

## ▶ Air Cooled Condensing Units

# CDN 205 to 905



19 to 83 kW



Technical Brochure  
TM CDN-W.1GB  
Date : September 2004  
Supersedes : None

**Wesper**®

# Design Features

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The CDN air cooled condensing units are available in **8 sizes** (205, 305, 405M, 405, 505, 605, 755 and 905) covering nominal cooling capacities from 19 to 83 kW, which allow you to fit the air conditioning applications required for commercial, tertiary or industrial sectors.

The units are designed and optimized for operation with HFC 407C.

They are complete with single (on models CDN 205, 305 & 405M) and **double refrigerant circuits** (on models 405, 505, 605, 755 & 905) fitted with high efficiency and low vibration level Scroll compressors.

All units are completely assembled in the factory with all interconnecting refrigerant piping and internal wiring ready for field installation.

After assembly, extensive unit tests and checkout procedures are also performed in the factory to insure trouble-free startup when installation is complete. Each unit is shipped complete with nitrogen charge.

The CDN air cooled condensing units are designed for outdoor installation (on a roof or directly on ground) and are suitable for air conditioning applications requiring the use of direct expansion coils.

## Cabinet

The unit weather-resistant cabinet is made from galvanized steel coated with powder epoxy paint (colour close to **RAL 9002**).

On CDN 205, 305, 405, 505 and 605 units, two access panels are provided to get access to control box and refrigerant components.

On CDN 405M unit, the access to compressor is obtained through hinged control box. Side panel can be removed for major servicing.

On CDN 755 & 905 units, one access panel is provided to allow access first to control box; then, to refrigerant components thanks to the hinged control box.

## Compressors

Each unit is equipped with one or two (according to the models) hermetic Scroll compressors.

The compressors are mounted on rubber anti-vibration pads. The motors, refrigerant gas cooled type, are equipped with automatic reset internal thermal protection.

Crankcase heater is supplied on each compressor.

## Evaporator

Evaporator shall be provided by the installer. Its capacity must correspond to that of condensing unit for the correct operation of installation.

## Condenser Coils

Condenser coils consist of copper tubes arranged in a staggered row pattern. Each coil is mechanically expanded into aluminium fins with full collars.

## Condenser Fans and Motors

Units are equipped with low noise direct drive propeller fans consisting of two types of aerodynamic blades : plastic (610 mm diameter) and aluminium (800 mm diameter).

On two circuit units, CDN 405 to 905, independent air flow is provided on each circuit.

Fans are driven by single or 3-phase motors (according to the models) with automatic reset internal thermal protection.

## Refrigerant Equipment

Each refrigerant circuit is supplied with LP & HP tapping points and filter-drier. It is charged with nitrogen to protect the circuit and has brazed connections.

3 levels of refrigerant equipment are available :

- **BAZ version** : complete with standard components as stated above plus fan speed controller.
- **BAC version** : same as BAZ version plus suction accumulator.
- **BAL version** : same as BAZ version plus suction accumulator and liquid receiver.

## Electrical Box

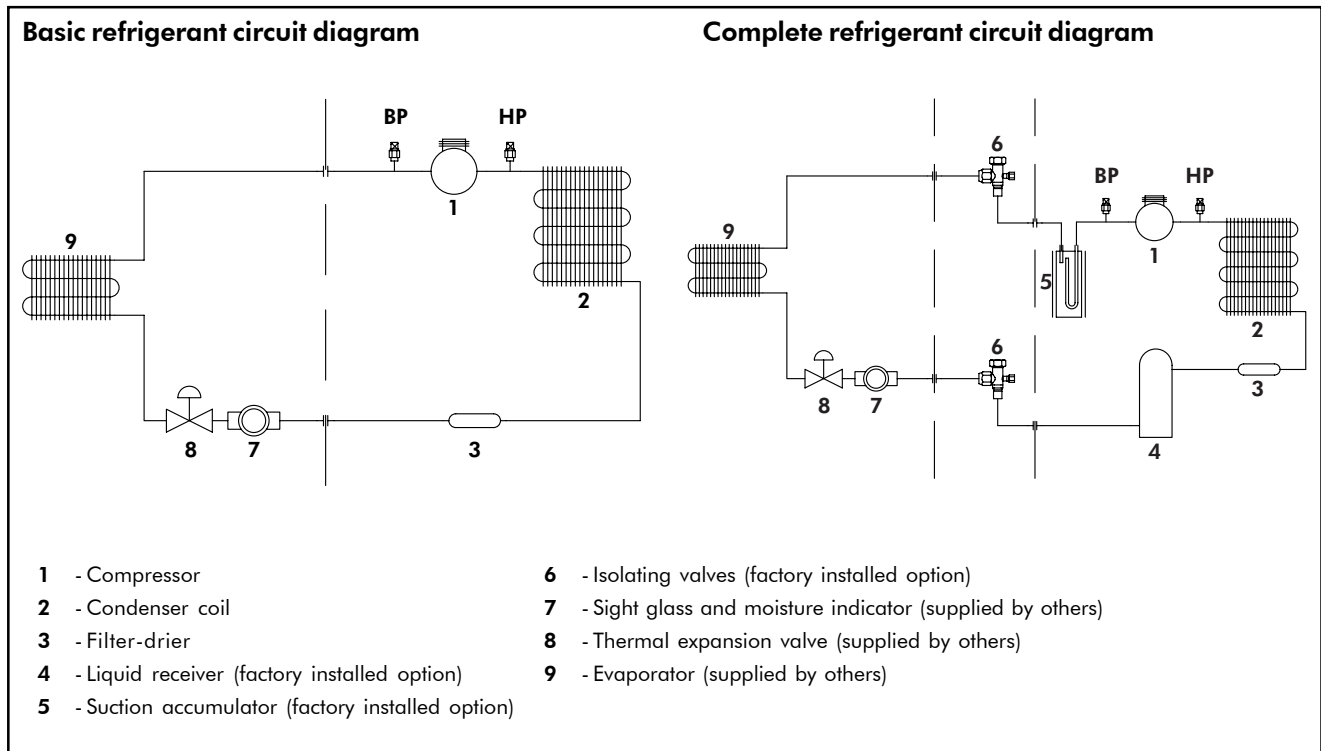
All electrical equipment required for proper unit operation is located in a weatherproof electrical control box including :

