Manual No. '17 • KX-DB-260

MITSUBISHI HEAVY INDUSTRIES

DATA BOOK

VRF INVERTER MULTI-SYSTEM AIR-CONDITIONERS (HEAT RECOVERY 3-PIPE SYSTEMS)

(OUTDOOR UNIT)

KXZR series (Heat recovery type)

Standard series

- **Single use**
  FDC224KXZRE1,280KXZRE1,335KXZRE1,400KXZRE1,450KXZRE1,475KXZRE1,500KXZRE1,560KXZRE1, 615KXZRE1,670KXZRE1
- **Combination use**
  FDC735KXZRE1,800KXZRE1,850KXZRE1,900KXZRE1,950KXZRE1,1000KXZRE1,1060KXZRE1,1120KXZRE1, 1200KXZRE1,1250KXZRE1,1300KXZRE1,1350KXZRE1,1425KXZRE1,1450KXZRE1,1500KXZRE1, 1560KXZRE1,1620KXZRE1,1680KXZRE1
- **High-COP combination use**
  FDC450KXZRXE1(FDC224KXZRE1+FDC224KXZRE1),
  FDC500KXZRXE1(FDC224KXZRE1+FDC280KXZRE1),
  FDC560KXZRXE1(FDC280,KXZRE1+FDC280KXZRE1),
  FDC615KXZRXE1(FDC280KXZRE1+FDC335KXZRE1),
  FDC670KXZRXE1(FDC335KXZRE1+FDC335KXZRE1),
  FDC735KXZRXE1(FDC224KXZRE1+FDC224KXZRE1+FDC280KXZRE1),
  FDC800KXZRXE1(FDC224KXZRE1+FDC280KXZRE1+FDC280KXZRE1),
  FDC850KXZRXE1(FDC280KXZRE1+FDC280KXZRE1+FDC280KXZRE1),
  FDC900KXZRXE1(FDC280KXZRE1+FDC280KXZRE1+FDC335KXZRE1),
  FDC950KXZRXE1(FDC280KXZRE1+FDC335KXZRE1+FDC335KXZRE1),
  FDC1000KXZRXE1(FDC335KXZRE1+FDC335KXZRE1+FDC335KXZRE1)

• Note:
(1) Regarding the Indoor unit series, refer to the No.'15 • KX-T-247
(2) Regarding the Duct Connected-High static Pressure-type Outdoor Air Processing Unit Series (FDU500～1800FKXE6), refer to the DATA BOOK No.'08 • KX-DB-122

MITSUBISHI HEAVY INDUSTRIES THERMAL SYSTEMS, LTD.

PREFACE

Combination table for KX4 series and KX6 series

( ) Date of launching in the market

Category	Outdoor unit	Connectable remote control		Indoor unit: Same series	Same series	Same series	Mixed series	Mixed series	Mixed series	Same or Mixed series	Mixed series	Same series
		3-wire type	RC-E1	KXE4	KXE4(A)	KXE4A	KXE4A	KXE4A	KXE4A			
		3-wire type	RC-E1R					KXE4R KXE4BR KXE5R	KXE4R KXE4BR KXE5R	KXE4R KXE4BR KXE5R	KXE4R KXE4BR KXE5R	
		2-wire type	RC-E3 RC-E4 RC-E5 RC-EX1A RC-EX3					KXE6 KXE6A KXE6B KXE6D KXE6F KXZE1	KXE6 KXE6A KXE6B KXE6D KXE6F KXZE1		KXE6 KXE6A KXE6B KXE6D KXE6F KXZE1	KXE6 KXE6A KXE6B KXE6D KXE6F KXZE1
Heat pump (2-pipe) systems	FDCA-HKXE4 5HP	(2004.4-)		YES [C]	YES [C]	YES [C]	NO	NO	NO	NO	NO	NO
	FDCA-HKXE4 8-48HP	(2004.4-)		NO	YES [C]	YES [C]	NO	NO	NO	NO	NO	NO
	FDCA-HKXE4A 5HP FDCA-HKXE4R 5,6HP	(2006.2-) (2006.5-)		NO	YES [C]	YES [C]	YES [C] *1	NO	NO	YES [C] *1	NO	NO
	FDCA-HKXE4A 8-48HP FDCA-HKXE4R 8-48HP FDCA-HKXE4BR 8-48HP FDCA-HKXE4D 8-48HP	(2006.2-) (2006.5-) (2007.4-) (2008.7-)		NO	YES [C]	YES [C]	YES [C]	YES [C]	YES [C]	YES [C]	YES [C]	YES [C]
	FDC-KXE6 4,5,6HP	(2008.3-)		NO	NO	NO	NO	NO	NO	NO	NO	YES [A] *6
	FDC-KXE6 8-12HP	(2009.2)		NO	NO	NO	NO	NO	NO	YES [B]	YES [B]	YES [A]
	FDC-KXE6 14-48HP	(2009.1)		NO	NO	NO	NO	NO	NO	YES [B]	YES [B]	YES [A]
	FDC-KXZE1 10-60HP	(2017.4-)		NO	NO	NO	NO	NO	NO	NO	NO	YES [A]
Heat recovery (3-pipe) systems [Note(3)]	FDCA-HKXRE4 8-48HP	(2004.11-)		NO	NO	YES [C]	NO	NO	NO	NO	NO	NO
	FDCA-HKXRE4A 8-48HP FDCA-HKXRE4R 8-48HP FDCA-HKXRE4BR 8-48HP FDCA-HKXRE4D 8-48HP	(2006.2-) (2006.6-) (2007.4-) (2008.7-)		NO	NO	YES [C]	YES [C]	YES [C]	YES [C]	YES [C]	YES [C]	YES [C]
	FDC-KXRE6 8-48HP	(2009.5~)		NO	NO	NO	NO	NO	NO	YES [B]	YES [B]	YES [A]
	FDC-KXZRE1 8-60HP	(2017.4~)		NO	NO	NO	NO	NO	NO	NO	NO	YES [A]

*1 except FDKA71KXE5R

Notes (1) YES: Connectable (See following table in detail), NO: Not connectable

	Outdoor unit	Connected Indoor unit: Same series	Connected Indoor unit: Mixed series	Dip switch setting of outdoor unit KXE6	Superlink Protocol	Limitation
YES [A]*2	KXE6&KXZ	KXE6&KXZ		Ⅱ (New)	New (for KX6)	New (for KX6)
YES [B]	KXE6&KXZ	KXE4 series	KXE6 & KXE4 series	Ⅰ (Previous)	Previous (for KX4)	Previous (for KX4)
YES [C]	KXE4 series	KXE4 series	KXE4 series		Previous (for KX4)	Previous (for KX4)

*2 If Outdoor unit system (YES [A]) is connected to other outdoor unit systems (YES [B] and/or YES [C]) in one Superlink network, the dip switch of outdoor unit KXE6 of (YES [A]) should be set from Ⅱ (New) to Ⅰ (Previous). In this case the Superlink protocol and limitation of outdoor unit system (YES [A]) are switched to Previous (for KX4).

(2) Combination with new central control, PC windows central control and BMS interface unit

		Central control, PC windows central control and BMS interface unit: SC-SL1N-E	SC-SL2N-E	SC-SL4N-AE/BE	SC-WGWN-A/B	SC-LGWN-A	SC-BGWN-A/B
YES [A]	Connectable I/U	16	64	128 (128x1)	128 (64x2) *3	96 (48x2)	128 (64x2) *3
	Superlink protocol	New	New	New	New	New	New
	Connectable network	1	1	1	2	2	2
YES[B] & YES[C]	Connectable I/U	16	48	144 (48x3)	96 (48x2) *4	96 (48x2) *4	96 (48x2) *4
	Superlink*5 protocol	Previous	Previous	Previous	Previous	Previous	Previous
	Connectable network	1	1	3	2	2	2

*3 Maximum number of AC cell is limited up to 96.
In case the number of connected indoor units are more than 96, some AC cells should hold 2 or more indoor units.
*4 In case of other central control like SC-SLxN-E is connected in the same network, the connectable indoor unit is limited up to 64 (32x2).
*5 In case of previous Superlink protocol, the Superlink mode of new central control should be set "Previous".
*6 In case of YES[A], previous central control is available to use. But the limitation of connectable indoor unit and so on is complied with the rule of previous Superlink.

(3) The compatibility of PFD (refrigerant flow branching control) is mentioned in following table.

Connectable PFD control		Indoor unit: KXE4 & KXE5 series	KXE6 & KXZE1 series
Outdoor unit	KXRE4 series	PFD-E PFD-ER	PFD-E PFD∗∗∗3-E PFD-ER PFD∗∗∗4-E(New)
Outdoor unit	KXRE6 series	PFD-E PFD-ER	PFD∗∗∗3-E PFD∗∗∗4-E(New)
Outdoor unit	KXZRE1 series		PFD∗∗∗3-E PFD∗∗∗4-E(New)

· Note:
All indoor unit downstream PFD box must be same series, KXZR,KX6 series or KX4/5 series

(4) Compatibility of the PFD control extension cables is as per the following table.

	PFD-control series: PFD ∗∗∗ 3-E	PFD ∗∗∗ 4-E
PFD-15WR-E	Yes	No
PFD4-15WR-E	No	Yes

CONTENTS

1. GENERAL INFORMATION 1
1.1 Specific features 1
1.2 Connectable indoor capacity 5
1.3 How to read the model name 6
1.4 Table of models 6
1.5 Outdoor units combination table 7
2. OUTDOOR UNIT 8
2.1 Specifications 8
2.2 Exterior dimensions 13
2.3 Electrical wiring 15
2.4 Noise level 18
3. RANGE OF USAGE & LIMITATIONS 19
4. PIPING SYSTEM 28
5. SELECTION CHART 31
6. WARNINGS ON REFRIGERANT LEAKAGE 58

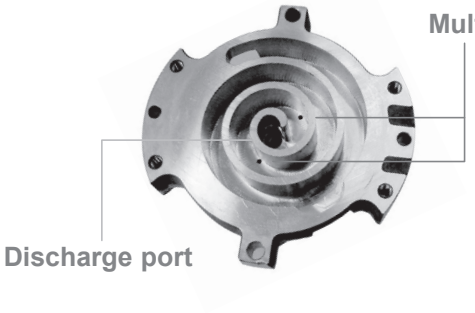
1. GENERAL INFORMATION

1.1 Specific features

(1) High efficiency & comfort

(a) Multiport compressor that achieves high efficiency

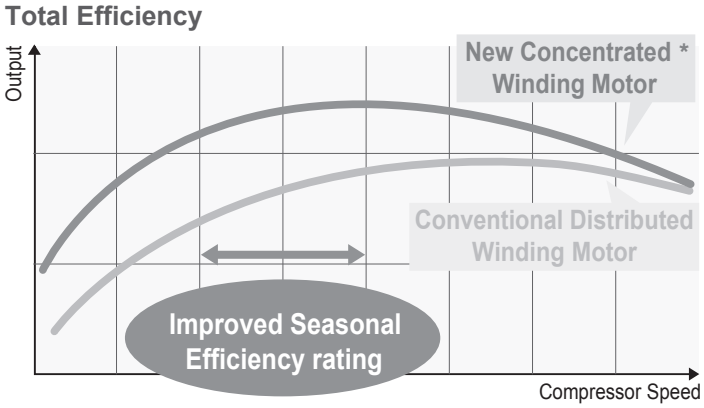
The new multiport discharge area in the compressor has optimized pressure control with better balancing.
The performance improvement at medium Hz has resulted in higher annual efficiencies.



By optimizing pressure adjustment in decompression, the compressor realizes higher efficiency.

(b) Concentrated winding motor achieves “High output” and “Total efficiency improvement”

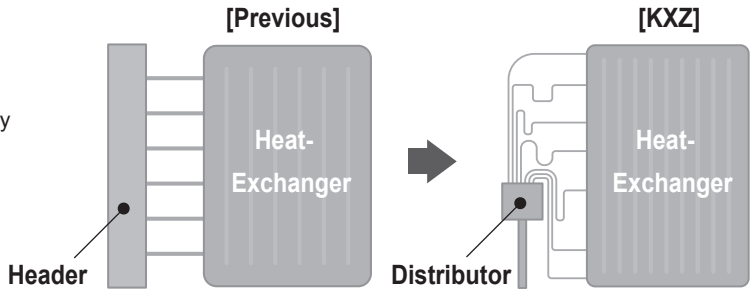
The newly designed high performance CPU enables high precision optimization for compressor speed, which leads to concentrated winding motor use.
Our product achieves high output and better energy saving effects and
in particular improves seasonal efficiency rating.



* Applied for KXZE1:10/12/17/18/20HP, KXZXE1:8HP & KXZ Lite:8/10HP

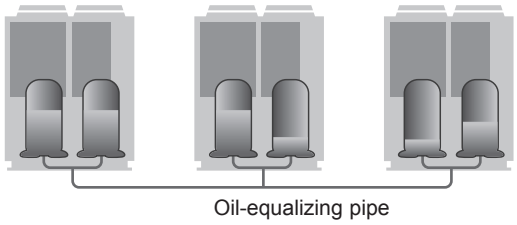
(c) Improved heat-exchanger

With piping layout rearranged from header to heat exchanger, refrigerant distribution flow has improved and maximum energy efficiency has been achieved. Heat exchanger has improved refrigerant distribution and increased effectiveness.
Furthermore due to expansion of effective heat transfer area in heat exchanger, energy efficiency has increased.



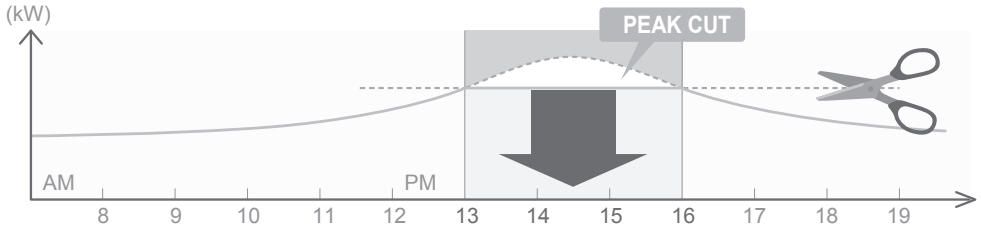
(d) Oil level control capability

Our proprietary technology of adjusting oil level for combination of two or three outdoor units has realized leveled operation rate, keeping performance of the units and ensuring long life of the system.



(e) Capacity control (KXZ)

Capacity control can be set by peak cut function with RC-EX3 for better energy saving.
Five-step capacity control is available. (100-80-60-40-0%)

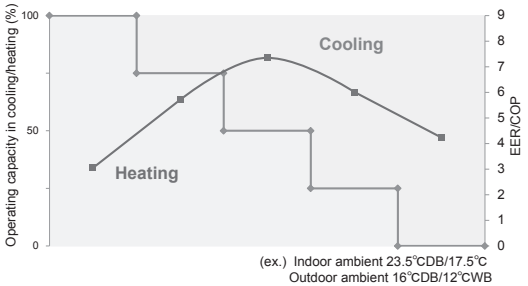


(2) High efficiency in mixed cooling and heating mode

Highly efficient operation mode is automatically determined inside the refrigerant system during simultaneous cooling and heating operation. Heat recovery efficiency is maximized by this control and Max COP 9.0 (*) is achieved during operation with simultaneous cooling and heating.

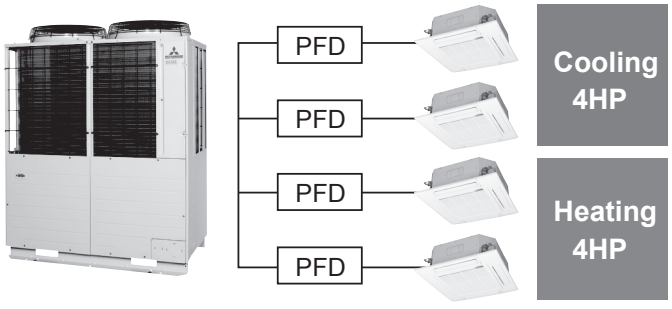
* Conditions for simultaneous cooling and heating (Our estimation in 8HP operation and the following conditions: Temperature outside the room DB16°C/WB12°C, temperature in the cooled room DB27°C/19°C, and temperature in the heated room DB20°C/WB14.5°C)

Energy efficiency in heat recovery mode



Max COP>9.0

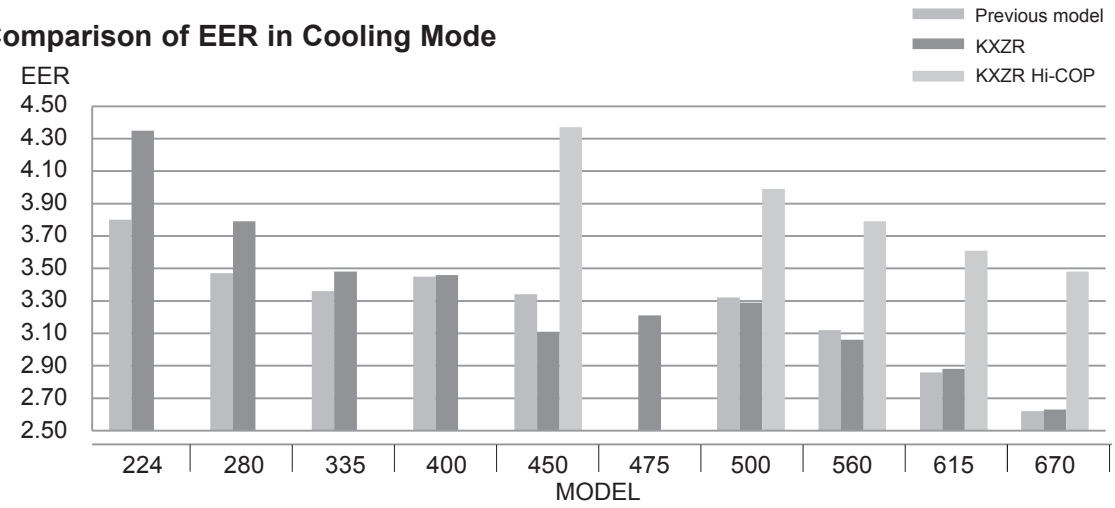
(Condition) FDC224KXZRE1
50% Indoor unit in cooling (27℃DB/19℃)
50% Indoor unit in heating (20℃DB/14.5℃)
Outdoor ambient 16℃DB/12℃WB



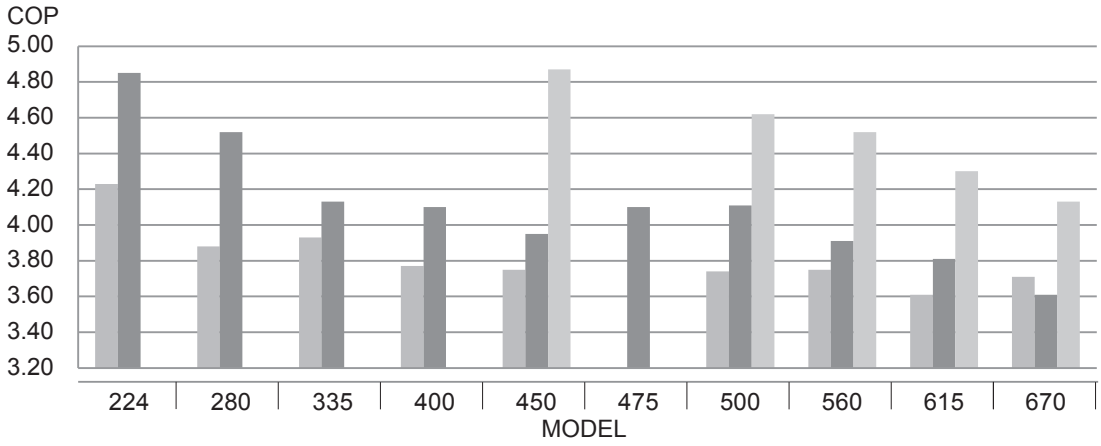
(3) High efficiency

The below graphs highlight the improved efficiencies between the previous models compared to the KXZR standard and Hi-COP models.

(a) Comparison of EER in Cooling Mode



(b) Comparison of COP in Heating Mode



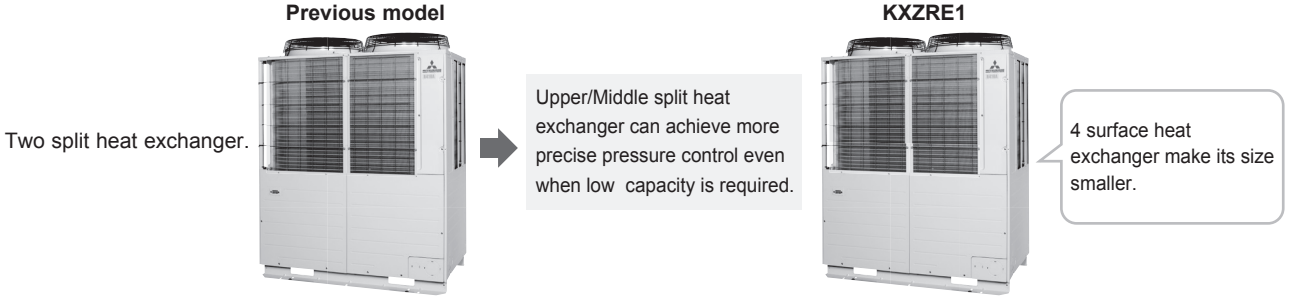
(4) Improved features

(a) New Heating Solution - Continuous Heating Capacity Control (CHCC) -

New defrosting control achieves more capacity than that of previous model in low ambient temperature condition.
Target pressure is controlled automatically before capacity drops, which makes longer period of heating operation and shorter defrosting time.
(*1) Patent is now under being applied. (*2) This control will be activated in specific condition. Please refer to the technical manual in detail.

(b) Improved cooling capacity in low ambient temperature

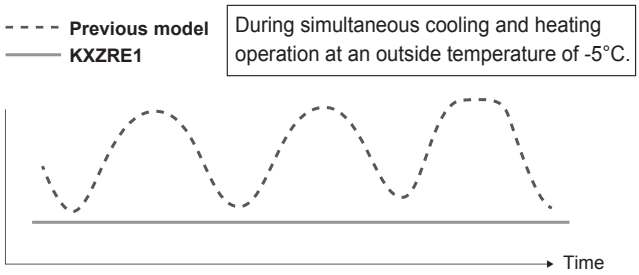
Small split heat exchanger and pressure control inside make it possible that outdoor unit can operate in cooling operation even with low ambient temperature condition, which achieves more capacity in such low ambient condition at -5℃, compared to previous model.



In previous model, when high demand for heating and low cooling demand are required at the same time in low ambient temperature condition, pressure control is adjusted to keep more heating capacity than good enough cooling capacity.
New adopted heat exchanger and pressure control in KXZR series, has improved its capacity for both good enough heating and cooling capacity at the same time. (*)

(*) Refrigerant system will priorities required heating mode more than very low cooling demand, in case most of indoor units are operated in heating mode.

* The numeric values are provisional.
Blown air temperature in the cooled room



(c) Improvement to the branching control noise level

Sound insulation box design specification, reducing the level of noises from the branching control generated due to the flow of refrigerant or other causes.

(5) Design flexibility

(a) Indoor unit capacity connection

HP	KXZR
8 - 16	200%
17 - 34	160%
36 - 60	130%

HP	KXZRX
16	200%
18 - 34	160%
36	130%

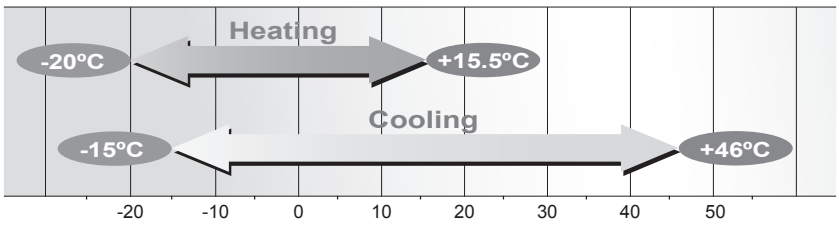
- In case that capacity connection is more than 130%, additional charge of refrigerant is required on site.
- In case of 8-34HP of the systems, if one or more indoor units of FDK, FDFL,FDFU and/or FDFW series are connected to the system, the total connecting capacity of indoor units should not exceed 130%.

(b) Connectable indoor units

Up to 91 indoor units can be connected to the largest capacity outdoor unit, with a range of 17 types of exposed or concealed indoor unit, in several capacities, a choice of 91 indoor units is available.

(c) Wide range of operation

KXZR series permits an extensible system design considering a heating range operation under a low temperature condition down to -20˚C and a cooling range operation up to 46˚C (previous model : 43˚C)



1.2 Connectable indoor capacity

Capacity from 50% to 200% is possible.

Model		Item	Number of connectable				Connectable capacity		
FDC	224	KXZRE1	1	to	29	units	112	–	448
FDC	280	KXZRE1	1	to	37	units	140	–	560
FDC	335	KXZRE1	1	to	44	units	168	–	670
FDC	400	KXZRE1	1	to	53	units	200	–	800
FDC	450	KXZRE1	1	to	60	units	225	–	900

Note (1) If one or more indoor units of FDK, FDFL, FDFU and/or FDFW series are connected to the system, the total connecting capacity of indoor units should not exceed 130%.

Capacity from 50% to 160% is possible.

Model		Item	Number of connectable				Connectable capacity		
FDC	475	KXZRE1	1	to	50	units	238	–	760
FDC	500	KXZRE1	1	to	53	units	250	–	800
FDC	560	KXZRE1	1	to	59	units	280	–	896
FDC	615	KXZRE1	2	to	65	units	308	–	984
FDC	670	KXZRE1	2	to	71	units	335	–	1072
FDC	735	KXZRE1	2	to	78	units	368	–	1176
FDC	800	KXZRE1	2	to	80	units	400	–	1280
FDC	850	KXZRE1	2	to	80	units	425	–	1360
FDC	900	KXZRE1	2	to	80	units	450	–	1440
FDC	950	KXZRE1	2	to	80	units	475	–	1520

Note (1) If one or more indoor units of FDK, FDFL, FDFU and/or FDFW series are connected to the system, the total connecting capacity of indoor units should not exceed 130%.

Capacity from 50% to 130% is possible.

Model		Item	Number of connectable				Connectable capacity		
FDC	1000	KXZRE1	2	to	80	units	500	–	1300
FDC	1060	KXZRE1	2	to	80	units	530	–	1378
FDC	1120	KXZRE1	2	to	80	units	560	–	1456
FDC	1200	KXZRE1	3	to	80	units	600	–	1560
FDC	1250	KXZRE1	3	to	80	units	625	–	1625
FDC	1300	KXZRE1	3	to	80	units	650	–	1690
FDC	1350	KXZRE1	3	to	80	units	675	–	1755
FDC	1425	KXZRE1	3	to	80	units	713	–	1852
FDC	1450	KXZRE1	3	to	80	units	725	–	1885
FDC	1500	KXZRE1	3	to	80	units	750	–	1950
FDC	1560	KXZRE1	3	to	80	units	780	–	2028
FDC	1620	KXZRE1	3	to	80	units	810	–	2106
FDC	1680	KXZRE1	3	to	80	units	840	–	2184

High-COP combination

Capacity from 80% to 200% is possible.

Model		Item	Number of connectable				Connectable capacity		
FDC	450	KXZRXE1	2	to	60	units	360	–	900

Note (1) If one or more indoor units of FDK, FDFL, FDFU and/or FDFW series are connected to the system, the total connecting capacity of indoor units should not exceed 130%.

Capacity from 80% to 160% is possible.

Model		Item	Number of connectable				Connectable capacity		
FDC	500	KXZRXE1	2	to	53	units	400	–	800
FDC	560	KXZRXE1	2	to	59	units	448	–	896
FDC	615	KXZRXE1	2	to	65	units	492	–	984
FDC	670	KXZRXE1	2	to	71	units	536	–	1072
FDC	735	KXZRXE1	3	to	78	units	588	–	1176
FDC	800	KXZRXE1	3	to	80	units	640	–	1280
FDC	850	KXZRXE1	3	to	80	units	680	–	1360
FDC	900	KXZRXE1	3	to	80	units	720	–	1440
FDC	950	KXZRXE1	3	to	80	units	760	–	1520

Note (1) If one or more indoor units of FDK, FDFL, FDFU and/or FDFW series are connected to the system, the total connecting capacity of indoor units should not exceed 130%.

High-COP combination

Capacity from 80% to 130% is possible.

Item / Model			Number of connectable				Connectable capacity		
FDC	1000	KXZRXE1	3	to	80	units	800	–	1300

1.3 How to read the model name

(1) Outdoor unit

Example: FDC 735 KXZR E 1

- 1 — Series No.
- E — Application power source...See the specifications
- KXZR — Multi KXZR (heat recovery) series
- 735 — Nominal capacity (nominal cooling capacity : 73.5kW)
- FDC — Model name (Outdoor unit)

(2) Indoor unit

Example: FDT 28 KX E 6F

- 6F — Series No.
- E — Application power source...See the specifications
- KX — Multi KX series
- 28 — Nominal capacity (nominal cooling capacity : 2.8 kW)
- FDT — Model name (Indoor unit : FDT, FDTC, FDTW, FDTS, FDTQ, FDU, FDUM, FDUT, FDK, FDE, FDFL, FDFU, FDFW, FDUH, FDU-F)

1.4 Table of models

Model \ Capacity	15	22	28	36	45	56	71	90	112	140	160	224	280
Ceiling cassette-4 way type (FDT)			○	○	○	○	○	○	○	○	○		
Ceiling cassette-4 way compact type (FDTC)	○	○	○	○	○	○							
Ceiling cassette-2 way type (FDTW)			○		○	○	○	○	○	○			
Ceiling cassette-1 way type (FDTS)					○		○						
Ceiling cassette-1 way compact type (FDTQ)		○	○	○									
Duct connected-High static pressure type (FDU)					○	○	○	○	○	○	○	○	○
Duct connected-Low/Middle static pressure type (FDUM)		○	○	○	○	○	○	○	○	○	○		
Duct connected (thin)-Low static pressure type (FDUT)	○	○	○	○	○	○	○						
Wall mounted type (FDK)		○	○	○	○	○	○						
Ceiling suspended type (FDE)				○	○	○	○		○	○			
Floor standing (with casing) type (FDFL)							○						
Floor standing (without casing) type (FDFU)			○		○	○	○						
Floor standing-2 way type (FDFW)			○		○	○							
Duct connected-compact and Flexible type (FDUH)		○	○	○									
Outdoor air processing unit (FDU-F)								○		○		○	○
Outdoor units to be combined (FDC)	FDC224KXZRE1-FDC1680KXZRE1												

Note (1) Reference No. of data book : ’15·KX-DB-247

1.5 Outdoor units combination table

Model \ Item			FDC 335 KXZRE1	FDC 400 KXZRE1	FDC 450 KXZRE1	FDC 475 KXZRE1	FDC 500 KXZRE1	FDC 560 KXZRE1	Connectable capacity			Number of connectable			
FDC	735	KXZRE1	1	1					368	—	1176	2	to	78	units
FDC	800	KXZRE1		2					400	—	1280	2	to	80	units
FDC	850	KXZRE1		1	1				425	—	1360	2	to	80	units
FDC	900	KXZRE1			2				450	—	1440	2	to	80	units
FDC	950	KXZRE1				2			475	—	1520	2	to	80	units
FDC	1000	KXZRE1					2		500	—	1300	2	to	80	units
FDC	1060	KXZRE1					1	1	530	—	1378	2	to	80	units
FDC	1120	KXZRE1						2	560	—	1456	2	to	80	units
FDC	1200	KXZRE1		3					600	—	1560	3	to	80	units
FDC	1250	KXZRE1		2	1				625	—	1625	3	to	80	units
FDC	1300	KXZRE1		1	2				650	—	1690	3	to	80	units
FDC	1350	KXZRE1			3				675	—	1755	3	to	80	units
FDC	1425	KXZRE1				3			713	—	1852	3	to	80	units
FDC	1450	KXZRE1				2	1		725	—	1885	3	to	80	units
FDC	1500	KXZRE1					3		750	—	1950	3	to	80	units
FDC	1560	KXZRE1					2	1	780	—	2028	3	to	80	units
FDC	1620	KXZRE1					1	2	810	—	2106	3	to	80	units
FDC	1680	KXZRE1						3	840	—	2184	3	to	80	units

High-COP combination

Model \ Item			FDC 224 KXZRE1	FDC 280 KXZRE1	FDC 335 KXZRE1	Connectable capacity			Number of connectable			
FDC	450	KXZRXE1	2			360	—	900	2	to	60	units
FDC	500	KXZRXE1	1	1		400	—	800	2	to	53	units
FDC	560	KXZRXE1		2		448	—	896	2	to	59	units
FDC	615	KXZRXE1		1	1	492	—	984	2	to	65	units
FDC	670	KXZRXE1			2	536	—	1072	2	to	71	units
FDC	735	KXZRXE1	2	1		588	—	1176	3	to	78	units
FDC	800	KXZRXE1	1	2		640	—	1280	3	to	80	units
FDC	850	KXZRXE1		3		680	—	1360	3	to	80	units
FDC	900	KXZRXE1		2	1	720	—	1440	3	to	80	units
FDC	950	KXZRXE1		1	2	760	—	1520	3	to	80	units
FDC	1000	KXZRXE1			3	800	—	1600	3	to	80	units

(a) Outdoor unit side branch pipe set (Option)

Outdoor unit	Branch pipe set
For two units	DOS-2A-3R
For three units	DOS-3A-3R

Note (1) Be sure to use this when combining units.

(b) Branch pipe set (Option)

In the upstream of a branching control

Total capacity downstream	Branching pipe set
Less than 180	DIS-22-1-R
180 or more but less than 371	DIS-180-1-R
371 or more but less than 540	DIS-371-2-R
540 or more	DIS-540-2-R

In the downstream of a branching control

Total capacity downstream	Branch pipe set
Less than 180	DIS-22-1
180 or more but less than 371	DIS-180-1
371 or more but less than 540	DIS-371-1
540 or more	DIS-540-1

(c) Branching control model (Option)

Total capacity downstream	Branching control model	Number of connectable units
Less than 112	PFD1124-E	1 - 5
112 or more but less than 180	PFD1804-E	1 - 8
180 or more but less than 280	PFD2804-E	1 - 10

• Restriction on the number of branching controls to be connected to the outdoor unit

Outdoor unit	Minimum number of connectable units	Outdoor unit	Minimum number of connectable units
-280(10HP)	2 units	-1130(40HP)	8 units
-560(20HP)	4 units	-1680(60HP)	10 units
-850(30HP)	6 units	—	—

(d) Integrated branching control (Option)

Model	Total of four branches		Per branch	
	Capacity restrictions	Maximum number of connectable units	Capacity restrictions	Maximum number of connectable units
PFD1124X4-E	Less than 371	16	Less than 112	5

Note (1) An indoor unit with a capacity up to 112 can be connected.

2. OUTDOOR UNIT

2.1 Specifications

• Single use (Used also for combination)

Model			FDC224KXZRE1	FDC280KXZRE1	FDC335KXZRE1	FDC400KXZRE1	FDC450KXZRE1	FDC475KXZRE1	FDC500KXZRE1	FDC560KXZRE1	FDC615KXZRE1	FDC670KXZRE1
Nominal cooling capacity*1		kW	22.4	28.0	33.5	40.0	45.0	47.5	50.0	56.0	61.5	67.0
Nominal heating capacity*2		kW	22.4	28.0	33.5	40.0	45.0	47.5	50.0	56.0	61.5	63.0
Maximum heating capacity		kW	25.0	31.5	37.5	45.0	50.0	53.0	56.0	63.0	63.0	63.0
Power source			3 Phase 380/415V 50Hz / 380V 60Hz									
Power consumption	Cooling	kW	5.15	7.38	9.64	11.55	14.45	14.82	15.19	18.31	21.35	25.51
	Heating		4.62	6.19	8.12	9.76	11.38	11.58	12.17	14.33	16.15	17.47
Running current	Cooling	A	9.0/8.3	12.2/11.2	15.8/14.5	18.5/17.1	23.2/21.2	24.0/22.0	24.6/22.5	29.6/27.1	34.6/31.6	41.3/37.8
	Heating		8.0/7.4	10.3/9.4	13.3/12.2	16.0/14.8	18.6/17.1	18.8/17.2	19.7/18.1	23.2/21.3	26.2/24.0	28.3/25.9
Power factor	Cooling	%	87/87	92/92	93/93	95/94	95/95	94/94	94/94	94/94	94/94	94/94
	Heating		88/88	92/92	93/93	93/92	93/93	94/94	94/94	94/94	94/94	94/94
EER			4.35	3.79	3.47	3.46	3.11	3.20	3.29	3.05	2.88	2.62
COP			4.84	4.52	4.12	4.09	3.95	4.10	4.10	3.90	3.80	3.60
Sound pressure level	(Cooling/Heating)	dB (A)	55/57	55/57	61/58	60/62	62/62	61/62	61/62	64/65	65/66	65/66
Sound power level	(Cooling/Heating)	dB (A)	73/75	74/76	81/77	81/83	82/83	81/82	81/82	84/85	84/85	84/85
Starting current		A	5					8				
Maximum current		A	16.0	20.0	21.2	30.0	32.0	40.4	41.0	41.6	42.0	42.4
Exterior dimensions Height × Width × Depth		mm	1690×1350×720			2048×1350×720						
Exterior appearance (Munsell coror)			Stucco White (4.2Y7.5/1.1) near equivalent									
Net weight		kg	289			357		410				
Refrigerant equipment compressor type & Q'ty			GTC5150NC47LF X 1			GUC5185ND47V X 1		GTC5150NC47LF X 2				
Motor		kW	3.41 X 1	4.80 X 1	6.54 X 1	7.92 X 1	9.73 X 1	4.53 X 2	4.84 X 2	5.79 X 2	7.05 X 2	9.87 X 2
Starting method			Direct line starting									
Crankcase heater		W	33 X 1			40 X 1		33×2				
Refrigerant equipment Heat exchanger			M fin & inner grooved tubing									
Refrigerant control			Electronic expansion valve									
Refrigerant type			R410A									
Refrigerant amount		kg	11.5									
Refrigerant oil		l	2.35 (M-MA32R)			3.3 (M-MA32R)		4.4 (M-MA32R)				
Defrost control			Microcomputer controlled De-Icer									
Air handling equipment fan type & Q'ty			Propeller fan × 2									
Motor		W	386×2									
Starting method			Direct start									
Air flow (Standard)		m3/min	220/200		280/200	280/260				310/290		
Abailable external static pressure		Pa	Max.50									
Shock & vibration absorber			Rubber mount (for compressor)									
Safety equipment			Compressor overheat protection / overcurrent protection / power transistor overheating protection / abnormal high pressure protection									
Installation data Refrigerant piping size	Liquid Line	mm (in)	φ9.52 (3/8")		φ12.7 (1/2")							
	Suction gas line	mm (in)	φ19.05 (3/4")	φ22.22 (7/8")	φ25.4 (1") (φ22.22 (7/8"))	φ25.4 (1") (φ28.58 (1・1/8"))	φ28.58 (1・1/8")					
	Discharge gas line	mm (in)	φ15.88 (5/8")	φ19.05 (3/4")		φ22.22 (7/8")					φ25.4 (1") (φ22.22 (7/8"))	
Connecting method			Gas line: Brazing / Liquid line: Flare									
MAX. Pressure		MPa	High 4.15 Low 2.21									
Drain			Hole for drain (φ20 × 10pcs , φ45 × 3pcs)									
Insullation for piping			IP24									
IP number			Necessary (both Liquid & Gas line)									
Accessories			-	-	-	-	-	-	-	-	-	-
Exterior dimensions			PCB004Z087			PCB004Z088						
Electrical wiring			PCB004Z089			PCB004Z090		PCB004Z091				

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27 ℃	19 ℃	35 ℃	24 ℃	ISO-T1
Heating	20 ℃	-	7 ℃	6 ℃	

(2) This air-conditioner is manufactured and tested in conformity with the.ISO.

