



30KAV Variable Speed Air-cooled Screw Chiller

Nominal capacity: 346.2~1472kW





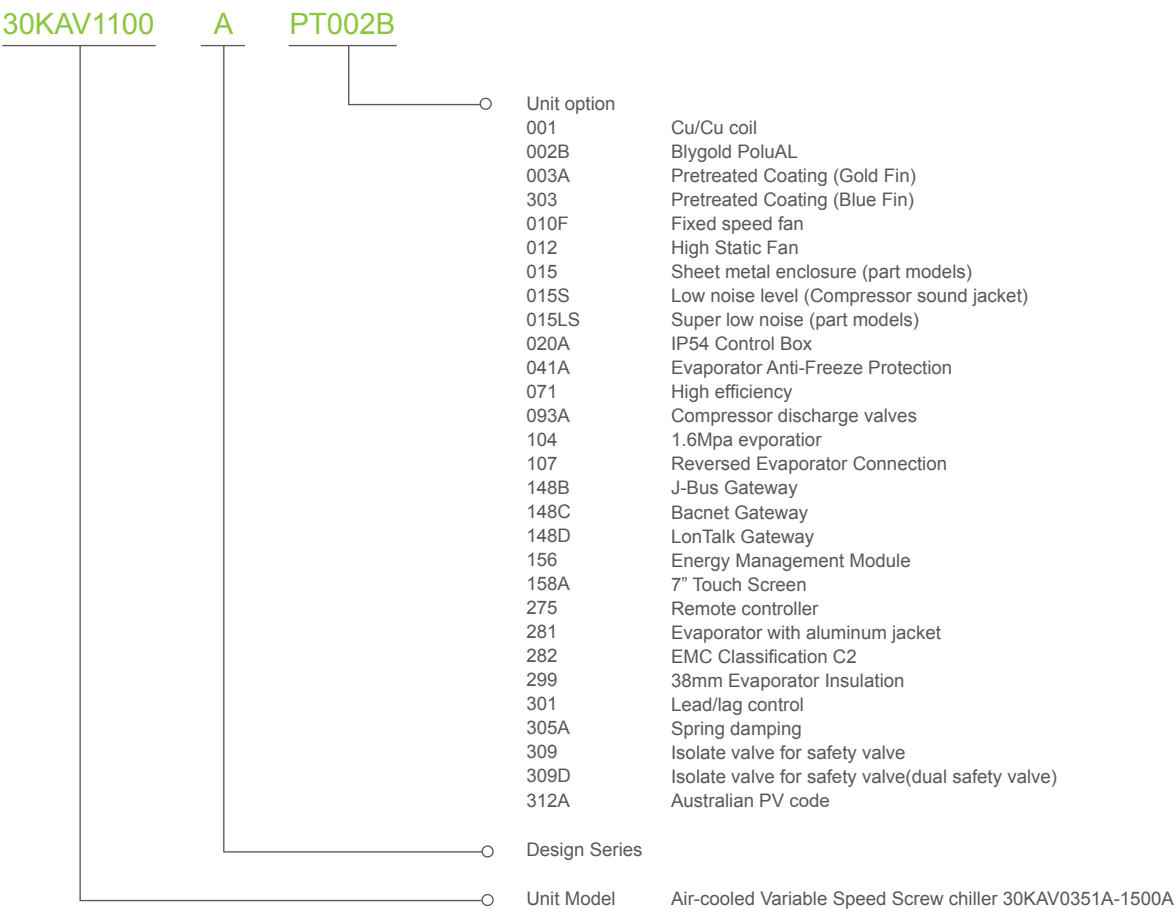
In 1998, Time magazine named Dr. Carrier one of its 20 most influential builders and titans of the 20th century.

Carrier® is a leading global provider of innovative HVAC, refrigeration, fire, security and building automation technologies. Supported by the iconic Carrier name, the company's portfolio includes industry-leading brands such as Carrier, Kidde, Edwards, LenelS2 and Automated Logic. Carrier's businesses enable modern life, delivering efficiency, safety, security, comfort, productivity and sustainability across a wide

range of residential, commercial and industrial applications.

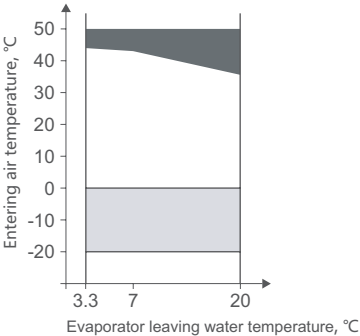


Nomenclature



Operating Range

Evaporator		Min. temperature	Max. temperature
Entering water temperature (at start)	°C	-	45
Entering water temperature (operating)	°C	6.8	26
Leaving water temperature (operating)	°C	3.3	20
Condenser		Min. temperature	Max. temperature
Outdoor air temperature	°C	-20	50



Below 0°C air temperature the unit must either be equipped with evaporator frost protection option (PT041A), or the water loop must be protected against frost by using a frost protection solution (by the installer).

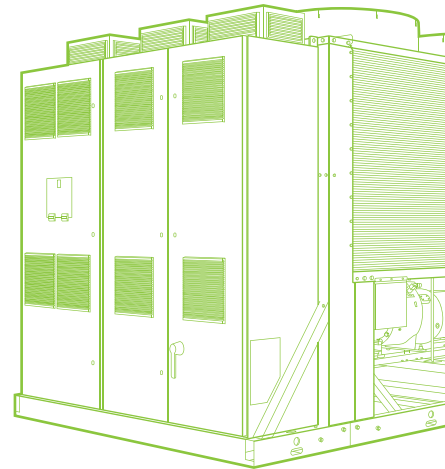
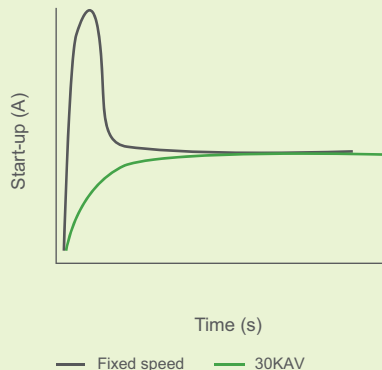
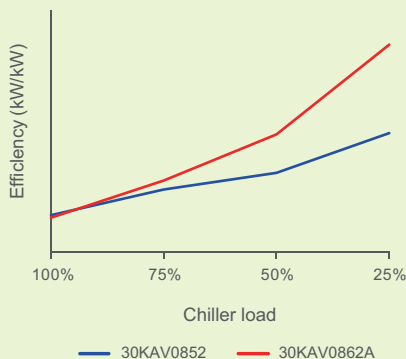
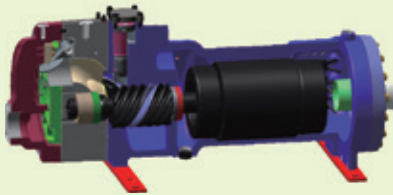
Part load average.

Introduction

- ✓ The Aquaforce chillers with Greenspeed™ Intelligence are the premium solution for commercial and industrial applications where installers, consultants and building owners require superior reliability and optimal performances, especially at part load.
- ✓ 30KAV are designed to meet current and future requirements in terms of energy efficiency, versatility and operating sound levels. Through the optimised combination of proven best-in-class technologies that include:
 - Exclusive new screw compressors with Greenspeed™ Intelligence.
 - Carrier Smartview.
 - 6th generation of Flying Birds fans Condenser fans with Greenspeed™ Intelligence.

Low Energy Consumption

- ✓ The air conditioning system could use 30%~40% of annual building energy consumption, 30KAV helps customer involved in green building certification with Greenspeed® inverter-driven technology.
- ✓ With advanced unit mounted inverter-driven technology, the 30KAV is designed for high performance both at full load and at part load. Exceptional efficiency performance at part load which is up to 5.69, customer even can select PT071 (high efficiency) to achieve high performance and energy saving.
- ✓ Cooperating with primary variable flow system, the system efficiency would be further enhanced by synchronized control of chillers and pumps.
- ✓ The high energy efficiency is reached thanks to:
 - Inverter driven twin-rotor screw compressors allowing precise capacity matching of building load and reducing unit power input, especially at part-load.
 - Inverter driven fan motors minimizing power consumption while granting optimum air flow.
 - Electronic expansion device permitting operation at a lower condensing pressure and improved utilization of the evaporator heat exchange surface.
 - Economizer system with electronic expansion device increases cooling capacity by 10% and efficiency by 4%.



Environmental Friendly

- ✔ HFC-134a refrigerant
Refrigerant of the HFC group with zero ozone depletion potential.
- ✔ Leak-tight refrigerant circuit.
Reduction of leaks as no capillary tubes and flare connections are used.
Verification of pressure transducers and temperature sensors without transferring refrigerant charge.

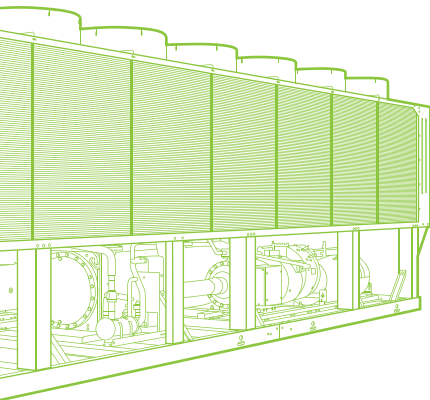


Absolute reliability

- ✔ Screw compressors with Greenspeed™ Intelligence:
 - Industrial-type screw compressors with oversized bearings and motor cooled by suction gas.
 - Specifically sized inverter for each compressor motor ensures reliable operation and easy maintenance.
 - All compressor components assembly are easily accessible on site minimising down-time.
- ✔ Fans with Greenspeed™ Intelligence.
 - 6th generation of Flying Bird fans equipped with inverter-driven asynchronous motors.
 - Specifically sized inverter optimize air flow management reducing cost.
 - Easily accessible inverter of fan speed control for easy service.

Exceptional endurance tests.

- ✔ Partnerships with specialised laboratories and use of limit simulation tools (finite element calculation) for the design of critical components.
- Transport simulation test equivalent to 2000 km by truck under harsh conditions.
- Salt mist corrosion resistance test in the laboratory for increased corrosion resistance.



Minimised Operating Sound Levels

- ✔ The inverter technology used for the compressor and fan motors minimises noise levels at part load operation. When the unit is delivering 25% for example, compressors and fans are running at minimum speed which implies lower noise.
- ✔ Standard unit features include:
 - Discharge dampers integrated in the oil separator (Carrier patent).
 - Condenser coils in W-shape with an open angle, allowing quieter air flow across the coil.
 - Low-noise 6th generation Flying Bird fans, made of a composite material (Carrier patent) which do not generate intrusive low frequency noise.



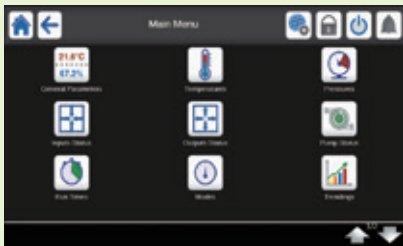
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General Features

🌱 New innovative smart control features:

- An intuitive and user-friendly, 4.3" colored interface (7" as option).
- Screen-shots with concise and clear information in local languages.
- Complete menu, customized for different users (end user, service personnel and Carrier-factory technicians).
- Easy access to the controller box with touch screen mounting to ensure legibility under any lighting conditions.
- Safe operation and unit setting: password protection ensures that unauthorized people cannot modify any advanced parameters.
- Simple and "smart" intelligence uses data collection from the constant monitoring of all machine parameters to optimise unit operation.
- Night-mode: Cooling capacity management for reduced noise level.
- Multiple protocols: BACnet IP & MSTP, Modbus IP & RTU, LON Talk, J-Bus are supported (BACnet IP/Modbus IP as standard).