- Main disconnect switch (wired but not mounted),
- Phase monitor,
- Compressor contactor with thermal relay,
- Control circuit fuse,
- Anti-short cycle relay,
- Automatic reset LP switch,
- Manual reset HP switch,
- Fan speed controller (voltage variation for single phase motors and frequency drive for 3-phase motors),
- Main terminal strip for On/Off by 230V dry contact from thermostat or other external control (not provided).

## Accessories and Options

- CAC CONTROLLER electronic control system,
- RCW2 multi-unit electronic programmable thermostat (available with CAC CONTROLLER only),
- ModBus interface with or without AircoNet (available with CAC CONTROLLER only),
- Factory-installed isolating valves.

# Refrigerant Circuit Diagram



## Operating Limits

Description	Mini.	Maxi.
Ambient air temperature °C	-10 (*)	46

(\*) Equipped with fan speed controller.

## Correction Factors

### Altitude factors

Altitude (meters)	Cooling Capacity (kW)	Power Input
0	1.000	1.000
600	0.987	1.01
1200	0.973	1.02
1800	0.958	1.029
2400	0.943	1.038

### Condenser fouling factors

Fouling factor m <sup>2</sup> .°C/kW	Correction factors	
	Cooling Capacity (kW)	Power Input
0.044	1.000	1.000
0.088	0.987	1.023
0.176	0.955	1.068
0.352	0.910	1.135

## Physical Data

CDN models		205	305	405M	405	505	605	755	905
Cooling capacity (1)	kW	18.6	27.8	36	35.1	44.4	55.6	69.1	83
Total power input (1)	kW	6.49	9.5	12.37	12.98	16.1	19	22.9	27.5
Number of refrigerant circuits		1	1	1	2	2	2	2	2
<b>Compressors</b>									
Type		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Number		1	1	2	2	2	2	2	2
Startup type		direct	direct	direct	direct	direct	direct	direct	direct
Supply voltage	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
<b>Condenser coils</b>									
Number		1	1	1	2	2	2	2	2
Total face area	m <sup>2</sup>	1.6	2.05	2.78	2.55	3.65	3.65	5.57	6.36
Number of rows		2	2	2	2	2	3	2	2
<b>Condenser fans</b>									
Number		1	1	1	2	2	2	2	2
Diameter		610	610	800	610	610	610	800	800
Air volume	m <sup>3</sup> /h	8600	9000	16000	2 x 9000	2 x 9000	2 x 9000	2 x 16000	2 x 16000
<b>Condenser fan motors</b>									
Total power input	kW	0.65	0.88	0.9	2 x 0.88	2 x 0.88	2 x 0.88	2 x 0.9	2 x 0.9
Rotational speed	rpm	900	900	700	900	900	900	700	700
Supply voltage	V/Ph/Hz	230/1/50	230/1/50	400/3/50	230/1/50	230/1/50	230/1/50	400/3/50	400/3/50
<b>Refrigerant connections</b>									
Suction line	inch	1"1/8	1"1/8	1"3/8	1"1/8	1"1/8	1"1/8	1"3/8	1"3/8
Liquid line	inch	1/2	1/2	5/8	1/2	1/2	1/2	5/8	5/8
<b>Dimensions and weight</b>									
Length	mm	900	1003	1003	1708	1708	1708	2213	2213
Width	mm	800	1003	1003	1123	1123	1123	1345	1345
Height	mm	1060	1094	1250	972	1171	1171	1304	1454
Weight	kg	164	187	245	317	378	405	490	530

(1) Data based on 7 °C dew point evaporating temperature and 35 °C ambient temperature.

## Electrical Data

CDN models		205	305	405M	405	505	605	755	905
Power supply		400 V / 3 Ph / 50 Hz + Neutral + Earth							
Maximum current	A	16.5	24	32	38	39	47	56	67
Maximum starting current	A	104	131	121	123	113	153	192	234
aM fuses	A	20	25	40	40	40	50	63	80

