GI Middle East

DC INVERTER VRF SYSTEMS

C-VRF

CLINT

Index

VRF System Overview

FULL DC INVERTER VRF SYSTEM

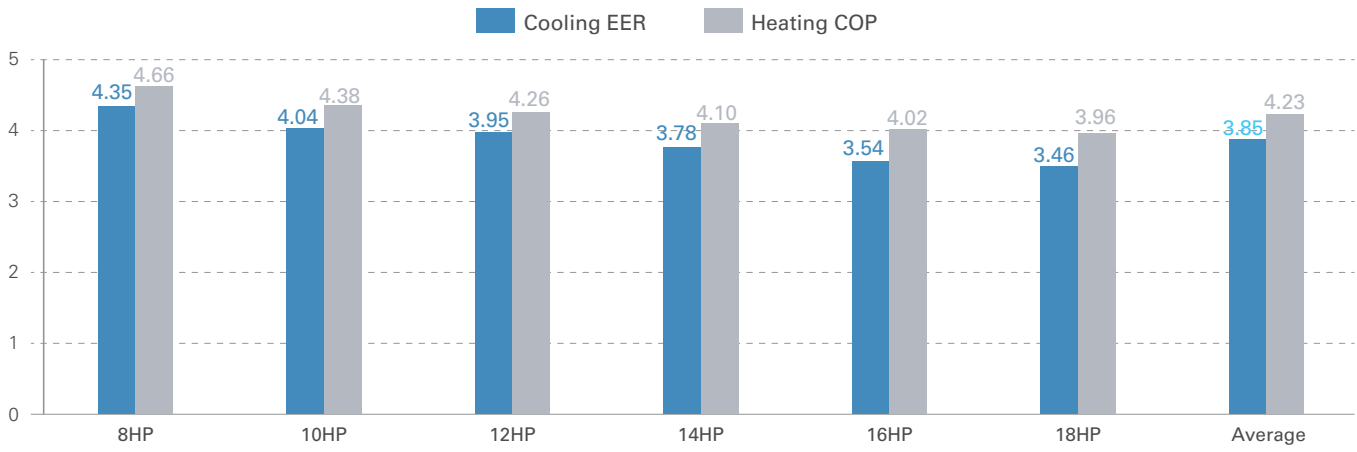
C-VRF models

C-VRF is the CLINT latest generation VRF product line: all compressors and fan motors are DC brushless type, so it has more excellent energy efficiency and some unique good features.

8HP 10HP 12HP 14HP 16HP 18HP

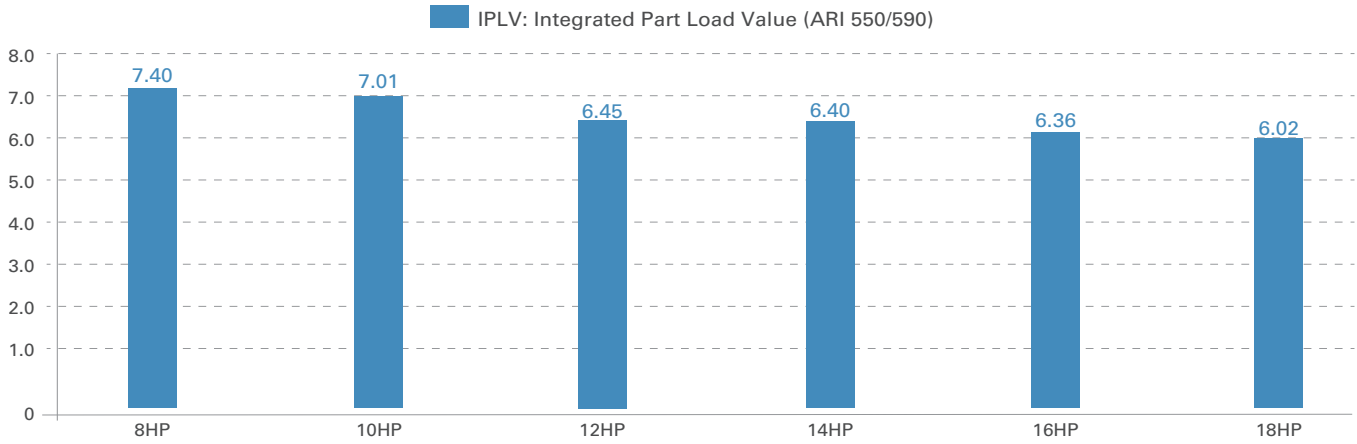
	8HP	10HP	12HP	14HP	16HP	18HP
Capacity	25.2kW	28kW	33.5kW	40kW	45kW	50kW
Compressor	DC INVERTER	DC INVERTER	DC INVERTER	2x DC INVERTER	2x DC INVERTER	2x DC INVERTER
Fan motor	DC INVERTER	DC INVERTER	2x DC INVERTER	2x DC INVERTER	2x DC INVERTER	2x DC INVERTER

EER & COP

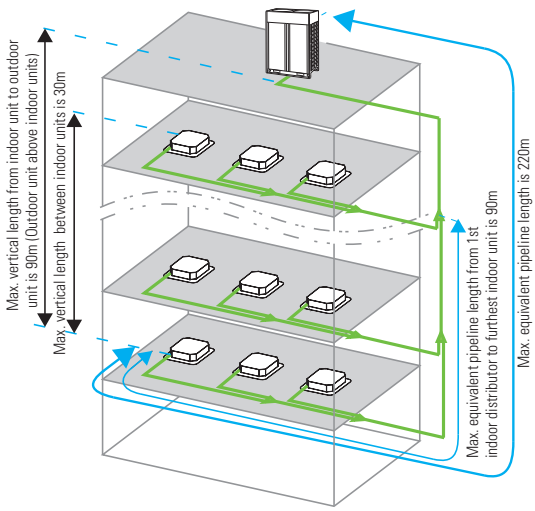


High efficiency at part load

The Integrated Part Load Value (IPLV) is a characteristic performance developed by the Air-Conditioning, Heating and Refrigeration Institute (AHRI). It is most commonly used to describe the performance of AC systems with capacity modulation. Unlike an EER (Energy Efficiency Ratio) or COP (Coefficient Of Performance), which describes the efficiency at full load conditions, the IPLV is derived from the equipment efficiency while operating at various capacities. Since a VRF system does not always run at 100% capacity, the EER or COP is not an ideal representation of the typical equipment performance. The IPLV is a very important value to consider since it can affect energy usage and operating costs throughout the useful life of the equipment.



Long Piping & Height Difference



- Total pipe length: 1000m
- Longest pipe:
  - Actual length 190m
  - Equivalent length 220m
- Equivalent length from first indoor distributor to last indoor unit: 90m
- Height difference between indoor and outdoor unit:
  - Outdoor unit above <90m
  - Outdoor unit below <110m
- Height difference between indoor units: 30m

Combination Table

Outdoor unit		C-VRF-08	C-VRF-10	C-VRF-12	C-VRF-14	C-VRF-16	C-VRF-18	Connected Indoor
HP	kW	8HP	10HP	12HP	14HP	16HP	18HP	Unit quantity
8	25,2	●						13
10	28		●					16
12	33,5			●				16
14	40				●			20
16	45					●		20
18	50						●	20
20	56		● ●					24
22	61,5		●	●				24
24	68		●		●			28
26	73		●			●		28
28	78,5			●		●		28
30	85				●	●		32
32	90					● ●		32
34	95					●	●	36
36	100						● ●	36
38	106,5		●	●		●		36
40	113		●		●	●		42
42	118		●			● ●		42
44	123,5			●		● ●		42
46	130				●	● ●		48
48	135					● ● ●		48
50	140					● ●	● ●	54
52	145					●	● ●	54
54	150						● ● ●	54
56	156		● ●				● ●	58
58	163		●			● ● ●		58
60	168,5			●		● ● ●		58
62	175				●	● ● ●		64
64	180					● ● ● ●		64
66	185					● ● ●	●	64
68	190					● ●	● ●	64
70	195					●	● ● ●	64
72	200						● ● ● ●	64

C-VRF MINI models

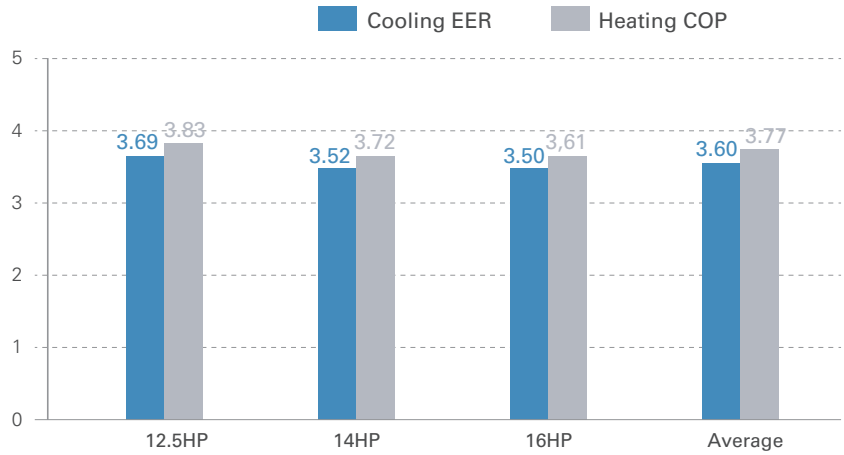
12,5HP

14HP

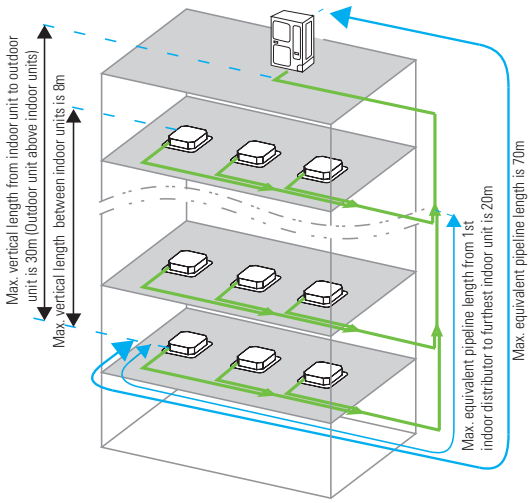
16HP

Capacity	12,5HP	14HP	16HP
Compressor	DC INVERTER	DC INVERTER	DC INVERTER
Fan motor	2 x DC INVERTER	2 x DC INVERTER	2 x DC INVERTER

EER & COP



Long Piping & Height Difference



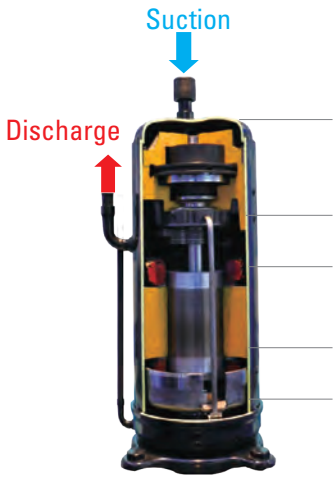
- Total pipe length: 100m
- Longest pipe:
  - Actual length 60m
  - Equivalent length 70m
- Equivalent length from first indoor distributor to last indoor unit: 20m
- Height difference between indoor and outdoor unit:
  - Outdoor unit above <30m
  - Outdoor unit below <20m
- Height difference between indoor units: 8m

C-VRF

Advantages

High Efficiency DC INVERTER Compressor

- Brushless DC INVERTER compressor.
- Small torque fluctuation, low vibration and quiet operation.
- High efficiency due to its patented internal structure design.
- Internal oil circulation structure.
- High reliability.
- Wide rotation speed range.
- High pressure chamber:
  - Small suction superheat and high refrigerant volume efficiency;
  - Large refrigerant discharge buffer volume, reduces vibration and noise.



Differential pressure oil film technology reduces noise and improves gas tightness

Special Scroll design for R410a

High precision processing: efficiency improved by 15%

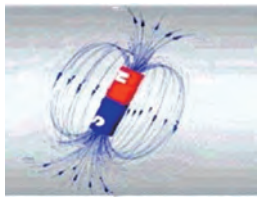
Concentrated winding: low frequency efficiency improved

Heavy-duty support, rigid shell.

