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Multi-DENCO[®]

TECHNICAL DATA



Type Code Basic Unit

Multi-DENCO

Example

D	M	A	0	1	0	D	P	S	I	S	4	P	E	1
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	Product	Range	Cooling System	Unit Size	Airflow Direction	Panel Configuration	Heat Exchanger	Compressor Control	Humidifier	Filter	Fan	Heating	Power Supply
D	DENCO												
M	Multi-DENCO												
A	Air cooled												
C	Chilled water												
X	Split system												
010	Size 010												
018	Size 018												
030	Size 030												
045	Size 045												
065	Size 065												
092	Size 092												
130	Size 130												
D	Downflow												
U	Upflow												
P	Front full height panel												
F	Front air inlet grille panel												
L	Front low level air discharge panel												
S	Standard heat exchanger												
L	Large heat exchanger												
C	CombiCool												
I	Inverter compressor scroll												
F	Fixed speed compressor scroll												
N	Not fitted												
S	Steam humidifier standard conductivity												
L	Steam humidifier low conductivity												
H	Steam humidifier high conductivity												
N	Not fitted												
4	Filter G4												
7	Filter F7												
2	Filter washable G2												
P	EC plug fan												
E	Electric heating												
T	Modulating electric heating												
W	Hot water heating												
R	Remote signal 0-10 V												
N	Not fitted												
1	3~ 400 V, N, PE, 50 Hz												
7	3~ 400 V, N, PE, 60 Hz												

NOTES!

Full selection typecode available on page 40.

Some options are only available in certain regions. Full type code is displayed above and particular combinations of options are not feasible. For further details please contact your local office.

FläktGroup reserves the right to modify/change/amend and update design and options without prior notice.



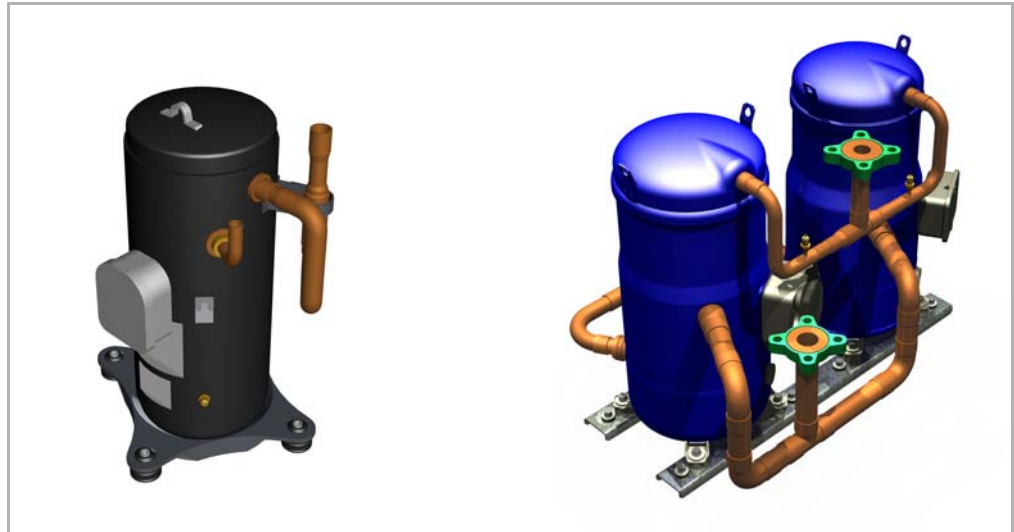
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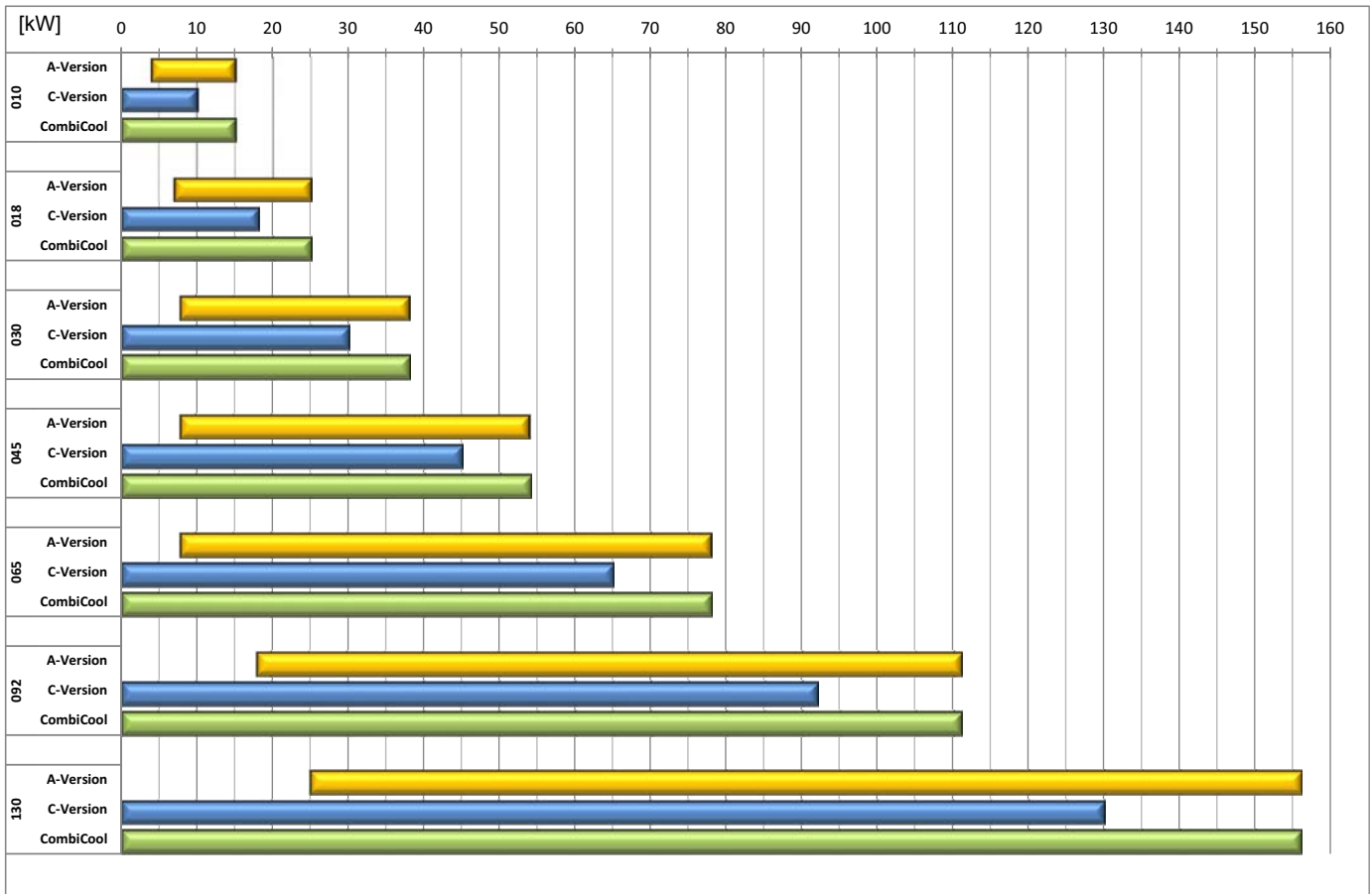
The Multi-DENCO range utilises inverter technology in the compressors to ensure that no energy is wasted in achieving the cooling demand of the room.

The compressors used in either a single compressor or tandem operation.



The technology brings several advantages:

- Variable control to reduce consumption by lower pressure difference in part load compared to fixed speed compressors
- Greater accuracy of control with ability to control temperatures up to +/- 0.3 °C
- Reduction in the number of stop/starts required by the compressor; therefore increasing the part's durability and extending its total lifespan
- Self-regulation of oil return: compressors have the ability to monitor oil and time spent running at lower speeds, they can then perform 'oil return boost' and protect themselves from damage
- Quieter operation: reduction in number of starts means less noise created during operation
- Permanent magnet motor technology provides greater efficiency compared to an equivalent induction motor and enables the compressors to respond faster to speed or load changes
- Lower minimum operating capacity: for example DMA065 can operate from capacities as low as 8 kW, DMA130 can operate from 25 kW



Pic. 1: Data calculated using 24 °C Supply Temperature, 45 % Relative Humidity, 45 °C Condensing Temperature. FläktGroup reserves the right to modify data without prior notice.

Operating Limits – Airflow

Size	Min		Max	
	m ³ /h	m ³ /s	m ³ /h	m ³ /s
10	1,197	0.33	2,993	0.83
18	2,059	0.57	5,148	1.43
30	3,456	0.96	8,640	2.40
45	5,089	1.41	12,722	3.53
65	7,335	2.04	18,338	5.09
92*	10,368	2.88	23,740	6.59
130*	14,904	4.14	33,100	9.19

* Airflow only valid for A-Version units. Other versions may vary.

Operating Limits – Temperature

Version	Air Inlet Temperature		Condensing Temp
	Min	Max	
	°C	°C	°C
A-Version	10	30	63
C-Version	10	40	N/A
CombiCool	10	40	63 / N/A

Cabinet



The cabinet is made of aluminium profile frame painted black connected together using aluminium triangular gussets and white laminate panels that are removable using a screwdriver to allow access.

The front curved doors are hinged, but removable and houses the touchscreen display in standard configuration.

The panels are insulated according to "O" class using non-eroding material and provide both acoustic and thermal insulation.

Cooling Coil



Inclined, high performance coil with rippled aluminium fins, spaced at 1.8 mm.

Aluminium intermediate drip tray with a stainless steel condensate drain tray with U trap.

For A-Version: Copper tubes 4 rows deep

For C-Version: 4 row and 6 row coils available

For CombiCool: 3 row / 3 row configuration used
(A-Version + CombiCool or C-Version + CombiCool)

Fans



Direct driven variable speed high efficiency EC plug fan with 7 backward curved three dimensional profiled blades.

Impeller optimally balanced according to ISO1940 and fan speed modulates on standard settings.

Variable speed regulation is performed using a 0-10 V controller signal.

Electronic Expansion Valve (EEV)



Used within A-Version (with or without CombiCool) units, the EEV comprises of a valve, pressure sensor and temperature sensor.

The EEV has the ability to close itself in the event of a power failure by using a power supply stored with the controller.

The EEV comes with an in built sight glass also.

Electric Heaters



Units with electrical heating are equipped with sturdy sheathed elements with stainless steel finning and are rated to operate at black heat in order to prevent annealing conditions and sparking.

Overheat protection is provided through a thermostat (Klixon).

The available heating duty is sufficient to prevent low supply temperatures in the dehumidification mode.

Air Filters



The filters have 30 % ASHRAE 52/76 standard, Eurovent 4/5, efficiency rate 90 % (G4).

The filters are installed before the heat exchanger in the return air flow and are held by quick release retaining clips/wire.

They are accessible from the front doors for replacement.

Humidifier



An electrode boiler humidifier can be installed into the bottom of the unit to allow humidity to be controlled.

The humidifier generates steam using proportional regulation of untreated mains cold water.

Electrode boiler humidifiers generate sterile, odourless and steam free of mineral deposits.

The humidifier has an inlet hose connection and a water drain connection to remove any remaining water.

Compressors and Inverter



Multi-DENCO units use variable speed inverter compressors.

These operate using R410A gas and have a high efficiency using a permanent magnet and brushless DC Motors.

Within the unit, the configuration can be; single compressor, in tandem with a fixed speed compressor or used in tandem with another inverter compressor.

The compressors are provided with Neoprene anti-vibrational mounts, motor protection against overcurrent and thermal overload and are able to perform periodical oil reclaim on a cyclical basis.

Units using only fixed speed compressors are only available for sizes 010 and 018.

Microprocessor Control



C5-12 capable of:

- Controlling temperature, humidity and performing auto-restart after power failure.
- Monitoring all digital and analogue inputs and outputs
- Acoustic alarms for issues with temperature, humidity, airflow, humidifier and communication faults.
- Networking, sensor averaging and auto-changeover

Touch Screen Display



4.3" colour touch screen display that is mounted into one of the front doors of the units (Standard Configuration).

The display settings are separated into three levels, allowing for password control from access to system settings.

The displays are able to switch between several languages and alarms are displayed in plain text.