Economical operation

🌱 Energy management:

- Internal time schedule clock controls chiller on/off times and operation at a second set-point.
- The DCT (Data Collection Tool) records the alarms history to simplify and facilitate service operations.

Remote Management (Standard)

- Units with Carrier SmartView™ control can be easily accessed from the internet, using a PC with an Ethernet connection. This makes remote control quick and easy and offers significant advantages for service operations.
- Equipped with an RS485 serial port that offers multiple remote control, monitoring and diagnostic possibilities. When networked with other Carrier equipment through the CCN (Carrier Comfort Network - proprietary protocol), all components form a HVAC system fully-integrated and balanced through one of the Carrier's network system products, like the Chiller System Manager or the Plant System Manager (optional). also communicates with other building management systems via optional communication gateways.



Quiet operation

- ✦ The following commands/visualizations are possible from remote
 - Start/Stop of the machine.
 - Dual set-point management: Through a dedicated contact is possible to activate a second set-point (example: unoccupied mode).
 - Demand limit setting: To limit the maximum chiller capacity to a predefined value.
 - Water pump control: These outputs control the contactors of one/two evaporator water pumps.
 - Operation visualization: Indication if the unit is operating or if it's in stand-by (no cooling load).
 - Alarm visualization.



Absolute reliability

- ✦ The Energy Management Module (EMM) offers extended remote control possibilities:
 - Room temperature: Permits set-point reset based on the building indoor air temperature (if Carrier thermostat are installed).
 - Set-point reset: Ensures reset of the cooling set-point based on a 4-20 mA or 0-10 V signal.
 - Demand limit: Permits limitation of the maximum chiller power or current based on 0-10 V signal.
 - Demand limit 1 and 2: Closing of these contacts limits the maximum chiller power or current to two predefined values.
 - User safety: This contact can be used for any customer safety loop; opening the contact generates a specific alarm.
 - Ice storage end: When ice storage has finished, this input permits return to the second set-point (unoccupied mode).
 - Time schedule override: Closing of this contact cancels the time schedule effects.
 - Out of service: This signal indicates that the chiller is completely out of service.
 - Chiller capacity: This analogue output (0-10 V) gives an immediate indication of the chiller capacity.
 - Alert indication: This volt-free contact indicates the necessity to carry out a maintenance operation or the presence of a minor fault.
 - Compressors running status : Set of outputs (as many as the compressors number) indicating which compressors are running.

Performance data

Model		30KAV	0550A	0660A	0700A	0800A	0900A	1000A	1100A
Nominal cooling capacity*		kW	546.3	664.8	712.9	798.3	887.9	986.2	1068
Compressor power input		kW	158.1	202.6	211.5	244.0	274.7	298.2	333.4
Total power input		kW	170.7	215.8	226.1	260.0	292.1	317.0	353.6
Nominal COP		kW/kW	3.200	3.081	3.153	3.070	3.040	3.111	3.020
IPLV.IP**		kW/kW	5.654	5.522	5.618	5.551	5.484	5.695	5.463
Compressor		VFD Semi-hermetic screw compressor							
CircuitA			1	1	1	1	1	1	1
CircuitB			1	1	1	1	1	1	1
CircuitC			-	-	-	-	-	-	-
CircuitD			-	-	-	-	-	-	-
Minimum capacity		%	10%	10%	10%	10%	10%	10%	10%
Refrigerant		R134a							
CircuitA		kg	85	92	92	100	100	125	125
CircuitB		kg	80	85	90	90	95	95	125
CircuitC		kg	-	-	-	-	-	-	-
CircuitD		kg	-	-	-	-	-	-	-
Control			Carrier SmartView™ system						
Condenser		Cu/Al heat exchanger							
Fans			VI generation FlyingBird axial fan						
Quantity			8	9	10	11	12	13	14
Total air flow		l/s	40080	45100	50110	55120	60130	65140	70150
Fan speed		rpm	950						
Evaporator			Flooded multi-pipe						
Water content		l	79	93	93	127	127	146	157
Nominal water flow		l/s	26.04	31.69	33.98	38.05	42.32	47.01	50.92
Nominal water pressure drop		kPa	47.2	53.4	46.3	31.1	45.9	46.3	44.4
Max. water-side pressure (without hydronic module)		kPa	1000						
Water connection		Victaulic							
Nominal Diameter		DN	125	150	150	150	150	200	200
Electrical data		400V-3Ph-50Hz							
Nominal power supply			VFD start						
Control power supply		24V via internal transformer							
Start-up method									
Fan and control power		kW	12.6	13.2	14.6	16.0	17.4	18.8	20.2
Nominal unit current draw	Circuit A+B	A	267	339	356	404	452	497	550
	Circuit C+D	A	-	-	-	-	-	-	-
Maximum uint current draw	Circuit A+B	A	343	425	450	517	585	610	682
	Circuit C+D	A	-	-	-	-	-	-	-
Maximum start-up current	Circuit A+B	A	343	425	450	517	585	610	682
	Circuit C+D	A	-	-	-	-	-	-	-
Max operation power	Circuit A+B	kW	221	274	290	333	377	393	439
	Circuit C+D	kW	-	-	-	-	-	-	-
Unit length		mm	5399	6475	6475	7555	7555	8635	8635
Unit width		mm	2253						
Unit height		mm	2379						
Shipping weight		kg	5368	5825	5981	6800	7284	7624	7812
Operating weight (Standard)		kg	5235	5626	5796	6620	7104	7428	7627

Notes: * Nominal conditions - evaporator entering/leaving water temperature=12/7°C, outdoor air temperature = 35°C

Evaporator fouling factor = 0.018m²K/kW

* IPLV Calculations according to standard performances (in accordance with AHRI 550-590)

Performance data

Model		30KAV	0351A	0451A	0551A	0651A	0751A	0901A	1160A	1230A	1300A	1350A	1400A	1500A
Nominal cooling capacity*		kW	346.2	430.2	537.3	614.1	738.1	875.1	1162	1224	1300	1348	1408	1472
Compressor power input		kW	101.9	129.5	161.4	191.5	229.7	269.4	364.0	383.2	407.1	423.2	440.1	461.2
Total power input		kW	110.9	138.5	173.2	203.3	244.3	286.8	387.0	406.2	432.9	449.0	468.7	489.8
Nominal COP		kW/kW	3.121	3.106	3.102	3.021	3.021	3.051	3.003	3.013	3.003	3.002	3.004	3.005
IPLV.IP**		kW/kW	5.481	5.695	5.463	5.384	5.437	5.572	5.352	5.349	5.381	5.387	5.434	5.413
Compressor		VFD Semi-hermetic screw compressor												
CircuitA			1	1	1	1	1	1	1	1	1	1	1	1
CircuitB			-	-	-	-	-	-	-	-	-	-	-	-
CircuitC			-	-	-	-	-	-	1	1	1	1	1	1
CircuitD			-	-	-	-	-	-	-	-	-	-	-	-
Minimum capacity		%	20%	30%	20%	30%	30%	20%	15%	15%	15%	15%	15%	15%
Refrigerant		R134a												
CircuitA		kg	95	100	160	170	180	200	160	170	160	170	160	180
CircuitB		kg	-	-	-	-	-	-	-	-	-	-	-	-
CircuitC		kg	-	-	-	-	-	-	170	170	180	180	200	180
CircuitD		kg	-	-	-	-	-	-	-	-	-	-	-	-
Control		Carrier SmartView™ system												
Condenser		Cu/Al heat exchanger												
Fans		VI generation FlyingBird axial fan												
Quantity			6	6	8	8	10	12	16	16	18	18	20	20
Total air flow		l/s	30060	30060	40080	40080	50110	60130	80170	80170	90190	90190	100200	100200
Fan speed		rpm	950											
Evaporator		Flooded multi-pipe												
Water content		l	44	84	84	101	101	127	185	202	185	202	211	202
Nominal water flow		l/s	16.50	20.51	25.61	29.27	35.19	41.71	55.40	58.34	61.96	64.25	67.12	70.16
Nominal water pressure drop		kPa	26.4	30.7	41.3	44.8	52.2	55.8	49.7	51.4	61.1	62.8	63.7	66.6
Max. water-side pressure (without hydronic module)		kPa	1000											
Water connection		Victaulic												
Nominal Diameter		DN	100	125	125	150	150	150	200	200	200	200	200	200
Electrical data														
Nominal power supply		400V-3Ph-50Hz												
Control power supply		VFD start												
Start-up method		24V via internal transformer												
Fan and control power		kW	9.0	9.0	11.8	11.8	14.6	17.4	23.0	23.0	25.8	25.8	28.6	28.6
Nominal unit current draw	Circuit A+B	A	174	218	272	319	383	450	272	319	272	319	272	383
	Circuit C+D	A	-	-	-	-	-	-	319	319	383	383	450	383
Maximum uint current draw	Circuit A+B	A	230	286	352	399	485	550	352	399	352	399	352	485
	Circuit C+D	A	-	-	-	-	-	-	399	399	485	485	550	485
Maximum start-up current	Circuit A+B	A	230	286	352	399	485	550	352	399	352	399	352	485
	Circuit C+D	A	-	-	-	-	-	-	399	399	485	485	550	485
Max operation power	Circuit A+B	kW	148	184	227	257	312	355	227	257	227	257	227	312
	Circuit C+D	kW	-	-	-	-	-	-	257	257	312	312	355	312
Unit length		mm	4325	4325	5405	5405	6485	7565	10775	10775	11855	11855	12970	12935
Unit width		mm	2253											
Unit height		mm	2379											
Shipping weight		kg	4233	4398	4798	5276	5658	6373	10074	10552	10456	10934	11171	11316
Operating weight (Standard)		kg	4065	4265	4665	5165	5496	6198	9830	10330	10161	10661	10863	10992

