



Application guide Installation, operating and maintenance manual **AIRCUBE - KSCM/KSHM**



- Providing indoor climate comfort



Congratulations you have made a wise choice and we feel sure that it will meet your expectations

WARNING: Read this manual before installation, reparation o maintenance works.

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Lennox have been providing environmental solutions since 1895, our range of AIRCUBE continues to meet the standards that have made LENNOX a household name. Flexible design solutions to meet YOUR needs and uncompromising attention to detail. Engineered to last, simple to maintain and Quality that comes as standard.
Information on local contacts at www.lennox europe.com.

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GENERAL DESCRIPTION

The condensing air conditioning units, range AIRCUBE cooling only and heat pump, are air conditioning units, of the air to air type, designed for small and medium shopping center and housing.

They are supplied to match with other type of indoor unit that customer needs.

They are designed for installation outdoors, with a wide range of options, completed-factory assembled are also available.

FURNITURE

Made of galvanized steel sheeting with epoxy painted finish, weather proofed with high resistant to corrosion. The units are provided with metal profiles, capable of withstanding the unit and able as well of installing the unit mounted on the floor.

COMPRESSORS

All units are provided with hermetically sealed compressors, scroll type, cooled by exhaust gas, with internal thermal insulation inside the engine, so no other additional protection is required. The compressor is fitted on vibration mountings both inside and outside.

FANS

The units are supplied with one, two outdoor fans axial type, of direct coupling and motor with external rotor and excellent features on sound levels. Two speeds in unit 112D to 214D.

HEAT EXCHANGERS

Made of copper tubing with aluminum corrugated swirl fins, they are designed and specially dimensioned to obtain the maximum output so as to prevent ice forming in the outer heater, extending the operating cycles to a maximum obtaining maximum output and exchange on reducing the frequency of defrosting.

COOLING CIRCUIT AND HEAT CIRCUIT

Made of welded dehumidifying copper tube. The units are supplied with high and low pressure switch, with automatic reset. Thermostatic expansion valve, 4-way valve, suction receiver and filter drier in heat pump version. They are supplied charged with Nitrogen.

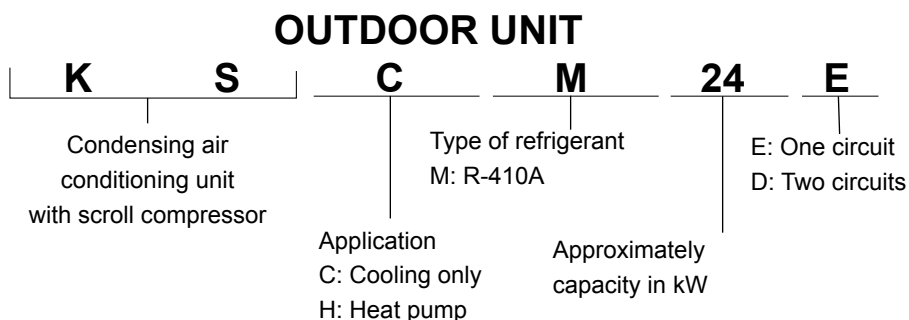
ELECTRICAL PANEL

- Unit wiring in compliance with standard EN 60204-1.
- IP 54 water protection.
- Circuit breaker protection for compressor and fan.
- Compressor and fan working contactors.
- Terminal block and wiring for power supply to the unit.

CONTROL

- Model: Climatic 40
- Control and check by microprocessor.
- Reading refrigerant temperatures.
- Reading of refrigerant pressure (heat pump units)
- Alarm signaling.
- Diagnostic per circuit.
- Adjustment of parameters adapted for operating conditions
- Hour counter and daily balance of operating time for each compressor by "first in/first out" permutation (units with two compressors).
- Remote alarm signal.
- Fan speed control (22E-86D)

DENOMINATION



PRODUCT RANGE UNITS COOLING ONLY WITH REFRIGERANT R-410A

22E



26E-43E



52D-86D



112D-152D



214D



OUTDOOR UNIT	Ph/V/Hz	NOMINAL (*)	NOMINAL (*)
		CAPACITY kW COOLING	CONSUMPTION kW COOLING
KSCM 22E	3N~400V 50Hz	19.7	6.43
KSCM 26E	3N~400V 50Hz	24.7	8.10
KSCM 32E	3N~400V 50Hz	28.4	9.63
KSCM 38E	3N~400V 50Hz	36.1	11.9
KSCM 43E	3N~400V 50Hz	42.0	14.1
KSCM 52D	3N~400V 50Hz	49.4	16.2
KSCM 64D	3N~400V 50Hz	56.7	19.3

OUTDOOR UNIT	Ph/V/Hz	NOMINAL (*)	NOMINAL (*)
		CAPACITY kW COOLING	CONSUMPTION kW COOLING
KSCM 76D	3N~400V 50Hz	72.1	23.7
KSCM 86D	3N~400V 50Hz	83.9	28.3
KSCM 112D	3N~400V 50Hz	104	34.3
KSCM 128D	3N~400V 50Hz	115	37.1
KSCM 152D	3N~400V 50Hz	141	46.2
KSCM 214D	3N~400V 50Hz	197	63.4

(*) Evaporating temperature= +7°C / Ambient, temperature=+35°C DB/24°C WB.

PRODUCT RANGE UNITS HEAT PUMP WITH REFRIGERANT R-410A

22E



26E-43E



52D-86D



112D-152D



214D



OUTDOOR UNIT	Ph/V/Hz	NOMINAL CAPACITY kW		NOMINAL CONSUMPTION kW	
		COOLING (*)	H. PUMP (**)	COOLING (*)	H. PUMP (**)
KSHM 22E	3N~400V 50Hz	19.7	19.8	6.43	6.18
KSHM 26E	3N~400V 50Hz	24.7	25.0	8.10	7.78
KSHM 32E	3N~400V 50Hz	28.4	28.6	9.63	9.18
KSHM 38E	3N~400V 50Hz	36.1	36.0	11.9	11.1
KSHM 43E	3N~400V 50Hz	42.0	40.2	14.1	12.9
KSHM 52D	3N~400V 50Hz	49.4	50.1	16.2	15.6
KSHM 64D	3N~400V 50Hz	56.7	57.1	19.3	18.4

OUTDOOR UNIT	Ph/V	NOMINAL CAPACITY kW		NOMINAL CONSUMPTION kW	
		COOLING (*)	H. PUMP (**)	COOLING (*)	H. PUMP (**)
KSHM 76D	3N~400V 50Hz	72.1	71.9	23.7	22.2
KSHM 86D	3N~400V 50Hz	83.9	80.3	28.3	25.9
KSHM 112D	3N~400V 50Hz	104	105	34.3	32.4
KSHM 128D	3N~400V 50Hz	115	114	37.1	35.6
KSHM 152D	3N~400V 50Hz	141	137	46.2	43.8
KSHM 214D	3N~400V 50Hz	197	191	63.4	59.8

(*) Evaporating temperature= +7°C / Ambient temperature=+35°C DB.

(**) Condensing temperature 50°C/Ambient temperature 6°C WB.

OPTIONS

OPTIONS	APPLICATION	DESCRIPTION
Low ambient kit 0°C	KSCM	Cranckcase heater for unit operation below 19°C (until 0°C).
Low ambient kit -15°C	KSCM	The unit can operate with outdoor temperatures below 19°C (until -15°C).
Low ambient kit -15°C FP1/FP2	KSCM 112D-214D with FP1/2 option	The unit can opetate with outdoor temperatures below 19°C (until -15°C).
Kit low noise	KSCM/KSHM	Compressor jacket to reduce noise level.
Precoated coil	KSCM/KSHM	Special protection for the aluminium condenser coil fins.
Main switch	KSCM/KSHM	Safety device to switch on/off the unit.
Soft-starter (400-III)	KSCM/KSHM	It reduces the peak compressor starting current up to 40%.
Return lock three phases (400-III)	KSCM/KSHM	It assures the unit will not operate on detection of overvoltage, undervoltage, phase reversal, faulter phase failure.
Modbus	KSCM/KSHM	One or several units can be connected through MODBUS protocol.
Rubber dumps	KSCM/KSHM	It avoids transmission of vibrations from the unit to the floor where it is installed.
Spring dumps	KSCM/KSHM 112D-214D	It avoids transmission of vibrations from the unit to the floor where it is installed.
Service valves	KSCM/KSHM	The unit is fitted with gas and liquid sevice valves, in order to make easier installation and maintenace operations.
Factory pre-charged	KSCM/KSHM	This option include service valves and R-410A refrigerant charge. (for 0m. of connection line).
Protection grill	KSCM/KSHM	It prevents damage in the coil installation and shipping.
High pressure 125Pa FP1	KSCM/KSHM 112D-214D	Unit with high pressure fans. Available static pressure up to 120Pa.
High pressure 250Pa FP2	KSCM/KSHM 112D-214D	Unit with high pressure fans. Available static pressure up to 250Pa.
Inlet plenum FP1/FP2	KSCM/HM 112D-214D with FP1/2 option	Accessory for adapting the condenser air intake with a duct.
Square discharge duct FP1/FP2	KSCM/HM 112D-214D with FP1/2 option	It is formed by 1 or 2 square frames, for adapting discharge air from the unit to a square duct.
Auxiliary drip tray	KSCM/HM 112D-214D with FP1/2 option	It should be placed under the unit to get all the defrost water.
Drive indoor fan motor	KSCM/KSHM	It includes the contactor and thermal switch for indoor fan motor.