Temperature and Humidity Sensor



Temperature and humidity readings fed back to the CCU are critical for controlling the unit. There are several arrangements available with the sensors to ensure you know the conditions of your room that can be classified into two types:

- **Return Air** – the sensor is taking measurements of air entering the CCU from the room
- **Supply Air** – Air that is leaving/has left the CCU

The following arrangements are available:

- 1: **Return Air:** T&H inside the CCU / **Supply Air:** N/A
- 2: **Return Air:** T&H up to 10m from CCU / **Supply Air:** N/A
- 3: **Return Air:** T&H inside the CCU / **Supply Air:** T ONLY inside the CCU
- 4: **Return Air:** T&H inside the CCU / **Supply Air:** T ONLY up to 10m from CCU
- 5: **Return Air:** T&H inside the CCU / **Supply Air:** T&H up to 10m from CCU
- 6: **Return Air:** T&H up to 10m from CCU / **Supply Air:** T ONLY inside the CCU
- 7: **Return Air:** T&H up to 10m from CCU / **Supply Air:** T&H up to 10m from CCU

Unit Size		010			018			030			045		
Duty Required ²	%	100	100	70	100	100	70	100	100	70	100	100	70
Conditions													
Air Inlet Temperature	°C	24	26	26	24	26	26	24	26	26	24	26	26
Relative Humidity	%	50	40	40	50	40	40	50	40	40	50	40	40
Air Volume	m ³ /h	2,993	2,993	2,095	5,148	5,148	3,604	8,640	8,640	6,048	12,722	12,722	8,905
Air Volume	m ³ /s	0.83	0.83	0.58	1.43	1.43	1.00	2.40	2.40	1.68	3.53	3.53	2.47
Cooling Duty ¹													
Gross Total Capacity	kW	10.1	10.7	7.6	18.6	18.6	12.8	30.6	30.2	21.6	45.2	45.2	32.6
Net Total Capacity	kW	9.5	10.1	7.3	17.0	16.9	12.2	29.1	28.7	20.9	42.7	42.6	31.5
SHR		0.98	1.00	1.00	0.95	1.00	1.00	0.96	1.00	1.00	0.96	1.00	1.00
EER Indoor		3.63	3.80	4.15	3.17	3.37	4.23	3.78	3.97	4.85	3.59	3.73	4.26
Power Consumption													
Power Consumption (Cooling)	kW	3.0	3.0	2.0	6.3	5.9	3.4	8.9	8.4	5.2	13.7	13.2	8.7
Compressor(s)	kW	2.2	2.2	1.5	4.3	3.9	2.4	6.6	6.1	3.8	10.1	9.6	6.6
Indoor Fans	kW	0.6	0.6	0.3	1.6	1.6	0.6	1.5	1.5	0.7	2.5	2.5	1.0
Outdoor Fans ⁴	kW	0.2	0.2	0.2	0.4	0.4	0.4	0.8	0.8	0.8	1.1	1.1	1.1
Misc Data													
Minimum Capacity	kW	4			7			8			8		
Maximum Capacity	kW	15			25			38			54		
Fan Quantity		1			1			1			1		
Number of Compressors		1			1			1			2		
Compressor Configuration		Inv			Inv			Inv			Inv + Fix		
Humidifier Capacity	kg/h	3.0			3.0			8.0			8.0		
Electrical Heating	kW	4.0			6.0			9.0			12.0		
Sound Power Level @ 100 %	dB(A)	80			90			86			94		
Air Filter (Standard G4)													
Quantity		2			2			2			3		
Height	mm	490			620			1136			1084		
Width	mm	375			510			442			457		
Depth	mm	50			50			50			50		
Connection Size													
Discharge Line	inch	1/2			5/8			5/8			3/4		
Liquid Line	inch	3/8			1/2			5/8			3/4		
Humidifier Feed	mm	15			15			15			15		
Condensate Drain ³	mm	22			2 x 22			2 x 22			2 x 22		
Example Air Cooled Condenser ⁴													
Unit Type		DMOUCD013E			DMOUCD026E			DMOUCD050E			DMOUCD075E		
Quantity		1			1			1			1		
Refrigeration Circuits		1			1			1			1		

NOTES!

Data is taken from downflow configuration and is representational of upflow arrangement.

1: Units operating with a 45°C condensing temperature.

2: Duty required is a % of the nominal, i.e. 100% = unit size in kW.

3: "2 x" refers to two separate connections for condensate; only if humidifier is fitted. When there is no humidifier then only 1 connection is used. When "2x" is not used, one common drain incorporates both types.

4: Outdoor unit used are examples for the conditions used in this dataset.

For details of all outdoor units available please refer to the next section of this document.



Unit Size		065			092			130		
Duty Required ²	%	100	100	70	100	100	70	100	100	70
Conditions										
Air Inlet Temperature	°C	24	26	26	24	26	26	24	26	26
Relative Humidity	%	50	40	40	50	40	40	50	40	40
Air Volume	m ³ /h	18,338	18,338	12,837	23,745	23,745	16,622	33,100	33,100	23,170
Air Volume	m ³ /s	5.09	5.09	3.57	6.60	6.60	4.62	9.19	9.19	6.44
Cooling Duty ¹										
Gross Total Capacity	kW	67.5	65.2	47.3	93.1	92.1	65.6	131.4	132.9	91.9
Net Total Capacity	kW	63.4	61.1	45.6	85.8	84.9	62.8	120.7	122.1	87.7
SHR		0.95	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
EER Indoor		3.45	3.79	4.62	3.31	3.35	3.90	3.24	3.37	4.02
Power Consumption										
Power Consumption (Cooling)	kW	21.1	18.8	11.8	30.3	29.7	19.0	43.8	42.5	26.0
Compressor(s)	kW	15.4	13.1	8.5	20.9	20.3	14.1	29.8	28.6	18.6
Indoor Fans	kW	4.1	4.1	1.7	7.2	7.2	2.7	10.8	10.8	4.2
Outdoor Fans ⁴	kW	1.6	1.6	1.6	2.2	2.2	2.2	3.2	3.2	3.2
Misc Data										
Minimum Capacity	kW	8			18			25		
Maximum Capacity	kW	78			111			156		
Fan Quantity		2			2			3		
Number of Compressors		2			2			2		
Compressor Configuration		Inv + Inv			Inv + Fix			Inv + Fix		
Humidifier Capacity	kg/h	8.0			15.0			15.0		
Electrical Heating	kW	12.0			18.0			18.0		
Sound Power Level @ 100 %	dB(A)	92			97			97		
Air Filter (Standard G4)										
Quantity		3			3			5		
Height	mm	1284			2 x 463			2 x 463		
Width	mm	552			528			456		
Depth	mm	50			50			50		
Connection Size										
Discharge Line	inch	7/8			1 1/8			1 3/8		
Liquid Line	inch	7/8			1 1/8			1 1/8		
Humidifier Feed	mm	15			15			15		
Condensate Drain ³	mm	2 x 22			22			22		
Example Air Cooled Condenser ⁴										
Unit Type		DMOUCD050E			DMOUCD075E			DMOUCD100E		
Quantity		2			2			2		
Refrigeration Circuits		1			1			1		

NOTES!

Data is taken from downflow configuration and is representational of upflow arrangement.

1: Units operating with a 45°C condensing temperature.

2: Duty required is a % of the nominal, i.e. 100% = unit size in kW.

3: "2 x" refers to two separate connections for condensate; only if humidifier is fitted. When there is no humidifier then only 1 connection is used. When "2x" is not used, one common drain incorporates both types.

4: Outdoor unit used are examples for the conditions used in this dataset.

For details of all outdoor units available please refer to the next section of this document.



Unit Size		010			018			030			045		
Duty Required ²	%	100	100	70	100	100	70	100	100	70	100	100	70
Conditions													
Air Inlet Temperature	°C	24	26	26	24	26	26	24	26	26	24	26	26
Relative Humidity	%	50	40	40	50	40	40	50	40	40	50	40	40
Air Volume	m ³ /h	2,993	2,993	2,095	5,148	5,148	3,604	8,640	8,640	6,048	12,722	12,722	8,905
Air Volume	m ³ /s	0.83	0.83	0.58	1.43	1.43	1.00	2.40	2.40	1.68	3.53	3.53	2.47
Cooling Duty ¹													
Gross Total Capacity	kW	10.7	11.9	9.0	18.4	20.4	15.6	31.1	34.5	26.4	46.0	51.0	39.1
Net Total Capacity	kW	10.1	11.2	8.7	16.8	18.8	15.0	29.6	33.0	25.7	43.5	48.5	38.0
SHR		0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
Power Consumption													
Power Consumption (Cooling)	kW	0.6	0.6	0.3	1.6	1.6	0.6	1.5	1.5	0.7	2.5	2.5	1.0
Indoor Fans	kW	0.6	0.6	0.3	1.6	1.6	0.6	1.5	1.5	0.7	2.5	2.5	1.0
Chilled Water Data													
Flow Rate	m ³ /h	1.80	2.20	1.40	3.20	3.60	2.50	5.40	5.80	4.70	7.90	8.60	6.80
Flow Rate	l/s	0.50	0.61	0.39	0.89	1.00	0.69	1.50	1.61	1.31	2.19	2.39	1.89
Unit Pressure Drop	kPa	44	59	30	45	55	30	46	54	34	33	40	25
Other Data													
Fan Quantity		1			1			1			1		
Humidifier Capacity	kg/h	3.0			3.0			8.0			8.0		
Electrical Heating	kW	4.0			6.0			9.0			12.0		
Sound Power Level @ 100%	dB(A)	80			90			86			94		
Air Filter (Standard G4)													
Quantity		2			2			2			3		
Height	mm	490			620			1136			1084		
Width	mm	375			510			442			457		
Depth	mm	50			50			50			50		
Connection Size													
Chilled Water Inlet	mm	22			28			35			42		
Chilled Water Outlet	mm	22			28			35			42		
Humidifier Feed	mm	15			15			15			15		
Condensate Drain	mm	22			22			22			22		

NOTES!

Data is taken from downflow configuration and is representational of upflow arrangement.

Units are using a 3 way valve with bypass. Other options are available.

1: Units operating a 5K approach (7/12), 100% water with a standard coil.

2: Duty required is a % of the nominal, i.e. 100% = unit size in kW.

Unit Size		065			092			130		
Duty Required ²	%	100	100	70	100	100	70	100	100	70
Conditions										
Air Inlet Temperature	°C	24	26	26	24	26	26	24	26	26
Relative Humidity	%	50	40	40	50	40	40	50	40	40
Air Volume	m ³ /h	18,338	18,338	12,837	23,745	23,745	16,622	33,100	33,100	23,170
Air Volume	m ³ /s	5.09	5.09	3.57	6.60	6.60	4.62	9.19	9.19	6.44
Cooling Duty ¹										
Gross Total Capacity	kW	67.8	75.1	57.5	98.9	107.2	81.1	135.6	147.3	111.6
Net Total Capacity	kW	63.7	71.0	55.8	84.0	100.0	78.3	124.8	136.5	107.4
SHR		0.94	1.00	1.00	0.92	1.00	0.99	0.93	1.00	0.99
Power Consumption										
Power Consumption (Cooling)	kW	4.1	4.1	1.7	7.2	7.2	2.7	10.8	10.8	4.2
Indoor Fans	kW	4.1	4.1	1.7	7.2	7.2	2.7	10.8	10.8	4.2
Chilled Water Data										
Flow Rate	m ³ /h	11.50	13.00	9.70	16.90	18.40	13.70	23.40	25.20	19.10
Flow Rate	l/s	3.19	3.61	2.69	4.69	5.11	3.81	6.50	7.00	5.31
Unit Pressure Drop	kPa	35	43	25	49	56	32	44	50	30
Other Data										
Fan Quantity			2			2			3	
Humidifier Capacity	kg/h		8.0			15.0			15.0	
Electrical Heating	kW		12.0			18.0			18.0	
Sound Power Level @ 100%	dB(A)		92			97			97	
Air Filter (Standard G4)										
Quantity			3			4			5	
Height	mm		1284			2 x 463			2 x 463	
Width	mm		552			495			523	
Depth	mm		50			50			50	
Connection Size										
Chilled Water Inlet	mm		54			54			67	
Chilled Water Outlet	mm		54			54			67	
Humidifier Feed	mm		15			15			15	
Condensate Drain	mm		22			22			22	

NOTES!

Data is taken from downflow configuration and is representational of upflow arrangement.

Units are using a 3 way valve with bypass. Other options are available.

1: Units operating a 5K approach (7/12), 100% water with a standard coil.

2: Duty required is a % of the nominal, i.e. 100% = unit size in kW.



