

DATA BOOK**VRF INVERTER MULTI-SYSTEM AIR-CONDITIONERS****(OUTDOOR UNIT)****KXZ series (Heat pump type)****Standard series**• **Single use (Used also for combination)**

FDC280KXZE1, 335KXZE1, 400KXZE1, 450KXZE1, 475KXZE1, 500KXZE1, 560KXZE1

• **Combination use**FDC615KXZE1, 670KXZE1, 735KXZE1, 800KXZE1, 850KXZE1, 900KXZE1, 950KXZE1, 1000KXZE1,
1060KXZE1, 1120KXZE1, 1200KXZE1, 1250KXZE1, 1300KXZE1, 1350KXZE1, 1425KXZE1,
1450KXZE1, 1500KXZE1, 1560KXZE1, 1620KXZE1, 1680KXZE1**Corrosion protection treatment series (Non-CE Marking models)**• **Single use (Used also for combination)**

FDCS280KXZE1, 335KXZE1, 400KXZE1, 450KXZE1, 475KXZE1, 500KXZE1, 560KXZE1

• **Combination use**FDCS615KXZE1, 670KXZE1, 735KXZE1, 800KXZE1, 850KXZE1, 900KXZE1, 950KXZE1, 1000KXZE1,
1060KXZE1, 1120KXZE1, 1200KXZE1, 1250KXZE1, 1300KXZE1, 1350KXZE1, 1425KXZE1,
1450KXZE1, 1500KXZE1, 1560KXZE1, 1620KXZE1, 1680KXZE1• **Note:**

(1) Regarding the Indoor unit series, refer to the No.'14 • KX-DB-206

(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

PREFACE

Combination table for KX4, KX6 and KXZE1 series

Category	Outdoor unit		Connectable remote control		Indoor unit							
					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				KXE6 KXE6A KXE6B KXE6D KXE6F	KXE6 KXE6A KXE6B KXE6D KXE6F		KXE6 KXE6A KXE6B KXE6D KXE6F	KXE6 KXE6A KXE6B KXE6D KXE6F
Heat pump (2-pipe) systems	FDCA-HKXE4	5HP			YES[D]	YES[D]	NO	NO	NO	NO	NO	NO
	FDCA-HKXE4	8-48HP			NO	YES[D]	NO	NO	NO	NO	NO	NO
	FDCA-HKXE4A FDCA-HKXE4R	5HP 5,6HP			NO	YES[D]	YES[D] ^{*1}	NO	NO	YES[D] ^{*1}	NO	NO
	FDCA-HKXE4A FDCA-HKXE4R FDCA-HKXE4BR FDCA-HKXE4D	8-48HP 8-48HP 8-48HP 8-48HP			NO	YES[D]	YES[D]	YES[D]	YES[D]	YES[D]	YES[D]	YES[D]
	FDC-KXE6	4,5,6HP			NO	NO	NO	NO	NO	NO	NO	YES[B] ^{*6}
	FDC-KXE6	8-48HP			NO	NO	NO	NO	NO	YES[C]	YES[C]	YES[B]
	FDC-KXZE1	10-60HP			NO	NO	NO	NO	NO	NO	NO	YES[A]

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

*1 Except FDKA71KXE5R

	Outdoor unit	Connected indoor unit		Dip switch setting of outdoor unit KXZE1/KXE6	Superlink protocol	Limitation
		Same series	Mixed series			
YES[A]*2	KXZE1	KXE6		II (New)	New (for KXZE1/KXE6)	New (for KXZE1/KXE6)
YES[B]*2	KXE6	KXE6		II (New)	New (for KXZE1/KXE6)	New (for KXZE1/KXE6)
YES[C]	KXE6	KXE4 series	KXE6 & KXE4 series	I (Previous)	Previous (for KXE4)	Previous (for KXE4)
YES[D]	KXE4 series	KXE4 series	KXE4 series		Previous (for KXE4)	Previous (for KXE4)

*2 If outdoor unit system (YES [A] or YES [B]) is connected to other outdoor unit systems (YES [C] and/or YES [D]) in one superlink network, the dip switch of outdoor unit KXZE1 (YES [A]) or KXE6 of (YES [B]) should be set from II(New) to I(Previous). In this case the superlink protocol and limitation of outdoor unit system (YES [A] or YES [B]) 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-SL2NA-E	SC-SL4-AE/BE	SC-WGWN-B/A/B	SC-LGWNA-A	SC-BGWNA-A/B
YES[A] & YES[B]	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[C] & YES[D]	Connectable I/U	16	48	144 (48x3)	96 *4 (48x2)	96 *4 (48x2)	96 *4 (48x2)
	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] or YES[B]), 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.

CONTENTS

1. GENERAL INFORMATION	1
1.1 Specific features.....	1
1.2 How to read the model name	1
1.3 Table of models	2
1.4 Outdoor units combination table	3
2. OUTDOOR UNIT	4
2.1 Specifications	4
2.2 Exterior dimensions.....	7
2.3 Electrical wiring	9
2.4 Noise level.....	12
2.5 Corrosion protection treatment series	13
3. RANGE OF USAGE & LIMITATIONS	14
4. PIPING SYSTEM	22
5. SELECTION CHART.....	25
6. WARNINGS ON REFRIGERANT LEAKAGE	48

1. GENERAL INFORMATION

1.1 Specific features

Connectable indoor capacity

Capacity from 50% to 130% is possible.

Model \ Item	Number of connectable units			Connectable capacity		
FDC(S)280KXZE1	1	to	24	140	—	364
FDC(S)335KXZE1	1	to	29	168	—	435
FDC(S)400KXZE1	1	to	34	200	—	520
FDC(S)450KXZE1	1	to	39	225	—	585
FDC(S)475KXZE1	1	to	41	238	—	617
FDC(S)500KXZE1	1	to	43	250	—	650
FDC(S)560KXZE1	1	to	48	280	—	728
FDC(S)615KXZE1	2	to	53	308	—	799
FDC(S)670KXZE1	2	to	58	335	—	871
FDC(S)735KXZE1	2	to	63	368	—	955
FDC(S)800KXZE1	2	to	69	400	—	1040
FDC(S)850KXZE1	2	to	73	425	—	1105
FDC(S)900KXZE1	2	to	78	450	—	1170
FDC(S)950KXZE1	2	to	80	475	—	1235
FDC(S)1000KXZE1	2	to	80	500	—	1300
FDC(S)1060KXZE1	2	to	80	530	—	1378
FDC(S)1120KXZE1	2	to	80	560	—	1456
FDC(S)1200KXZE1	3	to	80	600	—	1560
FDC(S)1250KXZE1	3	to	80	625	—	1625
FDC(S)1300KXZE1	3	to	80	650	—	1690
FDC(S)1350KXZE1	3	to	80	675	—	1755
FDC(S)1425KXZE1	3	to	80	713	—	1852
FDC(S)1450KXZE1	3	to	80	725	—	1885
FDC(S)1500KXZE1	3	to	80	750	—	1950
FDC(S)1560KXZE1	3	to	80	780	—	2028
FDC(S)1620KXZE1	3	to	80	810	—	2106
FDC(S)1680KXZE1	3	to	80	840	—	2184

Note

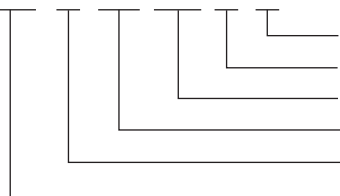
For outdoor unit, EN61000-3-2 and EN61000-3-12 are not applicable as consent by the utility company or notification to the utility company is given before usage.

1.2 How to read the model name

(1) Outdoor unit

Example:

FDC S 735 KXZ E 1



Series No.

Application power source...See the specifications

Multi KXZ series

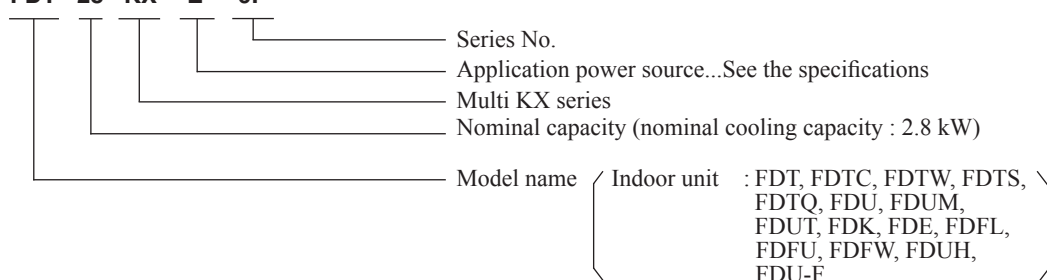
Nominal capacity (nominal cooling capacity : 73.5kW)

Corrosion protection treatment models (Nothing : Standard models)

Model name (Outdoor unit)

(2) Indoor unit

Example: FDT 28 KX E 6F



1.3 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)	FDC280KXZE1-FDC1680KXZE1												

Note (1) Reference No. of data book : '14-KX-DB-206

1.4 Outdoor units combination table

Item Models	Combination Outdoor unit models							Indoor unit	
	FDC280 KXZE1	FDC335 KXZE1	FDC400 KXZE1	FDC450 KXZE1	FDC475 KXZE1	FDC500 KXZE1	FDC560 KXZE1	Connectable capacity	Number of connectable units
FDC(S)615KXZE1	1	1	-	-	-	-	-	308 — 799	2 to 53 units
FDC(S)670KXZE1	-	2	-	-	-	-	-	335 — 871	2 to 58 units
FDC(S)735KXZE1	-	1	1	-	-	-	-	368 — 955	2 to 63 units
FDC(S)800KXZE1	-	-	2	-	-	-	-	400 — 1040	2 to 69 units
FDC(S)850KXZE1	-	-	1	1	-	-	-	425 — 1105	2 to 73 units
FDC(S)900KXZE1	-	-	-	2	-	-	-	450 — 1170	2 to 78 units
FDC(S)950KXZE1	-	-	-	-	2	-	-	475 — 1235	2 to 80 units
FDC(S)1000KXZE1	-	-	-	-	-	2	-	500 — 1300	2 to 80 units
FDC(S)1060KXZE1	-	-	-	-	-	1	1	530 — 1378	2 to 80 units
FDC(S)1120KXZE1	-	-	-	-	-	-	2	560 — 1456	2 to 80 units
FDC(S)1200KXZE1	-	-	3	-	-	-	-	600 — 1560	3 to 80 units
FDC(S)1250KXZE1	-	-	2	1	-	-	-	625 — 1625	3 to 80 units
FDC(S)1300KXZE1	-	-	1	2	-	-	-	650 — 1690	3 to 80 units
FDC(S)1350KXZE1	-	-	-	3	-	-	-	675 — 1755	3 to 80 units
FDC(S)1425KXZE1	-	-	-	-	3	-	-	713 — 1852	3 to 80 units
FDC(S)1450KXZE1	-	-	-	-	2	1	-	725 — 1885	3 to 80 units
FDC(S)1500KXZE1	-	-	-	-	-	3	-	750 — 1950	3 to 80 units
FDC(S)1560KXZE1	-	-	-	-	-	2	1	780 — 2028	3 to 80 units
FDC(S)1620KXZE1	-	-	-	-	-	1	2	810 — 2106	3 to 80 units
FDC(S)1680KXZE1	-	-	-	-	-	-	3	840 — 2184	3 to 80 units

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

Outdoor unit	Branch pipe set
For two units (for FDC615KXZE1-1120KXZE1)	DOS-2A-3
For three units (for FDC1200KXZE1-1680KXZE1)	DOS-3A-3

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

(b) Branch pipe set (Option)

Total capacity downstream	Branching pipe set
Less than 180	DIS-22-1G
180 or more but less than 371	DIS-180-1G
371 or more but less than 540	DIS-371-1G
540 or more	DIS-540-3

(c) Header pipe set (Option)

Total capacity downstream	Header set model type	Number of branches
Less than 180	HEAD4-22-1G	4 branches at the most
180 or more but less than 371	HEAD6-180-1G	6 branches at the most
371 or more but less than 540	HEAD8-371-2	8 branches at the most
540 or more	HEAD8-540-3	8 branches at the most

2. OUTDOOR UNIT

2.1 Specifications

• Single use (Used also for combination)

Models		FDC280KXZE1 FDCS280KXZE1	FDC335KXZE1 FDCS335KXZE1	FDC400KXZE1 FDCS400KXZE1	FDC450KXZE1 FDCS450KXZE1	FDC475KXZE1 FDCS475KXZE1	FDC500KXZE1 FDCS500KXZE1	FDC560KXZE1 FDCS560KXZE1
Nominal cooling capacity*1		28.0	33.5	40.0	45.0	47.5	50.0	56.0
Nominal heating capacity*2		31.5	37.5	45.0	50.0	53.0	56.0	63.0
Power source		3 Phase 380-415V 50Hz / 380V 60Hz						
Power consumption		kW	8.96	10.96	13.98	13.98	13.97	16.62
Running current		A	9.04	10.69	12.50	13.00	13.49	15.95
Power factor		%	11.9 / 10.9	17.5 / 16.2	22.4 / 20.5	22.6 / 20.7	22.6 / 20.7	26.9 / 24.6
Sound Pressure Level		dB (A)	12.0 / 11.0	14.8 / 13.5	20.4 / 18.7	21.0 / 19.2	21.8 / 20.0	25.8 / 23.6
Exterior dimensions			92 / 92	93 / 93	95 / 94	94 / 94	94 / 94	94 / 94
Height x Width x Depth		mm	92 / 92	93 / 93	93 / 93	94 / 94	94 / 94	94 / 94
Net weight		kg	55 / 57	61 / 58	60 / 62	61 / 62	61 / 62	64 / 66
Refrigerant equipment compressor type & Qty			1690×1350×720		2048×1350×720			
Motor		kW	272	317	370			
Starting method			GUC5150NC47LF×1		GTC5150NC47LF×2			
Crankcase heater		W	4.76×1	5.94×1	7.32×1	9.32×1	4.64×2	5.36×2
Refrigerant equipment Heat exchanger			33×1		40×1	Direct line starting		
Refrigerant control			M fin & inner grooved tubing		33×2			
Refrigerant			Electronic expansion valve		R410A			
Quantity		kg	11.0		11.5			
Refrigerant oil		l	2.25 (M-MA32R)	2.9 (M-MA32R)	4.2 (M-MA32R)			
Defrost control			Microcomputer controlled De-Icer		Propeller fan×2			
Air handling equipment fan type & Qty			386×2		Direct start			
Motor		W	220 / 200	280 / 200	280 / 260	280 / 260	280 / 260	310 / 290
Starting method			Max.50		Rubber mount (for compressor)			
Air flow (Standard)		CMH	Compressor overheat protection / overcurrent protection / power transistor overheating protection / abnormal high pressure protection		Liquid line : φ 12.7 (1/2")			
Static pressure		Pa	Liquid line : φ 9.52 (3/8")		Gas line : φ 28.58 (1 1/8")			
Shock & vibration absorber			Gas line : φ 25.4 (1") (φ 22.22 (7/8"))		Gas line : φ 25.4 (1") (φ 28.58 (1 1/8"))			
Safety equipment			Gas line : φ 25.4 (1") (φ 22.22 (7/8"))		Gas line : φ 25.4 (1") (φ 28.58 (1 1/8"))			
Installation data		mm (in)	Gas line : φ 25.4 (1") (φ 22.22 (7/8"))		Gas line : φ 25.4 (1") (φ 28.58 (1 1/8"))			
Refrigerant piping size			Gas line : φ 22.22 (7/8")		Gas line : φ 22.22 (7/8")			
Connecting method			Gas line : Brazing / Liquid line : Flare		Gas line : Brazing / Liquid line : Flare			
MAX. Pressure		MPa	High 4.15 Low 2.21		High 4.15 Low 2.21			
Drain			Hole for drain (φ 20×10pcs, φ 45×3pcs)		Hole for drain (φ 20×10pcs, φ 45×3pcs)			
Insulation for piping			Necessary (both Liquid & Gas lines)		Necessary (both Liquid & Gas lines)			
Accessories			-		-			
Exterior dimensions			PCB003Z817		PCB003Z818		PCB003Z818	
Electrical wiring			PCB003Z819		PCB003Z820		PCB003Z821	
Notes (1) The data are measured at the following conditions.			PCB003Z817		PCB003Z818		PCB003Z818	
Item		Indoor air temperature	Outdoor air temperature		Standards		Standards	
Operation		DB	WB	DB	WB	WB	WB	WB
Cooling*1		27°C	19°C	35°C	24°C	24°C	24°C	24°C
Heating*2		20°C	-	7°C	6°C	6°C	6°C	6°C
(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard. ISO-T1 "UNITARY AIR-CONDITIONERS"								
(3) Refrigerant piping size applicable to European installations are shown in parentheses.								
Adapted to RoHS directive								

PCB003Z816

• Combination use

Models		FDC615KXZE1 FDCS615KXZE1	FDC670KXZE1 FDCS670KXZE1	FDC735KXZE1 FDCS735KXZE1	FDC800KXZE1 FDCS800KXZE1	FDC850KXZE1 FDCS850KXZE1
Combination unit	Power source	3 Phase 380-415V 50Hz / 380V 60Hz				
	Nominal cooling capacity*1	61.5	67.0	73.5	80.0	85.0
Power consumption	Nominal heating capacity*2	69.0	75.0	82.5	90.0	95.0
	Cooling	16.20	17.92	19.92	21.92	24.94
Running current	Heating	16.32	18.08	19.73	21.38	23.19
	Cooling	26.5 / 24.3	29.2 / 26.8	32.1 / 29.6	35.0 / 32.4	39.9 / 36.7
Power factor	Heating	26.8 / 24.5	29.6 / 27.0	32.3 / 29.7	35.0 / 32.4	37.9 / 34.9
	Cooling	93 / 93	93 / 93	94 / 94	95 / 94	95 / 95
Net weight	Heating	93 / 93	93 / 93	93 / 92	93 / 92	93 / 92
	kg	544	544	589	634	634
Refrigerant piping size	Liquid line	φ 12.7				
	Gas line	φ 28.58				
Oil equalization		φ 9.52				
Models		FDC900KXZE1 FDCS900KXZE1	FDC950KXZE1 FDCS950KXZE1	FDC1000KXZE1 FDCS1000KXZE1	FDC1060KXZE1 FDCS1060KXZE1	FDC1120KXZE1 FDCS1120KXZE1
Combination unit	Power source	3 Phase 380-415V 50Hz / 380V 60Hz				
	Nominal cooling capacity*1	90.0	95.0	100.0	106.0	112.0
Power consumption	Nominal heating capacity*2	100.0	106.0	112.0	119.0	126.0
	Cooling	27.96	27.96	27.94	30.59	33.24
Running current	Heating	25.00	26.00	26.98	29.44	31.90
	Cooling	44.8 / 41.0	45.2 / 41.4	45.2 / 41.4	49.5 / 45.3	53.8 / 49.2
Power factor	Heating	40.8 / 37.4	42.0 / 38.4	43.6 / 40.0	47.6 / 43.6	51.6 / 47.2
	Cooling	95 / 95	94 / 94	94 / 94	94 / 94	94 / 94
Net weight	Heating	93 / 93	94 / 94	94 / 94	94 / 94	94 / 94
	kg	634	740	740	740	740
Refrigerant piping size	Liquid line	φ 15.88				
	Gas line	φ 31.75 (φ 34.92)				
Oil equalization		φ 9.52				

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

Item	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Operation	27°C	19°C	35°C	24°C	ISO-T1
Cooling*1	20°C	—	7°C	6°C	
Heating*2					

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

ISO-T1 "UNITARY AIR-CONDITIONERS"

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

Adapted to RoHS directive

PCB003Z816

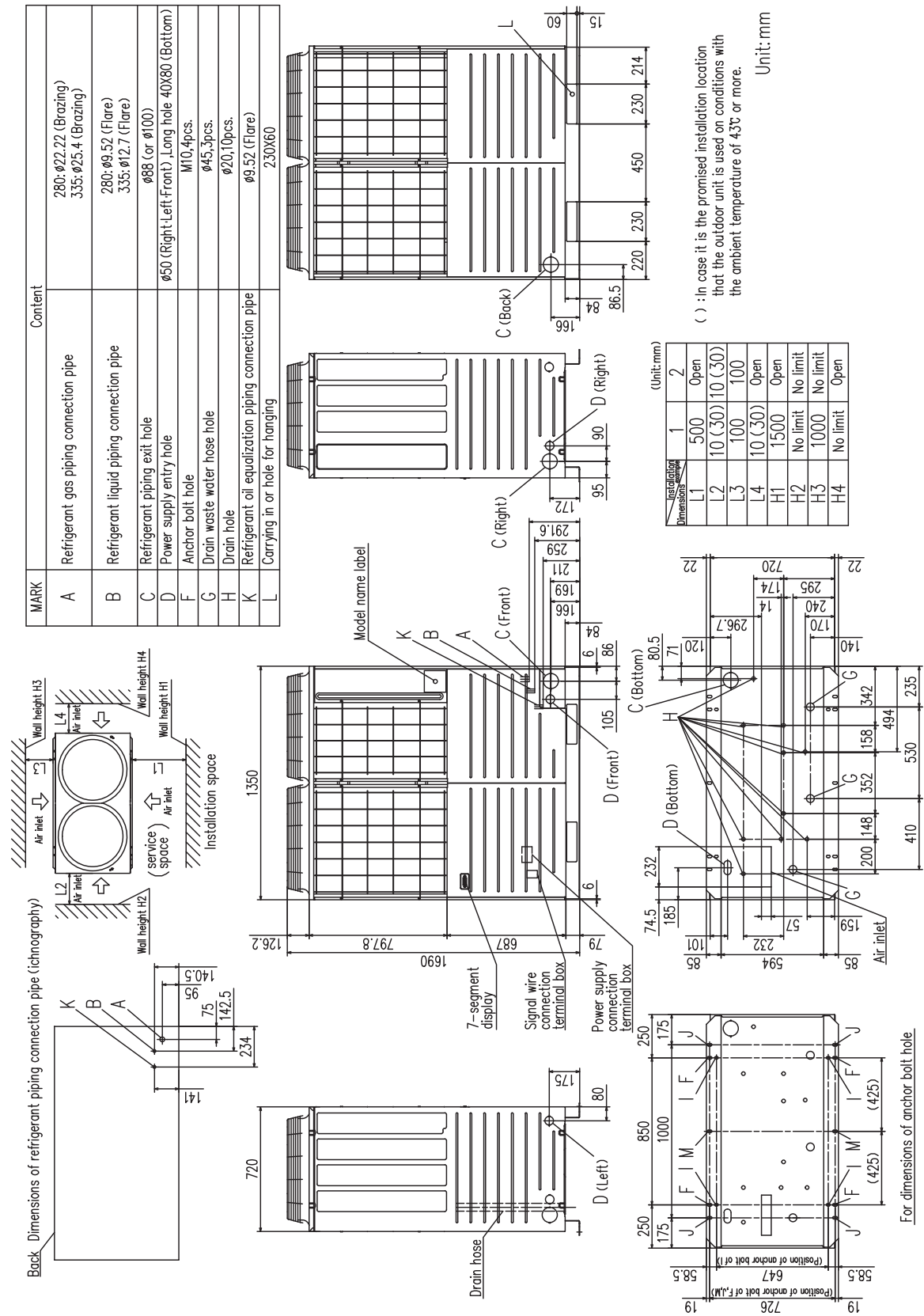
• Combination use

Models	FDC1200KXZE1 FDCS1200KXZE1	FDC1250KXZE1 FDCS1250KXZE1	FDC1300KXZE1 FDCS1300KXZE1	FDC1350KXZE1 FDCS1350KXZE1	FDC1425KXZE1 FDCS1425KXZE1
Combination unit	FDC400KXZE1 FDCS400KXZE1	FDC400KXZE1 FDCS400KXZE1	FDC400KXZE1 FDCS400KXZE1	FDC400KXZE1 FDCS400KXZE1	FDC400KXZE1 FDCS400KXZE1
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Power source	120.0	125.0	130.0	135.0	142.5
	135.0	140.0	145.0	150.0	159.0
	32.88	35.90	38.92	41.94	41.94
	32.07	33.88	35.69	37.50	39.00
Running current	52.5 / 48.6	57.4 / 52.9	62.3 / 57.2	67.2 / 61.5	67.8 / 62.1
	52.5 / 48.6	55.4 / 51.1	58.3 / 53.6	61.2 / 56.1	63.0 / 57.6
	95 / 94	95 / 94	95 / 95	95 / 95	94 / 94
	93 / 92	93 / 92	93 / 93	93 / 93	94 / 94
Net weight	951	951	951	951	1110
Refrigerant piping size	Liquid line	Liquid line	Liquid line	Liquid line	Liquid line
	Gas line	Gas line	Gas line	Gas line	Gas line
	Oil equalization	Oil equalization	Oil equalization	Oil equalization	Oil equalization
Models	FDC1450KXZE1 FDCS1450KXZE1	FDC1500KXZE1 FDCS1500KXZE1	FDC1560KXZE1 FDCS1560KXZE1	FDC1620KXZE1 FDCS1620KXZE1	FDC1680KXZE1 FDCS1680KXZE1
	FDC475KXZE1 FDCS475KXZE1	FDC500KXZE1 FDCS500KXZE1	FDC500KXZE1 FDCS500KXZE1	FDC500KXZE1 FDCS500KXZE1	FDC500KXZE1 FDCS500KXZE1
	FDC475KXZE1 FDCS475KXZE1	FDC500KXZE1 FDCS500KXZE1	FDC500KXZE1 FDCS500KXZE1	FDC500KXZE1 FDCS500KXZE1	FDC500KXZE1 FDCS500KXZE1
	FDC500KXZE1 FDCS500KXZE1	FDC500KXZE1 FDCS500KXZE1	FDC500KXZE1 FDCS500KXZE1	FDC500KXZE1 FDCS500KXZE1	FDC500KXZE1 FDCS500KXZE1
Power source	145.0	150.0	156.0	162.0	168.0
	162.0	168.0	175.0	182.0	189.0
	41.93	41.91	44.56	47.21	49.86
	39.49	40.47	42.93	45.39	47.85
Running current	67.8 / 62.1	67.8 / 62.1	72.1 / 66.0	76.4 / 69.9	80.7 / 73.8
	63.8 / 58.4	65.4 / 60.0	69.4 / 63.6	73.4 / 67.2	77.4 / 70.8
	94 / 94	94 / 94	94 / 94	94 / 94	94 / 94
	94 / 94	94 / 94	94 / 94	94 / 94	94 / 94
Net weight	1110	1110	1110	1110	1110
Refrigerant piping size	Liquid line	Liquid line	Liquid line	Liquid line	Liquid line
	Gas line	Gas line	Gas line	Gas line	Gas line
	Oil equalization	Oil equalization	Oil equalization	Oil equalization	Oil equalization

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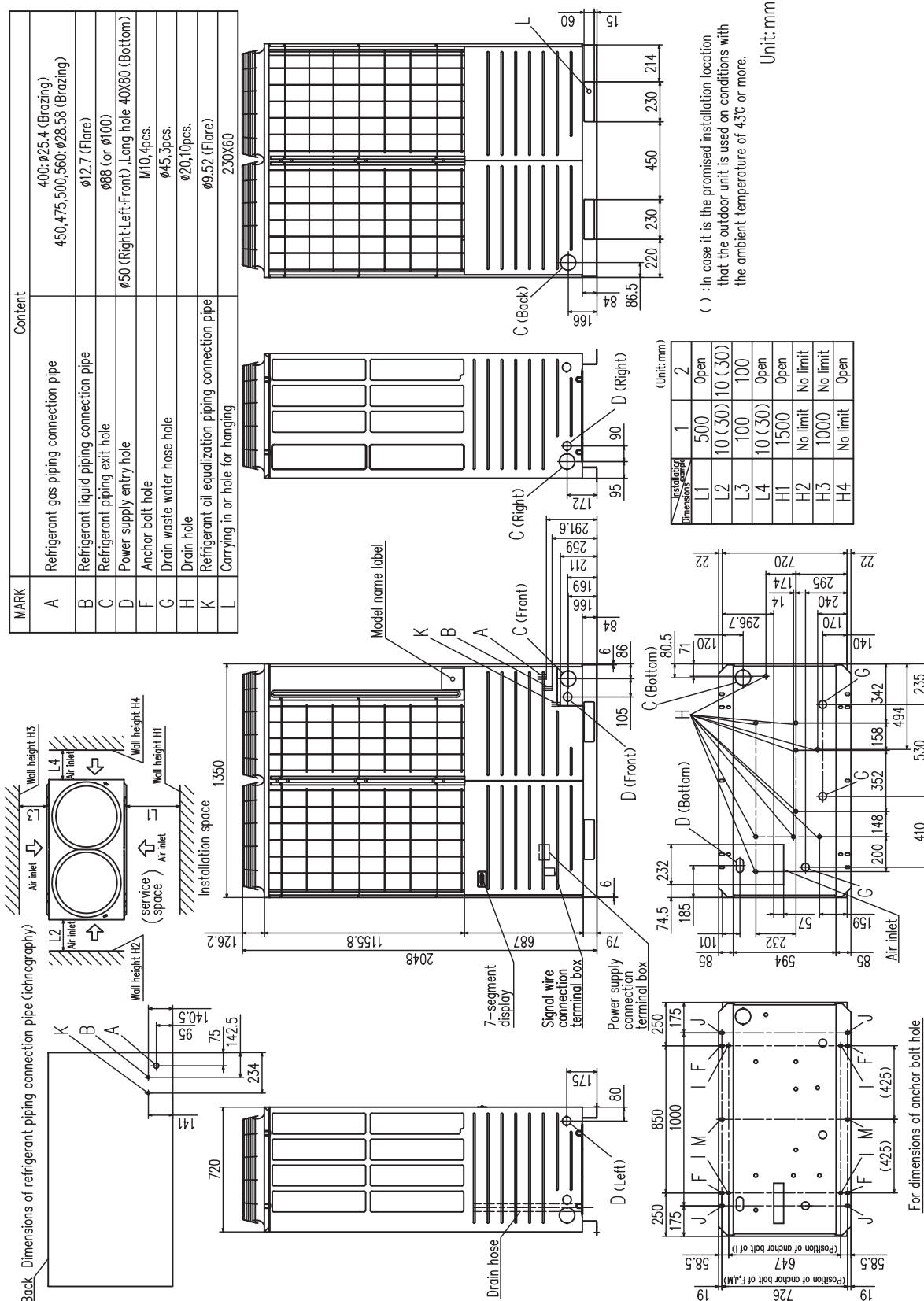
2.2 Exterior dimensions