## Sound Data

### Sound power levels - Lw in dB(A)

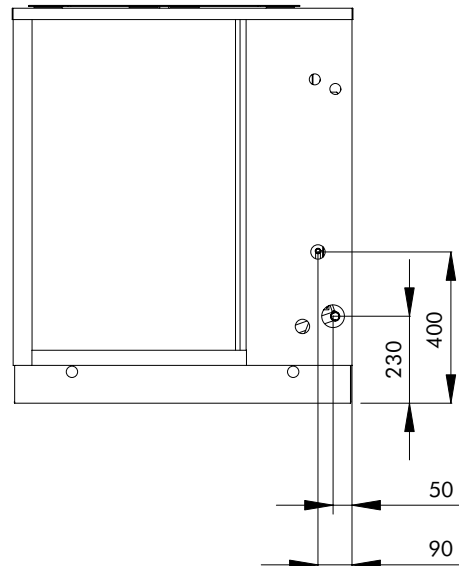
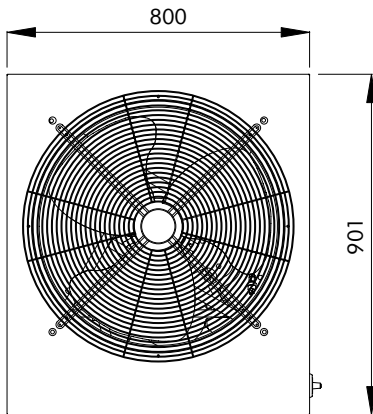
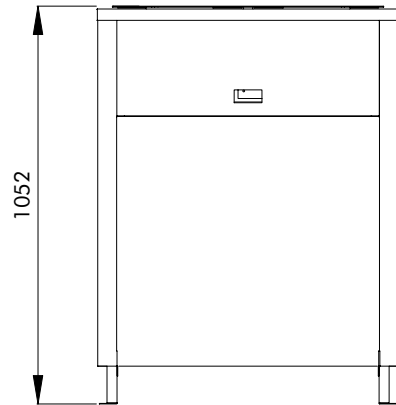
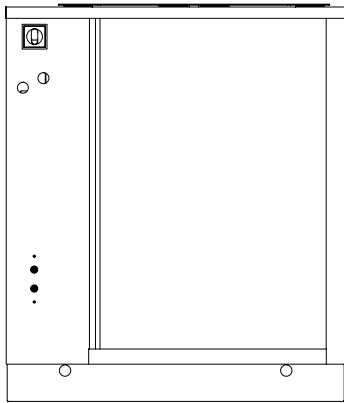
CDN models	Frequencies (Hz)						Lw global dB(A)
	125	250	500	1000	2000	4000	
205	62.0	65.0	70.7	75.2	70.2	65.6	78
305	64.5	71.6	76.1	77.4	75.5	68.4	82
405M	68.0	73.0	76.4	77.7	74.7	74.1	83
405	64.4	68.5	74.7	78.3	74.6	72.8	82
505	73.2	75.3	78.1	79.4	75.5	69.2	84
605	71.7	78.7	83.5	81.0	78.8	71.1	87
755	71.0	76.2	80.7	80.7	81.1	75.6	87
905	71.0	76.7	81.6	81.0	80.7	77.6	87