Unit Size		010			018			030			045		
Duty Required ²	%	100	100	70	100	100	70	100	100	70	100	100	70
Conditions													
Air Inlet Temperature	°C	24	26	26	24	26	26	24	26	26	24	26	26
Relative Humidity	%	50	40	40	50	40	40	50	40	40	50	40	40
Air Volume	m ³ /h	2,993	2,993	2,095	5,148	5,148	3,604	8,640	8,640	6,048	12,722	12,722	8,905
Air Volume	m ³ /s	0.83	0.83	0.58	1.43	1.43	1.00	2.40	2.40	1.68	3.53	3.53	2.47
Cooling Duty ¹													
Gross Total Capacity	kW	10.2	10.5	7.3	18.9	18.5	13.4	30.6	31.0	22.0	46.1	45.3	32.4
Net Total Capacity	kW	9.5	9.8	6.9	17.1	16.8	12.8	28.9	29.3	21.3	41.5	42.6	31.3
SHR		0.92	1.00	1.00	0.90	1.00	1.00	0.91	1.00	1.00	0.90	1.00	1.00
EER		3.24	3.31	4.00	2.94	3.09	3.89	3.27	3.50	4.38	3.21	3.43	4.01
CombiCool ²													
Gross Total Capacity	kW	9.1	10.4	8.0	15.5	17.6	13.6	26.0	29.6	23.0	38.4	43.7	33.9
Gross Sensible Capacity	kW	8.7	10.4	8.0	14.8	17.6	13.6	24.9	29.6	23.0	36.7	43.7	33.9
SHR		0.96	1.00	1.00	0.95	1.00	1.00	0.96	1.00	1.00	0.96	1.00	1.00
Flow Rate	m ³ /h	1.44	1.80	1.44	2.52	2.88	2.16	4.32	5.04	3.96	6.48	7.56	5.76
Flow Rate	l/s	0.40	0.50	0.40	0.70	0.80	0.60	1.20	1.40	1.10	1.80	2.10	1.60
Unit Pressure Drop	kPa	38	53	33	31	40	24	33	43	27	30	39	23
Power Consumption													
Power Consumption (Cooling)	kW	3.40	3.40	2.00	6.80	6.4	3.8	10.2	9.7	5.8	15.4	14.3	9.2
Compressor(s)	kW	2.50	2.50	1.50	4.70	4.3	2.8	7.7	7.2	4.3	11.6	10.5	7.0
Indoor Fans	kW	0.70	0.70	0.30	1.70	1.7	0.6	1.7	1.7	0.7	2.7	2.7	1.1
Outdoor Fans ⁵	kW	0.20	0.20	0.20	0.40	0.4	0.4	0.8	0.8	0.8	1.1	1.1	1.1
Misc Data													
Min. Capacity	kW	4			7			8			8		
Max. Capacity	kW	15			25			38			54		
Fan Quantity		1			1			1			1		
Number of Compressors		1			1			1			2		
Compressor Configuration		Inv			Inv			Inv			Inv + Fix		
Humidifier Capacity	kg/h	3.0			3.0			8.0			8.0		
Electrical Heating	kW	4.0			6.0			9.0			12.0		
Sound Power Level @ 100%	dB(A)	81			91			87			94		
Air Filter (Standard G4)													
Quantity		2			2			2			3		
Height	mm	490			620			1136			1084		
Width	mm	375			510			442			457		
Depth	mm	50			50			50			50		
Connection Size													
Discharge Line	inch	1/2			5/8			1 3/8			3/4		
Liquid Line	inch	3/8			1/2			1 3/8			3/4		
CombiCool Inlet	mm	22			28			35			42		
CombiCool Outlet	mm	22			28			35			42		
Humidifier Feed	mm	15			15			15			15		
Condensate Drain ⁴	mm	22			2 x 22			2 x 22			2 x 22		
Example Air Cooled Condenser ⁵													
Unit Type		DMOUCD013E			DMOUCD026E			DMOUCD050E			DMOUCD075E		
Quantity		1			1			1			1		
Refrigeration Circuits		1			1			1			1		

NOTES!

Data is taken from downflow configuration and is representational of upflow arrangement.

1: Units operating with a 45°C condensing temperature.

2: Units operating a 5 K approach (7/12), 100% water with a standard coil.

3: Duty required is a % of the nominal, i.e. 100% = unit size in kW.

4: "2 x" refers to two separate connections for condensate; if humidifier is fitted. When "2x" is not used, one common drain incorporates both types.

5: Outdoor unit used are examples for the conditions used in this dataset. For details of all outdoor units available please refer to the next section of this document.



Unit Size		065			092			130		
Duty Required ²	%	100	100	70	100	100	70	100	100	70
Conditions										
Air Inlet Temperature	°C	24	26	26	24	26	26	24	26	26
Relative Humidity	%	50	40	40	50	40	40	50	40	40
Air Volume	m ³ /h	18,338	18,338	12,837	23,745	23,745	16,622	33,100	33,100	23,170
Air Volume	m ³ /s	5.09	5.09	3.57	6.60	6.60	4.62	9.19	9.19	6.44
Cooling Duty ¹										
Gross Total Capacity	kW	65.8	65.5	47.9	94.7	93.2	65.9	133.7	131.2	92.3
Net Total Capacity	kW	59.4	61.0	46.1	83.7	86.0	63.0	117.9	120.6	87.9
SHR		0.90	1.00	1.00	0.88	0.97	1.00	0.88	0.97	1.00
EER		3.13	3.33	4.22	3.00	3.14	3.70	3.01	3.06	3.78
CombiCool ²										
Gross Total Capacity	kW	56.7	64.4	50.0	74.1	83.9	65.8	107.5	120.9	95.6
Gross Sensible Capacity	kW	54.2	64.4	50.0	70.7	83.9	65.8	102.4	120.9	95.6
SHR		0.96	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Flow Rate	m ³ /h	9.72	11.16	8.64	12.60	14.40	11.16	18.36	20.52	16.56
Flow Rate	l/s	2.70	3.10	2.40	3.50	4.00	3.10	5.10	5.70	4.60
Unit Pressure Drop	kPa	30	38	24	28	35	22	34	43	28
Power Consumption										
Power Consumption (Cooling)	kW	22.6	21.3	13.0	33.8	31.9	20.0	47.5	46.0	27.5
Compressor(s)	kW	16.5	15.2	9.6	24.4	22.5	14.9	33.7	32.2	20.0
Indoor Fans	kW	4.5	4.5	1.8	7.2	7.2	2.9	10.7	10.7	4.4
Outdoor Fans ⁵	kW	1.6	1.6	1.6	2.2	2.2	2.2	3.1	3.1	3.1
Misc Data										
Min. Capacity	kW		8			18			25	
Max. Capacity	kW		78			111			156	
Fan Quantity			2			2			3	
Number of Compressors			2			2			2	
Compressor Configuration			Inv + Inv			Inv + Fix			Inv + Fix	
Humidifier Capacity	kg/h		8.0			15.0			15.0	
Electrical Heating	kW		12.0			18.0			18.0	
Sound Power Level @ 100%	dB(A)		93			96			97	
Air Filter (Standard G4)										
Quantity			3			3			5	
Height	mm		1284			2 x 463			2 x 463	
Width	mm		552			528			456	
Depth	mm		50			50			50	
Connection Size										
Discharge Line	inch		7/8			1 1/8			1 3/8	
Liquid Line	inch		7/8			1 1/8			1 3/8	
Chilled Water Inlet	mm		54			54			67	
Chilled Water Out	mm		54			54			67	
Humidifier Feed	mm		15			15			15	
Condensate Drain ⁴	mm		2 x 22			22			22	
Example Air Cooled Condenser ⁵										
Unit Type			DMOUCD050E			DMOUCD075E			DMOUCD100E	
Quantity			2			2			2	
Refrigeration Circuits			1			1			1	

NOTES!

Data is taken from downflow configuration and is representational of upflow arrangement.

- 1: Units operating with a 45°C condensing temperature.
- 2: Units operating a 5 K approach (7/12), 100% water with a standard coil.
- 3: Duty required is a % of the nominal, i.e. 100% = unit size in kW.
- 4: "2 x" refers to two separate connections for condensate; if humidifier is fitted. When "2x" is not used, one common drain incorporates both types.
- 5: Outdoor unit used are examples for the conditions used in this dataset. For details of all outdoor units available please refer to the next section of this document.



Unit Size		010			018			030			045		
Duty Required ²	%	100	100	70	100	100	70	100	100	70	100	100	70
Conditions													
Air Inlet Temperature	°C	24	26	26	24	26	26	24	26	26	24	26	26
Relative Humidity	%	50	40	40	50	40	40	50	40	40	50	40	40
Air Volume	m ³ /h	2,993	2,993	2,095	5,148	5,148	3,604	8,640	8,640	6,048	12,722	12,722	8,905
Air Volume	m ³ /s	0.83	0.83	0.58	1.43	1.43	1.00	2.40	2.40	1.68	3.53	3.53	2.47
Cooling Duty ¹													
Gross Total Capacity	kW	10.7	13.5	10.5	15.5	17.6	13.6	26.1	29.7	23.1	38.4	43.7	33.9
Net Total Capacity	kW	10.0	12.8	10.2	13.7	15.9	13.0	24.4	28.0	22.4	35.7	41.0	32.8
SHR		0.94	0.88	0.83	0.96	1.00	1.00	0.96	1.00	1.00	0.96	1.00	1.00
Flow Rate	m ³ /h	1.80	2.16	1.80	2.52	2.88	2.16	4.32	5.04	3.96	6.48	7.56	5.76
Flow Rate	l/s	0.50	0.60	0.50	0.70	0.80	0.60	1.20	1.40	1.10	1.80	2.10	1.60
Unit Pressure Drop	kPa	44	67	44	31	40	24	35	45	28	30	39	23
CombiCool ¹													
Gross Total Capacity	kW	9.1	11.5	9.1	15.5	17.6	13.6	26.0	29.6	23.0	38.4	43.7	33.9
Net Total Capacity	kW	8.7	10.4	8.1	14.8	17.6	13.6	24.9	29.6	23.0	36.7	43.7	33.9
SHR		0.96	0.90	0.89	0.95	1.00	1.00	0.96	1.00	1.00	0.96	1.00	1.00
Flow Rate	m ³ /h	1.44	2.16	1.44	2.52	2.88	2.16	4.32	5.04	3.96	6.48	7.56	5.76
Flow Rate	l/s	0.40	0.60	0.40	0.70	0.80	0.60	1.20	1.40	1.10	1.80	2.10	1.60
Unit Pressure Drop	kPa	38	70	38	31	40	24	33	43	27	30	39	23
Power Consumption													
Power Consumption (Cooling)	kW	0.7	0.7	0.3	1.7	1.7	0.6	1.7	1.7	0.7	2.7	2.7	1.1
Indoor Fans	kW	0.7	0.7	0.3	1.7	1.7	0.6	1.7	1.7	0.7	2.7	2.7	1.1
Other Data													
Fan Quantity		1			1			1			1		
Humidifier Capacity	kg/h	3.0			3.0			8.0			8.0		
Electrical Heating	kW	4.0			6.0			9.0			12.0		
Sound Power Level @ 100%	dB(A)	81			91			87			94		
Air Filter (Standard G4)													
Quantity		2			2			2			3		
Height	mm	490			620			1136			1084		
Width	mm	375			510			442			457		
Depth	mm	50			50			50			50		
Connection Size													
Chilled Water Inlet	mm	22			28			35			42		
Chilled Water Outlet	mm	22			28			35			42		
CombiCool Inlet	mm	22			28			35			42		
CombiCool Outlet	mm	22			28			35			42		
Humidifier Feed	mm	15			15			15			15		
Condensate Drain	mm	22			22			22			22		

NOTES!

Data is taken from downflow configuration and is representational of upflow arrangement. Units are using a 3 way valve with bypass. Other options are available.

- 1: Units operating a 5 degrees approach (7/12), 100% water with a CombiCool coil.*
- 2: Duty required is a % of the nominal, i.e. 100% = unit size in kW.*

Unit Size		065			092			130		
Duty Required ²	%	100	100	70	100	100	70	100	100	70
Conditions										
Air Inlet Temperature	°C	24	26	26	24	26	26	24	26	26
Relative Humidity	%	50	40	40	50	40	40	50	40	40
Air Volume	m ³ /h	18,338	18,338	12,837	23,745	23,745	16,622	33,100	33,100	23,170
Air Volume	m ³ /s	5.09	5.09	3.57	6.60	6.60	4.62	9.19	9.19	6.44
Cooling Duty ¹										
Gross Total Capacity	kW	56.7	64.4	50.0	83.1	92.7	71.5	116.0	130.0	100.2
Net Total Capacity	kW	52.3	59.9	48.2	78.0	87.7	69.5	108.6	122.6	97.2
SHR		0.96	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Flow Rate	m ³ /h	9.72	11.16	8.64	14.04	15.84	12.24	19.80	22.32	17.28
Flow Rate	l/s	2.70	3.10	2.40	3.90	4.40	3.40	5.50	6.20	4.80
Unit Pressure Drop	kPa	30	38	24	37	46	28	42	53	32
CombiCool ¹										
Gross Total Capacity	kW	56.7	64.4	50.0	83.1	92.7	71.5	116.0	130.0	100.2
Net Total Capacity	kW	54.2	64.4	50.0	78.8	92.7	71.5	110.2	130.0	100.2
SHR		0.96	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Flow Rate	m ³ /h	9.72	11.16	8.64	14.04	15.84	12.24	19.80	22.32	17.28
Flow Rate	l/s	2.70	3.10	2.40	3.90	4.40	3.40	5.50	6.20	4.80
Unit Pressure Drop	kPa	30	38	24	37	46	28	42	53	32
Power Consumption										
Power Consumption (Cooling)	kW	4.5	4.5	1.8	5.1	5.1	2.0	7.3	7.3	2.9
Indoor Fans	kW	4.5	4.5	1.8	5.1	5.1	2.0	7.3	7.3	2.9
Other Data										
Fan Quantity		2			2			3		
Humidifier Capacity	kg/h	8.0			15.0			15.0		
Electrical Heating	kW	12.0			18.0			18.0		
Sound Power Level @ 100%	dB(A)	93			94			95		
Air Filter (Standard G4)										
Quantity		3			4			5		
Height	mm	1284			2 x 463			2 x 463		
Width	mm	552			495			523		
Depth	mm	50			50			50		
Connection Size										
Chilled Water Inlet	mm	54			54			67		
Chilled Water Outlet	mm	54			54			67		
CombiCool Inlet	mm	54			54			67		
CombiCool Outlet	mm	54			54			67		
Humidifier Feed	mm	15			15			15		
Condensate Drain	mm	22			22			22		

NOTES!



