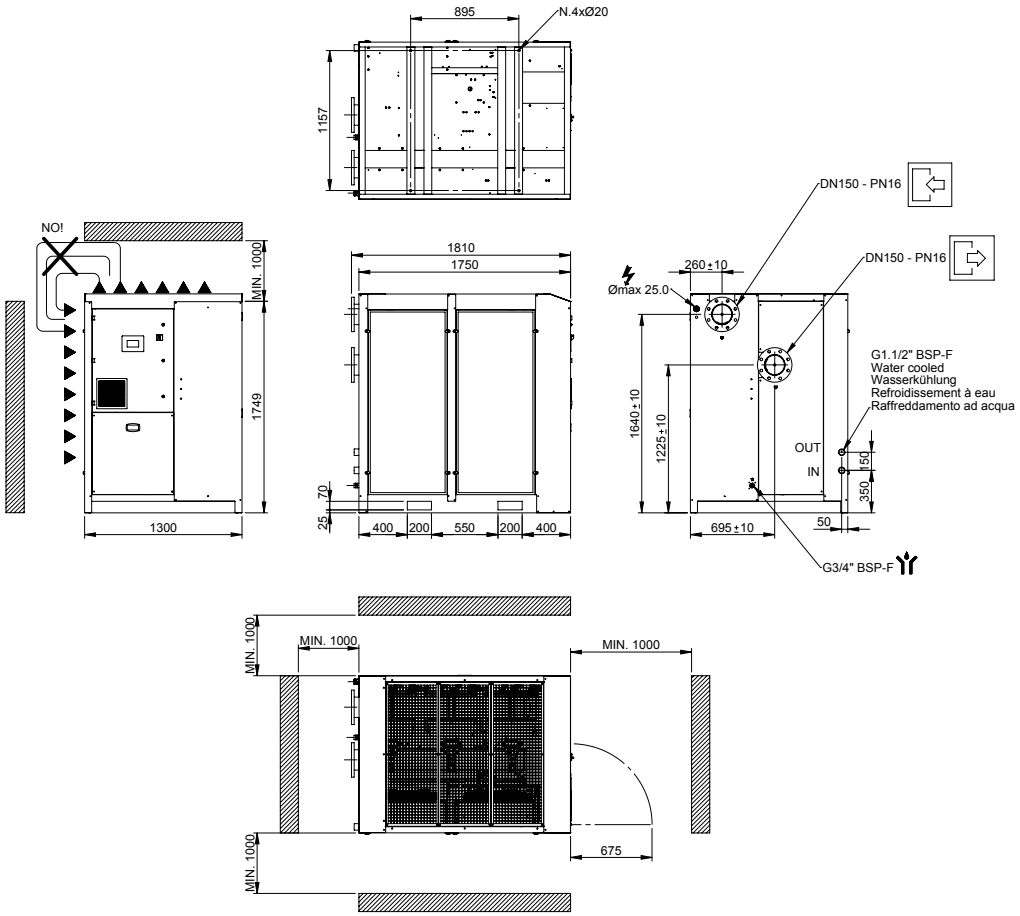
| Type | Weight kg | Air connections Inlet / Outlet DN | Water connections Inlet / Outlet BSP-F | Condensate connections BSP-F |
|---|---|---|---|---|
| DV 1260 | 248 | 80 - PN16 | G 3/4“ | G 1/2“ |
| DV 1650 | 282 | 80 - PN16 | G 3/4“ | G 1/2“ |
| DV 1800 | 317 | 80 - PN16 | G 3/4“ | G 1/2“ |
| DV 2000 | 317 | 80 - PN16 | G 3/4“ | G 1/2“ |

