13. WALL MOUNTED TYPE PACKAGED AIR-CONDITIONER

(Split system, Air to air heat pump type)

Refrigerant R22 use models

FDKN308HEN-SB FDKN258HEN-A

308HES-SB 258HEP-A

Refrigerant R407C use models

FDKNP308HEN-SB

308HES-SB

CONTENTS

13.1 GENERAL INFORMATION

13.1.1 Specific features

(1) Less refrigerant charge amount due to use of double phase refrigerant flow system. The total refrigerant charge amount has been reduced by more than 50%.

(2) The indoor outdoor interconnection signal wiring has been done away with. The microcomputer chip is installed in the indoor unit. There is no need for the unit to communicate between the outdoor and indoor units so the unit is more resistant to electromagnetic noise thus the incidence of microcomputer malfunction has been reduced. The compressor in the outdoor unit has its own self protection function, that reacts according to abnormal high pressure and excessive high temperature.

(3) There are only five power line between the outdoor and indoor unit. As no signal wire is used there is no need to separate the power line from the signal line. One cabtyre cable with 6 wires encased in one sheath is enough for conducting the wiring work between the outdoor unit and the indoor unit. This contributes to simpler wiring work in the field.

(4) All air supply ports have auto swing louvers. The indoor fan motor has two speeds of high and low.

(5) All models have service valves protruding from the outdoor unit for faster flare connection work in the field.

(6) Aero trap louver

(a) Pleasantness will be enhanced with the employment of aero trap louver. It has an excellent wind orientation and a homogeneous air conditioning feeling is ensured at every corner in a room with the auto swing blasting which can be adjusted the maximum 70° downward.

(b) Louver angle can be adjusted to 4 fixed positions with the remote control. It can be adjusted at any optional angle during the manual operation. Sidewise blast is adjustable by 40° in each direction.

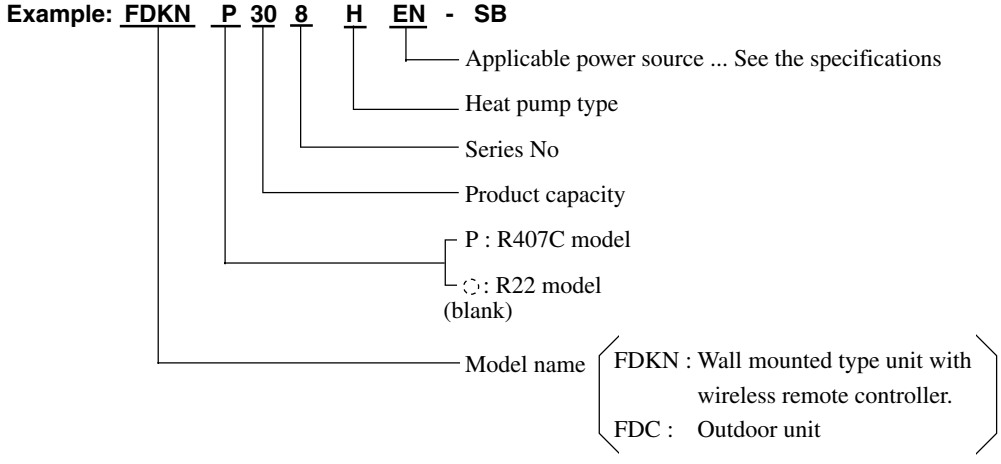
(7) Low noise

Specially developed silent fan is employed. A very gentle operation sound is assured because the noise like wind slashing sound are suppressed effectively.

(8) Thin and compact design

The unit measures 19.6 cm in thickness and its size is so compact as a room air conditioner. Body of the unit is dinished in the ivory white color and a pleasant and simple design produces a very pleasant harmony for the interior design.

13.1.2 How to read the model name



13.2 SELECTION DATA

13.2.1 Specifications

(1) Refrigerant R22 use models

Model FDKN308HEN-SB

Item		Model	FDKN308HEN-SB	
			FDKN308H	FDC308HEN3B
Nominal cooling capacity(1)		W	**7100**	
Nominal heating capacity(1)		W	**8000**	
Power source			**1 Phase, 220/240V, 50Hz**	
Operation data(3)	Cooling input	kW	2.95/3.15	
	Running current (Cooling)	A	13.8/14.3	
	Power factor (Cooling)	%	97/92	
	Heating input	kW	2.81/2.97	
	Running current (Heating)	A	13.2/13.6	
	Power factor (Heating)	%	97/91	
	Inrush current (L.R.A)	A	95	
	Noise level(4)	dB(A)	Hi 46 Lo:40	52
Exterior dimensions Height × Width × Depth		**mm**	**298 × 1155 × 196**	**845 × 880 × 340**
Net weight		**kg**	**13.5**	**74**
Refrigerant equipment Compressor type & Q'ty			–	**GT-A5534EN41 × 1**
	Motor	kW	–	**2.5**
	Starting method		–	Line starting
Heat exchanger			Louver fins & inner grooved tubing	Slitted fins & bare tubing
Refrigerant control			Capillary tube	
Refrigerant			**R22**	
Quantity		**kg**	**–**	**1.4 [Pre-charged up to the piping length of 5m]**
Refrigerant oil		ℓ	–	**1.45 (BARREL FREEZE 32SAM)**
Defrost control			MC controlled de-icer	
High pressure control			High pressure switch	
Air handling equipment Fan type & Q'ty			Tangential fan × 1	Propeller fan × 1
	Motor	W	**40 × 1**	**55 × 1**
	Starting method		Line starting	Line starting
Air flow (Standard)		**CMM**	**Hi:21 Lo:15**	**58**
Fresh air intake			Unavailable	–
Air filter, Q'ty			Long life filter ×3(washable)	–
Shock & vibration absorber			Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater		W	–	33 (Crank case heater)
Operation control Operation switch			Wireless remote control switch	– (Indoor unit side)
Room temperature control			Thermostat by electronics	–
Safety equipment			Internal thermostat for fan motor. Frost protection thermostat.	Internal thermostat for fan motor. Abnormal discharge temperature protection.
Installation data Refrigerant piping size		**mm (in)**	**Liquid line: ϕ9.52 (3/8″) Gas line: ϕ15.88 (5/8″)**	
Connecting method			**Flare piping**	
Drain hose			(Connectable with VP16)	–
Insulation for piping			Necessary (both Liquid & Gas lines)	
Accessories			Mounting kit. Wireless remote controller. Drain hose	
Optional parts			–	

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

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO-T1, JIS B8616
Heating	20˚C	–	7˚C	6˚C	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard. ISO-T1 "UNITARY AIR-CONDITIONERS"

(3) The operation data indicate when the air-conditioner is operated at 220/240V 50Hz.

(4) Indicates the value at mild mode.

Model FDKN308HES-SB

Item		Model	FDKN308HES-SB	
			FDKN308H	FDC308HES3B
Nominal cooling capacity(1)		W	**7100**	
Nominal heating capacity(1)		W	**8000**	
Power source			**3 Phase, 380/415V, 50Hz**	
Operation data(3)	Cooling input	kW	2.87/2.93	
	Running current (Cooling)	A	5.0/5.4	
	Power factor (Cooling)	%	87/75	
	Heating input	kW	2.51/2.57	
	Running current (Heating)	A	4.5/4.7	
	Power factor (Heating)	%	85/76	
	Inrush current (L.R.A)	A	45	
	Noise level(4)	dB(A)	Hi 46 Lo:40	52
Exterior dimensions Height × Width × Depth		**mm**	**298 × 1155 × 196**	**845 × 880 × 340**
Net weight		**kg**	**13.5**	**74**
Refrigerant equipment Compressor type & Q'ty			–	**GT-A5534ES41 × 1**
	Motor	kW	–	**2.5**
	Starting method		–	Line starting
Heat exchanger			Louver fins & inner grooved tubing	Slitted fins & bare tubing
Refrigerant control			Capillary tube	
Refrigerant			**R22**	
Quantity		**kg**	**–**	**1.4 [Pre-charged up to the piping length of 5m]**
Refrigerant oil		ℓ	–	**1.45 (BARREL FREEZE 32SAM)**
Defrost control			MC controlled de-icer	
High pressure control			High pressure switch	
Air handling equipment Fan type & Q'ty			Tangential fan × 1	Propeller fan × 1
	Motor	W	**40 × 1**	**55 × 1**
	Starting method		Line starting	Line starting
Air flow (Standard)		**CMM**	**Hi:21 Lo:15**	**58**
Fresh air intake			Unavailable	–
Air filter, Q'ty			Long life filter ×3(washable)	–
Shock & vibration absorber			Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater		W	–	33 (Crank case heater)
Operation control Operation switch			Wireless remote control switch	– (Indoor unit side)
Room temperature control			Thermostat by electronics	–
Safety equipment			Internal thermostat for fan motor. Frost protection thermostat.	Internal thermostat for fan motor. Abnormal discharge temperature protection.
Installation data Refrigerant piping size		**mm (in)**	**Liquid line: ϕ9.52 (3/8″) Gas line: ϕ15.88 (5/8″)**	
Connecting method			**Flare piping**	
Drain hose			(Connectable with VP16)	–
Insulation for piping			Necessary (both Liquid & Gas lines)	
Accessories			Mounting kit. Wireless remote controller. Drain hose	
Optional parts			–	

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

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO-T1, JIS B8616
Heating	20˚C	–	7˚C	6˚C	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard. ISO-T1 "UNITARY AIR-CONDITIONERS"

(3) The operation data indicate when the air-conditioner is operated at 380/415V 50Hz.

(4) Indicates the value at mild mode.

Model FDKN258HEN-A

Item			Model	FDKN258HEN-A	
				FDKN258H	FDC256HEN3A
Nominal cooling capacity(1)		W		**5900**	
Nominal heating capacity(1)		W		**6100**	
Power source				**1 Phase, 220/240V, 50Hz**	
Operation data(3)	Cooling input	kW		2.57/2.61	
	Running current (Cooling)	A		12.5/13.1	
	Power factor (Cooling)	%		93/83	
	Heating input	kW		2.36/2.40	
	Running current (Heating)	A		11.5/12.1	
	Power factor (Heating)	%		93/83	
	Inrush current (L.R.A)	A		64	
	Noise level(4)	dB(A)		Hi: 45 Lo: 38	57
Exterior dimensions Height × Width × Depth		**mm**		**298 × 940 × 196**	**615 × 850 × 290 + 30**
Net weight		**kg**		**11**	**57**
Refrigerant equipment Compressor type & Q'ty				–	**RC5527ENE1 × 1**
	Motor	kW		–	**1.87**
	Starting method			–	Line starting
Heat exchanger				Louver fins & inner grooved tubing	Slitted fins & bare tubing
Refrigerant control				Capillary tube	
Refrigerant				**R22**	
Quantity		**kg**		**–**	**1.25 [Pre-charged up to the piping length of 5m]**
Refrigerant oil		ℓ		–	**1.63 (SUNISO 3GS)**
Defrost control				IC controlled de-icer	
High pressure control				High pressure regulator valve	
Air handling equipment Fan type & Q'ty				Tangential fan × 1	Propeller fan × 1
	Motor	W		40 × 1	55 × 1
	Starting method			Line starting	Line starting
Air flow (Standard)		**CMM**		**Hi:17 Lo:10**	**42**
Fresh air intake				Unavailable	–
Air filter, Q'ty				Long life filter ×2(washable)	–
Shock & vibration absorber				Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater		W		–	40 (Crank case heater)
Operation control Operation switch				Wireless remote control switch	– (Indoor unit side)
Room temperature control				Thermostat by electronics	–
Safety equipment				Internal thermostat for fan motor. Frost protection thermostat.	Internal protector for compressor. Internal thermostat for fan motor. Internal pressure relief valve for compressor.
Installation data Refrigerant piping size		**mm (in)**		**Liquid line: ϕ9.52 (3/8″) Gas line: ϕ15.88 (5/8″)**	
Connecting method				**Flare piping**	
Drain hose				(Connectable with VP16)	–
Insulation for piping				Necessary (both Liquid & Gas lines)	
Accessories				Mounting kit. Wireless remote controller. Drain hose	
Optional parts				–	

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

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO-T1, JIS B8616
Heating	20˚C	12˚C	7˚C	6˚C	

(2) This packaged air conditioner is manufactured and tested in conformity with the following standard. ISO-T1 "UNITARY AIR CONDITIONERS"

(3) The operation data indicate when the air-conditioner is operated at 220/240V 50Hz.

