

HYDRONIC CASSETTES **INSTALLATION OPERATION AND SERVICE MANUAL**

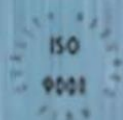
PCE(F)2-V/P~AC SERIES

V ~ 2 pipe

P ~ 4 pipe



HARDI
Heating, Air conditioning & Refrigeration Distributors International
PROUD MEMBER
2012 - 2013



INVESTING IN QUALITY, RELIABILITY & PERFORMANCE.

ISO 9001 Quality



Every product is manufactured to meet the stringent requirements of the internationally recognized ISO 9001 standard for quality assurance in design, development and production.

World Leading Design and Technology

Equipped with the latest CAD/CAM computer aided design and manufacturing technology, our factories in China and Thailand produce over 2,000,000 air conditioning units each year, all conforming to the highest international standards of quality and safety.

CE SAFETY STANDARDS



All products conform to the Certificate Europe directives (Machinery Safety, Electromagnetic Compatibility and Low Voltage), as required throughout the European Community, to guarantee correct standards of safety.

The Highest Standards of Manufacturing

In order to guarantee the very highest standards and performance, we manage every stage in the manufacturing of our products. Throughout the production process we maintain strict control, originating with our extensive resources in research and development through to the design and manufacture of almost every individual component, from molded plastics to the assembly of units and controllers.

WEEE Mark



All products conform to the "WEEE" directive to guarantee correct standards of environmental solutions.

Quality Controlled from Start to Finish

Our highly trained staff and strict quality control methods enable us to produce products with an exceptional reputation for reliability and efficiency, maintained over many years. As well as full CE certification and ISO 9001, several products have UL / ETL safety approval in the USA and Canada, ROHS compliance for Europe, giving you the confidence of knowing our company is the right choice when selecting air conditioning equipment.

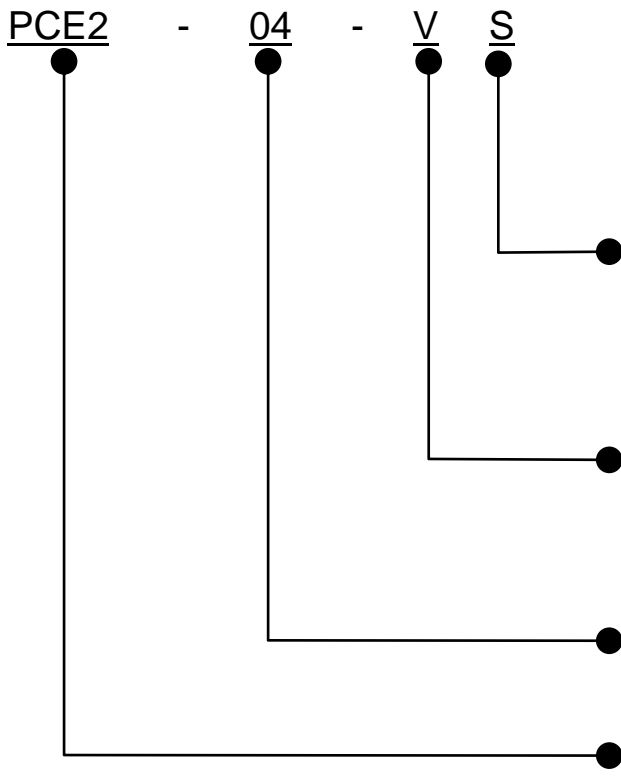
ALWAYS MAKE SURE THIS MANUAL REMAINS WITH THE WATER CASSETTE. READ THIS MANUAL BEFORE PERFORMING ANY OPERATION ON THE WATER CASSETTE.

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Model Code Nomenclature

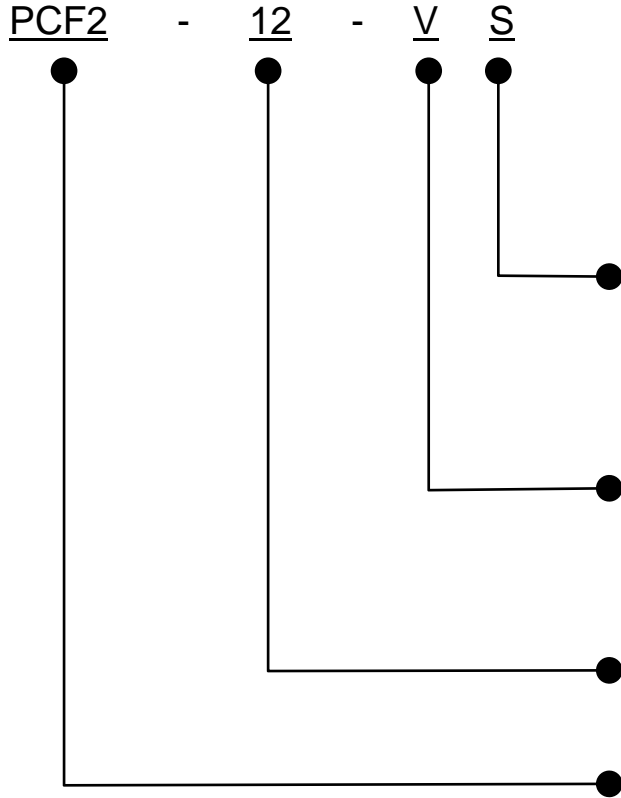


S	Complete function onboard PCB with integrated group control functionality.
W	Limited function onboard PCB with drain-pump, louver and zone control functionality.

P	Chilled/Hot Water, 4-Pipe
V	Chilled/Hot Water, 2-Pipe
VEH	Chilled Water, 2-Pipe with Electric Heater

03 - 16	Unit Sizes. See General Specification section A for cooling and heating capacities
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PCE2	Hydronic Cassette E2 Series
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S	Complete function onboard PCB with integrated group control functionality.
W	Limited function onboard PCB with drain-pump, louver and zone control functionality.

P	Chilled/Hot Water, 4-Pipe
V	Chilled/Hot Water, 2-Pipe
VEH	Chilled Water, 2-Pipe with Electric Heater

09 - 20	Unit Sizes. See General Specification section A for cooling and heating capacities
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PCF2	Hydronic Cassette F2 Series
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A. Technical Data

A.1. General Specification

A.1.1. 2-Pipe Systems

Product range: PCEF2 Standard/Flexi Hydronic Cassette



PCE(F)2-V~ Hydronic Cassette 2-pipe 3-speed

		PCE(F)2-[Size]-V--3S		PCE2-03	PCE2-04	PCE2-06	PCE2-08		
Unit Configuration	Configuration		2-pipe						
	Number Of Fan Blowers		Single						
	Power Supply	(V/Ph/Hz)	230 / 1 / 50 220 / 1 / 60						
	Operation Control - PCE(F)2		~S: Complete function onboard PCB with integrated group control functionality, incl. 1 pc return air sensor and 2 pcs temperature sensors. ~W: Limited function onboard PCB with drain-pump, louver and zone control functionality, incl. 1 pc coil temperature sensors.						
Performance Data	Air	Total Air Flow ^e	H	m ³ /hr	380	575	722	810	
			M	240	290	522	617		
			L	200	200	450	450		
	Cooling	Cooling Capacity ^e	H	kW	2.37	3.2	4.08	4.56	
			M		1.7	2.06	3.1	3.76	
			L		1.41	1.41	2.7	2.7	
		Sensible Cooling Capacity ^e	H		1.89	2.5	3	3.17	
			M		1.62	1.62	2.45	2.85	
			L		1.11	1.11	2.15	2.15	
	FCEER ^e	Rating		60	61	98	91		
		Class		D	D	C	C		
	Heating	Heating Capacity ^e	H	kW	2.8	3.65	5.29	6.15	
			M		2	2.4	4.1	4.9	
			L		1.6	1.6	3.51	3.5	
		Max. Electric Heater Capacity			1		2		
	FCCOP ^e	Rating		69	69	128	120		
			Class		E	E	C	C	
	Sound	Sound Pressure Level (Outlet)		dB(A)	34 / 30 / 27		44 / 35 / 30		
		Sound Power Level (Outlet) ^e			42 / 37 / 35		57 / 46 / 42		
	Electrical	Fan Motor Power ^e	H	W	38	60	56	85	
			M		27	32	33	43	
			L		24	24	26	26	
		Fan Motor Running Current @ H			0.217		0.26		0.37
			Fan Motor Starting Current @ H		0.78		0.83		
Hydraulic	Cooling Water Flow Rate	H	L/h	407	549	700	783		
		M		292	354	532	645		
		L		242	242	463	463		
	Cooling Pressure Drop ^e	H		7.3	10	28	36.8		
		M		3.8	4.9	16	25		
		L		3	3	10	10		
	Heating Water Flow Rate @H/M/L			L/h		Same as "Cooling Water Flow Rate"			
	Heating Pressure Drop ^e	H		kPa	5.9	7	25	33	
M		3	4		13	21			
L		2	2		8	8			
Water Content		L	1.25		1.56				
Construction and Packing Data	Water Connections	Type		Socket (Threaded Female)					
		In	mm[in]	19.05[3/4]					
	Out								
	Condensate Drainage Connection								
	Dimensions PCE(F)2	L	mm	570					
		W		570					
H		250		290					
Panel Dimensions		680 x 680 x 28							
Net Weight		Kg	28		30				

1."e" refers to technical information listed on the Eurovent website. Eurovent testing conditions:

a. Cooling mode (2-pipe):

- Return air temperature: 27C DB/ 19C WB.
- Inlet/ outlet water temperature: 7C/ 12C.
- Water flow-rate: variable.

b. Heating mode (2-pipe):

- Return air temperature: 20C.
- Inlet water temperature: 50C.
- Water flow-rate: same as 2-pipe cooling.

Product range: PCEF2 Standard/Flexi Hydronic Cassette



PCE(F)2-V- Hydronic Cassette 2-pipe 3-speed

		PCE(F)2-[Size]-V--3S		PCE2-08R	PCE2-09	PCE2-12	PCE2-16		
Unit Configuration	Configuration		2-pipe						
	Number Of Fan Blowers		Single	Twin					
	Power Supply	(V/Ph/Hz)	230 / 1 / 50 220 / 1 / 60						
	Operation Control - PCE(F)2		~S: Complete function onboard PCB with integrated group control functionality, incl. 1 pc return air sensor and 2 pcs temperature sensors. ~W: Limited function onboard PCB with drain-pump, louver and zone control functionality, incl. 1 pc coil temperature sensors.						
Performance Data	Air	Total Air Flow ^e	H	m ³ /hr	810	1020	1280	1450	
			M	617	540	910	1100		
			L	450	360	780	780		
	Cooling	Cooling Capacity ^e	H	kW	4.93	6.12	7.7	8.5	
			M		3.92	3.62	5.4	6.6	
			L		3.03	2.48	4.6	4.6	
		Sensible Cooling Capacity ^e	H		3.45	4.53	6.08	6.68	
			M		2.73	2.85	4.84	5.7	
			L		2.1	1.93	4.1	4.1	
	Heating	FCEER ^e	Rating		100	55	84	80	
			Class		C	E	C	D	
			Heating Capacity ^e	H	kW	5.79	7.32	9.3	10.3
		M		4.6	4.27	6.5	8.05		
	L	3.53		3	5.6	5.6			
	FCCOP ^e	Rating		118	66	103	97		
		Class		C	E	C	D		
	Sound	Sound Pressure Level (Outlet)		dB(A)		46 / 40 / 30	39 / 33 / 28	45 / 39 / 33	47 / 41 / 33
		Sound Power Level (Outlet) ^e				60 / 52 / 42	50 / 42 / 37	59 / 48 / 44	63 / 54 / 44
	Electrical	Fan Motor Power ^e	H	W	85	100	110	170	
			M		43	64	66	85	
L			26		47	52	52		
Fan Motor Running Current @ H		A		0.41	0.51	0.74	0.78		
Fan Motor Starting Current @ H				1.16	1.33	2.22	2.35		
Hydraulic	Cooling Water Flow Rate	H	L/h	846	995	1322	1459		
		M		673	621	927	1133		
		L		522	426	790	790		
	Cooling Pressure Drop ^e	H	kPa	42	33	32.3	38		
		M		28	14	17.3	20		
		L		18	6.5	11.5	10		
	Heating Water Flow Rate @H/M/L		L/h		Same as "Cooling Water Flow Rate"				
	Heating Pressure Drop ^e	H	kPa	40	31	29.7	34		
M		26		12	14.2	17			
L		15		4	8.3	7			
Water Content		L		1.38	2.22	2.77			
Construction and Packing Data	Water Connections	Type		Socket (Threaded Female)					
		In	mm[in]	19.05[3/4]					
	Out								
	Condensate Drainage Connection								
	Dimensions PCE(F)2	L	mm	570	1130				
		W		570	580				
H		290		250	290				
Panel Dimensions				680 x 680 x 28	680 x 1240 x 28				
Net Weight		Kg		33	50	52			

1."e" refers to technical information listed on the Eurovent website. Eurovent testing conditions:

a. Cooling mode (2-pipe):

- Return air temperature: 27C DB/ 19C WB.
- Inlet/ outlet water temperature: 7C/ 12C.
- Water flow-rate: variable.

b. Heating mode (2-pipe):

- Return air temperature: 20C.
- Inlet water temperature: 50C.
- Water flow-rate: same as 2-pipe cooling.

Product range: PCEF2 Standard/Flexi Hydronic Cassette



PCE(F)2-V- Hydronic Cassette 2-pipe 3-speed

PCE(F)2-[Size]-V--3S			PCF2-09	PCF2-10	PCF2-12	PCF2-16	PCF2-18	PCF2-20		
Unit Configuration	Configuration		2-pipe							
	Number Of Fan Blowers		Single							
	Power Supply	(V/Ph/Hz)	230 / 1 / 50 220 / 1 / 60							
	Operation Control - PCE(F)2		-S: Complete function onboard PCB with integrated group control functionality, incl. 1 pc return air sensor and 2 pcs temperature sensors. -W: Limited function onboard PCB with drain-pump, louver and zone control functionality, incl. 1 pc coil temperature sensors.							
Performance Data	Air	Total Air Flow ^e	H	m ³ /hr	960	1050	1300	1970	2130	2250
			M	820	820	960	1640	1640	1970	
			L	700	700	700	1380	1380	1380	
	Cooling	Cooling Capacity ^e	H	kW	5.6	6.1	6.9	9.55	10.9	11.5
			M		5.1	5.1	5.6	8.9	8.9	10.2
			L		3.57	3.57	3.57	6.8	7.69	7.69
		Sensible Cooling Capacity ^e	H		4.37	4.89	5.06	8.37	7.87	8.21
			M		3.85	3.85	4.37	7.13	6.35	7.37
			L		2.96	2.96	2.96	5.72	5.52	5.52
	FCEER ^e	Rating	78	77	69	56	61	54		
		Class	D	D	D	D	D	E		
	Heating	Heating Capacity ^e	H	kW	6.7	8	8.54	11.8	13.4	14.1
			M		5.83	6.7	6.7	11	10.9	12.6
			L		4.68	4.68	4.68	8.8	9.43	9.43
		Max. Electric Heater Capacity			3			4		
		FCCOP ^e	Rating		97	100	88	73	76	69
		Class	D	C	D	D	D	E		
	Sound	Sound Pressure Level (Outlet)		dB(A)	42 / 40 / 36	47 / 40 / 36	50 / 42 / 36	50 / 46 / 39	52 / 46 / 39	54 / 50 / 39
		Sound Power Level (Outlet) ^e			57 / 53 / 46	61 / 53 / 46	65 / 57 / 46	65 / 61 / 58	67 / 61 / 58	70 / 65 / 58
	Electrical	Fan Motor Power ^e	H	W	83	106	147	267	286	310
			M		61	61	83	187	187	267
			L		47	47	47	100	100	100
		Fan Motor Running Current @ H		A	0.62	0.64	0.69	1.28	1.35	1.39
	Fan Motor Starting Current @ H		1.85		1.9	1.96	3.98	4.04	4.16	
Hydraulic	Cooling Water Flow Rate	H	L/h	961	1047	1184	1716	1819	2008	
		M		875	875	961	1344	1344	1716	
		L		613	613	613	1126	1126	1126	
	Cooling Pressure Drop ^e	H	kPa	22	27.7	31	38	46	49	
		M		18	17.9	22	34	34	38	
		L		9	9.1	9	18	18	18	
	Heating Water Flow Rate @H/M/L		L/h	Same as "Cooling Water Flow Rate"						
	Heating Pressure Drop ^e	H	kPa	18	24	26	35	43	47	
M		15		15.2	18	31	31	35		
L		7		7	7	15	15	15		
Water Content		L	1.78			2.41				
Construction and Packing Data	Water Connections	Type	Socket (Threaded Female)							
		In Out	mm[in]							
	Condensate Drainage Connection		19.05[3/4]							
	Dimensions PCE(F)2	L	730			830				
		W	730			830				
		H	260			290				
Panel Dimensions		830 x 830 x 28			980 x 980 x 28					
Net Weight		Kg	36			50				

1."e" refers to technical information listed on the Eurovent website. Eurovent testing conditions:

a. Cooling mode (2-pipe):

- Return air temperature: 27C DB/ 19C WB.
- Inlet/outlet water temperature: 7C/ 12C.
- Water flow-rate: variable.

b. Heating mode (2-pipe):

- Return air temperature: 20C.
- Inlet water temperature: 50C.
- Water flow-rate: same as 2-pipe cooling.

A.1.2. 4-Pipe Systems

Product range: PCEF2 Standard/Flexi Hydronic Cassette



PCE(F)2-P- Hydronic Cassette 4-pipe 3-speed

			PCE(F)2-[Size]-P--3S	PCE2-06	PCE2-08	PCE2-09	PCE2-16	PCF2-12	PCF2-20		
Unit Configuration	Configuration			4-pipe							
	Number Of Fan Blowers			Single			Twin		Single		
	Power Supply		(V/Ph/H z)	230 / 1 / 50			220 / 1 / 60				
	Operation Control - PCE(F)2			~S: Complete function onboard PCB with integrated group control functionality, incl. 1 pc return air sensor and 2 pcs temperature sensors. ~W: Limited function onboard PCB with drain-pump, louver and zone control functionality, incl. 1 pc coil temperature sensors.							
Performance Data	Air	Total Air Flow ^e	H	m ³ /hr	722	810	1020	1450	1300	2250	
			M	522	617	540	1100	960	1970		
			L	450	450	360	780	700	1090		
	Cooling	Cooling Capacity ^e	H	kW	3.13	3.45	4.24	5.61	5.7	7.92	
			M		2.76	2.87	2.63	4.65	5.21	6.82	
			L		2.42	2.42	1.9	3.71	3.18	5.34	
		Sensible Cooling Capacity ^e	H	kW	2.7	2.88	3.73	4.5	4.46	6.57	
			M		2.43	2.55	2.34	3.94	4.2	5.97	
			L		2.18	2.18	1.68	3.25	2.76	4.94	
	FCEER ^e	Rating Class		86	77	40	60	60	37		
	Heating	Heating Capacity ^e	H	kW	3.84	4.25	7.32	8.37	5.03	9.65	
			M		3.48	3.68	4.85	7.38	4.63	8.63	
			L		3.27	3.27	3.91	6.21	3.42	7.56	
		Max. Electric Heater Capacity	Rating Class		2		3		4		
	FCCOP ^e	Rating Class		115	103	79	100	60	52		
	Sound	Sound Pressure Level (Outlet)		dB(A)		44 / 35 / 30	46 / 40 / 30	39 / 33 / 28	47 / 41 / 33	50 / 42 / 36	54 / 50 / 39
		Sound Power Level (Outlet) ^e		dB(A)		57 / 46 / 42	60 / 52 / 42	50 / 42 / 37	63 / 54 / 44	65 / 57 / 47	70 / 65 / 47
	Electrical	Fan Motor Power ^e	H	W	56	85	120	170	200	310	
			M		33	43	64	85	83	267	
			L		26	26	47	52	47	100	
		Fan Motor Running Current @ H		A		0.37	0.42	0.51	0.74	0.64	1.35
	Fan Motor Starting Current @ H		A		1.11	1.19	1.33	2.22	1.9	4.04	
	Hydraulic	Cooling Water Flow Rate	H	L/h	537	727	727	962	978	1360	
			M		473	451	451	798	894	1170	
L			415		326	326	636	545	916		
Cooling Pressure Drop ^e		H	kPa	20.8	22.6	28.1	25.9	40.3	40.2		
		M		14.7	17.6	16.2	18.5	34	30.8		
		L		14	14	13	12.5	14.2	19.8		
Heating Water Flow Rate		H	L/h	268	363	363	481	489	679		
		M		236	225	225	399	447	585		
		L		207	163	163	318	273	458		
Heating Pressure Drop ^e		H	kPa	10.4	12	22.1	28	15	26.6		
		M		7.2	8.9	12	22	11	21.8		
		L		5.9	5.9	8.9	15.2	6.7	17.2		
Water Content	Cooling Coil	L	1.07	1.07	1.359	1.913	1.37	1.665			
	Heating Coil		0.49	0.49	0.857	0.857	0.408	0.742			
Construction and Packing Data	Water Connections	Type		Socket (Threaded Female)							
		In	mm[in]	19.05[3/4]							
	Out	mm		570		1130		730	830		
	Dimensions PCE(F)2		W	570		580		730	830		
			H	290		250	290	260	290		
	Panel Dimensions		680 x 680 x 28		680 x 1240 x 28		830 x 830 x 28		980 x 980 x 28		
Net Weight		Kg		30	30	50	52	36	50		

1."e" refers to technical information listed on the Eurovent website. Eurovent testing conditions:

a. Cooling mode (4-pipe):

- Return air temperature: 27C DB/ 19C WB.
- Inlet/ outlet water temperature: 7C/ 12C.
- Water flow-rate: variable.

b. Heating mode (4-pipe):

- Return air temperature: 20C.
- Inlet/ outlet water temperature: 70C/ 60C.
- Water flow-rate: variable.

A.2. Coil Data

A.2.1. 2-Pipe Systems

Model	Fin Height (mm)	Fin Length (mm.)		Fins / inch	No. of rows	No. of circuits	Tube Diameter (inch)
		Inner	Outer				
PCE2-03-04-V	200	1196	1299	13	2	3	3/8"
PCE2-06-08-V	250	1196	1299	13	2	3	3/8"
PCE2-08R-V	250	1196	1299	13	3	5	0.276"
PCE2-09-V	200	2148	2286	13	2	4	3/8"
PCE2-12-16-V	250	2148	2286	13	2	5	3/8"
PCF2-09-10-12-V	225	1530	1634	13	2	4	3/8"
PCF2-16-V	250	1874	1979	13	2	6	3/8"
PCF2-18-20-V	250	1874	1979	13	2	6	3/8"

A.2.2. 4-Pipe Systems

Cooling Coil

Model	Fin Height (mm)	Fin Length (mm.)		Fins / inch	No. of rows	No. of circuits	Tube Diameter (inch)
		Inner	Outer				
PCE2-06-08-P	250	1196	1299	13	2	3	3/8"
PCE2-09-P	200	2148	2286	13	2	3	3/8"
PCE2-12-16-P	250	2148	2286	13	2	5	3/8"
PCF2-09-10-12-P	225	1530	1634	13	2	3	3/8"
PCF2-16-18-20-P	250	1874	1979	13	2	5	3/8"

Heating Coil

Model	Fin Height (mm)	Fin Length (mm.)		Fins / inch	No. of rows	No. of circuits	Tube Diameter (inch)
		Inner	Outer				
PCE2-06-08-P	250	1196	1299	13	1	3	3/8"
PCE2-09-P	200	2148	2286	13	1	3	3/8"
PCE2-12-16-P	250	2148	2286	13	1	3	3/8"
PCF2-09-10-12-P	225	1530	1634	13	1	2	3/8"
PCF2-16-18-20-P	250	1874	1979	13	1	3	3/8"

A.3. Performance Data

A.3.1. Cooling Capacity Table (2-Pipe Systems)

PCE2-03 and PCE2-04, for both 3 speed and 5 speed versions.

		TAI DB24°C -WB17.4°C						TAI DB27°C -WB19°C						TAI DB27°C -WB19.5°C						TAI DB28°C -WB21°C					
Twl	Qa	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw
°C	m3/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h
5	575	3.42	2.29	12.3	10.8	12.8	604	4.30	2.80	12.7	11.0	19.6	760	4.62	2.78	12.8	11.0	22.3	817	5.58	2.90	13.2	11.1	31.3	986
	380	2.45	1.81	10.8	10.6	8.2	433	3.00	2.16	10.9	10.8	9.5	530	3.00	2.02	10.8	10.8	9.8	530	3.95	2.25	11.5	10.9	16.6	698
	290	2.06	1.53	10.4	10.4	5.0	364	2.56	1.84	10.6	10.6	8.7	452	2.76	1.85	10.6	10.6	8.5	487	3.30	1.94	10.7	10.7	11.8	583
	240	1.81	1.34	10.1	10.0	4.2	318	2.10	1.53	10.4	10.4	6.4	371	2.21	1.58	10.4	10.4	7.0	390	2.70	1.65	10.5	10.5	9.2	477
	200	1.56	1.16	10.0	10.0	3.4	276	1.90	1.38	10.3	10.3	4.3	335	1.92	1.31	10.3	10.3	4.5	339	2.21	1.34	10.4	10.4	6.7	390
6	575	2.99	2.15	13.0	11.7	9.3	527	3.85	2.64	13.5	11.9	16.2	681	4.16	2.62	13.6	11.9	18.8	735	5.12	2.74	14.0	12.1	26.9	904
	380	2.11	1.67	11.7	11.6	4.4	373	2.69	2.03	11.9	11.8	8.3	475	2.83	1.97	11.8	11.7	9.0	499	3.60	2.13	12.3	11.9	14.2	636
	290	1.80	1.42	11.4	11.4	4.0	318	2.31	1.73	11.5	11.5	7.3	408	2.52	1.75	11.5	11.5	7.3	444	3.01	1.82	11.7	11.7	9.8	532
	240	1.55	1.20	11.0	10.9	3.3	272	1.90	1.44	11.3	11.3	5.4	336	2.01	1.46	11.3	11.3	4.9	355	2.47	1.55	11.5	11.5	8.7	437
	200	1.34	1.04	10.9	10.9	2.9	236	1.66	1.25	11.2	11.2	3.9	293	1.71	1.21	11.2	11.2	3.9	302	2.06	1.28	11.4	11.4	6.0	363
7	575	2.55	2.01	13.7	12.6	8.3	450	3.20	2.50	14.2	12.8	10.0	549	3.70	2.45	14.3	12.8	15.2	654	4.65	2.58	14.8	13.0	22.5	822
	380	1.77	1.52	12.6	12.5	3.9	313	2.37	1.89	12.8	12.7	7.3	407	2.65	1.92	12.8	12.6	8.1	468	3.24	2.00	13.0	12.8	11.7	573
	290	1.54	1.30	12.3	12.3	2.7	272	2.06	1.62	12.4	12.4	4.9	354	2.27	1.64	12.4	12.4	7.0	401	2.72	1.69	12.7	12.7	8.2	481
	240	1.28	1.05	11.8	11.8	2.3	226	1.70	1.35	12.1	12.1	3.8	292	1.81	1.33	12.1	12.1	4.5	320	2.24	1.44	12.4	12.4	7.2	396
	200	1.11	0.92	11.7	11.7	2.0	196	1.41	1.11	12.0	12.0	3.0	242	1.50	1.10	12.0	12.0	3.3	265	1.90	1.21	12.3	12.3	4.7	336
8	575	2.12	1.83	14.6	13.5	5.5	374	2.95	2.34	15.0	13.7	9.7	521	3.25	2.31	15.1	13.7	12.1	575	4.14	2.43	15.5	14.0	18.5	732
	380	1.48	1.34	14.0	13.4	3.3	261	2.07	1.78	13.6	13.6	5.2	366	2.33	1.80	13.7	13.5	7.5	411	2.89	1.88	13.9	13.8	10.3	511
	290	1.26	1.13	13.8	13.3	2.0	223	1.78	1.51	13.4	13.4	4.3	315	1.96	1.52	13.4	13.4	4.7	346	2.46	1.60	13.6	13.6	7.9	435
	240	1.09	0.97	13.6	13.0	1.7	193	1.54	1.33	13.2	13.2	3.2	272	1.62	1.32	13.2	13.2	3.6	286	1.94	1.45	13.4	13.4	4.7	342
	200	0.99	0.87	13.5	13.0	1.5	174	1.34	1.17	13.1	13.1	2.4	236	1.40	1.16	13.1	13.1	3.1	248	1.66	1.27	13.3	13.3	3.8	292
9	575	1.68	1.65	15.5	14.3	3.8	297	2.49	2.19	15.7	14.6	8.0	440	2.80	2.17	15.8	14.6	9.0	495	3.63	2.28	16.2	14.9	14.4	642
	380	1.18	1.15	15.3	14.2	1.7	208	1.77	1.67	14.4	14.4	3.9	313	2.00	1.67	14.5	14.4	4.9	354	2.54	1.75	14.7	14.7	7.5	449
	290	0.98	0.95	15.3	14.2	1.1	173	1.50	1.40	14.3	14.3	3.6	265	1.65	1.39	14.4	14.4	3.8	291	2.20	1.50	14.5	14.5	5.6	389
	240	0.90	0.89	15.3	14.2	1.0	159	1.38	1.31	14.2	14.2	3.0	243	1.43	1.30	14.2	14.2	3.4	252	1.64	1.45	14.3	14.3	3.6	287
	200	0.86	0.82	15.3	14.2	0.9	152	1.26	1.23	14.2	14.1	1.7	222	1.30	1.22	14.1	14.1	1.9	230	1.41	1.32	14.2	14.2	2.3	248
Pf: total cooling capacity Tal: in flow air temperature dPw: pressure drop standard coil Twl: entering water temperature, water temperature arise 5°C.																									
Qw: fluid flow rate in heat exchanger Qa: air flow Pfs: sensible cooling capacity Tad: discharge air temperature (DB) Taw: discharge air temperature (WB)																									

PCE2-06 and PCE2-08, for both 3 speed and 5 speed versions.

		TAI DB24°C -WB17.4°C						TAI DB27°C -WB19°C						TAI DB27°C -WB19.5°C						TAI DB28°C -WB21°C					
Twi	Qa	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw
°C	m3/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h
5	810	4.73	3.12	12.8	11.0	38.3	836	6.00	3.77	13.5	11.2	55.0	1060	6.38	3.73	13.6	11.3	61.6	1127	7.74	3.90	14.0	11.4	88.0	1368
	722	4.21	2.90	12.3	11.0	29.2	744	5.40	3.51	12.9	11.1	45.7	954	5.73	3.47	13.0	11.2	50.9	1013	6.93	3.61	13.4	11.3	71.5	1225
	617	3.66	2.62	11.7	10.9	25.1	647	4.64	3.15	12.1	11.0	40.5	820	4.96	3.14	12.2	11.1	39.3	877	5.98	3.26	12.6	11.2	54.7	1057
	520	3.15	2.35	11.0	10.8	17.4	557	4.00	2.83	11.3	10.9	28.8	707	4.24	2.81	11.4	11.0	29.4	750	5.00	2.92	11.4	11.1	39.9	884
	450	2.85	2.06	10.9	10.5	14.5	503	3.52	2.44	11.3	10.7	23.4	622	3.75	2.43	11.4	10.8	15.6	663	4.50	2.54	11.7	10.9	37.9	795
6	810	4.12	2.91	13.6	11.9	30.6	727	5.37	3.57	14.2	12.1	45.5	948	5.74	3.52	14.3	12.2	51.4	1013	7.09	3.69	14.7	12.3	75.5	1252
	722	3.69	2.71	13.1	11.9	25.8	652	4.83	3.32	13.6	12.0	43.5	854	5.17	3.28	13.8	12.1	42.5	913	6.33	3.42	14.2	12.3	61.2	1119
	617	3.21	2.45	12.5	11.8	18.3	568	4.15	2.98	12.9	12.0	26.3	733	4.48	2.97	13.0	12.0	33.0	792	5.47	3.08	13.5	12.2	46.8	967
	520	2.75	2.19	11.9	11.7	13.8	486	3.57	2.68	12.1	11.9	23.8	630	3.82	2.66	12.3	12.0	24.6	676	4.58	2.76	12.3	12.1	40.1	810
	450	2.49	1.92	11.8	11.5	7.7	439	3.18	2.31	12.1	11.6	17.4	561	3.40	2.30	12.1	11.7	13.2	602	4.13	2.40	12.1	11.9	29.8	730
7	810	3.50	2.70	14.3	12.8	20.9	619	4.56	3.17	14.9	13.0	36.8	783	5.09	3.31	15.0	13.1	41.3	899	6.43	3.48	15.4	13.2	63.0	1136
	722	3.17	2.52	13.8	12.7	17.6	560	4.08	3.00	14.3	12.9	28.0	700	4.60	3.08	14.5	13.0	34.1	813	5.73	3.22	14.9	13.2	50.9	1013
	617	2.76	2.28	13.2	12.6	13.8	488	3.76	2.85	13.7	12.9	25.0	645	4.00	2.80	13.8	12.9	26.7	707	4.96	2.89	14.3	13.1	43.5	877
	520	2.35	2.03	12.7	12.6	9.3	415	3.10	2.45	12.9	12.8	16.0	532	3.40	2.50	13.1	12.9	19.8	601	4.16	2.59	13.2	13.0	30.6	735
	450	2.12	1.77	12.7	12.4	5.6	374	2.70	2.15	12.9	12.5	10.0	463	3.05	2.16	13.1	12.6	10.8	540	3.76	2.26	13.2	12.8	25.9	665
8	810	2.95	2.51	15.0	13.6	15.7	520	4.06	3.17	15.6	13.9	30.3	717	4.42	3.13	15.7	14.0	32.6	781	5.72	3.28	16.1	14.2	51.4	1010
	722	2.66	2.31	14.7	13.5	10.5	469	3.67	2.94	15.1	13.8	25.2	648	4.01	2.90	15.2	13.9	27.1	708	5.13	3.03	15.7	14.1	41.9	906
	617	2.29	2.03	14.4	13.5	9.9	405	3.14	2.65	14.5	13.8	17.5	555	3.49	2.63	14.6	13.8	21.2	616	4.44	2.73	15.0	14.0	32.5	785
	520	1.95	1.76	14.2	13.5	7.2	344	2.71	2.37	13.8	13.7	13.4	478	2.96	2.35	13.9	13.8	15.7	523	3.73	2.45	14.0	13.9	26.7	659
	450	1.75	1.56	14.0	13.3	4.0	309	2.44	2.05	13.7	13.5	7.4	431	2.66	2.03	13.9	13.6	8.6	471	3.38	2.13	14.0	13.7	21.4	597
9	810	2.39	2.31	15.6	14.3	9.6	422	3.38	2.97	16.2	14.8	19.8	597	3.75	2.94	16.3	14.9	23.9	663	5.00	3.07	16.8	15.1	39.9	884
	722	2.14	2.10	15.5	14.3	8.5	378	3.07	2.74	15.8	14.7	16.5	542	3.41	2.72	15.9	14.8	20.1	603	4.52	2.84	16.4	15.0	37.9	799
	617	1.82	1.78	15.5	14.3	6.1	322	2.63	2.48	15.2	14.7	11.4	465	2.97	2.45	15.3	14.7	15.7	525	3.92	2.57	15.7	14.9	26.5	693
	520	1.54	1.49	15.6	14.3	4.1	272	2.28	2.21	14.6	14.6	9.6	403	2.52	2.20	14.7	14.7	11.6	445	3.30	2.30	14.8	14.8	19.0	583
	450	1.38	1.34	15.3	14.2	2.3	244	2.05	1.92	14.5	14.4	5.3	362	2.27	1.90	14.7	14.5	6.4	401	3.00	2.00	14.8	14.6	16.1	530
Pf: total cooling capacity Tal: in flow air temperature dPw: pressure drop standard coil Twi: entering water temperature, water temperature arise 5°C.																									
Qw: fluid flow rate in heat exchanger Qa: air flow Pfs: sensible cooling capacity Tad: discharge air temperature (DB) Taw: discharge air temperature (WB)																									

PCE2-08R, for both 3 speed and 5 speed versions.

		TAI DB24°C-WB17.4°C						TAI DB27°C-WB19°C						TAI DB27°C-WB19.5°C						TAI DB28°C-WB21°C					
Twi	Qa	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw
°C	m3/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h
5	810	4.86	3.27	11.4	10.2	41.2	832	5.80	3.85	12.0	10.6	55.9	994	6.12	3.86	12.0	10.7	61.4	1051	7.10	4.05	12.2	11.2	79.4	1217
	722	4.43	2.98	11.1	10.0	35.1	760	5.28	3.50	11.7	10.4	47.6	907	5.57	3.51	11.7	10.5	52.2	958	6.46	3.69	11.9	11.0	67.4	1109
	617	3.87	2.60	10.8	9.7	27.8	662	4.61	3.05	11.3	10.1	37.6	792	4.86	3.06	11.3	10.2	41.2	835	5.63	3.21	11.5	10.7	53.1	965
	520	3.36	2.25	10.4	9.5	21.9	576	4.01	2.65	10.9	9.8	29.6	688	4.22	2.65	10.9	9.9	32.4	724	4.89	2.79	11.0	10.3	41.6	839
	450	2.99	2.00	10.1	9.3	17.9	515	3.56	2.35	10.5	9.6	24.1	612	3.75	2.35	10.5	9.7	26.4	644	4.34	2.47	10.7	10.0	33.9	745
6	810	4.41	3.07	12.2	10.9	34.9	756	5.37	3.65	12.8	11.3	49.0	920	5.69	3.66	12.8	11.5	53.9	976	6.67	3.85	13.0	11.9	71.0	1143
	722	4.03	2.79	11.9	10.8	29.8	689	4.89	3.32	12.5	11.2	41.5	839	5.18	3.33	12.5	11.3	45.9	889	6.07	3.51	12.7	11.7	60.3	1042
	617	3.52	2.44	11.6	10.5	23.6	603	4.27	2.89	12.1	10.9	32.9	733	4.52	2.90	12.1	11.0	36.3	776	5.29	3.06	12.3	11.4	47.6	907
	520	3.06	2.11	11.3	10.3	18.7	524	3.71	2.51	11.7	10.6	25.9	637	3.93	2.52	11.7	10.7	28.5	673	4.60	2.65	11.9	11.1	37.3	788
	450	2.72	1.88	11.0	10.1	15.3	468	3.30	2.23	11.4	10.4	21.1	567	3.49	2.23	11.4	10.5	23.3	599	4.08	2.35	11.6	10.8	30.4	700
7	810	3.96	2.86	12.9	11.6	28.6	680	4.93	3.45	13.5	12.0	42.0	846	5.25	3.45	13.5	12.2	46.4	900	6.24	3.65	13.7	12.6	62.5	1069
	722	3.62	2.60	12.7	11.5	24.4	619	4.49	3.14	13.3	11.9	35.0	770	4.78	3.14	13.3	12.0	39.5	821	5.68	3.32	13.5	12.4	53.2	976
	617	3.16	2.27	12.4	11.3	19.4	544	3.92	2.73	12.9	11.6	28.0	673	4.18	2.74	12.9	11.7	31.3	716	4.95	2.90	13.1	12.1	42.0	850
	520	2.76	1.97	12.1	11.1	15.4	472	3.41	2.37	12.5	11.4	22.0	586	3.63	2.38	12.5	11.5	24.6	623	4.31	2.51	12.7	11.8	33.0	738
	450	2.45	1.75	11.8	10.9	12.6	421	3.03	2.10	12.2	11.2	18.0	522	3.23	2.11	12.2	11.3	20.1	554	3.82	2.23	12.4	11.6	26.9	655
8	810	3.47	2.65	13.8	12.4	22.9	596	4.45	3.25	14.4	12.8	35.2	763	4.78	3.25	14.3	12.9	39.4	819	5.77	3.45	14.5	13.3	54.6	990
	722	3.17	2.41	13.6	12.3	19.6	542	4.06	2.95	14.1	12.7	29.8	696	4.35	2.96	14.1	12.8	33.6	747	5.26	3.14	14.3	13.2	46.5	904
	617	2.77	2.10	13.3	12.1	15.6	477	3.55	2.57	13.8	12.4	23.7	608	3.81	2.58	13.8	12.5	26.7	653	4.59	2.74	13.9	12.9	36.7	787
	520	2.42	1.83	13.0	12.0	12.4	415	3.09	2.23	13.4	12.2	18.7	531	3.31	2.24	13.4	12.3	21.0	569	3.99	2.38	13.6	12.6	28.9	684
	450	2.16	1.62	12.7	11.8	10.2	370	2.75	1.98	13.1	12.0	15.3	472	2.95	1.99	13.1	12.1	17.2	506	3.55	2.11	13.3	12.4	23.6	608
9	810	2.97	2.44	14.6	13.2	17.2	511	3.97	3.04	15.2	13.5	28.3	680	4.30	3.04	15.1	13.6	32.4	738	5.30	3.25	15.3	14.0	46.6	911
	722	2.71	2.22	14.4	13.1	14.7	464	3.62	2.76	14.9	13.4	24.2	623	3.92	2.77	14.9	13.5	27.7	673	4.83	2.96	15.1	13.9	39.7	832
	617	2.38	1.93	14.1	12.9	11.8	410	3.17	2.41	14.6	13.2	19.2	544	3.43	2.41	14.6	13.3	22.0	590	4.22	2.58	14.7	13.6	31.4	724
	520	2.08	1.68	13.9	12.8	9.4	357	2.76	2.09	14.3	13.0	15.2	475	2.99	2.10	14.2	13.1	17.4	515	3.67	2.24	14.4	13.4	24.7	630
	450	1.86	1.49	13.6	12.6	7.7	319	2.46	1.86	14.0	12.8	12.5	421	2.66	1.86	14.0	12.9	14.3	457	3.27	1.99	14.1	13.2	20.2	562
Pf: total cooling capacity Tal: in flow air temperature dPw: pressure drop standard coil Twi: entering water temperature, water temperature arise 5°C.																									
Qw: fluid flow rate in heat exchanger Qa: air flow Pfs: sensible cooling capacity Tad: discharge air temperature (DB) Taw: discharge air temperature (WB)																									

PCE2-09, for both 3 speed and 5 speed versions.