# Cooling Capacities

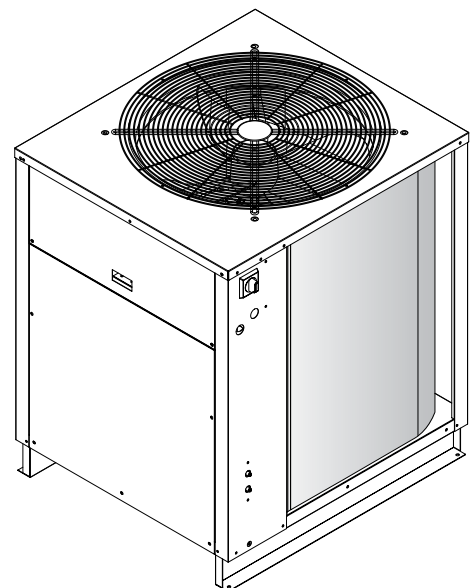
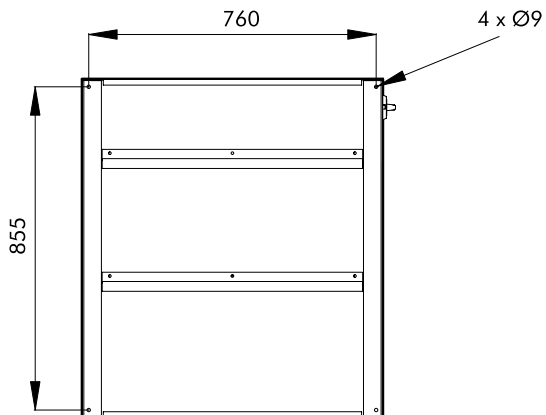
CDN Models	Dew point evap. temp. (°C)	Ambient air temperature (°C)									
		25		30		35		40		45	
		Cool. Cap. (kW)	Power Input (kW)	Cool. Cap. (kW)	Power Input (kW)	Cool. Cap. (kW)	Power Input (kW)	Cool. Cap. (kW)	Power Input (kW)	Cool. Cap. (kW)	Power Input (kW)
205	3	18.06	5.08	17.09	5.61	16.12	6.15	15.16	6.68	14.19	7.22
	5	19.31	5.20	18.31	5.76	17.31	6.31	16.31	6.87	15.31	7.42
	7	20.52	5.35	19.55	5.92	<b>18.57</b>	<b>6.49</b>	17.59	7.06	16.62	7.63
	9	22.21	5.53	21.02	6.10	19.83	6.66	18.64	7.22	17.45	7.78
	11	23.47	5.65	22.35	6.24	21.23	6.83	20.11	7.43	18.98	8.02
	13	25.31	5.79	23.93	6.39	22.54	6.98	21.16	7.57	19.78	8.17
305	3	27.04	7.43	25.59	8.22	24.14	9.00	22.69	9.78	21.24	10.57
	5	28.90	7.62	27.41	8.43	25.91	9.24	24.42	10.05	22.93	10.86
	7	30.72	7.83	29.26	8.66	<b>27.80</b>	<b>9.50</b>	26.34	10.34	24.88	11.17
	9	33.25	8.10	31.47	8.92	29.69	9.75	27.90	10.57	26.12	11.39
	11	35.14	8.27	33.46	9.14	31.78	10.00	30.10	10.87	28.42	11.74
	13	37.89	8.48	35.82	9.35	33.75	10.22	31.68	11.08	29.61	11.95
405M	3	35.02	9.68	33.14	10.70	31.26	11.72	29.38	12.74	27.50	13.76
	5	37.43	9.92	35.49	10.98	33.56	12.03	31.62	13.09	29.69	14.14
	7	39.79	10.19	37.89	11.28	<b>36.00</b>	<b>12.37</b>	34.11	13.46	32.21	14.55
	9	43.06	10.54	40.75	11.62	38.44	12.69	36.14	13.76	33.83	14.84
	11	45.51	10.77	43.33	11.90	41.16	13.03	38.98	14.15	36.80	15.28
	13	49.06	11.04	46.38	12.17	43.70	13.30	41.02	14.43	38.34	15.56
405	3	34.18	10.16	32.35	11.23	30.51	12.30	28.68	13.37	26.84	14.44
	5	36.53	10.41	34.64	11.52	32.76	12.62	30.87	13.73	28.98	14.84
	7	38.84	10.70	36.99	11.84	<b>35.14</b>	<b>12.98</b>	33.29	14.12	31.44	15.26
	9	42.03	11.06	39.78	12.19	37.52	13.32	35.27	14.44	33.02	15.57
	11	44.42	11.30	42.30	12.48	40.17	13.67	38.05	14.85	35.92	16.04
	13	47.89	11.59	45.28	12.77	42.66	13.96	40.04	15.15	37.43	16.33
505	3	43.19	12.60	40.87	13.93	38.55	15.25	36.24	16.58	33.92	17.91
	5	46.16	12.91	43.77	14.28	41.39	15.66	39.00	17.03	36.62	18.41
	7	49.07	13.27	46.73	14.68	<b>44.40</b>	<b>16.10</b>	42.07	17.52	39.73	18.93
	9	53.10	13.72	50.26	15.12	47.41	16.52	44.57	17.91	41.72	19.31
	11	56.13	14.02	53.44	15.48	50.76	16.95	48.07	18.42	45.39	19.89
	13	60.51	14.37	57.21	15.84	53.90	17.32	50.60	18.79	47.29	20.26
605	3	54.09	14.87	51.18	16.43	48.28	18.00	45.38	19.56	42.47	21.13
	5	57.80	15.24	54.82	16.86	51.83	18.48	48.84	20.10	45.85	21.72
	7	61.45	15.66	58.52	17.33	<b>55.60</b>	<b>19.00</b>	52.68	20.67	49.75	22.34
	9	66.50	16.20	62.94	17.84	59.37	19.49	55.81	21.14	52.25	22.79
	11	70.28	16.54	66.92	18.27	63.56	20.01	60.20	21.74	56.84	23.47
	13	75.78	16.96	71.64	18.70	67.50	20.43	63.36	22.17	59.22	23.91
755	3	67.22	17.92	63.61	19.81	60.00	21.69	56.39	23.58	52.78	25.47
	5	71.84	18.36	68.12	20.32	64.41	22.27	60.70	24.23	56.99	26.18
	7	76.37	18.87	72.73	20.89	<b>69.10</b>	<b>22.90</b>	65.47	24.91	61.83	26.93
	9	82.64	19.52	78.22	21.51	73.79	23.49	69.36	25.48	64.93	27.46
	11	87.35	19.94	83.17	22.03	79.00	24.11	74.82	26.20	70.64	28.29
	13	94.18	20.44	89.03	22.54	83.89	24.63	78.74	26.72	73.60	28.81
905	3	80.74	21.52	76.41	23.79	72.07	26.05	67.74	28.32	63.40	30.58
	5	86.29	22.05	81.83	24.40	77.37	26.75	72.91	29.09	68.45	31.44
	7	91.73	22.66	87.36	25.08	<b>83.00</b>	<b>27.50</b>	78.64	29.92	74.27	32.34
	9	99.27	23.44	93.95	25.83	88.63	28.21	83.31	30.60	77.99	32.98
	11	104.92	23.94	99.90	26.45	94.89	28.96	89.87	31.46	84.85	33.97
	13	113.12	24.55	106.94	27.06	100.76	29.58	94.58	32.09	88.40	34.60

**Note :** For conditions different from those indicated in capacity table above, interpolation is allowed; however, extrapolation is not permitted.