Data is taken from downflow configuration and is representational of upflow arrangement.

Units are using a 3 way valve with bypass. Other options are available.

1: Units operating a 5 degrees approach (7/12), 100% water with a CombiCool coil.

2: Duty required is a % of the nominal, i.e. 100% = unit size in kW.

Unit Size	DMOUCD008			DMOUCD013			DMOUCD021			DMOUCD026			
Type ²	EC Max	EC	AC	EC Max	EC	AC	EC Max	EC	AC	EC Max	EC	AC	
Conditions													
Heat of Rejection ¹	kW	– ⁴	6.8	6.8	15.2	11.3	11.3	23.1	16.8	16.8	27.3	22.8	22.8
Airflow	m ³ /h	–	2,590	2,590	7,100	4,104	4,104	10,900	6,840	6,840	12,000	8,208	8,208
Airflow	m ³ /s	–	0.72	0.72	1.97	1.14	1.14	3.03	1.90	1.90	3.33	2.28	2.28
Fan Data													
Power Consumption	kW	–	0.2	0.2	0.8	0.2	0.2	1.0	0.3	0.5	1.0	0.3	0.5
Speed	1/min	–	– ⁴	–	1,439	877	–	1,189	770	–	1,197	825	–
Sound Power Level	dB(A)	–	65	65	82	70	71	79	70	76	79	71	76
Misc Data													
Heat Exchanger Face Area	m ²	0.25		0.49		0.72		1.00					
Heat Exchanger Rows		3		3		3		3					
Fan Quantity		1		1		1		1					
Fan Diameter	mm	450		500		630		630					
Connection Size													
Discharge Line	inch	5/8		3/4		7/8		1 1/8					
Liquid Line	inch	5/8		3/4		7/8		1 1/8					
Dimensions and Weight													
Length	mm	645		825		975		1,125					
Width	mm	571		717		867		1,021					
Height	mm	690		790		810		945					
Weight ³	mm	35		45		50		70					



NOTES!

- 1: Units operating with a 45°C condensing temperature in a 32 °C ambient temperatures.
- 2: "EC Max" represents EC fan configuration at Maximum airflow. "EC" data is at the same airflow as "AC" for direct comparison.
- 3: For EC fans only. AC fans may vary.
- 4: Data currently unavailable.

AC Fans only available in certain regions to to ErP legislation. Please contact your region's sales office for further details.

Unit Size		DMOUCD032			DMOUCD050			DMOUCD075			DMOUCD100		
Type ²		EC Max	EC	AC	EC Max	EC	AC	EC Max	EC	AC	EC Max	EC	AC
Conditions													
Heat of Rejection ¹	kW	31.1	24.5	24.5	52.3	44.1	44.1	77.4	58.3	58.3	112.9	86.7	86.7
Airflow	m ³ /h	12,400	8,748	8,748	23,900	15,840	15,840	34,900	22,356	22,356	47,800	31,680	31,680
Airflow	m ³ /s	3.44	2.43	2.43	6.64	4.40	4.40	9.69	6.21	6.21	13.28	8.80	8.80
Fan Data													
Power Consumption	kW	0.9	0.3	0.5	1.9	0.6	1.0	3.0	0.9	1.6	3.8	1.2	2.1
Speed	1/min	1,198	844	–	1,197	802	–	1,199	784	–	1,197	802	–
Sound Power Level	dB(A)	79	72	76	82	74	79	84	75	81	85	77	82
Misc Data													
Heat Exchanger Face Area	m ²	1.21			1.96			2.60			3.92		
Heat Exchanger Rows		3			3			3			3		
Fan Quantity		1			2			3			4		
Fan Diameter	mm	630			630			630			630		
Connection Size													
Discharge Line	inch	1 1/8			1 3/8			1 3/8			1 5/8		
Liquid Line	inch	1 1/8			1 3/8			1 3/8			1 5/8		
Dimensions and Weight													
Length	mm	1,225			2,095			2,760			2,415		
Width	mm	1,121			1,067			1,067			2,440		
Height	mm	945			945			945			1,045		
Weight ³	mm	80			135			210			412		

NOTES!

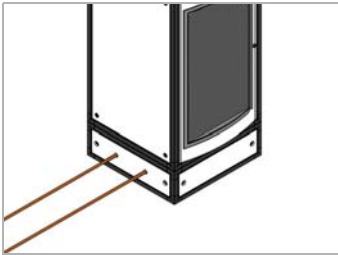


- 1: Units operating with a 45°C condensing temperature in a 32 °C ambient temperatures.
- 2: "EC Max" represents EC fan configuration at Maximum airflow. "EC" data is at the same airflow as "AC" for direct comparison.
- 3: For EC fans only. AC fans may vary.
- 4: "Data currently unavailable."

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Substructures

Plinth

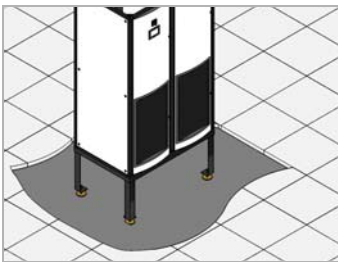


If an upflow unit is required for a room without a raised floor, a plinth should be used to allow space underneath the unit, so that refrigerant and drain connections can be made through the side of the plinth.

The standard plinth is 200 mm tall and made of the same frame and panel construction as the close control unit, therefore give a natural looking height extension.

The panels are fixed to the unit using the same screw (crosshead) as the unit panel so only one tool is required to remove all panels.

Base stand



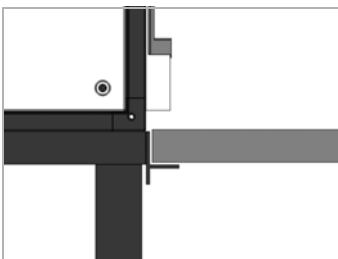
For units to be used with a raised floor (upflow and downflow), a base stand should be used underneath the close control unit.

The base stand comes complete with adjustable feet (+/- 25 mm available). The surface between the base stand and the close control unit is lined with a 3mm semi-hard gasket.

The height of the base stand frame can be from a minimum of 300 mm tall.

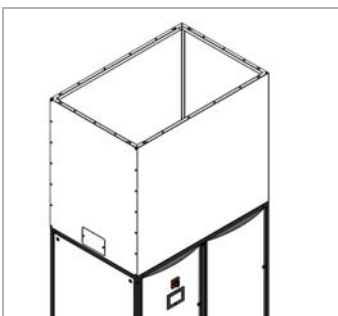
Other versions of the base stand design are available on special request: such as sheeted and lined sides, scoops and grilles.

Raised Floor Tile Support



To complement the use of a base stand, raise floor tile support can be added to the base stand to allow for the floor tiles that are closest to the close control unit to be supported.

Ceiling Connection Duct

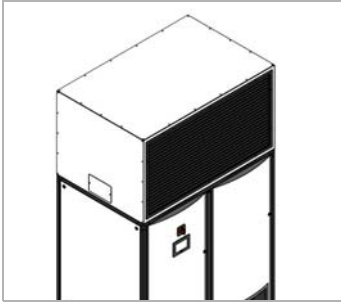


For units that wish to connect with a suspending ceiling, whether it is to receive the air or supply the air (upflow and downflow), a ceiling connection duct can be used to create this air path.

For downflow units, the ceiling connection duct could be used instead to draw warmer air from a higher position within the room that will help improve efficiency of the return air temperature.

The ceiling connection duct is made of the same material as the unit panels. Heights of ceiling connection ducts are made to specification and they can bolt onto the top of the close control unit through a service panel on either side.

Horizontal Air Discharge



For upflow units that do not have ceiling voids, a horizontal air discharge section can be used to change the airflow direction.

It consists of a sheet metal box (same colour and material as the unit panels) with a double deflection grille fitted in either the front panel (1 way blow) or the front panel and both side panels (3 way blow).

The assembly is bolted onto the top of the close control unit through the frame. This can be accessed via the service panels on either side of the unit.

Shut Off Damper



A top mounted damper is available for downflow units to restrict or stop air entering into the close control unit.

This control is linked to the unit's controller and can be made to open/close depending on the unit's operation or can close if a critical alarm is generated. It can also be linked to fire alarm shutdown routines to protect your units.

Protection Grille



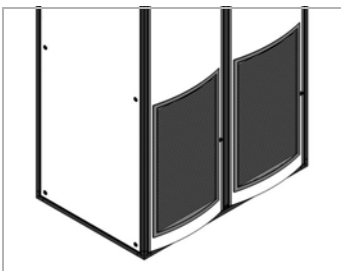
This is the standard grille that is placed directly on top of a close control unit to protect individuals from gaining access to the rotating fan blades during operation.

There are two variations depending on the unit's airflow direction:

Upflow: Top Air Discharge Protection Grille

Downflow: Top Air Inlet Protection Grille

Front Low Level Air Discharge Panels

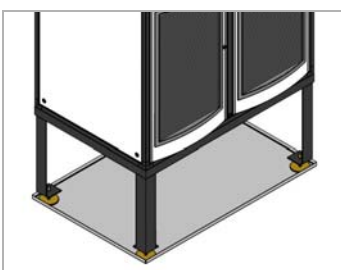


For 'in room' cooling of air, low level grilles can be mounted into the front doors of the unit. Discharge grilles are used for downflow units and intake grilles are used for upflow units.

Both grilles are double deflection and are a standard size throughout the range.

This option is required when there is no raised floor.

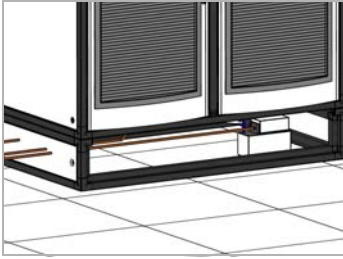
Under Unit Drip Tray



To protect the floor underneath a close control unit from any condensation a drip tray can be mounted underneath.

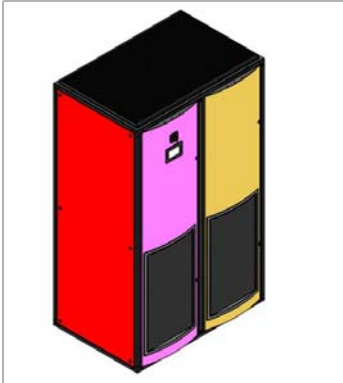
This drip tray can be used in a raised floor (underneath a base frame) or with a plinth.

It is designed to hold a small volume of water and should be used along with water detection tape or spot sensor to prevent any significant build-up of water.

Condensate Pump

In situations where it is not possible to use gravity operated drains, a condensate pump is available to remove water collected by the condensate tray underneath the cooling coil.

For any given unit there are two types of condensate pumps: 'Hot Water' for close control units that have humidifiers and 'Cold Water' for those without humidifiers.

Special Colours

The Multi-DENCO range is able to accommodate a variety of different panel colours, including accessories.

For standard configuration, the frame is black and the panels are white. Colour swatches can be provided upon request. Please contact your regional sales office for details.

For special paint finish please provide a BS number, RAL-number or similar, if available otherwise please provide swatches of panel requirements.

Filters

The CCU comes with standard EU4 filters (G4) to protect the coil against dust and dirt.

As an option, fine dust filters of EU7 grade (F7) filters are an alternative available with all units.

Shut Off Valves (SOV)

Enable easy isolation of parts of your refrigerant circuit with the use of shut off valves.

As standard a SOV is provided on the liquid line, but as an additional option, SOVs can be installed on the suction and discharge line, allowing for service or maintenance without evacuation of the system.

Similar valves are available on entry/exit position of chilled water systems.

Refrigerant Leak Detection

A sensor to detect any refrigerant particles present in the airflow through the unit.

Once detected an alarm can be generated and shown on the unit's display.

Service Connections



Three Schrader connection points that utilise capillaries to each line, enabling use of testing points without the removal of commissioning plates.

Interfaces



C5-12 controllers have inbuilt Modbus (RS485) connectivity.

Additional interfaces are able to be installed into the controller.