		TAI DB24°C -WB17.4°C						TAI DB27°C -WB19°C						TAI DB27°C -WB19.5°C						TAI DB28°C -WB21°C					
Twi	Qa	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw
°C	m3/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h
5	1020	5.71	4.18	12.1	11.3	27.5	981	7.28	5.05	12.6	11.5	43.7	1250	7.86	5.02	12.7	11.5	50.4	1350	9.56	5.22	13.1	11.6	71.7	1643
	767	4.43	3.42	11.1	11.1	17.2	761	5.61	4.15	11.3	11.3	27.2	963	6.04	4.15	11.3	11.3	31.3	1037	7.34	4.34	11.6	11.4	44.5	1261
	540	3.35	2.59	10.8	10.8	10.7	575	4.10	3.07	11.0	11.0	16.8	704	4.40	3.08	11.0	11.0	17.3	756	5.30	3.27	11.0	11.0	26.0	911
	450	2.78	2.13	10.6	10.6	8.1	477	3.50	2.60	10.8	10.8	13.6	601	3.76	2.61	10.8	10.8	14.1	646	4.50	2.76	10.8	10.8	18.6	773
	360	2.30	1.74	10.4	10.4	5.8	396	2.84	2.09	10.6	10.6	9.2	488	3.04	2.10	10.6	10.6	11.0	522	3.70	2.26	10.6	10.6	13.7	636
6	1020	4.93	3.92	12.9	12.2	21.6	847	6.54	4.79	13.4	12.4	36.5	1124	7.10	4.75	13.5	12.4	42.4	1220	8.75	4.95	13.9	12.5	61.6	1503
	767	3.80	3.16	12.1	12.1	13.2	653	5.04	3.91	12.2	12.2	22.6	865	5.44	3.90	12.2	12.2	26.2	933	6.73	4.11	12.5	12.3	38.3	1157
	540	3.03	2.43	11.4	11.4	9.1	520	3.86	2.96	11.5	11.5	15.6	663	4.15	2.96	11.5	11.5	16.3	713	5.10	3.19	11.5	11.5	25.3	877
	450	2.55	2.02	11.2	11.2	6.9	437	3.31	2.52	11.3	11.3	12.0	569	3.57	2.52	11.3	11.3	13.4	612	4.34	2.69	11.3	11.3	17.7	745
	360	2.08	1.64	11.1	11.1	5.0	358	2.66	2.01	11.2	11.2	7.9	457	2.85	2.01	11.2	11.2	9.0	489	3.51	2.18	11.2	11.2	12.5	604
7	1020	4.14	3.65	13.6	13.1	15.6	712	6.12	4.53	14.1	13.2	33.0	995	6.34	4.47	14.2	13.2	34.3	1089	7.93	4.67	14.6	13.4	51.4	1362
	767	3.17	2.90	13.0	13.0	9.1	544	4.84	3.67	13.0	13.0	18.0	765	4.83	3.65	13.1	13.1	21.0	829	6.12	3.87	13.3	13.2	32.1	1052
	540	2.70	2.27	12.0	12.0	7.5	464	3.62	2.85	12.0	12.0	14.0	621	3.90	2.84	12.0	12.0	15.3	670	4.90	3.10	12.0	12.0	24.6	842
	450	2.31	1.91	11.8	11.8	5.8	397	3.12	2.43	11.8	11.8	10.0	535	3.37	2.43	11.8	11.8	12.6	578	4.17	2.62	11.8	11.8	16.8	716
	360	1.86	1.54	11.8	11.8	4.1	320	2.48	1.93	11.8	11.8	6.5	426	2.65	1.91	11.8	11.8	7.0	455	3.32	2.09	11.8	11.8	11.2	571
8	1020	3.44	3.16	15.0	13.9	11.1	590	4.89	4.23	14.9	14.2	21.9	840	5.44	4.20	15.0	14.2	26.5	934	7.03	4.40	15.4	14.4	41.9	1207
	767	2.68	2.52	14.4	13.7	6.7	461	3.76	3.34	14.3	14.0	13.1	645	4.16	3.39	14.1	14.1	16.1	713	5.43	3.62	14.2	14.2	26.1	933
	540	2.27	2.05	13.1	12.9	5.6	389	3.19	2.67	12.9	12.9	11.2	547	3.47	2.66	12.9	12.9	12.6	596	4.45	2.90	12.9	12.9	20.8	765
	450	1.92	1.72	13.0	12.8	4.1	330	2.71	2.25	12.8	12.8	7.9	466	2.95	2.25	12.8	12.8	9.6	506	3.76	2.45	12.8	12.8	14.7	645
	360	1.55	1.38	13.0	12.8	3.0	265	2.15	1.79	12.8	12.8	5.0	369	2.34	1.78	12.8	12.8	5.7	402	2.99	1.95	12.8	12.8	9.2	513
9	1020	2.73	2.67	16.3	14.6	6.6	469	3.97	3.92	15.7	15.1	14.5	682	4.54	3.92	15.7	15.1	18.7	780	6.13	4.13	16.1	15.3	32.3	1053
	767	2.19	2.14	15.8	14.4	4.3	376	3.05	3.00	15.5	15.0	8.3	524	3.48	3.13	15.0	15.0	11.2	598	4.74	3.36	15.1	15.1	20.0	814
	540	1.83	1.82	14.2	13.8	3.7	314	2.76	2.48	13.8	13.8	8.1	473	3.04	2.48	13.8	13.8	9.9	522	4.00	2.70	13.8	13.8	16.9	687
	450	1.53	1.52	14.2	13.8	2.4	262	2.30	2.07	13.8	13.8	5.5	395	2.53	2.06	13.8	13.8	6.5	434	3.34	2.27	13.8	13.8	12.5	573
	360	1.23	1.22	14.2	13.8	1.9	211	1.82	1.64	13.8	13.8	3.5	312	2.03	1.65	13.8	13.8	4.4	349	2.65	1.80	13.8	13.8	7.1	455
Pf: total cooling capacity Tal: in flow air temperature dPw: pressure drop standard coil Twi: entering water temperature, water temperature arise 5°C.																									
Qw: fluid flow rate in heat exchanger Qa: air flow Pfs: sensible cooling capacity Tad: discharge air temperature (DB) Taw: discharge air temperature (WB)																									

PCE2-16, for both 3 speed and 5 speed versions.

		TAI DB24°C-WB17.4°C						TAI DB27°C-WB19°C						TAI DB27°C-WB19.5°C						TAI DB28°C-WB21°C					
Twi	Qa	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw
°C	m3/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h
5	1450	8.68	6.69	12.9	11.6	39.6	1534	11.20	8.13	13.5	11.8	50.4	1900	12.10	8.08	13.6	11.8	58.7	2139	14.80	8.36	14.1	11.9	84.0	2612
	1280	7.68	5.86	12.5	11.3	27.1	1357	9.79	7.13	13.0	11.5	42.0	1667	10.60	7.08	13.1	11.5	48.6	1868	12.90	7.33	13.6	11.6	68.7	2273
	1100	6.68	5.28	11.9	11.2	21.0	1180	8.45	6.44	12.2	11.4	32.2	1439	9.10	6.38	12.3	11.4	42.5	1608	11.00	6.63	12.7	11.5	52.2	1951
	910	5.44	4.53	11.1	11.1	14.2	961	6.92	5.53	11.3	11.3	22.0	1178	7.43	5.51	11.3	11.3	25.2	1313	9.03	5.84	11.4	11.4	46.5	1596
	780	4.75	3.66	10.9	11.0	13.0	839	6.12	4.44	11.1	11.1	18.0	1043	6.58	4.41	11.1	11.0	20.0	1163	7.90	4.60	11.3	11.3	35.3	1396
6	1450	7.34	6.26	13.6	12.6	24.3	1296	9.87	7.69	14.2	12.7	40.9	1680	10.80	7.63	14.3	12.7	48.3	1903	13.40	7.93	14.8	12.9	71.1	2371
	1280	6.68	5.49	13.2	12.2	21.4	1180	8.78	6.74	13.8	12.4	39.9	1494	9.49	6.68	13.9	12.4	46.7	1676	11.70	6.93	14.4	12.6	58.4	2069
	1100	5.76	4.94	12.7	12.1	16.4	1018	7.53	6.07	13.0	12.3	26.4	1281	8.06	5.99	13.0	12.3	33.0	1424	10.10	6.28	13.5	12.5	44.5	1780
	910	4.67	4.19	12.1	12.1	10.9	825	6.16	5.19	12.2	12.2	18.0	1049	6.68	5.18	12.2	12.2	20.9	1181	8.24	5.49	12.4	12.4	38.0	1457
	780	4.11	3.41	11.9	11.9	8.0	725	5.46	4.20	12.0	12.0	14.0	930	5.89	4.17	12.2	12.2	15.0	1041	7.23	4.35	12.2	12.2	23.0	1277
7	1450	5.99	5.82	14.3	13.5	16.4	1058	8.50	6.68	14.9	13.6	38.0	1459	9.49	7.18	15.0	13.6	43.8	1667	12.10	7.49	15.5	13.8	58.2	2130
	1280	5.67	5.12	13.9	13.0	15.7	1002	7.70	6.08	14.5	13.2	28.0	1322	8.40	6.28	14.6	13.3	38.9	1484	10.60	6.53	15.1	13.5	48.0	1865
	1100	4.84	4.60	13.4	13.0	11.8	855	6.60	5.70	13.8	13.2	20.0	1133	7.01	5.59	13.6	13.2	23.0	1239	9.10	5.92	14.3	13.4	39.8	1608
	910	3.90	3.84	13.0	13.0	7.6	689	5.40	4.84	13.1	13.1	15.0	927	5.93	4.84	13.1	13.1	16.6	1048	7.45	5.14	13.3	13.3	28.9	1317
	780	3.46	3.16	13.0	13.0	5.0	611	4.60	4.10	13.1	13.1	10.0	790	5.20	3.93	13.1	13.1	12.0	919	6.55	4.10	13.3	13.3	20.0	1157
8	1450	5.25	5.11	15.2	14.0	13.2	927	7.29	6.54	15.7	14.5	23.9	1196	8.13	6.75	15.7	14.5	37.5	1431	10.60	7.05	16.2	14.8	46.6	1869
	1280	4.74	4.43	15.0	13.8	11.5	837	6.62	5.97	15.2	14.1	21.2	1085	7.26	5.92	15.3	14.2	25.0	1282	9.32	6.16	15.8	14.5	41.5	1648
	1100	4.04	3.89	14.7	13.8	8.5	714	5.63	5.12	14.7	14.1	15.6	924	6.16	5.29	14.5	14.1	18.5	1089	8.07	5.59	15.1	14.4	36.4	1425
	910	3.26	3.20	14.5	13.8	5.4	575	4.58	4.25	14.4	14.1	10.3	751	5.11	4.50	14.1	14.1	12.8	902	6.60	4.79	14.3	14.3	20.5	1166
	780	2.89	2.72	14.5	13.8	3.0	510	4.07	3.61	14.4	14.1	8.0	667	4.50	3.68	14.1	14.1	10.0	796	5.83	3.86	14.3	14.3	17.0	1029
9	1450	4.50	4.40	16.0	14.5	9.9	795	6.00	5.83	16.4	15.3	16.3	984	6.76	6.31	16.4	15.4	20.5	1195	9.10	6.60	16.9	15.7	41.4	1608
	1280	3.80	3.73	16.0	14.5	7.3	671	5.47	5.60	15.9	15.0	14.7	897	6.11	5.55	16.0	15.1	18.0	1080	8.09	5.78	16.5	15.4	36.5	1430
	1100	3.24	3.18	16.0	14.5	5.2	572	4.66	4.53	15.6	15.0	10.6	764	5.31	4.98	15.4	15.0	14.0	938	7.03	5.25	15.8	15.3	23.2	1242
	910	2.61	2.56	16.0	14.5	3.2	461	3.75	3.65	15.6	15.0	6.6	615	4.28	4.16	15.0	15.0	9.0	756	5.74	4.43	15.2	15.2	15.5	1014
	780	2.31	2.27	16.0	14.5	1.6	408	3.33	3.27	15.5	15.0	4.6	546	3.80	3.42	15.0	15.0	7.0	672	5.10	3.62	15.2	15.2	11.3	901
Pf: total cooling capacity Tal: in flow air temperature dPw: pressure drop standard coil Twi: entering water temperature, water temperature arise 5°C.																									
Qw: fluid flow rate in heat exchanger Qa: air flow Pfs: sensible cooling capacity Tad: discharge air temperature (DB) Taw: discharge air temperature (WB)																									

PCF2-12, for both 3 speed and 5 speed versions.

		TAI DB24°C -WB17.4°C						TAI DB27°C -WB19°C						TAI DB27°C -WB19.5°C						TAI DB28°C -WB21°C					
Twi	Qa	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw
°C	m3/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h
5	1300	7.00	4.65	13.3	10.7	32.1	1202	8.83	5.63	14.1	10.9	48.6	1513	9.37	5.58	14.2	11.0	54.3	1606	11.40	5.80	14.7	11.0	77.3	1952
	1050	6.50	4.39	12.9	10.6	27.8	1108	8.10	5.30	13.6	10.8	41.4	1384	8.57	5.25	13.7	10.9	46.2	1470	10.30	5.45	14.2	11.0	64.6	1770
	960	5.91	4.13	12.6	10.6	23.6	1015	7.37	4.98	13.2	10.8	35.0	1263	7.87	4.96	13.2	10.8	39.7	1349	9.47	5.14	13.7	10.9	55.2	1624
	820	5.10	3.70	11.8	10.5	17.5	858	6.21	4.46	12.2	10.7	25.8	1065	6.68	4.44	12.3	10.7	29.6	1145	8.00	4.61	12.7	10.8	40.9	1373
	700	3.63	2.75	10.8	10.8	9.2	623	4.60	3.36	10.9	10.9	14.2	789	4.95	3.36	11.0	11.0	16.4	849	5.94	3.53	11.1	11.1	22.9	1019
6	1300	6.15	4.37	14.0	11.6	25.8	1054	7.88	5.33	14.8	11.9	40.1	1351	8.41	5.28	14.9	12.0	45.0	1443	10.40	5.50	15.4	12.0	66.4	1788
	1050	5.64	4.11	13.6	11.6	22.0	964	7.24	5.03	14.3	11.8	34.3	1239	7.73	4.97	14.4	11.9	38.6	1325	9.46	5.16	14.9	12.0	55.5	1624
	960	5.18	3.86	13.3	11.5	18.9	889	6.64	4.72	13.9	11.7	29.3	1140	7.10	4.68	14.0	11.8	33.2	1216	8.69	4.88	14.4	11.9	47.6	1490
	820	4.45	3.46	12.6	11.4	14.1	754	5.61	4.22	13.0	11.6	21.7	961	6.03	4.19	13.1	11.7	24.7	1033	7.35	4.37	13.5	11.8	35.3	1260
	700	3.17	2.56	11.7	11.7	7.3	543	4.11	3.16	11.9	11.9	11.7	705	4.48	3.16	11.9	11.9	13.8	767	5.47	3.34	12.0	12.0	19.9	938
7	1300	5.29	4.09	14.6	12.5	19.4	906	6.90	5.06	15.4	12.8	31.0	1184	7.45	4.97	15.5	12.9	35.8	1279	9.46	5.20	16.0	12.9	55.4	1623
	1050	4.78	3.82	14.3	12.5	16.1	821	6.10	4.89	14.9	12.7	28.0	1047	6.88	4.68	15.1	12.8	31.0	1180	8.61	4.87	15.6	12.9	46.5	1476
	960	4.44	3.59	14.0	12.4	14.1	761	5.60	4.37	14.6	12.6	22.0	961	6.32	4.40	14.7	12.7	26.6	1083	7.91	4.61	15.1	12.8	40.0	1356
	820	3.79	3.22	13.3	12.3	10.7	649	5.10	3.85	13.8	12.5	18.0	857	5.37	3.93	13.9	12.6	19.8	921	6.69	4.13	14.2	12.7	29.7	1147
	700	2.70	2.36	12.6	12.6	5.4	463	3.57	2.96	12.8	12.8	9.0	613	4.00	2.96	12.8	12.8	11.1	686	5.00	3.14	12.9	12.9	16.8	857
8	1300	4.53	3.80	15.3	13.4	14.2	776	6.24	4.74	16.1	13.7	24.6	1070	6.85	4.69	16.2	13.8	29.0	1176	8.84	4.91	16.7	13.9	45.9	1516
	1050	4.09	3.56	15.0	13.4	11.8	702	5.75	4.47	15.6	13.6	21.3	986	6.33	4.42	15.8	13.7	25.2	1084	8.09	4.61	16.3	13.8	38.9	1386
	960	3.82	3.35	14.7	13.3	10.4	655	5.33	4.19	15.3	13.5	18.5	916	5.79	4.15	15.4	13.6	21.4	993	7.44	4.33	15.9	13.7	33.4	1276
	820	3.27	2.96	14.2	13.2	7.8	561	4.53	3.75	14.5	13.4	13.9	777	4.93	3.70	14.7	13.5	16.0	845	6.30	3.88	15.0	13.6	24.8	1080
	700	2.19	2.00	14.3	13.6	3.8	374	3.14	2.77	13.7	13.7	7.1	537	3.46	2.75	13.8	13.8	8.6	594	4.45	2.93	13.9	13.9	13.7	763
9	1300	3.76	3.51	15.9	14.3	8.8	645	5.54	4.44	16.7	14.6	17.7	950	6.25	4.40	16.8	14.6	22.1	1071	8.22	4.61	17.3	14.8	36.3	1409
	1050	3.40	3.30	15.6	14.3	7.3	583	5.12	4.18	16.3	14.5	15.4	878	5.77	4.15	16.4	14.5	19.2	989	7.56	4.34	16.9	14.7	31.2	1296
	960	3.20	3.11	15.3	14.2	6.7	548	4.76	3.92	16.0	14.4	13.4	816	5.26	3.89	16.1	14.5	16.1	902	6.97	4.05	16.6	14.6	26.8	1195
	820	2.75	2.69	15.0	14.1	4.9	471	4.06	3.52	15.2	14.3	10.2	695	4.48	3.46	15.4	14.4	12.1	768	5.91	3.63	15.8	14.5	20.0	1013
	700	1.67	1.64	16.0	14.5	2.2	286	2.65	2.57	14.6	14.6	5.1	454	2.92	2.53	14.7	14.7	6.1	501	3.90	2.71	14.8	14.8	10.5	668
Pf: total cooling capacity Tal: in flow air temperature dPw: pressure drop standard coil Twi: entering water temperature, water temperature arise 5°C.																									
Qw: fluid flow rate in heat exchanger Qa: air flow Pfs: sensible cooling capacity Tad: discharge air temperature (DB) Taw: discharge air temperature (WB)																									

PCF2-20, for both 3 speed and 5 speed versions.

		TAI DB24°C -WB17.4°C						TAI DB27°C -WB19°C						TAI DB27°C -WB19.5°C						TAI DB28°C -WB21°C					
Twi	Qa	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw
°C	m3/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h
5	2250	11.80	8.19	12.9	11.4	47.8	2028	15.10	9.94	13.5	11.6	74.4	2589	16.30	9.78	13.7	11.6	85.2	2795	19.90	10.20	14.2	11.7	122.0	3411
	2130	10.60	7.51	12.3	11.2	45.7	1818	13.50	9.10	12.8	11.4	70.1	2306	14.50	8.97	13.0	11.4	80.0	2486	17.60	9.30	13.5	11.5	113.0	3018
	1950	10.10	7.39	12.1	11.3	36.2	1731	12.80	8.91	12.6	11.5	55.5	2200	13.90	8.78	12.8	11.5	63.5	2375	16.90	9.17	13.2	11.6	91.3	2897
	1640	8.93	6.69	11.6	11.2	25.4	1423	11.37	8.12	11.9	11.4	43.0	1814	12.30	8.03	12.1	11.4	45.1	1957	14.90	8.37	12.4	11.5	64.4	2377
	1380	7.75	5.98	11.1	11.1	14.6	1115	9.93	7.32	11.2	11.2	35.8	1428	10.70	7.28	11.3	11.2	31.8	1540	12.90	7.57	11.6	11.3	43.5	1857
6	2250	10.20	7.70	13.6	12.3	37.2	1743	13.40	9.40	14.2	12.5	60.8	2300	14.60	9.27	14.4	12.5	70.6	2503	18.10	9.64	14.9	12.7	103.7	3103
	2130	9.15	7.04	13.0	12.1	35.7	1569	12.00	8.61	13.6	12.3	49.6	2057	13.00	8.48	13.7	12.3	66.6	2229	16.10	8.79	14.3	12.5	96.3	2752
	1950	8.69	6.90	12.9	12.2	28.0	1490	11.40	8.43	13.4	12.4	45.4	1957	12.40	8.32	13.5	12.4	52.9	2130	15.40	8.67	14.0	12.6	77.3	2632
	1640	7.70	6.23	12.5	12.1	19.7	1227	10.14	7.66	12.8	12.3	36.2	1764	11.00	7.58	12.9	12.3	37.4	1755	13.55	7.92	13.3	12.5	54.5	2160
	1380	6.71	5.55	12.0	12.0	11.4	965	8.88	6.89	12.1	12.1	33.0	1570	9.59	6.84	12.2	12.2	32.0	1379	11.70	7.16	12.5	12.3	34.7	1688
7	2250	8.50	7.20	14.2	13.2	26.6	1457	11.50	8.21	14.9	13.4	49.0	2008	12.90	8.76	15.0	13.4	56.0	2210	16.30	9.08	15.6	13.6	85.3	2795
	2130	7.70	6.57	13.7	13.0	25.7	1320	10.90	7.87	14.3	13.2	46.0	1819	11.50	7.98	14.4	13.2	44.2	1971	14.50	8.28	15.0	13.4	79.6	2486
	1950	7.28	6.41	13.6	13.1	19.9	1247	10.20	7.37	14.1	13.3	38.0	1716	11.00	7.86	14.2	13.3	43.5	1886	13.80	8.16	14.7	13.5	63.2	2366
	1640	6.48	5.76	13.3	13.0	14.0	1031	8.90	6.35	13.6	13.2	34.0	1344	9.74	7.13	13.7	13.2	33.5	1552	12.20	7.46	14.0	13.4	45.6	1942
	1380	5.67	5.11	12.9	12.9	8.2	815	7.69	5.52	13.0	13.0	18.0	1126	8.47	6.40	13.1	13.1	17.2	1218	10.60	6.75	13.3	13.3	34.2	1518
8	2250	6.92	6.22	15.5	14.0	18.2	1186	9.94	8.41	15.5	14.3	35.9	1704	11.10	8.28	15.7	14.3	43.7	1905	14.40	8.57	16.3	14.6	68.8	2462
	2130	6.35	5.72	15.0	13.8	16.0	1088	8.99	7.64	15.0	14.1	33.6	1541	9.98	7.53	15.1	14.1	36.1	1710	12.80	7.81	15.7	14.4	64.5	2199
	1950	5.97	5.47	15.1	13.9	12.1	1022	8.50	7.43	14.9	14.2	26.8	1457	9.50	7.42	14.9	14.2	34.6	1629	12.20	7.72	15.4	14.5	51.3	2091
	1640	5.30	4.89	14.9	13.9	8.8	844	7.61	6.70	14.5	14.1	19.1	1211	8.43	6.70	14.5	14.1	31.0	1343	10.82	7.03	14.8	14.4	36.3	1724
	1380	4.63	4.31	14.6	13.8	5.6	666	6.72	5.97	14.0	13.9	11.4	966	7.36	5.97	14.0	14.0	13.5	1058	9.43	6.33	14.2	14.2	31.3	1356
9	2250	5.34	5.23	16.8	14.8	9.9	916	8.15	7.96	16.1	15.2	34.6	1397	9.33	7.79	16.3	15.2	34.0	1600	12.40	8.06	16.9	15.5	52.2	2129
	2130	4.99	4.87	16.3	14.6	10.4	856	7.42	7.16	15.7	15.0	23.8	1273	8.45	7.08	15.8	15.0	32.0	1448	11.20	7.33	16.4	15.3	46.5	1912
	1950	4.65	4.52	16.6	14.7	7.5	797	7.00	6.92	15.7	15.1	18.3	1200	8.00	6.97	15.6	15.1	31.0	1372	10.60	7.27	16.1	15.4	43.0	1817
	1640	4.12	4.02	16.5	14.7	5.2	657	6.30	6.21	15.4	15.0	13.1	1002	7.12	6.26	15.3	15.0	16.8	1135	9.45	6.59	15.6	15.3	32.0	1505
	1380	3.59	3.51	16.3	14.6	2.9	516	5.60	5.49	15.0	14.8	7.9	805	6.24	5.54	14.9	14.9	9.8	898	8.30	5.90	15.1	15.1	16.6	1194
Pf: total cooling capacity Tal: in flow air temperature dPw: pressure drop standard coil Twi: entering water temperature, water temperature arise 5°C.																									
Qw: fluid flow rate in heat exchanger Qa: air flow Pfs: sensible cooling capacity Tad: discharge air temperature (DB) Taw: discharge air temperature (WB)																									

A.3.2. Heating Capacity Tables (2-Pipe Systems)

PCE2-03 and PCE2-04, for both 3 speed and 5 speed versions.

			TAI 18°C				TAI 20°C				TAI 22°C				TAI 24°C			
Tw _i	Tw _o	Q _a	P _f	T _{ad}	Q _w	dP _w	P _f	T _{ad}	Q _w	dP _w	P _f	T _{ad}	Q _w	dP _w	P _f	T _{ad}	Q _w	dP _w
°C	°C	m ³ /h	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa
45	40	575	3.60	36.4	617	12.4	3.27	36.8	560	10.4	2.99	37.1	512	8.9	2.71	37.4	464	7.4
		380	2.71	38.8	464	7.2	2.47	39.0	423	6.1	2.23	39.1	382	5.0	1.99	39.2	341	3.9
		290	2.34	39.7	401	5.5	2.15	40.0	369	4.7	1.94	40.1	332	3.9	1.73	40.2	296	3.1
		240	2.15	42.2	368	5.1	2.00	42.3	343	4.5	1.79	42.3	307	3.7	1.60	42.3	274	3.0
		200	1.75	42.3	300	3.6	1.65	42.4	283	3.2	1.50	42.4	257	2.4	1.36	42.4	233	2.2
50	40	575	3.80	37.2	325	3.9	3.46	37.8	296	3.3	3.15	38.2	270	2.8	2.84	38.6	244	2.3
		380	2.83	39.7	242	2.2	2.61	40.0	223	1.9	2.37	40.2	203	1.6	2.13	40.4	183	1.3
		290	2.47	40.9	211	1.7	2.28	41.2	195	1.5	2.07	41.3	177	1.3	1.86	41.4	160	1.1
		240	2.20	42.4	189	1.4	1.98	42.4	170	1.2	1.82	42.4	156	1.0	1.67	42.4	143	0.9
		200	1.78	42.4	152	1.0	1.65	42.4	141	0.9	1.50	42.4	128	0.8	1.34	42.4	114	0.5
70	60	575	6.95	53.1	595	11.7	6.58	53.7	564	10.6	6.28	54.1	538	9.8	5.98	54.5	512	8.9
		380	5.13	57.3	439	6.4	4.92	57.7	421	6.0	4.68	58.0	401	5.5	4.44	58.3	381	5.0
		290	4.46	59.6	382	5.0	4.30	60.0	368	4.7	4.09	60.0	350	4.3	3.88	60.0	332	3.9
		240	4.10	64.5	351	4.7	3.98	64.6	341	4.5	3.78	64.5	324	4.1	3.60	64.5	308	3.8
		200	3.45	64.8	296	3.3	3.25	64.8	278	3.0	3.18	64.8	272	2.9	2.95	64.8	252	2.5

P_f: total heating capacity dP_w: pressure drop standard coil Q_w: fluid flow rate in heat exchanger T_{ad}: discharge air temperature (DB)
 T_{ai}: in flow air temperature Tw_i: in flow fluid temperature Tw_o: out flow fluid temperature Q_a: air flow

PCE2-08, for both 3 speed and 5 speed versions.

			TAI 18°C				TAI 20°C				TAI 22°C				TAI 24°C			
Tw1	Two	Qa	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw
°C	°C	m3/h	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa
45	40	810	4.87	35.7	834	33.0	4.45	36.1	763	28.0	4.02	36.6	689	23.0	3.59	37.1	615	19.0
		722	4.26	36.8	730	26.0	3.90	37.1	668	22.0	3.53	37.5	605	19.0	3.16	37.9	542	15.0
		617	4.06	37.2	696	24.0	3.70	37.5	634	20.0	3.35	37.9	574	17.0	3.00	38.3	514	13.0
		520	3.80	37.7	651	21.0	3.46	38.1	593	18.0	3.13	38.3	536	15.0	2.80	38.5	479	12.0
		450	3.60	38.2	617	19.0	3.29	38.4	564	16.0	2.98	38.7	510	14.0	2.67	39.0	456	11.0
50	40	810	5.10	36.5	437	10.0	4.65	36.9	399	9.0	4.25	37.4	364	7.0	3.85	37.9	329	6.0
		722	4.44	37.6	380	8.0	4.10	38.0	351	7.0	3.73	38.4	319	6.0	3.36	38.8	287	5.0
		617	4.23	38.1	362	7.0	3.90	38.5	334	6.0	3.55	38.8	304	5.0	3.20	39.1	274	4.0
		520	3.98	38.7	341	7.0	3.65	39.0	312	6.0	3.31	39.3	283	5.0	2.97	39.6	254	4.0
		450	3.78	39.2	324	6.0	3.47	39.4	297	5.0	3.16	39.7	270	4.0	2.85	40.0	243	4.0
70	60	810	9.30	51.8	797	31.0	8.90	52.3	762	28.0	8.46	52.7	725	26.0	8.02	53.1	688	23.0
		722	8.17	54.0	700	24.0	7.80	54.3	668	22.0	7.41	54.7	635	20.0	7.02	55.1	602	18.0
		617	7.75	54.8	664	22.0	7.40	55.1	634	20.0	7.06	55.5	605	19.0	6.72	55.9	576	17.0
		520	7.26	56.0	622	20.0	6.92	56.2	593	18.0	6.58	56.4	564	16.0	6.24	56.6	535	15.0
		450	6.90	56.6	591	18.0	6.58	56.9	564	16.0	6.28	57.2	538	15.0	5.98	57.5	512	14.0
Pf: total heating capacity dPw: pressure drop standard coil Qw: fluid flow rate in heat exchanger Tad: discharge air temperature (DB)																		
Tai: in flow air temperature Tw1: in flow fluid temperature Two: out flow fluid temperature Qa: air flow																		

PCE2-08R, for both 3 speed and 5 speed versions.

			TAI 18°C				TAI 20°C				TAI 22°C				TAI 24°C			
Tw1	Two	Qa	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw
°C	°C	m3/h	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa
45	40	810	5.27	37.0	907	39.1	4.82	37.5	828	33.4	4.37	38.0	752	28.2	3.93	38.5	677	23.4
		722	4.77	37.4	821	32.9	4.36	37.9	752	28.1	3.96	38.3	684	23.7	3.56	38.8	612	19.7
		617	4.18	37.8	720	26.1	3.82	38.3	659	22.3	3.47	38.7	598	18.9	3.12	39.2	536	15.7
		520	3.63	38.3	626	20.4	3.33	38.8	572	17.5	3.02	39.2	518	14.8	2.72	39.6	468	12.3
		450	3.20	38.8	551	16.4	2.93	39.2	504	14.0	2.66	39.5	457	11.9	2.39	39.9	414	9.9
50	40	810	5.86	39.1	504	13.9	5.40	39.6	464	12.1	4.95	40.1	425	10.4	4.50	40.6	389	8.8
		722	5.32	39.6	457	11.7	4.90	40.0	421	10.2	4.49	40.5	385	8.8	4.08	41.0	352	7.4
		617	4.67	40.2	403	9.4	4.30	40.6	371	8.1	3.94	41.0	340	7.0	3.59	41.4	309	6.0
		520	4.06	40.8	349	7.4	3.75	41.2	323	6.4	3.44	41.5	296	5.5	3.13	41.9	269	4.7
		450	3.59	41.3	309	6.0	3.31	41.7	285	5.2	3.03	42.0	261	4.5	2.76	42.4	238	3.8
70	60	810	10.10	54.6	871	33.7	9.67	55.2	832	31.0	9.20	55.7	792	28.4	8.73	56.2	749	25.9
		722	9.19	55.3	788	28.3	8.76	55.8	752	26.0	8.33	56.4	716	23.8	7.91	56.9	680	21.8
		617	8.05	56.2	691	22.5	7.68	56.7	659	20.6	7.30	57.2	626	18.9	6.93	57.7	598	17.3
		520	7.00	57.2	601	17.6	6.67	57.6	572	16.1	6.35	58.1	547	14.8	6.03	58.5	518	13.5
		450	6.17	58.0	529	14.0	5.88	58.5	504	12.9	5.59	58.9	479	11.8	5.31	59.3	457	10.8
Pf: total heating capacity dPw: pressure drop standard coil Qw: fluid flow rate in heat exchanger Tad: discharge air temperature (DB)																		
Tai: in flow air temperature Tw1: in flow fluid temperature Two: out flow fluid temperature Qa: air flow																		

PCE2-09, for both 3 speed and 5 speed versions.

		TAI 18°C					TAI 20°C					TAI 22°C				TAI 24°C			
Twi	Two	Qa	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	
°C	°C	m3/h	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa	
45	40	1020	6.60	36.5	1131	33.0	6.06	37.0	1038	28.5	5.48	37.3	939	23.7	4.90	37.6	840	18.9	
		767	5.40	38.2	925	23.0	4.95	38.5	848	19.7	4.49	38.8	769	16.6	4.03	39.1	690	13.5	
		540	4.91	40.9	841	19.0	4.51	40.9	773	16.3	4.07	41.0	698	13.5	3.67	41.0	629	11.3	
		450	4.23	42.1	725	14.5	3.89	42.0	666	12.5	3.51	42.0	602	10.3	3.17	41.9	543	8.7	
		360	3.51	42.4	601	9.8	3.20	42.4	548	8.3	2.92	42.4	500	7.1	2.65	42.4	454	6.0	
50	40	1020	7.00	37.6	600	10.6	6.43	38.0	551	9.0	5.90	38.5	505	7.8	5.37	39.0	459	6.6	
		767	5.74	39.4	492	7.4	5.30	39.8	454	6.4	4.83	40.1	414	5.4	4.36	40.4	374	4.4	
		540	5.24	42.3	449	6.1	4.83	42.5	414	5.3	4.42	42.6	379	4.5	4.00	42.7	343	3.8	
		450	4.53	43.7	388	4.7	4.18	43.6	358	4.1	3.82	43.6	327	3.5	3.45	43.7	295	2.9	
		360	3.90	44.6	334	3.6	3.56	44.8	305	3.0	3.27	44.8	280	2.6	2.97	44.6	255	2.2	
70	60	1020	12.65	53.4	1084	30.6	12.12	54.0	1038	28.5	11.56	54.4	990	26.2	11.00	54.8	942	23.9	
		767	10.34	56.6	886	21.3	9.86	56.9	845	19.5	9.44	57.3	809	18.1	9.02	57.7	773	16.7	
		540	9.40	62.0	805	16.4	9.00	62.0	771	15.2	8.60	62.0	737	14.0	8.19	62.0	702	12.8	
		450	8.16	63.8	699	12.7	7.76	64.0	665	11.6	7.42	64.0	636	10.7	7.06	64.0	605	9.8	
		360	6.78	64.8	581	8.6	6.48	64.9	555	8.0	6.15	64.8	527	7.2	5.87	64.9	503	6.7	
Pf: total heating capacity dPw: pressure drop standard coil Qw: fluid flow rate in heat exchanger Tad: discharge air temperature (DB)																			
Tai: in flow air temperature Twi: in flow fluid temperature Two: out flow fluid temperature Qa: air flow																			

PCE2-16, for both 3 speed and 5 speed versions.

		TAI 18°C					TAI 20°C				TAI 22°C				TAI 24°C				
Twi	Two	qa	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	
°C	°C	m3/h	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa	
45	40	1450	9.80	35.8	1680	36.7	8.96	36.3	1536	31.3	8.10	36.7	1388	26.0	7.24	37.1	1240	20.7	
		1280	8.37	37.2	1434	27.6	7.65	37.5	1311	23.5	6.95	37.8	1191	19.8	6.25	38.1	1071	16.1	
		1100	7.73	37.6	1325	23.6	7.08	37.9	1213	20.2	6.40	38.2	1097	16.8	5.72	38.5	981	13.4	
		910	6.83	38.9	1170	19.2	6.24	39.1	1069	16.3	5.66	39.3	970	13.7	5.08	39.5	871	11.1	
		780	6.63	38.8	1136	17.9	6.06	39.1	1038	15.3	5.49	39.3	941	12.7	4.92	39.5	844	10.1	
50	40	1450	10.33	36.8	885	11.6	9.52	37.2	816	10.0	8.64	37.7	740	8.4	7.76	38.2	664	6.8	
		1280	8.84	38.2	757	8.7	8.10	38.5	694	7.4	7.40	39.0	634	6.4	6.70	39.5	574	5.4	
		1100	8.15	38.7	698	7.4	7.52	39.0	644	6.5	6.87	39.3	588	5.5	6.22	39.6	532	4.5	
		910	7.22	40.1	618	6.1	6.64	40.3	569	5.2	5.98	40.8	512	4.3	5.32	41.3	455	3.4	
		780	6.63	38.8	1136	17.9	6.06	39.1	1038	15.3	5.49	39.3	941	12.7	4.92	39.5	844	10.1	
70	60	1450	18.76	52.1	1608	33.9	17.88	52.5	1532	31.0	17.06	53.0	1462	28.6	16.24	53.5	1392	26.2	
		1280	16.02	54.7	1373	25.5	15.30	55.0	1311	23.5	14.60	55.4	1251	21.6	13.90	55.8	1191	19.7	
		1100	14.80	55.5	1268	21.8	14.16	55.8	1213	20.2	13.50	56.1	1157	18.5	12.84	56.4	1101	16.8	
		910	13.05	57.9	1118	17.6	12.50	58.1	1071	16.3	11.72	58.9	1004	14.5	10.94	59.7	937	12.7	
		780	12.70	58.0	1088	16.6	12.12	58.2	1038	15.2	11.56	58.4	990	14.0	11.00	58.6	942	12.8	
		Pf: total heating capacity		dPw: pressure drop standard coil		Qw: fluid flow rate in heat exchanger		Tad: discharge air temperature (DB)											
		Tai: in flow air temperature			Twi: in flow fluid temperature			Two: out flow fluid temperature			Qa: air flow								

PCF2-12, for both 3 speed and 5 speed versions.

		TAI 18°C					TAI 20°C					TAI 22°C				TAI 24°C			
Twi	Two	Qa	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	
°C	°C	m3/h	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa	
45	40	1300	6.98	34.6	1196	27.9	6.36	35.1	1090	23.5	5.26	35.7	987	19.7	4.16	36.3	884	15.9	
		1050	6.53	35.1	1119	24.7	5.97	35.6	1023	21.0	5.40	36.1	925	17.5	4.83	36.6	827	14.0	
		960	6.23	35.4	1068	22.6	5.70	36.0	977	19.4	5.16	36.4	884	16.1	4.62	36.8	791	12.8	
		820	5.55	36.5	951	18.5	5.06	36.9	867	15.6	4.59	37.3	786	13.1	4.12	37.7	705	10.6	
		700	4.13	37.9	708	10.8	3.76	38.2	644	9.2	3.39	38.5	581	7.6	3.03	38.7	519	6.1	
50	40	1300	7.33	35.4	628	8.8	6.72	35.9	576	7.5	6.13	36.5	525	6.3	5.54	37.1	474	5.2	
		1050	6.87	36.0	588	7.8	6.31	36.5	540	6.7	5.75	37.0	492	5.6	5.19	37.5	444	4.6	
		960	6.56	36.4	562	7.2	6.02	36.9	516	6.2	5.50	37.4	471	5.2	4.98	37.9	426	4.2	
		820	5.84	37.5	500	5.8	5.36	37.9	459	5.0	4.88	38.3	418	4.2	4.40	38.7	377	3.4	
		700	4.32	39.0	370	3.4	4.00	39.4	343	3.0	3.61	39.5	309	2.4	3.26	39.8	280	2.0	
70	60	1300	13.35	49.7	1144	25.7	12.72	50.2	1090	23.5	12.12	50.8	1038	21.6	11.52	51.4	986	19.7	
		1050	12.50	50.7	1071	22.8	11.95	51.2	1024	21.0	11.40	51.8	977	19.4	10.85	52.4	930	17.8	
		960	11.90	51.4	1020	20.8	11.40	51.9	977	19.3	10.86	52.5	930	17.7	10.32	53.1	883	16.1	
		820	10.75	52.6	921	17.4	10.13	53.8	868	15.6	9.66	54.2	828	14.4	9.19	54.6	788	13.2	
		700	7.83	55.8	671	9.7	7.52	56.4	645	9.1	7.13	56.7	611	8.3	6.80	57.0	583	7.6	
Pf: total heating capacity dPw: pressure drop standard coil Qw: fluid flow rate in heat exchanger Tad: discharge air temperature (DB)																			
Tai: in flow air temperature Twi: in flow fluid temperature Two: out flow fluid temperature Qa: air flow																			

PCF2-20, for both 3 speed and 5 speed versions.

			TAI 18°C				TAI 20°C				TAI 22°C				TAI 24°C			
Twi	Two	Qa	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw
°C	°C	m3/h	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa
45	40	2250	11.40	33.6	1954	36.7	10.40	34.2	1782	31.0	9.43	34.9	1616	26.1	8.46	35.6	1450	21.2
		2130	10.35	34.4	1774	32.7	9.47	35.0	1623	27.9	8.60	35.6	1474	23.6	7.73	36.2	1325	19.3
		1950	10.21	34.6	1750	30.2	9.34	35.1	1601	25.7	8.44	35.7	1446	21.4	7.54	36.3	1291	17.1
		1640	9.66	35.1	1655	27.3	8.82	35.6	1512	23.2	7.98	36.1	1367	19.4	7.13	36.7	1222	15.5
		1380	9.10	35.5	1560	24.4	8.30	36.0	1422	20.7	7.51	36.5	1287	17.3	6.72	37.0	1152	13.9
50	40	2250	11.95	34.3	1024	11.5	10.97	35.0	940	9.9	10.00	35.6	857	8.3	9.03	36.2	774	6.8
		2130	10.87	35.2	931	10.2	9.97	35.8	855	8.8	9.10	36.4	780	7.5	8.23	37.0	705	6.2
		1950	10.67	35.4	914	9.4	9.80	35.9	840	8.0	8.92	36.5	764	6.7	8.04	37.1	688	5.4
		1640	10.12	35.9	867	8.6	9.29	36.4	796	7.3	8.46	37.0	725	6.2	7.64	37.5	654	5.0
		1380	9.56	36.4	819	7.7	8.77	36.9	751	6.6	8.00	37.4	685	5.6	7.23	37.9	619	4.6
70	60	2250	21.87	47.8	1874	34.1	20.87	48.5	1788	31.4	19.86	49.1	1702	28.6	18.85	49.7	1616	25.8
		2130	19.82	49.4	1698	30.3	18.95	50.0	1624	28.0	18.06	50.6	1548	25.7	17.17	51.2	1472	23.4
		1950	19.50	49.7	1671	27.7	18.65	50.3	1598	25.6	17.78	50.8	1524	23.5	16.91	51.3	1450	21.4
		1640	18.45	50.6	1581	25.1	17.63	51.2	1510	23.2	16.80	51.7	1440	21.3	15.98	52.1	1370	19.4
		1380	17.40	51.5	1491	22.5	16.60	52.1	1422	20.7	15.82	52.5	1356	19.0	15.04	52.9	1290	17.3
Pf: total heating capacity dPw: pressure drop standard coil Qw: fluid flow rate in heat exchanger Tad: discharge air temperature (DB)																		
Tai: in flow air temperature Twi: in flow fluid temperature Two: out flow fluid temperature Qa: air flow																		

A.3.3. Cooling Capacity Table (4-Pipe Systems)

PCE2-08, for both 3 speed and 5 speed versions.