PHYSICAL DATA



MODELS KSCM/KSHM		22E	26E	32E	38E	43E	52D	64D	76D	86D	112D	128D	152D	214D	
Compressor	Nr / Type	1 / Scroll					2 / Scroll				3 / Scroll		4/Scroll		
	Capacity steps	1					2				2				
Capacity steps	Nr	1					2				2				
	%	0-100%					0-50-100%				0-60-100%		0-50-100%		
Net weight	KSCM	Kg	137	190	209	226	244	415	420	442	478	609	771	860	1613
	KSHM	Kg	142	195	214	231	249	425	430	457	493	723	799	884	1633
Dimensions	Height	mm	1375	1375	1375	1375	1375	1375	1375	1375	1375	1875	1875	1875	1975
	Width	mm	660	980	980	980	980	1195	1195	1195	1195	1420	1420	1420	2300
	Long	mm	1195	1195	1195	1195	1195	1960	1960	1960	1960	2250	2250	2250	2250
Refrigerant connections	Liquid		1/2"	5/8"	5/8"	5/8"	5/8"	2x(5/8")	2x(5/8")	2x(5/8")	2x(5/8")	3/4"+5/8"	3/4"+5/8"	2x(3/4")	2x(7/8")
	Gas		7/8"	1 1/8"	1 1/8"	1 3/8"	1 3/8"	2x(1 1/8")	2x(1 1/8")	2x(1 3/8")	2x(1 3/8")	1 5/8"+1 3/8"	1 5/8"+1 3/8"	2x(1 5/8")	2x(1 5/8")

ELECTRICAL DATA

MODELS KSCM/KSHM		22E	26E	32E	38E	43E	52D	64D	76D	86D	112D	128D	152D	214D
Voltage	Ph/V/Hz	3N~400V-50Hz												
Max. absorbed power	kW	8.55	10.8	12.5	16.4	17.7	21.6	25.0	32.8	35.5	45.6	48.7	59.9	83.0
Maximum current	A	16.6	24.0	25.4	29.0	34.4	48.0	50.8	58.0	68.8	84.0	90.4	110	152
Start up current	A	87.5	97.4	103.7	137.7	171.7	121.4	129	167	206	221	228	292	454

MODELS KSCM/KSHM WITH FP1/FP2 OPTION		112D FP1/FP2	128D FP1/FP2	152D FP1/FP2	214D FP1/FP2
Voltage	Ph/V/Hz	3N~400V-50Hz			
Max. absorbed power	kW	47.6/51.8	50.6/54.8	60.9/65.1	88.8/97.2
Maximum current	A	87.2/93.8	93.6/100	111/118	161.2/174.4
Start up current	A	225/231	231/238	294/300	463.7/477

VOLTAGE OPERATING LIMITS: 342-462V

FAN PERFORMANCES

MODELS KSCM/KSHM		22E	26E	32E	38E	43E	52D	64D	76D	86D	112D	128D	152D	214D	
Fan type	Type	Condenser fan helicoidal													
	Ph/V/Hz	1~230V-50Hz										3~400V-50Hz			
Fan number	C1+C2	r.p.m.	900	900	900	900	900	900+900	900+900	900+900	900+900	900+700	900+700	900+900	900+900
			2		1					2					4
Air flow	C1+C2	m³/h	6800	9750	11500	11300	11000	9750+9750	11500+11500	11300+11300	11000+11000	22700+18100	22700+18100	22700+22700	28600+28600

MODELS KSCM/KSHM WITH FP1/FP2 OPTION		112D FP1/FP2	128D FP1/FP2	152D FP1/FP2	214D FP1/FP2
Fan type	Type	Condenser high static fan			
	Ph/V/Hz	3~400V-50Hz			
	r.p.m.	900 FP1 (Low speed) / 1450 FP2 (High speed)			
Fan number		2		4	

Air flow data: FP1 option.

Air flow data: FP2 option.

MODELS:		112D-128D-152D	214D	
Fan type:		Axial "short case"-direct coupling 900 r.p.m.(Low speed) 3~400V		
Fan number:		2	4	
Available static pressure Pa.	50	Air flow m³/h	19000+19000	28000+28000
		Absorbed power kW	5	10
	75	Air flow m³/h	18000+18000	24000+24000
		Absorbed power kW	5.1	10.2
	100	Air flow m³/h	17000+17000	22000+22000
		Absorbed power kW	5.2	10.4
125	Air flow m³/h	15000+15000	20000+20000	
	Absorbed power kW	5.3	10.6	

MODELS:		112D-128D-152D	214D	
Fan type:		Axial "short case" direct coupling 1450 r.p.m. (High speed) 3~400V		
Fan number:		2	4	
Available static pressure Pa.	150	Air flow m³/h	22000+22000	34000+34000
		Absorbed power kW	9.2	18.4
	200	Air flow m³/h	20000+20000	28000+28000
		Absorbed power kW	9.3	18.6
	250	Air flow m³/h	18000+18000	24000+24000
		Absorbed power kW	9.4	18.8

TECHNICAL DATA



SOUND PRESSURE / SOUND POWER LEVELS FOR OUTDOOR UNIT

KSCM/KSHM		Spectrum per octave band (dB)							Sound power Lw dB(A)	Sound pressure at 10 m Lp dB(A)	
		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz			
22E	(1)	67.6	70.6	71.2	71.1	69.2	67.0	59.1	76	48	
	(2)	67.6	70.6	71.1	70.6	68.3	65.4	58.0	75	47	
26E	(1)	73.8	69.6	71.9	69.6	73.4	69.9	61.5	78	50	
	(2)	73.8	69.6	69.8	66.4	71.7	67.4	61.5	76	48	
32E	(1)	80.3	72.2	74.2	75.3	76.4	70.7	65.0	81	53	
	(2)	80.3	72.2	73.3	74.0	73.7	65.5	65.0	79	51	
38E	(1)	80.3	72.2	73.8	75.3	75.1	68.7	62.2	80	52	
	(2)	80.3	72.2	73.3	74.0	73.4	65.2	62.2	79	51	
43E	(1)	80.3	72.2	73.8	75.8	75.7	68.3	62.8	81	53	
	(2)	80.3	72.2	73.3	74.0	73.5	65.3	62.8	79	51	
52D	(1)	76.8	72.7	74.9	72.6	76.4	73.0	64.5	81	53	
	(2)	76.8	72.6	72.8	69.4	74.7	70.4	64.5	79	51	
64D	(1)	83.3	75.3	77.2	78.3	79.4	73.7	68.0	84	56	
	(2)	83.3	75.2	76.3	77.0	76.7	68.5	68.0	82	54	
76D	(1)	83.3	75.2	76.9	78.4	78.2	71.7	65.2	83	55	
	(2)	83.3	75.2	76.3	77.0	76.4	68.2	65.2	82	54	
86D	(1)	83.3	75.2	76.8	78.8	78.7	71.3	65.8	84	56	
	(2)	83.3	75.2	76.3	77.0	76.5	68.3	65.8	82	54	
112D	Low speed	(1)	73.3	70.9	74.7	77.9	76.6	71.3	64.6	82	54
		(2)	73.3	70.8	72.4	75.4	71.2	62.6	64.6	78	50
	High speed	(1)	81.9	78.4	78.9	82.6	81.9	75.8	67.0	87	59
		(2)	81.9	78.4	78.2	81.9	80.9	74.2	67.0	86	58
128D	Low speed	(1)	73.3	70.9	74.5	78.4	78.2	72.3	66.1	83	55
		(2)	73.3	70.8	72.3	75.4	72.0	63.0	66.1	79	51
	High speed	(1)	81.9	78.4	78.9	82.8	82.4	76.2	67.9	87	59
		(2)	81.9	78.4	78.2	81.9	80.9	74.2	67.9	86	58
152D	Low speed	(1)	75.0	73.4	76.8	82.0	83.6	76.5	69.4	87	59
		(2)	75.0	72.6	74.1	77.2	76.1	65.5	69.4	81	53
	High speed	(1)	84.2	80.8	80.8	85.4	86.1	79.7	71.0	90	62
		(2)	84.2	80.6	80.0	83.9	83.5	77.1	71.0	88	60
214D	Low speed	(1)	76.3	74.9	78.1	82.1	83.8	75.5	66.0	88	60
		(2)	73.5	71.2	72.9	75.8	76.3	64.5	65.7	81	53
	High speed	(1)	79.3	77.4	79.9	83.6	84.8	75.7	66.6	89	61
		(2)	79.3	76.9	78.3	81.3	80.6	68.0	66.6	85	57
FP1 OPTION	112D	(1)	84.2	80.6	80.5	84.3	81.0	74.4	68.4	87	59
		(2)	84.2	80.6	80.0	83.8	79.7	72.0	68.4	87	59
	128D	(1)	84.2	80.6	80.4	84.4	81.7	74.9	69.1	88	60
		(2)	84.2	80.6	79.9	83.8	79.9	72.0	69.1	87	59
	152D	(1)	84.2	80.8	80.8	85.4	84.9	77.7	71.0	90	62
		(2)	84.2	80.6	80.0	83.9	80.7	72.3	71.0	87	59
	214D	(1)	87.2	83.7	83.6	87.6	86.0	78.0	70.8	91	63
		(2)	87.2	83.6	83.0	86.9	83.2	75.0	70.8	90	62
FP2 OPTION	112D	(1)	96.4	93.6	91.6	93.0	89.4	86.3	81.9	97	69
		(2)	96.4	93.6	91.5	93.0	89.2	86.2	81.9	97	69
	128D	(1)	96.4	93.6	91.6	93.1	89.5	86.3	81.9	97	69
		(2)	96.4	93.6	91.5	93.0	89.2	86.2	81.9	97	69
	152D	(1)	96.4	93.6	91.6	93.2	90.2	86.6	82.0	97	69
		(2)	96.4	93.6	91.5	93.0	89.3	86.2	82.0	97	69
	214D	(1)	99.4	96.6	94.6	96.1	92.7	89.3	84.8	100	72
		(2)	99.4	96.6	94.5	96.0	92.3	89.2	84.8	100	72