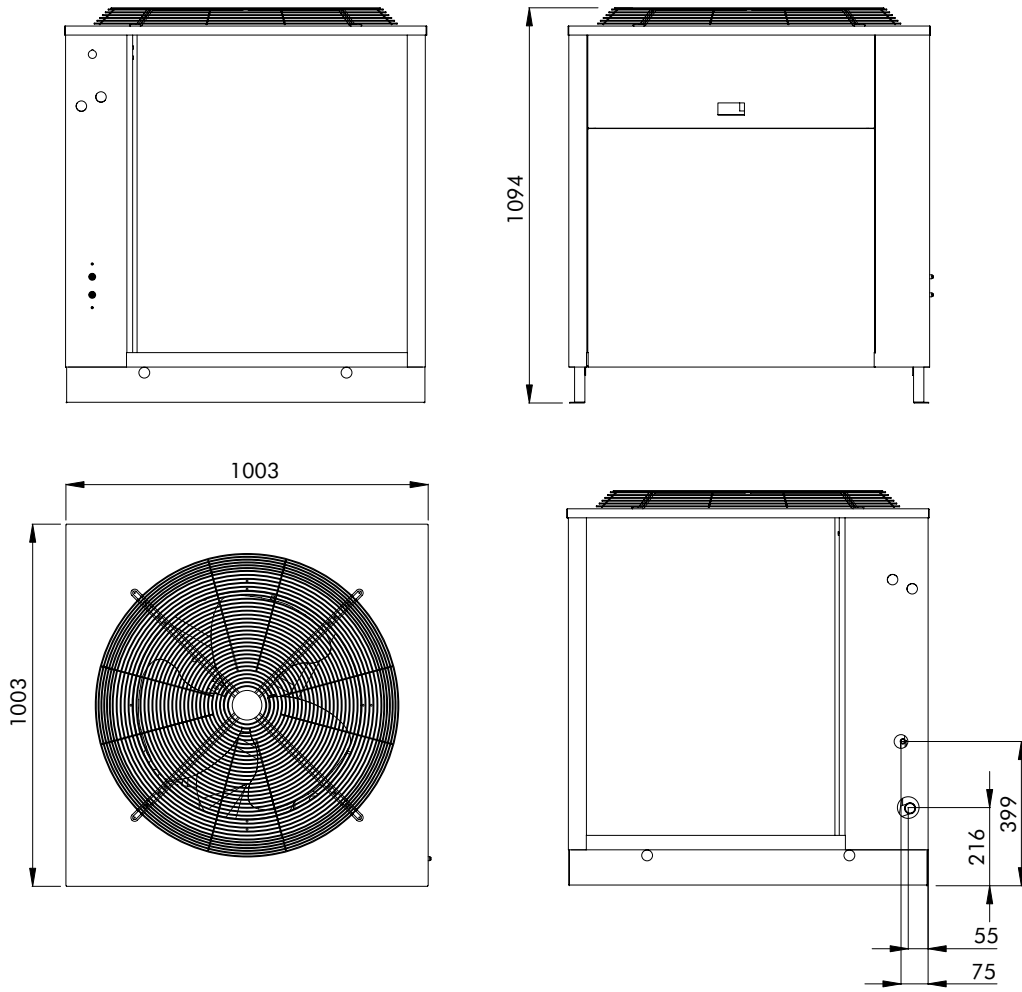
# Dimensions - CDN 205



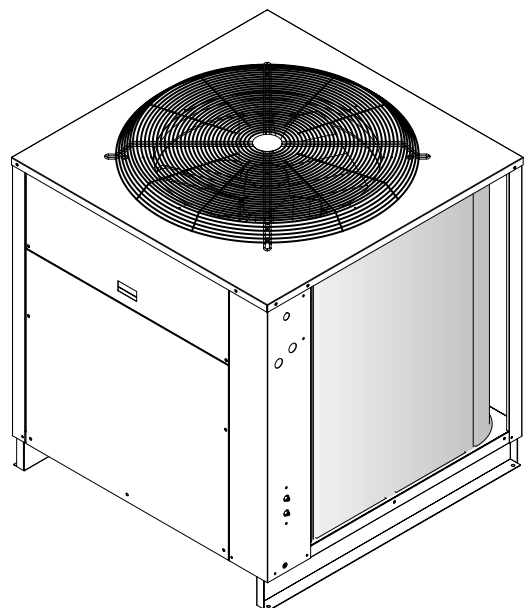
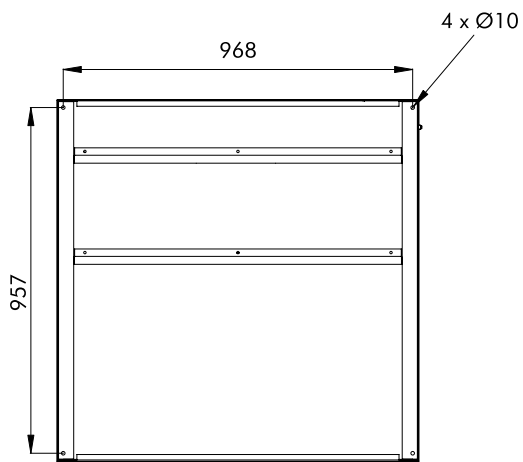
## Vibration isolator fixing points - Bottom view