Models FDC280KXZE1, 335KXZE1
FDCS280KXZE1, 335KXZE1



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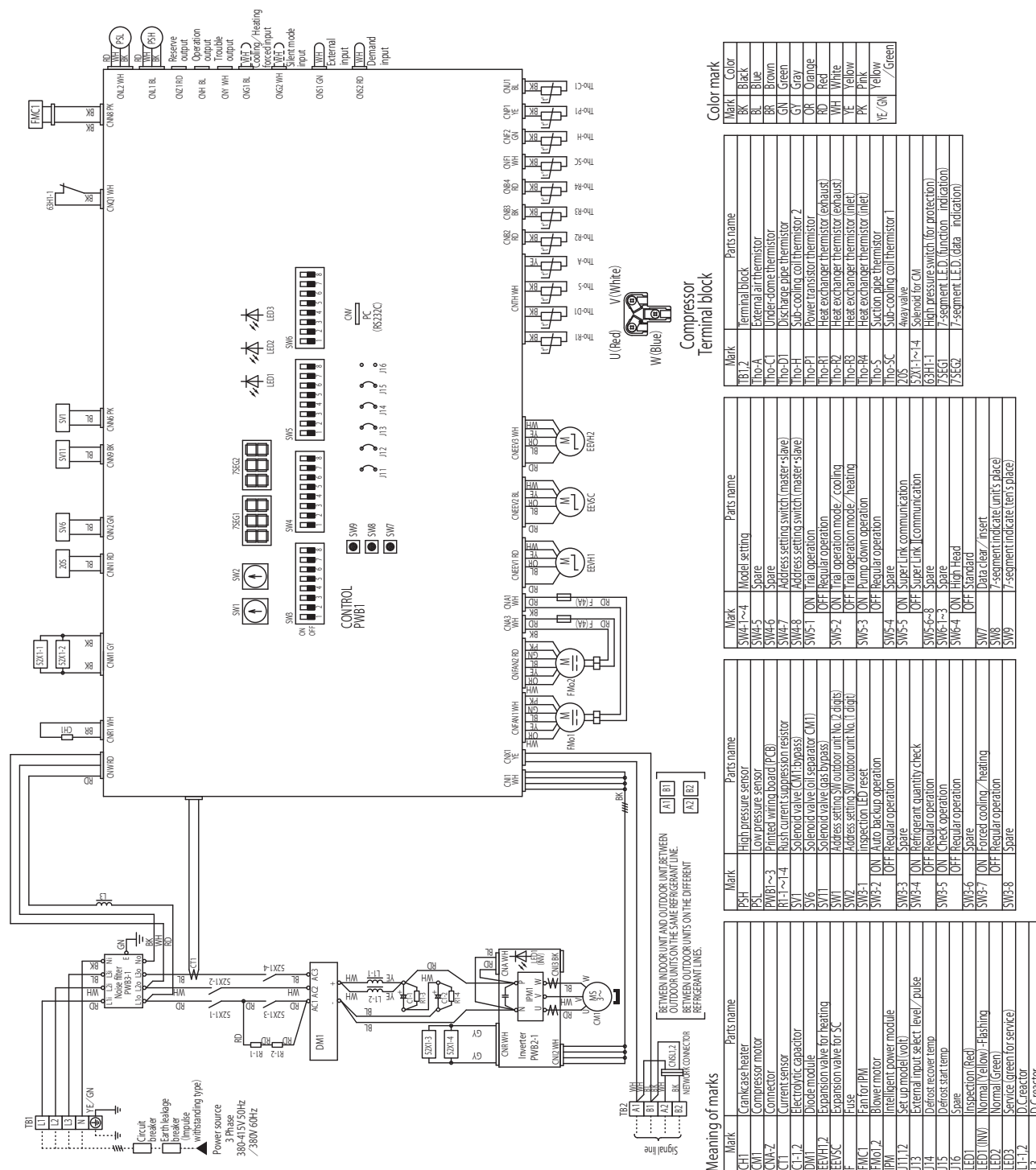
**Models FDC400KXZE1, 450KXZE1, 475KXZE1, 500KXZE1, 560KXZE1
FDSC400KXZE1, 450KXZE1, 475KXZE1, 500KXZE1, 560KXZE1**



PCB003Z818

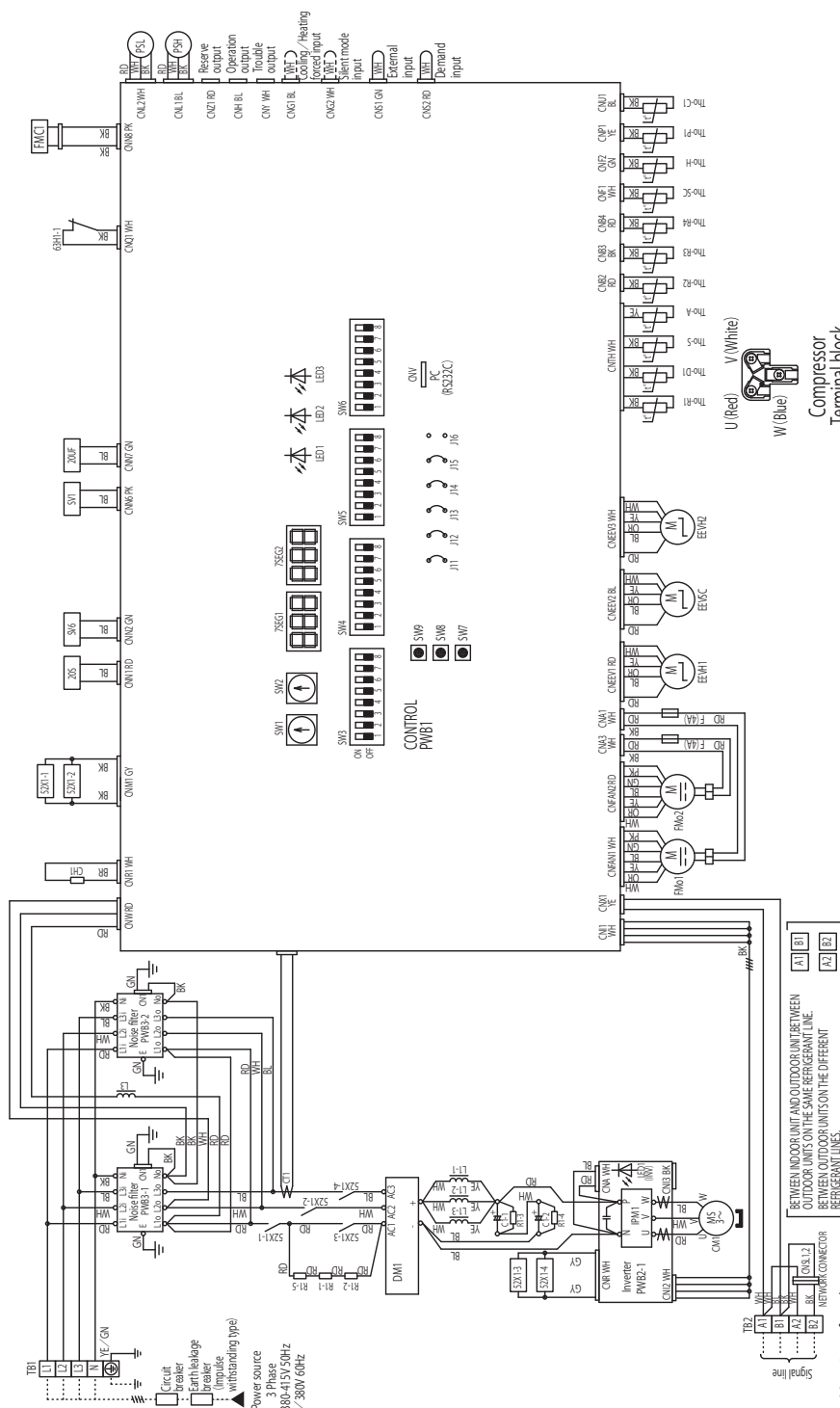
2.3 Electrical wiring

Models FDC280KXZE1, 335KXZE1
FDCS280KXZE1 335KXZE1



PCB003Z819

Models FDC400KXZE1, 450KXZE1
FD400KXZE1, 450KXZE1



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

Mark	Parts name
TB1.2	Terminal block
Th-A	External air thermistor
Tho-A	Under-dome thermistor
Tho-C1	Discharge pipe thermistor
Tho-D1	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-SC	Suction pipe thermistor
Tho-SC	Sub-cooling coil thermistor 1
Z05	4-way valve
Z05F	Capacity control
SX11~14	Solenoid for CM1
63H1-1	High pressure switch (for protection)
7SEG1	7-segment LED (function indication)
7SEG2	7-segment LED (data indication)

Mark	Parts name
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
SW5-2	ON Trial operation / cooling
SW5-3	ON Trial operation mode / heating
SW5-4	ON Pump down operation
SW5-5	OFF Regular operation
SW5-6	Spare
SW5-7	ON Super Link communication
SW5-8	OFF Super Link I communication
SW5-9	Spare
SW6-1~3	Spare
SW6-4	ON High Head
SW6-5	OFF Standard
SW7	Data clear / insert
SW8	7-segment indicate (unit's place)
SW9	7-segment indicate (ten's place)

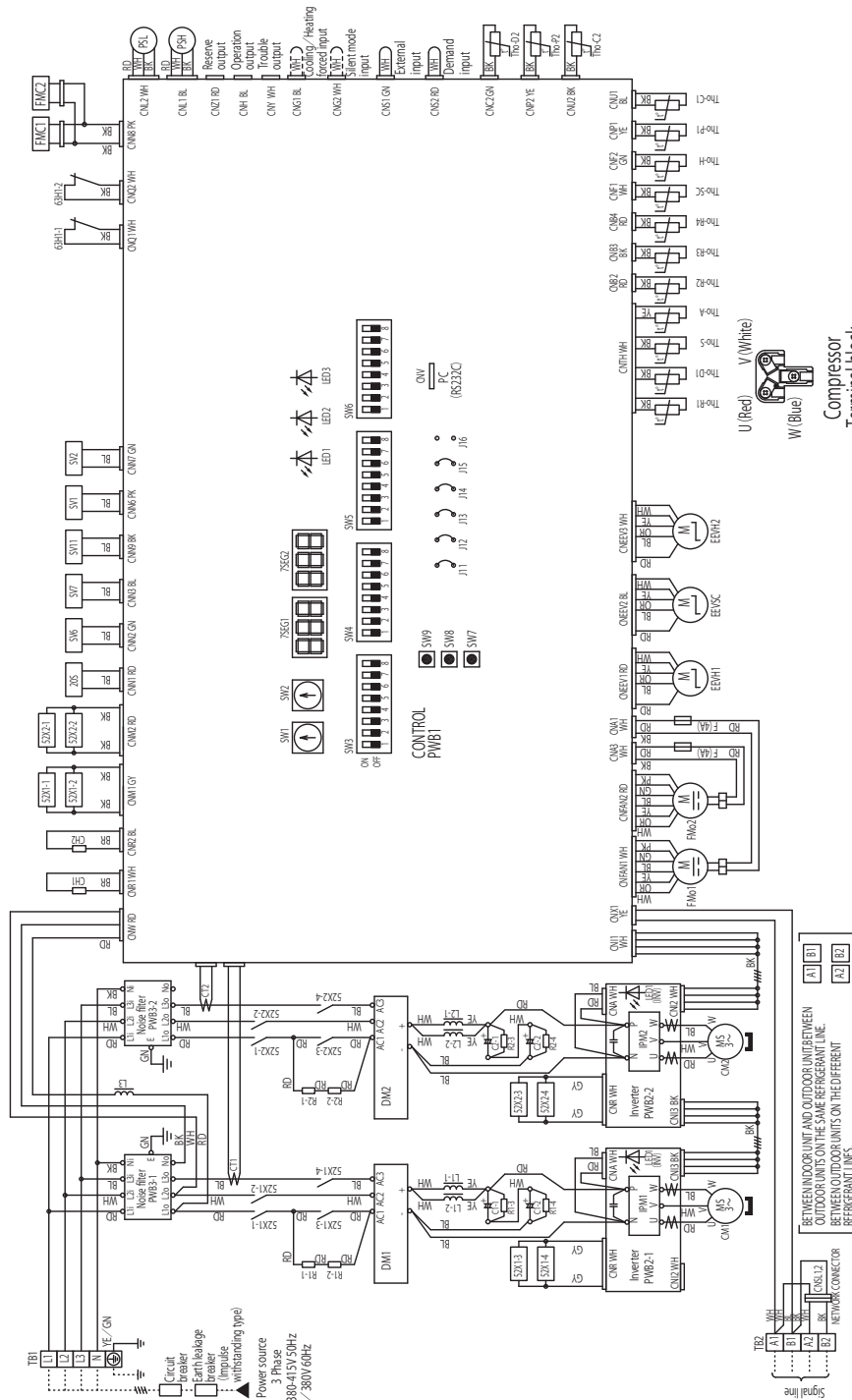
Mark	Parts name
PSH	High pressure sensor
PSL	Low pressure sensor
PWR1~3	Printed wiring board (PCB)
R1-1~15	Rich current suppression resistor
SV1	Solenoid valve (oil bypass)
SV6	Solenoid valve (oil separator CM1)
SW1	Address setting SW (outdoor unit No. 2 digit)
SW2	Address setting SW (outdoor unit No. 1 digit)
SW3-1	Inspection LED reset
SW3-2	ON Auto backup operation
SW3-3	OFF Regular operation
SW3-4	Spare
SW3-5	ON Refrigerant quantity check
SW3-6	OFF Regular operation
SW3-7	ON Check operation
SW3-8	OFF Regular operation
SW3-9	Spare
SW3-10	ON Forced cooling / heating
SW3-11	OFF Regular operation
SW3-12	Spare

Meaning of marks

Mark	Parts name
CH1	Crankcase heater
CM1	Compressor motor
CNA-Z	Connector
CT1	Current sensor
CI-1.2	Electronic capacitor
DM1	Diode module
EDH1.2	Expansion valve for heating
EDH5C	Expansion valve for SC
Fuse	Fuse
FAN1	Fan for PPM
FAN1.2	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	Spare
LED1	Inspection (Red)
LED1 (INV)	Normal (Yellow) - Flashing
LED2	Normal (Green)
LED3	Service (green for service)
L1-1~3	D.C reactor
L3	D.C reactor

PCB003Z820

**Models FDC475KXZE1, 500KXZE1, 560KXZE1
FDSC475KXZE1, 500KXZE1, 560KXZE1**



PCB003Z821

2.4 Noise level

Measured based on JIS B 8616

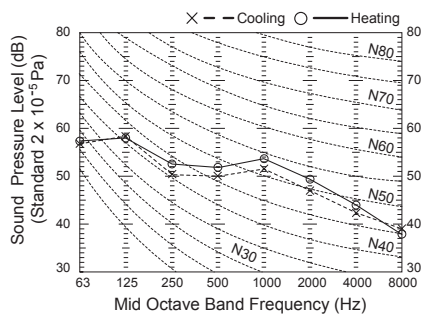
Mike position as highest noise level in position as below

Distance from front side 1m

Height 1m

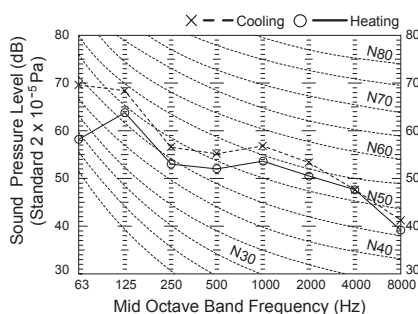
Model FDC280KXZE1 FDCS280KXZE1

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



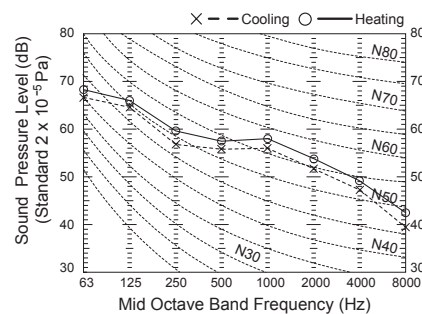
Model FDC335KXZE1 FDCS335KXZE1

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



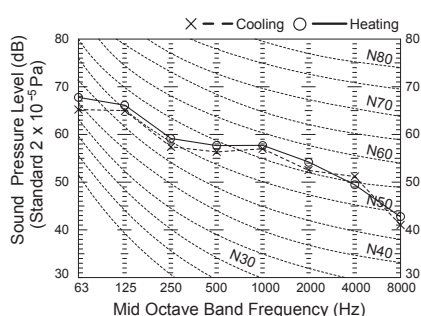
Model FDC400KXZE1 FDCS400KXZE1

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



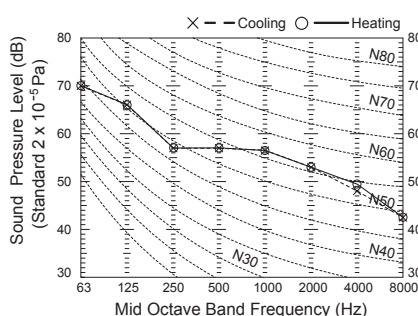
Model FDC450KXZE1 FDCS450KXZE1

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



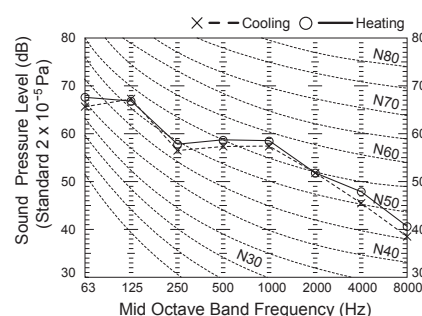
Model FDC475KXZE1 FDCS475KXZE1

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



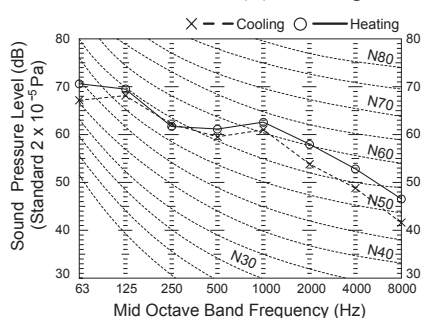
Model FDC500KXZE1 FDCS500KXZE1

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



Model FDC560KXZE1 FDCS560KXZE1

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



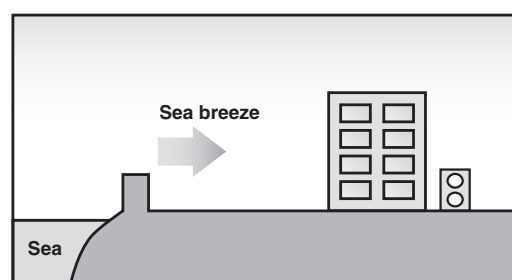
2.5 Corrosion protection treatment series

KXZ outdoor series are available with special coating applied for not only sheet metals but also small parts in order to prevent salt corrosion caused by sea breeze in area along coast line (Within approximately 500m from coast line).

Model No. Nominal Cooling Capacity

FDCS280KXZE1	28.0kW
FDCS335KXZE1	33.5kW
FDCS400KXZE1	40.0kW
FDCS450KXZE1	45.0kW
FDCS475KXZE1	47.5kW
FDCS500KXZE1	50.0kW
FDCS560KXZE1	56.0kW

Production by order



Additional treatment from the standard series

Parts		Description
Exterior panel		undercoat: Cation electrodeposition coating topcoat: acrylic baked coating
Base plate		undercoat: Cation electrodeposition coating topcoat: acrylic baked coating
Drain pan		undercoat: Cation electrodeposition coating topcoat: acrylic baked coating
Fan motor		application of anticorrosion compound
Fan motor base		application of anticorrosion compound
Heat exchanger	Fin	Precoated Aluminum Blue Fins in high anticorrosion specification
	pipe	application of anticorrosion compound
	Side plate	application of anticorrosion compound
Compressor		application of anticorrosion compound
Accumulator		application of anticorrosion compound
Receiver		application of anticorrosion compound
Control box		galvanized steel sheet + undercoat: Cation electrodeposition coating + topcoat: acrylic baked finish
Baffle plate		
Service valve bracket		galvanized steel sheet + undercoat: Cation electrodeposition coating + topcoat: acrylic baked finish
Screw tap for exterior panel		zinc coating + chromate treatment + fluorine coating
Screw tap for inside of exterior panel		zinc coating + chromate treatment + fluorine coating

Corrosion protection treatment complies with regulation of The Japan Refrigeration and Air Conditioning Industry Association

Caution

Even if the outdoor unit is protected with the anti-salt damage treatment, it cannot be perfectly free from rusting. The following points should be kept in mind during installation and maintenance of the outdoor units.

Installation

- (1) When installing the outdoor unit close to the coastal area, provide a windbreak to protect it from direct sea breeze and salt water splash.
- (2) Select a well-drained place to install.
- (3) If any scratch or damages occurred on the outdoor unit during installation, repair it carefully.

Maintenance

- (1) Clean salt grains on the outdoor unit with fresh water periodically.
- (2) Apply rust preventive at regular intervals for maintenance depending on the conditions at the installation place (consulting with the withstanding capacity).
- (3) Confirm reset of screw tap after maintenance, if missing it may cause corrosion occurred from the hole of screw tap.
- (4) During prolonged non operation periods, protect the unit with covering.

3. RANGE OF USAGE & LIMITATIONS

• Single use (also for combined use)

System		FDC280KXZE1 FDCS280KXZE1	FDC335KXZE1 FDCS335KXZE1	FDC400KXZE1 FDCS400KXZE1
Item				
Indoor air temperature (Upper, lower limits)		Refer to page 19		
Outdoor air temperature (Upper, lower limits)				
Indoor units that can be used in combination	Number of connected units	1 to 24 units	1 to 29 units	1 to 34 units
	Connectable capacity ⁽¹⁾	140 - 364	168 - 435	200 - 520
Total piping length ⁽²⁾		1000m or less		
Main pipe length		130m or less		
Single direction piping length		Actual length : 160m or less, Equivalent length : 185m or less		
Allowable pipe length from the first branching		90m or less (However, difference between the longest and shortest piping : 40m or less ⁽⁶⁾)		
Elevation difference between the first branching point and the indoor unit		18m or less		
Difference in height between indoor and outdoor units	Outdoor unit is higher	50m or less (Max. 70m or less) ⁽⁵⁾		
	Outdoor unit is lower	40m or less ⁽³⁾		
Difference in the elevation of indoor units in a system		18m or less		
Indoor unit atmosphere (behind ceiling) temperature and humidity (Only models FDT, FDT, FDTW, FDT, FDTQ,) (FDE, FDK, FDFL, FDFU, FDFW : Dew point temperature 23℃ or less, relative humidity 80% or less)		Dew point temperature 28℃ or less, relative humidity 80% or less (FDE, FDK, FDFL, FDFU, FDFW : Dew point temperature 23℃ or less, relative humidity 80% or less)		
Compressor stop/start frequency	1 cycle time	5 min or more (from stop to stop or from start to start)		
	Stop time	3 min or more		
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage		
	Voltage drop during start	Within -15% of rated voltage		
	Phase unbalance	Within 3%		

System		FDC450KXZE1 FDCS450KXZE1	FDC475KXZE1 FDCS475KXZE1	FDC500KXZE1 FDCS500KXZE1	FDC560KXZE1 FDCS560KXZE1
Item					
Indoor air temperature (Upper, lower limits)		Refer to page 19			
Outdoor air temperature (Upper, lower limits)					
Indoor units that can be used in combination	Number of connected units	1 to 39 units	1 to 41 units	1 to 43 units	1 to 48 units
	Connectable capacity ⁽¹⁾	225 - 585	238 - 617	250 - 650	280 - 728
Total piping length ⁽²⁾		1000m or less			
Main pipe length		130m or less			
Single direction piping length		Actual length : 160m or less, Equivalent length : 185m or less			
Allowable pipe length from the first branching		90m or less (However, difference between the longest and shortest piping : 40m or less ⁽⁶⁾)			
Elevation difference between the first branching point and the indoor unit		18m or less			
Difference in height between indoor and outdoor units	Outdoor unit is higher	50m or less (Max. 70m or less) ⁽⁵⁾			
	Outdoor unit is lower	40m or less ⁽³⁾			
Difference in the elevation of indoor units in a system		18m or less			
Indoor unit atmosphere (behind ceiling) temperature and humidity (Only models FDT, FDT, FDTW, FDT, FDTQ,) (FDE, FDK, FDFL, FDFU, FDFW : Dew point temperature 23℃ or less, relative humidity 80% or less)		Dew point temperature 28℃ or less, relative humidity 80% or less (FDE, FDK, FDFL, FDFU, FDFW : Dew point temperature 23℃ or less, relative humidity 80% or less)			
Compressor stop/start frequency	1 cycle time	5 min or more (from stop to stop or from start to start)			
	Stop time	3 min or more			
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage			
	Voltage drop during start	Within -15% of rated voltage			
	Phase unbalance	Within 3%			

Note (1) When connecting the indoor unit type FDK, FDFL, FDFU or FDFW Series, limit the connectable capacity not higher than 130%.

(2) When the pipe extension length exceeds 510 m, additional refrigerant oil must be charged (1,000 cc).

(3) It must be less than 30 m when conducting the cooling operation with the outdoor air temperature lower than 10℃.

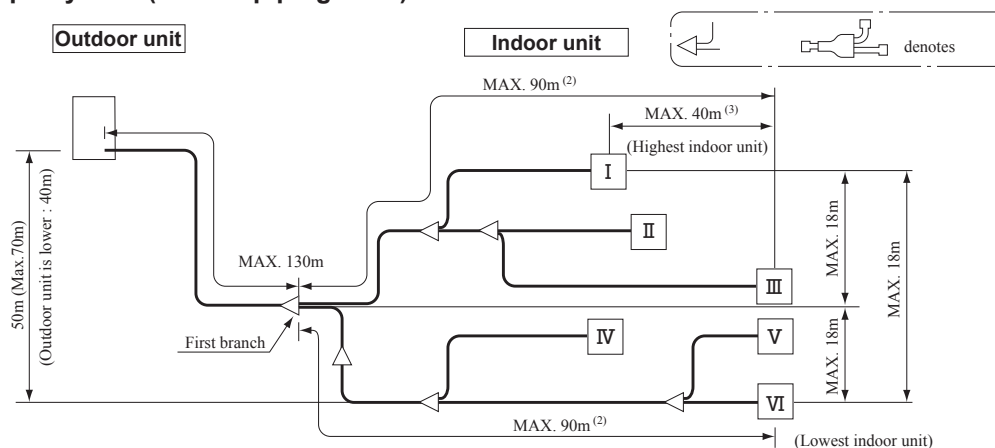
(4) If superlink I (previous superlink) is selected, all the range of usage and limitations, not only the limitations of connectable indoor capacity and connectable number of indoor unit but also of the piping length, operating temperature range and etc., become same as those of KX4 (See technical manual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

(5) When it is required to install in a range of 50 to 70 m, the limitation of use, etc. are different from those described here. For details, refer to page 20.

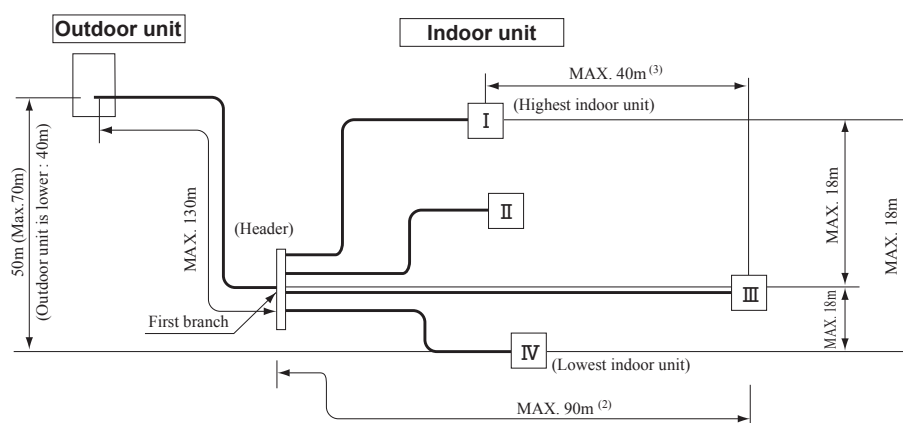
(6) When it is required to install in the difference between the longest and shortest piping more than 40m, refer to page 21.

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

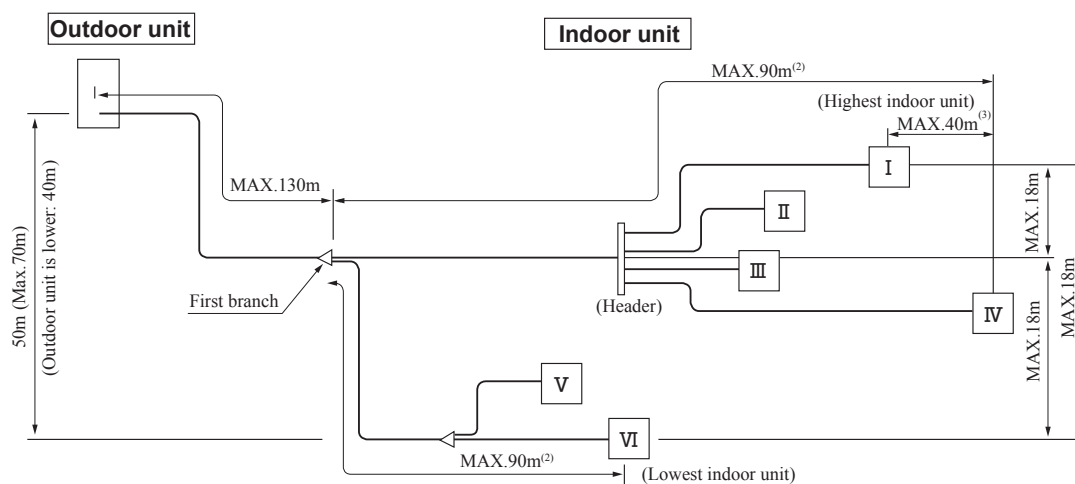
(1) Branch pipe System (Branch piping used)



(2) Header System (Header used)



(3) Mixed System (Branch piping and Header used)



Note (1) A branch piping system cannot be connected after a header system.