Protocols available are as follows:

- BACnet SNMP Webpage Interface
- BACnet MS/TP Interface
- LonWorks Interface
- Trend BMS Interface is available as a separate accessory.

Water Detection



5 m long water sensing tapes can be installed below the unit to monitor any leaks or excessive condensation, along with a sensor that detects when too much water is within the tray.

Options for spot sensors (of varying numbers) are available to allow for a different sample of water detection.

Run Status Volt Free Contact (VFC)

A volt free contact can be added to communicate the operating status of the unit to the controller or onto a BMS system.

Air Volume Monitoring



Airflow measurements using a pressure sensor located within the fan's inlet ring to produce live readings of air pressure that can be shown on the unit's display.

Energy Monitoring



Power meter with current transformer for each phase with the controller monitoring voltage, current, power and total unit power consumption.

Values taken by this module are also viewable through the touchscreen display to give live readings.

Values from the energy monitoring option are accessible via a BMS system.

Automatic Transfer Switch (ATS)

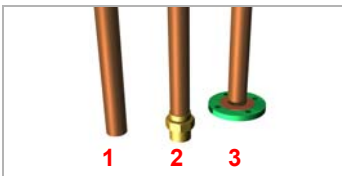
A power switch to allow for the automatic change over between two power supplies upon the failure of one of the power supplies.

The equipment also has a manual override feature.

Smoke Detection

A sensor to detect smoke particles in the airflow through the unit.

Upon detection an alarm can be generated to shut down the unit and close the Air Damper (if fitted/required).

Pipework Connections

Several pipework connections are available for chilled water units (C-Version and CombiCool):

- 1 Solder Connection
- 2 British Standard Pipe (BSP) Male Connections
- 3 Flange connections (PN06 and PN16)

Water Temperature Monitor

Sensors to monitor and display the temperature of the water entering and exiting the unit and can show them on the unit's display.

Valves and Actuators

A variety of modulating ball valves are available with the *Multi-DENCO* units:

- 3 way valve
- 3 way valve with double regulating valve (DRV)
- 2 way valves
- 2 way pressure independent control (PIC) valves

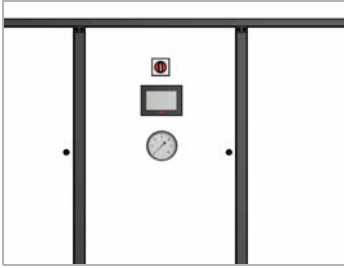
All valves are fully modulating and are placed within the return pipework.

Multi-DENCO actuators come in 2 varieties:

- Drive Open Drive Close (DODC)
- 0-10 V control

These options, combined with the variety of valves, ensure that you have a valve and actuator combination that meets your exact requirements.

Filter Gauge



Differential pressure gauge mounted within the front door connected via flexible hoses to measuring points across the filter.

Remote Display



The 4.3" touchscreen display can be mounted remotely up to 50m away from the close control unit.

60 Hz Power Supply



60 Hz power supply is now available for all sizes Multi-DENCO when used with EC fans on the outdoor unit.

Components within Multi-DENCO units are dual rated for 50 Hz and 60 Hz allowing for a standard configuration for both situations.

Fans

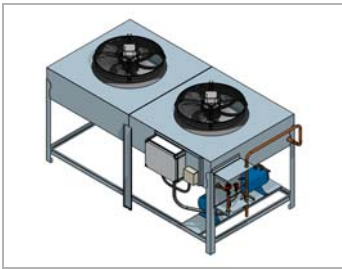


Multi-DENCO outdoor units are available with AC* or EC fans.

These are like for like replacements between them therefore they do not affect the overall dimensions of the condensers.

* AC fans only available for a limited time for countries within the EU due to EU Regulation (ErP). Other countries outside the EU may have continued availability.

Winter Start Kits

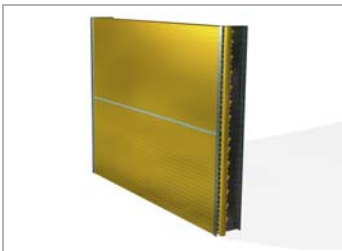


Generally recommended for temperatures between $-25\text{ }^{\circ}\text{C}$ and $-40\text{ }^{\circ}\text{C}$ and at wind exposed installations, winter start kits comprises of a horizontal type liquid receiver with trace heater and a pressure relief valve to assist with the restarts of units when they have been in cold temperatures.

For vertically blow condensers, the kit is situated in a special section below the condenser/condensing unit.

For horizontal blow condensers a special base section is fitted to house this below the unit (typically 400 mm tall).

Heat Exchanger Coating



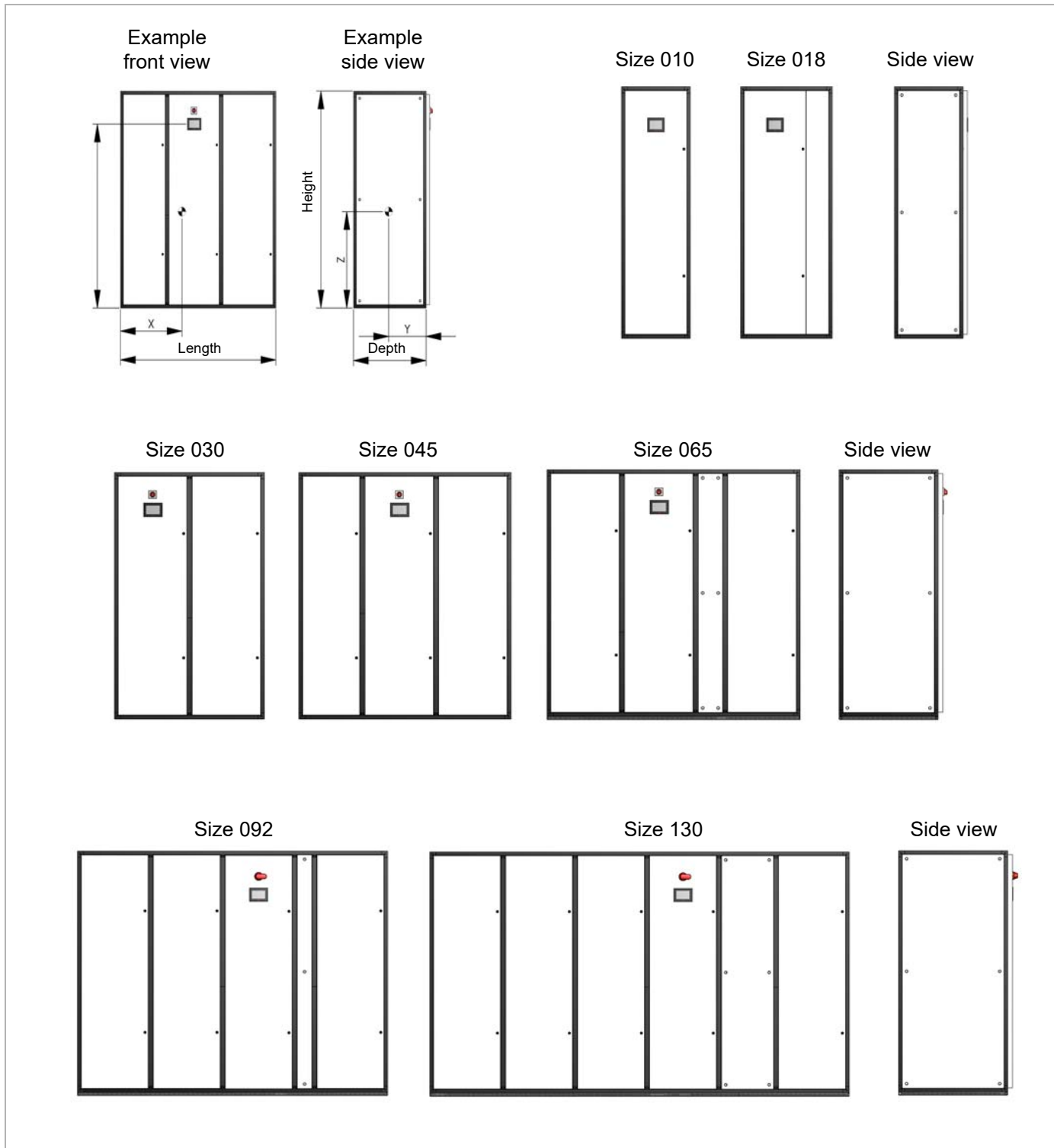
Blygold coating or Epoxy coating is available to coat the condenser's cooling coil to add further protection, generally used when units are located near costal regions.

Special Colours

Special colours for outdoor units upon request.

Please provide samples or colour standard reference to enable accurate supply.

Unit Overview All Sizes



Centre of Gravity dimensions are approximations. CombiCool and other options may vary the data given below.
For more informations please see specific customer drawings.

A-Version				
Size	Weight [kg]	Centre of Gravity [mm]		
		X	Y	Z
010	170	280	275	830
018	180	410	265	895
030	256	600	340	885
045	362	870	340	845
065	462	1,450*	350	800
092	583	1,435	430	900
130	785	2,000	440	885

Tab. 1

* Upflow Version = 950 mm

C-Version				
Size	Weight [kg]	Centre of Gravity [mm]		
		X	Y	Z
010	143	310	285	1,010
018	156	380	290	995
030	237	590	365	975
045	310	850	375	975
065	413	1,450*	370	890
092	512	1,175	405	1,000
130	674	1,570	435	1,010

Tab. 2

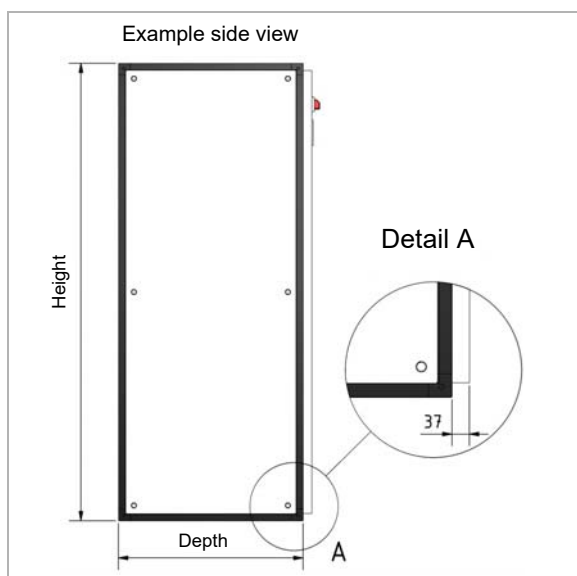
* Upflow Version = 950 mm

Dimensions all Units

Size	Length [mm]	Depth ** [mm]	Height [mm]
010	600	600	1,940
018	800	600	1,940
030	1,180	780	1,940
045	1,670	780	1,940
065	1,992	780	1,968
092	2,500	880	1,968
130	3,380	880	1,968

Tab. 3

** Depth is a measurement for the frame dimension. Please see notes below for curved door overhang.



NOTE!

Multi-DENCO units utilise a curved door design, therefore this provides a 37 mm overhang when compared to the frame.

Service Area and Airflow Configuration

Clearances for Maintenance and Service

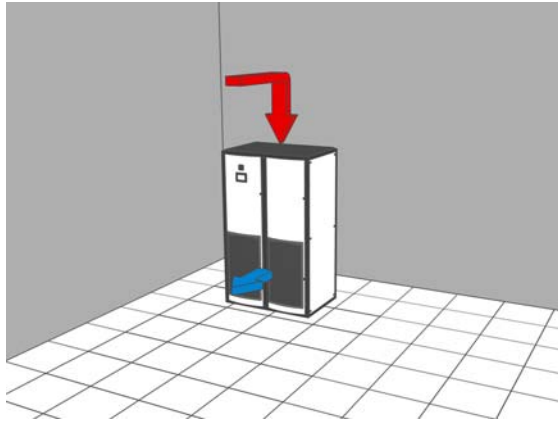


Multi-DENCO units have been designed to allow for maintenance from the front exclusively. The front doors are hinged and the doors are removable for access and maintenance. Parts of some frame mullions are removable to allow removal of larger components.