(3) Sound level indicates the value in an anechoic chamber.
During operation these value are somewhat higher due to ambient conditions.

(4) Refrigerant piping size applicable to European installations are shown in parentheses.

(5) This air-conditioner is adapted RoHS directive.

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• **Combination use**

Model			FDC735KXZRE1	FDC800KXZRE1	FDC850KXZRE1	FDC900KXZRE1
Combination unit			FDC335KXZRE1	FDC400KXZRE1	FDC400KXZRE1	FDC450KXZRE1
			FDC400KXZRE1	FDC400KXZRE1	FDC450KXZRE1	FDC450KXZRE1
Power source			3 Phase 380–415V 50Hz/380V 60Hz			
Nominal cooling capacity*1		kW	73.5	80.0	85.0	90.0
Nominal heating capacity*2		kW	73.5	80.0	85.0	90.0
Power consumption	Cooling	kW	21.2	23.1	26.0	28.9
	Heating		17.9	19.5	21.1	22.8
Running current	Cooling	A	34.30/31.60	37.00/34.20	41.70/38.30	46.40/42.40
	Heating		29.30/27.00	32.00/29.60	34.60/31.90	37.20/34.20
Power factor	Cooling	%	94/94	95/94	95/95	95/95
	Heating		93/93	93/92	93/93	93/93
Net weight		kg	646	714	714	714
Refrigerant piping size	Liquid line	ϕmm (in)	ϕ15.88 (5/8")			
	Suction gas line	ϕmm (in)	ϕ31.75 (1・1/4") (ϕ34.92 (1・3/8"))			
	Discharge gas line		ϕ25.4 (1") (ϕ28.58 (1・1/8"))	ϕ28.58 (1・1/8")		
	Oil equalization	ϕmm (in)	ϕ9.52 (3/8")			

Model			FDC950KXZRE1	FDC1000KXZRE1	FDC1060KXZRE1	FDC1120KXZRE1
Combination unit			FDC475KXZRE1	FDC500KXZRE1	FDC500KXZRE1	FDC560KXZRE1
			FDC475KXZRE1	FDC500KXZRE1	FDC560KXZRE1	FDC560KXZRE1
Power source			3 Phase 380–415V 50Hz/380V 60Hz			
Nominal cooling capacity*1		kW	95.0	100.0	106.0	112.0
Nominal heating capacity*2		kW	95.0	100.0	106.0	112.0
Power consumption	Cooling	kW	29.6	30.4	33.5	36.6
	Heating		23.2	24.3	26.5	28.7
Running current	Cooling	A	48.00/44.00	49.20/45.00	54.20/49.60	59.20/54.20
	Heating		37.60/34.40	39.40/36.20	42.90/39.40	46.40/42.60
Power factor	Cooling	%	94/94	94/94	94/94	94/94
	Heating		94/94	94/94	94/94	94/94
Net weight		kg	820	820	820	820
Refrigerant piping size	Liquid line	ϕmm (in)	ϕ15.88 (5/8")		ϕ19.05 (3/4")	
	Suction gas line	ϕmm (in)	ϕ31.75 (1・1/4") (ϕ34.92 (1・3/8"))	ϕ38.1 (1・1/2") (ϕ34.92 (1・3/8"))		
	Discharge gas line		ϕ28.58 (1・1/8")		ϕ31.75 (1・1/4") (ϕ28.58 (1・1/8"))	
	Oil equalization	ϕmm (in)	ϕ9.52 (3/8")			

PCB004Z085 △C

• Combination use

Model			FDC1200KXZRE1	FDC1250KXZRE1	FDC1300KXZRE1	FDC1350KXZRE1	FDC1425KXZRE1
Combination unit			FDC400KXZRE1	FDC400KXZRE1	FDC400KXZRE1	FDC450KXZRE1	FDC475KXZRE1
			FDC400KXZRE1	FDC400KXZRE1	FDC450KXZRE1	FDC450KXZRE1	FDC475KXZRE1
			FDC400KXZRE1	FDC450KXZRE1	FDC450KXZRE1	FDC450KXZRE1	FDC475KXZRE1
Power source			3 Phase 380–415V 50Hz/380V 60Hz				
Nominal cooling capacity*1		kW	120.0	125.0	130.0	135.0	142.5
Nominal heating capacity*2		kW	120.0	125.0	130.0	135.0	142.5
Power consumption	Cooling	kW	34.65	37.55	40.45	43.35	44.46
	Heating	kW	29.28	30.90	32.52	34.14	34.74
Running current	Cooling	A	55.5/51.3	60.2/55.4	64.9/59.5	69.6/63.6	72.0/66.0
	Heating	A	48.0/44.4	50.6/46.7	53.2/49.0	55.8/51.3	56.4/51.6
Power factor	Cooling	%	95/94	95/94	95/95	95/95	94/94
	Heating	%	93/92	93/92	93/93	93/93	94/94
Net weight		kg	1071	1071	1071	1071	1230
Refrigerant piping size	Liquid line	ϕmm (in)	ϕ19.05 (3/4")				
	Suction gas line	ϕmm (in)	ϕ38.1 (1・1/2") (ϕ34.92 (1・3/8"))				
	Discharge gas line	ϕmm (in)	ϕ31.75 (1・1/4") (ϕ28.58 (1・1/8"))				
	Oil equalization	ϕmm (in)	ϕ9.52 (3/8")				

Model			FDC1450KXZRE1	FDC1500KXZRE1	FDC1560KXZRE1	FDC1620KXZRE1	FDC1680KXZRE1
Combination unit			FDC475KXZRE1	FDC500KXZRE1	FDC500KXZRE1	FDC500KXZRE1	FDC560KXZRE1
			FDC475KXZRE1	FDC500KXZRE1	FDC500KXZRE1	FDC560KXZRE1	FDC560KXZRE1
			FDC500KXZRE1	FDC500KXZRE1	FDC560KXZRE1	FDC560KXZRE1	FDC560KXZRE1
Power source			3 Phase 380–415V 50Hz/380V 60Hz				
Nominal cooling capacity*1		kW	145.0	150.0	156.0	162.0	168.0
Nominal heating capacity*2		kW	145.0	150.0	156.0	162.0	168.0
Power consumption	Cooling	kW	44.83	45.57	48.69	51.81	54.93
	Heating	kW	35.33	36.51	38.67	40.83	42.99
Running current	Cooling	A	72.6/66.5	73.8/67.5	78.8/72.1	83.8/76.7	88.8/81.3
	Heating	A	57.3/52.5	59.1/54.3	62.6/57.5	66.1/60.7	69.6/63.9
Power factor	Cooling	%	94/94	94/94	94/94	94/94	94/94
	Heating	%	94/94	94/94	94/94	94/94	94/94
Net weight		kg	1230	1230	1230	1230	1230
Refrigerant piping size	Liquid line	ϕmm (in)	ϕ19.05 (3/4")				
	Suction gas line	ϕmm (in)	ϕ38.1 (1・1/2") (ϕ34.92 (1・3/8"))				
	Discharge gas line	ϕmm (in)	ϕ31.75 (1・1/4") (ϕ28.58 (1・1/8"))				
	Oil equalization	ϕmm (in)	ϕ9.52 (3/8")				

PCB004Z085 ⚠C

• High-COP Combination use

Model			FDC450KXZRXE1	FDC500KXZRXE1	FDC560KXZRXE1	FDC615KXZRXE1	FDC670KXZRXE1
Combination unit			FDC224KXZRE1	FDC224KXZRE1	FDC280KXZRE1	FDC280KXZRE1	FDC335KXZRE1
			FDC224KXZRE1	FDC280KXZRE1	FDC280KXZRE1	FDC335KXZRE1	FDC335KXZRE1
Power source			3 Phase 380–415V 50Hz/380V 60Hz				
Nominal cooling capacity*1		kW	45.0	50.0	56.0	61.5	67.0
Nominal heating capacity*2		kW	45.0	50.0	56.0	61.5	67.0
Power consumption	Cooling	kW	10.29	12.53	14.76	17.02	19.28
	Heating	kW	9.24	10.81	12.38	14.31	16.24
Running current	Cooling	A	18.0/16.6	21.2/19.5	24.4/22.4	28.0/25.7	31.6/29.0
	Heating	A	16.0/14.8	18.3/16.8	20.6/18.8	23.6/21.6	26.6/24.4
Power factor	Cooling	%	87/87	90/90	92/92	93/93	93/93
	Heating	%	88/88	90/90	92/92	93/93	93/93
Net weight		kg	578	578	578	578	578
Refrigerant piping size	Liquid line	φmm (in)	φ12.7 (1/2")				
	Suction gas line	φmm (in)	φ28.58 (1・1/8")				
	Discharge gas line	φmm (in)	φ22.22 (7/8")			φ25.4 (1") (φ22.22 (7/8"))	
	Oil equalization	φmm (in)	φ9.52 (3/8")				

Model			FDC735KXZRXE1	FDC800KXZRXE1	FDC850KXZRXE1	FDC900KXZRXE1	FDC950KXZRXE1	FDC1000KXZRXE1
Combination unit			FDC224KXZRE1	FDC224KXZRE1	FDC280KXZRE1	FDC280KXZRE1	FDC280KXZRE1	FDC335KXZRE1
			FDC224KXZRE1	FDC280KXZRE1	FDC280KXZRE1	FDC280KXZRE1	FDC335KXZRE1	FDC335KXZRE1
			FDC280KXZRE1	FDC280KXZRE1	FDC280KXZRE1	FDC335KXZRE1	FDC335KXZRE1	FDC335KXZRE1
Power source			3 Phase 380–415V 50Hz/380V 60Hz					
Nominal cooling capacity*1		kW	73.5	80.0	85.0	90.0	95.0	100.0
Nominal heating capacity*2		kW	73.5	80.0	85.0	90.0	95.0	100.0
Power consumption	Cooling	kW	17.67	19.91	22.14	24.40	26.66	28.92
	Heating	kW	15.43	17.00	18.57	20.50	22.43	24.36
Running current	Cooling	A	30.2/27.8	33.4/30.7	36.6/33.6	40.2/36.9	43.8/40.2	47.4/43.5
	Heating	A	26.3/24.2	28.6/26.2	30.9/28.2	33.9/31.0	36.9/33.8	39.9/36.6
Power factor	Cooling	%	89/89	90/90	92/92	92/92	93/93	93/93
	Heating	%	89/89	91/91	92/92	92/92	93/93	93/93
Net weight		kg	867	867	867	867	867	867
Refrigerant piping size	Liquid line	φmm (in)	φ15.88 (5/8")					
	Suction gas line	φmm (in)	φ31.75 (1・1/4") (φ34.92 (1・3/8"))					φ38.1 (1・1/2") (φ34.92 (1・3/8"))
	Discharge gas line	φmm (in)	φ25.4 (1") (φ28.58 (1・1/8"))	φ28.58 (1・1/8")				
	Oil equalization	φmm (in)	φ9.52 (3/8")					

PCB004Z085 △C

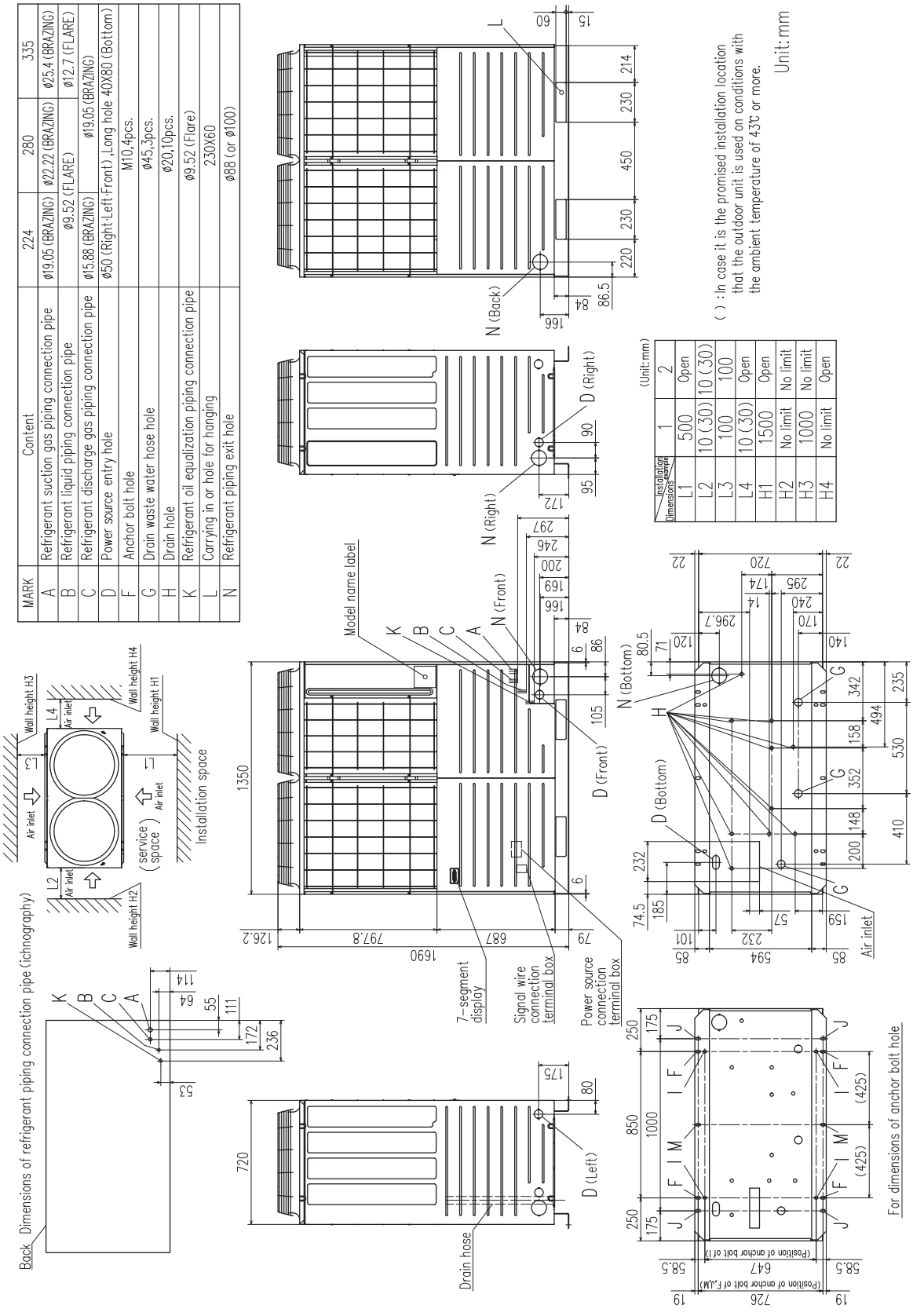
・Weights of packing parts

Unit : kg

Model \ Material		Gross weight	Packing parts weight (Total)	Paper	Foam Polystyrene	Plastic	Metal		Wood	Glass	Other
							Aluminium	Steel			
Outdoor unit	FDC224KXZRE1	312.00	23.00	0.04	—	0.10	—	0.81	22.06	—	—
	FDC280KXZRE1	312.00	23.00	0.04	—	0.10	—	0.81	22.06	—	—
	FDC335KXZRE1	312.00	23.00	0.04	—	0.10	—	0.81	22.06	—	—
	FDC400KXZRE1	380.00	23.00	0.04	—	0.10	—	0.81	22.06	—	—
	FDC450KXZRE1	380.00	23.00	0.04	—	0.10	—	0.81	22.06	—	—
	FDC475KXZRE1	433.00	23.00	0.04	—	0.10	—	0.81	22.06	—	—
	FDC500KXZRE1	433.00	23.00	0.04	—	0.10	—	0.81	22.06	—	—
	FDC560KXZRE1	433.00	23.00	0.04	—	0.10	—	0.81	22.06	—	—
	FDC615KXZRE1	433.00	23.00	0.04	—	0.10	—	0.81	22.06	—	—
	FDC670KXZRE1	433.00	23.00	0.04	—	0.10	—	0.81	22.06	—	—
PFD branching control	PFD1124-E	14.10	4.30	4.02	—	0.28	—	—	—	—	—
	PFD1804-E	14.20	3.90	3.62	—	0.28	—	—	—	—	—
	PFD2804-E	16.40	4.50	4.22	—	0.28	—	—	—	—	—
	PFD1124X4-E	56.80	15.90	15.04	—	0.86	—	—	—	—	—

2.2 Exterior dimensions

Models FDC224KXZRE1, 280KXZRE1,335KXZRE1



MARK	Content	224	280	335
A	Refrigerant suction gas piping connection pipe	ø19.05 (BRAZING)	ø22.22 (BRAZING)	ø25.4 (BRAZING)
B	Refrigerant liquid piping connection pipe	ø9.52 (FLARE)		ø12.7 (FLARE)
C	Refrigerant discharge gas piping connection pipe	ø15.88 (BRAZING)	ø19.05 (BRAZING)	
D	Power source entry hole	ø50 (Right·Left·Front), Long hole 40X80 (Bottom)		
F	Anchor bolt hole	M10,4pcs.		
G	Drain waste water hose hole	ø45,3pcs.		
H	Drain hole	ø20,10pcs.		
K	Refrigerant oil equalization piping connection pipe	ø9.52 (Flare)		
L	Carrying in or hole for hanging	230X60		
N	Refrigerant piping exit hole	ø88 (or ø100)		

(Unit: mm)

Installation Dimensions	1	2
L1	500	Open
L2	10 (30)	10 (30)
L3	100	100
L4	10 (30)	Open
H1	1500	Open
H2	No limit	No limit
H3	1000	No limit
H4	No limit	Open

Models FDC400KXZRE1, 450KXZRE1, 475KXZRE1, 500KXZRE1, 560KXZRE1
FDC615KXZRE1, 670KXZRE1

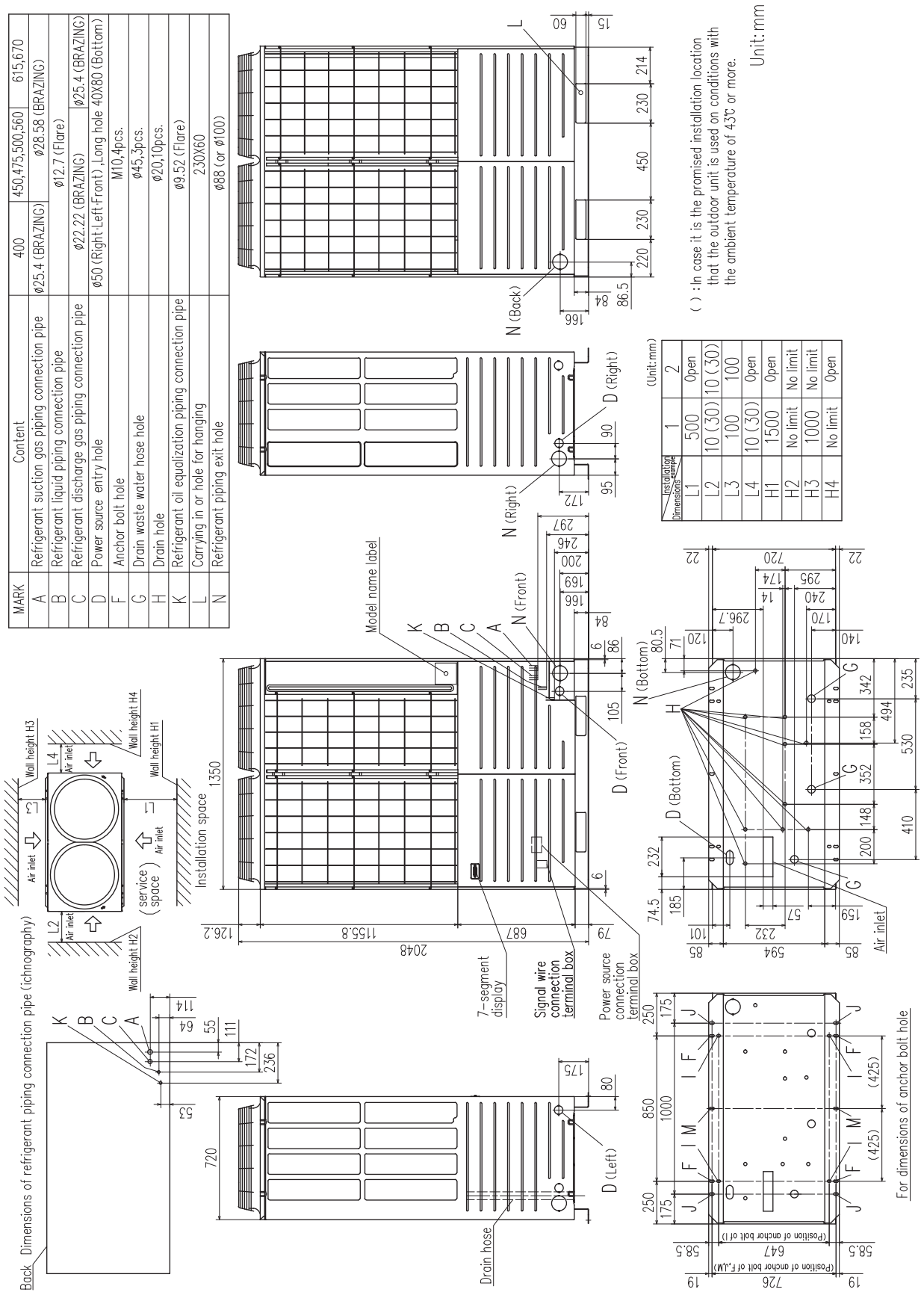
MARK	Content	400	450,475,500,560	615,670
A	Refrigerant suction gas piping connection pipe	ø25.4 (BRAZING)	ø28.58 (BRAZING)	
B	Refrigerant liquid piping connection pipe	ø12.7 (Flare)		
C	Refrigerant discharge gas piping connection pipe	ø22.22 (BRAZING)	ø25.4 (BRAZING)	ø25.4 (BRAZING)
D	Power source entry hole	ø50 (Right Left Front) ,Long hole 40X80 (Bottom)		
F	Anchor bolt hole	M10,4pcs.		
G	Drain waste water hose hole	ø45,3pcs.		
H	Drain hole	ø20,10pcs.		
K	Refrigerant oil equalization piping connection pipe	ø9.52 (Flare)		
L	Carrying in or hole for hanging	230X60		
N	Refrigerant piping exit hole	ø88 (or ø100)		

( ) : In case it is the promised installation location that the outdoor unit is used on conditions with the ambient temperature of 43℃ or more.

Unit: mm

(Unit: mm)

Installation condition / Dimensions	1	2
L1	500	Open
L2	10 (30)	10 (30)
L3	100	100
L4	10 (30)	Open
H1	1500	Open
H2	No limit	No limit
H3	1000	No limit
H4	No limit	Open



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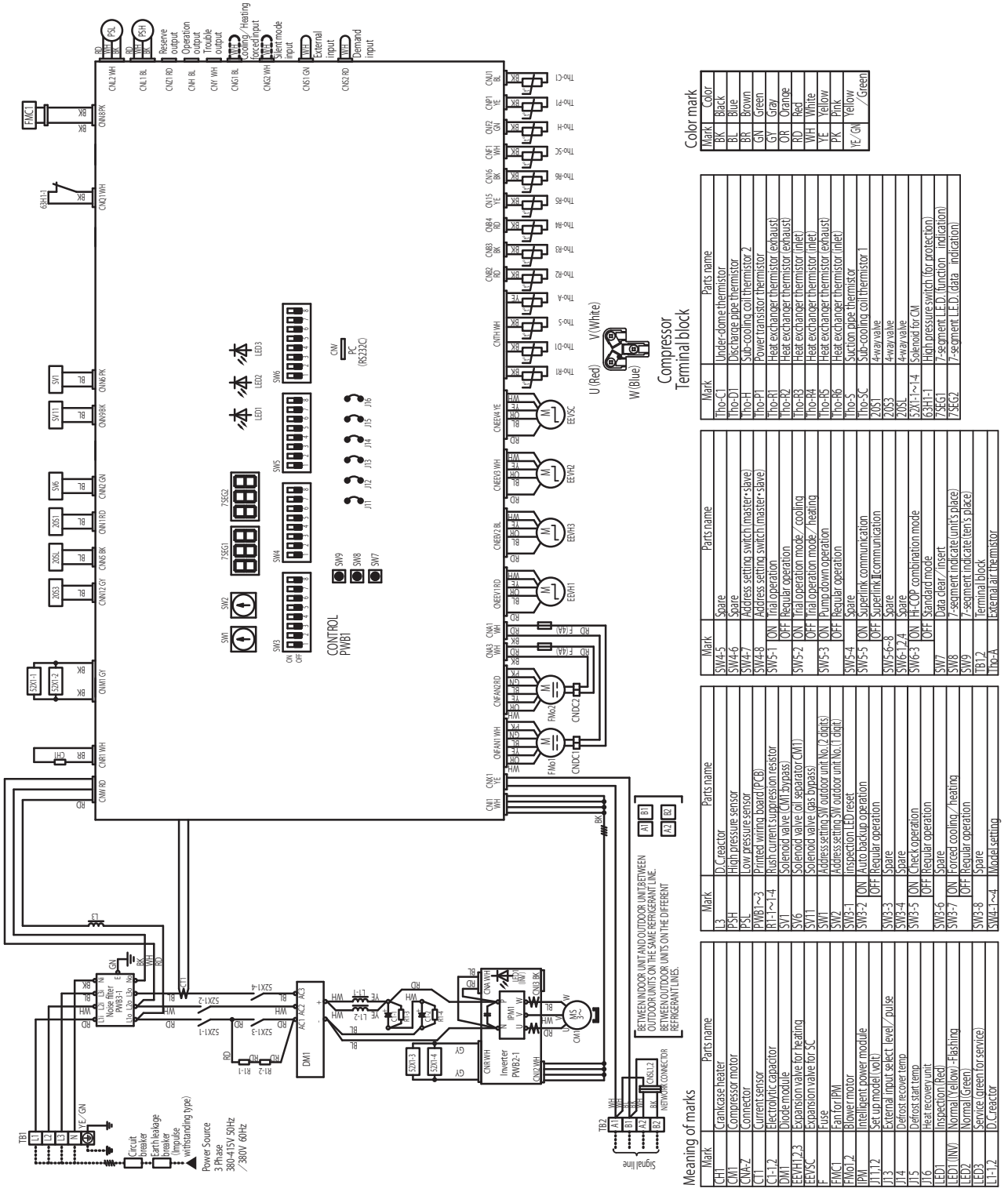
2.3 Electrical wiring

Models FDC224KXZRE1, 280KXZRE1,335KXZRE1



Meaning of marks

Mark	Parts name
CH1	Crankcase heater
CM1	Compressor motor
CNA-Z	Connector
CT1	Current sensor
C1-2	Electrolytic capacitor
DM1	Diode module
EEV1,2,3	Expansion valve for heating
EEV5C	Expansion valve for SC
F	Fuse
FMC1	Fan for IPM
FMo1,2	Blower motor
IPM	Intelligent power module
J11,12	Set up model (volt)
J13	External input select level / pulse
J14	Defrost recover temp
J15	Defrost start temp
J16	Heat recovery unit
LED1	Inspection (Red)
LED1 (INV)	Normal (Yellow) : Flashing
LED2	Normal (Green)
LED3	Service (green for service)
L1-2	D.C reactor
L3	D.C reactor
PSH	High pressure sensor
PSL	Low pressure sensor
PWB1~3	Printed wiring board (PCB)
R1-1~1-4	Rush current suppression resistor
SV1	Solenoid valve (CM1 bypass)
SV6	Solenoid valve oil separator (CM1)
SV11	Solenoid valve (gas bypass)
SW1	Address setting SW outdoor unit No.(2 digits)
SW2	Address setting SW outdoor unit No.(1 digit)
SW3-1	Inspection LED reset
SW3-2	ON: Auto backup operation OFF: Regular operation
SW3-3	Spare
SW3-4	Spare
SW3-5	ON: Check operation OFF: Regular operation
SW3-6	Spare
SW3-7	ON: Forced cooling / heating OFF: Regular operation
SW3-8	Spare
SW4-1~4	Model setting
SW4-5	Spare
SW4-6	Spare
SW4-7	Address setting switch (master•slave)
SW4-8	Address setting switch (master•slave)
SW5-1	ON: Trial operation OFF: Regular operation
SW5-2	ON: Trial operation mode / cooling OFF: Trial operation mode / heating
SW5-3	ON: Pump down operation OFF: Regular operation
SW5-4	Spare
SW5-5	ON: Superlink communication OFF: Superlink Ⅱcommunication
SW5-6~8	Spare
SW6-1,2,4	Spare
SW6-3	ON: HI-COP combination mode OFF: Standard mode
SW7	Data clear / insert
SW8	7-segment indicate (unit's place)
SW9	7-segment indicate (ten's place)
TB1,2	Terminal block
Tho-A	External air thermistor
Tho-C1	Under-dome thermistor
Tho-D1	Discharge pipe thermistor
Tho-H	Sub-cooling coil thermistor 2
Tho-P1	Power transistor thermistor
Tho-R1	Heat exchanger thermistor (exhaust)
Tho-R2	Heat exchanger thermistor (exhaust)
Tho-R3	Heat exchanger thermistor (inlet)
Tho-R4	Heat exchanger thermistor (inlet)
Tho-R5	Heat exchanger thermistor (exhaust)
Tho-R6	Heat exchanger thermistor (inlet)
Tho-S	Suction pipe thermistor
Tho-SC	Sub-cooling coil thermistor 1
20S1	4-way valve
20S3	4-way valve
20SL	4-way valve
52X1-1~1-4	Solenoid for CM
63H1-1	High pressure switch (for protection)
7SEG1	7-segment L.E.D. (function indication)
7SEG2	7-segment L.E.D. (data indication)

Color mark

Mark	Color
BK	Black
BL	Blue
BR	Brown
GN	Green
GY	Gray
OR	Orange
RD	Red
WH	White
YE	Yellow
PK	Pink
YE/GN	Yellow /Green

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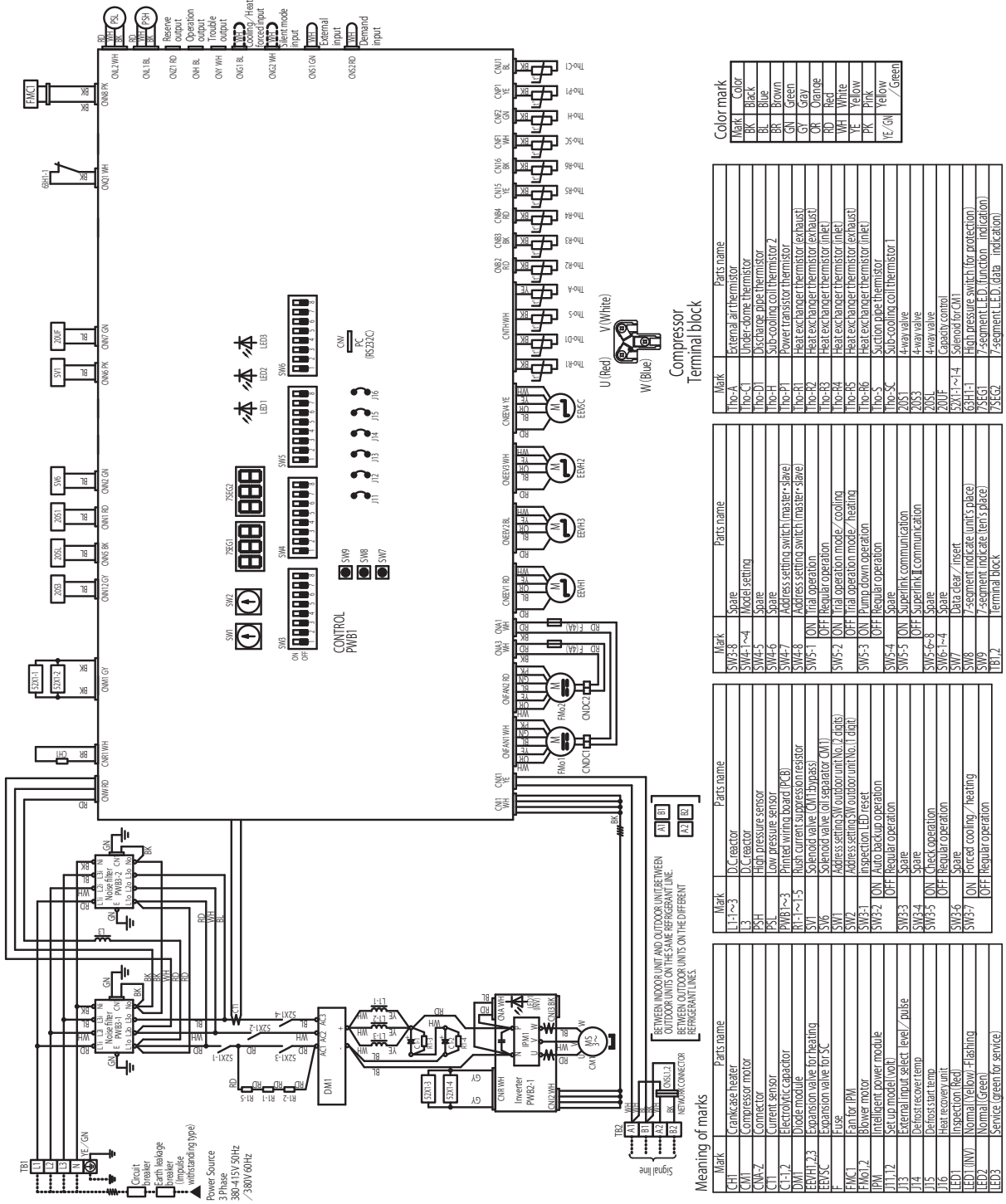
Models FDC400KXZRE1, 450KXZRE1



Meaning of marks

Mark	Parts name
CH1	Crankcase heater
CM1	Compressor motor
CNN-Z	Connector
CT1	Current sensor
C1-3	Electrolytic capacitor
DM1	Diode module
EEVH1,2,3	Expansion valve for heating
EEVSC	Expansion valve for SC
F	Fuse
FMC1	Fan for IPM
FMo1,2	Blower motor
IPM1	Intelligent power module
J11,12	Set up model (volt)
J13	External input select level / pulse
J14	Defrost recover temp
J15	Defrost start temp
J16	Heat recovery unit
LED1	Inspection (Red)
LED1 (INV)	Normal (Yellow) - Flashing
LED2	Normal (Green)
LED3	Service (green for service)

Mark	Parts name
L1-1~3	D.C reactor
L3	D.C reactor
PSH	High pressure sensor
PSL	Low pressure sensor
PWB1~3	Printed wiring board (PCB)
R1-1~1-5	Rush current suppression resistor
SV1	Solenoid valve (CM1 bypass)
SV6	Solenoid valve (oil separator CM1)
SW1	Address setting SW outdoor unit No.2 digit(s)
SW2	Address setting SW outdoor unit No.1 digit)
SW3-1	Inspection LED reset
SW3-2	ON Auto backup operation
	OFF Regular operation
SW3-3	Spare
SW3-4	Spare
SW3-5	ON Check operation
	OFF Regular operation
SW3-6	Spare
SW3-7	ON Forced cooling / heating
	OFF Regular operation