		TAI DB24°C -WB17.4°C						TAI DB27°C -WB19°C						TAI DB27°C -WB19.5°C						TAI DB28°C -WB21°C					
Twi	Qa	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw
°C	m3/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h
5	810	3.70	2.69	14.3	12.5	29.3	654	4.92	3.29	15.1	12.7	48.6	870	5.45	3.28	15.3	12.7	59.1	963	6.62	3.35	15.8	12.9	83.2	1170
	722	3.30	2.52	13.8	12.5	23.0	583	4.45	3.08	14.5	12.6	39.3	786	4.85	3.00	14.6	12.6	45.6	857	5.90	3.14	15.2	12.9	65.2	1043
	617	3.10	2.40	13.5	12.4	21.5	548	4.10	2.93	14.1	12.6	35.2	724	4.45	2.89	14.2	12.6	40.9	786	5.50	3.00	14.7	12.8	59.9	972
	520	2.87	2.28	13.2	12.4	18.1	507	3.86	2.79	13.8	12.5	30.6	682	4.20	2.74	14.0	12.5	35.3	742	5.10	2.85	14.4	12.8	50.2	901
	450	2.48	2.05	12.6	12.3	14.3	438	3.27	2.50	13.0	12.5	23.4	578	3.56	2.48	13.1	12.5	27.4	630	4.78	2.66	14.2	12.6	46.6	845
6	810	3.05	2.52	14.9	13.4	21.3	538	4.26	3.12	15.7	13.6	38.4	753	4.72	3.10	15.9	13.7	46.4	833	5.92	3.18	16.4	13.9	69.0	1046
	722	2.75	2.33	14.6	13.4	16.9	486	3.87	2.92	15.2	13.5	31.2	683	4.23	2.83	15.4	13.6	36.1	747	5.28	2.97	15.9	13.9	54.0	933
	617	2.57	2.19	14.4	13.3	15.6	453	3.56	2.77	14.8	13.5	27.7	629	3.89	2.74	14.9	13.6	32.7	687	4.93	2.84	15.4	13.8	49.6	871
	520	2.41	2.09	14.1	13.3	13.3	425	3.36	2.64	14.5	13.4	24.1	594	3.70	2.59	14.7	13.4	28.5	654	4.57	2.69	15.2	13.8	41.6	808
	450	2.06	1.83	13.8	13.2	10.3	364	2.85	2.36	13.8	13.4	18.6	503	3.14	2.34	13.9	13.4	22.2	555	4.15	2.49	14.6	13.6	36.9	734
7	810	2.39	2.34	15.5	14.3	13.3	422	3.45	2.88	16.3	14.5	22.6	592	3.98	2.91	16.4	14.6	33.6	703	5.22	3.01	17.0	14.8	54.5	922
	722	2.20	2.14	15.3	14.2	11.0	389	3.13	2.70	15.8	14.4	20.8	537	3.60	2.66	16.1	14.5	26.6	636	4.66	2.79	16.6	14.8	42.6	823
	617	2.03	1.98	15.3	14.2	9.5	358	2.87	2.55	15.5	14.4	17.6	492	3.33	2.58	15.6	14.5	24.3	588	4.36	2.68	16.1	14.7	39.3	770
	520	1.94	1.90	15.0	14.1	8.6	343	2.76	2.43	15.2	14.3	14.7	473	3.20	2.43	15.4	14.3	21.7	565	4.04	2.53	15.9	14.7	32.9	714
	450	1.64	1.60	15.0	14.1	6.3	290	2.42	2.18	14.5	14.3	14.0	415	2.71	2.20	14.6	14.3	16.9	479	3.52	2.31	15.0	14.5	27.0	622
8	810	2.02	1.97	16.9	14.8	9.7	356	3.06	2.70	17.2	15.2	21.1	541	3.32	2.76	17.0	15.5	25.1	586	4.55	2.83	17.7	15.7	43.3	804
	722	1.86	1.81	16.6	14.7	8.0	329	2.80	2.51	16.8	15.1	17.3	495	3.09	2.50	16.8	15.3	20.7	546	4.13	2.62	17.3	15.6	34.8	730
	617	1.69	1.64	16.8	14.8	7.2	297	2.58	2.34	16.6	15.1	15.2	455	2.79	2.38	16.5	15.4	18.1	492	3.80	2.51	16.8	15.6	31.2	671
	520	1.62	1.59	16.5	14.7	6.1	287	2.45	2.24	16.3	15.0	13.7	433	2.73	2.28	16.1	15.1	16.7	483	3.60	2.38	16.6	15.5	27.0	635
	450	1.35	1.32	16.6	14.7	4.4	239	2.08	1.96	16.0	15.0	10.3	367	2.30	2.02	16.0	15.3	12.5	407	3.07	2.16	15.8	15.4	21.3	542
9	810	1.64	1.59	18.2	15.3	5.9	290	2.52	2.46	18.0	15.9	14.1	445	2.65	2.60	17.5	16.3	16.3	468	3.88	2.64	18.3	16.5	31.9	686
	722	1.52	1.48	17.9	15.2	4.9	268	2.32	2.27	17.7	15.8	11.8	410	2.58	2.34	17.4	16.0	14.6	456	3.60	2.45	17.9	16.3	26.8	636
	617	1.34	1.30	18.2	15.3	4.8	236	2.13	2.08	17.7	15.8	10.1	376	2.24	2.18	17.3	16.2	11.6	395	3.24	2.34	17.5	16.4	23.0	572
	520	1.30	1.27	17.9	15.2	3.6	230	2.04	2.00	17.4	15.7	9.5	360	2.26	2.13	16.8	15.9	11.6	400	3.15	2.23	17.3	16.2	21.1	556
	450	1.06	1.03	18.2	15.3	2.5	187	1.73	1.70	17.4	15.7	6.7	306	1.89	1.84	17.3	16.2	8.2	334	2.61	2.01	16.6	16.3	15.6	461
Pf: total cooling capacity Tal: in flow air temperature dPw: pressure drop standard coil Twi: entering water temperature, water temperature arise 5°C.																									
Qw: fluid flow rate in heat exchanger Qa: air flow Pfs: sensible cooling capacity Tad: discharge air temperature (DB) Taw: discharge air temperature (WB)																									

PCE2-09, for both 3 speed and 5 speed versions.

Twi	TAI DB24°C -WB17.4°C							TAI DB27°C -WB19°C							TAI DB27°C -WB19.5°C							TAI DB28°C -WB21°C						
	Qa	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw			
°C	m3/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h			
5	1020	4.50	3.21	15.4	13.5	32.0	795	5.90	4.08	16.1	13.5	52.3	1043	6.30	4.00	16.1	13.6	58.9	1113	8.03	4.16	16.6	13.7	91.3	1419			
	767	3.30	2.63	14.0	13.3	21.4	583	4.26	3.33	14.3	13.3	32.5	753	4.63	3.31	14.4	13.4	34.0	818	5.89	3.46	14.8	13.5	52.4	1041			
	540	2.21	2.05	13.1	13.1	14.1	390	3.10	2.63	13.1	13.1	19.2	548	3.43	2.64	13.0	13.0	21.3	606	4.30	2.77	13.4	13.1	29.0	760			
	450	1.97	1.77	12.7	12.7	12.0	348	2.78	2.27	12.6	12.6	17.3	491	3.00	2.26	12.6	12.6	18.9	530	3.78	2.45	12.7	12.7	23.1	668			
	360	1.63	1.43	12.5	12.5	9.4	288	2.30	1.84	12.3	12.3	14.3	406	2.56	1.89	12.3	12.3	16.2	452	3.12	2.00	12.3	12.3	21.3	552			
6	1020	3.68	3.01	16.1	14.2	22.8	650	5.07	3.91	16.8	14.4	40.6	896	5.44	3.79	16.8	14.5	46.2	961	7.11	3.92	17.3	14.7	74.0	1256			
	767	2.68	2.32	15.2	14.0	17.1	473	3.66	3.14	15.0	14.2	22.5	646	3.95	3.12	15.1	14.4	26.1	697	5.20	3.24	15.6	14.5	42.3	919			
	540	2.06	1.97	13.7	13.5	13.2	363	2.87	2.49	13.8	13.6	17.1	507	3.16	2.50	13.9	13.7	19.7	558	4.00	2.63	14.2	13.8	25.6	707			
	450	1.79	1.68	13.2	13.2	10.6	316	2.54	2.17	13.2	13.2	16.2	449	2.77	2.16	13.2	13.2	17.1	489	3.48	2.32	13.4	13.4	20.1	615			
	360	1.49	1.38	13.0	13.0	6.4	263	2.10	1.76	13.0	13.0	13.2	371	2.34	1.80	13.0	13.0	15.2	413	2.92	1.92	13.0	13.0	17.1	516			
7	1020	2.86	2.80	16.8	14.8	17.2	505	4.24	3.73	17.4	15.3	28.1	727	4.58	3.58	17.4	15.4	33.4	809	6.18	3.67	18.0	15.6	56.7	1092			
	767	2.05	2.00	16.3	14.6	13.4	362	3.05	2.94	15.7	15.0	18.0	523	3.26	2.92	15.8	15.3	20.1	576	4.51	3.01	16.4	15.4	32.1	797			
	540	1.90	1.89	14.2	13.8	13.1	336	2.63	2.34	14.4	14.0	16.2	451	2.88	2.36	14.8	14.3	17.2	509	3.70	2.48	15.0	14.4	22.2	654			
	450	1.61	1.60	13.7	13.6	9.2	284	2.30	2.07	13.8	13.8	14.0	394	2.53	2.06	13.8	13.8	16.0	447	3.18	2.18	14.0	14.0	19.9	562			
	360	1.35	1.32	13.4	13.4	5.6	238	1.90	1.68	13.6	13.6	13.0	326	2.12	1.70	13.6	13.6	13.1	374	2.72	1.83	13.6	13.6	16.7	480			
8	1020	2.72	2.63	17.1	15.1	17.2	481	4.00	3.47	17.9	15.5	26.1	707	4.41	3.36	18.0	15.6	31.3	780	5.99	3.45	18.6	15.8	53.8	1059			
	767	1.93	1.87	16.8	15.0	13.2	340	2.91	2.78	16.3	15.2	14.6	514	3.18	2.76	16.4	15.4	19.9	562	4.41	2.86	17.0	15.6	30.9	779			
	540	1.77	1.75	14.9	14.1	12.4	312	2.55	2.20	15.4	14.3	15.8	450	2.75	2.20	15.6	14.6	17.1	485	3.59	2.34	15.9	14.7	21.1	635			
	450	1.53	1.50	14.4	13.8	8.1	270	2.21	1.93	14.7	14.0	13.8	390	2.42	1.94	14.8	14.2	15.1	427	3.12	2.05	15.0	14.2	19.3	551			
	360	1.29	1.26	13.9	13.6	5.1	227	1.83	1.61	14.2	13.8	12.6	324	2.03	1.62	14.3	13.9	13.5	358	2.61	1.73	14.3	13.9	15.2	461			
9	1020	2.58	2.46	17.4	15.4	15.4	456	3.76	3.21	18.4	15.6	23.4	664	4.24	3.14	18.5	15.7	29.1	750	5.80	3.22	19.1	15.9	50.8	1025			
	767	1.80	1.74	17.3	15.4	10.4	318	2.76	2.62	16.9	15.4	17.2	488	3.10	2.59	17.0	15.5	19.8	548	4.30	2.70	17.6	15.7	29.7	760			
	540	1.63	1.60	15.6	14.3	9.1	288	2.46	2.05	16.3	14.5	15.3	434	2.61	2.04	16.4	14.8	16.5	461	3.48	2.20	16.8	15.0	20.0	615			
	450	1.45	1.40	15.0	14.0	5.4	256	2.12	1.79	15.5	14.2	13.3	374	2.30	1.81	15.7	14.5	13.7	406	3.05	1.91	15.9	14.4	18.3	539			
	360	1.22	1.20	14.3	13.8	3.0	215	1.76	1.53	14.7	14.0	10.3	311	1.93	1.54	14.9	14.2	13.1	341	2.50	1.63	15.0	14.2	16.1	442			
Pf: total cooling capacity Tal: in flow air temperature dPw: pressure drop standard coil Twi: entering water temperature, water temperature arise 5°C.																												
Qw: fluid flow rate in heat exchanger Qa: air flow Pfs: sensible cooling capacity Tad: discharge air temperature (DB) Taw: discharge air temperature (WB)																												

PCE2-16, for both 3 speed and 5 speed versions.

		TAI DB24°C-WB17.4°C						TAI DB27°C-WB19°C						TAI DB27°C-WB19.5°C						TAI DB28°C-WB21°C					
Twi	Qa	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw
°C	m3/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h
5	1450	6.00	4.40	15.5	13.2	28.9	1060	8.40	5.50	16.5	13.4	53.3	1484	9.00	5.40	16.7	13.6	60.1	1591	11.50	5.59	17.3	13.7	93.8	2032
	1280	5.25	4.08	15.2	13.3	23.7	928	7.42	5.04	16.1	13.4	44.2	1311	8.05	4.94	16.3	13.5	50.9	1423	10.00	5.05	17.0	13.8	74.4	1767
	1100	5.00	3.89	14.8	13.1	20.9	884	6.40	4.83	15.6	13.3	37.4	1220	7.40	4.73	15.7	13.4	42.3	1308	9.30	4.89	16.3	13.6	63.5	1644
	910	4.50	3.70	14.5	13.2	18.0	795	6.43	4.58	15.4	13.3	34.2	1136	7.00	4.52	15.6	13.4	39.7	1237	8.70	4.64	16.1	13.6	58.4	1538
	780	3.81	3.29	13.8	13.1	13.4	673	5.32	4.06	14.4	13.2	24.3	940	5.75	3.98	14.6	13.3	27.7	1016	7.25	4.19	15.0	13.5	42.3	1281
6	1450	4.93	3.98	16.4	14.0	21.1	870	7.01	5.00	17.5	14.4	39.6	1238	7.58	4.91	17.6	14.6	45.2	1339	9.98	5.07	18.2	14.7	73.8	1763
	1280	4.37	3.64	16.2	14.0	17.5	772	6.30	4.56	17.2	14.3	33.4	1113	6.72	4.48	17.2	14.5	37.8	1188	8.73	4.62	17.9	14.8	59.5	1542
	1100	4.08	3.46	15.9	14.0	15.0	721	5.53	4.38	16.7	14.3	27.9	1021	6.21	4.30	16.7	14.4	31.7	1098	8.11	4.45	17.3	14.6	50.5	1433
	910	3.80	3.30	15.6	13.9	13.5	671	5.48	4.15	16.6	14.2	26.0	968	5.90	4.10	16.6	14.4	29.9	1042	7.60	4.24	17.1	14.6	46.6	1343
	780	3.17	2.87	15.1	13.9	9.9	560	4.52	3.66	15.6	14.1	18.4	798	4.88	3.63	15.7	14.3	21.2	862	6.34	3.80	16.2	14.5	33.6	1119
7	1450	3.85	3.55	17.4	14.9	13.2	681	5.61	4.50	18.5	15.4	25.9	962	6.15	4.43	18.5	15.6	30.4	1087	8.45	4.55	19.2	15.8	53.8	1494
	1280	3.49	3.19	17.2	14.8	11.2	617	5.18	4.08	18.3	15.3	22.7	889	5.40	4.02	18.1	15.5	24.7	953	7.46	4.20	18.8	15.8	44.5	1318
	1100	3.16	3.03	17.0	14.8	9.2	558	4.65	3.94	17.8	15.3	18.5	798	5.03	3.87	17.7	15.5	21.1	888	6.92	4.02	18.3	15.7	37.5	1222
	910	3.10	2.90	16.8	14.7	9.0	547	4.53	3.71	17.7	15.2	17.9	777	4.79	3.69	17.6	15.4	20.1	846	6.50	3.84	18.2	15.7	34.8	1149
	780	2.54	2.44	16.4	14.6	6.4	448	3.71	3.25	16.9	15.1	12.5	636	4.01	3.28	16.8	15.3	14.6	709	5.42	3.40	17.4	15.6	24.9	958
8	1450	3.63	3.39	17.6	15.0	11.8	641	5.43	4.32	18.7	15.5	24.3	959	5.98	4.23	18.8	15.7	28.8	1056	8.28	4.36	19.5	15.9	51.8	1463
	1280	3.25	3.04	17.4	14.9	9.9	573	5.04	3.87	18.7	15.3	21.7	890	5.31	3.86	18.5	15.6	24.1	939	7.36	4.02	19.1	15.8	43.6	1300
	1100	2.93	2.84	17.3	15.0	7.9	519	4.48	3.77	18.0	15.4	17.2	791	4.89	3.72	18.0	15.6	20.1	864	6.76	3.84	18.7	15.8	36.0	1194
	910	2.89	2.75	17.1	14.8	8.0	512	4.41	3.55	18.1	15.2	17.2	780	4.68	3.54	17.9	15.5	19.3	827	6.40	3.68	18.5	15.7	33.9	1131
	780	2.35	2.27	16.9	14.8	5.7	415	3.64	3.12	17.2	15.1	12.1	643	3.92	3.15	17.1	15.4	14.0	692	5.35	3.28	17.7	15.6	24.4	944
9	1450	3.40	3.22	17.8	15.1	10.4	601	5.24	4.14	19.0	15.6	22.8	926	5.80	4.04	19.2	15.8	27.3	1025	8.10	4.17	19.9	16.0	49.9	1432
	1280	3.00	2.89	17.7	15.1	8.6	530	4.90	3.67	19.0	15.4	20.8	866	5.23	3.70	18.9	15.7	23.4	924	7.26	3.85	19.5	15.9	42.6	1283
	1100	2.71	2.65	17.6	15.1	6.7	480	4.30	3.60	18.3	15.5	16.0	760	4.75	3.57	18.4	15.7	19.1	840	6.60	3.67	19.1	15.9	34.4	1166
	910	2.69	2.61	17.4	15.0	7.0	476	4.30	3.38	18.4	15.3	16.6	760	4.57	3.39	18.3	15.6	18.5	807	6.30	3.52	18.9	15.8	33.0	1113
	780	2.17	2.10	17.4	15.0	5.0	383	3.56	2.99	17.6	15.2	11.8	630	3.82	3.02	17.5	15.5	13.4	675	5.27	3.15	18.1	15.7	23.9	931
Pf: total cooling capacity Tal: in flow air temperature dPw: pressure drop standard coil Twi: entering water temperature, water temperature arise 5°C.																									
Qw: fluid flow rate in heat exchanger Qa: air flow Pfs: sensible cooling capacity Tad: discharge air temperature (DB) Taw: discharge air temperature (WB)																									

PCF2-12, for both 3 speed and 5 speed versions.

		TAI DB24°C -WB17.4°C						TAI DB27°C -WB19°C						TAI DB27°C -WB19.5°C						TAI DB28°C-WB21°C					
Twi	Qa	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw
°C	m3/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h
5	1300	6.33	4.28	15.0	12.0	48.5	1090	8.27	5.23	16.0	12.2	78.7	1424	8.85	5.18	16.1	12.3	89.1	1523	10.94	5.31	16.8	12.4	130.0	1883
	1050	5.74	4.06	14.6	12.0	40.7	988	7.60	4.97	15.5	12.1	67.8	1308	8.14	4.88	15.7	12.2	76.4	1402	10.00	5.03	16.3	12.3	110.0	1721
	960	5.14	3.86	14.2	12.1	33.4	884	6.89	4.71	15.0	12.1	56.9	1186	7.29	4.61	15.1	12.2	62.5	1255	9.00	4.76	15.7	12.3	91.4	1550
	820	4.38	3.47	13.5	12.0	25.0	754	5.86	4.22	14.2	12.0	42.3	1009	6.35	4.18	14.3	12.0	49.1	1093	7.73	4.31	14.9	12.2	69.5	1330
	700	3.20	2.58	11.7	11.7	14.5	550	4.13	3.14	11.8	11.8	23.0	711	4.42	3.12	11.9	11.9	26.0	761	5.50	3.30	12.1	11.9	39.0	947
6	1300	5.28	4.04	15.5	13.0	36.0	909	7.20	4.96	16.6	13.2	62.2	1239	7.78	4.89	16.6	13.2	71.6	1338	9.87	5.05	17.4	13.4	109.1	1699
	1050	4.84	3.83	15.2	12.9	30.8	833	6.65	4.72	16.1	13.1	54.1	1144	7.22	4.61	16.3	13.1	62.2	1243	9.03	4.79	16.9	13.3	92.8	1555
	960	4.33	3.61	14.8	13.0	25.2	745	6.05	4.46	15.6	13.0	45.7	1042	6.50	4.37	15.8	13.1	51.4	1118	8.11	4.51	16.3	13.3	76.4	1396
	820	3.73	3.25	14.2	12.9	19.2	641	5.16	4.00	14.9	12.9	34.2	888	5.61	3.94	15.0	13.0	39.7	965	6.98	4.08	15.6	13.2	58.3	1201
	700	2.71	2.38	12.6	12.6	11.0	467	3.66	2.95	12.7	12.7	18.6	629	3.96	2.94	12.8	12.8	21.6	682	4.99	3.12	13.0	12.9	33.0	859
7	1300	3.94	3.59	15.7	13.8	20.8	678	5.70	4.46	16.7	14.0	40.3	978	6.30	4.34	16.9	14.0	48.0	1084	8.06	4.54	17.4	14.2	75.5	1387
	1050	3.73	3.48	15.5	13.8	18.9	642	5.46	4.33	16.5	14.0	37.3	937	6.00	4.24	16.7	14.0	44.2	1032	7.64	4.40	17.2	14.2	68.4	1315
	960	3.52	3.36	15.3	13.8	17.0	606	5.21	4.20	16.2	13.9	34.0	894	5.70	4.13	16.4	14.0	40.3	981	7.21	4.25	16.9	14.2	61.3	1242
	820	3.07	3.03	14.8	13.7	13.3	528	4.46	3.77	15.5	13.8	26.0	765	4.87	3.70	15.7	13.9	30.2	838	6.22	3.85	16.2	14.1	47.0	1071
	700	2.22	2.17	13.5	13.5	7.4	382	3.18	2.76	13.6	13.6	14.2	545	3.50	2.76	13.7	13.7	17.1	602	4.48	2.93	13.8	13.8	27.0	771
8	1300	3.21	2.97	17.5	14.8	14.6	552	5.04	4.26	17.6	15.0	33.2	868	5.63	4.17	17.7	15.1	40.4	968	7.70	4.32	18.5	15.2	70.3	1326
	1050	2.97	2.77	17.4	14.7	12.7	511	4.48	4.05	17.3	14.9	29.7	814	5.27	3.94	17.4	15.0	35.8	906	7.08	4.10	18.0	15.1	60.6	1218
	960	2.71	2.61	17.0	14.7	10.6	467	4.35	3.79	16.9	14.8	25.5	748	4.82	3.73	17.0	14.9	30.5	830	6.37	3.85	17.6	15.1	49.7	1096
	820	2.34	2.32	16.8	14.6	8.2	401	3.72	3.34	16.4	14.7	19.1	640	4.13	3.34	16.4	14.8	23.0	711	5.47	3.48	16.9	15.0	37.9	942
	700	1.75	1.71	15.7	14.4	5.2	300	2.67	2.44	15.1	14.5	10.3	460	2.95	2.55	14.7	14.7	12.7	506	3.92	2.72	14.8	14.8	21.4	675
9	1300	2.20	2.13	19.0	15.6	5.6	378	3.96	3.82	18.1	15.9	20.8	682	4.55	3.74	18.3	16.0	26.7	783	6.60	3.85	19.0	16.1	52.3	1136
	1050	2.00	1.94	19.0	15.6	4.6	344	3.26	3.64	17.8	15.8	19.1	647	4.23	3.54	17.9	15.9	23.6	728	6.10	3.65	18.6	16.0	45.6	1050
	960	1.90	1.85	18.7	15.5	4.2	326	3.48	3.38	17.5	15.7	16.5	599	3.94	3.32	17.6	15.8	20.7	678	5.52	3.44	18.2	16.0	38.0	950
	820	1.60	1.60	18.7	15.5	3.0	275	2.98	2.90	17.2	15.6	12.1	512	3.39	2.97	17.0	15.7	15.8	583	4.72	3.10	17.5	15.9	28.7	812
	700	1.27	1.24	17.9	15.2	3.0	218	2.16	2.12	16.6	15.4	6.3	371	2.39	2.33	15.6	15.6	8.3	411	3.36	2.51	15.7	15.7	15.7	579
Pf: total cooling capacity Tal: in flow air temperature dPw: pressure drop standard coil Twi: entering water temperature, water temperature arise 5°C.																									
Qw: fluid flow rate in heat exchanger Qa: air flow Pfs: sensible cooling capacity Tad: discharge air temperature (DB) Taw: discharge air temperature (WB)																									

PCF2-20, for both 3 speed and 5 speed versions.

		TAI DB24°C -WB17.4°C						TAI DB27°C -WB19°C						TAI DB27°C -WB19.5°C						TAI DB28°C -WB21°C					
Twi	Qa	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw	Pf	Pfs	Tad	Taw	dPw	Qw
°C	m3/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h	kW	kW	°C	°C	kPa	l/h
5	2250	8.85	6.29	15.4	13.0	49.2	1520	11.32	7.73	16.4	13.6	76.2	1945	12.40	7.58	16.5	13.6	90.0	2131	15.83	7.78	17.3	13.8	139.5	2720
	2130	7.86	5.79	14.9	12.9	39.8	1350	10.16	7.16	15.7	13.4	63.3	1746	11.03	7.03	15.9	13.5	73.2	1894	14.42	7.21	16.6	13.4	118.4	2478
	1970	7.60	5.66	14.8	12.9	37.2	1305	9.65	7.04	15.5	13.5	57.6	1658	10.67	6.92	15.7	13.5	69.0	1833	13.61	7.10	16.4	13.6	106.7	2339
	1380	6.53	5.08	14.2	12.8	28.4	1122	8.42	6.31	14.8	13.3	120.0	1446	9.12	6.20	15.0	13.4	51.8	1567	11.62	6.45	15.5	13.5	80.4	1988
	1090	5.90	4.74	13.7	12.7	23.7	1014	7.56	5.81	14.3	13.2	36.9	1299	8.20	5.77	14.4	13.3	42.9	1408	10.78	5.95	15.0	13.1	70.1	1852
6	2250	7.20	5.80	16.1	13.9	35.0	1236	9.62	7.35	16.9	14.5	58.2	1653	10.65	7.20	17.1	14.5	69.9	1830	14.01	7.40	17.8	14.7	113.7	2408
	2130	6.34	5.23	15.8	13.8	27.6	1089	8.61	6.77	16.3	14.3	48.0	1479	9.48	6.67	16.5	14.4	56.9	1628	12.86	6.81	17.2	14.3	97.4	2209
	1970	6.21	5.19	15.6	13.8	26.6	1067	8.24	6.66	16.1	14.4	44.3	1415	9.16	6.54	16.3	14.4	53.6	1574	12.01	6.71	17.0	14.6	86.1	2063
	1380	5.37	4.61	15.1	13.7	20.3	921	7.21	5.98	15.5	14.2	72.2	1237	7.81	5.88	15.6	14.3	40.5	1350	10.28	6.10	16.2	14.5	65.4	1761
	1090	4.81	4.20	14.9	13.6	16.7	826	6.45	5.51	15.1	14.1	28.4	1108	7.08	5.44	15.1	14.2	33.6	1216	9.59	5.64	15.7	14.1	57.6	1648
7	2250	5.54	5.31	16.7	14.7	20.6	952	7.92	6.57	17.4	15.3	40.2	1360	8.90	6.81	17.6	15.4	49.7	1529	12.19	7.01	18.3	15.6	87.8	2095
	2130	4.81	4.67	16.6	14.7	15.5	826	7.06	6.05	16.9	15.2	32.7	1211	7.92	6.31	17.0	15.3	40.5	1361	11.30	6.41	17.8	15.2	76.2	1941
	1970	4.82	4.71	16.3	14.6	15.8	828	6.82	5.97	16.7	15.2	30.8	1170	7.65	6.16	16.9	15.3	38.0	1314	10.40	6.32	17.6	15.5	65.6	1787
	1380	4.20	4.13	16.0	14.5	12.2	721	5.99	5.37	16.2	15.1	24.3	1028	6.50	5.56	16.2	15.2	29.3	1133	8.93	5.75	16.8	15.4	50.3	1534
	1090	3.72	3.65	16.0	14.5	9.5	639	5.34	4.94	15.9	15.0	19.8	916	5.96	5.10	15.8	15.1	24.2	1024	8.40	5.32	16.3	15.0	45.0	1443
8	2250	4.64	4.46	17.9	15.2	14.9	796	7.21	6.44	18.1	15.8	32.3	1200	7.54	6.44	18.1	16.1	37.8	1295	10.70	6.61	18.9	16.3	70.4	1839
	2130	4.03	3.91	17.8	15.2	11.1	691	6.16	5.76	17.9	15.7	25.4	1058	6.83	5.95	17.6	15.9	31.7	1173	9.75	6.06	18.4	16.1	59.6	1674
	1970	3.98	3.87	17.7	15.1	11.1	683	5.95	5.63	17.8	15.7	23.9	1023	6.60	5.78	17.5	15.9	29.6	1133	9.16	5.95	18.2	16.2	53.0	1574
	1380	3.42	3.34	17.5	15.1	8.4	586	5.13	4.92	17.5	15.7	18.0	881	5.66	5.14	17.0	15.8	22.7	981	7.88	5.41	17.5	16.1	40.7	1353
	1090	3.15	3.09	17.2	15.0	7.1	541	4.56	4.45	17.4	15.6	14.4	783	5.11	4.63	16.8	15.8	18.3	878	7.29	5.02	17.0	15.9	35.6	1252
9	2250	3.73	3.61	19.0	15.6	9.0	641	6.50	5.92	18.8	16.2	24.3	1039	6.17	6.06	18.6	16.7	25.8	1059	9.21	6.20	19.4	17.0	53.0	1582
	2130	3.24	3.14	19.0	15.6	6.8	556	5.25	5.14	18.8	16.2	18.0	902	5.73	5.59	18.1	16.5	22.8	985	8.19	5.70	18.9	16.9	42.8	1406
	1970	3.13	3.03	19.0	15.6	6.3	538	5.08	4.97	18.8	16.2	16.8	873	5.54	5.40	18.1	16.5	21.2	952	7.92	5.58	18.8	16.9	40.2	1361
	1380	2.63	2.55	19.0	15.6	4.5	451	4.27	4.18	18.8	16.2	11.7	733	4.82	4.71	17.8	16.4	16.1	828	6.82	5.06	18.1	16.8	30.9	1171
	1090	2.58	2.53	18.4	15.4	4.5	443	3.78	3.69	18.8	16.2	9.0	649	4.26	4.16	17.8	16.4	12.5	732	6.17	4.71	17.6	16.7	26.0	1059
Pf: total cooling capacity Tal: in flow air temperature dPw: pressure drop standard coil Twi: entering water temperature, water temperature arise 5°C.																									
Qw: fluid flow rate in heat exchanger Qa: air flow Pfs: sensible cooling capacity Tad: discharge air temperature (DB) Taw: discharge air temperature (WB)																									

A.3.4. Heating Capacity Table (4-Pipe Systems)

PCE2-06 and PCE2-08, for both 3 speed and 5 speed versions.

			TAI 18°C				TAI 20°C				TAI 22°C				TAI 24°C			
Tw _i	Two	q _a	P _f	T _{ad}	Q _w	dP _w	P _f	T _{ad}	Q _w	dP _w	P _f	T _{ad}	Q _w	dP _w	P _f	T _{ad}	Q _w	dP _w
°C	°C	m ³ /h	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa
45	40	810	2.36	26.9	401	13.5	2.13	28.0	362	11.2	1.91	29.2	326	9.3	1.70	30.4	289	7.4
		722	2.14	27.8	363	11.5	1.92	28.8	327	9.5	1.73	29.9	294	7.8	1.54	31.0	261	6.0
		617	2.04	28.0	347	10.5	1.85	29.1	314	8.7	1.66	30.2	283	7.2	1.48	31.3	251	5.7
		520	1.92	28.4	327	9.3	1.75	29.5	298	8.0	1.58	30.5	268	6.6	1.40	31.5	239	5.1
		450	1.86	28.8	315	8.8	1.68	29.8	287	7.4	1.52	30.8	258	6.2	1.36	31.8	229	5.0
50	40	810	2.31	26.7	196	4.0	2.10	27.9	178	3.5	1.89	29.1	160	3.0	1.67	30.3	142	2.5
		722	2.08	27.5	177	3.0	1.89	28.6	160	2.6	1.67	30.2	142	2.1	1.46	31.8	124	1.6
		617	1.99	27.8	169	2.9	1.83	29.0	155	2.5	1.65	30.1	140	2.0	1.46	31.2	125	1.6
		520	1.90	28.3	162	2.7	1.73	29.4	147	2.2	1.55	30.4	132	1.8	1.37	31.4	117	1.4
		450	1.82	28.6	155	2.5	1.66	29.7	141	2.1	1.49	30.7	126	2.0	1.32	31.7	111	1.9
70	60	810	4.50	34.9	383	12.5	4.25	36.1	363	12.0	4.04	37.2	344	10.2	3.82	38.3	325	8.9
		722	4.06	36.5	345	10.5	3.84	37.6	328	10.4	3.59	39.7	305	8.3	3.33	41.8	282	7.0
		617	3.90	37.2	331	9.6	3.68	38.2	314	8.9	3.50	39.3	298	7.9	3.31	40.4	282	7.1
		520	3.68	38.0	313	8.7	3.48	39.0	297	7.2	3.33	40.1	283	7.2	3.16	41.2	270	6.6
		450	3.56	38.7	303	8.2	3.27	41.0	279	5.9	3.19	40.6	271	6.7	3.11	40.2	264	6.3
P _f : total heating capacity dP _w : pressure drop standard coil Q _w : fluid flow rate in heat exchanger T _{ad} : discharge air temperature (DB)																		
T _{ai} : in flow air temperature T _{wi} : in flow fluid temperature T _{wo} : out flow fluid temperature Q _a : air flow																		

PCE2-09, for both 3 speed and 5 speed versions.

			TAI 18°C				TAI 20°C				TAI 22°C				TAI 24°C			
Twi	Two	Qa	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw
°C	°C	m3/h	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa
45	40	1020	4.01	29.8	691	26.8	3.67	30.8	632	22.9	3.30	31.7	567	18.7	2.93	32.6	503	14.5
		767	3.38	31.4	583	19.6	3.09	32.2	532	16.7	2.80	33.0	482	14.2	2.52	33.8	433	11.7
		540	2.64	33.3	455	11.0	2.41	34.0	415	9.5	2.18	34.7	375	7.9	1.95	35.3	335	6.3
		450	2.48	34.0	427	9.8	2.26	34.7	390	8.4	2.05	35.3	352	7.1	1.83	35.8	315	5.8
		360	2.13	35.4	367	7.5	1.95	35.7	335	6.5	1.76	36.2	303	5.4	1.58	36.7	271	4.4
50	40	1020	4.14	30.2	357	8.2	3.78	31.1	326	6.9	3.42	32.1	295	5.8	3.06	33.1	264	4.6
		767	3.51	31.8	302	6.1	3.21	32.6	277	5.2	2.91	33.5	250	4.3	2.60	34.4	224	3.4
		540	2.75	33.9	236	3.4	2.52	34.6	217	2.9	2.28	35.3	197	2.4	2.05	35.9	177	1.9
		450	2.57	34.7	222	3.0	2.37	35.3	203	2.6	2.15	35.9	185	2.2	1.93	36.5	166	1.8
		360	2.22	35.9	191	2.3	2.04	36.4	176	2.1	1.85	37.0	159	1.8	1.66	37.5	143	1.4
70	60	1020	7.70	40.7	663	25.0	7.32	41.5	630	22.1	6.94	42.4	598	20.7	6.57	43.3	565	18.6
		767	6.41	43.0	553	17.9	6.18	44.3	532	16.0	5.80	44.9	499	14.9	5.42	45.5	465	13.1
		540	5.06	47.4	435	10.3	4.85	48.0	416	12.0	4.62	48.5	397	8.8	4.39	49.1	378	8.0
		450	4.75	48.9	409	9.3	4.53	49.4	390	9.5	4.31	49.9	371	7.7	4.09	50.4	353	6.9
		360	4.10	50.9	353	7.0	3.91	51.4	337	8.9	3.72	51.9	321	6.7	3.53	52.4	305	6.5
Pf: total heating capacity dPw: pressure drop standard coil Qw: fluid flow rate in heat exchanger Tad: discharge air temperature (DB)																		
Tai: in flow air temperature Twi: in flow fluid temperature Two: out flow fluid temperature Qa: air flow																		

PCE2-12 and PCE2-16, for both 3 speed and 5 speed versions.

			TAI 18°C				TAI 20°C				TAI 22°C				TAI 24°C			
Twi	Two	Qa	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw
°C	°C	m3/h	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa
45	40	1450	4.81	27.0	825	35.9	4.43	28.3	760	31.3	3.96	29.4	679	25.3	3.48	30.5	598	19.3
		1280	4.40	27.8	755	30.8	4.01	28.9	687	25.8	3.61	30.1	618	21.4	3.21	31.3	549	17.0
		1100	4.27	28.0	731	29.0	3.90	29.2	668	24.8	3.51	30.3	601	20.5	3.12	31.4	534	16.3
		910	4.04	28.5	693	26.6	3.69	29.6	631	22.4	3.33	30.6	570	18.6	2.97	31.6	509	14.8
		780	3.57	29.6	612	21.2	3.26	30.6	559	17.9	2.94	31.5	503	14.9	2.62	32.4	448	11.9
50	40	1450	4.97	27.3	426	11.0	4.56	28.5	390	9.4	4.11	29.7	352	7.8	3.67	30.9	314	6.2
		1280	4.53	28.1	388	9.4	4.17	29.3	358	8.1	3.76	30.4	322	6.7	3.36	31.5	287	5.3
		1100	4.40	28.3	377	8.9	4.02	29.5	343	7.4	3.64	30.6	311	6.3	3.26	31.7	279	5.1
		910	4.17	28.8	357	8.0	3.80	29.9	326	6.7	3.46	31.0	297	5.7	3.12	32.1	268	4.7
		780	3.69	30.0	316	6.4	3.38	30.9	289	5.5	3.06	31.9	262	4.6	2.74	32.9	235	3.6
70	60	1450	8.82	36.5	756	31.0	8.37	37.7	718	28.0	7.92	38.9	680	25.3	7.48	40.1	642	22.5
		1280	8.04	38.0	689	26.2	7.63	39.0	654	24.0	7.23	40.0	619	21.6	6.82	41.0	584	19.3
		1100	7.78	38.4	666	24.6	7.38	39.4	632	22.0	6.98	40.4	598	20.0	6.59	41.4	565	17.7
		910	7.37	39.0	631	22.3	7.03	40.1	602	18.0	6.69	41.2	573	18.8	6.35	42.3	544	17.0
		780	6.52	41.0	559	17.9	6.21	42.1	532	15.2	5.90	43.2	504	15.0	5.59	44.3	477	13.6

Pf: total heating capacity dPw: pressure drop standard coil Qw: fluid flow rate in heat exchanger Tad: discharge air temperature (DB)

Tai: in flow air temperature Twi: in flow fluid temperature Two: out flow fluid temperature Qa: air flow

PCF2-12, for both 3 speed and 5 speed versions.

			TAI 18°C				TAI 20°C				TAI 22°C				TAI 24°C			
Twi	Two	Qa	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw
°C	°C	m3/h	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa
45	40	1300	2.91	24.9	499	17.5	2.65	26.3	454	14.9	2.39	27.6	410	12.3	2.13	28.9	366	9.7
		1050	2.78	25.2	476	16.2	2.52	26.6	432	13.6	2.27	28.0	389	11.3	2.02	29.4	346	8.9
		960	2.60	25.3	445	14.0	2.44	26.8	419	12.8	2.19	28.1	375	10.4	1.94	29.4	332	8.1
		820	2.40	26.0	410	12.1	2.23	27.4	382	10.8	2.01	28.7	344	9.0	1.79	30.0	306	7.2
		700	1.97	27.6	337	8.7	1.79	28.8	306	7.4	1.62	29.9	278	6.1	1.45	31.0	249	4.9
50	40	1300	2.94	25.0	252	5.1	2.68	26.3	229	11.8	2.41	27.7	206	3.6	2.14	29.1	183	4.6
		1050	2.80	25.3	240	4.7	2.56	26.7	219	4.0	2.31	28.0	198	3.3	2.06	29.3	177	2.6
		960	2.62	25.3	224	4.1	2.46	26.9	210	3.8	2.23	28.2	191	3.1	2.00	29.5	172	2.4
		820	2.40	26.0	205	3.4	2.27	27.6	194	3.2	2.04	28.8	175	2.7	1.81	30.0	156	2.2
		700	2.00	27.8	171	2.6	1.83	28.9	157	2.2	1.66	30.1	142	1.8	1.49	31.3	127	1.4
70	60	1300	5.30	32.6	454	14.9	5.03	34.0	431	15.0	4.76	35.4	408	12.1	4.49	36.8	385	10.7
		1050	5.05	33.2	432	13.7	4.81	34.6	412	12.0	4.57	36.0	392	11.5	4.33	37.4	372	10.4
		960	4.88	33.7	418	12.8	4.63	35.0	396	11.0	4.38	36.3	374	10.6	4.13	37.6	352	9.5
		820	4.46	34.9	382	11.0	4.24	36.2	363	8.4	4.02	37.5	344	8.8	3.80	38.8	325	7.7
		700	3.59	37.5	307	7.4	3.42	38.6	293	6.7	3.25	39.7	279	6.1	3.08	40.8	265	5.5

Pf: total heating capacity dPw: pressure drop standard coil Qw: fluid flow rate in heat exchanger Tad: discharge air temperature (DB)
 Tai: in flow air temperature Twi: in flow fluid temperature Two: out flow fluid temperature Qa: air flow

PCF2-20, for both 3 speed and 5 speed versions.

