Carrier

greenspeed AQUAFORCE™

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 20thcentury.

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.

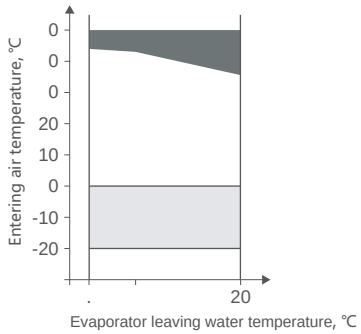
Nomenclature

30KAV1100 A PT002B

PT002B	Unit option	
	001	Cu/Cu coil
	002B	Blygold PoluAL
	003A	Pretreated Coating (Gold Fin)
	303	Pretreated Coating (Blue Fin)
	010F	Fixed speed fan
	012	High Static Fan
	015	Sheet metal enclosure (part models)
	015S	Low noise level (Compressor sound jacket)
	015LS	Super low noise (part models)
	020A	IP54 Control Box
	041A	Evaporator Anti-Freeze Protection
	071	High efficiency
	093A	Compressor discharge valves
	104	1.6Mpa evporatior
	107	Reversed Evaporator Connection
	148B	J-Bus Gateway
	148C	Bacnet Gateway
	148D	LonTalk Gateway
	156	Energy Management Module
	158A	7" Touch Screen
	275	Remote controller
	281	Evaporator with aluminum jacket
	282	EMC Classification C2
	299	38mm Evaporator Insulation
	301	Lead/lag control
	305A	Spring damping
	309	Isolate valve for safety valve
	309D	Isolate valve for saftey valve(dual safety valve)
	312A	Australian PV code
A	Design Series	
30KAV1100	Unit Model	Air-cooled Variable Speed Screw chiller 30KAV0351A-1500A

Operating Range

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



Below 0℃ air tempature 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 A uaforce chillers with reenspeed^{T} Intelligence are the premium solution for commercial and industrial applications where installers, consultants and building owners re uire superior reliability and optimal performances, especially at part load.

- 0KAV are designed to meet current and future re uirements in terms of energy efficiency, versatility and operating sound levels. Through the optimised combination of proven best-in-class technologies that include
  - E clusive new screw compressors with reenspeed^{T} Intelligence.
  - Carrier Smartvu^{T} .
  - th generation of lying irds fans Condenser fans with reenspeed^{T} Intelligence.

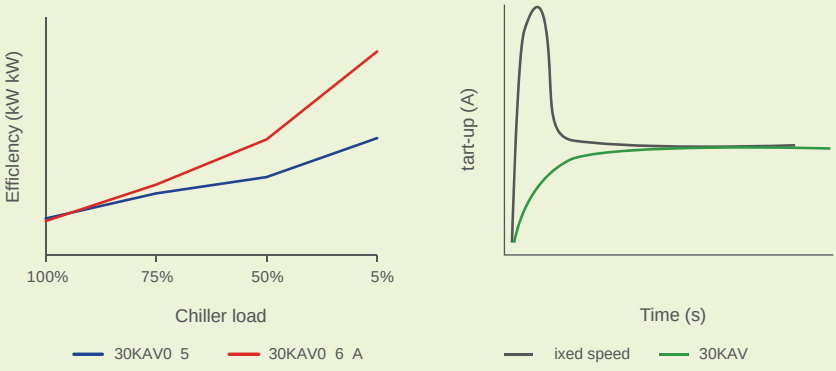
Low Energy Consumption

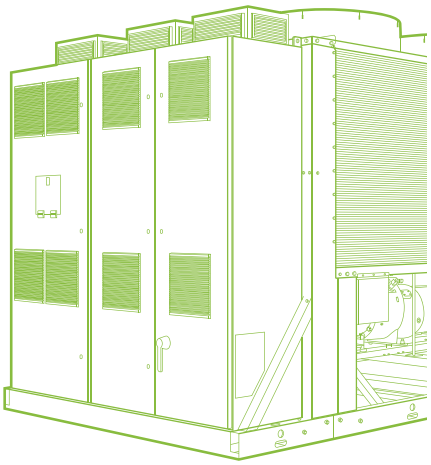
- The air conditioning system could use 30%~40% of anual buidling engery consumption, 30KAV helps customer involved in green building certification with Greenspeed® inveter - driven technology.

- With advanced unit mounted inverter-driven technolgy, 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 viarable 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 buliding 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%.



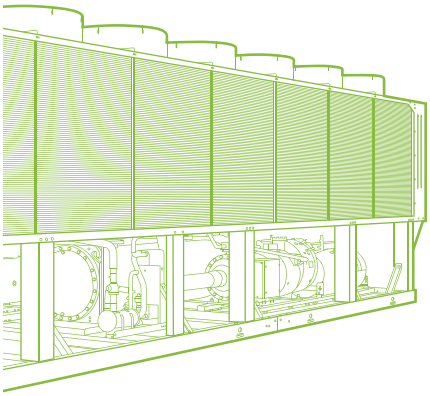


Environmental Friendly

- C-134a refrigerant
  efrigerant of the C group with zero ozone depletion potential.

- eak-tight refrigerant circuit.
  eduction of leaks as no capillary tubes and flare connections are used.
  Verification of pressure transducers and temperature sensors without transferring refrigerant charge.

Absolute reliability



- crew compressors with Greenspeed^{T} Intelligence:
  - Industrial-type screw compressors with oversized bearings and motor cooled by suction gas.
  - pecifically sized inverter for each compressor motor ensures reliable operation and easy maintenance.
  - All compressor components assembly are easily accessible on site minimising down-time.

- ans with Greenspeed^{T} Intelligence.
  - 6th generation of lying ird fans e uipped with inverter-driven asynchronous motors.
  - pecifically 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 e uivalent to 000 km by truck under harsh conditions.
- alt mist corrosion resistance test in the laboratory for increased corrosion resistance.

Minimised Operating Sound Levels

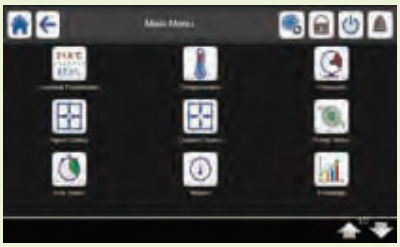
ERTIFIED®
ww.ahridirectory.org
and 551/591

- The inverter technology used for the compressor and fan motors minimises noise levels at part load operation. When the unit is delivering 5% for example, compressors and fans are running at minimum speed which implies lower noise.

- tandard unit features include:
  - ischarge dampers integrated in the oil separator (Carrier patent).
  - Condenser coils in W-shape with an open angle, allowing ieter air flow across the coil.
  - ow-noise 6th generation lying ird fans, made of a composite material (Carrier patent) which do not generate intrusive low fre uency noise.

e eral eatures

ew innovative smart control features
- An intuitive and user-friendly, . colored interface 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 bo 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.
- ight-mode Cooling capacity management for reduced noise level.
- ultiple protocols ACnet I ST , odbus I T , L Tal , - us are supported Acnet I odbus I as standard .



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Energy management
- Internal time schedule cloc controls chiller on off times and opera tion at a second set-point.
- The DCT Data Collection Tool records the alarms history to simplify and facilitate service operations.

e ote a a e e t ta ar

- nits with Carrier SmartVu^{T} control can be easily accessed from the internet, using a C with an Ethernet connection. This ma es remote control uic and easy and offers significant advantages for service operations.
- E uipped with an S 8 serial port that offers multiple remote control, monitoring and diagnostic possibilities. hen networ ed with other Carrier e uipment through the CC Carrier Comfort etwor - proprietary protocol , all components form a HVAC system fully-integrated and balanced through one of the Carrier's networ system products, li e the Chiller System anager or the lant System anager optional . also communicates with other building management systems viaoptional communication gateways.

uiet o eratio

- 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 e ample unoccupied mode .
  - Demand limit setting To limit the ma imum chiller capacity to a predefined value.
  - ater pump control These outputs control the contactors of one two evaporator water pumps.
  - peration visualization Indication if the unit is operating or if it's in stand-by no cooling load .
  - Alarm visualization.

