INSTALLATION
OPERATION AND SERVICE MANUAL

PCG – PS SERIES

4 PIPE HYDRONIC CASSETTE
AIR CONDITIONERS

Fisher

2010 V.1.0

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.

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.

WEEE MARK

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

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

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.

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.

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/CSA (NRTL) safety approval plus ARI Certification in the USA, ROHS compliance for Europe, giving you the confidence of knowing our company is the right choice when selecting air conditioning equipment.

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PCG-PS SERIES
4 PIPE HYDRONIC CASSETTES

CASSETTE MODEL ASSIGNMENTS

P C G - 0 6 - P S

S	**230V/1PH/50HZ**

P	**CHILLED/HOT WATER, 4-PIPE**

06	**NOMINAL 3.24 KW**
08	**NOMINAL 3.60 KW**
09	**NOMINAL 4.15 KW**
12	**NOMINAL 5.10 KW**
16	**NOMINAL 5.90 KW**

PCG	**HYDRONIC CASSETTE G SERIES**

PCG – PS (4-PIPE) SERIES 3-SPEED SPECIFICATIONS

Model			PCG-06	PCG-08	PCG-09	PCG-12	PCG-16
Number Of Fan Blowers			Single	Single	Twin	Twin	Twin
Total flow	H	m^3/hr	750	846	1098	1296	1650
	M		648	540	924	1176	1300
	L		588	410	858	1098	1100
Cooling Capacity*	H	kW	3.24	3.60	4.15	5.10	5.90
	M		2.86	3.02	3.23	4.70	4.80
	L		2.60	2.42	3.06	3.95	3.65
Sensible Cooling Capacity	H	kW	2.75	2.94	3.82	4.40	4.93
	M		2.48	2.60	3.16	4.04	4.31
	L		2.33	2.22	2.98	3.54	3.56
Heating Capacity **	H	kW	4.14	4.43	6.67	7.20	7.90
	M		3.84	4.00	5.85	6.60	6.95
	L		3.64	3.41	5.57	5.95	5.96
Noise Level @ 1 M (H/M/L)		dB(A)	43/41/35	46/43/35	40/38/32	43/42/36	48/44/38
Power Supply		(V/Ph/Hz)	230/1/50				
Fan Motor Power		W	58	60	62	116	124
Fan Motor Running Current		A	0.24	0.32	0.34	0.48	0.64
Fan Motor Starting Current		A	0.76	0.89	0.88	1.52	1.77
Operation Control & Thermostat			Remote Control Handset & Wired Wall Pad				
Cooling Water Flow Rate		L/h	580	636	733	901	1043
Heating Water Flow Rate		L/h	354	380	571	617	677
Cooling Water Pressure Drop		kPa	12.0	14.7	27.8	22.4	29.0
Heating Water Pressure Drop		kPa	3.0	3.5	8.7	10.1	12.0
Cooling Water Content		L	1.07	1.07	1.36	1.91	1.90
Heating Water Content		L	0.49	0.49	0.86	0.86	0.86
Cond. Drain Connection I.D.		mm(in)	19.05(3/4)				
Dimensions	L	mm	585	585	1140	1140	1140
	W	mm	585	585	580	580	580
	H	mm	290	290	250	290	290
Panel Dimensions (L x W x H)		mm	680×680×28		680x1240x28		
Gross Weight		Kg	33	33	52	59	59
Connection Method			Socket (Threaded Female)				
Water Connection	In	mm(in)	19.05(3/4)				
	Out	mm(in)	19.05(3/4)				

* Cooling : 27°C db/19°C wb entering air temperature,7°C entering water and 12°C leaving water temperature with water flow rates as above.

**Heating : 20°C db entering air temperature ,70°C entering water temperature and 60°C leaving water temperature.

PCG – PS (4-PIPE) SERIES 5-SPEED SPECIFICATIONS

Model			PCG-06	PCG-08	PCG-09	PCG-12	PCG-16
Number Of Fan Blowers			Single	Single	Twin	Twin	Twin
Total flow	5	M^3/hr	710	846	1080	1350	1650
	4		648	708	738	1236	1350
	3		600	648	600	1140	1236
	2		450	600	500	852	1140
	1		350	450	400	650	852
Cooling Capacity*	5	kW	3.02	3.60	4.24	5.00	5.98
	4		2.86	3.02	2.78	4.75	5.00
	3		2.60	2.86	2.32	3.98	4.75
	2		1.98	2.60	2.00	3.22	3.98
	1		1.72	1.98	1.62	2.65	3.22
Sensible Cooling Capacity	5	kW	2.60	2.94	3.73	4.27	4.85
	4		2.48	2.60	2.72	4.04	4.27
	3		2.33	2.48	2.27	3.58	4.04
	2		1.82	2.33	1.95	2.82	3.58
	1		1.56	1.82	1.58	2.32	2.82
Heating Capacity **	5	kW	4.00	4.43	6.67	6.98	7.91
	4		3.84	4.00	5.27	6.60	6.98
	3		3.63	3.84	4.63	5.92	6.60
	2		2.79	3.63	4.11	5.10	5.92
	1		2.05	2.79	3.58	4.20	5.10
Noise Level @ 1 M (H/M/L)		dB(A)	44/40/38/32/30	46/44/40/38/32	39/35/33/31/28	45/41/39/33/31	47/45/41/39/33
Power Supply		(V/Ph/Hz)	230/1/50				
Fan Motor Power		W	58	66	100	116	132
Fan Motor Running Current		A	0.26	0.29	0.44	0.52	0.58
Fan Motor Starting Current		A	0.77	0.88	1.33	1.54	1.77
Operation Control & Thermostat			Remote Control Handset & Wired Wall Pad				
Cooling Water Flow Rate		L/h	533	636	749	883	1057
Heating Water Flow Rate		L/h	342	380	571	598	678
Cooling Water Pressure Drop		kPa	10.7	14.7	28.8	20.9	29.0
Heating Water Pressure Drop		kPa	3.0	3.5	13.0	15.0	17.5
Cooling Water Content		L	1.07	1.07	1.36	1.91	1.91
Heating Water Content		L	0.49	0.49	0.86	0.86	0.86
Cond. Drain Connection I.D.		mm(in)	19.05(3/4)				
Dimensions	L	mm	585	585	1140	1140	1140
	W	mm	585	585	580	580	580
	H	mm	290	290	250	290	290
Panel Dimensions (L x W x H)		mm	680×680×28		680x1240x28		
Gross Weight		Kg	33	33	52	59	59
Connection Method			Socket (Threaded Female)				
Water Connection	In	mm(in)	19.05(3/4)				
	Out	mm(in)	19.05(3/4)				

* Cooling : 27°C db/19°C wb entering air temperature,7°C entering water and 12°C leaving water temperature with water flow rates as above.

**Heating : 20°C db entering air temperature ,70°C entering water temperature and 60°C leaving water temperature.

COIL DATA - COOLING

Model	Fin Height (mm)	Fin Length (mm.)		Fins per inch	No. of rows	No. of circuits	Tube Diameter
		Inner	Outer				
PCG-06-08-PS	250	1176	1277	13	2	3	3/8”
PCG-09-PS	200	2148	2286	13	2	3	3/8”
PCG-12-16-PS	250	2148	2286	13	2	5	3/8”

COIL DATA - HEATING

Model	Fin Height (mm)	Fin Length (mm.)		Fins per inch	No. of rows	No. of circuits	Tube Diameter
		Inner	Outer				
PCG-06-08-PS	250	1176	1277	13	1	3	3/8”
PCG-09-PS	200	2148	2286	13	1	3	3/8”
PCG-12-16-PS	250	2148	2286	13	1	3	3/8”

COOLING CAPACITY TABLES

PCG-06-PS		TAI DB24℃-WB17.4℃						TAI DB27℃-WB19℃						TAI DB27℃-WB19.5℃						TAI DB28℃-WB21					
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	750	3.3	2.52	13.8	12.5	12.1	583	4.45	3.08	14.5	12.6	20.7	786	4.85	3	14.6	12.6	24	857	5.9	3.14	15.2	12.9	34.3	1043
	648	2.87	2.28	13.2	12.4	9.45	507	3.86	2.79	13.8	12.5	16.1	682	4.2	2.74	14	12.5	18.6	742	5.1	2.85	14.4	12.8	26.4	901
	588	2.66	2.14	12.9	12.3	8.2	470	3.56	2.63	13.3	12.4	14	630	3.88	2.58	13.6	12.4	16.1	685	4.7	2.68	14	12.7	22.7	830
6	750	2.75	2.33	14.55	13.35	8.93	486	3.865	2.915	15.15	13.5	16.35	683	4.225	2.83	15.35	13.55	19	746.5	5.28	2.965	15.9	13.85	28.35	933
	648	2.405	2.09	14.1	13.25	6.985	425	3.36	2.635	14.5	13.4	12.74	593.5	3.7	2.585	14.7	13.4	15	653.5	4.57	2.69	15.15	13.75	21.85	807.5
	588	2.24	1.96	13.8	13.1	6.15	395.	3.08	2.48	14.05	13.35	15.95	545	3.395	2.435	14.3	13.35	12.85	599.5	4.215	2.53	14.75	13.65	18.8	744.5
7	750	2.2	2.14	15.3	14.2	5.76	389	3.24	2.75	15.8	14.4	12	580	3.6	2.66	16.1	14.5	14	636	4.66	2.79	16.6	14.8	22.4	823
	648	1.94	1.9	15	14.1	4.52	343	2.86	2.48	15.2	14.3	9.37	505	3.2	2.43	15.4	14.3	11.4	565	4.04	2.53	15.9	14.7	17.3	714
	588	1.82	1.79	14.7	14	4.1	321	2.6	2.33	14.8	14.3	7.9	460	2.91	2.29	15	14.3	9.6	514	3.73	2.38	15.5	14.6	14.9	659
8	750	1.86	1.81	16.6	14.7	4.18	328.	2.8	2.51	16.7	15.1	9.1	495	3.09	2.5	16.7	15.2	10.8	546	4.13	2.62	17.2	15.5	18.2	729.
	648	1.62	1.55	16.4	14.6	3.21	286.	2.45	2.24	16.3	15	7.18	432.	2.73	2.28	16.1	15.1	8.75	482.	3.59	2.38	16.6	15.4	14.2	635
	588	1.5	1.47	16.3	14.6	2.8	264	2.25	2.09	16	14.9	6.1	398	2.51	2.14	15.7	15.0	7.5	443.	3.32	2.23	16.2	15.3	12.2	587.
9	750	1.52	1.48	17.9	15.2	2.6	268	2.32	2.27	17.7	15.8	6.2	410	2.58	2.34	17.4	16	7.7	456	3.6	2.45	17.9	16.3	14.1	636
	648	1.3	1.27	17.9	15.2	1.9	230	2.04	2	17.4	15.7	5	360	2.26	2.13	16.8	15.9	6.1	400	3.15	2.23	17.3	16.2	11.1	556
	588	1.18	1.15	17.9	15.2	1.5	208	1.91	1.86	17.2	15.6	4.2	337	2.11	1.99	16.5	15.8	5.4	373	2.92	2.09	17	16.1	9.6	516

TAI: Air in temperature
Twi: Fluid in temperature
Qw: Fluid flow rate in heat exchanger
Dpw: Pressure drop standard coil
Qa: Air flow
Pf: Total cooling capacity
Pfs: Sensible cooling capacity
Tad: Discharge air dry bulb temperature
Taw: Discharge air wet bulb temperature

Note: Design and specification are subject to change without prior notice for product improvement.

PCG-08-PS		TAI DB24℃-WB17.4℃						TAI DB27℃-WB19℃						TAI DB27℃-WB19.5℃						TAI DB28℃-WB21					
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	846	3.7	2.69	14.3	12.5	15.4	654	4.92	3.29	15.1	12.7	25.6	870	5.45	3.28	15.3	12.7	31.1	963	6.62	3.35	15.8	12.9	43.8	1170
	700	3.1	2.4	13.5	12.4	11.3	548	4.1	2.93	14.1	12.6	18.5	724	4.45	2.89	14.2	12.6	21.5	786	5.5	3	14.7	12.8	31.5	972
	550	2.48	2.05	12.6	12.3	7.5	438	3.27	2.5	13	12.5	12.3	578	3.56	2.48	13.1	12.5	14.4	630	4.78	2.66	14.2	12.6	24.5	845
6	846	3.05	2.52	14.9	13.4	11.2	538	4.26	3.12	15.7	13.6	20.15	753	4.72	3.10	15.85	13.65	24.4	833	5.92	3.18	16.4	13.85	36.25	1046
	700	2.57	2.19	14.4	13.3	8.15	453	3.56	2.77	14.8	13.5	14.6	628.5	3.89	2.74	14.9	13.55	17.15	687	4.93	2.84	15.4	13.75	26.1	871
	550	2.06	1.83	13.8	13.2	5.4	364	2.85	2.36	13.75	13.4	9.75	502.5	3.14	2.34	13.85	13.4	11.65	554.5	4.15	2.485	14.6	13.55	19.35	733.5
7	846	2.39	2.34	15.5	14.3	7	422	3.6	2.94	16.3	14.5	14.7	636	3.98	2.91	16.4	14.6	17.7	703	5.22	3.01	17	14.8	28.7	922
	700	2.03	1.98	15.3	14.2	5	358	3.02	2.60	15.5	14.4	10.7	533	3.33	2.58	15.6	14.5	12.8	588	4.36	2.68	16.1	14.7	20.7	770
	550	1.64	1.6	15	14.1	3.3	290	2.42	2.22	14.5	14.3	7.2	427	2.71	2.2	14.6	14.3	8.9	479	3.52	2.31	15	14.5	14.2	622
8	846	2.015	1.965	16.85	14.8	5.05	356	3.06	2.7	17.15	15.2	11.05	540.5	3.315	2.755	16.95	15.45	13.15	585.5	4.55	2.825	17.65	15.65	22.75	804
	700	1.685	1.64	16.75	14.75	3.75	297	2.575	2.34	16.6	15.1	8	454.5	2.785	2.38	16.45	15.35	9.45	491.5	3.8	2.51	16.8	15.55	16.4	671
	550	1.35	1.315	16.6	14.7	2.3	238.5	2.075	1.96	15.95	15	5.35	366.5	2.3	2.02	15.95	15.25	6.6	406.5	3.065	2.16	15.8	15.4	11.22	541.5
9	846	1.64	1.59	18.2	15.3	3.1	290	2.52	2.46	18	15.9	7.4	445	2.65	2.6	17.5	16.3	8.6	468	3.88	2.64	18.3	16.5	16.8	686
	700	1.34	1.3	18.2	15.3	2.5	236	2.13	2.08	17.7	15.8	5.3	376	2.24	2.18	17.3	16.2	6.1	395	3.24	2.34	17.5	16.4	12.1	572
	550	1.06	1.03	18.2	15.3	1.3	187	1.73	1.7	17.4	15.7	3.5	306	1.89	1.84	17.3	16.2	4.3	334	2.61	2.01	16.6	16.3	8.23	461

TAI: Air in temperature
Twi: Fluid in temperature
Qw: Fluid flow rate in heat exchanger
Dpw: Pressure drop standard coil
Qa: Air flow

Pf: Total cooling capacity
Pfs: Sensible cooling capacity
Tad: Discharge air dry bulb temperature
Taw: Discharge air wet bulb temperature

Note: Design and specification are subject to change without prior notice for product improvement.

PCG-09-PS		TAI DB24℃-WB17.4℃						TAI DB27℃-WB19℃						TAI DB27℃-WB19.5℃						TAI DB28℃-WB21					
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	1098	4.5	3.21	15.4	13.5	32	795	5.9	4.08	16.1	13.5	52.3	1043	6.3	4	16.1	13.6	58.9	1113	8.03	4.16	16.6	13.7	91.3	1419
	924	3.51	2.8	14.2	13.4	20.7	620	4.56	3.51	14.7	13.4	32.7	806	5.03	3.48	14.8	13.4	39.3	889	6.34	3.65	15.2	13.6	59.7	1120
	858	3.3	2.63	14	13.3	18.4	583	4.26	3.33	14.3	13.3	29.2	753	4.63	3.31	14.4	13.4	34	818	5.89	3.46	14.8	13.5	52.4	1041
6	1098	3.68	3.005	16.1	14.15	22.75	650	5.07	3.905	16.75	14.4	40.55	896	5.44	3.79	16.75	14.5	46.15	961	7.105	3.915	17.3	14.65	74	1255.5
	924	2.835	2.45	15.4	14.05	14.55	500.5	3.91	3.305	15.4	14.25	25.2	691	4.295	3.275	15.5	14.35	30.25	759.5	5.585	3.435	15.9	14.55	48.2	986.5
	858	2.675	2.315	15.15	13.95	13.04	472.5	3.655	3.135	15	14.15	22.5	646	3.945	3.115	15.1	14.35	26.1	697	5.2	3.235	15.6	14.45	42.25	919
7	1098	2.86	2.8	16.8	14.8	13.5	505	4.15	3.82	17.4	15.3	27.8	733	4.58	3.58	17.4	15.4	33.4	809	6.18	3.67	18	15.6	56.7	1092
	924	2.16	2.1	16.6	14.7	8.4	381	3.23	3.16	16.1	15.1	17.7	576	3.56	3.07	16.2	15.3	21.2	630	4.83	3.22	16.6	15.5	36.7	853
	858	2.05	2	16.3	14.6	7.68	362	3.06	2.98	15.7	15	15.8	539	3.26	2.92	15.8	15.3	18.2	576	4.51	3.01	16.4	15.4	32.1	797
8	1098	2.72	2.63	17.1	15.1	12.7	480.5	4	3.47	17.9	15.45	26.1	706.5	4.41	3.36	17.95	15.55	31.25	779.5	5.99	3.445	18.55	15.75	53.75	1058.5
	924	2.06	1.995	16.95	15.05	7.75	363.5	3.095	2.925	16.7	15.3	16.25	547	3.43	2.885	16.8	15.45	19.8	606.5	4.715	3.025	17.3	15.65	35.05	833
	858	1.925	1.87	16.8	15	6.59	340	2.905	2.78	16.3	15.2	14.6	513.5	3.18	2.755	16.4	15.4	17.4	562	4.405	2.855	17	15.55	30.9	778.5
9	1098	2.58	2.46	17.4	15.4	11.9	456	3.76	3.21	18.4	15.6	23.4	664	4.24	3.14	18.5	15.7	29.1	750	5.8	3.22	19.1	15.9	50.8	1025
	924	1.96	1.89	17.3	15.4	7.1	346	2.93	2.75	17.3	15.5	14.8	518	3.3	2.7	17.4	15.6	18.4	583	4.6	2.83	18	15.8	33.4	813
	858	1.8	1.74	17.3	15.4	5.5	318	2.76	2.62	16.9	15.4	13.4	488	3.1	2.59	17	15.5	16.6	548	4.3	2.7	17.6	15.7	29.7	760

TAI: Air in temperature
Twi: Fluid in temperature
Qw: Fluid flow rate in heat exchanger
Dpw: Pressure drop standard coil
Qa: Air flow

Pf: Total cooling capacity
Pfs: Sensible cooling capacity
Tad: Discharge air dry bulb temperature
Taw: Discharge air wet bulb temperature

Note: Design and specification are subject to change without prior notice for product improvement.

PCG-12-PS		TAI DB24℃-WB17.4℃						TAI DB27℃-WB19℃						TAI DB27℃-WB19.5℃						TAI DB28℃-WB21					
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	1296	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	5.05	17	13.8	74.4	1767
	1171	4.5	3.7	14.5	13.2	18	795	6.43	4.58	15.4	13.3	34.2	1136	7	4.52	15.6	13.4	39.7	1237	8.7	4.64	16.1	13.6	58.4	1538
	1098	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	13.5	42.3	1281
6	1296	4.615	3.785	15.9	13.85	18.75	815.5	6.435	4.76	16.85	14.25	34.35	1137	6.805	4.64	16.75	14.4	38.45	1202.5	8.825	4.795	17.5	14.7	60.4	1559.5
	1171	4	3.44	15.3	13.75	14.5	706.5	5.59	4.31	16.2	14.15	26.65	987.5	6.005	4.25	16.2	14.3	30.7	1061	7.7	4.395	16.75	14.55	47.5	1361
	1098	3.355	3.035	14.6	13.65	10.63	592.5	4.59	3.785	15.25	14.05	18.7	811	4.975	3.755	15.3	14.2	21.75	879	6.41	3.92	15.8	14.45	34.1	1132.5
7	1296	3.98	3.49	16.6	14.4	13.8	703	5.10	4.48	17.6	15.1	22.4	901	5.56	4.34	17.2	15.3	26	982	7.65	4.54	18	15.6	46.4	1352
	1171	3.5	3.18	16.1	14.3	11	618	4.70	4.04	17	15	19.1	839	5.01	3.98	16.8	15.2	21.7	885	6.7	4.15	17.4	15.5	36.6	1184
	1098	2.9	2.78	15.4	14.2	7.86	512	3.95	3.54	16.1	14.9	13.1	682	4.2	3.53	16	15.1	15.8	742	5.57	3.65	16.6	15.4	25.9	984
8	1296	3.49	3.19	17.15	14.75	11.2	616.5	5.175	4.075	18.3	15.25	22.65	914.5	5.395	4.02	18.05	15.5	24.7	953	7.455	4.195	18.75	15.75	44.5	1317.5
	1171	3.095	2.895	16.75	14.65	9	547	4.525	3.71	17.7	15.15	17.85	799.5	4.79	3.685	17.55	15.4	20.1	846	6.5	3.835	18.15	15.65	34.8	1148.5
	1098	2.535	2.44	16.4	14.6	6.43	447.5	3.71	3.25	16.85	15.05	12.45	656	4.01	3.275	16.75	15.3	14.6	708.5	5.42	3.4	17.35	15.55	24.9	957.5
9	1296	3	2.89	17.7	15.1	8.6	530	4.9	3.67	19	15.4	20.8	866	5.23	3.7	18.9	15.7	23.4	924	7.26	3.85	19.5	15.9	42.6	1283
	1171	2.69	2.61	17.4	15	7	476	4.3	3.38	18.4	15.3	16.6	760	4.57	3.39	18.3	15.6	18.5	807	6.3	3.52	18.9	15.8	33	1113
	1098	2.17	2.1	17.4	15	5	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

TAI: Air in temperature
Twi: Fluid in temperature
Qw: Fluid flow rate in heat exchanger
Dpw: Pressure drop standard coil
Qa: Air flow

Pf: Total cooling capacity
Pfs: Sensible cooling capacity
Tad: Discharge air dry bulb temperature
Taw: Discharge air wet bulb temperature

Note: Design and specification are subject to change without prior notice for product improvement.