(4) Indicates the value at mild mode.

Model FDKN258HEP-A

Item				Model	FDKN258HEP-A	
					FDKN258H	FDC256HEP3A
Nominal cooling capacity(1)			ISO-T1	W	**6200**	
			ISO-T3		**5200**	
Nominal heating capacity(1)			ISO-T1	W	**6400**	
Power source					**1 Phase, 220V, 60Hz**	
Operation data(3)	**ISO-T1**	Cooling input		kW	2.66	
		Running current (Cooling)		A	12.3	
		Power factor (Cooling)		%	98	
		Heating input		kW	2.45	
		Running current (Heating)		A	11.6	
		Power factor (Heating)		%	96	
	ISO-T3	Cooling input		kW	3.04	
		Running current (Cooling)		A	14.3	
		Power factor (Cooling)		%	97	
	Inrush current (L.R.A)			A	66	
	Noise level(4)			dB(A)	Hi:45 Lo:38	57
Exterior dimensions Height × Width × Depth				**mm**	**298 × 940 × 196**	**615 × 850 × 290 + 30**
Net weight				**kg**	**11**	**57**
Refrigerant equipment Compressor type & Q'ty					–	**RC5528EPE1 × 1**
Motor				kW	–	**1.68**
Starting method					–	Line starting
Heat exchanger					Louver fins & inner grooved tubing	Slitted fins & bare tubing
Refrigerant control					Capillary tube	
Refrigerant					**R22**	
Quantity				**kg**	**–**	**1.25 [Pre-charged up to the piping length of 5m]**
Refrigerant oil				ℓ	–	**1.63 (SUNISO 3GS)**
Defrost control					IC controlled de-icer	
High pressure control					High pressure regulator valve	
Air handling equipment Fan type & Q'ty					Tangential fan × 1	Propeller fan × 1
Motor				W	40 × 1	55 × 1
Starting method					Line starting	Line starting
Air flow (Standard)				**CMM**	**Hi:17 Lo:10**	**44**
Fresh air intake					Unavailable	–
Air filter, Q'ty					Long life filter ×2(washable)	–
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater				W	–	40 (Crank case heater)
Operation control Operation switch					Wireless remote control switch	– (Indoor unit side)
Room temperature control					Thermostat by electronics	–
Safety equipment					Internal thermostat for fan motor. Frost protection thermostat.	Internal protector for compressor. Internal thermostat for fan motor. Internal pressure relief valve for compressor.
Installation data Refrigerant piping size				**mm (in)**	**Liquid line: ϕ9.52 (3/8″) Gas line: ϕ15.88 (5/8″)**	
Connecting method					**Flare piping**	
Drain hose					(Connectable with VP16)	–
Insulation for piping					Necessary (both Liquid & Gas lines)	
Accessories					Mounting kit. Wireless remote controller. Drain hose	
Optional parts					–	

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

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO-T1, JIS B8616
Heating	20˚C	–	7˚C	6˚C	
Cooling	29˚C	19˚C	46˚C	24˚C	ISO-T3, SASO

(2) This packaged air conditioner is manufactured and tested in conformity with the following standard. ISO-T1 "UNITARY AIR CONDITIONERS"

(3) The operation data indicate when the air-conditioner is operated at 220V 60Hz.

(4) Indicates the value at mild mode.

(2) Refrigerant R407C use models

Model FDKNP308HEN-SB

Item		Model	FDKNP308HEN-SB	
			FDKN308H	FDCP308HEN3B
Nominal cooling capacity(1)		W	**7100**	
Nominal heating capacity(1)		W	**8000**	
Power source			**1 Phase, 220/240V, 50Hz**	
Operation data(3)	Cooling input	kW	3.18/3.33	
	Running current (Cooling)	A	14.8/15.2	
	Power factor (Cooling)	%	98/91	
	Heating input	kW	2.93/3.07	
	Running current (Heating)	A	13.8/14.2	
	Power factor (Heating)	%	97/90	
	Inrush current (L.R.A)	A	95	
	Noise level(4)	dB(A)	Hi 46 Lo:40	52
Exterior dimensions Height × Width × Depth		**mm**	**298 × 1155 × 196**	**845 × 880 × 340**
Net weight		**kg**	**13.5**	**76**
Refrigerant equipment Compressor type & Q'ty			–	**GT-A5534HN41 × 1**
	Motor	kW	–	**2.5**
	Starting method		–	Line starting
Heat exchanger			Louver fins & inner grooved tubing	Slitted fins & bare tubing
Refrigerant control			Capillary tube	
Refrigerant			**R407C**	
Quantity		**kg**	**–**	**1.75 [Pre-charged up to the piping length of 5m]**
Refrigerant oil		ℓ	–	**1.45 (MA32)**
Defrost control			MC controlled de-icer	
High pressure control			High pressure switch	
Air handling equipment Fan type & Q'ty			Tangential fan × 1	Propeller fan × 1
	Motor	W	**40 × 1**	**55 × 1**
	Starting method		Line starting	Line starting
Air flow (Standard)		**CMM**	**Hi:21 Lo:15**	**58**
Fresh air intake			Unavailable	–
Air filter, Q'ty			Long life filter ×3(washable)	–
Shock & vibration absorber			Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater		W	–	33 (Crank case heater)
Operation control Operation switch			Wireless remote control switch	– (Indoor unit side)
Room temperature control			Thermostat by electronics	–
Safety equipment			Internal thermostat for fan motor. Frost protection thermostat.	Internal thermostat for fan motor. Abnormal discharge temperature protection. High pressure swich for protection
Installation data Refrigerant piping size		**mm (in)**	**Liquid line: ϕ9.52 (3/8″) Gas line: ϕ15.88 (5/8″)**	
Connecting method			**Flare piping**	
Drain hose			(Connectable with VP16)	–
Insulation for piping			Necessary (both Liquid & Gas lines)	
Accessories			Mounting kit. Wireless remote controller. Drain hose	
Optional parts			–	

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

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO-T1, JIS B8616
Heating	20˚C	–	7˚C	6˚C	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard. ISO-T1 "UNITARY AIR-CONDITIONERS"

(3) The operation data indicate when the air-conditioner is operated at 220/240V 50Hz.

(4) Indicates the value at mild mode.

Model FDKNP308HES-SB

Item		Model	FDKNP308HES-SB	
			FDKN308H	FDCP308HES3B
Nominal cooling capacity(1)		W	**7100**	
Nominal heating capacity(1)		W	**8000**	
Power source			**3 Phase, 380/415V, 50Hz**	
Operation data(3)	Cooling input	kW	3.10/3.25	
	Running current (Cooling)	A	5.4/5.7	
	Power factor (Cooling)	%	87/79	
	Heating input	kW	2.95/3.09	
	Running current (Heating)	A	5.4/5.7	
	Power factor (Heating)	%	82/75	
	Inrush current (L.R.A)	A	45	
	Noise level(4)	dB(A)	Hi 46 Lo:40	52
Exterior dimensions Height × Width × Depth		**mm**	**298 × 1155 × 196**	**845 × 880 × 340**
Net weight		**kg**	**13.5**	**76**
Refrigerant equipment Compressor type & Q'ty			–	**GT-A5534HS41 × 1**
	Motor	kW	–	**2.5**
	Starting method		–	Line starting
Heat exchanger			Louver fins & inner grooved tubing	Slitted fins & bare tubing
Refrigerant control			Capillary tube	
Refrigerant			**R407C**	
Quantity		**kg**	**–**	**1.75 [Pre-charged up to the piping length of 5m]**
Refrigerant oil		ℓ	–	**1.45 (MA32)**
Defrost control			MC controlled de-icer	
High pressure control			High pressure switch	
Air handling equipment Fan type & Q'ty			Tangential fan × 1	Propeller fan × 1
	Motor	W	**40 × 1**	**55 × 1**
	Starting method		Line starting	Line starting
Air flow (Standard)		**CMM**	**Hi:21 Lo:15**	**58**
Fresh air intake			Unavailable	–
Air filter, Q'ty			Long life filter ×3(washable)	–
Shock & vibration absorber			Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater		W	–	33 (Crank case heater)
Operation control Operation switch			Wireless remote control switch	– (Indoor unit side)
Room temperature control			Thermostat by electronics	–
Safety equipment			Internal thermostat for fan motor. Frost protection thermostat.	Internal thermostat for fan motor. Abnormal discharge temperature protection. High pressure swich for protection
Installation data Refrigerant piping size		**mm (in)**	**Liquid line: ϕ9.52 (3/8″) Gas line: ϕ15.88 (5/8″)**	
Connecting method			**Flare piping**	
Drain hose			(Connectable with VP16)	–
Insulation for piping			Necessary (both Liquid & Gas lines)	
Accessories			Mounting kit. Wireless remote controller. Drain hose	
Optional parts			–	

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

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO-T1, JIS B8616
Heating	20˚C	–	7˚C	6˚C	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard. ISO-T1 "UNITARY AIR-CONDITIONERS"

(3) The operation data indicate when the air-conditioner is operated at 380/415V 50Hz.

(4) Indicates the value at mild mode.

13.2.2 Renge of usage & limitations

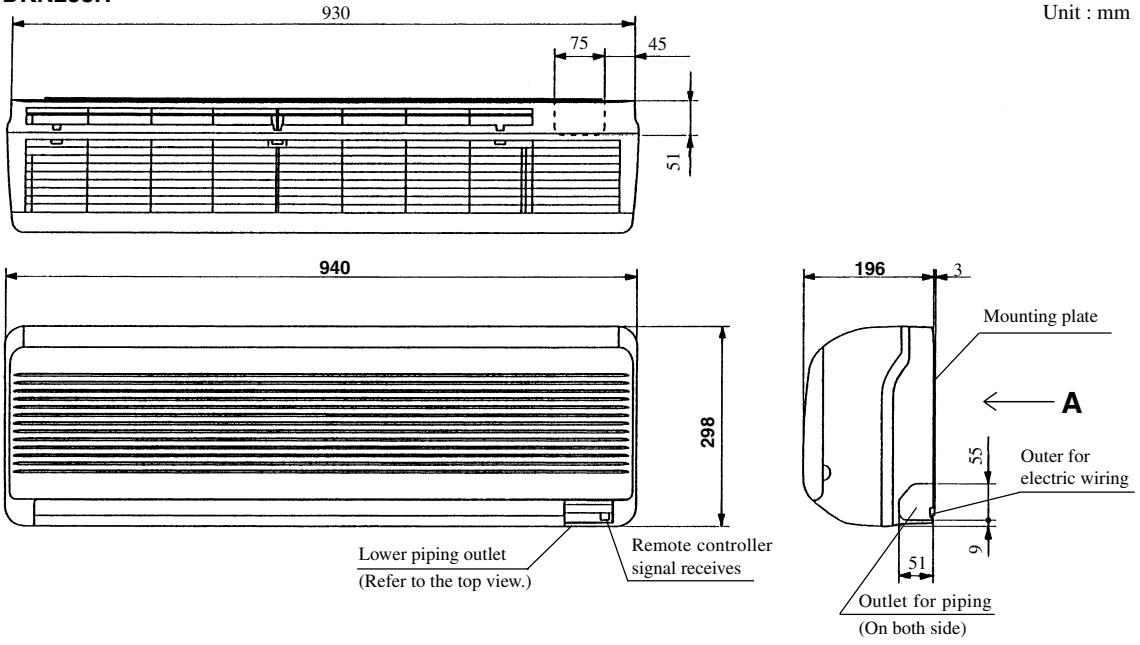
Item \ Models	FDKN(P)308	FDKN258
Indoor return air temperature (Upper, lower limits)	Refer to the selection chart	
Outdoor air temperature (Upper, lower limits)		
Refrigerant line (one way) length	**Max. 50 m**	**Max. 30 m**
Vertical height difference between outdoor unit and indoor unit	**Max. 30 m (Outdoor unit is higher)** **Max. 15 m (Outdoor unit is lower)**	**Max. 15 m**
Power source voltage	Rating ± 10%	
Voltage at starting	Min. 85% of rating	
Frequency of ON-OFF cycle	Max. 10 times/h	
ON and OFF interval	Min. 3 minutes	