Absolute reliability

- The Energy anagement odule E offers e tended remote control possibilities
  - oom temperature ermits 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 -20 mA or 0-10 V signal.
  - Demand limit ermits limitation of the ma imum chiller power or current based on 0-10 V signal.
  - Demand limit 1 and 2 Closing of these contacts limits the ma imum chiller power or current to two predefined values.
  - ser safety This contact can be used for any customer safety loop opening the contact generates a specific alarm.
  - Ice storage end hen 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.
  - ut 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 fau.
  - 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® SmartVu™ 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									
Nominal power supply			400V-3Ph-50Hz						
Control power supply			VFD start						
Start-up method			24V via internal transformer						
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 conditoins - evaporator entering/leaving water temperature=12/7˚C, outdoor air temperature = 35˚C
Evaporator fouling factor = 0.018m^2K/kW
* IPLV Calculations according to standard performances (in accordance with AHRI 550-590)

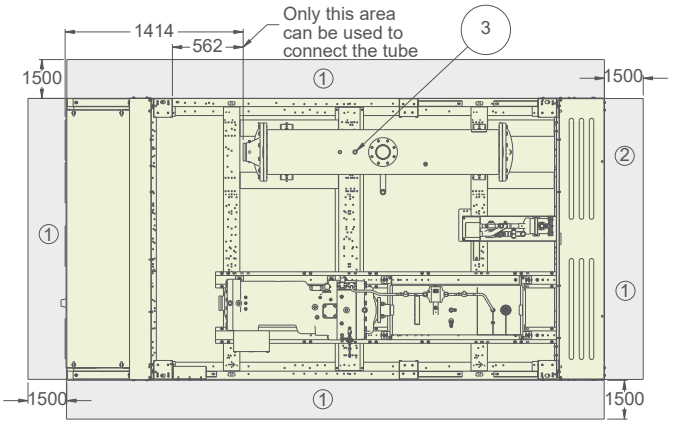
Performance data

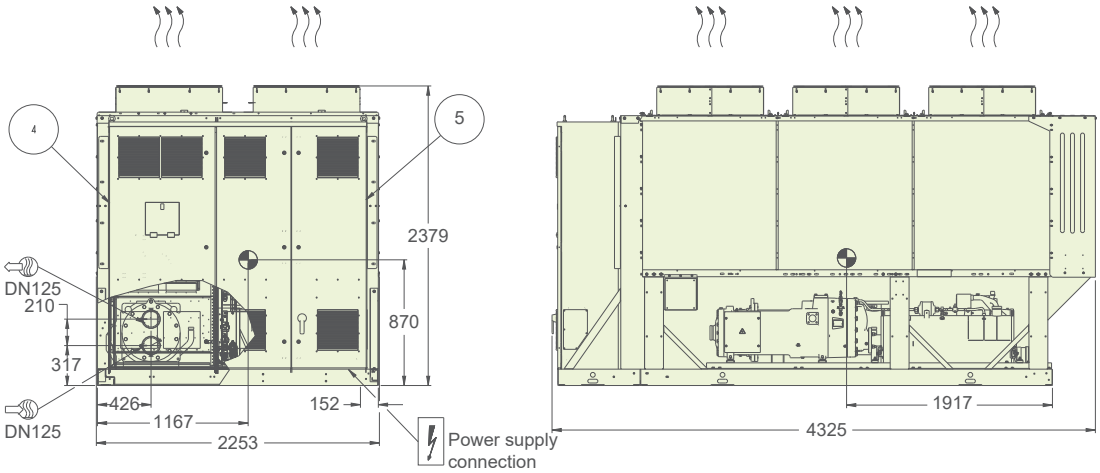
Model		30KAV	0351A	0451A	0551A	0651A	0751A	0901A	1160A	1230A	1300A	1350A	1400A	1500A
Nominal cooling capacity*		kW	346.2	430.2	537.3	614.1	738.1	875.1	1162	1224	1300	1348	1408	1472
Compressor power input		kW	101.9	129.5	161.4	191.5	229.7	269.4	364.0	383.2	407.1	423.2	440.1	461.2
Total power input		kW	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® SmartVu™ 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

Notes: * Nominal conditoins - evaporator entering/leaving water temperature=12/7˚C, outdoor air temperature = 35˚C
Evaporator fouling factor = 0.018m^{2}K/kW
* IPLV Calculations according to standard performances (in accordance with AHRI 550-590)

Dimension Drawing

30KAV0351A



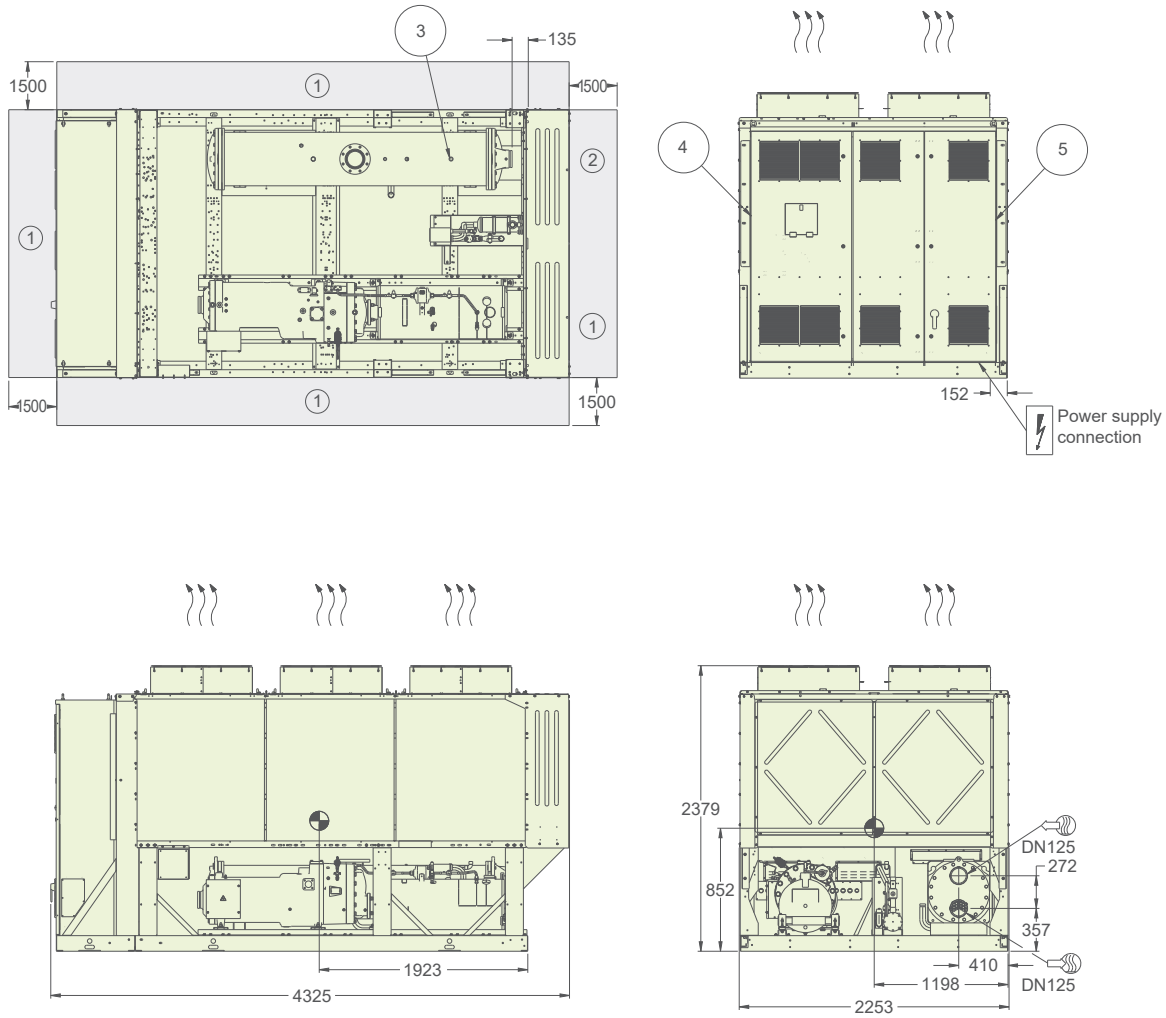


① Required clearances for maintenance
② Recommended space for evaparator tube removal
③ Safety valve
④ Fan drive cabinet
⑤ Comp drive cabinet