PCG-16-PS		TAI DB24℃-WB17.4℃						TAI DB27℃-WB19℃						TAI DB27℃-WB19.5℃						TAI DB28℃-WB21					
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	1650	6	4.4	15.5	13.2	28.9	1060	8.4	5.5	16.5	13.4	53.3	1484	9	5.4	16.7	13.6	60.1	1591	11.5	5.59	17.3	13.7	93.8	2032
	1300	5	3.89	14.8	13.1	20.9	884	6.4	4.83	15.6	13.3	37.4	1220	7.4	4.73	15.7	13.4	42.3	1308	9.3	4.89	16.3	13.6	63.5	1644
	1100	3.8	3.24	13.7	13	12.7	671	5.32	4.03	14.3	13.1	23.4	940	5.7	3.96	14.4	13.2	26.4	1007	7.17	4.13	14.9	13.4	39.8	1267
6	1650	5.15	4.14	16.2	13.9	22.45	910	7.19	5.175	17.2	14.3	41.1	1271	7.75	5.105	17.2	14.45	46.75	1370	10.15	5.26	17.85	14.6	75.7	1793.5
	1300	4.3	3.645	15.55	13.8	16.25	760	5.7	4.55	16.4	14.2	29.15	1052	6.35	4.45	16.3	14.3	32.7	1122	8.265	4.625	16.9	14.5	52.05	1461
	1100	3.37	3.04	14.65	13.65	10.4	595.5	4.65	3.805	15.25	14	18.65	821.5	4.95	3.74	15.1	14.1	20.85	874.5	6.385	3.89	15.6	14.3	32.7	1128.5
7	1650	4.3	3.88	16.9	14.6	16	760	5.90	4.93	17.9	15.2	29.0	1043	6.5	4.81	17.7	15.3	33.4	1149	8.8	4.93	18.4	15.5	57.6	1555
	1300	3.6	3.4	16.3	14.5	11.6	636	4.80	4.31	17.2	15.1	20.9	883	5.3	4.17	16.9	15.2	23.1	936	7.23	4.36	17.5	15.4	40.6	1278
	1100	2.94	2.84	15.6	14.3	8.1	520	3.65	3.56	16.2	14.9	13.9	703	4.2	3.52	15.8	15	15.3	742	5.6	3.65	16.3	15.2	25.6	990
8	1650	3.85	3.55	17.35	14.85	13.2	680.5	5.61	4.495	18.45	15.4	25.85	991.5	6.15	4.425	18.45	15.55	30.35	1087	8.45	4.55	19.15	15.75	53.75	1493.5
	1300	3.155	3.025	16.95	14.8	9.15	558	4.65	3.935	17.75	15.3	18.45	821.5	5.025	3.87	17.65	15.45	21.1	888	6.915	4.015	18.3	15.65	37.5	1222
	1100	2.545	2.475	16.6	14.7	6.1	450	3.45	3.315	16.75	15.15	12	646.5	3.97	3.26	16.6	15.25	13.85	701.5	5.4	3.395	17.15	15.45	24.05	954.5
9	1650	3.4	3.22	17.8	15.1	10.4	601	5.24	4.14	19	15.6	22.8	926	5.8	4.04	19.2	15.8	27.3	1025	8.1	4.17	19.9	16	49.9	1432
	1300	2.71	2.65	17.6	15.1	6.7	480	4.3	3.6	18.3	15.5	16	760	4.75	3.57	18.4	15.7	19.1	840	6.6	3.67	19.1	15.9	34.4	1166
	1100	2.15	2.11	17.6	15.1	4.1	380	3.34	3.05	17.3	15.4	10.1	590	3.74	3	17.4	15.5	12.4	661	5.2	3.14	18	15.7	22.5	919

TAI: Air in temperature
Twi: Fluid in temperature
Qw: Fluid flow rate in heat exchanger
Dpw: Pressure drop standard coil
Qa: Air flow

Pf: Total cooling capacity
Pfs: Sensible cooling capacity
Tad: Discharge air dry bulb temperature
Taw: Discharge air wet bulb temperature

Note: Design and specification are subject to change without prior notice for product improvement.

ETHYLENE GLYCOL SOLUTIONS

Adding Ethylene Glycol to the water system so as to multiply the performance figures by the values given in the following table.

Freezing point (℃)						
	0	-5	-10	-15	-20	-25
Percentage of ethylene glycol in weight						
	0	12%	20%	28%	35%	40%
cPf	1	0.985	0.98	0.974	0.97	0.965
cQ	1	1.02	1.04	1.075	1.11	1.14
cdp	1	1.07	1.11	1.18	1.22	1.24

cPf: correction factor cooling capacity
cQ: correction factor flow rate
cdp: correction factor pressure drop

HEATING CAPACITY TABLES

PCG-06-PS			TAI 18℃				TAI 20℃				TAI 22℃				TAI 24℃			
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	750	2.28	27.4	390	2.36	2.07	28.5	354	1.98	1.86	29.6	318	1.64	1.65	30.7	282	1.3
		648	2.12	28	363	2.1	1.92	29.1	329	1.74	1.73	30.2	296	1.44	1.54	31.3	263	1.14
		588	2	28.4	342.8	1.86	1.82	29.5	312	1.6	1.64	30.5	281	1.31	1.46	31.5	250	1.02
50	40	750	2.24	27.2	192	0.6	2.04	28.4	175	0.557	1.83	29.5	166.9	0.457	1.62	30.6	158.8	0.357
		648	2.07	27.8	177	0.57	1.9	29	162	0.491	1.71	30.1	146.6	0.406	1.52	31.2	131.2	0.321
		588	1.98	28.3	170	0.53	1.8	29.4	154	0.445	1.61	30.4	138	0.362	1.42	31.4	122	0.279
70	60	750	4.37	36	374.6	2.2	4.14	37	354	1.98	3.91	38.1	335	1.78	3.68	39.2	316	1.58
		648	4.05	37.2	347	1.91	3.84	38.2	329	1.74	3.64	39.3	312	1.58	3.44	40.4	295	1.42
		588	3.83	38	328	1.73	3.63	39	311	1.56	3.46	40.1	296.6	1.44	3.29	41.2	282.2	1.32

TAI: Air in temperature
Twi: Fluid in temperature
Qw: Fluid flow rate in heat exchanger
Dpw: Pressure drop standard coil
Qa: Air flow
Pf: Total heating capacity
Tad: Discharge air temperature

Note: Design and specification are subject to change without prior notice for product improvement.

PCG-08-PS			TAI 18℃				TAI 20℃				TAI 22℃				TAI 24℃			
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	846	2.45	26.9	420	2.7	2.21	28	378.9	2.23	1.99	29.2	341	1.85	1.77	30.4	303.1	1.47
		700	2.22	27.8	380	2.3	2	28.8	342.9	1.9	1.8	29.9	308	1.55	1.6	31	273.1	1.2
		550	1.93	28.8	330	1.76	1.75	29.8	300	1.47	1.58	30.8	270	1.23	1.41	31.8	240	0.99
50	40	846	2.4	26.7	205	0.8	2.18	27.9	186.9	0.7	1.96	29.1	168	0.6	1.74	30.3	149.1	0.5
		700	2.16	27.5	185	0.6	1.96	28.6	168	0.52	1.74	30.2	149	0.42	1.52	31.8	130	0.32
		550	1.89	28.6	162	0.5	1.73	29.7	148	0.414	1.55	30.7	132	0.4	1.37	31.7	116	0.386
70	60	846	4.68	34.9	401	2.5	4.43	36.1	380	2.3	4.2	37.2	360	2.04	3.97	38.3	340	1.78
		700	4.22	36.5	361	2.1	4	37.6	343	1.9	3.73	39.7	319	1.65	3.46	41.8	295	1.4
		550	3.7	38.7	317	1.63	3.41	41	292	1.4	3.32	40.6	284	1.33	3.23	40.2	276	1.26

TAI: Air in temperature
Twi: Fluid in temperature
Qw: Fluid flow rate in heat exchanger
Dpw: Pressure drop standard coil
Qa: Air flow
Pf: Total heating capacity
Tad: Discharge air temperature

Note: Design and specification are subject to change without prior notice for product improvement.

PCG-09-PS			TAI 18℃				TAI 20℃				TAI 22℃				TAI 24℃			
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	1098	4.22	29.8	723.4	15.3	3.86	30.8	661.7	13.1	3.47	31.7	594	10.7	3.08	32.6	526.3	8.3
		924	3.78	30.9	648	12.6	3.42	31.7	586.2	10.4	3.09	32.6	530	8.7	2.76	33.5	473.8	7
		858	3.56	31.4	610	11.2	3.25	32.2	557	9.54	2.95	33	505	8.1	2.65	33.8	453	6.66
50	40	1098	4.36	30.2	373.7	4.7	3.98	31.1	341	3.95	3.6	32.1	308.6	3.3	3.22	33.1	276.2	2.65
		924	3.88	31.2	332.6	3.8	3.54	32.2	303	3.2	3.21	33	275	2.67	2.88	33.8	247	2.14
		858	3.69	31.8	316.3	3.5	3.38	32.6	289.7	2.95	3.06	33.5	262	2.46	2.74	34.4	234.3	1.97
70	60	1098	7.61	40.7	671.3	14.3	6.67	41.5	571	13	6.27	42.4	551	11.8	6.08	43.3	522	10.6
		924	7.01	42.6	602.1	11.5	5.85	43.5	546.3	10.5	5.55	44.4	537	9.53	5.82	45.3	507.7	8.56
		858	6.46	43	558.6	10.2	5.57	44.3	537	9.5	5.27	44.9	528	8.5	5.61	45.5	467	7.5

TAI: Air in temperature
Twi: Fluid in temperature
Qw: Fluid flow rate in heat exchanger
Dpw: Pressure drop standard coil
Qa: Air flow
Pf: Total heating capacity
Tad: Discharge air temperature

Note: Design and specification are subject to change without prior notice for product improvement.

PCG-12-PS			TAI 18℃				TAI 20℃				TAI 22℃				TAI 24℃			
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	1296	4.54	27.8	778	17.4	4.13	28.9	708	14.6	3.72	30.1	637	12.1	3.31	31.3	566	9.6
		1176	4.17	28.5	714.8	15	3.8	29.6	651	12.65	3.43	30.6	588	10.5	3.06	31.6	525	8.35
		1098	3.68	29.6	630.8	12	3.36	30.6	576	10.1	3.03	31.5	519	8.4	2.7	32.4	462	6.7
50	40	1296	4.67	28.1	400	5.3	4.3	29.3	368.6	4.6	3.88	30.4	332	3.8	3.46	31.5	295.4	3
		1176	4.3	28.8	368	4.54	3.92	29.9	336	3.8	3.57	31	306	3.24	3.22	32.1	276	2.68
		1098	3.8	30	325.7	3.63	3.48	30.9	298	3.1	3.15	31.9	270	2.58	2.82	32.9	242	2.06
70	60	1296	8.07	36.8	745	16.2	7.20	38	710	14.8	6.87	39	674	13.5	6.45	40	638	12.2
		1176	7.55	38.1	681	13.7	6.6	39	651	12.6	6.25	40.1	621	11.6	5.95	41.2	591	10.6
		1098	6.85	40.1	604	11	5.95	41	576	10.1	5.65	42.1	548	9.3	5.68	43.2	520	8.5

TAI: Air in temperature
Twi: Fluid in temperature
Qw: Fluid flow rate in heat exchanger
Dpw: Pressure drop standard coil
Qa: Air flow
Pf: Total heating capacity
Tad: Discharge air temperature

Note: Design and specification are subject to change without prior notice for product improvement.

PCG-16-PS			TAI 18℃				TAI 20℃				TAI 22℃				TAI 24℃			
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	1650	4.96	27	850	20.3	4.57	28.3	783	17.7	4.08	29.4	700	14.3	3.59	30.5	617	10.9
		1300	4.4	28	754	16.4	4.02	29.2	689	14	3.62	30.3	620	11.6	3.22	31.4	551	9.2
		1100	3.75	29.4	642.8	12.3	3.43	30.5	588	10.6	3.1	31.6	531	8.8	2.77	32.7	474	7
50	40	1650	5.12	27.3	439	6.2	4.7	28.5	402	5.3	4.24	29.7	363	4.4	3.78	30.9	324	3.5
		1300	4.54	28.3	389	5	4.14	29.5	354	4.2	3.75	30.6	321	3.54	3.36	31.7	288	2.88
		1100	3.86	29.7	330	3.7	3.53	30.8	302.6	3.2	3.21	31.8	275	2.7	2.89	32.8	247.4	2.2
70	60	1650	8.51	35.3	755	18.9	7.90	36.5	677	17.5	7.33	37.7	620	15.9	7.07	38.9	601	14.3
		1300	7.42	37.2	681	15.2	6.95	38.4	627	13.9	6.81	39.4	592	12.6	6.20	40.4	567	11.3
		1100	6.50	39.6	617	11.5	5.96	40.8	582	10.3	6.25	41.7	557	9.52	5.82	42.6	532	8.74

TAI: Air in temperature
Twi: Fluid in temperature
Qw: Fluid flow rate in heat exchanger
Dpw: Pressure drop standard coil
Qa: Air flow
Pf: Total heating capacity
Tad: Discharge air temperature

Note: Design and specification are subject to change without prior notice for product improvement.

THE INSTALLATION MANUAL

HOT & CHILLED WATER SYSTEM AIR CONDITIONERS
First check the contents of the package.

FACTORY SUPPLIED ACCESSORIES
Check to ensure all factory supplied accessories are supplied with the unit.

FACTORY SUPPLIED ACCESSORIES	AMOUNT
LCD Remote control	1
Mounting Bracket (Already on the unit)	1
Installation manual	1
Batteries	2
External drain pan	1

The appliance should be installed in accordance with national wiring regulation.

SAFETY CONSIDERATIONS
1. When working on air conditioning equipment, observe precautions in this manual, and on plates and tables attached to the unit. Follow all safety codes and other safety precautions that may apply.
2. Installing and servicing air conditioning equipment should be done by trained and qualified service personnel only. Untrained personnel can perform only basic maintenance functions such as cleaning coils, filters and replacing filters.
3. Ensure that the electrical supply and frequency are adequate for the operating current required for this specific installation.

WARNING - Before any service or maintenance operations turn off the main power switch.
1. The manufacturer denies any responsibility and warranty shall be void if these installation instructions are not observed.
2. Never switch off the power main supply when unit is operating in the cooling cycle. To switch off the fan coil unit use only the ON-OFF button.
3. This avoids over-flow in the drain pan, by allowing the pump to drain any condensate water due to regulating valve losses when chiller is working.

OPERATING LIMITS
1. Power supply

Volt	Phase	Hz
230	1	50

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

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.
PCG fan coils must be installed by an authorized company only.
PCG 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.

1. It is advisable to place the unit close to the installation site without removing it from the packaging.
2. Do not put heavy tools or weights on the packaging.
3. 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.
4. Check immediately for installation accessories inside the packaging.
5. Do not lift unit by the condensate drain discharge pipe or by the water connections; lift it by the four corners.(Fig.1)
6. Check and note the unit serial number.

Fig.1

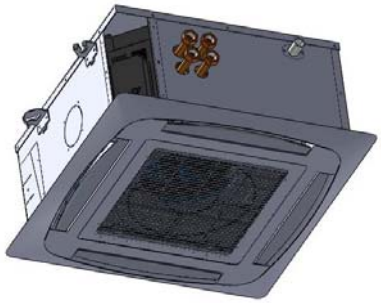
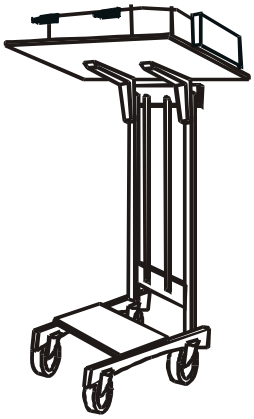


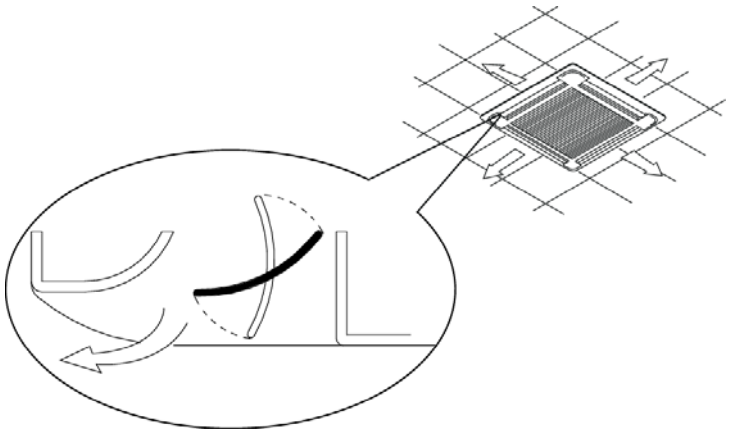
Fig.2



SELECT LOCATION

1. 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.
2. 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.
3. Installation of the unit will be facilitated by using a stacker and inserting a plywood sheet between the unit and the elevated stacker.(Fig.2)
4. It is recommended to position the unit as centrally as possible in the room to ensure optimum air distribution. (Fig.3)
   Generally the best louver position is the one which allows air diffusion along the ceiling.
   Alternatively intermediate positions can be selected.
5. Check that it is possible to remove panels from ceiling in the selected position, to allow enough clearance for maintenance and servicing operations.

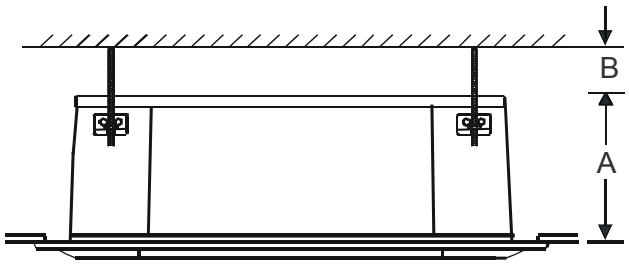
Fig.3



INSTALLATION LOCATION
INSTALL THE UNIT IN A POSITION:

1. Having sufficient strength to carry the weight of the unit.
2. Where the inlet and outlet grilles are not obstructed and the conditioned air is able to blow all over the room.
3. From where condensate can be easily run to drain.
4. Check the distance between the upper slab and false ceiling to ensure the unit will suit the distance. See Fig.4

Fig.4



Model	A (mm.)	B (mm.)
PCG-09	250	10 or more
PCG-06/08/12/16	290	10 or more

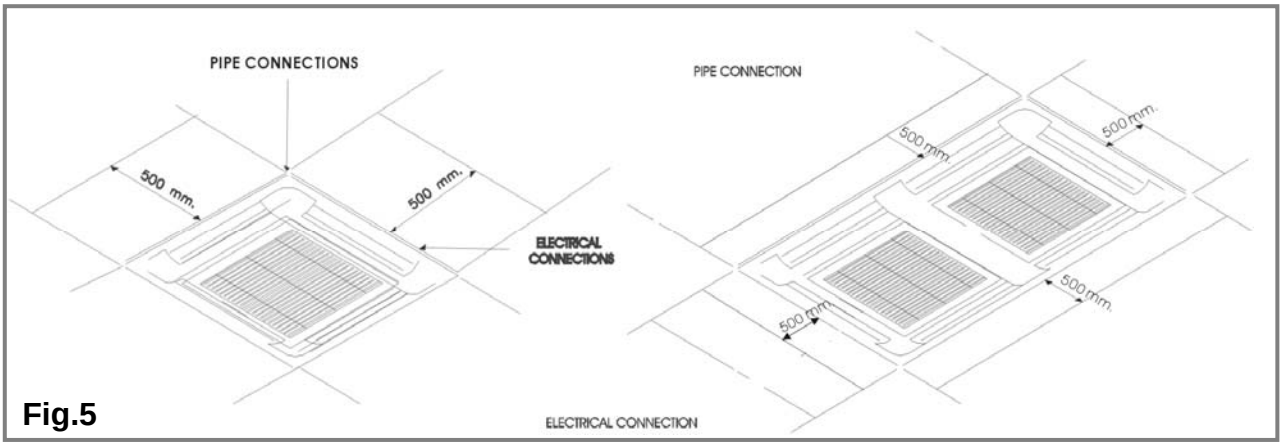
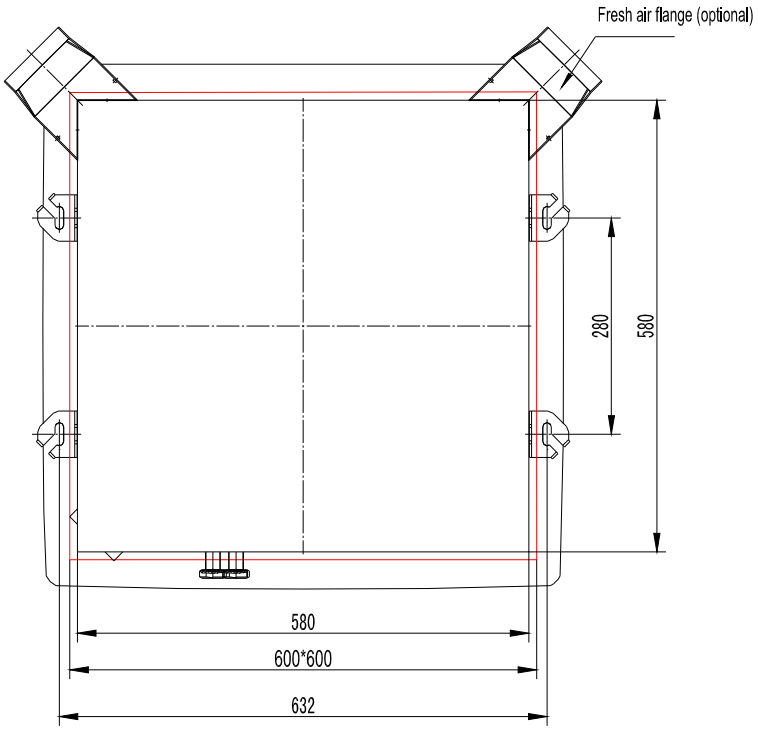


Fig.5

5. Ensure there is sufficient space around the unit to service it. See Fig.5

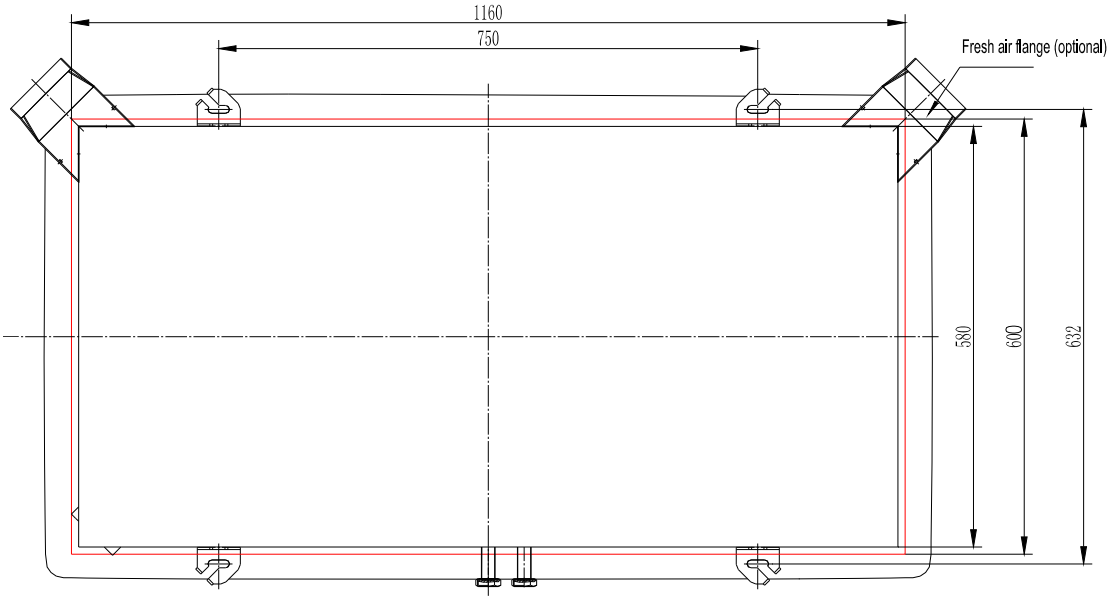
INSTALLATION METHOD
CASSETTE UNIT

Using the installation template open ceiling panels and install the suspension bolts as in Fig.6 below



600 x 600: Dimensions for opening
632 x 280: Suspension Bolts

MODELS	PCG-06/08



600 x 1160: Dimensions for opening
750 x 632: Suspension Bolts

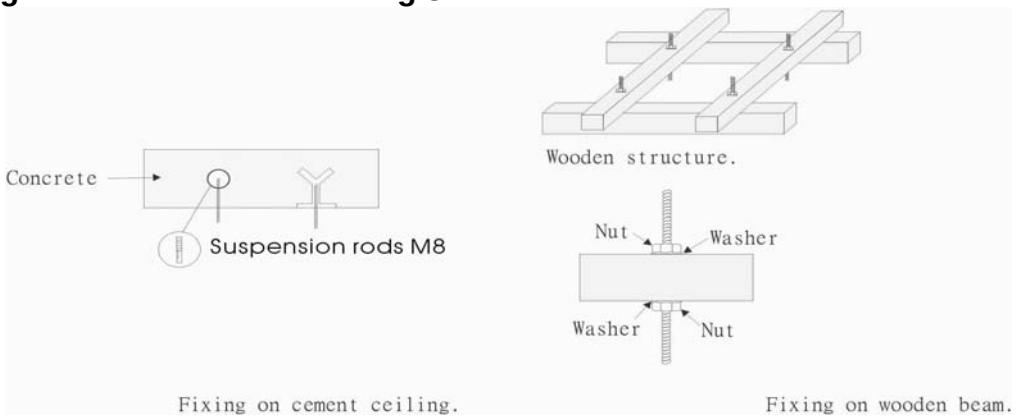
MODELS	PCG-09/12/16

FIG. 6

OPENING DIMENSIONS AND POSITIONS FOR SUSPENSION BOLTS

1. Mark position of suspension rods, water lines and condensate drain pipe, power supply cables and remote control cable.
2. Supporting rods can be fixed, depending on the type of ceiling, as shown in Fig. 7 and Fig.8.
3. Fit suspension brackets supplied with the unit to the threaded rods (Fig.9).
4. 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.