(1) The above data shows noise levels **without** compressor isolation (option).

(2) The above data shows noise levels **with** compressor isolation.

For units: KSCM/KSHM 112D to 214D

- **Low speed:** - For ambient temperatures < +35°C and unit working on cooling mode.
- For ambient temperatures > +7°C and unit working on heating mode.
- **High speed:** - For ambient temperatures ≥ +35°C and unit working on cooling mode.
- For ambient temperatures ≤ +7°C and unit working on heating mode.

- Global sound power level measured in compliance with ISO standard 3744 and under Eurovent certification program.

- Sound pressure in dB(A) calculated at 10 m, in a free field on a reflecting surface, is given as a guide only and with a directivity of +/- 3 dBA.

- Only the sound power spectrum and the global sound power value are used in determining pressure characteristics on site.

Remark for FP1/FP2 option:

Total Lw, is global sound power level radiated for the fan motor AT FREE DISCHARGE. Sound pressure level (Lp) has to be calculated according the pressure drop introduced in the installation considering the type of the air duct, isolation class, duct length, etc ...

This value is orientative and must always consider for each installation the value of sound power level in the table to calculate the value of sound pressure level.

MODELS KSCM/KSHM

22E

26E

EVAPORATING TEMPERATURE	kW	AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (DRY BULB)					AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (DRY BULB)				
		25°C	30°C	35°C	40°C	45°C	25°C	30°C	35°C	40°C	45°C
0°C	Total Capacity	17.3	16.8	15.9	14.7	13.5	21.9	21.3	20.0	18.5	16.8
	Power Input	5.27	5.55	6.01	6.67	7.42	6.71	7.01	7.64	8.46	9.41
5°C	Total Capacity	20.3	19.8	18.6	17.2	15.8	25.6	24.9	23.3	21.6	19.8
	Power Input	5.49	5.71	6.30	6.97	7.73	6.95	7.25	7.95	8.78	9.73
7°C	Total Capacity	21.6	21.0	19.7	18.3	16.8	27.2	26.4	24.7	22.9	21.0
	Power Input	5.59	5.84	6.43	7.10	7.86	7.05	7.39	8.10	8.93	9.88
10°C	Total Capacity	24.0	23.0	21.5	20.0	18.4	30.1	28.6	26.8	24.9	22.9
	Power Input	5.64	6.03	6.64	7.31	8.08	7.11	7.64	8.35	9.18	10.1
15°C	Total Capacity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Power Input	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

32E

38E

EVAPORATING TEMPERATURE	kW	AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (DRY BULB)					AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (DRY BULB)				
		25°C	30°C	35°C	40°C	45°C	25°C	30°C	35°C	40°C	45°C
0°C	Total Capacity	25.4	24.7	23.0	21.1	19.1	32.0	31.4	29.4	27.3	25.0
	Power Input	7.94	8.25	9.11	10.1	11.2	9.83	10.2	11.2	12.3	13.5
5°C	Total Capacity	29.7	28.8	26.8	24.6	22.4	37.5	36.4	34.1	31.6	29.0
	Power Input	8.20	8.60	9.48	10.5	11.6	10.1	10.6	11.7	12.8	14.1
7°C	Total Capacity	31.8	30.5	28.4	26.1	23.8	40.1	38.5	36.1	33.5	30.7
	Power Input	8.21	8.76	9.63	10.6	11.7	10.1	10.8	11.9	13.0	14.3
10°C	Total Capacity	35.2	33.1	30.8	28.4	25.9	44.2	41.8	39.1	36.3	33.3
	Power Input	8.24	9.01	9.90	10.9	12.0	10.2	11.2	12.2	13.4	14.7
15°C	Total Capacity	n/a	n/a	n/a	n/a	n/a	50.4	47.5	44.5	41.2	37.8
	Power Input	n/a	n/a	n/a	n/a	n/a	10.8	11.8	12.8	14.0	15.3

43E

52D

EVAPORATING TEMPERATURE	kW	AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (DRY BULB)					AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (DRY BULB)				
		25°C	30°C	35°C	40°C	45°C	25°C	30°C	35°C	40°C	45°C
0°C	Total Capacity	37.5	36.6	34.3	31.8	29.1	43.8	42.5	40.0	37.0	33.7
	Power Input	11.6	12.0	13.2	14.5	16.0	13.4	14.0	15.3	16.9	18.8
5°C	Total Capacity	44.3	42.4	39.7	36.8	33.7	51.2	49.8	46.6	43.2	39.6
	Power Input	11.8	12.6	13.9	15.2	16.7	13.9	14.5	15.9	17.6	19.5
7°C	Total Capacity	47.4	44.9	42.0	38.9	35.7	54.5	52.7	49.4	45.8	42.0
	Power Input	11.8	12.9	14.1	15.5	17.0	14.1	14.8	16.2	17.9	19.8
10°C	Total Capacity	51.6	48.6	45.5	42.2	38.6	60.2	57.2	53.6	49.8	45.7
	Power Input	12.2	13.3	14.6	16.0	17.5	14.2	15.3	16.7	18.4	20.3
15°C	Total Capacity	58.6	55.2	51.6	47.7	n/a	n/a	n/a	n/a	n/a	n/a
	Power Input	12.9	14.1	15.4	16.8	n/a	n/a	n/a	n/a	n/a	n/a

64D

76D

EVAPORATING TEMPERATURE	kW	AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (DRY BULB)					AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (DRY BULB)				
		25°C	30°C	35°C	40°C	45°C	25°C	30°C	35°C	40°C	45°C
0°C	Total Capacity	50.8	49.4	45.9	42.2	38.2	64.1	62.7	58.7	54.5	50.0
	Power Input	15.9	16.5	18.2	20.2	22.4	19.7	20.3	22.3	24.5	26.9
5°C	Total Capacity	59.5	57.5	53.5	49.3	44.8	75.0	72.8	68.2	63.3	58.1
	Power Input	16.4	17.2	19.0	20.9	23.2	20.3	21.2	23.3	25.6	28.1
7°C	Total Capacity	63.7	60.9	56.7	52.3	47.5	80.3	77.0	72.1	66.9	61.4
	Power Input	16.4	17.5	19.3	21.2	23.5	20.3	21.7	23.7	26.1	28.6
10°C	Total Capacity	70.4	66.2	61.6	56.9	51.8	88.5	83.5	78.3	72.6	66.6
	Power Input	16.5	18.0	19.8	21.8	24.0	20.5	22.3	24.4	26.8	29.3
15°C	Total Capacity	n/a	n/a	n/a	n/a	n/a	101	95.0	88.9	82.4	75.5
	Power Input	n/a	n/a	n/a	n/a	n/a	21.7	23.6	25.7	28.1	30.7