(2) 90m or less (However, difference between the longest and shortest piping : 40m or less⁽³⁾)

(3) When it is required to install the difference between the longest and shortest piping more than 40m, refer to page 21.

Important

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

Outdoor unit	P + I (kg)
280-670	40
735-1350	80
1425-1680	100

P: Additional refrigerant quantity for piping (kg)

I: Additional refrigerant quantity for indoor units (kg)

• Combination use

System		FDC615KXZE1 FDCS615KXZE1	FDC670KXZE1 FDCS670KXZE1	FDC735KXZE1 FDCS735KXZE1	FDC800KXZE1 FDCS800KXZE1	FDC850KXZE1 FDCS850KXZE1
Item						
Indoor air temperature (Upper, lower limits)		Refer to page 19				
Outdoor air temperature (Upper, lower limits)						
Indoor units that can be used in combination	Number of connected units	2 to 53 units	2 to 58 units	2 to 63 units	2 to 69 units	2 to 73 units
	Connectable capacity ⁽¹⁾	308 – 799	335 – 871	368 – 955	400 – 1040	425 – 1105
Total piping length ⁽²⁾		1000m or less				
Single direction piping length		Actual length : 160m or less, Equivalent length : 185m or less				
Main pipe length		130m or less				
Allowable pipe length from the first branching		90m or less (However, difference between the longest and shortest piping : 40m or less ⁽⁶⁾)				
Elevation difference between the first branching point and the indoor unit		18m or less				
Difference in height between indoor and outdoor units	Outdoor unit is higher	50m or less (Max.70m or less) ⁽⁵⁾				
	Outdoor unit is lower	40m or less ⁽³⁾				
Difference in the elevation of indoor units in a system		18m or less				
Difference in height between outdoor units (Same system)		MAX. 0.4m				
Difference between an outdoor unit and on outdoor unit side branch pipe		MAX. 5m				
Length of oil equalization piping		MAX. 10m				
Indoor unit atmosphere (behind ceiling) temperature and humidity Only models FDT, FDTc, FDTW, FDTS, FDTQ, FDU, FDUM, FDUT, FDUH, FDU-F		Dew point temperature 28 ℃ or less, relative humidity 80% or less (FDE, FDK, FDFL, FDFU, FDFW : Dew point temperature 23 ℃ or less, relative humidity 80% or less)				
Compressor stop/start frequency	1 cycle time	5 min or more (from stop to stop or from start to start)				
	Stop time	3 min or more				
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage				
	Voltage drop during start	Within -15% of rated voltage				
	Phase unbalance	Within 3%				

System		FDC900KXZE1 FDCS900KXZE1	FDC950KXZE1 FDCS950KXZE1	FDC1000KXZE1 FDCS1000KXZE1	FDC1060KXZE1 FDCS1060KXZE1	FDC1120KXZE1 FDCS1120KXZE1
Item						
Indoor air temperature (Upper, lower limits)		Refer to page 19				
Outdoor air temperature (Upper, lower limits)						
Indoor units that can be used in combination	Number of connected units	2 to 78 units	2 to 80 units	2 to 80 units	2 to 80 units	2 to 80 units
	Connectable capacity	450 – 1170	475 – 1235	500 – 1300	530 – 1378	560 – 1456
Total piping length ⁽²⁾		1000m or less				
Single direction piping length		Actual length : 160m or less, Equivalent length : 185m or less				
Main pipe length		130m or less				
Allowable pipe length from the first branching		90m or less (However, difference between the longest and shortest piping : 40m or less ⁽⁶⁾)				
Elevation difference between the first branching point and the indoor unit		18m or less				
Difference in height between indoor and outdoor units	Outdoor unit is higher	50m or less (Max.70m or less) ⁽⁵⁾				
	Outdoor unit is lower	40m or less ⁽³⁾				
Difference in the elevation of indoor units in a system		18m or less				
Difference in height between outdoor units (Same system)		MAX. 0.4m				
Difference between an outdoor unit and on outdoor unit side branch pipe		MAX. 5m				
Length of oil equalization piping		MAX. 10m				
Indoor unit atmosphere (behind ceiling) temperature and humidity Only models FDT, FDTc, FDTW, FDTS, FDTQ, FDU, FDUM, FDUT, FDUH, FDU-F		Dew point temperature 28 ℃ or less, relative humidity 80% or less (FDE, FDK, FDFL, FDFU, FDFW : Dew point temperature 23 ℃ or less, relative humidity 80% or less)				
Compressor stop/start frequency	1 cycle time	5 min or more (from stop to stop or from start to start)				
	Stop time	3 min or more				
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage				
	Voltage drop during start	Within -15% of rated voltage				
	Phase unbalance	Within 3%				

Note (1) When connecting the indoor unit type FDK, FDFL, FDFU or FDFW Series, limit the connectable capacity not higher than 130%.

(2) When the pipe extension length exceeds 510 m, additional refrigerant oil must be charged (1,000 cc).

(3) It must be less than 30 m when conducting the cooling operation with the outdoor air temperature lower than 10°C.

(4) 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 and KXZ such as automatic address setting function for multiple refrigerant systems and etc. will be cancelled.

(5) When it is required to install in a range of 50 to 70 m, the limitation of use, etc. are different from those described here. For details, refer to page 20.

(6) When it is required to install in the difference between the longest and shortest piping more than 40m, refer to page 21.

System		FDC1200KXZE1 FDCS1200KXZE1	FDC1250KXZE1 FDCS1250KXZE1	FDC1300KXZE1 FDCS1300KXZE1	FDC1350KXZE1 FDCS1350KXZE1	FDC1425KXZE1 FDCS1425KXZE1
Item						
Indoor air temperature (Upper, lower limits)		Refer to page 19				
Outdoor air temperature (Upper, lower limits)						
Indoor units that can be used in combination	Number of connected units	3 to 80 units	3 to 80 units	3 to 80 units	3 to 80 units	3 to 80 units
	Connectable capacity ⁽¹⁾	600 – 1560	625 – 1625	650 – 1690	675 – 1755	713 – 1852
Total piping length ⁽²⁾		1000m or less				
Single direction piping length		Actual length : 160m or less, Equivalent length : 185m or less				
Main pipe length		130m or less				
Allowable pipe length from the first branching		90m or less (However, difference between the longest and shortest piping : 40m or less ⁽⁶⁾)				
Elevation difference between the first branching point and the indoor unit		18m or less				
Difference in height between indoor and outdoor units	Outdoor unit is higher	50m or less (Max.70m or less) ⁽⁵⁾				
	Outdoor unit is lower	40m or less ⁽³⁾				
Difference in the elevation of indoor units in a system		18m or less				
Difference in height between outdoor units (Same system)		MAX. 0.4m				
Difference between an outdoor unit and on outdoor unit side branch pipe		MAX. 5m				
Length of oil equalization piping		MAX. 10m				
Indoor unit atmosphere (behind ceiling) temperature and humidity Only models FDT, FDT, FDTW, FDTS, FDTQ, FDU, FDUM, FDUT, FDUH, FDU-F		Dew point temperature 28℃ or less, relative humidity 80% or less (FDE, FDK, FDFL, FDFU, FDFW : Dew point temperature 23℃ or less, relative humidity 80% or less)				
Compressor stop/start frequency	1 cycle time	5 min or more (from stop to stop or from start to start)				
	Stop time	3 min or more				
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage				
	Voltage drop during start	Within -15% of rated voltage				
	Phase unbalance	Within 3%				

System		FDC1450KXZE1 FDCS1450KXZE1	FDC1500KXZE1 FDCS1500KXZE1	FDC1560KXZE1 FDCS1560KXZE1	FDC1620KXZE1 FDCS1620KXZE1	FDC1680KXZE1 FDCS1680KXZE1
Item						
Indoor air temperature (Upper, lower limits)		Refer to page 19				
Outdoor air temperature (Upper, lower limits)						
Indoor units that can be used in combination	Number of connected units	3 to 80 units	3 to 80 units	3 to 80 units	3 to 80 units	3 to 80 units
	Connectable capacity	725 – 1885	750 – 1950	780 – 2080	810 – 2106	840 – 2184
Total piping length ⁽²⁾		1000m or less				
Single direction piping length		Actual length : 160m or less, Equivalent length : 185m or less				
Main pipe length		130m or less				
Allowable pipe length from the first branching		90m or less (However, difference between the longest and shortest piping : 40m or less ⁽⁶⁾)				
Elevation difference between the first branching point and the indoor unit		18m or less				
Difference in height between indoor and outdoor units	Outdoor unit is higher	50m or less (Max.70m or less) ⁽⁵⁾				
	Outdoor unit is lower	40m or less ⁽³⁾				
Difference in the elevation of indoor units in a system		18m or less				
Difference in height between outdoor units (Same system)		MAX. 0.4m				
Difference between an outdoor unit and on outdoor unit side branch pipe		MAX. 5m				
Length of oil equalization piping		MAX. 10m				
Indoor unit atmosphere (behind ceiling) temperature and humidity Only models FDT, FDT, FDTW, FDTS, FDTQ, FDU, FDUM, FDUT, FDUH, FDU-F		Dew point temperature 28℃ or less, relative humidity 80% or less (FDE, FDK, FDFL, FDFU, FDFW : Dew point temperature 23℃ or less, relative humidity 80% or less)				
Compressor stop/start frequency	1 cycle time	5 min or more (from stop to stop or from start to start)				
	Stop time	3 min or more				
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage				
	Voltage drop during start	Within -15% of rated voltage				
	Phase unbalance	Within 3%				

Note (1) When connecting the indoor unit type FDK, FDFL, FDFU or FDFW Series, limit the connectable capacity not higher than 130%.

(2) When the pipe extension length exceeds 510 m, additional refrigerant oil must be charged (1,000 cc).

(3) It must be less than 30 m when conducting the cooling operation with the outdoor air temperature lower than 10°C.

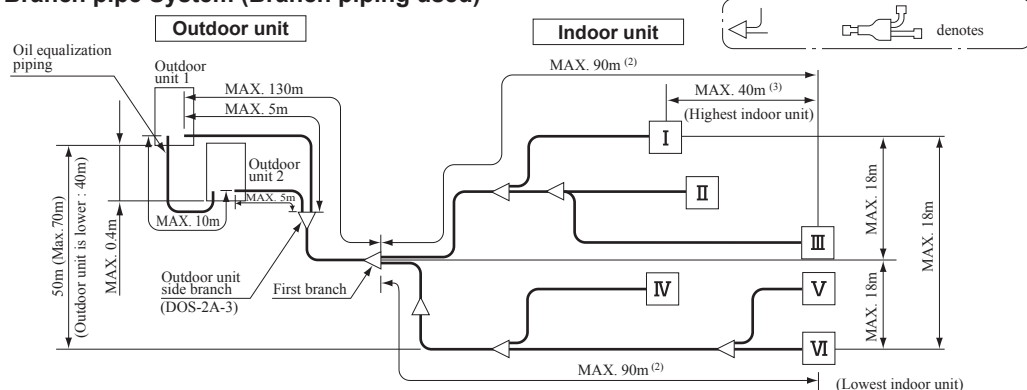
(4) If superlink I (previous superlink) is selected, all the range of usage and limitations, not only the limitations of connectable indoor capacity and connectable number of indoor unit but also of the piping length, operating temperature range and etc., become same as those of KX4 (See technical manual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

(5) When it is required to install in a range of 50 to 70 m, the limitation of use, etc. are different from those described here. For details, refer to page 20.

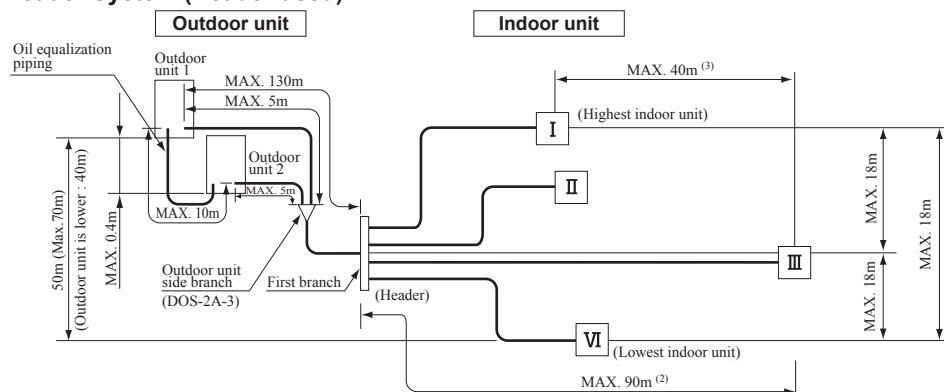
(6) When it is required to install in the difference between the longest and shortest piping more than 40m, refer to page 21.

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

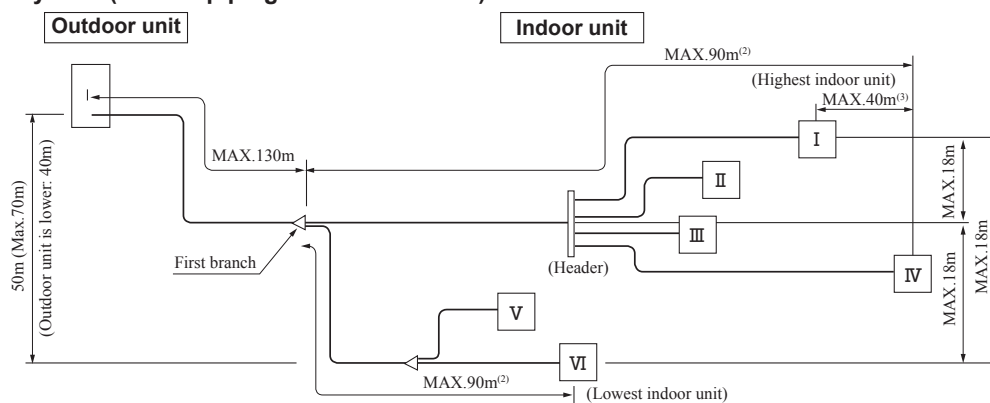
(1) Branch pipe System (Branch piping used)



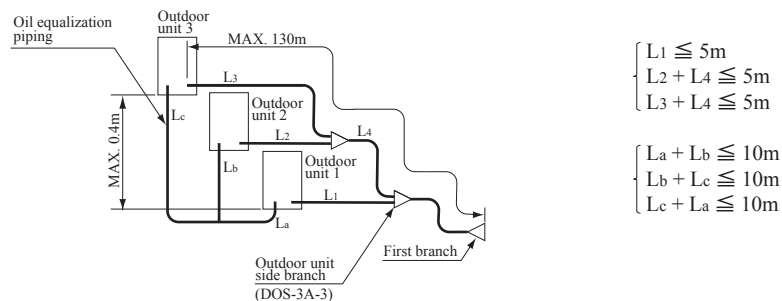
(2) Header System (Header used)



(3) Mixed System (Branch piping and Header used)



(4) Pipe system for combination of 3 outdoor units (Displaying only outdoor units)



Note (1) A branch piping system cannot be connected after a header system.

(2) 90m or less (However, difference between the longest and shortest piping : 40m or less ⁽³⁾)

(3) When it is required to install the difference between the longest and shortest piping more than 40m, refer to page 21.

Important

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

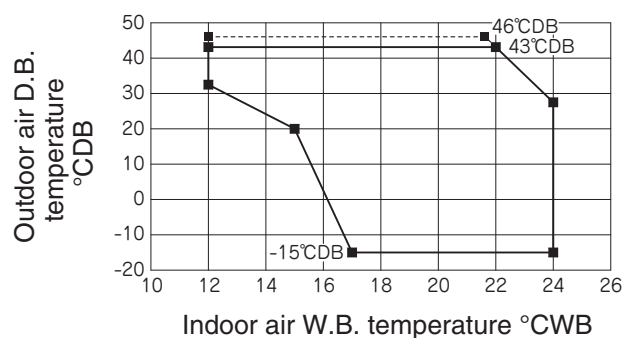
Outdoor unit	P + I (kg)
280-670	40
735-1350	80
1425-1680	100

P: Additional refrigerant quantity for piping (kg)

I: Additional refrigerant quantity for indoor units (kg)

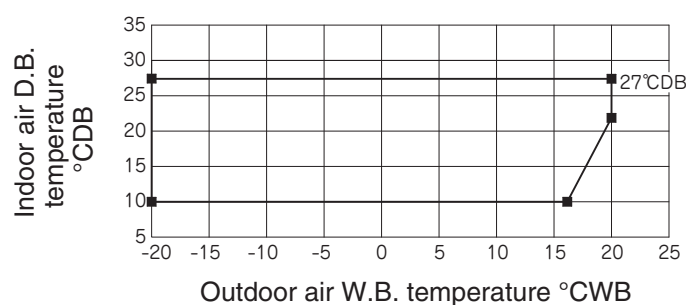
Operating temperature range

Cooling operation



*In case it is the promised installation location that the outdoor unit is used on conditions with the ambient temperature of 43°C or more, refer to page 7 (2.2 Exterior dimensions).

Heating operation



“CAUTION” Cooling operation under low outdoor air temperature conditions

KXZ 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.

Specification for installation with large head difference (Applicable to: FDC280 - 1680KXZE1)

In case when the outdoor unit is installed at a higher place and **the difference in the elevation between the indoor and the outdoor units is larger than 50 m and smaller than 70 m**, the limitation on application differs partially from ordinary applications and, instead, the following specification applies. The pipe size, refrigerant amount and way of switch setting become also different.

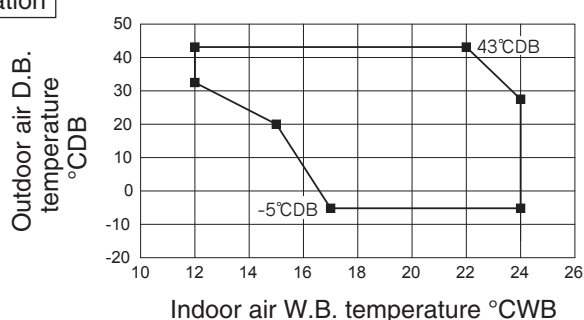
In the range of use, **the outdoor air temperature (lower limit), indoor units allowed to combine, total piping length and difference in the elevation between indoor units in the same system** are different from ordinary applications.

Table 1 Range of use

Item		FDC280-1680KXZE1 FDCS280-1680KXZE1
Indoor air temperature (Upper, lower limits)		Refer to Table 2
Outdoor air temperature (Upper, lower limits)		
Indoor units that can be used in combination	Number of connected units Connectable capacity	Refer to Table 3
Total piping length		510m or less
Main pipe length		130m or less
Single direction piping length		Actual length : 160m or less, Equivalent length : 185m or less
Allowable pipe length from the first branching		90m or less (However, difference between the longest and shortest piping : 40m or less)
Allowable difference in the elevation	Elevation difference between the first branching point and the indoor unit	18m or less
	Outdoor unit is higher	50m or more-70m or less
	Outdoor unit is lower	40m or less
	Difference in the elevation of indoor units in a system	15m or less
Limitation on piping from outdoor unit to branching pipe at outdoor unit side	Difference in the elevation	0.4m or less
	Elevation from outdoor unit to branching pipe at outdoor unit side	5m or less
	Oil equalizing pipe length	10m or less
	Length between outdoor branching pipes for a combination of 3 units	5m or less
Indoor unit atmosphere (behind ceiling) temperature and humidity Only models FDT,FDC,FDTW,FDTQ,FDTS,FDU,FDUM,FDUH,FDUT		Dew point temperature 28°C or less, relative humidity 80% or less (FDT,FDK,FDL,FDU,FDW : Dew point temperature 28°C or less, relative humidity 80% or less)
Compressor stop/start frequency	1 cycle time	5 min or less (from stop to stop or from start to start)
	Stop time	3 min or more
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage
	Voltage drop during start	Within -15% of rated voltage
	Phase unbalance	Within 3%

Table 2 Indoor air temperature/Outdoor air temperature

Cooling operation



Heating operation

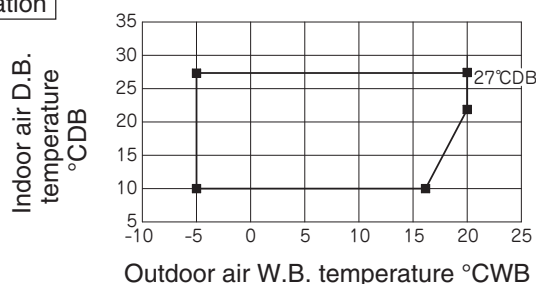


Table 3 Number of connectable indoor units and capacity range

Model/Item	Number of connectable units	Connectable capacity
FDC(S)280KXZE1	1 to 1.8	140 - 280
FDC(S)335KXZE1	1 to 2.2	168 - 335
FDC(S)400KXZE1	1 to 2.6	200 - 400
FDC(S)450KXZE1	1 to 3.0	225 - 450
FDC(S)475KXZE1	1 to 3.1	238 - 475
FDC(S)500KXZE1	1 to 3.3	250 - 500
FDC(S)560KXZE1	1 to 3.7	280 - 560
FDC(S)615KXZE1	2 to 4.1	308 - 615
FDC(S)670KXZE1	2 to 4.4	335 - 670
FDC(S)735KXZE1	2 to 4.9	368 - 735
FDC(S)800KXZE1	2 to 5.3	400 - 800
FDC(S)850KXZE1	2 to 5.6	425 - 850
FDC(S)900KXZE1	2 to 6.0	450 - 900
FDC(S)950KXZE1	2 to 6.3	475 - 950
FDC(S)1000KXZE1	2 to 6.6	500 - 1000
FDC(S)1060KXZE1	2 to 7.0	530 - 1060
FDC(S)1120KXZE1	2 to 7.4	560 - 1120
FDC(S)1200KXZE1	3 to 8.0	600 - 1200
FDC(S)1250KXZE1	3 to 8.0	625 - 1250
FDC(S)1300KXZE1	3 to 8.0	650 - 1300
FDC(S)1350KXZE1	3 to 8.0	675 - 1350
FDC(S)1425KXZE1	3 to 8.0	713 - 1425
FDC(S)1450KXZE1	3 to 8.0	725 - 1450
FDC(S)1500KXZE1	3 to 8.0	750 - 1500
FDC(S)1560KXZE1	3 to 8.0	780 - 1560
FDC(S)1620KXZE1	3 to 8.0	810 - 1620
FDC(S)1680KXZE1	3 to 8.0	840 - 1680

<Pipe size selection>

In the figure for pipe selection, sizes of main pipe and the pipe between the branch at the indoor side and the indoor unit are selected on the basis different from normal practice.

(1) Main pipe (branch of the outdoor unit – first branch at the indoor side)

Size of liquid pipe is different. Change the size of main pipe according to Table 4.

When the maximum length (from the outdoor unit to the furthest indoor unit) is larger than 90 m (actual length), change the size of main pipe according to Table 4.

Table 4 Main pipe size

Table 4 Main pipe size				
Outdoor unit	Main pipe size (normal)		Pipe size for an actual length of 90m or longer	
	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe
280	$\phi 22.22 \times t 1.0$	<u>$\phi 12.7 \times t 0.8$</u>	$\phi 25.4 (\phi 22.22) \times t 1.0$	<u>$\phi 12.7 \times t 0.8$</u>
335	$\phi 25.4 (\phi 22.22) \times t 1.0$	<u>$\phi 15.88 \times t 1.0$</u>		$\phi 28.58 \times t 1.0$
400	$\phi 25.4 (\phi 28.58) \times t 1.0$			
450	$\phi 28.58 \times t 1.0$			
475				
500				
560				
615				
670	$\phi 31.8 \times t 1.1$ ($\phi 28.58 \times t 1.0$)			
735				
800				
850				
900				
950	$\phi 31.8 \times t 1.1$ ($\phi 34.92 \times t 1.2$)	<u>$\phi 19.05 \times t 1.0$</u>	<u>$\phi 19.05 \times t 1.0$</u>	
1000				
1060				
1120				
1200				
1250	$\phi 38.1 \times t 1.35$ ($\phi 34.92 \times t 1.2$)	<u>$\phi 22.22 \times t 1.0$</u>	$\phi 38.1 \times t 1.35$ ($\phi 34.92 \times t 1.2$)	<u>$\phi 22.22 \times t 1.0$</u>
1300				
1350				
1425				
1450				
1500				
1560				
1620				
1680				

(2) Between branch at the indoor side and indoor unit

Size of gas pipe for indoor unit with capacity larger than 112 is different. Change the size of pipe connected to indoor unit according to Table 5.

Table 5 Indoor unit connecting pipe size

Indoor unit	Capacity	Gas pipe	Liquid pipe
	15,22,28	$\phi 9.52 \times t 0.8$	$\phi 6.35 \times t 0.8$
	36,45,56	$\phi 12.7 \times t 0.8$	
	71,90	$\phi 15.88 \times t 1.0$	
	112,140,160	$\phi 19.05 \times t 1.0$	$\phi 9.52 \times t 0.8$
	224	$\phi 22.22 \times t 1.0$	
	280	$\phi 25.4 \times t 1.0$	

(3) Refrigerant quantity

In addition to normal charge quantity for refrigerant pipes, charge quantity for the difference in capacity between the indoor and the outdoor units, and standard additional refrigerant quantity, measure and charge the additional refrigerant quantity for the installation with the difference in the elevation being over 50 m and less than 70 m.

Table 6 Additional refrigerant quantity for the installation with the difference in the elevation being over 50 m and less than 70 m

Outdoor unit	(kg)	Outdoor unit	(kg)	Outdoor unit	(kg)	Outdoor unit	(kg)
280	0.3	615	0.8	1000	1.6	1425	2.4
335	0.5	670	1.0	1060	1.7	1450	2.4
400	0.6	735	1.1	1120	1.8	1500	2.4
450	0.7	800	1.2	1200	1.8	1560	2.5
475	0.8	850	1.3	1250	1.9	1600	2.6
500	0.8	900	1.4	1300	2.0	1680	2.7
560	0.9	950	1.6	1350	2.1		

(4) Microcomputer control

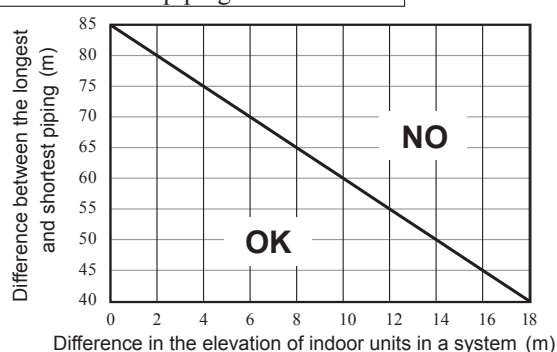
Setting of microcomputer control needs to be changed when the outdoor unit is installed upwards and the difference in elevation is larger than 50 m and less than 70 m. Make sure to set SW6-4 at ON position on both the master and slave units, before turning the power on.

Specification for installation with the difference between the longest and shortest piping more than 40m

When the difference between the longest and shortest piping is longer than 40 m, adjust the difference in the elevation of indoor units in a system such that it will fall in the OK range on the following graph.

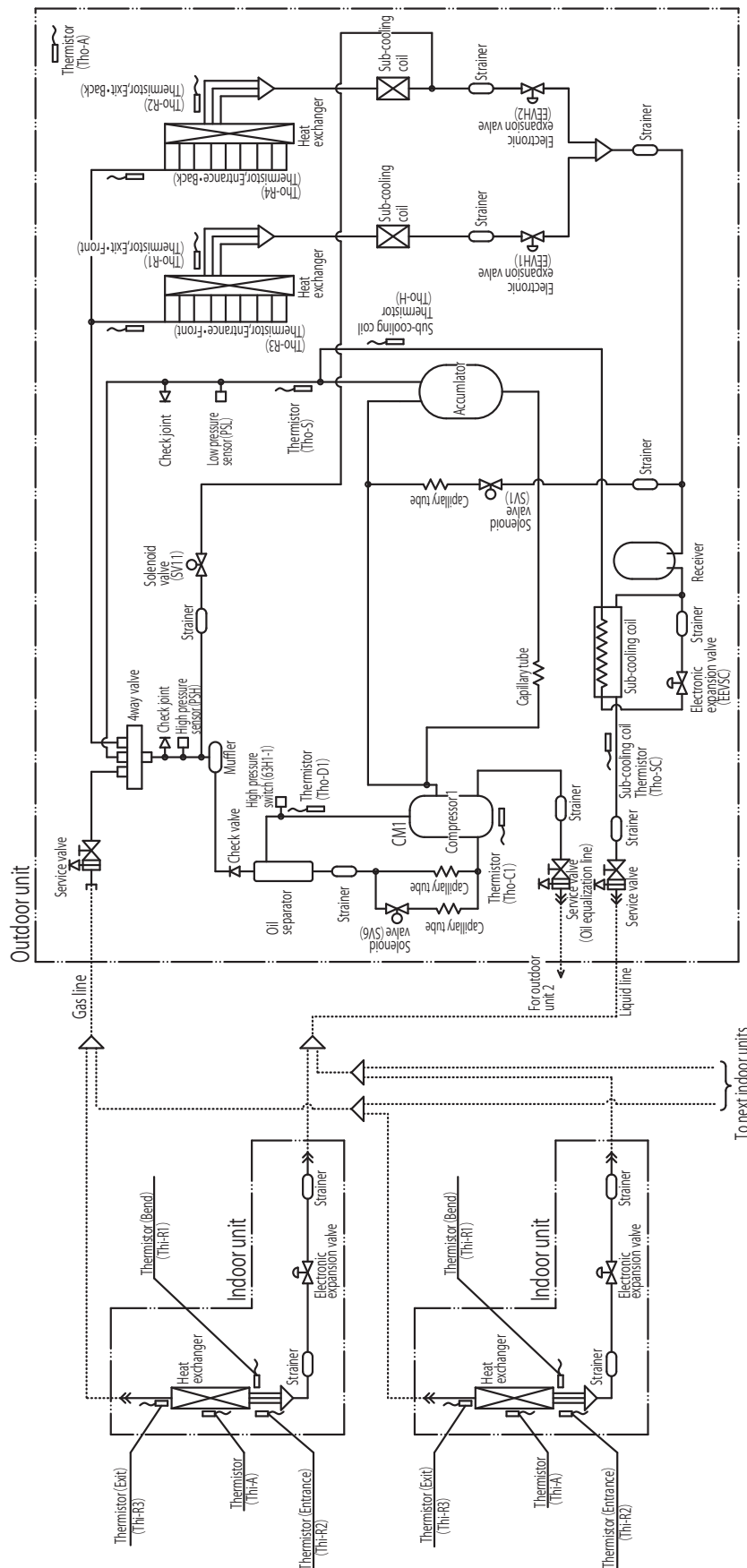
When the difference in the elevation between the indoor and the outdoor units is 50 m – 70 m, the difference between the longest and shortest piping cannot exceed 40 m. Reduce it to less than 40 m.