Mark	Parts name
SW3-8	Spare
SW4-1~4	Model setting
SW4-5	Spare
SW4-6	Spare
SW4-7	Address setting switch (master•slave)
SW4-8	Address setting switch (master•slave)
SW5-1	ON Trial operation
	OFF Regular operation
SW5-2	ON Trial operation mode / cooling
	OFF Trial operation mode / heating
SW5-3	ON Pump down operation
	OFF Regular operation
SW5-4	Spare
SW5-5	ON Superlink communication
	OFF Superlink II communication
SW5-6~8	Spare
SW6-1~4	Spare
SW7	Data clear / insert
SW8	7-segment indicate (unit's place)
SW9	7-segment indicate (ten's place)
TB1,2	Terminal block

Mark	Parts name
Tho-A	External air thermistor
Tho-C1	Under-dome thermistor
Tho-D1	Discharge pipe thermistor
Tho-H	Sub-cooling coil thermistor 2
Tho-P1	Power transistor thermistor
Tho-R1	Heat exchanger thermistor (exhaust)
Tho-R2	Heat exchanger thermistor (exhaust)
Tho-R3	Heat exchanger thermistor (inlet)
Tho-R4	Heat exchanger thermistor (inlet)
Tho-R5	Heat exchanger thermistor (exhaust)
Tho-R6	Heat exchanger thermistor (inlet)
Tho-S	Suction pipe thermistor
Tho-SC	Sub-cooling coil thermistor 1
20S1	4-way valve
20S3	4-way valve
20S4	4-way valve
20UF	Capacity control
52X1-1~1-4	Solenoid for CM1
63H1-1	High pressure switch (for protection)
7SEG1	7-segment LED (unction indication)
7SEG2	7-segment LED (data indication)

Color mark

Mark	Color
BK	Black
BL	Blue
BR	Brown
GN	Green
GY	Gray
OR	Orange
RD	Red
WH	White
YE	Yellow
PK	Pink
YE / GN	Yellow / Green

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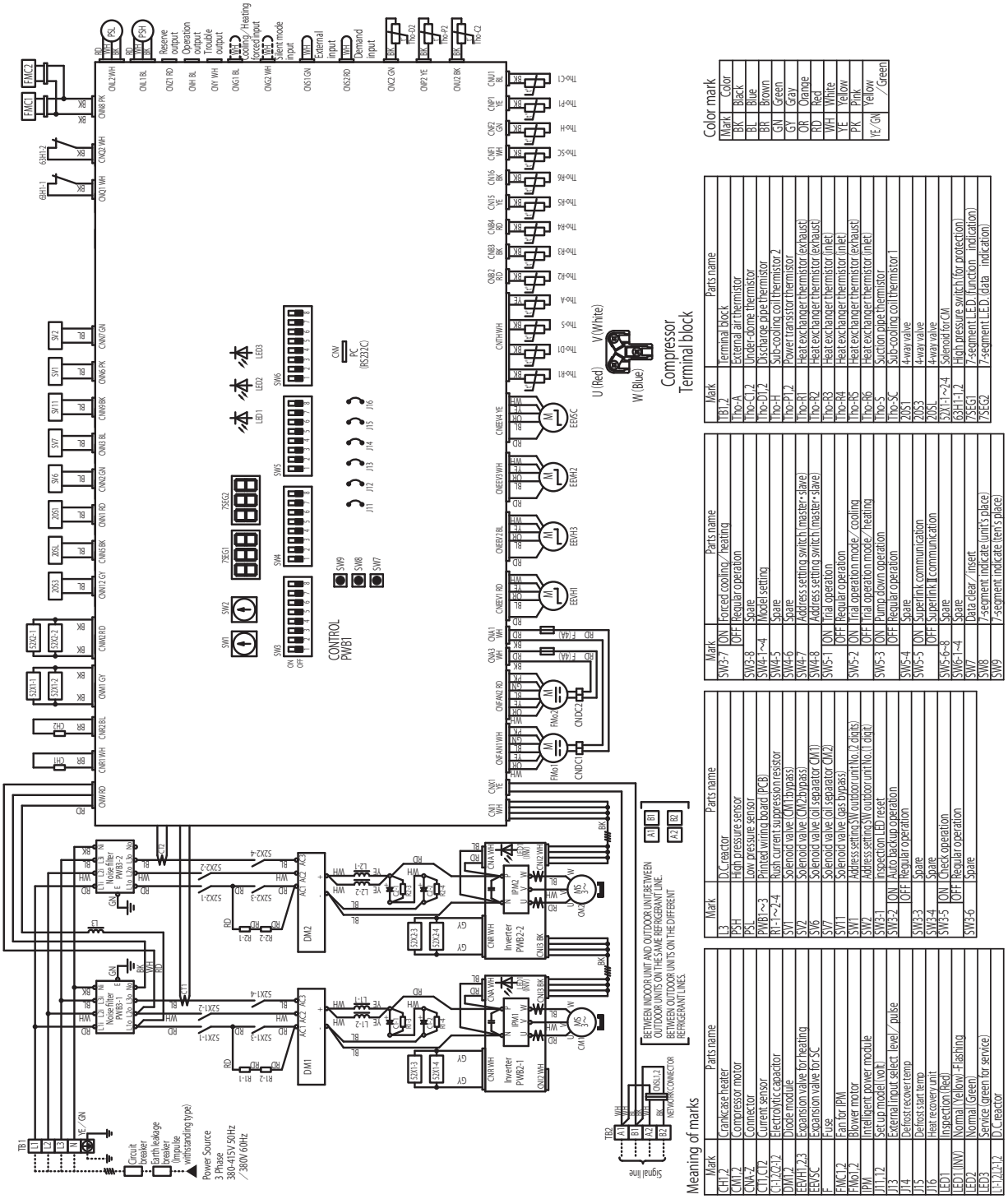
Models FDC475KXZRE1, 500KXZRE1, 560KXZRE1
FDC615KXZRE1, 670KXZRE1



Meaning of marks

Mark	Parts name
CH1,2	Crankcase heater
CM1,2	Compressor motor
CN4,7	Connector
CT1,CT2	Current sensor
C1-2,C2-2	Electrolytic capacitor
DM1,2	Diode module
EEVH1,2,3	Expansion valve for heating
EEVSC	Expansion valve for SC
F	Fuse
FMC1,2	Fan for IPM
FMo1,2	Blower motor
IPM	Intelligent power module
J11,12	Set up model (volt)
J13	External input select (level / pulse)
J14	Defrost recover temp
J15	Defrost start temp
J16	Heat recovery unit
LED1	Inspection (Red)
LED1 (INV)	Normal (Yellow) - Flashing
LED2	Normal (Green)
LED3	Service (green for service)
L1-2,L2-2	D.C reactor

Mark	Parts name
L3	D.C reactor
PSH	High pressure sensor
PSL	Low pressure sensor
PWB1~3	Printed wiring board (PCB)
R1-1~2-4	Rush current suppression resistor
SV1	Solenoid valve (CM1 bypass)
SV2	Solenoid valve (CM2 bypass)
SV6	Solenoid valve (oil separator CM1)
SV7	Solenoid valve (oil separator CM2)
SV11	Solenoid valve (gas bypass)
SW1	Address setting (W outdoor unit No.2 digits)
SW2	Address setting (W outdoor unit No.1 digit)
SW3-1	Inspection LED reset
SW3-2	ON Auto backup operation
	OFF Regular operation
SW3-3	Spare
SW3-4	Spare
SW3-5	ON Check operation
	OFF Regular operation
SW3-6	Spare

Mark		Parts name
SW3-7	ON	Forced cooling / heating
	OFF	Regular operation
SW3-8		Spare
SW4-1~4		Model setting
SW4-5		Spare
SW4-6		Spare
SW4-7		Address setting switch (master-slave)
SW4-8		Address setting switch (master-slave)
SW5-1	ON	Trial operation
	OFF	Regular operation
SW5-2	ON	Trial operation mode / cooling
	OFF	Trial operation mode / heating
SW5-3	ON	Pump down operation
	OFF	Regular operation
SW5-4		Spare
SW5-5	ON	Superlink communication
	OFF	Superlink II communication
SW5-6~8		Spare
SW6-1~4		Spare
SW7		Data clear / insert
SW8		7-segment indicate (unit's place)
SW9		7-segment indicate (ten's place)

Mark	Parts name
TB1,2	Terminal block
Tho-A	External air thermistor
Tho-C1,2	Under-dome thermistor
Tho-D1,2	Discharge pipe thermistor
Tho-H	Sub-cooling coil thermistor 2
Tho-P1,2	Power transistor thermistor
Tho-R1	Heat exchanger thermistor (exhaust)
Tho-R2	Heat exchanger thermistor (exhaust)
Tho-R3	Heat exchanger thermistor (inlet)
Tho-R4	Heat exchanger thermistor (inlet)
Tho-R5	Heat exchanger thermistor (exhaust)
Tho-R6	Heat exchanger thermistor (inlet)
Tho-S	Suction pipe thermistor
Tho-SC	Sub-cooling coil thermistor 1
20S1	4-way valve
20S3	4-way valve
20S4	4-way valve
52X1-1~2-4	Solenoid for CM
63H1-1,2	High pressure switch (for protection)
7SEG1	7-segment LED (function indication)
7SEG2	7-segment LED (data indication)

Color mark

Mark	Color
BK	Black
BL	Blue
BR	Brown
GN	Green
GY	Gray
OR	Orange
RD	Red
WH	White
YE	Yellow
PK	Pink
YE /GN	Yellow / Green

PCB004Z091

2.4 Noise level

Measured based on JIS B 8616

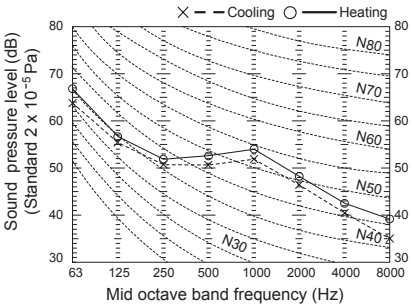
Mike position as highest noise level in position as below

Distance from front side 1m

Height 1m

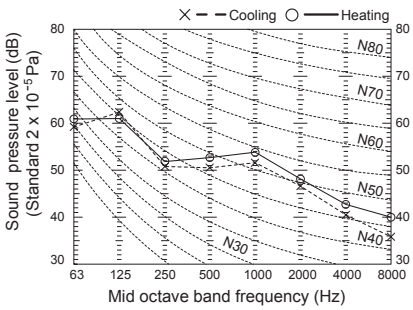
Model FDC224KXZRE1

Noise level 55 dB (A) at cooling
57 dB (A) at heating



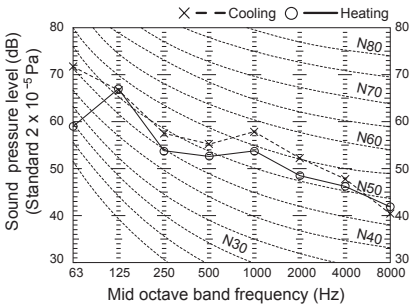
Model FDC280KXZRE1

Noise level 55 dB (A) at cooling
57 dB (A) at heating



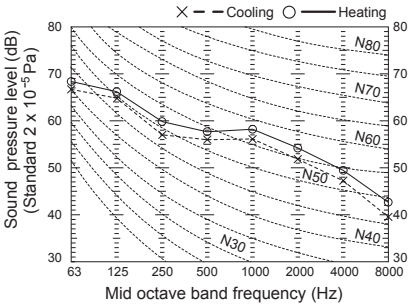
Model FDC335KXZRE1

Noise level 61 dB (A) at cooling
58 dB (A) at heating



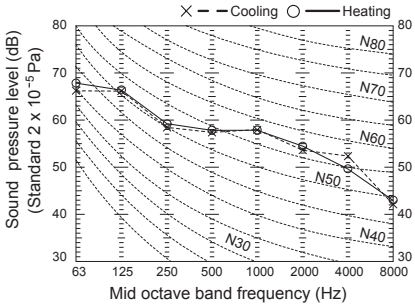
Model FDC400KXZRE1

Noise level 60 dB (A) at cooling
62 dB (A) at heating



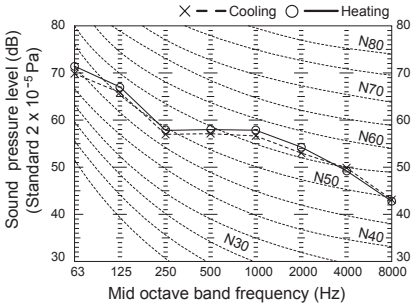
Model FDC450KXZRE1

Noise level 62 dB (A) at cooling
62 dB (A) at heating



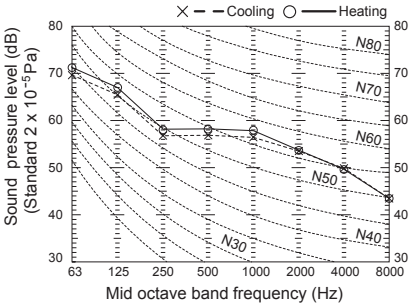
Model FDC475KXZRE1

Noise level 61 dB (A) at cooling
62 dB (A) at heating



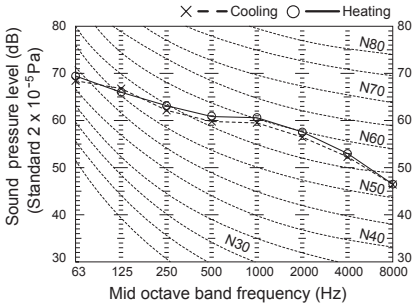
Model FDC500KXZRE1

Noise level 61 dB (A) at cooling
62 dB (A) at heating



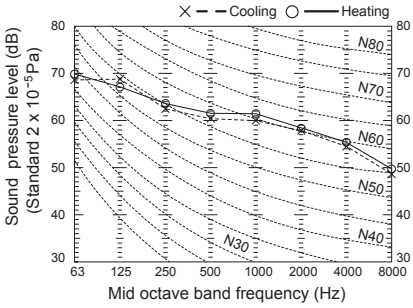
Model FDC560KXZRE1

Noise level 64 dB (A) at cooling
65 dB (A) at heating



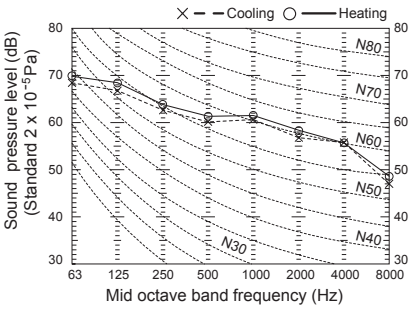
Model FDC615KXZRE1

Noise level 65 dB (A) at cooling
66 dB (A) at heating



Model FDC670KXZRE1

Noise level 65 dB (A) at cooling
66 dB (A) at heating



3. RANGE OF USAGE & LIMITATIONS

・Single use

Item \ Outdoor unit		FDC224KXZRE1	FDC280KXZRE1	FDC335KXZRE1
Indoor intake air temperature (Upper & lower limits)		Refer to page 27		
Outdoor air temperature (Upper & lower limits)				
Indoor unit	Number of connectable units	1 to 29 units	1 to 37 units	1 to 44 units
	Total connectable capacity(1)	112 - 448	140 - 560	167 - 670
Total piping length(2)		1000m or less		
Main piping length (from outdoor unit to the first branching)		130m or less		
Maximum piping length from outdoor unit to the furthest indoor unit		Actual length : 160m or less, Equivalent length : 185m or less		
Allowable piping length from the first branching to the furthest indoor unit		90m or less (Difference between the longest and the shortest piping : 40m or less)		
Allowable piping length from the branching control (PFD box) to the indoor unit		40m or less		
Height difference between outdoor and indoor units	Outdoor unit is above	50m or less		
	Outdoor unit is below	40m or less(3)		
Height difference between the indoor units		18m or less		
Height difference between the branching controls (PFD boxes)		18m or less		
Height difference between the first branching and the indoor unit		18m or less		
Height difference between the branching nearest to the branching control (PFD box) and the PFD box		Refer to note(4)		
Height difference between the first branching and the branching control (PFD box)		18m or less		
Height difference between the branching control (PFD box) and the indoor unit	Indoor unit is above	1m or less		
	Indoor unit is below	4m or less		
Air flow volume and static pressure		Install the duct and air outlet grille with good insulation performance (arranged on site) within the range of fan characteristics. (for ducting models only such as FDU and etc)		
Air filter		Install air filter (arranged on site) at the place for easy maintenance (for ducting models only such as FDU and etc)		
Insulation of refrigerant piping		Insulation with 20mm or more thickness is required when the relative humidity exceeds 70% in such surroundings as inside of ceiling and etc.		
Insulation of drain piping		Insulation with 10mm or more thickness is required when the relative humidity exceeds 70% in such surroundings as inside of ceiling and etc.		
Indoor unit atmosphere (inside the ceiling) temperature and humidity 〔Only the models FDT, FDTC, FDTW, FDTS, FDTQ FDU, FDUM, FDQS and FDUH〕		Dew-point temperature: 28℃or less, Relative humidity: 80% or less (for FDE, FDK, FDFL, FDFU, FDFW) Dew-point temperature: 23℃ or less, Relative humidity: 80% or less		
Compressor start/stop frequency	Minimum operation cycle	5 minutes or more * Max. 12 min or more at low outdoor air temperatures (stop operation- start -stop or start operation-stop-start)		
	Minimum stopping period	3 minutes or more		
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage		
	Voltage drop at starting	Within ±15% of rated voltage		
	Unbalance between phases	Within ±3% of rated voltage		

Notes (1) **When connecting the indoor unit type FDK, FDFL, FDFU or FDFW series, the total connectable capacity should not exceed 130% of the outdoor unit capacity.**

(2) When the total piping length exceeds 510m, 1000cc of additional refrigerant oil should be charged.

(3) When conducting cooling operation at 10℃ or lower outdoor air temperature, it must be 30m or less.

(4) When all of following conditions (a) (b) and (c) are established, height difference between the branching nearest to the branching control (PFD box) and the PFD box should be **limited to 4m or less.**

(a) When the connected indoor unit **model is 22 or 28**.

(b) When the piping length from the first branching and the indoor unit is **40m or more**.

(c) When the branching control (PFD box) is installed above the branching nearest to the PFD box.

In such case the size of discharge gas piping between the branching nearest to the branching control (PFD box) and the PFD box should be **increased from ϕ6.35 to ϕ9.52.**

(5) If Superlink I (previous Superlink) is selected, all the range of usage and limitations, not only the limitations of connectable indoor capacity and connectable number of indoor unit but also of the piping length, operating temperature range and etc., become same as those of KX4 (See technical manual '07・KX・KXR-T-114). In addition to above limitations, all of new functions for KX6 such as automatic address setting function for multiple refrigerant systems and etc. will be cancelled.

Important

When the Additional refrigerant quantity for piping (P) is over the following table, please separate the refrigerant line.

Outdoor unit	Additional refrigerant charging amount
224-335	50

・Single use (For combination use as well)

Item \ Outdoor unit		FDC400KXZRE1	FDC450KXZRE1	FDC500KXZRE1
Indoor intake air temperature(Upper & lower limits)		Refer to page 27		
Outdoor air temperature(Upper & lower limits)				
Indoor unit	Number of connectable units	1 to 53 units	1 to 60 units	1 to 50 units
	Total connectable capacity(1)	200 - 800	225 - 900	250 - 800
Total piping length(2)		1000m or less		
Main piping length (from outdoor unit to the first branching)		130m or less		
Maximum piping length from outdoor unit to the furthest indoor unit		Actual length : 160m or less, Equivalent length : 185m or less		
Allowable piping length from the first branching to the furthest indoor unit		90m or less (Difference between the longest and the shortest piping : 40m or less)		
Allowable piping length from the branching control (PFD box) to the indoor unit		40m or less		
Height difference between outdoor and indoor units	Outdoor unit is above	50m or less		
	Outdoor unit is below	40m or less(3)		
Height difference between the indoor units		18m or less		
Height difference between the branching controls		18m or less		
Height difference between the first branching and the indoor unit		18m or less		
Height difference between the branching nearest to the branching control (PFD box) and the PFD box		Refer to note(4)		
Height difference between the first branching and the branching control (PFD box)		18m or less		
Height difference between the branching control (PFD box) and the indoor unit	Indoor unit is above	1m or less		
	Indoor unit is below	4m or less		
Air flow volume and static pressure		Install the duct and air outlet grille with good insulation performance (arranged on site) within the range of fan characteristics. (for ducting models only such as FDU and etc)		
Air filter		Install air filter (arranged on site) at the place for easy maintenance (for ducting models only such as FDU and etc)		
Insulation of refrigerant piping		Insulation with 20mm or more thickness is required when the relative humidity exceeds 70% in such surroundings as inside of ceiling and etc.		
Insulation of drain piping		Insulation with 10mm or more thickness is required when the relative humidity exceeds 70% in such surroundings as inside of ceiling and etc.		
Indoor unit atmosphere (inside the ceiling) temperature [Only the models FDT, FDTC, FDTW, FDTS, FDTQ FDU, FDUM, FDQS and FDUH]		Dew-point temperature: 28℃or less, Relative humidity: 80% or less (for FDE, FDK, FDFL, FDFU, FDFW) Dew-point temperature: 23℃ or less, Relative humidity: 80% or less		
Compressor start/stop frequency	Minimum operation cycle	5 minutes or more * Max. 12 min or more at low outdoor air temperatures (stop operation- start -stop or start operation-stop-start)		
	Minimum stopping period	3 minutes or more		
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage		
	Voltage drop at starting	Within ±15% of rated voltage		
	Unbalance between phases	Within ±3% of rated voltage		

Notes (1) **When connecting the indoor unit type FDK, FDFL, FDFU or FDFW series, the total connectable capacity should not exceed 130% of the outdoor unit capacity.**

(2) When the total piping length exceeds 510m, 1000cc of additional refrigerant oil should be charged.

(3) When conducting cooling operation at 10℃ or lower outdoor air temperature, it must be 30m or less.

(4) When all of following conditions (a) (b) and (c) are established, height difference between the branching nearest to the branching control (PFD box) and the indoor unit should be **limited to 4m or less**.

(a) When the connected indoor unit **model is 22 or 28**.

(b) When the piping length from the first branching and the indoor unit is **40m or more**.

(c) When the branching control (PFD box) is installed above the branching nearest to the PFD box.

In such case the size of discharge gas piping between the branching nearest to the branching control (PFD box) and the PFD box should be **increased from ϕ6.35 to ϕ9.52.**

(5) If Superlink I (previous Superlink) is selected, all the range of usage and limitations, not only the limitations of connectabl e indoor capacity and connectable number of indoor unit but also of the piping length, operating temperature range and etc., become same as those of KX4 (See technical manual '07・KX・KXR-T-114). In addition to above limitations, all of new functions for KX6 such as automatic address setting function for multiple refrigerant systems and etc. will be cancelled.

Important

When the calculation result of additional refrigerant charging amount exceeds the value mentioned in following table, please split the refrigerant system into two.

Outdoor unit	Additional refrigerant charging amount
400-500	50

・Single use (For combination use as well)

Item \ Outdoor unit		FDC560KXZRE1	FDC615KXZRE1	FDC670KXZRE1
Indoor intake air temperature(Upper & lower limits)		Refer to page 27		
Outdoor air temperature(Upper & lower limits)				
Indoor unit	Number of connectable units	1 to 59 units	2 to 65 units	2 to 71 units
	Total connectable capacity(1)	280 - 896	308 - 984	335 - 1172
Total piping length(2)		1000m or less		
Main piping length (from outdoor unit to the first branching)		130m or less		
Maximum piping length from outdoor unit to the furthest indoor unit		Actual length : 160m or less, Equivalent length : 185m or less		
Allowable piping length from the first branching to the furthest indoor unit		90m or less (Difference between the longest and the shortest piping : 40m or less)		
Allowable piping length from the branching control (PFD box) to the indoor unit		40m or less		
Height difference between outdoor and indoor units	Outdoor unit is above	50m or less		
	Outdoor unit is below	40m or less(3)		
Height difference between the indoor units		18m or less		
Height difference between the branching controls		18m or less		
Height difference between the first branching and the		18m or less		
Height difference between the branching nearest to the branching control (PFD box) and the PFD box		Refer to note(4)		
Height difference between the first branching and the branching control (PFD box)		18m or less		
Height difference between the branching control (PFD box) and the indoor unit	Indoor unit is above	1m or less		
	Indoor unit is below	4m or less		
Air flow volume and static pressure		Install the duct and air outlet grille with good insulation performance (arranged on site) within the range of fan characteristics. (for ducting models only such as FDU and etc)		
Air filter		Install air filter (arranged on site) at the place for easy maintenance (for ducting models only such as FDU and etc)		
Insulation of refrigerant piping		Insulation with 20mm or more thickness is required when the relative humidity exceeds 70% in such surroundings as inside of ceiling and etc.		
Insulation of drain piping		Insulation with 10mm or more thickness is required when the relative humidity exceeds 70% in such surroundings as inside of ceiling and etc.		
Indoor unit atmosphere (inside the ceiling) temperature 〔Only the models FDT, FDTC, FDTW, FDTS, FDTQ FDU, FDUM, FDQS and FDUH〕		Dew-point temperature: 28℃ or less, Relative humidity: 80% or less (for FDE, FDK, FDFL, FDFU, FDFW) Dew-point temperature: 23℃ or less, Relative humidity: 80% or less		
Compressor start/stop frequency	Minimum operation cycle	5 minutes or more * Max. 12 min or more at low outdoor air temperatures (stop operation- start -stop or start operation-stop-start)		
	Minimum stopping period	3 minutes or more		
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage		
	Voltage drop at starting	Within ±15% of rated voltage		
	Unbalance between phases	Within ±3% of rated voltage		

Notes (1) **When connecting the indoor unit type FDK, FDFL, FDFU or FDFW series, the total connectable capacity should not exceed 130% of the outdoor unit capacity.**

(2) When the total piping length exceeds 510m, 1000cc of additional refrigerant oil should be charged.

(3) When conducting cooling operation at 10℃ or lower outdoor air temperature, it must be 30m or less.

(4) When all of following conditions (a) (b) and (c) are established, height difference between the branching nearest to the branching control (PFD box) and the indoor unit should be **limited to 4m or less**.

(a) When the connected indoor unit **model is 22 or 28**.

(b) When the piping length from the first branching and the indoor unit is **40m or more**.

(c) When the branching control (PFD box) is installed above the branching nearest to the PFD box.

In such case the size of discharge gas piping between the branching nearest to the branching control (PFD box) and the PFD box should be **increased from ϕ6.35 to ϕ9.52**.

(5) If Superlink I (previous Superlink) is selected, all the range of usage and limitations, not only the limitations of connectabl e indoor capacity and connectable number of indoor unit but also of the piping length, operating temperature range and etc., become same as those of KX4 (See technical manual '07・KX・KXR-T-114). In addition to above limitations, all of new functions for KX6 such as automatic address setting function for multiple refrigerant systems and etc. will be cancelled.

Important

When the calculation result of additional refrigerant charging amount exceeds the value mentioned in following table, please split the refrigerant system into two.

Outdoor unit	Additional refrigerant charging amount
560-670	50

・Combination use

Item \ Outdoor unit		FDC735KXZRE1	FDC800KXZRE1	FDC850KXZRE1	FDC900KXZRE1	FDC950KXZRE1
Indoor intake air temperature(Upper & lower limits)		Refer to page 27				
Outdoor air temperature(Upper & lower limits)						
Indoor unit	Number of connectable units	2 to 78 units	2 to 80 units	2 to 80 units	2 to 80 units	2 to 80 units
	Total connectable capacity(1)	368 - 1176	400 - 1280	425 - 1360	450 - 1440	475 - 1520
Total piping length(2)		1000m or less				
Main piping length (from outdoor unit to the first branching)		130m or less				
Maximum piping length from outdoor unit to the furthest indoor unit		Actual length : 160m or less, Equivalent length : 185m or less				
Allowable piping length from the first branching to the furthest indoor unit		90m or less (Difference between the longest and the shortest piping : 40m or less)				
Allowable piping length from the branching control (PFD box) to the indoor unit		40m or less				
Height difference between outdoor and indoor units	Outdoor unit is above	50m or less				
	Outdoor unit is below	40m or less(3)				
Height difference between the indoor units		18m or less				
Height difference between the branching controls		18m or less				
Height difference between the first branching and the indoor unit		18m or less				
Height difference between the branching nearest to the branching control (PFD box) and the PFD box		Refer to note(4)				
Height difference between the first branching and the branching control (PFD box)		18m or less				
Height difference between the branching control (PFD box) and the indoor unit	Indoor unit is above	1m or less				
	Indoor unit is below	4m or less				
Height difference between master and slave outdoor units		0.4m or less(6)				
Height difference between the outdoor unit and the outdoor side branching		5m or less				
Allowable piping length of oil equalization piping		10m or less				
Air flow volume and static pressure		Install the duct and air outlet grille with good insulation performance (arranged on site) within the range of fan characteristics. (for ducting models only such as FDU and etc)				
Air filter		Install air filter (arranged on site) at the place for easy maintenance (for ducting models only such as FDU and etc)				
Insulation of refrigerant piping		Insulation with 20mm or more thickness is required when the relative humidity exceeds 70% in such surroundings as inside of ceiling and etc.				
Insulation of drain piping		Insulation with 10mm or more thickness is required when the relative humidity exceeds 70% in such surroundings as inside of ceiling and etc.				
Indoor unit atmosphere (inside the ceiling) temperature and humidity [Only the models FDT, FDTC, FDTW, FDTS, FDTQ FDU, FDUM, FDQS and FDUH]		Dew-point temperature: 28℃ or less, Relative humidity: 80% or less (for FDE, FDK, FDFL, FDFU, FDFW) Dew-point temperature: 23℃ or less, Relative humidity: 80% or less				
Compressor start/stop frequency	Minimum operation cycle	5 minutes or more * Max. 12 min or more at low outdoor air temperatures (stop operation- start -stop or start operation-stop-start)				
	Minimum stopping period	3 minutes or more				
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage				
	Voltage drop at starting	Within ±15% of rated voltage				
	Unbalance between phases	Within ±3% of rated voltage				

Notes (1) **When connecting the indoor unit type FDK, FDFL, FDFU or FDFW series, the total connectable capacity should not exceed 130% of the outdoor unit capacity.**

(2) When the total piping length exceeds 510m, 1000cc of additional refrigerant oil should be charged.

(3) When conducting cooling operation at 10℃ or lower outdoor air temperature, it must be 30m or less.

(4) When all of following conditions (a) (b) and (c) are established, height difference between the branching nearest to the branching control (PFD box) and the indoor unit should be **limited to 4m or less.**

(a) When the connected indoor unit **model is 22 or 28**.

(b) When the piping length from the first branching and the indoor unit is **40m or more**.

(c) When the branching control (PFD box) is installed above the branching nearest to the PFD box.

In such case the size of discharge gas piping between the branching nearest to the branching control (PFD box) and the PFD box should be **increased from ϕ6.35 to ϕ9.52.**

(5) If Superlink I (previous Superlink) is selected, all the range of usage and limitations, not only the limitations of connectabl e indoor capacity and connectable number of indoor unit but also of the piping length, operating temperature range and etc., become same as those of KX4 (See technical manual '07・KX・KXR-T-114). In addition to above limitations, all of new functions for KX6 such as automatic address setting function for multiple refrigerant systems and etc. will be cancelled.

(6) When using the outdoor units under 0℃, install them on the same level.

Important

When the calculation result of additional refrigerant charging amount exceeds the value mentioned in following table, please split the refrigerant system into two.

Outdoor unit	Additional refrigerant charging amount
730-950	100

・Combination use

Item \ Outdoor unit		FDC1000 KXZRE1	FDC1060 KXZRE1	FDC1120 KXZRE1	FDC1200 KXZRE1	FDC1250 KXZRE1	FDC1300 KXZRE1	FDC1350 KXZRE1
Indoor intake air temperature (Upper & lower limits)		Refer to page 27						
Outdoor air temperature (Upper & lower limits)								
Indoor unit	Number of connectable units	2 to 80 units	2 to 80 units	2 to 80 units	3 to 80 units	3 to 80 units	3 to 80 units	3 to 80 units
	Total connectable capacity(1)	500 - 1300	530 - 1378	560 - 1456	600 - 1560	625 - 1625	650 - 1690	675 - 1755
Total piping length(2)		1000m or less						
Main piping length (from outdoor unit to the first branching)		130m or less						
Maximum piping length from outdoor unit to the furthest indoor unit		Actual length : 160m or less, Equivalent length : 185m or less						
Allowable piping length from the first branching to the furthest indoor unit		90m or less (Difference between the longest and the shortest piping : 40m or less)						
Allowable piping length from the branching control (PFD box) to the indoor unit		40m or less						
Height difference between outdoor and indoor units	Outdoor unit is above	50m or less						
	Outdoor unit is below	40m or less(3)						
Height difference between the indoor units		18m or less						
Height difference between the branching controls		18m or less						
Height difference between the first branching and the indoor unit		18m or less						
Height difference between the branching nearest to the branching control (PFD box) and the PFD box		Refer to note(4)						
Height difference between the first branching and the branching control (PFD box)		18m or less						
Height difference between the branching control (PFD box) and the indoor unit	Indoor unit is above	1m or less						
	Indoor unit is below	4m or less						
Height difference between master and slave outdoor units		0.4m or less (6)						
Height difference between the outdoor unit and the outdoor side branching		5m or less						
Allowable piping length of oil equalization piping		10m or less						
Air flow volume and static pressure		Install the duct and air outlet grille with good insulation performance (arranged on site) within the range of fan characteristics. (for ducting models only such as FDU and etc)						
Air filter		Install air filter (arranged on site) at the place for easy maintenance (for ducting models only such as FDU and etc)						
Insulation of refrigerant piping		Insulation with 20mm or more thickness is required when the relative humidity exceeds 70% in such surroundings as inside of ceiling and etc.						
Insulation of drain piping		Insulation with 10mm or more thickness is required when the relative humidity exceeds 70% in such surroundings as inside of ceiling and etc.						
Indoor unit atmosphere (inside the ceiling) temperature and humidity 〔Only the models FDT, FDTC, FDTW, FDTS, FDTQ FDU, FDUM, FDQS and FDUH〕		Dew-point temperature: 28℃ or less, Relative humidity: 80% or less (for FDE, FDK, FDFL, FDFU, FDFW) Dew-point temperature: 23℃ or less, Relative humidity: 80% or less						
Compressor start/stop frequency	Minimum operation cycle	5 minutes or more * Max. 12 min or more at low outdoor air temperatures (stop operation- start -stop or start operation-stop-start)						
	Minimum stopping period	3minutes or more						
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage						
	Voltage drop at starting	Within ±15% of rated voltage						
	Unbalance between phases	Within ±3% of rated voltage						

Notes (1) **When connecting the indoor unit type FDK, FDFL, FDFU or FDFW series, the total connectable capacity should not exceed 130% of the outdoor unit capacity.**

(2) When the total piping length exceeds 510m, 1000cc of additional refrigerant oil should be charged.

(3) When conducting cooling operation at 10℃ or lower outdoor air temperature, it must be 30m or less.

(4) When all of following conditions (a) (b) and (c) are established, height difference between the branching nearest to the branching control (PFD box) and the indoor unit should be **limited to 4m or less.**

(a) When the connected indoor unit **model is 22 or 28**.

(b) When the piping length from the first branching and the indoor unit is **40m or more**.

(c) When the branching control (PFD box) is installed above the branching nearest to the PFD box.

In such case the size of discharge gas piping between the branching nearest to the branching control (PFD box) and the PFD box should be **increased from ϕ6.35 to ϕ9.52.**

(5) If Superlink I (previous Superlink) is selected, all the range of usage and limitations, not only the limitations of connectabl e indoor capacity and connectable number of indoor unit but also of the piping length, operating temperature range and etc., become same as those of KX4 (See technical manual '07・KX・KXR-T-114). In addition to above limitations, all of new functions for KX6 such as automatic address setting function for multiple refrigerant systems and etc. will be cancelled.

(6) When using the outdoor units under 0℃, install them on the same level.

Important

When the calculation result of additional refrigerant charging amount exceeds the value mentioned in following table, please split the refrigerant system into two.