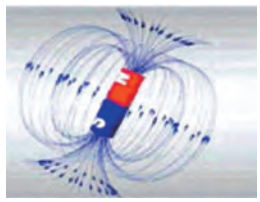
- Neodymium permanent magnet rotor with powerful magnetic force: large torque and high efficiency.

Neodymium permanent magnet rotor

Powerful magnetic force allows large power periods and high efficiency



Ferrite magnet

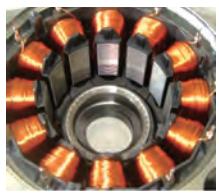


Neodymium permanent magnet

Concentrated winding

Magnetic efficiency is 12% higher than distributed winding

Distributed winding



Concentrated winding

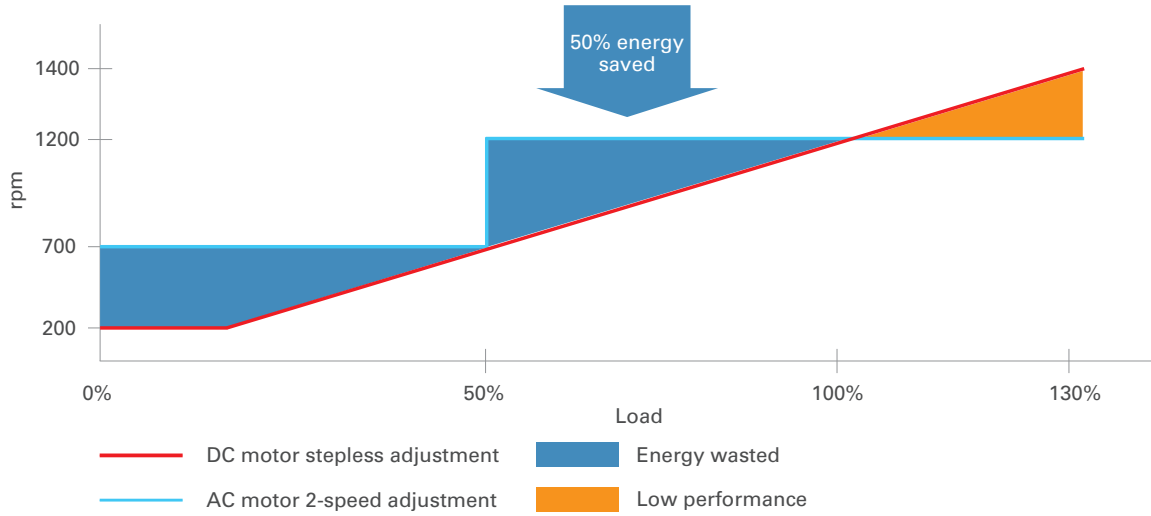
High Efficiency DC INVERTER Motor

- High efficiency DC INVERTER fan motor.
- Low noise and high efficiency due to high-density wire winding engineering.
- Brushless DC INVERTER motor with built-in sensor.

Stepless Control

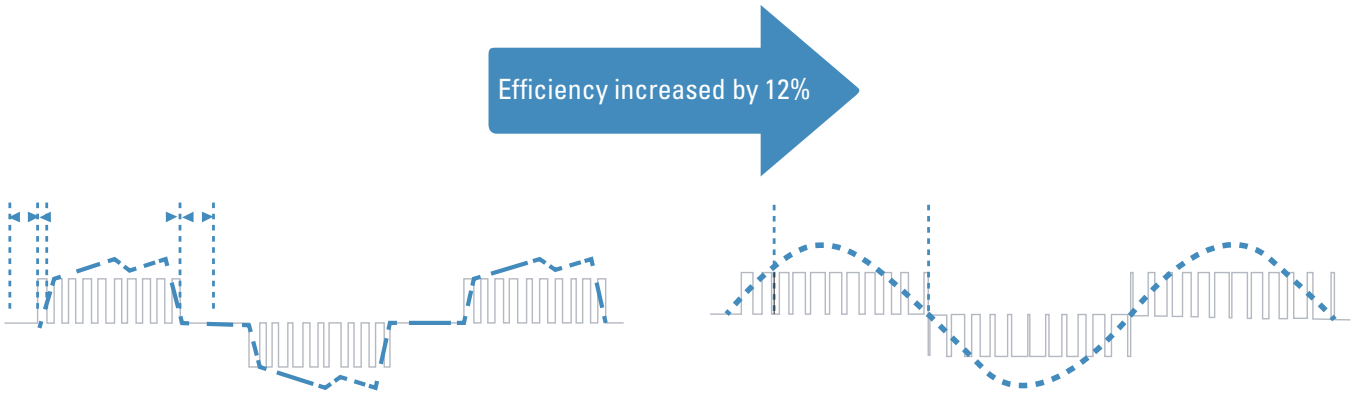
DC INVERTER fan motor can be stepless controlled by an outdoor PCB according to the system's operating pressure. It is able to reduce the energy consumption and maintain the system in its best performance, especially at partial loads.

Load-Revolution curve



180° Sine Waveform Control

The perfect combination of 180°Sine Waveform Rotor Frequency Drive Control technology and excellent IPM INVERTER reduces the motor-driven reactive loss and increases motor efficiency by 12%.

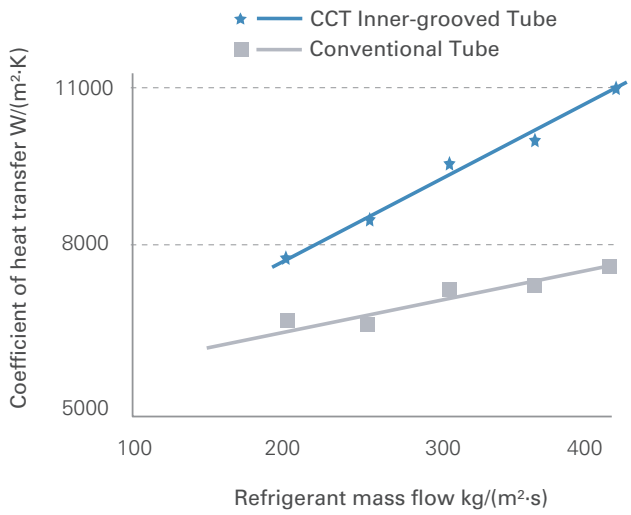


Conventional Waveform

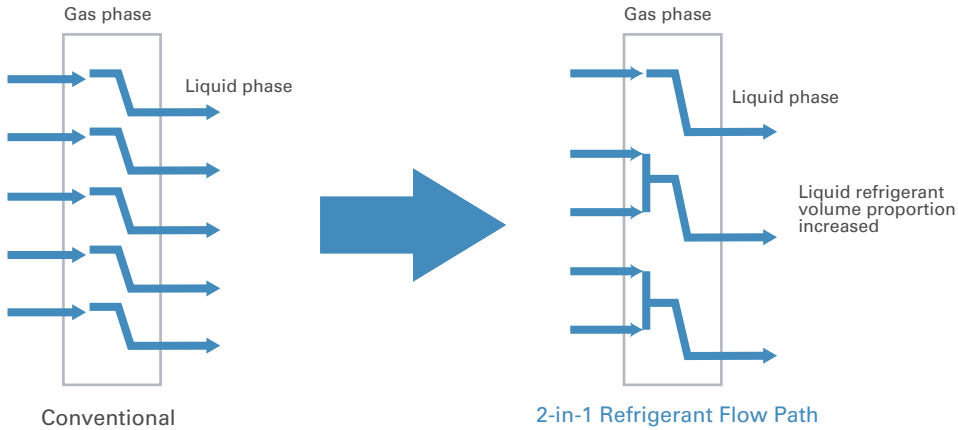
180° Sine Waveform

CCT Inner-grooved Tube

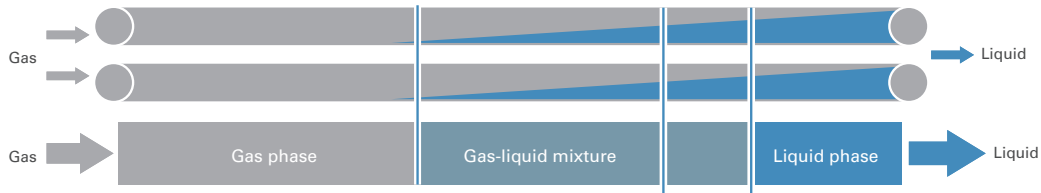
CCT (Continuous Cooling Transformation) inner-grooved copper tube has high thermometic conductivity.This inner-grooved fins break the refrigerant flow boundary layer to enhance refrigerant disturbance to increase heat-exchanging efficiency.



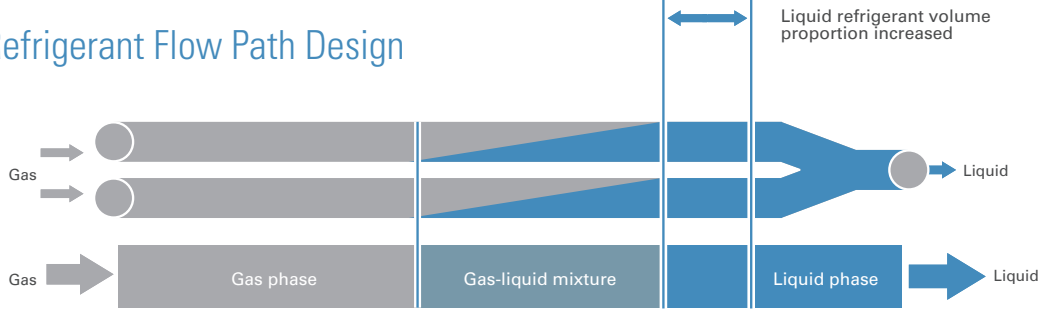
2-in-1 Refrigerant Flow Path Design



Conventional design

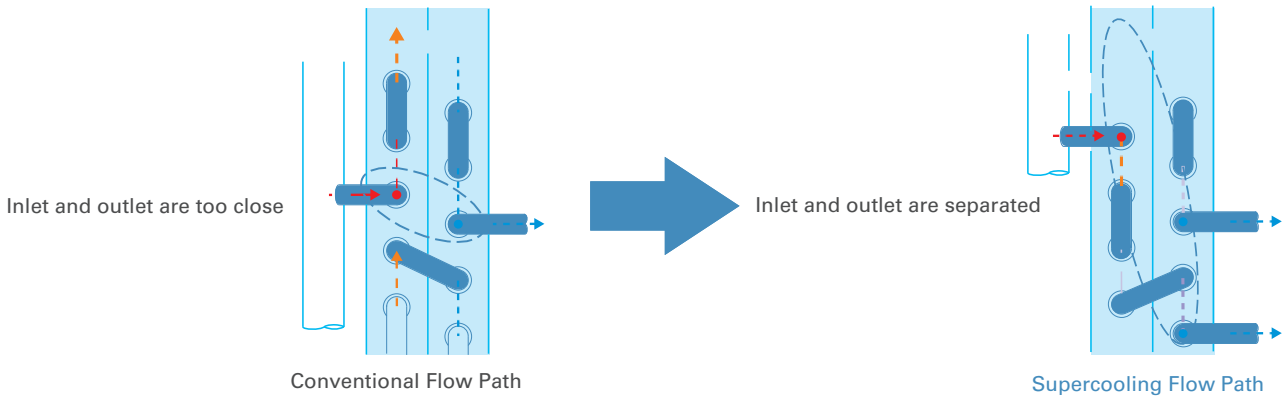


2-in-1 Refrigerant Flow Path Design



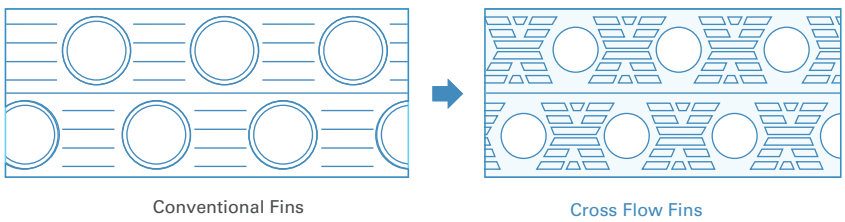
Supercooling Flow Path Design

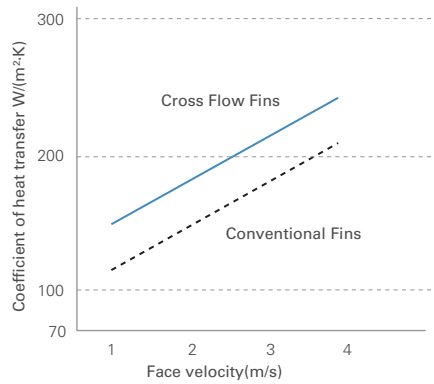
Supercooling Flow Path Design separates the refrigerant inlet and outlet, increasing the supercooling degree. Therefore system efficiency is greatly increased.