If the refrigerant quantity over occurs when the difference between the longest and shortest piping is longer than 40 m, there is a risk that the heating capacity becomes insufficient. Take sufficient care to adjust the additional refrigerant quantity at correct value.



4. PIPING SYSTEM

Models FDC280KXE1, 335KXE1
FDCS280KXE1, 335KXE1



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 : For control of defrosting.

Tho-A : For control of defrosting.

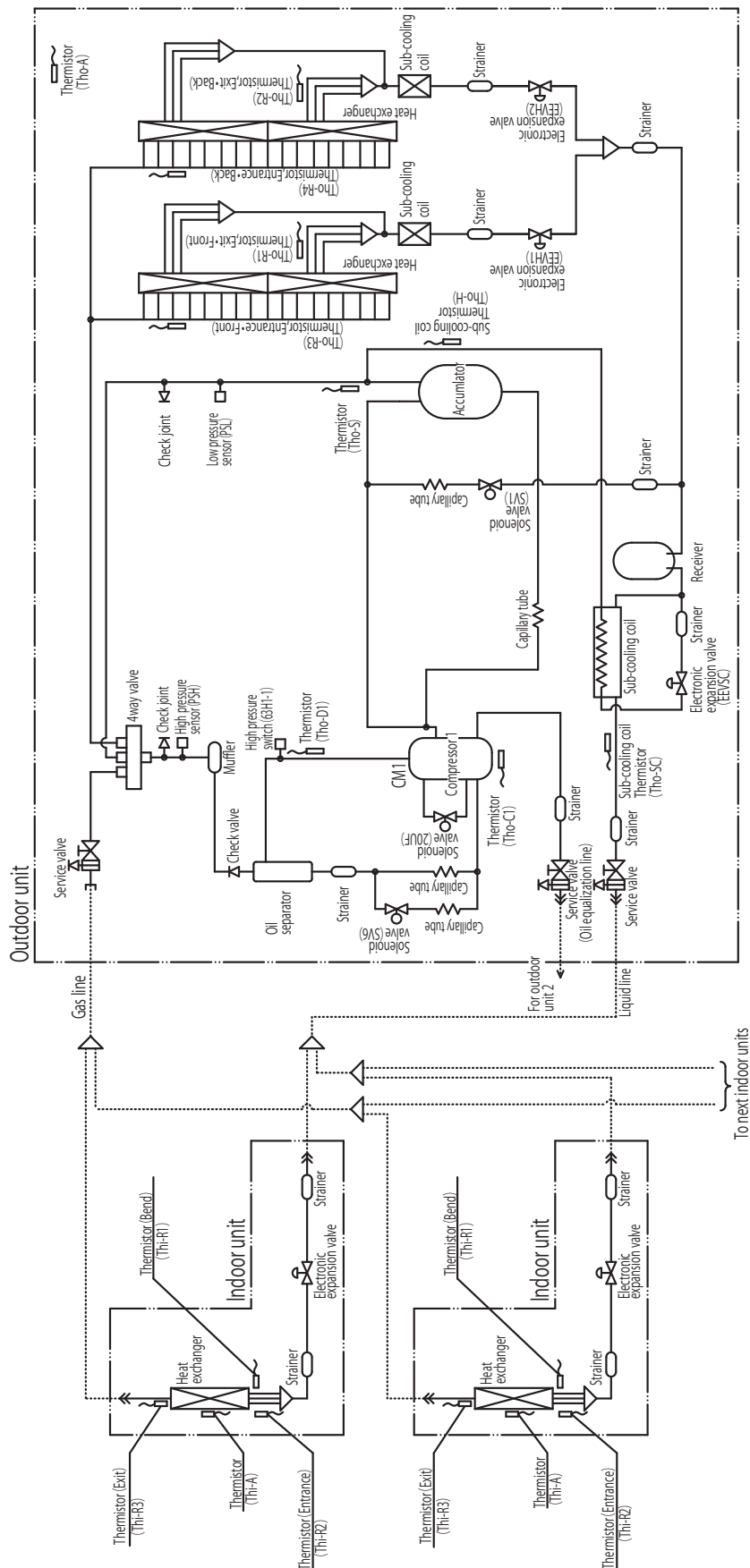
Tho-R3, R4 : Electronic expansion valve (EEVH1, 2) control of heating operation

Tho-SC : Electronic expansion valve (EEVSC) control of cooling operation.

Tho-H : For super heat control of sub-cooling coil.

PCB003Z822

Models FDC400KXE1, 450KXE1
FDCS400KXE1, 450KXE1



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 : For control of defrosting.

Tho-A : For control of defrosting.

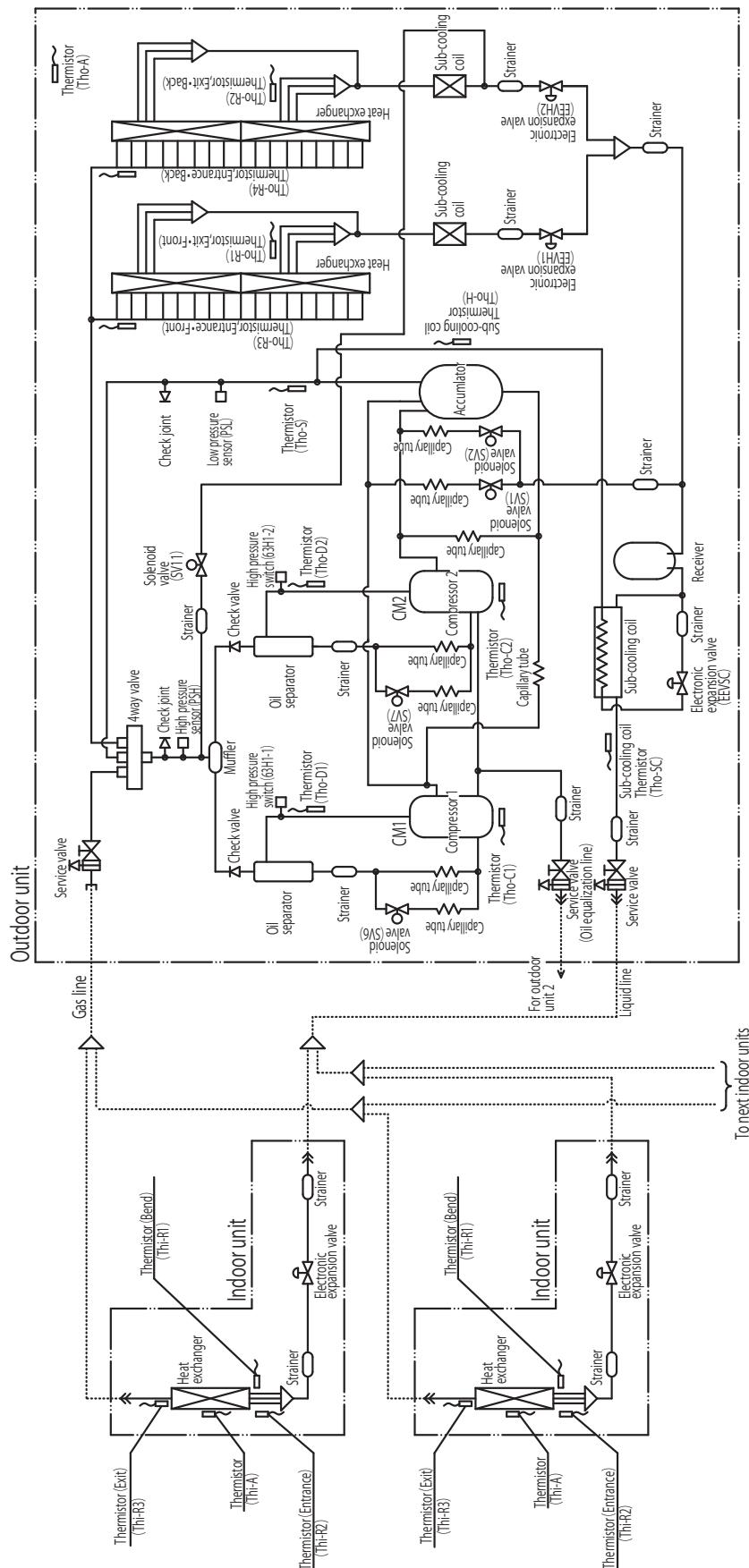
Tho-R3, R4 : Electronic expansion valve (EEVH1, 2) control of heating operation

Tho-SC : Electronic expansion valve (EEVSC) control of cooling operation.

Tho-H : For super heat control of sub-cooling coil.

PCB003Z823

**Models FDC475KXZE1, 500KXZE1, 560KXZE1
FD475KXZE1, 500KXZE1, 560KXZE1**



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 : For control of defrosting.

Tho-A : For control of defrosting.

Tho-R3, R4 : Electronic expansion valve (EEVH1, 2) control of heating operation

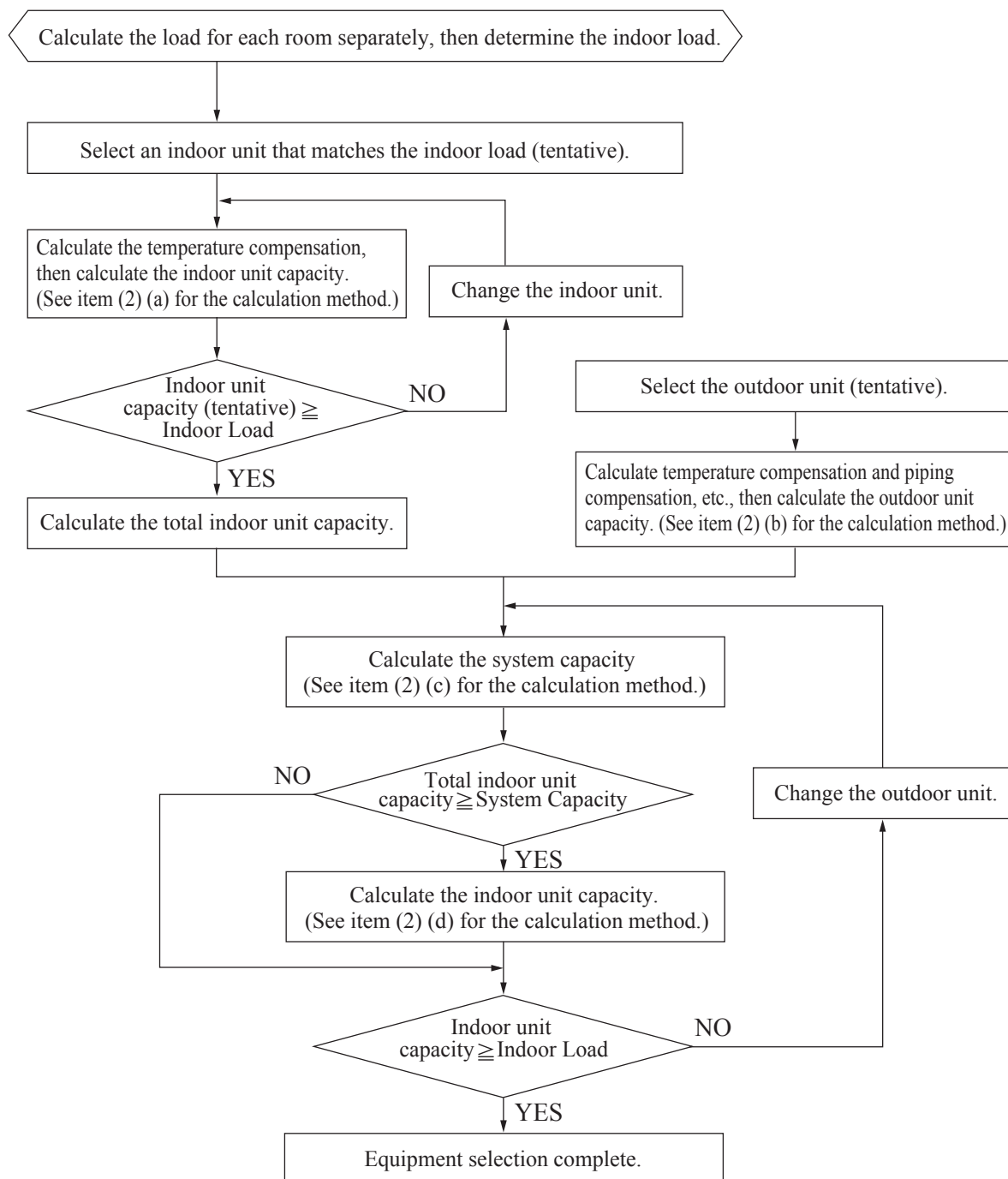
Tho-SC : Electronic expansion valve (EEVSC) control of cooling operation.

Tho-H : For super heat control of sub-cooling coil.

PCB003Z824

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) ① only]

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 FDC450KXZE1 1 Unit
- Indoor unit FDT56KXE6F 7 Units, All fan tap: PHi
- 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 28)
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 28)
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 30)
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 concurrently operating indoor unit: (56 × 7) / 450 ≈ 87%); (See page 47-1)
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 34)
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 FDC450KXZE1 1 Unit
- Indoor unit FDT56KXE6F 10 Units, All fan tap: PHi
- 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 28)
- Indoor unit cooling capacity: $5.6 \text{ kW} \times 0.95 \approx 5.3 \text{ kW}$
- Indoor unit total cooling capacity calculation;
indoor unit total cooling capacity: $5.3 \text{ kW} \times 10 \text{ units} \approx \underline{53.0 \text{ kW}}$

<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 28)
- Outdoor unit cooling capacity: $45.0 \text{ kW} \times 0.95 \approx 42.8 \text{ kW}$
- Capacity compensation coefficient according to piping length: 0.94 (calculated according to 60 m length); (See page 30)
- Collection of cooling capacity in relation to the anti-frost: 1.0 (calculated according to outdoor 35°C DB, Total capacity of concurrently operating indoor unit: $(56 \times 10) / 450 \approx 124\%$)
- 42.8 kW $\times 0.94 \approx 40.2 \text{ kW}$
- 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: $1.04 \leftarrow (56 \times 10) / 450 \approx 124\%$ (See page 36)
- 40.2 kW $\times 1.04 \approx \underline{41.8 \text{ kW}}$

<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.

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

Example 3**Heating (when the indoor unit connected total capacity is 100% or higher)**

- Outdoor unit FDC450KXZE1 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 temperature conditions:
1.04 (Calculated according to Outdoor 6°C WB / Indoor 19°C DB); (See page 29)
- Indoor unit heating capacity: $6.3 \text{ kW} \times 1.04 \approx 6.6 \text{ kW}$
- Indoor unit total heating capacity calculation;
indoor unit total heating capacity: $6.6 \text{ kW} \times 10 \text{ units} \approx \underline{66.0 \text{ kW}}$

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

- Outdoor unit rated heating capacity: 50.0 kW
- Capacity compensation coefficient according to temperature conditions:
1.04 (Calculated according to Outdoor 6°C WB / Indoor 19°C DB); (See page 29)
Outdoor unit heating capacity: 50.0 kW × 1.04 = 52.0 kW
- Capacity compensation coefficient according to piping length: 0.982 (calculated according to 60 m length); (See page 33)
52.0 kW × 0.982 = 51.0 kW
- Capacity compensation coefficient according to height difference: 0.96 (calculated according to 20 m difference); (See page 34)
51.0 kW × 0.96 = 49.0 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 34)
49.0 kW × 1.0 = 49.0 kW.
- Capacity compensation coefficient according to indoor unit connected total capacity: 1.0 ← (56 × 10) / 450 = 124% (See page 36)
49.0 kW × 1.0 = 49.0 kW.

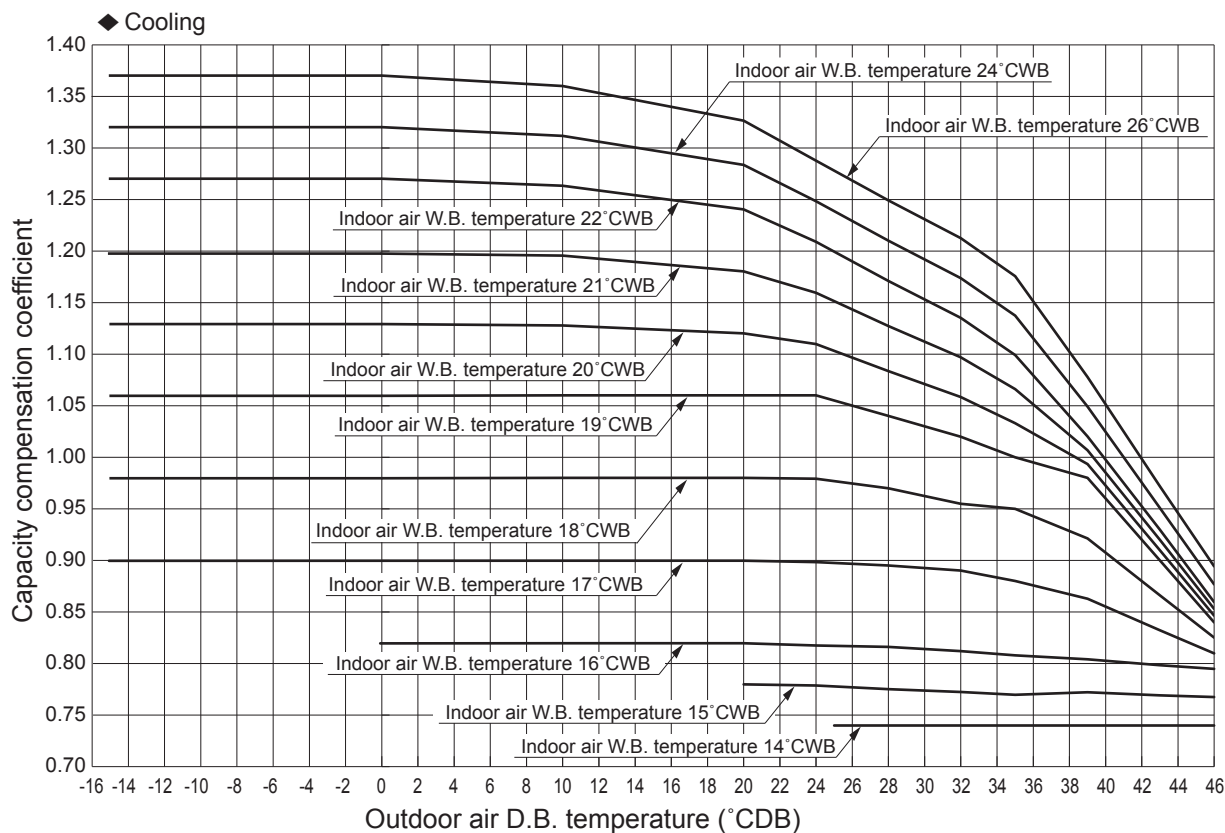
<System heating capacity> : Item (2) (c) calculation

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

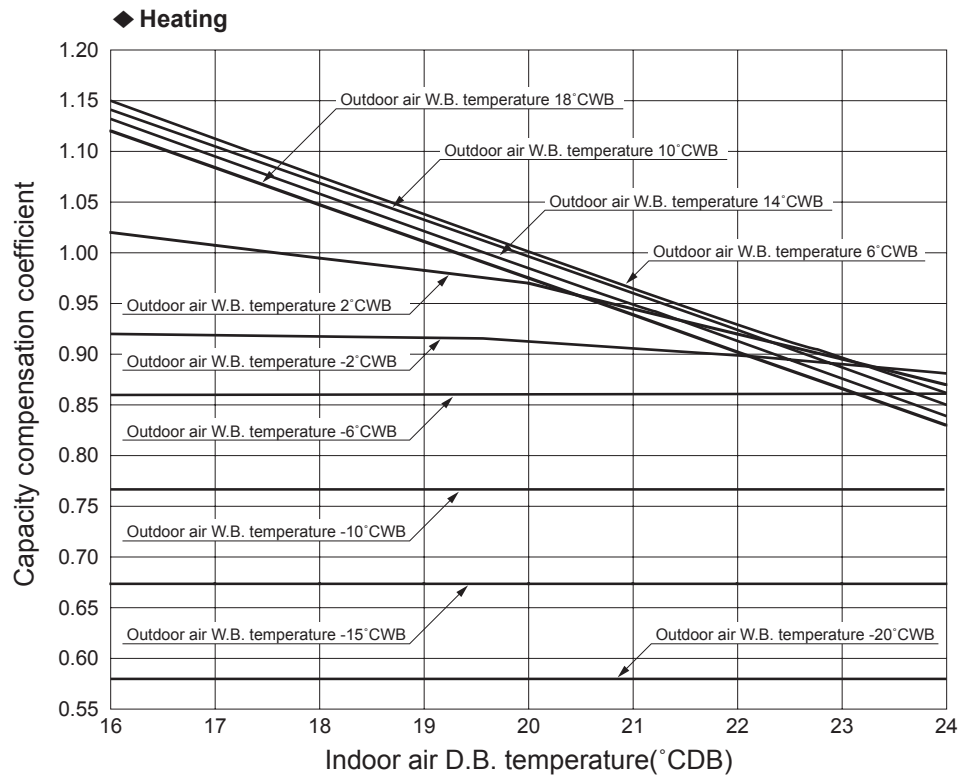
- Indoor unit total heating capacity : 66.0 kW ⇒ System heating capacity: 49.0 kW
- Outdoor unit maximum heating capacity : 49.0 kW

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

$$\frac{49.0 \text{ kW} \times 6.6 \text{ kW}}{66.0 \text{ kW}} = 4.9 \text{ kW}$$

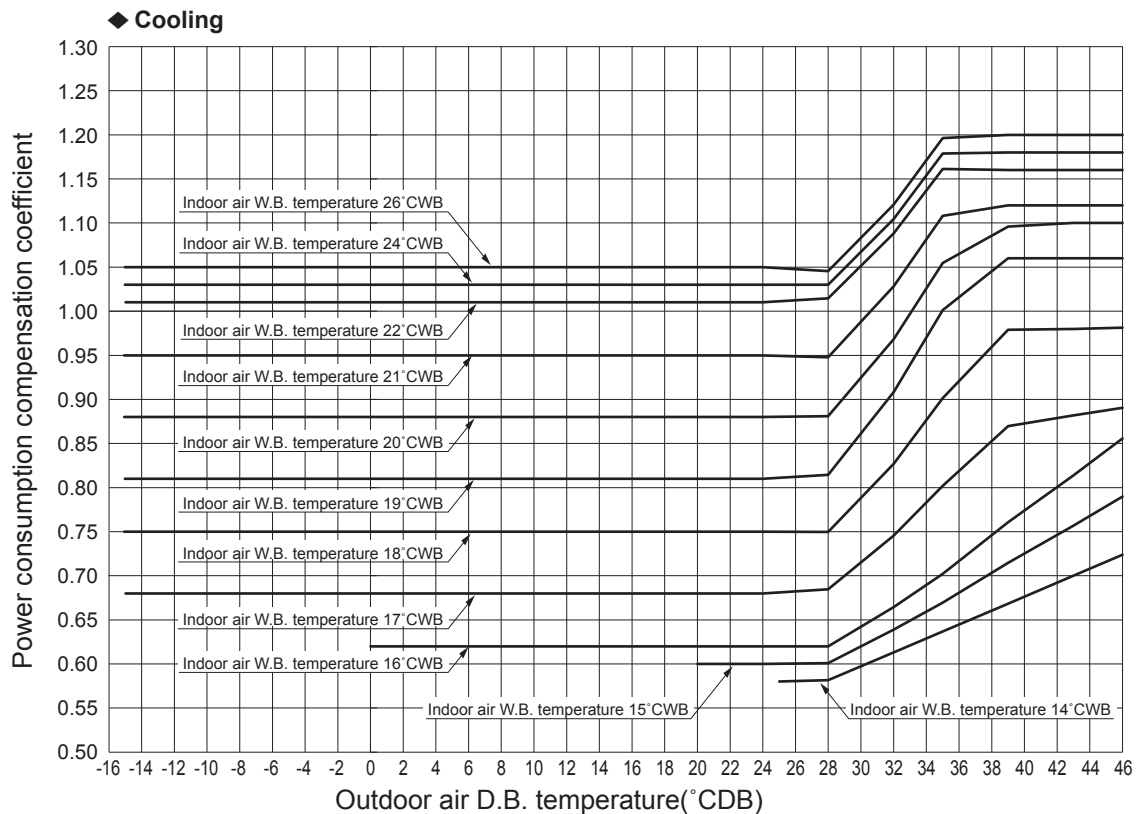
(3) Capacity compensation coefficient**(a) Capacity compensation coefficient and power consumption compensation coefficient according to indoor and outdoor temperature conditions.****1) Capacity compensation coefficient**

- Note (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 may decrease by frequent actuation of anti-frost control in low outdoor temperature. Please avoid using the air-conditioners for computer rooms or industrial uses which require annual cooling operation.

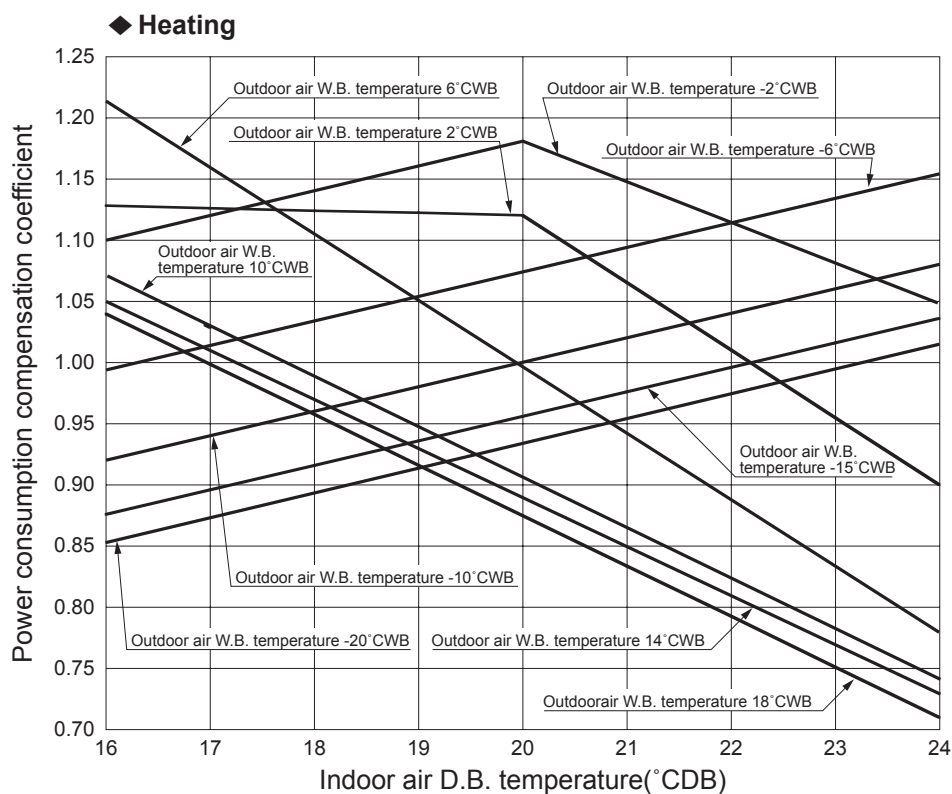


Note (1) The above-mentioned table shows a typical condition among conditions to occur via controlling an air-conditioning equipment.

2) Power consumption correction factor



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



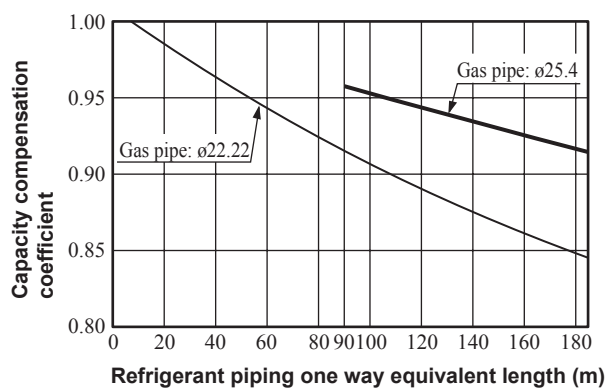
Note (1) The above-mentioned table shows a typical condition among conditions to occur via controlling an air-conditioning equipment.

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

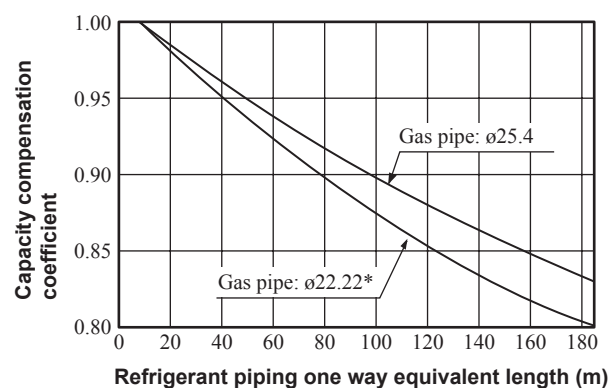
(Note) This table is for reference only. If the refrigerant piping one way equivalent after the first branch is extended longer than 40 m, it could drop further by about 10% in the worst case.

