

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 pre-cooled 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.

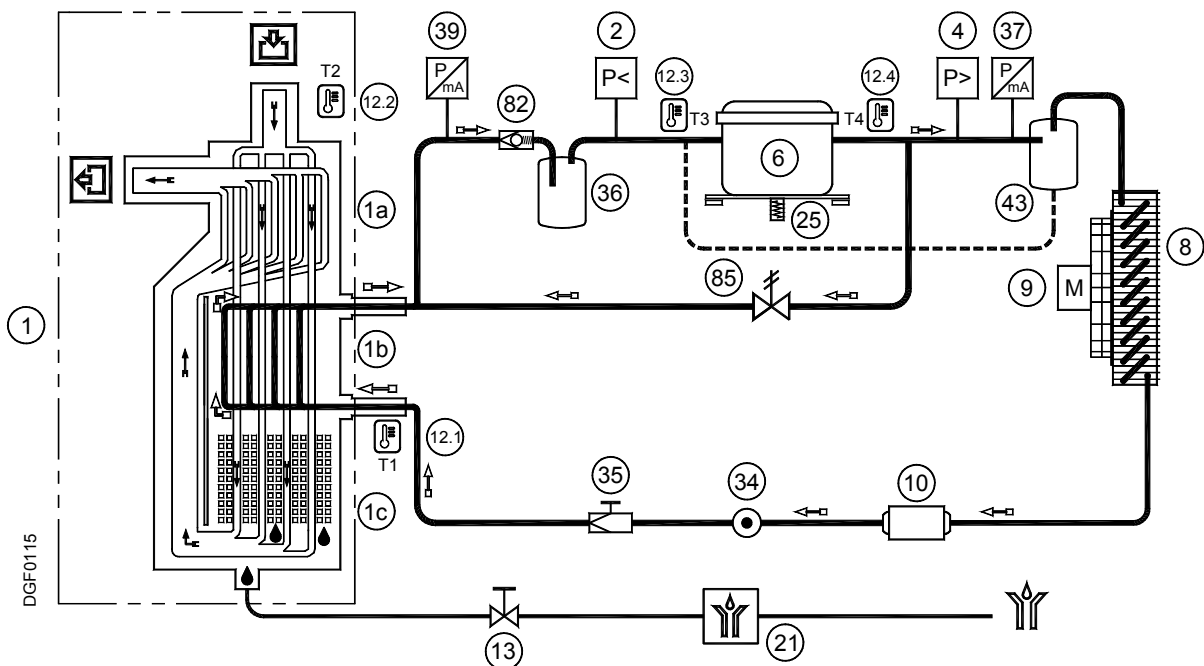
The pressure dewpoint achieved depends on the design and operating conditions and is + 3°C at nominal operating conditions.

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. Available in air or water cooled versions
17 sizes for nominal volume flows up to 21.000 m ³ /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 message
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 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	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

PRODUCT SPECIFICATIONS

Type	Volume flow m ³ /h	Volume flow m ³ /min.	Differential pressure mbar	Cooling air requirement * m ³ /h	Cooling water requirement ** m ³ /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	Pressure dewpoint (°C)	3	5	7	10
	Correction factor ftu	1,00	0,96	0,90	0,82	0,72		0,60	Correction factor ftpd	1,00	1,09