Fig.7 **Fig.8**



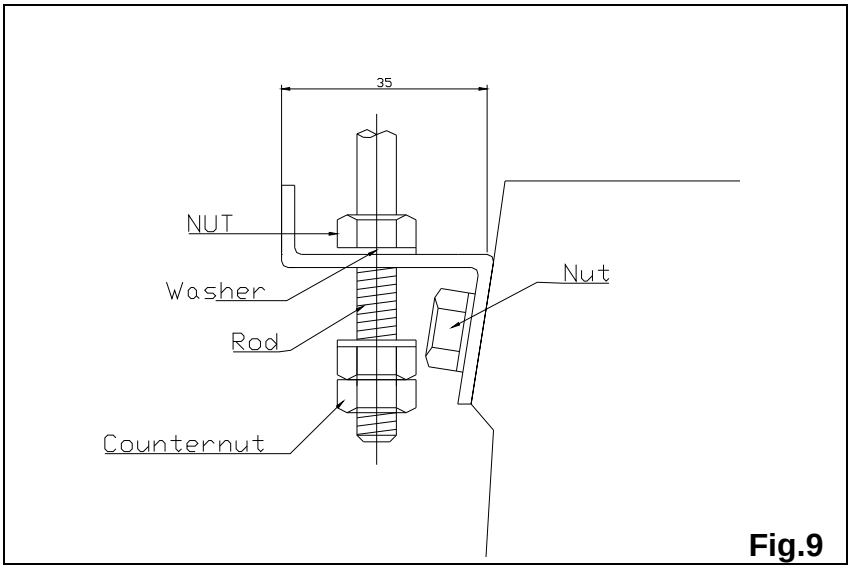


Fig.9

5. Ensure the ceiling is horizontally level, otherwise condensate water cannot drain.
6. 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.
7. When lifting the Cassette into position care should be taken not to lift the unit by the drip tray, which could be damaged.
8. 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.
9. Incline unit (Fig.10, Fig.11, Fig.13, Fig.14) and insert it into the false ceiling. Insert the rods into the bracket slot. With minimum height (see table) false ceilings, it might be necessary to remove some T brackets of the false ceiling temporarily.
10. 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 (Fig.12 Fig.15).
11. Line up the unit to the supporting bars of the false ceiling tightening the nuts and counter nuts of the threaded rods.

12. After connection of the condensate drain piping and piping connections, check again that the unit is level.

Fig. 10

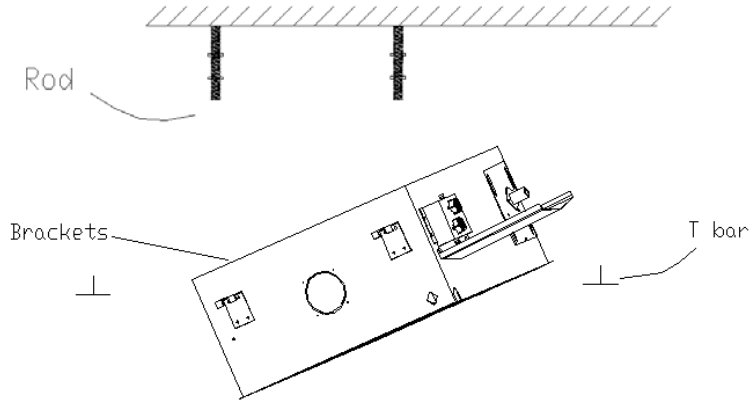


Fig. 11

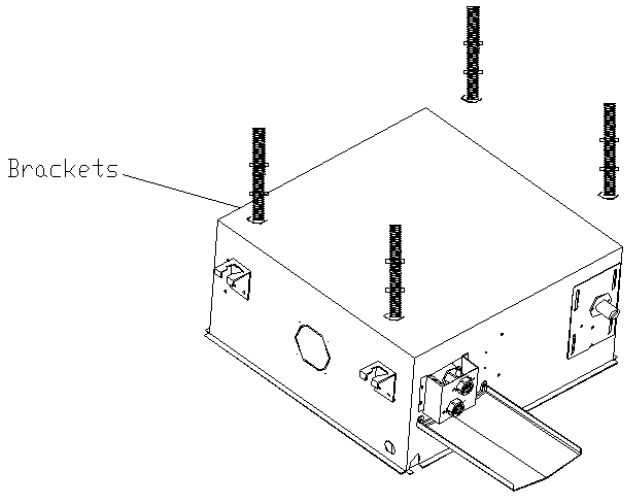
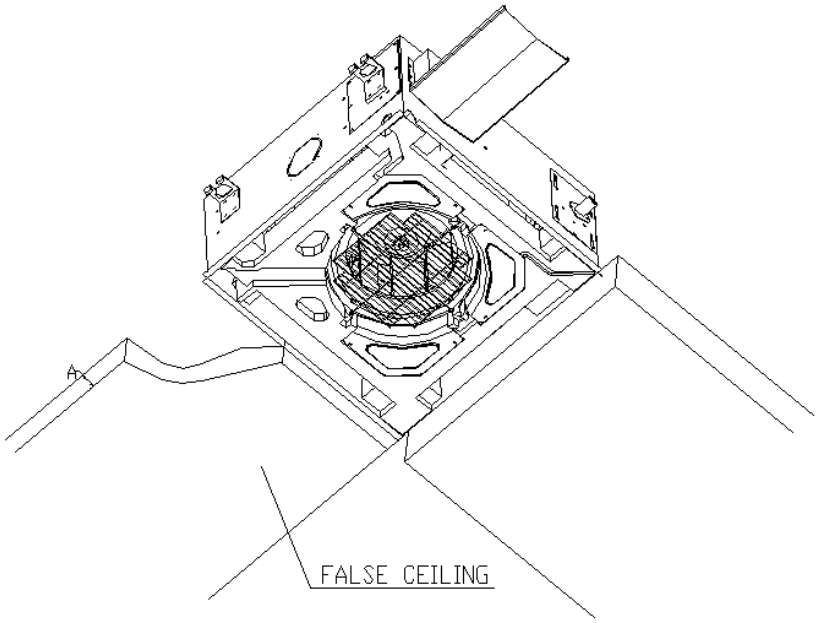
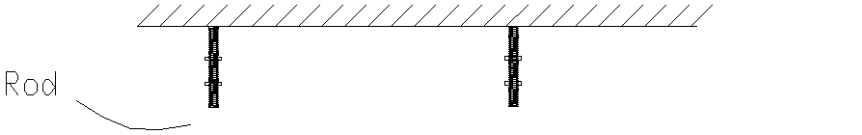


Fig. 12



MODEL	PCG-06/08
A (mm.)	3

Fig. 13



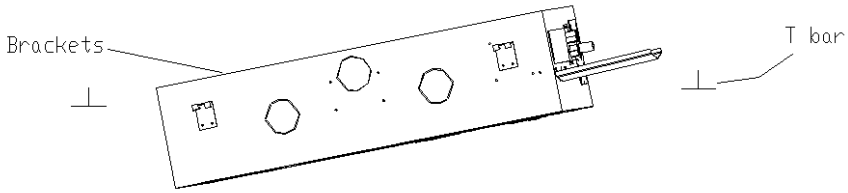


Fig. 14

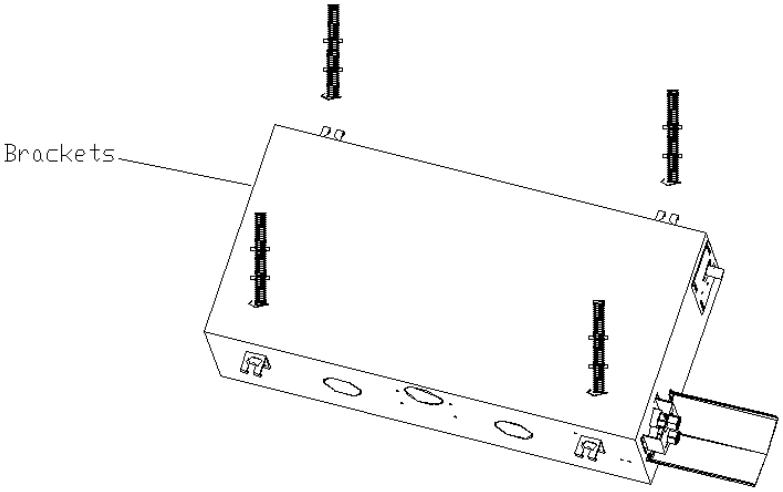
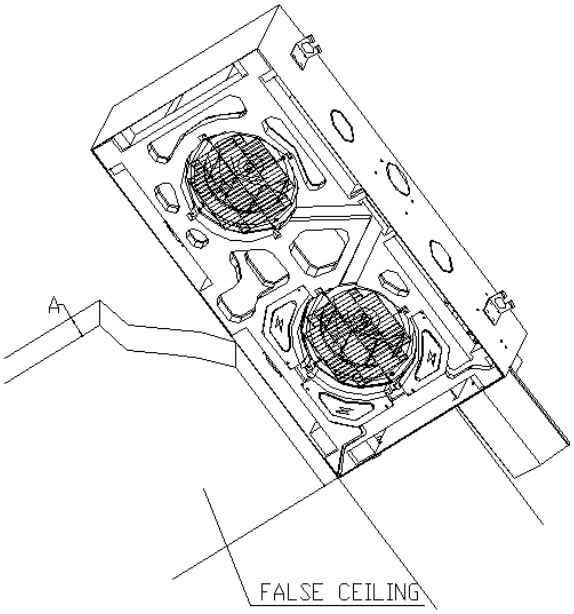


Fig. 15



MODEL	PCG-09/12/16
A (mm.)	3

13. The spaces between the unit and ceiling can now be adjusted. Use the drop rods to make the adjustment.
14. Check to ensure the unit is level. The drain will then automatically be lower than the rest of the drip tray.
15. Tighten the nuts on the suspended rods.

DRAIN PIPE WORK
INDOOR UNIT

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

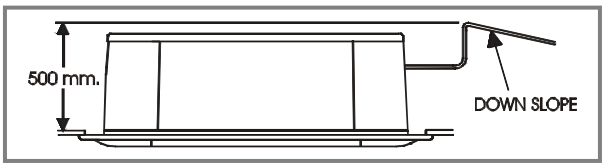


Fig. 16

WATER CONNECTIONS

The hydraulic connections of the PCG unit is 3/4" water connection with gaskets it is advisable to tighten the gaskets with a spanner.

For piping dimensional drawing please refer to "DIMENSIONAL DRAWINGS"

VALVE CONFIGURATION

There are two types of valve configuration for PCG cassette: a) Internal integrated valve and b) external valve –

a) Pre-installed 2-way and 3-way integrated valves (Fig. 17)

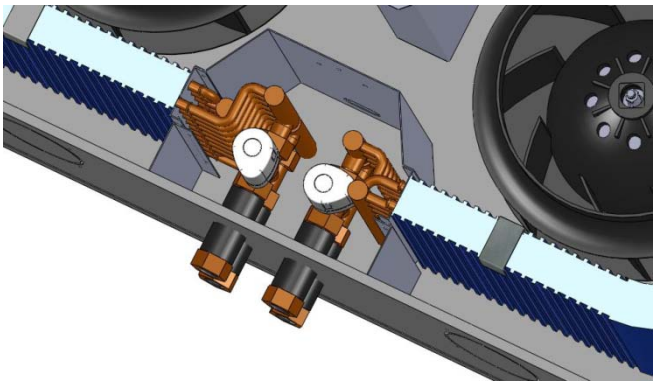


Fig. 17

Model	Integrated valve information	
	Type	inch
PCG-06/08	2-way & 3-way	1/2"
PCG-09/12/16	2-way & 3-way	3/4"

(please refer to "VALVE INFORMATION")

b) External valves

i. Replace integrated valve with plug-and-play replacement connector

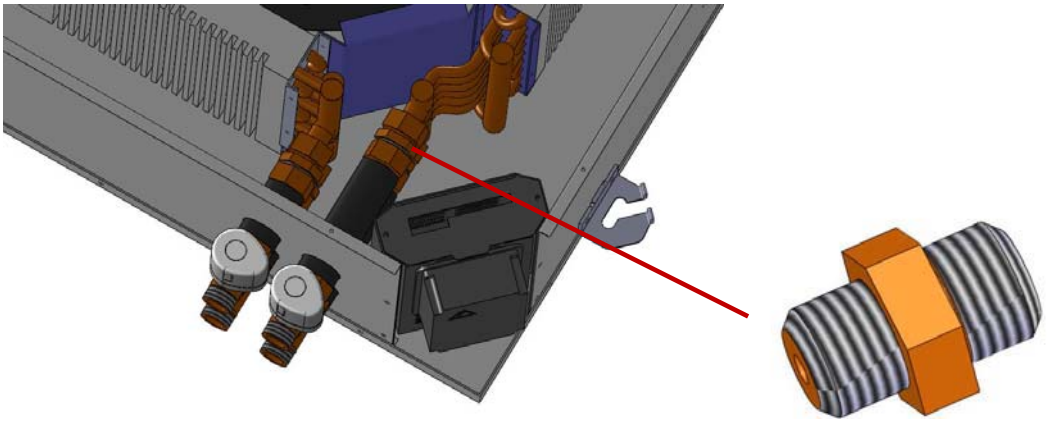


Fig. 18

Procedures:

1) Before connecting water supply to the PCG cassette. First remove the integrated valve using spanner
2) Replace with plug-and-play connector (Fig. 18)
3) Connect the external valve directly onto the cassette.

ii. Disable integrated valve functionality using valve cap

Procedures:

1) Remove integrated valve actuator by pressing on both sides. (Fig. 19)
2) Place the valve cap onto the valve body. (Fig. 20)
3) Connect the external valve directly onto the cassette.

Fig. 19

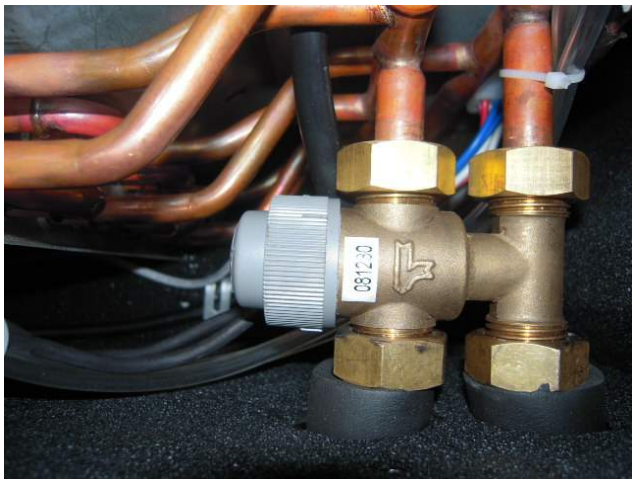


Fig. 20

EXTERNAL DRAIN PAN

Procedures:

- Align the two (2) screw holes in the fixing plate to the two (2) holes in the external drain pan. (Fig. 21)
- Make sure the drain pan is horizontal.
- Tighten the two screws and making sure the external drain pan is installed flush with the fixing plate. (Fig. 22)

When the installation is completed, it is necessary to wrap connecting pipe with insulation to prevent leakage to ceiling tile.

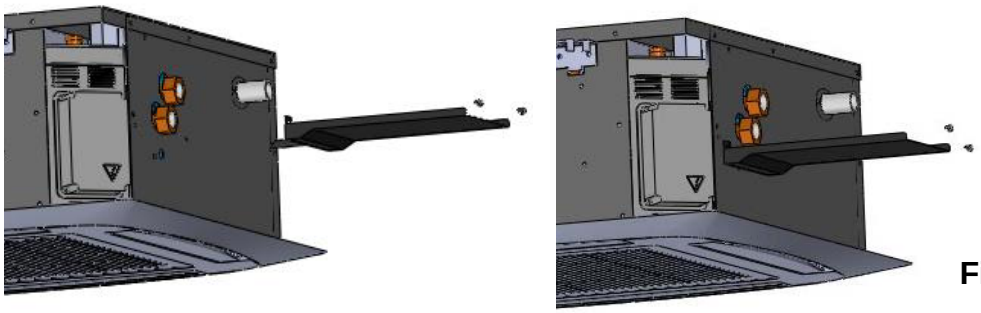


Fig. 21

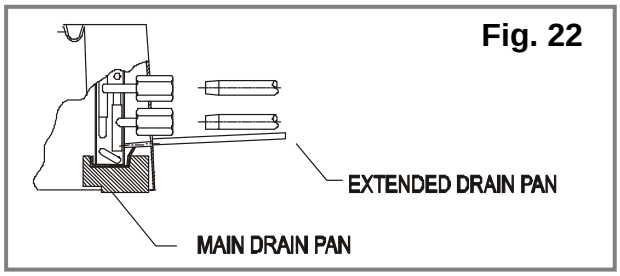


Fig. 22

FRESH AIR RENEWAL CONNECTION

The fresh air system for PCG cassette allows up to 15% of unit airflow as fresh air intake (per connection). Maximum 2 fresh air connections per unit.

1. The corners of the cassette allow separate ductwork to be installed for outside air intake (Fig.23)
2. Cut and remove anti-condensate insulating material.
3. Open the mounting plate (Fig. 24)
3. Install the flanges to casing and fix it with 2 screws. Flange is rectangular duct with dimension 110 x 55mm.

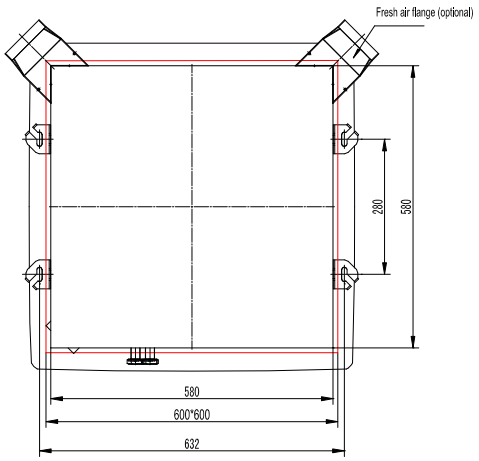


Fig. 23

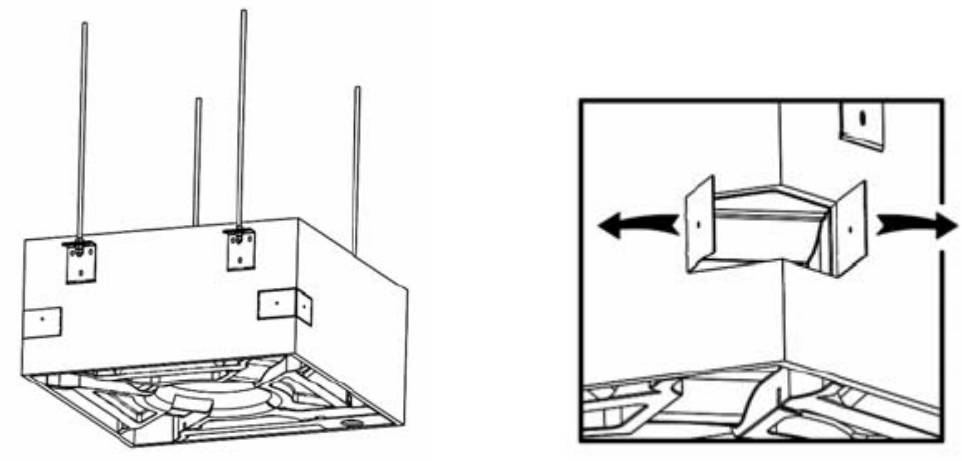


Fig. 24

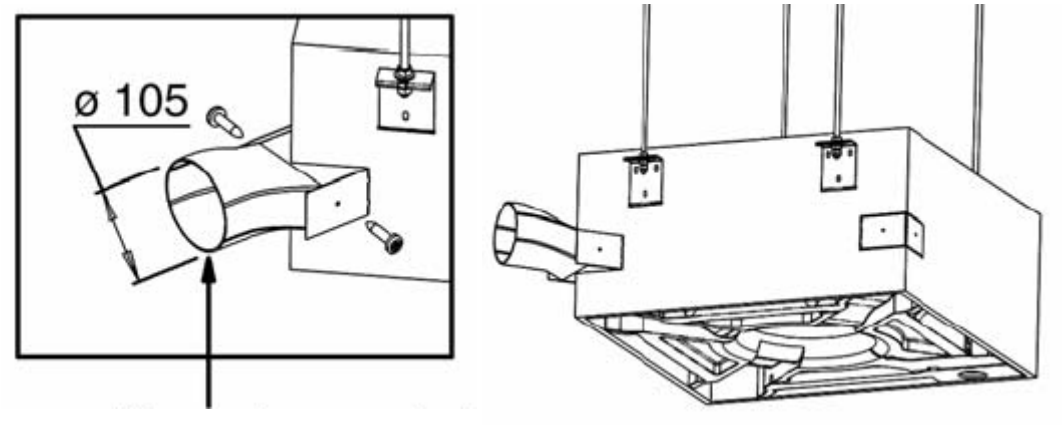
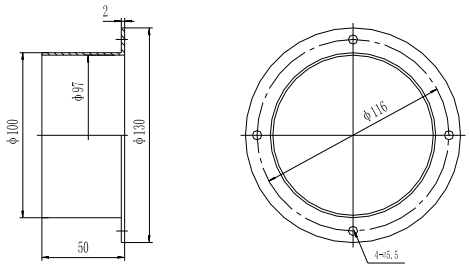


Fig. 25

BRANCH DUCT CONNECTION

- The side opening allows separate ductwork to be installed for branch ducting. (Fig. 26)
- Cut and remove anti-condensate insulating material.
- 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).