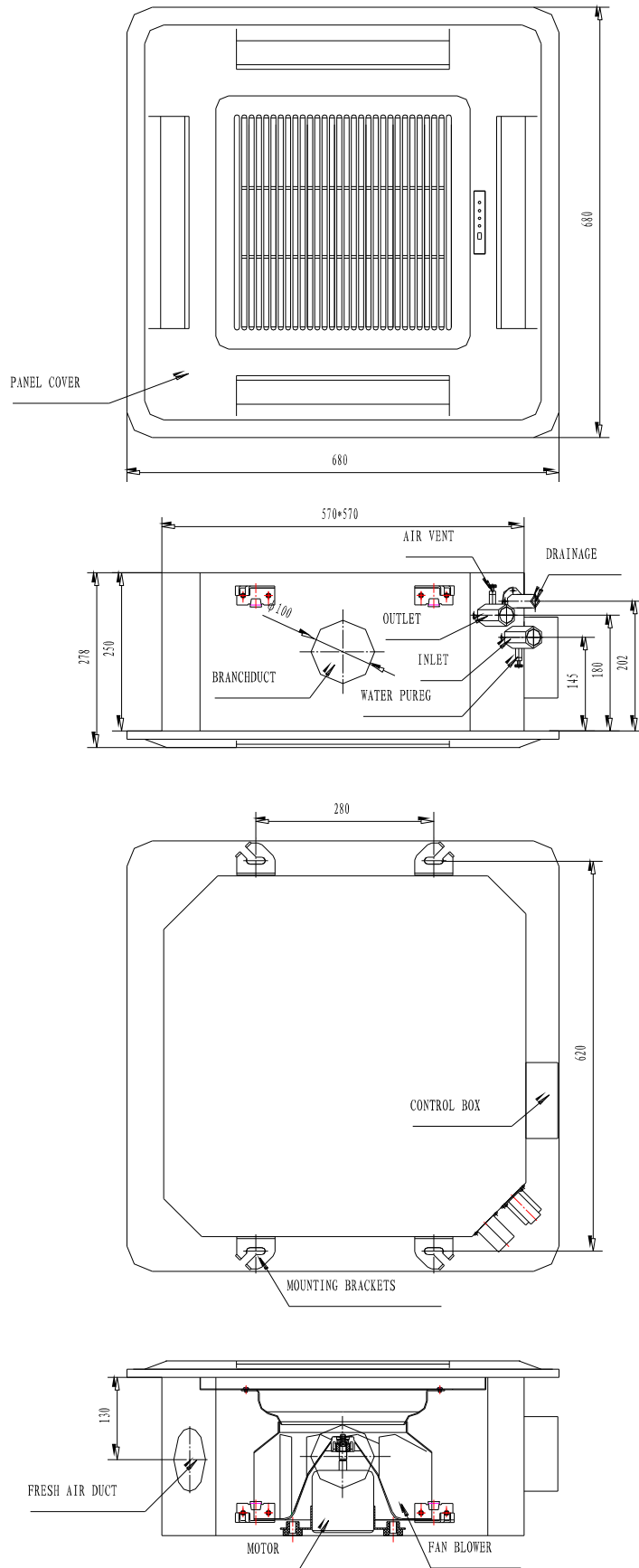
			TAI 18°C				TAI 20°C				TAI 22°C				TAI 24°C			
Twi	Two	qa	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw	Pf	Tad	Qw	dPw
°C	°C	m3/h	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa	kW	°C	l/h	kPa
45	40	2290	5.29	25.2	906	31.4	4.83	26.6	828	26.8	4.34	27.9	744	22.0	3.85	29.2	660	17.2
		2100	4.87	25.9	834	27.0	4.43	27.2	760	22.8	4.00	28.5	685	19.0	3.57	29.8	610	15.3
		1950	4.73	26.1	810	25.6	4.30	27.4	737	21.6	3.88	28.6	665	18.0	3.46	29.8	593	14.4
		1380	4.33	26.8	742	21.8	3.95	28.0	677	18.6	3.56	29.2	610	15.4	3.17	30.4	543	12.2
		1090	4.16	27.2	713	20.4	3.77	28.4	646	17.0	3.42	29.5	586	14.4	3.07	30.6	526	11.8
50	40	2290	5.40	25.4	463	9.4	4.90	26.7	420	8.0	4.45	28.1	381	6.6	4.00	29.5	342	5.2
		2100	4.93	26.0	422	8.0	4.50	27.3	385	6.8	4.08	28.6	350	5.6	3.66	29.9	315	4.4
		1950	4.80	26.3	411	7.6	4.38	27.5	375	6.4	3.97	28.8	340	5.4	3.56	30.1	305	4.4
		1380	4.41	27.0	378	6.6	4.03	28.2	345	5.6	3.64	29.4	312	4.6	3.25	30.6	279	3.6
		1090	4.23	27.4	362	6.0	3.86	28.5	330	5.2	3.50	29.7	300	4.2	3.14	30.9	270	3.2
70	60	2290	10.10	31.8	865	28.8	9.65	33.2	827	26.6	9.18	34.5	786	24.4	8.71	35.8	745	22.2
		2100	9.29	33.1	796	24.8	8.87	34.4	760	23.0	8.43	35.7	722	21.0	7.99	37.0	684	19.0
		1950	9.05	33.5	775	23.6	8.63	34.8	740	21.8	8.19	36.0	702	19.8	7.75	37.2	664	17.8
		1380	8.30	34.8	711	20.4	7.90	36.0	677	18.6	7.50	37.2	642	16.8	7.10	38.4	607	15.0
		1090	7.95	35.4	681	18.8	7.56	36.7	648	17.2	7.19	37.9	616	15.6	6.82	39.1	584	14.0

Pf: total heating capacity dPw: pressure drop standard coil Qw: fluid flow rate in heat exchanger Tad: discharge air temperature (DB)

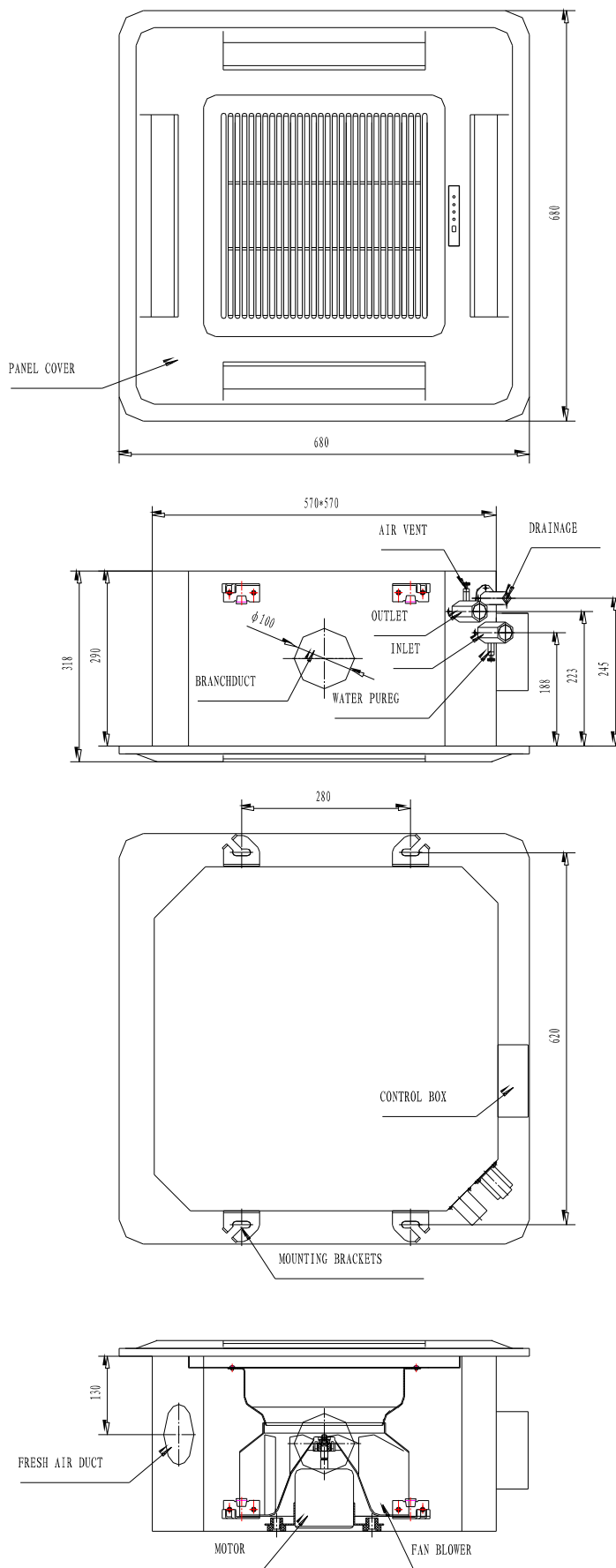
Tai: in flow air temperature Twi: in flow fluid temperature Two: out flow fluid temperature Qa: air flow

A.4. Dimensional Drawings

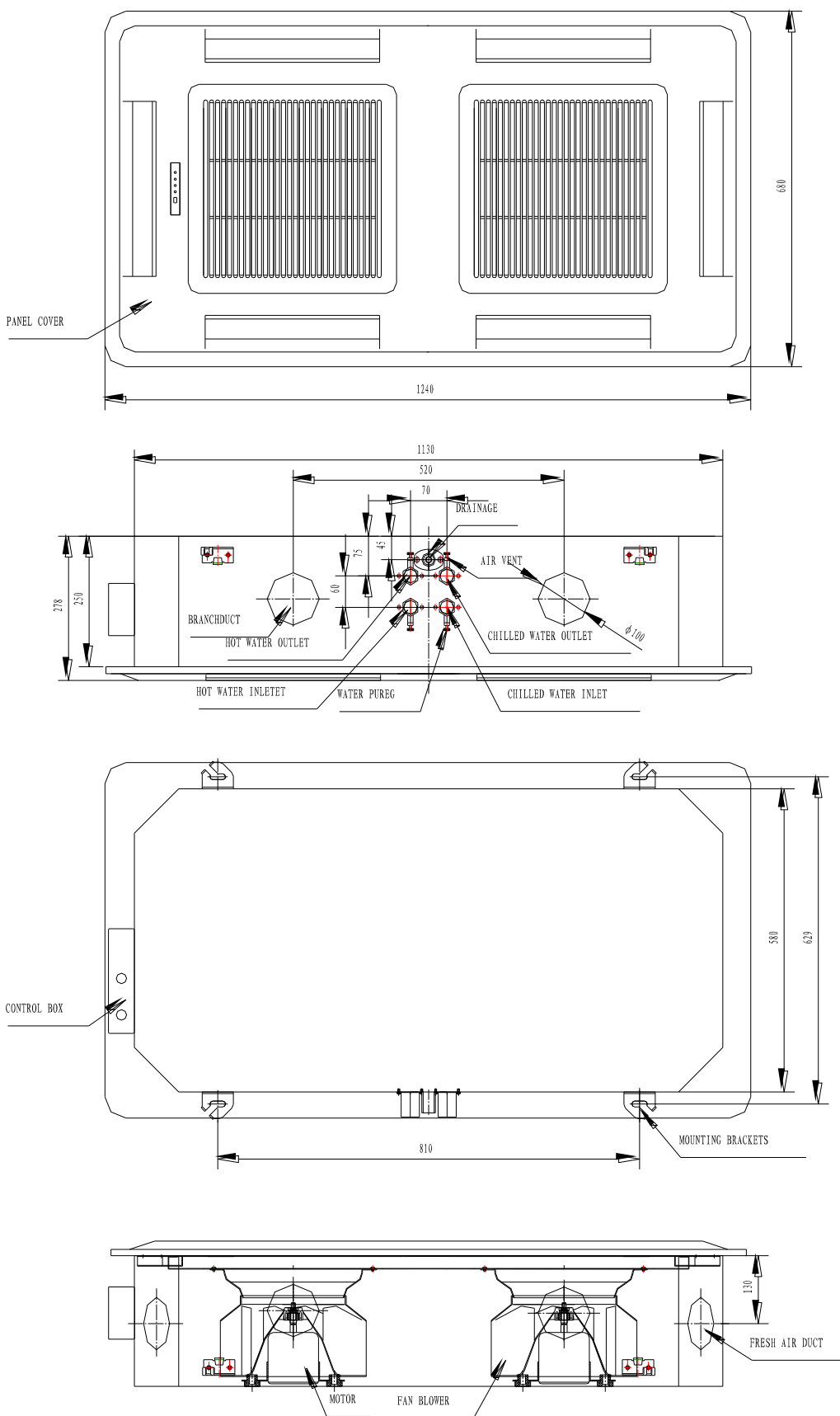
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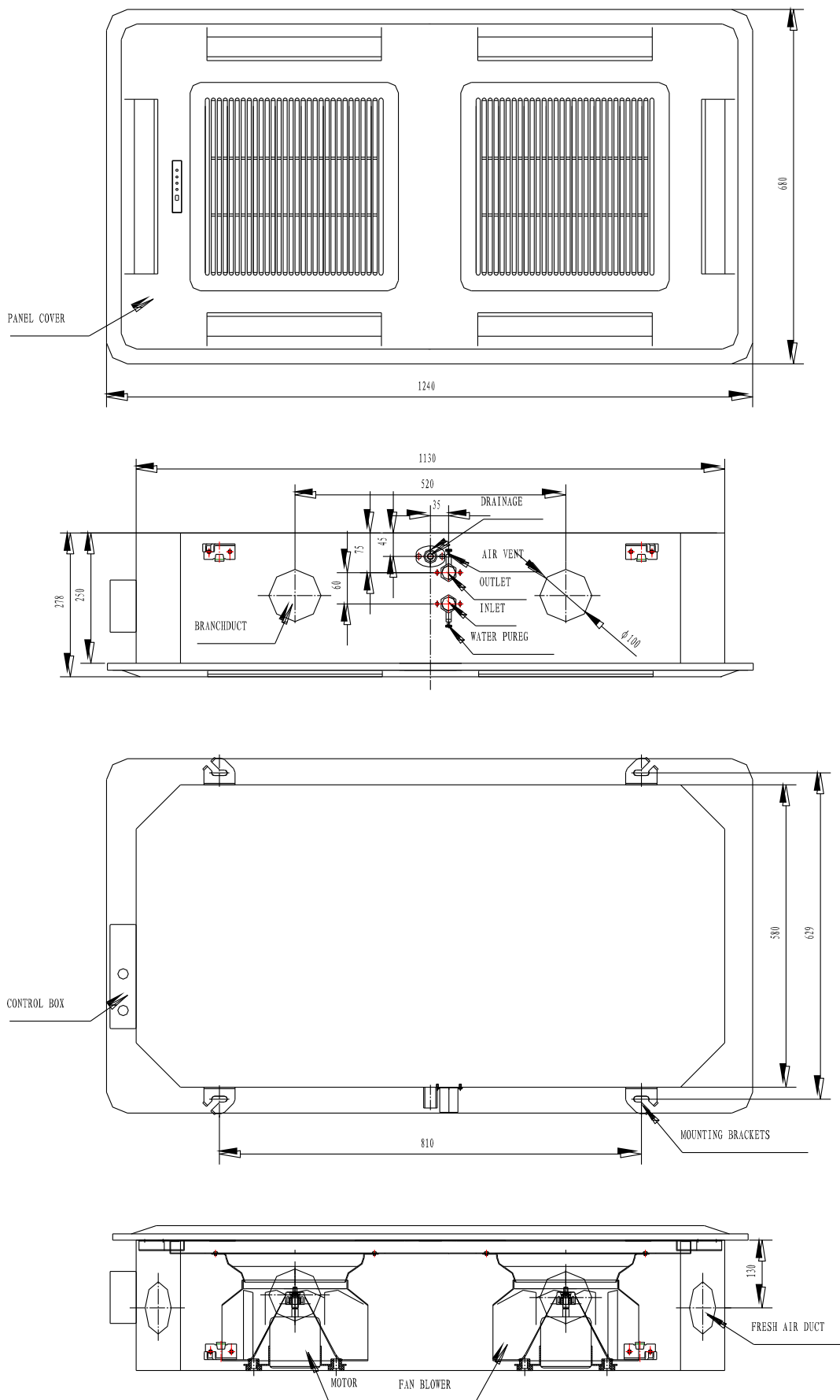
Dimensional Drawings: PCE2-06/08/08R-V



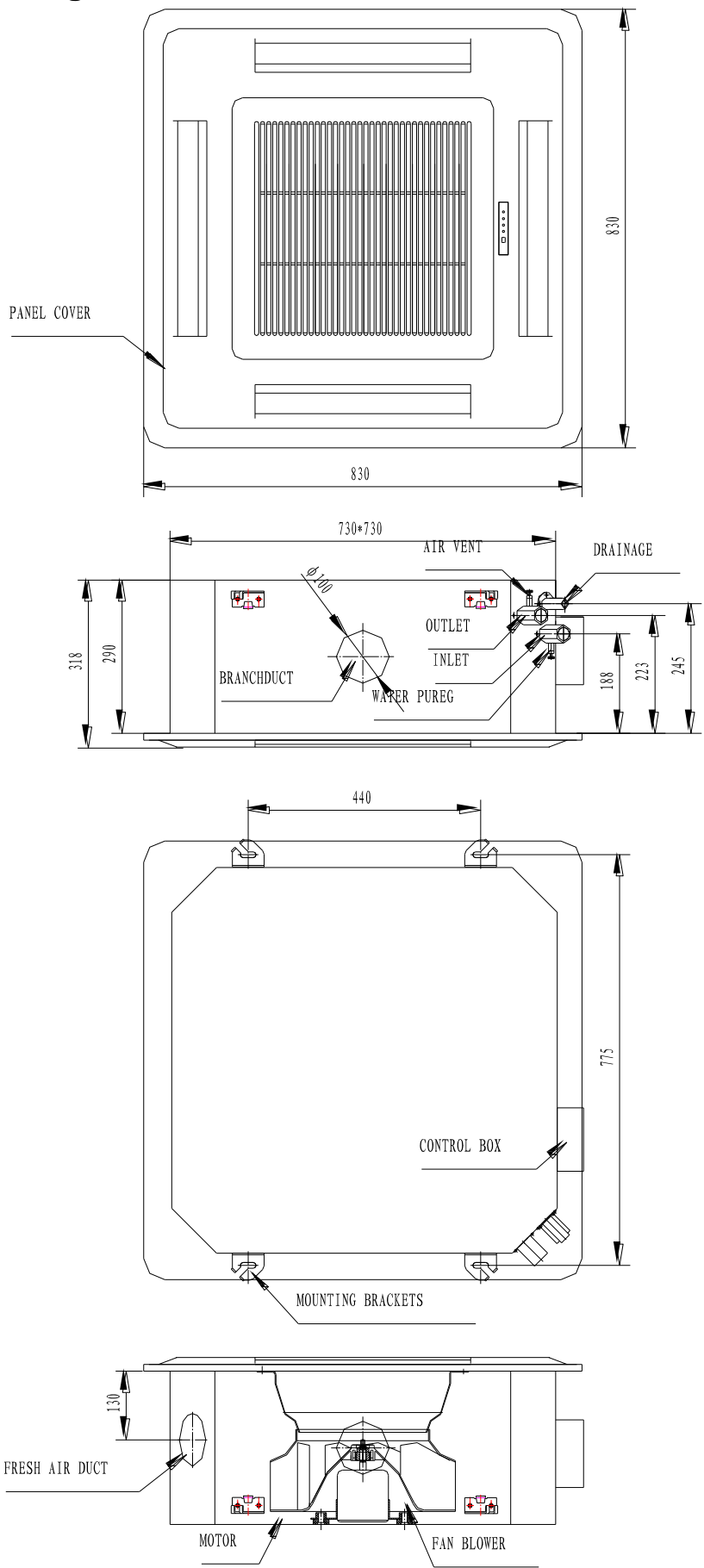
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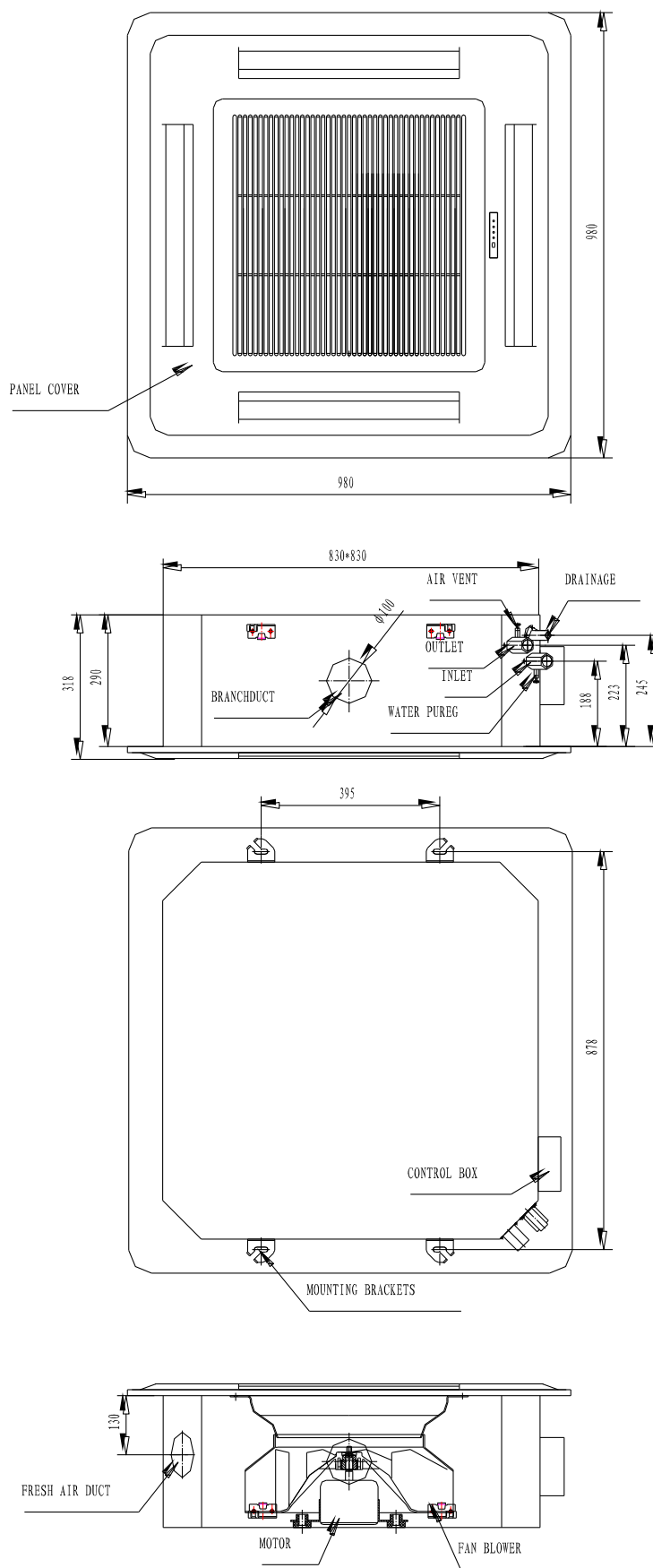
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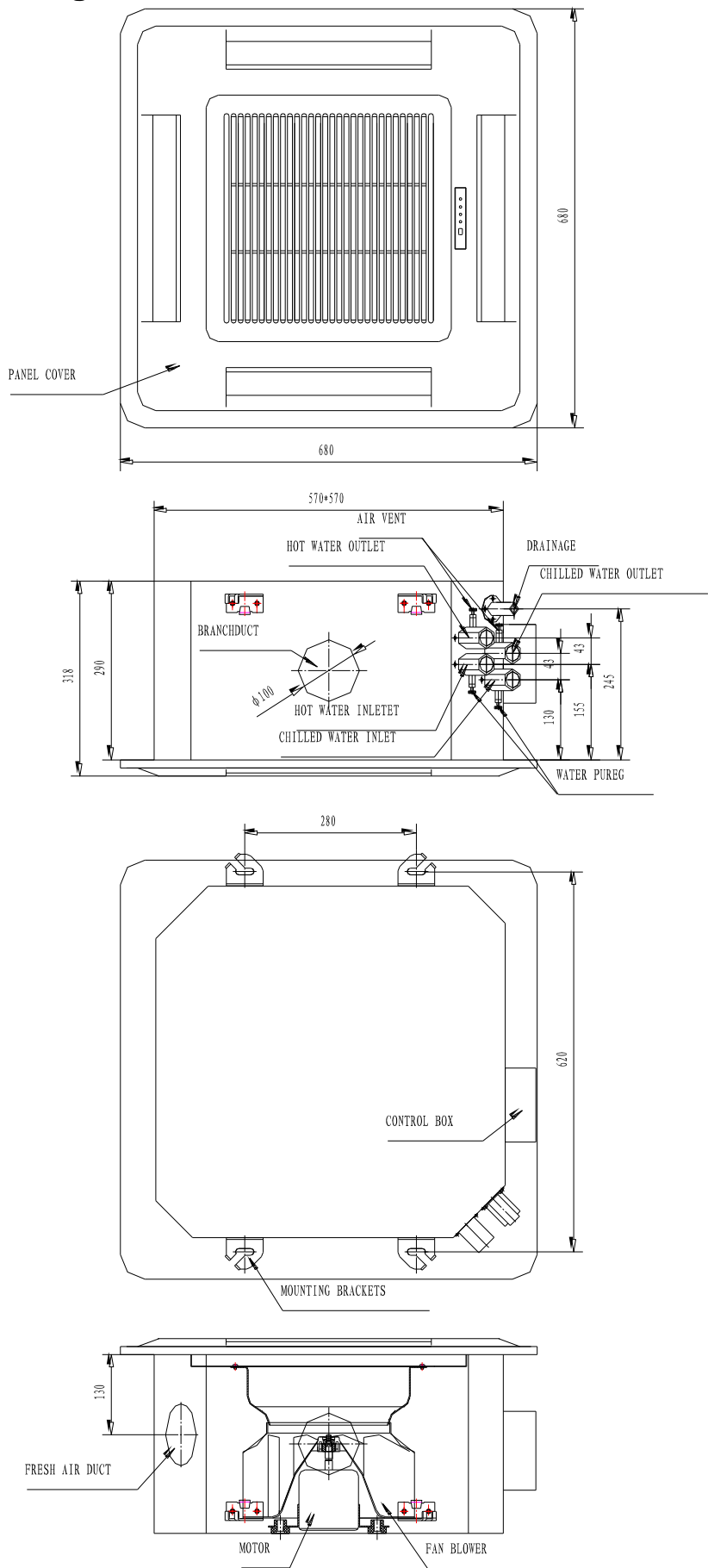
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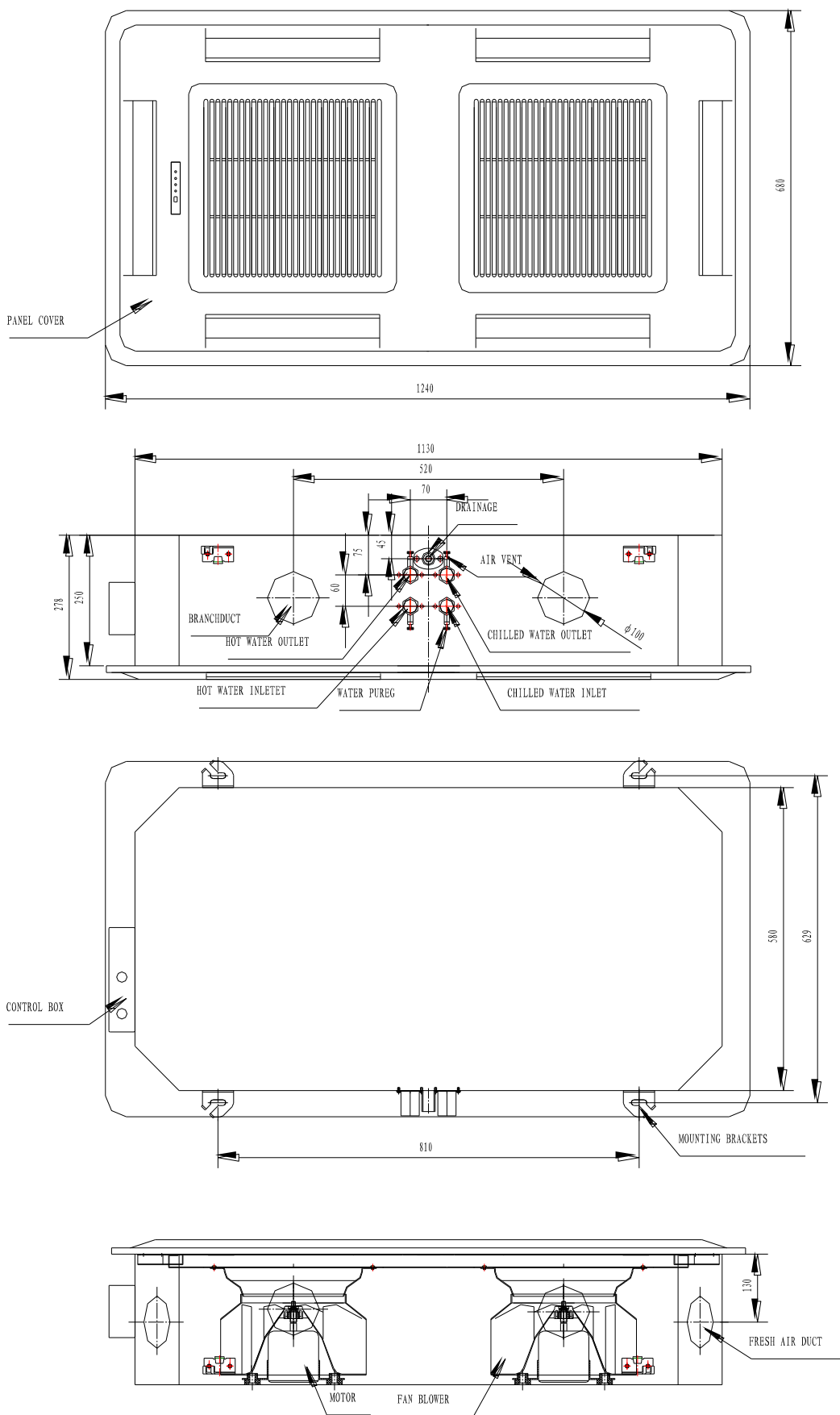
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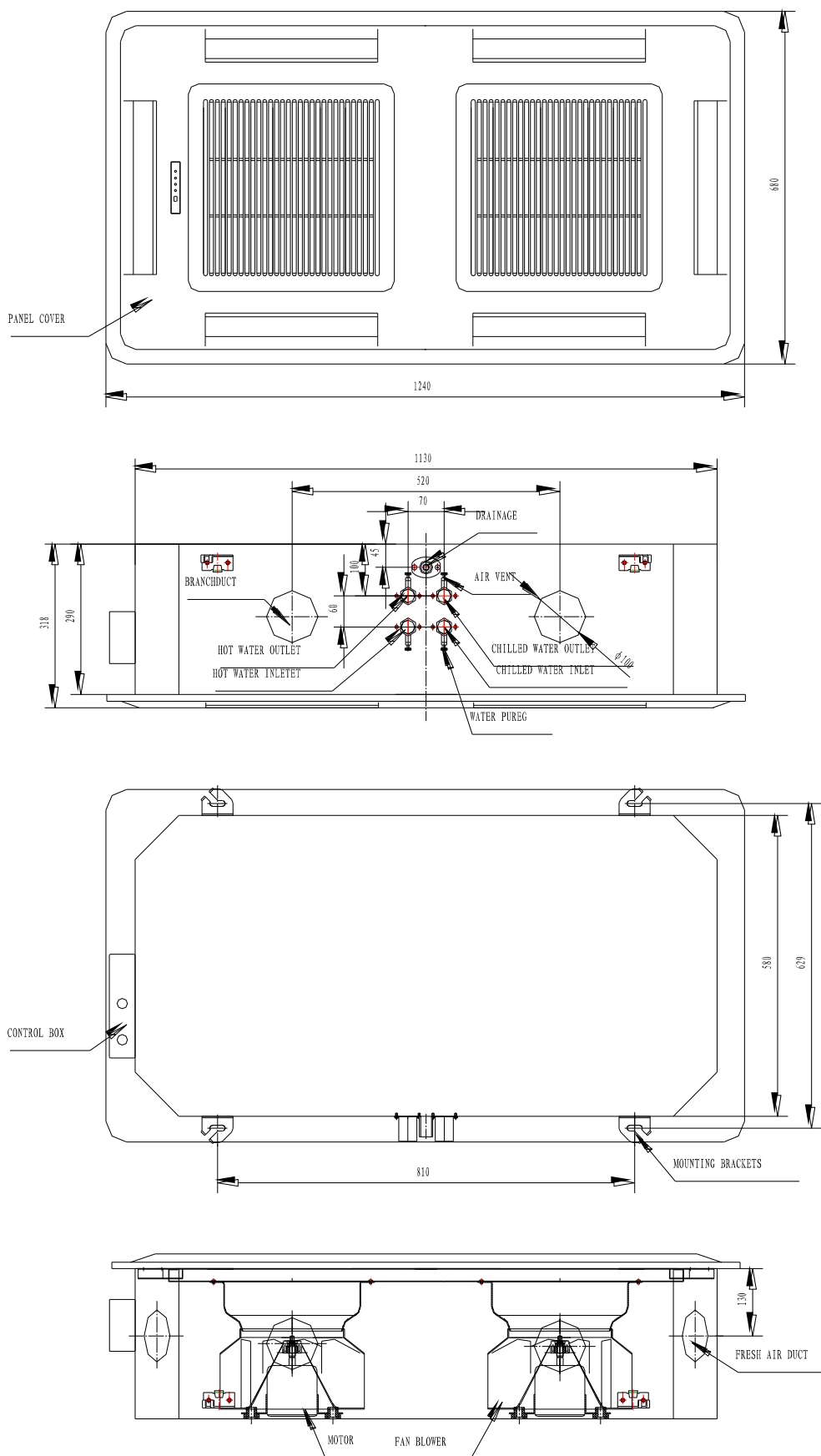
Dimensional Drawings: PCE2-08-P



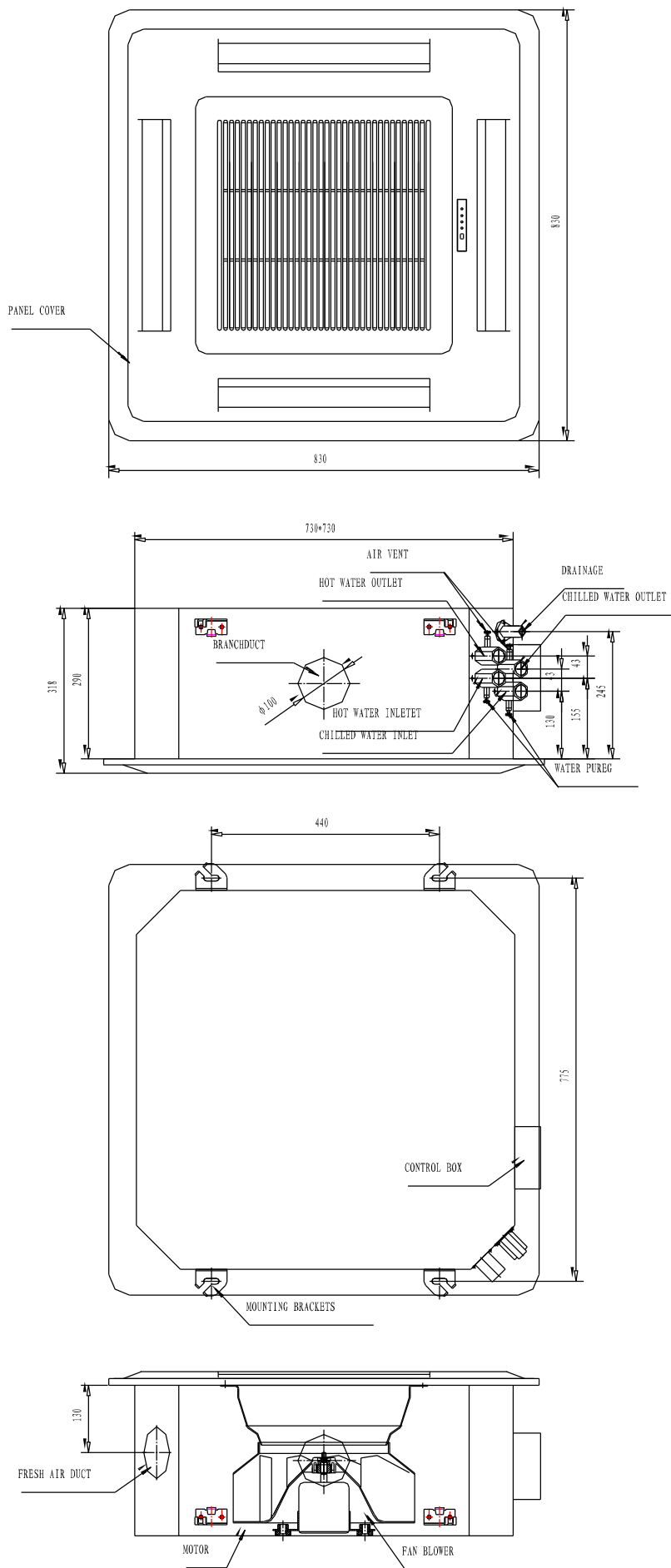
Dimensional Drawings: PCE2-09-P



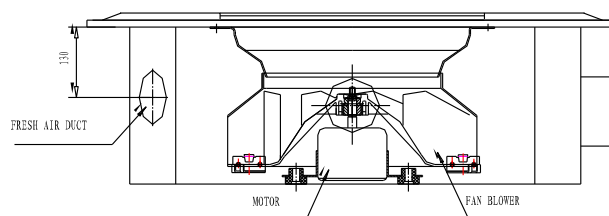
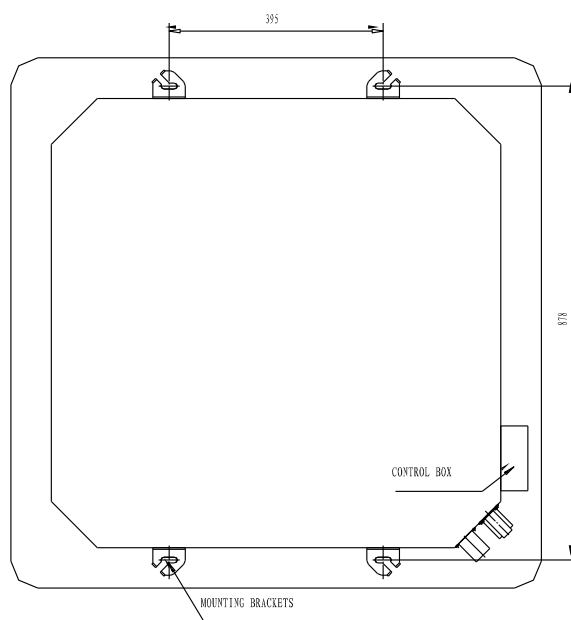
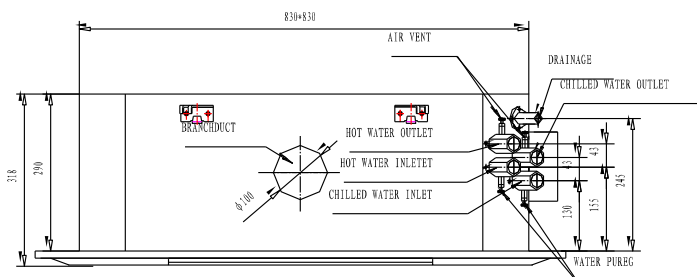
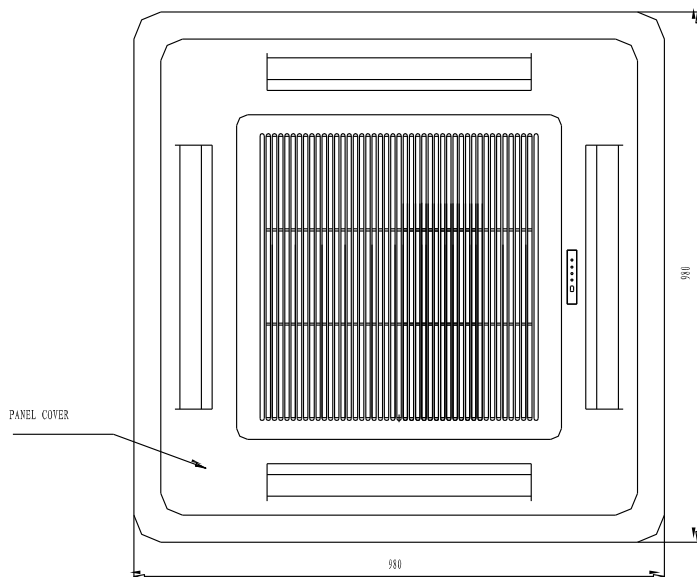
Dimensional Drawings: PCE2-16-P



Dimensional Drawings: PCF2-12-P



Dimensional Drawings: PCF2-20-P



A.5. Valve Information

Model Definitions

SK-DFPS-A-005a:

3-way ball valve with 3/4" inch connectors and on/ off motorized actuator

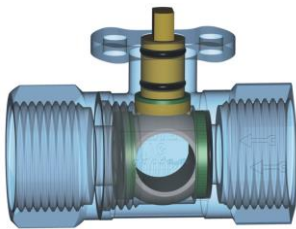
SK-DFPS-A-005b:

2-way ball valve with 3/4" inch connectors and on/ off motorized actuator

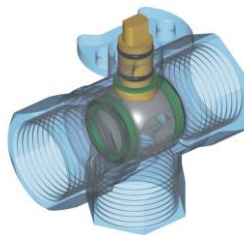


Specifications	Materials
Medium: Cool/Hot water or 60% glycol Caliber: DN15, DN20, DN25, DN32 Structure: Two way or Three way Operating Mode: On/Off or 3-point control (24VAC) Power Supply: AC110V, AC220V, AC24V etc. Power Consumption: 6W (during valve position change) Running Times: 15 sec. Pipe Fitting: NPT internal thread	Body: Forged brass, nickel plated Ball: Chrome plated brass Stem: Brass Seats: Fiberglass reinforced Teflon PTFE Seal: 2 EPDM O-rings, lubricated Pressure Rating: 2MPa Media Temp. Range: 34°F to 203°F (1°C to 95°C) Max. Differential Pressure: 1MPa Protection Grade: IP65 Types: 2-way Valve, 3-way Valve (base)

Structure Schematic of Valve Bodies

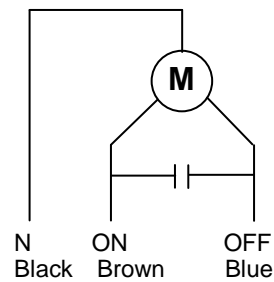


2- way Valve

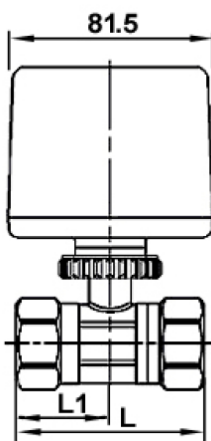


3- way Valve (base)

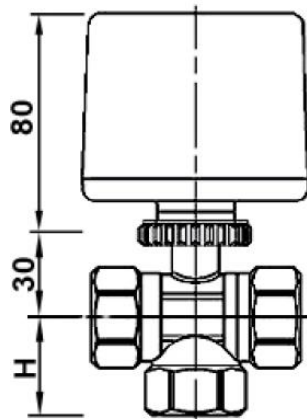
Wiring Diagrams



Dimension



2- way Valve



3- way Valve (base)

Caliber Inch (mm)	Kv Value	L	L1	H
3/4" (DN20)	7.50	66mm	33mm	36mm

B. Safety Precautions

- When installing or performing maintenance or servicing the air conditioning equipment, observe the precautions stated in this manual, in addition to those stated in the labels attached around the unit.
- Ensure all local and national safety codes, laws, regulations, as well as general electrical and mechanical safety guidelines are followed for installation, maintenance and service.
- The appliance is for indoor use only.
- Ensure the correct mains supply, with respect to the rating label on the unit, is used.
- Power supply shall be incorporated in the fixed wiring and have an air gap in contact separation of at least 3mm in each active phase of conductors.
- If the supply cord is damaged, it must be replaced by qualified persons.
- Installing and servicing air conditioning equipment should be done by qualified service personnel only.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning.
- Children should be supervised to ensure they do not play with the appliance.
- User of this appliance is responsible for his / her own safety.
- Warranty shall be voided if installation instructions and safety precaution stated in this manual are not observed.
- Never cut off the mains supply when unit is under operation. The unit should be switched off by using only the ON-OFF button on the control interface.