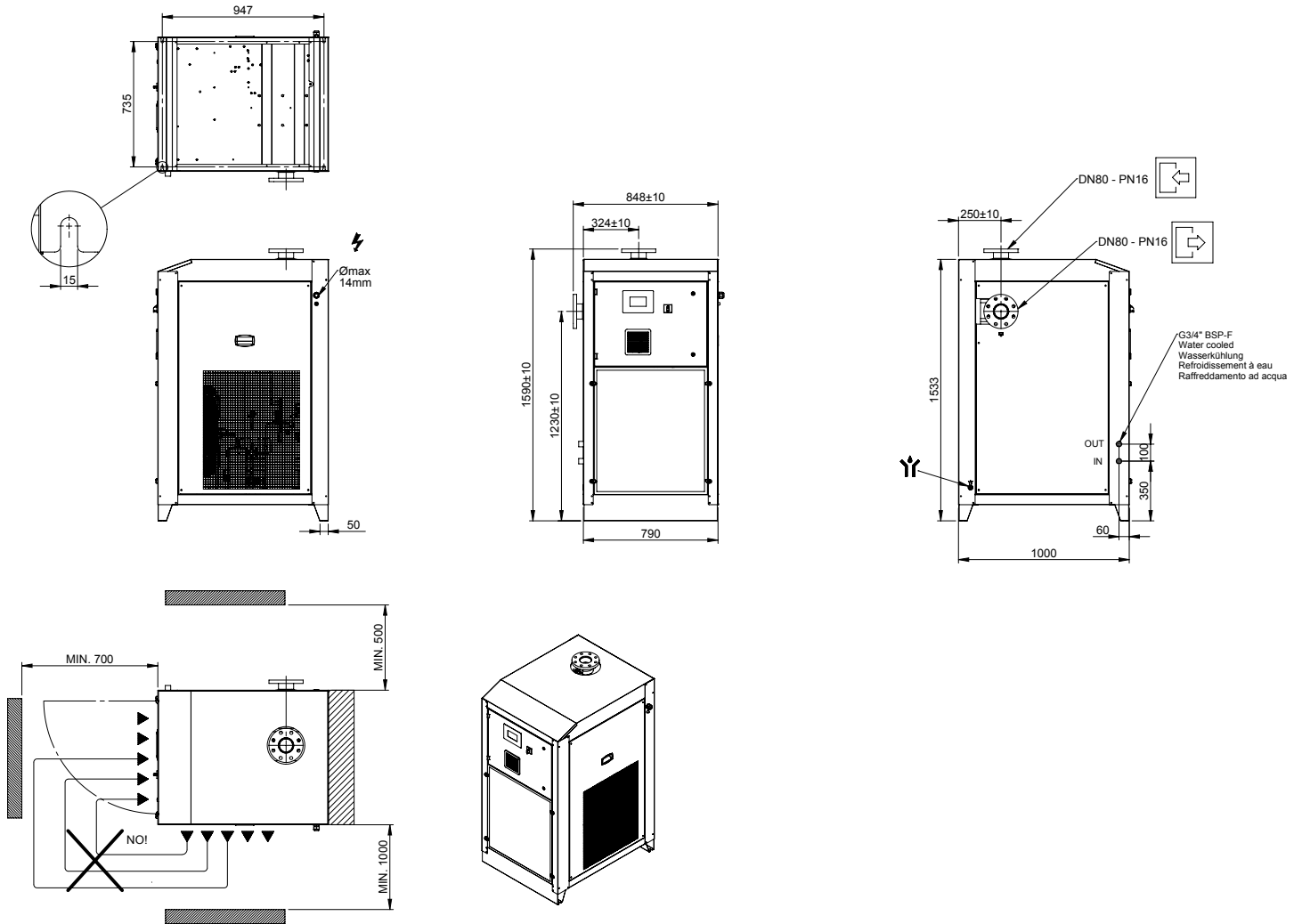
Example:

$\dot{V}_{nom} = 1800 \text{ m}^3/\text{h}$ (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