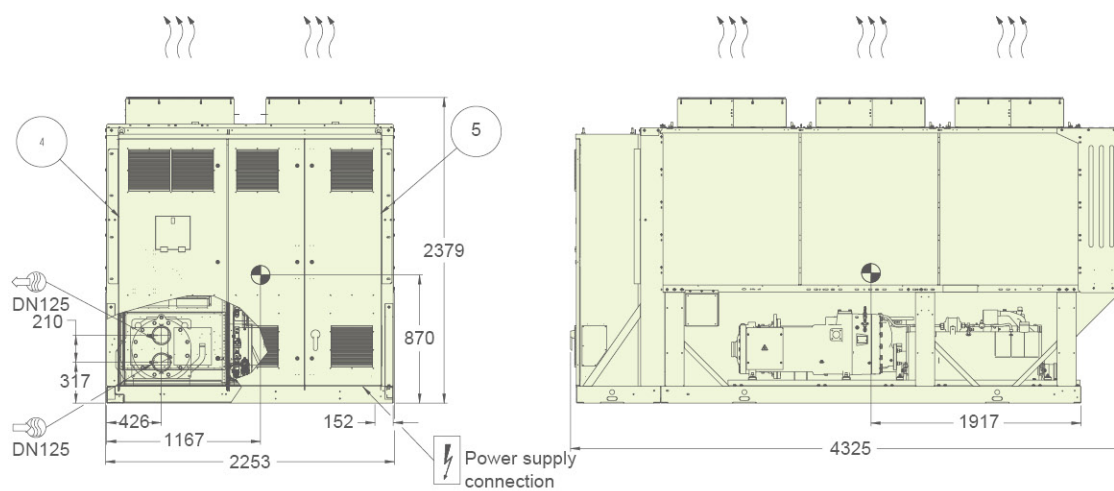
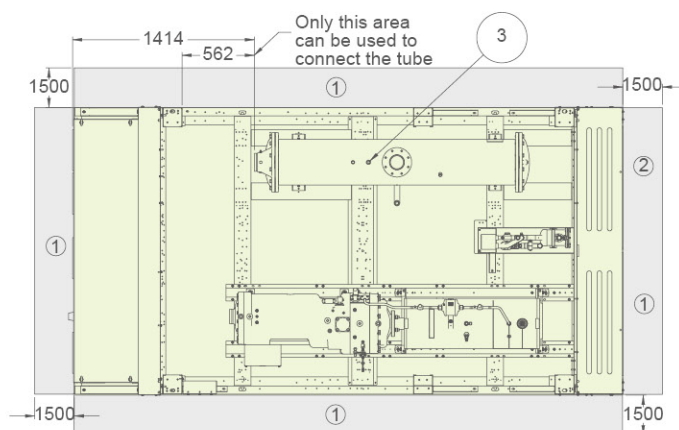
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Evaporator fouling factor = 0.018m²K/kW

* IPLV Calculations according to standard performances (in accordance with AHRI 550-590)

Dimension Drawing

30KAV0351A

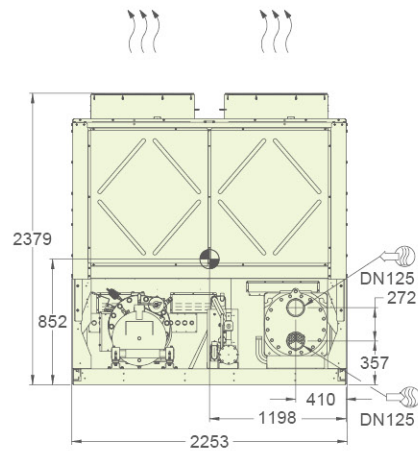
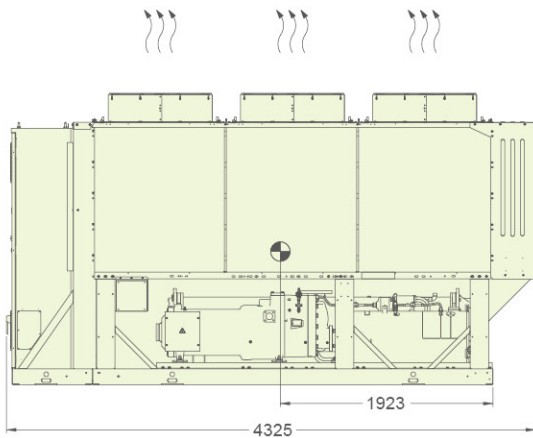
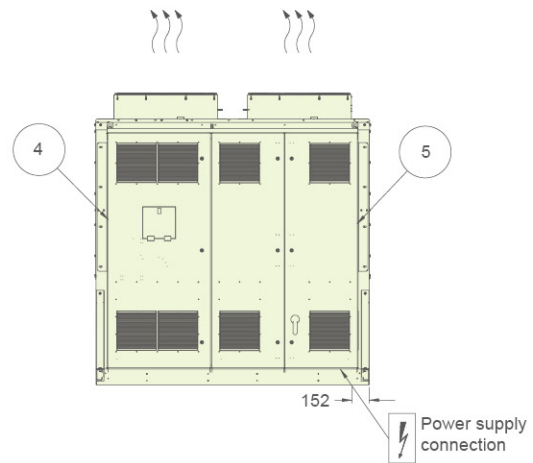
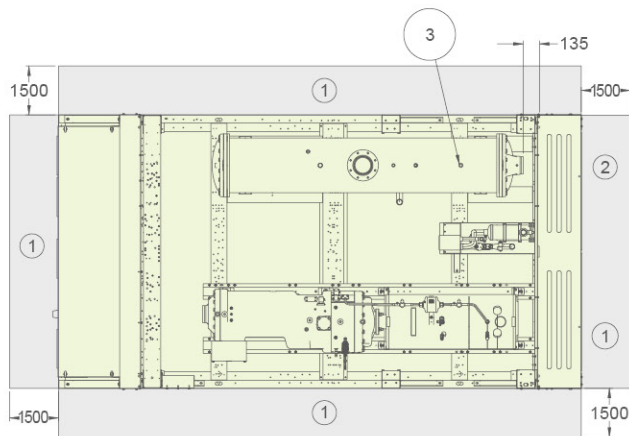


- ① Required clearances for maintenance
- ② Recommended space for evaporator tube removal
- ③ Safety valve
- ④ Fan drive cabinet
- ⑤ Comp drive cabinet

- Water inlet
- Water outlet
- Air outlet
- Power supply connection
- Center gravity

Dimension Drawing

30KAV0451A

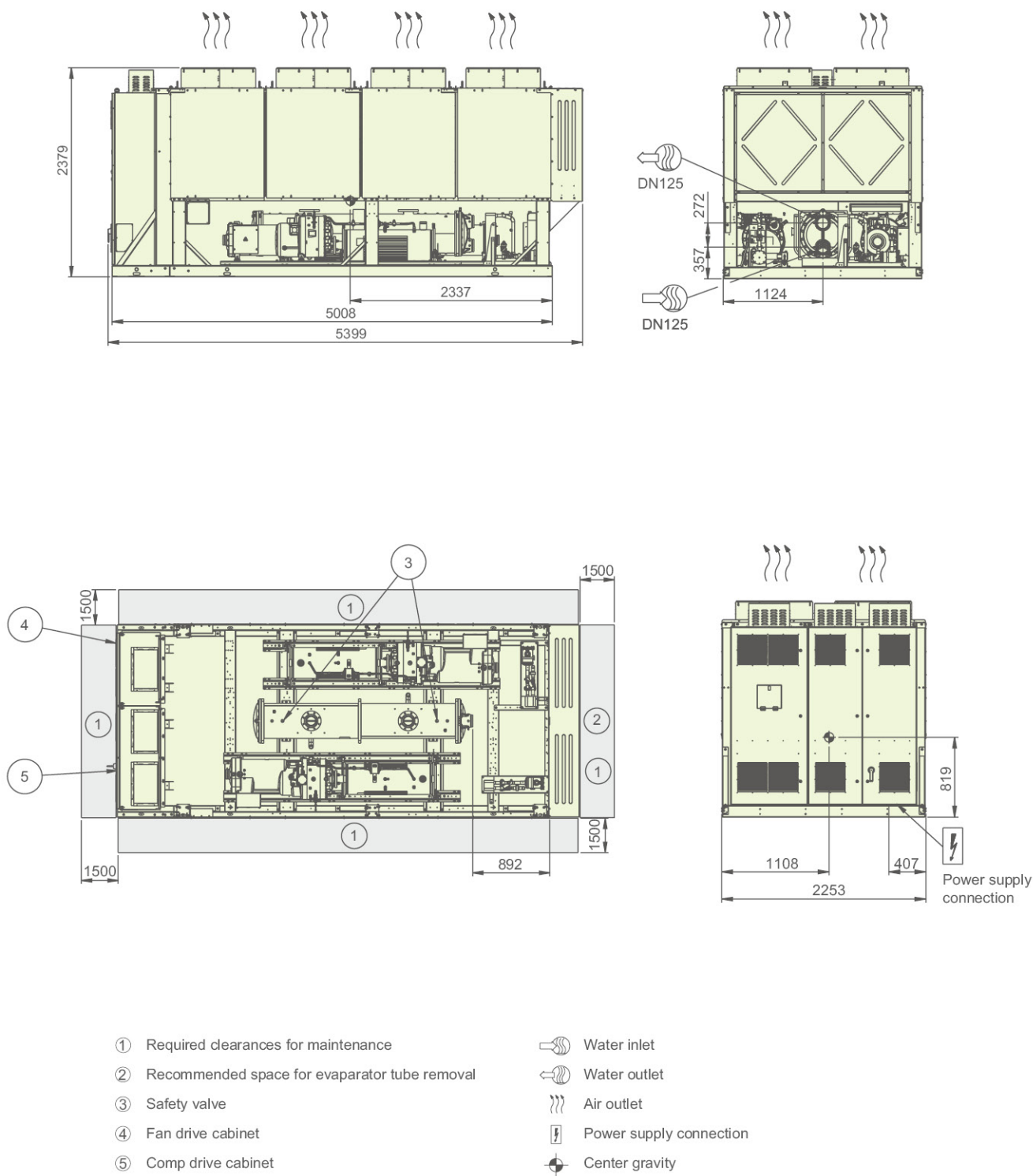


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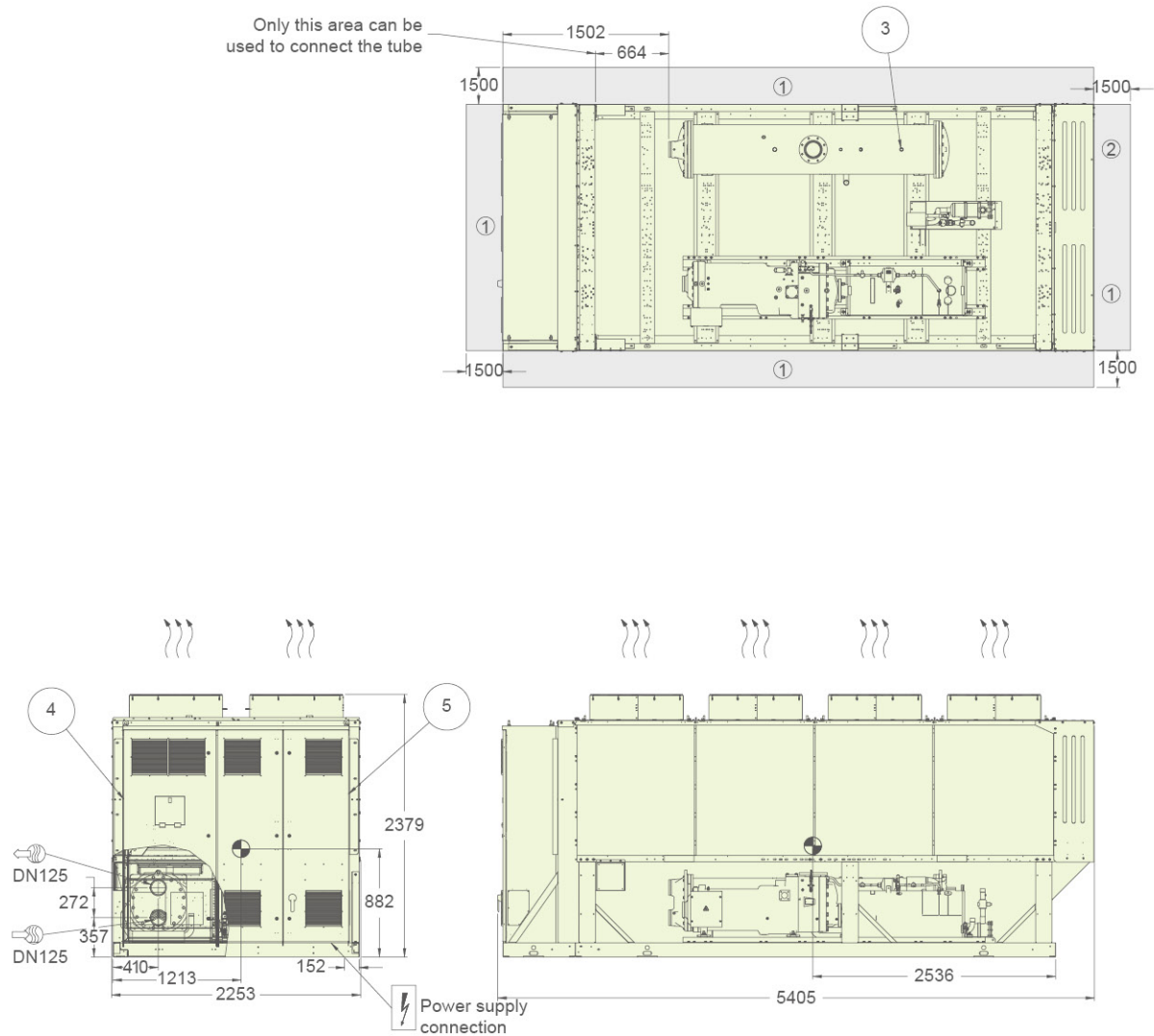
Dimension Drawing