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



BRANCH DUCT DIMENSION

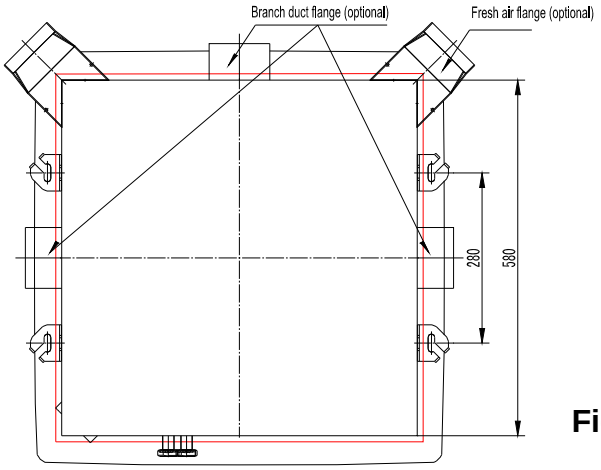
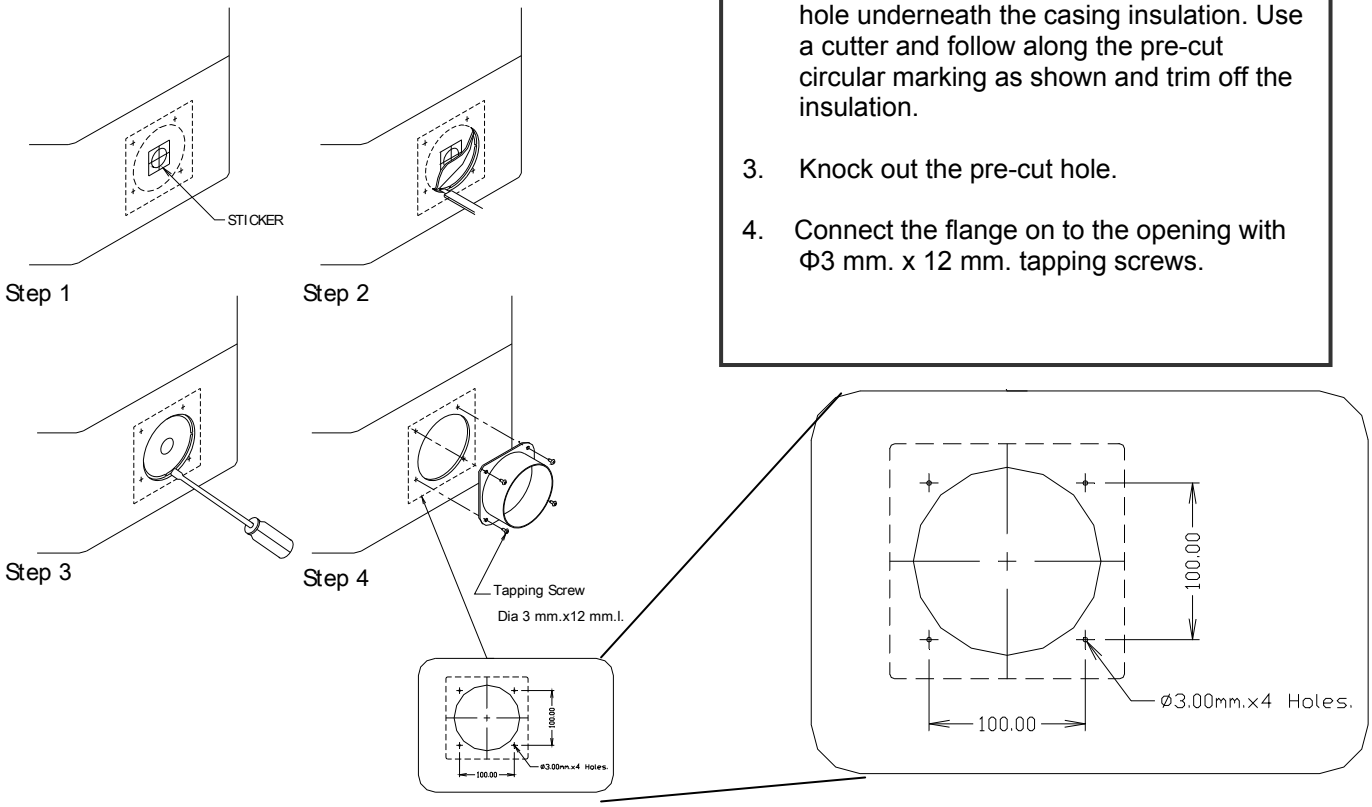


Fig. 26

BRANCH DUCT INSTALLATION

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 Φ3 mm. x 12 mm. tapping screws.



INTERCONNECTING WIRING

We recommend that screened cable be used in electrically noisy areas.

1. Always separate low voltage (5VDC) signal wires from power line (230 VAC) to avoid electro-magnetic disturbance of control system.
2. Do not install the unit where electromagnetic waves are directly radiated at the infra red receiver on the unit.
3. Install the unit and components as far away as is practical (at least 5 meters) from the electromagnetic wave source.
4. Where electromagnetic waves exist use shielded sensor cable.
5. Install a noise filter if any harmful noise exists in the power supply.

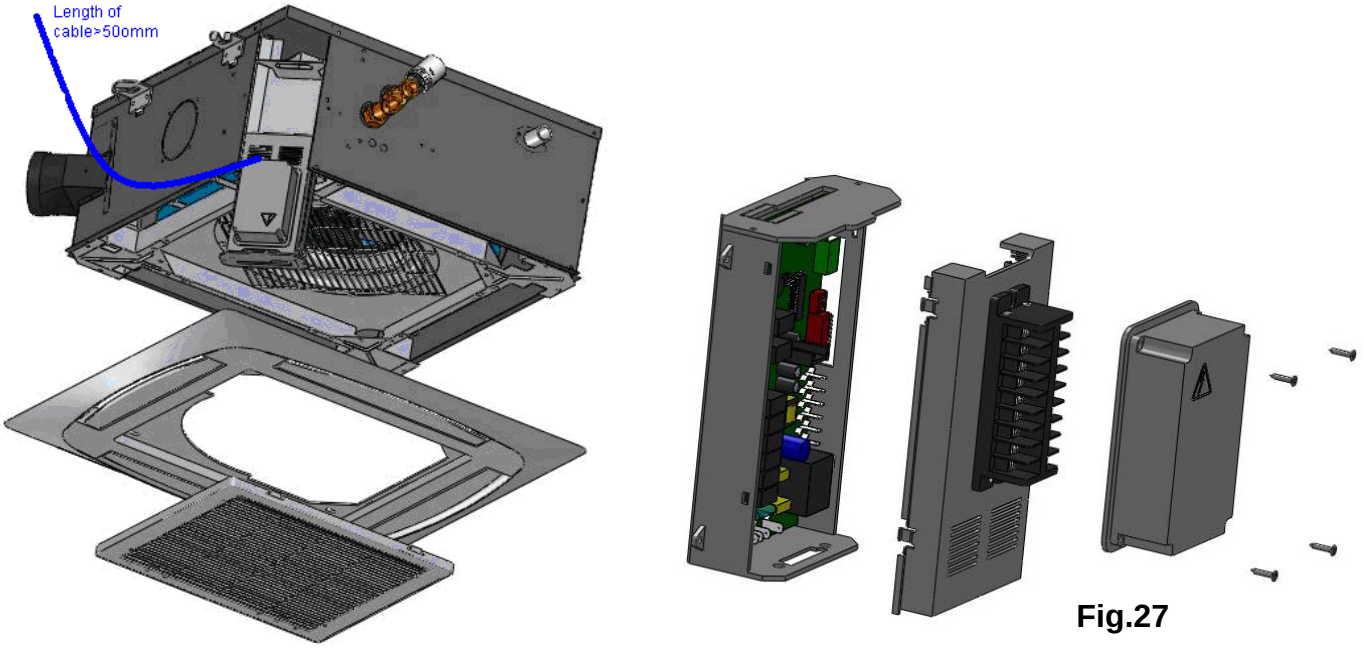


Fig.27

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

Wiring procedures:

1) Open the terminal block cover by removing 4 screws
2) Connect L & N cable to the terminal according to wiring diagram on page 63
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.

CONTORL BOX CONFIGURAITON

a) Plug-and-play control box with full functionality PCB (please refer to wiring diagram on page 60)

The PCB is a universal type with multiple configurations selectable using dipswitches. Please provide dip-switch setting according to below.

There are 2 DIP Switch sets on the PCB, one with 8 Dip-switches which named as DIP-Switch A and one with 6 Dip-switches which named as DIP-Switch B

For master-slave connection setting, please refer to Appendix I.

DIP Switch A SW1-SW6 is used for master slave address setting.
DIP switch address setting: 1 for ON, 0 for OFF.

SW7	SW8	Model setting
0	0	Cool-Heat
0	1	Cool-Heat + booster heater
1	0	Cooling only
1	1	Cool + primary heater

DIP Switch B is used for model configuration as follow:-
DIP switch setting: 1 for ON, 0 for OFF.

SW1	PR-O contact setting
0	Economy contact
1	Window contact

SW2	System setting
0	2 pipes system
1	4 pipes system

SW3	Preheat setting
0	28C
1	36C

SW4	MTV setting [applicable to 2 pipes system only]
0	Without motorized valve
1	With motorized valve

SW5	Reserved

SW6	RS485 termination setting
0	Other than below
1	Last unit on RS485 communication bus

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 Fig 28,29

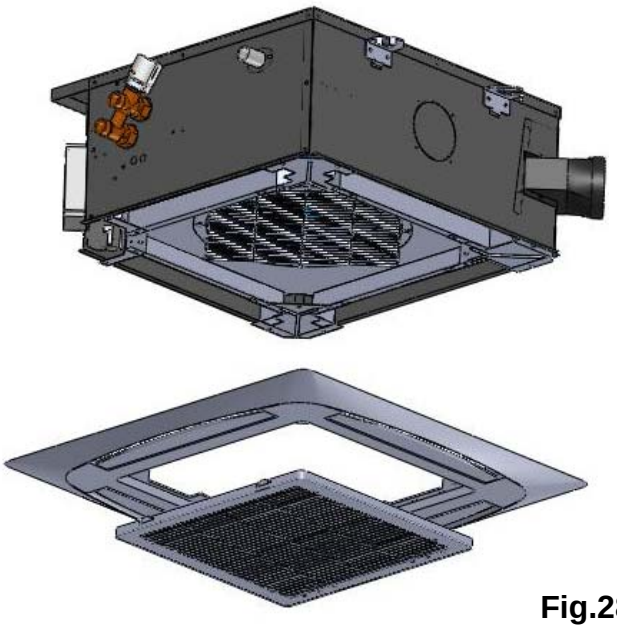


Fig.28

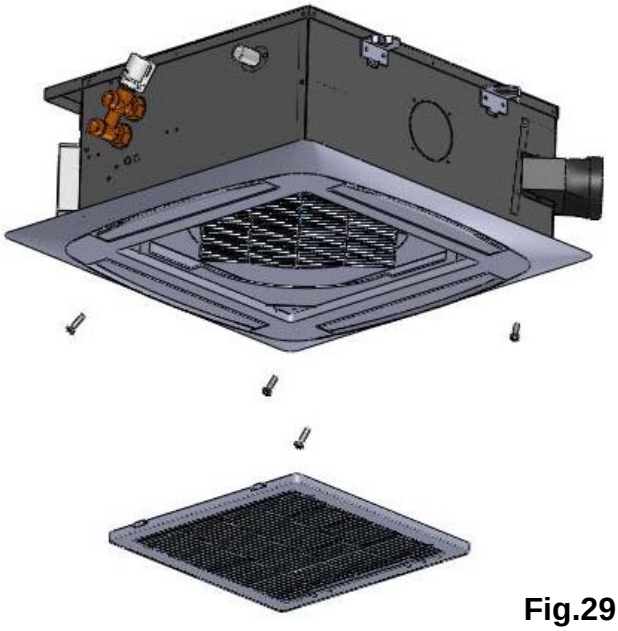
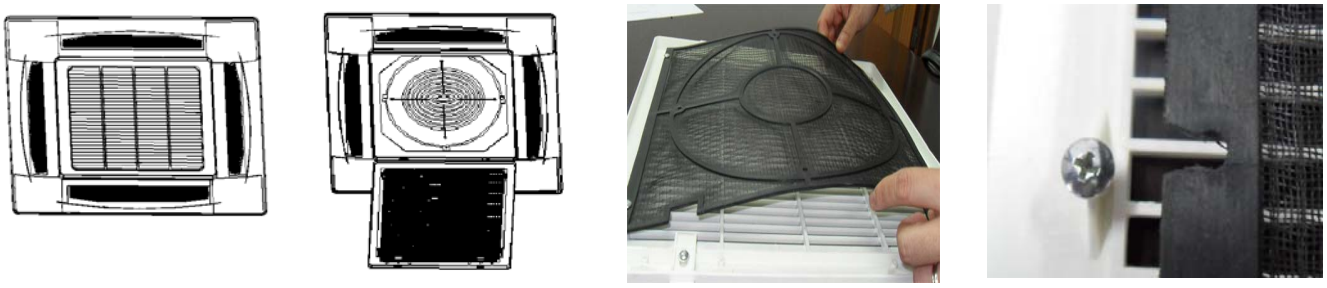


Fig.29

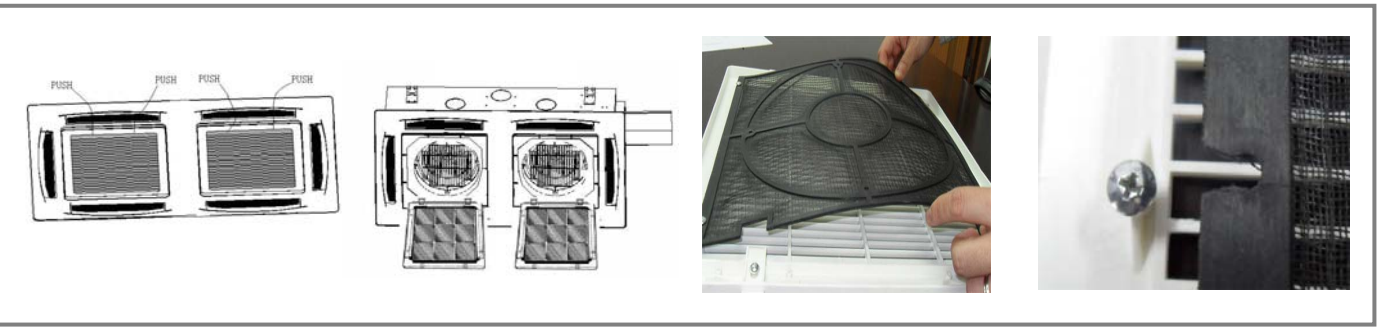
FILTER REMOVAL

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.

PCG-06/08



PCG-09/12/16



PRELIMINARY CHECKS BEFORE START-UP

1. The unit should not be started up until the system piping has been cleaned and all the air has been purged.
2. Check condensate drain pipe slope.
3. 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:
4. Install the cassette unit in an absolute horizontal position.
5. Fill the internal drain pan (manually) with enough water to ensure the drain pump is working.
6. You can fill the drain pan by pouring water through the external drain pan.
   If everything is correct, the water will be pushed out into the pipe work you have installed. If the valve does not open, you have to make sure the float switch is not hung up inside the unit and you will have to loosen it by hand.

7. Make sure that air filter is clean and properly installed.
8. Ensure that voltage and current values correspond with the unit nameplate values; check electrical connections.
9. Verify that air outlets are not closed.

MAINTENANCE

1. Before performing any service or maintenance operations, turn off the main power switch.
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 Fig.19 and the section filter removal.
3. Check the filter periodically and before the operating season; clean or replace as necessary.

PROLONGED UNIT SHUT-DOWN

1. Prior to restarting the unit:
2. Clean or replace the air filters.
3. Check and remove any obstruction from the external drain pan and the internal drain pan.

EXTRA MAINTENANCE

1. The electrical panel is easily accessible by removing the cover panel.
2. The inspection or replacement of internal components such as; heat exchanger coil, condensate
3. Drain pump, float switch, involves the removal of the condensate drain pan. See Fig.20-25.
4. 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.
5. Remove fixing screws of the drain pan fixture and remove condensate drain pan with care.

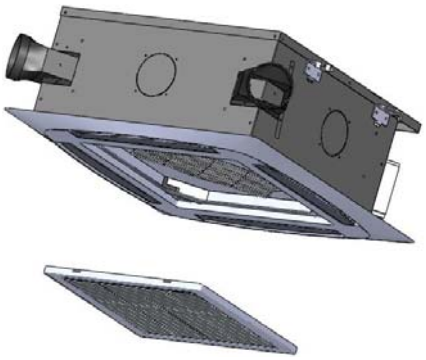
The appliance is intended to be maintained by qualified service personnel and located at a height of not less than 2.5m.

HOW TO ACCESS AIR VENT AND WATER PURGE

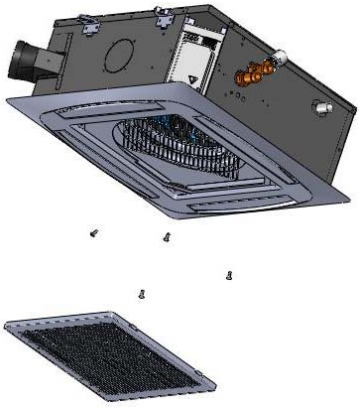
1st STEP: remove the grill, air vent and water purge are located at the pointed area.

2nd STEP: release the air vent / water purge by loosen the screws.

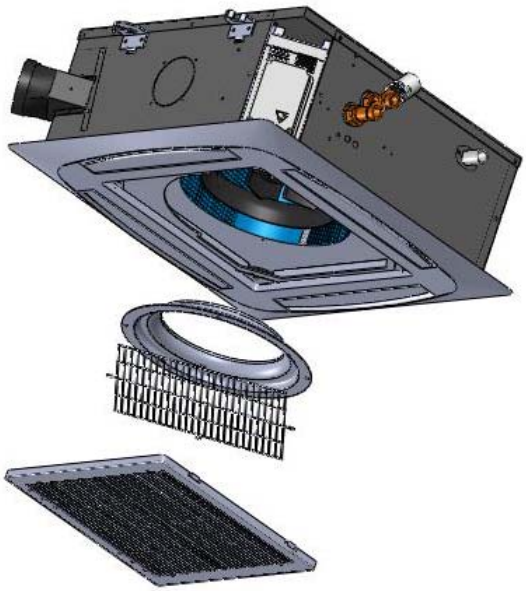
HOW TO CONNECT NON-DEFAULT FAN SPEED



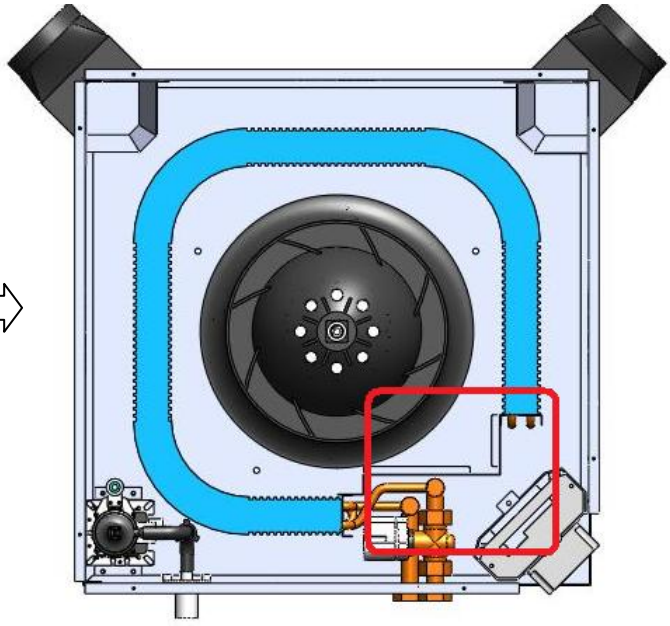
1st STEP: remove the grill.



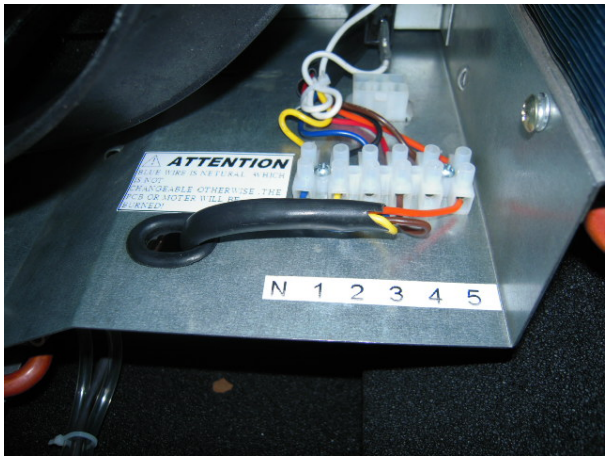
2nd STEP: remove the finger guard by removing 4 screws.