86D

112D

EVAPORATING TEMPERATURE	kW	AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (DRY BULB)					AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (DRY BULB)				
		25°C	30°C	35°C	40°C	45°C	25°C	30°C	35°C	40°C	45°C
0°C	Total Capacity	74.9	73.3	68.6	63.6	58.3	92.0	89.1	84.1	78.0	71.5
	Power Input	23.3	24.1	26.5	29.1	31.9	28.4	29.8	32.3	35.5	39.1
5°C	Total Capacity	88.6	84.9	79.4	73.6	67.5	108	104	97.7	90.7	83.3
	Power Input	23.6	25.3	27.7	30.5	33.4	29.1	30.7	33.7	37.0	40.6
7°C	Total Capacity	94.8	89.7	83.9	77.8	71.3	115	110	104	96.1	88.2
	Power Input	23.7	25.8	28.3	31.0	34.0	29.3	31.3	34.3	37.6	41.3
10°C	Total Capacity	103.2	97.3	90.9	84.3	77.2	126	120	112	104	95.8
	Power Input	24.3	26.6	29.1	31.9	35.0	30.1	32.3	35.3	38.6	42.4
15°C	Total Capacity	117	110	103	95.5	n/a	n/a	n/a	n/a	n/a	n/a
	Power Input	25.9	28.1	30.7	33.5	n/a	n/a	n/a	n/a	n/a	n/a

n/a: Not available

COOLING CAPACITIES

MODELS KSCM/KSHM

128D

152D

EVAPORATING TEMPERATURE	kW	AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (DRY BULB)					AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (DRY BULB)				
		25°C	30°C	35°C	40°C	45°C	25°C	30°C	35°C	40°C	45°C
0°C	Total Capacity	102	99.0	93.4	86.6	79.3	125	122	115	106	97.1
	Power Input	30.8	32.2	35.0	38.5	42.4	38.5	39.8	43.5	47.8	52.5
5°C	Total Capacity	119	116	109	101	92.5	146.6	142.5	133.1	123.4	113
	Power Input	31.8	33.2	36.4	40.1	44.1	39.1	41.5	45.4	49.7	54.6
7°C	Total Capacity	127	123	115	107	97.9	157	151	141	131	120
	Power Input	32.0	33.8	37.1	40.7	44.8	40.1	42.3	46.2	50.6	55.5
10°C	Total Capacity	140	133	125	116	106	174	164	153	142	130
	Power Input	32.3	34.8	38.1	41.8	45.9	40.3	43.6	47.6	52.0	56.9
15°C	Total Capacity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Power Input	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

214D

n/a: Not available

EVAPORATING TEMPERATURE	kW	AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (DRY BULB)				
		25°C	30°C	35°C	40°C	45°C
0°C	Total Capacity	174	170	160	148	136
	Power Input	52.7	54.6	59.4	65.3	72.0
5°C	Total Capacity	204	199	186	173	159
	Power Input	54.7	56.7	62.1	68.3	75.3
7°C	Total Capacity	218	211	197	183	168
	Power Input	55.1	57.9	63.4	69.6	76.6
10°C	Total Capacity	241	229	214	199	183
	Power Input	55.5	59.8	65.3	71.7	78.9
15°C	Total Capacity	277	261	244	227	210
	Power Input	58.3	63.3	69.0	75.5	83.0

CORRECTION FACTORS COOLING MODE

To find out the performances for units installed with air ducts, apply the following coefficients for capacity and consumption, over the performance tables of standard fan units without ducts.

AIR AVAILABLE STATIC PRESSURE UP TO	VERSION	MODELS	Available static pressure Pa	Maximum ambient temperature °C	Correction coefficient cooling capacity	Correction coefficient consumption ((1) only FP1/FP2)	
50Pa	STANDARD	22E-214D	30	43	0.95	1.06	
			50	39	0.89	1.16	
			50	45	0.964	1.072	
	125Pa	FP1	112D-214D	75	42	0.935	1.094
				100	38	0.9	1.171
				125	36	0.856	1.269
250Pa	FP2	112D-214D	150	47	1.01	0.98	
			200	44	0.97	1.037	
			250	41	0.94	1.099	

(1) After applying correction coefficient consumption is needed to add the following power input to get total power consumption.

EXTRA POWER COMSUPTION				
MODELS	112D	128D	152D	214D
FP1	1.95	1.95	1	5.8
FP2	6.25	6.25	5.3	14.4

OPERATING LIMITS FOR (COOLING ONLY) UNITS

COOLING CYCLE OPERATION	INDOOR TEMPERATURE	MAXIMUM TEMPERATURES	MINIMUM TEMPERATURES
		32°C DB / 23°C WB	21°C DB / 15°C WB
	OUTDOOR TEMPERATURE	45°C (22E-26E-32E-52D-64D) 47°C (38E-43E-76D-86D-112D-128D-152D-214D)	+19°C STANDARD UNIT (*) (**)

BS.- Dry bulb temperature.
BH.- Wet bulb temperature.

(*) With kit low temperature 0°C option.

(**) With kit low temperature -15°C option.

HEATING CAPACITIES

R-410A

MODELS KSHM

22E

26E

CONDENSING TEMPERATURE	kW	AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (WET BULB)							AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (WET BULB)						
		-11°C	-6°C	-1°C	4°C	6°C	8°C	18°C	-11°C	-6°C	-1°C	4°C	6°C	8°C	18°C
30°C	Total Capacity	12.9	15.0	17.4	20.0	21.1	22.4	29.9	16.5	19.0	22.0	25.3	26.7	28.3	37.8
	Power Input	3.89	3.92	3.95	3.98	3.99	4.01	4.15	5.22	5.22	5.21	5.20	5.19	5.20	5.29
35°C	Total Capacity	12.9	14.8	17.1	19.6	20.8	22.0	29.2	16.3	18.8	21.7	24.9	26.3	27.9	37.0
	Power Input	4.36	4.38	4.41	4.43	4.45	4.46	4.58	5.77	5.76	5.74	5.73	5.73	5.73	5.84
40°C	Total Capacity	12.8	14.7	16.9	19.3	20.4	21.6	28.6	16.2	18.7	21.5	24.5	25.9	27.4	36.1
	Power Input	4.88	4.90	4.92	4.94	4.96	4.97	5.07	6.41	6.38	6.35	6.32	6.32	6.32	6.41
45°C	Total Capacity	n/a	14.6	16.7	19.0	20.1	21.2	27.9	n/a	18.5	21.2	24.1	25.5	26.9	35.2
	Power Input	n/a	5.49	5.51	5.52	5.53	5.54	5.61	n/a	7.11	7.05	7.01	6.99	6.98	7.06
50°C	Total Capacity	n/a	n/a	16.6	18.8	19.8	20.9	27.3	n/a	n/a	20.9	23.8	25.0	26.4	34.4
	Power Input	n/a	n/a	6.17	6.18	6.18	6.19	6.24	n/a	n/a	7.88	7.80	7.78	7.76	7.79
55°C	Total Capacity	n/a	n/a	n/a	18.6	19.5	20.5	26.6	n/a	n/a	n/a	23.4	24.6	25.9	33.5
	Power Input	n/a	n/a	n/a	6.93	6.93	6.93	6.95	n/a	n/a	n/a	8.74	8.70	8.67	8.63

32E

38E

CONDENSING TEMPERATURE	kW	AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (WET BULB)							AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (WET BULB)						
		-11°C	-6°C	-1°C	4°C	6°C	8°C	18°C	-11°C	-6°C	-1°C	4°C	6°C	8°C	18°C
30°C	Total Capacity	18.9	21.8	25.2	28.9	30.5	32.3	42.7	23.9	27.4	31.5	36.0	37.9	40.0	53.1
	Power Input	6.01	6.01	6.00	5.99	5.99	6.00	6.11	7.41	7.46	7.49	7.51	7.52	7.55	7.84
35°C	Total Capacity	18.7	21.5	24.8	28.4	30.0	31.8	41.9	23.7	27.2	31.2	35.5	37.4	39.5	52.1
	Power Input	6.70	6.69	6.67	6.65	6.65	6.65	6.71	8.10	8.19	8.24	8.25	8.26	8.27	8.45
40°C	Total Capacity	18.5	21.3	24.5	28.0	29.5	31.2	41.0	23.5	27.0	30.9	35.1	37.0	39.0	51.2
	Power Input	7.46	7.45	7.42	7.39	7.38	7.37	7.39	8.85	8.99	9.07	9.10	9.10	9.11	9.20
45°C	Total Capacity	n/a	21.1	24.2	27.5	29.0	30.7	40.1	23.4	26.7	30.5	34.7	36.5	38.5	50.2
	Power Input	n/a	8.32	8.28	8.24	8.22	8.20	8.17	9.65	9.86	9.98	10.0	10.1	10.1	10.1
50°C	Total Capacity	n/a	n/a	23.9	27.1	28.6	30.1	39.1	23.2	26.5	30.2	34.2	36.0	37.9	49.1
	Power Input	n/a	n/a	9.26	9.20	9.18	9.15	9.07	10.5	10.8	11.0	11.1	11.1	11.1	11.2
55°C	Total Capacity	n/a	n/a	n/a	26.7	28.1	29.6	38.1	23.0	26.3	29.9	33.8	35.4	37.3	48.0
	Power Input	n/a	n/a	n/a	10.3	10.3	10.2	10.1	11.4	11.8	12.1	12.2	12.3	12.3	12.4