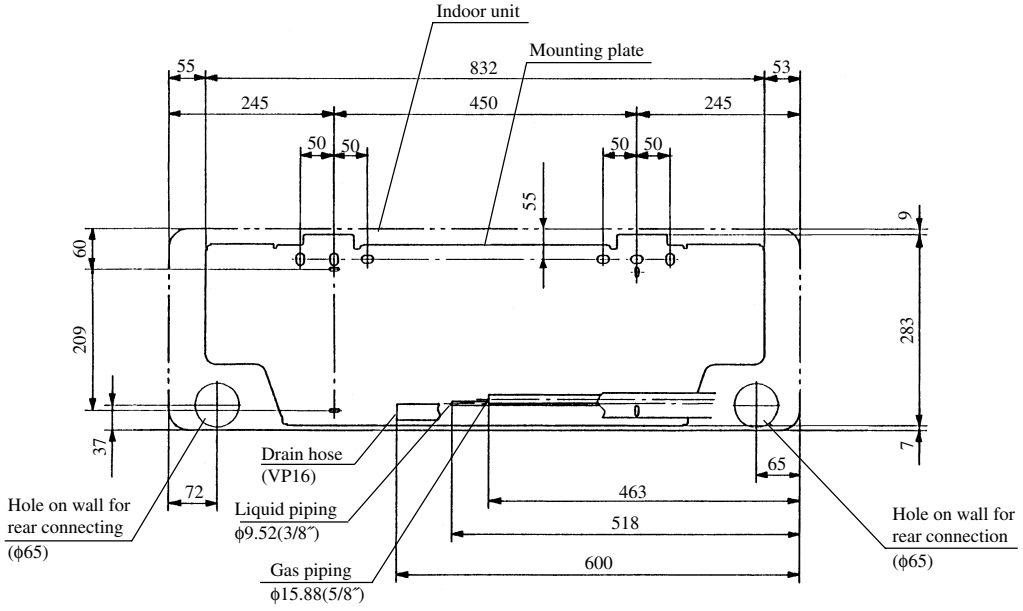
13.2.3 Exterior dimensions

(1) Indoor unit

Model FDKN258H

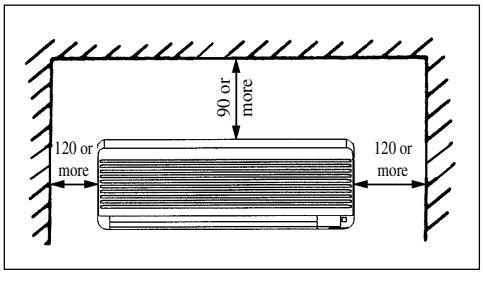
Unit : mm





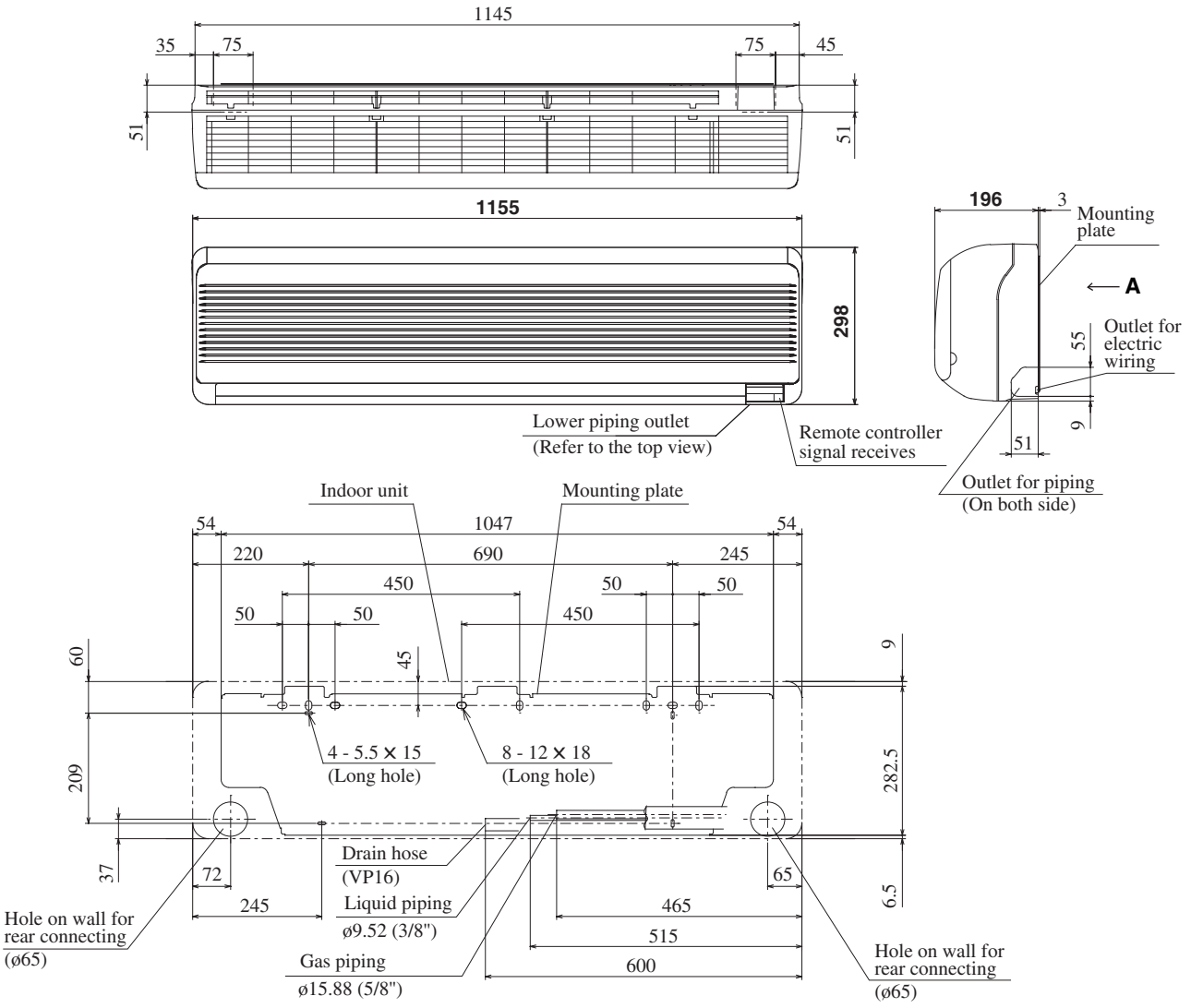
VIEW A (Rear side)

Space for installation and service



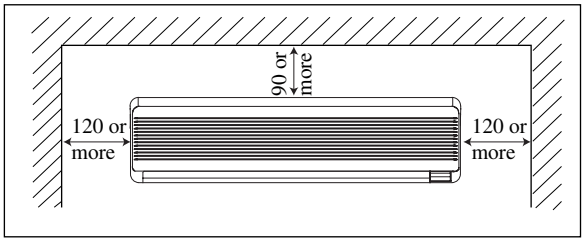
Model FDKN308H

Unit : mm



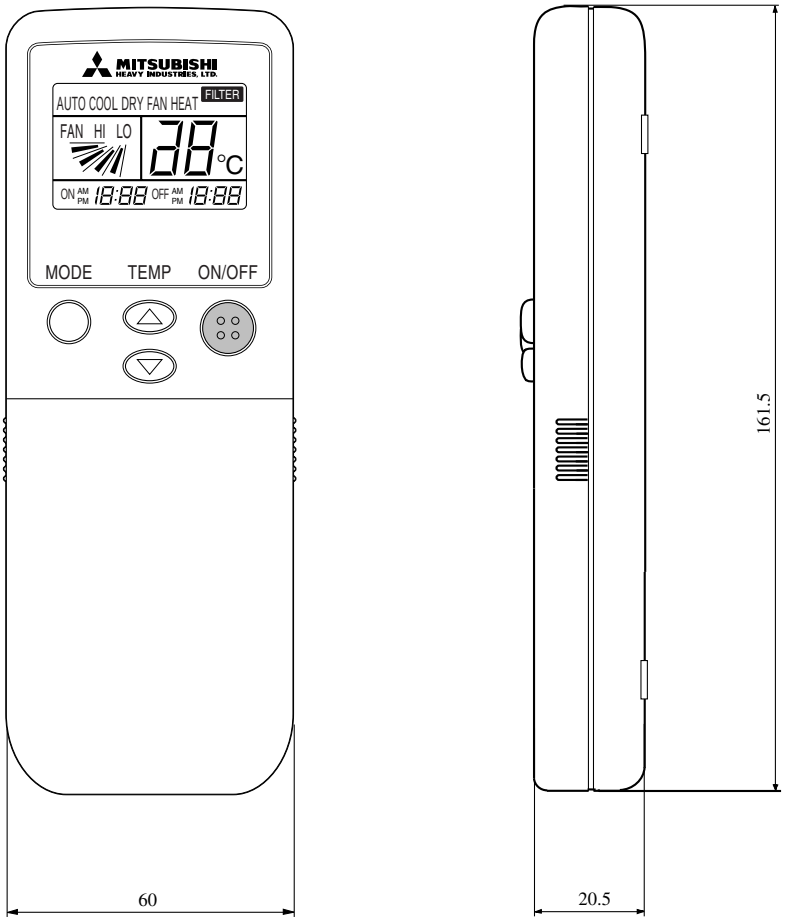
VIEW A (Rear side)