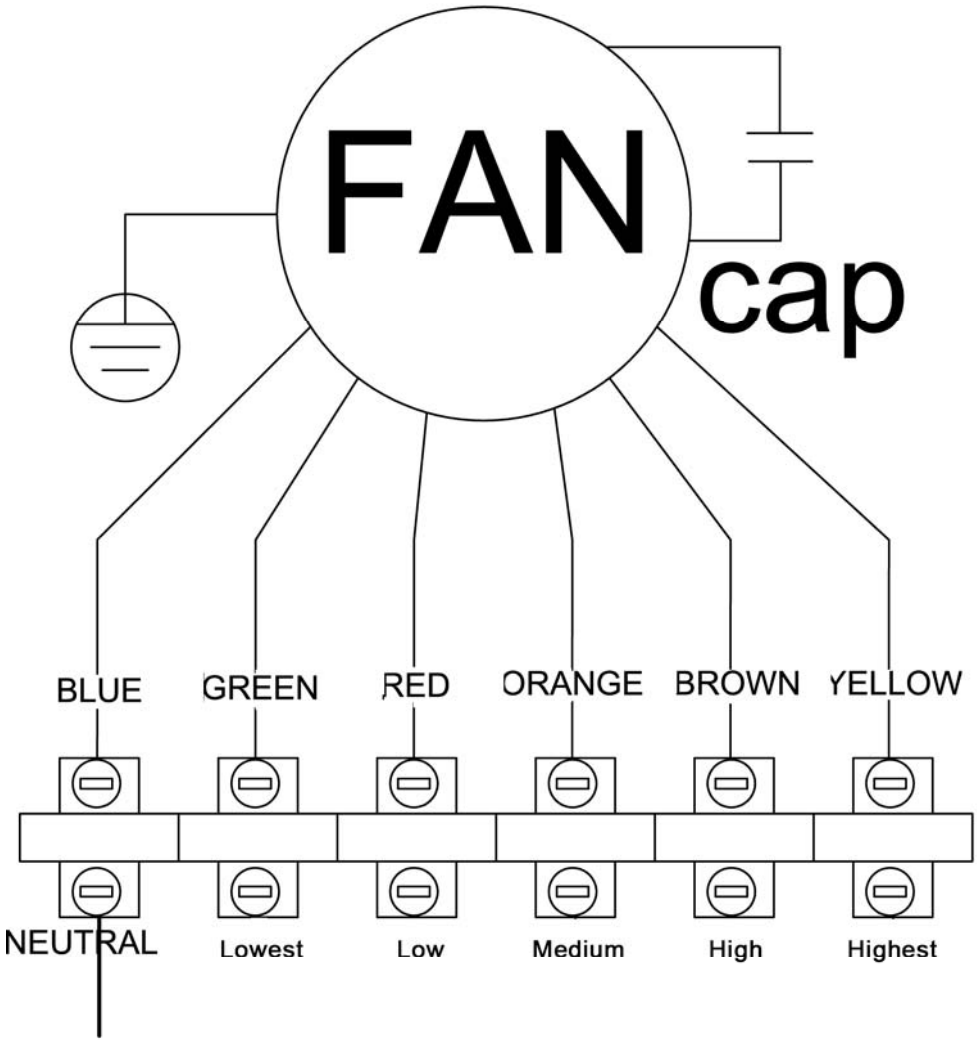
3rd STEP: remove the finger guard and venturi



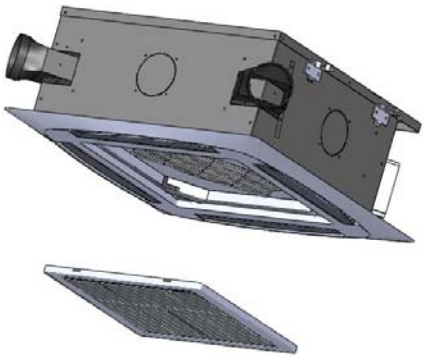
4th STEP: Fan speed terminal is located in the area inside the red rectangle.



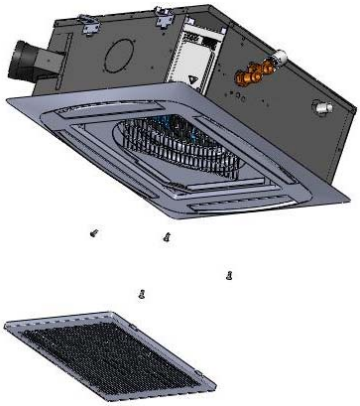
5th STEP: change the fan speed wiring according to below wiring diagram



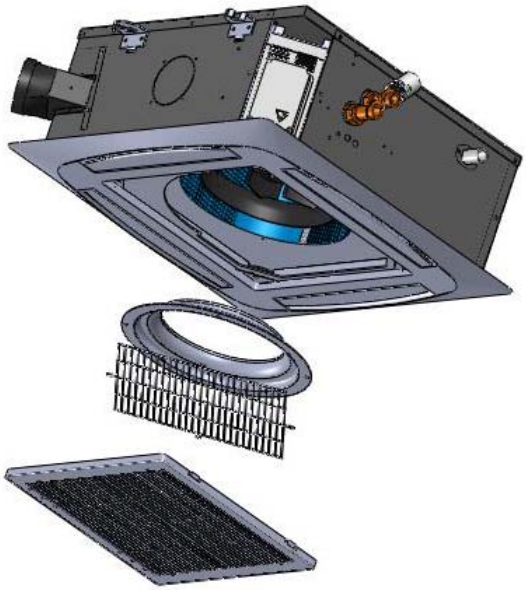
HOW TO FIX THE MOTOR AND FAN BLOWER



1st STEP: remove the grill.



2nd STEP: remove the finger guard by removing 4 screws.

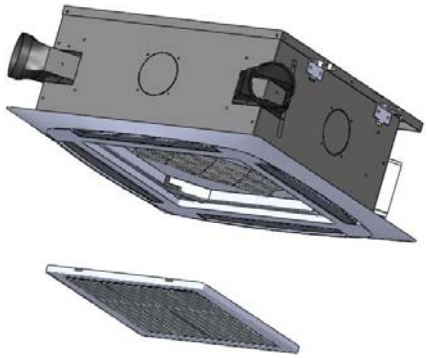


3rd STEP: remove the finger guard and Venturi

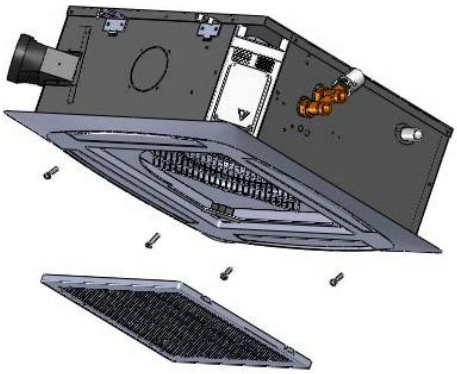
4th STEP: remove fan blower using a spanner

5th STEP: remove the motor by removing 4 bolts and disconnect fan motor wire connector.

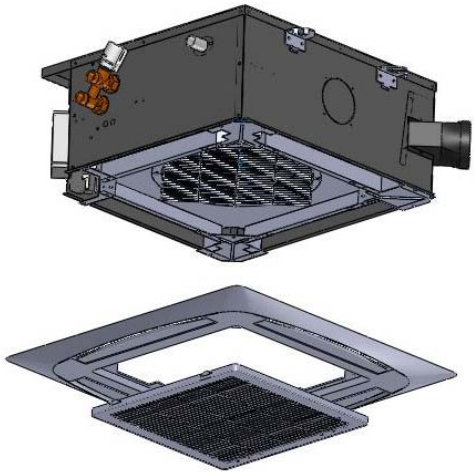
HOW TO FIX CONDENSATE PUMP AND INTERNAL VALVE



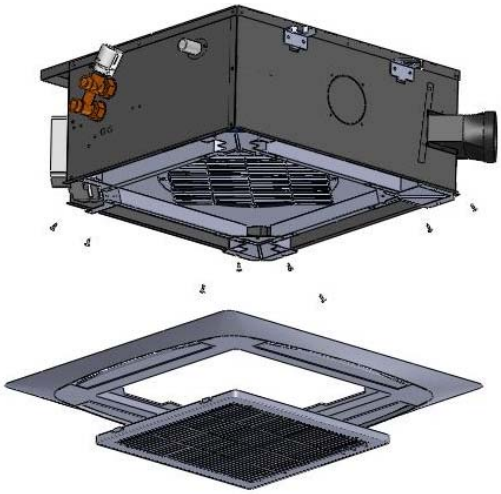
1st STEP: remove the grill.



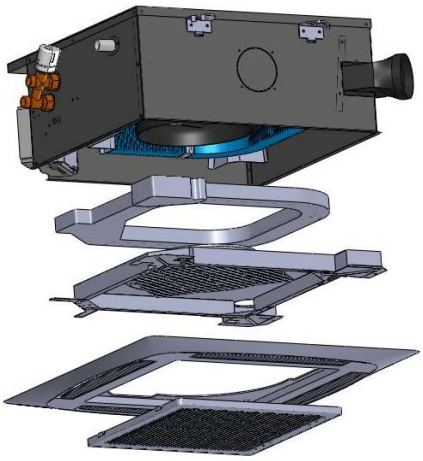
2nd STEP: remove the front panel by removing 4 screws.



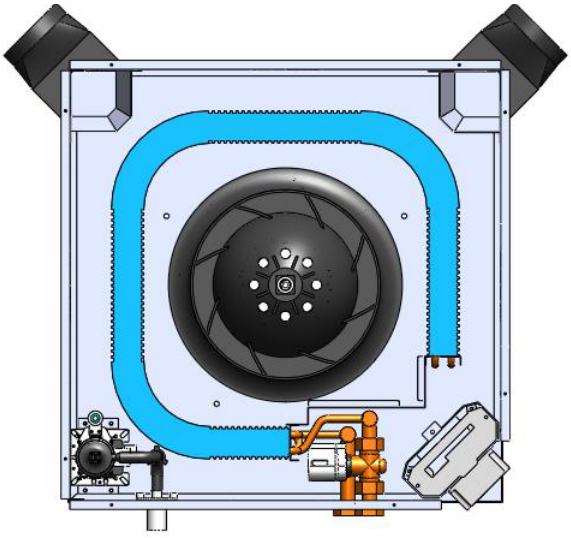
3rd STEP: remove the front panel by disconnecting stepping motor and IR receiver.



4th STEP: removing the drain pan fixture by removing 8 screws.

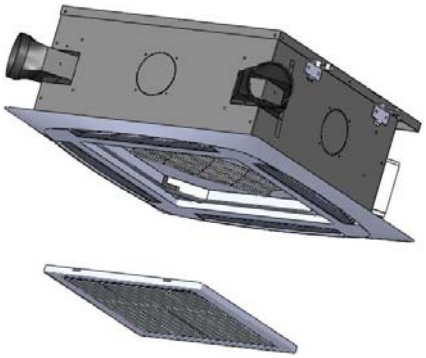


5th STEP: remove the drain pan fixture and internal drain pan

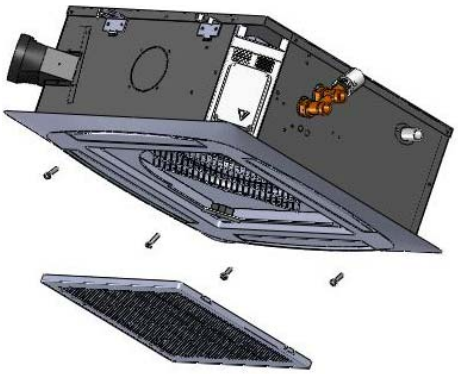


6th STEP: remove the drain pump or valve

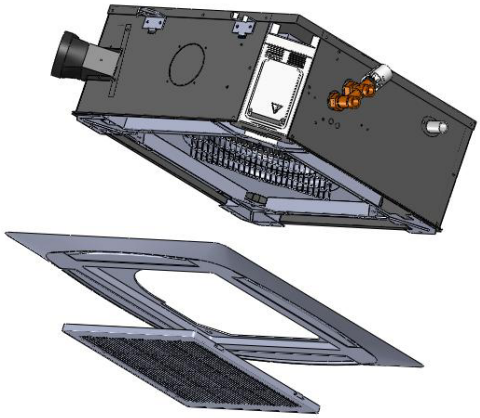
HOW TO FIX CONTROL BOX



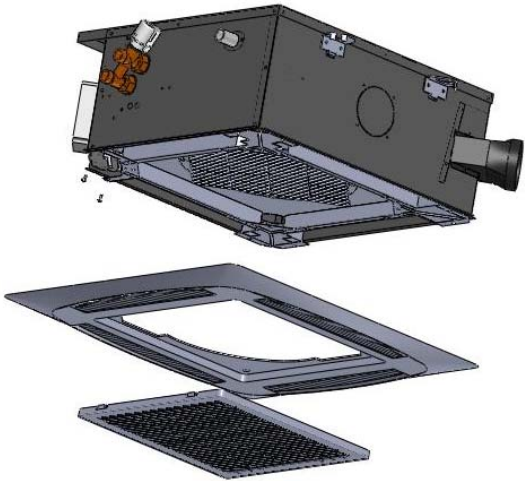
1st STEP: remove the grill.



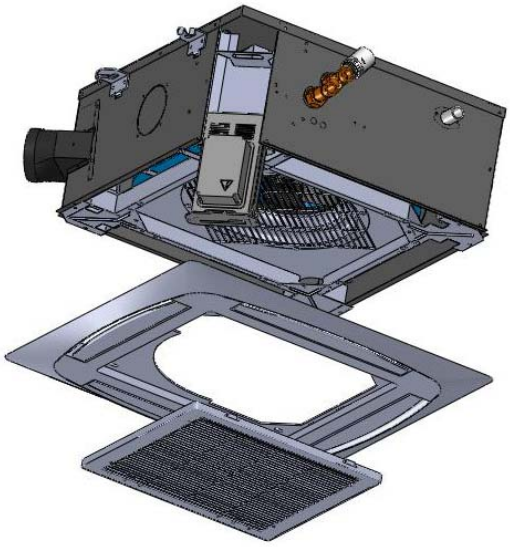
2nd STEP: remove the front panel by removing 4 screws.



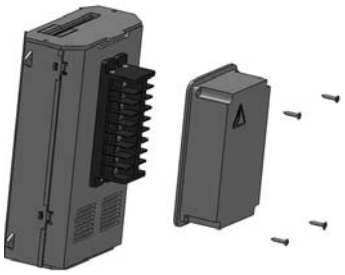
3rd STEP: remove the front panel by disconnecting stepping motor and IR receiver.



4th STEP: remove 2 screws on the control box.

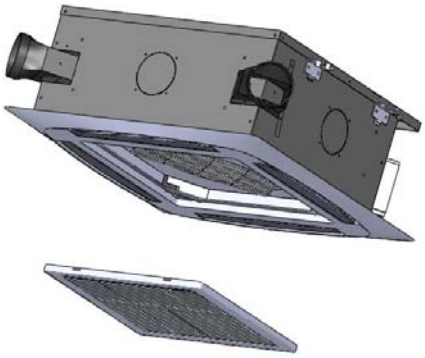


5th STEP: sliding out the control box.

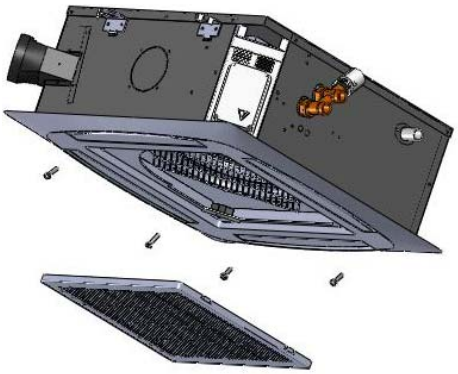


6th STEP: Remove the terminal cover by removing 4 screws and unplug the wiring on the terminal. And replace with a new control box

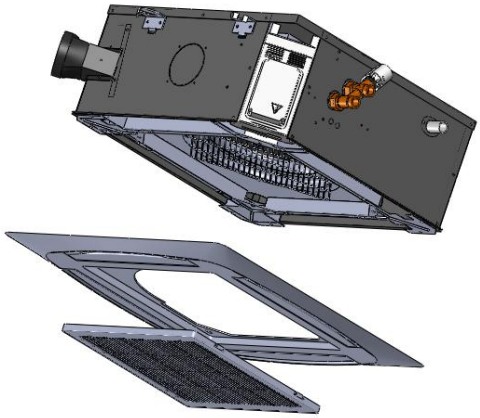
HOW TO INSTALL ELECTRIC HEATER



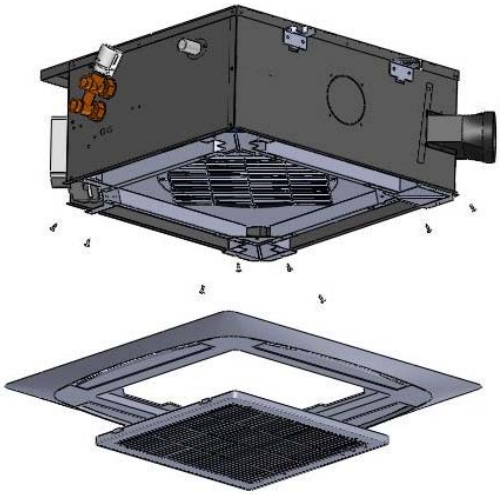
1st STEP: remove the grill.



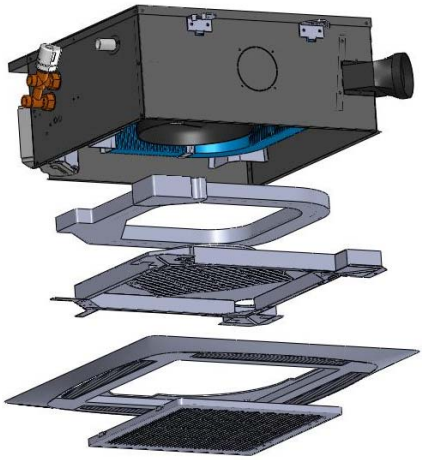
2nd STEP: remove the front panel by removing 4 screws.



3rd STEP: remove the front panel by disconnecting stepping motor and IR receiver.

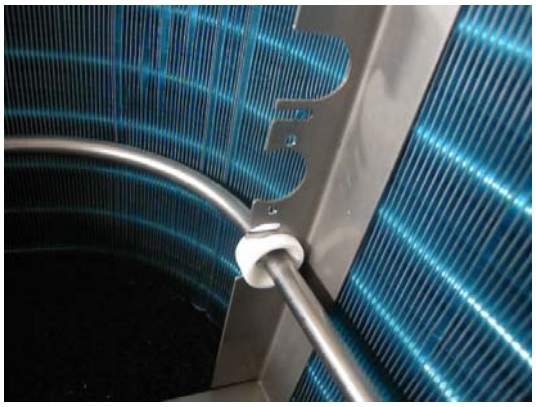


4th STEP: remove the drain pan fixture by removing 8 screws.

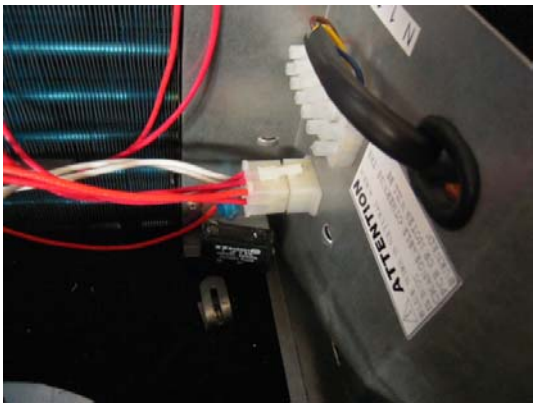


5th STEP: remove internal drain pan fixture and internal drain pan

6th STEP: slide in the insulated ring of the electric heater to the electric heater mounting shown above



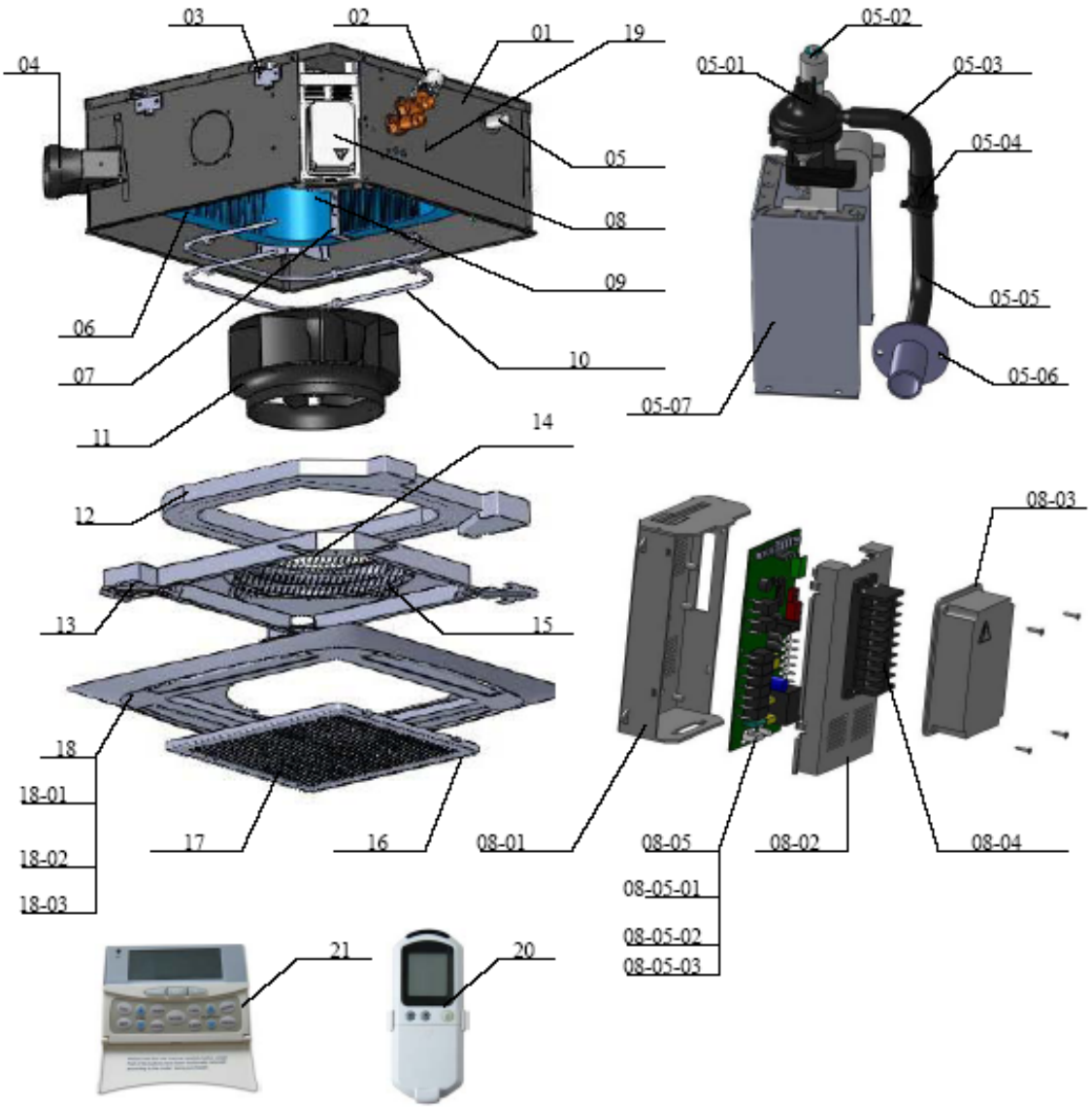
7th STEP: slide in the rest insulated rings of the electric heater to the electric heater mounting shown above



8th STEP: Plug in the electric heater wiring to the connector shown above.