Water inlet
Water outlet
Air outlet
Power supply connection
Center gravity

Dimension Drawing

30KAV0451A



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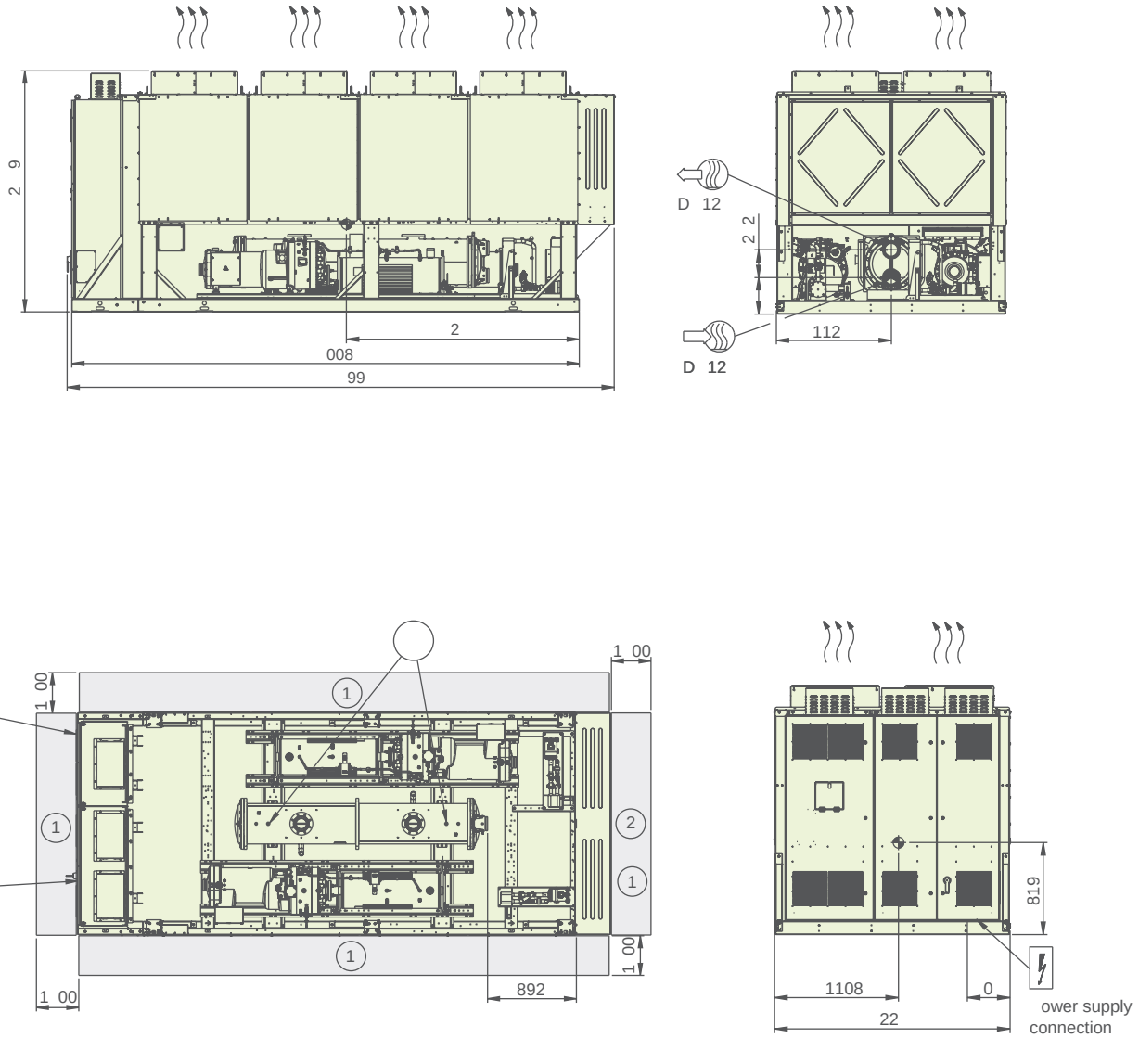
Water inlet
Water outlet
Air outlet
Power supply connection
Center gravity

Dimension Drawing

30KAV0550A



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◯ Safety valve

◯ an drive cabinet

◯ Comp drive cabinet

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Air outlet

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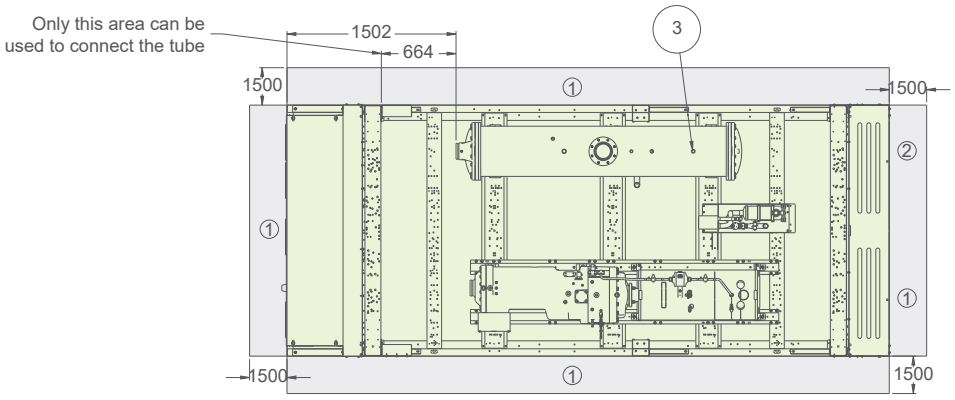
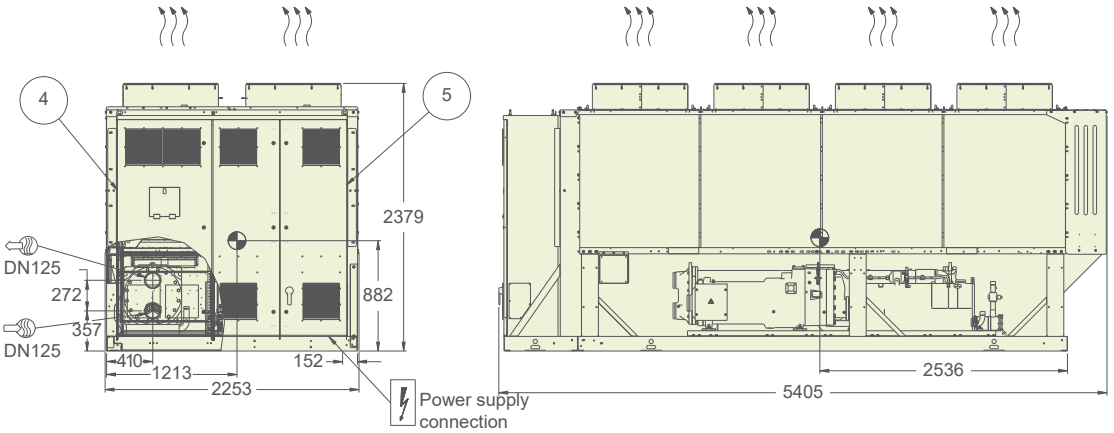
Center gravity

Dimension Drawing

30KAV0551A





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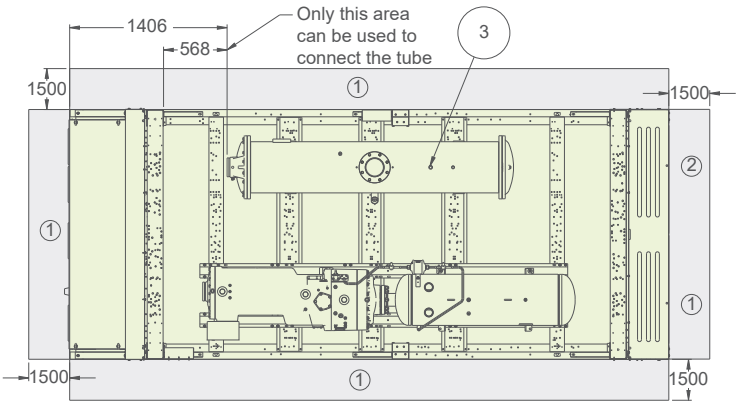
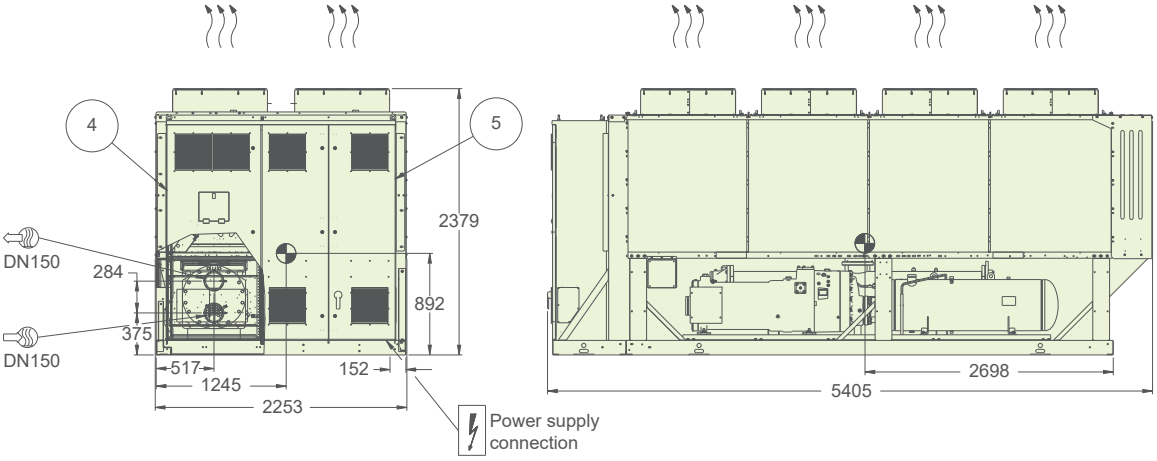
Water inlet
Water outlet
Air outlet
Power supply connection
Center gravity