1) Cooling

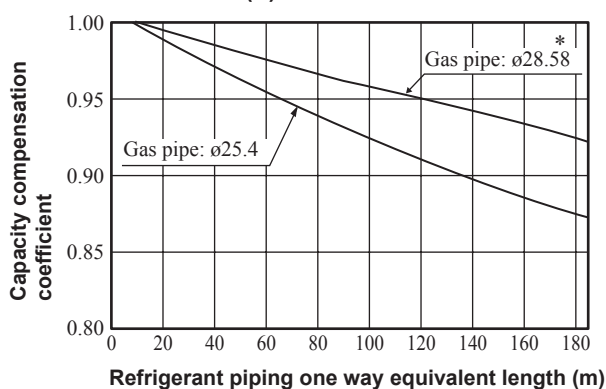
Model FDC(S)280KXZE1



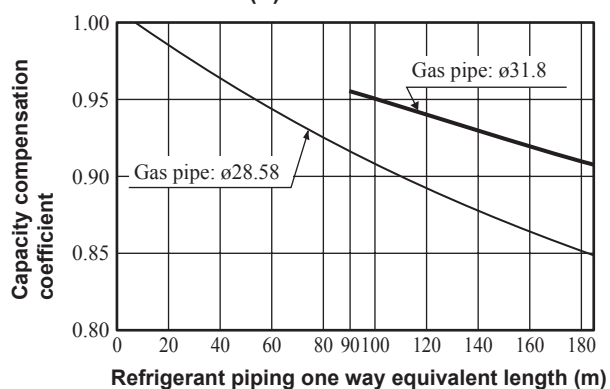
Model FDC(S)335KXZE1



Model FDC(S)400KXZE1

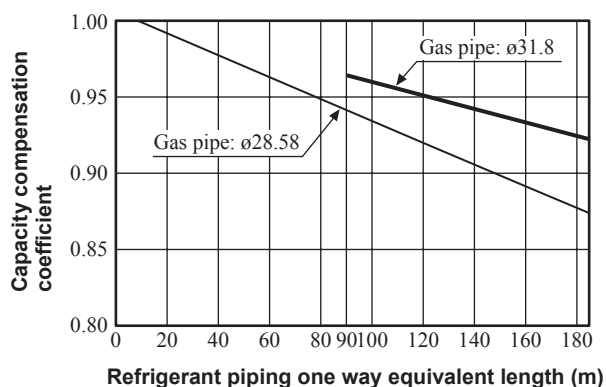


Model FDC(S)450KXZE1

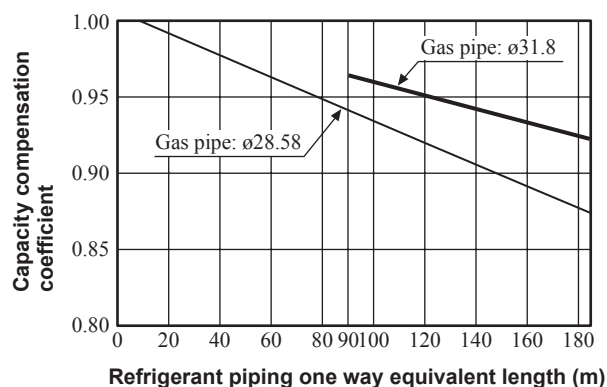


Note (1) Parts with the * mark show the piping size in case used in Europe.

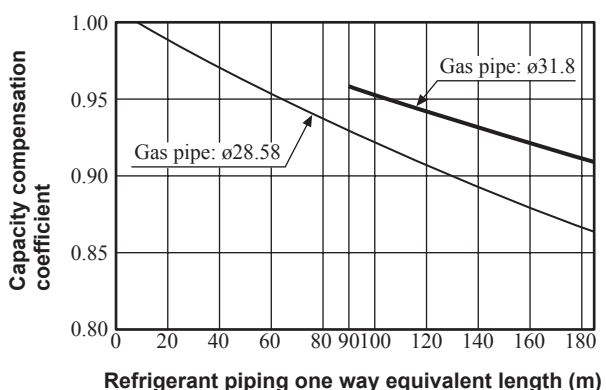
Model FDC(S)475KXZE1



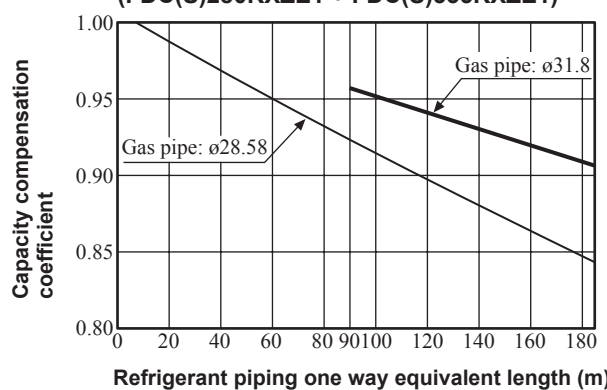
Model FDC(S)500KXZE1



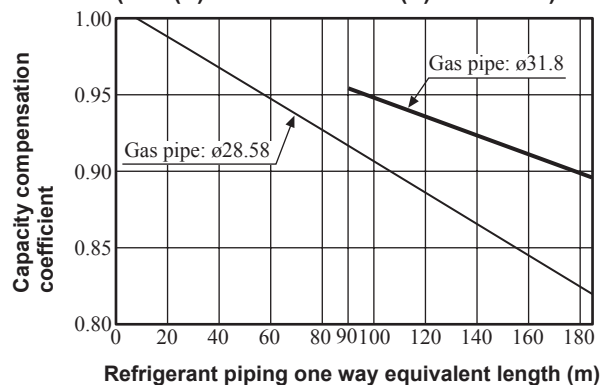
Model FDC(S)560KXZE1



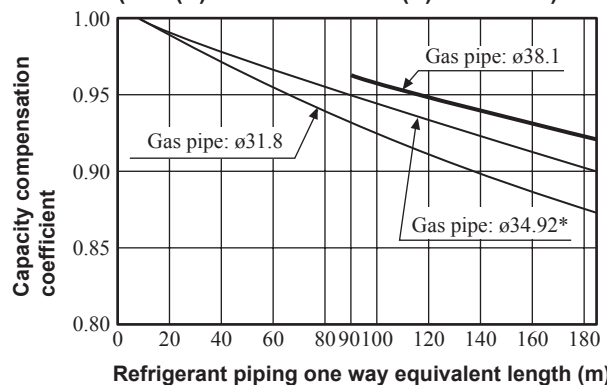
**Model FDC(S)615KXZE1
(FDC(S)280KXZE1 + FDC(S)335KXZE1)**



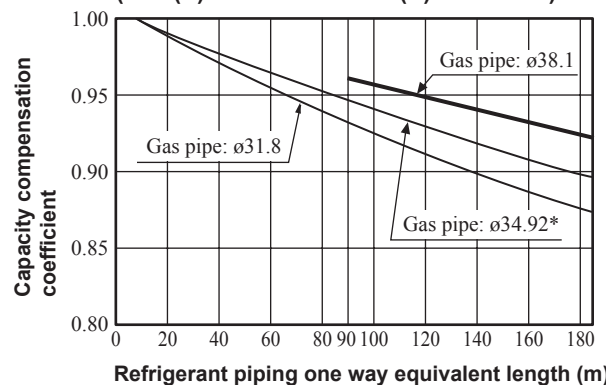
**Model FDC(S)670KXZE1
(FDC(S)335KXZE1 + FDC(S)335KXZE1)**



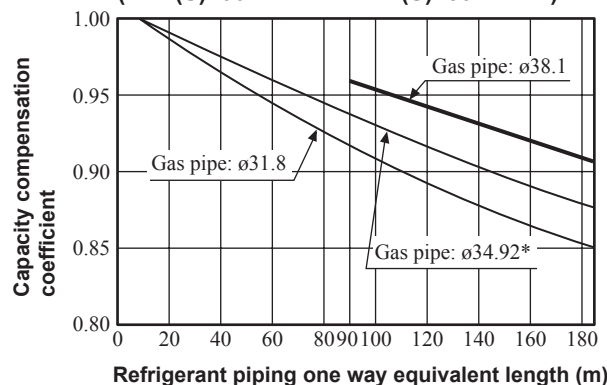
**Model FDC(S)735KXZE1
(FDC(S)335KXZE1 + FDC(S)400KXZE1)**



**Model FDC(S)800KXZE1
(FDC(S)400KXZE1 + FDC(S)400KXZE1)**

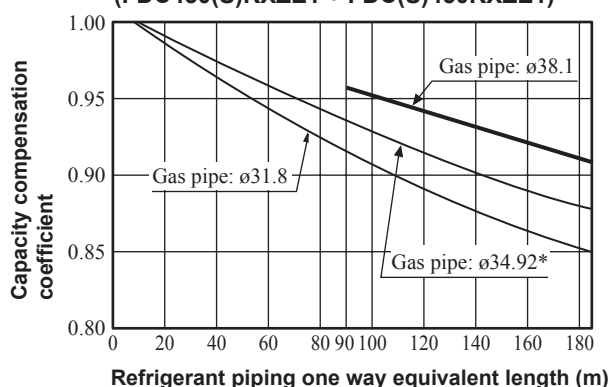


**Model FDC(S)850KXZE1
(FDC(S)400KXZE1 + FDC(S)450KXZE1)**

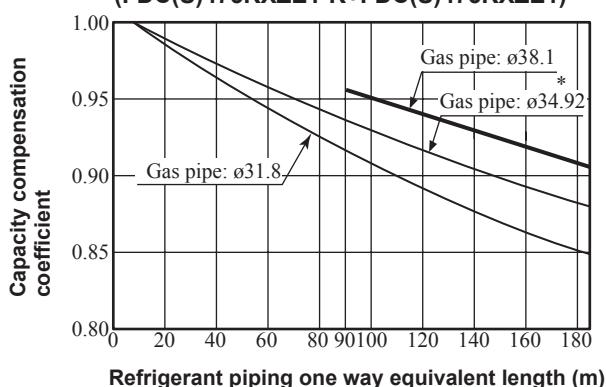


Note (1) Parts with the * mark show the piping size in case used in Europe.

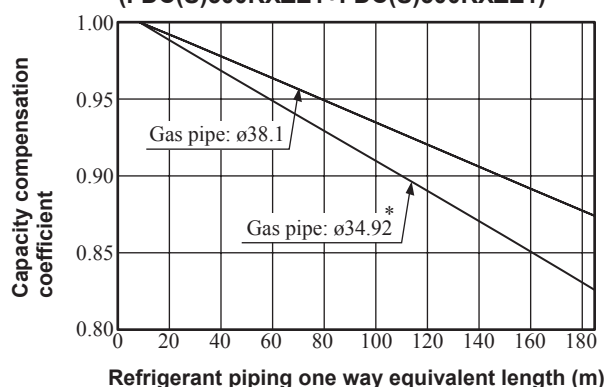
Model FDC900(S)KXZE1
(FDC450(S)KXZE1 + FDC(S)450KXZE1)



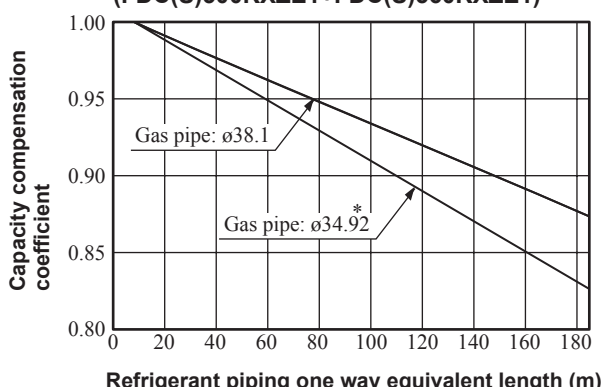
Model FDC(S)950KXZE1
(FDC(S)475KXZE1-K+FDC(S)475KXZE1)



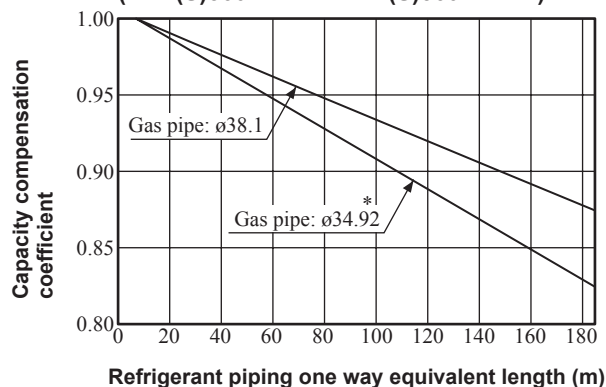
Model FDC(S)1000KXZE1
(FDC(S)500KXZE1+FDC(S)500KXZE1)



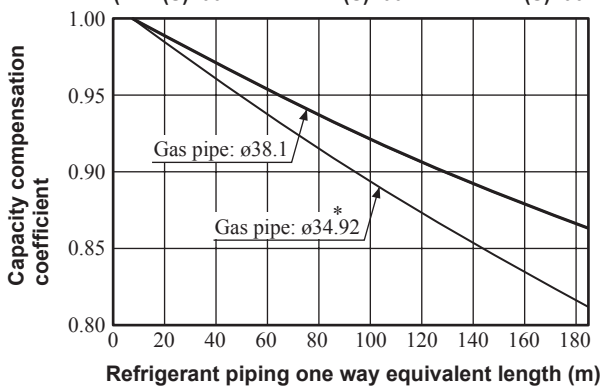
Model FDC(S)1060KXZE1
(FDC(S)500KXZE1+FDC(S)560KXZE1)



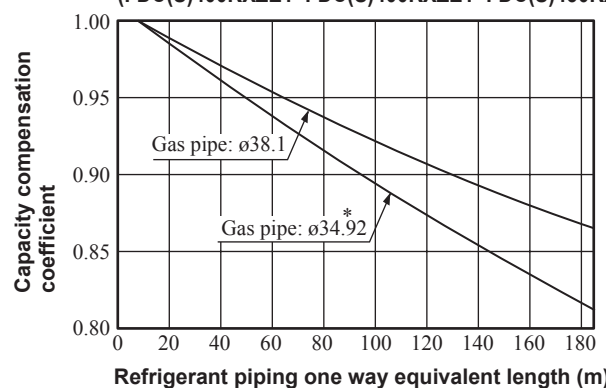
Model FDC(S)1120KXZE1
(FDC(S)560KXZE1+FDC(S)560KXZE1)



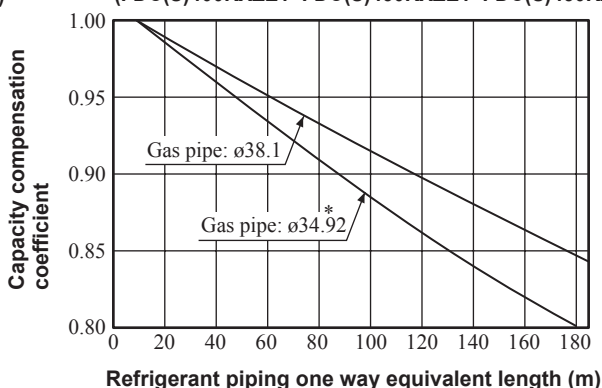
Model FDC(S)1200KXZE1
(FDC(S)400KXZE1+FDC(S)400KXZE1+FDC(S)400KXZE1)



Model FDC(S)1250KXZE1
(FDC(S)400KXZE1+FDC(S)400KXZE1+FDC(S)450KXZE1)

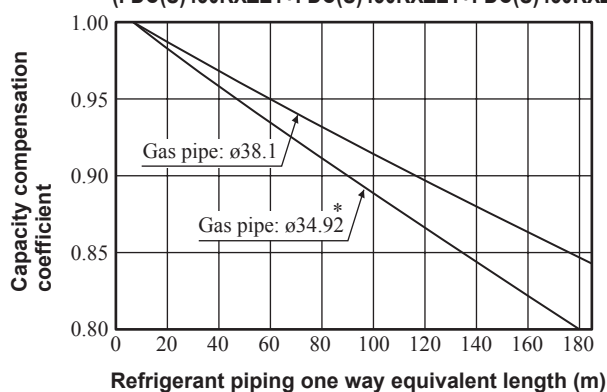


Model FDC(S)1300KXZE1
(FDC(S)400KXZE1+FDC(S)450KXZE1+FDC(S)450KXZE1)

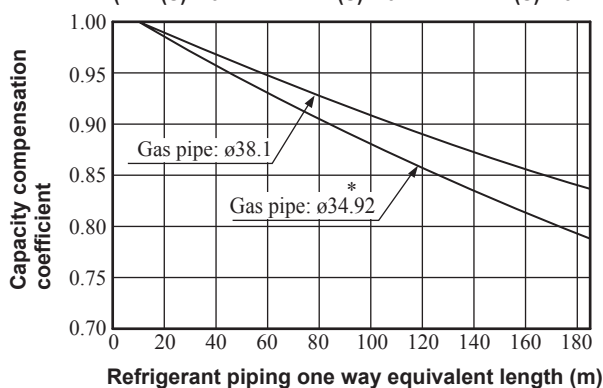


Note (1) Parts with the * mark show the piping size in case used in Europe.

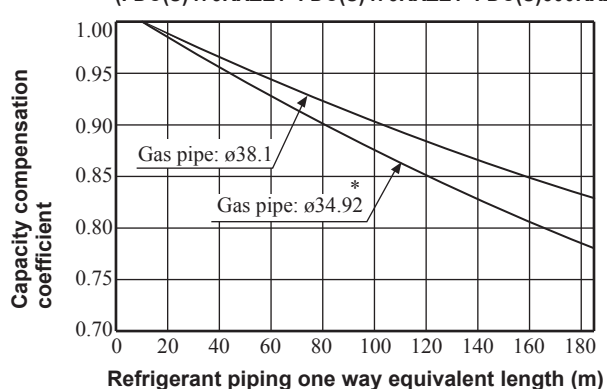
Model FDC(S)1350KXZE1
(FDC(S)450KXZE1+FDC(S)450KXZE1+FDC(S)450KXZE1)



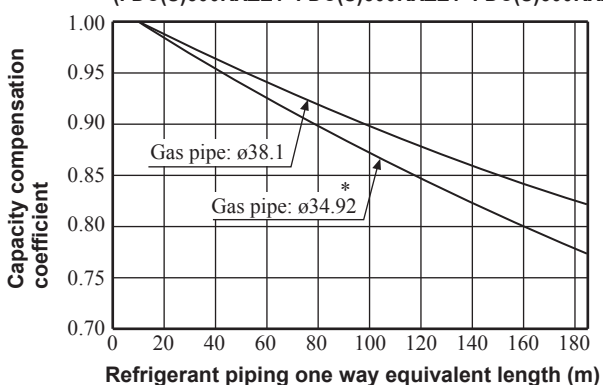
Model FDC(S)1425KXZE1
(FDC(S)475KXZE1+FDC(S)475KXZE1+FDC(S)475KXZE1)



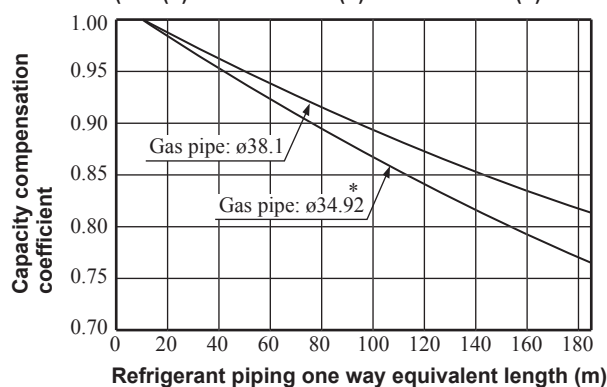
Model FDC(S)1450KXZE1
(FDC(S)475KXZE1+FDC(S)475KXZE1+FDC(S)500KXZE1)



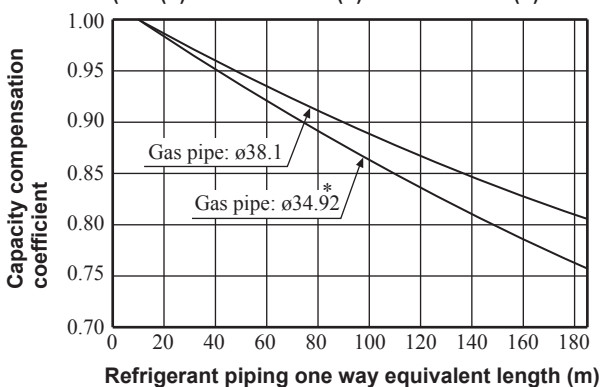
Model FDC(S)1500KXZE1
(FDC(S)500KXZE1+FDC(S)500KXZE1+FDC(S)500KXZE1)



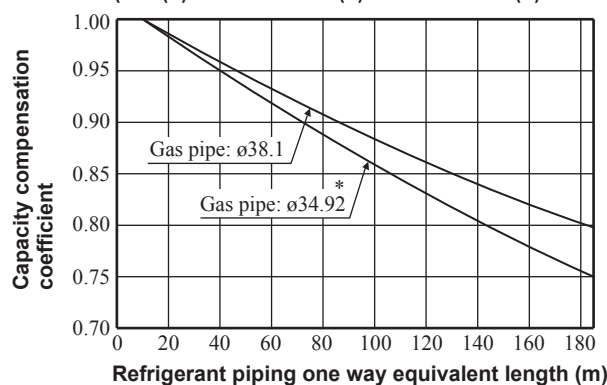
Model FDC(S)1560KXZE1
(FDC(S)500KXZE1+FDC(S)500KXZE1+FDC(S)560KXZE1)



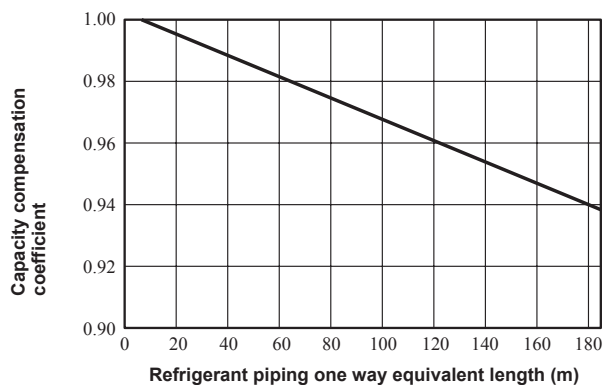
Model FDC(S)1620KXZE1
(FDC(S)500KXZE1+FDC(S)560KXZE1+FDC(S)560KXZE1)



Model FDC(S)1680KXZE1
(FDC(S)560KXZE1+FDC(S)560KXZE1+FDC(S)560KXZE1)



2) Heating



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

Note (1) Equivalent piping length can be obtained by calculating as follows.

$$\text{Equivalent piping length} = \text{Real gas piping length} + \text{Number of bends in gas piping} \times \text{Equivalent piping length of bends.}$$

Equivalent length of each joint

Unit : m/one part

Gas piping size	φ15.88	φ19.05	φ22.22	φ25.4	φ28.58	φ31.8	φ34.92	φ38.1
Joint (90° elbow)	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	35 m
Adjustment coefficient	0.99	0.98	0.97	0.96	0.95	0.94	0.93

Height difference between the indoor unit and outdoor unit in the vertical height difference	40 m	45 m	50 m	55 m	60 m	65 m	70 m
Adjustment coefficient	0.92	0.91	0.90	0.89	0.88	0.87	0.86

- (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.

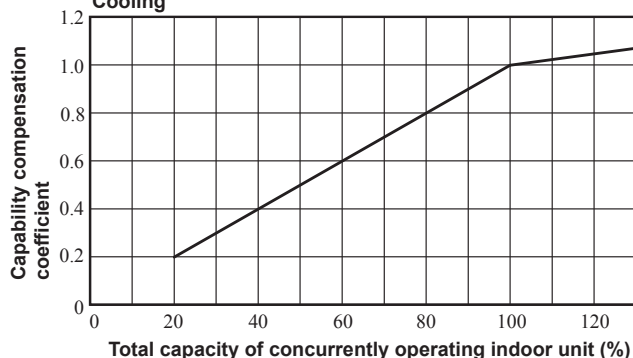
- (e) The capacity compensation coefficient and power consumption compensation coefficient vary according to the total capacity of concurrently operating indoor units, as shown below.

(Note) This table shows typical values.

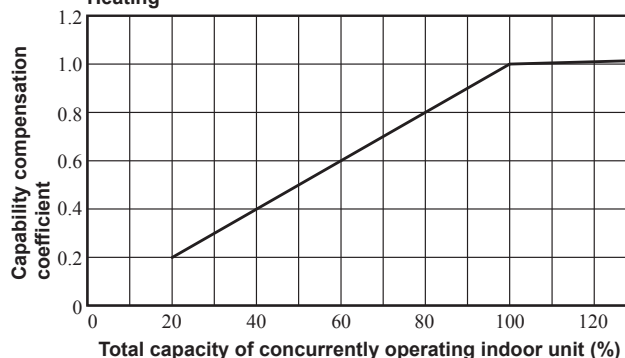
Model FDC(S)280KXZE1

◆ Capability compensation coefficient

Cooling

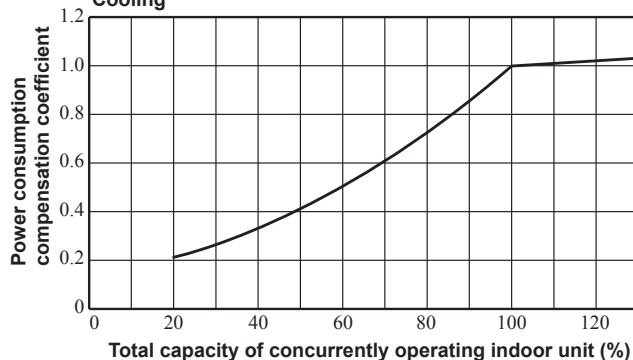


Heating

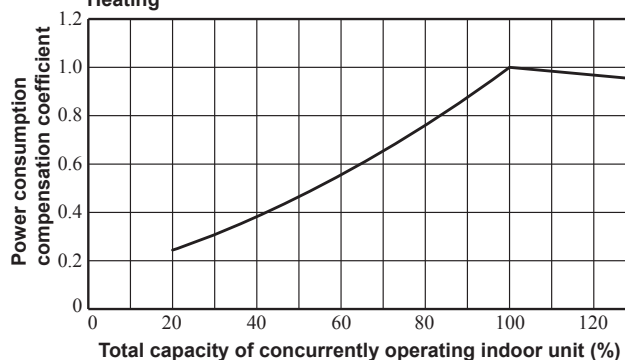


◆ Power consumption compensation coefficient

Cooling



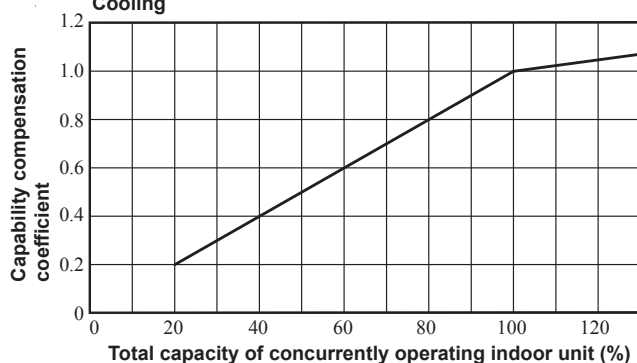
Heating



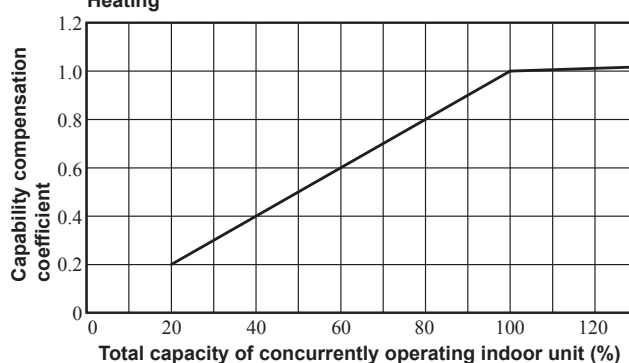
Model FDC(S)335KXZE1

◆ Capability compensation coefficient

Cooling

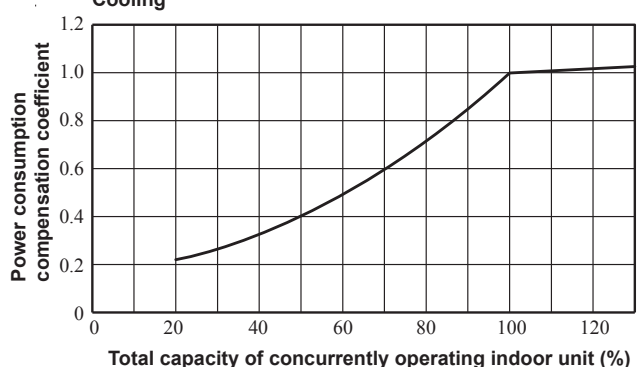


Heating

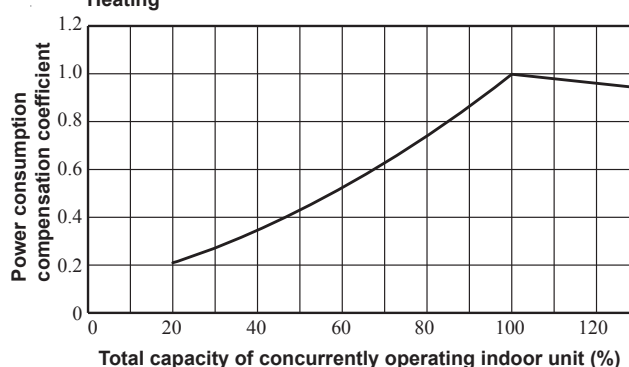


◆ Power consumption compensation coefficient

Cooling



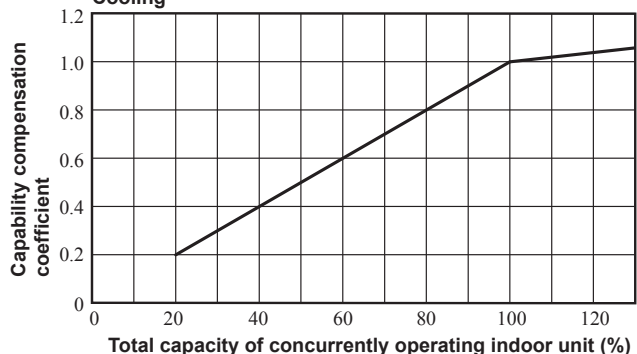
Heating



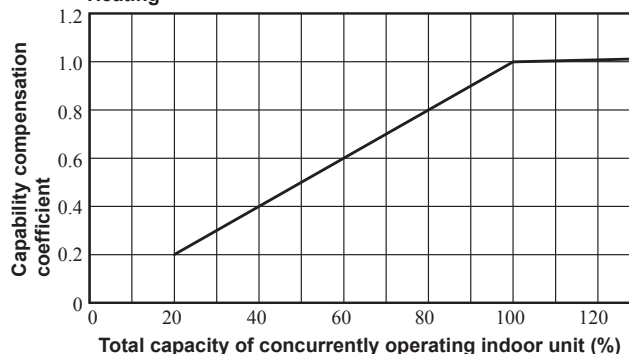
Model FDC(S)400KXZE1

◆ Capability compensation coefficient

Cooling

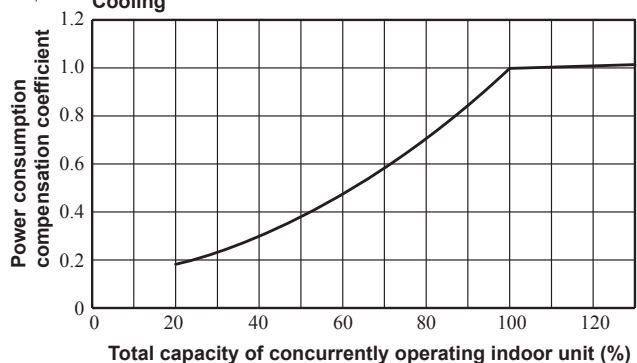


Heating

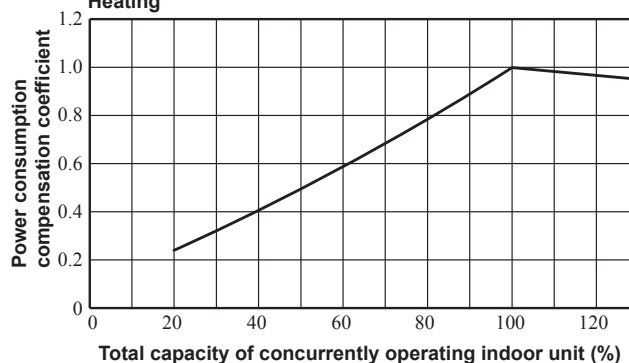


◆ Power consumption compensation coefficient

Cooling

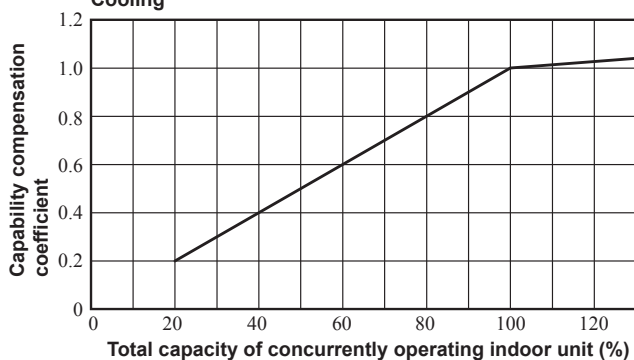


Heating

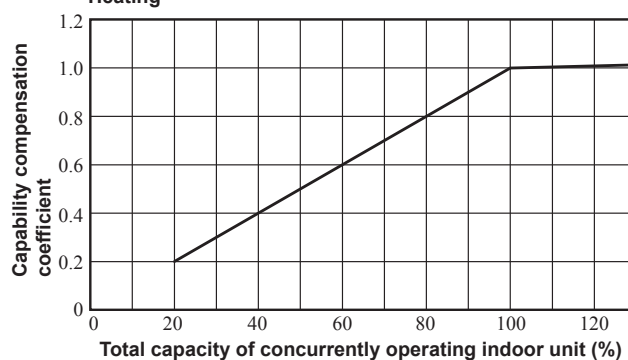


Model FDC(S)450KXZE1

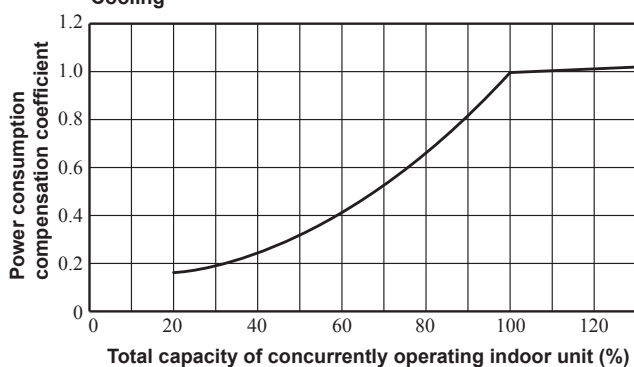
◆ Capability compensation coefficient
Cooling