43E

52E

CONDENSING TEMPERATURE	kW	AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (WET BULB)							AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (WET BULB)						
		-11°C	-6°C	-1°C	4°C	6°C	8°C	18°C	-11°C	-6°C	-1°C	4°C	6°C	8°C	18°C
30°C	Total Capacity	26.5	30.4	34.9	39.8	42.0	44.3	58.7	32.9	38.0	44.0	50.5	53.4	56.7	75.7
	Power Input	8.54	8.64	8.68	8.70	8.71	8.73	8.99	10.4	10.4	10.4	10.4	10.4	10.4	10.6
35°C	Total Capacity	26.3	30.2	34.6	39.4	41.5	43.7	57.7	32.7	37.7	43.4	49.8	52.6	55.7	73.9
	Power Input	9.34	9.48	9.56	9.59	9.59	9.60	9.74	11.5	11.5	11.5	11.5	11.5	11.5	11.7
40°C	Total Capacity	26.2	30.0	34.3	39.0	41.0	43.2	56.7	32.4	37.3	42.9	49.0	51.7	54.7	72.2
	Power Input	10.2	10.4	10.5	10.6	10.6	10.6	10.7	12.8	12.8	12.7	12.7	12.7	12.7	12.8
45°C	Total Capacity	16.1	29.8	34.0	38.6	40.6	42.7	55.7	n/a	36.9	42.4	48.3	50.9	53.8	70.5
	Power Input	11.1	11.4	11.6	11.7	11.7	11.7	11.8	n/a	14.2	14.1	14.0	14.0	14.0	14.1
50°C	Total Capacity	25.9	29.6	33.8	38.2	40.2	42.2	54.7	n/a	n/a	41.8	47.5	50.1	52.8	68.7
	Power Input	12.1	12.5	12.8	12.9	12.9	13.0	13.0	n/a	n/a	15.8	15.6	15.6	15.5	15.6
55°C	Total Capacity	25.8	29.5	33.5	37.8	39.7	41.7	53.7	n/a	n/a	n/a	46.8	49.3	51.9	67.0
	Power Input	13.2	13.7	14.0	14.2	14.3	14.4	14.4	n/a	n/a	n/a	17.5	17.4	17.3	17.3

64D

76D

CONDENSING TEMPERATURE	kW	AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (WET BULB)							AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (WET BULB)						
		-11°C	-6°C	-1°C	4°C	6°C	8°C	18°C	-11°C	-6°C	-1°C	4°C	6°C	8°C	18°C
30°C	Total Capacity	37.7	43.6	50.4	57.8	61.0	64.6	85.4	47.9	54.9	63.0	71.9	75.8	80.1	106
	Power Input	12.0	12.0	12.0	12.0	12.0	12.0	12.2	14.8	14.9	15.0	15.0	15.1	15.1	15.7
35°C	Total Capacity	37.3	43.1	49.7	56.9	60.0	63.6	83.8	47.5	54.4	62.3	71.0	74.9	79.0	104
	Power Input	13.4	13.4	13.3	13.3	13.3	13.3	13.4	16.2	16.4	16.5	16.5	16.5	16.5	16.9
40°C	Total Capacity	37.0	42.6	49.0	56.0	59.0	62.5	82.1	47.1	53.9	61.7	70.2	73.9	78.0	102
	Power Input	14.9	14.9	14.9	14.8	14.8	14.8	14.8	17.7	18.0	18.1	18.2	18.2	18.2	18.4
45°C	Total Capacity	n/a	42.2	48.4	55.1	58.1	61.4	80.2	46.7	53.5	61.1	69.3	72.9	76.9	100
	Power Input	n/a	16.6	16.6	16.5	16.4	16.4	16.3	19.3	19.7	20.0	20.1	20.1	20.1	20.2
50°C	Total Capacity	n/a	n/a	47.8	54.2	57.1	60.2	78.3	46.3	53.0	60.4	68.4	71.9	75.8	98.2
	Power Input	n/a	n/a	18.5	18.4	18.4	18.3	18.1	21.0	21.6	22.0	22.2	22.2	22.2	22.3
55°C	Total Capacity	n/a	n/a	n/a	53.5	56.2	59.1	76.3	46.0	52.5	59.8	67.5	70.9	74.6	96.1
	Power Input	n/a	n/a	n/a	20.6	20.5	20.5	20.2	22.9	23.7	24.2	24.5	24.6	24.6	24.7

86D

112D

CONDENSING TEMPERATURE	kW	AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (WET BULB)							AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (WET BULB)						
		-11°C	-6°C	-1°C	4°C	6°C	8°C	18°C	-11°C	-6°C	-1°C	4°C	6°C	8°C	18°C
30°C	Total Capacity	53.0	60.8	69.7	79.6	84.0	88.5	117	69.4	79.8	91.9	105	111	117	156
	Power Input	17.1	17.3	17.4	17.4	17.4	17.5	18.0	28.8	21.9	22.0	22.0	22.0	22.1	22.9
35°C	Total Capacity	52.7	60.4	69.1	78.8	83.0	87.4	115	68.8	79.1	90.8	104	109	116	153
	Power Input	18.7	19.0	19.1	19.2	19.2	19.2	19.5	23.9	24.1	24.1	24.1	24.1	24.2	24.7
40°C	Total Capacity	52.4	60.0	68.6	78.0	82.1	86.4	113	68.2	78.3	89.8	102	108	114	150
	Power Input	20.4	20.8	21.1	21.2	21.2	21.2	21.3	26.2	23.5	26.6	26.6	26.6	26.6	26.9
45°C	Total Capacity	52.1	59.6	68.0	77.2	81.2	85.4	111	n/a	77.5	88.7	101	106	112	146
	Power Input	22.2	22.8	23.2	23.4	23.4	23.4	23.5	n/a	29.1	29.3	29.3	29.3	29.3	29.5
50°C	Total Capacity	51.9	59.3	67.6	76.5	80.3	84.4	109	n/a	n/a	87.6	99.4	105	110	143
	Power Input	24.2	25.0	25.5	25.8	25.9	25.9	26.0	n/a	n/a	32.3	32.4	32.4	32.4	32.5
55°C	Total Capacity	51.7	59.0	67.1	75.7	79.4	83.5	107	n/a	n/a	n/a	97.9	103	108	140
	Power Input	26.3	27.3	28.0	28.5	28.6	28.7	28.9	n/a	n/a	n/a	35.9	35.9	36.0	36.0

n/a: Not available

HEATING CAPACITIES

MODELS KSHM

128D

152D

CONDENSING TEMPERATURE	kW	AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (WET BULB)							AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (WET BULB)						
		-11°C	-6°C	-1°C	4°C	6°C	8°C	18°C	-11°C	-6°C	-1°C	4°C	6°C	8°C	18°C
30°C	Total Capacity	75.8	87.2	100	115	121	128	170	90.7	104	120	138	146	154	205
	Power Input	23.6	23.8	23.8	23.9	23.9	24.0	24.9	29.3	29.6	29.7	29.9	30.0	30.1	30.9
35°C	Total Capacity	75.1	86.3	99.1	113	119	126	167	90.1	103	119	136	143	152	201
	Power Input	26.0	26.2	26.3	26.3	26.3	26.3	26.9	32.2	32.4	32.6	32.7	32.8	32.9	33.5
40°C	Total Capacity	74.5	85.5	98.0	112	118	124	163	89.7	103	118	134	141	149	197
	Power Input	28.5	28.8	29.0	29.0	29.0	29.0	29.3	35.4	35.7	35.8	36.0	36.0	36.1	36.5
45°C	Total Capacity	n/a	84.7	96.9	110	116	122	160	n/a	102.0	116	132	139	147	192
	Power Input	n/a	31.8	32.0	32.1	32.1	32.1	32.2	n/a	39.3	39.5	39.6	39.7	39.7	40.0
50°C	Total Capacity	n/a	n/a	95.8	109	114	120	156	n/a	n/a	115	131	137	145	188
	Power Input	n/a	n/a	35.4	35.5	35.6	35.6	35.6	n/a	n/a	43.6	43.8	43.8	43.8	44.0
55°C	Total Capacity	n/a	n/a	n/a	107	112	118	153	n/a	n/a	n/a	129	135	142	184
	Power Input	n/a	n/a	n/a	39.4	39.4	39.5	39.4	n/a	n/a	n/a	48.5	48.5	48.5	48.7

214D

CONDENSING TEMPERATURE	kW	AIR ENTRY TEMPERATURE INTO THE OUTDOOR UNIT °C (WET BULB)						
		-11°C	-6°C	-1°C	4°C	6°C	8°C	18°C
30°C	Total Capacity	126	145	167	191	202	213	284
	Power Input	40.0	40.3	40.6	40.9	41.0	41.2	42.4
35°C	Total Capacity	125	143	165	188	199	210	279
	Power Input	43.7	44.1	44.4	44.7	44.8	44.9	45.9
40°C	Total Capacity	124	142	163	186	196	207	273
	Power Input	47.9	48.4	48.7	49.0	49.1	49.2	50.0
45°C	Total Capacity	n/a	142	162	184	193	204	267
	Power Input	n/a	53.2	53.6	54.0	54.1	54.2	54.9
50°C	Total Capacity	n/a	n/a	161	181.7	191	201	262
	Power Input	n/a	n/a	59.3	59.7	59.8	59.9	60.5
55°C	Total Capacity	n/a	n/a	n/a	180	189	198	256
	Power Input	n/a	n/a	n/a	66.2	66.3	66.4	67.0

n/a: Not available

CORRECTION FACTORS HEATING MODE

To find out the performances for units installed with air ducts, apply the following coefficients for capacity and consumption, over the performance tables of standard fan units without ducts.