Dimension Drawing

30KAV0651A





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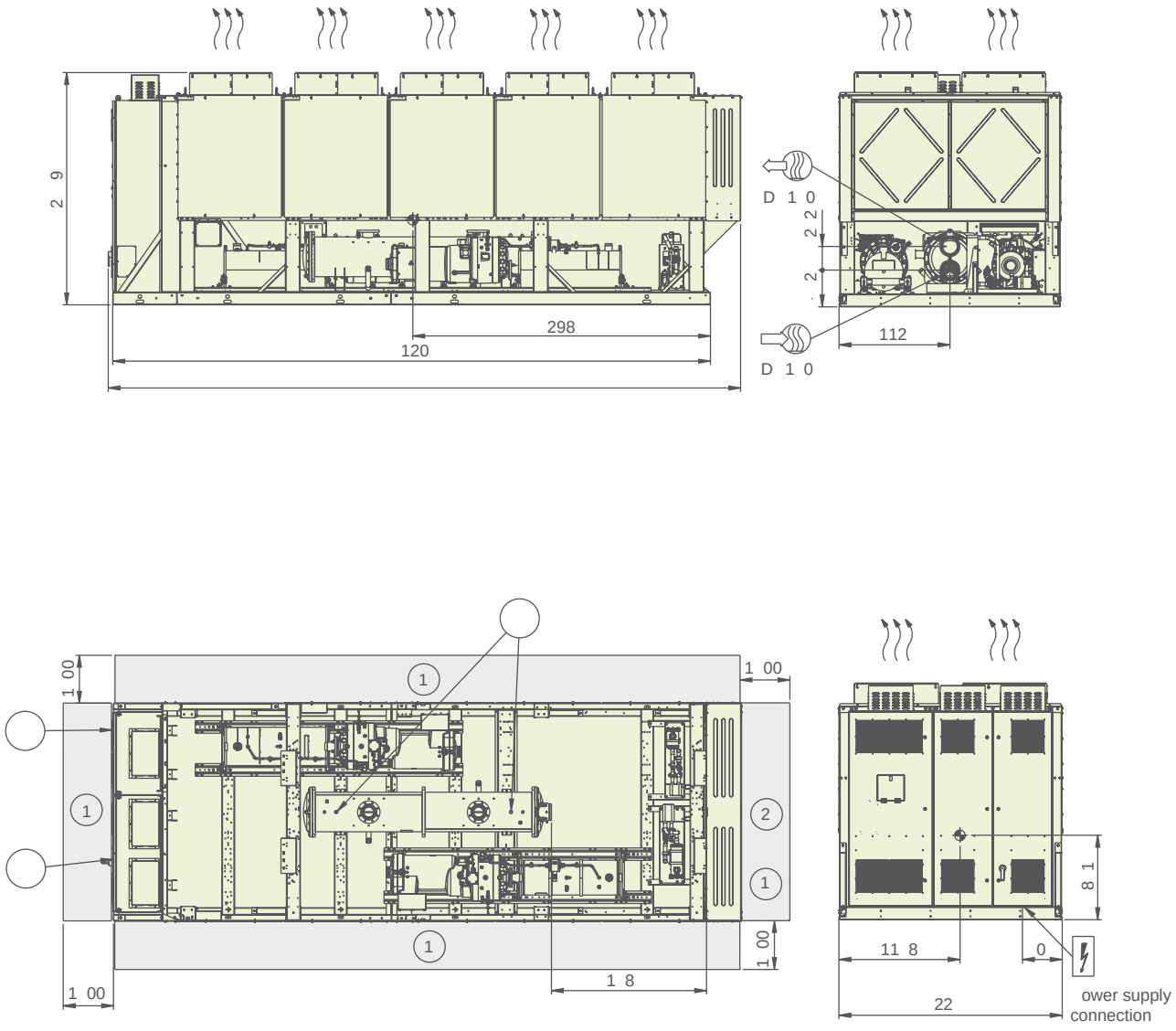
Water inlet
Water outlet
Air outlet
Power supply connection
Center gravity

Dimension Drawing

30KAV0660A



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Safety valve

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Comp drive cabinet

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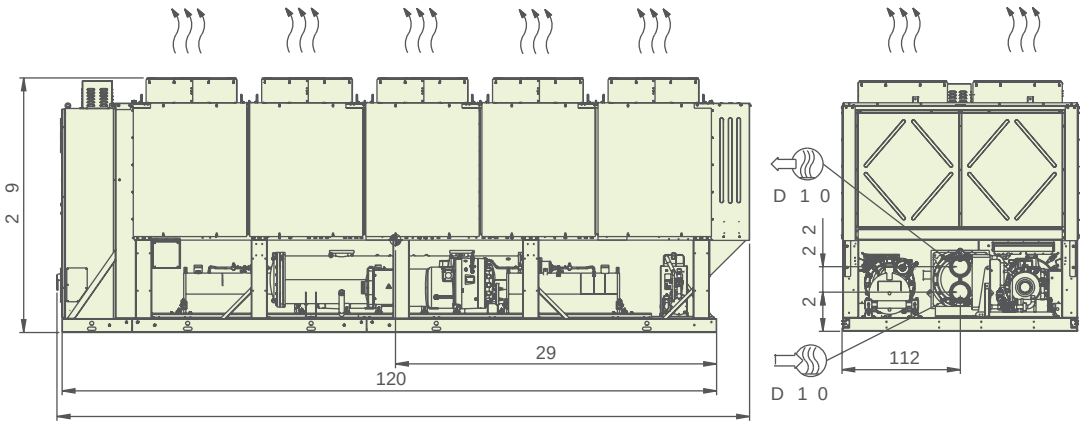
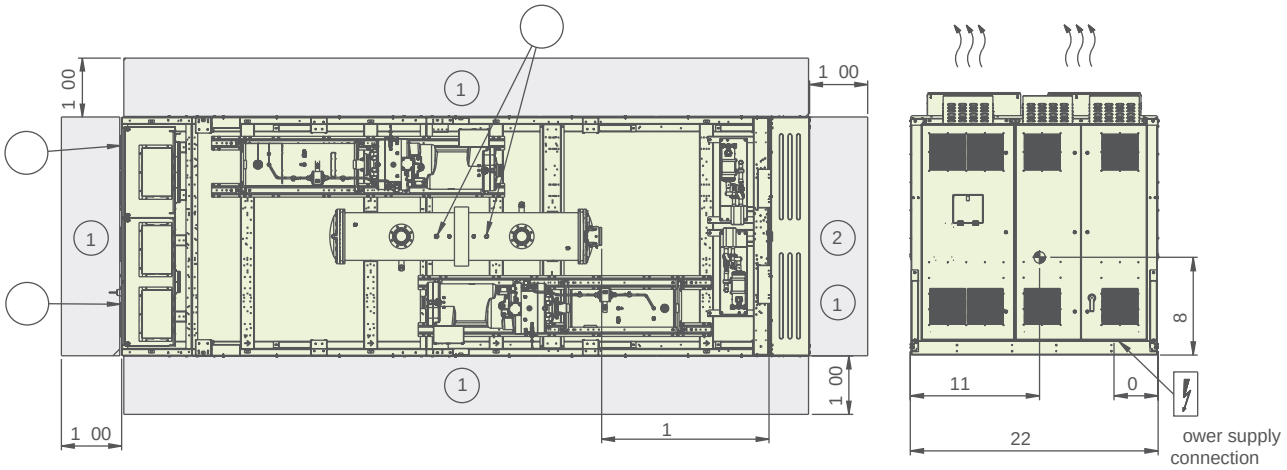
Dimension Drawing