Space for installation and service

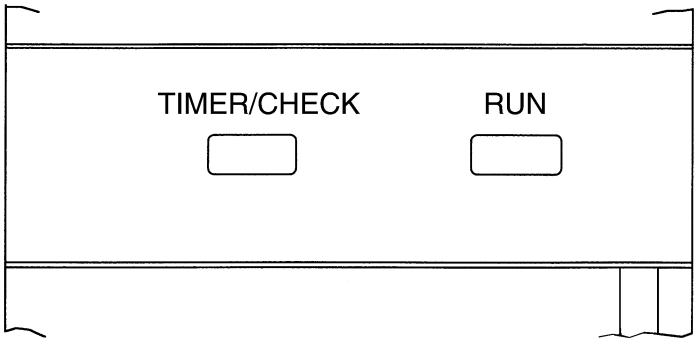


(2) Wireless remote controller

Unit: mm



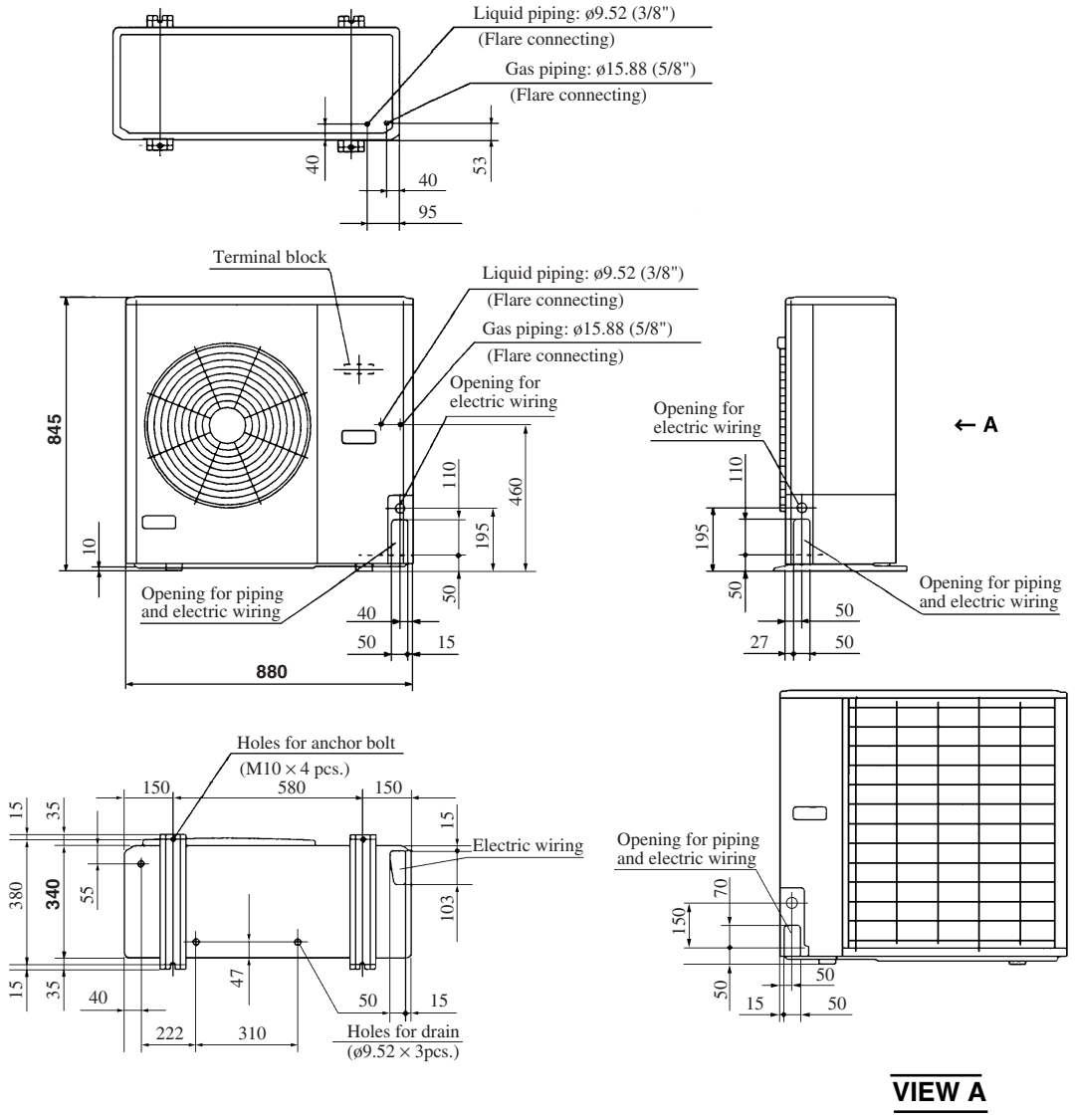
(3) Indication board of indoor unit



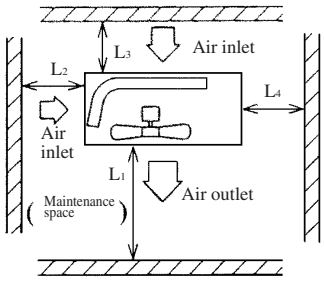
(4) Outdoor unit

Models FDC308HEN3B, 308HES3B
FDCP308HEN3B, 308HES3B

Unit: mm



Required space for maintenance and air flow



Minimum allowable space to the obstacles

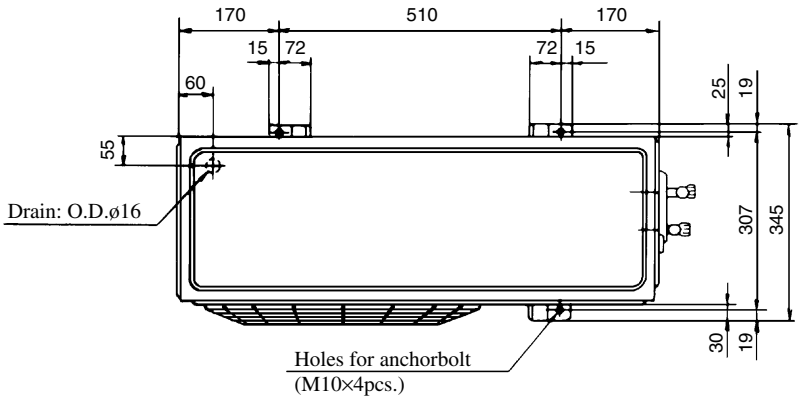
Unit:mm

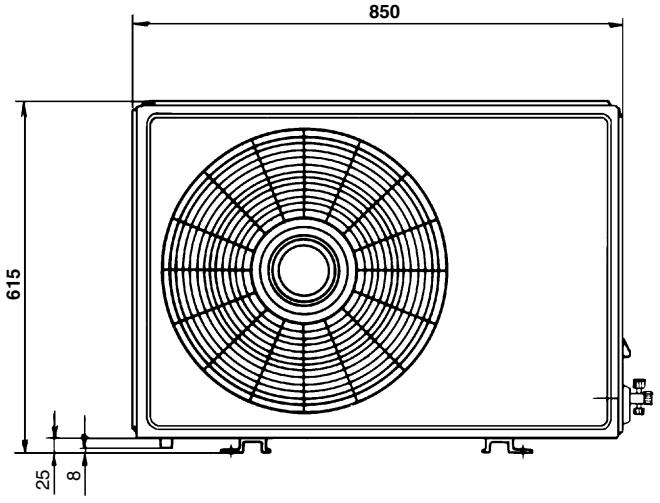
Mark \ Installation type	Ⅰ	Ⅱ	Ⅲ
L_1	Open	Open	500
L_2	300	5	Open
L_3	100	150	100
L_4	5	5	5

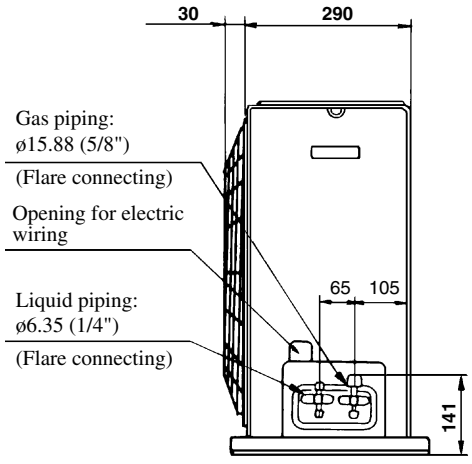
Notes
(1) Avoid the location where four sides are entirely surrounded by walls.
(2) Fix the unit by anchor bolts without fail. Restrict the protrusion length of anchor bolt to 15 mm and under.
(3) When strong wind blows against the unit, direct the discharge port at a right angle to the wind direction.
(4) Secure the space of 1 m and over at the top of unit.
(5) Make the height of obstruction wall in front of discharge port lower than the height of unit.

Models FDC256HEN3A, 256HEP3A

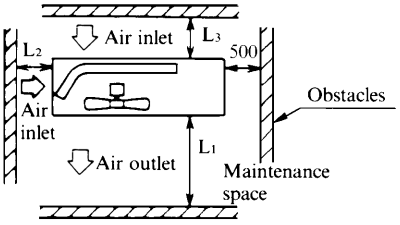
Unit: mm







Required space for maintenance and air flow



Minimum allowable space to the obstacles

Unit:mm

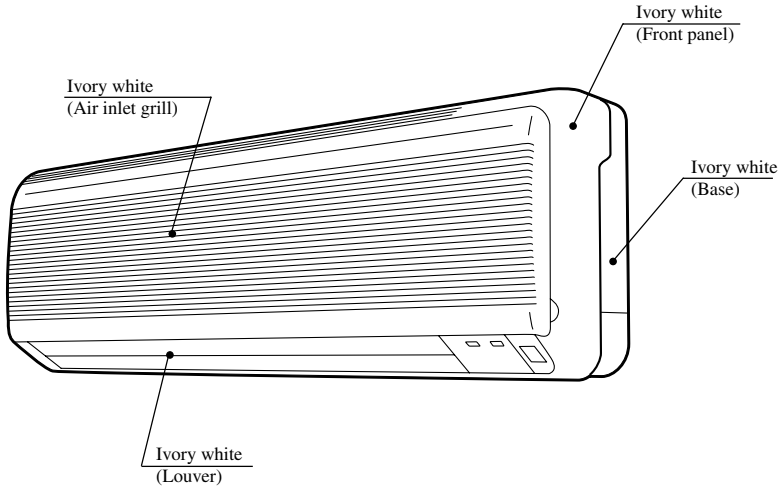
Mark \ Installation type	Ⅰ	Ⅱ
L_1	Open	100
L_2	100	Open
L_3	100	500

Notes
(1) Fix the unit with anchor bolts.
(2) Strong wind must not be directed to the air outlet.
(3) Free space over the unit must be larger than 1 m.
(4) The unit should not be surrounded by obstructions in all direction.
At least one direction around the unit must be free.