Cross Flow Fins

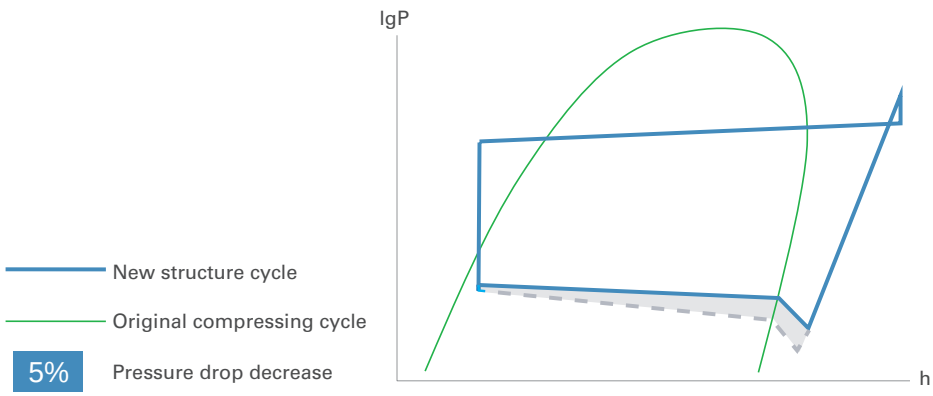
- Low air resistance and great heat transfer coefficient.
- Frosting improved, well-distributed frost on heat exchanger and easy defrosting.





Low Resistance Internal piping

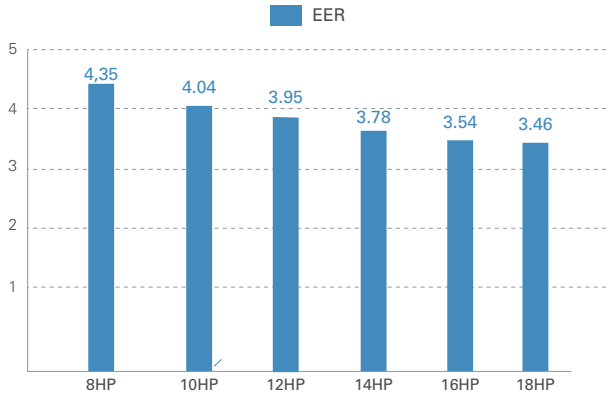
- Thanks to the optimised pipeline design, 5% pressure drop are reduced.
- Increased EER and COP thanks to of evaporating temperature increase and compressor work decrease.

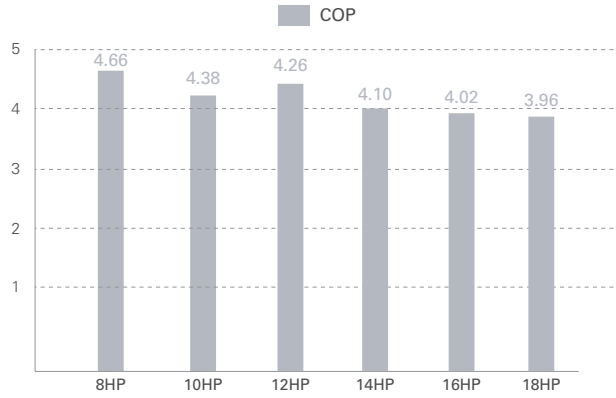


Benefits For Users

Excellent EER & COP

Thanks to DC INVERTER devices (compressor and fan motor), piping optimization design and new refrigerant control logic, EER and COP are significantly increased.

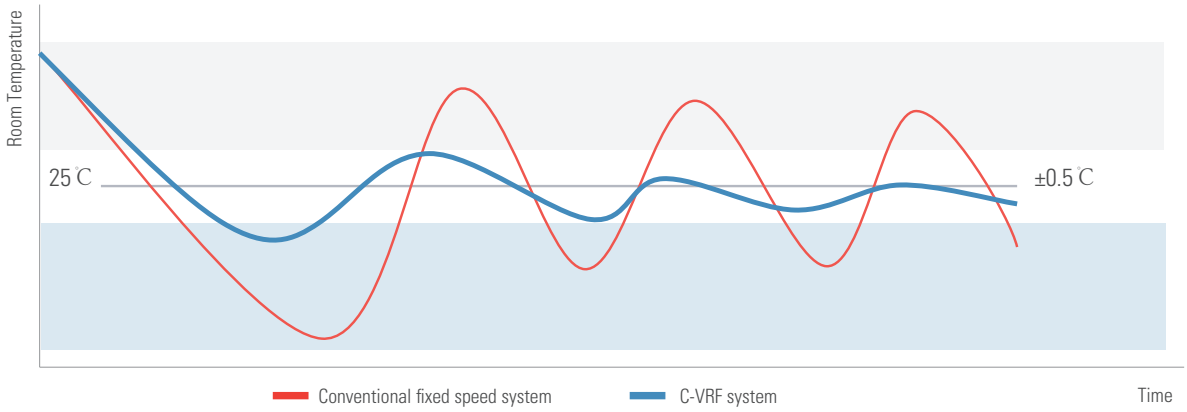




Outstanding Comfort Ability

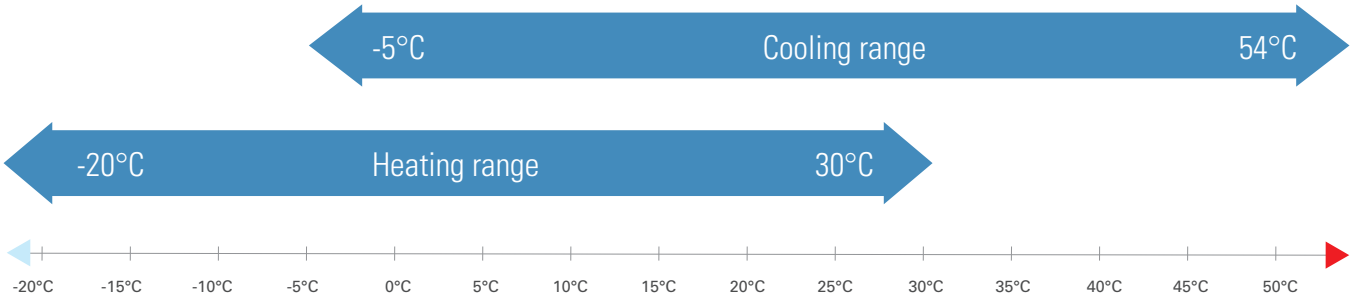
C-VRF system guarantees excellent cooling & heating performances thanks to the high efficiency DC INVERTER fan motor, DC INVERTER compressor and optimized refrigerant flow control logic.

Precise room temperature control (adopting 2000 pulse EXV) and indoor temperature fluctuation within 0,5°C offer outstanding comfort ability.



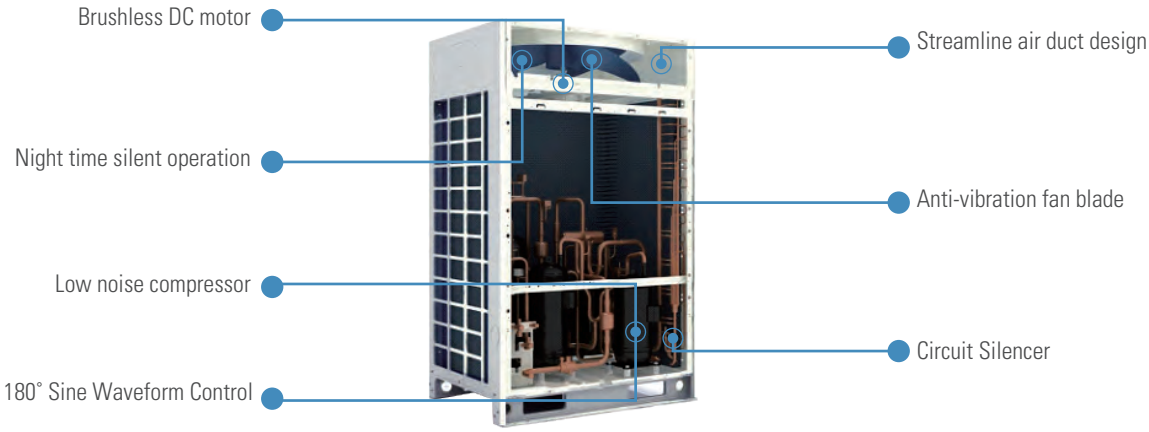
Wide Operation Range

- Cooling operating temperature is up to 54°C, suitable for the hot Regions.
- Heating operating temperature is down to -20°C. Also in the cold winter, C-VRF system can stably produce heat.



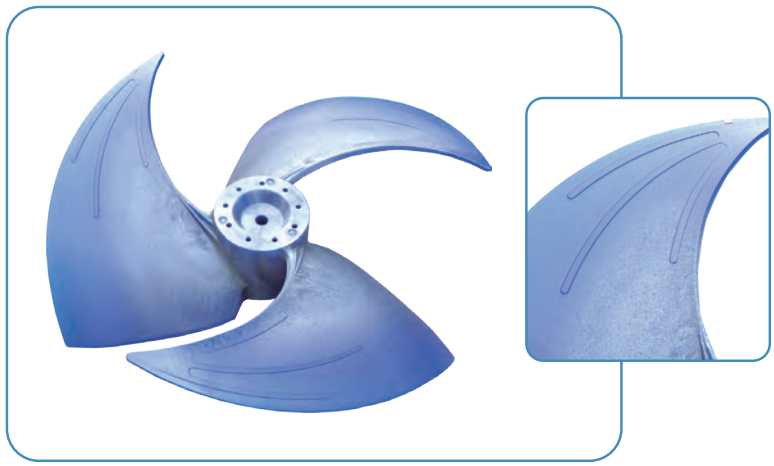
Low noise devices

Maximum 10 dB(A) of operating sound decrease.