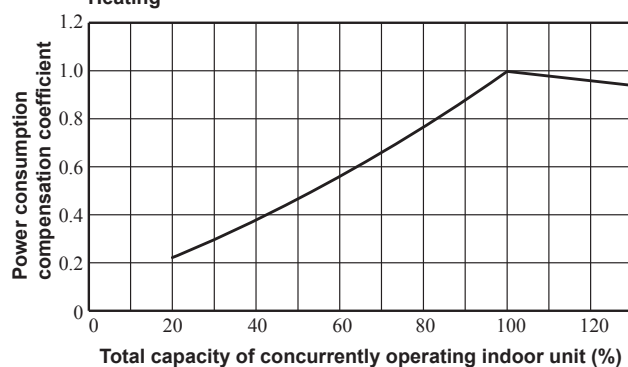
Heating



◆ Power consumption compensation coefficient
Cooling

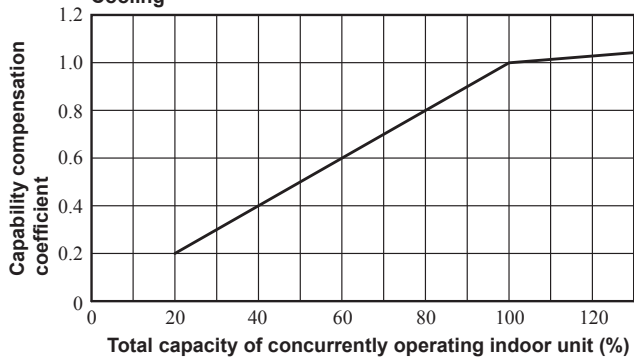


Heating

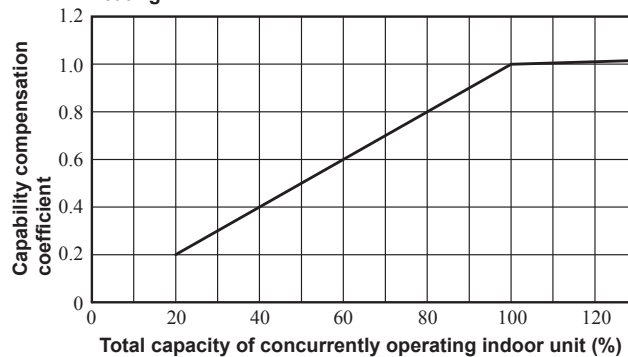


Model FDC(S)475KXZE1

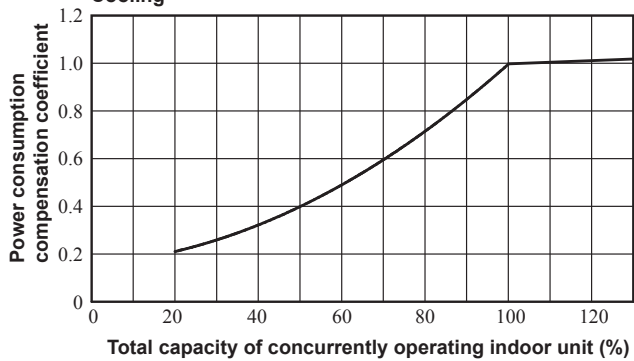
◆ Capability compensation coefficient
Cooling



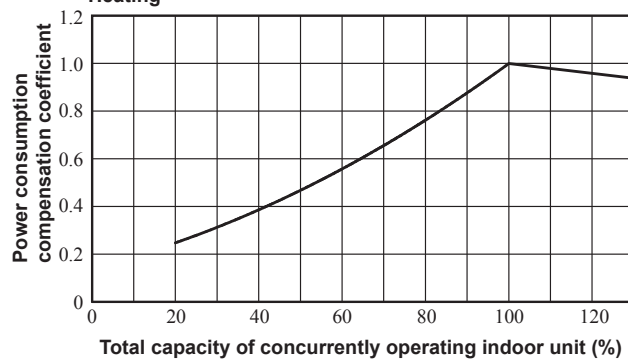
Heating



◆ Power consumption compensation coefficient
Cooling

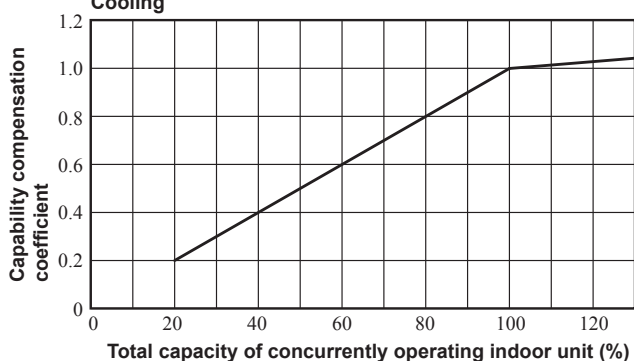


Heating

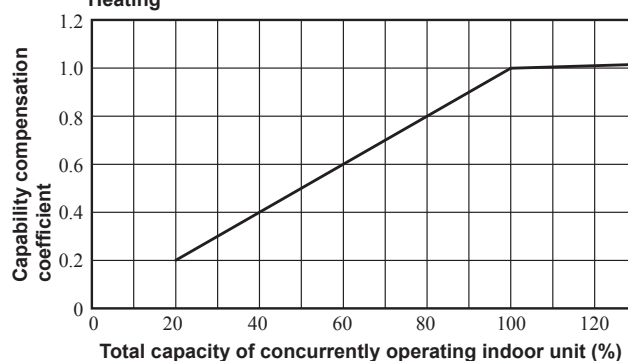


Model FDC(S)500KXZE1

◆ Capability compensation coefficient
Cooling

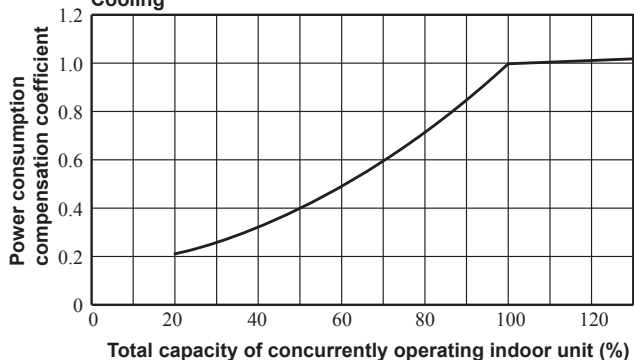


Heating

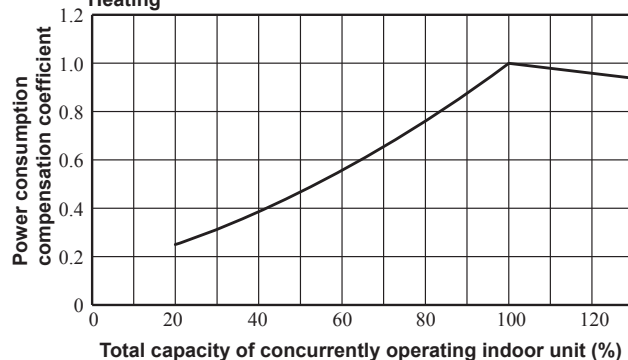


◆ Power consumption compensation coefficient

Cooling

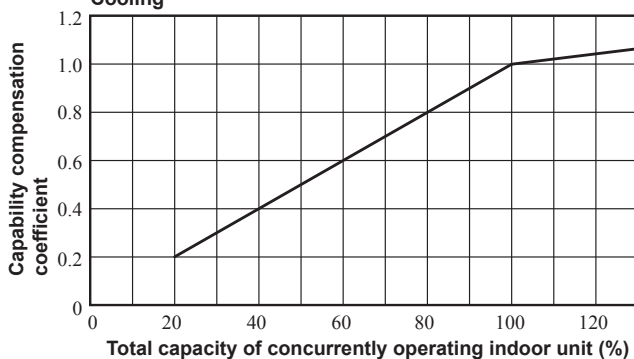


Heating

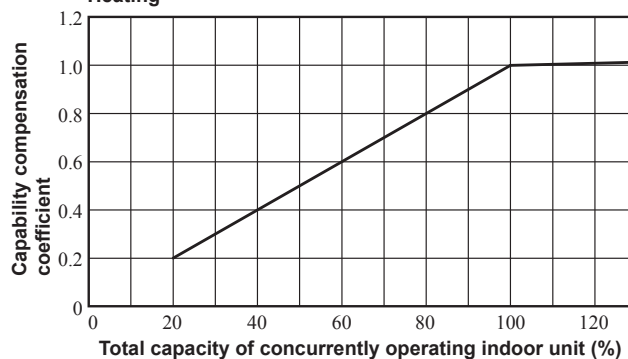


Model FDC(S)560KXZE1

◆ Capability compensation coefficient
Cooling

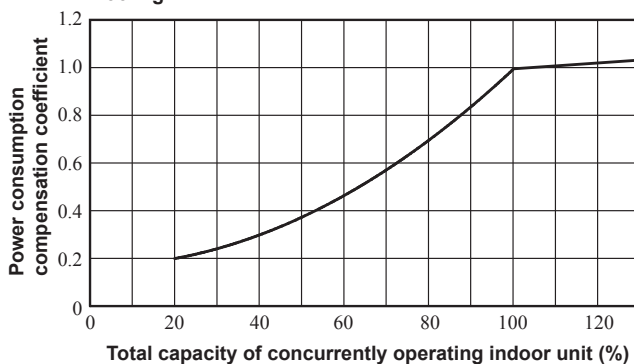


Heating

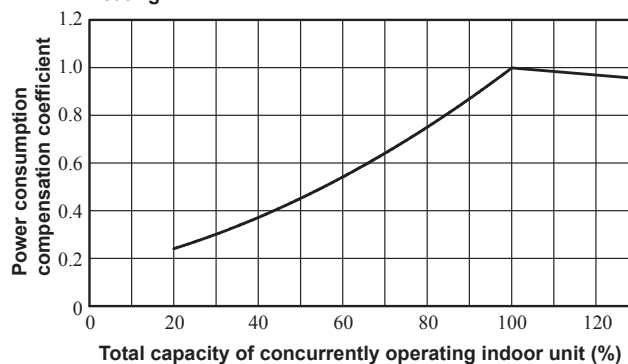


◆ Power consumption compensation coefficient

Cooling

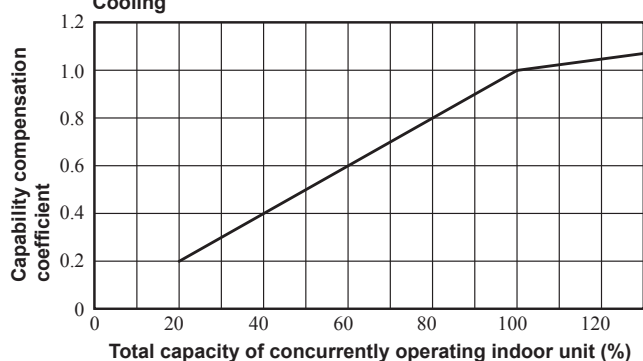


Heating

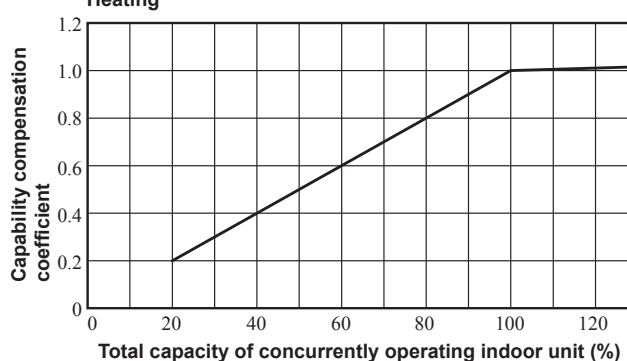


Model FDC(S)615KXZE1

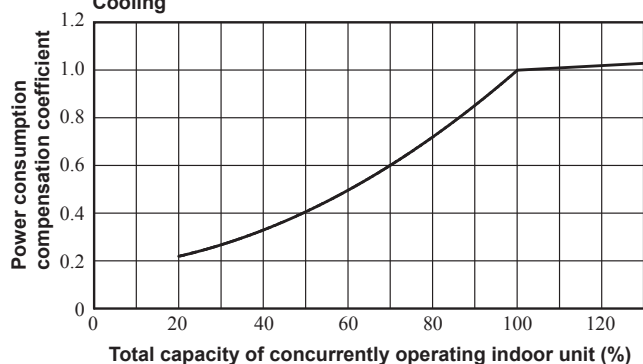
◆ Capability compensation coefficient
Cooling



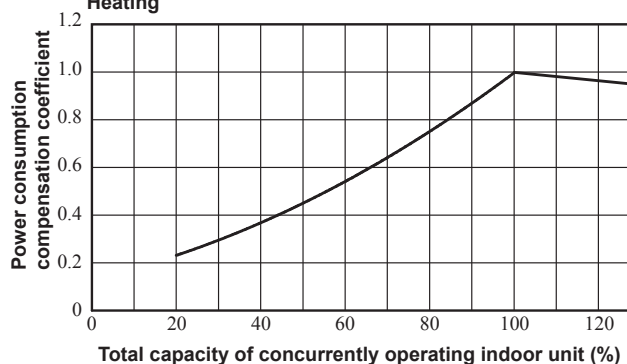
Heating



◆ Power consumption compensation coefficient
Cooling

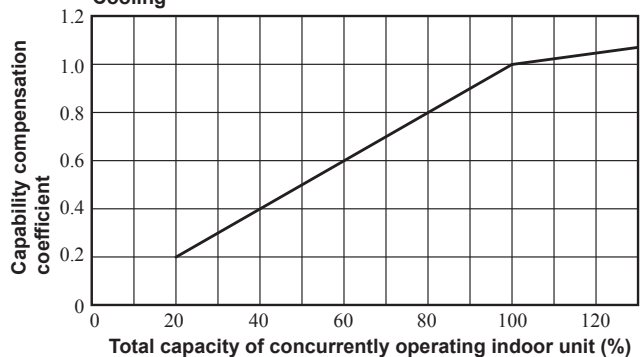


Heating

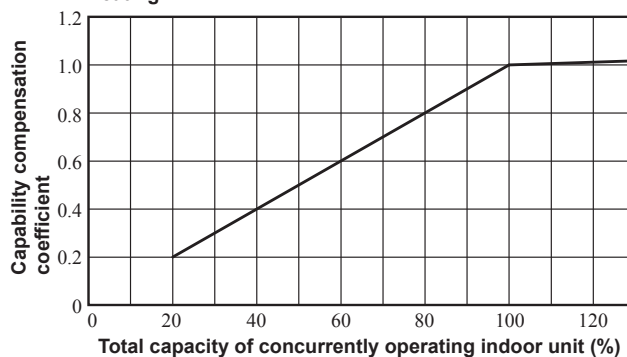


Model FDC(S)670KXZE1

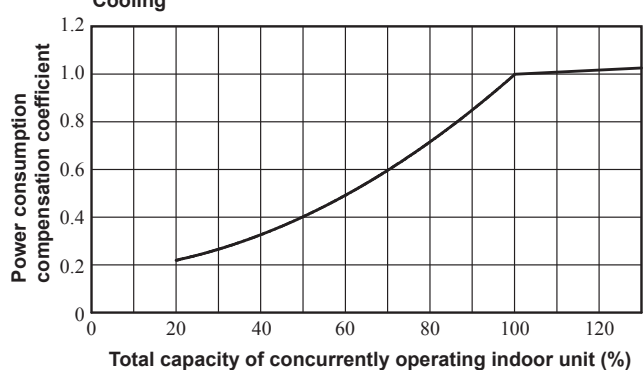
◆ Capability compensation coefficient
Cooling



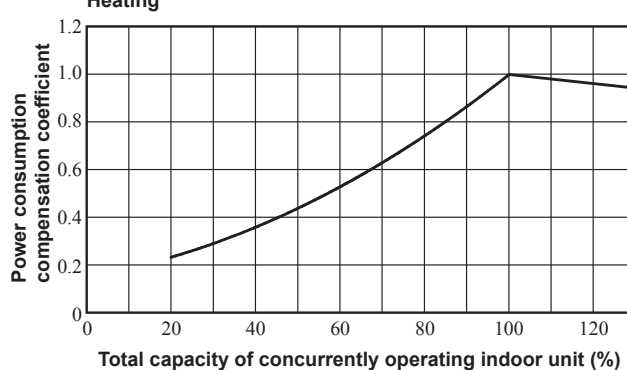
Heating



◆ Power consumption compensation coefficient
Cooling

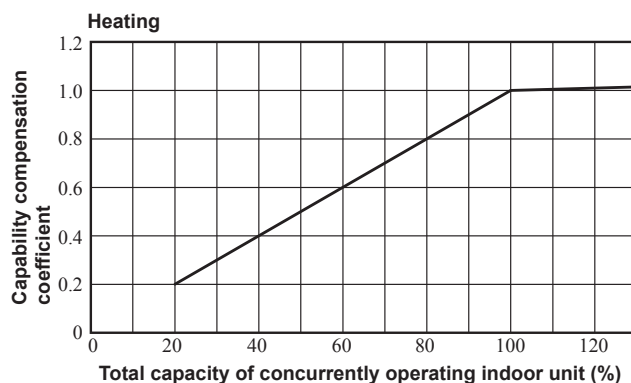
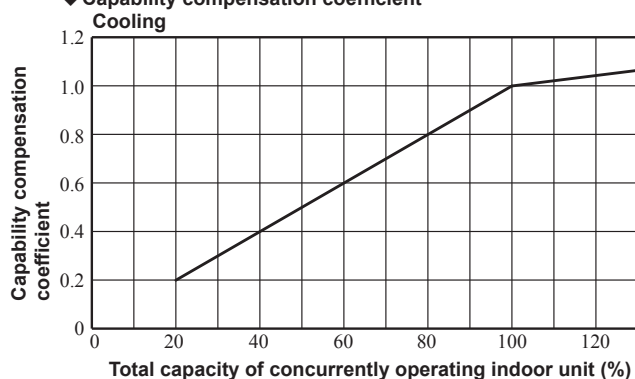


Heating

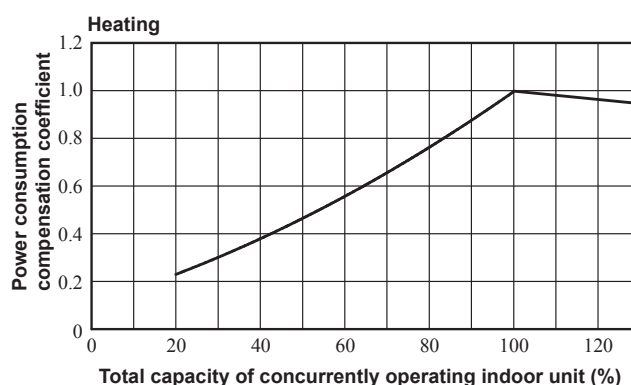
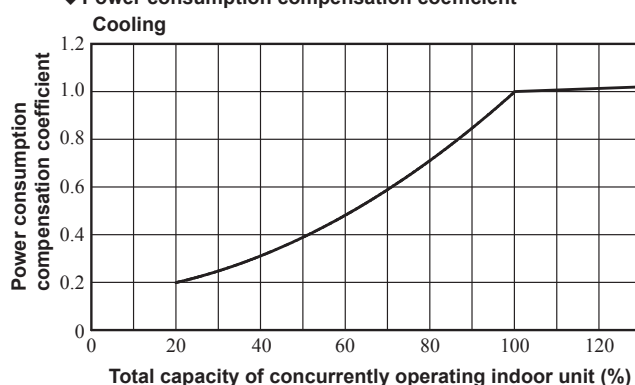


Model FDC(S)735KXZE1

◆ Capability compensation coefficient

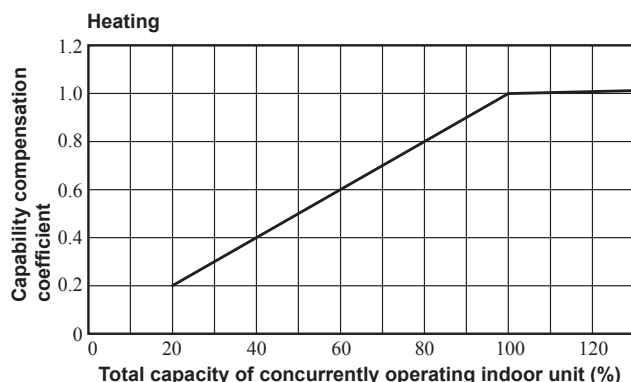
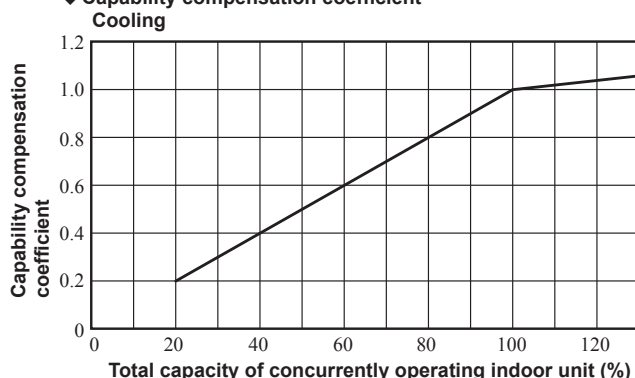


◆ Power consumption compensation coefficient

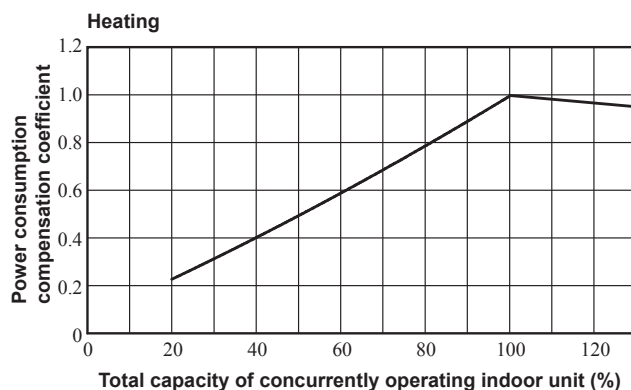
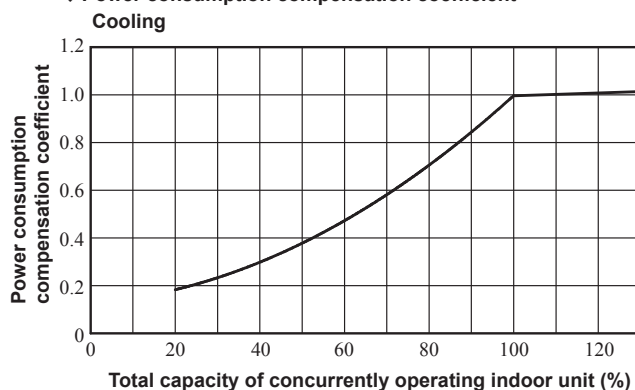


Model FDC(S)800KXZE1

◆ Capability compensation coefficient

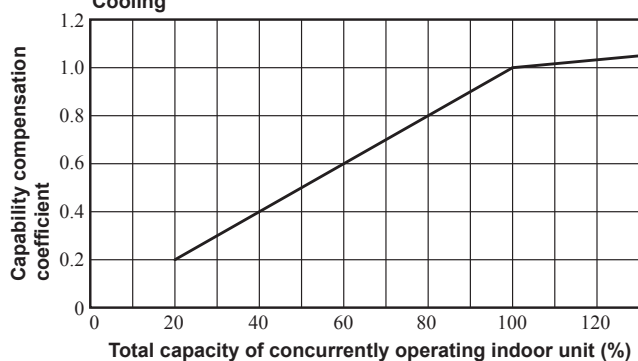


◆ Power consumption compensation coefficient

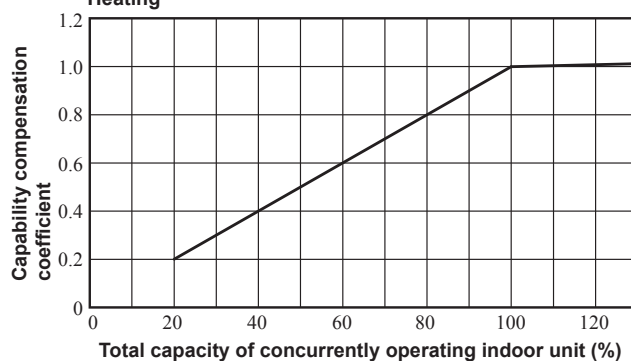


Model FDC(S)850KXZE1

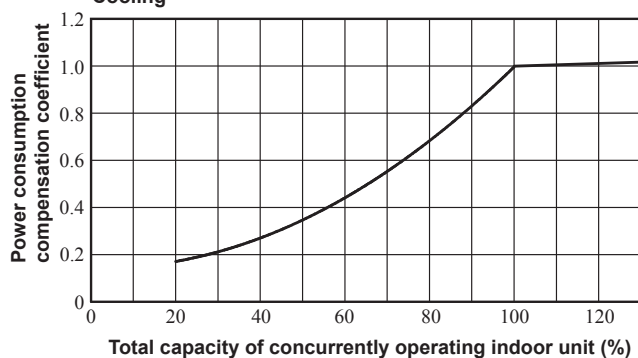
◆ Capability compensation coefficient
Cooling



