GLOBAL

L/M-STAT AMV SERIES INSTALLATION, OPERATION & SERVICE MANUAL

PDWA - V / P - AC MOTOR

V - 2pipe / P -4pipe





SK2020 GLOBAL PDWA-V/P-AC-001

INVESTING IN QUALITY, RELIABILITY & PERFORMANCE

ISO 9001 QUALITY



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

Equipped with the latest air-conditioning test rooms and manufacturing technology, we produce over 50,000 fan coil units each year, all conforming to the highest international standards of quality and safety.

CE SAFETY STANDARDS



Product Service

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

The Highest Standards of Manufacturing

In order to guarantee the very highest standards and performance, we manage every stage in the manufacturing of our products. Throughout the production process we maintain strict control, starting 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.

EUROVENT CERTIFICATION



WEEE MARK



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

Quality Controlled from Start to Finish

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

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

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A. Technical Data

A.1. General Description

The Duct Fan Coil is designed to meet and exceed the demanding requirements for efficiency and quiet operation.

Structure

The structure is made from heavy gauge galvanized steel panels with couplings for the connection of ducting and a gravity drain pan with insulation for condensation. Fire resistant insulation is optional for internal case to provide both thermal and acoustic insulation. Insulation is also fitted on the top of coil.

Condensate Pans

Positive sloped drain pans are steel and powder coated with self-extinguishing closed cell expanded polyethylene with thermal properties. The drain pan outlet is 3/4'' (standard on the same side of coil connections).

Coils

Constructed with seamless copper tubes and headers. The tubes are mechanically expanded into corrugated aluminum fin material for a permanent primary to secondary surface bond. Coils are tested at 35 bar and recommended for maximum operation at 20 bar. Coils include manual air vent and water purge valve.

Fan Wheels

They are double inlet forward curved centrifugal type. Wheels are statically and dynamically balanced for smooth, quite operation. The housing is constructed from heavy gauge galvanized steel with die-formed inlet cones.

AC Motor

Standard motors are PSC, permanently lubricated type with internal thermal overload protection. The unit is using 3-speed AC motor.

Air filter

It is easily removable and washable and is made from self-extinguishing acrylic with an efficiency of class EU2 (G2) (Merv 2-4). G4 (Merv 8) efficiency is as optional.

Complete Function Control (AC-S1 type)

The PCB (printed circuit board) Modbus microprocessor controls functionality of the indoor fan motor, water valves (ON/OFF) and electric heater (optional), to maintain room conditions at a user-defined set point. Temperature settings, fan speeds and other control functions can be changed by either infrared handset or wired wall pad controller.

Terminal Strip (T1 type)

Terminal block is preinstalled and connected to AC motor. The motor can be controlled by external thermostat. 40VA (24VAC) transformer is optional which supplies power to thermostat and modulating valve.

Terminal Strip (T2 type)

A 24VAC relays board is used to drive 3-speed AC motor. 40VA (24VAC) transformer is optional and supplies power to thermostat and modulating valve.



A.2. General Specifications

A.2.1. 2-pipe Systems

Product range: PDWA(3R) Low Static Hydronic Ducted Fan Coil Unit PDWA(3R)-V~ Hydronic Ducted 2-pipe Unit with 3-row Coils and AC motor