AIR AVAILABLE STATIC PRESSURE UP TO	VERSION	MODELS	Available static pressure Pa	Maximum ambient temperature °C	Correction coefficient heating capacity	Correction coefficient consumption ((1) only FP1/FP2)	
AIR AVAILABLE STATIC PRESSURE UP TO	50Pa	STANDARD	22E-214D	30	-9	0.94	1.02
				50	-8	0.89	1.03
				50	-10	1	1
	125Pa	FP1	112D-214D	75	-8	0.94	1.02
				100	-6	0.89	1.03
				125	-5	0.87	1.04
				150	-10	1.01	0.99
	250Pa	FP2	112D-214D	200	-10	1	1
				200	-10	1	1
				250	-8	0.94	1.02

(1) After applying correction coefficient consumption is needed to add the following power input to get total power consumption.

EXTRA POWER COMSUPTION				
MODELS	112D	128D	152D	214D
FP1	1.95	1.95	1	5.8
FP2	6.25	6.25	5.3	14.4

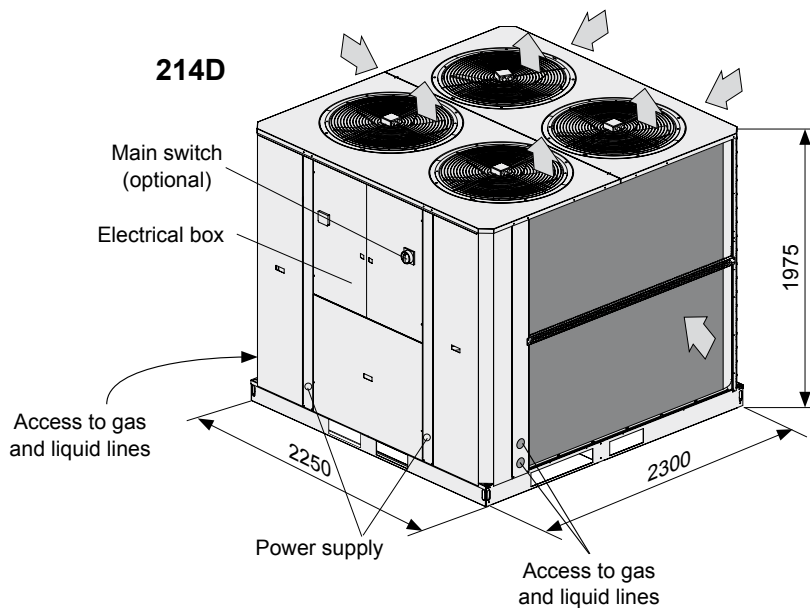
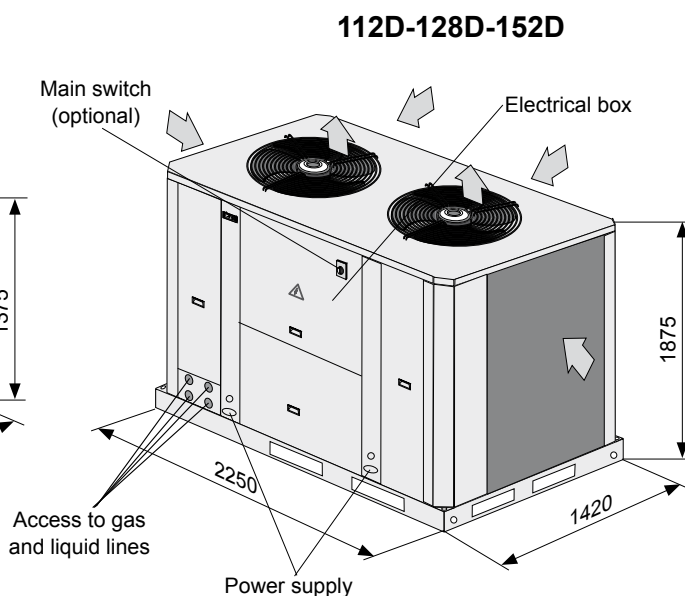
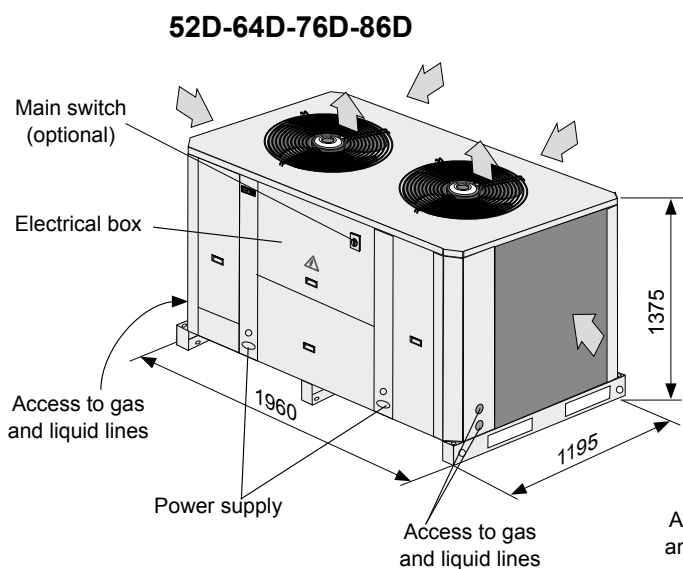
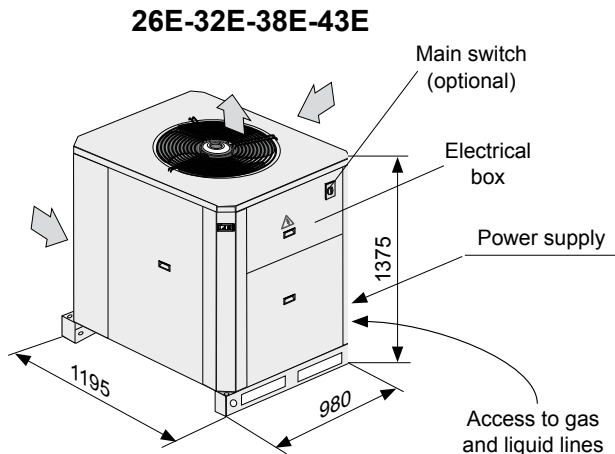
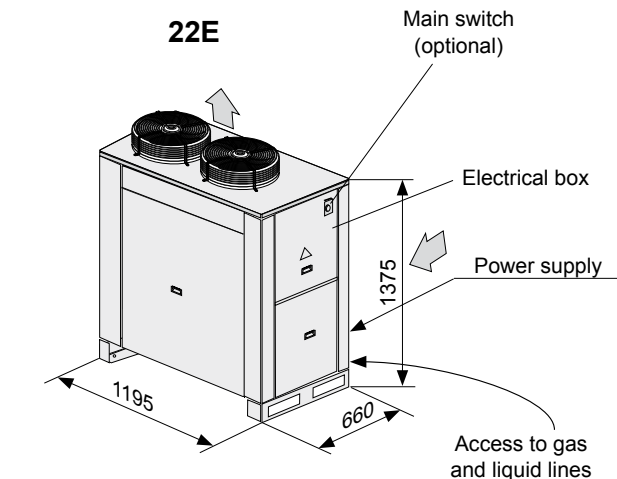
OPERATING LIMITS FOR (HEAT PUMP) UNITS

COOLING CYCLE OPERATION	INDOOR TEMPERATURE	MAXIMUM TEMPERATURE	MINIMUM TEMPERATURE
		OUTDOOR TEMPERATURE	32°C DB / 23°C WB
HEATING CYCLE OPERATION	INDOOR TEMPERATURE	45°C (22E-26E-32E-52D-64D) 47°C (38E-43E-76D-86D-112D-128D-152D-214D)	0°C
	OUTDOOR TEMPERATURE	27°C DB	15°C DB
		DEPENDENT ON MODELS (See tables for heating capacities)	-10°C DB / -11°C WB