30KAV0550A



Dimension Drawing

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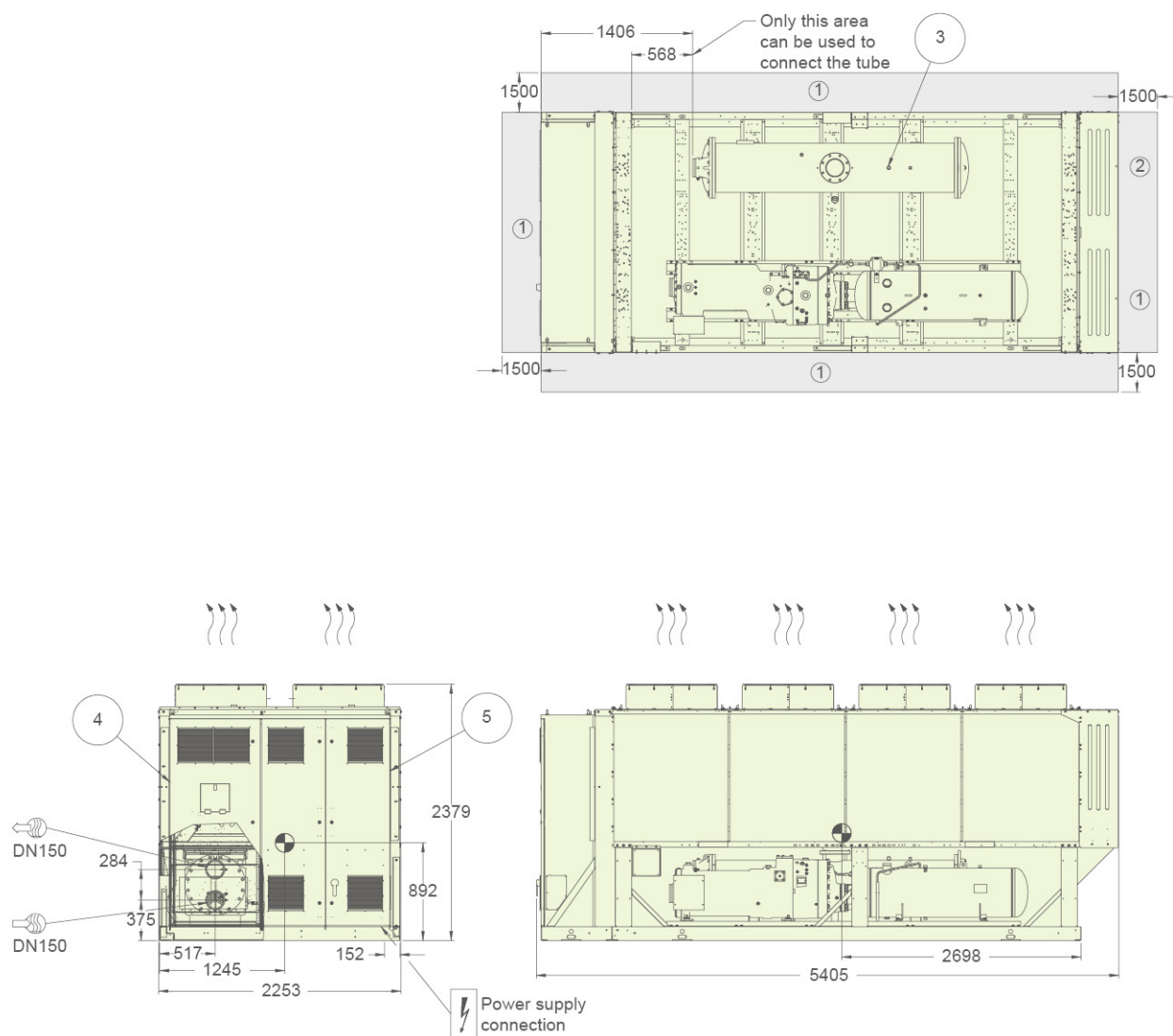


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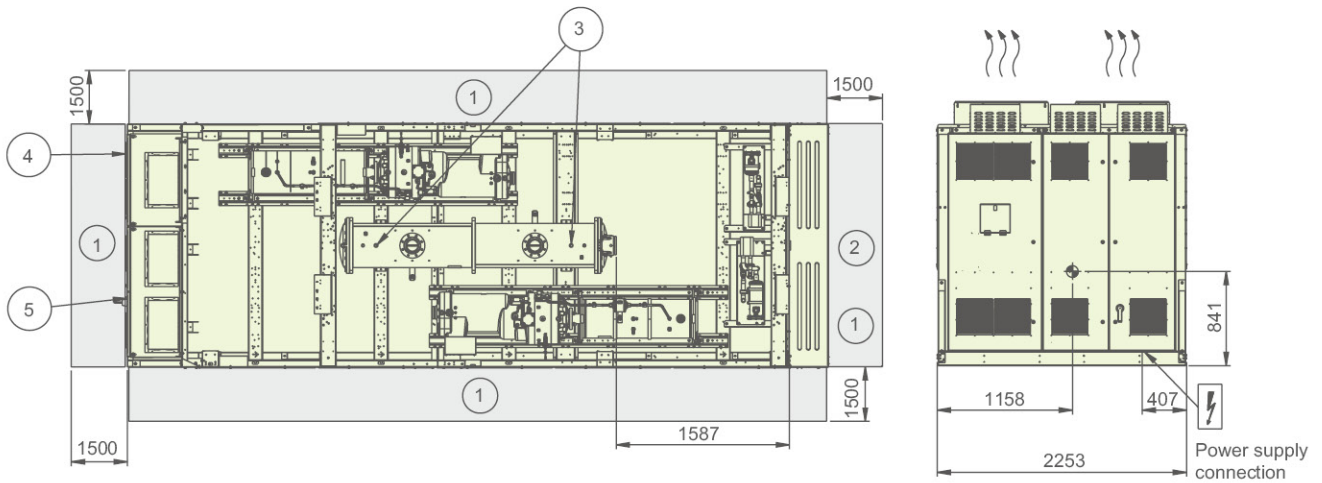
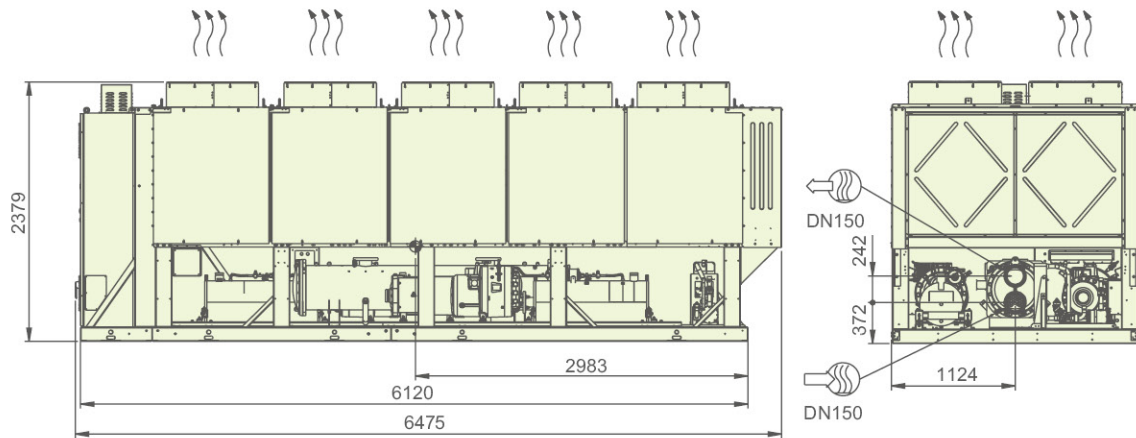
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Dimension Drawing