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

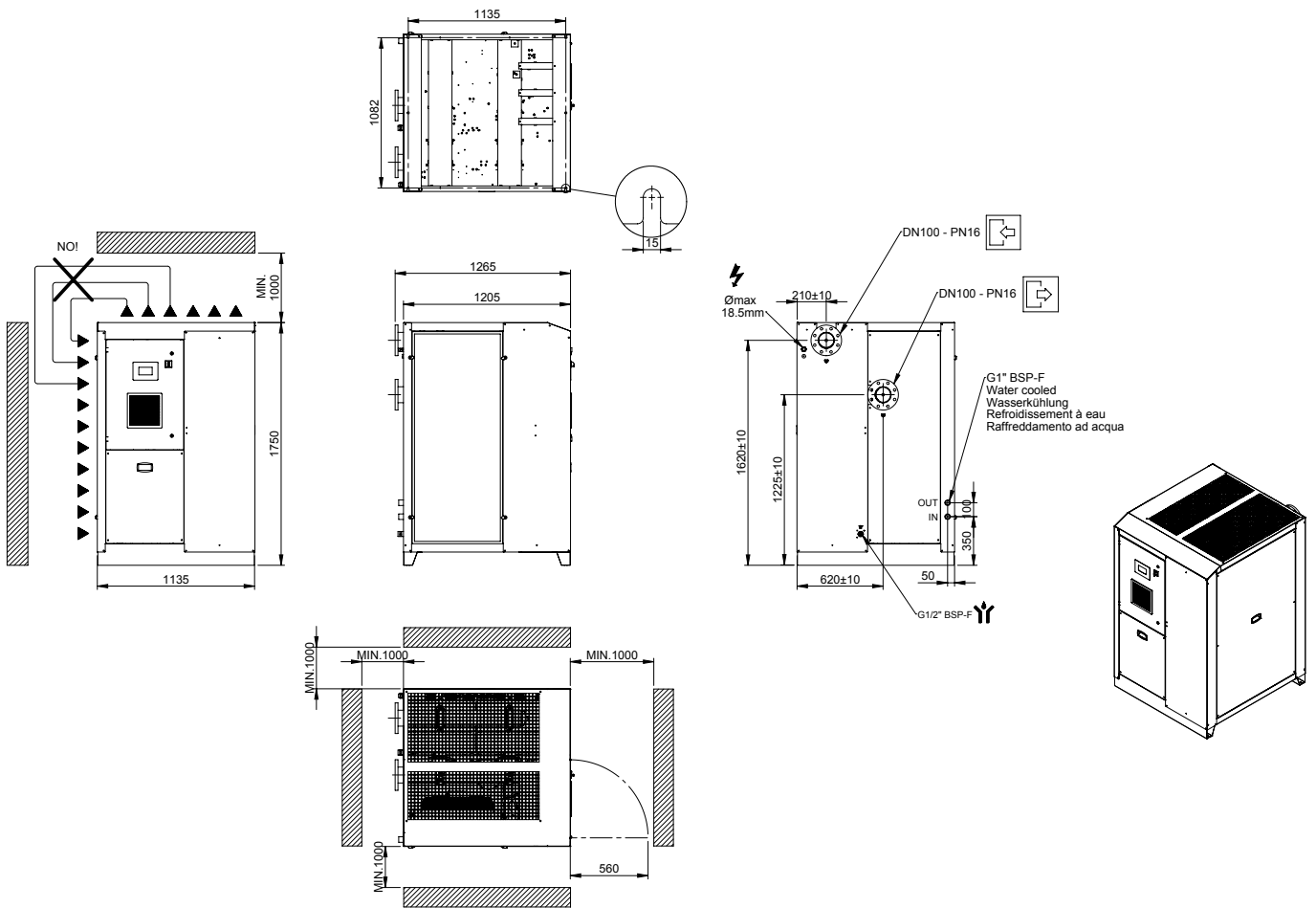
**Calculated dryer size:
DV 2300**

DIMENSIONS



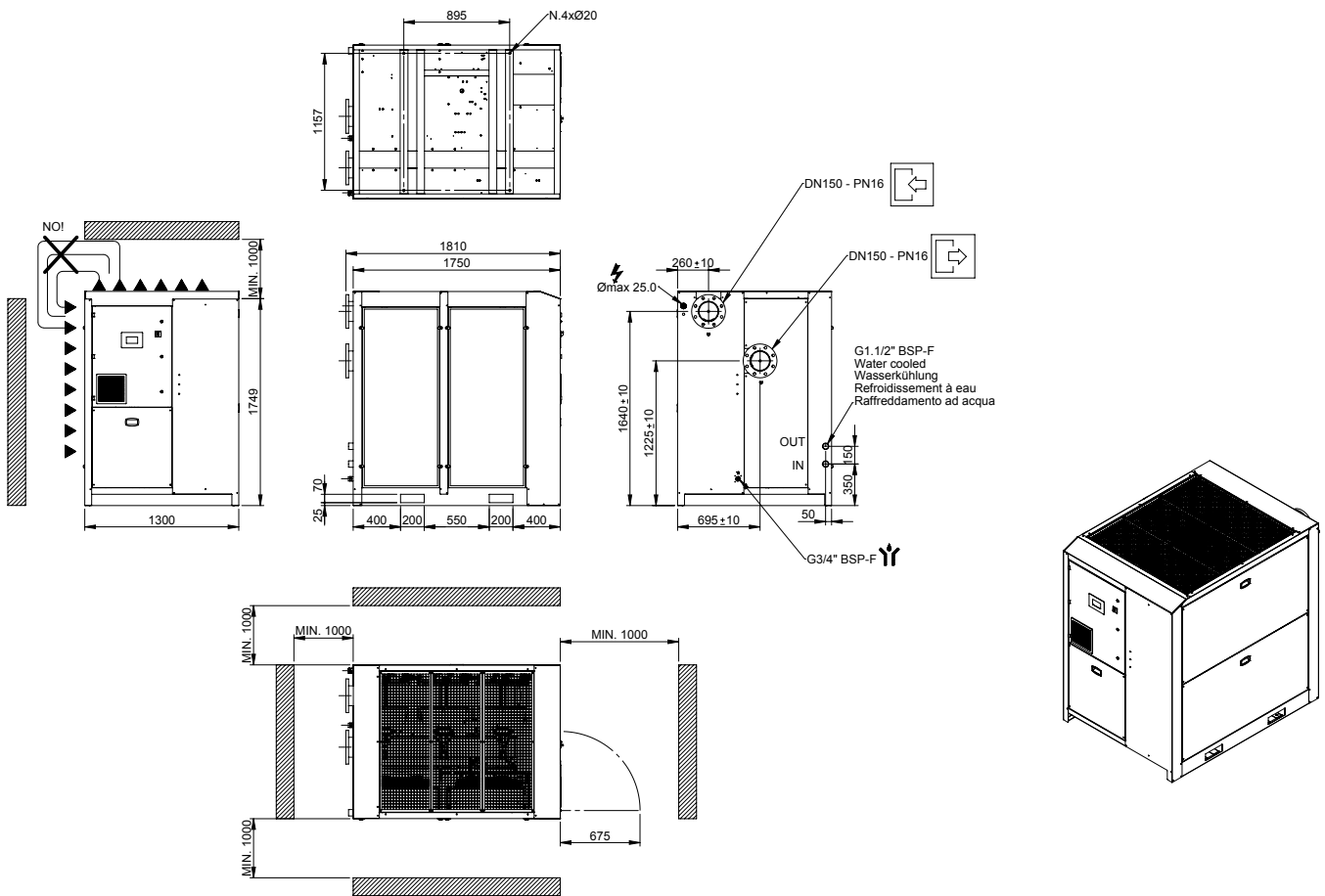
Type	Weight kg	Air connections Inlet / Outlet DN	Water connections Inlet / Outlet BSP-F	Condensate connections BSP-F
DV 1260	248	80 - PN16	G 3/4"	G 1/2"
DV 1650	282	80 - PN16	G 3/4"	G 1/2"
DV 1800	317	80 - PN16	G 3/4"	G 1/2"
DV 2000	317	80 - PN16	G 3/4"	G 1/2"