30KAV0700A





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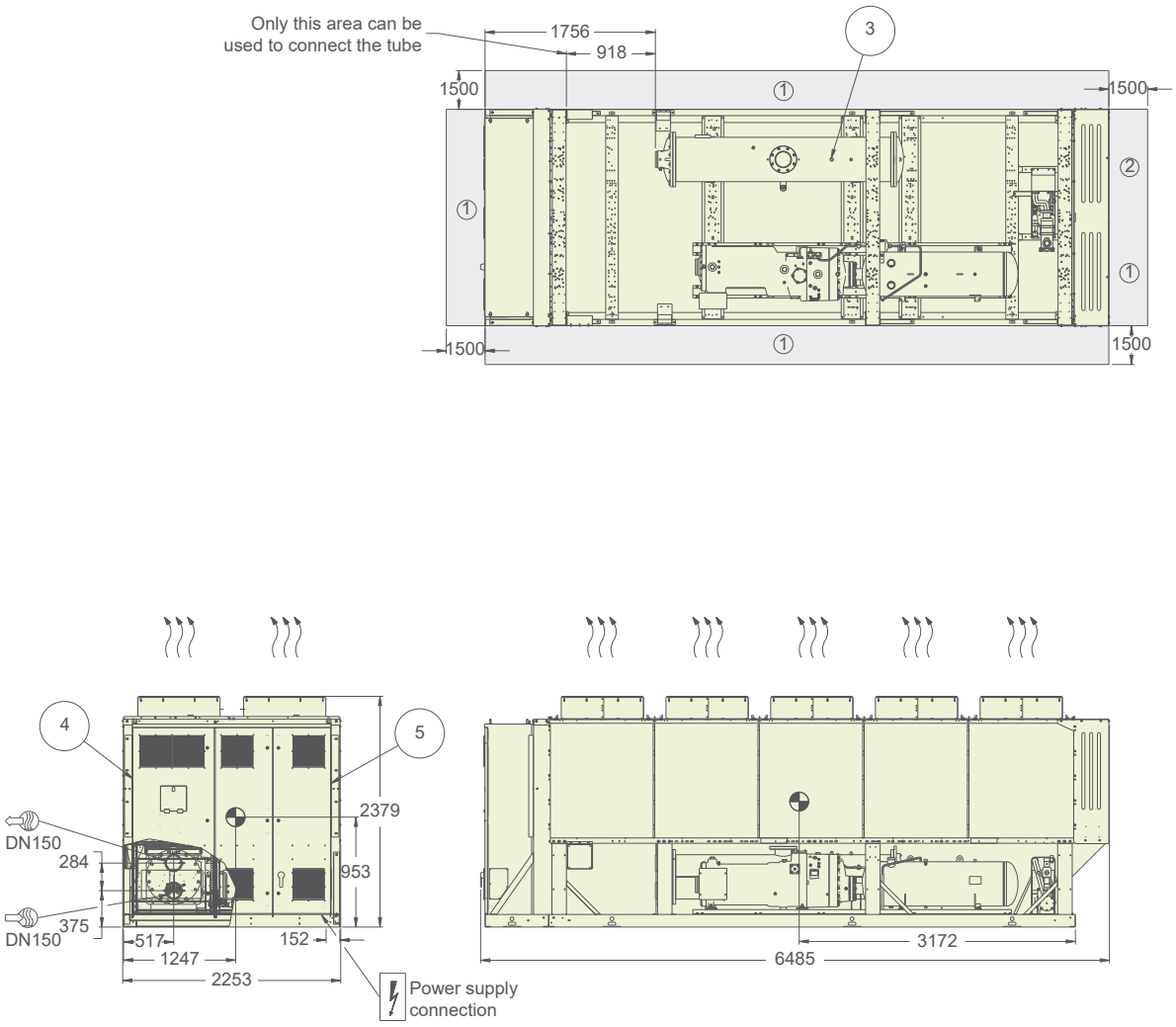

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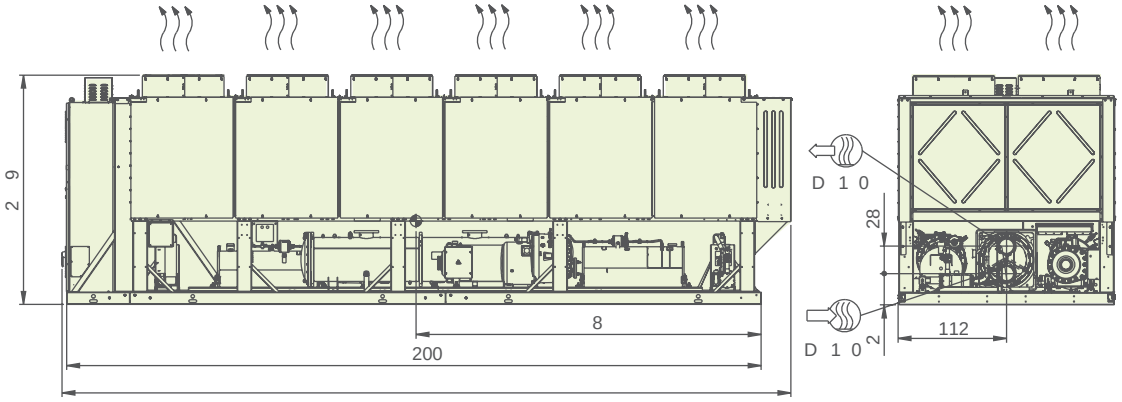
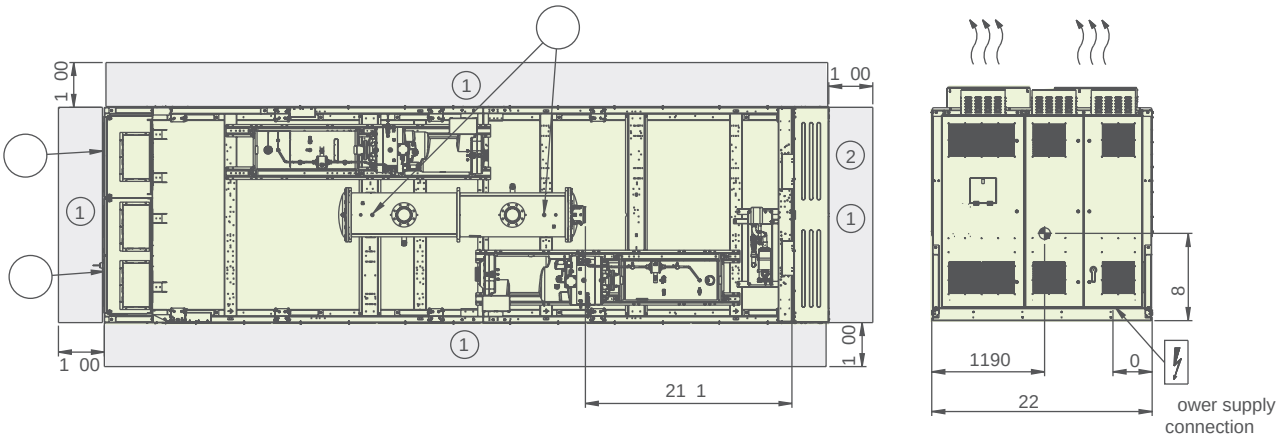
Dimension Drawing