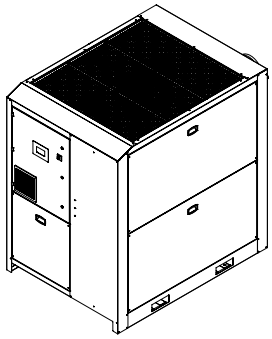
## DIMENSIONS




| Type | Weight kg | Air connections Inlet / Outlet DN | Water connections Inlet / Outlet BSP-F | Condensate connections BSP-F |
|---|---|---|---|---|
| DV 2300 | 470 | 100 - PN16 | G 1“ | G 1/2“ |
| DV 2800 | 545 | 100 - PN16 | G 1“ | G 1/2“ |
| DV 3500 | 549 | 100 - PN16 | G 1“ | G 1/2“ |
| DV 4300 | 621 | 100 - PN16 | G 1“ | G 1/2“ |

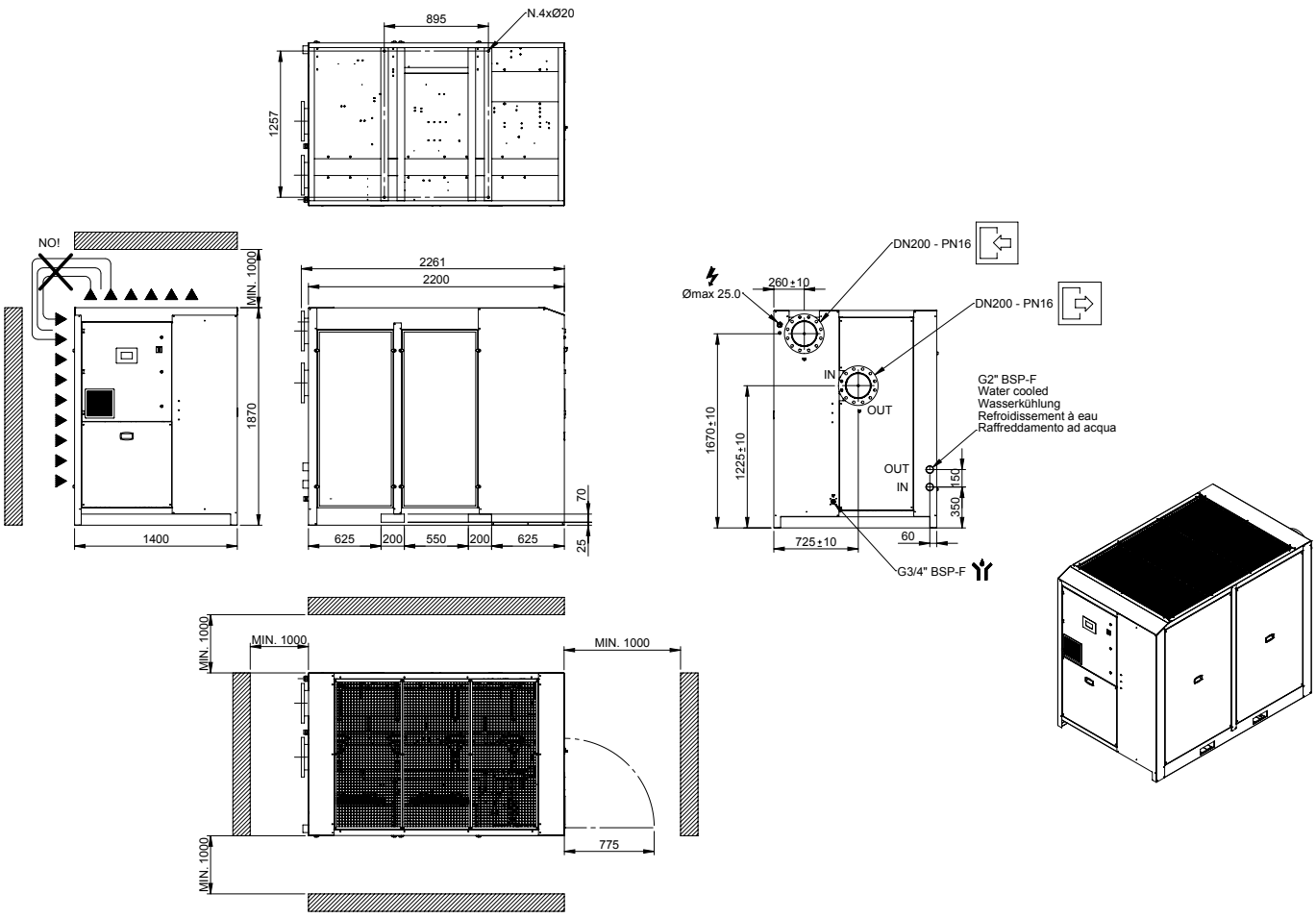
## DIMENSIONS



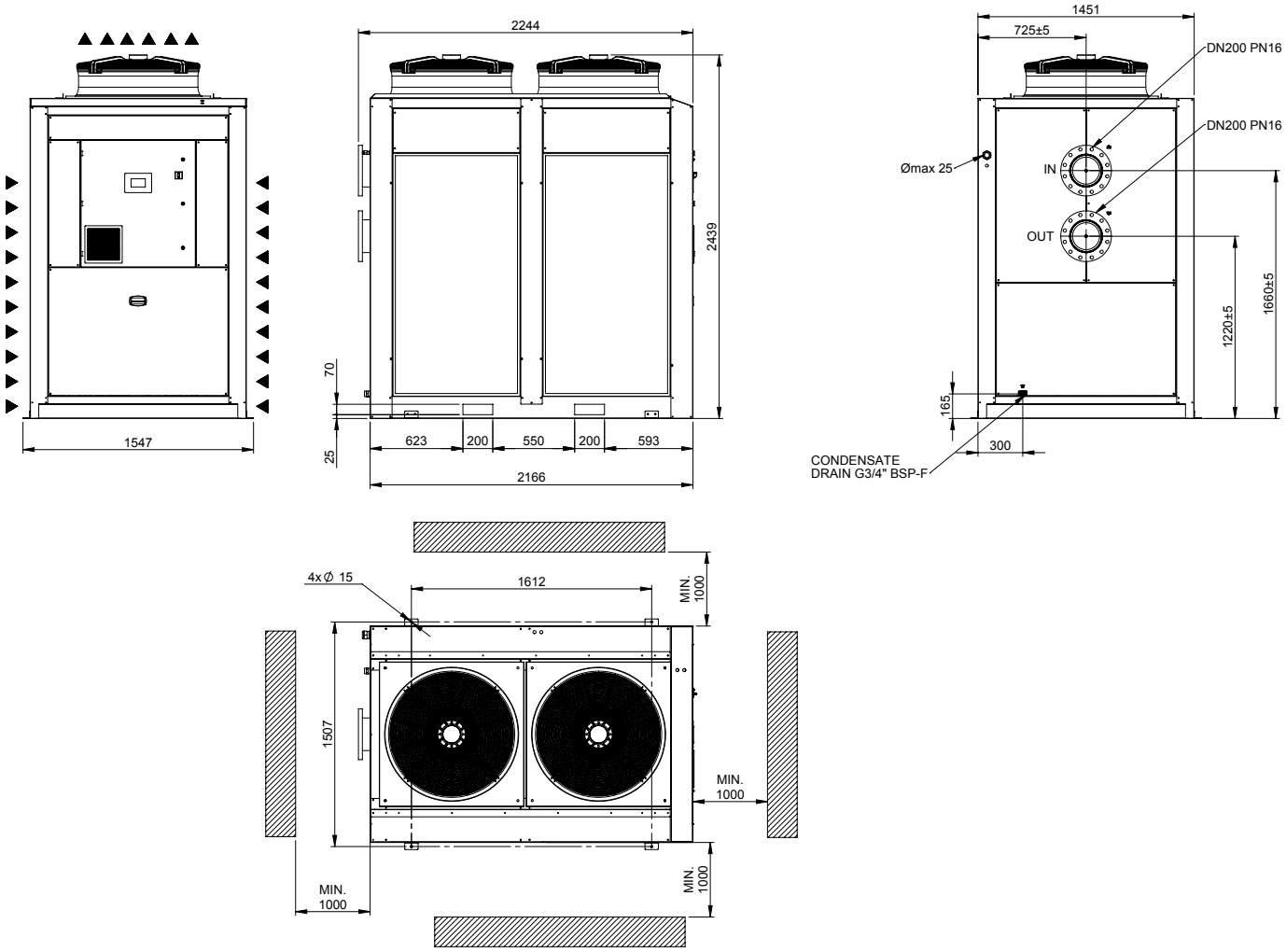
| Type | Weight kg | Air connections Inlet / Outlet DN | Water connections Inlet / Outlet BSP-F | Condensate connections BSP-F |
|---|---|---|---|---|
| DV 5500 | 840 | 150 - PN16 | G 1 1/2“ | G 3/4“ |
| DV 6250 | 950 | 150 - PN16 | G 1 1/2“ | G 3/4“ |