30KAV0660A

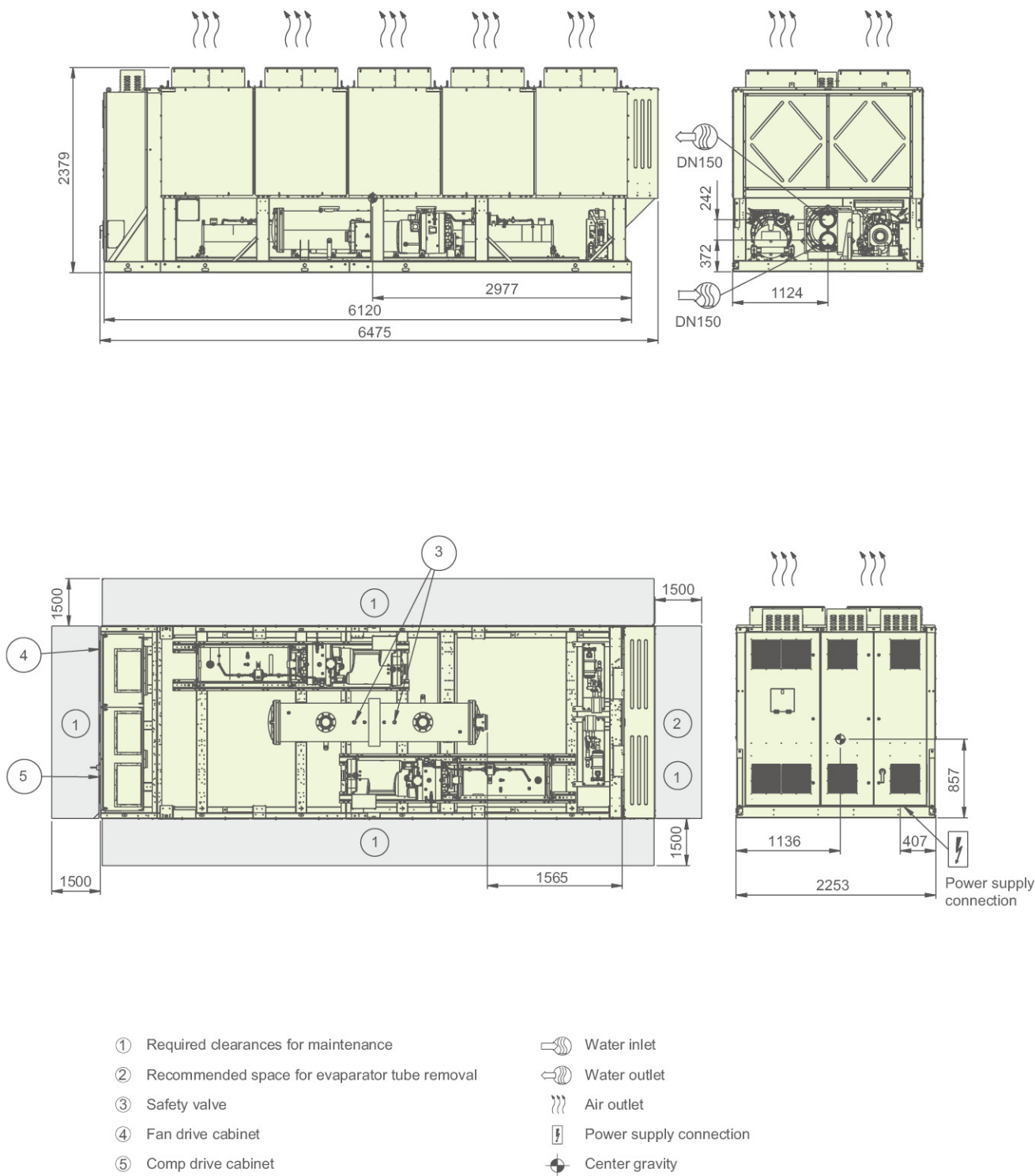


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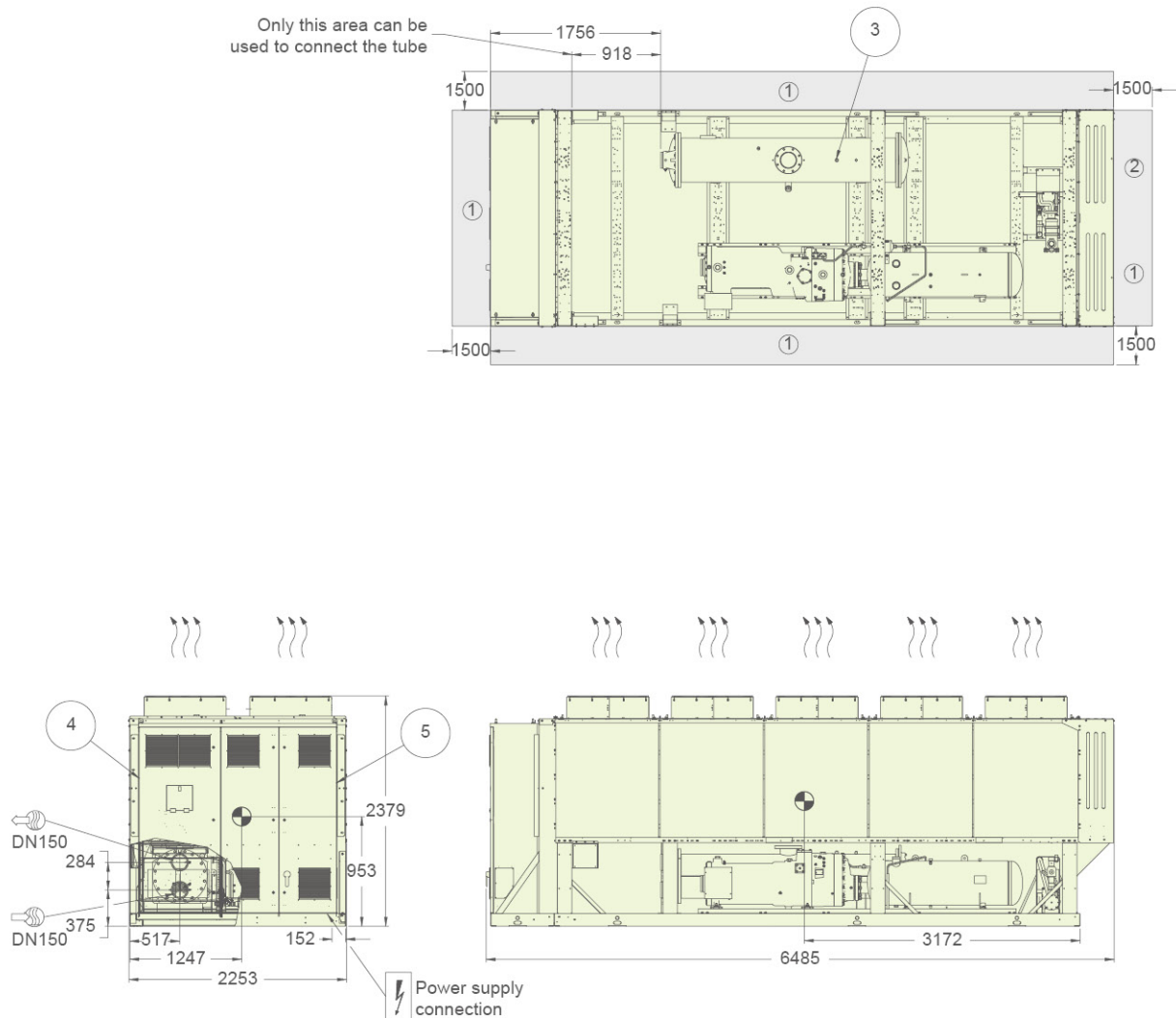
Dimension Drawing

30KAV0700A



Dimension Drawing

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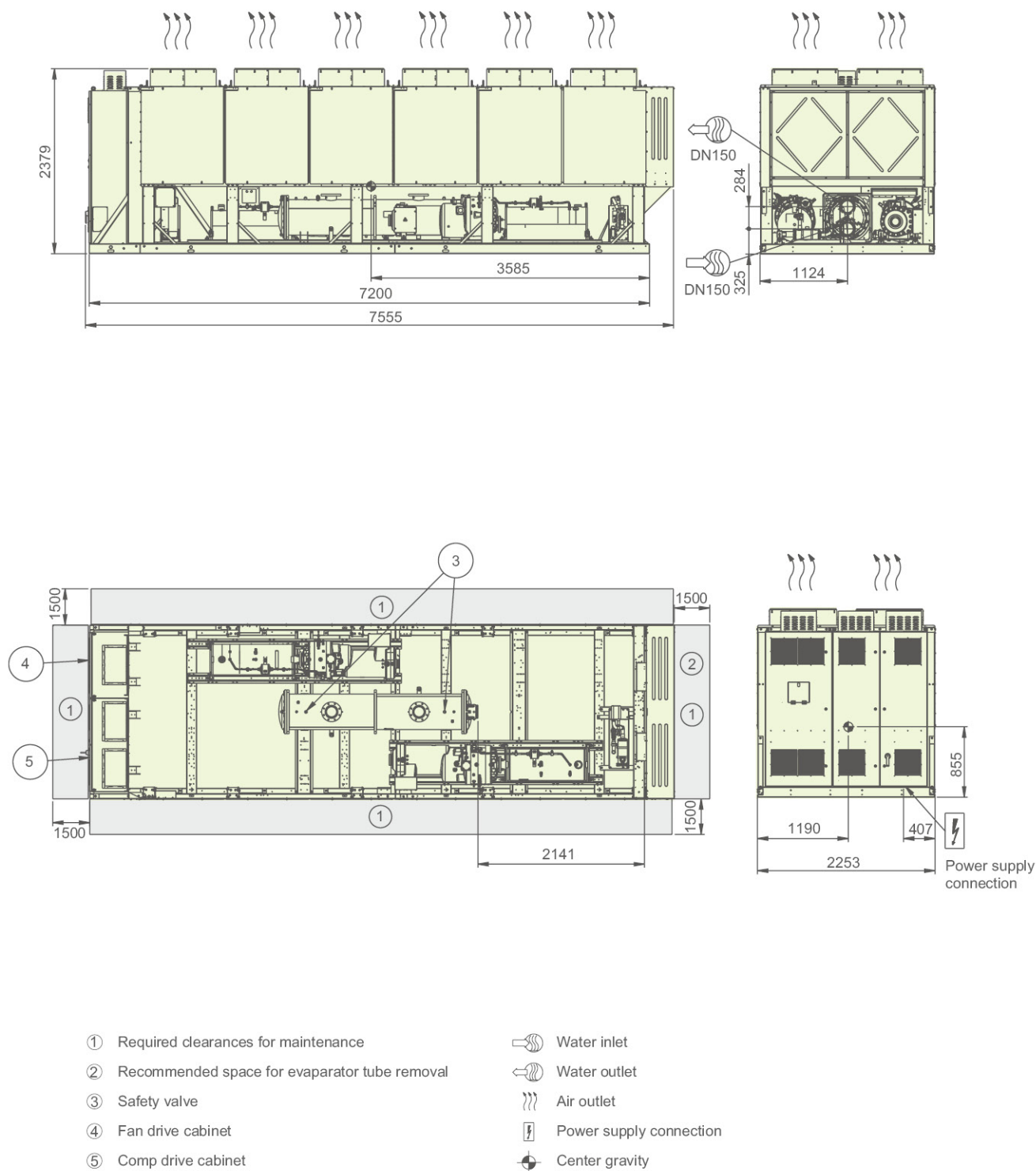