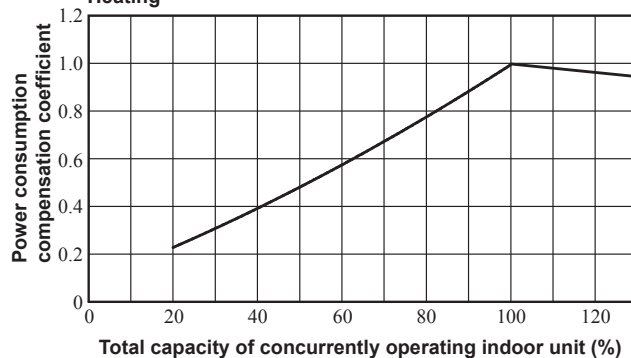
Heating



◆ Power consumption compensation coefficient
Cooling

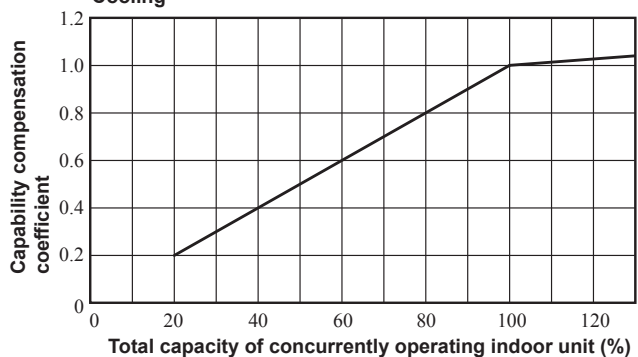


Heating

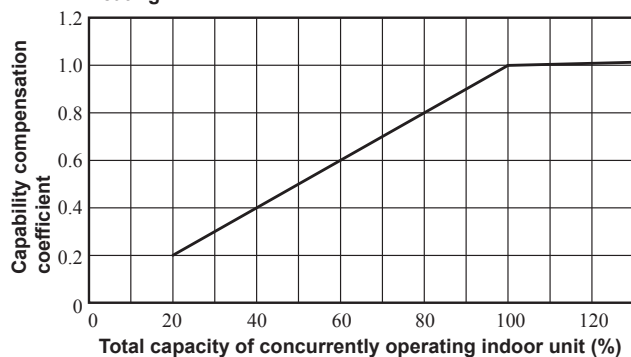


Model FDC(S)900KXZE1

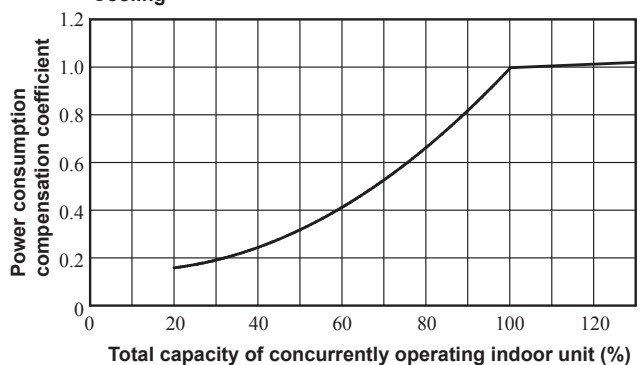
◆ Capability compensation coefficient
Cooling



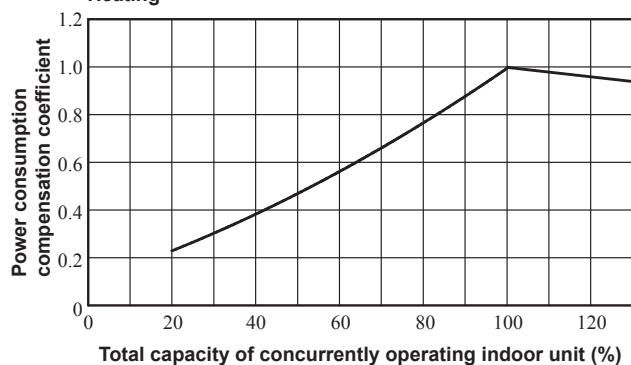
Heating



◆ Power consumption compensation coefficient
Cooling

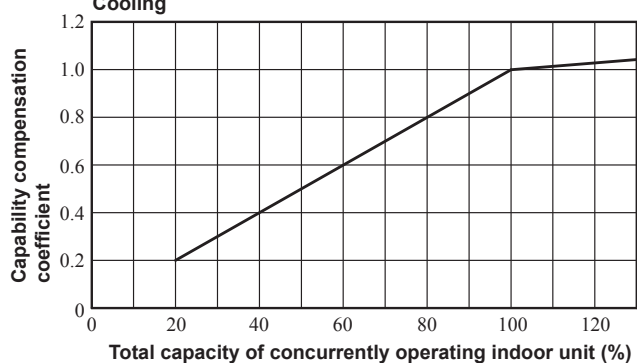


Heating

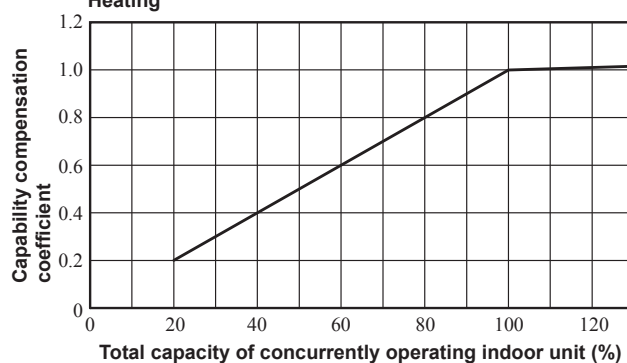


Model FDC(S)950KXZE1

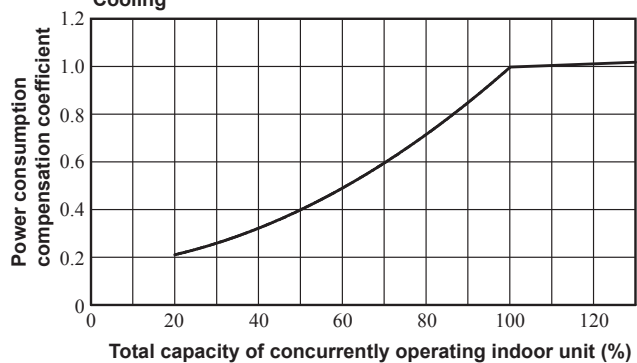
◆ Capability compensation coefficient
Cooling



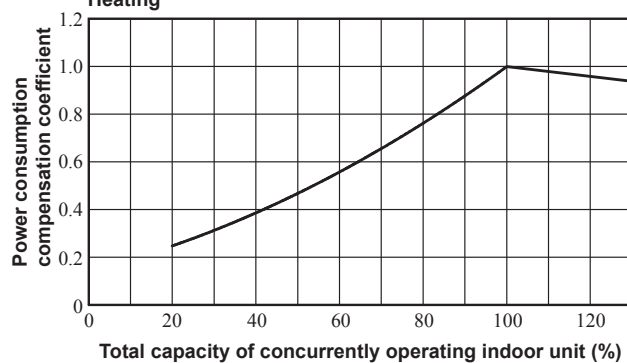
Heating



◆ Power consumption compensation coefficient
Cooling

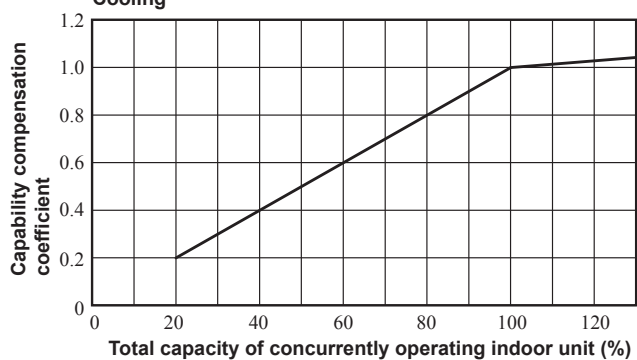


Heating

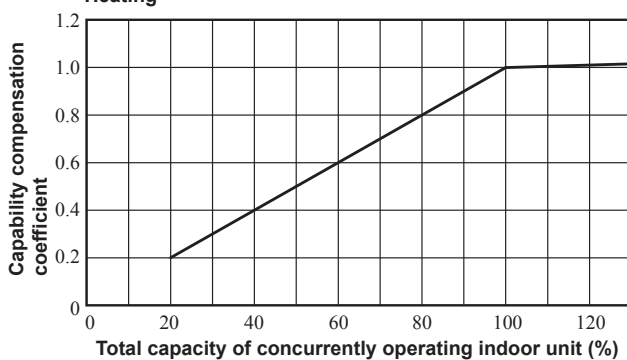


Model FDC(S)1000KXZE1

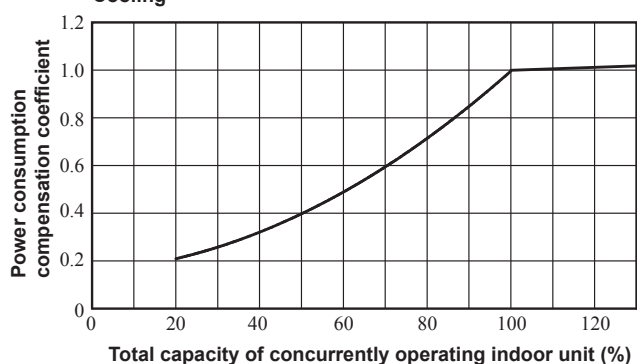
◆ Capability compensation coefficient
Cooling



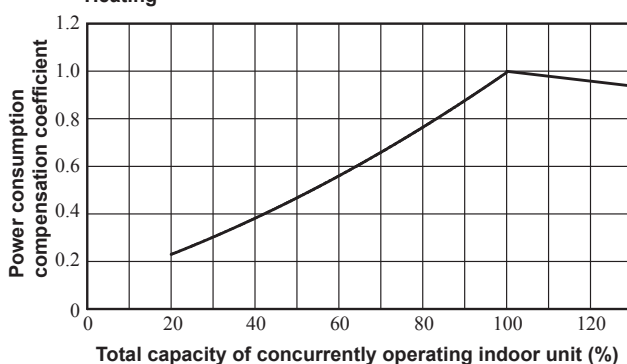
Heating



◆ Power consumption compensation coefficient
Cooling

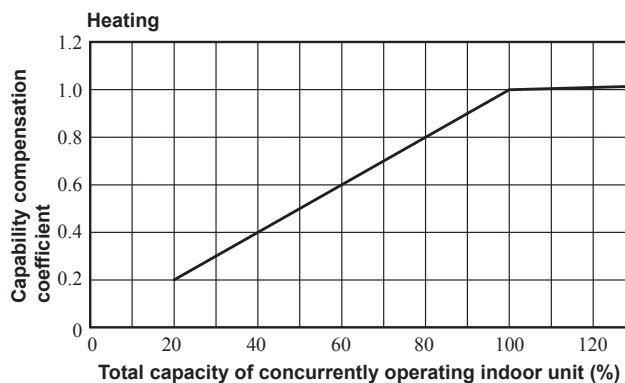
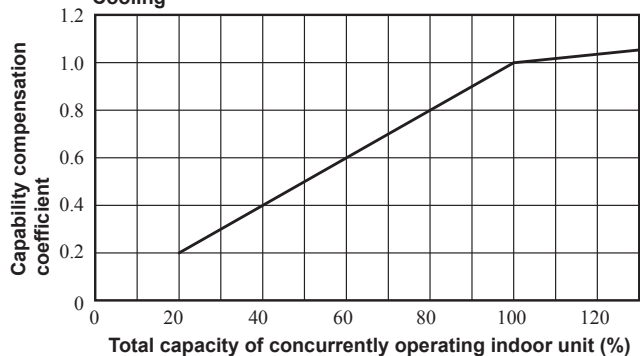


Heating

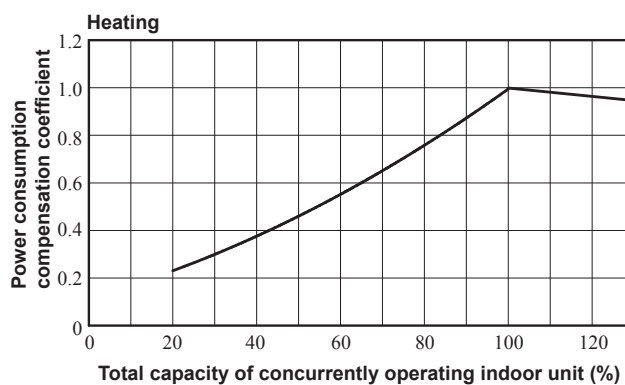
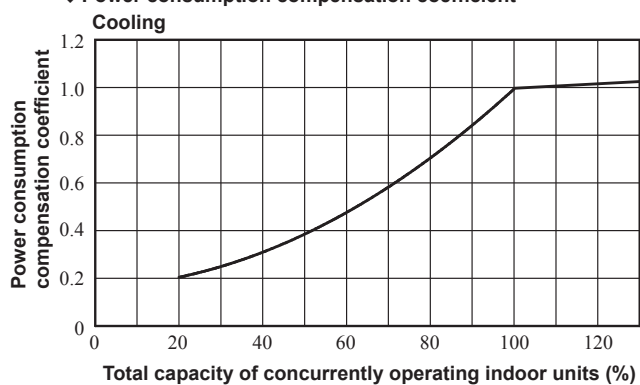


Model FDC(S)1060KXZE1

- ◆ Capability compensation coefficient

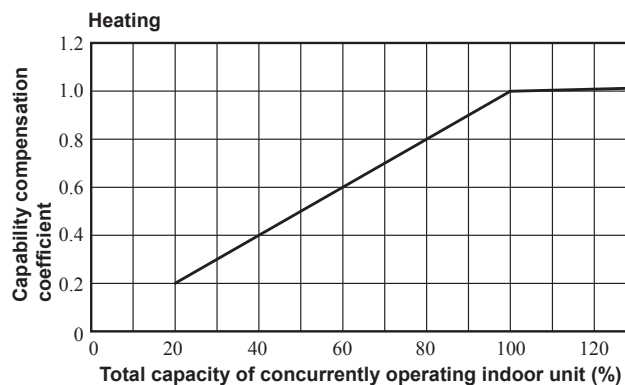
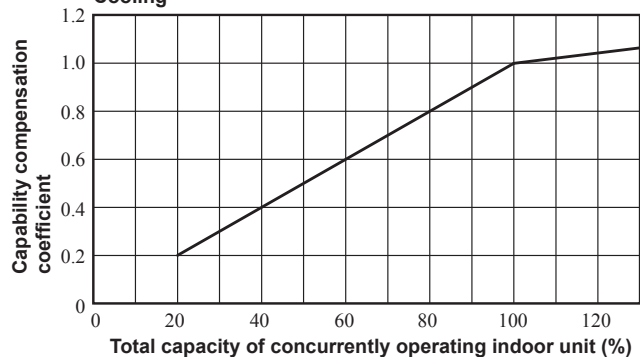


- ◆ Power consumption compensation coefficient

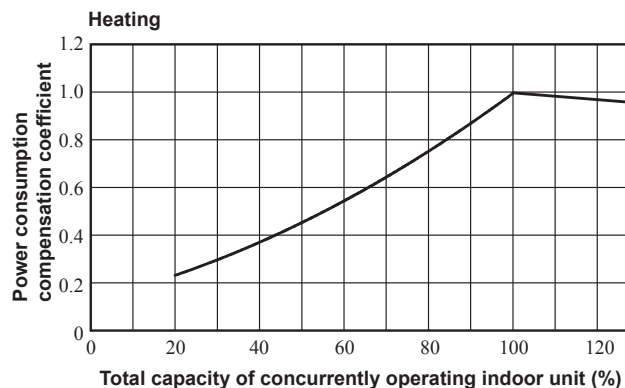
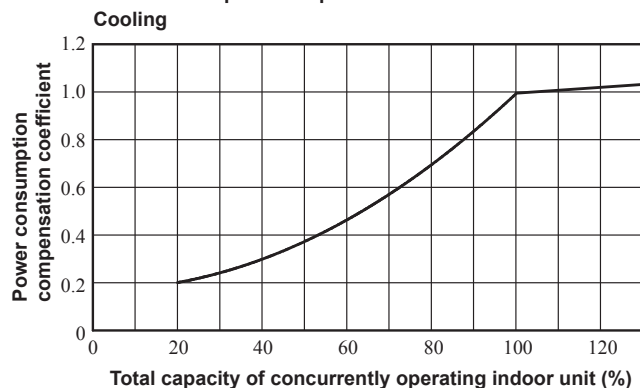


Model FDC(S)1120KXZE1

- ◆ Capability compensation coefficient



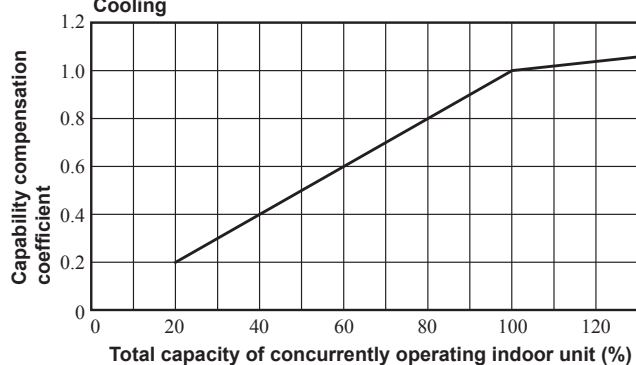
- ◆ Power consumption compensation coefficient



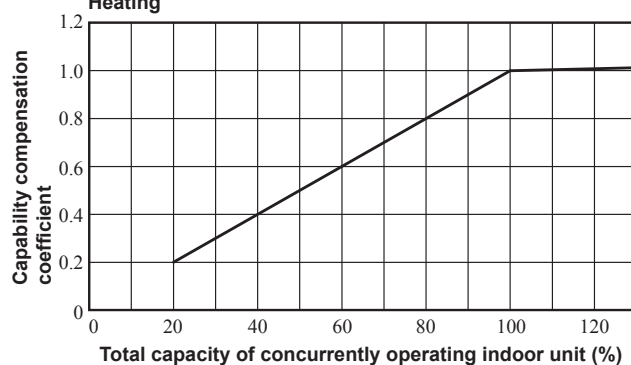
Model FDC(S)1200KXZE1

◆ Capability compensation coefficient

Cooling

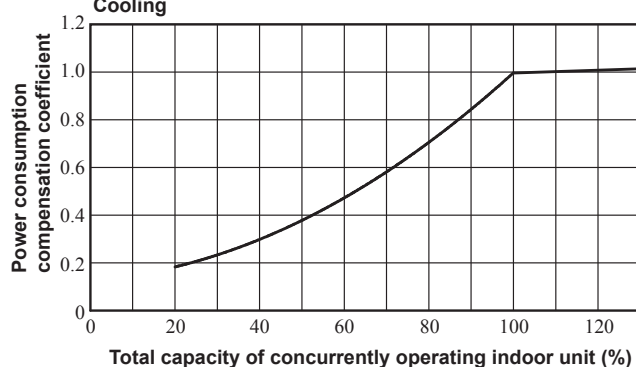


Heating

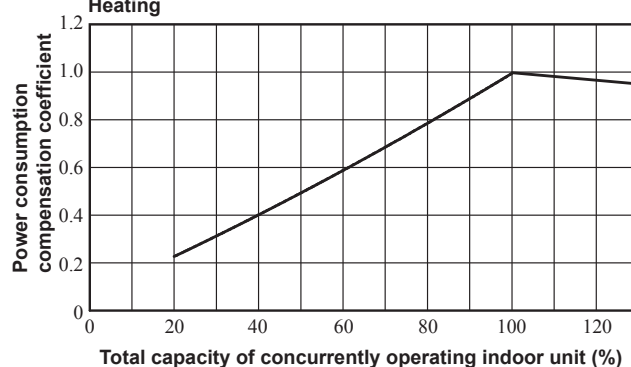


◆ Power consumption compensation coefficient

Cooling



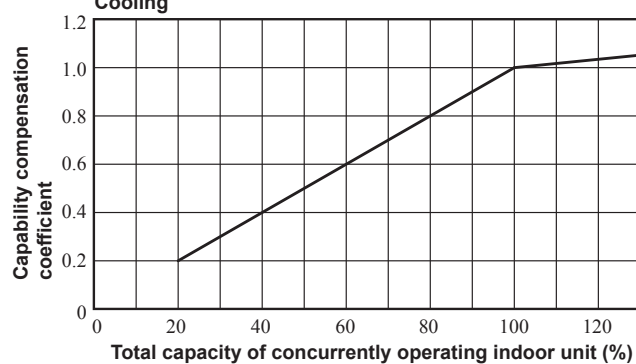
Heating



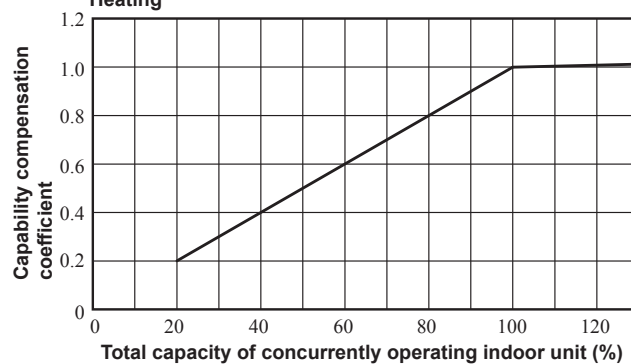
Model FDC(S)1250KXZE1

◆ Capability compensation coefficient

Cooling

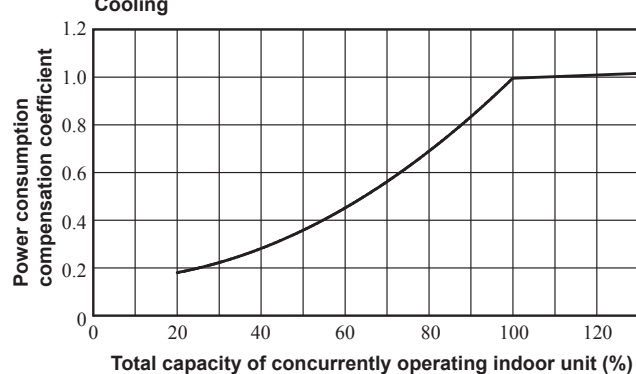


Heating

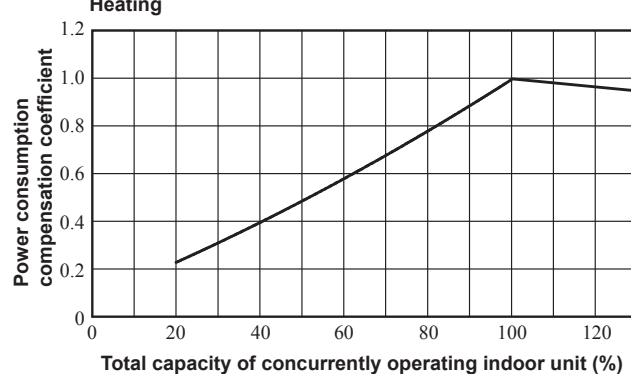


◆ Power consumption compensation coefficient

Cooling



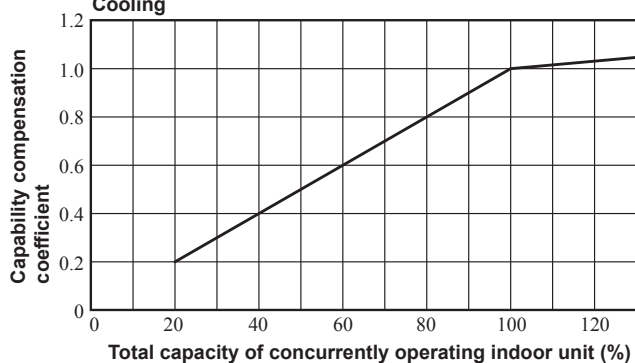
Heating



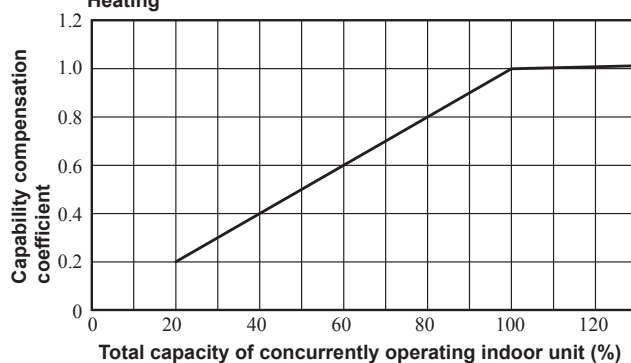
Model FDC(S)1300KXZE1

◆ Capability compensation coefficient

Cooling

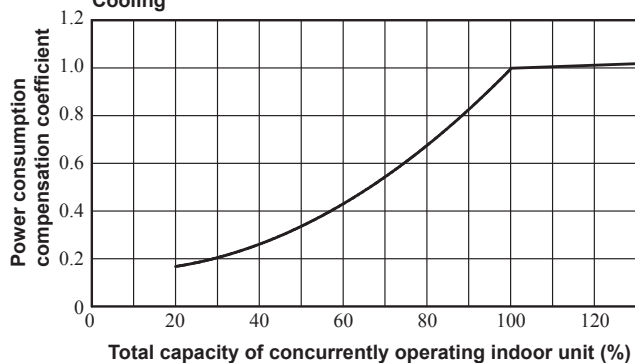


Heating

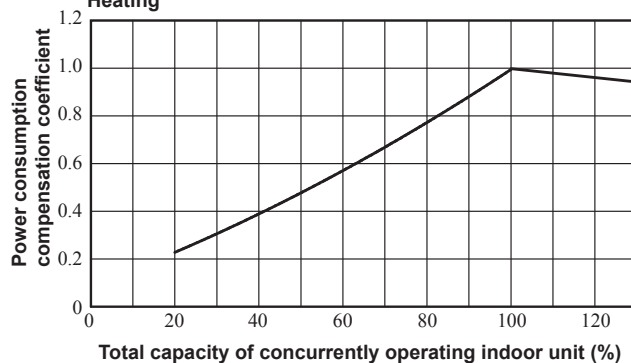


◆ Power consumption compensation coefficient

Cooling



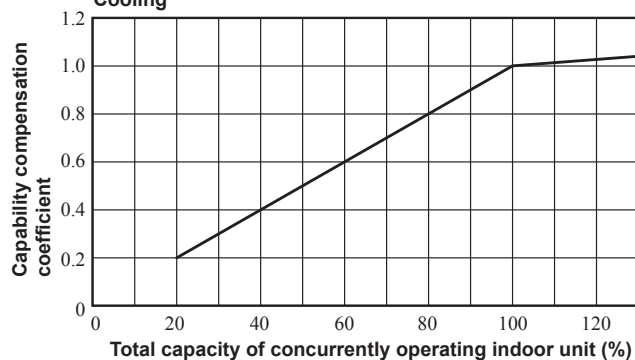
Heating



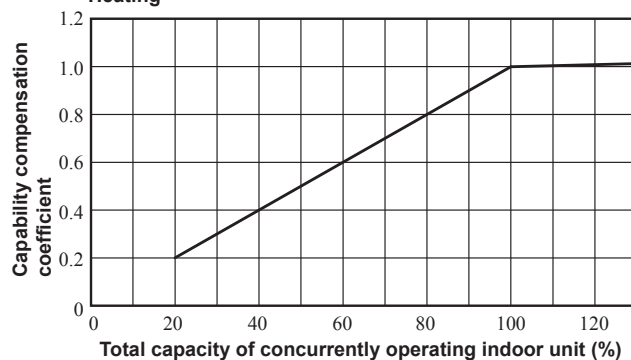
Model FDC(S)1350KXZE1

◆ Capability compensation coefficient

Cooling

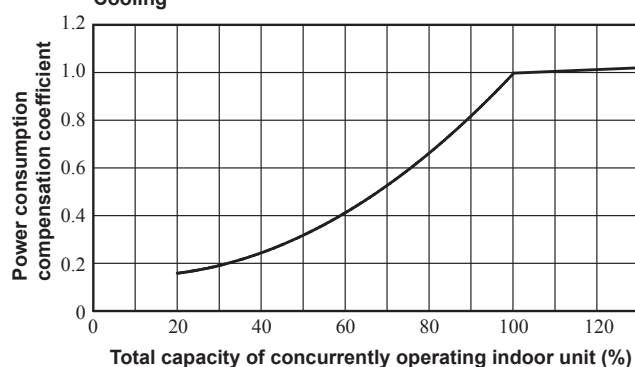


Heating

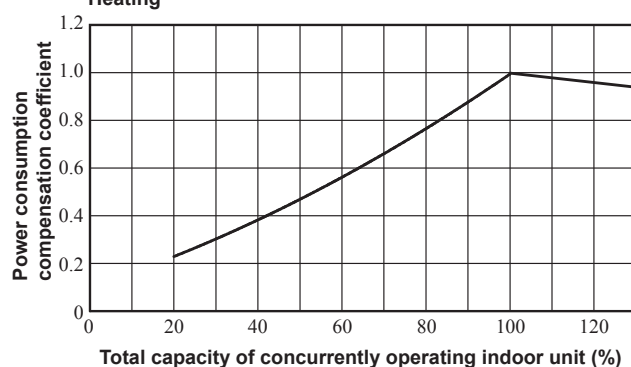


◆ Power consumption compensation coefficient

Cooling

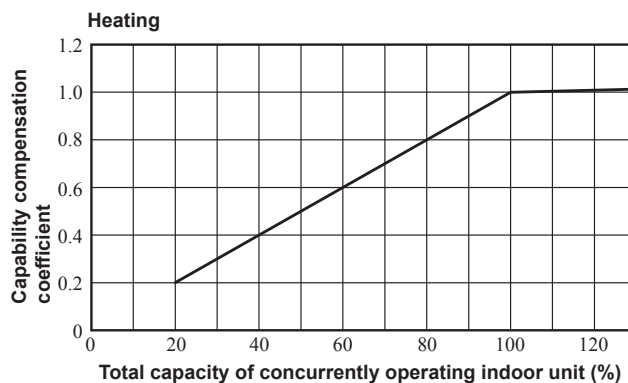
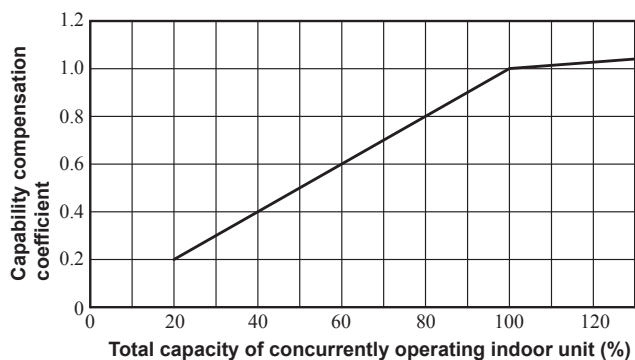