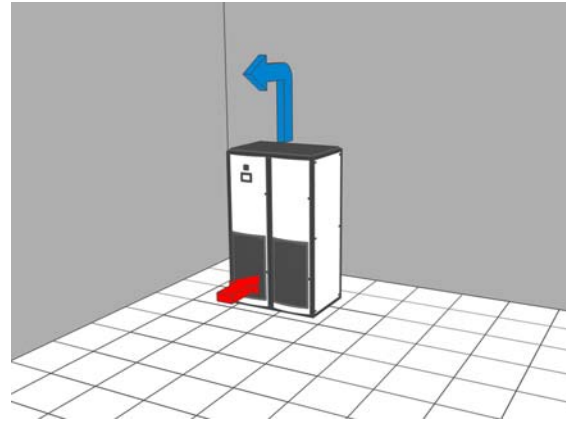
Size	Minimum Clearance Required [mm]
010	600
018	600
030	600
045	600
065	600
092	880
130	880

Tab. 4

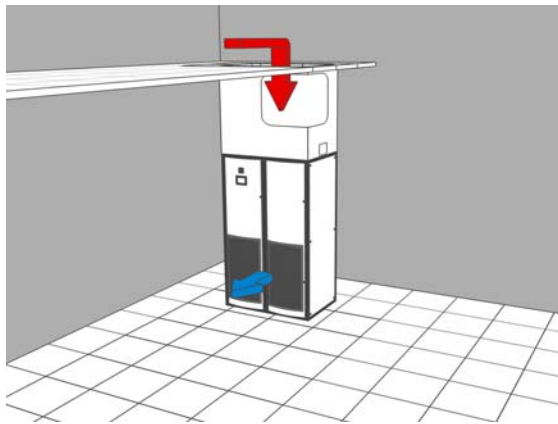
Airflow configuration



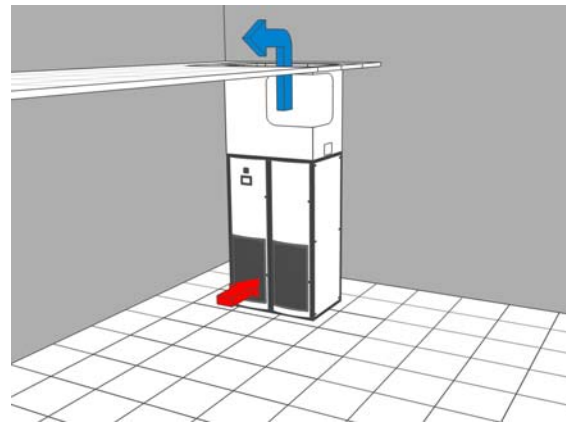
In Room Downflow



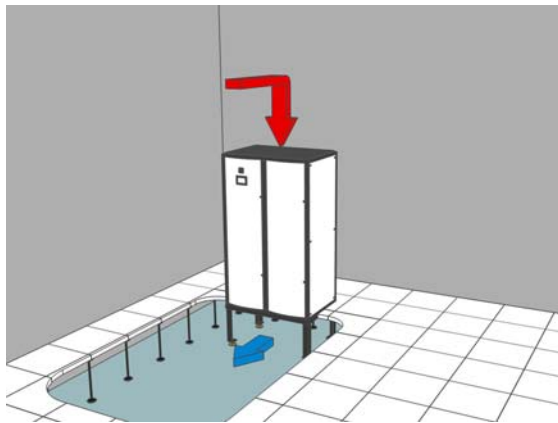
In Room Upflow



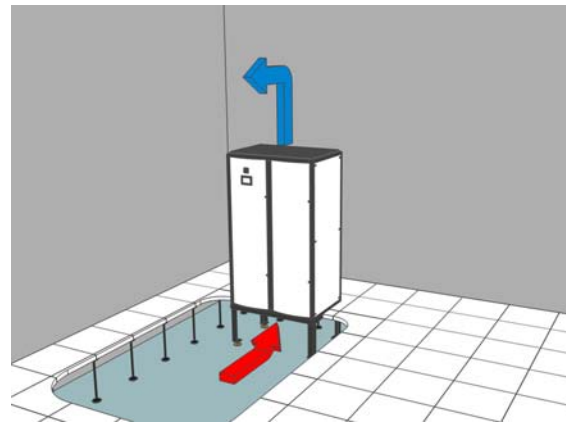
Suspended Ceiling Downflow



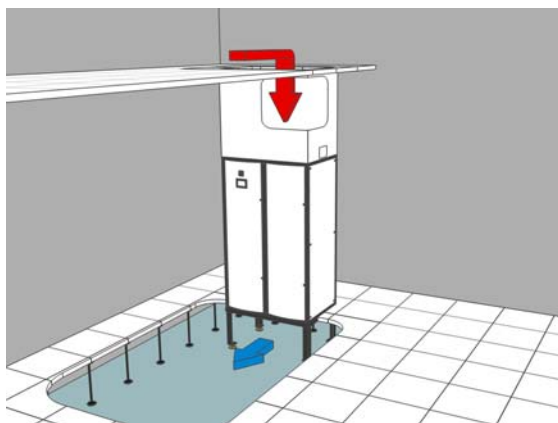
Suspended Ceiling Upflow



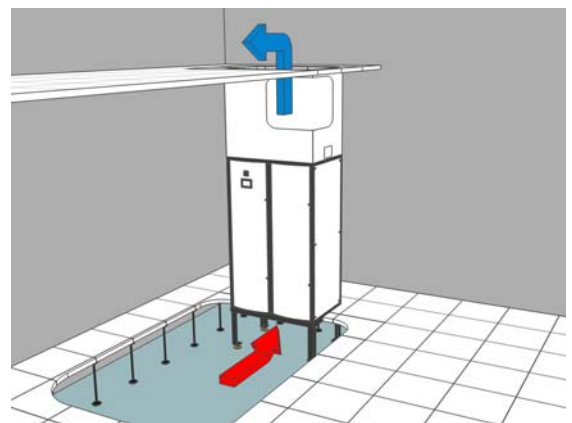
Raised Floor Downflow



Raise Floor Upflow



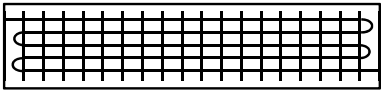














Combination Downflow

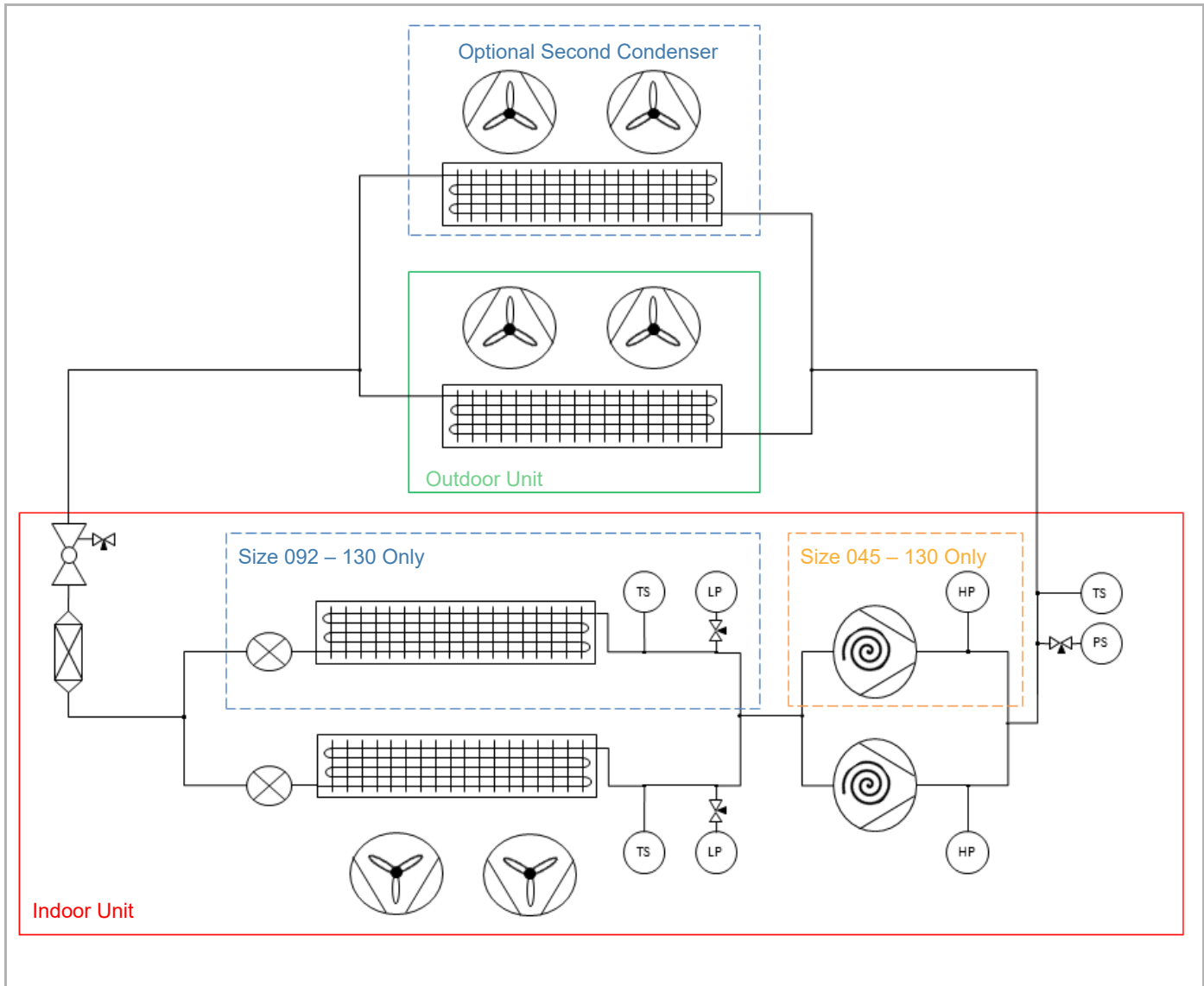


Combination Upflow

<p>Diagram showing the top detail of the unit. It features a panel on the left and a box frame on the right. The panel has a width of 28 units. The box frame has a height of 20 units and a width of 22 units. A 20 mm recess is shown at the top of the box frame. Labels 'Panel' and 'Box Frame' are present.</p>	<p>Top Detail</p>	<p>All Units</p>	<p>The standard top arrangement for all units.</p> <p>The box frame is the same all around the edge of the unit and allows for a 20 mm recess to be used for top connections.</p> <p>Ceiling return Sections, Top Air Discharge Protection Grilles (Eyelash) and Top Air Inlet Protection Grille (Eggcrate) sit on top of the unit matching the unit's outside edge.</p>
<p>Diagram showing the bottom detail of the unit. It features a panel on the left and a box frame on the right. The panel has a width of 28 units. The box frame has a height of 20 units and a width of 22 units. A 20 mm recess is shown at the bottom of the box frame. Labels 'Panel' and 'Box Frame' are present.</p>	<p>Bottom Detail</p>	<p>Sizes 010 - 045</p>	<p>The standard bottom arrangement for smaller units.</p> <p>The box frame is the same all around the edge of the unit and allows for a 20 mm recess.</p> <p>All plinths/base frames match the outside edge of the unit.</p>
<p>Diagram showing the bottom detail of the unit with a base frame. It features a panel on the left, a box frame in the middle, and a base frame at the bottom. The panel has a width of 28 units. The box frame has a height of 20 units and a width of 22 units. The base frame has a height of 78 units and a width of 53 units. Labels 'Panel', 'Box Frame', and 'Baseframe' are present.</p>	<p>Bottom Detail with Base frame</p>	<p>Sizes 065 - 130</p>	<p>Larger units require an additional base frame to support the unit.</p> <p>This raises the height of the unit by 28 mm.</p> <p>The base frame is made of 3 mm sheet metal and provides a flat surface below for any sub-structure connections.</p>

Legend

	Cooling Coil		Pressure Sensor
	Electronic Expansion Valve		Temperature Sensor
	Filter Drier		Low Pressure Switch
	Schrader Valve		High Pressure Switch
	Ball Valve (Shut Off Valve)		Double Regulating Valve
	Fan		Drain
	Compressor		Test Point
	3 Way Valve		