Outdoor unit	Additional refrigerant charging amount
1000-1350	100

・Combination use

Item \ Outdoor unit		FDC1425 KXZRE1	FDC1450 KXZRE1	FDC1500 KXZRE1	FDC1560 KXZRE1	FDC1620 KXZRE1	FDC1680 KXZRE1
Indoor intake air temperature (Upper & lower limits)		Refer to page 27					
Outdoor air temperature (Upper & lower limits)							
Indoor unit	Number of connectable units	3 to 80 units	3 to 80 units	3 to 80 units	3 to 80 units	3 to 80 units	3 to 80 units
	Total connectable capacity(1)	713 - 1852	725 - 1885	750 - 1950	780 - 2028	810 - 2106	840 - 2184
Total piping length(2)		1000m or less					
Main piping length (from outdoor unit to the first branching)		130m or less					
Maximum piping length from outdoor unit to the furthest indoor unit		Actual length : 160m or less, Equivalent length : 185m or less					
Allowable piping length from the first branching to the furthest indoor unit		90m or less (Difference between the longest and the shortest piping : 40m or less)					
Allowable piping length from the branching control (PFD box) to the indoor unit		40m or less					
Height difference between outdoor and indoor units	Outdoor unit is above	50m or less					
	Outdoor unit is below	40m or less(3)					
Height difference between the indoor units		18m or less					
Height difference between the branching controls		18m or less					
Height difference between the first branching and the indoor unit		18m or less					
Height difference between the branching nearest to the branching control (PFD box) and the PFD box		Refer to note(4)					
Height difference between the first branching and the branching control (PFD box)		18m or less					
Height difference between the branching control (PFD box) and the indoor unit	Indoor unit is above	1m or less					
	Indoor unit is below	4m or less					
Height difference between master and slave outdoor units		0.4m or less (6)					
Height difference between the outdoor unit and the outdoor side branching		5m or less					
Allowable piping length of oil equalization piping		10m or less					
Air flow volume and static pressure		Install the duct and air outlet grille with good insulation performance (arranged on site) within the range of fan characteristics. (for ducting models only such as FDU and etc)					
Air filter		Install air filter (arranged on site) at the place for easy maintenance (for ducting models only such as FDU and etc)					
Insulation of refrigerant piping		Insulation with 20mm or more thickness is required when the relative humidity exceeds 70% in such surroundings as inside of ceiling and etc.					
Insulation of drain piping		Insulation with 10mm or more thickness is required when the relative humidity exceeds 70% in such surroundings as inside of ceiling and etc.					
Indoor unit atmosphere (inside the ceiling) temperature and humidity 〔Only the models FDT, FDTC, FDTW, FDTS, FDTQ FDU, FDUM, FDQS and FDUH〕		Dew-point temperature: 28℃ or less, Relative humidity: 80% or less (for FDE, FDK, FDFL, FDFU, FDFW) Dew-point temperature: 23℃ or less, Relative humidity: 80% or less					
Compressor start/stop frequency	Minimum operation cycle	5 minutes or more * Max. 12 min or more at low outdoor air temperatures (stop operation- start -stop or start operation-stop-start)					
	Minimum stopping period	3 minutes or more					
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage					
	Voltage drop at starting	Within ±15% of rated voltage					
	Unbalance between phases	Within ±3% of rated voltage					

Notes (1) **When connecting the indoor unit type FDK, FDFL, FDFU or FDFW series, the total connectable capacity should not exceed 130% of the outdoor unit capacity.**

(2) When the total piping length exceeds 510m, 1000cc of additional refrigerant oil should be charged.

(3) When conducting cooling operation at 10℃ or lower outdoor air temperature, it must be 30m or less.

(4) When all of following conditions (a) (b) and (c) are established, height difference between the branching nearest to the branching control (PFD box) and the indoor unit should be **limited to 4m or less.**

(a) When the connected indoor unit **model is 22 or 28**.

(b) When the piping length from the first branching and the indoor unit is **40m or more**.

(c) When the branching control (PFD box) is installed above the branching nearest to the PFD box.

In such case the size of discharge gas piping between the branching nearest to the branching control (PFD box) and the PFD box should be **increased from φ6.35 to φ9.52.**

(5) If Superlink I (previous Superlink) is selected, all the range of usage and limitations, not only the limitations of connectabl e indoor capacity and connectable number of indoor unit but also of the piping length, operating temperature range and etc., become same as those of KX4 (See technical manual '07・KX・KXR-T-114). In addition to above limitations, all of new functions for KX6 such as automatic address setting function for multiple refrigerant systems and etc. will be cancelled.

(6) When using the outdoor units under 0℃, install them on the same level.

Important

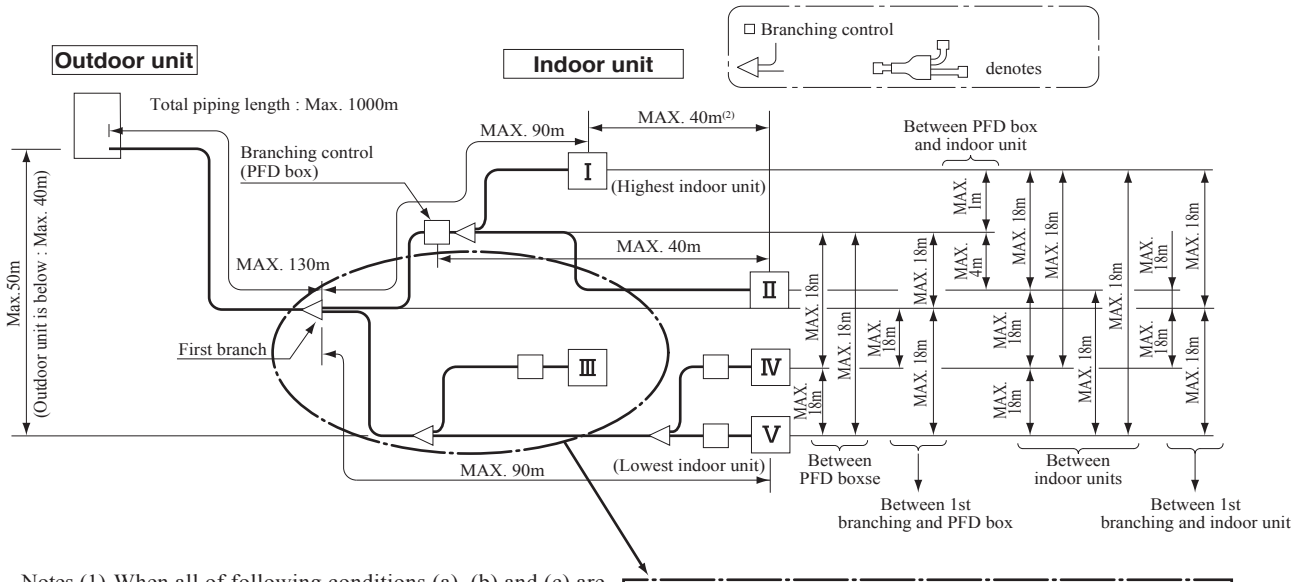
When the calculation result of additional refrigerant charging amount exceeds the value mentioned in following table, please split the refrigerant system into two.

Outdoor unit	Additional refrigerant charging amount
1425-1680	100

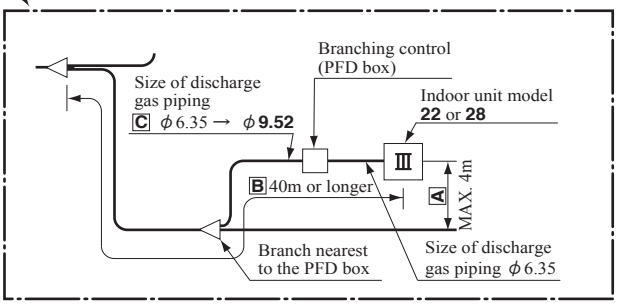
Allowable length of refrigerant piping, height difference between indoor and outdoor unit

(a) Single use

1) Branching system

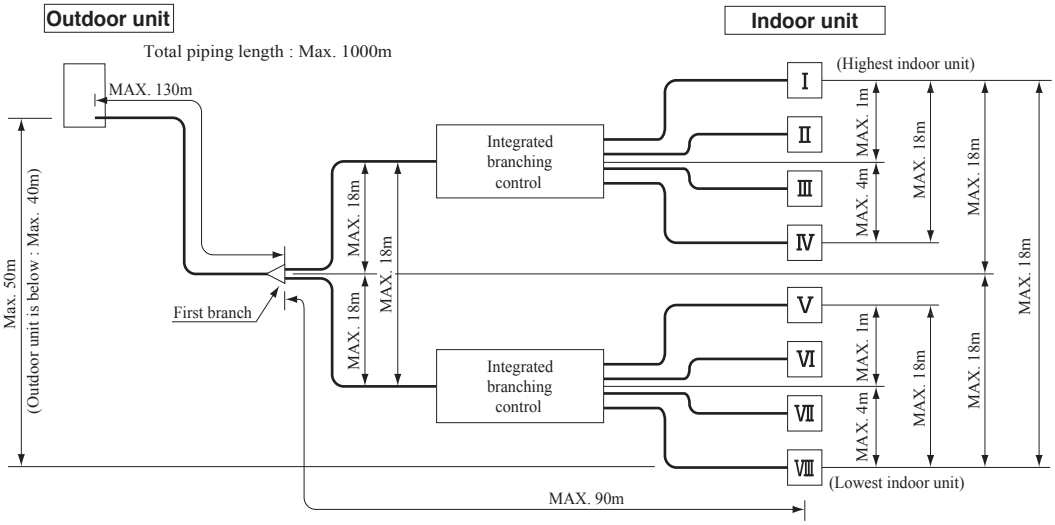


Notes (1) When all of following conditions (a), (b) and (c) are established, height difference A shown in right figure is limited to **4m or less**.
(a) When the connected indoor unit **model is 22 or 28**.
(b) When the piping length B is **40m or more**.
(c) When the PFD box is installed above the branching nearest to the PFD box.
Size of discharge gas piping C should be increased from **ϕ6.35 to ϕ9.52**.



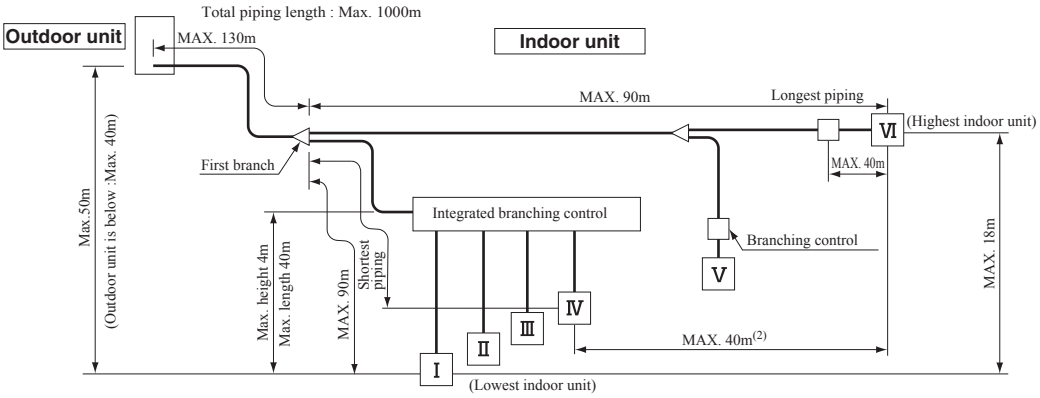
(2) Do not install any large traps ( ) or bumps ( ) **exceeded 500mm** in height in the piping system.
(3) Difference between the longest and shortest piping :**40m or less**.

2) Integrated branching system



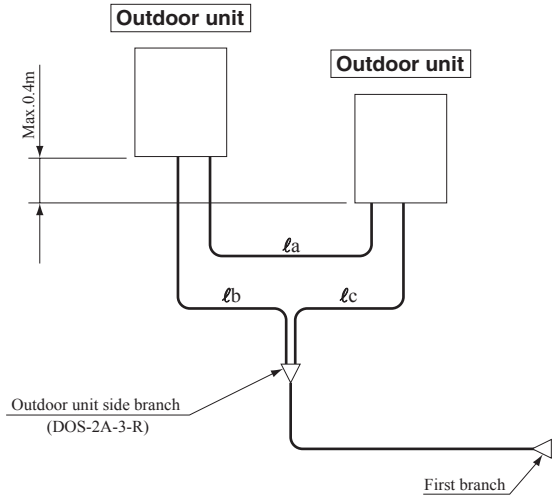
Note (1) Do not install any large traps ( ) or bumps ( ) **exceeded 500mm** in height in the piping system.

3) Mixed system (Branching control and Integrated branching control)



Notes (1) Do not install any large traps ( ) or bumps ( ) **exceeded 500mm** in height in the piping system.
(2) Difference between the longest and shortest piping : **40m or less**.

(b) Combination use



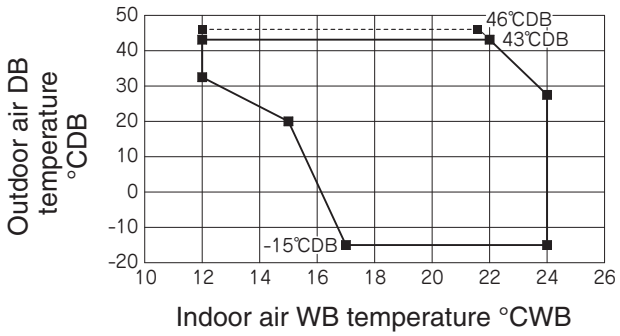
Allowable piping length

- Equalizing oil pipe ℓa ≦ 10m
- Refrigerant piping ℓb ≦ 5m
- Refrigerant piping ℓc ≦ 5m

Notes (1) Limitations other than above are the same as that for the single use.
(2) When using the outdoor units under 0˚C, install them on the same level.

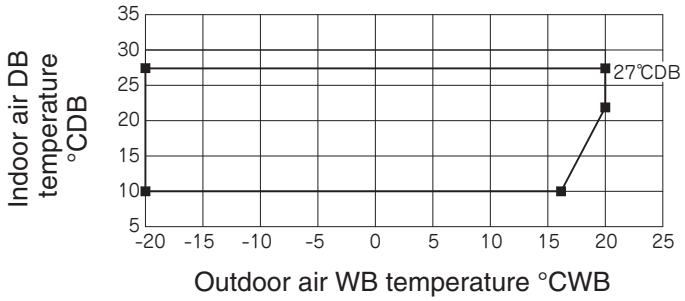
Operating temperature range

Cooling operation



∗In case it is the promised installation location that the outdoor unit is used on conditions with

Heating operation



Note(1) Mixed operation of cooling/heating is prohibited with the outdoor air temperature at -5℃ or lower.

“CAUTION” Cooling operation under low outdoor air temperature conditions

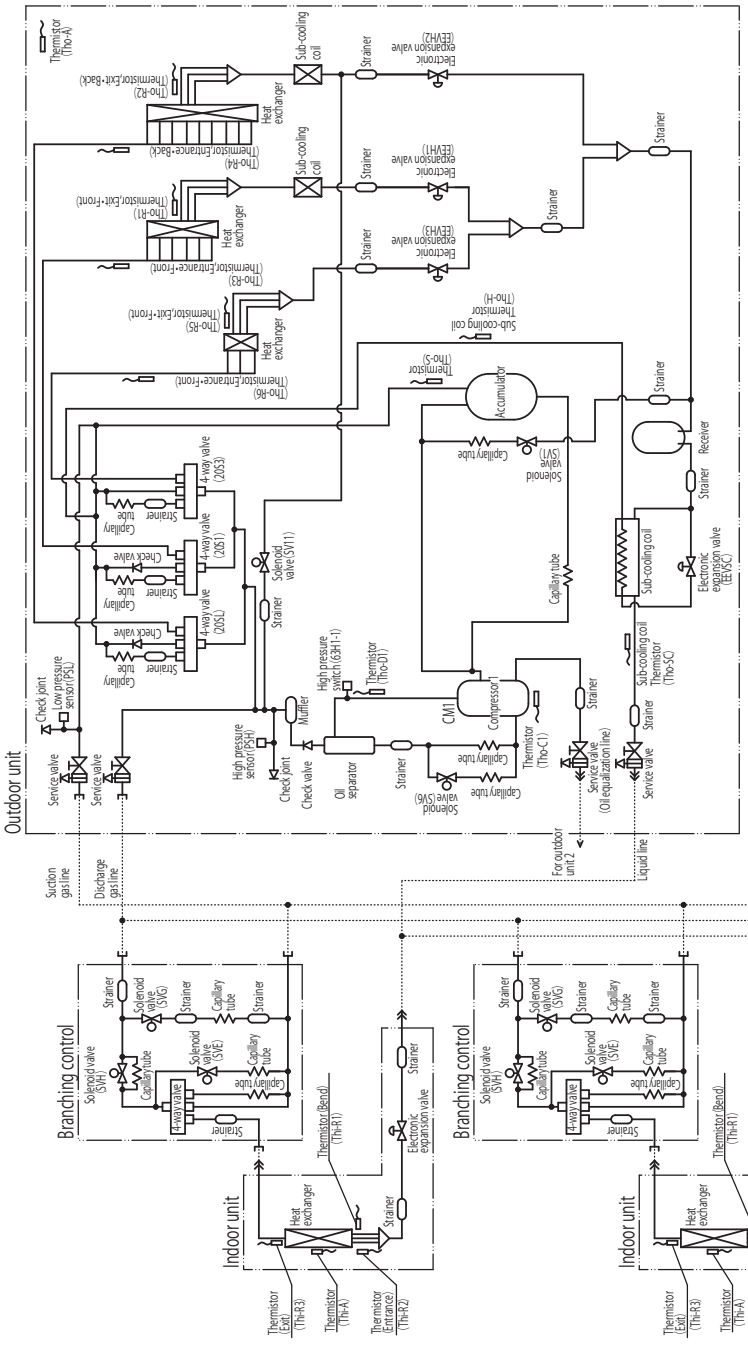
KXZR models can be operated in cooling mode at low outdoor air temperature condition within above temperature range.
However in case of severely low temperature conditions if the following precaution is not observed, it may not be operated in spite of operable temperature range mentioned above and cooling capacity may not be established under certain conditions.
[Precaution]
In case of severely low temperature condition

1) Install the outdoor unit at the place where strong wind cannot blow directly into the outdoor unit.
2) If there is no installation place where can prevent strong wind from directly blowing into the outdoor unit, prepare a windbreak fence or something like that locally in order to divert the strong wind from the outdoor unit.

[Reason]
Under the low outdoor air temperature conditions of -5˚C or lower, if strong wind directly blow into the outdoor unit, the outdoor heat exchanger temperature will drop, even though the outdoor fan is stopped by outdoor fan control. This makes high and low pressures to drop as well. This low pressure drop makes the indoor heat exchanger temperature to drop and will activate anti-frost control at indoor heat exchanger at frequent intervals, that cooling operation may not be established for any given time.

4. PIPING SYSTEM

Models FDC224KXZRE1, 280KXZRE1, 335KXZRE1



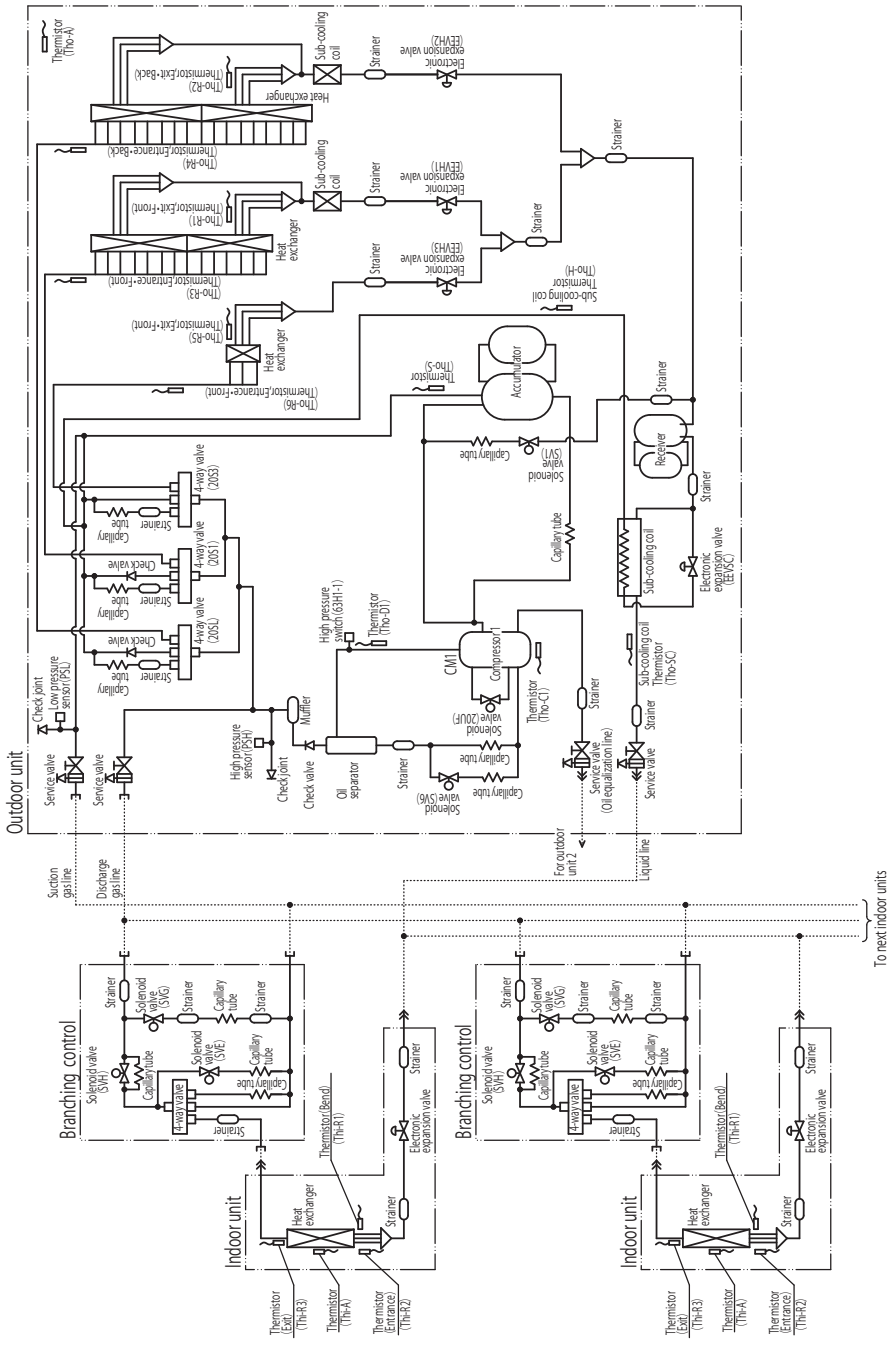
Notes (1) Preset point of protective devices
63H1-1 : Open 4.15MPa, Close 3.15MPa
(For protection)

(2) Function of thermistor
PSH : For compressor control
3.70 ON (MPa)
PSL : ON 0.18MPa, OFF 0.20MPa
(For compressor control)
ON 0.134MPa, OFF 0.18MPa
(For protection)

Thi-R1, R2 : Heating operation : Indoor fan control.
Cooling operation : Frost prevention control.
Super heat control.
Thi-R3 : For super heat control of cooling operation.
Tho-D : For control of discharge pipe temperature.
Tho-C : For control of temperature under the dome.
Tho-S : For control of suction pipe temperature.
Tho-R1,R2,R5 : For control of defrost operation.
Tho-A : For control of defrost operation.
Tho-R3, R4,R6 : Electronic expansion valve (EEVH1, 2) control of heating operation.
Tho-SC : Electronic expansion valve (EEVSC) control of cooling operation.
Tho-H : For super heat control of sub-cooling coil.

PCB004Z092

Models FDC400KXZRE1, 450KXZRE1

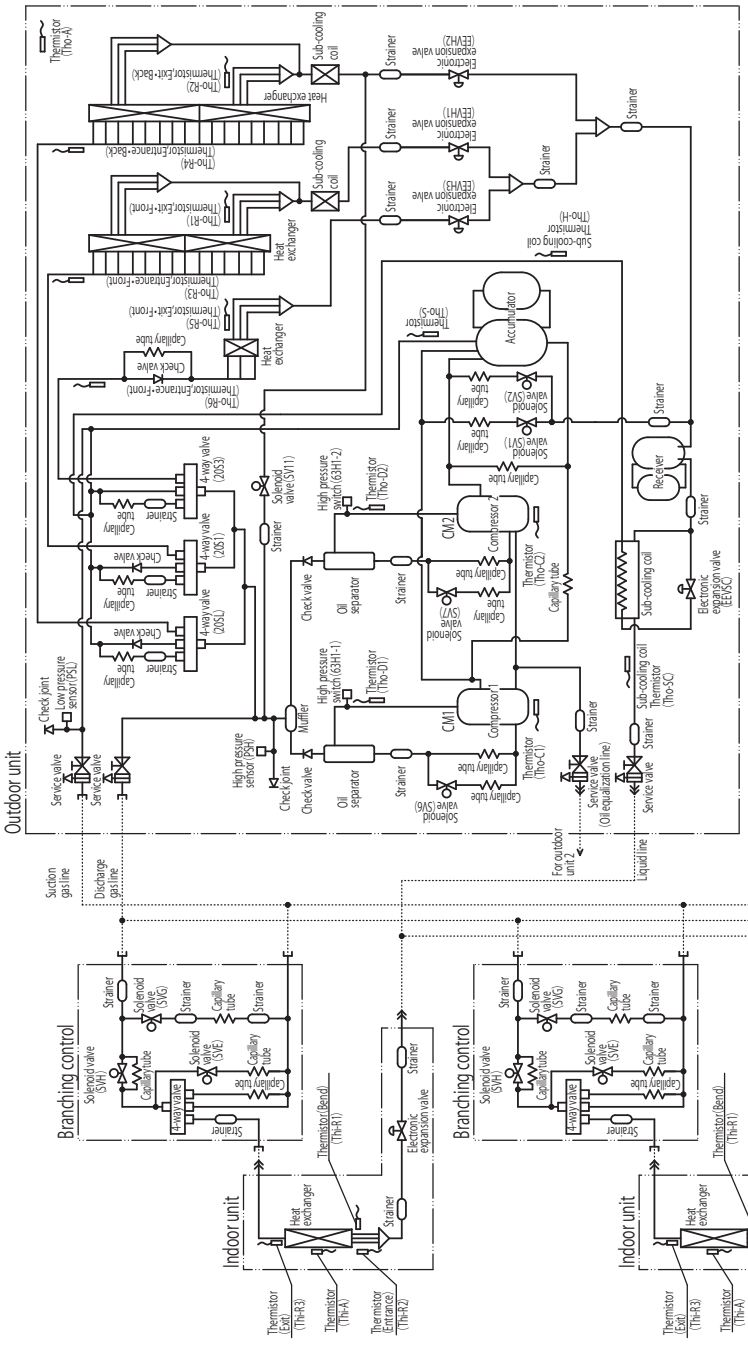


Notes (1) Preset point of protective devices
63H1-1 : Open 4.15MPa, Close 3.15MPa
(For protection)
(2) Function of thermistor
PSH : For compressor control
3.70 ON (MPa)
PSL : ON 0.18MPa, OFF 0.20MPa
(For compressor control)
ON 0.134MPa, OFF 0.18MPa
(For protection)

Thi-R1, R2 : Heating operation : Indoor fan control.
Cooling operation : Frost prevention control.
Super heat control.
Thi-R3 : For super heat control of cooling operation.
Tho-D : For control of discharge pipe temperature.
Tho-C : For control of temperature under the dome.
Tho-S : For control of suction pipe temperature.
Tho-R1,R2,R5 : For control of defrost operation.
Tho-A : For control of defrost operation.
Tho-R3, R4,R6 : Electronic expansion valve (EEVH1, 2) control of heating operation.
Tho-SC : Electronic expansion valve (EEVSC) control of cooling operation.
Tho-H : For super heat control of sub-cooling coil.

PCB004Z093

Models FDC475KXZRE1, 500KXZRE1, 560KXZRE1
FDC615KXZRE1, 670KXZRE1



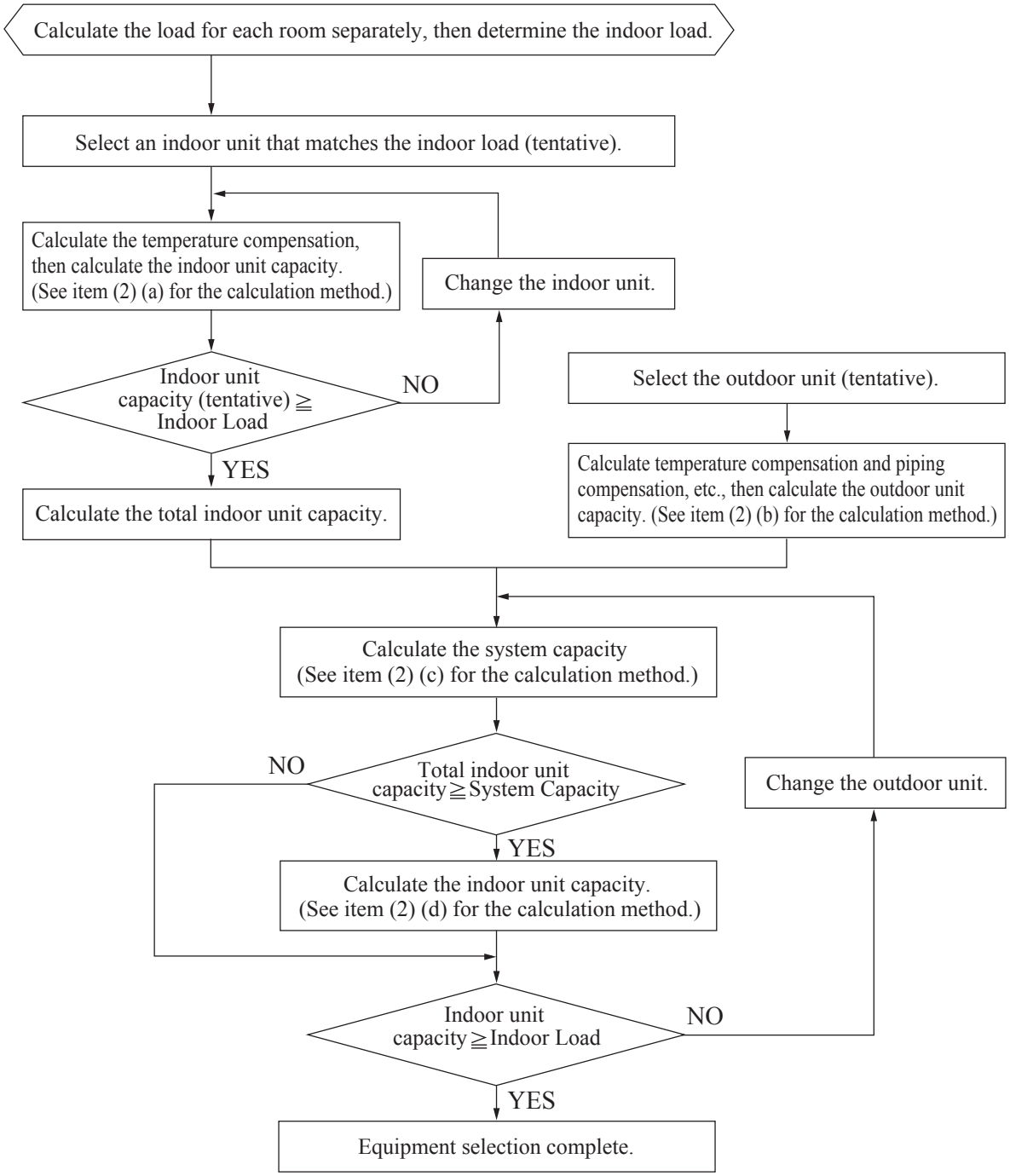
Notes (1) Preset point of protective devices
63H1-1, 2 : Open 4.15MPa, Close 3.15MPa
(For protection)
(2) Function of thermistor
PSH : For compressor control
3.70 ON (MPa)
PSL : ON 0.18MPa, OFF 0.20MPa
(For compressor control)
ON 0.134MPa, OFF 0.18MPa
(For protection)

Thi-R1, R2 : Heating operation : Indoor fan control.
Cooling operation : Frost prevention control.
Super heat control.
Thi-R3 : For super heat control of cooling operation.
Tho-D1, D2 : For control of discharge pipe temperature.
Tho-C1, C2 : For control of temperature under the dome.
Tho-S : For control of suction pipe temperature.
Tho-R1, R2 , R5 : For control of defrost operation.
Tho-A : For control of defrost operation.
Tho-R3, R4 , R6 : Electronic expansion valve (EEVH1, 2) control of heating operation.
Tho-SC : Electronic expansion valve (EEVSC) control of cooling operation.
Tho-H : For super heat control of sub-cooling coil.

PCB004Z094

5. SELECTION CHART

(1) Equipment selection flow



(2) Capacity calculation method

(a) Calculating the indoor unit capacity compensation

Indoor unit capacity (cooling, heating) = Indoor unit total rated capacity
× Capacity compensation coefficient according to temperature conditions

See item (3) (a) concerning the capacity compensation coefficient according to temperature conditions.

(b) Calculating the outdoor unit capacity compensation

Outdoor Unit Capacity (Cooling, Heating) = Outdoor unit rated capacity (rated capacity when 100% connected)
× Capacity compensation coefficient according to temperature conditions
× Capacity compensation coefficient according to piping length
× Capacity compensation coefficient according to height difference

× Correction of heating capacity in relation to the frost on the outdoor unit heat exchanger
× Capacity compensation coefficient according to indoor unit connection capacity
× Correction of cooling capacity in relation to the anti-frost on the indoor unit heat exchanger

① See item (3) (a) concerning the capacity compensation coefficient according to temperature conditions.
② See item (3) (b) concerning the capacity compensation coefficient according to piping length.
③ See item (3) (c) concerning the capacity compensation coefficient according to height difference. This compensation should be carried out only in cases where the outdoor unit is lower during cooling and higher during heating.
④ See item (3) (d) correction of heating capacity in relation to the frost on the outdoor unit heat exchanger. This compensation should be carried out only when calculating the heating capacity.
⑤ See item (3) (e) concerning the capacity compensation coefficient according to indoor unit connected capacity. This compensation should be carried out only in cases where the indoor unit total capacity is 100% or higher.
⑥ See item (3) (f) correction of cooling capacity in relation to the anti-frost on the indoor unit heat exchanger. This compensation should be carried out only when calculating the cooling capacity.

(c) Calculating system capacity

Compare the capacities determined in items (a) and (b) above and let the smaller value be the system capacity (cooling, heating).

① In cases where indoor unit total capacity (cooling, heating) > outdoor unit capacity (cooling, heating)
System capacity (cooling, heating) = Outdoor unit capacity (cooling, heating)
② In cases where indoor unit total capacity (cooling, heating) < outdoor unit capacity (cooling, heating)
System capacity (cooling, heating) = Indoor unit capacity (cooling, heating)

(d) Calculating indoor unit capacity [item (c) ①only]

Indoor unit capacity (cooling, heating) = System capacity (cooling, heating)
× [(Indoor unit capacity) / (Indoor unit total capacity)]

Capacity calculation examples

Example 1

Cooling (when the indoor unit connected total capacity is less than 100%)

- •Outdoor unit FDC450KXZRE1 ..... 1 Unit
- • Indoor unit FDT56KXE6F ..... 7 Units, All fan tap: P-Hi
- • Piping length ..... 60 m (Equivalent length)
- • Indoor, outdoor unit height difference ..... 15 m (Outdoor unit is lower)
- • Temperature conditions ..... Outdoor temperature: 33˚C DB
- • Temperature conditions ..... Indoor temperature: 19˚C WB

<Indoor unit total cooling capacity>: Item (2) (a) calculation.

- • Indoor unit rated cooling capacity: 5.6 kW
- • Capacity compensation coefficient according to temperature conditions:
  1.02 (Calculated according to Indoor 19˚C WB / Outdoor 33˚C DB); (See page 34)
  Indoor unit cooling capacity: 5.6 kW × 1.02 ≒ 5.7 kW
- • Indoor unit total cooling capacity calculation;
  indoor unit total cooling capacity: 5.7 kW × 7 units = 39.9 kW

<Outdoor unit maximum cooling capacity> : Item (2) (b) calculation

- • Outdoor unit rated cooling capacity: 45.0 kW
- • Capacity compensation coefficient according to temperature conditions:
  1.02 (Calculated according to Indoor 19˚C WB / Outdoor 33˚C DB); (See page 34)
  Outdoor unit cooling capacity: 45.0 kW × 1.02 ≒ 45.9 kW
- • Capacity compensation coefficient according to piping length: 0.94 (calculated according to 60 m length); (See page 37)
  45.9 kW × 0.94 ≒ 43.1 kW
- • Correction of cooling capacity in relation to the anti-frost: 1.0 (calculated according to outdoor 33˚C DB, Total capacity of concurently operating indoor unit: (56 × 7) / 450 ≒ 87%); (See page 55)
  Outdoor unit cooling capacity: 43.1 kW × 1.0 ≒ 43.1 kW
- • Capacity compensation coefficient according to height difference: 0.97 (calculated according to 15 m difference); (See page 40)
  43.1 kW × 0.97 ≒ 41.8 kW
- • Capacity compensation coefficient according to indoor unit connected total capacity: 1.0 ← (56 × 7) / 450 < 100%)
  No compensation

<System cooling capacity>: Item (2) (c) calculation

Compare the indoor unit total cooling capacity and the outdoor unit maximum cooling capacity. The smaller value is the actual system cooling capacity.

- Indoor unit total cooling capacity: 39.9 kW
- Outdoor unit maximum cooling capacity: 41.8 kW

⇨ System cooling capacity: 39.9 kW

<Indoor unit capacity compensation> No compensation (5.7 kW)

Example 2

Cooling (when the indoor unit connected total capacity is 100% or higher)

- •Outdoor unit FDC450KXZRE1 ..... 1 Unit
- Indoor unit FDT56KXE6F ..... 10 Units, All fan tap: P-Hi
- Piping length ..... 60 m (Equivalent length)
- Indoor, outdoor unit height difference ..... 15 m (Outdoor unit is higher)
- Temperature conditions ..... Outdoor temperature: 35˚C DB
- Temperature conditions ..... Indoor temperature: 18˚C WB

<Indoor unit total cooling capacity>: Item (2) (a) calculation.