30KAV0800A





① e uired clearances for maintenance

② ecommended space for evaparator tube removal

◯ Safety valve

◯ an drive cabinet

◯ Comp drive cabinet

ater inlet

ater outlet

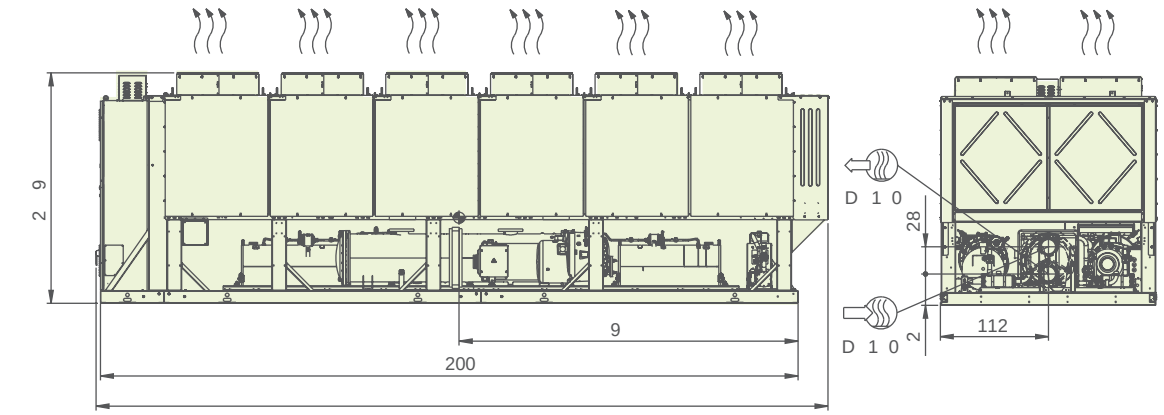
Air outlet

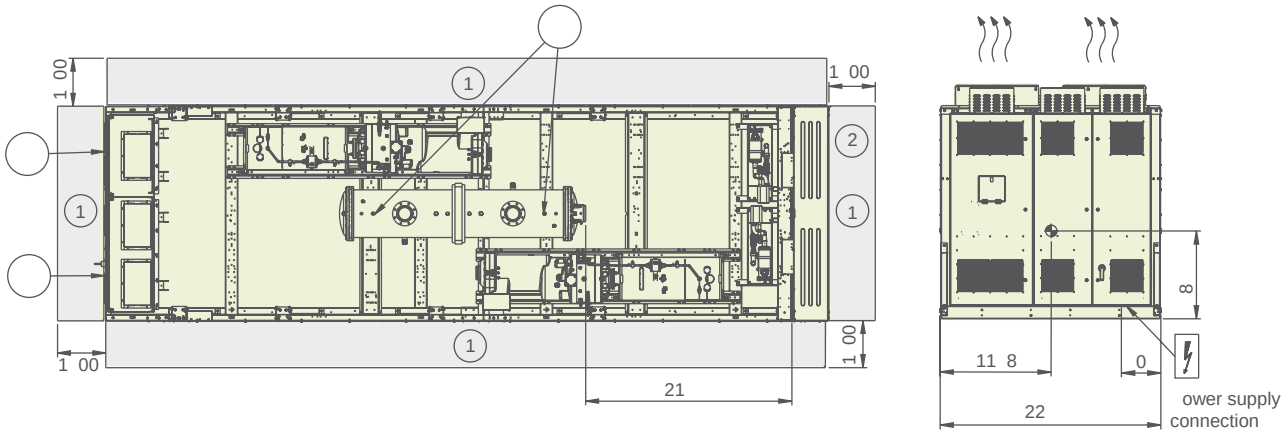
ower supply connection

Center gravity

Dimension Drawing

30KAV0900A





① e uired clearances for maintenance

② ecommended space for evaparator tube removal

◯ Safety valve

◯ an drive cabinet

◯ Comp drive cabinet

ater inlet

ater outlet

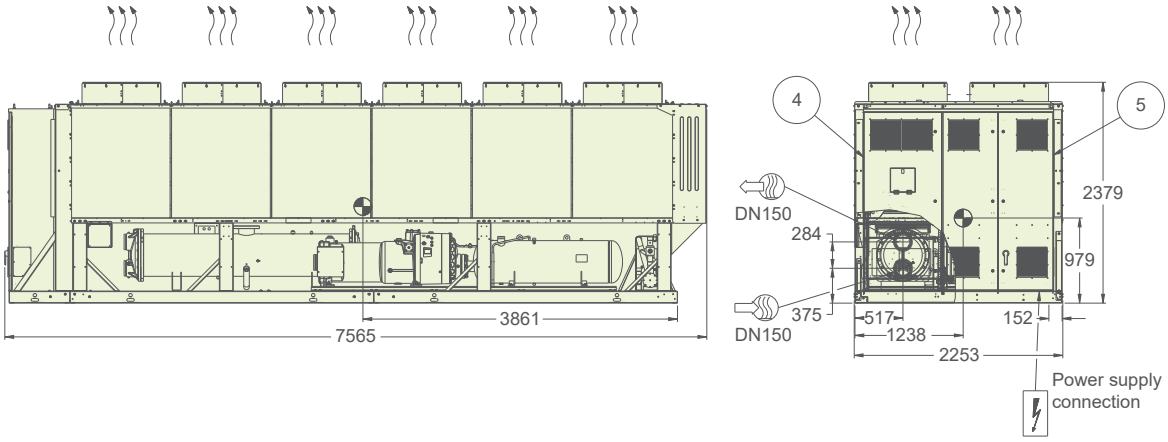
Air outlet

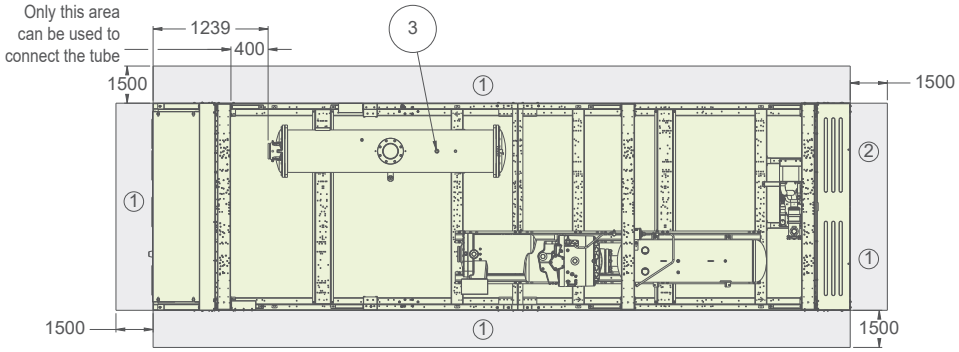
ower supply connection

Center gravity

Dimension Drawing

30KAV0901A



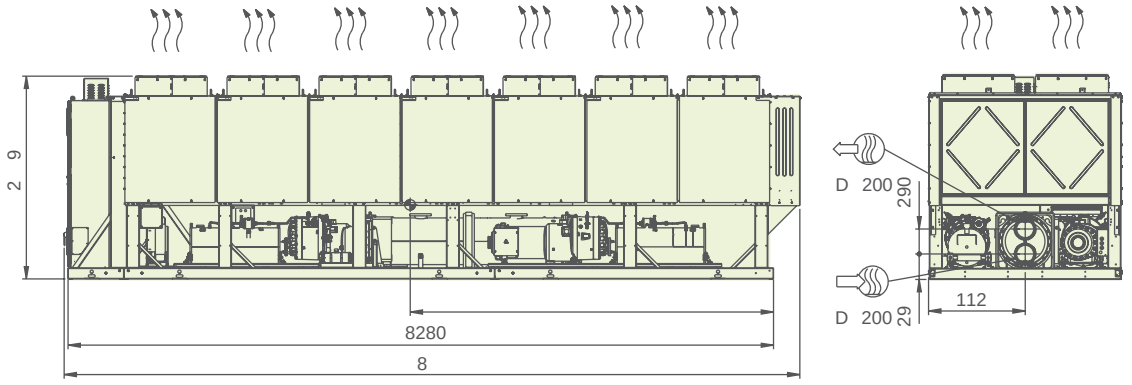


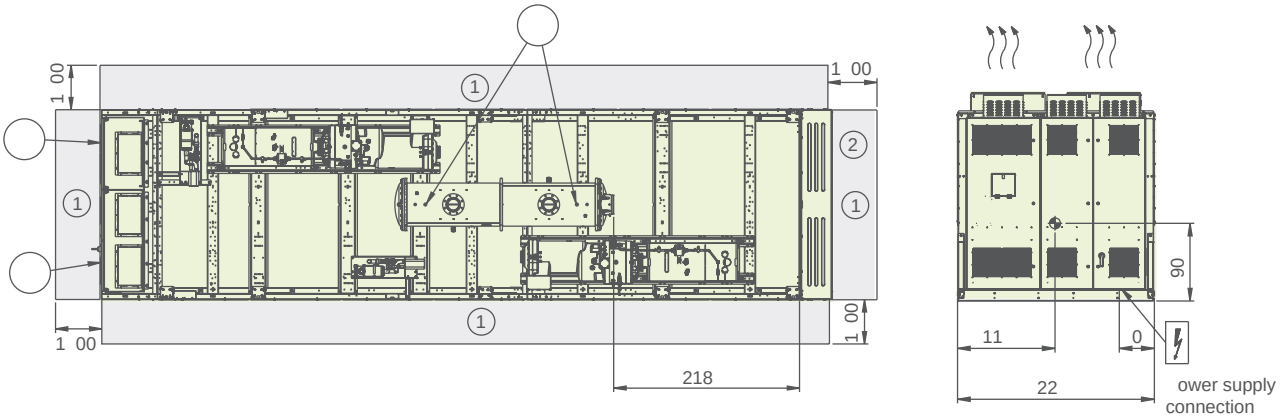
① Required clearances for maintenance
② Recommended space for evaparator tube removal
③ Safety valve
④ Fan drive cabinet
⑤ Comp drive cabinet