WARNING

Before any service or maintenance operations turn off the mains electrical supply.

B.1. Installation

First check the contents of the package.

B.1.1. Standard configurations and accessories

There are three types of plug-and-play control box:

- **SK-NCEF-001b control box:**

PCE2(F2)-(V/P)S configuration – complete function integrated controller, compatible with IR handset controller, wired wall-pad, serial networking for master-slave and MODBUS applications.

- **SK-NCEF-002 control box:**

PCE2(F2)-(V/P)W or PCE2(F2)-(V/P)W-EH configuration – limited function controller, compatible with standard wired thermostat controller, with zone control functionality.

Optional and standard accessories supplied with the unit are dependent on control configuration type.

Accessory list:	Control Configuration Type	
	~S: Complete function onboard PCB with integrated group control functionality.	~W: Limited function onboard PCB with drain-pump, louver and zone control functionality.
SK-NCEF-001b Control box with complete function controller.	Standard: Factory installed	N/A
SK-DFPS-A-002.1: IR remote handset	Optional (1 pc)	N/A
SK-DFPS-A-002.2: Wired wall-pad	Optional (1 pc)	N/A
SK-NCEF-002 Control box with limited functionality	N/A	Standard: Factory installed
SK-DFPS-A-001~: STCD wired thermostats ALL models	N/A	Optional (1 pc)
Installation Manual	Standard (1 pc)	Standard (1 pc)
External Drain Pan	Standard (1 pc)	Standard (1 pc)

B.1.2. Operating Limits

Power supplies

Volt	Phase	Hz
230	1	50
220	1	60

Water circuit

Minimum entering water temperature	+2 °C
Maximum entering water temperature	+80 °C
Water side maximum pressure	1400 kPa (142 m.w.c)

B.1.3. Before Installation

- The installation site must be established by the system designer or other qualified professional, taking account of the technical requisites and current standards and legislation.
- Cassette fan coils must be installed by an authorized company only.
- Cassette fan coils are designed for installation in a false ceiling, for intake of fresh air from outside and for deviation of a small part of the treated air for discharge in a neighboring room.
- They must be installed in such a way as to enable treated air to circulate throughout the room and in respect of the minimum distances required for technical maintenance operations.
- It is advisable to place the unit close to the installation site without removing it from the packaging.
- Do not put heavy tools or weights on the packaging.
- Upon receipt, the unit and the packaging must be checked for damage sustained in transit and if necessary, a damage claim must be filed with the shipping company.
- Check immediately for installation accessories inside the packaging.
- Do not lift unit by the condensate drain discharge pipe or by the water connections; lift it by the four corners.(Figure 1)
- Check and note the unit serial number.

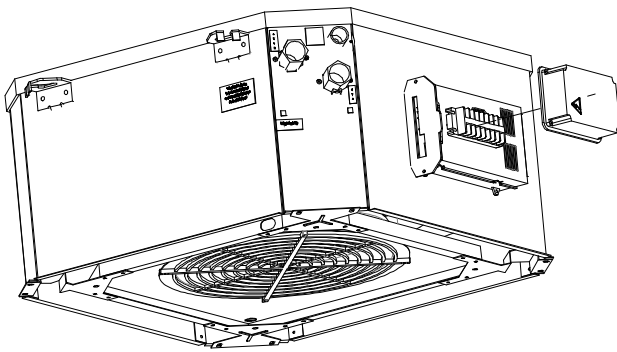


Figure 1

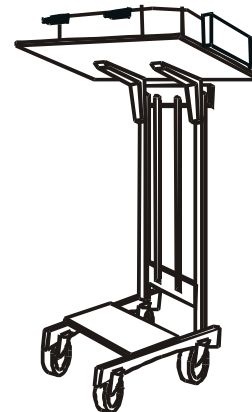


Figure 2

B.1.4. Installation Location

- Do not install the unit in rooms where flammable gas or alkaline acid substances are present. Aluminum/copper coils and/or internal plastic components can be damaged irreparably.
- Do not install in workshops or kitchens; oil vapors drawn in by treated air might deposit on the coils and alter their performance or damage the internal plastic parts of the unit.
- Installation of the unit will be facilitated by using a stacker and inserting a plywood sheet between the unit and the elevated stacker.(Figure 2)
- It is recommended to position the unit as centrally as possible in the room to ensure optimum air distribution.(Figure 3)
- Generally the best louver position is the one which allows air diffusion along the ceiling. Alternatively intermediate positions can be selected.
- Check that it is possible to remove panels from ceiling in the selected position, to allow enough clearance for maintenance and servicing operations.

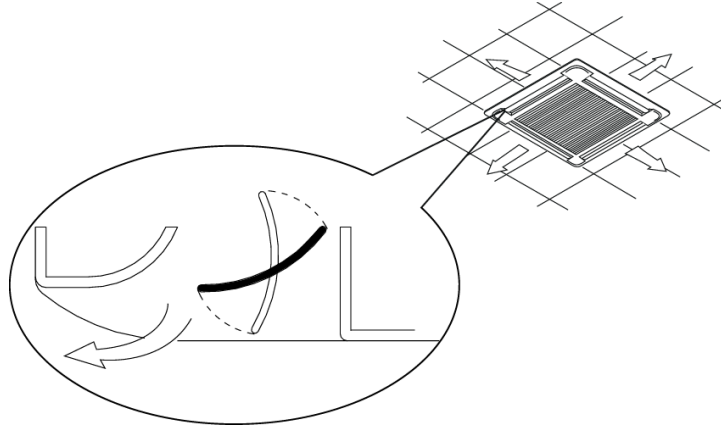


Figure 3

B.1.5. Installation and False Ceiling Clearance

- Having sufficient strength to carry the weight of the unit.
- Where the inlet and outlet grilles are not obstructed and the conditioned air is able to blow all over the room.
- From where condensate can be easily run to drain.
- Check the distance between the upper slab and false ceiling to ensure the unit will suit the distance.
- Ensure there is sufficient space around the unit to service it.

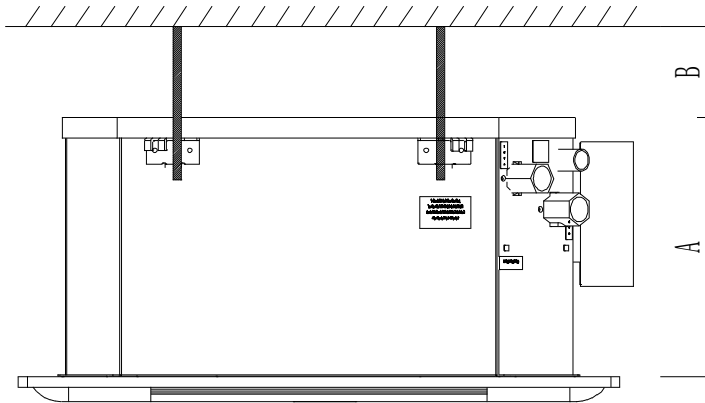


Figure 4

Model	A (mm.)	B (mm.)
PCE2-03/04/09	255	10 or more
PCE2-06/08/08R/12/16	290	10 or more
PCF2-16/18/20		
PCF2-09/10/12	260	10 or more

B.1.6. Pipe Works

Indoor Unit

- The unit is fitted with a condensate pump with a 500 mm. lift.
- The unit is provided with 22 mm. bore flexible hose 300 mm. long.
- The flexible hose should be fitted into a 22 mm O/S Φ . polyvinyl tube and sealed.
- The drain must be installed with a downward slope.
- On completion the drain line should be insulated.

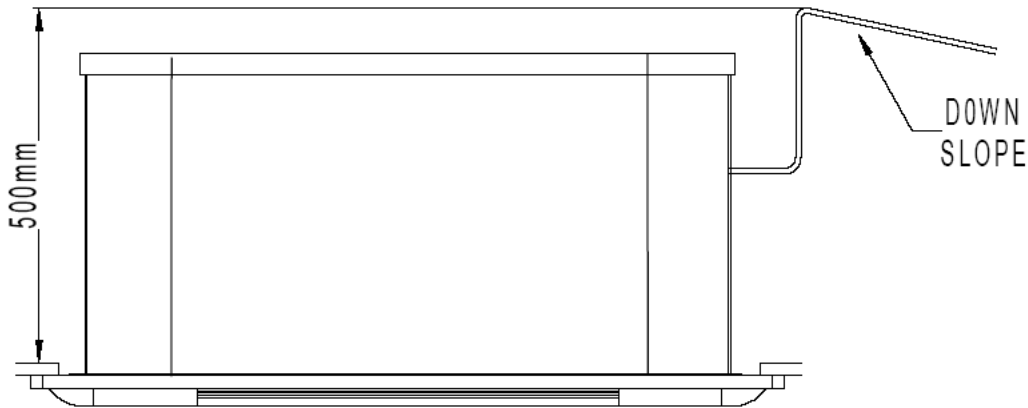


Figure 5

B.1.7. Water Connections

The cassette unit uses a 3/4" water piping connection with gaskets. It is advisable to tighten the connections with two spanners.

B.1.8. Valve configurations

- ~S: Units are compatible with:
 - 230VAC 2-way and 3-way on/off valves (thermoelectric or electric motor-driven actuation), with OPEN/CLOSE state actuation.
- ~W: Valve control originates in external wired thermostat. See thermostat manual for details.
- Connections:

Review below table for information on valve diameter.

Model	External valve information	
	Type	Connector dia. (inch)
All models	2-way & 3-way	3/4"

- Valve installations:

See drawings of external valve installation below, by model type.

2-pipe systems:

Single fan model

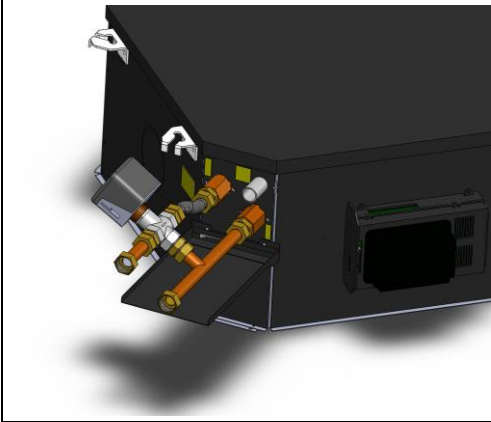


Figure 6

Twin fan model

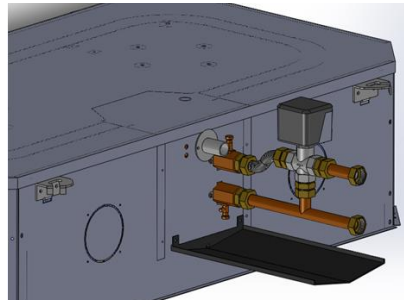


Figure 7

4-pipe systems:

Single fan model

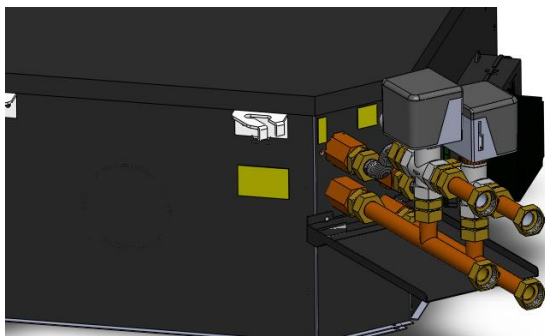


Figure 8

Twin fan model

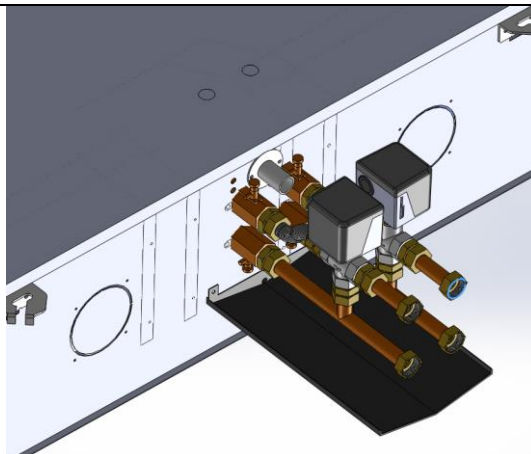


Figure 9

B.1.9. External Drain Pan

Procedures:

1. Align the two screw holes in the fixing plate to the two holes in the external drain pan. (Figure 10)
2. Make sure the drain pan is horizontal.
3. Tighten the two screws and making sure the external drain pan is installed flush with the fixing plate. (Figure 11)

When the installation is completed, it is necessary to wrap connecting pipe with thermal insulation to prevent condensation on ceiling tiles.

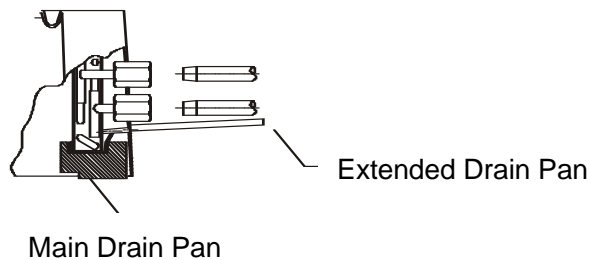
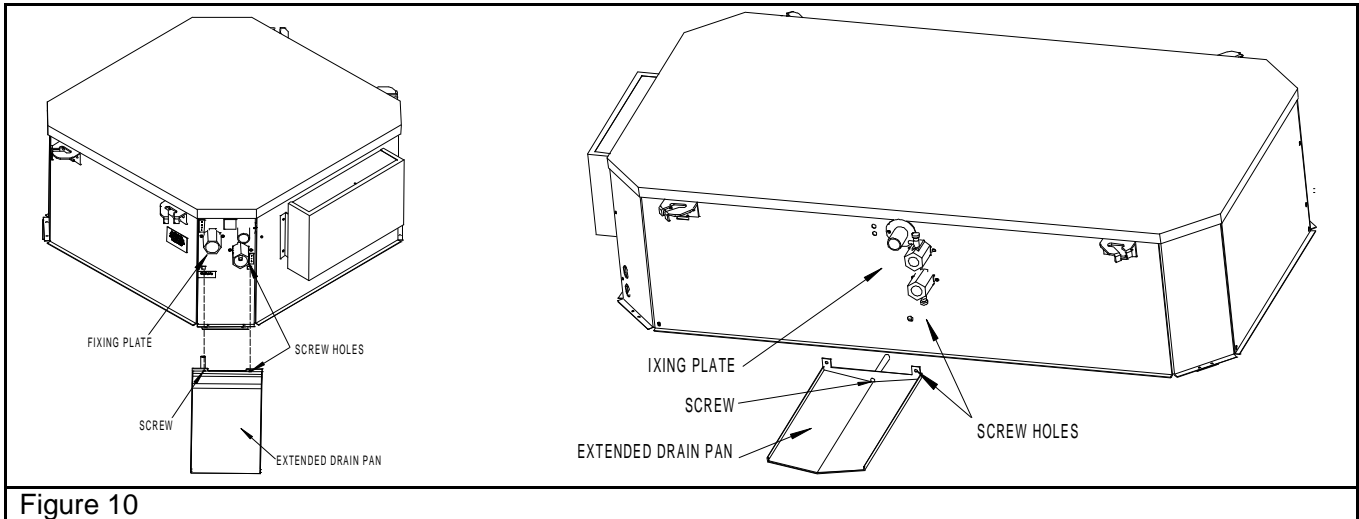


Figure 11

B.1.10. Fresh Air Renewal Connection

The fresh air system for cassette unit allows fresh air intake.

1. The side opening allows separate ductwork to be installed for outside air intake and branch ducting. (Figure 12).
2. Cut and remove thermal insulating material.
3. Open the mounting plate.
4. Install your flanges and conduits to casing. Conduit can be flexible polyester with spring core or corrugated aluminium externally coated (dia.4 in.) with anti- condensate material (fiberglass 12-25 mm thickness).

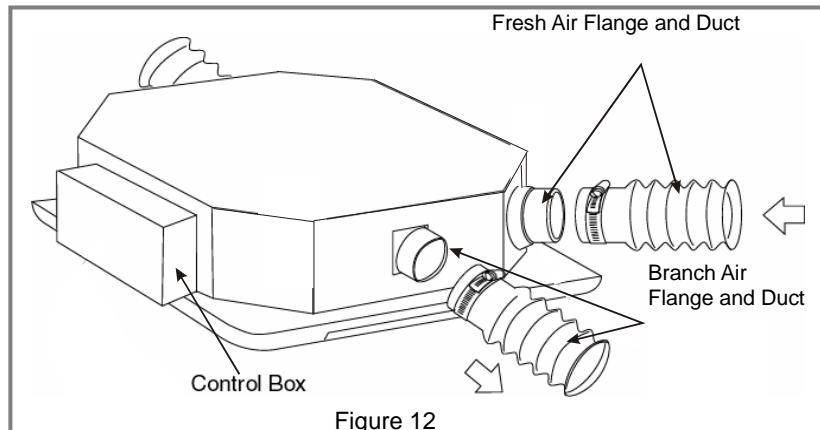


Figure 12

Fresh air

There is one opening for connecting a fresh air duct for PCE2-04-08 and PCF2-12-20. There are two openings for connecting fresh air ducts for PCE2-09-16.

Branch air

PCE2-04-08 and PCF212-20: Two openings each.

PCE2-09-16: Four openings each.

Order flanges (spigots) and blanking plates as accessories separately.

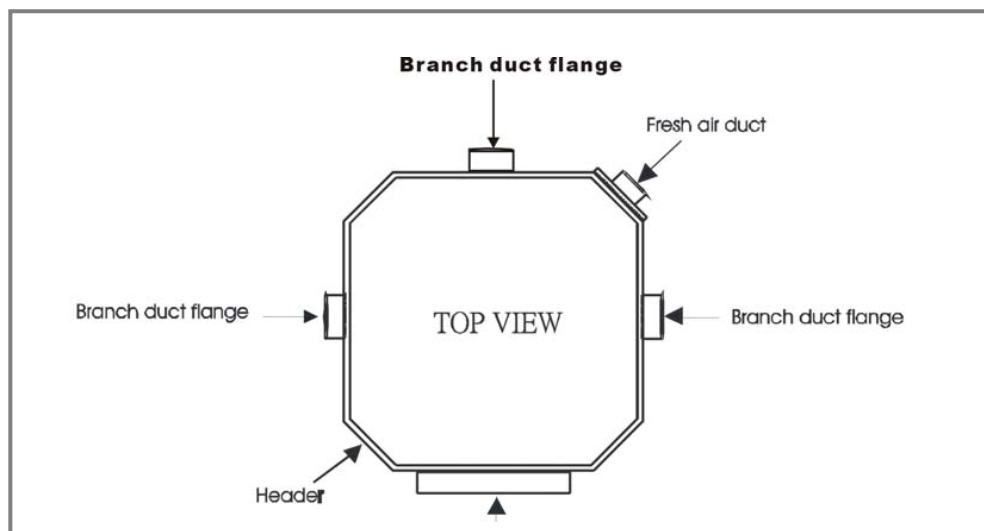


Figure 13

NOTE:

- Branch duct flange (Optional part)
- Fresh air duct flange (Optional part)
- Blanking plate (Optional part)

B.1.11. Branch or Fresh air Duct Connection

- The side opening allows separate ductwork to be installed for branch ducting. (Figure 14).
- Cut and remove anti-condensate insulating material.
- Install your flanges and conduits to casing. Conduit can be flexible polyester with spring core or corrugated aluminum externally coated (dia.4 in.) with anti-condensate material (fiberglass 12-25 mm thickness).

Flanges (spigots) and blanking plates are available as separate accessories items.

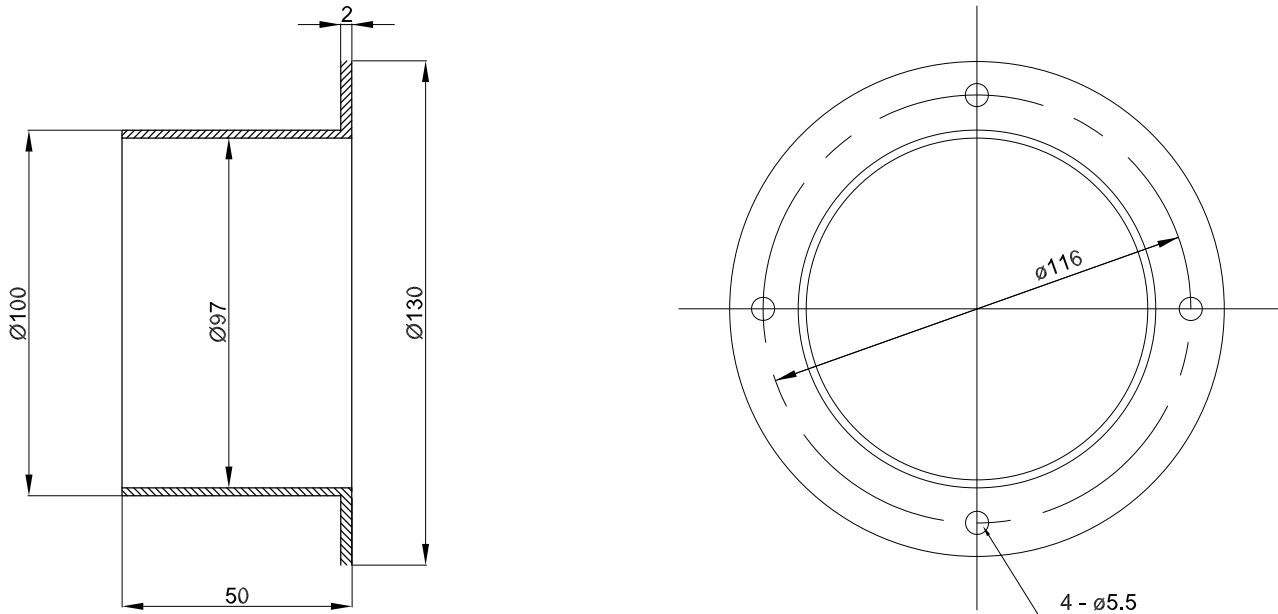


Figure 14 - Branch and Fresh air Duct Dimension

B.1.12. Branch Duct Installation Procedure

1. Look for the yellow sticker on the casing for location of branch duct or fresh air intake connections.
2. The sticker is at the center of a knock out hole underneath the casing insulation. Use a cutter and follow along the pre-cut circular marking as shown and trim off the insulation.
3. Knock out the pre-cut hole.
4. Connect the flange on to the opening with $\Phi 3$ mm. x 12 mm. tapping screws.

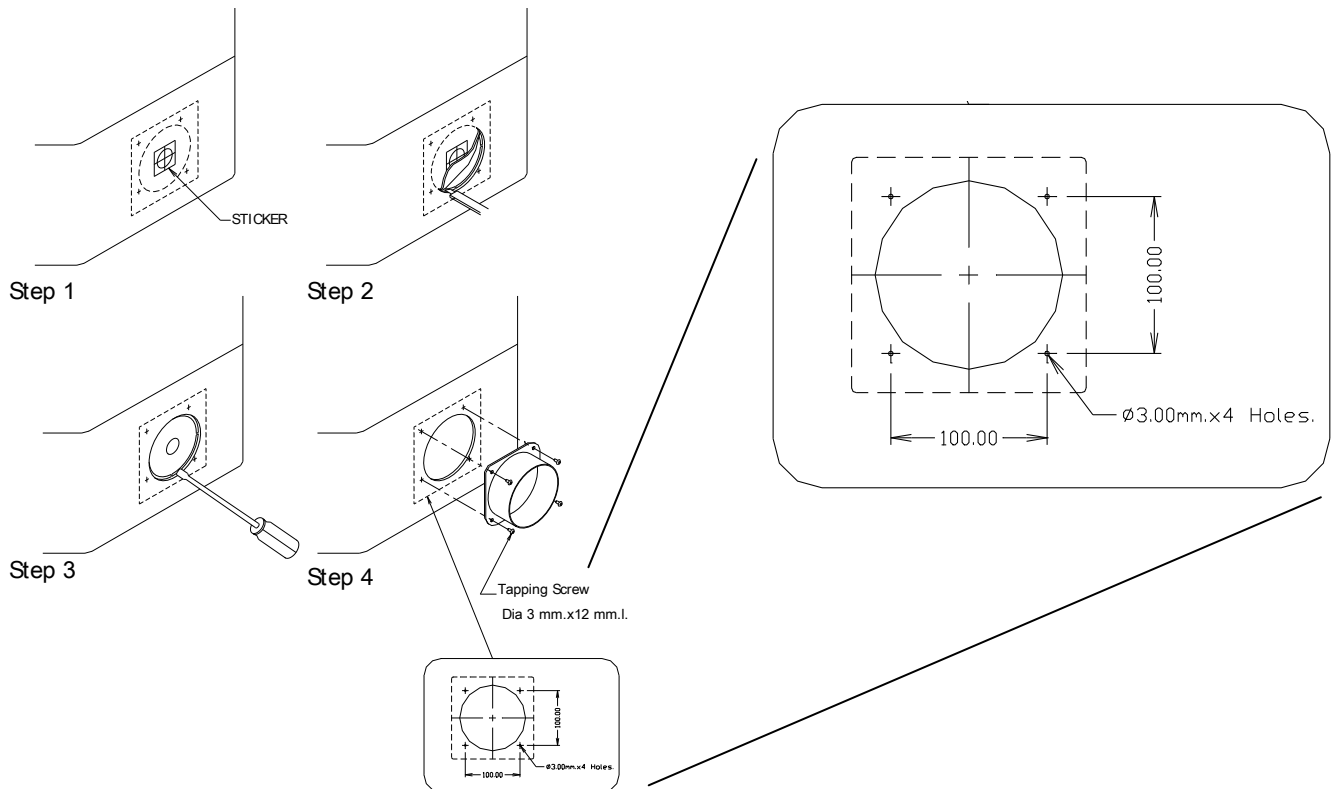


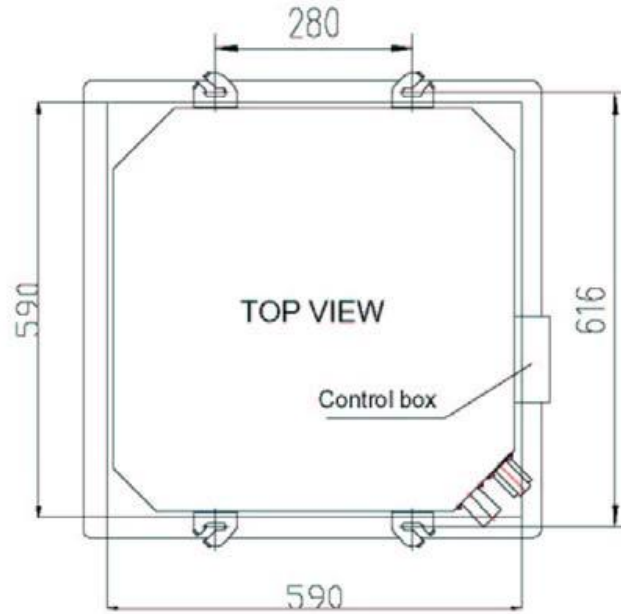
Figure 15

(All dimensions shown in mm)

B.2. Suspension Bolts Layout and False Ceiling Opening

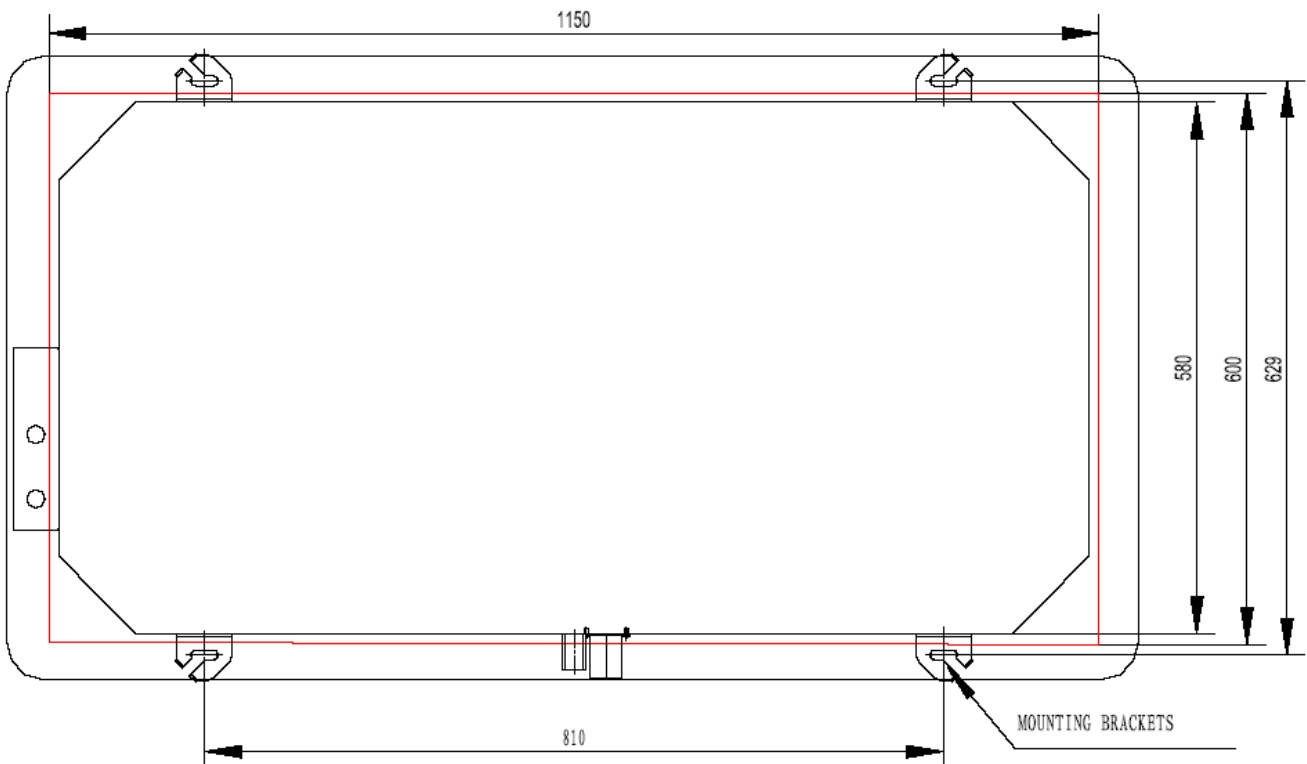
Using the installation template open ceiling panels and install the suspension bolts as in Figures below.

PCE2-03/04/06/08/08R~



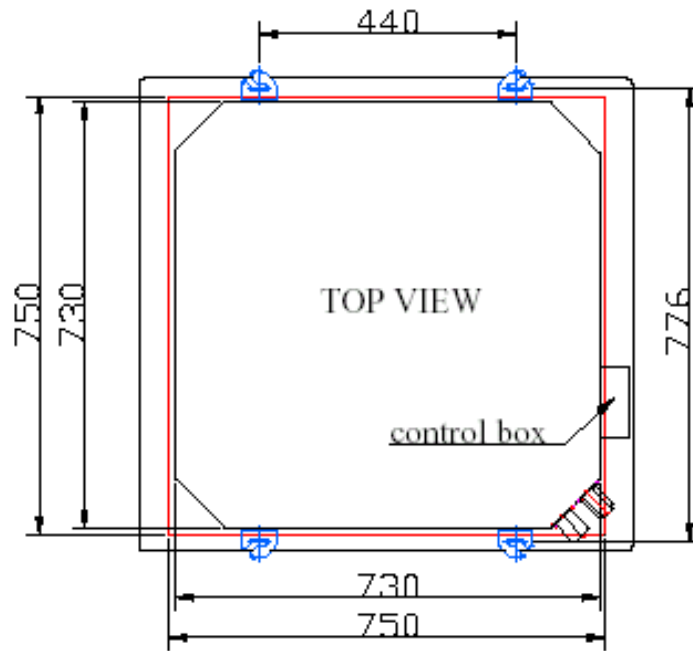
590 x 590: Dimensions for opening
616 x 280: Suspension Bolts

PCE2-09/12/16~



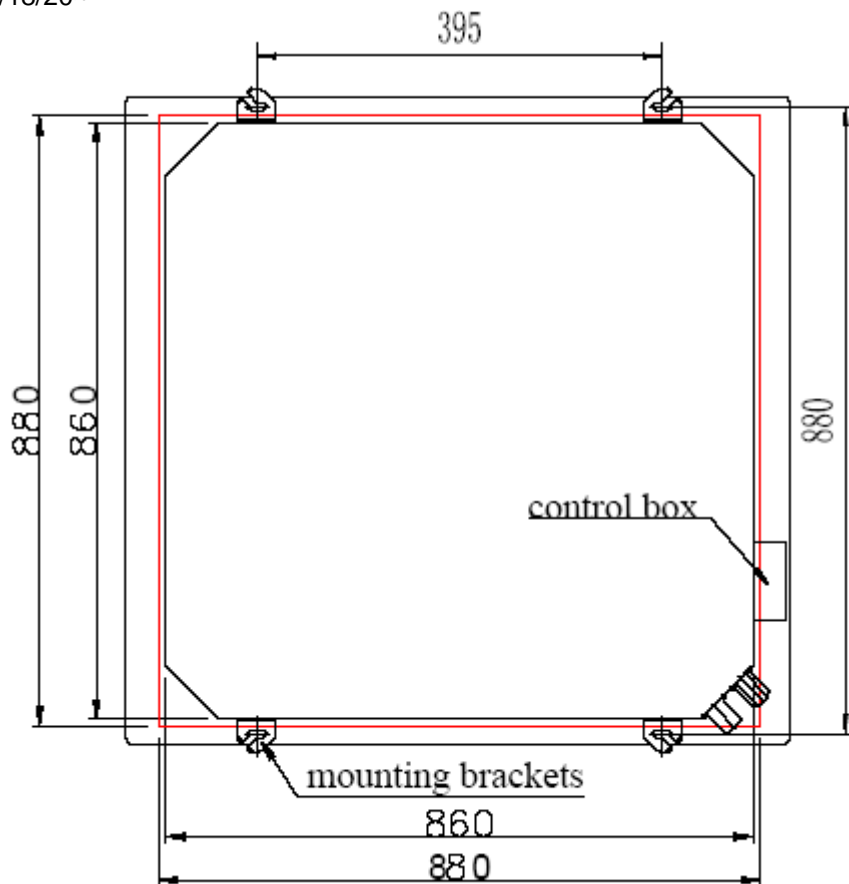
600 x 1150: Dimensions for opening
810 x 629: Suspension Bolts

PCF2-09/10/12~



750×750: Dimensions for opening
440×776: Suspension Bolts

PCF2-16/18/20~



850× 850: Dimensions for opening
395 × 880: Suspension Bolts

B.2.1. Suspension Structure

- Mark position of suspension rods, water lines and condensate drain pipe, power supply cables and remote control cable.
- Supporting rods can be fixed, depending on the type of ceiling, as shown in Figure 16 and Figure 17.
- Fit suspension brackets supplied with the unit to the threaded rods (Figure 18)
- Do not tighten nuts and counter nuts; this operation has to be done only after final leveling of the unit, when all the connections have been completed.
- Ensure the ceiling is horizontally level, otherwise condensate water cannot drain.
- The casing is fixed to the slab with 4 drop rods. The rods should have two nuts and washers to lock the unit in position. The cassette brackets will then hook over the washers.
- When lifting the cassette into position, care should be taken. Don't lift the unit by the drip tray.

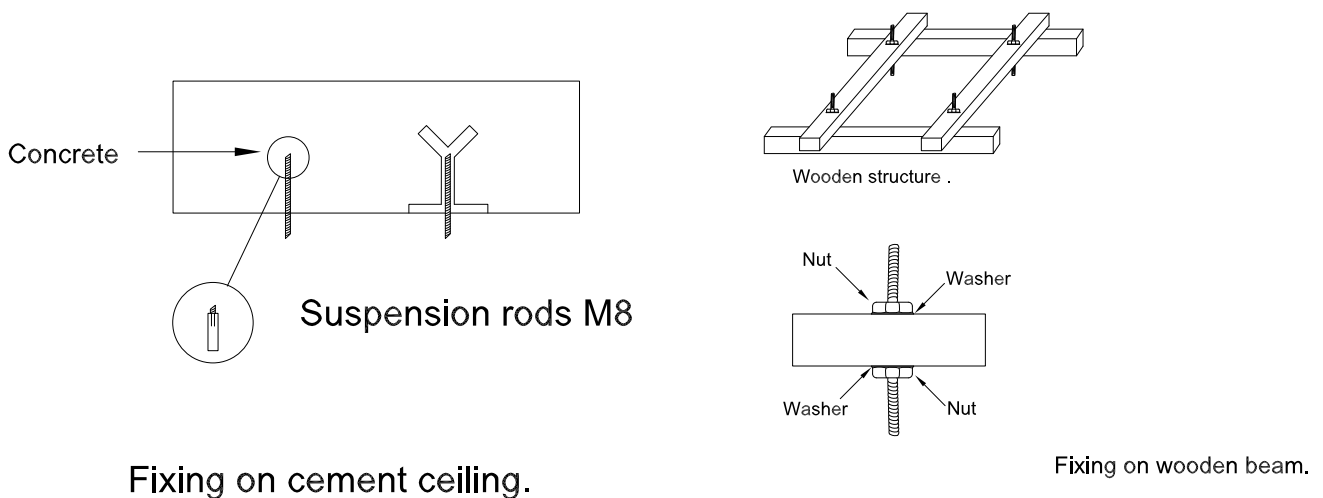
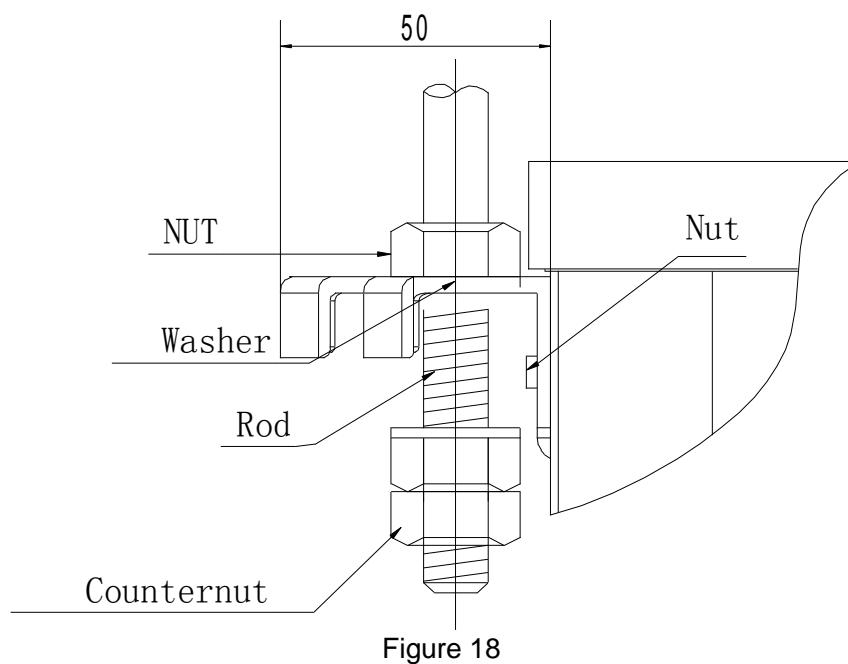


Figure 16

Figure 17



B.2.2. Installation Procedure

1. Lift unit (without the air panel) with care by its four corners only. Do not lift unit by the condensate drain discharge pipe or by the piping connections.
2. Incline the unit (Figure 19, Figure 20, Figure 22, Figure 23) and insert it into the false ceiling. Insert the rods into the bracket slot. With minimum false ceilings clearance, it might be necessary to remove some T bars of the false ceiling temporarily.
3. Using a level guide, line up the unit with a spirit level, and keep dimension between the body and the lower part of the false ceiling (Figure 21, Figure 24).
4. Line up the unit to the supporting bars of the false ceiling tightening the nuts and counter nuts of the threaded rods.
5. After connection of the condensate drain piping and piping connections, check again that the unit is level.
6. The spaces between the unit and ceiling can now be adjusted. Use the drop rods to make the adjustment.
7. Check to ensure the unit is level. The drain will then automatically be lower than the rest of the drip tray.
8. Tighten the nuts on the suspended rods.