	PDWA(3R)-[Size]-V~				200B	300	400	500	600	800	1000	1200	1400	1600B
	c c	Config	uration						2-p	ipe				
	tio	Number Of	Fan Blowers		Sin	gle		Twin		Three	Fo	our	Three	Four
nit	nra	Power Supr	olv (V/Ph/Hz)						230/	1 / 50 ^e				
_ ⊃	nfig		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						220/	1/60				
	ē	Operatio	on Control		~S: Comple	ete function	onboard PC	CB with inte	grated grou	p control fu	nctionality.			
	1			1	~T: Termin	al strip only				10.00				
		A: 51	н	2.4	463	574	/84	913	1085	1363	1611	1915	24//	3198
		AIT FIOW	IMI	m3/nr	429	553	/46	892	1051	1310	1554	18/1	23/4	3019
	Air		L		401	524	656	749	953	1146	1413	1/6/	2247	2912
		565	H	D-	58	54	59	55	62	56	52	60	60	5/
		ESP	IVI	Ра	50	50	50	50	50	50	50	50	50	50
			L		35	35	30	52	59	31 8 20	35	40	43	39
		Cooling Conscitut	м		2.62	2.39	4.54	5.15	5.04	0.59	0.74	10.21	13.25	17.54
		Cooling Capacity	1		2.00	3.29	3 70	J.02	5.2	7 35	7 95	9.67	12.00	14.05
			H	kW	2.52	2.42	3.75	3.60	1 16	5.08	6.31	7 30	9.55	11 1/
	50	Sensible Cooling	M		1.91	2.34	3.03	3.6	4.05	5.78	6.15	7.27	9.25	10.62
	lin	Capacity ^e	L		1.8	2.25	2.72	3.14	3.74	5.18	5.7	6.95	8.77	10.25
	Ö		H		0.79	0.97	1.19	1.44	1.68	2.41	2.43	2.82	3.7	4.4
		Latent Cooling	М	kW	0.75	0.95	1.16	1.42	1.65	2.35	2.38	2.79	3.61	4.23
		Capacity	L		0.72	0.92	1.07	1.29	1.56	2.17	2.25	2.72	3.5	4.15
		505500	Ratin	g	42.4	40.8	33.5	39.1	33.2	38.7	37.5	31.8	35.2	32.3
		FCEER®	Class	-	С	С	D	D	D	D	D	D	D	D
			н		2.43	3.04	3.98	4.67	5.52	7.13	8.23	9.52	12.2	15.3
		Heating Capacity ^e	М		2.32	2.95	3.82	4.6	5.38	6.94	8.02	9.36	11.9	14.6
	gu		L	kW	2.2	2.82	3.47	3.99	5.03	6.26	7.42	8.96	11.4	14.3
	eati	Max. Electric Heater Capacity@220V			2	3	4	5	5	6	6	6	6	6
Date	Ĩ				-									
e		FCCOP ^e	Ratin	5	37.1	36.4	30.5	35.2	31.3	32.9	35.0	29.5	32.7	32.3
Jan		Sound Prossure Love	Class		U 49/47/42	D	D	D	D	D				
orn		Sound Pressure Leve			40/47/43	50/45/40	52/50/44	52/51/40	54/52/45	55/52/4/	50/54/50	50/55/52	50/54/50	55/57/55
erf	p	(Inlet + Radiated)	.1		50/49/45	52/51/48	54/52/46	54/53/48	56/54/51	55/54/49	58/56/52	60/57/54	60/56/52	61/59/57
–	no	Sound Power Level (Outlet)e	dB(A)	57/56/52	59/58/55	61/59/53	61/60/55	63/61/58	62/61/56	65/63/59	67/64/61	67/63/59	68/66/64
	S	Sound Power Level	,					co /co /co						
		(Inlet + Radiated) ^e			59/58/54	61/60/57	63/61/55	63/62/5/	65/63/60	64/63/58	67/65/61	69/66/63	69/65/61	/0/68/66
			н		67	82	120	123	167	204	222	314	430	554
	ical	Fan Motor Power ^e	М	W	66	80	120	122	166	203	220	310	365	494
	ctr		L		58	78	116	117	163	194	216	307	345	424
	Ele	Fan Motor Running	Current @ H	Α	0.29	0.36	0.52	0.53	0.73	0.89	0.97	1.37	1.87	2.41
1		Fan Motor Starting	Current @ H	Α	0.87	1.07	1.57	1.60	2.18	2.66	2.90	4.10	5.61	7.23
1		Cooling Water Flow	H		483	581	744	880	1002	1438	1498	1751	2272	2663
1		Rate	M	L/h	456	564	718	861	976	1394	1463	1724	2205	2546
			L		433	543	649	760	908	1260	1363	1658	2104	2468
		Cooling Pressure	H	kD-	23.6	36.47	20.51	30.04	41.16	46.3	17.45	24.15	44.88	63.92
	Ŀ.	Drop	IVI	кра	21.42	34.68	16.27	28.9	39.41	43.94	14.95	23.52	42.65	59.2
	aul				19.58 /17	52.5	692	23.4 801	54.8Z	5/ 1222	1/10	1622	22.30	2615
1	ydr	Heating Water	M	I/h	41/	522	655	0U1 799	947 022	1100	1274	1605	2033	2015
1	-	Flow Rate	1		357	 	596	685	862	107/	1274	1525	10/17	2301
1			H		15.4	25 5	14.8	21.6	31.6	29.8	13 3	18.1	33.4	52.9
		Heating Pressure	M	kPa	14.2	24.1	13.8	21.0	30.2	28.4	12.7	17.6	31.6	49.1
		Drop	L		12.9	22.4	11.7	16.5	27	23.8	11.1	16.3	29.4	47.2
1		water cont	ent -	L	0.72	0.87	1.02	1.17	1.32	1.92	2.07	2.22	2.59	2.87
	1		Туре	1				S	ocket (Threa	aded Femal	e)	1		
1		Water	In		1				•					
pu	Ð	Connections	Out	mm					40.0-	[2/4]				
na	Dat	Condensate Dr	rainage	[in]					19.05	[3/4]				
ctio	ngl	Connectio	on											
itru	icki		L		755	855	955	1155	1255	1655	1755	1855	1755	1955
suo	Ра	Dimensions	W	mm		•		5	50		•		6	20
۰ I			Н	1				2	50				3	00
		Net Weig	ht	kg	17	23	24	28	31	36	43	45	51	60