Water inlet
Water outlet
Air outlet
Power supply connection
Center gravity

Dimension Drawing

30KAV1000A





① e uired clearances for maintenance

② ecommended space for evaparator tube removal

Safety valve

an drive cabinet

Comp drive cabinet

ater inlet

ater outlet

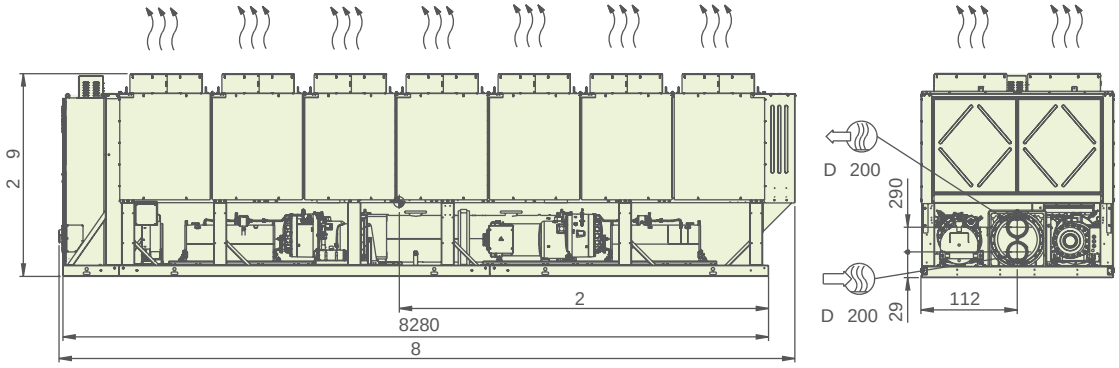
Air outlet

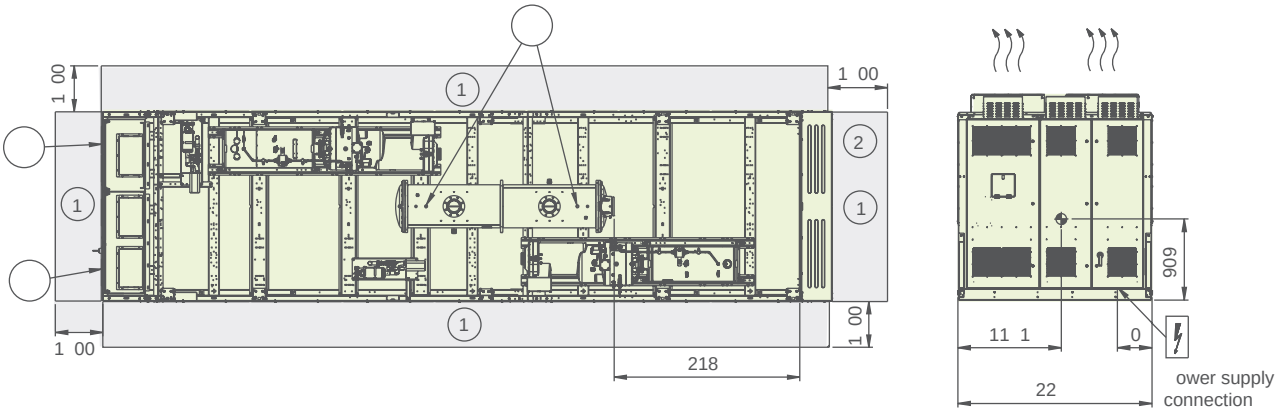
ower supply connection

Center gravity

Dimension Drawing

30KAV1100A





① e uired clearances for maintenance

② ecommended space for evaparator tube removal

◯ Safety valve

◯ an drive cabinet

◯ Comp drive cabinet

ater inlet

ater outlet

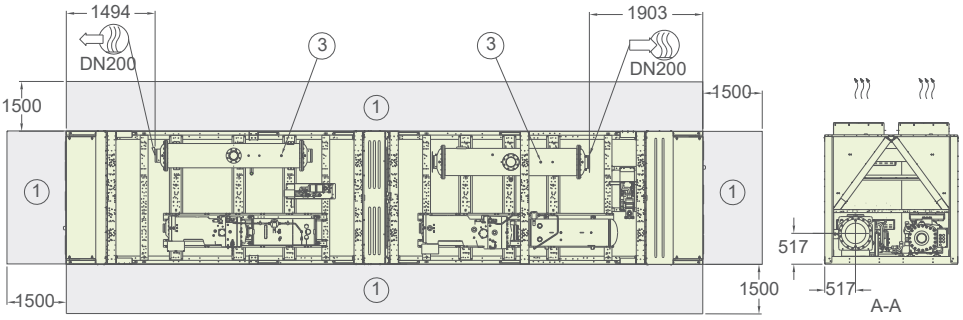
Air outlet

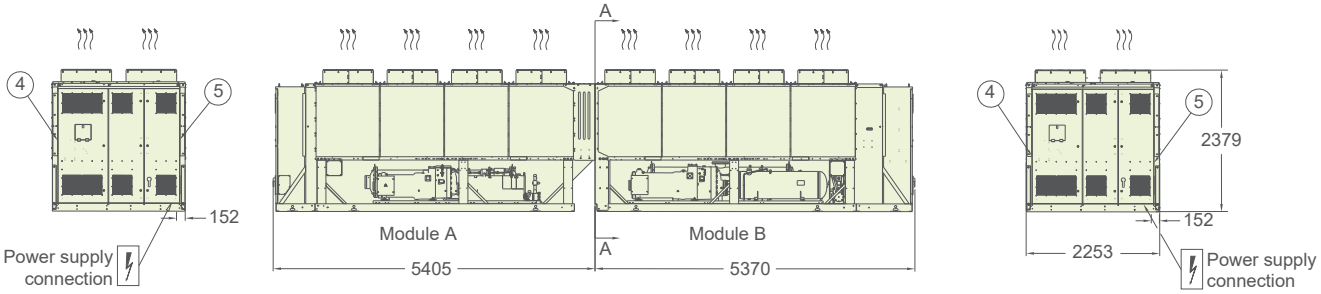
ower supply connection

Center gravity

Dimension Drawing

30KAV1160A



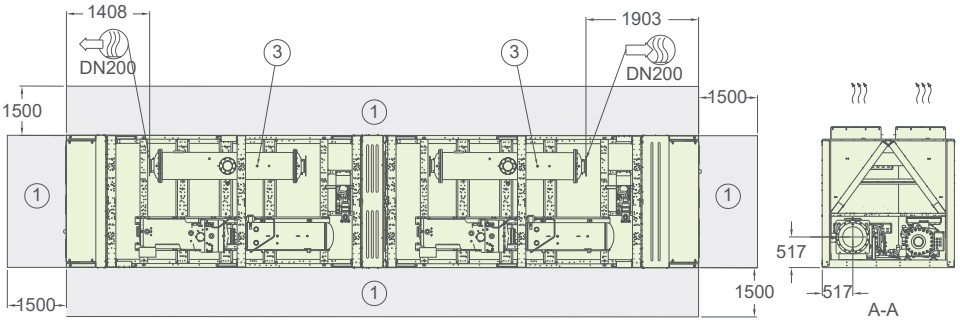


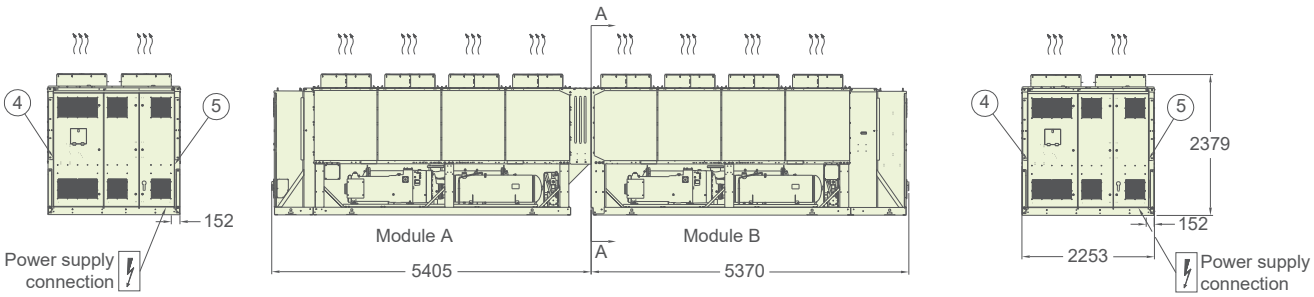
① Required clearances for maintenance
② Recommended space for evaparator tube removal
③ Safety valve
④ Fan drive cabinet
⑤ Comp drive cabinet

Water inlet
Water outlet
Air outlet
Power supply connection
Center gravity

Dimension Drawing

30KAV1230A



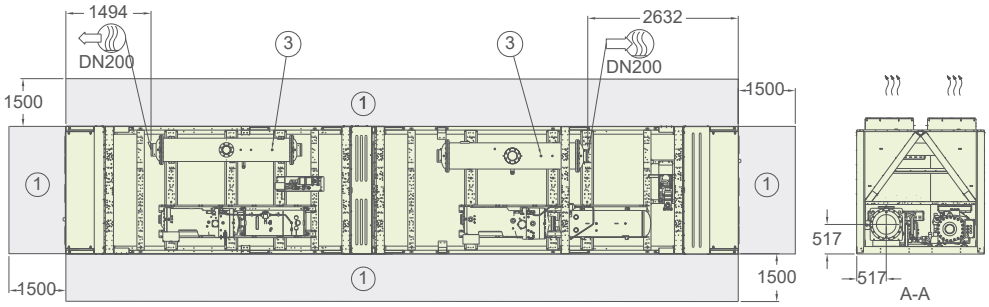


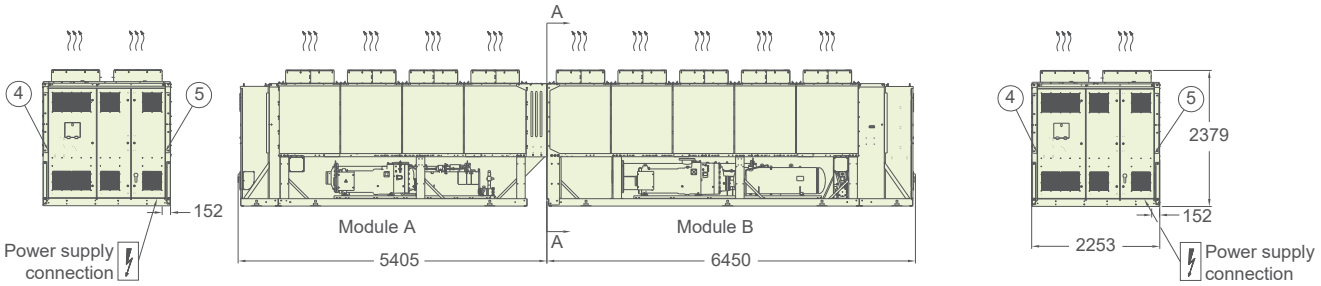
① Required clearances for maintenance
② Recommended space for evaparator tube removal
③ Safety valve
④ Fan drive cabinet
⑤ Comp drive cabinet