- Indoor unit rated cooling capacity: 5.6 kW
- Capacity compensation coefficient according to temperature conditions:
  0.95 (Calculated according to Indoor 18˚C WB / Outdoor 35˚C DB); (See page 34)
  Indoor unit cooling capacity: 5.6 kW × 0.95 ≒ 5.3 kW
- Indoor unit total cooling capacity calculation;
  indoor unit total cooling capacity: 5.3 kW × 10 units ≒ 53.0 kW

<Outdoor unit maximum cooling capacity> : Item (2) (b) calculation

- Outdoor unit rated cooling capacity: 45.0 kW
- Capacity compensation coefficient according to temperature conditions:
  0.95 (Calculated according to Indoor 18˚C WB / Outdoor 35˚C DB); (See page 34)
  Outdoor unit cooling capacity: 45.0 kW × 0.95 ≒ 42.8 kW
- Capacity compensation coefficient according to piping length: 0.94 (calculated according to 60 m length); (See page 37)
  42.8 kW × 0.94 ≒ 40.2 kW
- Collection of cooling capacity in relation to the anti-frost: 1.0 (calculated according to outdoor 35˚C DB, Total capacity of concurently operating indoor unit: (56 × 10) / 450 ≒ 124%)
  40.2 kW × 1.0 ≒ 40.2 kW
- Capacity compensation coefficient according to height difference: 1.0 (the outdoor unit is higher during cooling)
  No compensation
- Capacity compensation coefficient according to indoor unit connected total capacity: 1.04 ← (56 × 10) / 450 ≒ 124%) (See page 43)
  40.2 kW × 1.04 ≒ 41.8 kW

<System cooling capacity>: Item (2) (c) calculation

Compare the indoor unit total cooling capacity and the outdoor unit maximum cooling capacity. The smaller value is the actual system cooling capacity.

- Indoor unit total cooling capacity : 53.0 kW
- Outdoor unit maximum cooling capacity : 41.8 kW

⇨ System cooling capacity: 41.8 kW

<Indoor unit cooling capacity Compensation>: Item (2) (d) calculation.

$$\frac{41.8\ \text{kW} \times 5.3\ \text{kW}}{53.0\ \text{kW}} \fallingdotseq 4.2\ \text{kW}$$

Example 3

Heating (when the indoor unit connected total capacity is 100% or higher)

- •Outdoor unit FDC450KXZRE1 ..... 1 Unit
- Indoor unit FDT56KXE6F ..... 10 Units
- Piping length ..... 60 m (Equivalent length)
- Indoor, outdoor unit height difference ..... 20 m (Outdoor unit is higher)
- Temperature conditions ..... Outdoor temperature: 6˚C WB
- Temperature conditions ..... Indoor temperature: 19˚C DB

<Indoor unit total heating capacity>: Item (2) (a) calculation.

- Indoor unit rated heating capacity:6.3 kW
- Capacity compensation coefficient according to temprature conditions:
  1.04 (Calculated according to Outdoor 6˚C WB / Indoor 19˚C DB); (See page 35)
  Indoor unit heating capacity: 6.3 kW × 1.04 ≒. 6.6 kW
- Indoor unit total heating capacity calculation;
  indoor unit total heating capacity: 6.6 kW × 10 units ≒ 66.0 kW

<Outdoor unit maximum heating capacity> : Item (2) (b) calculation

- Outdoor unit rated heating capacity: 50.0 kW Correct the heating capacity based on the maximum capacity.
- Capacity compensation coefficient according to temperature conditions:
  1.04 (Calculated according to Outdoor 6˚C WB / Indoor 19˚C DB); (See page 35)
  Outdoor unit heating capacity: 50.0 kW × 1.04 = 52.0 kW
- Capacity compensation coefficient according to piping length: 0.975 (calculated according to 60 m length); (See page 40)
  52.0 kW × 0.975 ≒ 50.7 kW
- Capacity compensation coefficient according to height difference: 0.96 (calculated according to 20 m difference); (See page 40)
  50.7 kW × 0.96 ≒ 48.7 kW
- Correction of heating capacity in relation to the frost on the outdoor unit heat exchanger:
  1.0 (calculated according to 6˚C WB); (See page 40)
  48.7 kW × 1.0 ≒ 48.7 kW.
- Capacity compensation coefficient according to indoor unit connected total capacity: 1.0 ← (56 × 10) / 450 ≒ 124%) (See page 43)
  48.7 kW × 1.0 ≒ 48.7 kW.

<System heating capacity> : Item (2) (c) calculation

Compare the indoor unit total heating capacity and the outdoor unit maximum heating capacity. The smaller value is the actual system heating capacity.

- Indoor unit total heating capacity : 66.0 kW ⇨ System heating capacity: 48.7 kW
- Outdoor unit maximum heating capacity : 48.7 kW

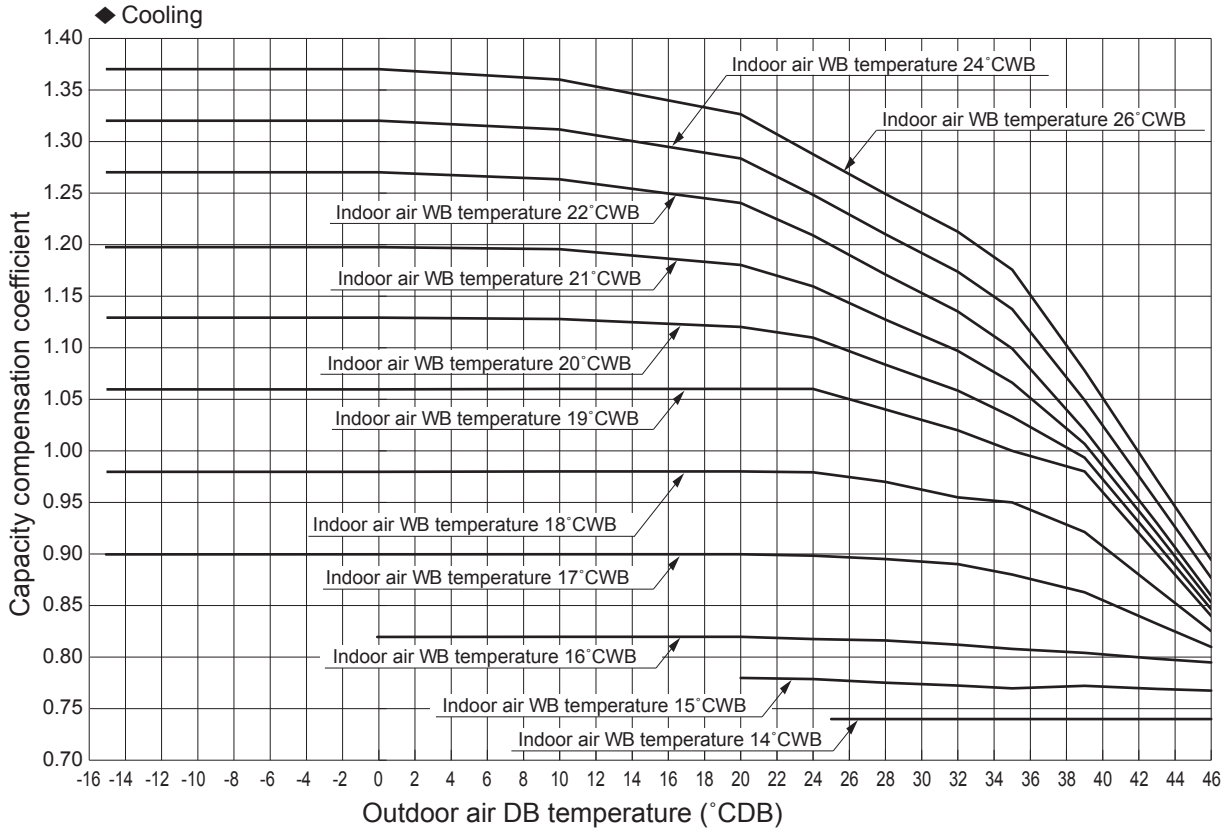
<Indoor unit heating capacity compensation> : Item (2) (d) calculation

$$\frac{48.7\ \text{kW} \times 6.6\ \text{kW}}{66.0\ \text{kW}} \fallingdotseq 4.9\ \text{kW}$$

(3) Capacity compensation coefficient

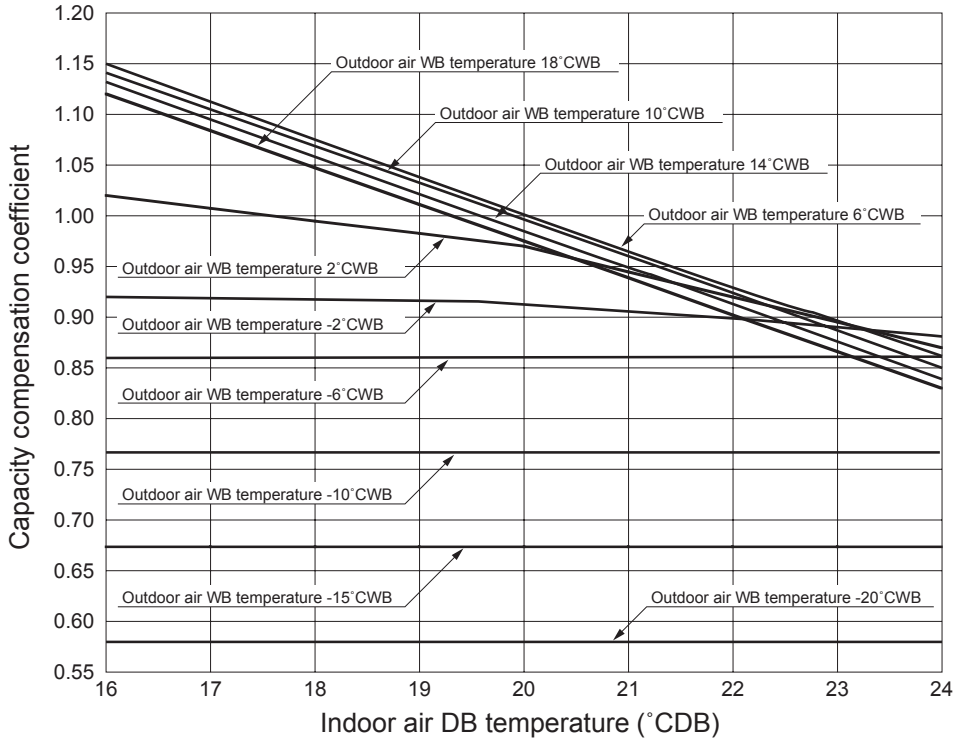
(a) Capacity compensation coefficient and power consumption compensation coefficient according to indoor and outdoor temperature conditions.

1) Capacity compensation coefficient



Notes (1) The above-mentioned table shows a typical condition among conditions to occur via controlling an air-conditioning equipment.
(2) When performing the cooling operation with the outdoor air temperature being -5°C or under, a windbreak fence must be installed.
(3) The cooling capacity might decrease due to the anti-frost control and decreased refrigerant circulation volume in low outdoor temperature. Please avoid using the air-conditioners for computer rooms or industrial uses which require annual cooling operation.
(4) Oil-return control might be performed every few minutes in order to protect the compressor. If this occurs, the expected capacity might not be output.

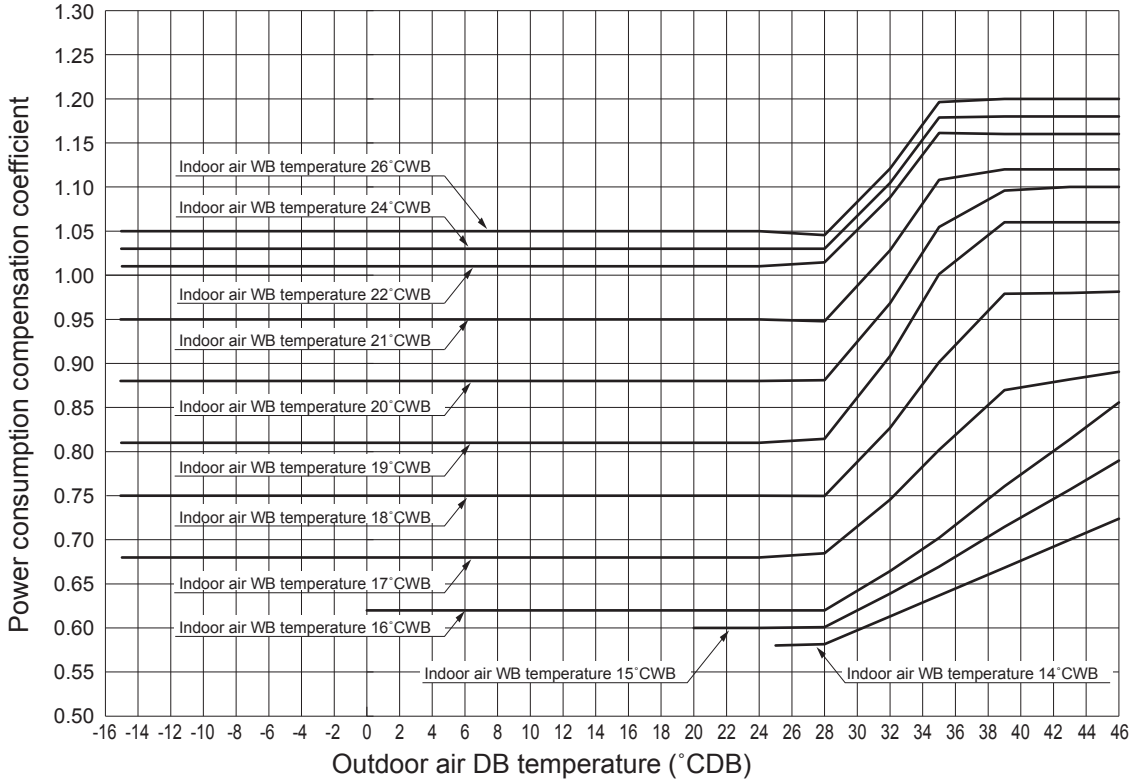
◆ **Heating**



Notes (1) The above-mentioned table shows a typical condition among conditions to occur via controlling an air-conditioning equipment.
(2) Oil-return control might be performed every few minutes in order to protect the compressor. If this occurs, the expected capacity might not be output.

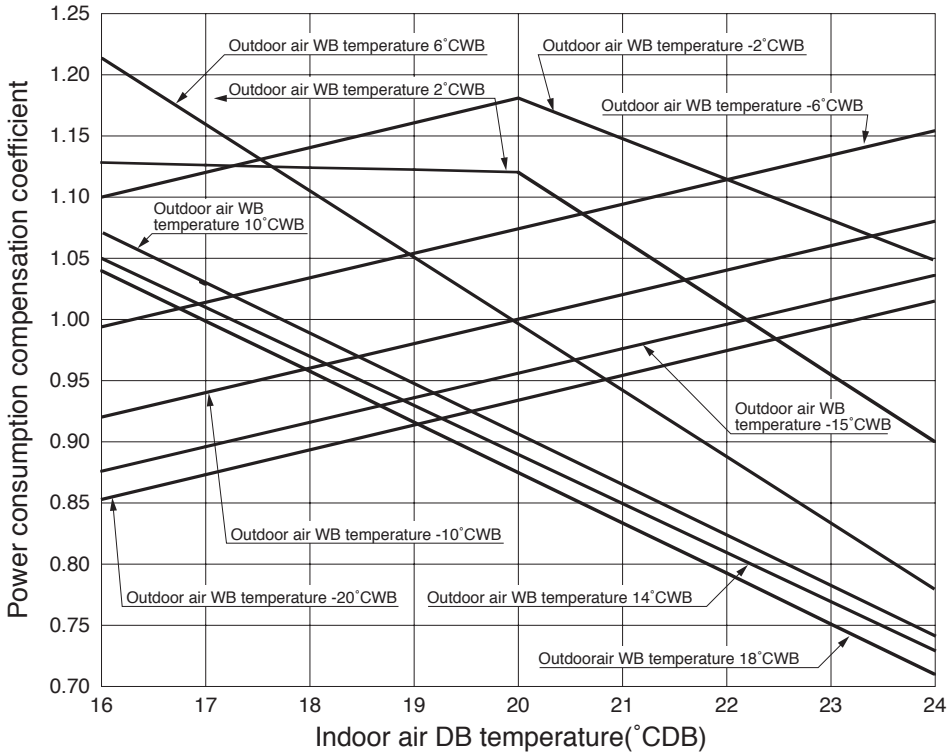
2) Power consumption correction factor

◆ **Cooling**



Note (1) The above-mentioned table shows a typical condition among conditions to occur via controlling an air-conditioning equipment.

◆**Heating**



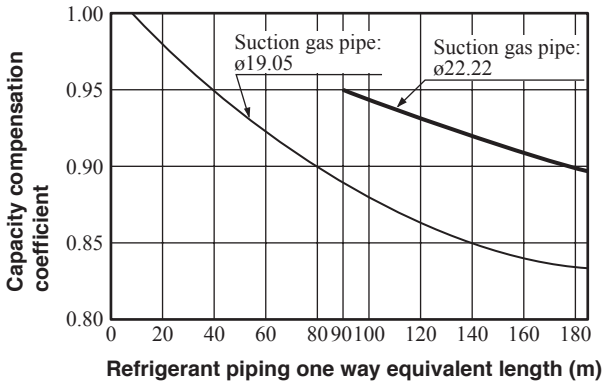
Note (1) The above-mentioned table shows a typical condition among conditions to occur via controlling an air-conditioning equipment.

(b) Correction of cooling and heating capacity in relation to one way length of refrigerant piping.

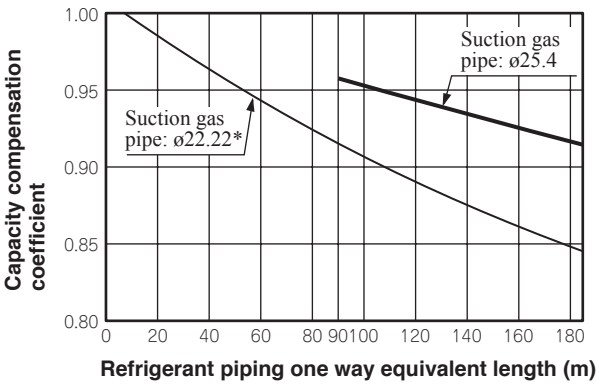
(Note) This table is for reference only. If the refrigerant piping one way equivalent after the first branch is extended longer than 40 m, it could drop further by about 10% in the worst case.

1) Cooling

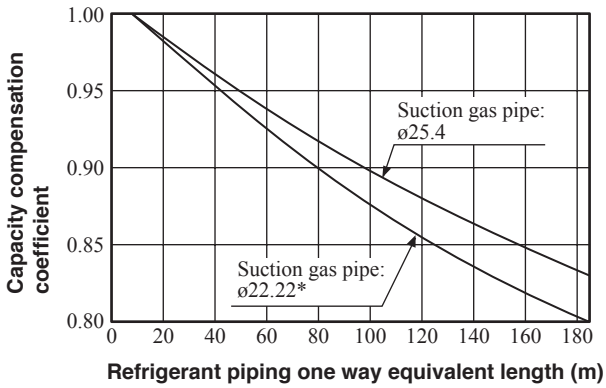
Model FDC224KXZRE1



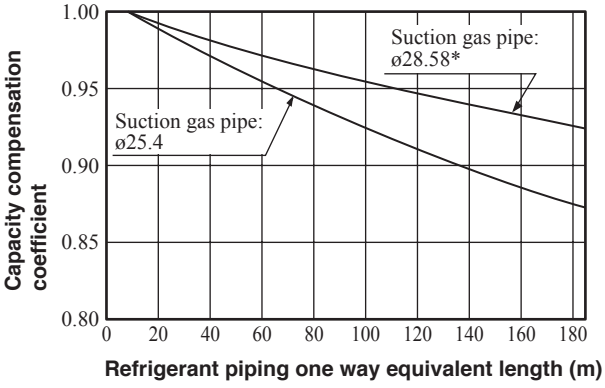
Model FDC280KXZRE1



Model FDC335KXZRE1

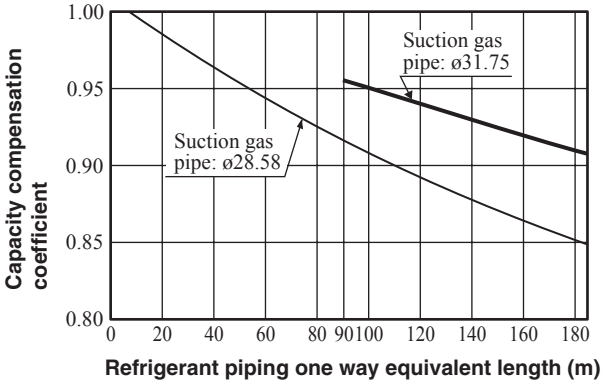


Model FDC400KXZRE1

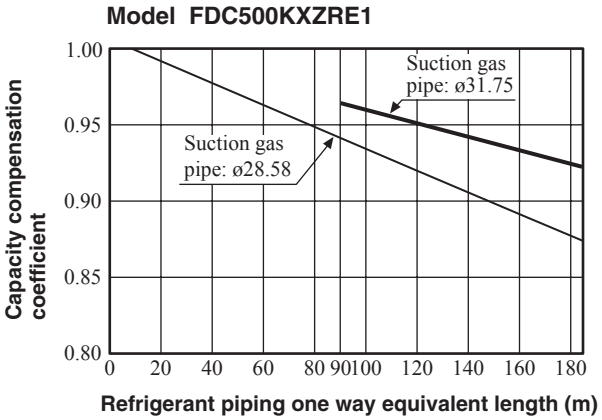


Note (1) Parts with the ∗ mark show the piping size in case used in Europe.

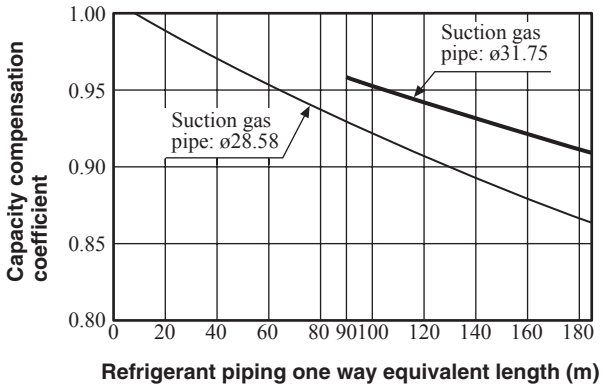
Model FDC450KXZRE1



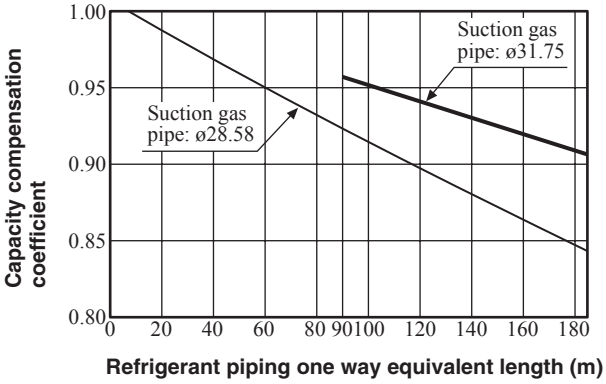
Model FDC500KXZRE1



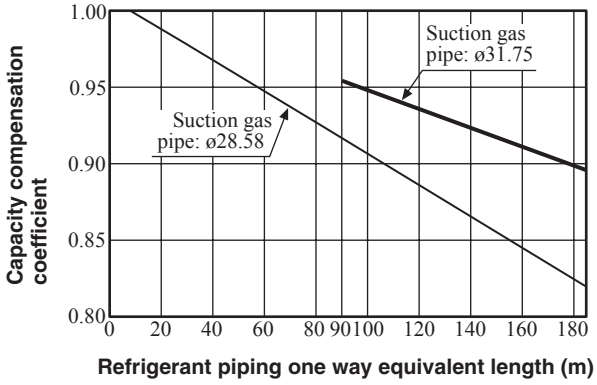
Model FDC560KXZRE1



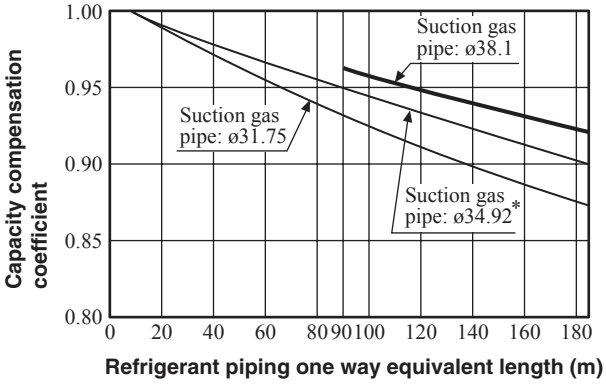
Model FDC615KXZRE1



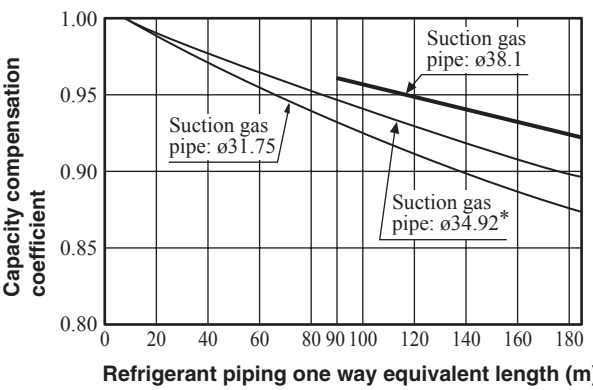
Model FDC670KXZRE1



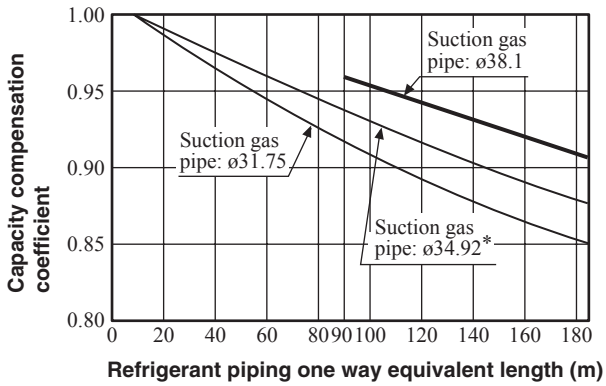
Model FDC735KXZRE1



Model FDC800KXZRE1

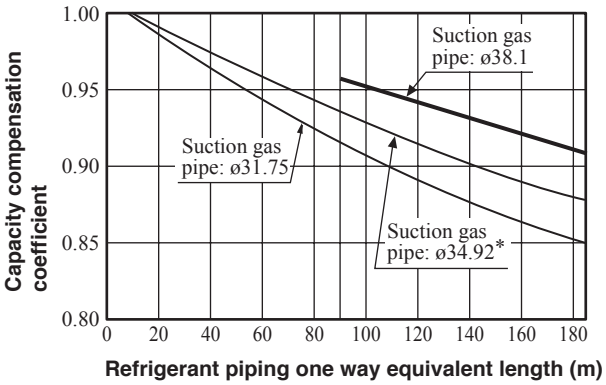


Model FDC850KXZRE1

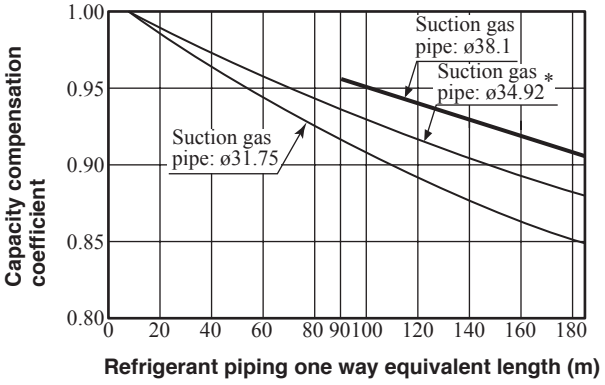


Note (1) Parts with the * mark show the piping size in case used in Europe.

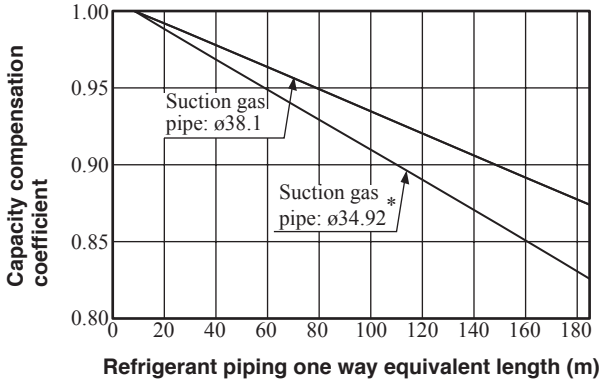
Model FDC900KXZRE1



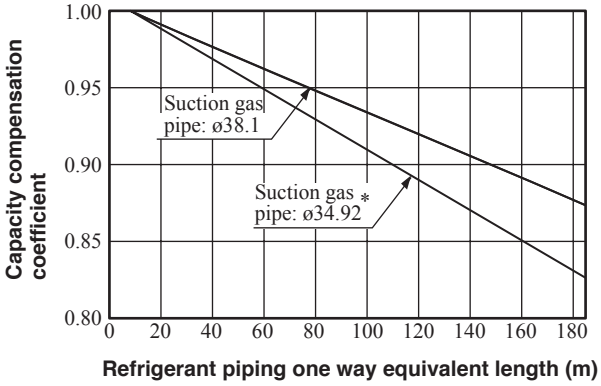
Model FDC950KXZRE1



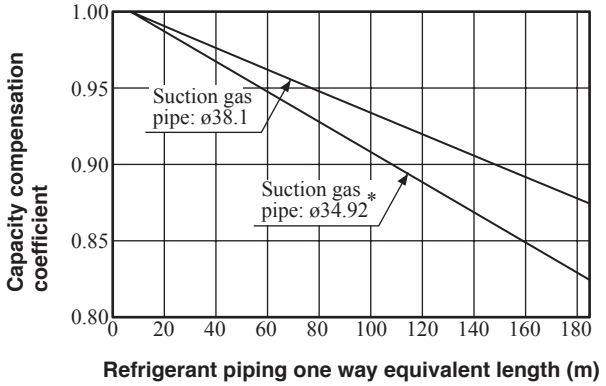
Model FDC1000KXZRE1



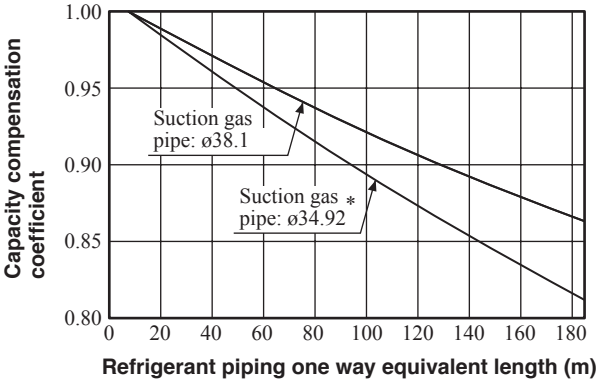
Model FDC1060KXZRE1



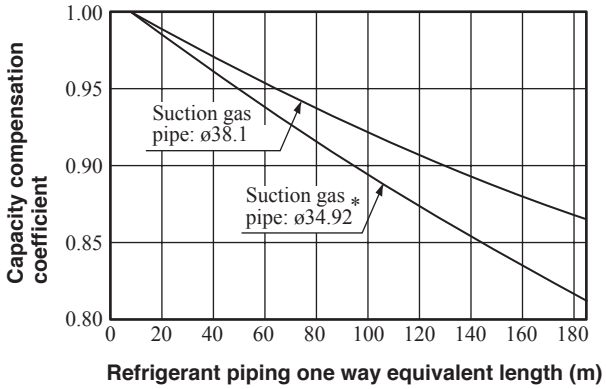
Model FDC1120KXZRE1



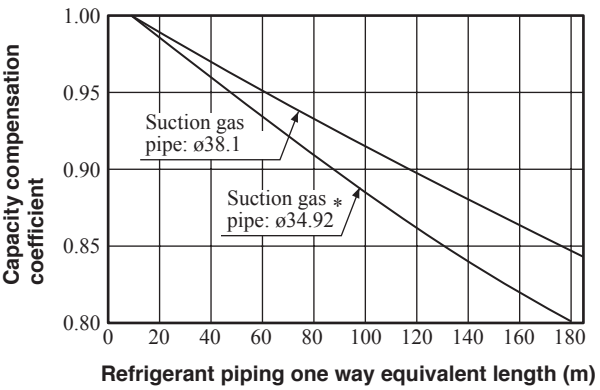
Model FDC1200KXZRE1



Model FDC1250KXZRE1

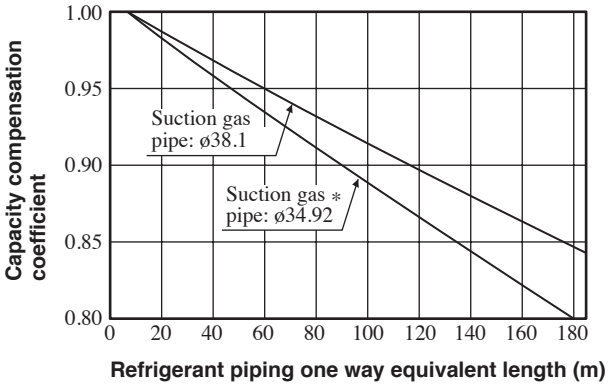


Model FDC1300KXZRE1

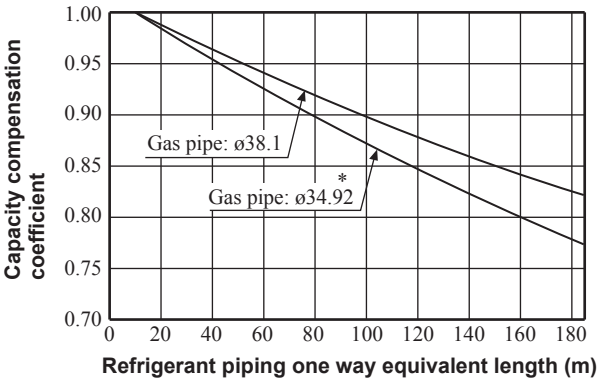


Note (1) Parts with the * mark show the piping size in case used in Europe.

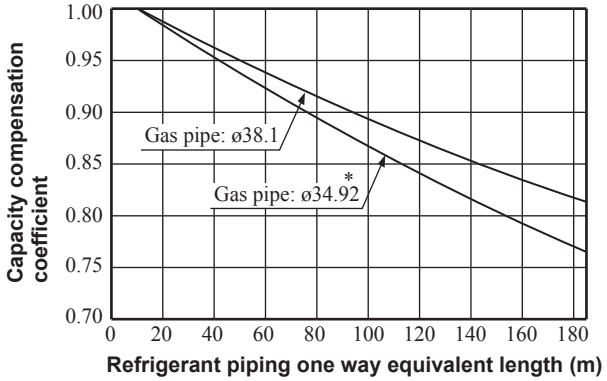
Model FDC1350KXZRE1



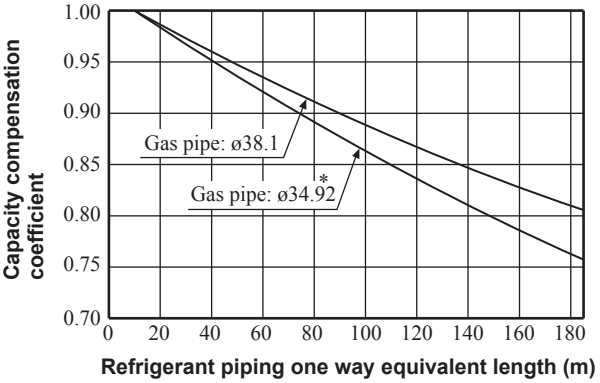
Model FDC1500KXZRE1



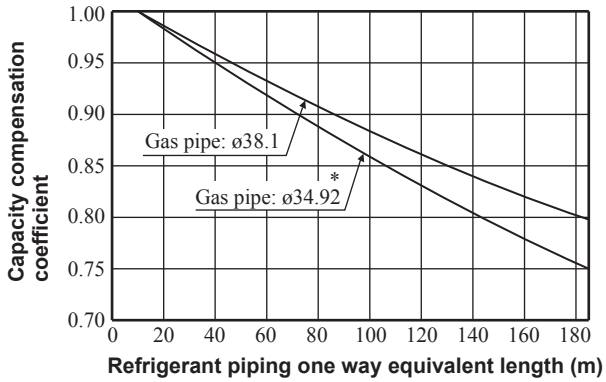
Model FDC1560KXZRE1



Model FDC1620KXZRE1

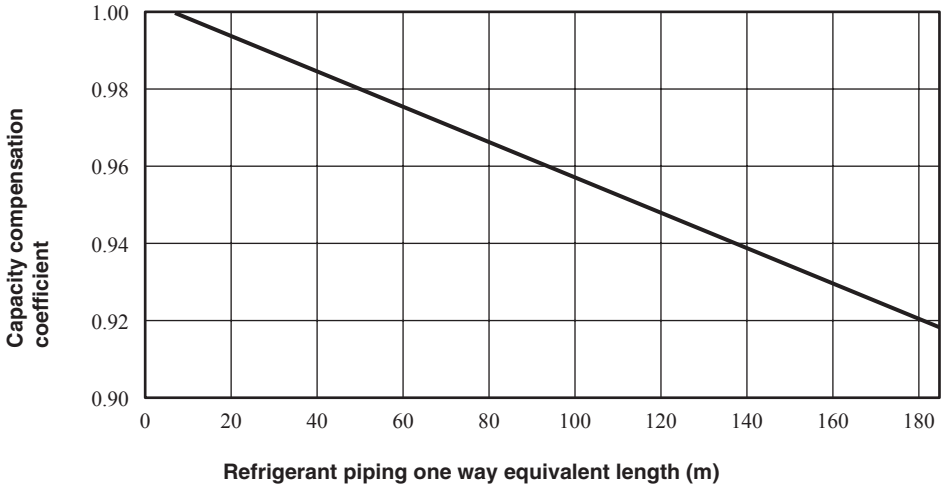


Model FDC1680KXZRE1



Note (1) Parts with the * mark show the piping size in case used in Europe.