DIMENSIONS



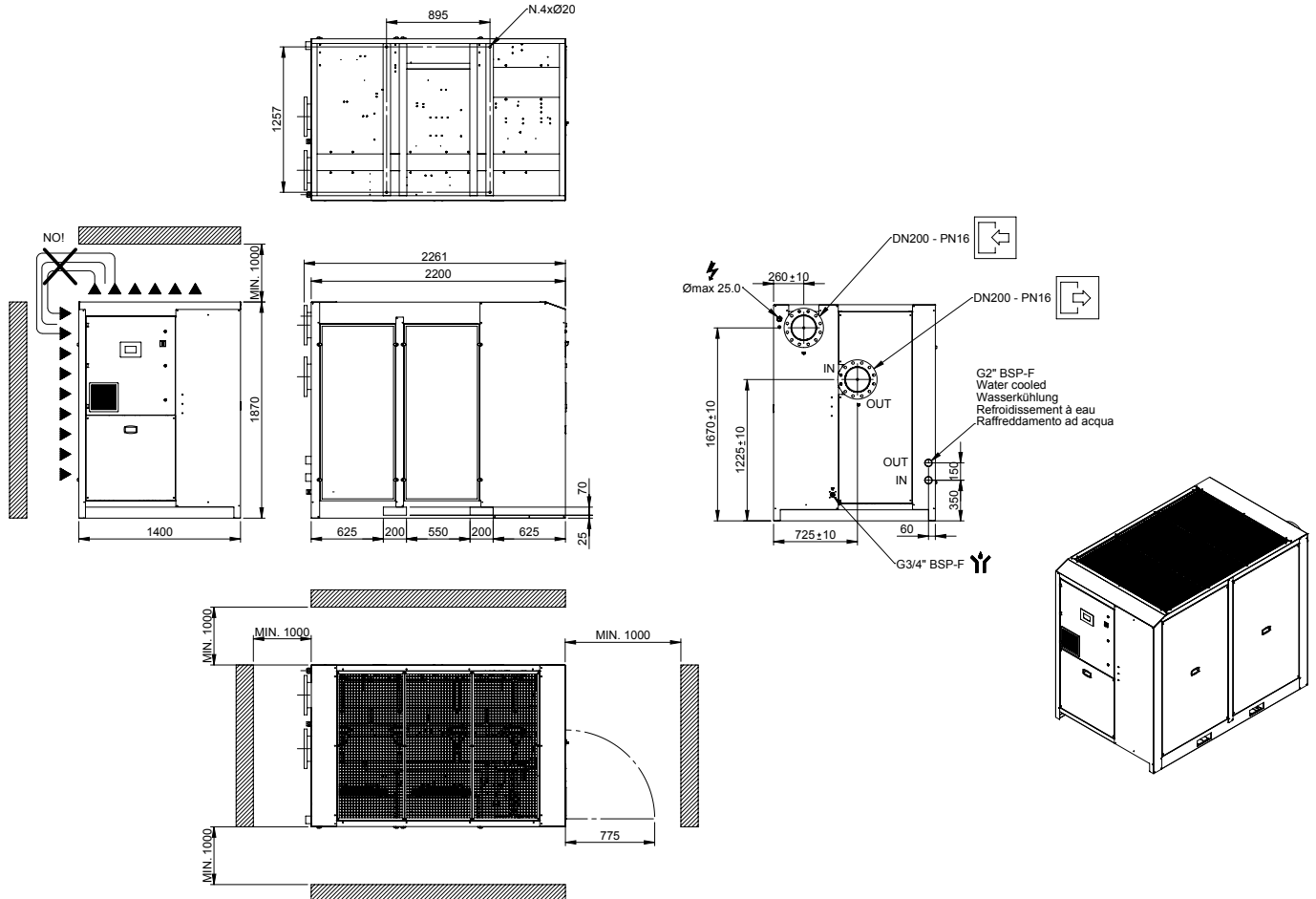
Type	Weight kg	Air connections Inlet / Outlet DN	Water connections Inlet / Outlet BSP-F	Condensate connections BSP-F
DV 2300	470	100 - PN16	G 1"	G 1/2"
DV 2800	545	100 - PN16	G 1"	G 1/2"
DV 3500	549	100 - PN16	G 1"	G 1/2"
DV 4300	621	100 - PN16	G 1"	G 1/2"