13.2.4 Exterior appearance

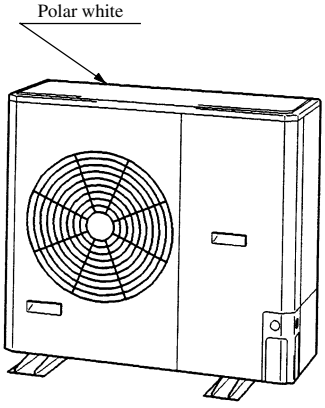
(1) Indoor unit

Models All models

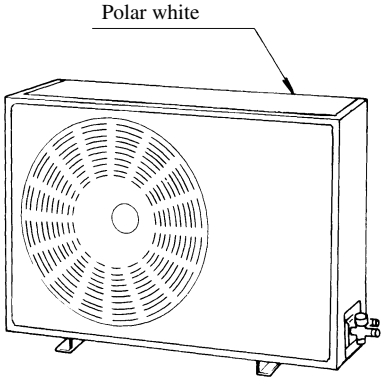


(2) Outdoor unit

Models FDC308HEN3B, 308HES3B
FDCP308HEN3B, 308HES3B

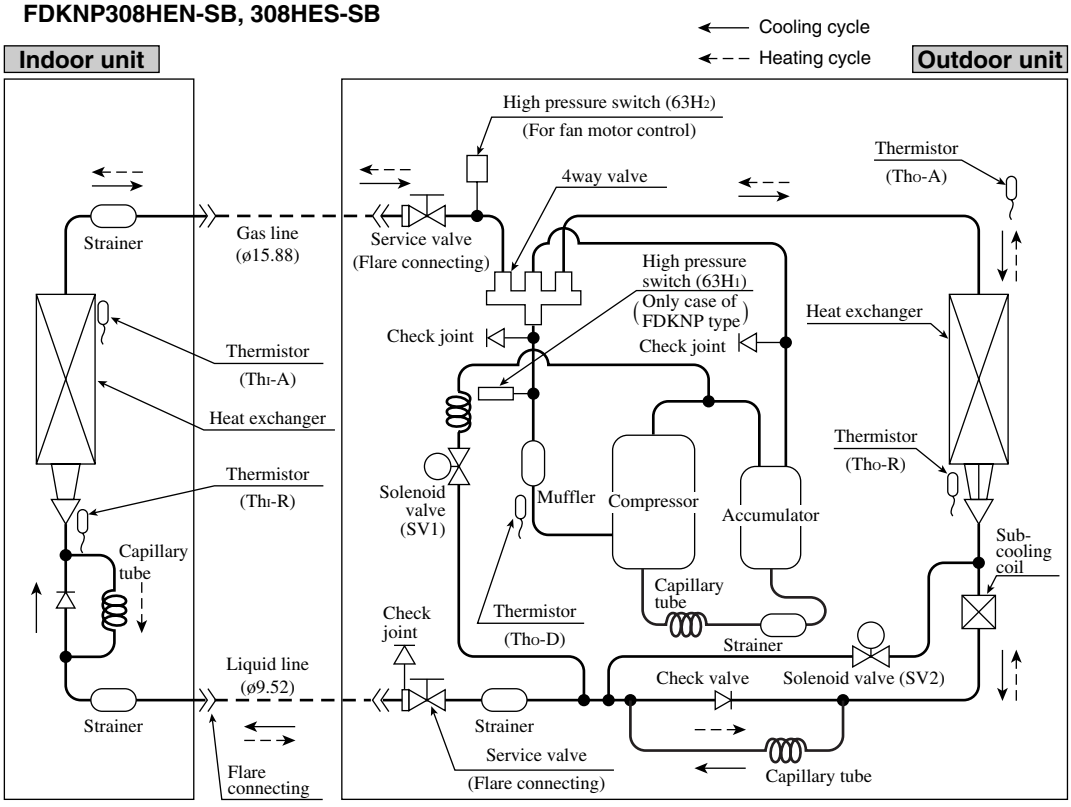


Models FDC256HEN3A
256HEP3A

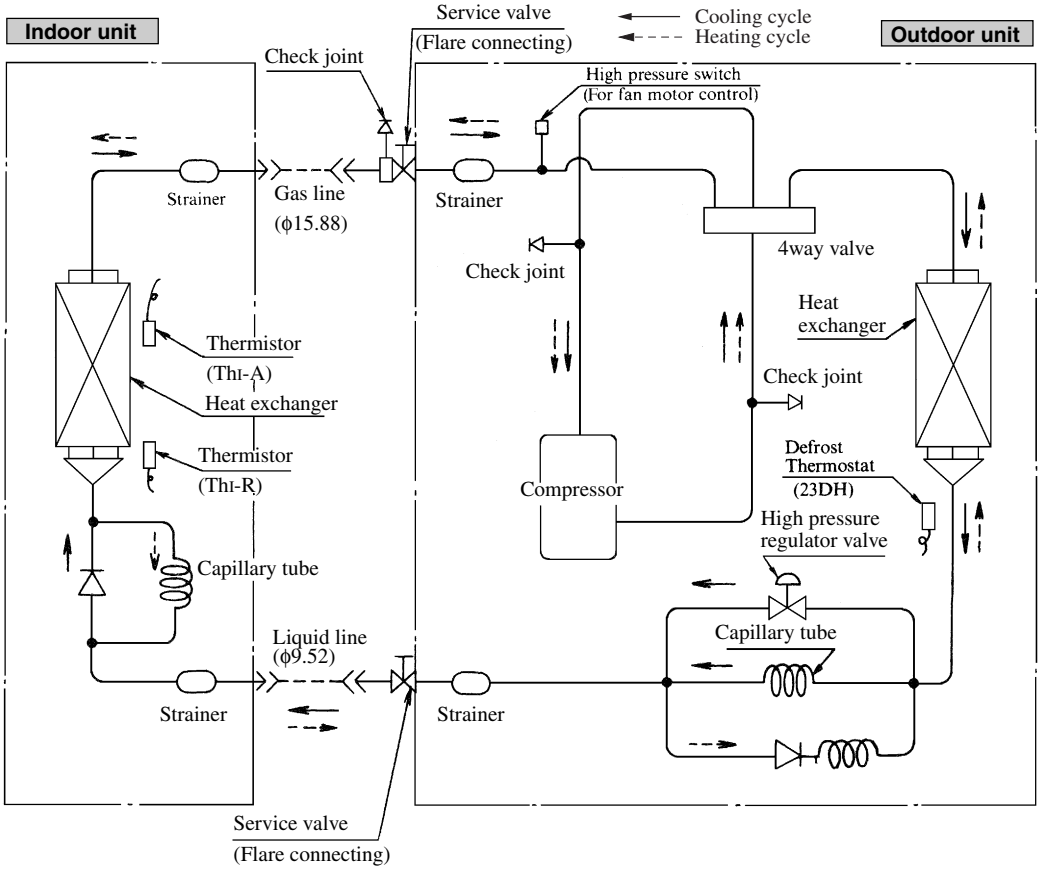


13.2.5 Piping system

Models FDKN308HEN-SB, 308HES-SB
FDKNP308HEN-SB, 308HES-SB



Models FDKN258HEN-A, 258HEP-A



Preset point of the protective devices

Parts name	Mark	Equipped unit	FDKN308	FDKNP308	FDKN208
Thermistor (for protection over loading in heating)	**Th_I-R**	Indoor unit	OFF 68 °C ON 61 °C		
Thermistor (for frost prevention)			OFF 2.5 °C ON 10 °C		
Thermistor (for detecting discharge pipe temp.)	**Th_O-D**	Outdoor unit	OFF 135 °C ON 90 °C		———
Thermistor (for detecting heat exchanger temp.)	**Th_O-R**	Outdoor unit	OFF 70 °C ON 60 °C		———
Defrost thermostat	**$23DH_2$**	Outdoor unit	———	———	OFF 12 °C
	$23DH_1$				ON -6 °C
High pressure switch (for controlling FMo)	**$63H_2$**	Outdoor unit	OFF 2.50MPa ON 2.06MPa	OFF 2.79MPa ON 2.26MPa	OFF 2.50MPa ON 1.86MPa
High pressure switch (for protection)	**$63H_1$**	Outdoor unit	———	OFF 3.24MPa ON 2.65MPa	———

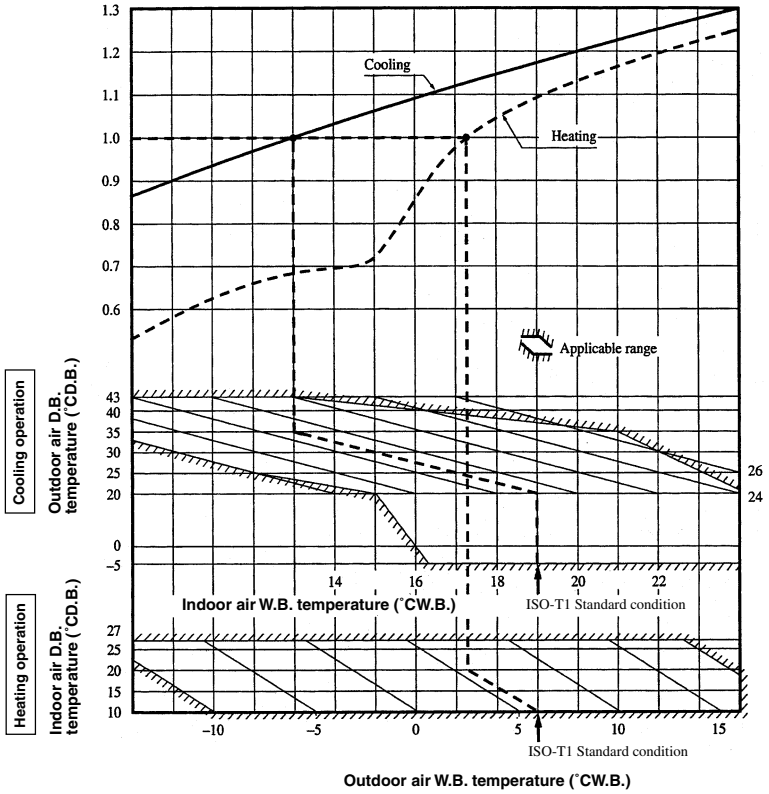
13.2.6 Selection chart

Correct the cooling and heating capacity in accordance with the conditions as follows. The net cooling and heating capacity can be obtained in the following way.

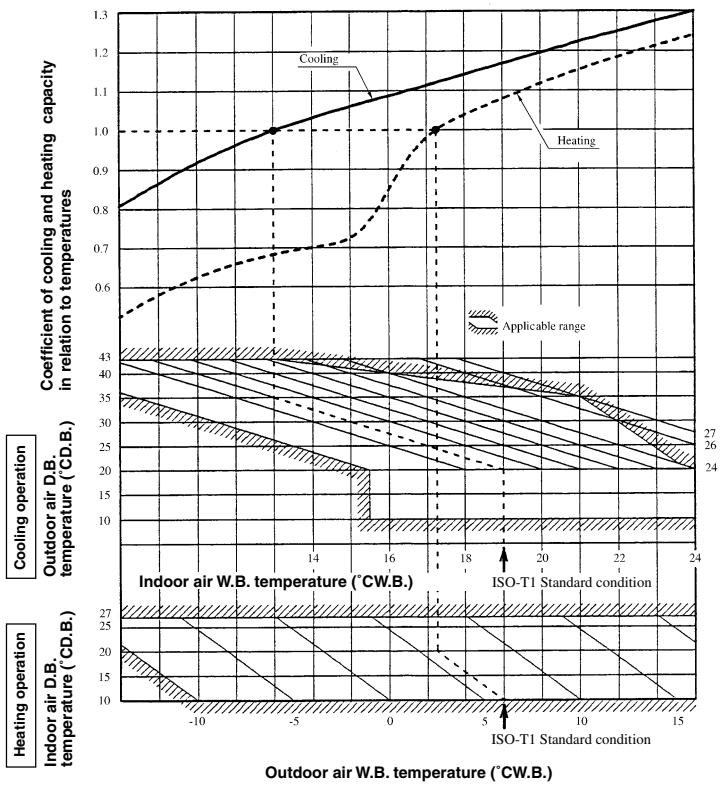
Net capacity = Capacity shown on specification × Correction factors as follows.

(1) Coefficient of cooling and heating capacity in relation to temperatures

FDKN(P)308



FDKN256HEN-A



FDKN256HEP-A

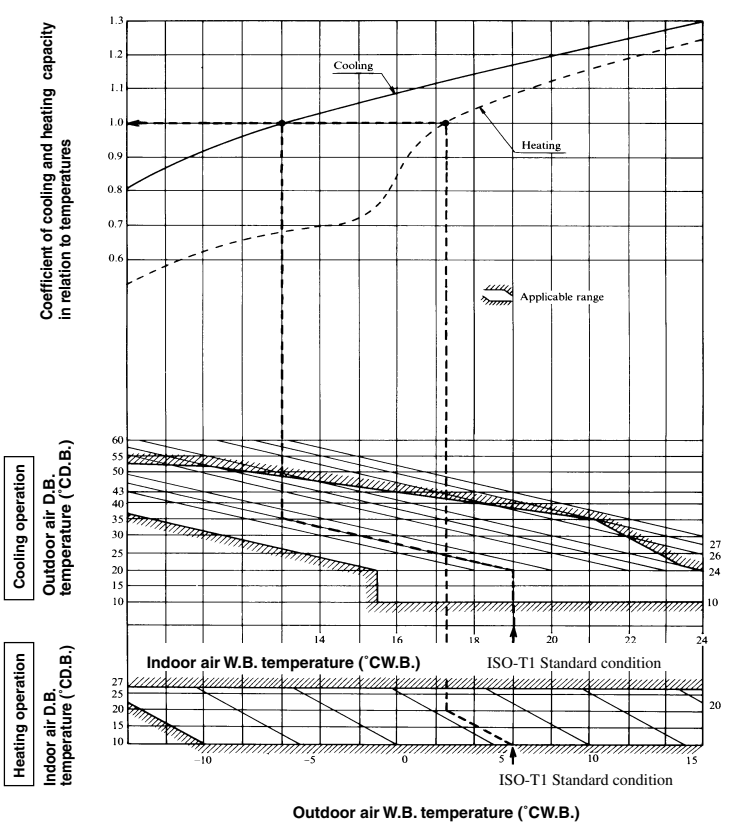


Table of bypass factor

Item \ Model		FDKN258	FDKN(P)308
Air flow	Hi	0.03	0.04

(2) Correction of cooling and heating capacity in relation to air flow rate control (fan speed)

Coefficient: 1.00 at High, 0.95 at Low

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

It is necessary to correct the cooling and heating capacity in relation to the one way equivalent piping length between the indoor and outdoor units.