DB.- Dry bulb temperature
WB.- Wet bulb temperature

UNIT DIMENSIONS

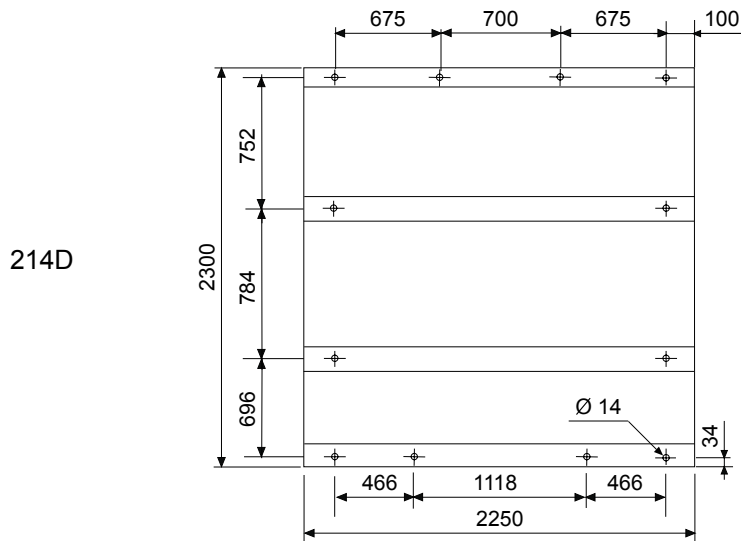
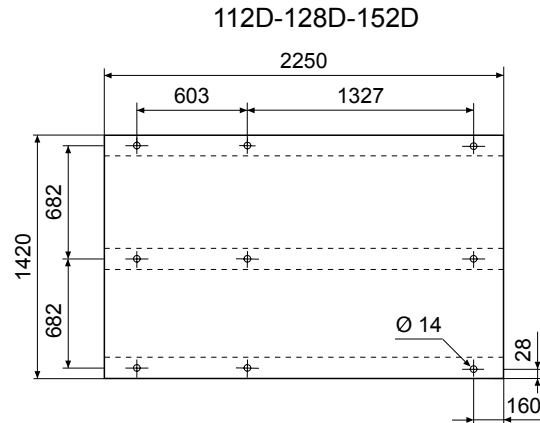
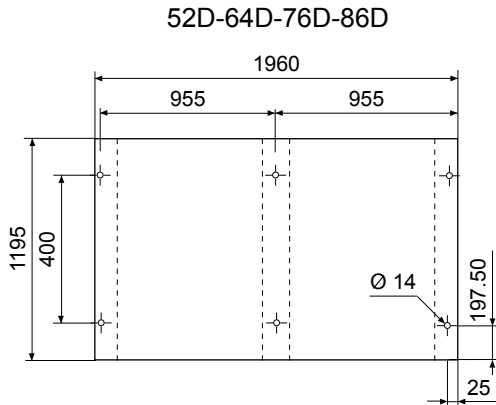
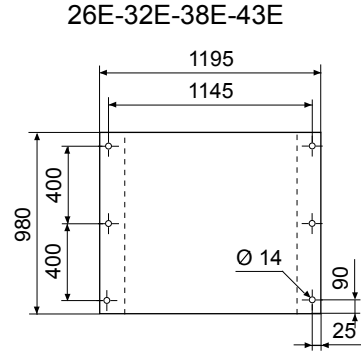
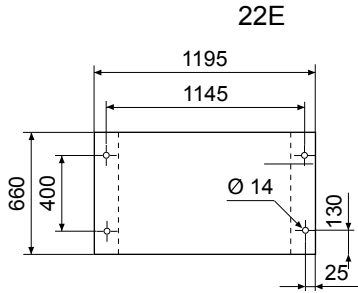
MODELS KSCM/KSHM



NOTE: As an option, service valves are available for liquid and gas lines with welded connection.

UNIT INSTALLATION

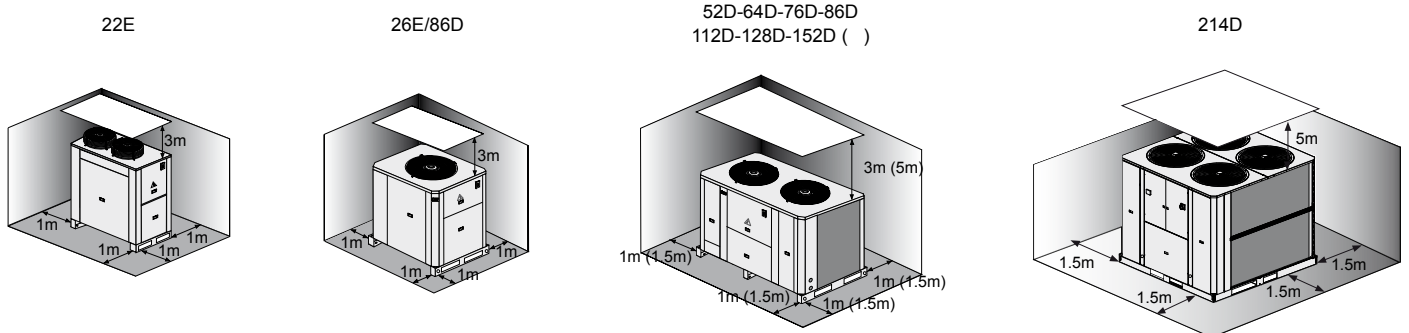
MOUNTING PLATES



Sizes in mm.

SERVICE SPACE

Space should be left free for access and servicing, and for intake and discharge air flow as well.



PIPE CONNECTIONS

REFRIGERANT CONNECTIONS



The units are factory pre-charged with Nitrogen (N₂). The installer should remove this gas and charge the units with refrigerant R-410A.

Refrigerant connections on outdoor unit

NOTE: The unit is supplied with welded connections.

As an option, service valves are available for liquid and gas lines with welded connection.

As an option, refrigerant factory precharged kit is available (this option includes service valves).

SEE OPTION SECTION ON THIS MANUAL



Piping connection lines

For calculating piping connection lines between outdoor and indoor units, distance and drop between lines are very important aspects.

To achieve the best features for the units, take special care about:

- The gas line must be always insulated.
- The horizontal lines must be typed at least 2% toward the outdoor unit .
- The minimum speed suction must not be below 6 m/s on the vertical line of the gas line, and siphons must be installed every few meters upward to assure the oil returns to the compressor properly.
- The maximum speed inside lines should not be higher than 15m/s.

Amount of refrigerant charge R-410A for the installation

The amount of refrigerant R-410A for the system will depend on the size of connecting line between indoor and outdoor unit and on the expansion system of the indoor unit. Prior to charge the unit, a proper vacuum must be done.

Finally, it is necessary to adjust the expansion system, with the unit already charged, to achieve the best features for the units, such as evaporating temperature, condensing temperature, discharge, etc.



PRECAUTIONS TO BE TAKEN IN THE USE OF R-410A Refrigerant:

R-410A Refrigerant is used in the unit; therefore, the following precautions characteristic of this gas should be taken:

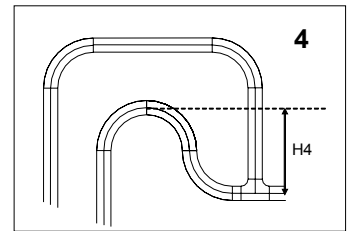
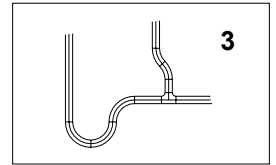
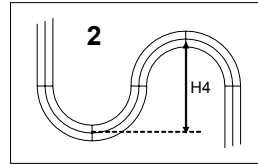
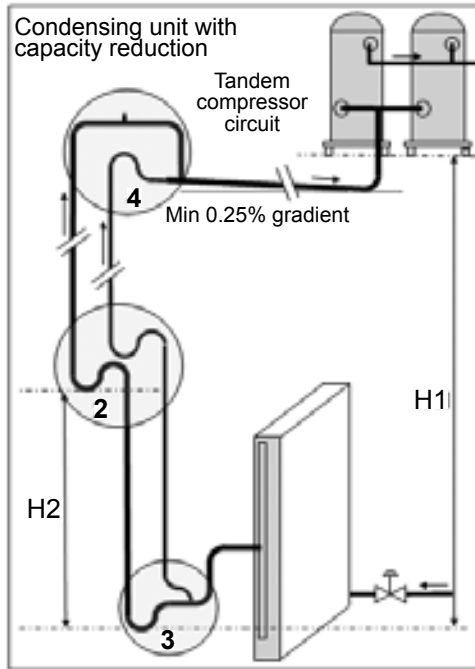
- The Vacuum Pump must have a Check Valve or Solenoid Valve.
- Pressure Gauges and Hoses for the exclusive use with R-410A Refrigerant should be used.
- The charge should be carried out in the Liquid Phase.
- Always use scales to weight-in charge
- Use the Leak Detector exclusive for R-410A Refrigerant.
- Do not use mineral oil, only synthetic oil to ream, expand or make connections.
- Keep pipes wrapped before using them and be very thorough about any possible dirt (dust, filings, burrs, etc.).
- When there is a leak, gather what is left of the charge, create a vacuum in the unit and completely recharge with new R-410A Refrigerant.
- Brazing should always be carried out in a nitrogen atmosphere.
- Reamers should always be well sharpened.

PIPE CONNECTIONS

ADDITIONAL CAPACITY STEP

112D to 152D units with 3 compressors can be work using three capacity steps. 214D working with 4 capacity steps. (They can use the last one as an additional step).

See the picture below for the installation if an additional capacity step is used for units with tandem compressor circuit. An additional gas line has to be used to assure the correct operation of the system.



H1: 15m Max
H2: 5m Max
H4: 0,15m Min

- 2 - Coupled trap.
- 3 - Lower trap with double tubes.
- 4 - Higher trap with double tubes.