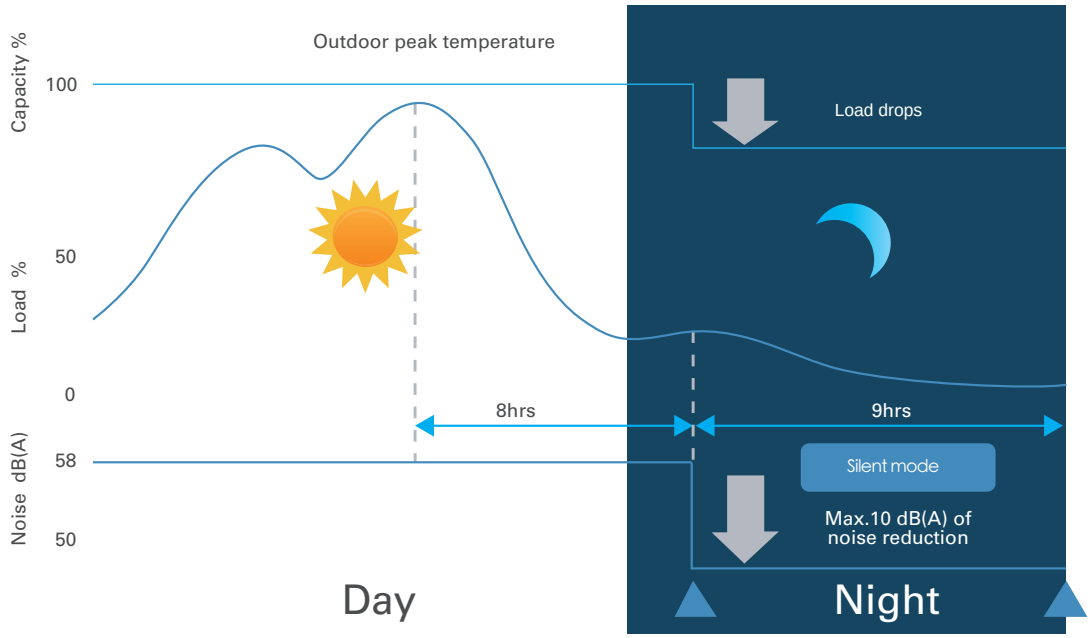
Low Noise Fan Blade

- Anti-vibration.
- Special design to reduce air vibration and disturbance.



Silent Mode: Night Time Noise Control

Compressor and fan motor rotating speed can be reduced at night, lowering the noise up to 10 dB(A).
Maximum 10 dB(A) decrease.

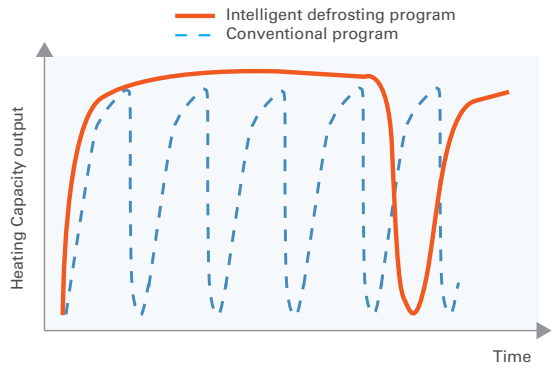


Snow-proof Function

- At low winter temperatures outdoor fan runs at intervals to prevent snow accumulation, that can damage both fan blades rotating and motor.

Intelligent Defrosting Program

- Fixed conventional defrosting timing and duration.
- The smart defrosting programm starts according to heat exchange efficiency and capacity. Due to less temperature flucutuations, comfort conditions are guarateed even in winter time.



3-stage Back-up Function

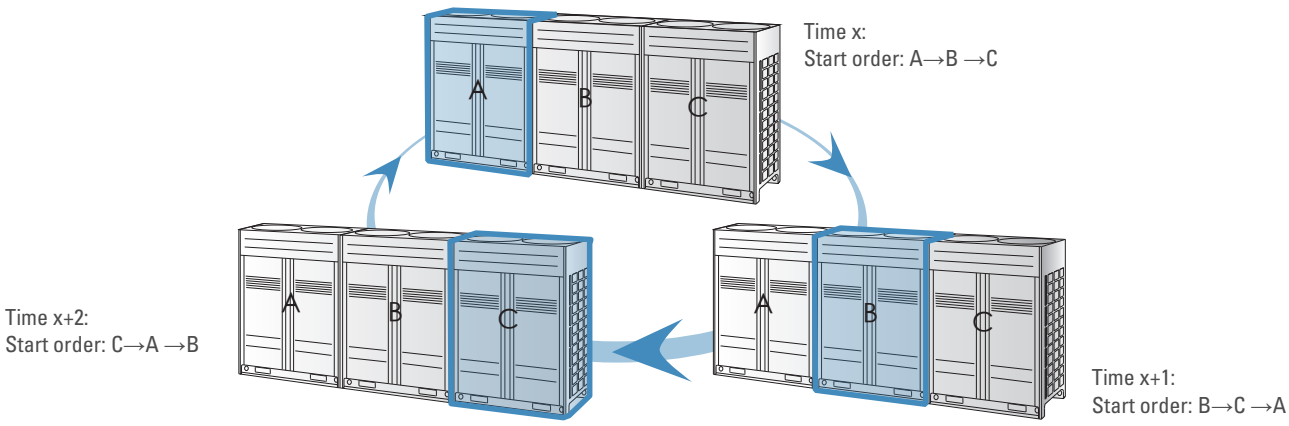
1 Module back up function: when some modules fail, the others can keep running.

2 Compressor back-up function: when one compressor fails, the other one can keep running.

3 Fan motor back-up function: when one fan motor fails, the other one can keep running.

All Outdoor Units Cycle Operation

- Any outdoor unit can run as master unit.
- Easy outdoor units lifespan balance.

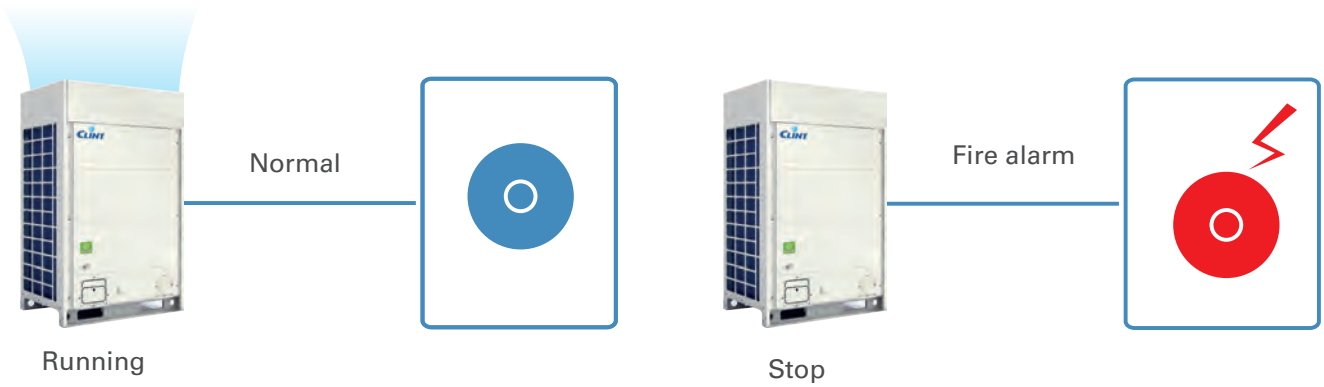


Remote ON/OFF Control Function

- Indoor built-in standard units feature ON/OFF control port.
- Useful for hotel cards (no indoor unit control module needed) or for long distance remote ON/OFF control.
- With open contactor (card pulled out) indoor units cannot be controlled and running parameters will be saved in the indoor PCB.
- With closed contactor (inserted card) previous running state will be recovered.

Emergency Stop Operation Function

Emergency Stop Operation Function



Benefits For Installers

Optimization for Designers and Installers

C-VRF DC INVERTER system is designed with flexible modular combination concept: optimised module sizes, reduced equipement, customised solutions and unique technologies.

4 Units Combination, Capacity up to 72HP

C-VRF

- 8HP ~ 18HP

- 20HP ~ 32HP

- 34HP ~ 48HP

- 50HP ~ 72HP

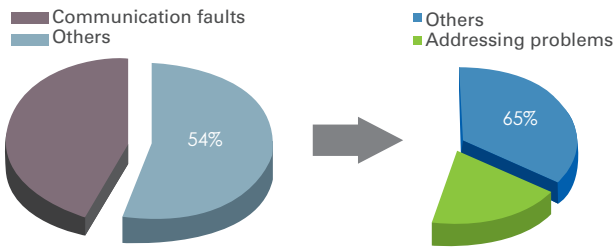
Adjustable Outdoor Fan External Static Pressure

- Thanks to DC INVERTER fan motor, the external static pressure of outdoor fan is adjustable.
- Outdoor units can be installed in service floor or facility room.
- Maximum ESP 85Pa.

New Wired Controller

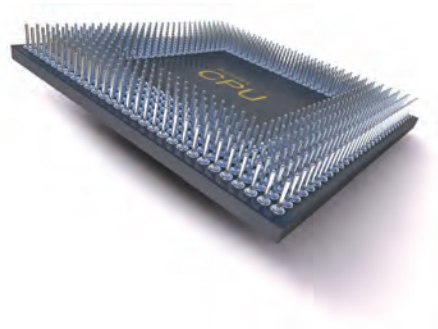
- Bi-directional communication: Indoor unit's operating parameters (error code, temperature, address) can be inquired and displayed on the controller.
- Compact design.
- Timer function.
- User can easily check the error code or inquiry unit status.

Automatic Addressing



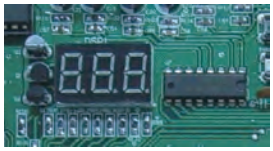
- 54% system failure are caused by communication faults.
- 65% communication faults are caused by address problems.
- Automatic addressing reduces faults by 35%.

Addressing Methods



- System distributes address to indoor unit automatically.
- Manually adressing by wireless remote controller.
- Addressing method can be easily selcted by adjusting the switch on outdoor PCB.

LED Display on the PCB



- LED display on the PCB can show operation status and error codes.

Service Window

- The service window guaratees an easy status check and setting.
- No need to remove the electric control box cover.

Humanized Internal Structure

- Front access to all key components optimised for maintenance activities.
- Thanks to the new balance technology, gas balance pipe does no longer exist: brazing points and leaking risk are decreased.

Easy installation

- Compact size allows easy trasnport to roof floor by elevator.
- Communication wire length can be up to 1000m.

Technical Data

BASIC MODULES

Outdoor unit (OTU)			C-VRF-08	C-VRF-10	C-VRF-12	C-VRF-14	C-VRF-16	C-VRF-18
Capacity Range		HP	8	10	12	14	16	18
Cooling	Cooling Capacity (1)	BTU/h	85.000	95.000	114.000	136.000	153.000	170.500
		KW	25,2	28,0	33,5	40,0	45,0	50,0
		TON	7,2	8,0	9,5	11,4	12,8	14,2
	Power input (1)	KW	5,7	6,9	8,4	10,5	12,7	14,4
	EER (1)		4,35	4,04	3,95	3,78	3,54	3,46
Heating	Heating Capacity (2)	BTU/h	93.000	107.000	127.000	153.000	170.000	190.960
		KW	27,4	31,5	37,5	45,0	50,0	56,0
		TON	7,8	9,0	10,7	12,8	14,2	15,9
	Power input (2)	kW	5,88	7,19	8,80	10,98	12,44	14,14
	COP (2)		4,66	4,38	4,26	4,10	4,02	3,96
Max. connected indoor units quantity		n°	13	16		20		
Compressor	Quantity	n°	1			2		
	Type		DC INVERTER					
Refrigerant	Type		R410A					
	Volume	Kg	10		12	16		16
Fan	Type		DC INVERTER					
	Quantity	n°	1		2			
	ESP	Pa	85					
Dimension (W×H×D)	Net	mm	970×1620×765		1260×1620×765			
	Packing	mm	1030x1750x825		1315x1750x825			
Weights	Net	Kg	208		242	286		314
	Packing	Kg	218		254	298		326
Sound pressure level (3)		dB(A)	58			60		
Operating range	Cooling	°C	-5°C to 54°C					
	Heating	°C	-20°C to 30°C					
Electrical characteristics	Power supply	V/Ph/Hz	380-415 / 3 / 50					
Piping data								
Max pipe lenght	Total pipe lenght	m	1000					
	From OTU to furthest INU (equivalent lenght)	m	220					
	From 1st indoor distributor to furthest INU	m	90					
Max vertical pipe lenght	Between OTU-INU (OTU above INU)	m	90					
	Between OTU-INU (OTU below INU)	m	110					
	Between INUs	m	30					
Total equivalent pipeline length < 90m	Liquid	mm	Ø12.7			Ø15.9		
	Gas	mm	Ø22.2	Ø25.4	Ø28.6			Ø31.8
Total equivalent pipeline length ≥ 90m	Liquid	mm	Ø12.7		Ø15.9			Ø19.1
	Gas	mm	Ø25.4		Ø28.6	Ø31.8		
Oil balance pipe		mm	/					

Notes:
1. Cooling conditions: indoor side 27°C(80.6°F) db, 19°C(60°F) wb; outdoor side 35°C(95°F) db.
2. Heating conditions: indoor side 20°C(68°F) db, 15°C(44.6°F) wb; outdoor side 7°C(42.8°F) db.
3. Sound pressure level measured in free field conditions at 1 m from the unit and at 1,5 m from the ground.