DIMENSIONS



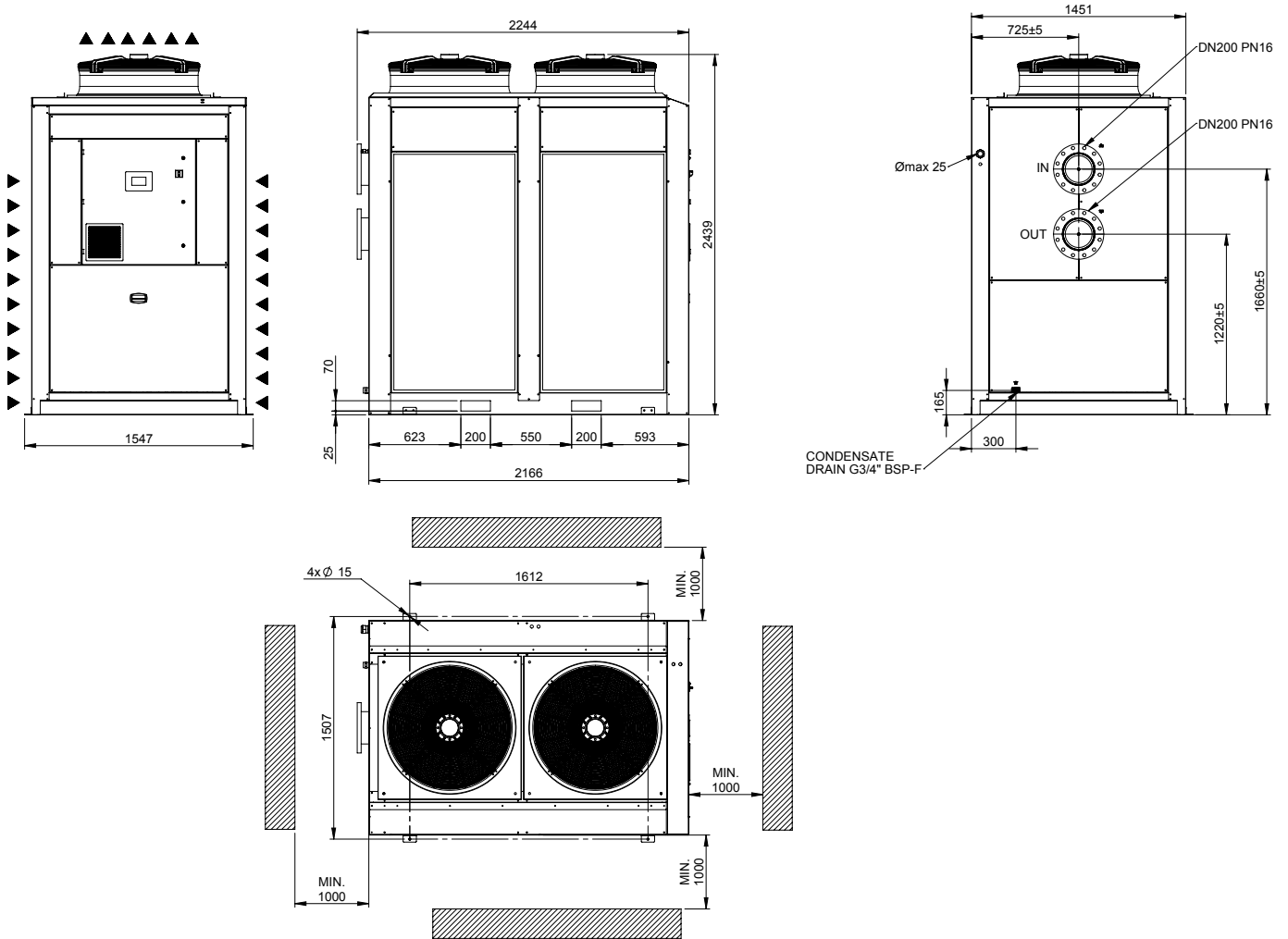
Type	Weight kg	Air connections Inlet / Outlet DN	Water connections Inlet / Outlet BSP-F	Condensate connections BSP-F
DV 5500	840	150 - PN16	G 1 1/2"	G 3/4"
DV 6250	950	150 - PN16	G 1 1/2"	G 3/4"