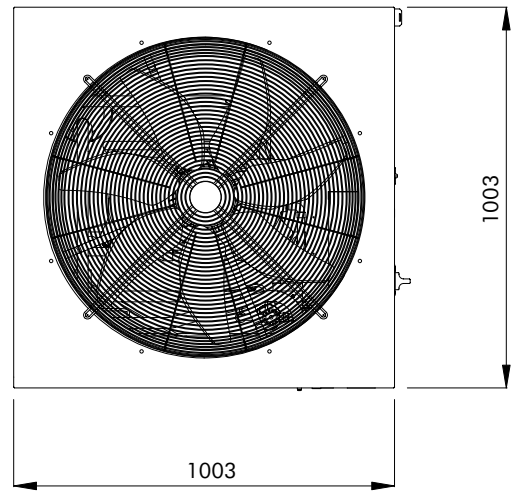
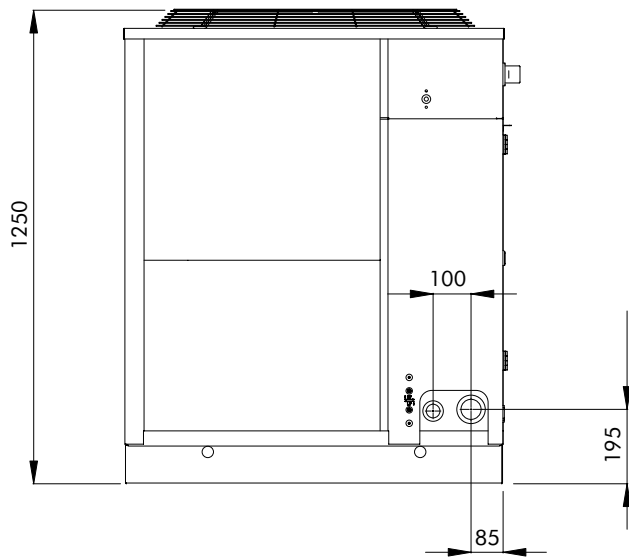
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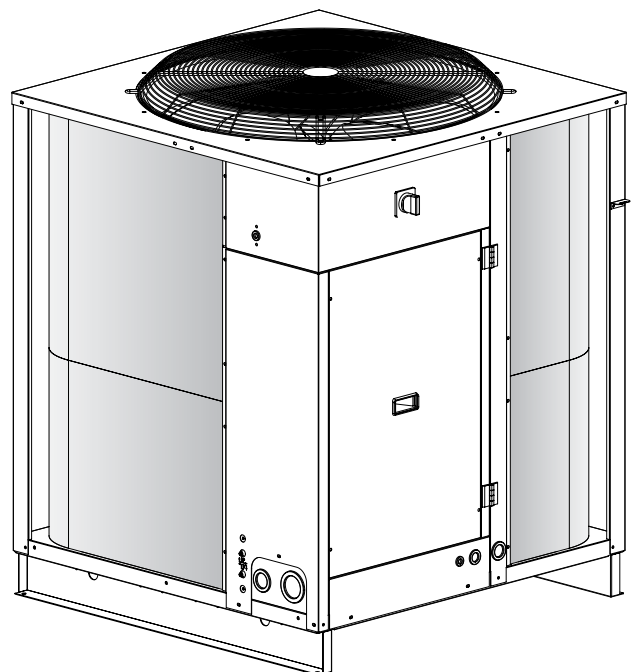
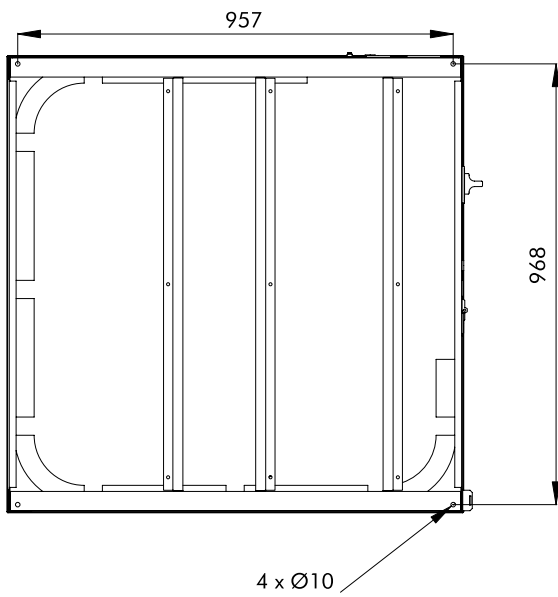
## Vibration isolator fixing points - Bottom view



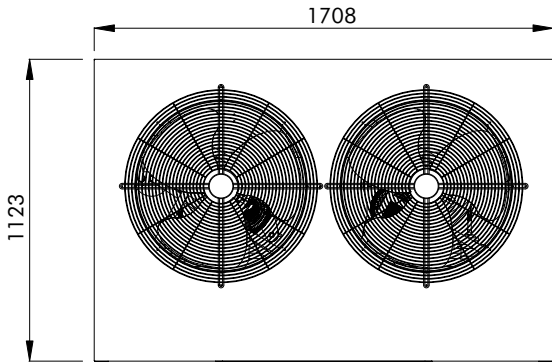
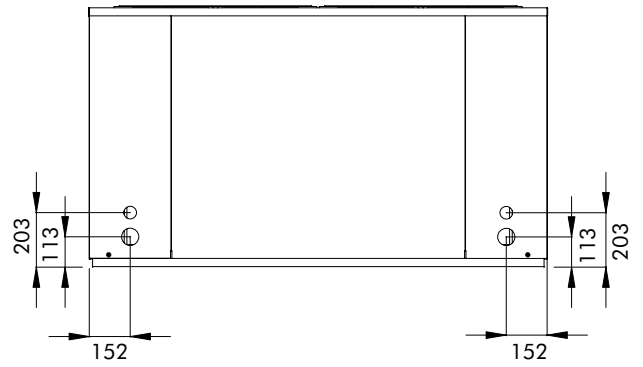
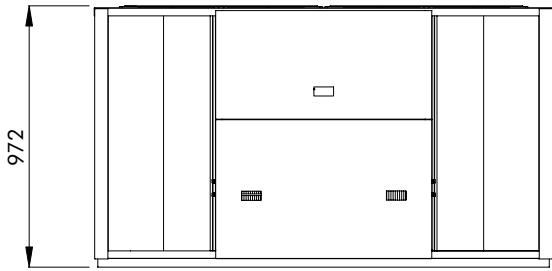
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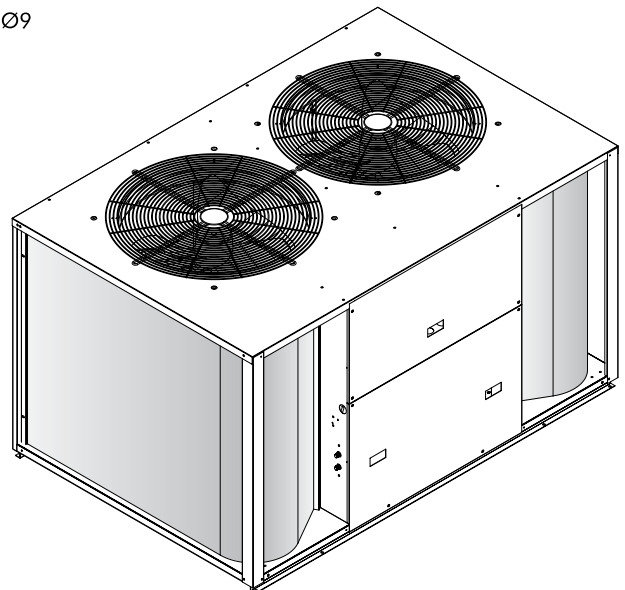
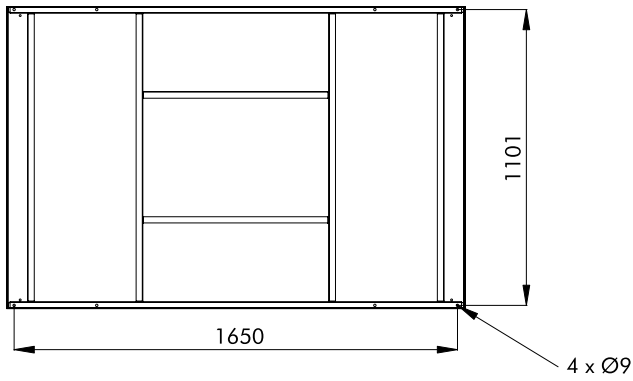
## Vibration isolator fixing points - Bottom view