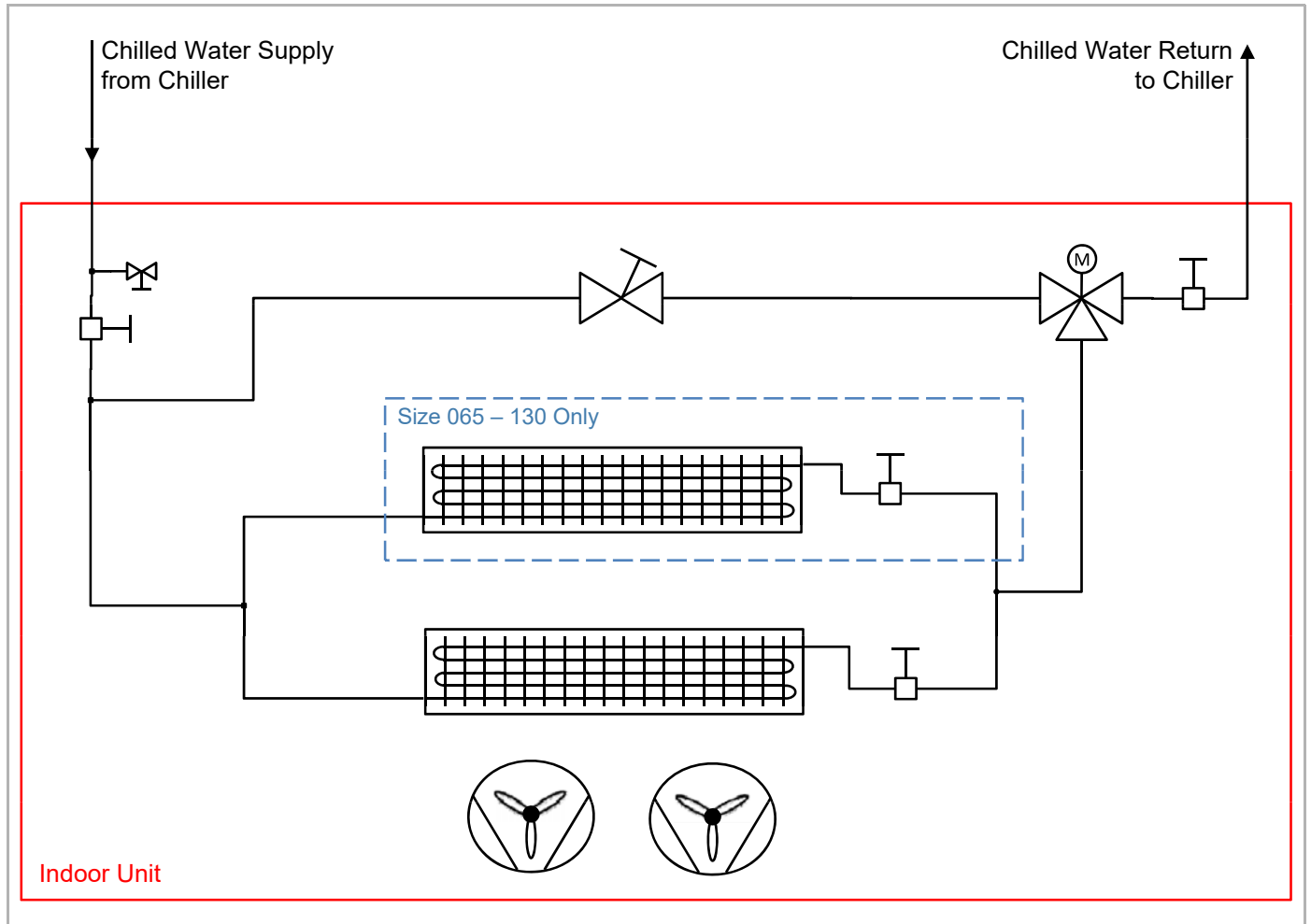


NOTES!



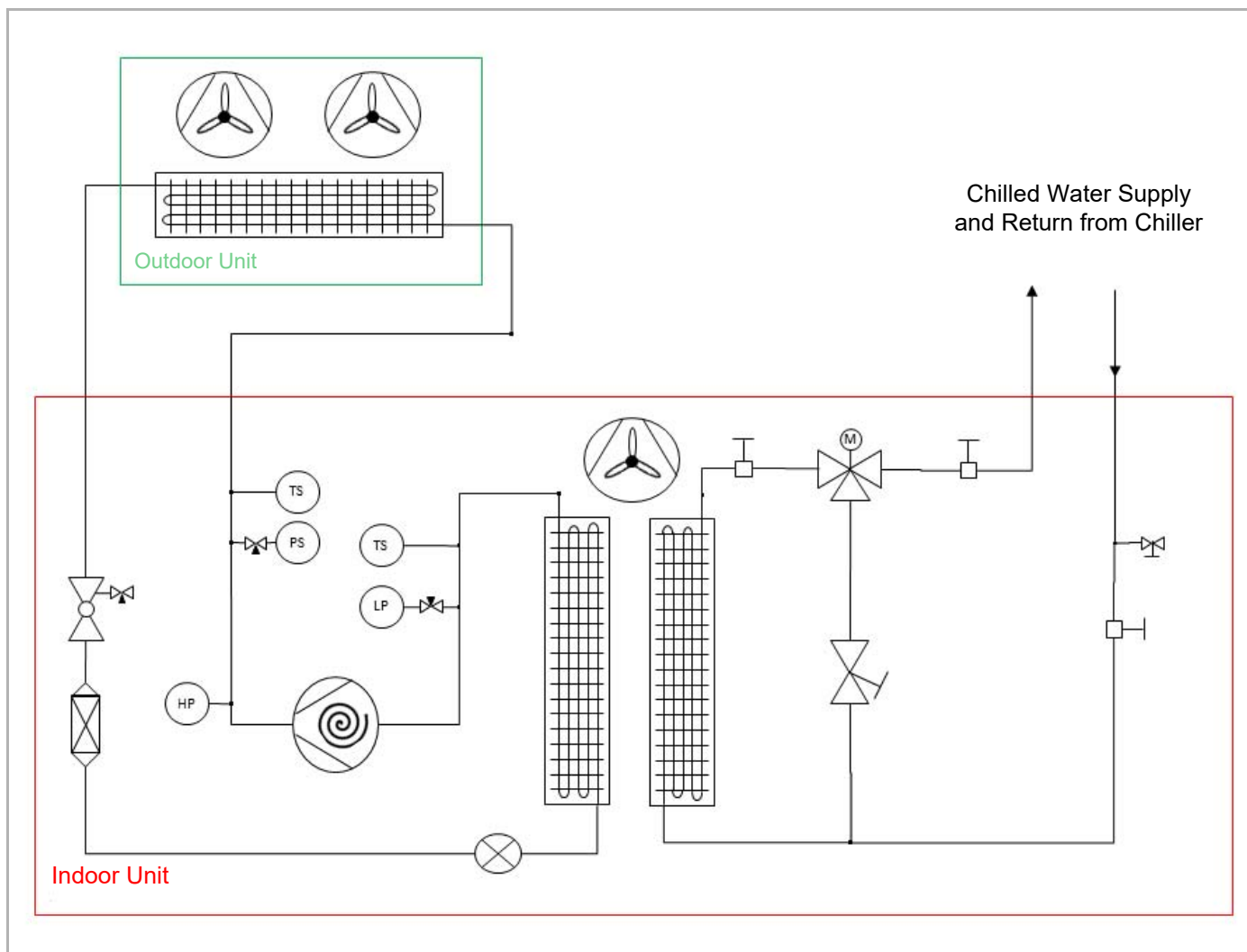
- 1: Second condenser dependent upon unit selection.
- 2: Fan Pressure Switch may vary depending on outdoor unit configuration.
- 3: Not all options are displayed on this schematic. For more details please review type code.

C-Version

**NOTES!**

- 1: Various valve options available (3 way, 2 way, 2 way PICV). Schematic representative of 3 way valve with double regulating valve.
- 2: Double regulating valve optional.
- 3: Not all options are displayed on this schematic. For more details please review type code.

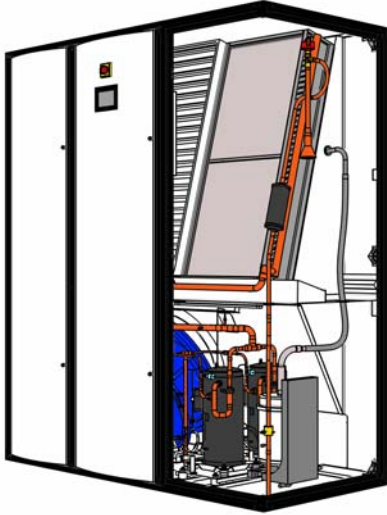




NOTES!



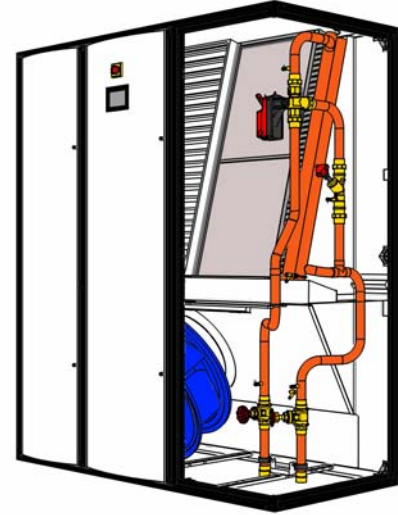
- 1: Various valve options available (3 way, 2 way, 2 way PICV). Schematic representative of 3 way valve with double regulating valve in the CombiCool circuit.
- 2: Secondary condensers available for certain sizes.
- 3: Double regulating valve optional.
- 4: Not all options are displayed on this schematic. For more details please review type code.
- 5: C-Version + CombiCool units have the same schematics as the right hand circuit above, for both circuits.



A-Version units are cooled using refrigerant.
Main components:

- Compressors
- Evaporating Coil
- Electronic Expansion Valve

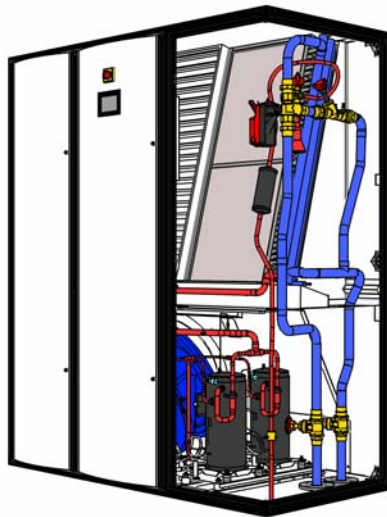
A-Version units are used with outdoor condenser.



C-Version units are cooled using water or water/glycol mixture.
Main components:

- Chilled Water Cooling Coil
- Valve (3 Way or 2 way)

A variety of valves, actuators and other options are available and C-Version units are used with chillers.

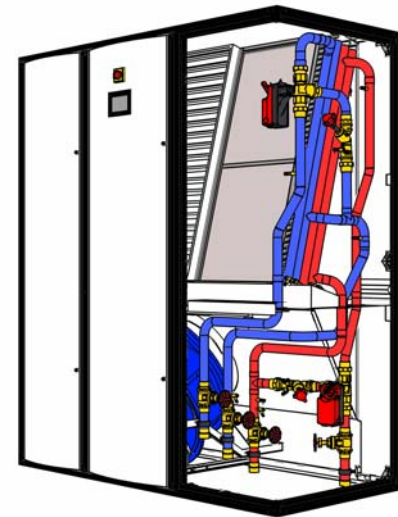


A-Version + CombiCool units are a combination of both the A-Version unit and the C-Version unit.

Red highlights the A-Version circuit of the unit, whereas blue highlights the CombiCool circuit.

There is only 1 coil used, but 3 rows are used for the refrigerant circuit and the other 3 rows are used for the chilled water cooling.

The refrigerant circuit would need to be connected to a condenser and the chilled water circuit to a chiller or free-cooling equipment.



C-Version + CombiCool units are a duplication of 2 C-Version circuits within 1 unit.

The blue and red show independent circuits and they in turn would be connected to separate chillers/free-cooling equipment. Each circuit uses 3 rows of the coil. Both circuits are shown with 3-Way valves and double regulating valves in the bypass.

Humidifier only shown in A-Version image for visual clarity

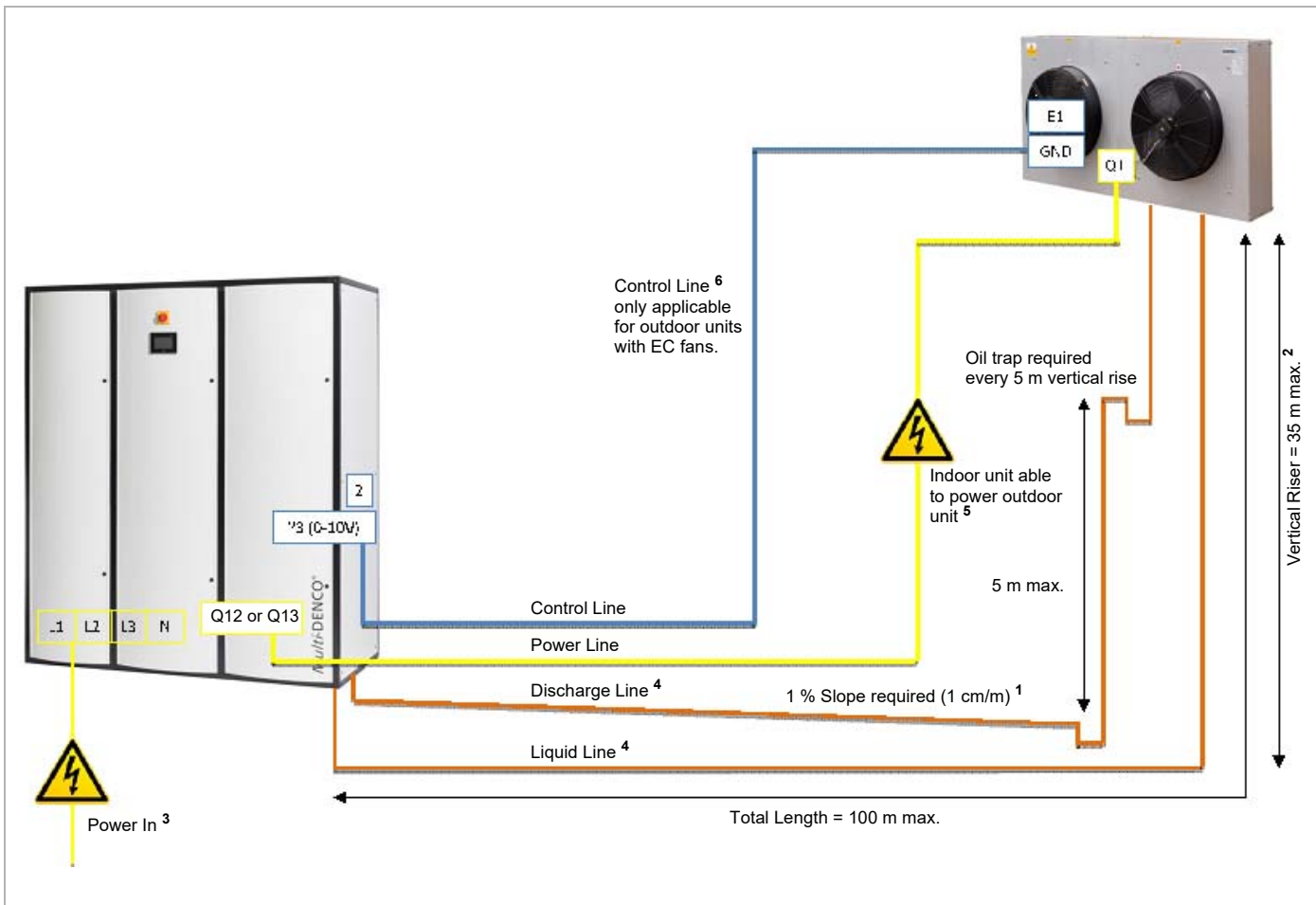


DIAGRAM NOTES!