Equivalent piping length(1) m		7.5	10	15	20	25	30	35	40	45	50	55
Heating		1.0	1.0	1.0	1.0	1.0	0.998	0.998	0.993	0.993	0.988	0.988
Cooling	FDKN258	1.0	0.998	0.993	0.988	0.983	0.978	0.973	—	—	—	—
	FDKN(P)308	1.0	0.995	0.985	0.975	0.965	0.955	0.945	0.935	0.925	0.915	0.905

Note (1) Equivalent piping length can be obtained by calculating as follows.
258, 308 series [ϕ15.88(5/8″)]: Equivalent piping length = Real piping length + (0.10 × Number or bends in piping)
[Equivalent piping length < Limitation length of piping + 5m]

(4) 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	5m	10m	15m	20m	25m	30m
Adjustment coefficient	0.01	0.02	0.03	0.04	0.05	0.06

Piping length limitations

Item \ Model	FDKN258	FDKN(P)308
Max. one way piping length	30m	50m
Max. vertical height difference	15m	30m (Outdoor unit is higher) 15m (Outdoor unit is lower)

Note(1) Values in the table indicate the one way piping length between the indoor and outdoor units.

How to obtain the cooling capacity

Example: The net cooling capacity of the model FDKNP308HEN-SB with the air flow "High", the piping length of 15m, the outdoor unit located 5m lower than the indoor unit, indoor wet-bulb temperature at 19.0 ˚C and outdoor dry-bulb temperature 35 ˚C is

Net cooling capacity = $\underline{7100}$ × $\underline{1.00}$ × $\underline{(0.985 - 0.01)}$ × $\underline{1.0}$ = **6923 w**

- 7100 → FDKNP308HEN-SB
- 1.00 → Air flow "High"
- (0.985 - 0.01) → Length 15m. Height difference 5 m
- 1.0 → Factor by air temperatures

13.2.7 Noise level

Notes (1) The data are based on the following conditions.
Ambient air temperature:
Indoor unit 27°C DB, 19°C WB
Outdoor unit 35°C DB,

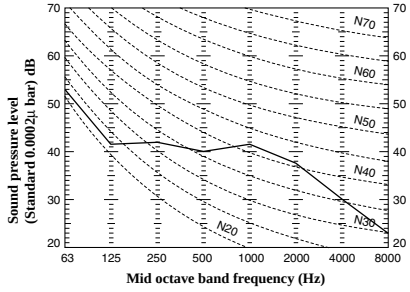
Indoor unit
Measured based on JIS B 8616
Mike position as below

Outdoor unit
Measured based on JIS B 8616
Mike position: at highest noise level in position as below
Distance from front side 1 m
Height 1 m

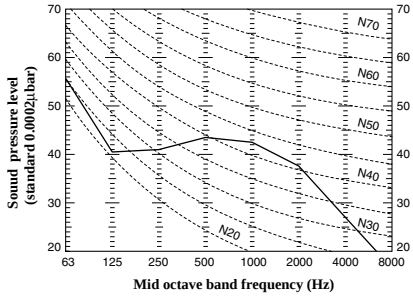
(2) The data in the chart are measured in an unechonic room.
(3) The noise levels measured in the field are usually higher than the data because of reflection.

(1) Indoor unit

Model FDKN258H
Noise level 45dB (A) at HIGH
38dB (A) at LOW

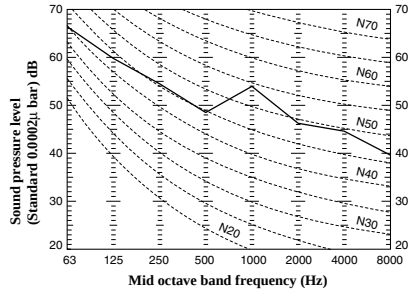


Model FDKN308H
Noise level 46dB (A) at HIGH
40dB (A) at LOW

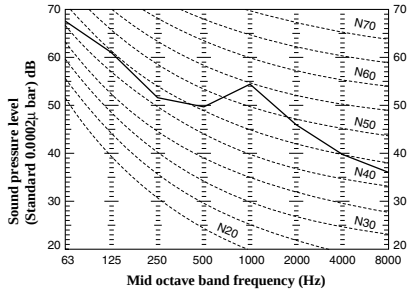


(2) Outdoor unit

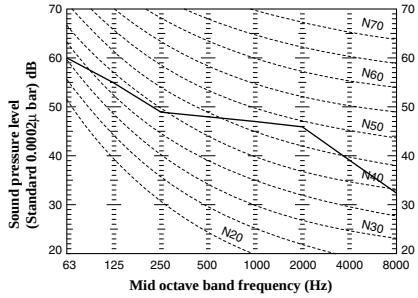
Model FDC258HEN3A
Noise level 57dB (A)



Model FDC256HEP3A
Noise level 57dB (A)



Models FDC308HEN3B, 308HES3B
FDCP308HEN3B, 308HES3B
Noise level 52dB (A)

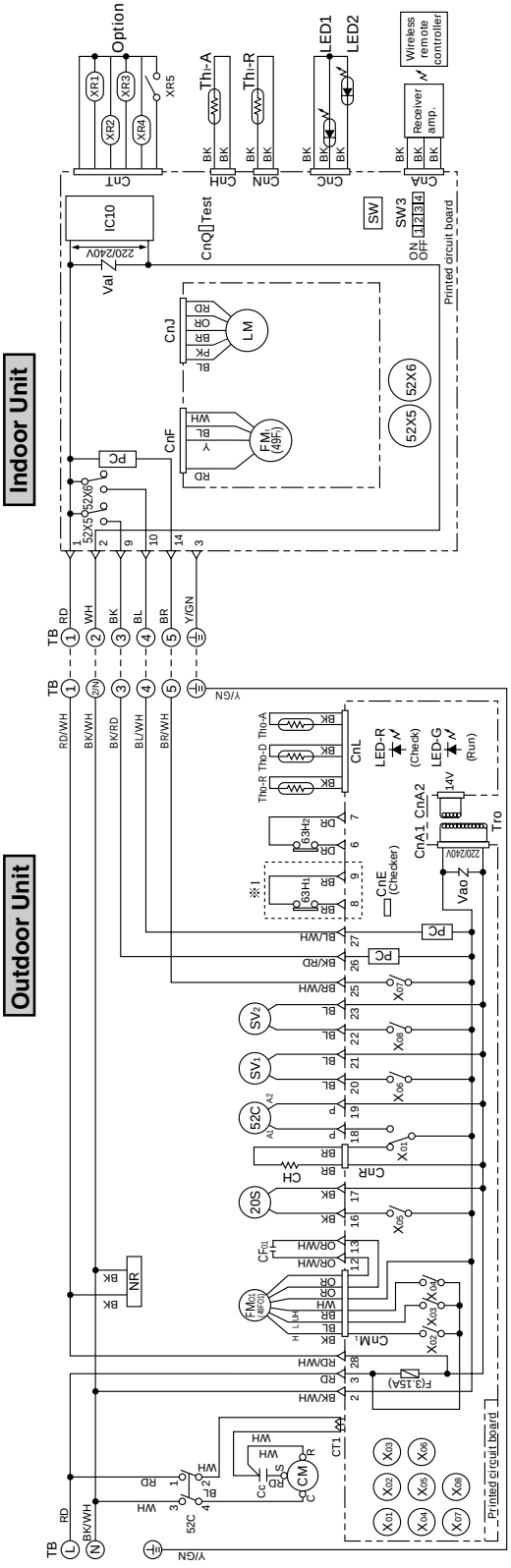


13.3 ELECTRICAL DATA

13.3.1 Electrical wiring

Models FDKN308HEN-SB
FDKNP308HEN-SB

Power source
1 Phase 220/240V 50Hz



Note (1) ※1 63H1 is equipped with only for FDKNP type.

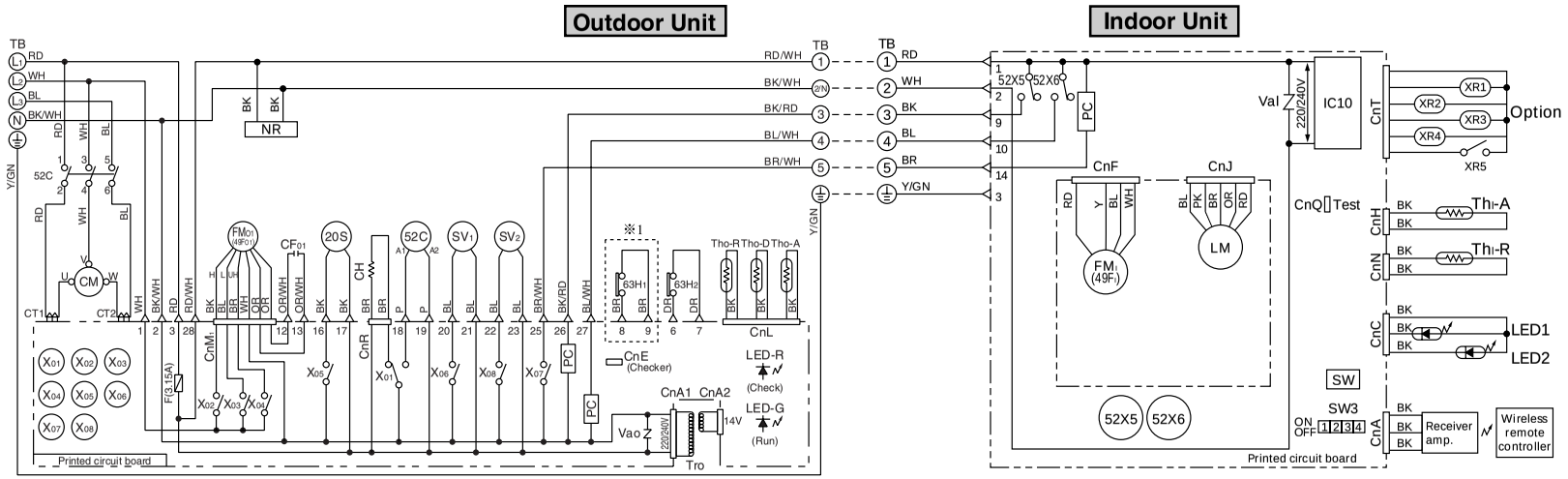
Meaning of marks

Mark	Parts name	Mark	Parts name
CC	Capacitor for CM	**Thi-R**	Thermistor
CFo	Capacitor for FMo	**Tho-A**	Thermistor
CH	Crankcase heater	**Tho-D**	Thermistor
CM	Compressor motor	**Tho-R**	Thermistor
CnA ~ W	Connector (□ mark)	**Tro**	Transformer
CT1	Current sensor	**Val**	Varistor
F	Fuse	**Vao**	Varistor
FMi	Fan motor (Indoor unit)	**20S**	4-way valve solenoid
FMo	Fan motor (Outdoor unit)	**49Fi**	Internal thermostat for FMi
LED1	Indication lamp (Green - Run)	**49Fo**	Internal thermostat for FMo
LED2	Indication lamp (Yellow - Timer/Check)	**52C**	Magnetic contactor for CM
LM	Louver motor	**52X5, 6**	Auxiliary relay
NR	Surge suppressor	**X01~8**	Auxiliary relay
PC	Photo coupler	**63Hi**	High pressure switch (for protection)
SV1, 2	Solenoid coil (for control)	**63H2**	High pressure switch (for control)
SW	Switch (ON/OFF)	**▽**	Terminal (F)
SW3	Changeover switch	**■**	Connector
TB	Terminal block (○ mark)	**LED-G**	Indication lamp (Green)
Thi-A	Thermistor	**LED-R**	Indication lamp (Red)

Color mark

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

Power source
3 Phase 380/415V 50Hz



Note (1) ※1 $63H_1$ is equipped with only for FDKNP type.