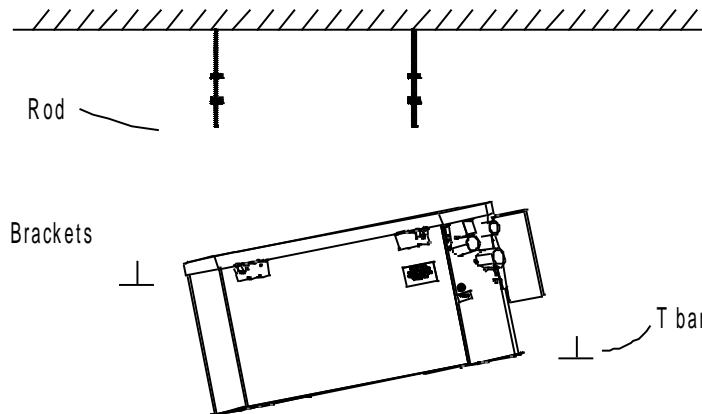


Figure 19

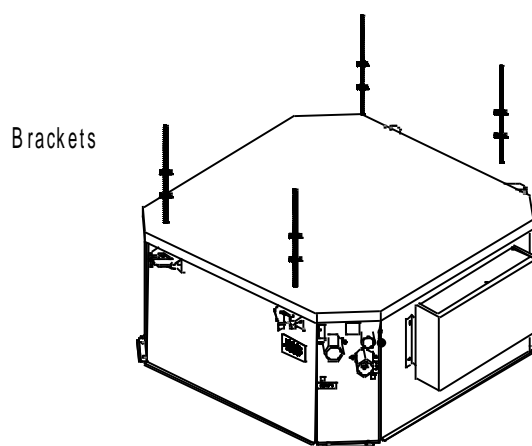


Figure 20

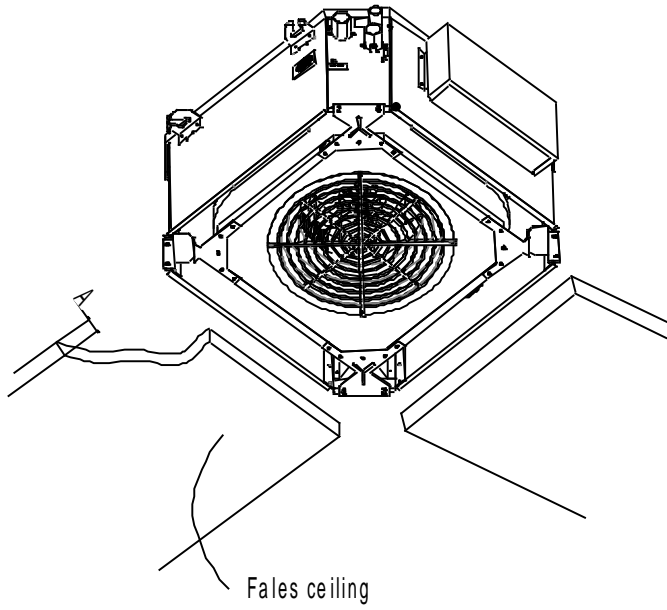


Figure 21

Clearance between the unit and false ceiling for models with single fan

MODEL	All single fan model
Clearance	3mm

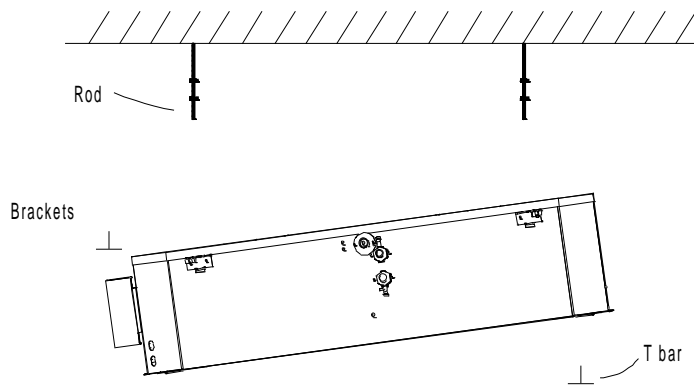


Figure 22

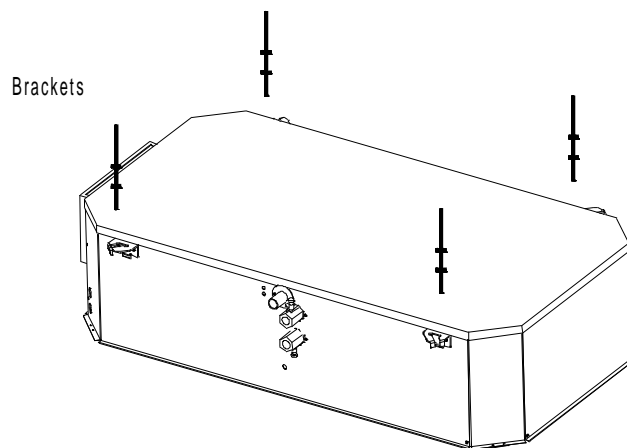


Figure 23

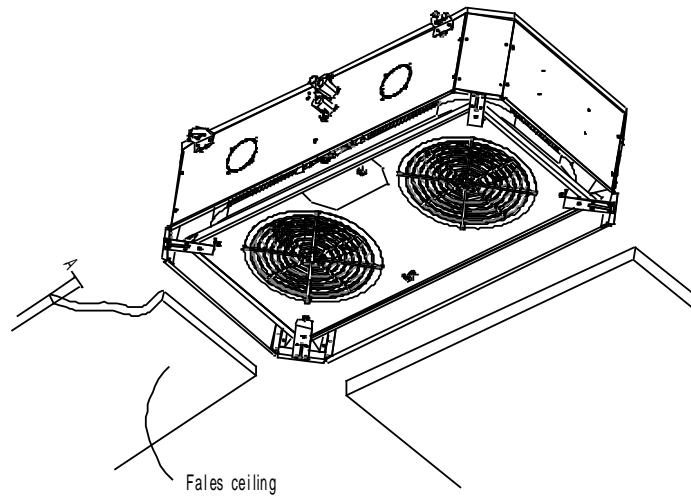


Figure 24

Clearance between the unit and false ceiling for models with twin fan

MODEL	All twin fan model
Clearance	3mm

B.3. Interconnecting Wiring

- We recommend that screened cable be used in electrically noisy areas.
- Always separate low voltage (5VDC) signal wires from power line (230 VAC).
- Do not install the unit where electromagnetic waves are directly radiated at the infra red receiver on the unit.
- Install the unit and components as far away as is practical (at least 5m) from the electromagnetic wave source.
- Where electromagnetic waves exist use shielded sensor cable.
- Install a noise filter if any harmful noise exists in the power supply.

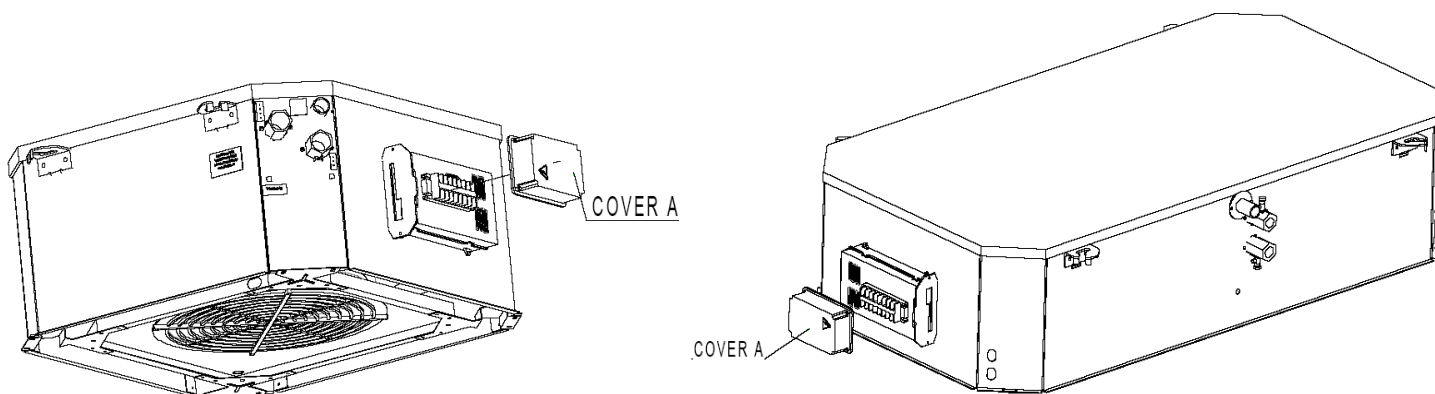


Figure 25

Important note: Please ensure the cable of the main powers supply is longer than 500mm from the control box terminal block. This is to ensure the control box can be slid out easily during maintenance activities.

Always take safety precaution before wiring for mains supply. See section B. Safety Precaution.

B.3.1. Wiring procedures:

1. Open the terminal block cover by removing 4 screws
2. Connect power cable to the terminal according to wiring diagram.
3. Connect room temperature sensor, coil temperature sensors to the control box
4. Connect stepping motor
5. Connect receiver display
6. Connect wall pad (optional)
7. Slide in the control box to the unit casing and fixed with 2 screws

B.3.2. Mounting Front Panel Assembly

1. Remove return grille from front panel.
2. Move the front panel to casing.
3. Tighten 4 screws as shown in Figure 26 and Figure 27.

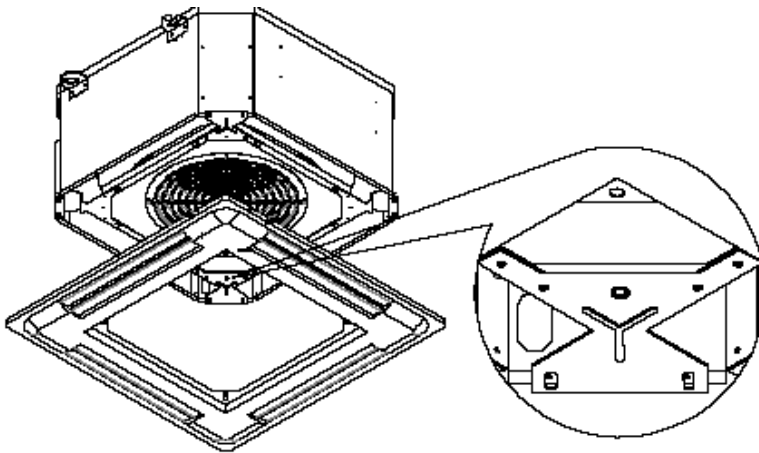


Figure 26

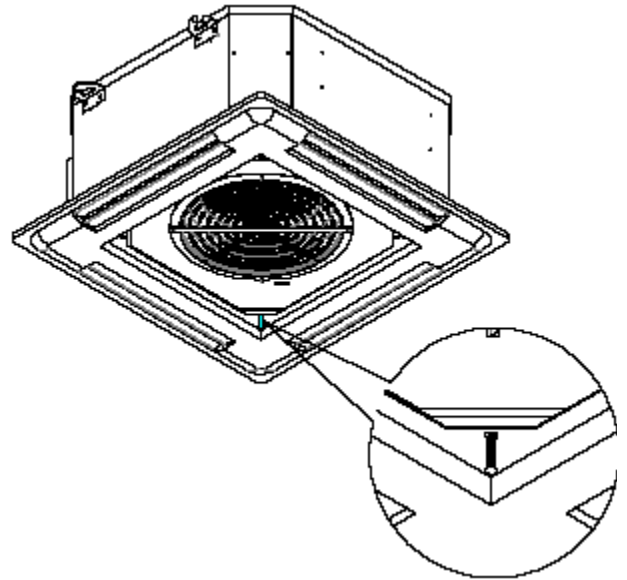


Figure 27

B.3.3. Filter Removal

1. Unlock the two fasteners on the front panel.
2. Open the grille downward with care.
3. Pull the filter out along the slot.
4. Clean the filter and reassemble.

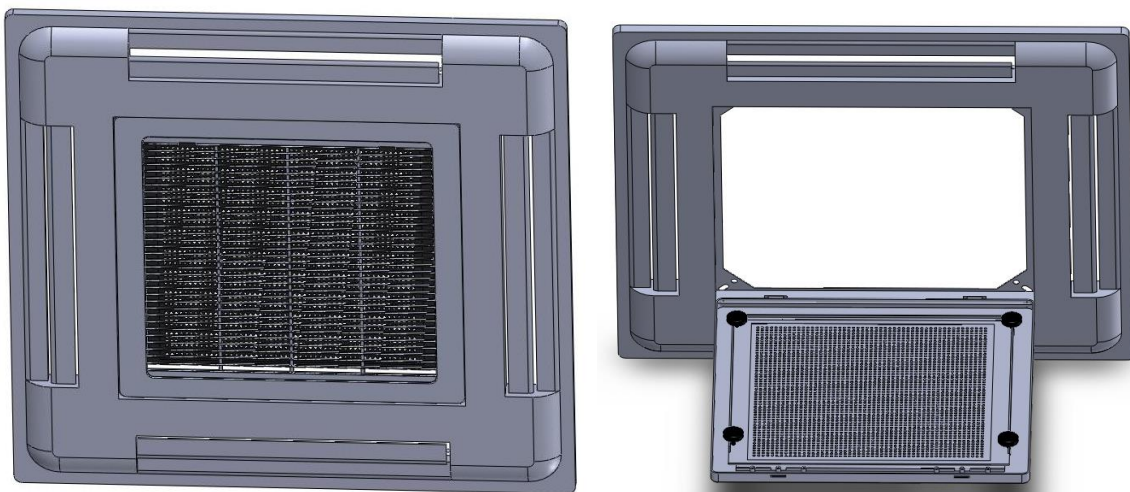


Figure 28

B.3.4. Getting Start-Up

- The unit should not be started up until the system piping has been cleaned and all the air has been purged.
- Check condensate drain pipe slope.
- After you have connected the main power supply to the cassette unit, it is necessary to check the good function of the condensate water pump which is installed inside.
- Due to transport vibration, it might be possible that the float switch is hung up and the pump might not work in the correct way. For this reason, you have to do the following to ensure good functioning of the unit.
- Install the cassette unit in an absolute horizontal position.
- Fill the internal drain pan (manually) with enough water to ensure the drain pump is working.
- You can fill the drain pan by pouring water through the external drain pan.
- If everything is correct, the water will be expelled from unit into the pipe work you have installed. If the water don't expel, please manually check the float switch is not faulty.
- Make sure that air filter is clean and properly installed.
- Ensure that voltage and current values correspond with the unit nameplate values; check electrical connections.
- Verify that louvers are open.

B.4. Maintenance

- 1) Before performing any service or maintenance operations, turn off the main power switch. Please see section B. "Safety Precautions".
- 2) The air filter is made of acrylic fiber and is washable in water. To remove filter simply open the intake grille by releasing the two catches. See Figure 28 for the section filter removal.
- 3) Check the filter periodically and before the operating season; clean or replace as necessary.

B.4.1. For Units Out Of Use for Extended Period.

Prior to restarting the unit:

- Clean or replace the air filters.
- Check and remove any obstruction from the external drain pan and the internal drain pan.

B.4.2. Extra Maintenance

- The electrical panel is easily accessible by removing the cover panel.
- The inspection or replacement of internal components such as; heat exchanger coil, condensate Drain pump, float switch, involves the removal of the condensate drain pan. See Figure 10 and Figure 11.
- During the removal of the condensate drain pan protect the floor under the unit with a plastic sheet from condensate water that could be spilled.
- Remove fixing screws of the drain pan fixture and remove condensate drain pan with care.
- The appliance is intended to be maintained by qualified service personnel and located at a height of not less than 2.5m.
- Please see section B. Safety Precaution.

B.5. Customize Fan Speed

Refer to Section B.3.2 for Step 1, 2 and 3.

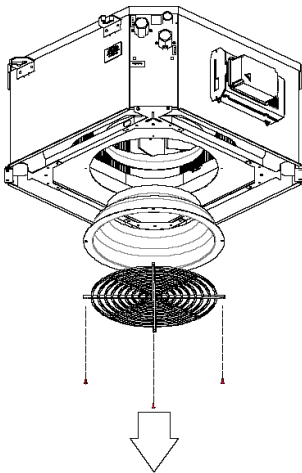


Figure 29
Step 3 : Remove inner grill and venture



Figure 31

Step 5 : Customizing fan speed by means of rewiring the terminal block shown in the picture.

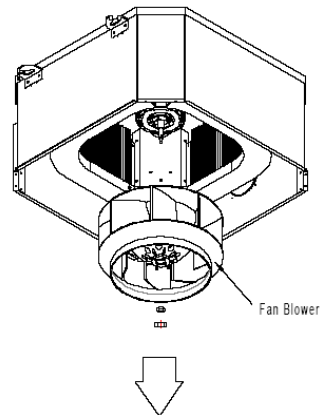


Figure 30

Step 4 : remove the fan blower

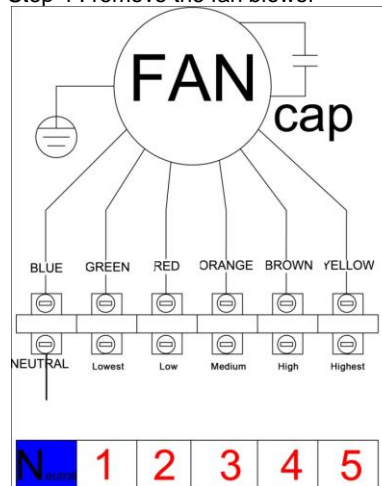


Figure 32

Step 6 : The 3 output wires from Control PCB for fan speed (labeled LF / MF / HF) may be rewired to any of the 5 input terminal for Motor (labeled 1, 2 , 3, 4, 5). ONE PCB output wire to ONE motor input terminal.

B.6. Replacing Motor and Fan Blower

Refer to Section B.3.2 for Step 1, 2 and 3.

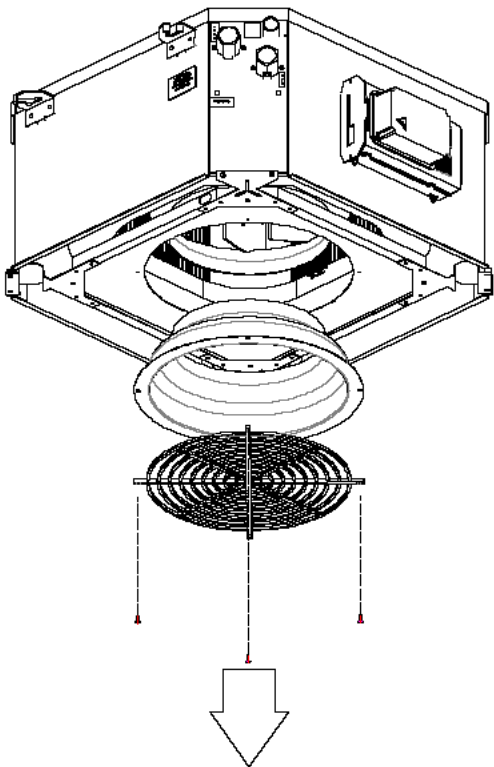


Figure 33

Step 4 : Remove fan blower by using a spanner.

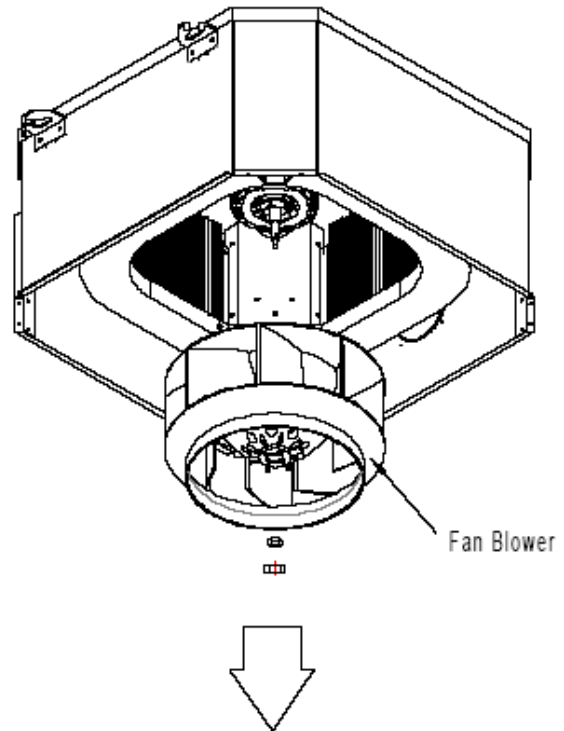


Figure 34

Step 5 : Remove the motor by removing 4 bolts and disconnect fan motor wire connector

B.7. Replacing Condensate Pump

Refer to Section B.3.2 for Step 1 and 2.

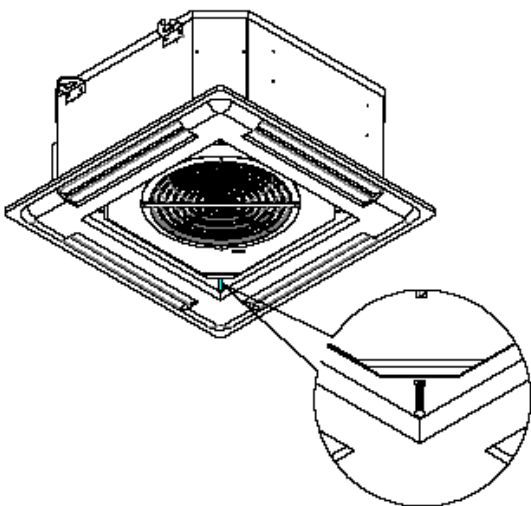


Figure 35

Step 3: Remove front panel and disconnect stepping motor and IR receiver.

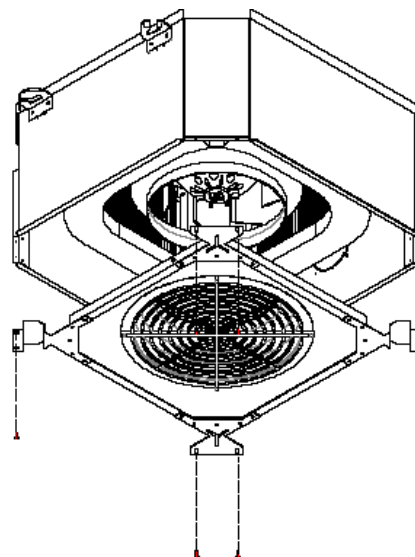


Figure 36

Step 4: Remove the drain pan fixture by removing the 8 screws as shown.

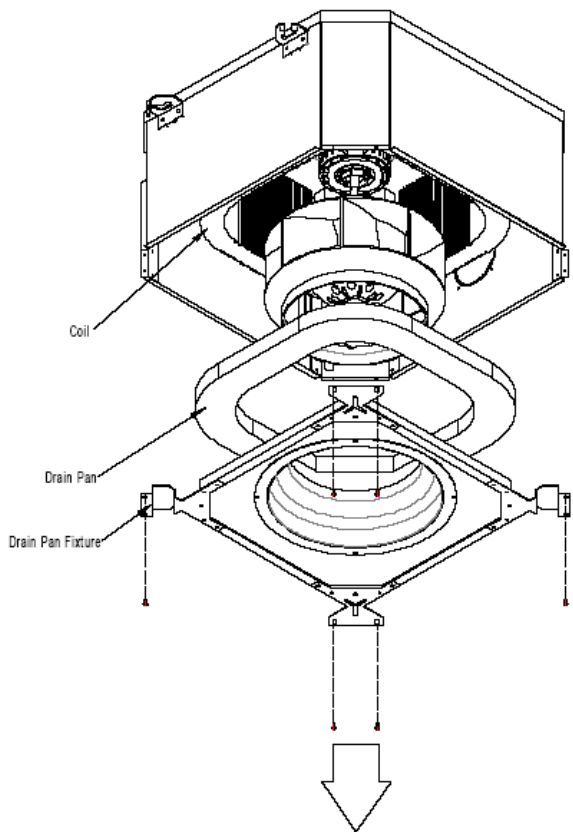


Figure 37
Step 5: Remove the drain pan fixture and internal drain pan.

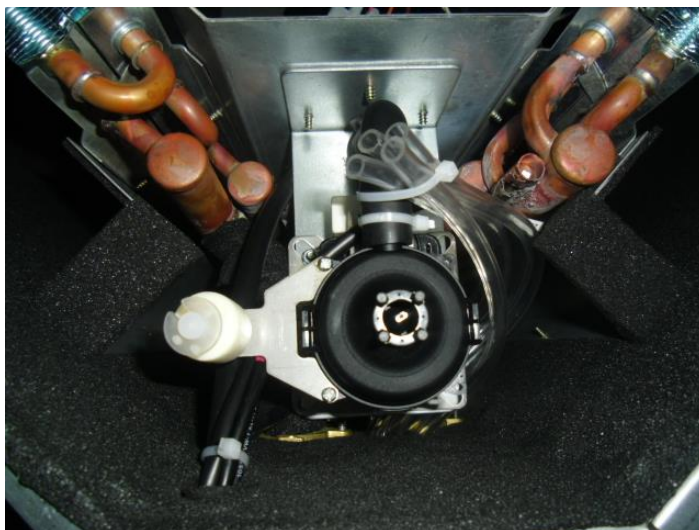


Figure 38

Step 6: Remove the drain pump.

B.8. Install Electric Heater

To access the inner coil area to install the electric heater, please refer to Figure 35, Figure 36 and Figure 37 for Step 1 ~ 5.

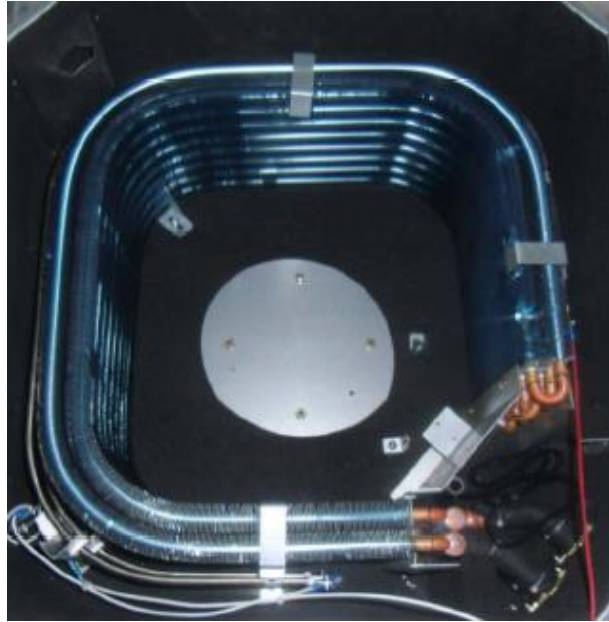


Figure 39

Step 6: Mounting the electrical heater brackets with casing shown above.



Figure 40

Step 7: Connect the electrical wires with control box EH plug shown above.

C. Control Specifications: SK-NCEF-001b ~S Configuration: Full Control PCB

Abbreviations

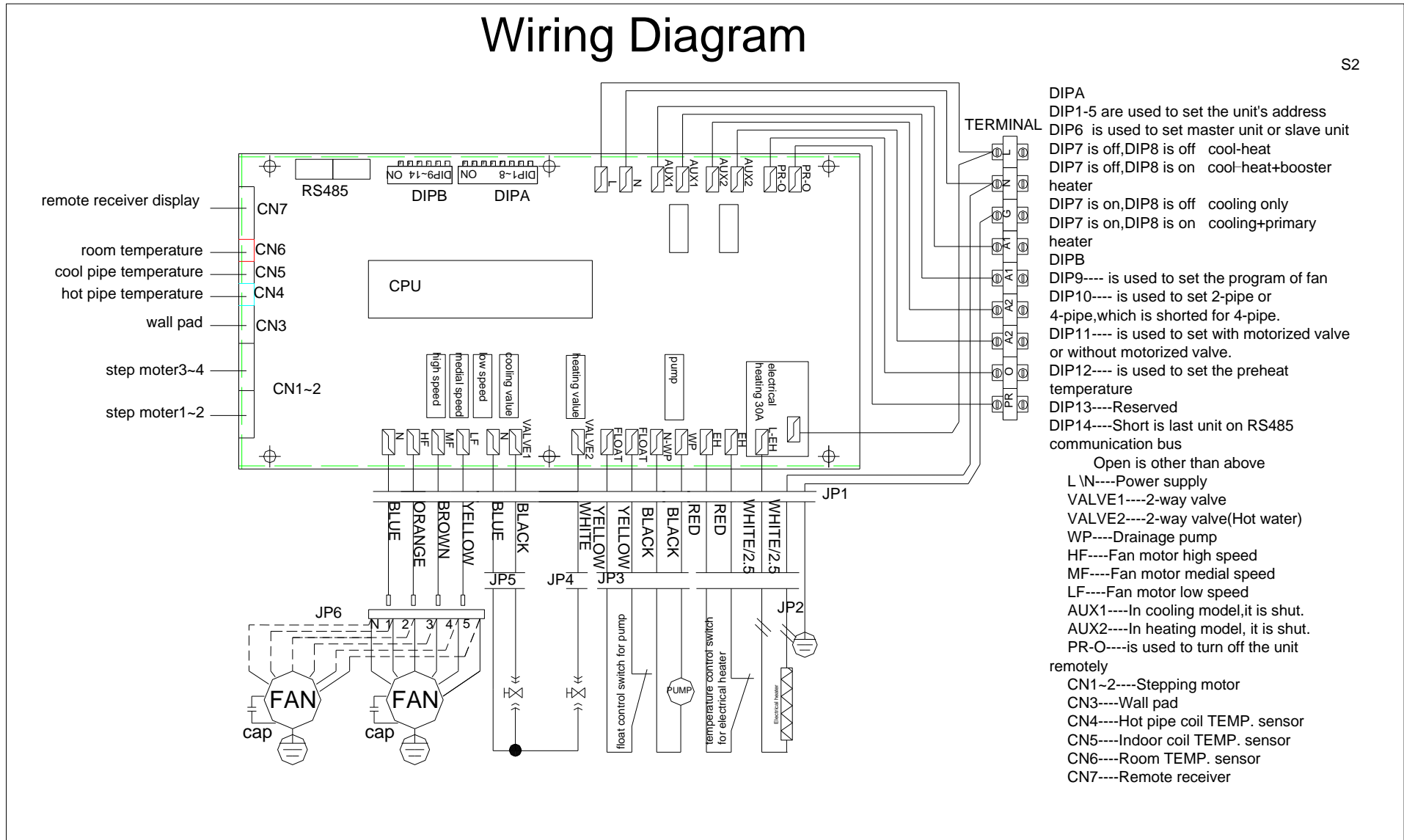
Ts = Setting temperature
 Tr = Room air temperature
 Ti1 = Chilled water coil temperature
 Ti2 = Hot water coil temperature
 AUX1 = Hot water free contact
 AUX2 = Chilled water free contact
 MTV1 = Chilled water valve
 MTV2 = Hot water valve

C.1. I/O Port Definitions

I/O		Code	2-Pipe	4-Pipe
Analogue Input	Room Sensor	CN6	Return air temperature (Tr)	
	Chilled water Sensor	CN5	Chilled / hot water coil circuit (Ti1)	Chilled water coil circuit (Ti1)
	Hot water Sensor	CN4	N/A	Hot water coil circuit (Ti2)
Input	IR receiver	CN7	Digital communication port to LED display/ IR receiver board.	
	Wired wall pad	CN3	Digital communication port to wired wall-pad board.	
Digital input	Occupancy contact	PR-O	This contact may be connected to occupancy sensor or BMS system. DIP-SWITCH IS ON. (Window contact) The contact is normally open. If the contact has been closed for 10 minutes, the unit will be shut down. When the contact is open again, the unit restarts. DIP-SWITCH IS OFF. (Economy contact) Cooling operation will only be activated when $Tr - Ts \geq 4^{\circ}\text{C}$. If $Tr < Ts$, cool operation will be terminated. Heating operation will only be activated when $Tr - Ts \leq -4^{\circ}\text{C}$. If $Tr > Ts$, heating operation will be terminated.	
	Float switch	Float	Voltage-free (NC)	
	Electrical heater safety switch	EH	Voltage-free (NC). The contact is closed before the EH is turned on.	
Power input	Phase	L	Power supply to the PCB and all the loads connected to the voltage outputs. Max length: 5m.	
	Neutral	N	Power supply to the PCB and all the loads connected to the voltage outputs. Max length: 5m.	
	Earth	GND	Power supply to the PCB and all the loads connected to the voltage outputs. Max length: 5m.	

I/O		Code	2-Pipe	4-Pipe
Voltage output	High fan speed	HF	Max length: 5m. Voltage output (L)	
	Medium fan speed	MF	Max length: 5m. Voltage output (L)	
	Low fan speed	LF	Max length: 5m. Voltage output (L)	
	Valve1	MTV1	Water valve Voltage output (L)	Chilled water valve Voltage output (L)
	Valve2	MTV2	Reserved	Hot water valve Voltage output (L)
	Water pump	WP	Voltage output (L)	
	Voltage of electrical heater (Live)	L-EH	Voltage output (L), maximum 30A	
Output	Stepping motor	CN1-2	Power supply to louver stepping motors Voltage output (L)	
	Cold water free contact.	AUX2	Voltage free contact. To ensure the sensitivity of the connection, please make sure Max wiring length < 30m. Maximum load 5A.	
	Hot water free contact.	AUX1	Voltage free contact. To ensure the sensitivity of the connection, please make sure Max wiring length < 30m. Maximum load 5A.	
	In Modbus signal	CN10	Terminals for local network serial connection	
	Out Modbus signal	CN11		

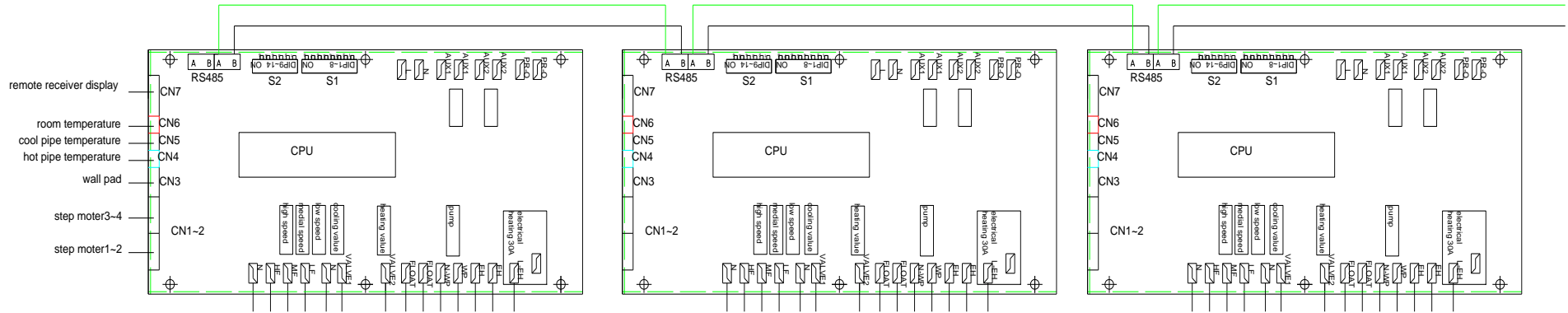
C.2. Wiring Diagram
 SK-NCEF-001b, ~S Configuration: Full Control PCB:



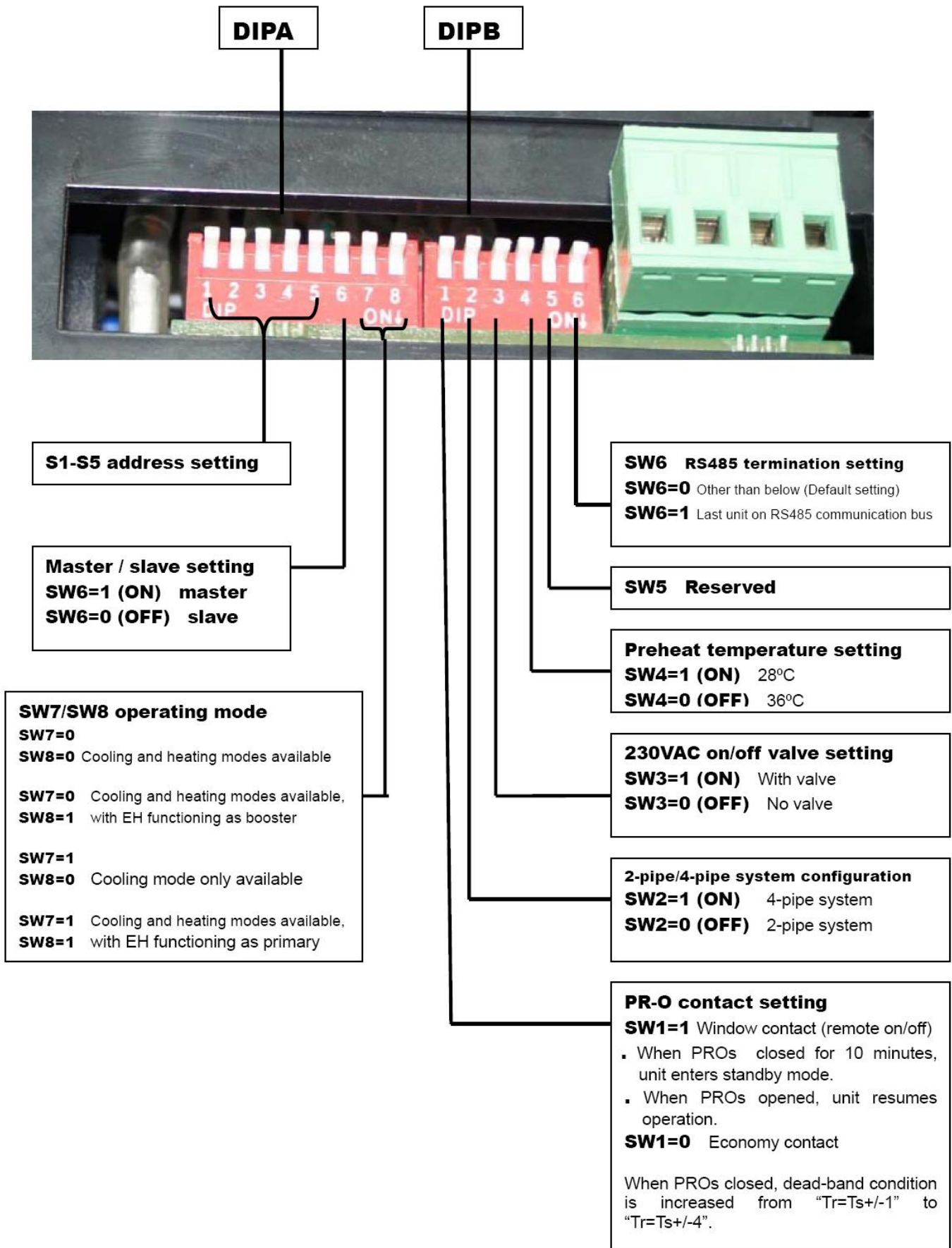
Master slave networking wiring diagram:

Master unit

TO slave unit



C.3. Configuration Settings



AIR CONDITIONER ON/OFF

There are 3 ways to turn the system on or off:

- a) By the ON/OFF button on the remote handset or wired wall pad;
- b) By the programmable timer on the handset or wired wall pad.
- c) By the manual control button on the air conditioner.

AUTO-RESTART

The system uses a non-volatile memory to save the present operation parameters when system is turned off or in case of system failure or cessation of power supply.

The restored parameter data-set depends on the type of user interface.

- a) Handset only user interface:

When the power on signal is received by the air conditioner and no wired wall-pad is installed, the Mode, Fan Speed, Set temperature and Louver/Swing setting will be the same as the handset setting before the last power off.

- b) Wall-pad only OR wall-pad and handset user interface:

When the power on signal is received by the air conditioner and wired wall-pad is installed, the Mode, Fan Speed, Set temperature, Louver/Swing setting and Timer ON/OFF weekly program will be the same as wall pad setting before the last power off.

C.4. Control Logics For 2-Pipe System

C.4.1. With Valve Configuration

COOL MODE

- a) MTV2, AUX1 and Electrical Heater are always off.
- b) If $T_r \geq T_s + 1 \text{ }^\circ\text{C}$ (or $+4 \text{ }^\circ\text{C}$ if economy contact is activated), cool operation is activated, MTV1 and AUX2 are turned on. Indoor fan runs at set speed.
- c) If $T_r < T_s$, cool operation is terminated, MTV1 and AUX2 are turned off. Indoor fan runs at set speed.
- d) The range of T_s is $16\text{-}30 \text{ }^\circ\text{C}$
- e) Indoor fan speed can be adjusted for low, medium, high and auto.
- f) When turned on, MTV1 requires 30 seconds before it is fully open.
- g) When turned off, MTV1 requires 120 seconds before it is fully closed.
- h) When the unit is turned off, indoor fan will delay for 5 seconds before it is turned off.

LOW TEMPERATURE PROTECTION OF INDOOR COIL

- a) If $T_{i1} \leq 2 \text{ }^\circ\text{C}$ for 2 minutes, MTV1 and AUX2 are turned off. If indoor fan is set for low speed, it will run at medium speed. If it is set at medium or high speed, it will keep running at the same speed.
- b) If $T_{i1} \geq 5 \text{ }^\circ\text{C}$ for 2 minutes, MTV1 and AUX2 are turned on. Indoor fan runs at set speed.

FAN MODE

- a) Indoor fan runs at the set speed while heater, MTV1, MTV2, AUX1 and AUX2 are turned off.
- b) Indoor fan speed can be adjusted for low, medium and high

HEAT MODE

Without Electrical Heater

- a) MTV2, AUX2 and heater are always off.
- b) If $T_r \leq T_s - 1\text{ }^\circ\text{C}$ (or $-4\text{ }^\circ\text{C}$ if economy contact is activated), heat operation is activated, MTV1 and AUX1 are turned on. Indoor fan runs at the set speed.
- c) If $T_r > T_s$, heat operation is terminated, MTV1 and AUX1 are turned off. Indoor fan repeatedly runs at low fan speed for 30 seconds and stops for 3 minutes.
- d) The range of T_s is $16\text{-}30\text{ }^\circ\text{C}$.
- e) Indoor fan speed can be adjusted for low, medium, high and auto.
- f) MTV1 will delay for 30 seconds before it is turned on.
- g) MTV1 will delay for 120 seconds before it is turned off.

With Electrical Heater as Booster

- a) MTV2 and AUX2 are always off.
- b) If $T_r \leq T_s - 1\text{ }^\circ\text{C}$ (or $-4\text{ }^\circ\text{C}$ if economy contact is activated), heat operation is activated, MTV1 and AUX1 are turned on. Indoor fan runs at the set speed.
- c) If $T_r > T_s$, heat operation is terminated, MTV1 and AUX1 are turned off. Indoor fan repeatedly runs at low fan speed for 30 seconds and stops for 3 minutes.
- d) If $T_{i1} < 40\text{ }^\circ\text{C}$, the electrical heater is turned on. If $40\text{ }^\circ\text{C} \leq T_{i1} < 45\text{ }^\circ\text{C}$, the electrical heater is kept in its original state. If $T_{i1} \geq 45\text{ }^\circ\text{C}$, the electrical heater is turned off.
- e) The range of T_s is $16\text{-}30\text{ }^\circ\text{C}$
- f) Indoor fan speed can be adjusted for low, medium, high and auto.
- g) MTV1 will delay for 30 seconds before it is turned on.
- h) MTV1 will delay for 120 seconds before it is turned off

With Electrical Heater as Primary Heat Source

- a) MTV1, MTV2 and AUX2 are always off.
- b) If $T_r \leq T_s - 1\text{ }^\circ\text{C}$ (or $-4\text{ }^\circ\text{C}$ if economy contact is activated), heat operation is activated, Electrical heater and AUX1 are turned on. Indoor fan runs at set speed.
- c) If $T_r > T_s$, heat operation is terminated, Electrical heater and AUX1 are turned off. Indoor fan repeatedly runs at low fan speed for 30 seconds and stops for 3 minutes and repeats.
- d) The range of T_s is $16\text{-}30\text{ }^\circ\text{C}$
- e) Indoor fan speed can be adjusted for low, medium, high and auto.

PRE-HEAT

Without Electrical Heater

- a) If $T_{i1} < 36\text{ }^\circ\text{C}$ [or $28\text{ }^\circ\text{C}$ depending on DIP setting], when MTV1 and AUX1 are on, indoor fan remains off.
- b) If $T_{i1} \geq 38\text{ }^\circ\text{C}$ [or $30\text{ }^\circ\text{C}$ depending on DIP setting], when MTV1 and AUX1 are on, indoor fan runs at set speed.
- c) If indoor coil temperature sensor is damaged, pre-heat time is set for 2 minutes and indoor fan runs at set speed.

With Electrical Heater

- a) Indoor fan will turn on after the electrical heater is turned on for 10 seconds.

POST HEAT

Without Electrical Heater

- a) If $T_{i1} \geq 38 \text{ }^\circ\text{C}$, when MTV1 and AUX 1 are off, indoor fan continues to run at set speed.
- b) If $36 \text{ }^\circ\text{C} \leq T_{i1} \leq 38 \text{ }^\circ\text{C}$, when MTV1 and AUX1 are off. Indoor fan keeps original state.
- c) If $T_{i1} < 36 \text{ }^\circ\text{C}$, when MTV1 and AUX1 are off. Indoor fan runs 30 seconds and stop 3 minutes repeatedly.
- d) If indoor coil temperature coil is damaged, post-heat time is set for 3 minutes with indoor fan running at set speed.