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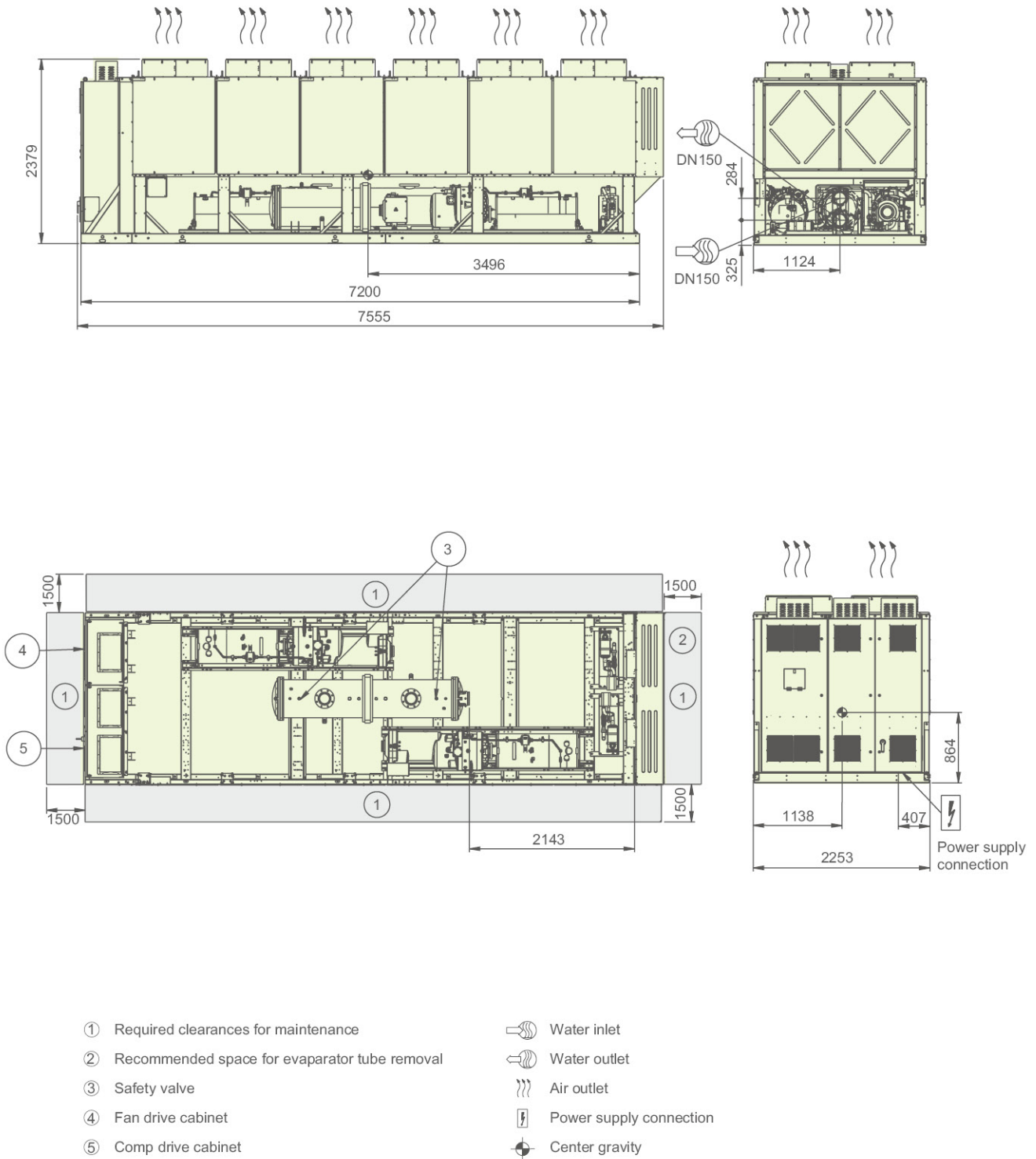
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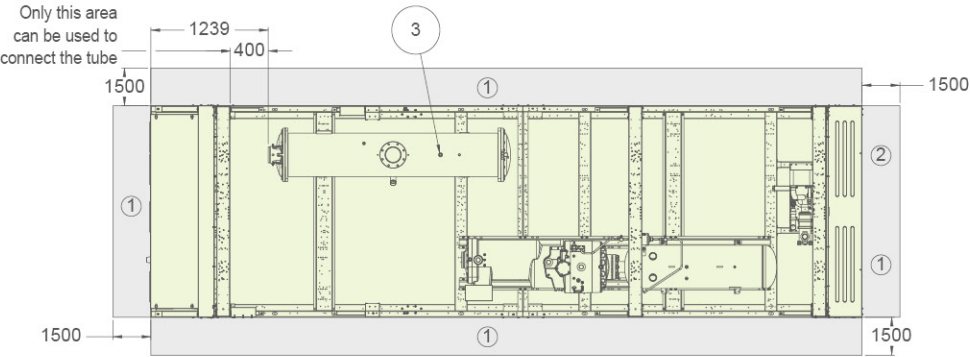
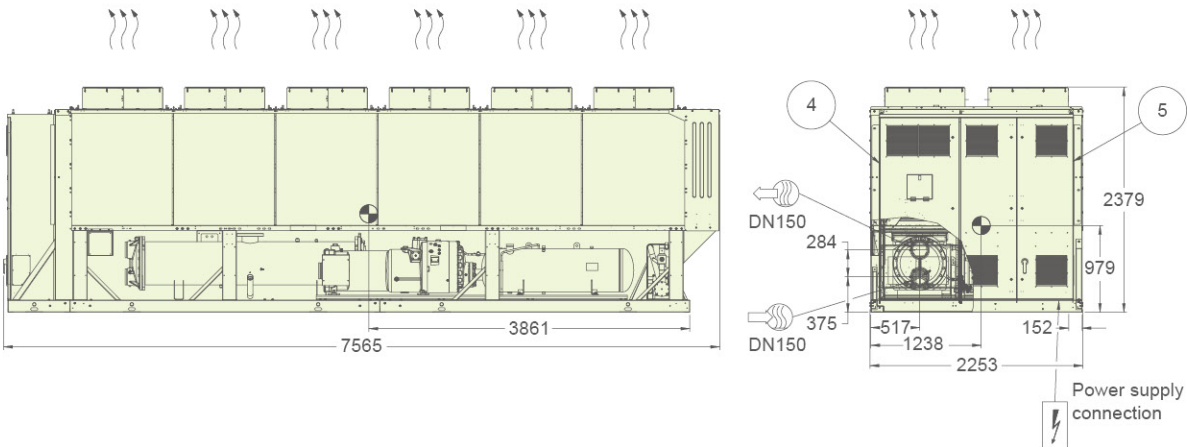
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30KAV0900A



Dimension Drawing

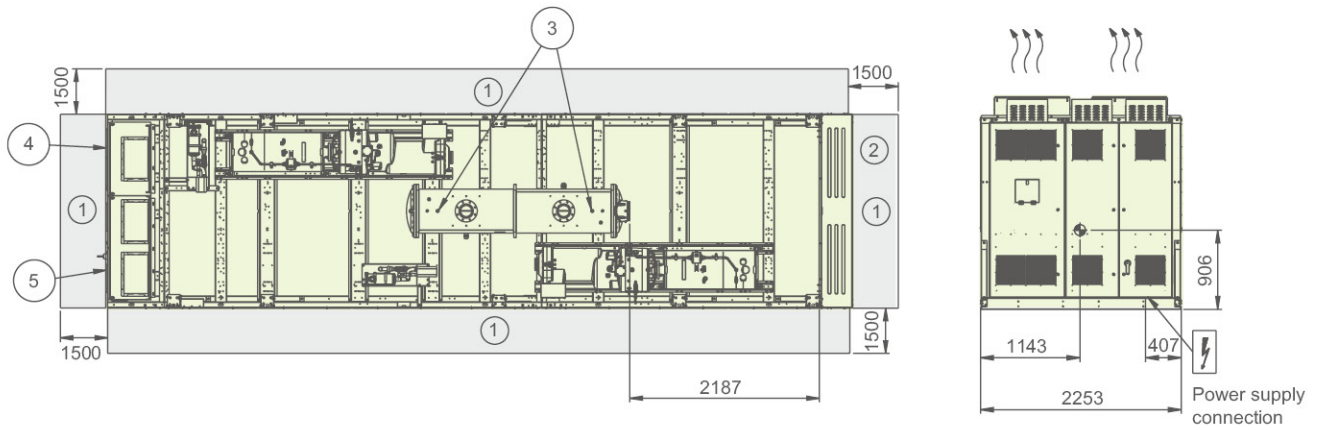
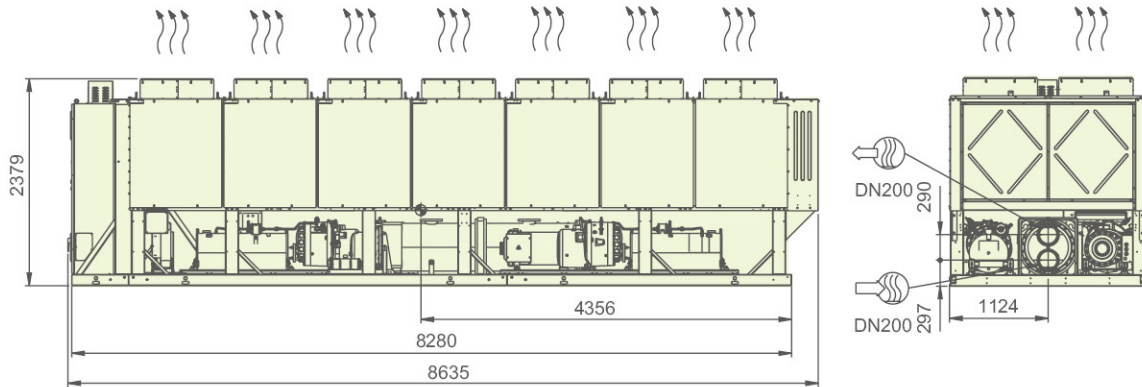
30KAV0901A