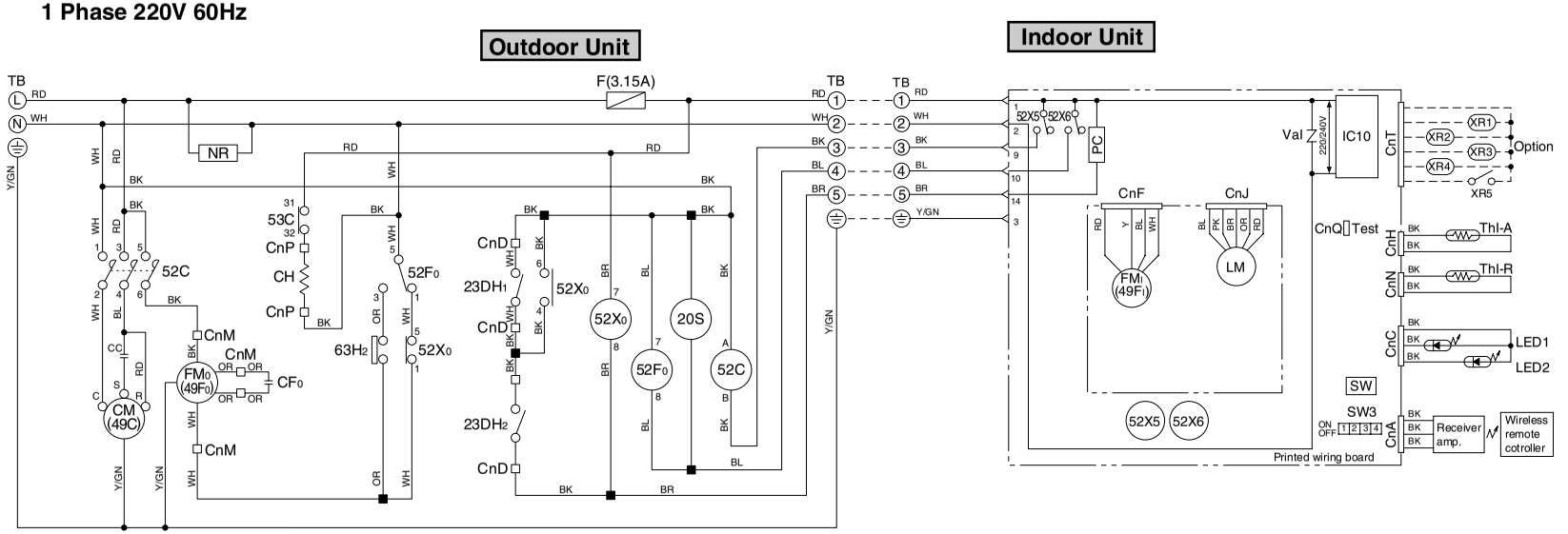
Meaning of marks

Mark	Parts name	Mark	Parts name
CF_1	Capacitor for FM_1	**Thi-R**	Thermistor
CF_{O1}	Capacitor for FM_O	**Tho-A**	Thermistor
CH	Crankcase heater	**Tho-D**	Thermistor
CM	Compressor motor	**Tho-R**	Thermistor
CnA ~ Z	Connector (□mark)	**Tro**	Transformer (Outdoor unit)
$CT_{1,2}$	Current sensor	**Val**	Varistor
F	Fuse	**Vao**	Varistor
FM_I	Fan motor (Indoor unit)	**20S**	4-way valve solenoid
FM_{O1}	Fan motor (Outdoor unit)	**49Fi**	Internal thermostat for FM_1
LED_1	Indication lamp (Green-Run)	**$49F_{O1}$**	Internal thermostat for FM_O
LED_2	Indication lamp (Yellow-Timer/Check)	**52C**	Magnetic contactor for CM
LM	Louver motor	**52X5, 6**	Auxiliary relay
NR	Surge suppressor	**$X_{01\sim08}$**	Auxiliary relay
PC	Photo coupler	**$63H_1$**	High pressure switch (for protection)
$SV_{1,2}$	Solenoid coil (for control)	**$63H_2$**	High pressure switch (for control)
SW	Switch (ON/OFF)	◁	Terminal (F)
SW3	Changeover switch	■	Connector
TB	Terminal block (○mark)	**LED-G**	Indication lamp (Green)
Thi-A	Thermistor	**LED-R**	Indication lamp (Red)

Color mark

Mark	Color	Mark	Color
BK	Black	**BK/RD**	Black/Red
BL	Blue	**BK/WH**	Black/White
BR	Brown	**BL/WH**	Blue/White
GR	Gray	**BR/WH**	Brown/White
OR	Orange	**OR/WH**	Orange/White
P	Pink	**RD/WH**	Red/White
RD	Red	**Y/GN**	Yellow/Green
WH	White		

Power source
FDKN258HEN-A
1 Phase 220/240V 50Hz
FDKN258HEP-A
1 Phase 220V 60Hz



Meaning of marks

Mark	Parts name	Mark	Parts name
CC	Capacitor for CM	**Val**	Varistor
CFo	Capacitor for FMo	**20S**	4-way valve solenoid
CH	Crankcase heater	**23DH**	Thermostat (deicer)
CM	Compressor motor	**49C**	Internal thermostat for CM
CnA ~ W	Connector (□ mark)	**49FI**	Internal thermostat for FMI
F	Fuse	**49Fo**	Internal thermostat for FMo
FMI	Fan motor (Indoor unit)	**52C**	Magnetic contactor for CM
FMo	Fan motor (Outdoor unit)	**52Fo**	Relay for FMo
LED1	Indication lamp (Green-Run)	**52Xo**	Relay for fan control
LED2	Indication lamp (Yellow-Check)	**52X5, 6**	Auxiliary relay
LM	Louver motor	**63H2**	High pressure switch (control)
NR	Surge suppressor	◁	Terminal (F)
PC	Photo coupler	■	Connector
SW	Switch (ON/OFF)		
SW3	Changeover switch		
TB	Terminal block (○ mark)		
ThI-A	Thermistor		
ThI-R	Thermistor		

Color mark

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

13.4 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

This is same as FDUR heat pump series. Refer to page 306.

13.5 APPLICATION DATA

SAFETY PRECAUTIONS

- Please read these "Safety Precautions" first then accurately execute the installation work.
- Though the precautionary points indicated herein are divided under two headings. ⚠WARNING and ⚠CAUTION, those points which are related to the strong possibility of an installation done in error resulting in death or serious injury are listed in the ⚠WARNING section. However, there is also a possibility of serious consequences in relationship to the points listed in the ⚠CAUTION section as well.
  In either case, important safety related information is indicated, so by all means, properly observe all that is mentioned.
- After completing the installation, along with confirming that no abnormalities were seen from the operation tests, please explain operating methods as well as maintenance methods to the user (customer) of this equipment, based on the owner's manual.
  Moreover, ask the customer to keep this sheet together with the owner's manual.

⚠WARNING

- This system should be applied to places of office, restaurant, residence and the like. Application to inferior environment such as engineering shop could cause equipment malfunction.
- Please entrust installation to either the company which sold you the equipment or to a professional contractor. Defects from improper installations can be the cause of water leakage, electric shocks and fires.
- Execute the installation accurately, based on following the installation manual. Again, improper installations can result in water leakage, electric shocks and fires.
- When a large air-conditioning system is installed to a small room, it is necessary to have a prior planned countermeasure for the rare case of a refrigerant leakage, to prevent the exceeding of threshold concentration.
  In regards to preparing this countermeasure, consult with the company from which you perchased the equipment, and make the installation accordingly. In the rare event that a refrigerant leakage and exceeding of threshold concentration does occur, there is the danger of a resultant oxygen deficiency accident.
- For installation, confirm that the installation site can sufficiently support heavy weight. When strength is insufficient, injury can result from a falling of the unit.
- Execute the prescribed installation construction to prepare for earthquakes and the strong winds of typhoons and hurricanes, etc. Improper installations can result in accidents due to a violent falling over of the unit.
- For electrical work, please see that a licensed electrician executes the work while following the safety standards related to electrical equipment, and local regulations as well as the installation instructions, and that only exclusive use circuits are used.
  Insufficient power source circuit capacity and defective installment execution can be the cause of electric shocks and fires.
- Accurately connect wiring using the proper cable, and insure that the external force of the cable is not conducted to the terminal connection part, through properly securing it. Improper connection or securing can result in heat generation or fire.
- Take care that wiring does not rise upward, and accurately install the lid/service panel. Its improper installation can also result in heat generation or fire.
- When setting up or moving the location of the air-conditioner, do not mix air etc. or anything other than the designated refrigerant within the refrigeration cycle.
  Rupture and injury caused by abnormal high pressure can result from such mixing.
- Always use accessory parts and authorized parts for installation construction. Using parts not authorized by this company can result in water leakage, electric shock, fire and refrigerant leakage.

⚠CAUTION

- Execute proper grounding. Do not connect the ground wire to a gas pipe, water pipe, lightning rod or a telephone ground wire. Improper placement of ground wires can result in electric shock.
- The installation of an earth leakage breaker is necessary depending on the established location of the unit. Not installing an earth leakage breaker may result in electric shock.
- Do not install the unit where there is a concern about leakage of combustible gas.
  The rare event of leaked gas collecting around the unit could result in an outbreak of fire.
- For the drain pipe, follow the installation manual to insure that it allows proper drainage and thermally insulate it to prevent condensation. Inadequate plumbing can result in water leakage and water damage to interior items.

13.5.1 Installation of indoor unit

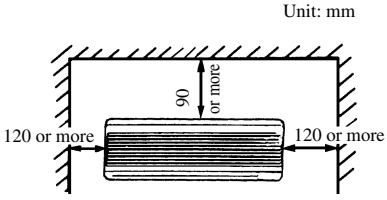
⚠NOTICE

All Wiring of this installation must comply with NATIONAL, STATE AND LOCAL REGULATIONS. These instructions do not cover all variations for every kind of installation circumstance. Should further information be desired or should particular problems occur, the matter should be referred to Mitsubishi Heavy Industries, Ltd. through your local distributor.

⚠WARNING

BE SURE TO READ THESE INSTRUCTIONS CAREFULLY BEFORE BEGINNING INSTALLATION. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD CAUSE SERIOUS INJURY OR DEATH, EQUIPMENT MALFUNCTION AND/OR PROPERTY DAMAGE.

(1) Selection of installation location

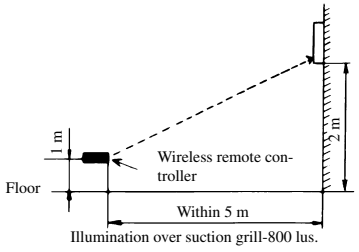


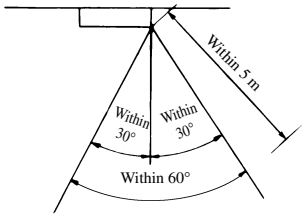
(a) Select the installation location that meets the following conditions and obtain the customer's consent.