With Electrical Heater

- a) Indoor fan will turn off after the unit is off for 20 seconds.

OVER HEAT PROTECTION OF INDOOR COIL

- a) If $T_{i1} \geq 75 \text{ }^\circ\text{C}$, MTV1 and AUX1 are turned off, indoor fan remains on and runs at high speed.
- b) If $T_{i1} < 70 \text{ }^\circ\text{C}$, MTV1 and AUX1 are turned on, indoor fan remains on and runs at set speed.
- c) If indoor coil temperature sensor is damaged, the protection mode will become obsolete and the unit will work according to the Pre-heat and Post-heat set times.

DEHUMIDIFICATION MODE

- a) MTV2, AUX1 and heater always off.
- b) If $T_r \geq 25 \text{ }^\circ\text{C}$, MTV1 and AUX2 will be ON for 3 minutes, and OFF for 4 minutes.
- c) If $16 \text{ }^\circ\text{C} \leq T_r < 25 \text{ }^\circ\text{C}$, MTV1 and AUX2 will be ON for 3 minutes, and OFF for 6 minutes.
- d) If $T_r < 16 \text{ }^\circ\text{C}$, MTV1 and AUX2 will be turned off for 4 minutes.
- e) At the end of the above dehumidification cycle, system will decide the next dehumidification control option. Indoor fan will run at low speed throughout the dehumidification process.

AUTOMODE

Without Electric Heater or With Electric Heater as Booster

- a) Every time the unit is turned on, MTV1 will be turned on, while AUX1, AUX2 and fan are off. MTV2 and heater always off. After 120sec, decide the subsequent operation mode as follow:
 - i. If the coil temperature sensor (T_{i1}) $\geq 36 \text{ }^\circ\text{C}$, MTV1, AUX1 and fan will be turned on or off according to HEAT mode.
 - ii. If $T_{i1} < 36 \text{ }^\circ\text{C}$, MTV1, AUX2 and fan will be turned on or off according to COOL mode.
- b) It will then stay at the above AUTO COOL or AUTO HEAT mode throughout the operating cycle until user change the mode manually or turn off and on the unit.
- c) Should there be failure of T_{i1} sensor, auto mode is not allowed.

With Electric Heater as Primary Heat Source

- a) If current running mode is AUTO COOL mode, it will change over to AUTO HEAT mode upon satisfy all the conditions below:
 - i. $T_s - T_r \geq 1 \text{ }^\circ\text{C}$ (or $-4 \text{ }^\circ\text{C}$ if economy contact is activated)
 - ii. MTV1 has stop $\geq 10 \text{ min}$.
- b) If current running mode is AUTO HEAT mode, it will change over to auto cool mode upon satisfy all the conditions below:
 - i. $T_r - T_s \geq 1 \text{ }^\circ\text{C}$ (or $+4 \text{ }^\circ\text{C}$ if economy contact is activated)
 - ii. MTV1 has stop $\geq 10 \text{ min}$.

Note: AUTO COOL or AUTO HEAT operations are the same as COOL or HEAT mode respectively.

C.4.2. Without Valve Configuration

COOL MODE

- a) Electrical Heater, AUX1, MTV1 and MTV2 are always off.
- b) If $T_r \geq T_s + 1$ °C (or +4 °C if economy contact is activated), cool operation is activated, AUX2 is on. Indoor fan runs at set speed.
- c) If $T_r < T_s$, cool operation is terminated, AUX2 is off. Indoor fan is turned off.
- d) The range of T_s is 16-30 °C
- e) Indoor fan speed can be adjusted for low, medium, high and auto.
- f) When the unit is turned off, indoor fan will delay for 5 seconds before it is turned off.

LOW TEMPERATURE PROTECTION OF INDOOR COIL

- a) If $T_{i1} \leq 2$ °C for 2 minutes, AUX2 is off. If indoor fan runs at low speed, it will run at medium speed. If indoor fan runs at medium or high speed, it will run at set speed.
- b) If $T_{i1} \geq 5$ °C for 2 minutes, AUX2 is on. Indoor fan runs at set speed.

FAN MODE

- a) Indoor fan runs at the set speed while heater, AUX1, AUX2, MTV1 and MTV2 are turned off.
- b) Indoor fan speed can be adjusted for low, medium and high.

HEAT MODE (Without Electrical Heater)

- a) MTV1, MTV2, AUX2 and heater are always off.
- b) If $T_r \leq T_s - 1$ °C (or -4 °C if economy contact is activated), heat operation is activated, AUX1 is turned on. Indoor fan runs at the set speed.
- c) If $T_r > T_s$, heat operation is terminated, AUX1 is turned off. Indoor fan repeatedly runs at low fan speed for 30 seconds and stops for 3 minutes.
- d) The range of T_s is 16-30 °C.
- e) Indoor fan speed can be adjusted for low, medium, high and auto.

HEAT MODE

With Electrical Heater as Booster

- a) MTV1, MTV2 and AUX2 are always off.
- b) If $T_r \leq T_s - 1$ °C (or -4 °C if economy contact is activated), heat operation is activated, AUX1 is turned on. Indoor fan runs at the set speed.
- c) If $T_r > T_s$, heat operation is terminated, AUX1 is turned off. Indoor fan repeatedly runs at low fan speed for 30 seconds and stops for 3 minutes.
- d) If $T_{i1} < 40$ °C, the electrical heater is turned on. If 40 °C $\leq T_{i1} < 45$ °C, the electrical heater is kept in its original state. If $T_{i1} \geq 45$ °C, the electrical heater is turned off.
- e) The range of T_s is 16-30 °C.
- f) Indoor fan speed can be adjusted for low, medium, high and auto.

With Electrical Heater as Primary Heat Source

- a) Not available

PRE-HEAT

Without Electrical Heater

- a) MTV1, MTV2 and AUX2 are off.
- b) If $T_{i1} < 36\text{ °C}$ [or 28 °C depending on DIP setting], AUX1 is on while indoor fan remains off.
- c) If $T_{i1} \geq 38\text{ °C}$ [or 30 °C depending on DIP setting], AUX1 is on while indoor fan runs at set speed.
- d) If indoor coil temperature sensor is damaged, pre-heat time is set for 2 minutes and indoor fan runs at set speed.

With Electrical Heater

- a) Indoor fan will turn on after the electrical heater is turned on for 10 seconds.

POST HEAT

Without Electrical Heater

- a) Not available

With Electrical Heater

- a) Not available

OVERHEAT PROTECTION OF INDOOR COIL

- a) If $T_{i1} \geq 75\text{ °C}$, AUX1 is turned off, indoor fan remains on and runs at high speed.
- b) If $T_{i1} < 70\text{ °C}$, AUX1 is turned on, indoor fan remains and runs at set speed.
- c) If indoor coil temperature sensor is damaged, the protection mode will become obsolete and the unit will work as the Pre-heat and Post-heat set times

DEHUMIDIFICATION MODE

- a) MTV1, MTV2, AUX1 and heater always off.
- b) If $T_r \geq 25\text{ °C}$, indoor fan and AUX2 will be ON for 3 minutes, and OFF for 4 minutes.
- c) If $16\text{ °C} \leq T_r < 25\text{ °C}$, indoor fan and AUX2 will be ON for 3 minutes, and OFF for 6 minutes.
- d) If $T_r < 16\text{ °C}$, indoor fan and AUX2 will be turned off for 4 minutes.
- e) At the end of the above dehumidification cycle, system will decide the next dehumidification control option. Indoor fan will run at low speed throughout the dehumidification process.

AUTOMODE

- a) Not available

C.5. Control Logics For 4-Pipe System

Note: 4-pipe system must always be equipped with 2 valves.

COOL MODE

- a) MTV2, AUX1 and Electrical Heater always off.
- b) If $T_r \geq T_s + 1$ °C (or +4 °C if economy contact is activated), cool operation is activated, MTV1 and AUX2 are turned on. Indoor fan runs at set speed.
- c) If $T_r < T_s$, cool operation is terminated, MTV1 and AUX2 are turned off. Indoor fan runs at set speed.
- d) The range of T_s is 16-30 °C
- e) Indoor fan speed can be adjusted for low, medium, high and auto.
- f) When turned on, MTV1 requires 30 seconds before it is fully open.
- g) When turned off, MTV1 requires 120 seconds before it is fully closed.
- h) When the unit is turned off, indoor fan will delay for 5 seconds before it is turned off.

LOW TEMPERATURE PROTECTION OF INDOOR COIL

- a) If $T_{i1} \leq 2$ °C for 2 minutes, MTV1 and AUX2 are turned off. If indoor fan is set for low speed, it will run at medium speed. If it is set at medium or high speed, it will keep running at the same speed.
- b) If $T_{i1} \geq 5$ °C for 2 minutes, MTV1 and AUX2 are turned on. Indoor fan runs at set speed.

FAN MODE

- a) Indoor fan runs at the set speed while heater, MTV1, MTV2, AUX1 and AUX2 are turned off.
- b) Indoor fan speed can be adjusted for low, medium and high.

HEAT MODE

Without Electrical Heater

- a) MTV1, AUX2 and heater always off.
- b) If $T_r \leq T_s - 1$ °C (or -4 °C if economy contact is activated), heat operation is activated, MTV2 and AUX1 are turned on. Indoor fan runs at the set speed.
- c) If $T_r > T_s$, heat operation is terminated, MTV2 and AUX1 are turned off. Indoor fan repeatedly runs at low fan speed for 30 seconds and stops for 3 minutes.
- d) The range of T_s is 16-30 °C.
- e) Indoor fan speed can be adjusted for low, medium, high and auto.
- f) MTV2 will delay for 30 seconds before it is turned on.
- g) MTV2 will delay for 120 seconds before it is turned off.

With Electrical Heater as Booster

- a) MTV1 and AUX2 are always off.
- b) If $T_r \leq T_s - 1$ °C (or -4 °C if economy contact is activated), heat operation is activated, MTV2 and AUX1 are turned on. Indoor fan runs at the set speed.
- c) If $T_r > T_s$, heat operation is terminated, MTV2 and AUX1 are turned off. Indoor fan repeatedly runs at low fan speed for 30 seconds and stops for 3 minutes.
- d) If $T_{i2} < 40$ °C, the electrical heater is turned on. If 40 °C $\leq T_{i2} < 45$ °C, the electrical heater is kept original state. If $T_{i2} \geq 45$ °C, the electrical heater is turned off.
- e) The range of T_s is 16-30 °C
- f) Indoor fan speed can be adjusted for low, medium, high and auto.
- g) MTV2 will delay for 30 seconds before it is turned on.
- h) MTV2 will delay for 120 seconds before it is turned off.

PRE-HEAT

Without Electrical Heater

- a) If $Ti2 < 36\text{ }^{\circ}\text{C}$ [or $28\text{ }^{\circ}\text{C}$ depends on DIP setting], when MTV2 and AUX1 are on, indoor fan remains off.
- b) If $Ti2 \geq 38\text{ }^{\circ}\text{C}$ [or $30\text{ }^{\circ}\text{C}$ depends on DIP setting], when MTV2 and AUX1 are on, indoor fan runs at set speed.
- c) If indoor coil temperature sensor is damaged, pre-heat time is set for 2 minutes and indoor fan runs at set speed.

With Electrical Heater

- a) MTV2 and AUX1 turn on.
- b) Indoor fan will turn on after the electrical heater is turned on for 10 seconds.

POST HEAT

Without Electrical Heater

- a) If $Ti2 \geq 38\text{ }^{\circ}\text{C}$, when MTV2 and AUX 1 are off, indoor fan continues to run at set speed.
- b) If $36\text{ }^{\circ}\text{C} \leq Ti2 \leq 38\text{ }^{\circ}\text{C}$, when MTV2 and AUX1 are off. Indoor fan keeps original state.
- c) If $Ti2 < 36\text{ }^{\circ}\text{C}$, when MTV2 and AUX1 are off. Indoor fan runs 30 seconds and stop 3 minutes repeatedly.
- d) If indoor coil temperature coil is damaged, post-heat time is set for 3 minutes with indoor fan running at set speed.

With Electrical Heater

- a) Indoor fan will turn off after the unit off for 20 seconds.

OVER HEAT PROTECTION OF INDOOR COIL

- a) If $Ti2 \geq 75\text{ }^{\circ}\text{C}$, MTV2 and AUX1 are turned off, indoor fan remains on and runs at high speed.
- b) If $Ti2 < 70\text{ }^{\circ}\text{C}$, MTV2 and AUX1 are turned on, indoor fan remains on and runs at set speed.
- c) If indoor coil temperature sensor is damaged, the protection mode will become obsolete and the unit will work as the Pre-heat and Post-heat set times.

DEHUMIDIFICATION MODE

- a) MTV2, AUX1 and heater always off.
- b) If $Tr \geq 25\text{ }^{\circ}\text{C}$, MTV1 and AUX2 will be ON for 3 minutes, and OFF for 4 minutes.
- c) If $16\text{ }^{\circ}\text{C} \leq Tr < 25\text{ }^{\circ}\text{C}$, MTV1 and AUX2 will be ON for 3 minutes, and OFF for 6 minutes.
- d) If $Tr < 16\text{ }^{\circ}\text{C}$, MTV1 and AUX2 will be turned off for 4 minutes.
- e) At the end of the above dehumidification cycle, system will decide the next dehumidification control option. Indoor fan will run at low speed throughout the dehumidification process.

AUTOMODE

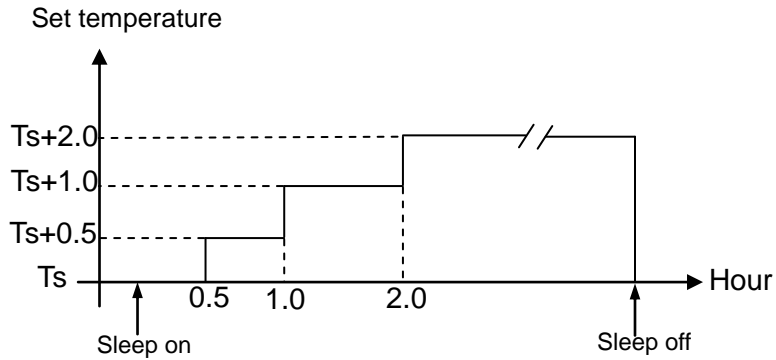
- a) If current running mode is AUTO COOL mode, it will change over to AUTO HEAT mode upon satisfy all the conditions below:
 - i. $Ts - Tr \geq 1.0\text{ }^{\circ}\text{C}$ (or $-4\text{ }^{\circ}\text{C}$ if economy contact is activated)
 - ii. MTV1 has stop $\geq 10\text{ min}$.
- b) If current running mode is AUTO HEAT mode, it will change over to AUTO COOL mode upon satisfy all the conditions below:
 - i. $Tr - Ts \geq 1.0\text{ }^{\circ}\text{C}$ (or $+4\text{ }^{\circ}\text{C}$ if economy contact is activated)
 - ii. MTV2 has stop $\geq 10\text{ min}$.

Note: AUTO COOL or AUTO HEAT operations are the same as COOL or HEAT mode respectively.

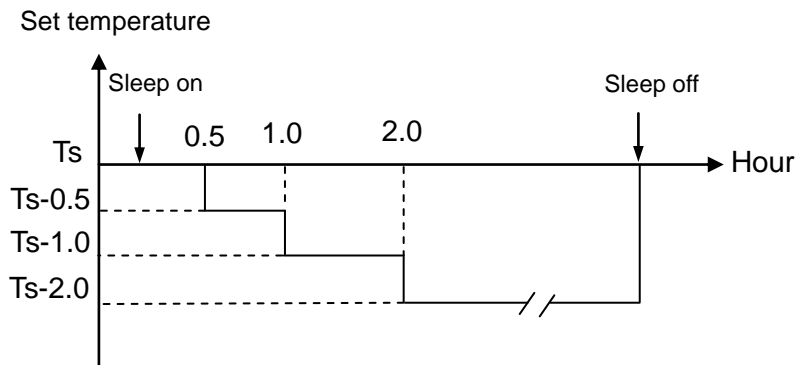
C.6. Sleep Mode

- The sleep mode can only be set when the unit is in cool mode or heat mode.
- If the sleep mode is activated when the unit is in cooling, the indoor fan will run at low speed and T_s will increase $2\text{ }^\circ\text{C}$ during 2 hours.
- If the sleep mode is activated when the unit is in heating, the indoor fan will run at set speed and T_s will decrease $2\text{ }^\circ\text{C}$ during 2 hours.
- Changing the mode of operation will cancel the sleep mode.

The cool mode sleep profile is:



The heat mode sleep profile is:

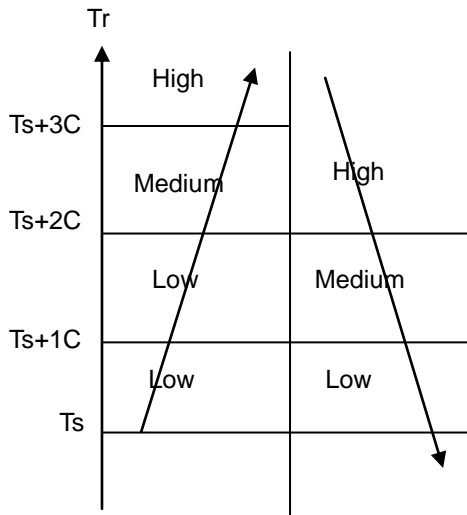


C.7. Auto Fan Speed

COOL MODE

Fan speed cannot change until it has run at this speed for more than 30 seconds.

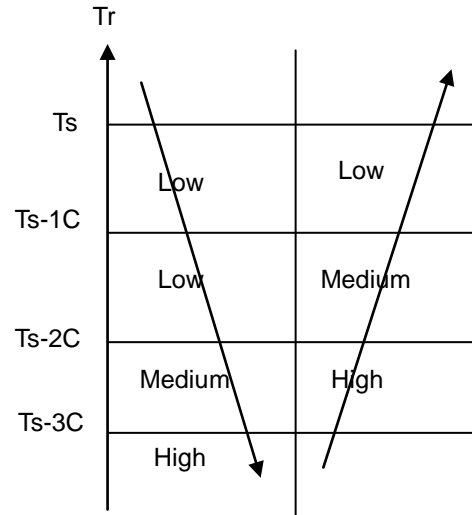
Fan speed is regulated according to the profile below.



HEAT MODE

Fan speed cannot change until it has run at this speed for more than 30 seconds.

Fan speed is regulated according to the profile below.



After 30 seconds the fan speed is modulated according to the difference between the room temperature and the set temperature. The controller adjusts the motor signal input from 0 to 5VDC by PID calculation at every 10 seconds interval. The air flow is adjusted from 15% to 100%.

C.8. Swing / Louver

For remote handset with Control Box – I (Integrated Full Control Version)

Whenever indoor fan is running, louver can swing or stop at the desired position.

Louver angle: 0~100 °, opens clockwise with largest angle at 100 °.

Swing angle: 35~100 °, opens clockwise to 68°. Below are the 4 fixed positions which can be set from wireless LCD handset.

Position	Angle against vertical
1	35 °
2	57 °
3	83 °
4	100 °

For wired wall pad with Control Box – I (Integrated Full Control Version)

Louver angle: 0~100 °, opens clockwise, and with biggest angle at 100 °.

Swing angle: 35~100 °, opens clockwise to 68°. User may stop louver at any desired position between 35~100 °.

C.9. Buzzer

If a command is received by the air conditioner, the master unit will respond with 2 beeps for each setting, and the slave unit will respond with 1 beep.

C.10. Auto Restart

The system uses non-volatile memory to save the present operation parameters when system is turned off or in case of system failure or cessation of power supply. Operation parameters are mode, set temperature, swing louver's position, and the fan speed. When power supply resumes or the system is switched on again, the same operations as previously set will function.

C.11. On/Off Switch On The Front Panel

- This is a tact switch to select Cool→Heat→Off operation mode.
- In COOL mode, the set temperature of the system is 24 °C with auto fan speed and swing. There are no timer and sleep modes.
- In HEAT mode, the set temperature of the system is 24 °C with auto fan speed and swing. There are no timer and sleep modes.
- Master unit that does not use wall pad will globally broadcast.

NOTE

When button pressing is effective, master unit buzzer will beep twice and slave unit beeps once.

C.12. Drain Pump

- Drain pump turns ON if thermostat cut in during cooling or dehumidification cooling cycle. It remains on for at least 5 minutes after thermostat cut out. During mode change from cooling to non cooling mode, water pump will on for minimum 5 minutes.

WARNING!

If the system is turned off at the circuit breaker (or main power supply), the drain pump will not work.

C.13. Float Switch

Float-switch opens before turning on.

- If float switch (N/C) is opened before the unit is turned on. MTV1 is off. Drain pump and indoor fan will operate. After float switch is closed, MTV1 is on.

Float switch is opened, when unit is on.

- If float switch is opened continuously ≥ 5 seconds, drain pump will work and MTV1 remain off. When the float switch is closed, the drain pump will run for an additional 5 minutes. If the float switch is opened for 10 minutes continuously, MTV1 will remain off. Indoor fan runs at set speed and system reports error.

Float switch is opened, when unit is off.

- If the float switch is opened, the drain pump will work. When the float switch is closed, the drain pump will run for an additional 5 minutes. If the float switch is opened for 10 minutes continuously, system reports error.

C.14. Electric Heater Safety Switch

- Before the electrical heater is turned on, the EH safety switch must be closed. If this contact is opened for ≥ 1 second, heater will be turned off immediately and report error. Once the contact is returned to close position ≥ 60 seconds, reset the error and heater will start again.
- When EH safety switch is opened ≥ 3 times within 60 minutes, heater is not allowed to start anymore. Turn off the unit to reset the fault provided that the switch has returned to closed position.

C.15. LED Indication and Error Description



SK-NCEF-001b		
Fan speed setting	LED indication	Condition
High speed	Red LED On	Normal
Medial speed	Yellow LED On	Normal
Low speed	Green LED On	Normal

For all units - Green LED			
Error Description	Blink	Reason	Remedy
Electrical heater failure	Green LED blink 1 times, stop 3 sec	<i>Only for unit with EH.</i> EH protection switches is opened.	<ol style="list-style-type: none"> 1. Change fan speed to high. 2. Replace the damaged protection switch of EH.
Indoor coil sensor 2 failure	Green LED blink 2 times, stop 3 sec	Ti2 sensor unplugged or damaged.	<ol style="list-style-type: none"> 1. Check Ti2 plug is connected or not. 2. Check sensor's resistance is correct or not.
Return air sensor failure	Green LED blink 3 times, stop 3 sec	Room sensor unplugged or damaged.	<ol style="list-style-type: none"> 1. Check Tr plug is connected or not. 2. Check sensor's resistance is correct or not.
Indoor coil sensor 1 failure	Green LED blink 4 times, stop 3 sec	Ti1 sensor unplugged or damaged.	<ol style="list-style-type: none"> 1. Check Ti1 plug is connected or not. 2. Check sensor's resistance is correct or not.
Indoor coil low temperature protection	Green LED blink 5 times, stop 3 sec	Water temperature is lower than 3 °C.	Check the water temperature.
Indoor coil over heat protection	Green LED blink 6 times, stop 3 sec	Water temperature is higher than 70 °C.	Check the water temperature
Water pump failure	Green LED blink 7 times, stop 3 sec	Float switch is opened.	<ol style="list-style-type: none"> 1. Check the condensate water pipe connected or not. 2. Check the pump functioned or not.

C.16. LED indication on Master/Slave connection

For master unit indicating defect status of all slave units. Error message can be found in LED lights on master unit.

Master unit LED		
Unit No.	Blink	Remedy
Unit 2 failure	RED LED blink 2 times, stop 3 sec	Check unit 2 communication plug and fix it
Unit 3 failure	RED LED blink 3 times, stop 3 sec	Check unit 3 communication plug and fix it
Unit 4 failure	RED LED blink 4 times, stop 3 sec	Check unit 4 communication plug and fix it
Unit 5 failure	RED LED blink 5 times, stop 3 sec	Check unit 5 communication plug and fix it
Unit 6 failure	RED LED blink 6 times, stop 3 sec	Check unit 6 communication plug and fix it
Unit 7 failure	RED LED blink 7 times, stop 3 sec	Check unit 7 communication plug and fix it
Unit 8 failure	RED LED blink 8 times, stop 3 sec	Check unit 8 communication plug and fix it
Unit 9 failure	RED LED blink 9 times, stop 3 sec	Check unit 9 communication plug and fix it
Unit 10 failure	RED LED blink 10 times, stop 3 sec	Check unit 10 communication plug and fix it
Unit 11 failure	RED LED blink 11 times, stop 3 sec	Check unit 11 communication plug and fix it
Unit 12 failure	RED LED blink 12 times, stop 3 sec	Check unit 12 communication plug and fix it
Unit 13 failure	RED LED blink 13 times, stop 3 sec	Check unit 13 communication plug and fix it
Unit 14 failure	RED LED blink 14 times, stop 3 sec	Check unit 14 communication plug and fix it
Unit 15 failure	RED LED blink 15 times, stop 3 sec	Check unit 15 communication plug and fix it
Unit 16 failure	RED LED blink 16 times, stop 3 sec	Check unit 16 communication plug and fix it
Unit 17 failure	RED LED blink 17 times, stop 3 sec	Check unit 17 communication plug and fix it
Unit 18 failure	RED LED blink 18 times, stop 3 sec	Check unit 18 communication plug and fix it
Unit 19 failure	RED LED blink 19 times, stop 3 sec	Check unit 19 communication plug and fix it
Unit 20 failure	RED LED blink 20 times, stop 3 sec	Check unit 20 communication plug and fix it
Unit 21 failure	RED LED blink 21 times, stop 3 sec	Check unit 21 communication plug and fix it
Unit 22 failure	RED LED blink 22 times, stop 3 sec	Check unit 22 communication plug and fix it
Unit 23 failure	RED LED blink 23 times, stop 3 sec	Check unit 23 communication plug and fix it
Unit 24 failure	RED LED blink 24 times, stop 3 sec	Check unit 24 communication plug and fix it
Unit 25 failure	RED LED blink 25 times, stop 3 sec	Check unit 25 communication plug and fix it
Unit 26 failure	RED LED blink 26 times, stop 3 sec	Check unit 26 communication plug and fix it
Unit 27 failure	RED LED blink 27 times, stop 3 sec	Check unit 27 communication plug and fix it
Unit 28 failure	RED LED blink 28 times, stop 3 sec	Check unit 28 communication plug and fix it
Unit 29 failure	RED LED blink 29 times, stop 3 sec	Check unit 29 communication plug and fix it
Unit 30 failure	RED LED blink 30 times, stop 3 sec	Check unit 30 communication plug and fix it
Unit 31 failure	RED LED blink 31 times, stop 3 sec	Check unit 31 communication plug and fix it
Unit 32 failure	RED LED blink 32 times, stop 3 sec	Check unit 32 communication plug and fix it

D. Networking System

D.1. Master-Slave Network

The control PCB can be set either as a master unit or slave unit.

MASTER UNIT FUNCTION

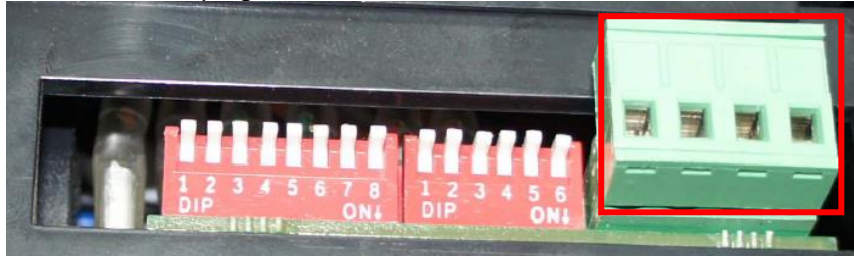
- a) The master unit sends data on its setting to the slave unit.
- b) The master unit settings are Unit ON/OFF, Mode, Fan Speed, Timer, Clock, Set Temperature, Swing Function, and Sleep Function for handset operation.
- c) The master unit settings are Unit ON/OFF, Mode, Fan Speed, Timer, Clock, Set Temperature, Swing Function, and Sleep Function for wall pad operation.

SLAVE UNIT FUNCTION

- a) The slave unit receives data on its settings from the master unit.
- b) The slave unit is allowed to change to a locally desired setting by local controller as long as there are no subsequent changes to the settings of the master unit.
- c) The slave units can be set individually for timer on and off function by handset or wall pad. The handset cannot override wall pad timer and clock setting.

D.1.1. Master – Slave Network Setup

- 1) Disconnect the communication plug from the SK-NCEF-001b



- 2) Communication plug

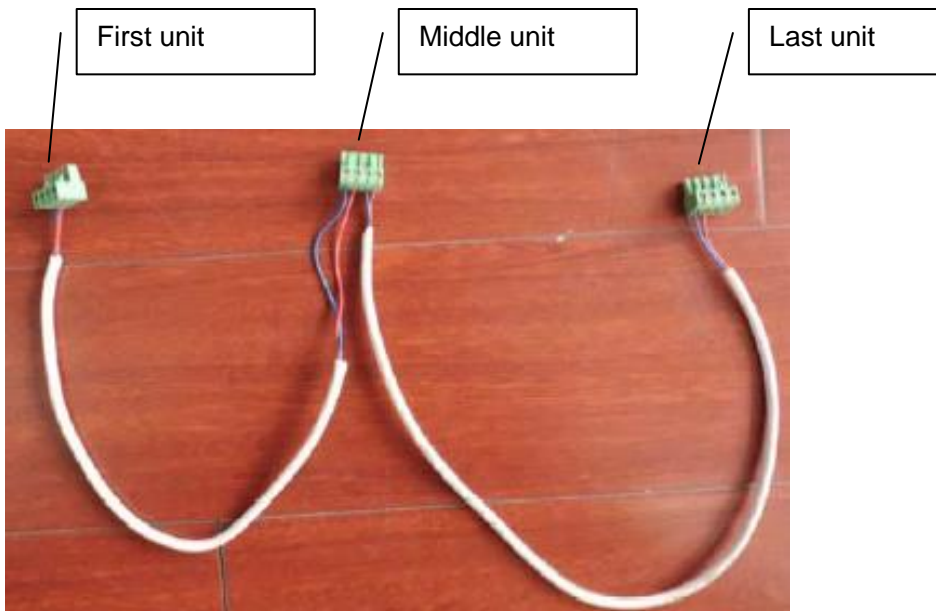
A, B, A, B is printed on the main PCB. When you connect the wires, please ensure connection of A to A and B to B.

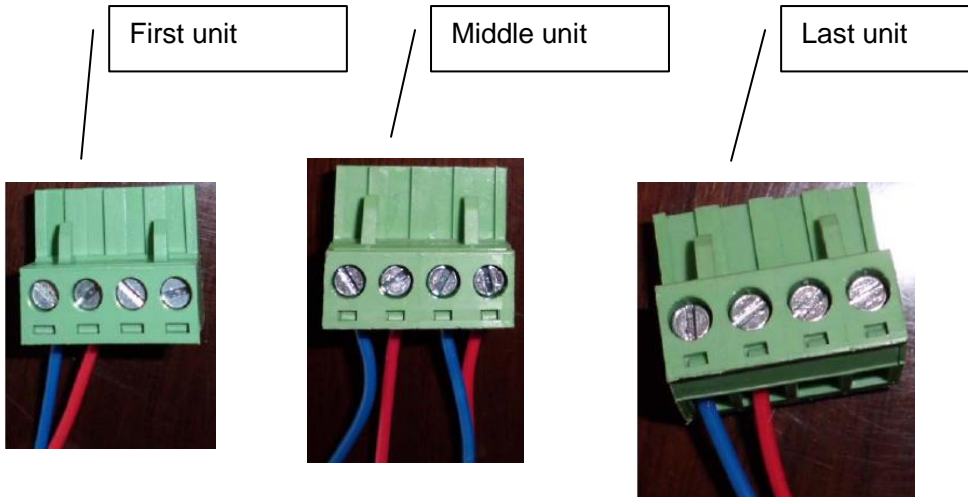


- 3) Connection wire

- 3.1) If the total length of wire is more than 1000m, please use shielded wire in order to protect the signal transmission.

- 3.2) Complete wire connection

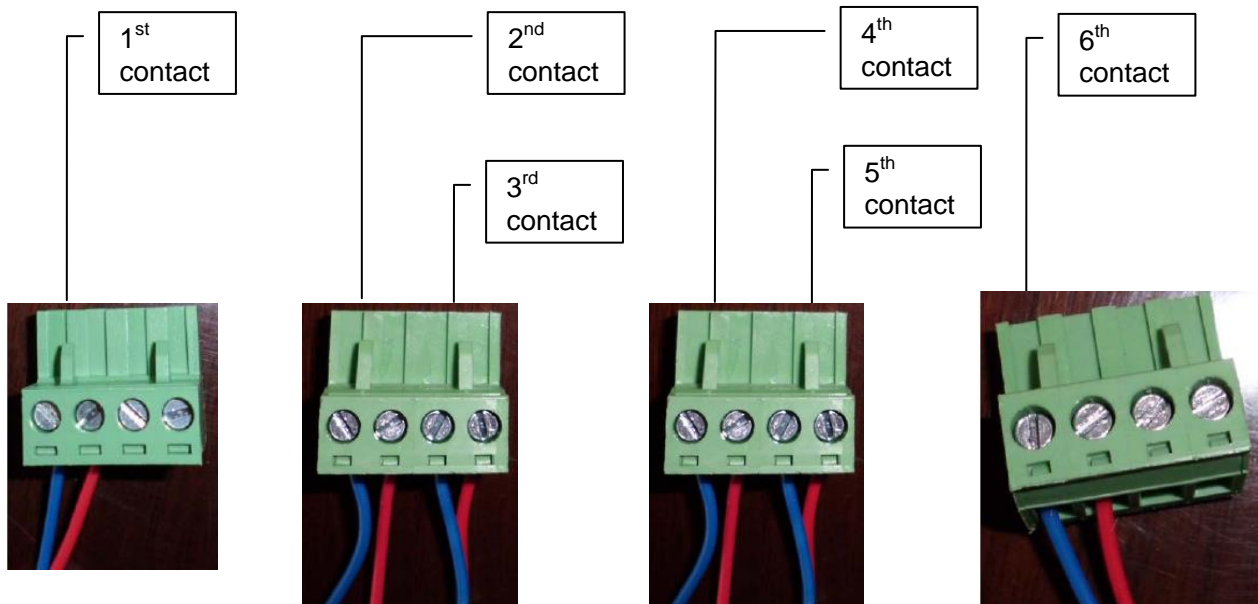




3.3) Wire connection check

3.3.1) After wire connection complete, please check the wire colour is correspondence.

3.3.2) Check the wire contact by using a multimeter.



3.3.3) Check 1 and 2, 3 and 4, 5 and 6 to be sure connections correct.

3.3.4) If the resistance between two wire contacts is too high, please check and reconnect the wire contacts.

4) Reconnect the communication plug to control box

Using Remote Control Handset to Set Master Control Unit:

- a) Connect all the units PCBs according to the wire color and type of connector.
- b) Select the master unit by setting DIPA-S1 SW6 to ON (=1) in the PCB.
- c) Ensure the DIPA-S1 SW6 is set to OFF (=0) in the PCB on each slave unit.
- d) Switch on the units by connecting the main power supply.
- e) Using handset set the operation parameters for the Master unit which will automatically send the settings to the slave unit when pressing the “Network” button for 3 seconds.
- f) Master unit will beep twice confirming receipt of commands while Slave unit will beep once.

Using Wall pad to Set Master Control Unit:

- a) Connect all the units PCBs according to the wire color and type of connector.
- b) Select the master unit by setting DIPA-S1 SW6 to ON (=1) in the PCB.
- c) Ensure the DIPA-S1 SW6 is set to OFF (=0) in the PCB on each slave unit.
- d) Provide each slave unit an addressable code by configuring SW1 – SW5 of DIPA-S1 according to the DIP switch setting table.
- e) Switch on the units by connecting the main power supply.
- f) Using the wall pad set the operation parameters for the Master unit which will send the setting to the slave units based on Global-control communication or Addressable communication methods.
- g) Master unit will beep twice confirming receipt of commands while Slave unit will beep once.

MASTER-SLAVE CONTROL

The control PCB can receive data from both wireless LCD handset and wired wall pad.

D.1.2. Master-Slave Communication Method

There are two modes for Master-slave structure.

Global Control communication

Master will broadcast the settings to all slave units. During normal operation, slave units can receive commands from its wireless handset and wall pad control panel. Upon reception of master global commands, all slave unit settings will be replaced by the master settings.

Addressable communication

Master controller must be LCD wall pad. Slave unit parameters are set as usual. Upon receiving the control commands from a master, the addressed slave unit settings will be replaced by the master settings.

DIPA-S1 address setting: ON=1, OFF=0.

DIPA-S1 SW6	DIPA-S1 SW5	DIPA-S1 SW4	DIPA-S1 SW3	DIPA-S1 SW2	DIPA-S1 SW1	Unit No.	Remark
1	0	0	0	0	0	01	Master
0	0	0	0	0	1	02	Slave
0	0	0	0	1	0	03	Slave
0	0	0	0	1	1	04	Slave
0	0	0	1	0	0	05	Slave
0	0	0	1	0	1	06	Slave
0	0	0	1	1	0	07	Slave
0	0	0	1	1	1	08	Slave
0	0	1	0	0	0	09	Slave
0	0	1	0	0	1	10	Slave
0	0	1	0	1	0	11	Slave
0	0	1	0	1	1	12	Slave
0	0	1	1	0	0	13	Slave
0	0	1	1	0	1	14	Slave
0	0	1	1	1	0	15	Slave
0	0	1	1	1	1	16	Slave
0	1	0	0	0	0	17	Slave
0	1	0	0	0	1	18	Slave
0	1	0	0	1	0	19	Slave
0	1	0	0	1	1	20	Slave
0	1	0	1	0	0	21	Slave
0	1	0	1	0	1	22	Slave
0	1	0	1	1	0	23	Slave
0	1	0	1	1	1	24	Slave
0	1	1	0	0	0	25	Slave
0	1	1	0	0	1	26	Slave
0	1	1	0	1	0	27	Slave
0	1	1	0	1	1	28	Slave
0	1	1	1	0	0	29	Slave
0	1	1	1	0	1	30	Slave
0	1	1	1	1	0	31	Slave
0	1	1	1	1	1	32	Slave

If master unit is equipped with wireless handset only, it can only use Global-Control communication method. If it is equipped with wall pad, it can use both communication methods.

D.2. Open Modbus protocol

Transfer Mode: RTU, BAUD Rate: 9600bps, 8 data bit, 1 stop bit, None parity bit

The communications require a delay between reading an answer and sending the next command of 80ms. All temperature is equal to reading data*10 accuracy: 0.1 degree C.

Supported Functions:

Function Code	Function Description
01(01H)	Read Coils
02(02H)	Read Discrete Inputs
03(03H)	Read Holding Registers
04(04H)	Read Input Registers
05(05H)	Write Single Coil
06(06H)	Write Single Register
15(0FH)	Write Multiple Coils
16(10H)	Write Multiple Registers
255(FFH)	Extended Commands which is used to test

Valid Error code table:

Error code	Description	Definition
01 (01H)	Invalid commands	Received commands beyond valid commands
02 (02H)	Invalid data address	Data addresses beyond valid data address
03 (03H)	Invalid data	Data beyond definition range
04 (04H)	Write data not succeed	Write data not succeed

Coils table:

Description	Address	Type*	Remark
Unit ON/OFF	100000	R/W	
Sleep mode	100001	R/W	
Louver swing	100002	R/W	
Reserved	100003		
Reserved	100004		
Reserved	100005		
Reserved	100006		
Reserved	100007		
Reserved	100008		
Reserved	100009		
Reserved	100010		
Reserved	100011		
Reserved	100012		
Reserved	100013		
Reserved	100014		
Reserved	100015		

* R = read only, W = write only, R/W = read and write.

Discrete table:

Description	Address	Type*	Remark
MTV1	200000	R	
MTV2	200001	R	
AUX1	200002	R	
AUX2	200003	R	
Condensate pump	200004	R	
Electrical heater	200005	R	
Wired wall pad	200006	R	
PRO	200007	R	
Float switch	200008	R	
Reserved	200009	R	
EH protection switch	200010	R	
Internal actually running and unit Unit ON/OFF	200011	R	Testing purpose only.

* R = read only, W = write only, R/W = read and write.

Holding Register table:

Description	Address	Type*	Remark
Mode setting	300000	R/W	Cooling mode = 01(H) Humidify mode = 02(H) Fan mode = 04(H) Heating mode = 08(H) Auto mode = 10(H)
Fan speed setting	300001	R/W	Low speed = 04(H) Medium speed = 02(H) High speed = 01(H) Auto fan speed = 07(H)
Louver swing setting	300002	R/W	Position 1 = 01(H) Position 2 = 02(H) Position 3 = 03(H) Position 4 = 04(H) Auto = 0F(H) Stop = 00(H)
Setting temperature	300003	R/W	16~30 degree C (actual*10 format)
Address setting	300004	R	Set by dip-switch, reading only
Reset	300005	W	=0x33 reset error
Week	300006	W	Calibration wired wall pad and set timer function
Hour	300007	W	Calibration wired wall pad and set timer function
Minute	300008	W	Calibration wired wall pad and set timer function
Second	300009	W	Calibration wired wall pad and set timer function
Hours in Timer on	300010	R/W	Timer ON
Minute in Timer on	300011	R/W	Timer ON
Hours in Timer off	300012	R/W	Timer OFF
Minute in Timer off	300013	R/W	Timer OFF
Icon of Timer ON or OFF	300014	R/W	BIT0 = Icon of Timer ON BIT1 = Icon of Timer OFF 1 = enable 0 = disable
Super low speed rpm	310000	R/W	200~1500
Low speed rpm	310001	R/W	200~1500
Medium speed rpm	310002	R/W	200~1500
High speed rpm	310003	R/W	200~1500
RPM setting	310004	R/W	0~2000 (used to test · 0 = disable)
Temperature sampling time	310005	R/W	2~100, default:5S
Factor of auto fan speed	310006	R/W	2~150, default:20
Factor of modulating valve	310007	R/W	2~250, default:150

* R = read only, W = write only, R/W = read and write.

Input Register table:

Description	Address	Type*	Remark
Dip switch 1 status	400000	R	
Dip switch 2 status	400001	R	
Room temperature sensor	400002	R	
Ti1 temperature sensor	400003	R	
Ti2 temperature sensor	400004	R	
Error code	400005	R	Bit0 = Room temperature sensor error Bit1 = Ti1 temperature sensor error Bit2 = Ti2 temperature sensor error Bit3 = Float switch error Bit4 = Indoor coil low temperature protection Bit5 = Indoor coil over heat protection Bit6 = Reserved Bit7 = Electrical heater failure Bit8 = Motor1 Error Bit9 = Motor2 Error Bit10 = System parameters error Bit11 = Reserved Bit12 = Reserved Bit13 = Reserved Bit14 = Reserved Bit15 = Reserved
Fan speed status	400006	R	Low = 04(H) Medium = 02(H) High = 01(H)
Mode status	400007	R	Cooling mode = 01(H) Dehumidify mode = 02(H) Fan mode = 04(H) Heating = 08(H)
Setting temperature status	400008	R	Testing only
Room temperature in wall pad status	400009	R	
Room temperature in main PCB status	400010	R	
Unit type	400011	R	4-pipe = 03, 2-pipe = 02 This setting is configured by dip switch
EC motor 1# RPM	400012	R	
EC motor 2# RPM	400013	R	

* R = read only, W = write only, R/W = read and write.