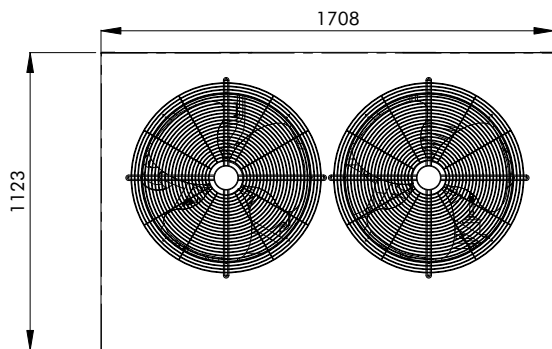
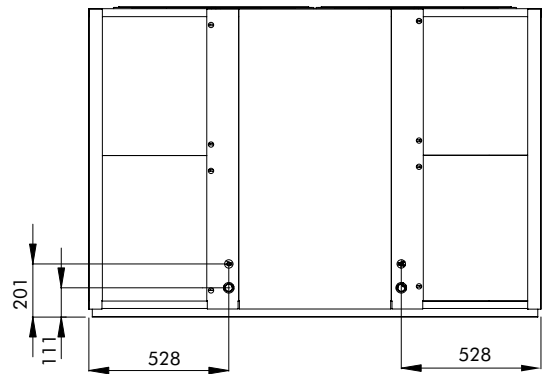
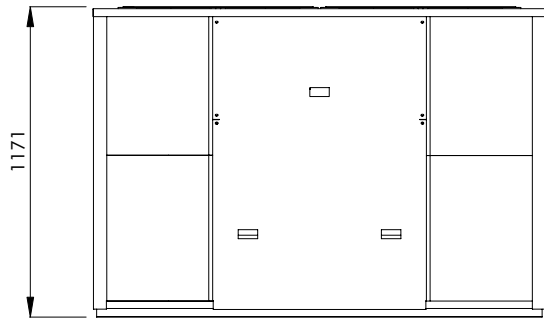
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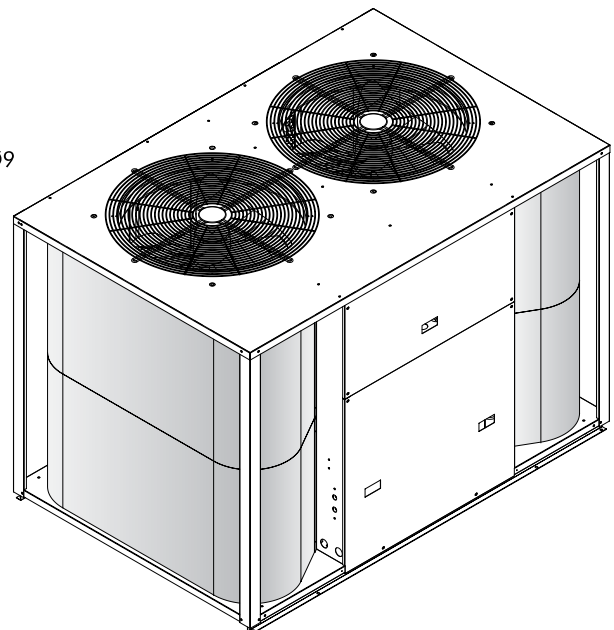
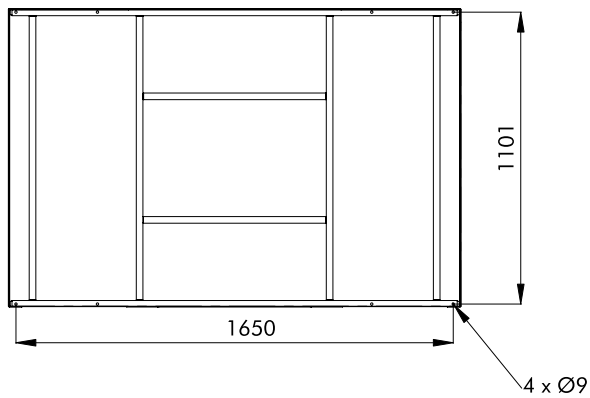
## Vibration isolator fixing points - Bottom view