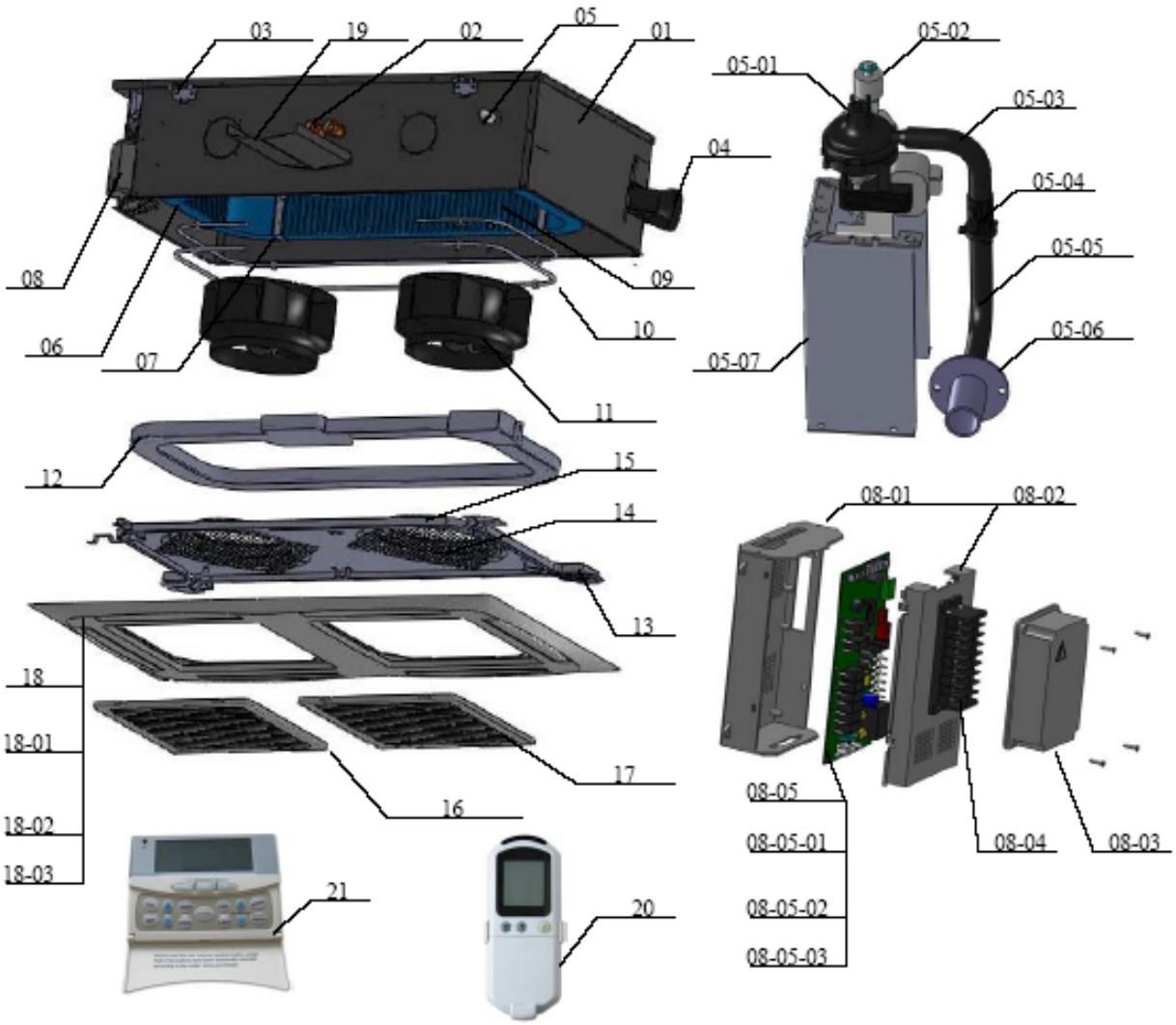
EXPLODED VIEW DRAWING

PCG-06/08-PS



01---casing	08-05---main PCB
02---3-way 4-ports valve (optional) G3/4	08-05-01---chilled water coil temperature sensor
03---mounting brackets	08-05-02---hot water coil temperature sensor
04---fresh air flange (optional)	08-05-03---room temperature sensor
05---Condensate water pump	09---motor with capacitor
05-01---pump body	10---electrical heater (optional)
05-02---float switch	11---fan blower
05-03---flexible hose 1	12---drain pan with 3mm insulation
05-04---non-return valve	13---drain pan fixture
05-05--- flexible hose 2	14---finger guard
05-06---drainage head	15---Venturi
05-07---pump fixture	16---returned air grill
06--- coil	17---filter
07---coil and EH's fixture	18---front panel
08---control system	18-01---stepping motor (2-corotation)
08-01---back of control box	18-02---stepping motor (2-reversion)
08-02---front of control box	18-03---IR receiver
08-03---cover of control box	19---external drain pan
08-04---terminal block	20--- remote handset and wired wall pad (optional)

PCG-09/12/16-PS



01---casing	08-05---main PCB
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05---Condensate water pump	09---motor with capacitor
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05-06---drainage head	15---Venturi
05-07---pump fixture	16---returned air grill
06--- coil	17---filter
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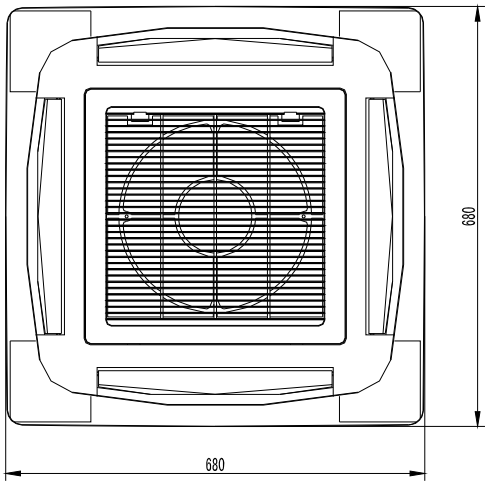
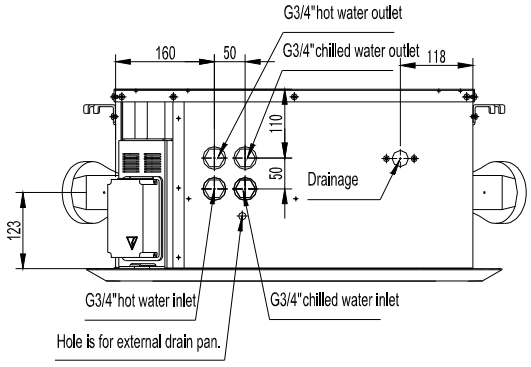
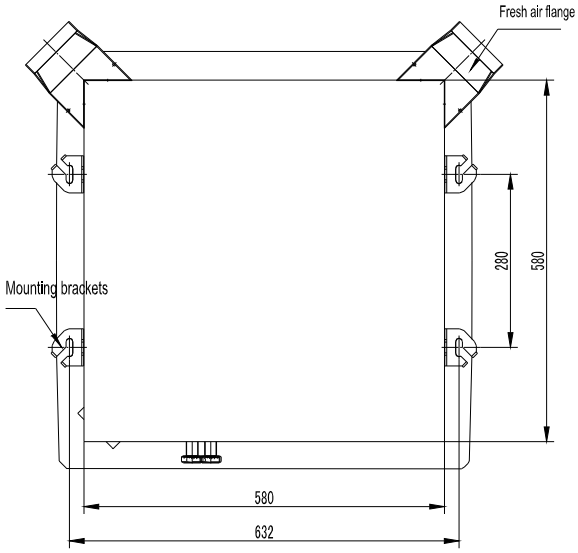
08-04---terminal block	20--- remote handset and wired wall pad (optional)

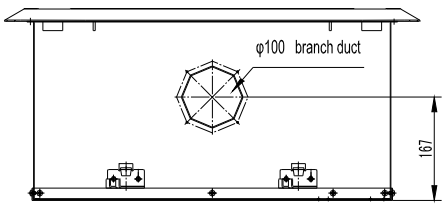
DIMENSIONAL DRAWINGS

PCG-06-08-PS

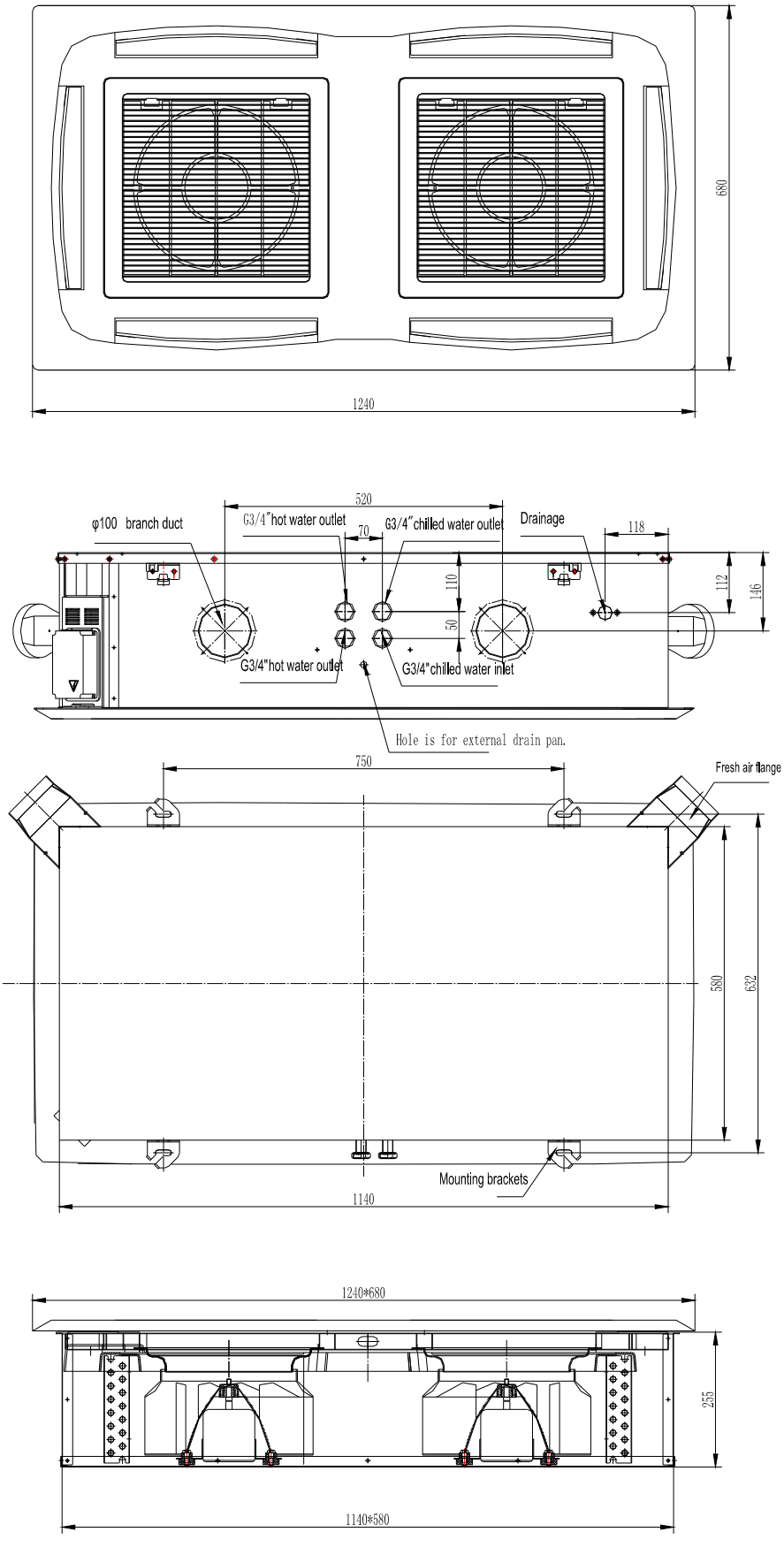




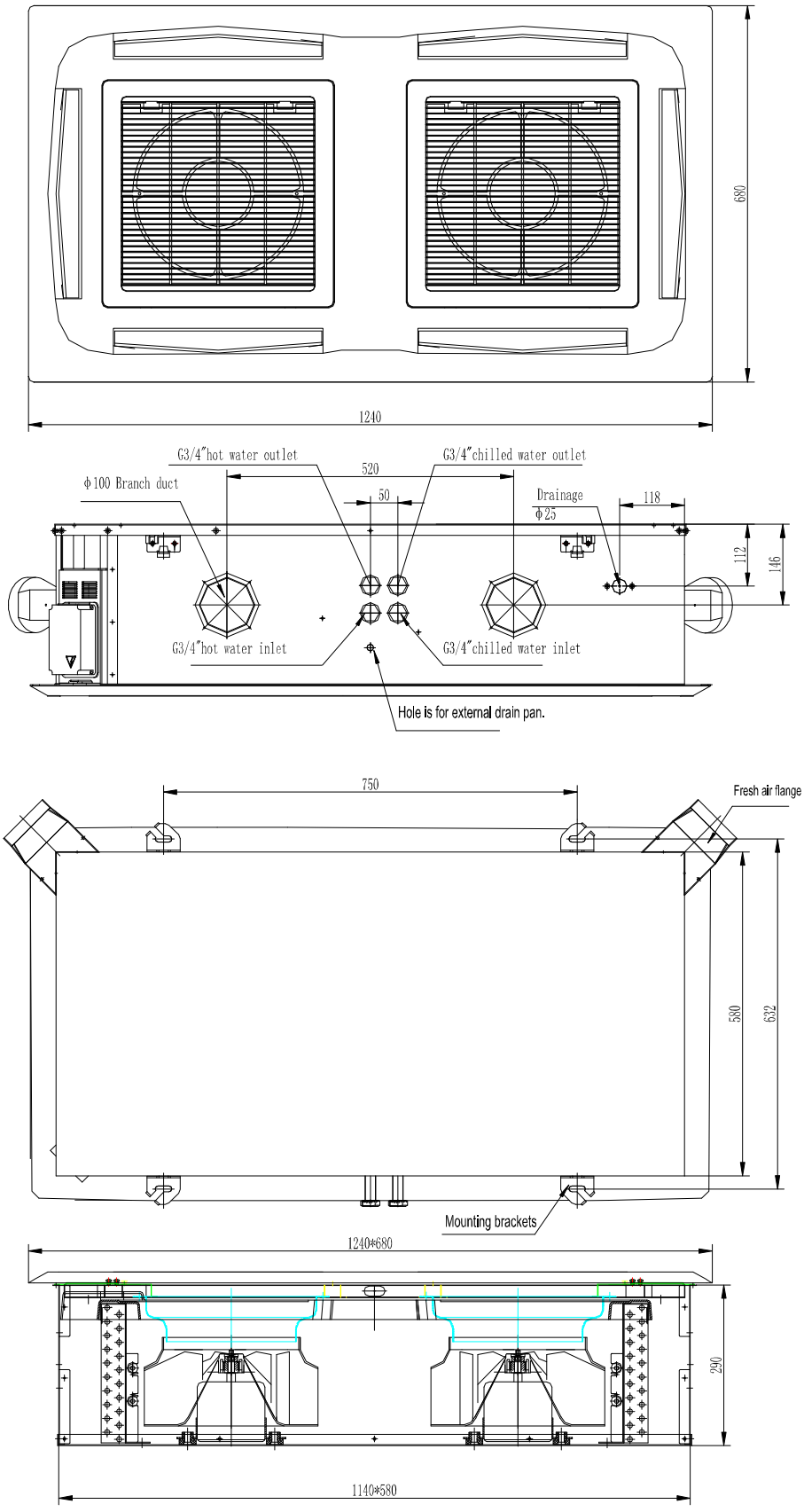




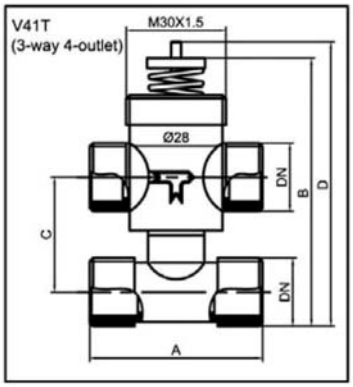
PCG-09-PS


680
1240
520
φ100 branch duct
G3/4"hot water outlet
70
G3/4"chilled water outlet
Drainage
118
110
112
146
50
G3/4"hot water outlet
G3/4"chilled water inlet
Hole is for external drain pan.
750
Fresh air flange
580
632
Mounting brackets
1140
1240*680
255
1140*580

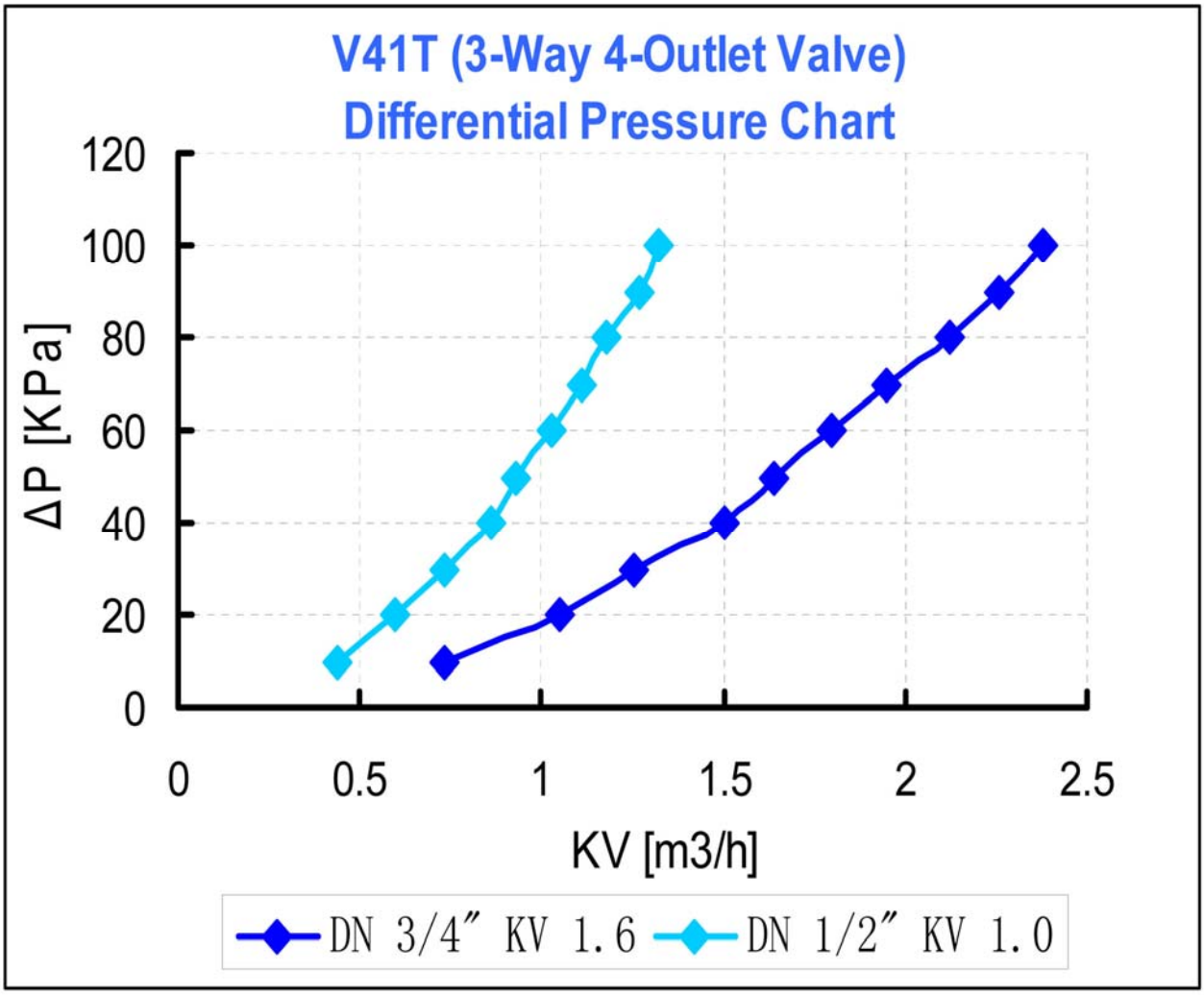
PCG-12/16-PS

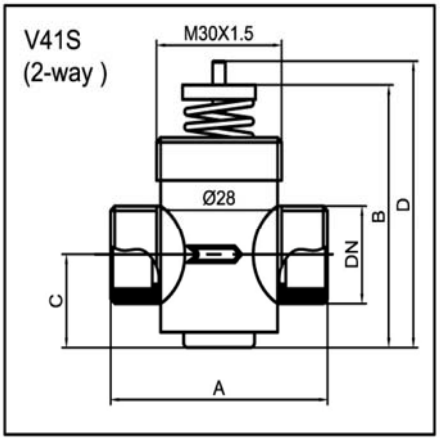

680
1240
G3/4"hot water outlet
520
G3/4"chilled water outlet
ϕ100 Branch duct
50
Drainage
ϕ25
118
112
146
G3/4"hot water inlet
G3/4"chilled water inlet
Hole is for external drain pan.
750
Fresh air flange
580
632
Mounting brackets
1240*680
290
1140*580