2 MODULES COMBINATIONS

Capacity Range		HP	20	22	24	26	28	30	32	34	36
Cooling	Cooling Capacity (1)	BTU/h	191.000	209.000	232.000	249.000	267.000	290.000	307.000	327.000	344.000
		KW	56,0	61,5	68,0	73,0	78,5	85,0	90,0	96,0	101
		TON	15,9	17,5	19,3	20,8	22,3	24,2	25,6	27,3	28,7
	Power input (1)	KW	13,9	15,4	17,5	19,6	21,2	23,3	25,4	27,2	28,9
	EER (1)		4,04	3,99	3,88	3,72	3,70	3,65	3,54	3,53	3,49
Heating	Heating Capacity (2)	BTU/h	214.000	235.000	261.000	278.000	298.000	324.000	341.000	368.000	385.000
		KW	63,0	69,0	76,5	81,5	87,5	95,0	100	108	113
		TON	17,9	19,6	21,8	23,2	24,9	27,0	28,4	30,7	32,1
	Power input (2)	kW	14,4	16,0	18,2	19,6	21,2	23,4	24,9	26,6	28,3
	COP (2)		4,38	4,31	4,21	4,15	4,12	4,06	4,02	4,06	4,00
Max. connected indoor units quantity		n°	24		28			32		36	
Compressor	Quantity	n°	1+1		1+2			2+2		2+2	
	Type		DC INVERTER								
Refrigerant	Type		R410A								
	Volume	Kg	10+10	10+12	10+15		12+15	15+15		15+16	16+16
Fan	Type		DC INVERTER								
	Quantity	n°	1+1	1+2			2+2			2+2	
	ESP	Pa	85								
Dimension (W×H×D)	Net	mm	/								
	Packing	mm	/								
Weights	Net	Kg	/								
	Packing	Kg	/								
Sound pressure level (3)		dB(A)	61	62			63				
Operating range	Cooling	°C	-5°C to 54°C								
	Heating	°C	-20°C to 30°C								
Electrical characteristics	Power supply	V/Ph/Hz	380-415 / 3 / 50								
Piping data											
Max pipe lenght	Total pipe lenght	m	1000								
	From OTU to furthest INU (equivalent lenght)	m	220								
	From 1st indoor distributor to furthest INU	m	90								
Max vertical pipe lenght	Between OTU-INU (OTU above INU)	m	90								
	Between OTU-INU (OTU below INU)	m	110								
	Between INUs	m	30								
Total equivalent pipeline length < 90m	Liquid	mm	Ø15.9			Ø19.1					
	Gas	mm	Ø31.8		Ø34.9					Ø41.3	
Total equivalent pipeline length ≥ 90m	Liquid	mm	Ø19.1			Ø22.2					
	Gas	mm	Ø31.8		Ø38.1					Ø41.3	
Oil balance pipe		mm	Ø6.35								

Notes:
1. Cooling conditions: indoor side 27°C(80.6°F) db, 19°C(60°F) wb; outdoor side 35°C(95°F) db.
2. Heating conditions: indoor side 20°C(68°F) db, 15°C(44.6°F) wb; outdoor side 7°C(42.8°F) db..
3. Sound pressure level measured in free field conditions at 1 m from the unit and at 1,5 m from the ground.

3 MODULES COMBINATIONS

Capacity Range		HP	38	40	42	44	46	48	50	52	54
Cooling	Cooling Capacity (1)	BTU/h	363.000	385.000	402.000	421.000	443.000	460.000	488.000	498.000	516.000
		KW	107	113	118	124	130	135	143	146	152
		TON	30,3	32,1	33,6	35,1	37,0	38,4	40,7	41,5	43,1
	Power input (1)	KW	28,1	30,2	32,4	33,9	36,0	38,1	39,9	41,6	43,4
	EER (1)		3,79	3,74	3,65	3,64	3,61	3,54	3,59	3,51	3,49
Heating	Heating Capacity (2)	BTU/h	406.000	431.000	448.000	469.000	494.000	511.000	542.000	556.000	576.000
		KW	119	127	132	138	145	150	159	163	169
		TON	33,8	36,0	37,4	39,1	41,2	42,7	45,2	46,3	48,1
	Power input (2)	KW	28,4	30,6	32,1	33,7	35,9	37,3	39,0	40,7	42,4
	COP (2)		4,19	4,13	4,10	4,08	4,04	4,02	4,07	4,00	3,98
Max. connected indoor units quantity		n°	36	42			48		54		
Compressor	Quantity	n°	1+1+2	1+2+2			2+2+2		2+2+2		
	Type		DC INVERTER								
Refrigerant	Type		R410A								
	Volume	Kg	10+12+15	10+15+15		12+15+15	15+15+15		15+15+16		
Fan	Type		DC INVERTER								
	Quantity	n°	1+2+2			2+2+2					
	ESP	Pa	85								
Dimension (W×H×D)	Net	mm	/								
	Packing	mm	/								
Weights	Net	Kg	/								
	Packing	Kg	/								
Sound pressure level (3)		dB(A)	64								
Operating range	Cooling	°C	-5°C to 54°C								
	Heating	°C	-20°C to 30°C								
Electrical characteristics	Power supply	V/Ph/Hz	380-415 / 3 / 50								
Piping data											
Max pipe lenght	Total pipe lenght	m	1000								
	From OTU to furthest INU (equivalent lenght)	m	220								
	From 1st indoor distributor to furthest INU	m	90								
Max vertical pipe lenght	Between OTU-INU (OTU above INU)	m	90								
	Between OTU-INU (OTU below INU)	m	110								
	Between INUs	m	30								
Total equivalent pipeline length < 90m	Liquid	mm	Ø19.1						Ø22.2		
	Gas	mm	Ø41.3						Ø44.5		
Total equivalent pipeline length ≥ 90m	Liquid	mm	Ø22.2						Ø25.4		
	Gas	mm	Ø41.3						Ø44.5		
Oil balance pipe		mm	Ø6.35						Ø6.35		

Notes:
1. Cooling conditions: indoor side 27°C(80.6°F) db, 19°C(60°F) wb; outdoor side 35°C(95°F) db.
2. Heating conditions: indoor side 20°C(68°F) db, 15°C(44.6°F) wb; outdoor side 7°C(42.8°F) db.
3. Sound pressure level measured in free field conditions at 1 m from the unit and at 1,5 m from the ground.

4 MODULES COMBINATIONS

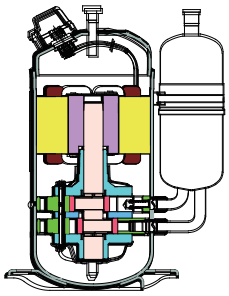
Capacity Range		HP	56	58	60	62	64	66	68	70	72
Cooling	Cooling Capacity (1)	BTU/h	539.000	556.000	574.000	597.000	614.000	626.000	648.000	665.000	682.000
		KW	158	163	169	175	180	184	190	195	200
		TON	44,9	46,3	47,9	49,8	51,2	52,2	54,0	55,4	56,9
	Power input (1)	KW	42,8	45,1	46,6	48,7	50,8	52,6	54,3	56,1	57,8
	EER (1)		3,69	3,62	3,61	3,59	3,54	3,49	3,50	3,48	3,46
Heating	Heating Capacity (2)	BTU/h	602.000	619.000	639.000	665.000	682.000	702.000	723.000	743.000	764.000
		KW	177	182	188	195	200	206	212	218	224
		TON	50,2	51,6	53,3	55,4	56,9	58,6	60,3	62,0	63,7
	Power input (2)	kW	42,7	44,5	46,1	48,3	49,8	51,5	53,2	54,9	56,6
	COP (2)		4,14	4,08	4,07	4,04	4,02	4,00	3,99	3,97	3,96
Max. connected indoor units quantity		n°	58			64					
Compressor	Quantity	n°	1+1+2+2	1+2+2+2		2+2+2+2		2+2+2+2			
	Type		DC INVERTER								
Refrigerant	Type		R410A								
	Volume	Kg	2x10+2x16	10+15 +15+15	12+15+15+15	15+15 +15+15		15+15+15+16	15+15+16+16	15+16+16+16	16+16+16+16
Fan	Type		DC INVERTER								
	Quantity	n°	1+1+2+2	1+2+2+2	2+2+2+2						
	ESP	Pa	85								
Dimension (W×H×D)	Net	mm	/								
	Packing	mm	/								
Weights	Net	Kg	/								
	Packing	Kg	/								
Sound pressure level (3)		dB(A)	65								
Operating range	Cooling	°C	-5°C to 54°C								
	Heating	°C	-20°C to 30°C								
Electrical characteristics	Power supply	V/Ph/Hz	380-415 / 3 / 50								
Piping data											
Max pipe lenght	Total pipe lenght	m	1000								
	From OTU to furthest INU (equivalent lenght)	m	220								
	From 1st indoor distributor to furthest INU	m	90								
Max vertical pipe lenght	Between OTU-INU (OTU above INU)	m	90								
	Between OTU-INU (OTU below INU)	m	110								
	Between INUs	m	30								
Total equivalent pipeline length < 90m	Liquid	mm	Ø22.2						Ø25.4		
	Gas	mm	Ø44.5						Ø44.5		
Total equivalent pipeline length ≥ 90m	Liquid	mm	Ø25.4						Ø25.4		
	Gas	mm	Ø44.5						Ø44.5		
Oil balance pipe		mm	Ø6.35								

Notes:
1. Cooling conditions: indoor side 27°C(80.6°F) db, 19°C(60°F) wb; outdoor side 35°C(95°F) db.
2. Heating conditions: indoor side 20°C(68°F) db, 15°C(44.6°F) wb; outdoor side 7°C(42.8°F) db.
3. Sound pressure level measured in free field conditions at 1 m from the unit and at 1,5 m from the ground.

C-VRF MINI

Advantages

High Efficiency DC INVERTER Compressor



Twin-rotary DC INVERTER compressor:

- High efficency and reliability
- Rotating speed can be down to 20 RPS
- High efficiency at partial loads.

High Efficiency, Low Noise:

- Optimized efficiency and reduced noise thanks to the latest technology.

Low Vibration:

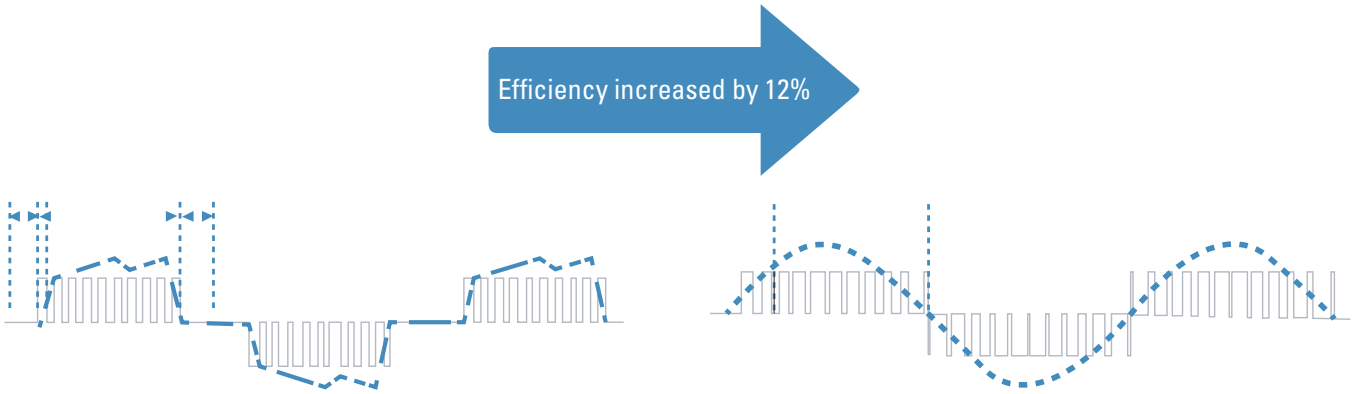
- New structure allows start-up and operation vibration reduction.