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Dimension Drawing

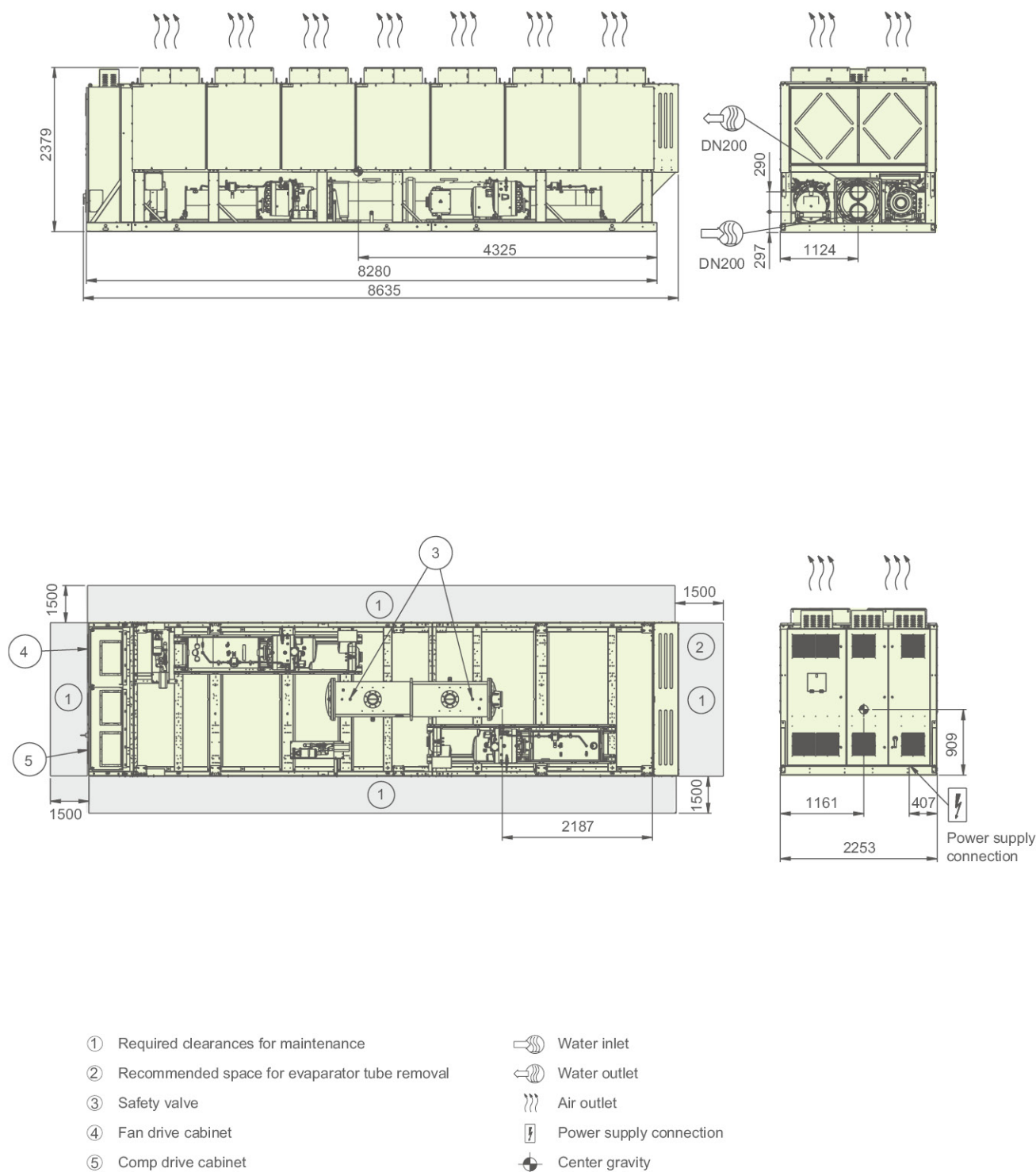
30KAV1000A



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| ③ Safety valve | Air outlet |
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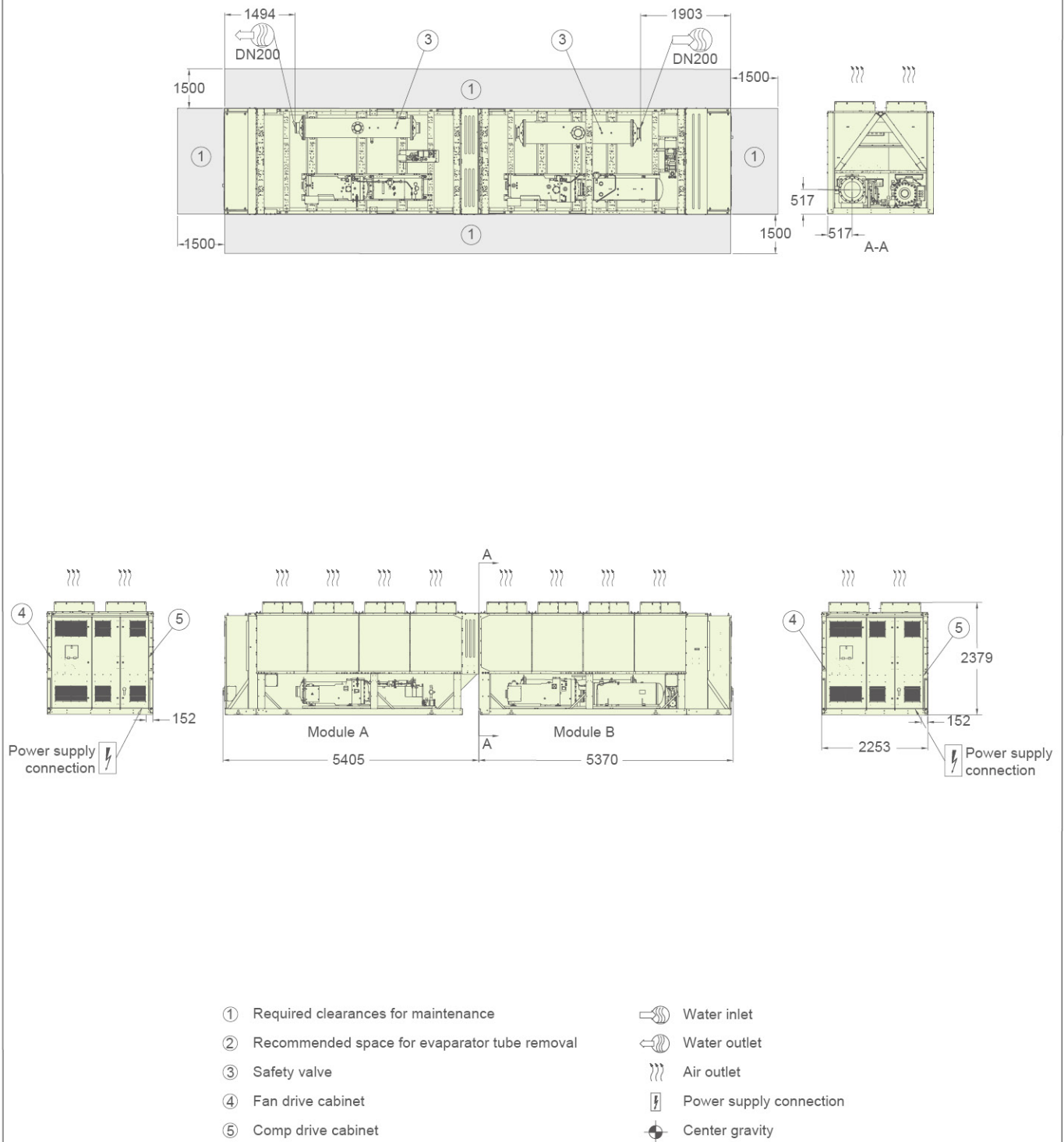
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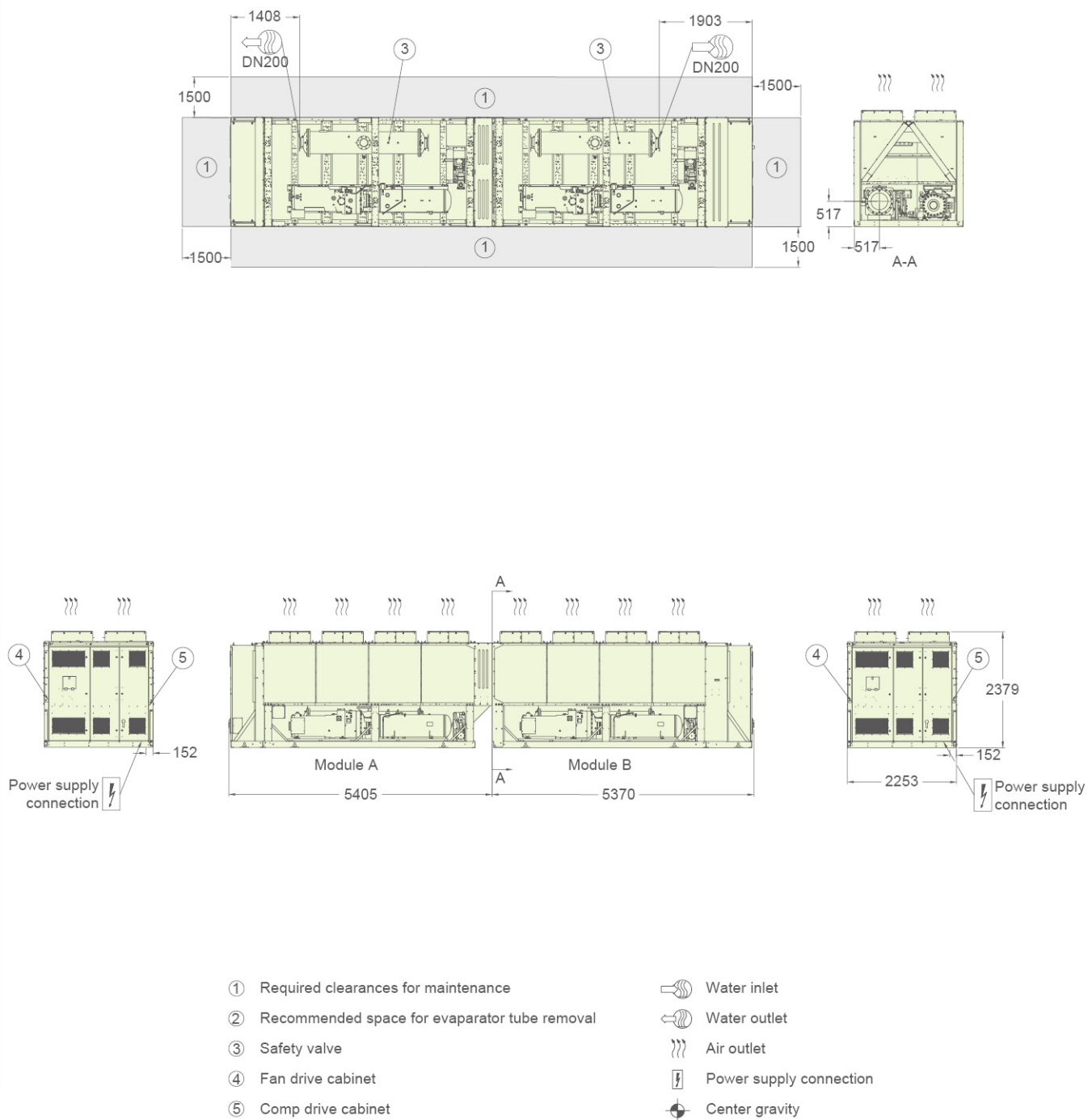
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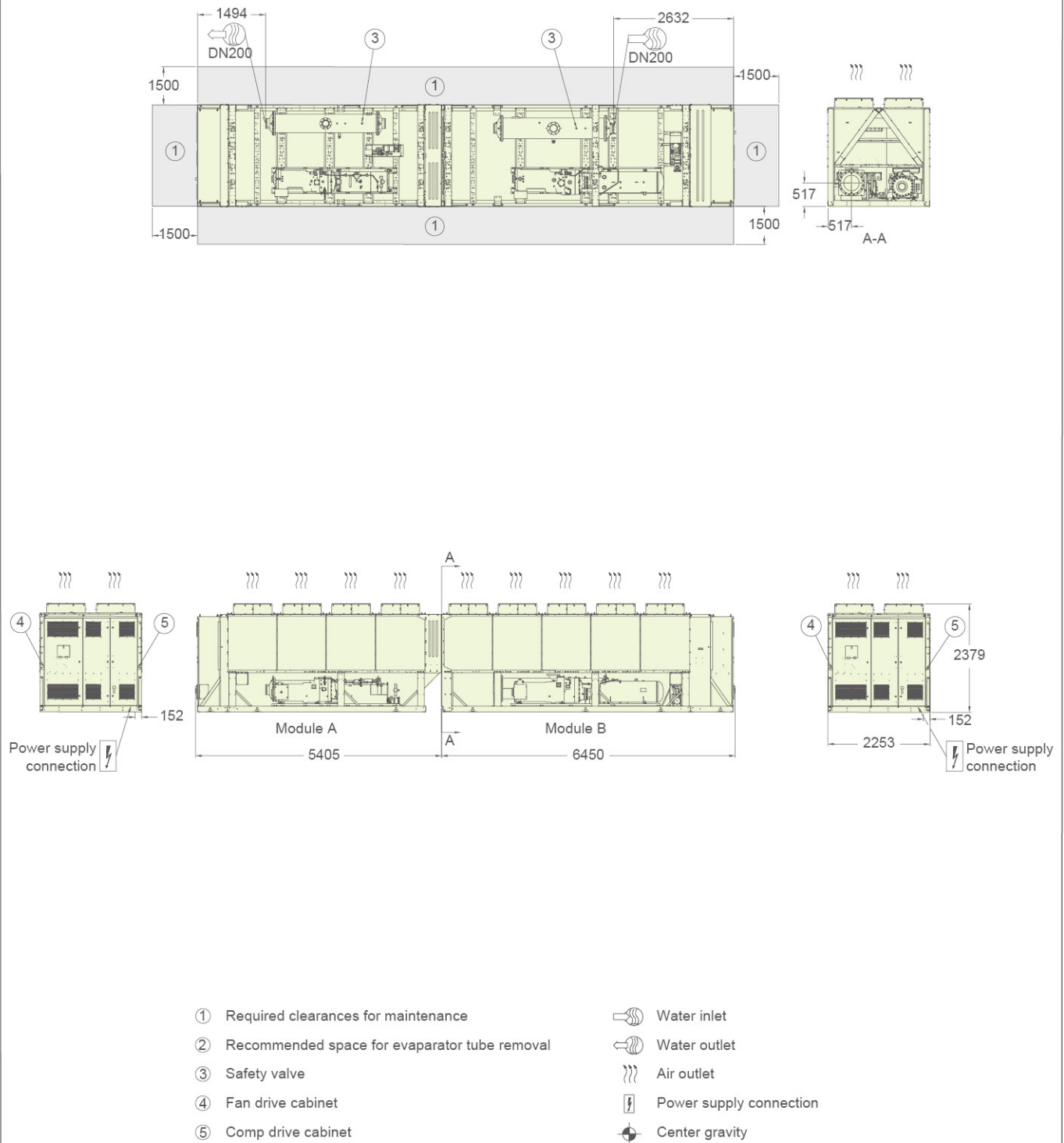
Dimension Drawing