Water inlet
Water outlet
Air outlet
Power supply connection
Center gravity

Dimension Drawing

30KAV1300A



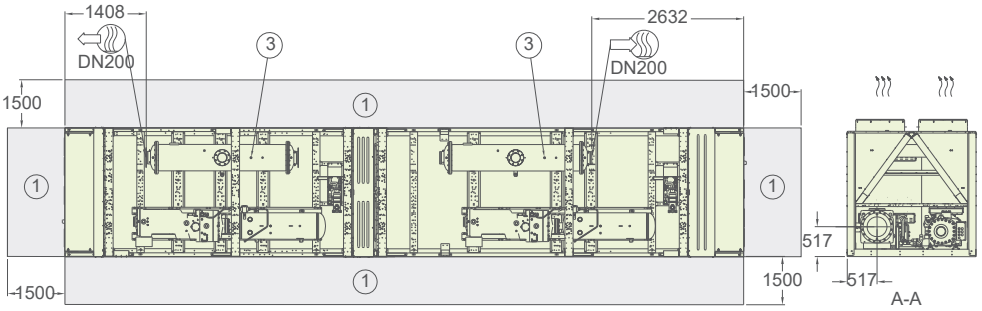


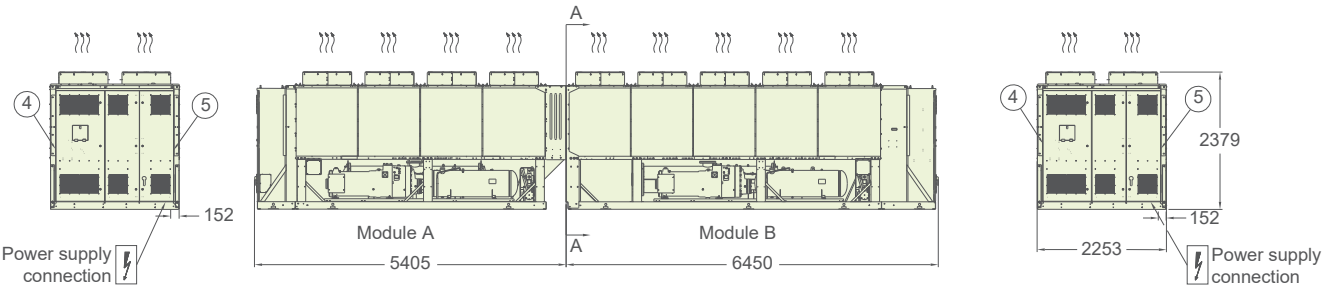
① Required clearances for maintenance
② Recommended space for evaparator tube removal
③ Safety valve
④ Fan drive cabinet
⑤ Comp drive cabinet

Water inlet
Water outlet
Air outlet
Power supply connection
Center gravity

Dimension Drawing

30KAV1350A



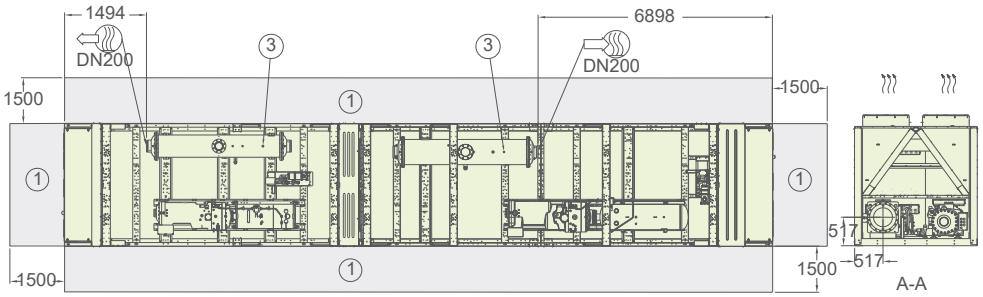


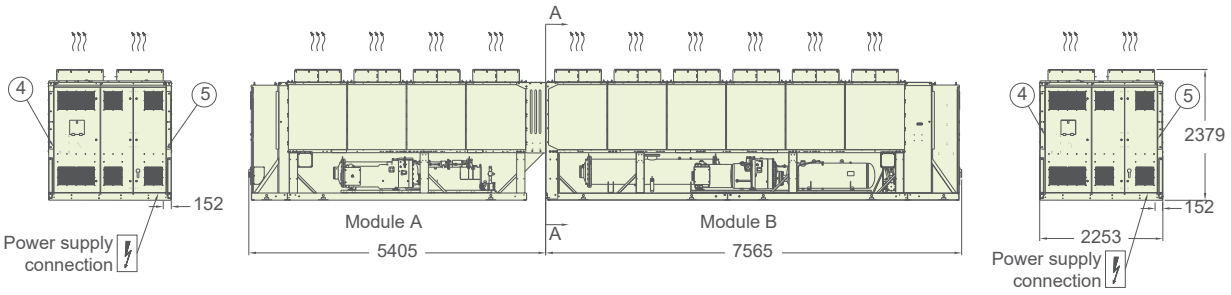
① Required clearances for maintenance
② Recommended space for evaparator tube removal
③ Safety valve
④ Fan drive cabinet
⑤ Comp drive cabinet

Water inlet
Water outlet
Air outlet
Power supply connection
Center gravity

Dimension Drawing

30KAV1400A



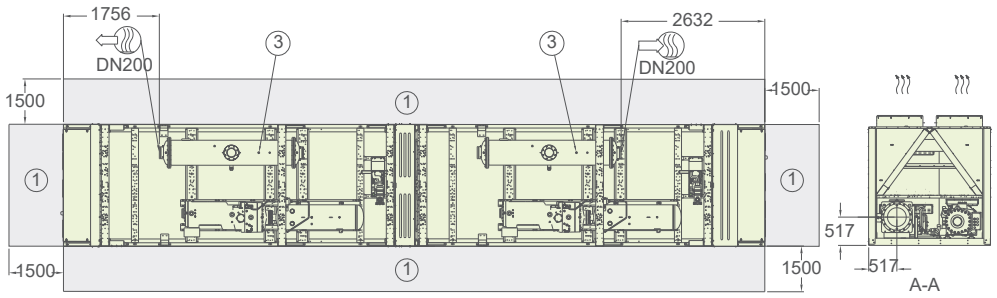


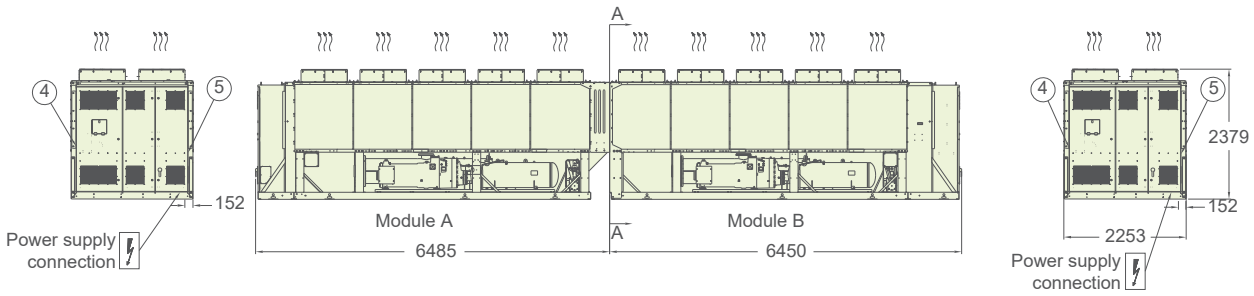
① Required clearances for maintenance
② Recommended space for evaporator tube removal
③ Safety valve
④ Fan drive cabinet
⑤ Comp drive cabinet

Water inlet
Water outlet
Air outlet
Power supply connection
Center gravity

Dimension Drawing

30KAV1500A





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

Water inlet
Water outlet
Air outlet
Power supply connection
Center gravity

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Supersede:	CAT_30KAV_E-2010-07
Effective date:	Apr, 2021