High Efficiency DC INVERTER Motor

- High efficiency DC INVERTER fan motor.
- Low noise and high efficiency thanks to high-density wire winding engineering.
- Brushless DC INVERTER motor with built-in sensor.

180° Sine Waveform Control

The perfect combination of 180°Sine Waveform Rotor Frequency Drive Control technology and excellent IPM INVERTER reduces the motor-driven reactive loss and increases motor efficienvy by 12%.

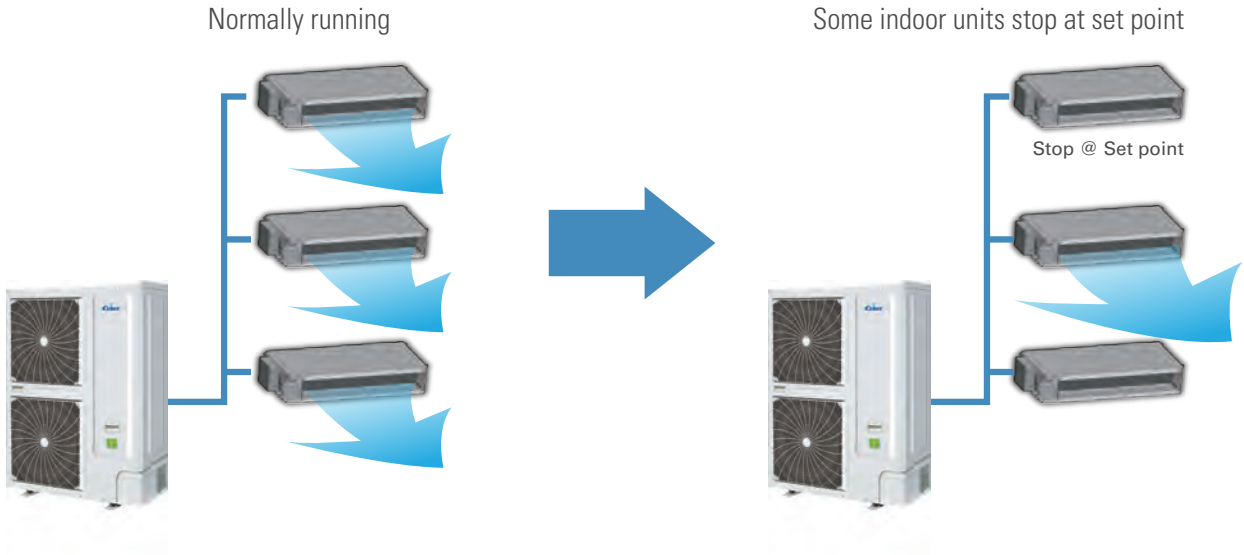


Conventional Waveform

180° Sine Waveform

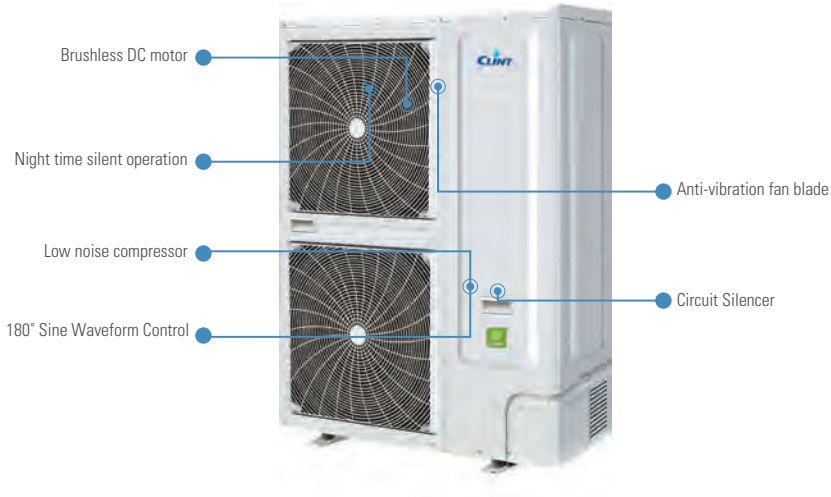
Fast Cooling and Heating

Every room meets set point most quickly and comfortably by optimized refrigerant control.



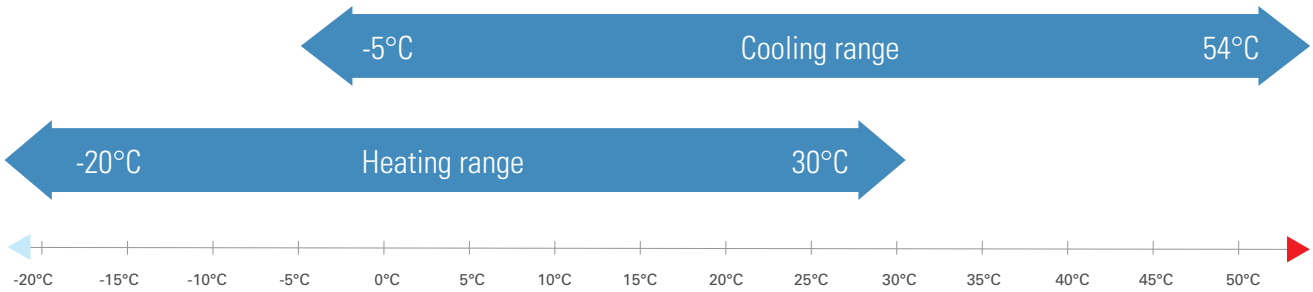
Low noise devices

Maximum 10 dB(A) of operating sound decrease.



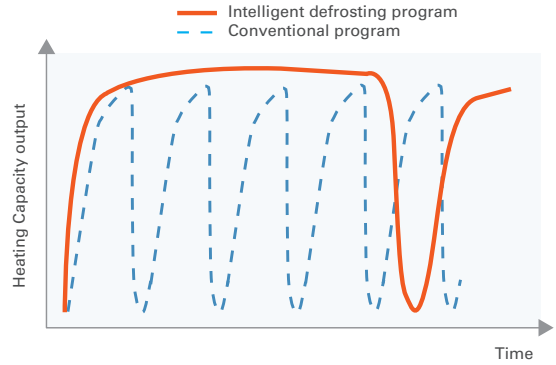
Wide Outdoor Operation Range

- Cooling operating temperature up to 54°C, suitable for the hot Regions.
- Heating operating temperature is down to -20°C. Also in the cold winter C-VRF can stably produce heat.

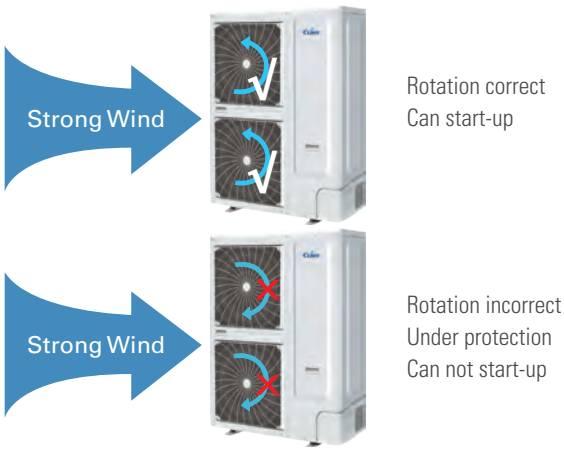


Intelligent Defrosting Program

- Fixed conventional defrosting timing and duration.
- The smart defrosting programm starts according to heat exchange efficiency and capacity. Due to less temperature flucutuations, comfort conditions are guarateed even in winter time..



Fan Reversal Protection

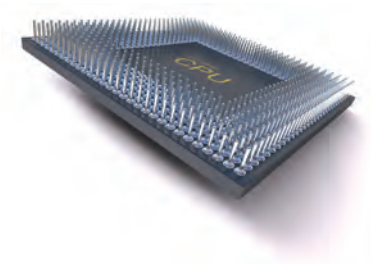


In standby, if the outdoor fan motor is rotating in opposite direction at a high speed by the wind or other natural factors, the unit can't start so as to keep the fan motor from broken down. It will start when the fan motor speed slow down.

Active PFC Module

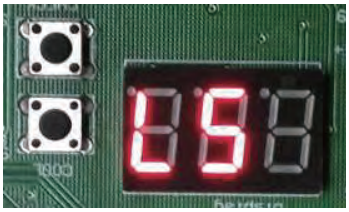
- PFC: Power Factor Corrector
- There can be a power loss because of the difference between voltage and current.
- With PFC module, the power used is higher. The power factor can be up to 98%, making the system more efficient.
- Power factor refers to the relationship between effective power and total power consumption.
- Power factor can measure power utilization rate, the power factor bigger, the higher power utilization rate.

Automatically Addressing



- System distributes address to indoor unit automatically
- Artificial faults and manual work reduction.

LED Display on the PCB



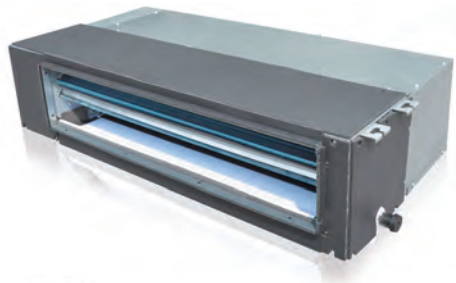
- LED display on the PCB can show operation status and error codes.

Technical Data

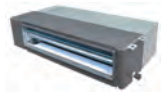
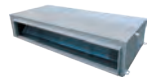
Outdoor unit (OTU)			C-VRF-04-H	C-VRF-05-H	C-VRF-06-H
Cooling	Cooling Capacity (1)	BTU/h	42.000	47.000	54.000
		KW	12,5	14,0	16,0
		TON	3,6	4,0	4,5
	Power input (1)	KW	3,4	4,0	4,6
	EER (1)		3,70	3,50	3,50
Heating	Heating Capacity (2)	BTU/h	47.000	54.000	63.000
		KW	14,0	16,0	18,5
		TON	4,0	4,5	5,3
	Power input (2)	kW	3,7	4,3	5,1
	COP (2)		3,8	3,7	3,6
Max. connected indoor units quantity		n°	6	7	8
Compressor	Quantity	n°	1		
	Type		DC INVERTER		
Refrigerant	Type		R410A		
	Volume	Kg	3,7	4,1	4,7
Fan	Type		DC INVERTER		
	Quantity	n°	2		
Dimension (W×H×D)	Net	mm	900×1330×345		
	Packing	mm	965×1445×400		
Weights	Net	Kg	89		96
	Packing	Kg	100		107
Sound pressure level (3)		dB(A)	45-58	45-58	45-58
Operating range	Cooling	°C	-5°C to 54°C		
	Heating	°C	-20°C to 30°C		
Electrical characteristics	Power supply	V/Ph/Hz	380-415 / 3 / 50		
Piping data					
Max pipe lenght	Total pipe lenght	m	100		
	From OTU to furthest INU (equivalent lenght)	m	70		
	From 1st indoor distributor to furthest INU	m	20		
Max vertical pipe lenght	Between OTU-INU (OTU above INU)	m	30		
	Between OTU-INU (OTU below INU)	m	20		
	Between INUs	m	8		
Connections	Liquid	mm	Ø9.53		
	Gas	mm	Ø15.9		

Notes:
1. Cooling condition: indoor temp.: 27˚C db (80.6˚F), 19˚C wb (60˚F); outdoor temp.: 35˚C db (95˚F); equivalent pipe length: 5m, drop length: 0m.
2. Heating condition: indoor temp.: 20˚C db (68˚F), 15˚C wb (44.6˚F); outdoor temp.: 7˚C db (42.8˚F); equivalent pipe length: 5m, drop length: 0m.
3. Sound pressure level measured in free field conditions at 1 m from the unit and at 1,5 m from the ground.