E. Control Specifications: SK-NCEF-002 ~W Configuration: Limited function PCB

Used in all PCE2/PCF2 [V/P] **W** unit configurations:

SK-NCEF-002 is used to PCE2/PCF2 with or without electrical heater.

E.1. Features:

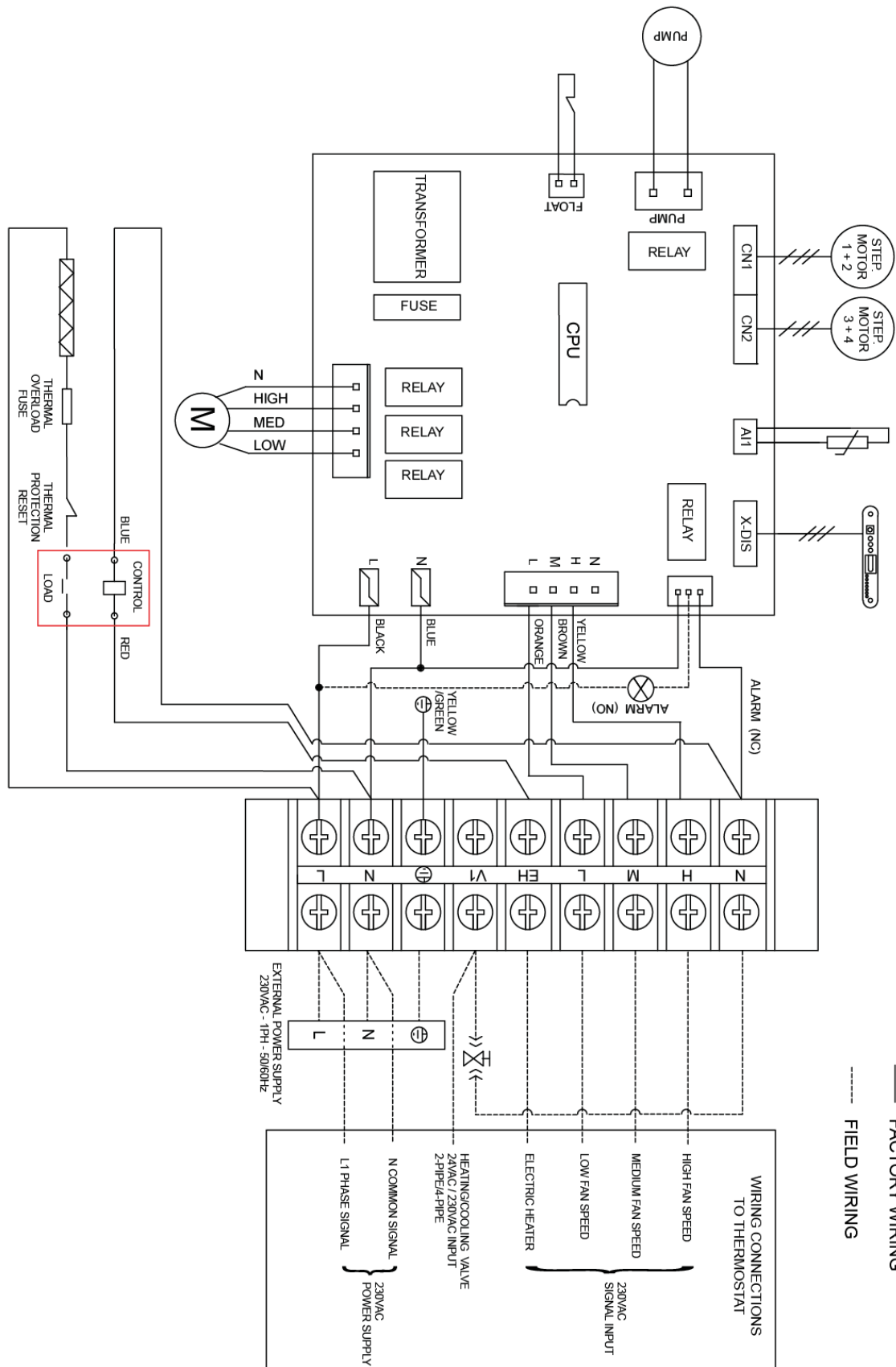
- a. Condensate management with valve protection and NC alarm contact.
- b. Integrated fan relays for zone control applications.
- c. ON/OFF thermostat input and low-voltage modulating fan speed input flexibility.
- d. Simple error diagnostic and LED error display.

E.2. I/O Port Definitions

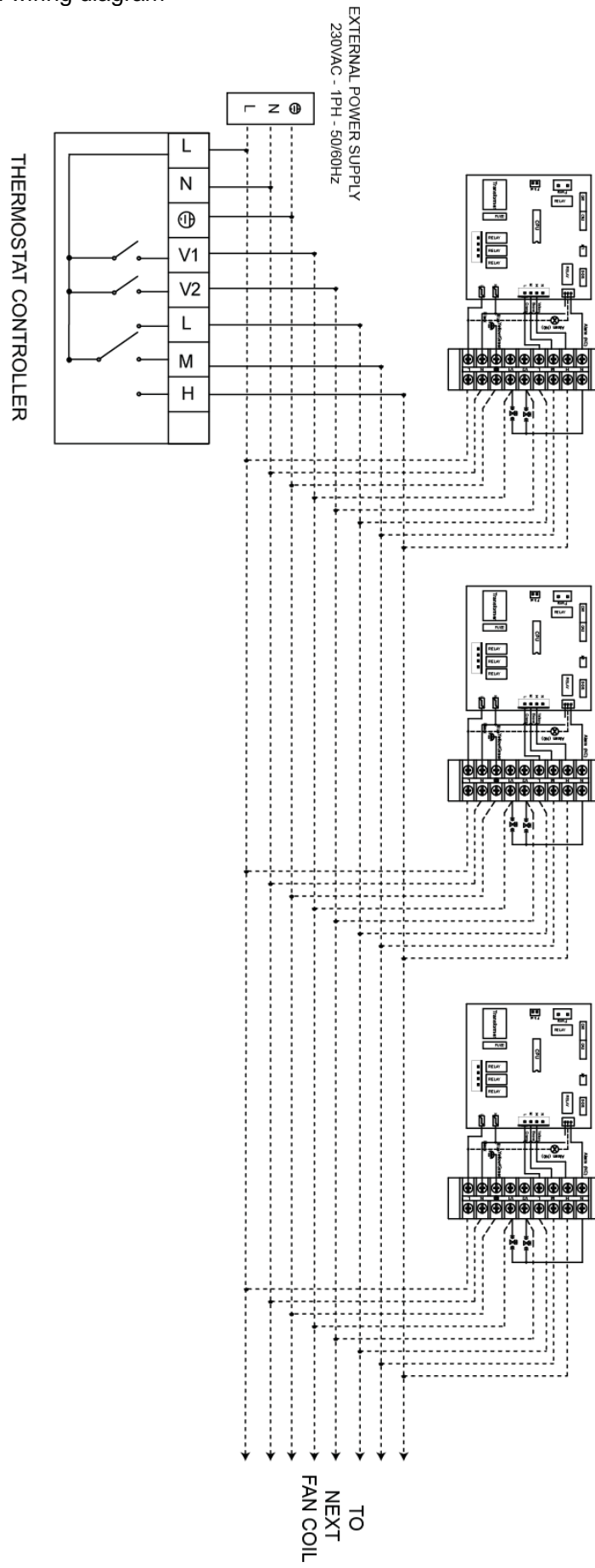
I/O		Code	2-Pipe	4-Pipe
Analogue input	Coil temperature sensor	AI1	Cooling / heating coil sensor (Ti1)	Cooling only coil sensor (Ti1)
Voltage input	High fan speed	H	230VAC input signals from wired thermostat	
	Medium fan speed	M		
	Low fan speed	L		
Voltage input	Phase	L	External 230VAC power supply connection to the PCB. Max length: 5 m	
	Neutral	N		
	Earth	GND		
Digital input	Float switch	Float	Voltage-free (NC)	
Voltage output	Water pump	Pump	Voltage output (L)	
Voltage output	High fan speed	H	230VAC outputs for 3-speed AC fan motor	
	Medium fan speed	M		
	Low fan speed	L		
	Neutral	N		
	Stepping motor	CN1-2	Low-voltage signal output	
Digital output	LED display	X-DIS	Low-voltage output	
Voltage-free output	Alarm		Voltage-free alarm contact: (a) Standard configuration is (NC). (b) Optional field-wired configuration is (NO).	

E.3. Wiring Diagrams

E.3.1. Standard unit wiring diagram of SK-NCEF-002



E.3.2. Zone control wiring diagram



E.4. Control logic specification

E.4.1. Unit power ON/OFF

- I. The unit is turned ON when any of the fan speed inputs (from thermostat) are ON.
- II. The unit is turned OFF only if all of the fan speed inputs (from thermostat) are OFF.

E.4.2. Alarm protection and error display

- I. If the float switch is open for 5 minutes, the (NC) voltage-free alarm contact shall be open, the (NO) voltage free alarm contact shall be closed.
- II. LED display reports a condensate management failure (see table below).

E.4.3. Drain-pump run management

- I. When the unit turns ON:
 - a) If $T_{i1} < 15\text{ }^{\circ}\text{C}$, the drain pump turns ON.
 - b) If $T_{i1} \geq 15\text{ }^{\circ}\text{C}$, the drain pump turns OFF
- II. When the unit turns OFF and the drain pump is ON:
the drain pump will remain ON for 5 minutes, before the drain pump turns OFF.
- III. At any time:
 - a) If the float switch is OPEN, the drain pump will turn ON.
 - b) If the float switch is OPEN and then CLOSES, the drain pump will remain ON for 5 minutes, and then turns OFF.

E.4.4. Swing and louver control

- I. When the unit is OFF, the louvers are closed (angle at 100° against vertical).
- II. When the unit turns ON, the louvers open (angle at 87° against the horizontal).
- III. When the unit turns OFF, the louver returns to a closed position (100° against the vertical).

E.5. LED Indication and Error Description

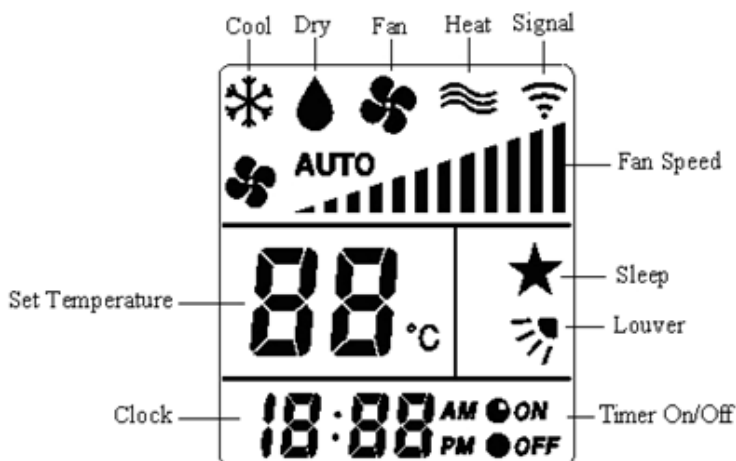
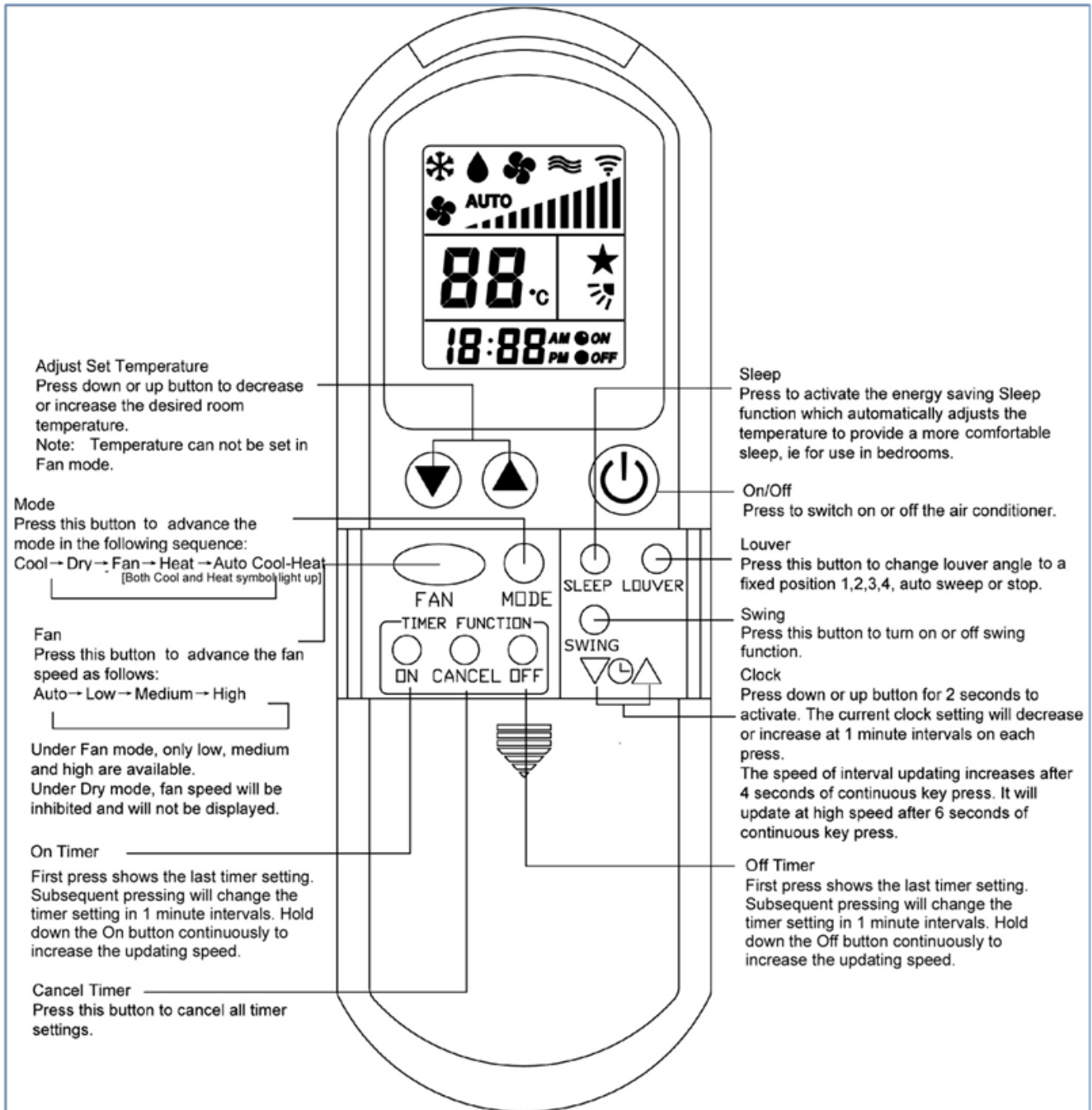


SK-NCEF-002		
Fan speed setting	LED indication	Condition
High speed	Red LED On	Normal
Medial speed	Yellow LED On	Normal
Low speed	Green LED On	Normal

Error Description	LED status			
	Red	Yellow	Green	Remedy
Coil temperature sensor failure	On	Blink	Blink	<ol style="list-style-type: none"> 1. Check Ti1 sensor plug is connected or not. 2. Check sensor's resistance is correct or not.
Water pump failure	Blink	Blink	Blink	<ol style="list-style-type: none"> 1. Check the condensate water pipe connected or not. 2. Check the pump functioned or not.

F. User Interface

F.1. Remote Handset

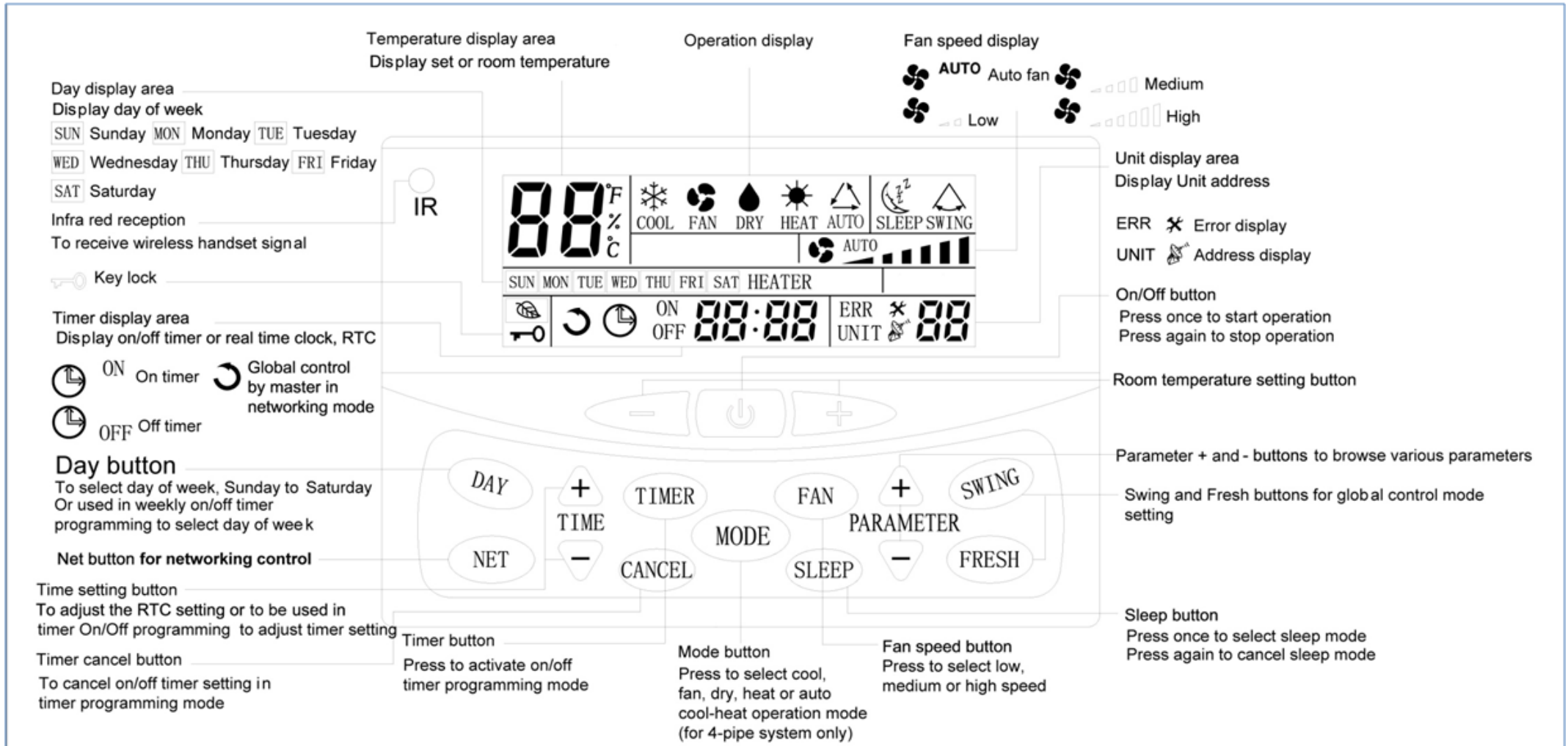


Attention

When unit with handset is master, settings are automatically sent to slaves;
Auto Cool-Heat operation will be applicable in 4-pipe system only.

Use "Swing" is not applicable.

F.2. Wired Wall Pad





Attention

- Wall pad will recognize the main board model automatically whether it is 2-pipe or 4-pipe system.
- Auto Cool-Heat operation is applicable in 4-pipe system only.
 When the wall pad is installed wall-pad temperature sensor automatically overrides the default return air sensor (attached to unit return air grille).

F.2.1. Wall Pad Operation Guidelines


a) Clock display and setting

System has an accurate internal real time clock used for time indication and timer ON/OFF function. Real

time clock display area indicates internal time clock which can be set by  or  button.














b) Day display and setting

The wall pad has day display function which is used for day indication and timer ON/OFF function. Day








display icon indicates current day. Press  button to set day.







c) Timer ON/OFF setting

If master unit is in global control mode and on/off timer setting is reached, master unit will command the whole network to be on or off. Otherwise timer on/off is effective to the local unit only. The system supports 7 days on/off timer setting.



- Press  button once,  and **ON** symbol blinking indicates on timer programming mode, day display area indicates the day for setting timer on. If on timer for this day is null, timer display area shows , otherwise the on timer setting will be shown. Press  or  button to change the on timer setting. Press  key to cancel the current on timer selected and the timer display area will show . Press  button to change the day the on timer is to be programmed.
- Press  button again,  and **OFF** symbol blinking indicates off timer programming mode. The setting method is the same as on timer setting above.
- Press  button again, to exit timer on/off setting function.
- Should there be any on or off timer being programmed,  will light up. Should there be any unexecuted on or off timer for the current day, its corresponding **ON** or **OFF** icon will light up.
- Hold down  button for 3 seconds to cancel all timer settings.

d) Timer set by master unit is as follows:





- Press  button to enter into networking control mode. Unit area blinking indicates the slave unit under control. Press  or  to select the desired slave unit. Units that are off will be skipped automatically.
- Press  button once to enter into on timer programming mode. Press  button to select the required day of the week. Master unit will then retrieve the setting from the selected slave unit and timer display area will show "rEAd". The on timer setting will be shown upon reading the data successfully. Press  or  button to change the on timer setting.

- Press  button again to enter into off timer programming mode. Press  button to select the required day of the week. Master unit will then retrieve the setting from the selected slave unit and timer display area will show “rEAd”. The off timer setting will be shown upon reading the data successfully. Press  or  button to change the off timer setting.
- Upon completion of changing timer settings for the selected day, press  button again to exit timer programming mode. The settings will then upload to the selected slave unit. The next day of the week settings can be done only upon completion of sending data to the slave units. (Repeat steps 1~4 if setting is required for the next day of the week).
- In Global control mode:
 - Pressing Master  button for 3 seconds will cancel all timer settings in all slave units.
 - Timer settings will be broadcast to all slave units.


e) Clock synchronization by master unit is as follows:

Press  and  buttons for 3 seconds to activate clock synchronization to all slave units. Master wall pad will respond with a beeping sound.


f) Key lock

In order to prevent unauthorized access to the system setting, a key lock function is provided to prevent mischief. Hold down  and  for 3 seconds to activate key lock,  symbol lights up. Repeat the same to exit key lock. Only  button is applicable in key lock mode.



g) Swing

Press  to activate or deactivate swing function.


h) Sleep

Press  button to activate or deactivate sleep setting. Sleep is valid in cool or heat modes only.


i) Temperature setting

Press  or  to enter into temperature setting mode, temperature display area blinks indicating the current set temperature. Press the above buttons to adjust the set temperature.


j) Mode setting

Press  button to change the operation mode.








k) Fan speed setting

Press  button to change the fan speed. Only low speed is available for dehumidification mode.



l) On/Off control



Press  to start or stop the air conditioner.

m) Networking Master - Slave Control (only master unit wall pad can control other units on the network)

- Press  button to enter into networking control mode. Unit area blinking indicates the slave unit under control. Press  or  to select the desired slave unit; Units that are off will be bypassed automatically. Parameters that can be controlled are on/off, timer weekly program, set temperature, mode, fan speed, swing and sleep. Parameter operation methods are the same as above. Press  button again to exit networking control mode.
- Hold down  and  buttons for 3 seconds to enter into global control mode,  lights up. Repeat the same to exit global control mode. In global control mode, the settings of the master unit will be broadcast to all the slave units.

n) Unit operation parameters browsing

Hold down  and  buttons for 3 seconds to enter into operation parameters browsing mode. Unit display area shows the slave unit under browsing. Slave unit selection method is the same as in

networking control above. Press  or  to browse various parameters as follow:

Wall pad display temperature area	Wall pad display time area
C0	Return air temperature displayed
C1	Indoor coil temperature displayed
C2	DIP switch setting displayed
C3	Indoor coil 2 temperature

Press  button to exit.

o) Error indication

When faulty slave unit is detected, Master unit display area shows the faulty unit address, time area shows the error code and wall pad backlight changes to red color. Should there be multiple units having problems, addresses and error codes will be shown one after another.

Error code definition:

Error	Error code
Electrical heater faulty	E1
Indoor coil sensor 2 faulty	E2
Return air sensor faulty	E3
Indoor coil sensor 1 faulty	E4
Indoor coil low temperature protection	E5
Indoor coil over heat protection	E6
Float switch alarm	E7
Local communication error	E8

G. Sensor Resistance R-T Conversion Table

Resistance : $R(25^{\circ}\text{C}) = 10\text{K}\Omega \pm 1\%$

Beta Constant : $B(25/85) = 3977 \pm 1\%$

T (°C)	Rmin (KΩ)	Rnom (KΩ)	Rmax (KΩ)	T (°C)	Rmin (KΩ)	Rnom (KΩ)	Rmax (KΩ)
-30	174	182.7	191.8	4	26.11	26.9	27.71
-29	163.4	171.5	179.9	5	24.85	25.59	26.34
-28	153.6	161.1	168.9	6	23.65	24.35	25.05
-27	144.4	151.3	158.5	7	22.52	23.17	23.83
-26	135.8	142.2	148.9	8	21.45	22.06	22.68
-25	127.8	133.8	140	9	20.44	21.01	21.59
-24	120.3	125.8	131.6	10	19.48	20.02	20.55
-23	113.3	118.4	123.8	11	18.58	19.7	19.58
-22	106.7	111.5	116.5	12	17.71	18.18	18.65
-21	100.6	105.1	109.7	13	16.9	17.33	17.77
-20	94.9	99.03	103.3	14	16.12	16.53	16.94
-19	89.51	93.39	97.41	15	15.39	15.77	16.16
-18	84.5	88.11	91.85	16	14.69	15.05	15.41
-17	79.8	83.17	86.64	17	14.03	14.37	14.7
-16	75.39	78.53	81.76	18	13.41	13.72	14.03
-15	71.26	74.18	77.19	19	12.81	13.1	13.4
-14	67.37	70.1	72.9	20	12.24	12.52	12.79
-13	63.73	66.26	68.88	21	11.7	11.96	12.22
-12	60.3	62.67	65.1	22	11.19	11.43	11.67
-11	57.08	59.28	61.55	23	10.71	10.93	11.15
-10	54.05	56.1	58.22	24	10.24	10.45	10.66
-9	51.19	53.12	55.08	25	9.8	10	10.2
-8	48.51	50.3	52.14	26	9.374	9.57	9.765
-7	45.98	47.66	49.37	27	8.969	9.16	9.351
-6	43.61	45.17	46.77	28	8.584	8.77	8.957
-5	41.36	42.82	44.31	29	8.218	8.4	8.582
-4	39.25	40.61	42	30	7.869	8.047	8.225
-3	37.26	38.53	39.83	31	7.537	7.71	7.885
-2	35.38	36.56	37.78	32	7.221	7.39	7.56
-1	33.6	34.71	35.85	33	6.92	7.085	7.251
0	31.93	32.97	34.02	34	6.633	6.794	6.956
1	30.35	31.32	32.3	35	6.36	6.517	6.675
2	28.85	29.76	30.68	36	6.099	6.252	6.407
3	27.44	28.29	29.15	37	5.85	6	6.151

Resistance : $R(25^{\circ}\text{C}) = 10\text{K}\Omega \pm 1\%$ Beta Constant : $B(25/85) = 3977 \pm 1\%$

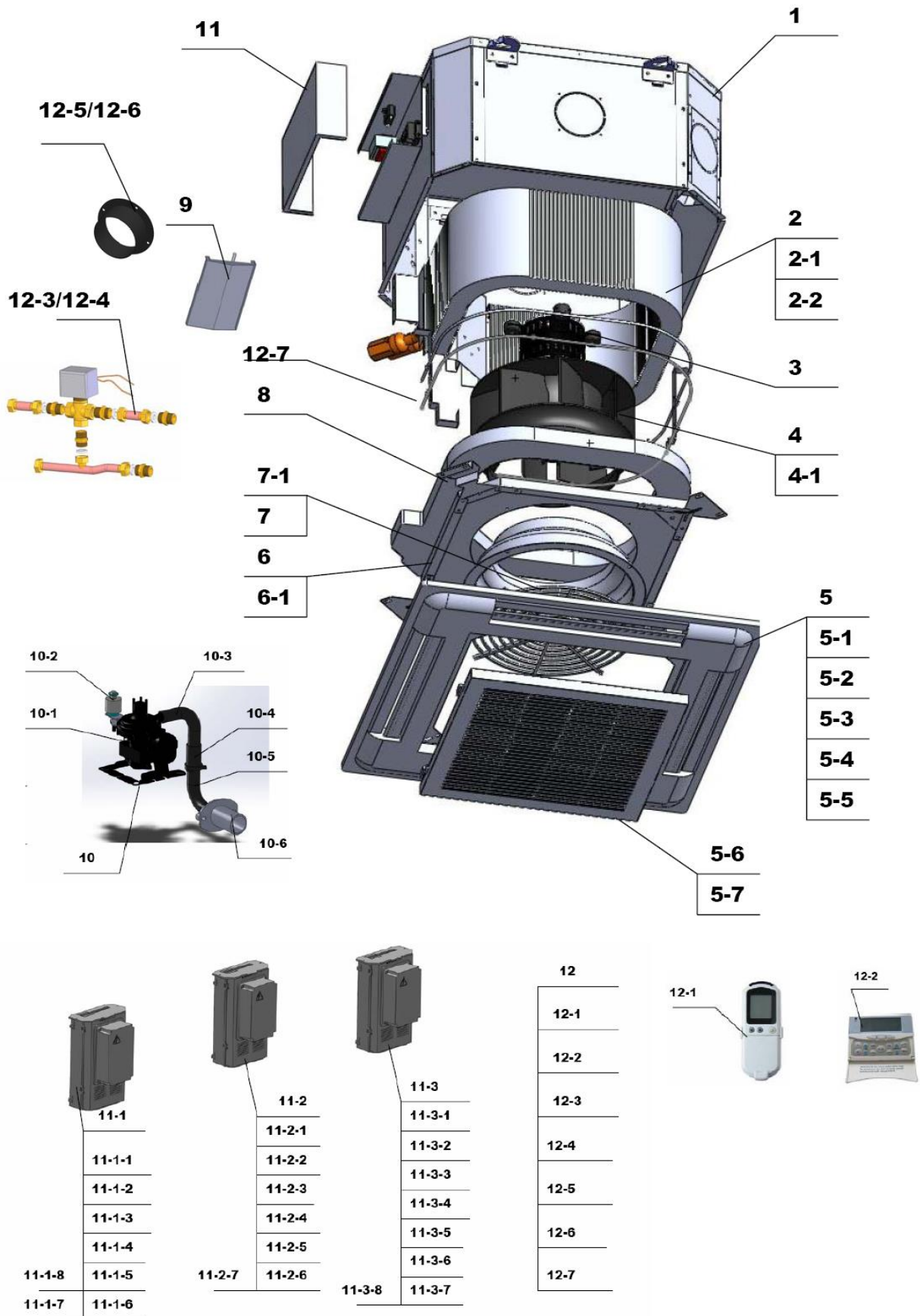
T (°C)	Rmin (KΩ)	Rnom (KΩ)	Rmax (KΩ)	T (°C)	Rmin (KΩ)	Rnom (KΩ)	Rmax (KΩ)
38	5.614	5.759	5.907	75	1.417	1.474	1.532
39	5.387	5.53	5.673	76	1.37	1.426	1.482
40	5.172	5.31	5.451	77	1.326	1.379	1.434
41	4.966	5.101	5.238	78	1.282	1.335	1.389
42	4.769	4.901	5.034	79	1.241	1.292	1.344
43	4.582	4.71	4.84	80	1.201	1.25	1.302
44	4.402	4.527	4.654	81	1.162	1.211	1.261
45	4.231	4.353	4.477	82	1.125	1.172	1.221
46	4.067	4.186	4.307	83	1.089	1.135	1.183
47	3.911	4.027	4.144	84	1.055	1.1	1.146
48	3.761	3.874	3.989	85	1.021	1.065	1.111
49	3.618	3.728	3.84	86	0.9891	1.032	1.077
50	3.481	3.588	3.697	87	0.9582	1	1.044
51	3.35	3.454	3.561	88	0.9284	0.9697	1.012
52	3.225	3.326	3.43	89	0.8998	0.9401	0.9818
53	3.105	3.204	3.305	90	0.8721	0.9115	0.9522
54	2.99	3.086	3.185	91	0.8455	0.8839	0.9237
55	2.88	2.974	3.07	92	0.8198	0.8573	0.8961
56	2.774	2.866	2.959	93	0.795	0.8316	0.8696
57	2.673	2.762	2.854	94	0.7711	0.8069	0.8439
58	2.576	2.663	2.752	95	0.748	0.783	0.8192
59	2.483	2.568	2.655	96	0.7258	0.7599	0.7953
60	2.394	2.477	2.562	97	0.7043	0.7376	0.7722
61	2.309	2.39	2.472	98	0.6836	0.7161	0.7499
62	2.227	2.306	2.386	99	0.6635	0.6953	0.7283
63	2.149	2.225	2.304	100	0.6442	0.6752	0.7075
64	2.073	2.148	2.224	101	0.6255	0.6558	0.6874
65	2.001	2.074	2.148	102	0.6075	0.6371	0.6679
66	1.931	2.002	2.075	103	0.59	0.619	0.6491
67	1.865	1.934	2.005	104	0.5732	0.6015	0.631
68	1.801	1.868	1.937	105	0.5569	0.5846	0.6134
69	1.739	1.805	1.872				
70	1.68	1.744	1.81				
71	1.623	1.686	1.75				
72	1.569	1.63	1.692				
73	1.516	1.576	1.637				
74	1.466	1.524	1.583				

H. Troubleshooting

Symptoms	Cause	Remedy
The fan coil does not start up	No voltage	- Check for presence of voltage
	Mains switch in the "OFF" position	- Place in the "ON" position
	Faulty room control	- Check the room control
	Faulty fan	- Check fan motor
Insufficient output	Filter clogged	- Clean the filter
	Air flow obstructed	- Remove obstacles
	Room control regulation	- Check the room air sensor
	Incorrect water temperature	- Check the water source
	Air present	- Check the air vent
Noise and vibrations	Contact between metal parts	- Check for loosening parts
	Loose screws	- Tighten screws

I. Exploded Diagrams & Sub-assembly Descriptions

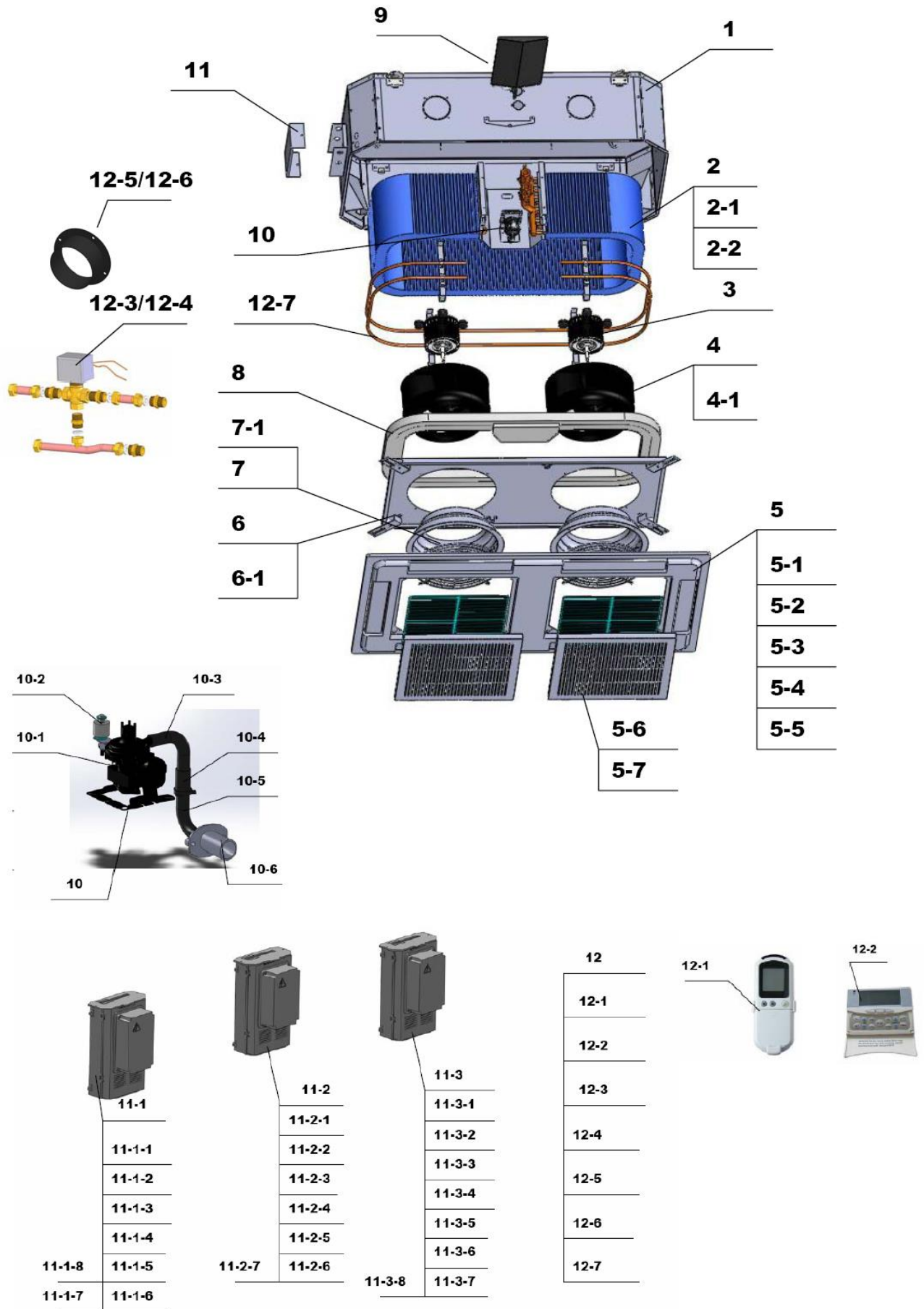
I.1. Exploded View for Single Fan Model



I.1.1. Spare Parts Of Single Fan Model

Item	Description	QTY	Item	Description	QTY
1	Casing	1	6	Mounting fixture	1
2	Coil	1	6-1	Room sensor	1
2-1	Chilled water coil sensor	1	7	Finger guard	1
2-2	Hot water coil sensor	1	7-1	Venturi	1
3	Motor	1	8	Drain pan	1
4	Fan blower	1	9	External drain pan	1
5	Front panel	1	10	Pump system	1
5-1	Front cover	1	10-1	Pump	1
5-2	Louver	4	10-2	Flow switch	1
5-3	IR receiver	1	10-3	Pump pipe-1	1
5-4	Stepping motor	2	10-4	Check valve	1
5-5	Stepping motor	2	10-5	Pump pipe-2	1
5-6	Grill	1	10-6	Drainage head	1
5-7	Filter	1			

I.2. Exploded View for Twin Fan Model



I.2.1. Spare Parts Of Twin Fan Model

Item	Description	QTY	Item	Description	QTY
1	Casing	1	6	Mounting fixture	1
2	Coil	1	6-1	Room sensor	1
2-1	Chilled water coil sensor	1	7	Finger guard	2
2-2	Hot water coil sensor	1	7-1	Venturi	2
3	Motor	2	8	Drain pan	1
4	Fan blower	2	9	External drain pan	1
5	Front panel	1	10	Pump system	1
5-1	Front cover	1	10-1	Pump	1
5-2	Louver	6	10-2	Flow switch	1
5-3	IR receiver	1	10-3	Pump pipe-1	1
5-4	Stepping motor	2	10-4	Check valve	1
5-5	Stepping motor	2	10-5	Pump pipe-2	1
5-6	Grill	2	10-6	Drainage head	1
5-7	Filter	2			

I.3. Optional Parts

11-Control system			
Item	Code	Description	QTY
11-1	SK-NCEF-001b	Control system	1
11-1-1	SK04-ST-KM(H)-001	Main PCB HMCST-REV2.0	1
11-1-2	SK04-ST-KM(H)-001-02	Communication plug	1
11-1-3	SK06-KMH-002	Control box base FP-KM4(6)-H-601	1
11-1-4	SK06-KMH-003	Control box cover FP-KM4(6)-H-602	1
11-1-5	SK06-KMH-004	Terminal cover FP-KM4(6)-H-603	1
11-1-6	SK06-KMH-005	Wires protection holeFP-KM4(6)-H-603/1	1
11-1-7	SK08-TB-010	Terminal block JX0-B9-1	1
11-1-8	SK10-XS-ST-KM-007	Wires cable HMCST-KM4-S2	1
Item	Code	Description	QTY
11-3	SK-NCEF-002	Control system	1
11-2-1	SK04-ST-KM(H)-002	AC mini PCB ST-MB-REV1.0	1
11-2-2	SK06-KMH-002	Control box base FP-KM4(6)-H-601	1
11-2-3	SK06-KMH-003	Control box cover FP-KM4(6)-H-602	1
11-2-4	SK06-KMH-004	Terminal cover FP-KM4(6)-H-603	1
11-2-5	SK06-KMH-005	Wires protection holeFP-KM4(6)-H-603/1	1
11-2-6	SK08-TB-010	Terminal block JX0-B9-1	1
11-2-7	SK08-DQPJ-004	EH relay 30A JQF-105F-4	1
11-2-8	SK10-XS-ST-KM-004	Wires STMB-EH-KM4(6)-P3-XS	1

I.4. Accessories

12-Accessories			
Item	Code	Description	QTY
12-1	SK-DFPS-A-002.1	Remote handset	1
12-2	SK-DFPS-A-002.2	Wired wall pad	1
12-3	SK-DFPS-A-005a	3-way valve with motorized actuator	1
12-3-1	SK-DFPS-C-011b	Pipe connections of 3-way valve	1
12-4	SK-DFPS-A-005b	2-way valve with motorized actuator	1
12-4-1	SK-DFPS-C-011a	Pipe connections of 2-way valve	1
12-5	SK-NCGH-009a	Branch duct flange	1
12-6	SK-NCGH-009a	Fresh air flange	1
12-7	SK-DFPS-C-006S-03-04	Electric heater for PCE2-03/04	1
12-7	SK-DFPS-C-006S-06-08	Electric heater for PCE2-06/08	1
12-7	SK-DFPS-C-006S-E09	Electric heater for PCE2-09	1
12-7	SK-DFPS-C-006S-E12-16	Electric heater for PCE2-12/16	1
12-7	SK-DFPS-C-006S-F09-12	Electric heater for PCF2-09/10/12	1
12-7	SK-DFPS-C-006S-F16-20	Electric heater for PCF2-16/18/20	1