DIMENSIONS



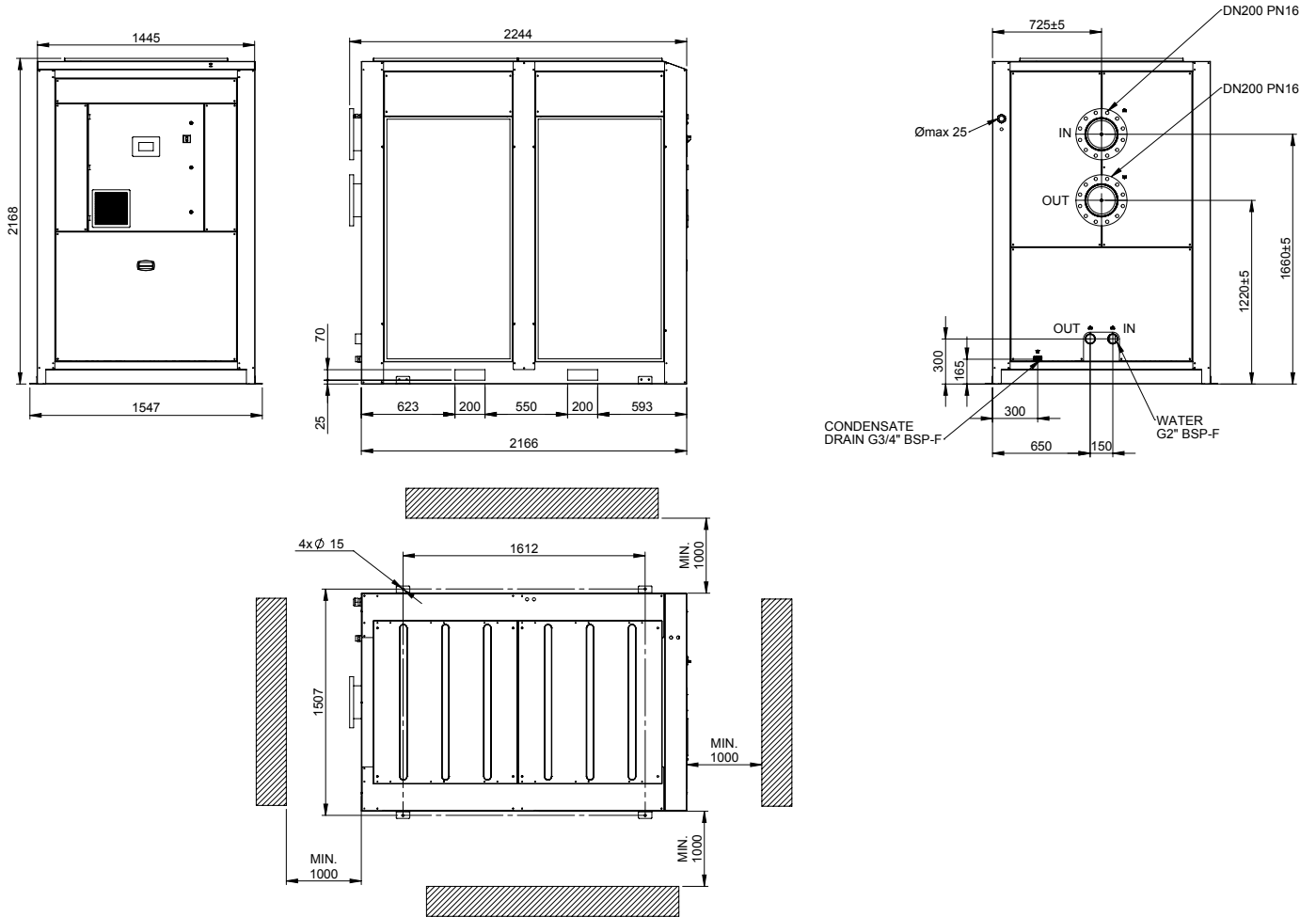
Type	Weight kg	Air connections Inlet / Outlet DN	Water connections Inlet / Outlet BSP-F	Condensate connections BSP-F
DV 7000	1065	200 - PN16	G 2"	G 3/4"
DV 8750	1210	200 - PN16	G 2"	G 3/4"