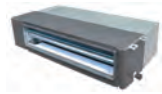
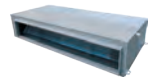
Indoor Units



Indoor Units Line Up

Capacity (kW)	4-Way Cassette (Compact Design)	4-Way Cassette	Wall Mounted	Floor/Ceiling	Low ESP Ducted Unit	Medium ESP Ducted Unit	High ESP Ducted Unit
							
2,2							
2,8	●		●		●		
3,6	●		●		●		
4,5	●		●	●	●		
5,6			●	●	●		
7,1			●	●			
9,0		●		●		●	
12,0						●	
12,5		●					
14,0		●		●			
15,0						●	
16,0		●		●			
20,0							●
22,4							
25,0							●
28,0							●

Indoor Units Features

Capacity (kW)	4-Way Cassette (Compact Design)	4-Way Cassette	Wall Mounted	Floor/Ceiling	Low ESP Ducted Unit	Medium ESP Ducted Unit	High ESP Ducted Unit
							
Controller							
Wireless controller	√	√	√	√	optional	optional	optional
Wired wall controller	optional	optional	optional	optional	optional	optional	optional
Centralized controller	optional	optional	optional	optional	optional	optional	optional
Features							
DC INVERTER motor	-	-	-	-	√	-	-
Autochange over mode	√	√	√	√	√	√	√
Ventilation mode	√	√	√	√	√	√	√
Sleep mode	√	√	√	√	√	√	√
Dehumidify	√	√	√	√	√	√	√
Timer	√	√	√	√	√	√	√
Air swing selection	√	√	√	√	-	-	-
Fan speed	3	3	3	3	3	3	3
Air filter	√	√	√	√	optional	√	√
Autorestart	√	√	√	√	√	√	√
Autocheck up	√	√	√	√	√	√	√
Drain pump	√	√	-	optional	√	optional	optional

4-Way Cassette

Compact Design

Controller		
Standard	Optional	
Wireless	Wired	Centralized
		

Features

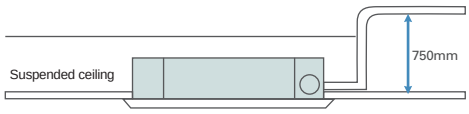
Accessories

Air filter	EXV	Drain pump
Standard	Standard (built-in)	Standard (built-in)

4 Ways air delivering

- Soft and smooth air flow: air can be delivered to every corner without dead angles, balancing the room temperature distribution.

Built-in with drain pump



- Low noise longlife drain pump. Flexible pumping head: 750 mm.
- N.B.: 4-way Cassette (compact version) pumping head: 700 mm.

Space saving & easy installation

- Suitable for low suspended ceilings: only 230 mm height.

Technical Data

			4-Way Cassette (Compact Design)			4-Way Cassette		
Indoor Unit (INU)			C-CK-28-S	C-CK-36-S	C-CK-45-S	C-CK-90-B	C-CK-125-B	C-CK-140-B
Cooling	Cooling Capacity (1)	BTU/h	9.500	12.200	15.300	30.700	42.600	47.700
		KW	2,8	3,6	4,5	9,0	12,5	14,0
		TON	0,8	1,0	1,3	2,6	3,6	4,0
Heating	Heating Capacity (2)	BTU/h	10.900	13.600	17.000	34.100	47.700	51.100
		KW	3,2	4,0	5,0	10,0	14,0	15,0
		TON	0,9	1,1	1,4	2,8	4,0	4,3
Fan	Air flow	m³/h	500	600	750	1600	1600	1600
		cfm	290	350	440	940	940	940
Refrigerant	Type		R410A					
Dimension - Body (W×H×D)	Net	mm	635×275×580			835×285×900		
	Packing	mm	745×375×675			920×310×960		
Dimension - Panel (W×H×D)	Net	mm	650×30×650			950×50×950		
	Packing	mm	750×95×750			1030×105×1030		
Weights - Body	Net	Kg	23			29		
	Packing	Kg	25			35		
Weights - Panel	Net	Kg	5			5		
	Packing	Kg	6			6		
Sound pressure level (3)		dB(A)	35~38			37~41		
Electrical characteristics	Power supply	V/Ph/Hz	220~240V/1/50			220~240V/1/50		
	Power Input	kW	0,065	0,070	0,075	0,160	0,160	0,160
	Max absorbed current	A	0,180	0,190	0,210	0,440	0,440	0,440
Piping data								
Connections	Liquid	mm	Ø6.35			Ø9.53		
	Gas	mm	Ø9.53	Ø12.7		Ø15.9		
	Drain	mm	Ø25			Ø25		

Note:
1. Cooling condition: indoor side 27°C db, 19°C wb; outdoor side 35°C db.
2. Heating condition: indoor side 20°C db, 15°C wb; outdoor side 7°C db.
3. Sound pressure level measured in free field conditions at 1 m from the unit and at 1,5 m from the ground.

Wall Mounted Unit

Controller		
Standard	Optional	
Wireless	Wired	Centralized
		

Features

Accessories

Air filter	EXV
Standard	Standard (built-in)

Space saving

Cross flow fan: horizontal cooling air flow, vertical heating air flow.

Easy installation

Refrigerant pipe can be connected from 3 directions.

Wide adjustable air supply angle

65° wide louver angle: it can be fixed or set by auto-swing controller.

Technical Data

Indoor Unit (INU)			C-WM-28	C-WM-36	C-WM-45	C-WM-51	C-WM-70
Cooling	Cooling Capacity (1)	BTU/h	9.500	12.200	15.300	19.100	24.200
		KW	2,8	3,6	4,5	5,6	7,1
		TON	0,8	1,0	1,3	1,6	2,0
Heating	Heating Capacity (2)	BTU/h	10.900	13.600	17.000	21.100	26.600
		KW	3,2	4,0	5,0	6,2	7,8
		TON	0,9	1,1	1,4	1,8	2,2
Fan	Air flow	m^3/h	540	600	780	1000	1000
		cfm	320	360	460	590	590
Refrigerant	Type		R410A				
Dimension (W×H×D)	Net	mm	900×282×205			1080×305×220	
	Packing	mm	975×365×290			1135×380×310	
Weights	Net	Kg	12			16	
	Packing	Kg	14			18	
Sound pressure level (3)		dB(A)	24~33		33~40		37~44
Electrical characteristics	Power supply	V/Ph/Hz	220~240V/1/50				
	Power Input	kW	0,055	0,058	0,060	0,060	0,060
	Max absorbed current	A	0,152	0,160	0,166	0,166	0,166
Piping data							
Connections	Liquid	mm	Ø6.35				Ø9.53
	Gas	mm	Ø9.53	Ø12.7			Ø15.9
	Drain	mm	Ø20				
	Gas	mm	Ø22.2				
	Drain	mm	Ø25				

Notes:
1. Cooling condition: indoor side 27°C db, 19°C wb; outdoor side 35°C db.
2. Heating condition: indoor side 20°C db, 15°C wb; outdoor side 7°C db.
3. Sound pressure level measured in free field conditions at 1 m from the unit and at 1,5 m from the ground.

Floor/Ceiling Unit

Controller		
Standard	Optional	
Wireless	Wired	Centralized
		

Features

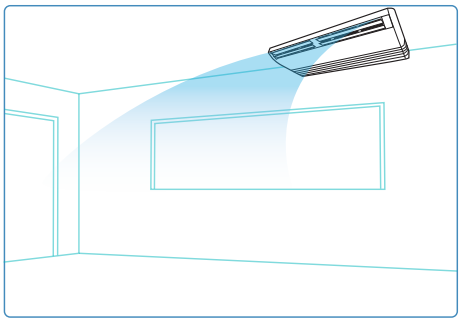
Accessories

Air filter	EXV	Drain pump
Standard	Standard (built-in)	Optional

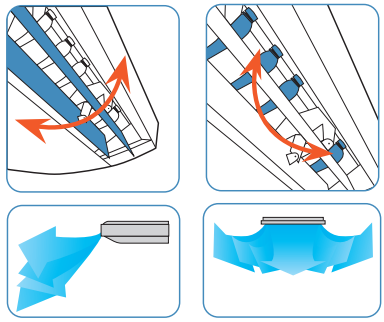
Space saving

Suspended installation allows to save useful floor space.

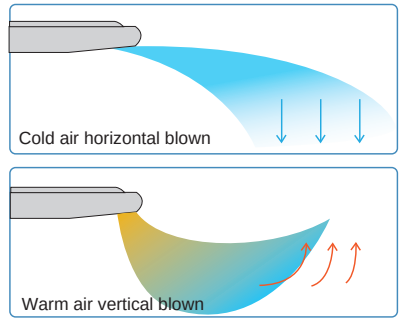
Wide angle air supply



Featuring low noise high performance centrifugal fans, the air flow is bigger and can reach longer distances.

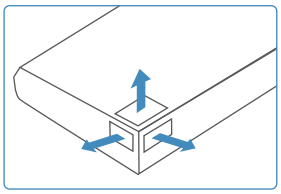


Wide multi-directional air flow angle.

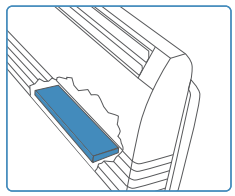


Horizontal cooling air flow, vertical heating air flow.

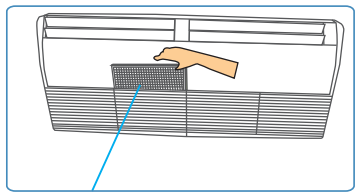
Easy installation



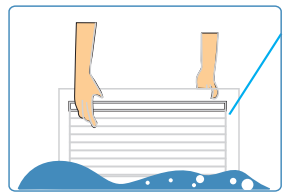
Refrigerant pipe can be connected from 3 directions.



Electrical control box placed in the rear of the fan blade case: easy removing and maintenance.



Long term filter can be removed from the air inlet grid to be cleaned.



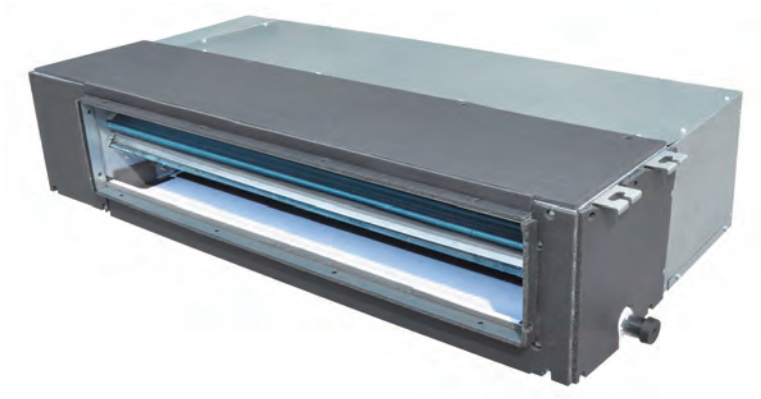
Water washable

Technical Data

Indoor Unit (INU)			C-CM-45	C-CM-56	C-CM-71	C-CM-90	C-CM-140
Cooling	Cooling Capacity (1)	BTU/h	15.300	19.100	24.200	30.700	47.700
		KW	4,5	5,6	7,1	9,0	14,0
		TON	1,3	1,6	2,0	2,6	4,0
Heating	Heating Capacity (2)	BTU/h	17.000	21.400	27.200	34.100	51.100
		KW	5,0	6,3	8,0	10,0	15,0
		TON	1,4	1,8	2,3	2,8	4,3
Fan	Air flow	m³/h	950	950	1300	1500	2300
		cfm	550	550	760	880	1350
Refrigerant	Type		R410A				
Dimension (W×H×D)	Net	mm	1270×635×225				1660×635×225
	Packing	mm	1325×770×325				1750×770×325
Weights	Net	Kg	36			38	51
	Packing	Kg	42			44	58
Sound pressure level (3)		dB(A)	37~46		39~48	44~50	45~52
Electrical characteristics	Power supply	V/Ph/Hz	220~240V/1/50				
	Power Input	kW	0,060	0,060	0,150	0,400	0,260
	Max absorbed current	A	0,166	0,166	0,414	1,105	0,718
Piping data							
Connections	Liquid	mm	Ø6.35		Ø9.53		
	Gas	mm	Ø12.7		Ø15.9		
	Drain	mm	Ø20		Ø25		
	Gas	mm	Ø22.2				
	Drain	mm	Ø25				

Notes:
1. Cooling condition: indoor side 27°C db, 19°C wb; outdoor side 35°C db.
2. Heating condition: indoor side 20°C db, 15°C wb; outdoor side 7°C db.
3. Sound pressure level measured in free field conditions at 1 m from the unit and at 1,5 m from the ground.