- 1: Oil trap and 1% slope are required for every vertical and horizontal section respectively.
- 2: Outdoor unit must no more than 10 m lower than the base of the indoor unit.
- 3: "Power in" demonstrates a single feed. Dual power supply option available.
- 4: Liquid line and Discharge Line pipe sizing dependent on multiple factors and vary from unit to unit.
- 5: Indoor unit able to power outdoor unit with EC fans. Indoor unit must power outdoor unit with AC fans. Specification of cable size/quality is responsibility of installing contractor/site engineer, but must be relative to condenser's current consumption and cable length from indoor unit. Q12 and Q13 demonstrate separate power supplies available for twin condensers. Mandatory for certain configurations.
- 6: FläktGroup Ltd recommend any 2 core screened data cable for control wiring, for example:
 - a. Beldon 8761
 - b. Alpha 2401C
 - c. BICC H8082

GENERAL NOTES!

- i. Terminals for power line between indoor and outdoor vary. Please refer to wiring diagram.
- ii. Twin condenser option is available (not shown in diagram).

**NOTES!**

Only pipe sizes with data entered are allowable. It is mandatory that these sizes are used only, for both horizontal and vertical risers.

It is recommended that an optimum pressure drop in the discharge line should be 1.0K and that the pipe size should not be used if this value exceeds 2.5 K.

Final responsibility for pipe sizing is of the contractor or installer and it is recommended that separate calculations are made by a suitable qualified engineer.

Data shown below is of a A-Version unit, using inverter compressors, operating at nominal capacity (i.e. size 010 = 10 kW). Data calculated using a 45 °C condensing temperature.

Imperial Measurements

Unit Size	Line Type	Pressure Drop Over 10 m Horizontal Run [inch]									
		3/8	1/2	5/8	3/4	7/8	1 1/8	1 3/8	1 5/8	2 x 7/8	2 x 1 1/8
010	Liquid	0.4	0.1	0.0	0.0						
	Discharge		0.5	0.1	0.1						
018	Liquid		0.2	0.1	0.0						
	Discharge			0.5	0.2						
030	Liquid			0.2	0.1	0.0					
	Discharge			1.1	0.4	0.2					
045	Liquid				0.1	0.1	0.0				
	Discharge				0.9	0.4	0.1				
065	Liquid					0.1	0.0				
	Discharge					0.8	0.3				
092	Liquid						0.1	0.0			
	Discharge						0.5	0.2		0.3	
130	Liquid						0.1	0.0			
	Discharge							0.3	0.1		0.2

Tab. 5

Unit Size	Line Type	Pressure Drop Over 25 m Horizontal Run [inch]									
		3/8	1/2	5/8	3/4	7/8	1 1/8	1 3/8	1 5/8	2 x 7/8	2 x 1 1/8
010	Liquid	0.8	0.2	0.1	0.0						
	Discharge		1.3	0.4	0.1						
018	Liquid		0.5	0.2	0.1						
	Discharge			1.1	0.4						
030	Liquid			0.4	0.1	0.1					
	Discharge			2.8	1.0	0.5					
045	Liquid				0.3	0.1	0.0				
	Discharge				2.2	1.0	0.3				
065	Liquid					0.3	0.1				
	Discharge					1.9	0.7				
092	Liquid						0.2	0.1			
	Discharge						1.2	0.4		0.7	
130	Liquid						0.3	0.1			
	Discharge							0.8	0.4		0.4

Tab. 6

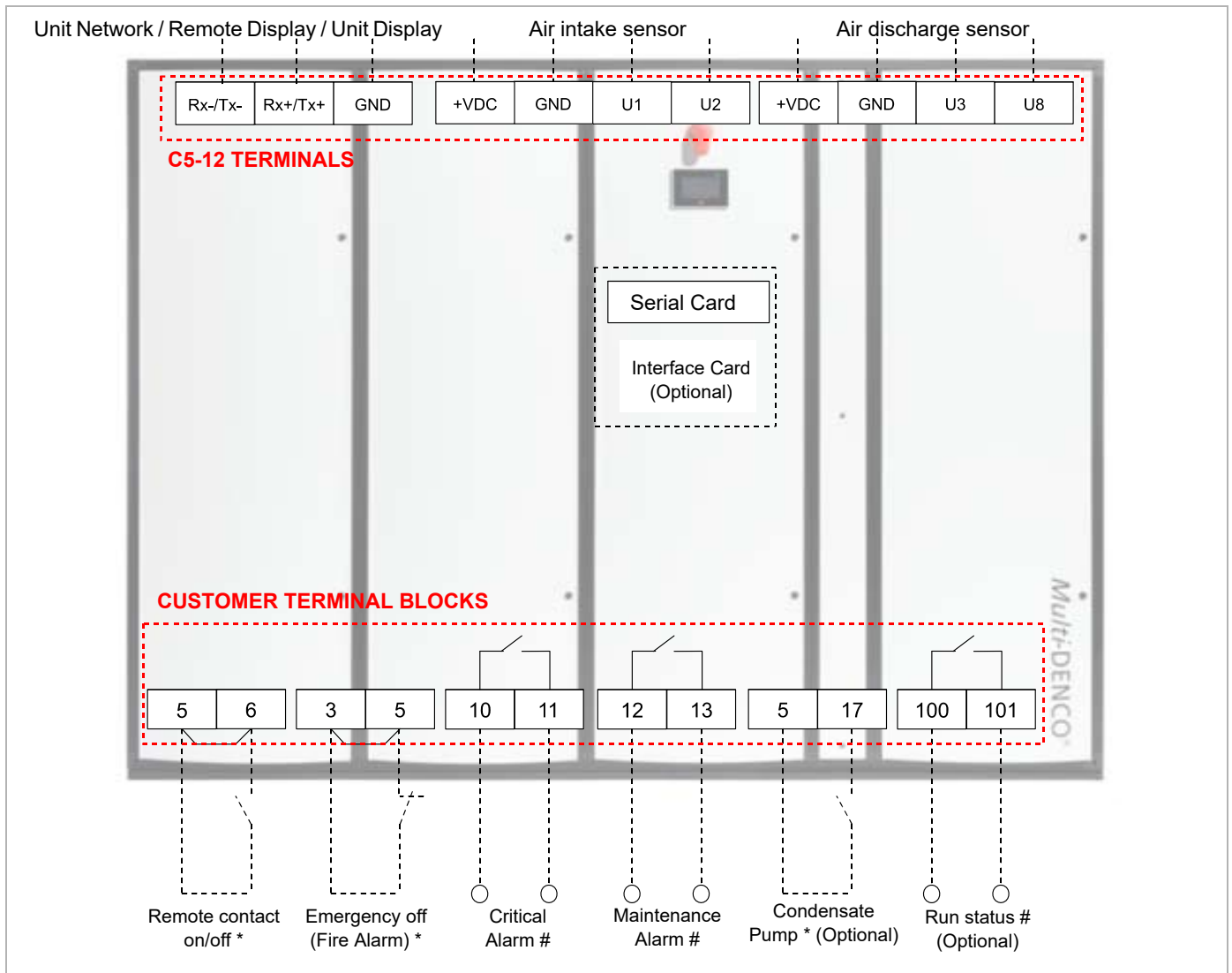
Metric Measurements

		Pressure Drop Over 10 m Horizontal Run [mm]									
Unit Size	Line Type	10	12	16	18	22	28	35	42	2 x 22	2 x 28
010	Liquid	0.3	0.1	0.0	0.0						
	Discharge		0.8	0.2	0.1						
018	Liquid		0.4	0.1	0.0						
	Discharge			0.5	0.2						
030	Liquid			0.2	0.1	0.0					
	Discharge			1.1	0.6	0.2					
045	Liquid				0.2	0.1	0.0				
	Discharge				1.3	0.4	0.1				
065	Liquid					0.1	0.0				
	Discharge					0.9	0.3				
092	Liquid						0.1	0.0			
	Discharge						0.6	0.2		0.3	
130	Liquid						0.1	0.0			
	Discharge							0.3	0.1		0.2

Tab. 7

		Pressure Drop Over 25 m Horizontal Run [mm]									
Unit Size	Line Type	10	12	16	18	22	28	35	42	2 x 22	2 x 28
010	Liquid	0.8	0.3	0.1	0.0						
	Discharge		1.9	0.4	0.2						
018	Liquid		0.8	0.2	0.1						
	Discharge			1.2	0.6						
030	Liquid			0.4	0.2	0.1					
	Discharge			2.8	1.5	0.5					
045	Liquid				0.4	0.1	0.0				
	Discharge				3.1	1.1	0.4				
065	Liquid					0.3	0.1				
	Discharge					2.0	0.7				
092	Liquid						0.2	0.1			
	Discharge						1.4	0.4		0.8	
130	Liquid						0.3	0.1			
	Discharge							0.8	0.3		0.5

Tab. 8



Terminals	Notes
5 – 6	Remote On/Off for activating and deactivating the unit via a normally open volt free contact by others.
3 – 5	Emergency Off, a volt free contact (supplied by others) opening, deactivates the unit (e.g. used in a fire alarm system)
10 – 11	The unit's critical alarm indication e.g. HP/LP, Airflow, High Temperature.
12 – 13	The unit's maintenance alarm indication e.g. Dirty Filter, humidifier.
5 – 17	Alarm contact of condensate pump (optional accessory)
100 – 101	Indication of unit's operation (i.e. fans enabled)
+VDC – GND – U1 – U2	Air intake sensor
+VDC – GND – U3 – U8	Air discharge sensor (optional, only if the item is fitted).
Serial Card	Interface cards for building management (optional).
Rx-/Tx- - Rx+/Tx+ - GND	Unit's network terminals for connecting multiple units. Displays already connected to these terminals.
-----	Cabling provided by others.
#	Volt free contacts (voltage or signal to be provided by others).
*	On-site volt free contacts must be provided (if function is required remove jumper).

NOTE!



Above details are only accurate for C5-12 controller, other controllers/interface combination may vary. In all instances, please consult the electrical drawing for specific details. FläktGroup reserve the right to make design modifications/updates/amendments and improvements without prior notice.



SAFE ISOLATION!

External electric circuits of *Multi-DENCO* must be safely isolated from active (live) components of other non-SELV or non-PELV electric circuits through using a double or reinforced insulation! In particular, safe isolation is required between switch contacts of external devices such as relays, contactors; auxiliary switches (e.g. remote On/Off contact etc.) and their electric circuits, if these are non-SELV and non-PELV circuits.

A large grid of small dots covers the majority of the page, intended for taking notes.

This section of the page is a grid of small dots intended for taking notes. The dots are arranged in a regular pattern of 15 rows and 15 columns, forming a large square area for handwritten text.

EXCELLENCE IN SOLUTIONS

FläktGroup is the European market leader for smart and energy efficient Indoor Air and Critical Air solutions to support every application area. We offer our customers innovative technologies, high quality and outstanding performance supported by more than a century of accumulated industry experience. The widest product range in the market, and strong market presence in 65 countries worldwide, guarantee that we are always by your side, ready to deliver Excellence in Solutions.

PRODUCT FUNCTIONS BY FLÄKTGROUP

Air Treatment | Air Movement | Air Diffusion | Air Distribution | Air Filtration
Air Management | Air Conditioning & Heating | Controls | Service

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