Models with tandem compressor

112D	128D	152D	214D
Circuit 1	Circuit 1	Circuit 1	Circuit 1 & 2

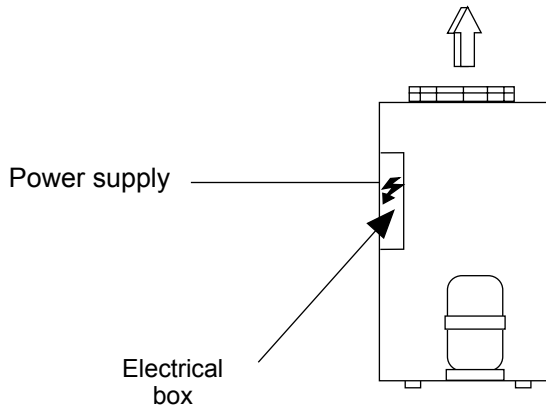
ELECTRICAL CONNECTIONS



- BEFORE MAKING ANY ELECTRICAL CONNECTIONS, BE SURE THAT ALL CIRCUIT BREAKERS ARE OPEN.

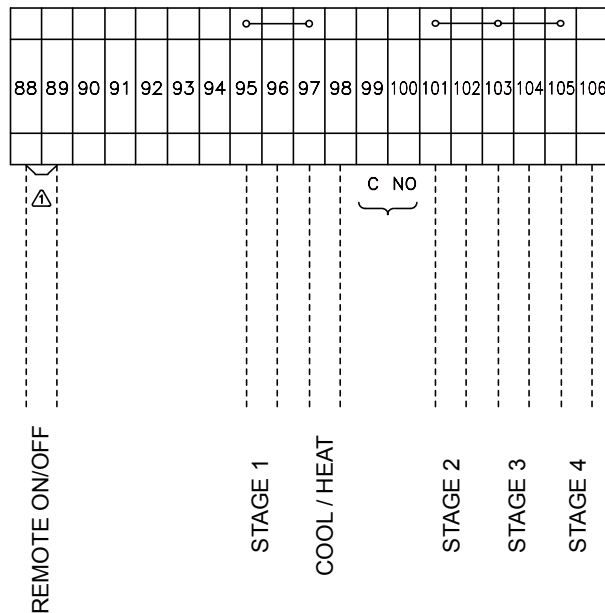
- IN ORDER TO CARRY OUT ELECTRICAL CONNECTIONS, FOLLOW THE ELECTRICAL DIAGRAM SUPPLIED WITH THE UNIT.

CONDENSING UNITS



	Power supply
KSCM/ KSHM 22E	5 x 4 mm ²
KSCM/ KSHM 26E	5 x 6 mm ²
KSCM/ KSHM 32E	5 x 6 mm ²
KSCM/ KSHM 38E	5 x 6 mm ²
KSCM/ KSHM 43E	5 x 10 mm ²
KSCM/ KSHM 52D	5 x 16 mm ²
KSCM/ KSHM 64D	5 x 16 mm ²
KSCM/ KSHM 76D	3 x 25 + 2 x 16 mm ²
KSCM/ KSHM 86D	3 x 25 + 2 x 16 mm ²
KSCM/ KSHM 112D	3 x 35 + 2 x 16 mm ²
KSCM/ KSHM 128D	3 x 35 + 2 x 16 mm ²
KSCM/ KSHM 152D	3 x 50 + 2 x 25 mm ²
KSCM/ KSHM 214D	3 x 70 + 2 x 35 mm ²

ELECTRICAL CONNECTION "REMOTE SIGNALS"



REMOVE LINK FOR REMOTE ON/OFF OPERATION

OPTIONS

LOW AMBIENT KIT 0°C (only available for KSCM units).

It is a crankcase heater for unit operation below 19°C (until 0°C).

The purpose of the heater is to keep the oil in the compressor at the correct temperature, while the compressor is stopped, so that it can be properly lubricated, when starts again.

LOW AMBIENT KIT -15°C (Only available for KSCM units).

It regulates the fan speed with pressure transducer, in order to control condensing temperature. This option includes also crankcase heater.

Thus the unit will be able to operate in the cooling cycles when the outdoor temperature is below 19°C (until -15°C).

A solenoid valve has to be fitted by the installer in the liquid line (indoor unit) to prevent liquid return to the compressor.

See electrical diagram supplied with the unit for the connection.

KIT LOW NOISE

Each compressor is fitted with a compressor acoustic jacket this provides attenuation of the compressor noise that radiates from the unit.

PRECOATED COIL

Special protection of the aluminum condenser coil fins, to protect it from aggressive external environmental conditions.

MAIN SWITCH

The main switch is located on the access panel to the electrical box. It is equipped with a clutch gadget, which allows opening the panel of the electrical box, when it is on OFF position.

COMPRESSOR STARTING CURRENT CONSTRAINED (“SOFT STARTER”).

It is an electronic element, which reduces the peak compressor starting current up to 40% (see pages of electrical data without soft starter).

RETURN LOCK THREE PHASES.

Located at electrical box of the unit. It assures that unit will not begin operation on detection of overvoltage, undervoltage, phase reversal fault or phase failure.

MODBUS

It is possible to connect several units with a communication system (MOD BUS Protocol).

RUBBER DUMPS & SPRING DUMPS.(Supplied loose)

To install under the unit, to avoid transmission of vibrations, to the floor where unit is installed, while unit is operating.

Two different types: rubber or springs anti-vibrations (according to models).

SERVICE VALVES

As an option, the unit is fitted with gas and liquid service valves in order to make easier installation and maintenance operations.

- Valves for gas and liquid lines inside the units with welded connection for 22E to 214D.



FACTORY PRECHARGED

This option includes service valves and R-410A refrigerant charged in outdoor unit (for 0 meters of connection lines).

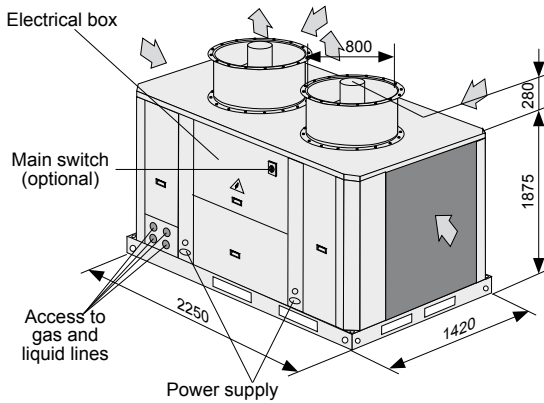
PROTECTION GRILL

The condenser coil protection grill prevents light damage to the coil when shipping and when installed.

OPTIONS

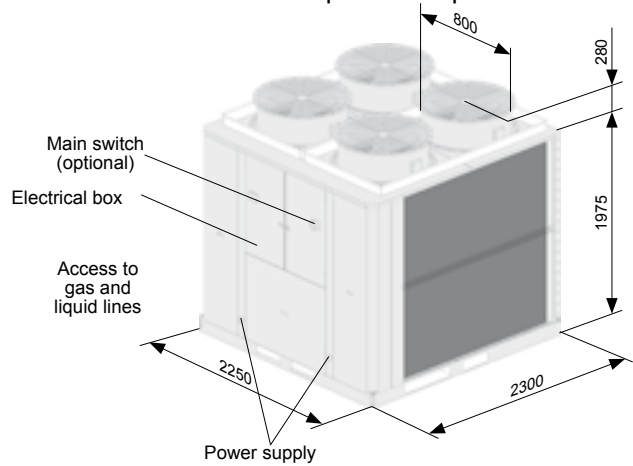
KIT HIGH PRESSURE 125Pa FP1 **(Only available for units 112D to 214D).**

Units with high pressure fans.
Available static pressure up to 125Pa.



KIT HIGH PRESSURE 250Pa FP2 **(Only available for units 112D to 214D).**

Units with high pressure fans.
Available static pressure up to 250Pa.



INLET PLENUM (FP1 and FP2 unit versions only). (Supplied loose).

It is a accessory for adapting the condenser air intake to accept a duct.

SQUARE DISCHARGE DUCT (FP1 and FP2 unit versions only).

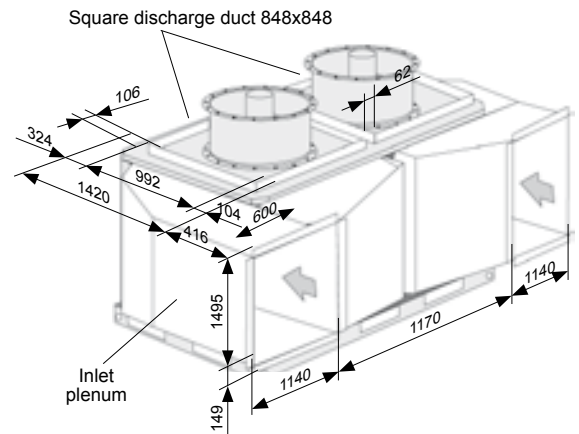
It is formed by 1 or 2 square frames, for adapting discharge air from the unit to a square duct.

AUXILIARY DRIP TRAY (Only available for heat pump units with FP1/FP2 option).

Heat pump units during defrost cycle produce a lot of quantity of water. You can use an auxiliary drip tray under the unit in order to get all the defrost water and take it where you decided.

DRIVE INDOOR FAN MOTOR OPTION.

It includes the contactor and thermal switch, for indoor fan motor.





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