DIMENSIONS



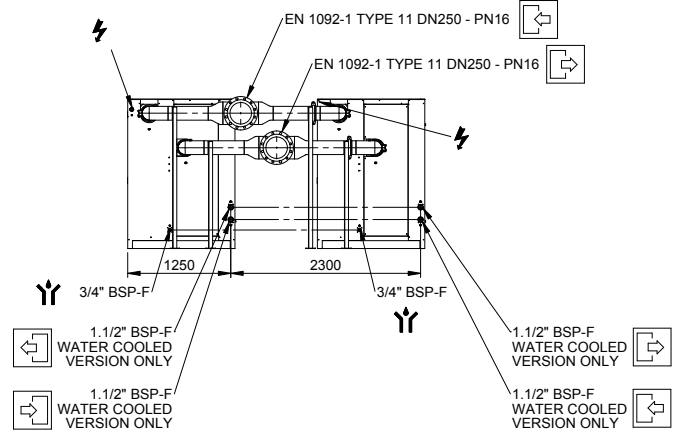
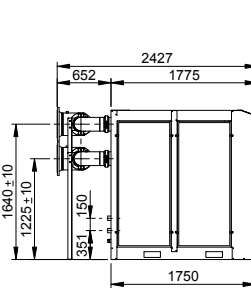
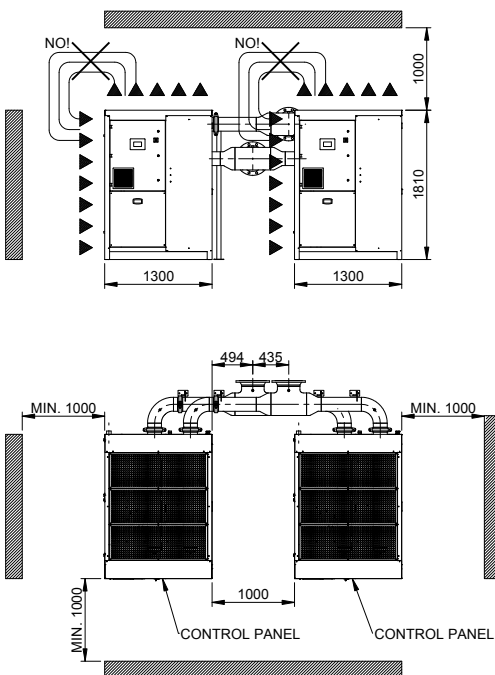
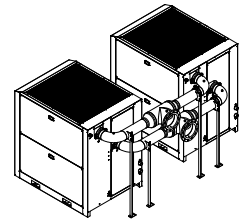
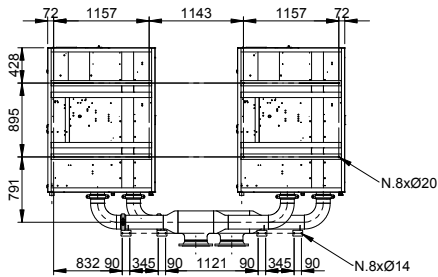
Type	Weight kg	Air connections Inlet / Outlet DN	Water connections Inlet / Outlet BSP-F	Condensate connections BSP-F
DV 10500 AVS	1660	200 - PN16	---	G 3/4"

DIMENSIONS



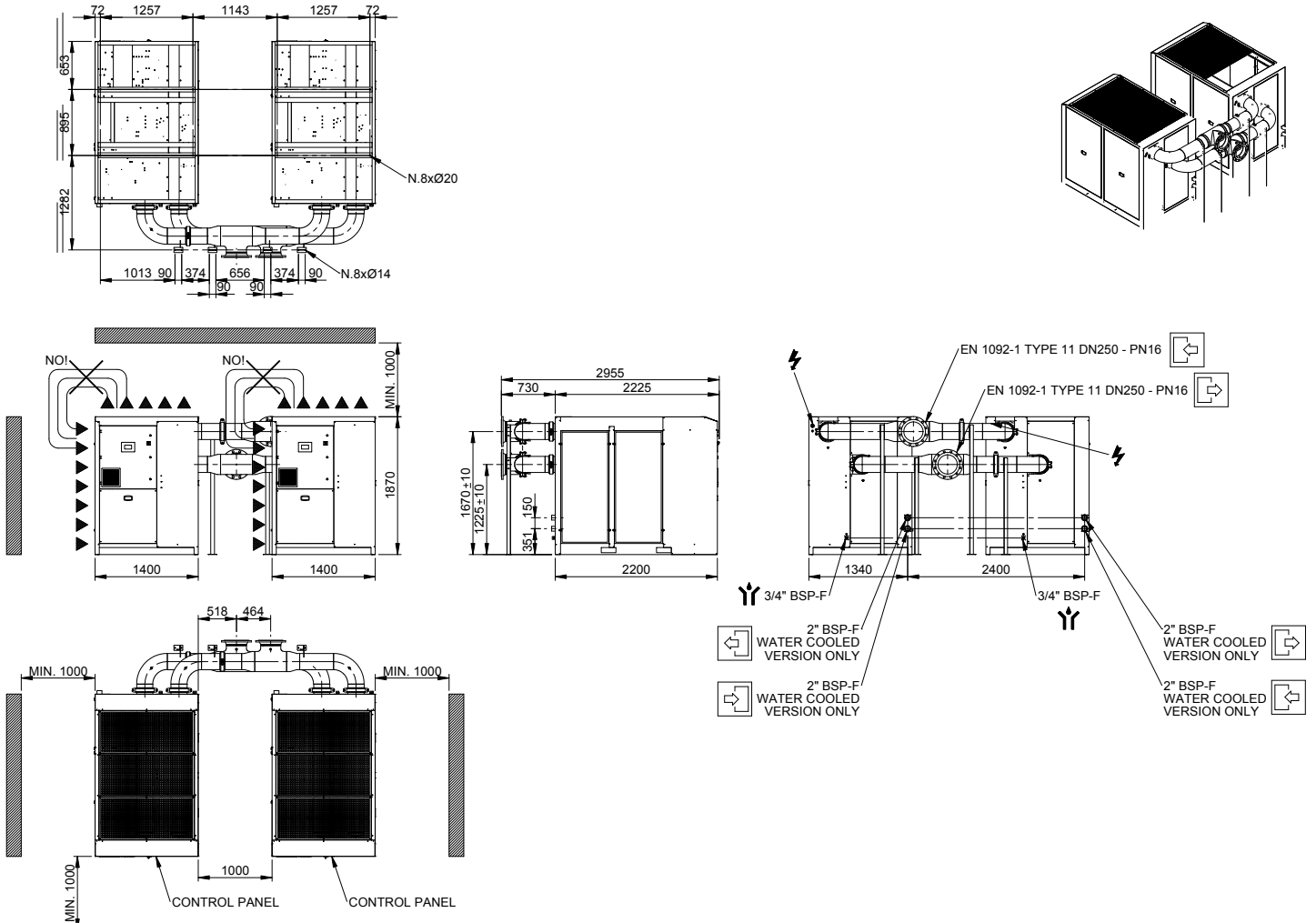
Type	Weight kg	Air connections Inlet / Outlet DN	Water connections Inlet / Outlet BSP-F	Condensate connections BSP-F
DV 10500 WVS	1460	200 - PN16	G 2"	G 3/4"