2) Heating (Common)



Note (1) Equivalent piping length can be obtained by calculating as follows.
Equivalent piping length = Real gas piping length + Number of bends in gas piping × Equivalent piping length of bends.

Equivalent length of each joint — Unit : m/one part

Gas piping size	ϕ9.52	ϕ12.7	ϕ15.88	ϕ19.05	ϕ22.22	ϕ25.4	ϕ28.58	ϕ31.8	ϕ34.92	ϕ38.1
Joint (90˚elbow)	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.55	0.60	0.65

(c) When the outdoor unit is located at a lower height than the indoor unit in cooling operation and when the outdoor unit is located at a higher height than the indoor unit in heating operation, the following values should be subtracted from the values in the above table.

Height difference between the indoor unit and outdoor unit in the vertical height difference	5 m	10 m	15 m	20 m	25 m	30 m
Adjustment coefficient	0.99	0.98	0.97	0.96	0.95	0.94

Height difference between the indoor unit and outdoor unit in the vertical height difference	35 m	40 m	45 m	50 m
Adjustment coefficient	0.93	0.92	0.91	0.90

(d) Correction of heating capacity in relation to the frost on the outdoor unit heat exchanger

Air inlet temperature of outdoor unit in ˚C WB	-20	-15	-13	-11	-9	-7	-5	-3	-1	1	3	5 or more
Adjustment coefficient	0.96	0.96	0.96	0.95	0.94	0.93	0.91	0.88	0.86	0.87	0.92	1

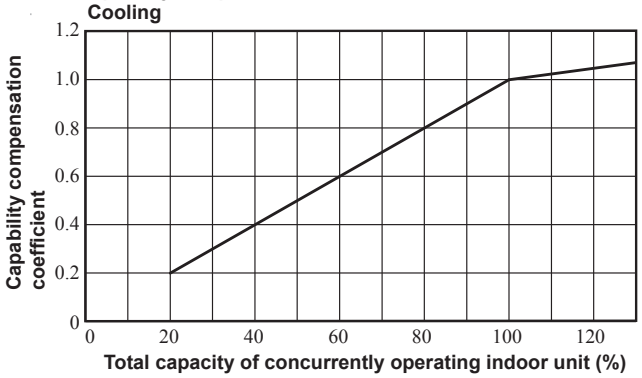
The correction factors will change drastically according to weather conditions. So necessary adjustment should be made empirically according to the weather data of the particular area.

(e) The capacity compensation coefficient and power consumption compensation coefficient vary according to the total capacity of concurrently operating indoor units, as shown next page.