## DIMENSIONS



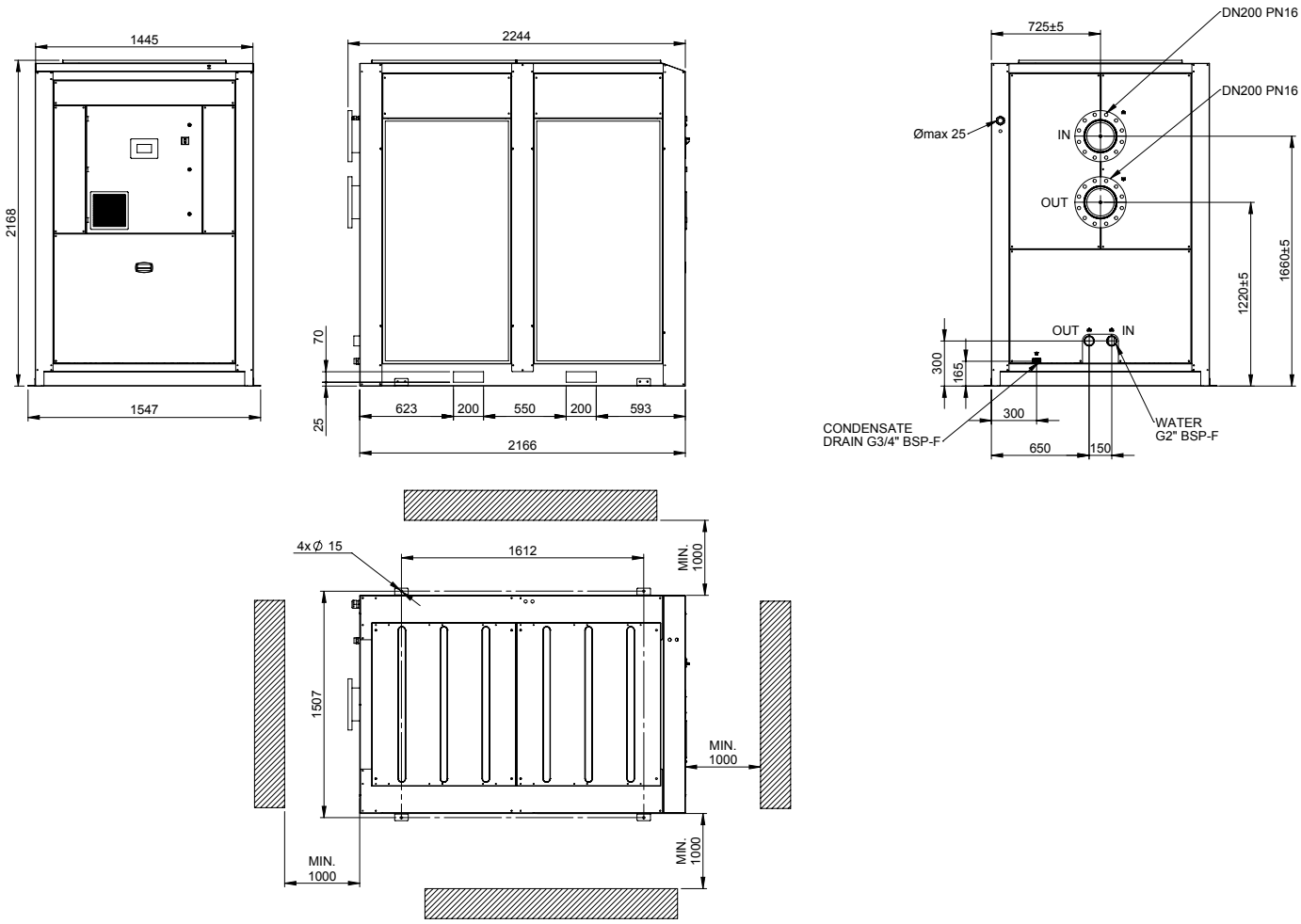

| Type | Weight kg | Air connections Inlet / Outlet DN | Water connections Inlet / Outlet BSP-F | Condensate connections BSP-F |
|---|---|---|---|---|
| DV 7000 | 1065 | 200 - PN16 | G 2" | G 3/4" |
| DV 8750 | 1210 | 200 - PN16 | G 2" | G 3/4" |

## DIMENSIONS



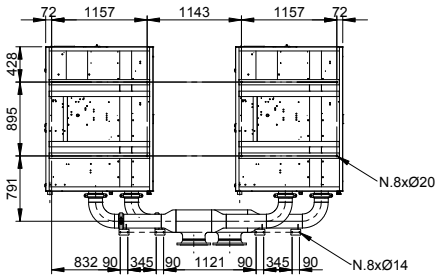

| Type | Weight kg | Air connections Inlet / Outlet DN | Water connections Inlet / Outlet BSP-F | Condensate connections BSP-F |