DIMENSIONS



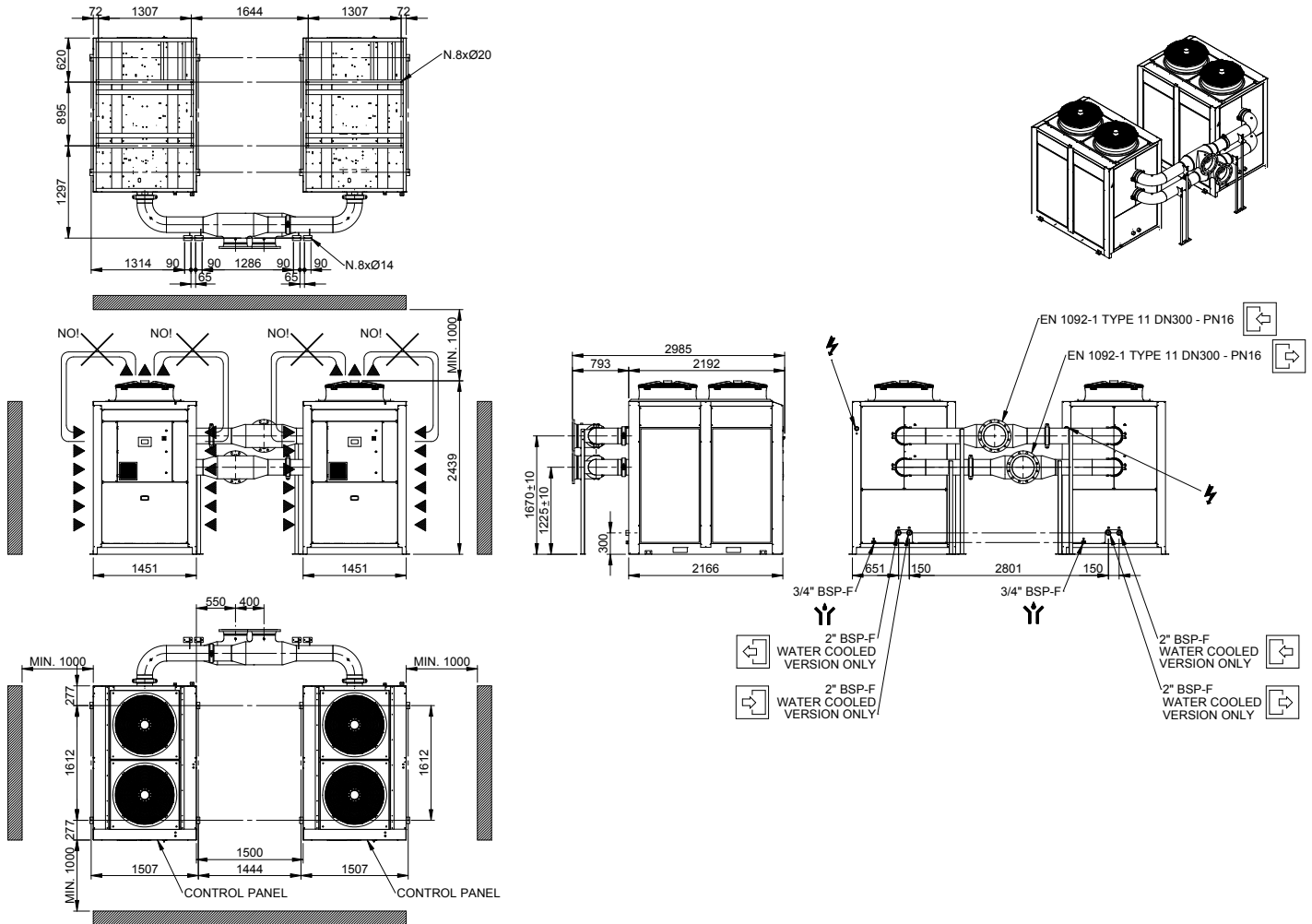
Type	Weight kg	Air connections Inlet / Outlet DN	Water connections Inlet / Outlet BSP-F	Condensate connections BSP-F
DV 12500	2178	250 - PN16	1 1/2" BSP-F	G 3/4"

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"