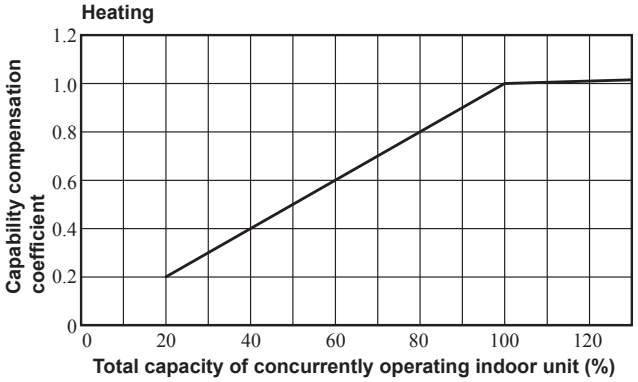
Model FDC224KXZRE1

◆**Capability compensation coefficient**

Cooling

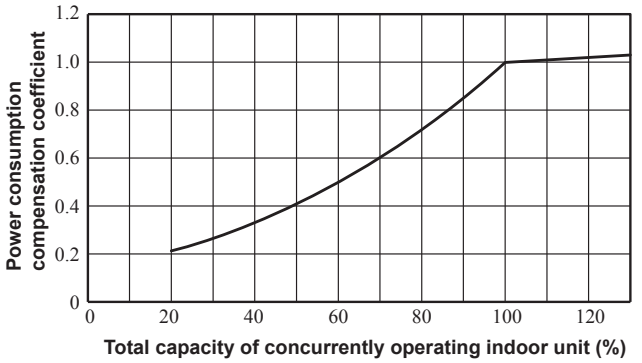


Heating

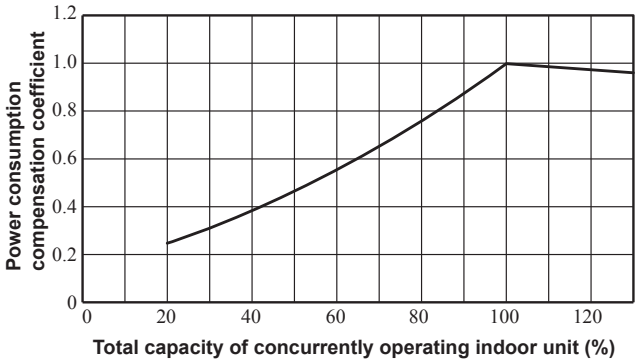


◆**Power consumption compensation coefficient**

Cooling



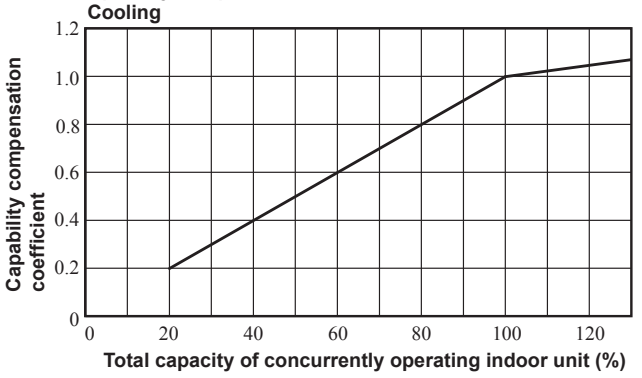
Heating



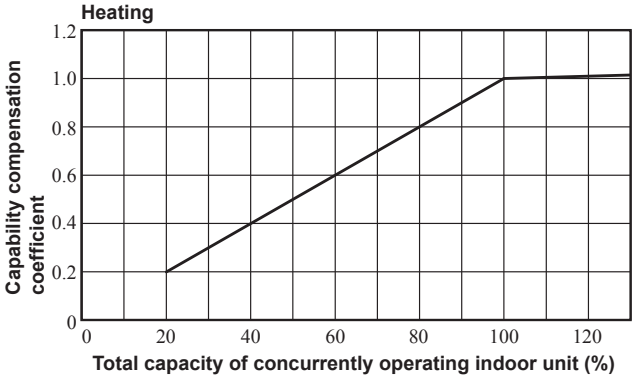
Model FDC280KXZRE1

◆**Capability compensation coefficient**

Cooling

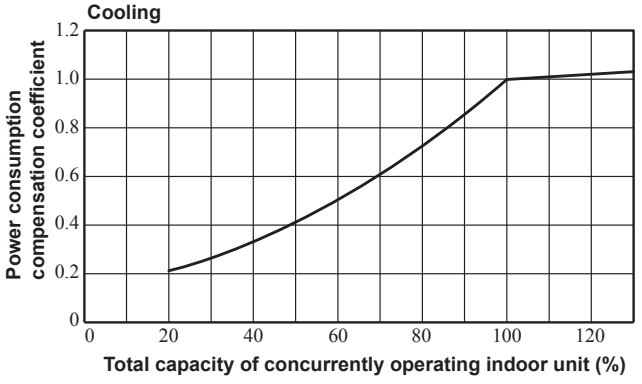


Heating

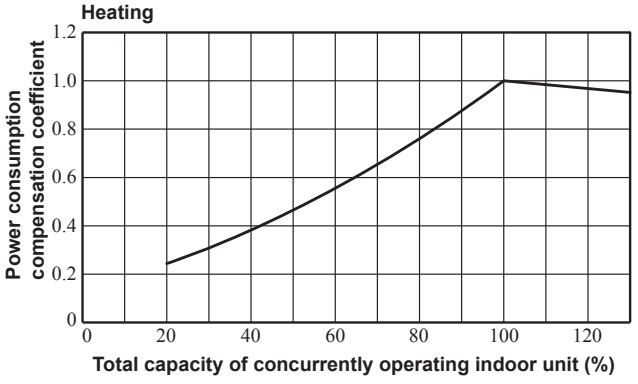


◆**Power consumption compensation coefficient**

Cooling



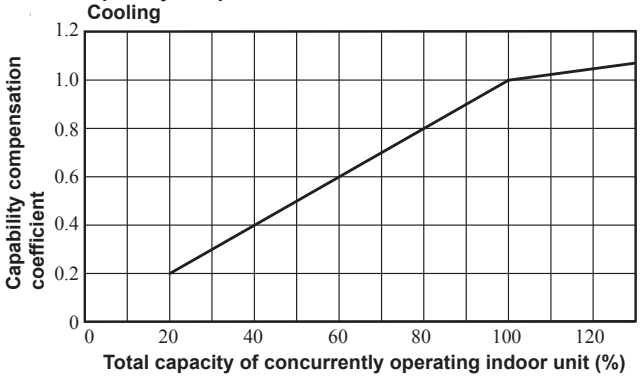
Heating



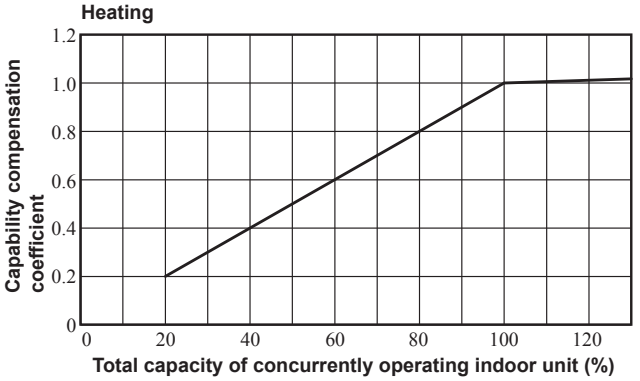
Model FDC335KXZRE1

◆Capability compensation coefficient

Cooling

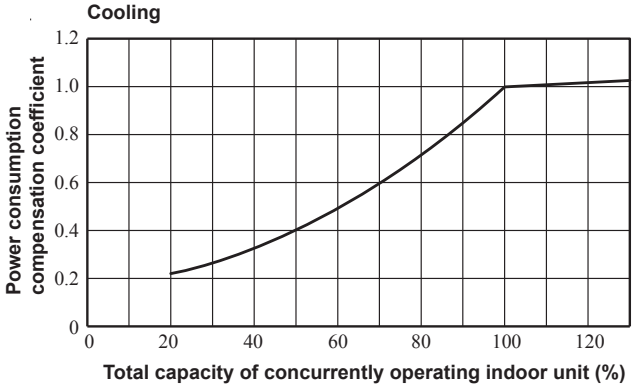


Heating

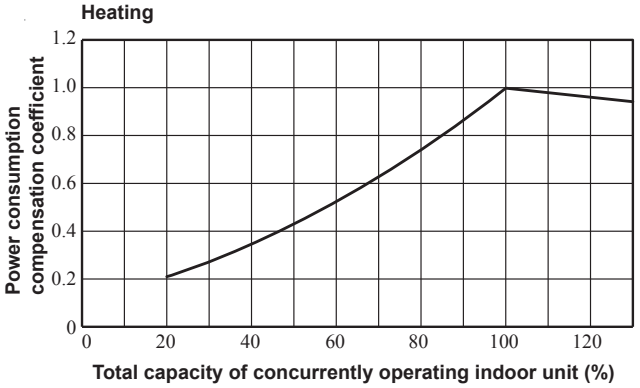


◆Power consumption compensation coefficient

Cooling



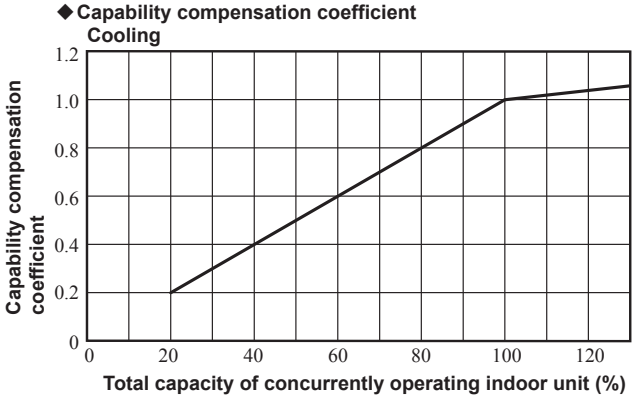
Heating



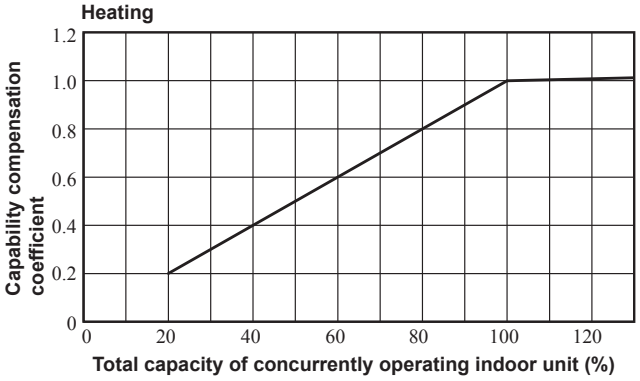
Model FDC400KXZRE1

◆Capability compensation coefficient

Cooling

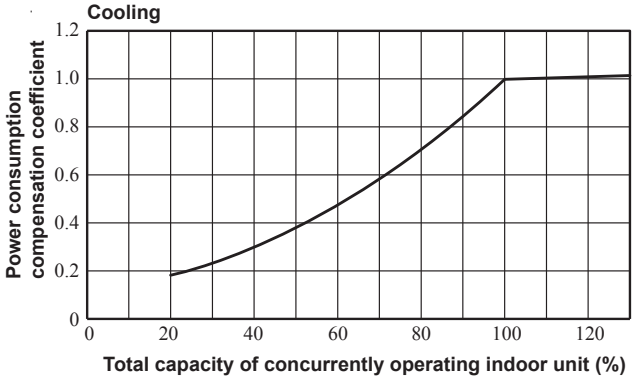


Heating

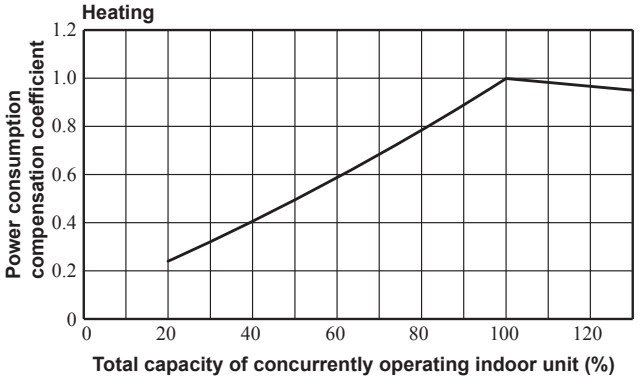


◆Power consumption compensation coefficient

Cooling



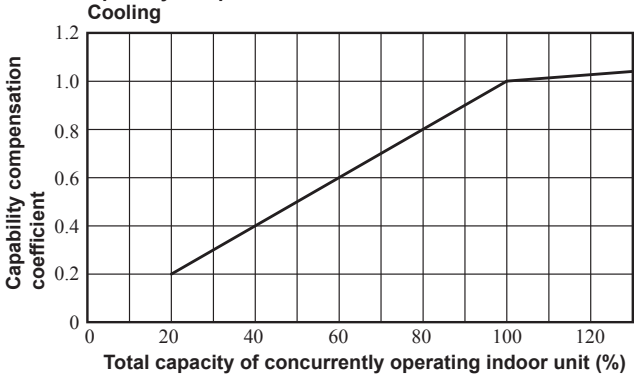
Heating



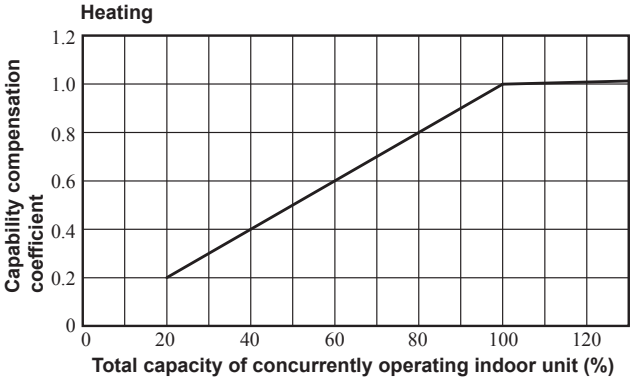
Model FDC450KXZRE1

◆Capability compensation coefficient

Cooling

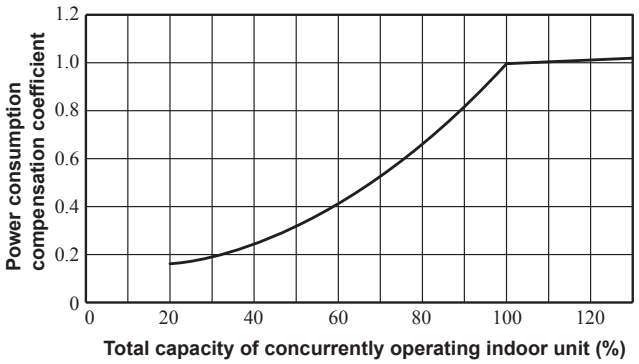


Heating

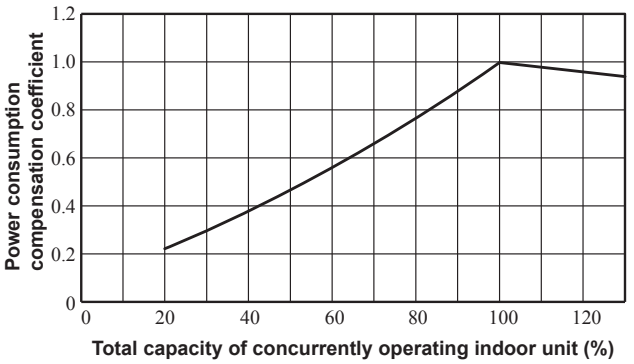


◆Power consumption compensation coefficient

Cooling



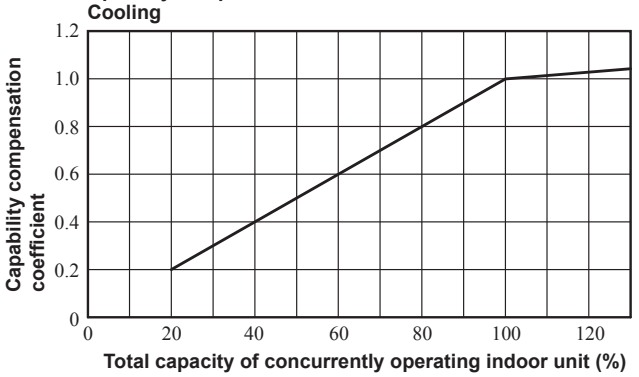
Heating



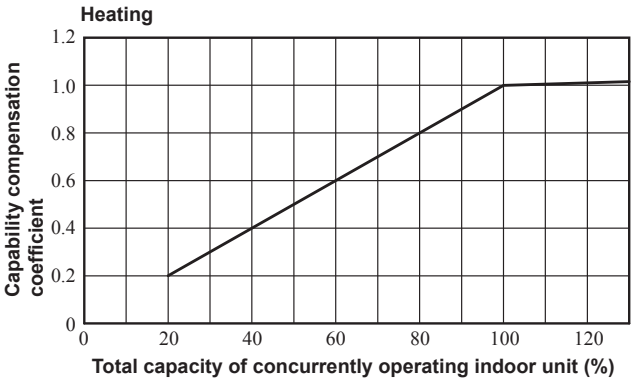
Model FDC475KXZRE1

◆Capability compensation coefficient

Cooling

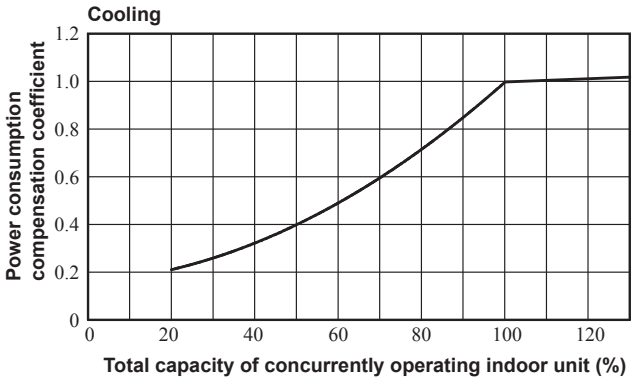


Heating

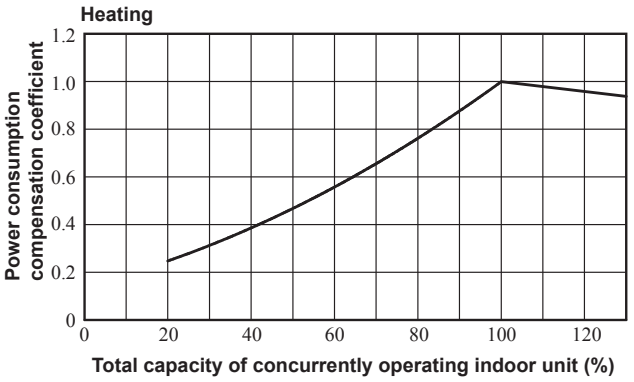


◆Power consumption compensation coefficient

Cooling



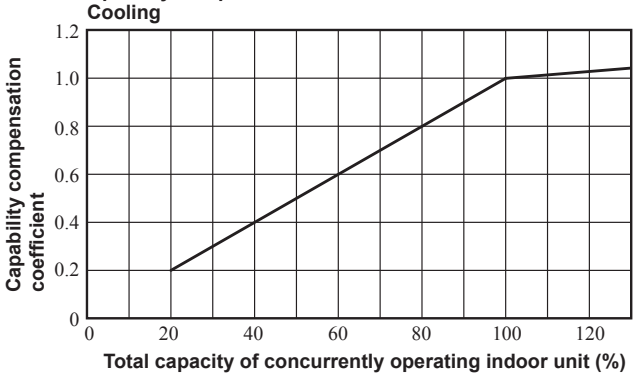
Heating



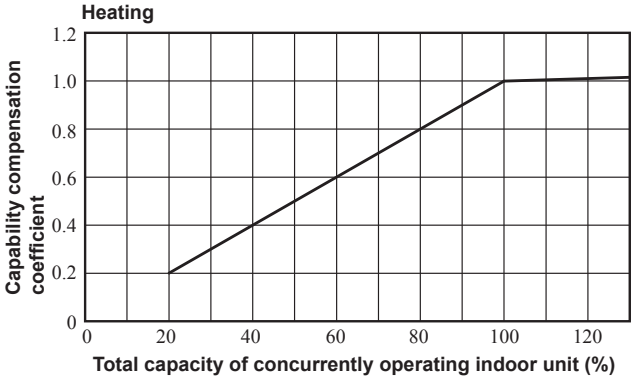
Model FDC500KXZRE1

◆**Capability compensation coefficient**

Cooling

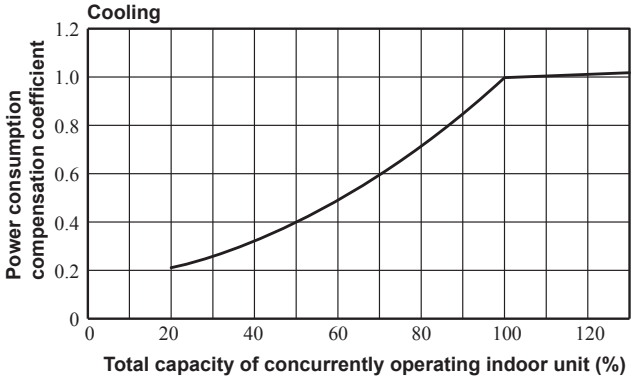


Heating

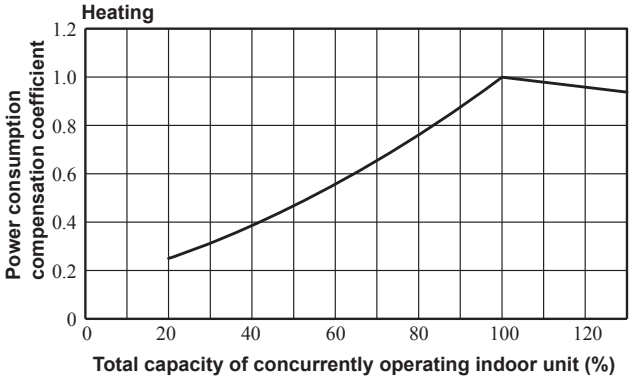


◆**Power consumption compensation coefficient**

Cooling



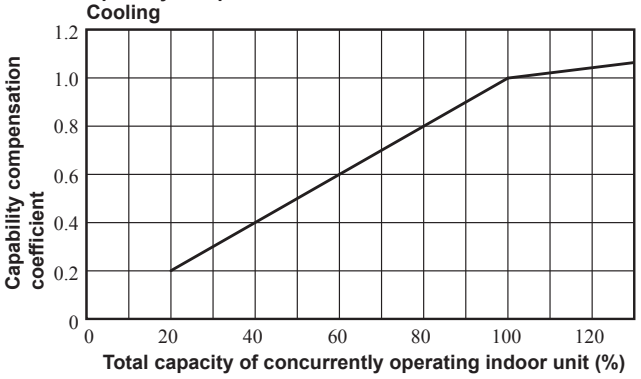
Heating



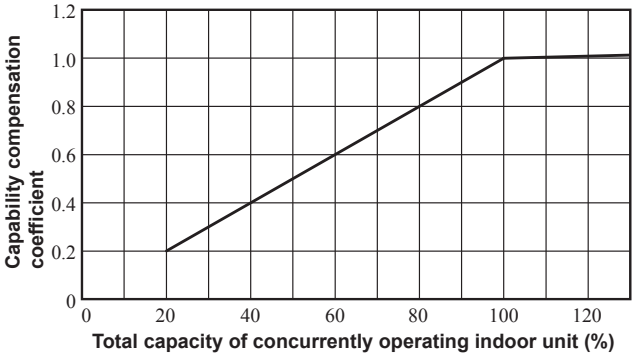
Model FDC560KXZRE1

◆**Capability compensation coefficient**

Cooling

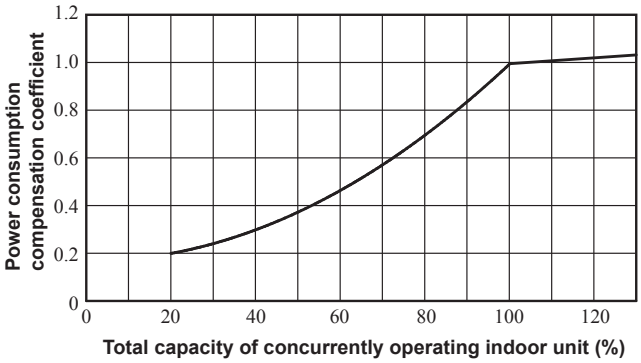


Heating

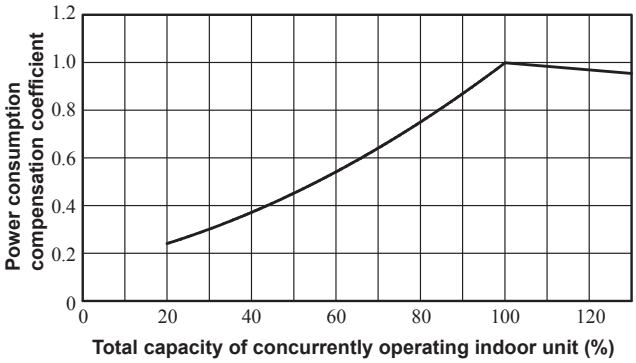


◆**Power consumption compensation coefficient**

Cooling



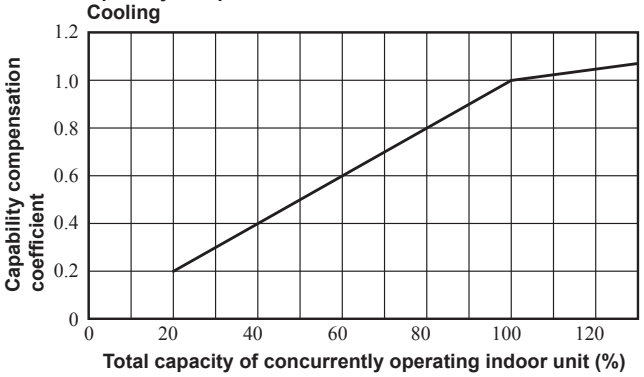
Heating



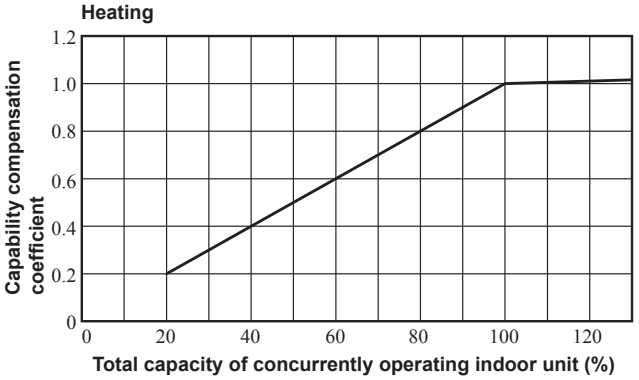
Model FDC615KXZRE1

◆Capability compensation coefficient

Cooling

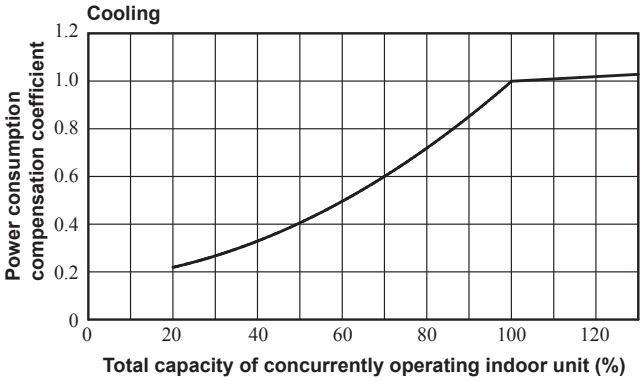


Heating

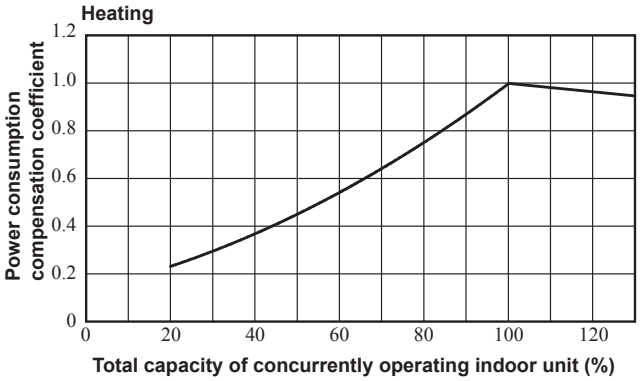


◆Power consumption compensation coefficient

Cooling



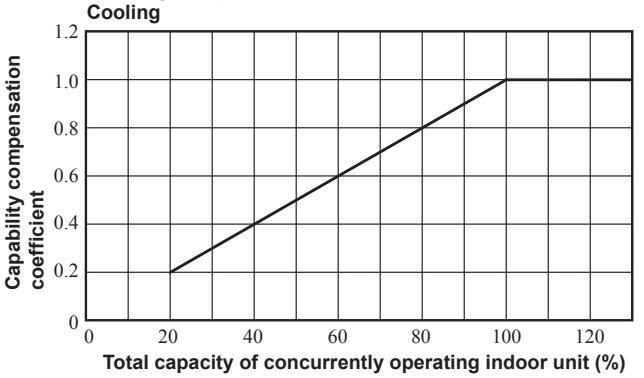
Heating



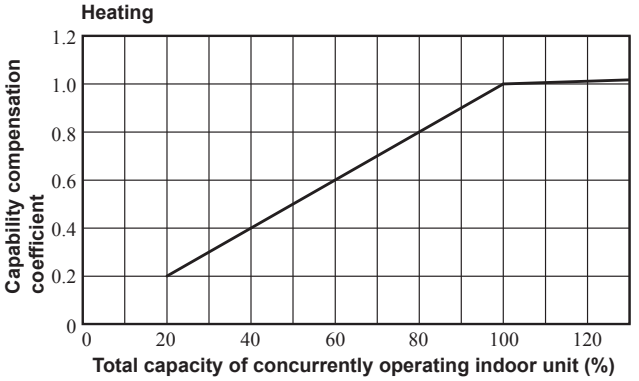
Model FDC670KXZRE1

◆Capability compensation coefficient

Cooling

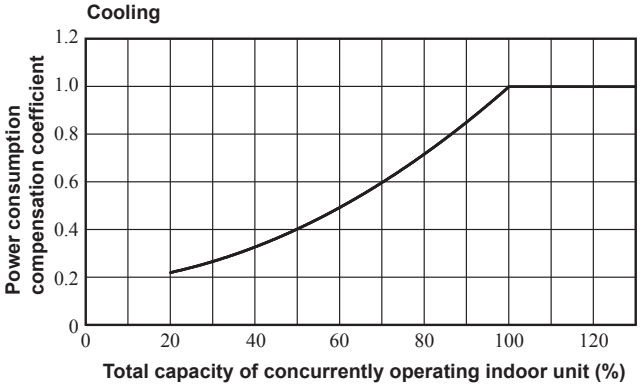


Heating

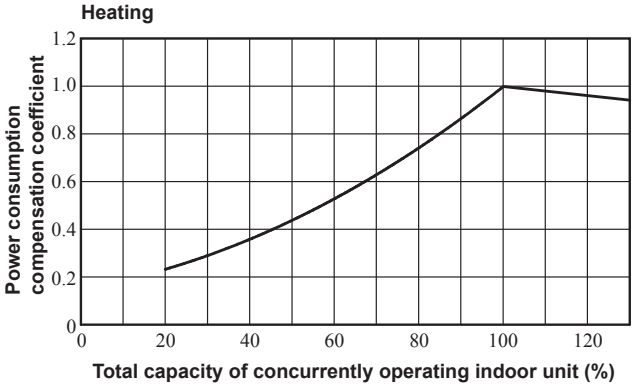


◆Power consumption compensation coefficient

Cooling



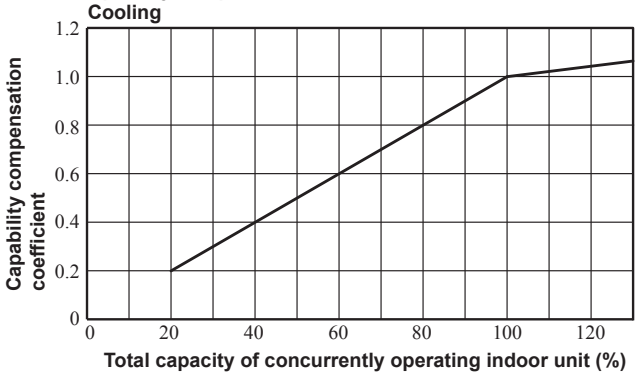
Heating



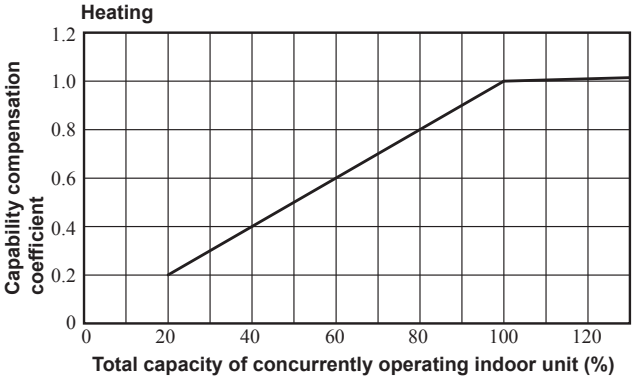
Model FDC735KXZRE1

◆**Capability compensation coefficient**

Cooling

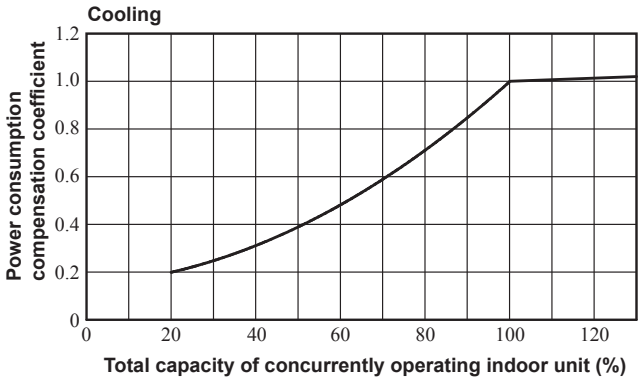


Heating

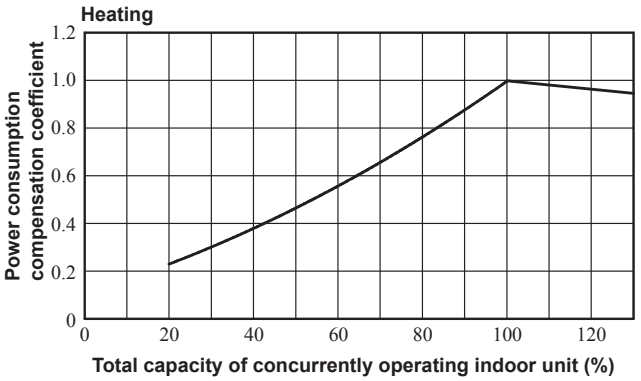


◆**Power consumption compensation coefficient**

Cooling



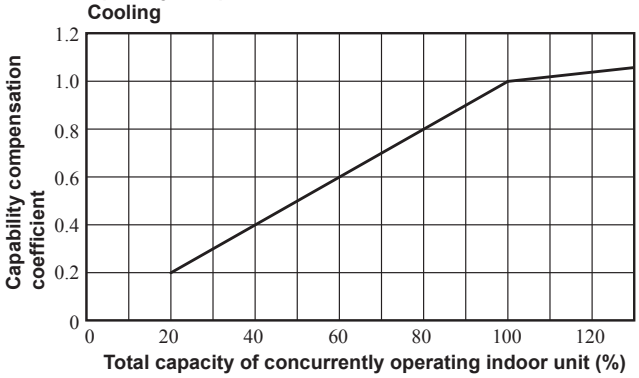
Heating



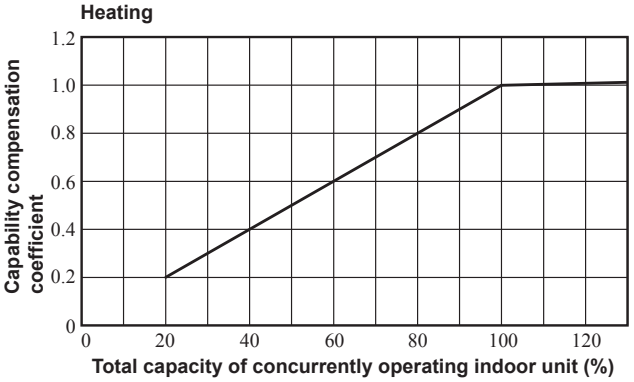
Model FDC800KXZRE1

◆**Capability compensation coefficient**

Cooling

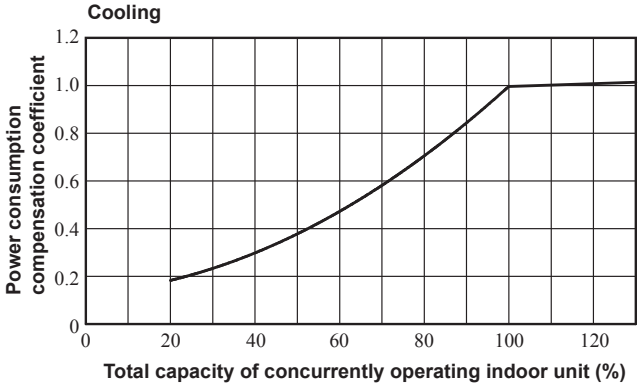


Heating

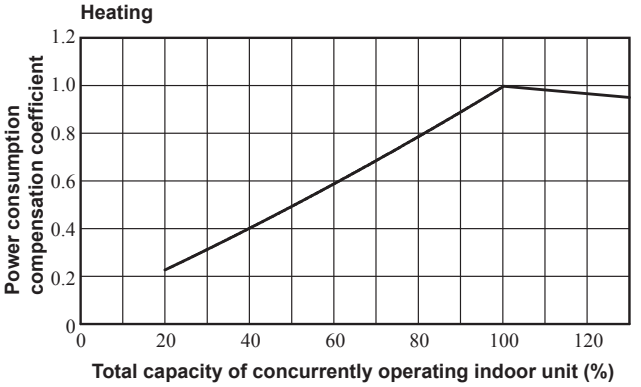


◆**Power consumption compensation coefficient**

Cooling



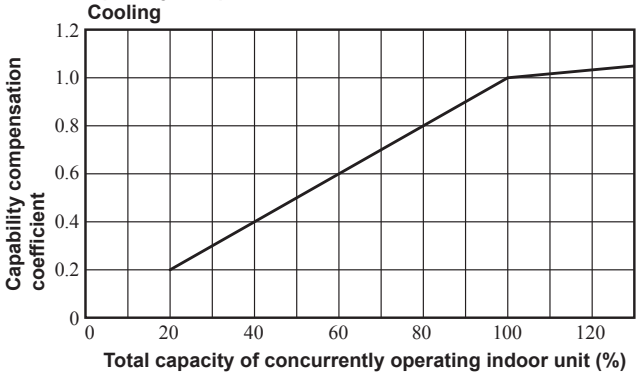
Heating



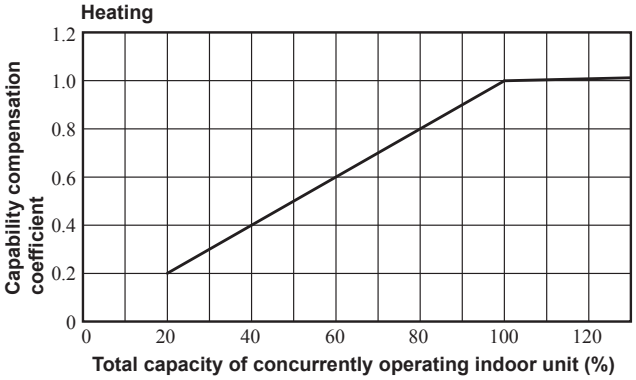
Model FDC850KXZRE1

◆**Capability compensation coefficient**

Cooling

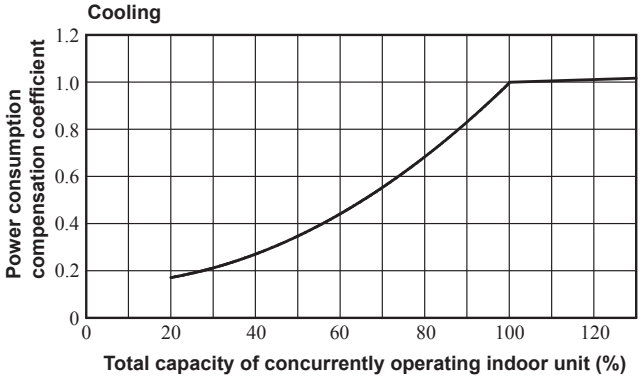


Heating

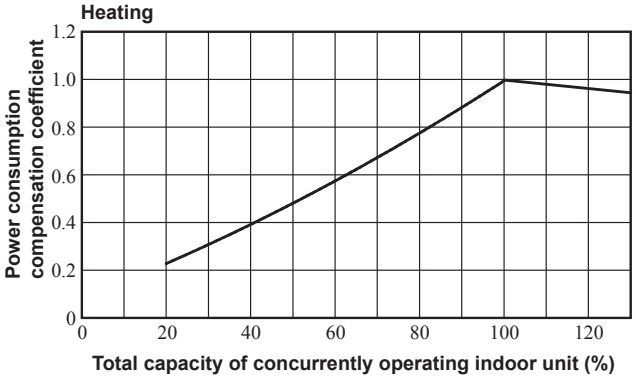


◆**Power consumption compensation coefficient**

Cooling



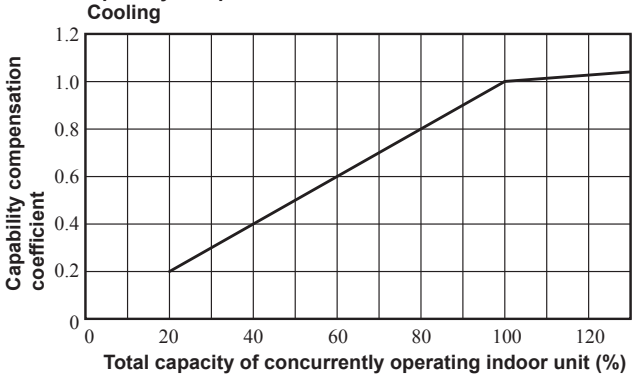
Heating



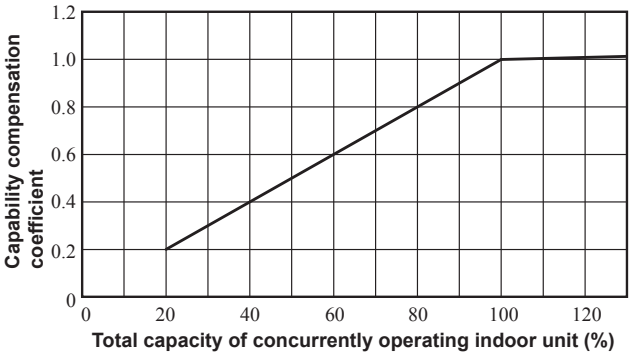
Model FDC900KXZRE1

◆**Capability compensation coefficient**

Cooling

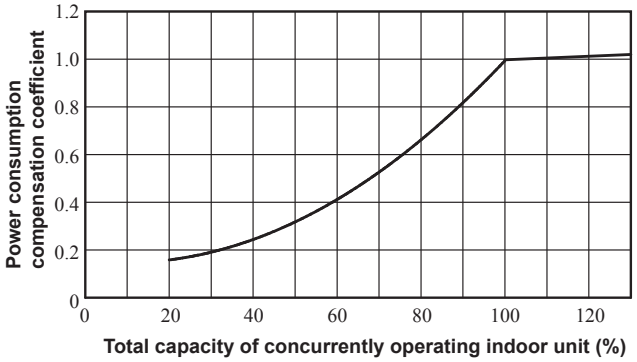


Heating

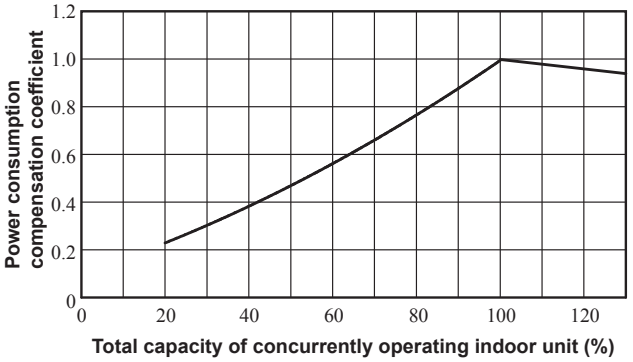


◆**Power consumption compensation coefficient**

Cooling



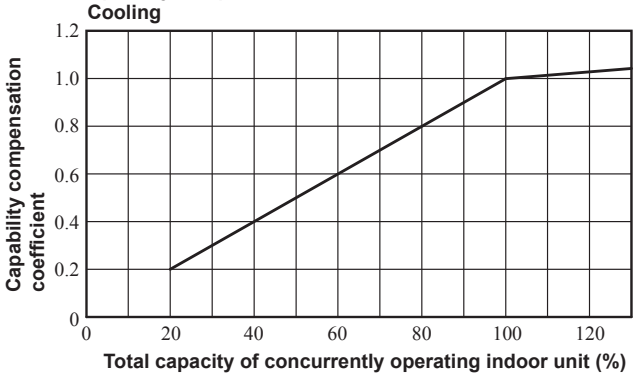
Heating



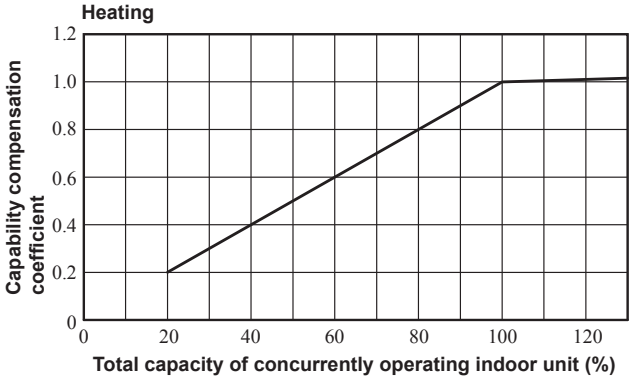
Model FDC950KXZRE1

◆**Capability compensation coefficient**

Cooling

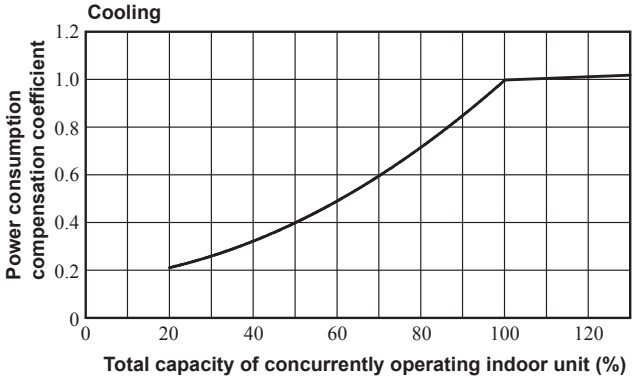


Heating

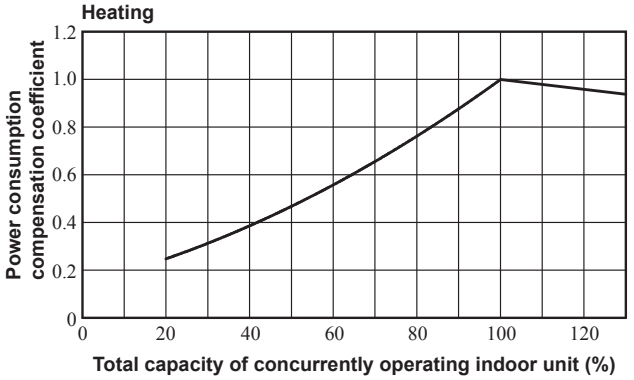


◆**Power consumption compensation coefficient**

Cooling



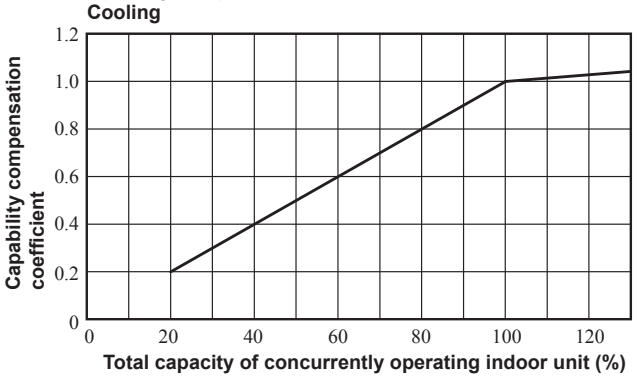
Heating



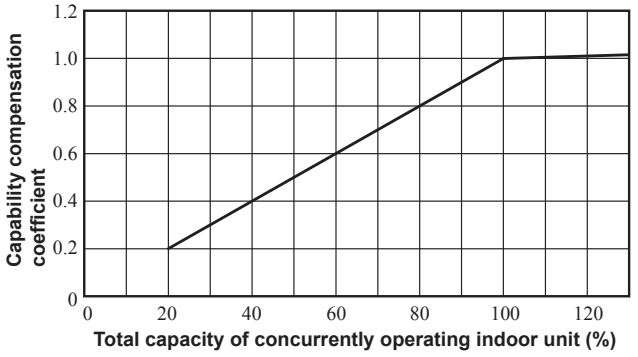
Model FDC1000KXZRE1

◆**Capability compensation coefficient**

Cooling

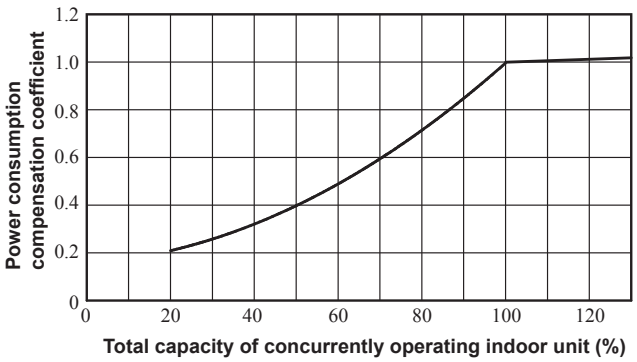


Heating

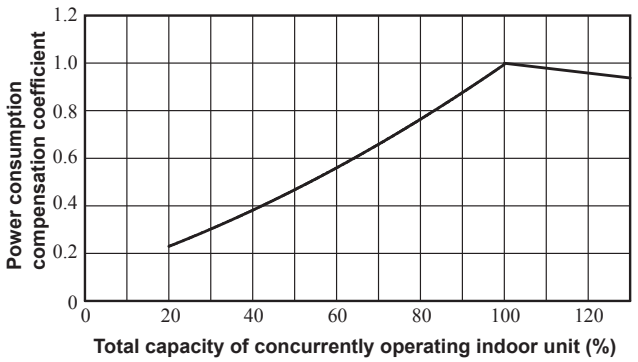


◆**Power consumption compensation coefficient**

Cooling



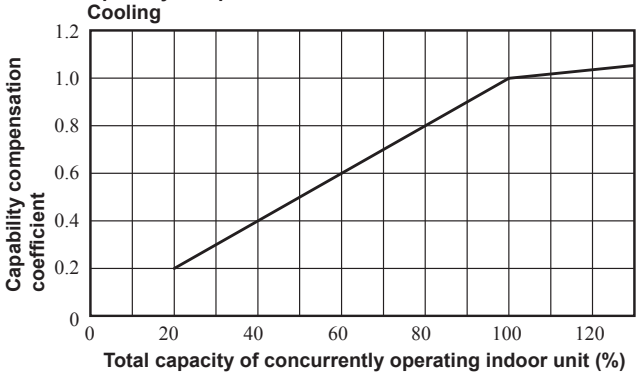
Heating



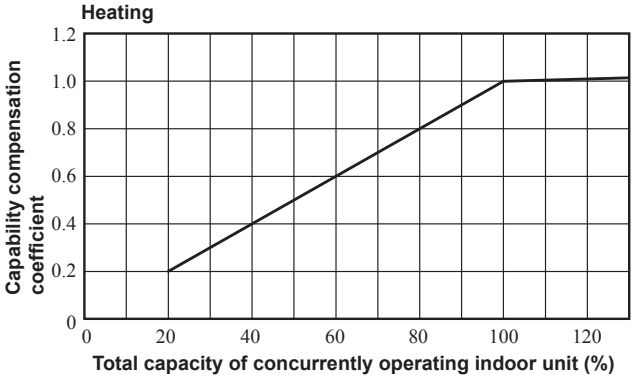
Model FDC1060KXZRE1

◆**Capability compensation coefficient**

Cooling

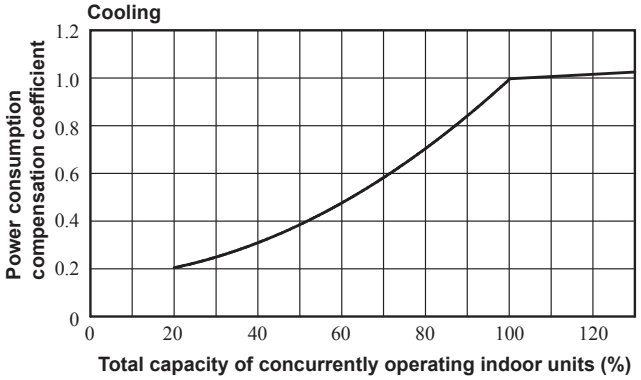


Heating

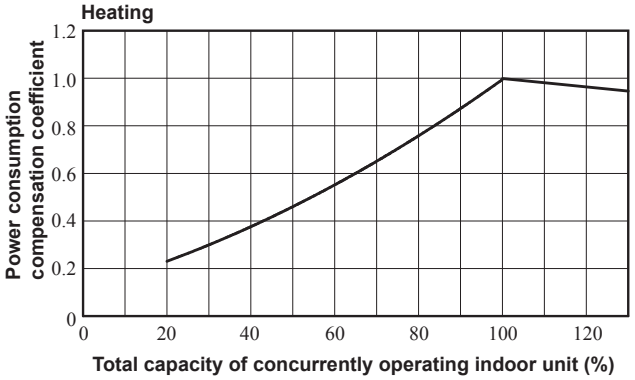


◆**Power consumption compensation coefficient**

Cooling



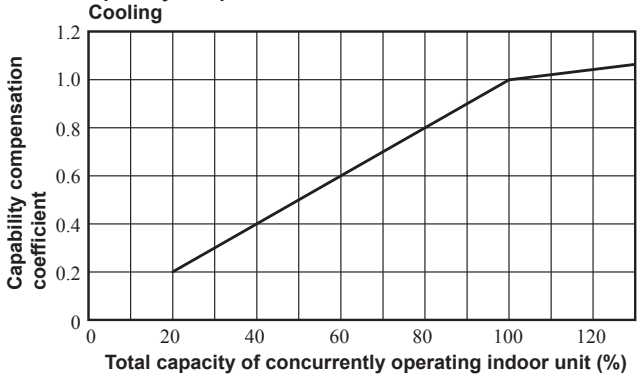
Heating



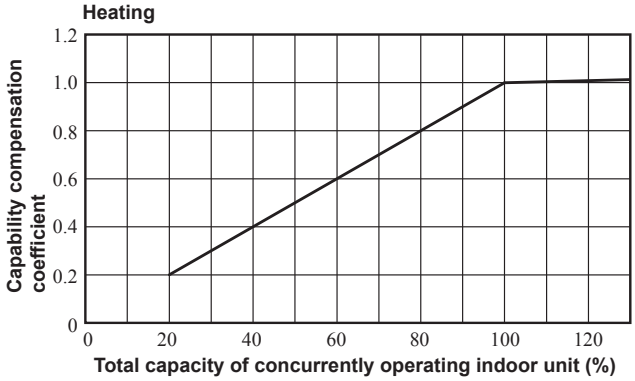
Model FDC1120KXZRE1

◆**Capability compensation coefficient**

Cooling

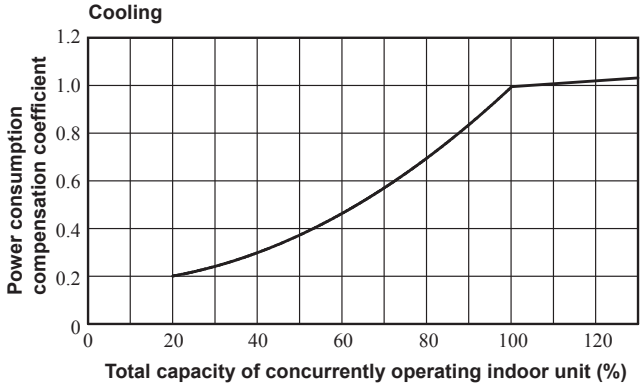


Heating

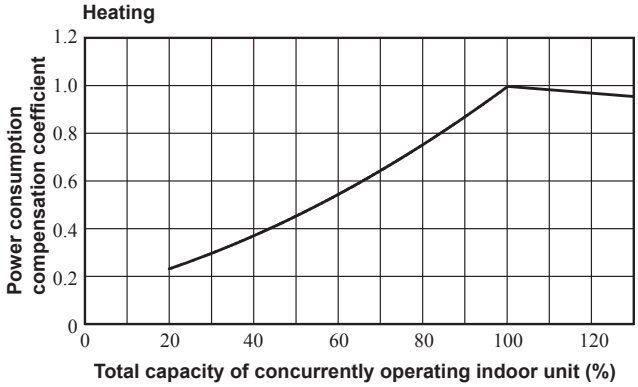


◆**Power consumption compensation coefficient**

Cooling



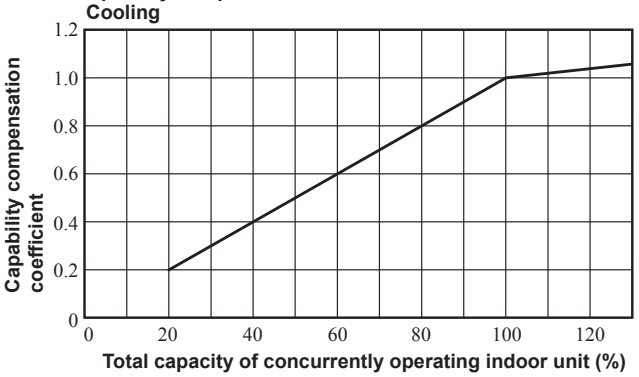
Heating



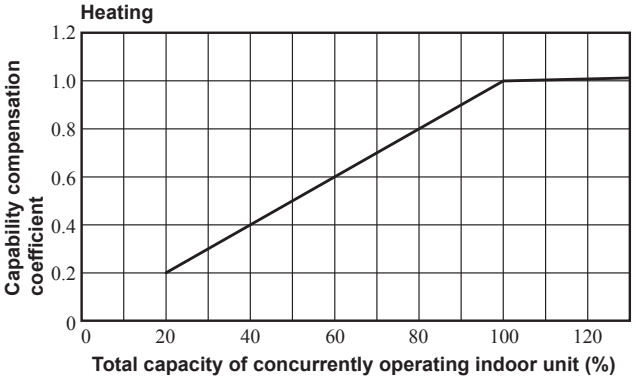
Model FDC1200KXZRE1

◆**Capability compensation coefficient**

Cooling

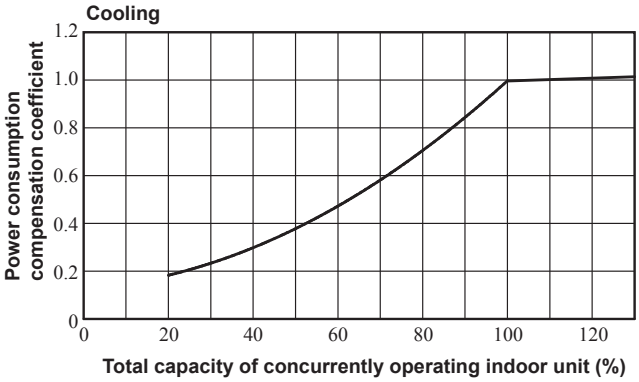


Heating

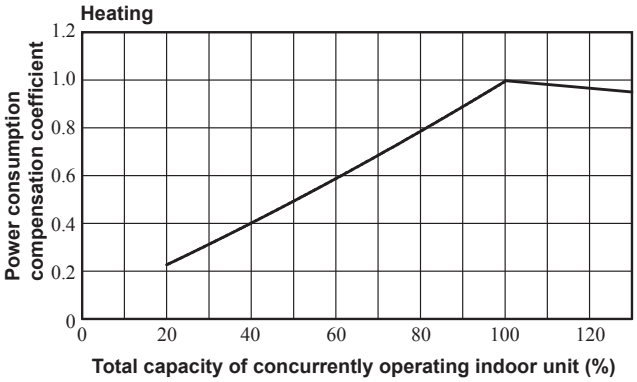


◆**Power consumption compensation coefficient**

Cooling



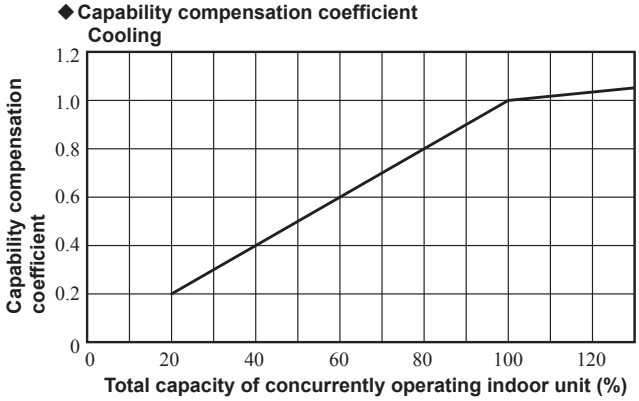
Heating



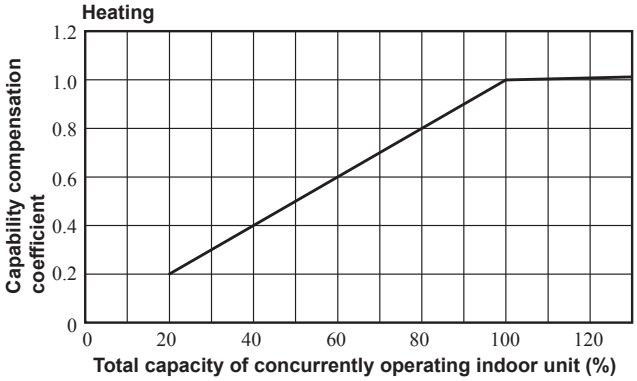
Model FDC1250KXZRE1

◆**Capability compensation coefficient**

Cooling

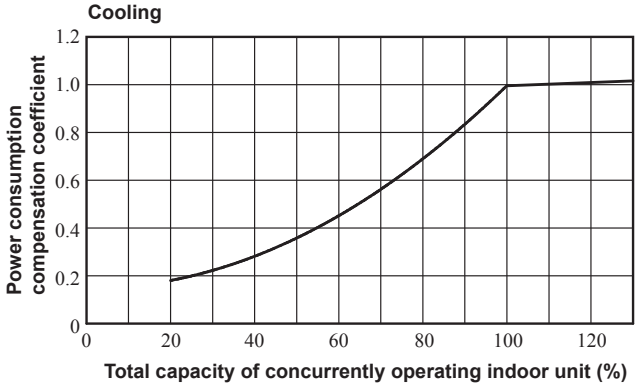


Heating

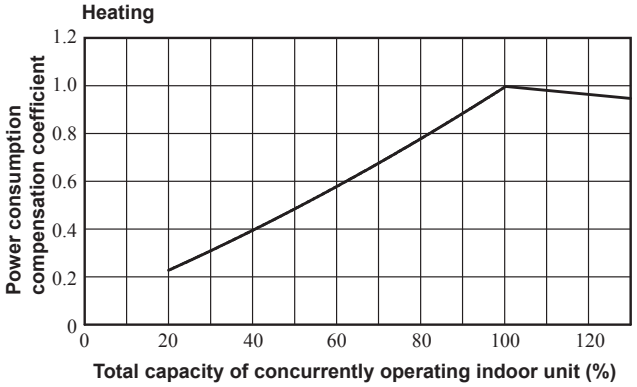


◆**Power consumption compensation coefficient**

Cooling



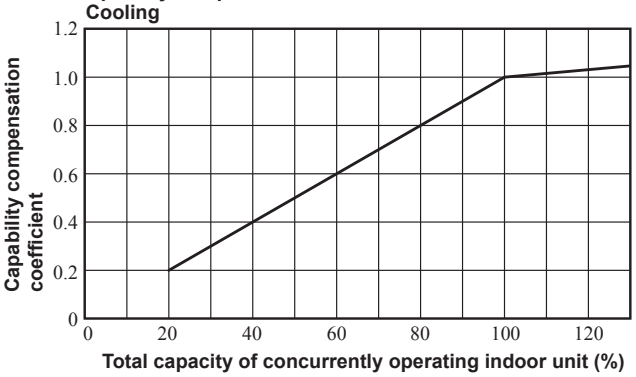
Heating



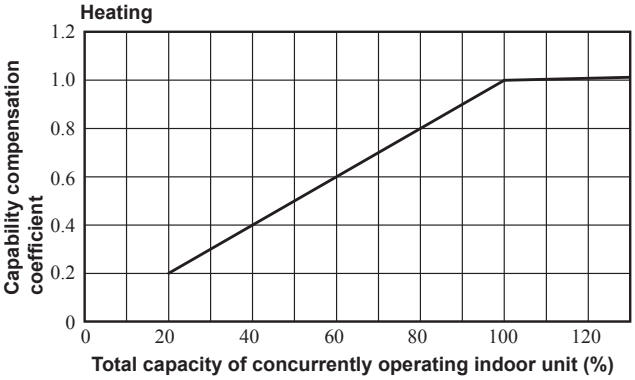
Model FDC1300KXZRE1

◆**Capability compensation coefficient**

Cooling

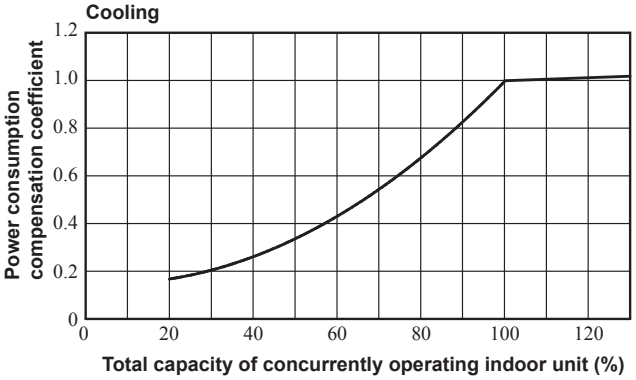


Heating

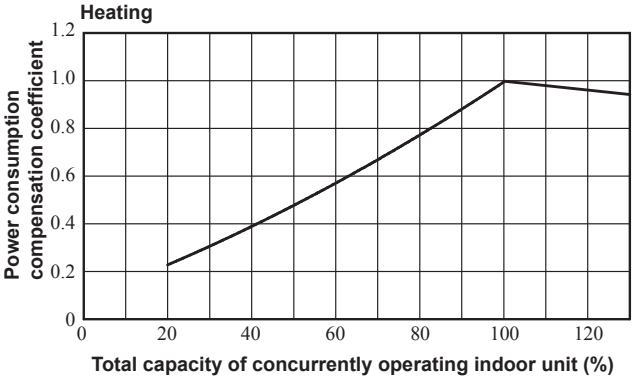


◆**Power consumption compensation coefficient**

Cooling



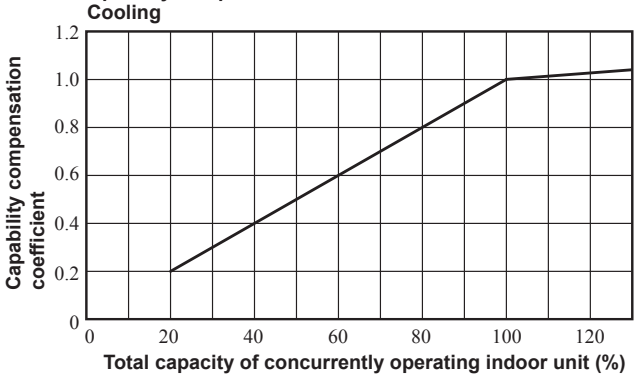
Heating



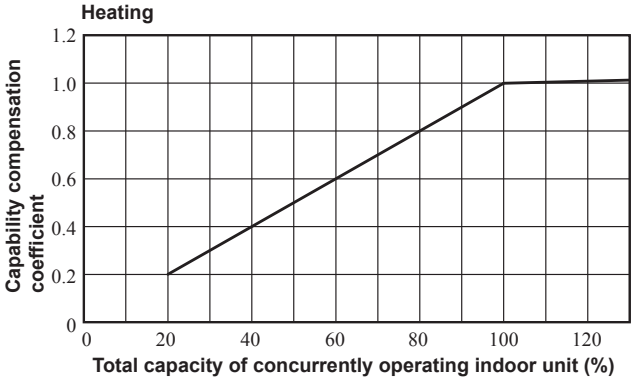
Model FDC1350KXZRE1

◆**Capability compensation coefficient**

Cooling

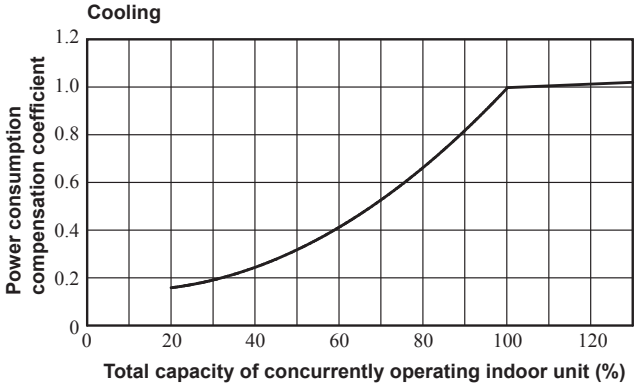


Heating

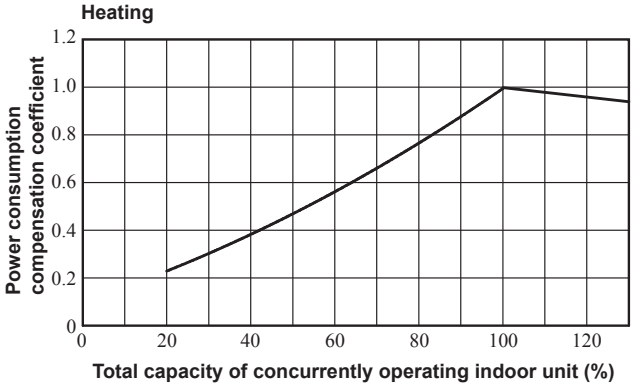


◆**Power consumption compensation coefficient**

Cooling

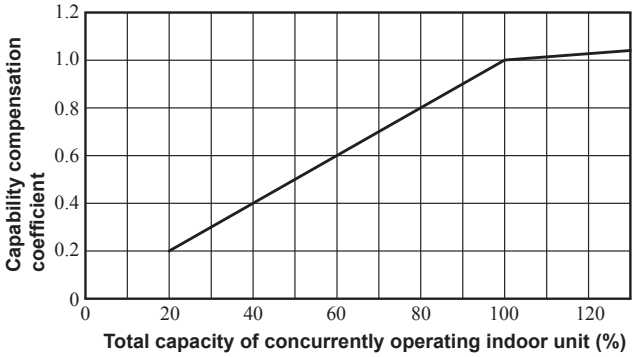


Heating

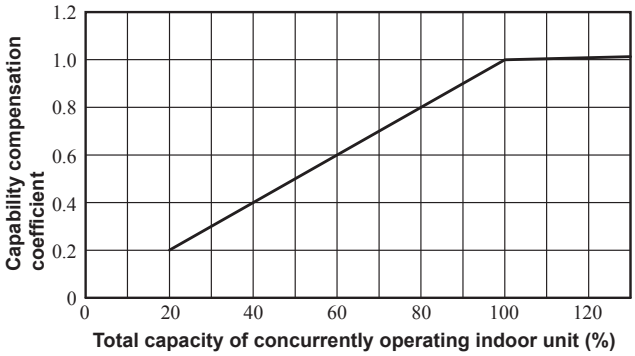


Model FDC1425KXZRE1

◆Capability compensation coefficient