1) Location where cold and warm air spread all over the room
2) Location where piping and wiring to the outdoors can easily be laid down.
3) Location where the drain can be discharged completely.
4) Location where the wall to mount the unit is rigid.
5) Location where there is no wind obstruction to the return air and supply air grills.
6) Location not exposed to direct sunshine.
7) Avoid the location exposed to oil splash or vapor.
8) Avoid the location near to the machine emitting high-frequency radio wave.
9) Avoid the location where the receiver of remote control is subject to strong illumination.
10) Select the location where the unit can securely be operated by the wireless remote controller referring to the Article "Effective distance of wireless remote controller" indicated at the backside.
11) Secure the space for inspection and maintenance work.

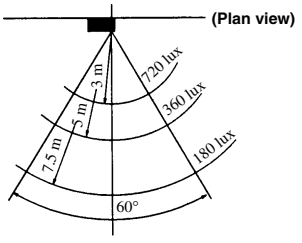
(2) Cautions for use of wireless remote controller

(a) Opareting distance of wireless remote controller

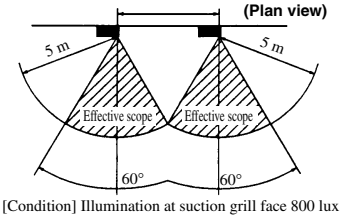




Relation between illumination at receiver unit and operating distance



Caution item for close installation of multiple units



[Condition] Illumination at suction grill face 800 lux

(b) Cautions for operation

1) Orient the remote control switch properly toward the receiver of the unit.
2) Operating distance is as shown above but it may vary largely depending on the conditions.
3) Effective distance may be shortened and the receiving may be disturbed when the receiver is under the condition of direct exposure to sunlight or other strong light like electric bulb, dust is accumulated on it and it is shielded with a curtain, etc.

(3) Carry-in and installation of unit

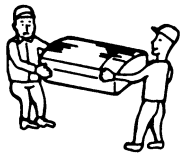
(a) Carry-in

1) When carrying in the unit, carry it in as packed to the installation site as near as possible.

2) If you are compelled to carry in the unit unpacked, cover it with a nylon sling so that it is not damaged.

Note(1) Do not carry the unit by holding it at the supply air louver.

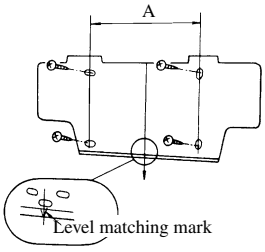
3) When laying the unit on the ground after unpacking. place it with its front side up without fail.



(b) Attaching of mounting plate

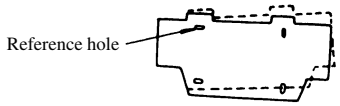
1) The indoor unit weighs approx, FDKN258 model : 11kg, FDKN(P)308 model : 13.5kg. Therefore, check whether the portion to install the unit can bear the weight of unit. If it seems to be danger, reinforce the portion by a plate or a beam before installing the unit. It is not allowed to install the unit directly on the wall. Whenever you install the unit, use the attached mounting plate.

- Find structural members (Intermediate pillar, etc.) suitable for mounting the unit, then install the unit firmly while checking levelness.



Dimension \ Model	FDKN258	FDKN(P)308
A	450	690

- Adjust the level of mounting plate under the condition that four screws are tightened temporarily.

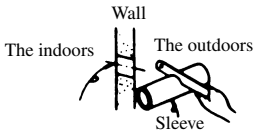


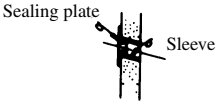
- Turn the mounting plate around the reference hole to adjust the levelness.

⚠WARNING

- Install the unit where it can bear the weight with sufficient strength margin. In the case of insufficient strength or insufficient installation work, the unit may fall and cause injury.

(c) Procedure for making hole on the wall



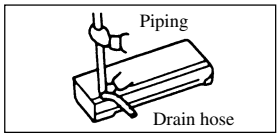


- Make a downgrade (5°) from the indoors toward the outdoors.

(d) Forming of piping and drain hose

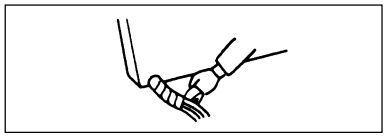
1) Rear take out case

- Forming of piping



- Hold the root portion of piping, change the direction then expand and make forming.

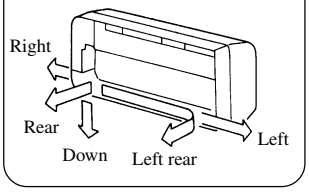
- Tape winding



- Wind the tape on the portion which passes through the hole on the wall.
- Always make taping on the wiring which crosses with the piping, if any.

After forming of piping and before tape winding, confirm that the connecting wire is securely fixed to the terminal table.

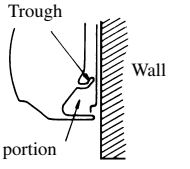
The piping can be taken out from the rear, left, left rear, right and down.



2) Cautions for left take-out and rear take-out case

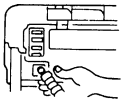
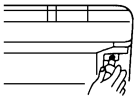
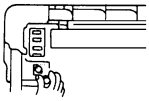
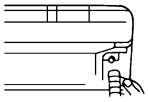
a) Looking down

For left running horizontal piping	For right running horizontal piping
For left rear take-out piping For left running horizontal piping	For right rear take-out piping For right running horizontal piping

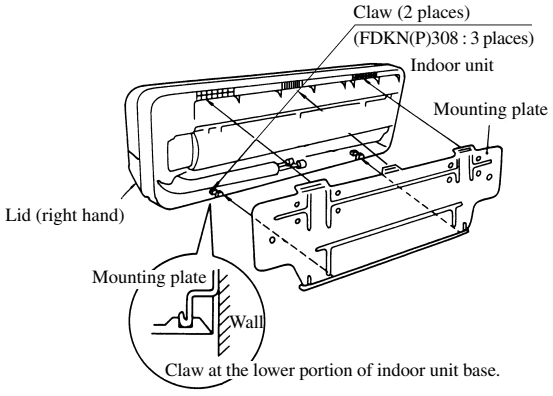


This air-conditioner is so constructed that dew generated on the backside is gathered in the drain pan to drain, therefore, do not store the power cable, etc. at the higher place than the trough.

b) Procedure for changing drain hose

1. Remove the drain hose.	2. Remove the drain cap.	3. Insert the drain cap.	4. Connect the drain hose.
			
• Loosen spring type clamp to remove.	• Remove by hand or pliers.	• Insert the drain cap which was removed in procedure 2 securely using a hexagonal wrench, etc. Note(1) When it is not inserted securely, water leakage may occur.	• Loosen the spring type clamp to insert the drain hose securely. Note(1) When it is not inserted securely, water leakage may occur.

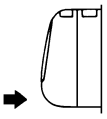
(e) Installation of unit



- To remove the unit from the mounting plate, remove the right and left lids then remove the claw at the lower portion of base.

Installation work procedure

(1) Hang the upper portion of indoor unit on the mounting plate.



(2) The indoor unit can be fixed with one action by pushing its lower portion slightly.

(4) Refrigerant piping

(a) Comply the following table for the tightening torque of the flared nut and flange bolt.

Flared nut tightening torque

ϕ6.35: 14 to 18 (N-m)

ϕ9.52: 34 to 42 (N-m)

ϕ15.88: 68 to 82 (N-m)

Wrap the gaseous refrigerant piping and liquid refrigerant piping with thermal insulator perfectly.

(b) In the case of liquid refrigerant piping, if it is not insulated, dew condensation and water leakage may occur.

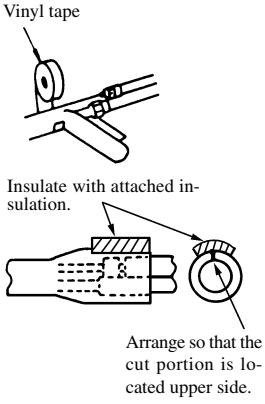
(c) When removing the flared nut at the piping end of unit, always use 2 of spanners, and when connecting the pipe tighten it firmly using 2 of spanners.

(d) When connecting the flared nut, apply refrigerating machine oil on the back surface of flare and screw-in the nut for the first 3 to 4 turns by hand.

(e) Use the pipe made of the following material. It is very convenient to use the separately sold piping kit.

Material: Phosphor deoxidized seamless copper tube.

(f) Cover the connection part with indoor unit insulation material and insulate the notched part with attached insulation and then wrap it up with tape.



(5) Drain piping

(a) Lay the drain piping with downgrade to facilitate flow of drain,and do not make a trap or chevron-shaped bend. (The drain piping can be taken out from the unit to the left, right, rear and down direction.)

Wrap the thermal insulator on the hard vinyl chloride pipe (VP-16) laid in the room.

(b) Pour water into the drain pan below the heat exchanger to check that water is drained outdoors.

⚠CAUTION

The drainage work must be performed surely and the drainage must be checked. If drainage is not perfect, it causes water leakage.

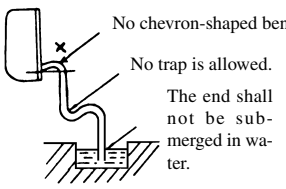
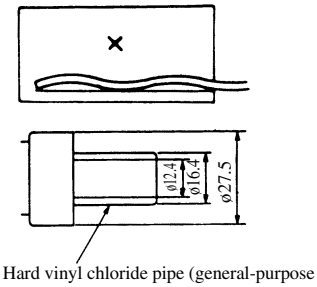


Illustration showing the end of drain hose



(6) Fixing of wiring

(a) Remove the front panel.

(b) Connect the wire from the indoor and outdoor units to the terminal table of control box.

(c) Attach the front panel.

Notes (1) Refer to the illustration below for the removal and attaching of the front panel.

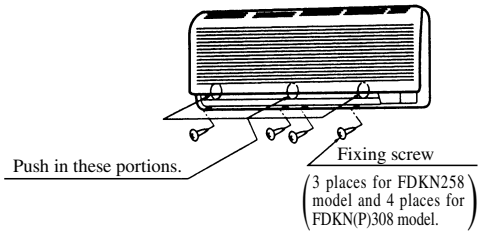
(2) Before connecting the wiring to the terminal table, confirm the terminal number.

(d) Removal order of the panel

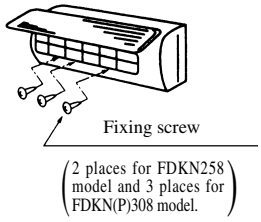
1) Open the return air grill. (Pull both lower ends of the return air grill, raise the grill until the reaction is felt after disengaging the latch. The return air grill will stop at approx. 60° open position.)
2) Remove the air filter.
3) Remove 2 fixing screws for FDKN258 model and 3 fixing screws for FDKN(P)308 model.
4) Close the return air grill. (Hold both lower ends of the return air grill, lower the grill slowly downward, push it slightly to engage the latch and again push the center portion slightly.)
5) Remove the fixing screw of front panel. (3 places for model 258 and 4 places for model 308.)
6) Lift the lower portion of front panel this side and remove it while pushing the upper portion up.

(e) Attaching order of the panel

1) Lay the front panel on the main body.
2) Push the "O" portion shown in the illustration from front side.
3) Tighten the fixing screw of front panel.
4) Open the return air grill to tighten the cap screw.
5) Set the air filter.
6) Close the return air grill.



By switching the dip switch (SW3-3) on the indoor unit printed circuit board ("Specify the following switch number."), the operation mode can be changed to the quiet mode (mild mode). Confirm at installation and change if necessary.



13.5.2 Installation of outdoor unit

This is same as FDUR heat pump series. Refer to page 330.

13.6 MAINTENANCE DATA

This is same as FDUR heat pump series. Refer to page 340.

MEMO