VALVE INFORMATION

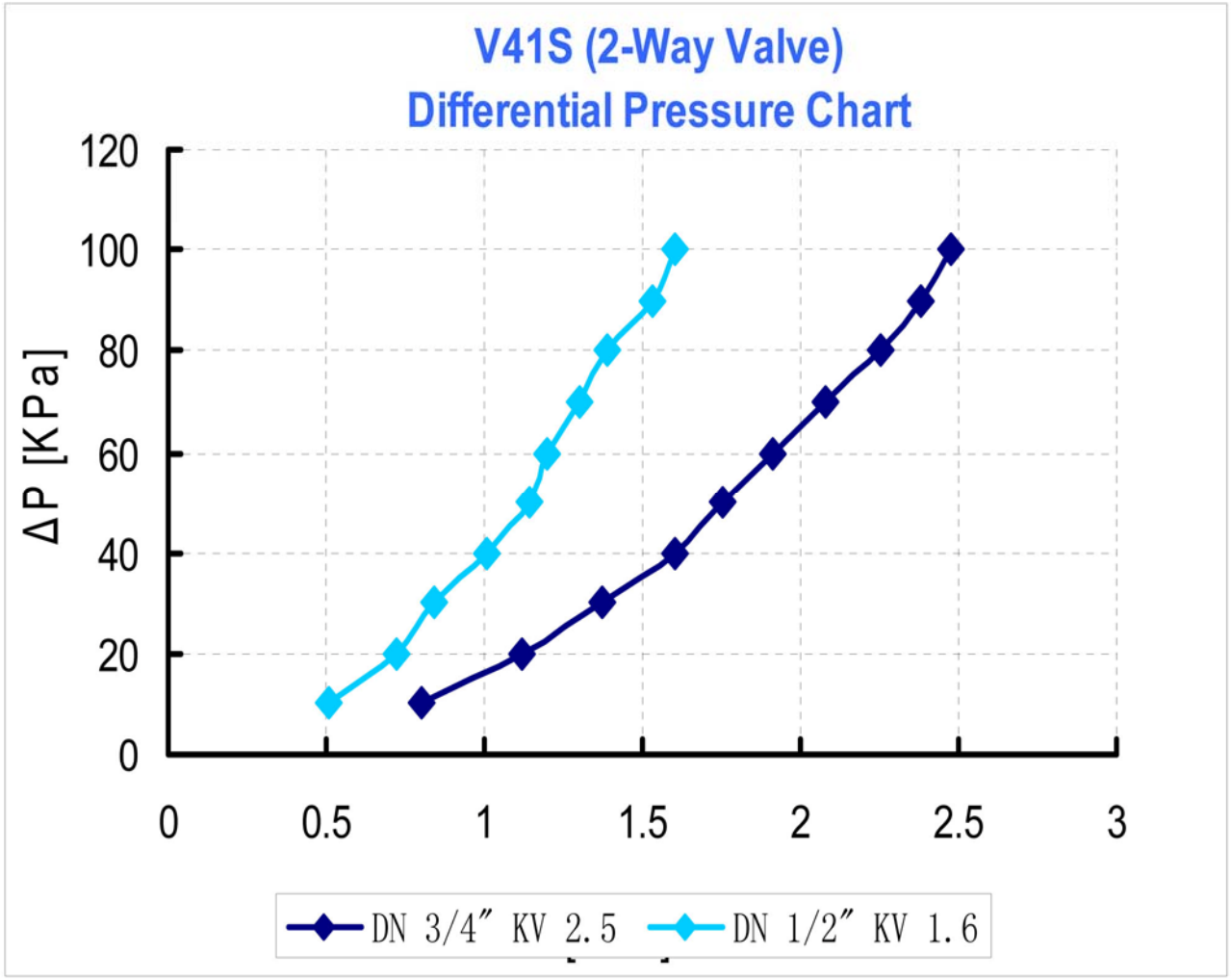


Valve Model	Valve Dimensions (mm)				
	DN	A	B	C	D
V41D15T160	D15 (G1/2")	52	70	35	86
V41D20T250	D20 (G3/4")	56	88	50	104



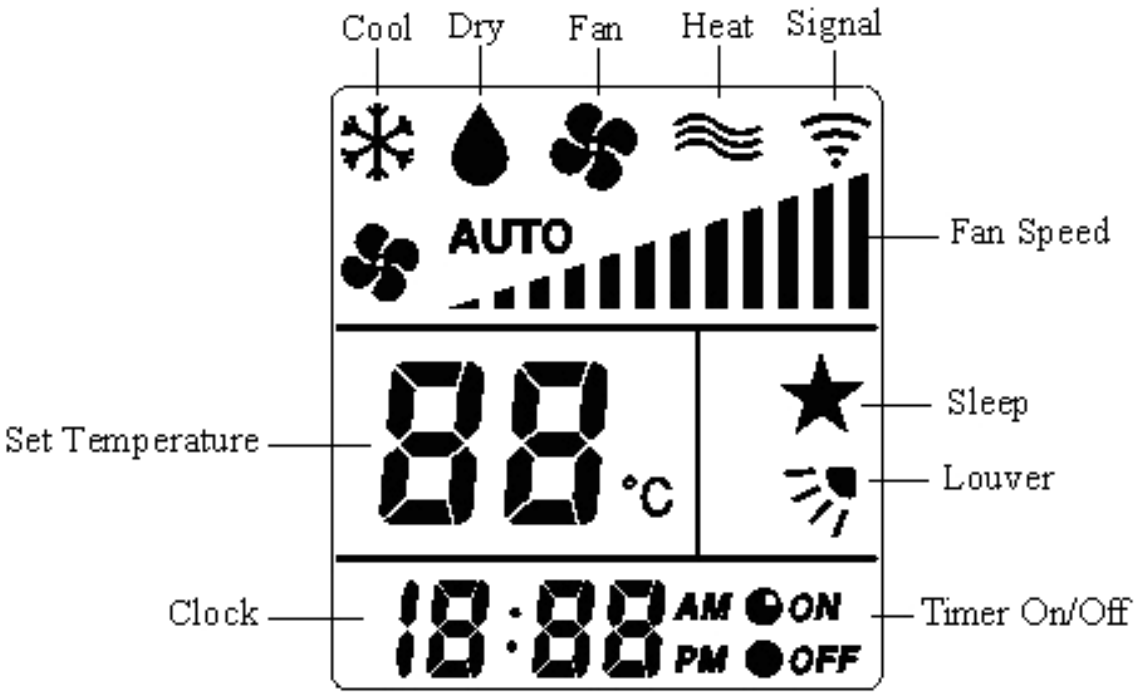


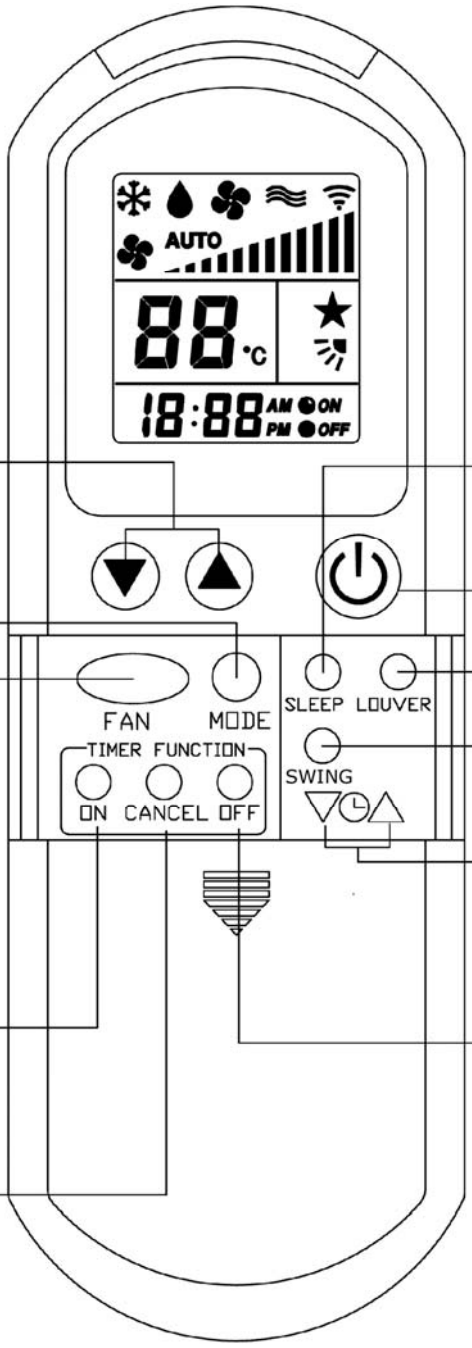
Valve Model	Valve Dimensions (mm)				
	DN	A	B	C	D
V41D15S160	D15 (G1/2")	52	47	19.5	63
V41D20S250	D20 (G3/4")	56	47	22	63



REMOTE CONTROL HANDSET

WIRELESS LCD HANDSET DISPLAY





Adjust Set Temperature
Press down or up button to decrease or increase the desired room temperature.
Note: Temperature can not be set in Fan mode.

Mode
Press this button to advance the mode in the following sequence:
Cool→Dry→Fan→Heat→Auto Cool-Heat
[Both Cool and Heat symbol light up]

Fan
Press this button to advance the fan speed as follows:
Auto→Low→Medium→High

Under Fan mode, only low, medium and high are available.
Under Dry mode, fan speed will be inhibited and will not be displayed.

On Timer
First press shows the last timer setting. Subsequent pressing will change the timer setting in 1 minute intervals. Hold down the On button continuously to increase the updating speed.

Cancel Timer
Press this button to cancel all timer settings.

Sleep
Press to activate the energy saving Sleep function which automatically adjusts the temperature to provide a more comfortable sleep, ie for use in bedrooms.

On/Off
Press to switch on or off the air conditioner.

Louver
Press this button to change louver angle to a fixed position 1,2,3,4, auto sweep or stop.

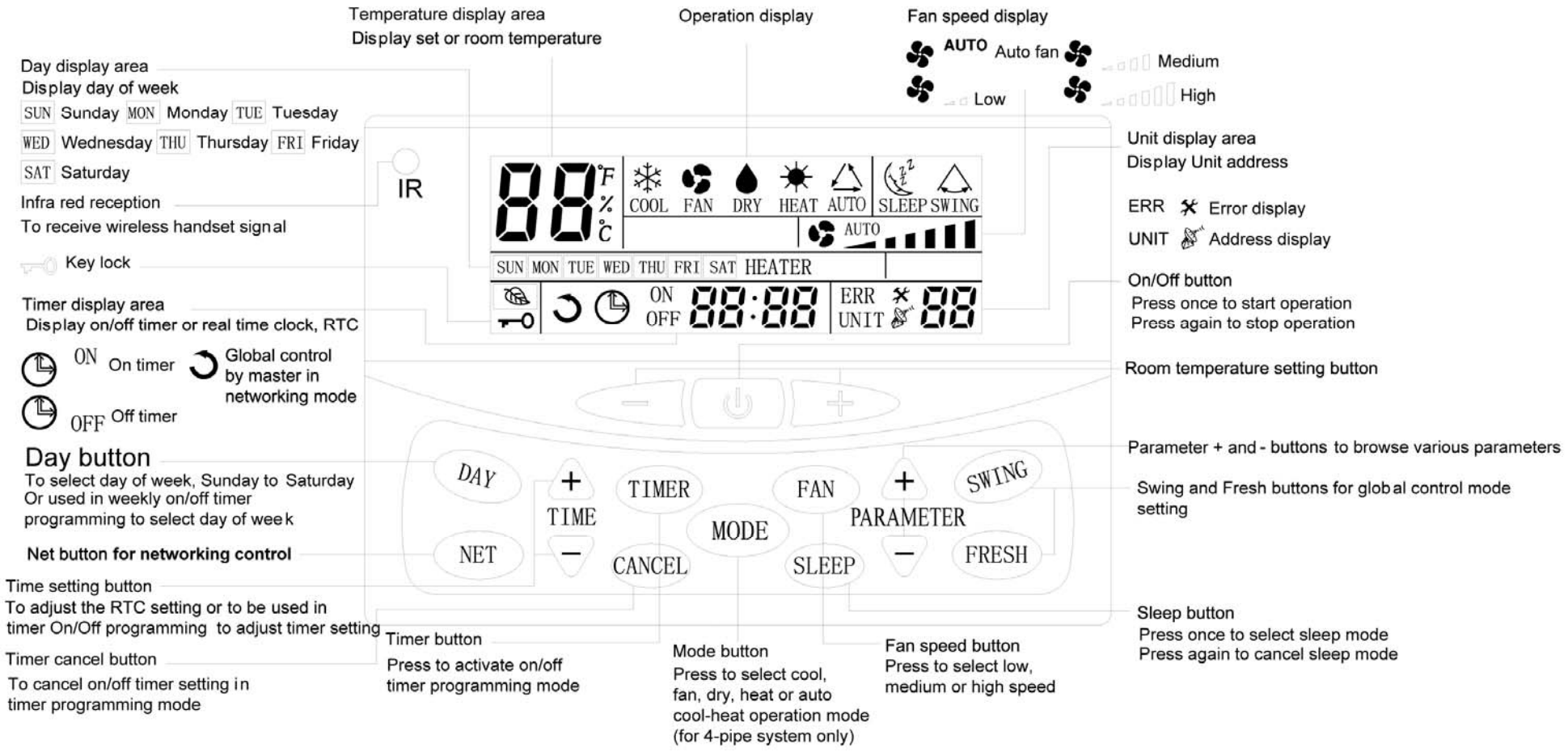
Swing
Press this button to turn on or off swing function.

Clock
Press down or up button for 2 seconds to activate. The current clock setting will decrease or increase at 1 minute intervals on each press.
The speed of interval updating increases after 4 seconds of continuous key press. It will update at high speed after 6 seconds of continuous key press.

Off Timer
First press shows the last timer setting. Subsequent pressing will change the timer setting in 1 minute intervals. Hold down the Off button continuously to increase the updating speed.

*****When unit with handset is master, settings are automatically sent to slaves;**
*****Auto Cool-Heat operation will be applicable in 4-pipe system only.**
*****Swing is not applicable to PCG models.**

WALL PAD DISPLAY



*****Wall pad will recognize the main board model automatically whether it is 2 pipes or 4 pipes. Auto Cool-Heat operation will be applicable in 4 pipe system only.**

*****When the wall pad is connected to the main board, air sensor inside the wall pad will be automatically set as primary source and the return air sensor from the unit will be disabled.**

WALL PAD OPERATION

1) 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 TIME or TIME button.

2) 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 DAY button to set day.

3) 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.

a) Press TIMER 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 TIME or TIME button to change the on timer setting. Press CANCEL key to cancel the current on timer selected and the timer display area will show --:--. Press DAY button to change the day the on timer is to be programmed.

b) Press TIMER button again, and **OFF** symbol blinking indicates off timer programming mode. The setting method is the same as on timer setting above.

c) Press TIMER button again, to exit timer on/off setting function.

d) 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.

e) Hold down CANCEL button for 3 seconds to cancel all timer settings.

Timer set by master unit is as follows:-

1. Press NET button to enter into networking control mode. Unit area blinking indicates the slave unit under control. Press TIME or TIME to select the desired slave unit. Units that are off will be skipped automatically.
2. Press TIMER button once to enter into on timer programming mode. Press DAY 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 TIME or TIME button to change the on timer setting.

3. Press TIMER button again to enter into off timer programming mode. Press DAY 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 TIME or TIME button to change the off timer setting.
4. Upon completion of changing timer settings for the selected day, press TIMER 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).
5. In Global control mode:
   - Pressing Master CANCEL button for 3 seconds will cancel all timer settings in all slave units.
   - Timer settings will be broadcast to all slave units.

Clock synchronization by master unit is as follows:

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

4) 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.

5) Swing

Press SWING to activate or deactivate swing function.

6) Sleep

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

7) 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.

8) Mode setting

Press MODE button to change the operation mode.

9) Fan speed setting

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

10) On/Off control

Press to start or stop the air conditioner.

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

Press NET button to enter into networking control mode. Unit area blinking indicates the slave unit under control. Press TIME or TIME 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 NET button again to exit networking control mode.

Hold down SWING and FRESH 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.

12) Unit operation parameters browsing

Hold down CANCEL and FAN 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 PARAMETER ss PARAMETER HUMIDIFY or HUMIDIFY 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 CANCEL button to exit.

13) 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
Water pump faulty	E7
Local communication error	E8

For system without master-slave settings, wall pad will indicate unit error codes as above.

CONTROL SPECIFICATIONS

HOT AND CHILLED WATER CASSETTE
WITH MASTER-SLAVE CONTROL

1. ABBREVIATIONS AND DEFINITION OF INPUT & OUTPUT PORTS

Ts = Setting temperature
Tr = Room air temperature
Ti1 = Indoor coil temperature, ID1
Ti2 = Indoor coil temperature, ID2
MTV1 = Cool Motorized valve
MTV2 = Heat Motorized valve
AUX1 = Hot water free contact
AUX2 = Cold water free contact

I/O		Code	2-Pipe	4-Pipe
Analogue Input	Room Sensor	CN8	Return air	Return air
	Chilled water Sensor	CN7	Indoor coil	Chilled water coil
	Hot water Sensor	CN6	Reserved	Hot water coil
Input	IR receiver	CN9	Used	Used
	Wired wall pad	CN5	Used	Used
Digital input	Occupancy contact	PR-O	**DIP-SWITCH IS ON. (Window contact)** The contact is normally open. If the contact has been closed for 10 minutes, the unit will go to stand-by mode (all output signals will be disabled). When the contact is open again, the unit will resume running normally. **DIP-SWITCH IS OFF. (Economy contact)** Cooling operation will only be activated when Tr - Ts >= 4 ºC. If Tr < Ts, cool operation will be terminated. Heating operation will only be activated when Tr – Ts <= -4 ºC. 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: 5 m.	
	Neutral	N	Power supply to the PCB and all the loads connected to the voltage outputs. Max length: 5 m.	
	Earth	GND	Power supply to the PCB and all the loads connected to the voltage outputs. Max length: 5 m.	

Voltage output	High fan speed	HF	Max length: 5 m. Voltage output (L)	
	Medium fan speed	MF	Max length: 5 m. Voltage output (L)	
	Low fan speed	LF	Max length: 5 m. 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	CN1-4		
	Cold water free contact.	AUX2	Voltage free contact. To ensure the sensitivity of the connection, please make sure Max wiring length < 30 m.	
	Hot water free contact.	AUX1	Voltage free contact. To ensure the sensitivity of the connection, please make sure Max wiring length < 30 m.	
	In Modbus signal	CN10	Terminals for local network serial connection	
	Out Modbus signal	CN11		

2. CONTROL SYSTEM OPERATION

4-PIPES SYSTEM

System always with Motorized Valve

COOL MODE

1. MTV2, AUX1 and heater always off.
2. If Tr >= Ts+1ºC (or +4 ºC if economy contact is activated), cool operation is activated, MTV1 and AUX2 are turned on. Indoor fan runs at set speed.
3. If Tr < Ts, cool operation is terminated, MTV1 and AUX2 are turned off. Indoor fan runs at set speed.
4. The range of Ts is 16-30 ºC
5. Indoor fan speed can be adjusted for low, medium, high and auto.
6. When turned on, MTV1 requires 30 seconds before it is fully open.
7. When turned off, MTV1 requires 120 seconds before it is fully closed.
8. When the unit is turned off, indoor fan will delay for 5 seconds before it is turned off.

LOW TEMPERATURE PROTECTION OF INDOOR COIL

1. If Ti1 ≦ 2 ºC 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.
2. If Ti1 ≧ 5ºC for 2 minutes, MTV1 and AUX2 are turned on. Indoor fun runs at set speed.

FAN MODE

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

HEAT MODE

i. HEAT MODE--- WITHOUT ELECTRICAL HEATER

1. MTV1, AUX2 and heater always off.
2. If Tr <= Ts – 1 ºC (or -4 ºC if economy contact is activated), heat operation is activated, MTV2 and AUX1 are turned on. Indoor fan runs at the set speed.
3. If Tr >Ts, 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.
4. The range of Ts is 16~30 ºC。
5. Indoor fan speed can be adjusted for low, medium, high and auto.
6. MTV2 will delay for 30 seconds before it is turned on.
7. MTV2 will delay for 120 seconds before it is turned off.

ii. HEAT MODE---WITH ELECTRICAL HEATER AS BOOSTER

1. MTV1 and AUX2 are always off.
2. If Tr <= Ts – 1 ºC (or -4 ºC if economy contact is activated), heat operation is activated, MTV2 and AUX1 are turned on. Indoor fan runs at the set speed.
3. If Tr >Ts, 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.
4. If Ti1<40 ºC, the electrical heater is turned on. If 40<= Ti1<45 ºC, the electrical heater is kept original state. If Ti1>=45 ºC, the electrical heater is turned off.
5. The range of Ts is 16~30 ºC
6. Indoor fan speed can be adjusted for low, medium, high and auto.
7. MTV2 will delay for 30 seconds before it is turned on.
8. MTV2 will delay for 120 seconds before it is turned off.

iii. PRE-HEAT---WITHOUT ELECTRICAL HEATER

1. If Ti1<36 ºC [or 28C depends on DIP setting], when MTV2 and AUX1 are on, indoor fan remains off.
2. If Ti1>=38 ºC [or30C depends on DIP setting], when MTV2 and AUX1 are on, indoor fan runs at set speed.
3. If indoor coil temperature sensor is damaged, pre-heat time is set for 2 minutes and indoor fan runs at set speed.

iv. PRE-HEAT---WITH ELECTRICAL HEATER

1. MTV2 and AUX2 turn on.
2. Indoor fan will turn on after the electrical heater is turned on for 10 seconds.

v. POST-HEAT---WITHOUT ELECTRICAL HEATER

1. If Ti2≧38ºC, when MTV2 and AUX 1 are off, indoor fan continues to run at set speed.
2. If 36 °C <= Ti2< =38 °C, when MTV2 and AUX1 are off. Indoor fan keeps original state.
3. If Ti2<36ºC, when MTV2 and AUX1 are off. Indoor fan runs 30 seconds and stop 3 minutes repeatedly.
4. If indoor coil temperature coil is damaged, post-heat time is set for 3 minutes with indoor fan running at set speed.

vi. POST-HEAT---WITH ELECTRICAL HEATER

1. Indoor fan will turn off after the unit off for 20 seconds.

vii. OVER HEAT PROTECTION OF INDOOR COIL

1. If Ti2 >= 75 ºC, MTV2 and AUX1 are turned off, indoor fan remains on and runs at high speed.
2. If Ti2<70 ºC, MTV2 and AUX1 are turned on, indoor fan remains on and runs at set speed.
3. 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

1. MTV2, AUX1 and heater always off.
2. If Tr >= 25 ºC, MTV1 and AUX2 will be ON for 3 minutes, and OFF for 4 minutes.
3. If 16 ºC < =Tr < 25 ºC, MTV1 and AUX2 will be ON for 3 minutes, and OFF for 6 minutes.
4. If Tr <16 ºC, MTV1 and AUX2 will be turned off for 4 minutes.

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

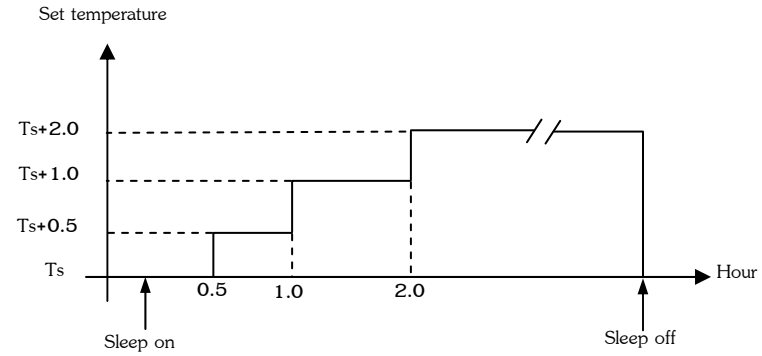
1. If current running mode is auto cool mode, it will change over to auto heat mode upon satisfy all the conditions below:
   - Ts-Tr≧1.0°C(or -4 ºC if economy contact is activated)
   - MTV1 has stop≧10 min.
2. If current running mode is auto heat mode, it will change over to auto cool mode upon satisfy all the conditions below:
   - Tr-Ts≧1.0°C(or +4 ºC if economy contact is activated)
   - MTV2 has stop≧10 min.

Note: Auto cool or auto heat operation are the same as cool or heat mode respectively.