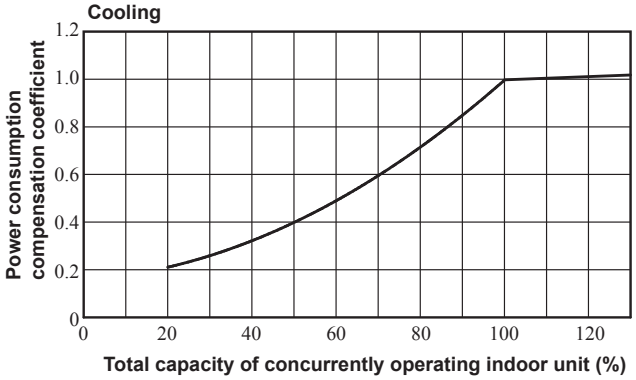


Heating

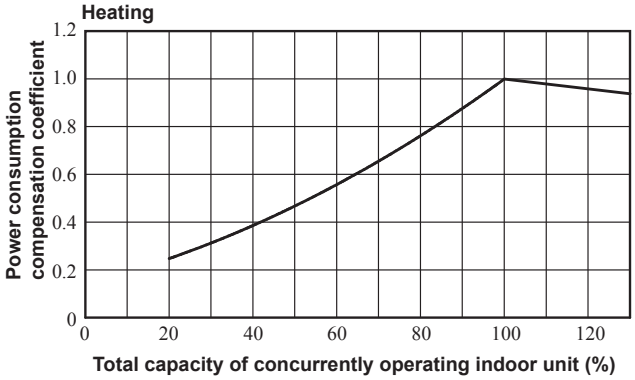


◆Power consumption compensation coefficient

Cooling



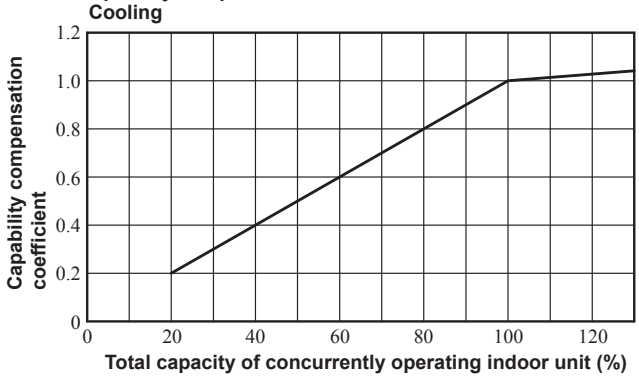
Heating



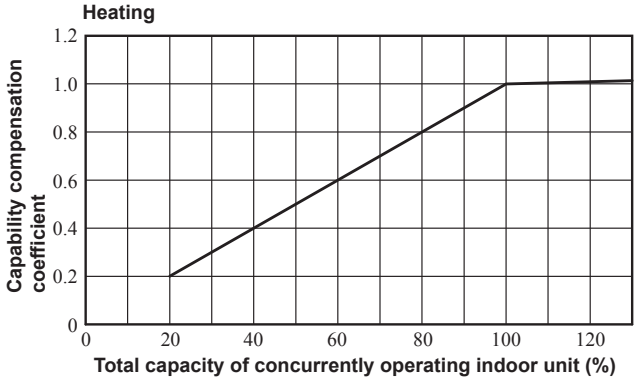
Model FDC1450KXZRE1

◆Capability compensation coefficient

Cooling

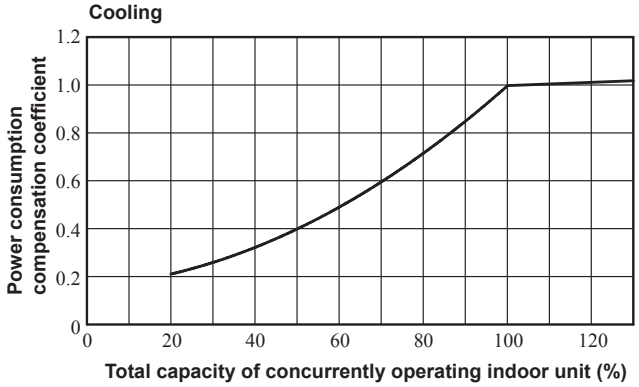


Heating

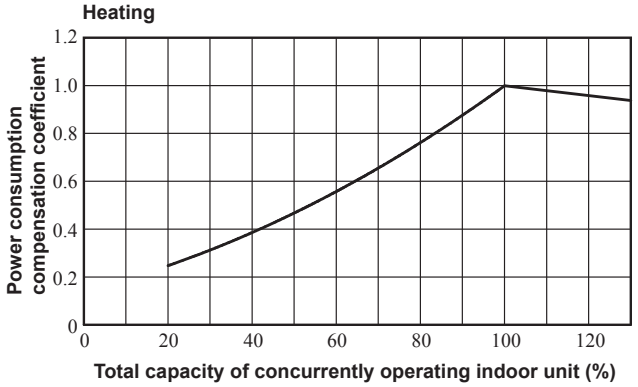


◆Power consumption compensation coefficient

Cooling



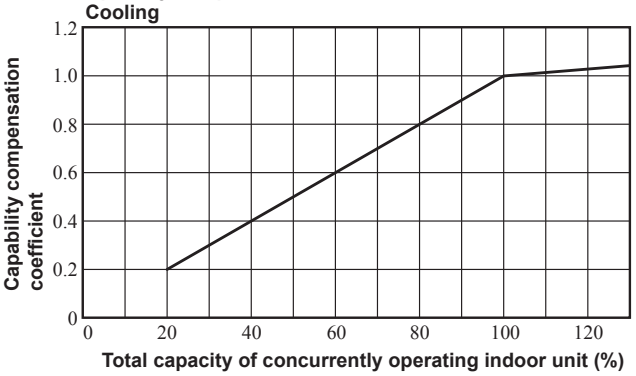
Heating



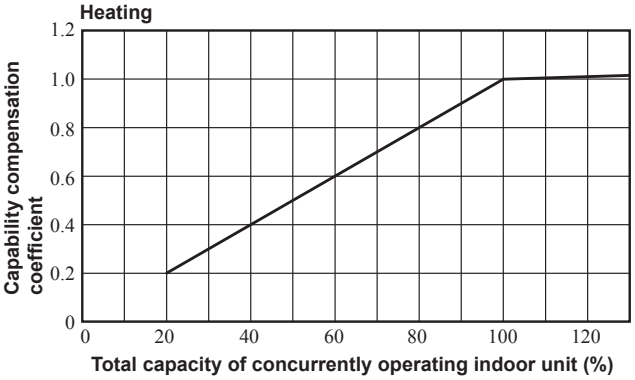
Model FDC1500KXZRE1

◆**Capability compensation coefficient**

Cooling

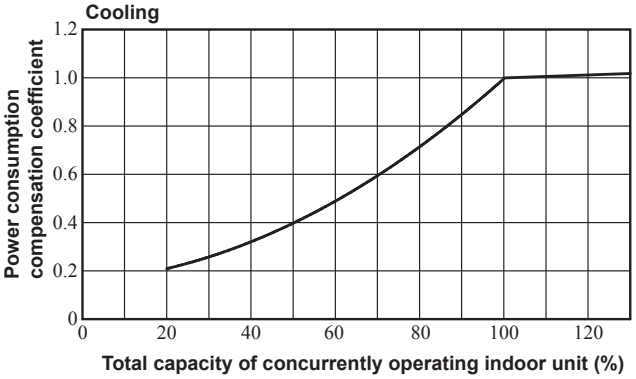


Heating

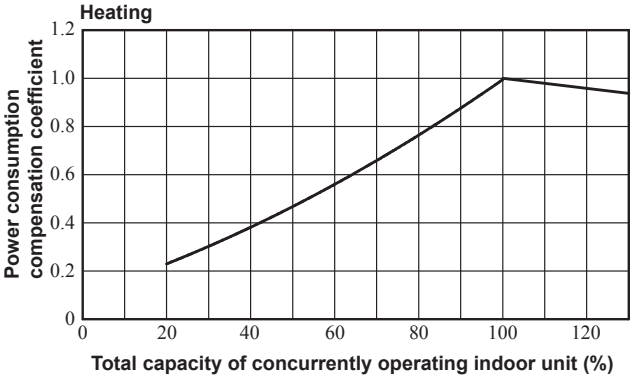


◆**Power consumption compensation coefficient**

Cooling



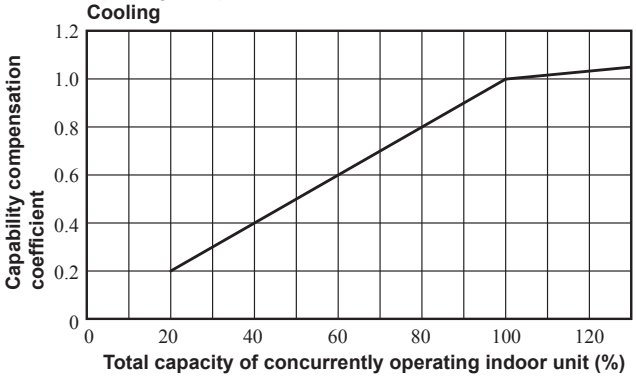
Heating



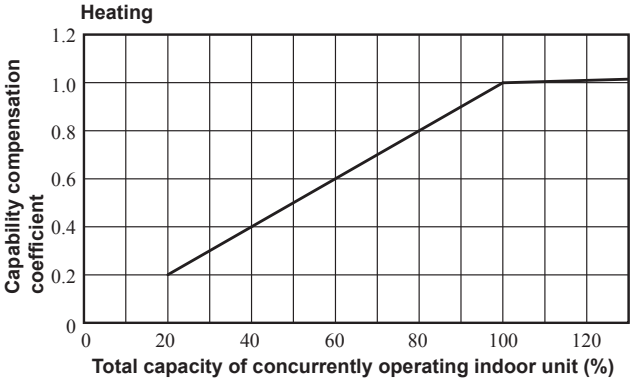
Model FDC1560KXZRE1

◆**Capability compensation coefficient**

Cooling

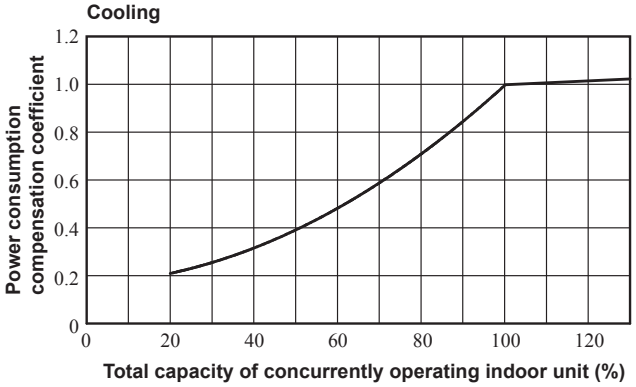


Heating

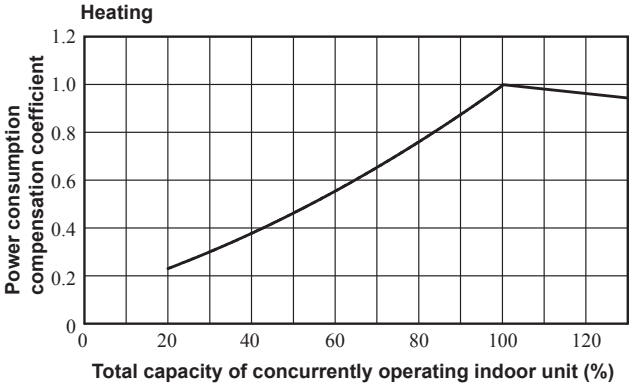


◆**Power consumption compensation coefficient**

Cooling



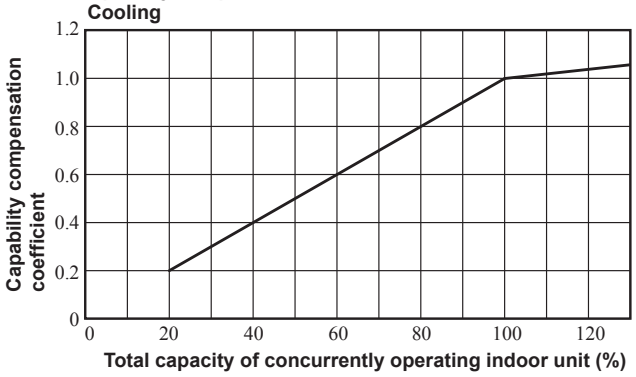
Heating



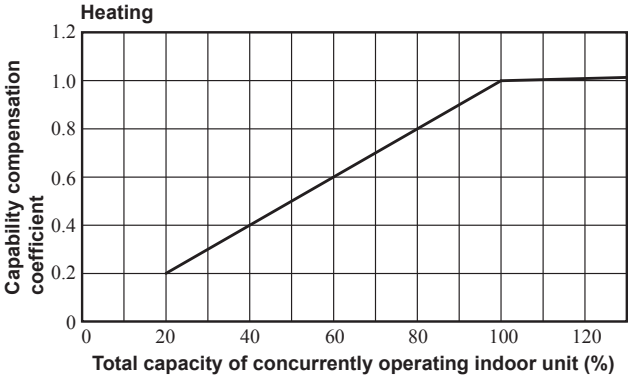
Model FDC1620KXZRE1

◆**Capability compensation coefficient**

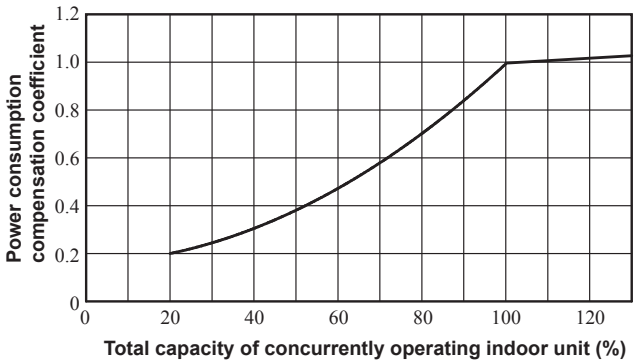
Cooling



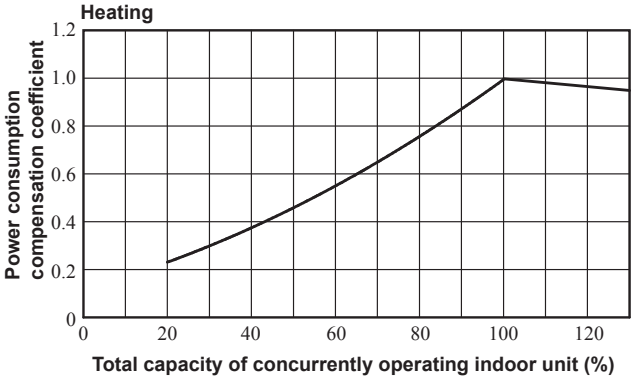
Heating



◆**Power consumption compensation coefficient**



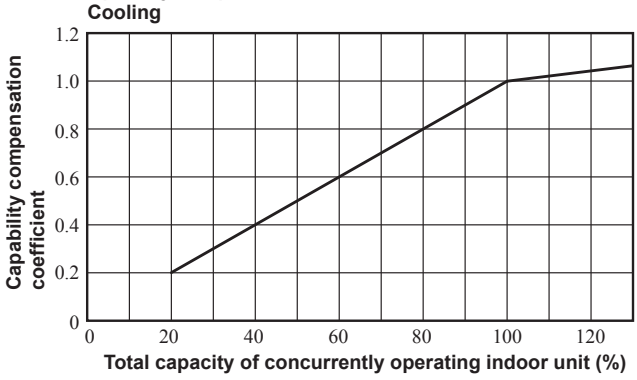
Heating



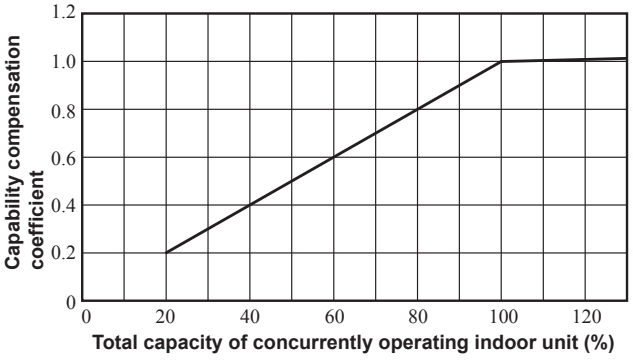
Model FDC1680KXZRE1

◆**Capability compensation coefficient**

Cooling

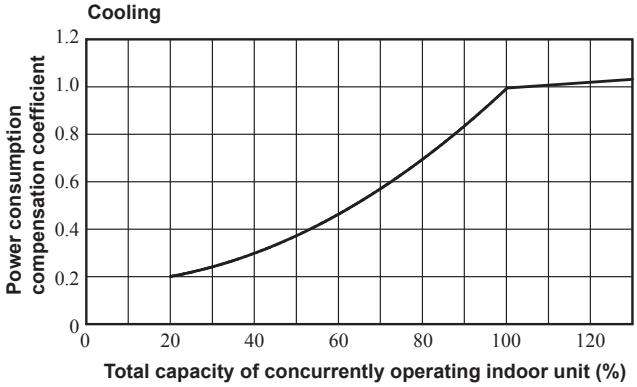


Heating

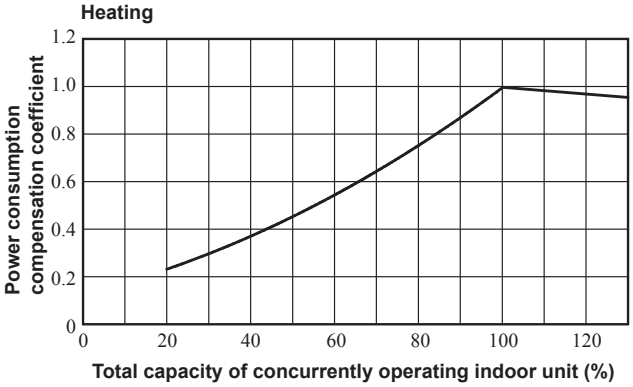


◆**Power consumption compensation coefficient**

Cooling

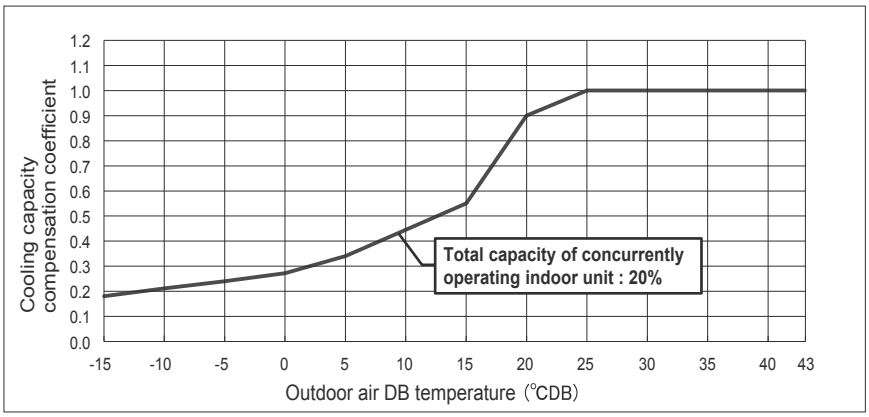


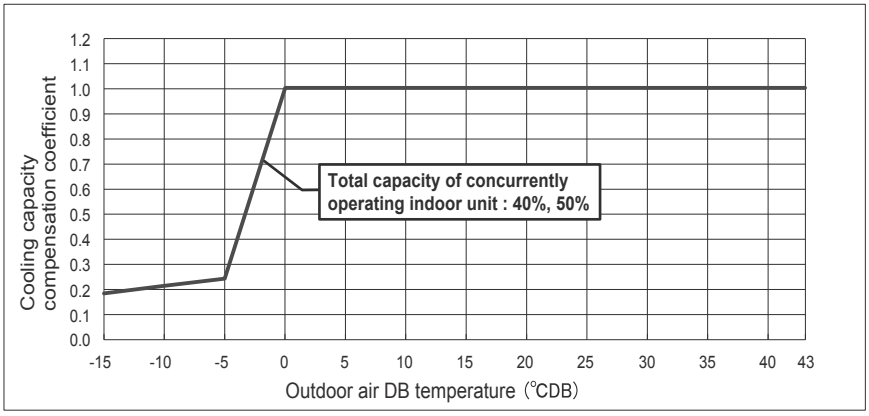
Heating

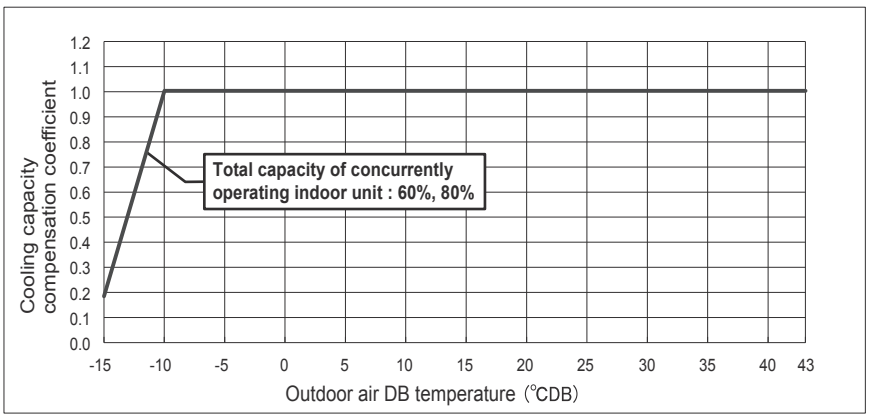


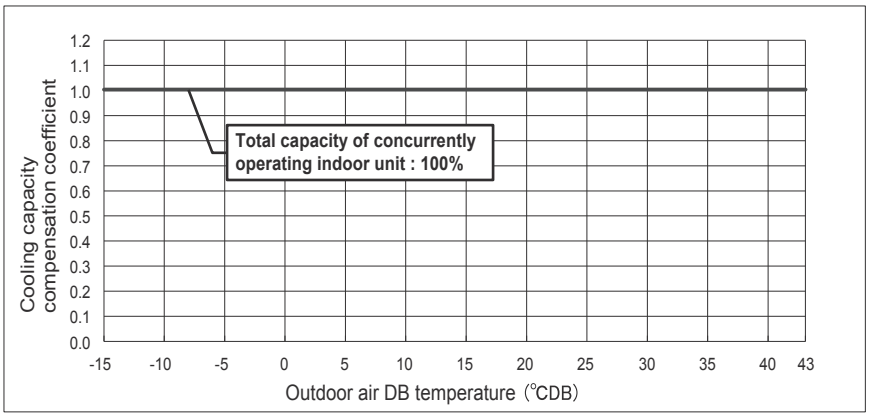
(f) The capacity compensation coefficient:
Cooling capacity in low temperature under operation of Anti-frost control.

(i) Indoor fan tap: P-Hi



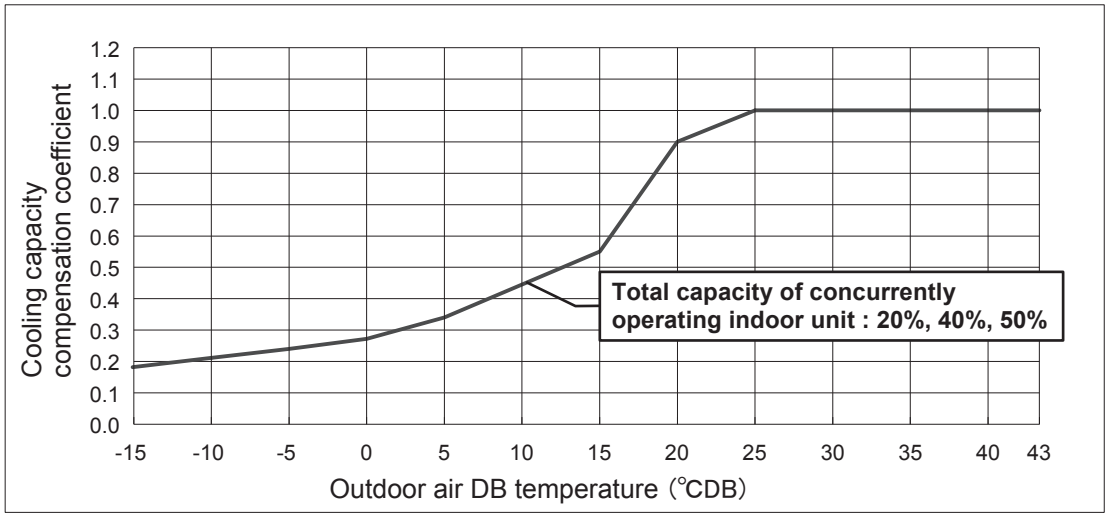


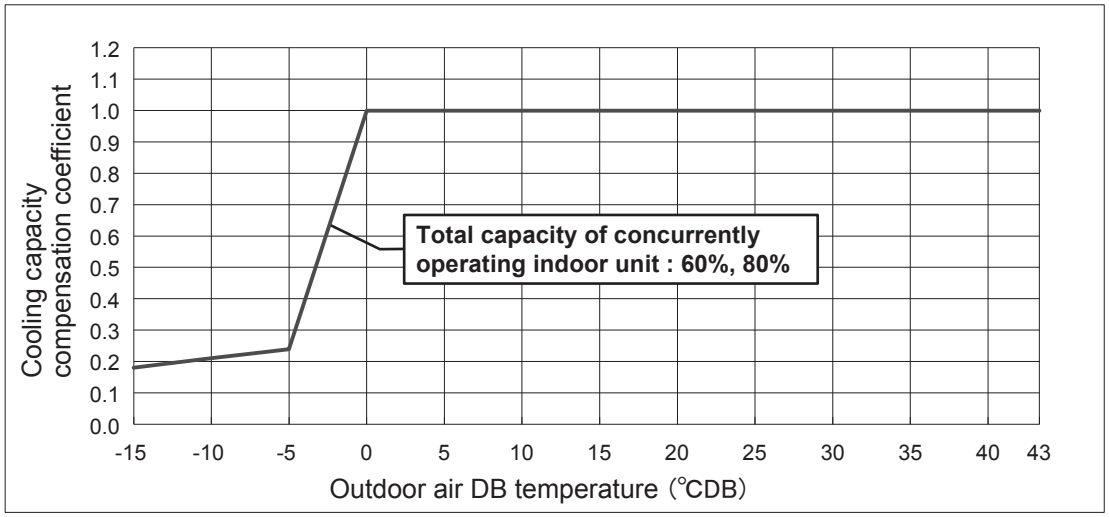


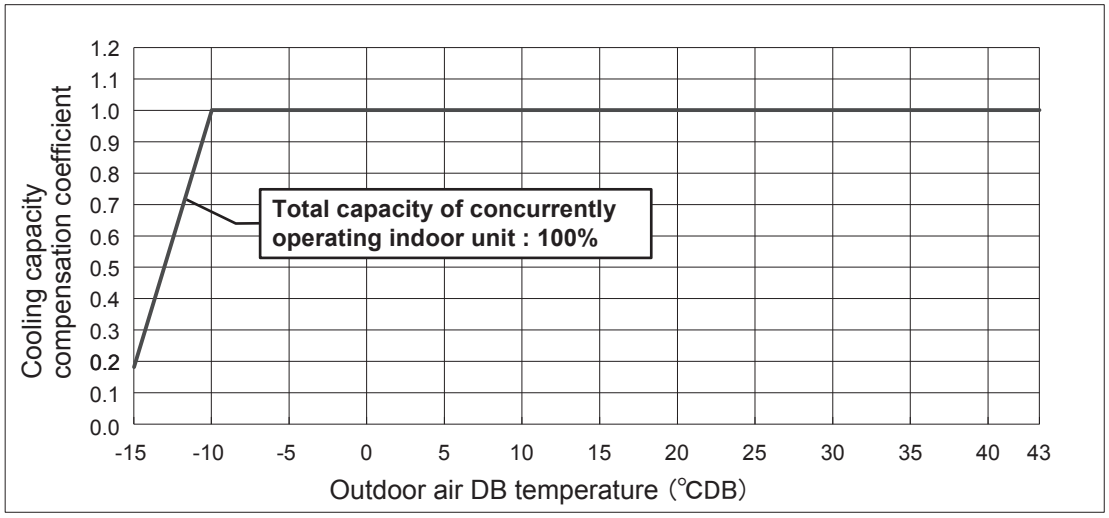


Capacity compensation coefficient is that of cooling capacity at each fan-tap.
(Condition) Room temp: 27 ℃DB/19℃WB
(*) If room temp. is lower than 27℃DB/19℃WB, cooling capacity ratio tends to be smaller than values shown in graph.
The lowest fan tap in the operating indoor units should be selected on above graph.

(ii) Indoor fan tap: Lo

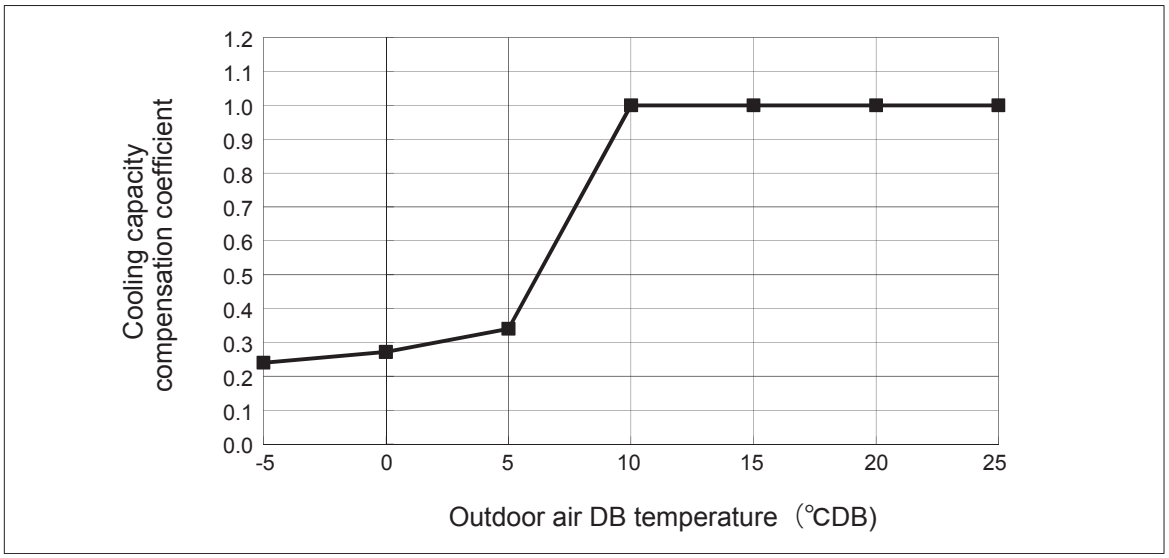






Capacity compensation coefficient is that of cooling capacity at each fan-tap.
(Condition) Room temp: 27 ℃DB/19℃WB
(*) If room temp. is lower than 27℃DB/19℃WB, cooling capacity ratio tends to be smaller than values shown in graph.
The lowest fan tap in the operating indoor units should be selected on above graph.

(g)Cooling capacity compensation for simultaneous cooling and heating operations
Cooling capacity under the anti-frost control at low temperatures

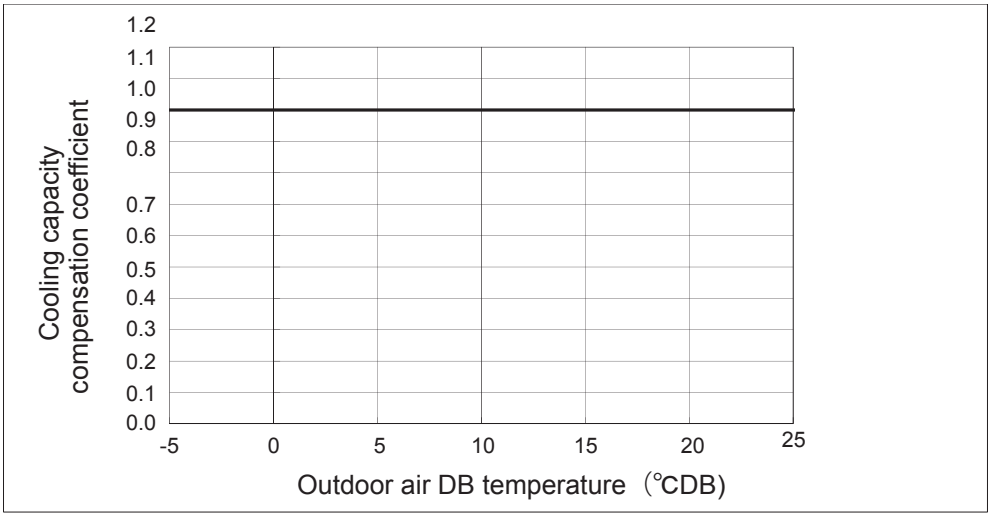


Cooling capacity compensation for simultaneous cooling and heating operations when the following conditions are met

①In the case of single operation,
Difference in operation capacities = Cooling operation capacity – Heating operation capacity ≧ 7.1 kW
In the case of combined operation, the difference in cooling and heating capacities must exceed that of single operation.

②Connection capacity: Connection capacity ≦ 130%

③Additional refrigerant quantity: Additional refrigerant charge quantity
(A: Standard additional refrigerant quantity +
B: Refrigerant quantity calculated based on pipe length x 1.4) is smaller than the following value:
FDC224,280KXZRE1：37.4kg
FDC400,450KXZRE1：50.0kg
FDC475,500,560,615,670KXZRE1：32.8kg
FDC735～：100kg



6. WARNINGS ON REFRIGERANT LEAKAGE

Check of concentration limit

The room in which the air conditioner is to be installed requires a design that in the event of refrigerant gas leaking out, its concentration will not exceed a set limit.

The refrigerant R410A which is used in the air conditioner is safe,without the toxicity or combustibility of ammonia, and is not restricted by laws to be imposed which protect the ozone layer. However, since it contains more than air, it poses the risk of suffocation if its concentration should rise excessively.

Suffocation from leakage of R410A is almost nonexistent. With the recent increase in the number of high concentration buildings, however, the installation of multi air conditioner systems is on the increase because of the need for effective use of floor space, individual control, energy conservation by curtailing heat and carrying power etc.

Most importantly, the multi air conditioner system is able to replenish a large amount of refrigerant compared with conventional individual air conditioners. If a single unit of the multi conditioner system is to be installed in a small room, select a suitable model and installation procedure so that if the refrigerant accidentally leaks out, its concentration dose not reach the limit (and in the event of an emergency, measures can be made before injury can occur).

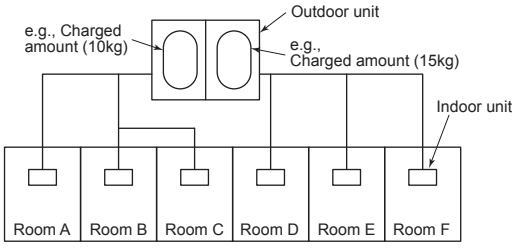
In a room where the concentration may exceed the limit, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device.

The concentration is as given below.

$$\frac{\text{Total amount of refrigerant (kg)}}{\text{Min. volume of the indoor unit installed room (m}^3\text{)}} \leqq \text{Concentration limit (kg/m}^3\text{)}$$

The concentration limit of R410A which is used in multi air conditioners is 0.42kg/m^3. (ISO5149)

Note(1) If there are 2 or more refrigerating systems in a single refrigerating device, the amounts of refrigerant should be as charged in each independent device.

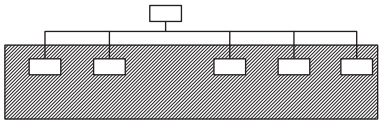


For the amount of charge in this example:
The possible amount of leaked refrigerant gas in rooms A, B and C is 10kg.
The possible amount of leaked refrigerant gas in rooms D, E and F is 15kg.

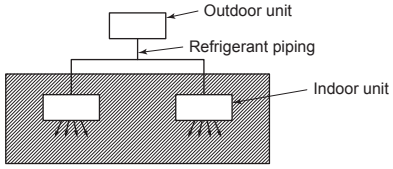
Important

Note(2) The standards for minimum room volume are as follows.

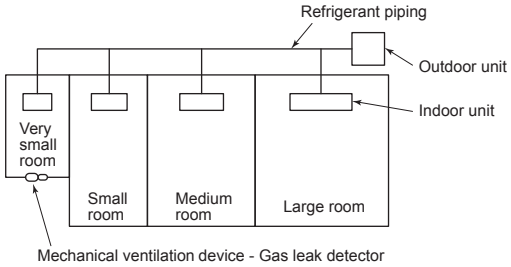
① No partition (shaded portion)



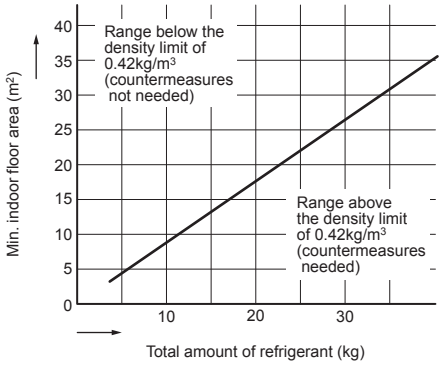
② When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door,or an opening 0.15% or larger than the respective floor spaces at the top or bottom of the door).



③ If an indoor unit is installed in each partitioned room and the refrigerant tubing is interconnected, the smallest of course becomes the object.
But when a mechanical ventilation is installed interlocked with a gas leakage detector in the smallest room where the density limit is exceeded, the volume of the next smallest room becomes the object.



Note(3) The minimum indoor floor area compared with the amount of refrigerant is roughly as follows: (When the ceiling is 2.7m high)



VRF INVERTER MULTI-SYSTEM AIR-CONDITIONERS

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