|---|---|---|---|---|
| DV 10500 AVS | 1660 | 200 - PN16 | --- | G 3/4“ |

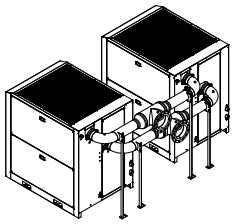
## DIMENSIONS

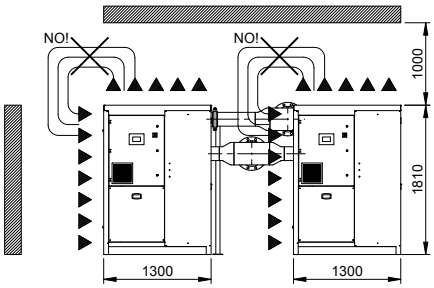


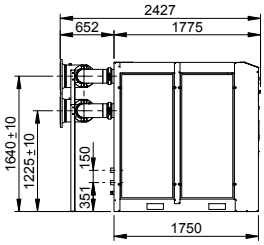

| Type | Weight kg | Air connections Inlet / Outlet DN | Water connections Inlet / Outlet BSP-F | Condensate connections BSP-F |
|---|---|---|---|---|
| DV 10500 WVS | 1460 | 200 - PN16 | G 2“ | G 3/4“ |