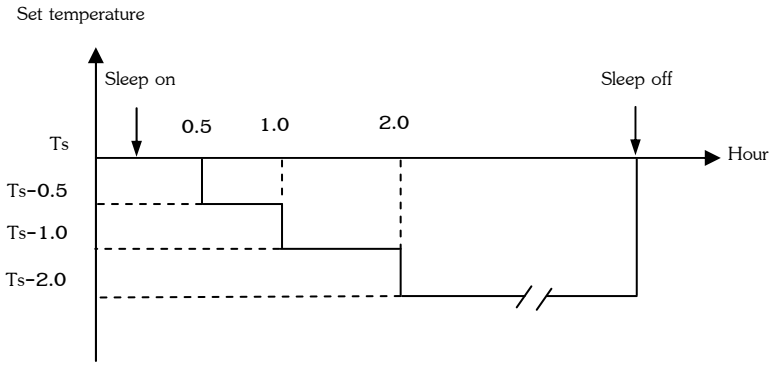
SLEEP MODE

a) Sleep mode can only be set in cool or heat modes only.
b) In cool mode, after sleep mode is set, the indoor fan will run at low speed and Ts will increase 2 ºC during 2 hours.
c) In heat mode, after sleep mode is set, the indoor fan will run at set speed and Ts will decrease 2 ºC during 2 hours.
d) Changing of operation mode will cancel sleep mode.

The cool mode sleep profile is:

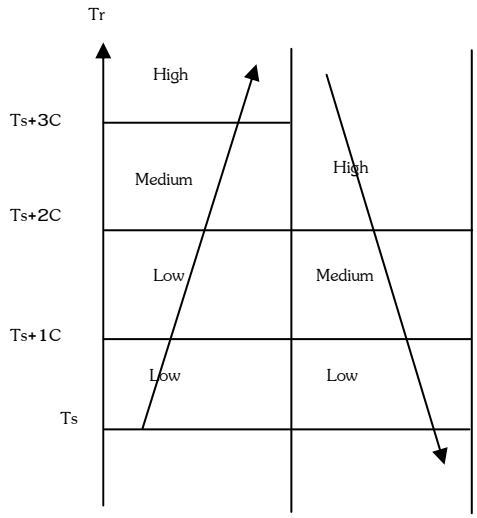


The heat mode sleep profile is:

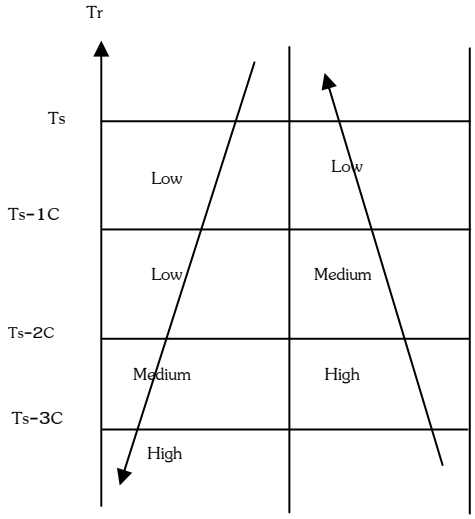


AUTO FAN SPEED

In cool mode, the fan speed cannot change until it has run at this speed for more then 30 seconds. Fan speed is regulated according to the profile below.



In heat mode, the fan speed cannot change until it has run at this speed for more then 30 seconds.



SWING / LOUVER

For remote handset
Whenever indoor fan is running, louver can swing or stop at the desired position.
Louver angle: 0~100 º, opens clockwise with largest angle at 100 º.
Swing angle: 35~100 º, opens clockwise to 68º. Below are the 4 fixed positions which can be set from wireless LCD handset.

Position	Angle
1	35 º
2	57 º
3	83 º
4	100 º

For wired wall pad
Louver angle: 0~100 º, opens clockwise, and with biggest angle at 100 º.
Swing angle: 35~100 º, opens clockwise to 68º. User may stop louver at any desired poison between 35~100 º.

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.

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.

OPERATION OF CONTROL PANEL ON HIGH WALL UNIT
ON/OFF SWITCH
i. This is a tact switch to select Cool→Heat→Off operation mode.
ii. In cool mode, the set temperature of the system is 24ºC with auto fan speed and swing. There are no timer and sleep modes.
iii. In heat mode, the set temperature of the system is 24ºC with auto fan speed and swing. There are no timer and sleep modes.
iv. Master unit that does not use LCD wall pad will globally broadcast.
v. Master unit that does not use LCD wall pad will globally broadcast.
Note: When button pressing is effective, master unit buzzer will beep twice and slave unit beeps once.

DRAIN PUMP
Drain pump turns on if thermostat cut in during cooling or dehumidification cooling cycle. It will remain 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 turn off the system by circuit breaker (or main power supply) the drain pump does not work after turn off.

FLOAT SWITCH
Float-switch open 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 ≧5sec, drain pump will work and MTV1 cut off. When the float switch is closed, the drain pump will run for 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 report 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 additional 5 minutes. If the float switch is opened for 10 minutes continuously, system report error.

ELECTRIC HEATER SAFETY SWITCH
Before the electrical heater is turned on, the EH safety switch must be closed. If this contact is opened continuously ≧1sec, heater must be cut off immediately and report error. Once the contact is returned to close position ≧60sec, reset the error and heater is allowed to cut in again.
Should EH safety switch be opened ≧ 3 times within 60 minutes, heater is not allowed to cut in anymore. Turn off the unit to reset the fault provided that the switch has returned to close position.

ERROR DESCRIPTION

LED lights

Indication - with Master-Slave Connection

For unit with handset only

Error message can be found in LED lights on unit body. Table below indicate the error code for master and all slave unit.

Table 1

For all units (both master and slave)	
High speed	Red LED On
For master unit indicating defect status of all slave unit	
Unit 2 failure	Blink 2 times, stop 3 sec
Unit 3 failure	Blink 3 times, stop 3 sec
Unit 4 failure	Blink 4 times, stop 3 sec
Unit 5 failure	Blink 5 times, stop 3 sec
Unit 6 failure	Blink 6 times, stop 3 sec
Unit 7 failure	Blink 7 times, stop 3 sec
Unit 8 failure	Blink 8 times, stop 3 sec
Unit 9 failure	Blink 9 times, stop 3 sec
Unit 10 failure	Blink 10 times, stop 3 sec
Unit 11 failure	Blink 11 times, stop 3 sec
Unit 12 failure	Blink 12 times, stop 3 sec
Unit 13 failure	Blink 13 times, stop 3 sec
Unit 14 failure	Blink 14 times, stop 3 sec
Unit 15 failure	Blink 15 times, stop 3 sec
Unit 16 failure	Blink 16 times, stop 3 sec
Unit 17 failure	Blink 17 times, stop 3 sec
Unit 18 failure	Blink 18 times, stop 3 sec
Unit 19 failure	Blink 19 times, stop 3 sec
Unit 20 failure	Blink 20 times, stop 3 sec
Unit 21 failure	Blink 21 times, stop 3 sec
Unit 22 failure	Blink 22 times, stop 3 sec
Unit 23 failure	Blink 23 times, stop 3 sec
Unit 24 failure	Blink 24 times, stop 3 sec
Unit 25 failure	Blink 25 times, stop 3 sec
Unit 26 failure	Blink 26 times, stop 3 sec
Unit 27 failure	Blink 27 times, stop 3 sec
Unit 28 failure	Blink 28 times, stop 3 sec
Unit 29 failure	Blink 29 times, stop 3 sec
Unit 30 failure	Blink 30 times, stop 3 sec
Unit 31 failure	Blink 31 times, stop 3 sec
Unit 32 failure	Blink 32 times, stop 3 sec

For all units Yellow light	
Medial speed	Yellow Led on

For all units Green LED light	
Low speed	Green LED ON
Electrical heater failure	Blink 1times, stop 3 sec
Indoor coil sensor 2 failure	Blink 2 times, stop 3 sec
Return air sensor failure	Blink 3 times, stop 3 sec
Indoor coil sensor 1 failure	Blink 4 times, stop 3 sec
Indoor coil low temperature protection	Blink 5 times, stop 3 sec
Indoor coil over heat protection	Blink 6 times, stop 3 sec
Water pump failure	Blink 7 times, stop 3 sec

For unit with wall pad only
Error message can be found in both LED lights on unit body (please refer to table 1) and wall pad error indication. (Please refer to page 49 Error Indication)

Note: If the address of slave unit is not set (refer to appendix I) LED lights and Wall pad of the master unit will not show the status of the defective slave unit.

Without Master-Slave connection
For unit with handset only

Table 2

For all units Red LED light on the unit	
High speed	Red LED On
Medial speed	Yellow LED On
Low speed	Green LED On

For all units Green LED light on the unit	
Electrical heater failure	Blink 1times, stop 3 sec
Return air sensor failure	Blink 3 times, stop 3 sec
Indoor coil sensor 1 failure	Blink 4 times, stop 3 sec
Indoor coil low temperature protection	Blink 5 times, stop 3 sec
Indoor coil over heat protection	Blink 6 times, stop 3 sec

For unit with wall pad only
Error message can be found in both LED lights on the unit body (please refer to table 2) and on the wall pad error indication. (Please refer to page 49 Error Indication)

SENSOR RESISTANCE R-T CONVERSION TABLE

R25: 10KΩ±1%
B25/85: 3977±1%

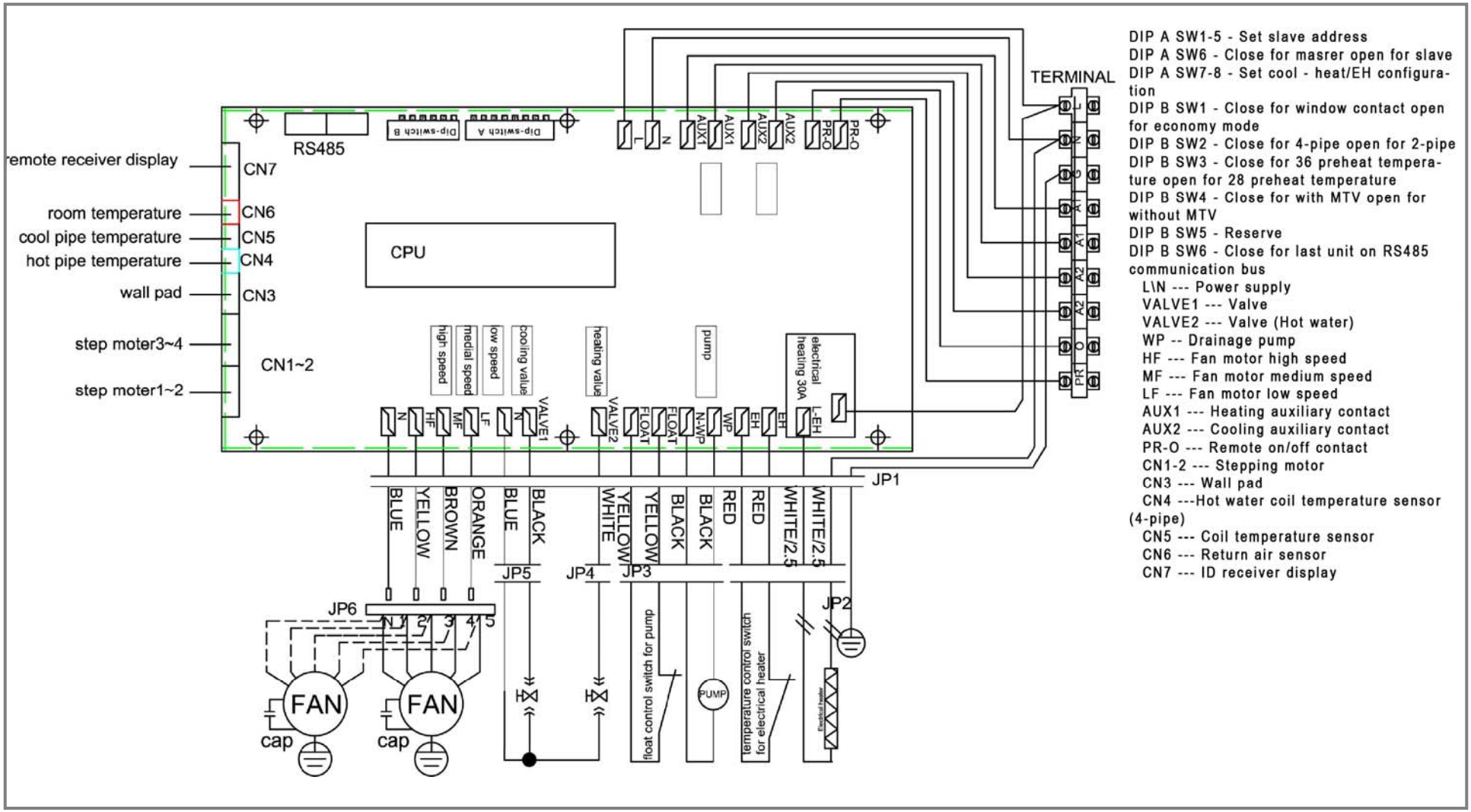
T	Rmin	Rnom	Rmax	T	Rmin	Rnom	Rmax
(℃)	(KΩ)	(KΩ)	(KΩ)	(℃)	(KΩ)	(KΩ)	(KΩ)
-30	174	182.7	191.8	4	26.11	26.9	27.71
-29	163.4	171.5	179.9	5	24.85	25.59	26.34
-28	153.6	161.1	168.9	6	23.65	24.35	25.05
-27	144.4	151.3	158.5	7	22.52	23.17	23.83
-26	135.8	142.2	148.9	8	21.45	22.06	22.68
-25	127.8	133.8	140	9	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	3402	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

R25: 10KΩ±1%

B25/85: 3977±1%

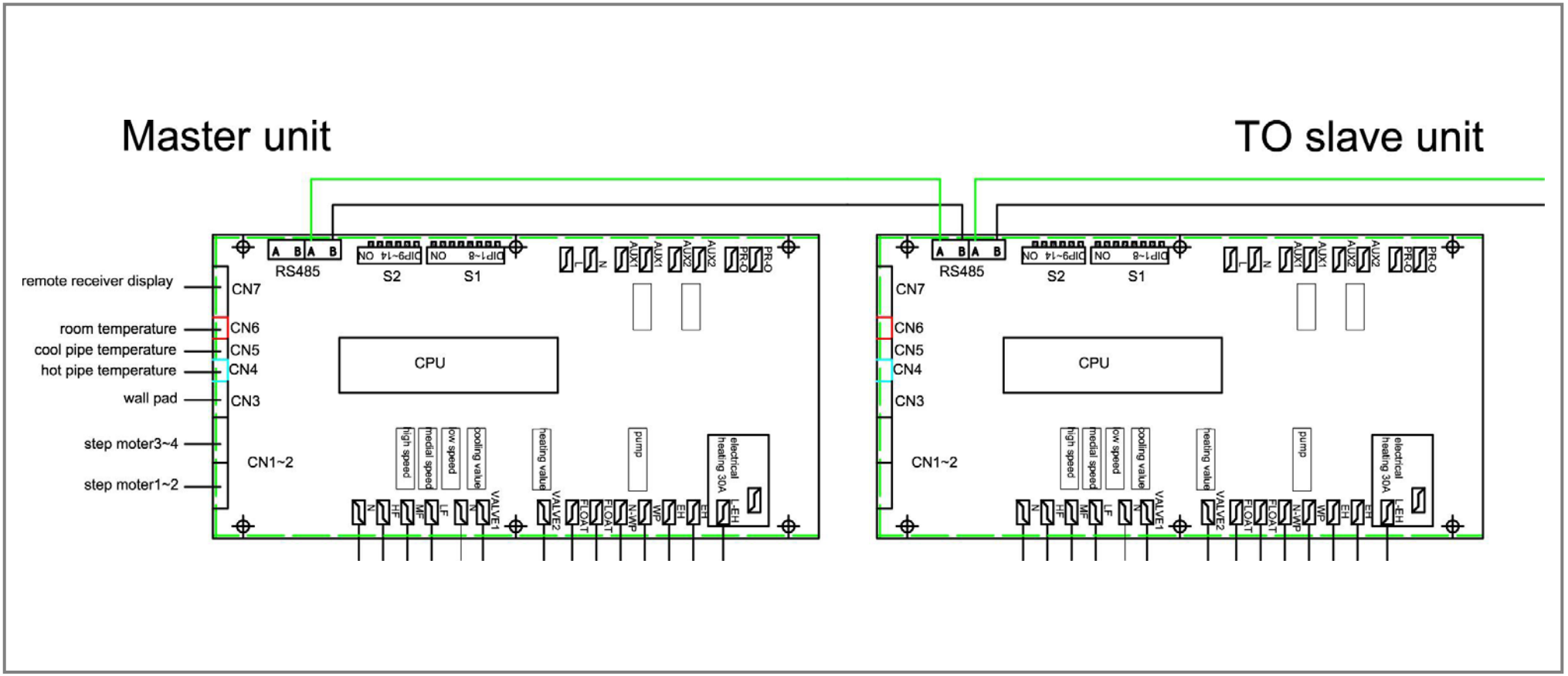
T	Rmin	Rnom	Rmax	T	Rmin	Rnom	Rmax
(℃)	(KΩ)	(KΩ)	(KΩ)	(℃)	(KΩ)	(KΩ)	(KΩ)
38	5.614	5.759	5.907	75	1.417	1.474	1.532
39	5.387	5.53	5.673	76	1.37	1.426	1.482
40	5.172	5.31	5.451	77	1.326	1.379	1.434
41	4.966	5.101	5.238	78	1.282	1.335	1.389
42	4.769	4.901	5.034	79	1.241	1.292	1.344
43	4.582	4.71	4.84	80	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				

CONTROL AND POWER SUPPLY WIRING DIAGRAMS



DIP A SW1-5 - Set slave address
DIP A SW6 - Close for masrer open for slave
DIP A SW7-8 - Set cool - heat/EH configuration
DIP B SW1 - Close for window contact open for economy mode
DIP B SW2 - Close for 4-pipe open for 2-pipe
DIP B SW3 - Close for 36 preheat temperature open for 28 preheat temperature
DIP B SW4 - Close for with MTV open for without MTV
DIP B SW5 - Reserve
DIP B SW6 - Close for last unit on RS485 communication bus
L\N --- Power supply
VALVE1 --- Valve
VALVE2 --- Valve (Hot water)
WP -- Drainage pump
HF --- Fan motor high speed
MF --- Fan motor medium speed
LF --- Fan motor low speed
AUX1 --- Heating auxiliary contact
AUX2 --- Cooling auxiliary contact
PR-O --- Remote on/off contact
CN1-2 --- Stepping motor
CN3 --- Wall pad
CN4 ---Hot water coil temperature sensor (4-pipe)
CN5 --- Coil temperature sensor
CN6 --- Return air sensor
CN7 --- ID receiver display

MASTER-SLAVE CONTROL WIRING DIAGRAM



MALFUNCTION	CAUSE	REMEDY
The fan coil does not start up	No voltage	- Check for presence of voltage
	Mains switch in the “OFF	- 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
	Incorrect water temperature	- Check
	Air present	- Vent
Noise and vibrations	Contact between metal parts	- Check
	Loose screws	- Tighten screws

Appendix I

MASTER AND SLAVE UNIT FUNCTION

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

2.A.1 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, Set Temperature, Swing Function, and Sleep Function for handset operation.

c) The master unit settings are Unit ON/OFF, Mode, Fan Speed, Set Temperature, Swing Function, Sleep Function and Weekly Timer ON/OFF program for wall pad operation.

2.A.2 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.

When unit is power on, buzzer responds as below:

With MTV: The master unit will beep 3 times, and the slave unit will beep once.
Without MTV: The master unit will beep 4 times, and the slave unit will beep twice

2.A.3 MASTER – SLAVE INSTALLATION

<u>HANDSET AS MASTER CONTROL UNIT:</u>

a) Connect all the units PCBs according to the wire color and type of connector.
b) Select the master unit by closing the SW6 DIP switch on the main PCB
c) Ensure the SW6 DIP switch in the PCB of the slave unit is opened.
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.
f) Master unit will beep twice confirming receipt of commands while Slave unit will beep once.

<u>WALLPAD AS MASTER CONTROL UNIT:</u>

a) Connect all the units PCBs according to the wire color and type of connector.
b) Select the master unit by closing the SW6 DIP switch on the main PCB
c) Ensure the SW6 DIP switch in the PCB of the slave unit is opened.
d) Provide each slave unit an addressable code by closing SW1 – SW5 DIP switch according to the DIP switch chart.
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. For detail please see **2.A.6 MASTER-SLAVE COMMUNICATION METHOD** & **Wall pad operation item 11 Networking Master – Slave control on page 49**.
g) Master unit will beep twice confirming receipt of commands while Slave unit will beep once.

2.A.4 MASTER-SLAVE CONFIGURATION

Master unit: close SW6 [DIP switch] before power on. Master will beep twice to the LCD wireless handset or LCD wall pad confirming receipt of commands. Each master can command up to 31 slave units.
Slave unit: open SW6 [DIP switch] before power on. Slave unit will beep once to the LCD wireless handset or LCD wall pad confirming receipt of commands.

Important note: Data loggers are not applicable to Master-Slave System.

2.A.5 MASTER-SLAVE CONTROL

Above control PCB can receive data from both wireless LCD handset and wired wall pad. Once wall pad is connected to the PCB, receiver from the unit will stop receiving signal from wireless LCD handset. LCD handset can only provide signal to Wall Pad receiver. When wall pad is disconnected from the PCB for 5 seconds, it will revert to wireless LCD handset reception automatically.

2.A.6 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.

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

DIP1 used for master slave address setting.
DIP switch address setting: 1 for ON, 0 for OFF.

SW6	SW5	SW4	SW3	SW2	SW1	Unit No.	Remark
1	0	0	0	0	0	01	Master
0	0	0	0	0	0	01	Slave
-	0	0	0	0	1	02	Slave
-	0	0	0	1	0	03	Slave
-	0	0	0	1	1	04	Slave
-	0	0	1	0	0	05	Slave
-	0	0	1	0	1	06	Slave
-	0	0	1	1	0	07	Slave
-	0	0	1	1	1	08	Slave
-	0	1	0	0	0	09	Slave
-	0	1	0	0	1	10	Slave
-	0	1	0	1	0	11	Slave
-	0	1	0	1	1	12	Slave
-	0	1	1	0	0	13	Slave
-	0	1	1	0	1	14	Slave
-	0	1	1	1	0	15	Slave
-	0	1	1	1	1	16	Slave
-	1	0	0	0	0	17	Slave

-	1	0	0	0	1	18	Slave
-	1	0	0	1	0	19	Slave
-	1	0	0	1	1	20	Slave
-	1	0	1	0	0	21	Slave
-	1	0	1	0	1	22	Slave
-	1	0	1	1	0	23	Slave
-	1	0	1	1	1	24	Slave
-	1	1	0	0	0	25	Slave
-	1	1	0	0	1	26	Slave
-	1	1	0	1	0	27	Slave
-	1	1	0	1	1	28	Slave
-	1	1	1	0	0	29	Slave
-	1	1	1	0	1	30	Slave
-	1	1	1	1	0	31	Slave
-	1	1	1	1	1	32	Slave