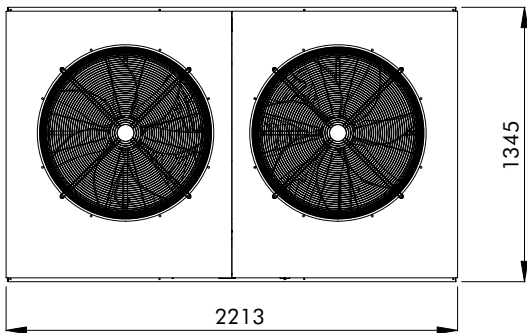
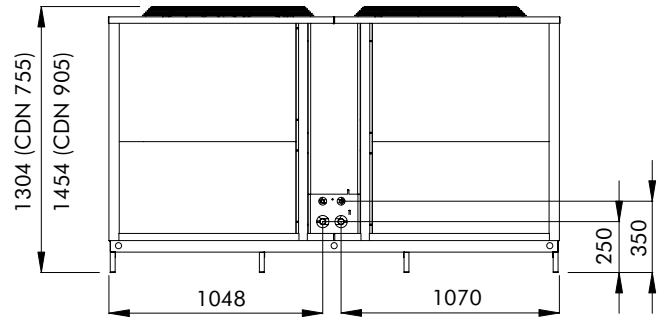
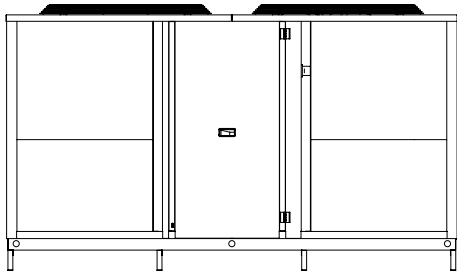
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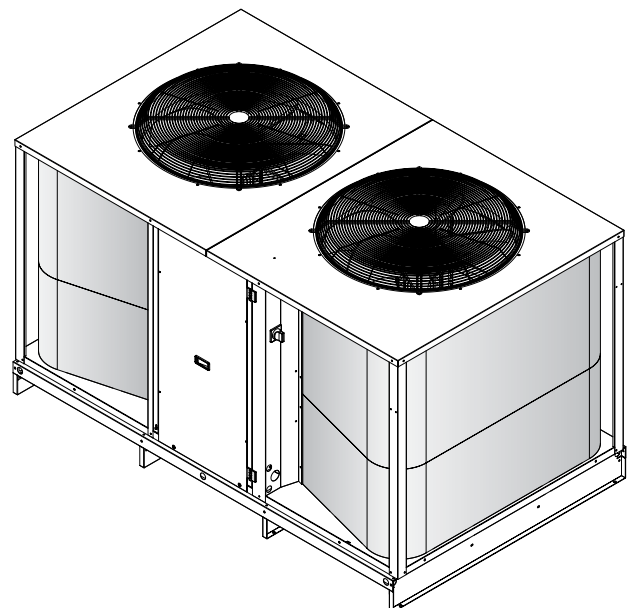
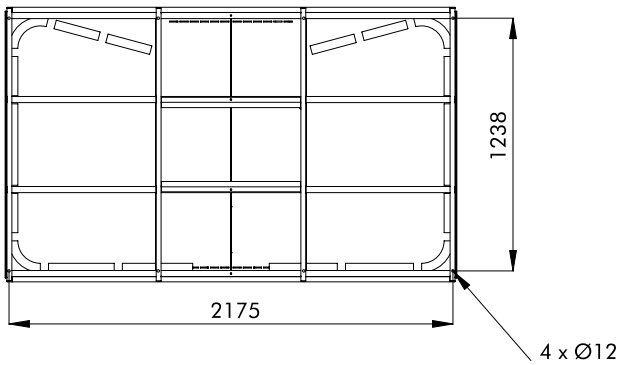
## Vibration isolator fixing points - Bottom view



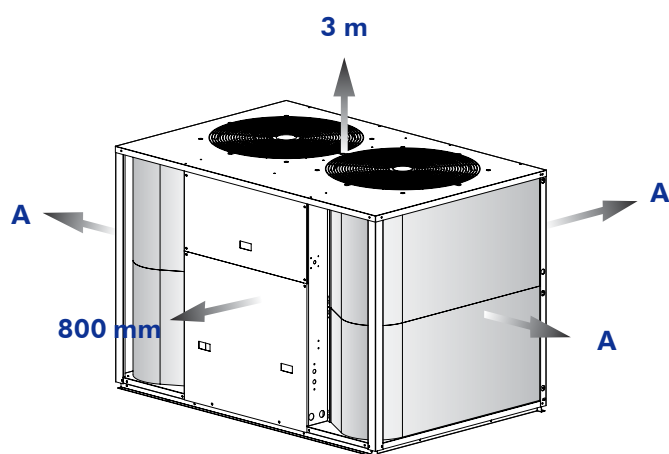
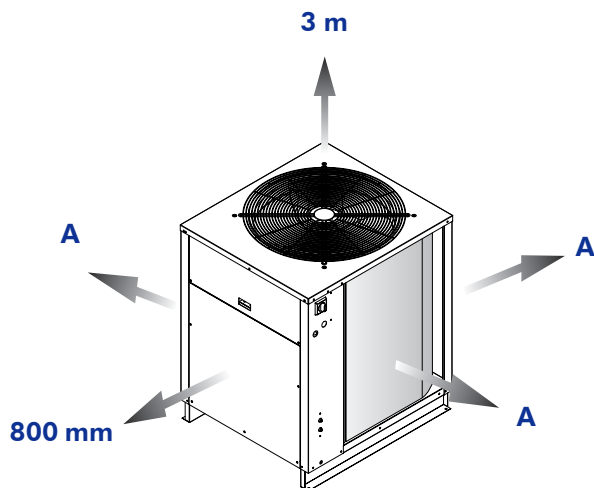
# Dimensions - CDN 755-905



## Vibration isolator fixing points - Bottom view



# Clearance Requirements



## Minimum clearances

CDN models	205	305	405M	405	505	605	755	905
A	500			800			1000	



As part of our ongoing product improvement programme, our products are subject to change without prior notice. Non contractual photos.

**Wesper**  
 42 cours Jean-Jaurès  
 17800 Pons  
 FRANCE

☎ : +33-5 46 92 33 33  
 📠 : +33-5 46 91 38 33 / 5 46 91 26 44 (Export Department)  
 www.wesper.com