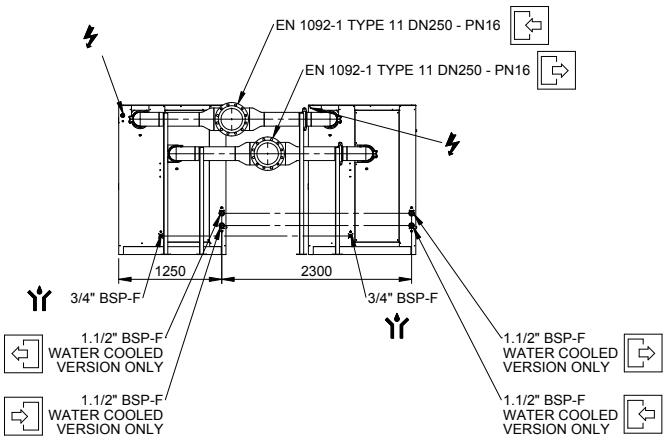
## DIMENSIONS

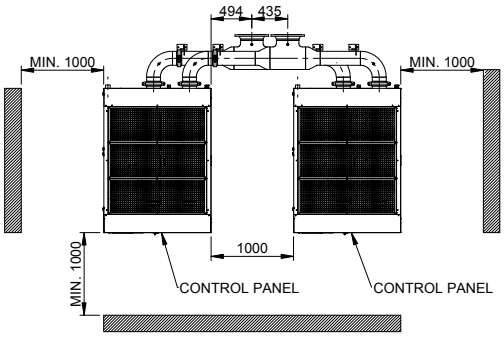




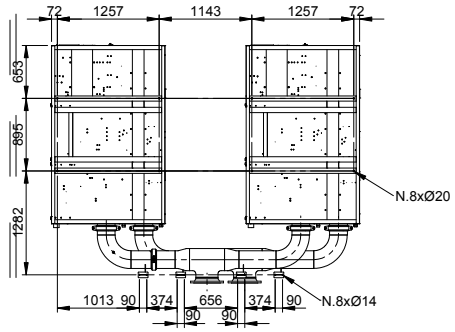



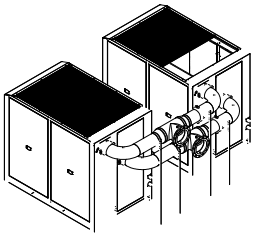



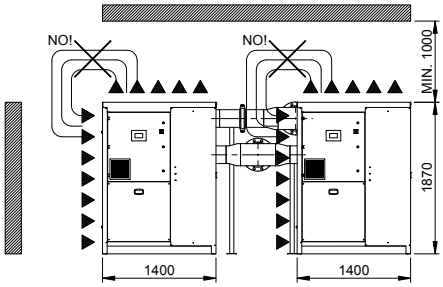



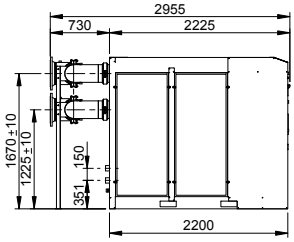

| Type | Weight kg | Air connections Inlet / Outlet DN | Water connections Inlet / Outlet BSP-F | Condensate connections BSP-F |
|---|---|---|---|---|
| DV 12500 | 2178 | 250 - PN16 | 1 1/2“ BSP-F | G 3/4“ |