Low Static Pressure Ducted Unit



Controller		
Standard	Optional	
Wired	Wireless	Centralized
		

Features

Accessories

Plenum box	Air filter	EXV	Drain pump
Standard	Optional	Standard (built-in)	Optional

Space saving & easy installation

Minimun 700mm width, light weight and low noise. Suitable for hotel room entrance ceiling.

Built-in with drain pump

Pumping head: 750 mm.

Technical Data

Indoor Unit (INU)			C-CC-28-L	C-CC-36-L	C-CC-45-L	C-CC-56-L
Cooling	Cooling Capacity (1)	BTU/h	9.500	12.200	15.300	19.100
		KW	2,8	3,6	4,5	5,6
		TON	0,8	1,0	1,3	1,6
Heating	Heating Capacity (2)	BTU/h	10.900	13.600	17.000	21.400
		KW	3,2	4,0	5,0	6,3
		TON	0,9	1,1	1,4	1,8
Fan	Air flow	m³/h	450	550	780	780
		cfm	260	320	450	450
	ESP	Pa	20			
		in WG	0,08			
Refrigerant	Type		R410A			
Dimension (W×H×D)	Net	mm	925×18×510		1205×180×510	
	Packing	mm	1055×250×605		1330×250×605	
Weights	Net	Kg	17	18	21	21
	Packing	Kg	20	21	25	25
Sound pressure level (3)		dB(A)	29~36	30~37	32~40	32~40
Electrical characteristics	Power supply	V/Ph/Hz	220~240V/1/50			
	Power Input	kW	0,04	0,06	0,07	0,07
	Max absorbed current	A	0,12	0,18	0,20	0,20
Piping data						
Connections	Liquid	mm	Ø6.35			
	Gas	mm	Ø9.53	Ø12.7		
	Drain	mm	Ø20			

Notes:
1. Cooling condition: indoor side 27°C db, 19°C wb; outdoor side 35°C db.
2. Heating condition: indoor side 20°C db, 15°C wb; outdoor side 7°C db.
3. Sound pressure level measured in free field conditions at 1 m from the unit and at 1,5 m from the ground.

Medium Static Pressure Ducted Unit

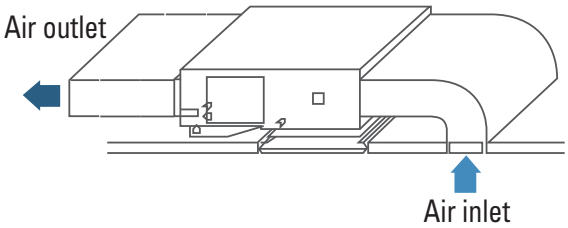
Controller		
Standard	Optional	
Wired	Wireless	Centralized
		

Features

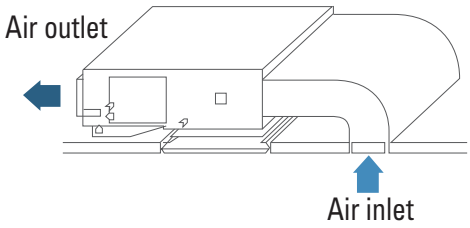
Accessories

Plenum box	Air filter	EXV	Drain pump
Standard	Standard	Standard (built-in)	Optional

Standard ESP: 70 Pa, 30 Pa customizable.



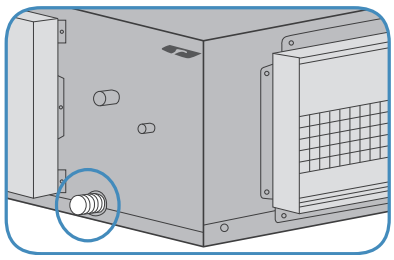
70 Pa ESP, suitable for long distance air supply



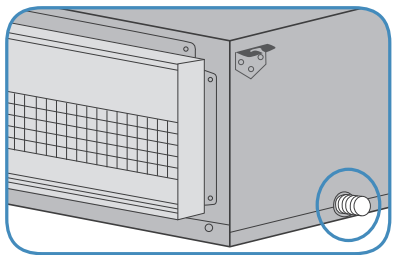
30 Pa (can be set on site), suitable for low noise requirement rooms

Easy and customized drain pump installation

Dedicated drain pipe outlet hole both on left and right side: the installer can choose the best one on site.



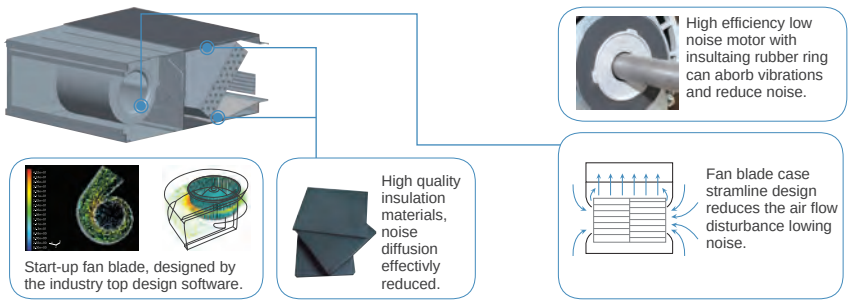
Left drain hole



Right drain hole

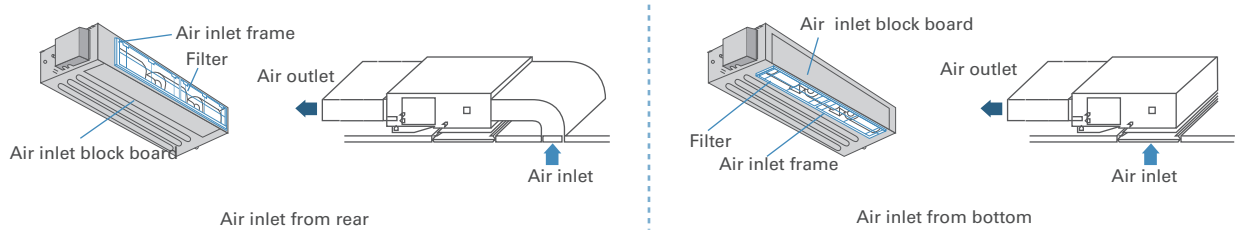
Low noise & Silent operation

Noise reduction technology: high efficiency low noise motor, start-up fan blade, low vibration fan case, unique design, high quality insulation materials.



Two air return installation methods

Rear or bottom air return option can be choose on site.



Technical Data

Indoor Unit (INU)			C-CC-90-M	C-CC-120-M	C-CC-150-M
Cooling	Cooling Capacity (1)	BTU/h	30.700	40.900	51.100
		KW	9,0	12,0	15,0
		TON	2,6	3,4	4,3
Heating	Heating Capacity (2)	BTU/h	34.100	44.300	58.000
		KW	10,0	13,0	17,0
		TON	2,8	3,7	4,8
Fan	Air flow	m³/h	1850	1850	1850
		cfm	1080	1080	1080
	ESP	Pa	70		
		in WG	0,28		
Refrigerant	Type		R410A		
Dimension (W×H×D)	Net	mm	1445×260×680		
	Packing	mm	1480×320×720		
Weights	Net	Kg	46		
	Packing	Kg	50		
Sound pressure level (3)		dB(A)	38~43		
Electrical characteristics	Power supply	V/Ph/Hz	220~240V/1/50		
	Power Input	kW	0,34		
	Max absorbed current	A	0,93		
Piping data					
Connections	Liquid	mm	Ø9.53		
	Gas	mm	Ø15.9		
	Drain	mm	Ø25		

Notes:
1. Cooling condition: indoor side 27°C db, 19°C wb; outdoor side 35°C db.
2. Heating condition: indoor side 20°C db, 15°C wb; outdoor side 7°C db.
3. Sound pressure level measured in free field conditions at 1 m from the unit and at 1,5 m from the ground.

High Static Pressure Ducted Unit

Controller		
Standard	Optional	
Wired	Wireless	Centralized
		

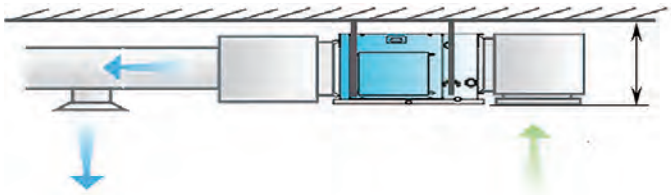
Features

Accessories

Plenum box	Air filter	EXV	Drain pump
Standard	Standard	Standard (built-in)	Optional

Slim structure

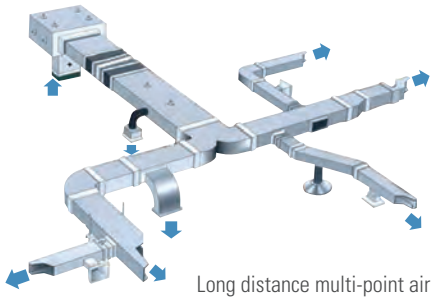
Slim body, saving suspended ceiling spaces.



High static pressure

High static pressure, big air flow: suitable for big spaces and different shapes of room.

High static pressure ducted unit



Long distance multi-point air supply

Technical Data

Indoor Unit (INU)			C-CC-200-H	C-CC-250-H	C-CC-280-H
Cooling	Cooling Capacity (1)	BTU/h	68.200	85.300	95.500
		KW	20,0	25,0	28,0
		TON	5,7	7,1	8,0
Heating	Heating Capacity (2)	BTU/h	75.000	93.800	105.000
		KW	22,0	27,5	30,8
		TON	6,3	7,8	8,8
Fan	Air flow	m^3/h	4000	4200	4400
		cfm	2350	2470	2580
	ESP	Pa	150		
		in WG	0,6		
Refrigerant	Type		R410A		
Dimension (W×H×D)	Net	mm	1465×450×810		
	Packing	mm	1510×490×870		
Weights	Net	Kg	102		
	Packing	Kg	106		
Sound pressure level (3)		dB(A)	45~53	45~54	45~55
Electrical characteristics	Power supply	V/Ph/Hz	220~240V/1/50		
	Power Input	kW	1,2		
	Max absorbed current	A	3,315		
Piping data					
Connections	Liquid	mm	Ø12.7		
	Gas	mm	Ø22.2		
	Drain	mm	Ø25		

Notes:
1. Cooling condition: indoor side 27°C db, 19°C wb; outdoor side 35°C db.
2. Heating condition: indoor side 20°C db, 15°C wb; outdoor side 7°C db.
3. Sound pressure level measured in free field conditions at 1 m from the unit and at 1,5 m from the ground.

Remote Controllers

Wireless Remote Controller

- Indoor unit address inquiry
- Indoor unit address setting
- Temperature setting
- Operation mode setting
- Fan speed setting
- Timer function

Wired Controller

Bidirectional communication. Indoor unit's operating parameters (error code, temperature, address) can be inquired and displayed on the controller.

- Compact design
- Timer function

Simple Centralized Controller

- Easy to install. Controller connects to outdoor units only.
- Able to install this controller after building decoration.
- One Controller can control max. 64 indoor units.
- Mode lock function: user can lock the running mode of indoor unit.