Heating

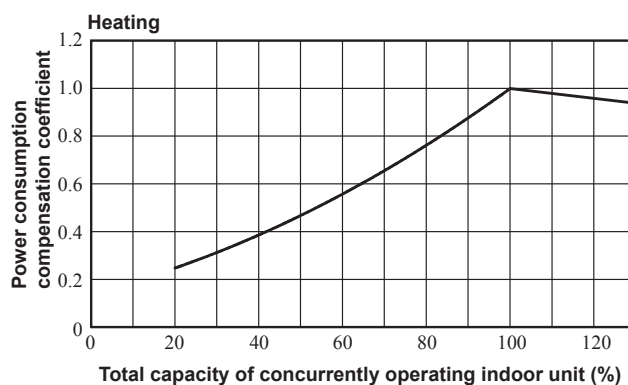
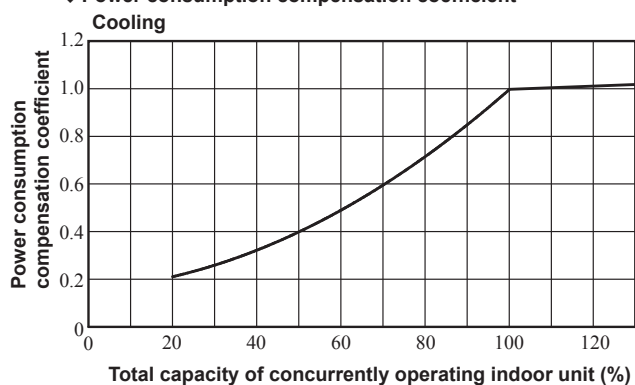


Model FDC(S)1425KXZE1

◆ **Capability compensation coefficient**

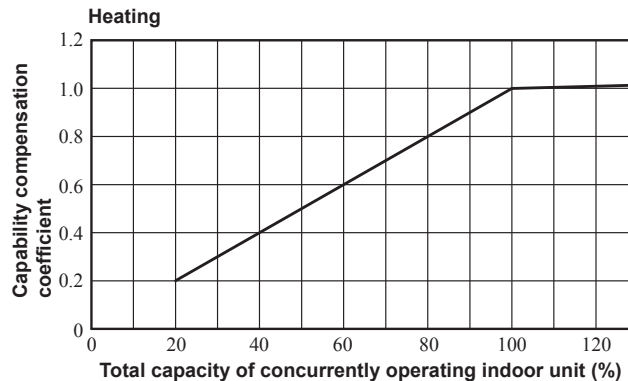
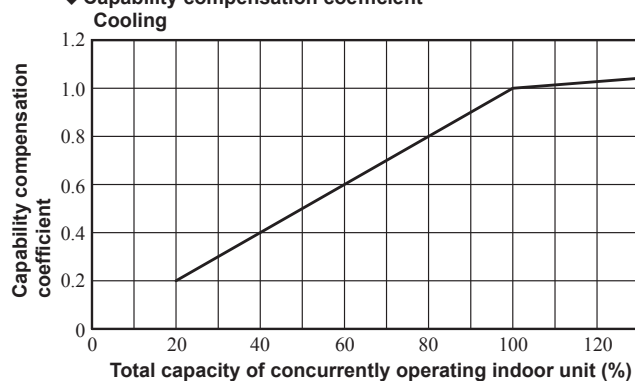


◆ **Power consumption compensation coefficient**

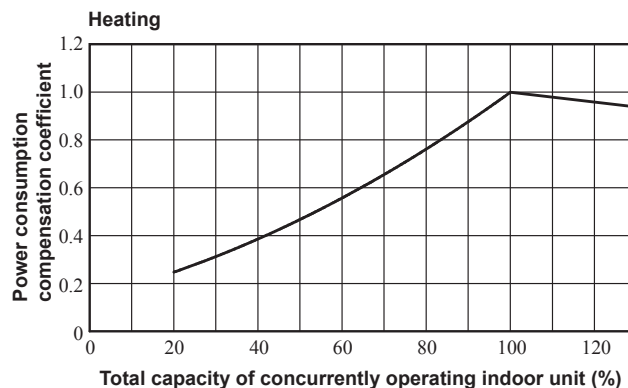
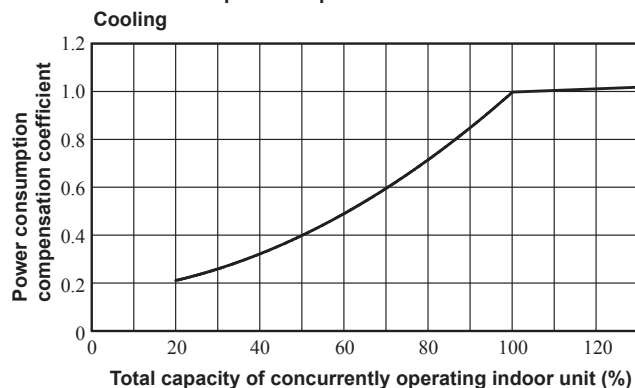


Model FDC(S)1450KXZE1

◆ **Capability compensation coefficient**

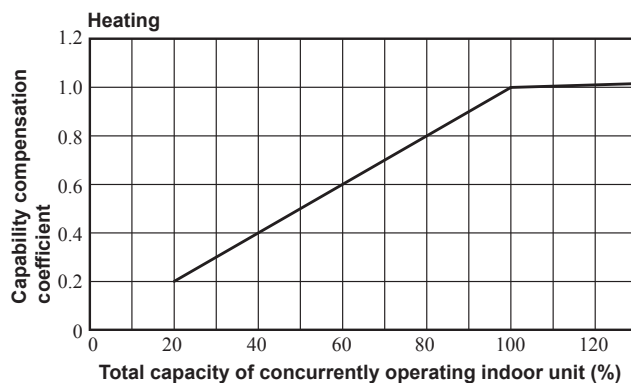
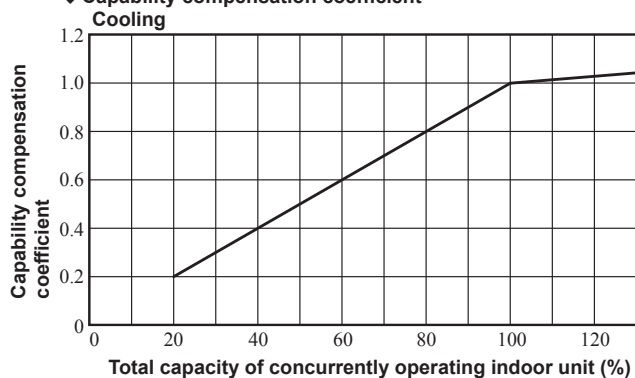


◆ **Power consumption compensation coefficient**

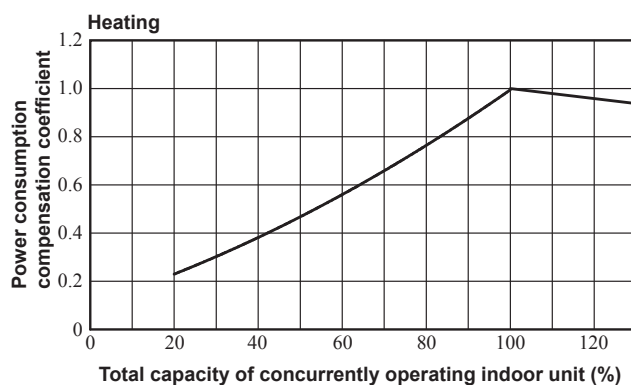
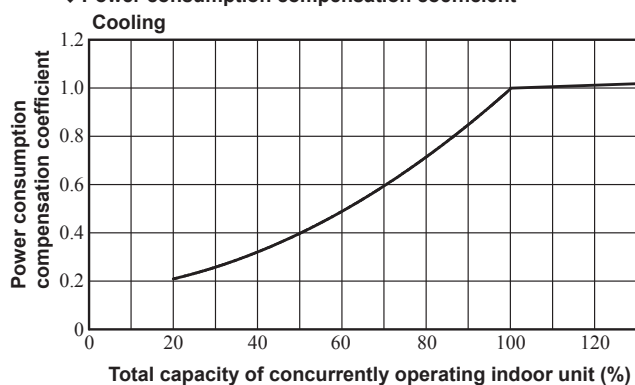


Model FDC(S)1500KXZE1

◆ Capability compensation coefficient

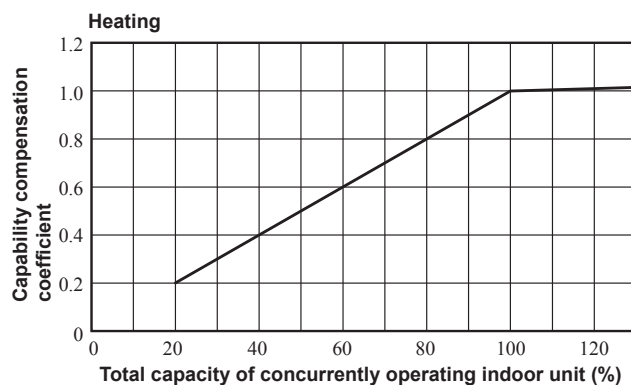
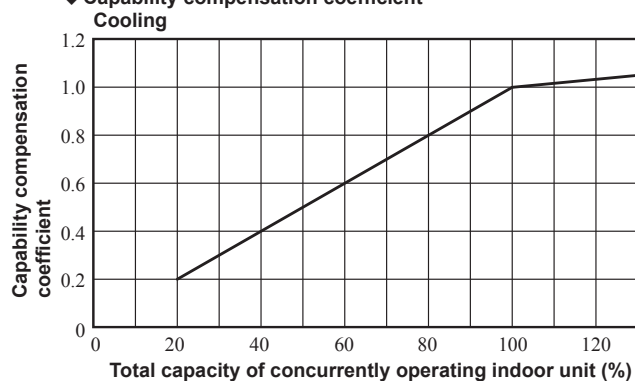


◆ Power consumption compensation coefficient

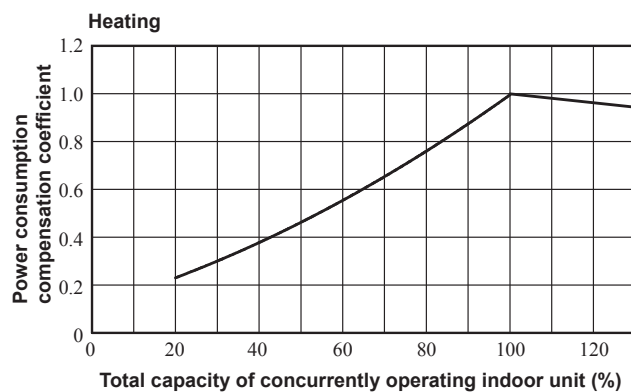
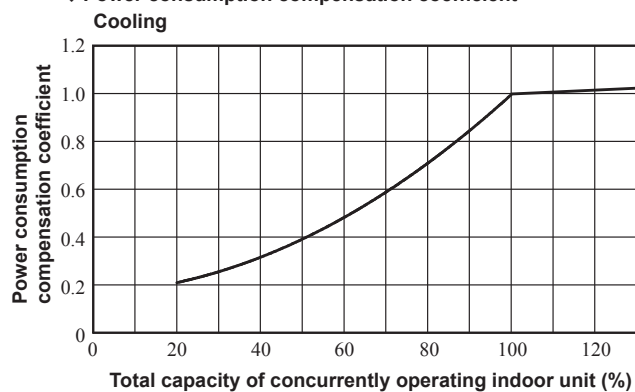


Model FDC(S)1560KXZE1

◆ Capability compensation coefficient



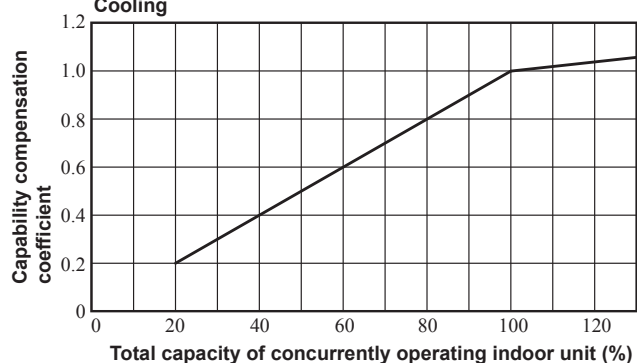
◆ Power consumption compensation coefficient



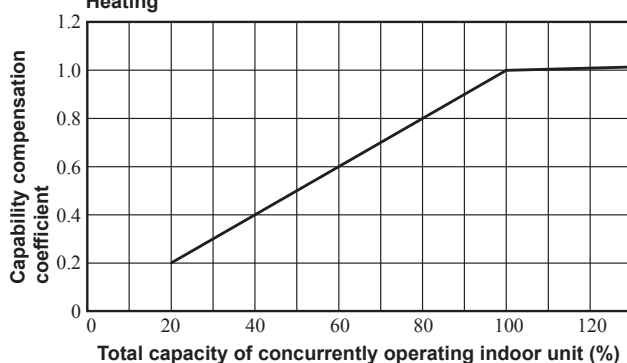
Model FDC(S)1620KXZE1

◆ **Capability compensation coefficient**

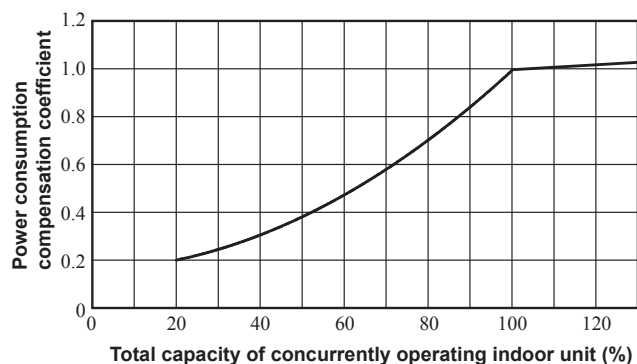
Cooling



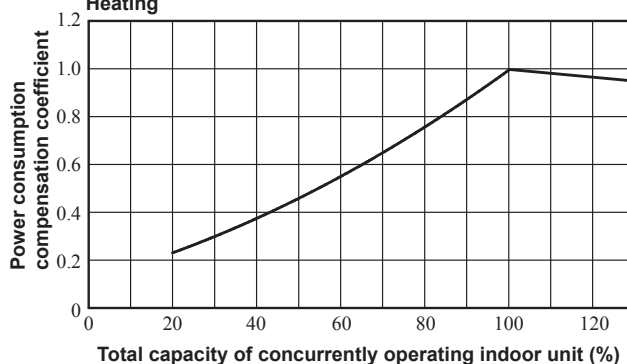
Heating



◆ **Power consumption compensation coefficient**



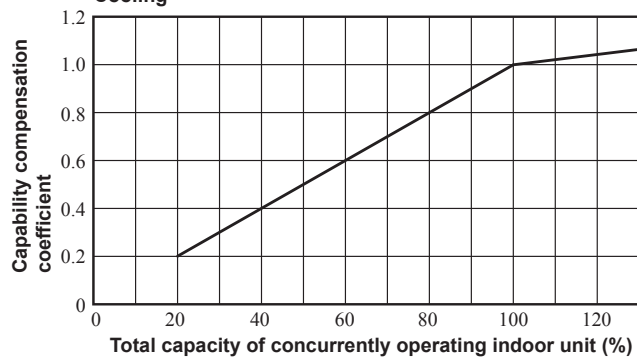
Heating



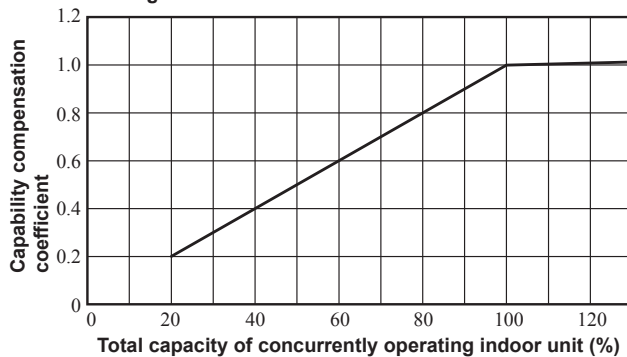
Model FDC(S)1680KXZE1

◆ **Capability compensation coefficient**

Cooling

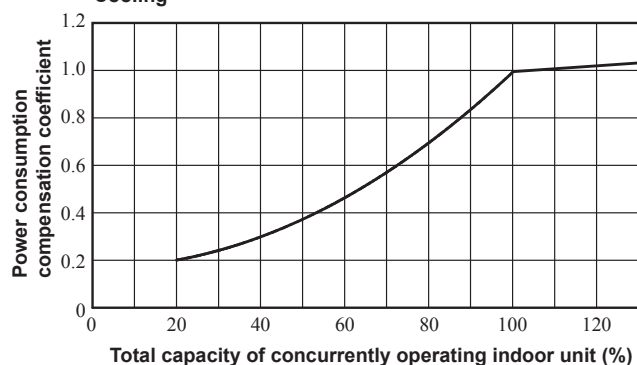


Heating

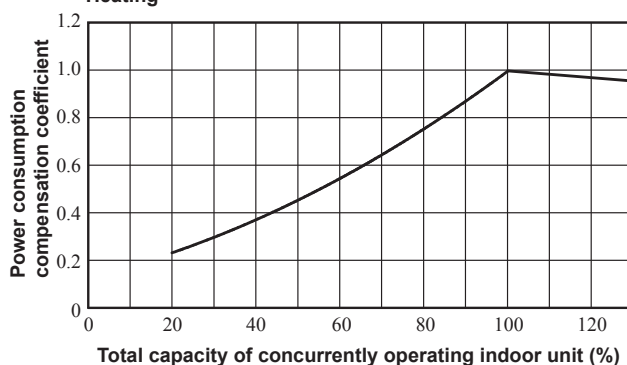


◆ **Power consumption compensation coefficient**

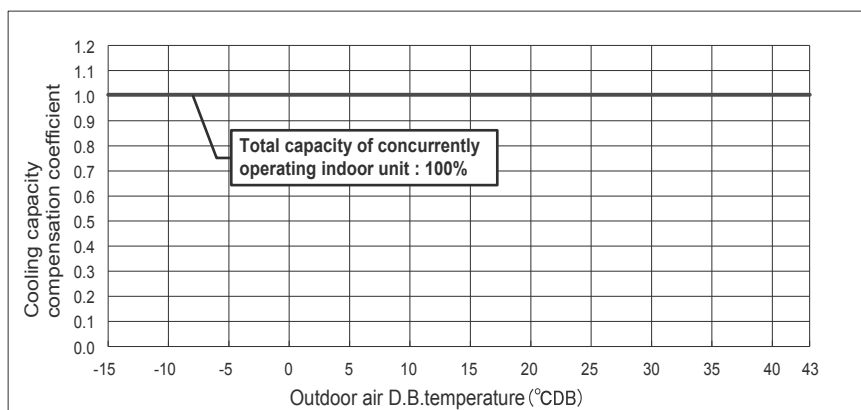
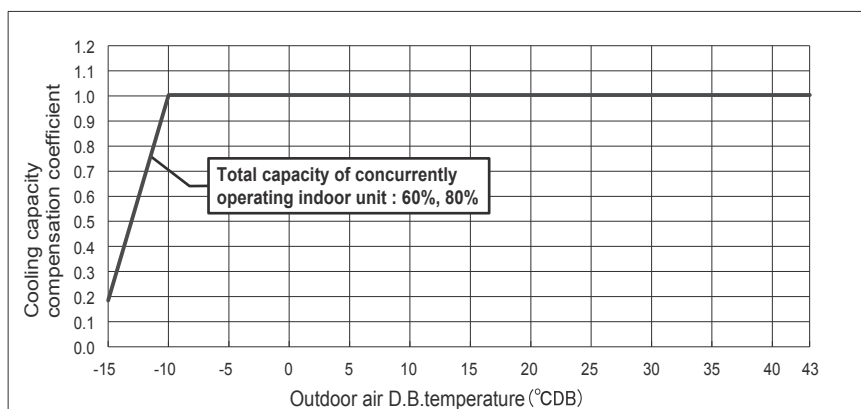
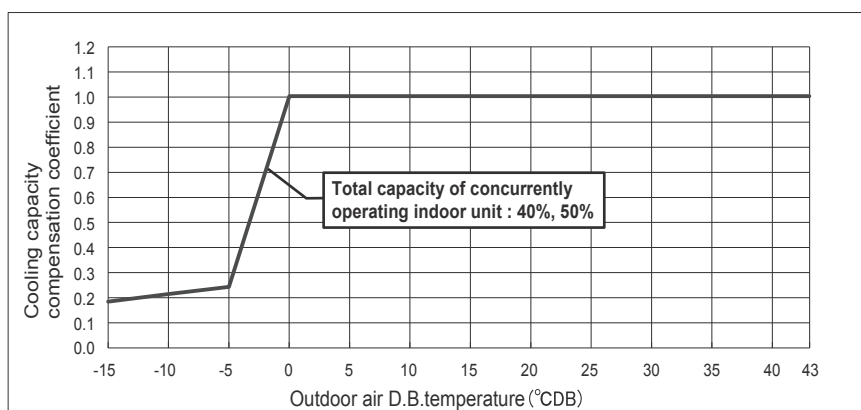
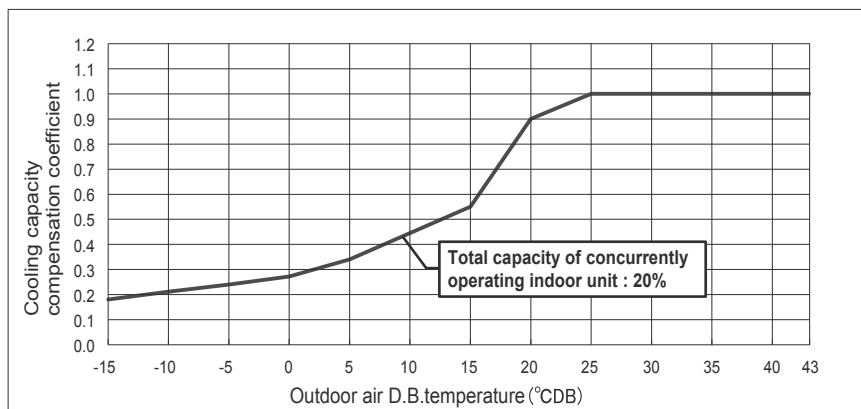
Cooling



Heating



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

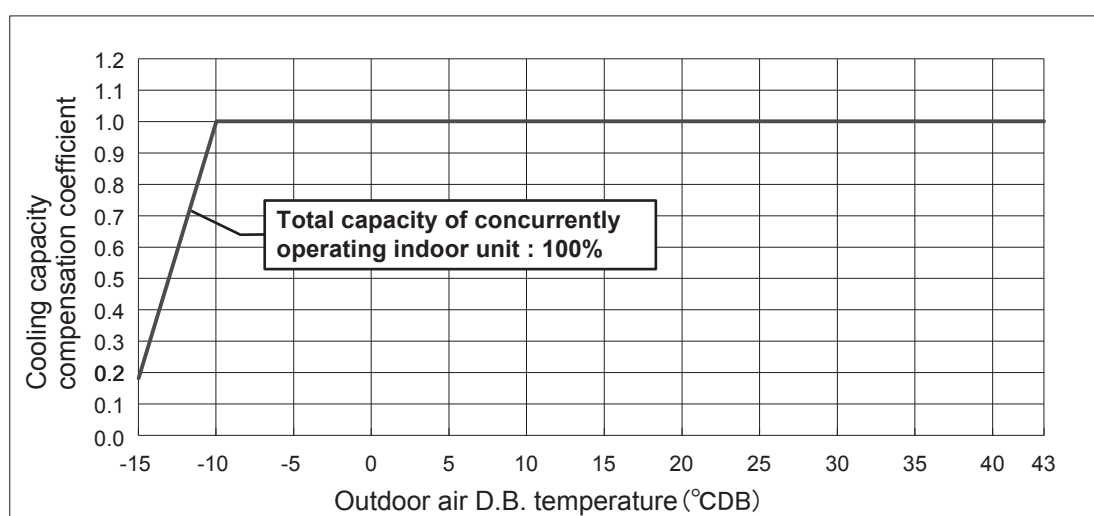
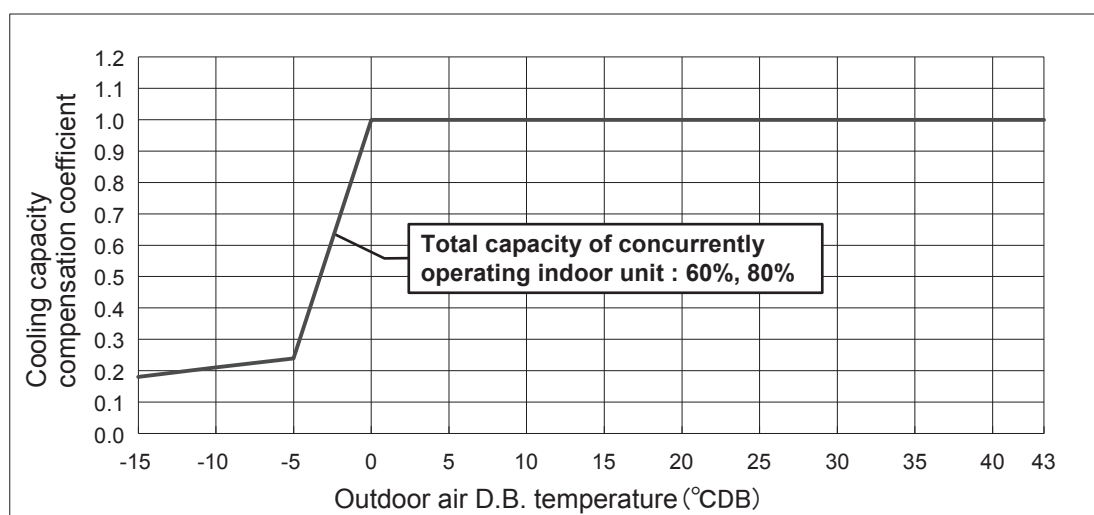
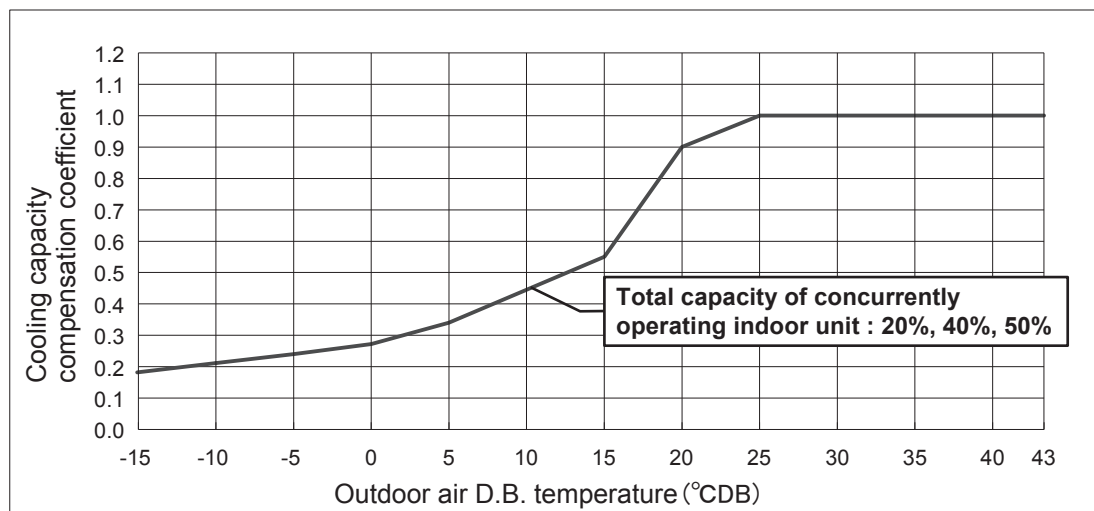


Capacity compensation coefficient is that of cooling capacity at each fan-tap.

(Condition) Room temp: 27 °CDB/19°CWB

(*) If room temp. is lower than 27°CDB/19°CWB, 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 °CDB/19°CWB

(*) If room temp. is lower than 27°CDB/19°CWB, 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.

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 does not reach the limit (and in the event of an emergency, measures can be made before injury can occur).

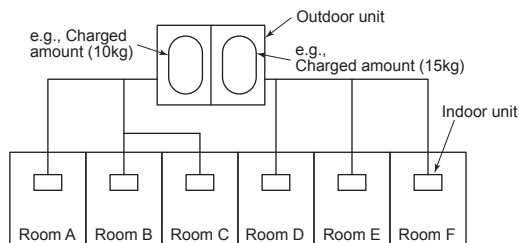
In a room where the concentration may exceed the limit, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device.

The concentration is as given below.

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

The concentration limit of R410A which is used in multi air conditioners is 0.42kg/m³. (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:

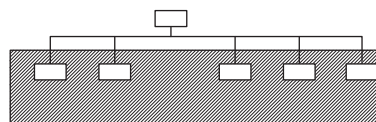
The possible amount of leaked refrigerant gas in rooms A, B and C is 10kg.

The possible amount of leaked refrigerant gas in rooms D, E and F is 15kg.

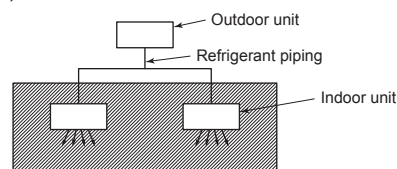
Important

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

① No partition (shaded portion)

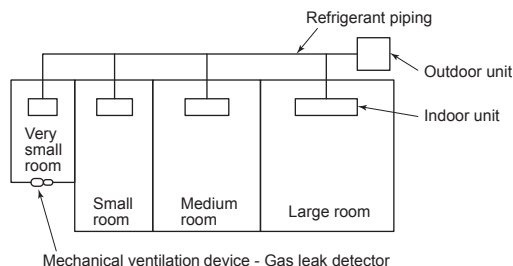


② When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15% or larger than the respective floor spaces at the top or bottom of the door).

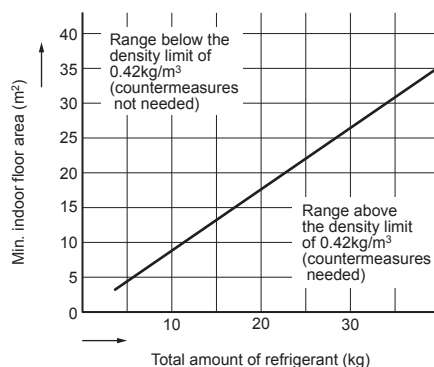


③ If an indoor unit is installed in each partitioned room and the refrigerant tubing is interconnected, the smallest of course becomes the object.

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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