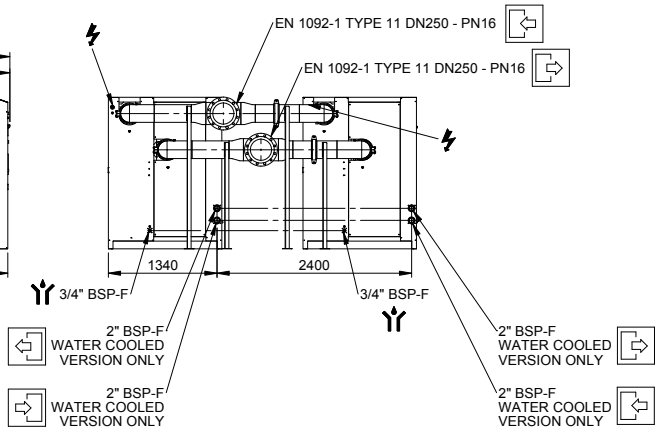
## DIMENSIONS

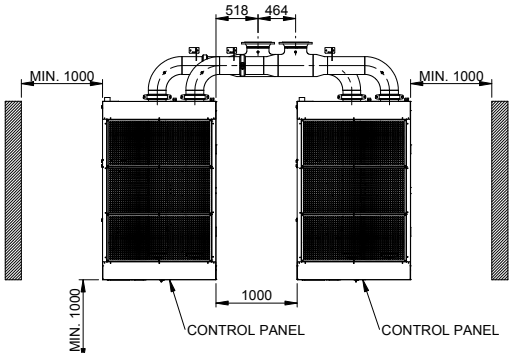




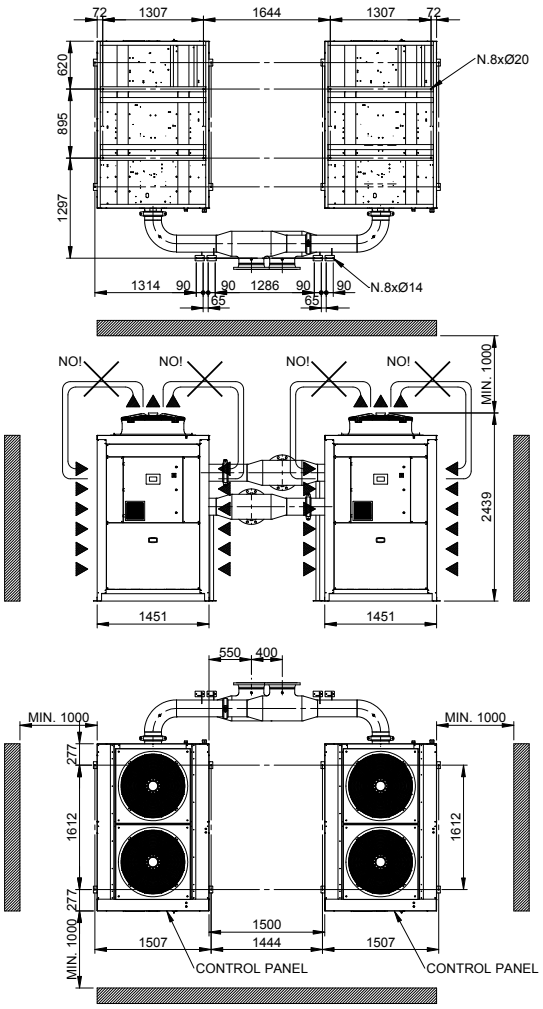



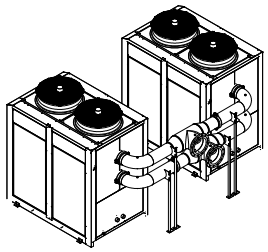



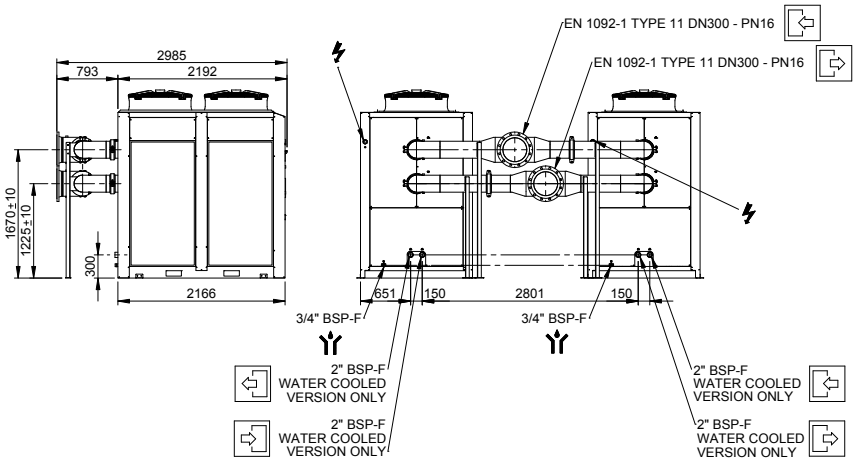




| Type | Weight kg | Air connections Inlet / Outlet DN | Water connections Inlet / Outlet BSP-F | Condensate connections BSP-F |
|---|---|---|---|---|
| DV 14000 | 2560 | 250 - PN16 | 2“ | G 3/4“ |
| DV 17500 | 2850 | 250 - PN16 | 2“ | G 3/4“ |

## DIMENSIONS






| Type | Weight kg | Air connections Inlet / Outlet DN | Water connections Inlet / Outlet BSP-F | Condensate connections BSP-F |
|---|---|---|---|---|
| DV 21000 | 3373 | 300 - PN16 | 2" | G 3/4" |