30KAV1230A



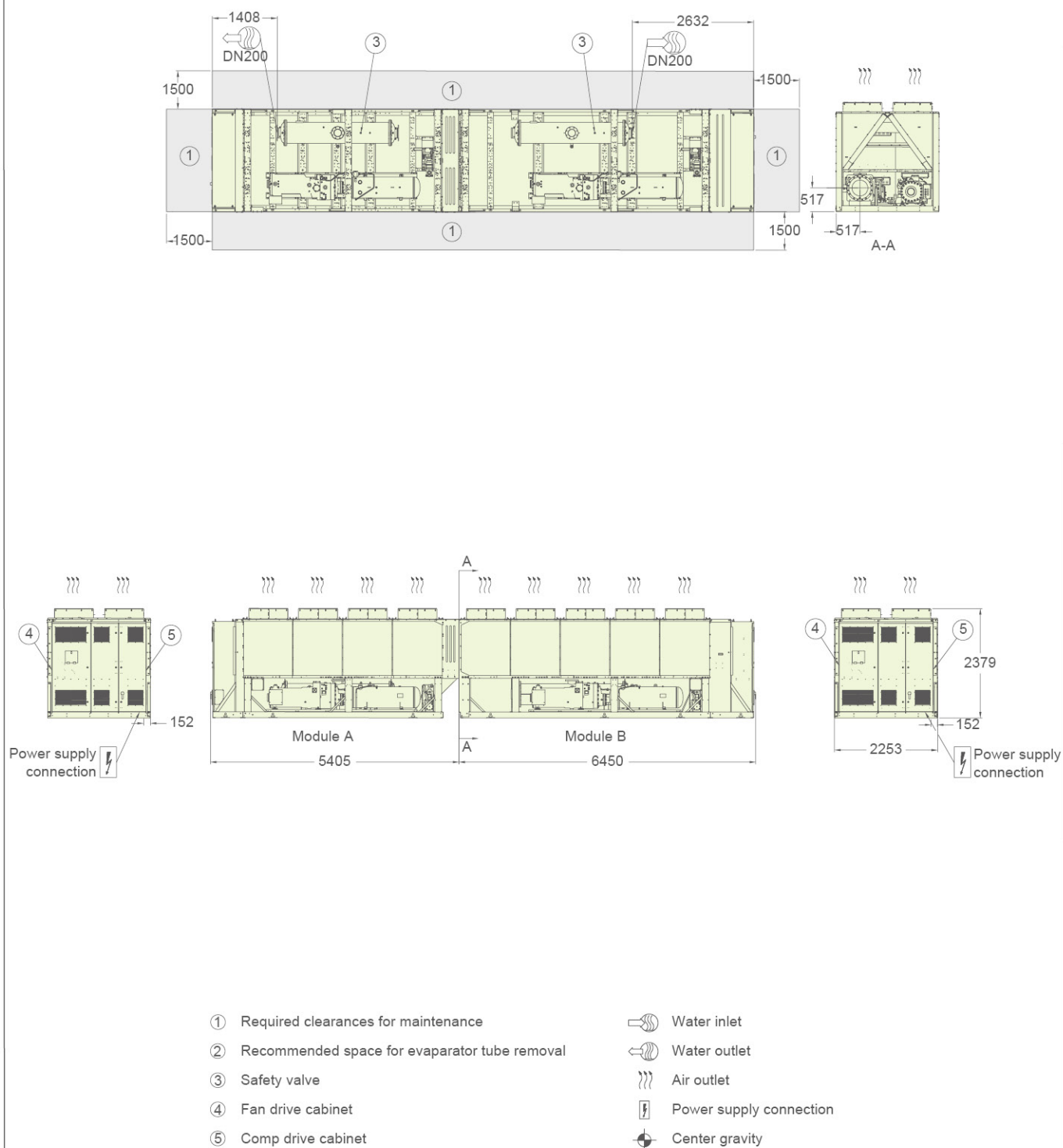
Dimension Drawing

30KAV1300A



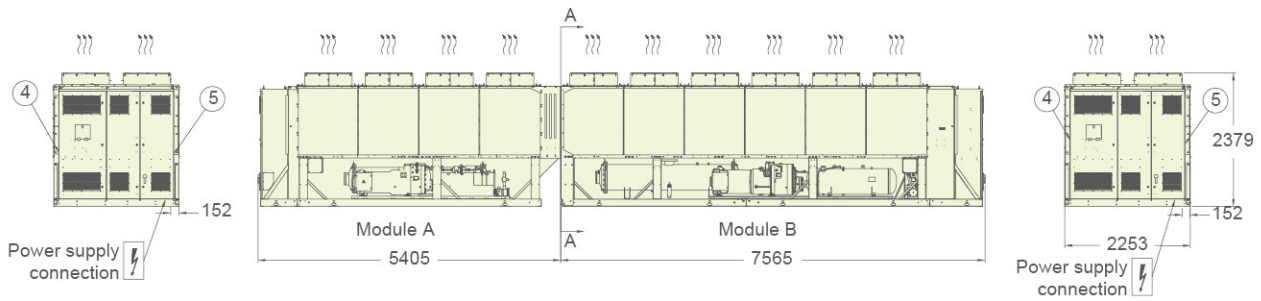
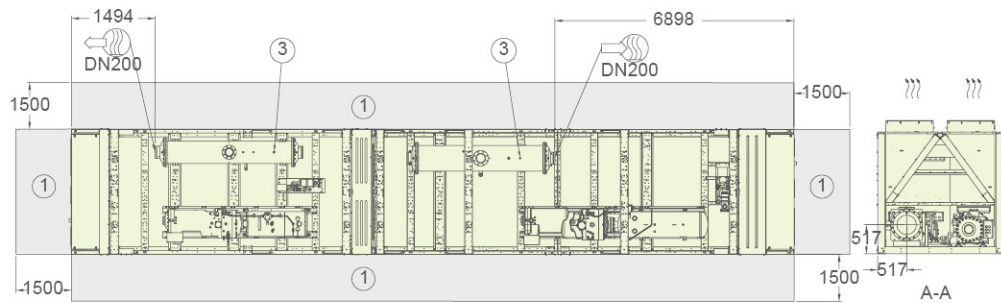
Dimension Drawing

30KAV1350A








Dimension Drawing

30KAV1400A

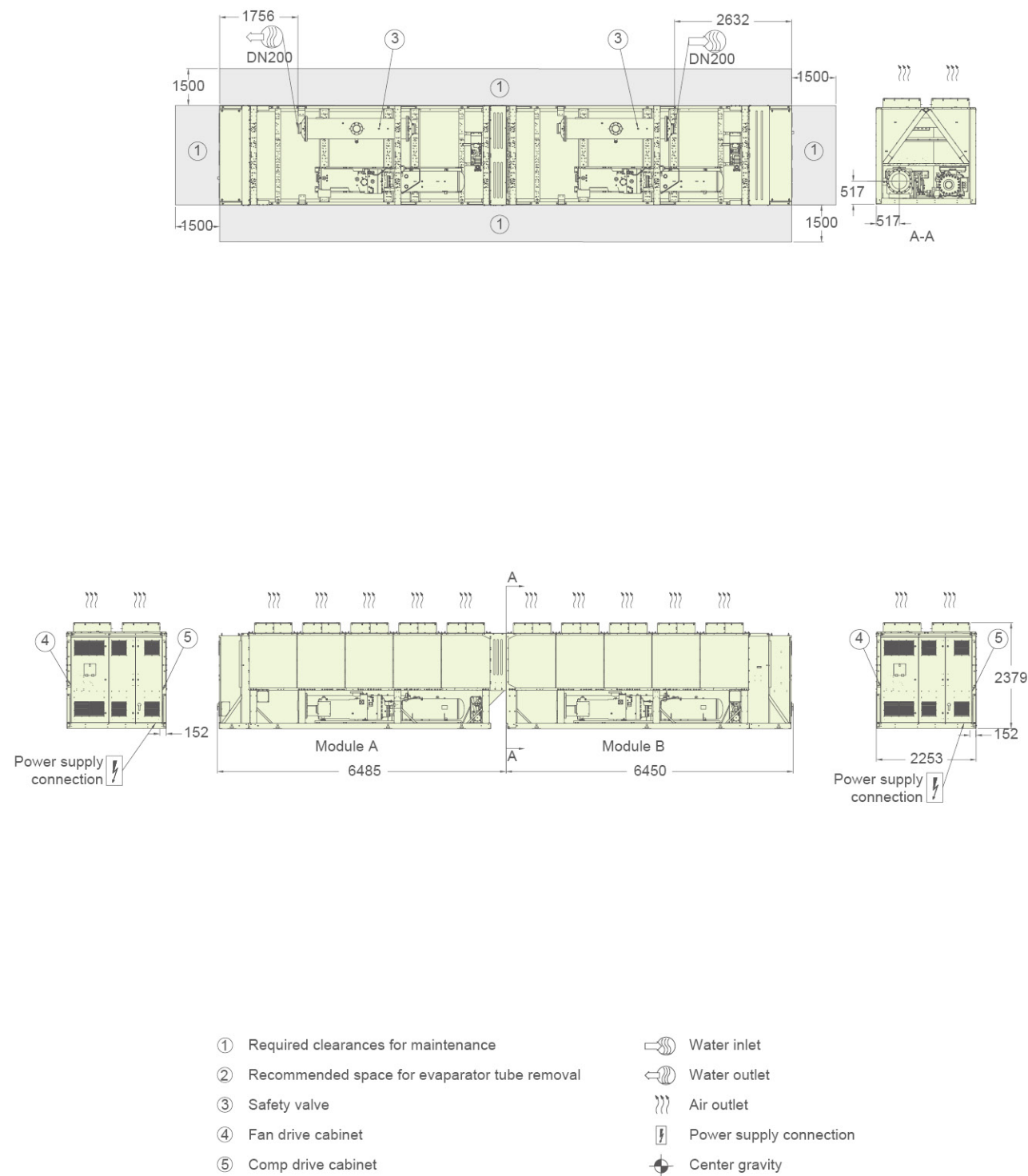


- ① Required clearances for maintenance
- ② Recommended space for evaporator tube removal
- ③ Safety valve
- ④ Fan drive cabinet
- ⑤ Comp drive cabinet

-  Water inlet
-  Water outlet
-  Air outlet
-  Power supply connection
-  Center gravity

Dimension Drawing

30KAV1500A





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Supersede:	CAT_30KAV_E-1911-06
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