"e": Above specifications are based on declared Eurovent test data for the year of publication of this document. To confirm the most updated specifications, please visit <u>www.eurovent-certification.com</u>.

Eurovent testing conditions:

a. Cooling mode:

- Return air temperature: 27C DB/ 19C WB.

- Inlet/ outlet water temperature: 7C/ 12C.

b. Heating mode:

- Return air temperature: 20C.

- Inlet/ Outlet water temperature: 45C/ 40C.

Product range:	PDWA(4R) Low Static District Cooling Hydronic Ducted Fan Coil Unit
PDWA(4R)-V~ Hy	dronic Ducted 2-pipe Unit with 4-row Coils and AC motor

		PDV	VA(4R)-	[Size]-	V~	200	300	400	500	600	800	1000	1200	1400	1600
		(Configu	ration						2-p	ipe				
		Numb	er Of F	an Blov	wers	Sir	ngle		Twin		Three	Fo	our	Three	Four
Unit Con	figuration	Powe	r Sunnh	, (\//Ph	/Hz)					230/	1/50				
		TOWE	Juppi	, (• / • •	/112)					220/	1/60				
		Op	eration	Contro	bl	~S: Comp	lete funct	ion on bo	ard PCB v	with integ	rated grou	up contro	l function	ality	
		99		-	T	~T: Termi	inal strip o	nly.						L	
			Н	3	- //	442	553	742	868	1040	1294	1538	1832	2440	3046
		Air Flow	M	2	m3/hr	411	531	709	849	1010	1243	1485	1798	2342	2878
	Air		L	1		386	504	629	721	921	1103	1361	1706	2215	2782
		Available	Н	3	_	58	54	59	55	62	56	52	60	60	57
		pressure	M	2	Ра	50	50	50	50	50	50	50	50	50	50
			L	1		35	35	30	32	39	31	35	40	43	39
		Cooling	н	3	-	2.09	2.53	3.35	4.2	4.//	6.66	7.5	8.77	11.19	12.67
		Capacity		2	-	1.98	2.46	3.26	4.11	4.66	6.47	7.32	8.63	10.86	12.13
	Cooling			1	kW	1.89	2.36	2.97	3.64	4.34	5.9	6.82	8.36	10.37	11.86
	_	Sensible	Н	3	-	1.46	1.75	2.32	2.92	3.31	4.61	5.17	6.05	7.8	8.85
		Cooling	IVI	2	-	1.37	1./	2.25	2.86	3.23	4.47	5.03	5.94	7.56	8.46
		Capacity	L	1		1.3	1.63	2.03	2.5	2.98	4.05	4.66	5.73	7.18	8.26
ata	Sound Pressur (Outlet)		ure Lev	el		48/47/43	50/49/46	52/50/44	52/51/46	54/52/49	53/52/47	56/54/50	58/55/52	58/54/50	59/57/55
ce Di	Sound	Sound Press (Inlet + Radia	ure Lev ated)	el	dB(A)	50/49/45	52/51/48	54/52/46	54/53/48	56/54/51	55/54/49	58/56/52	60/57/54	60/56/52	61/59/57
erformanc	Sound	Sound Powe (Outlet)	r Level		ub(/ ()	57/56/52	59/58/55	61/59/53	61/60/55	63/61/58	62/61/56	65/63/59	67/64/61	67/63/59	68/66/64
		Sound Powe (Inlet + Radi	r Level ated)			59/58/54	61/60/57	63/61/55	63/62/57	65/63/60	64/63/58	67/65/61	69/66/63	69/65/61	70/68/66
ď			н	3		67	82	120	123	167	204	222	314	430	554
		Fan Motor	М	2	W	66	80	120	122	166	203	220	310	365	494
		Tower	L	1		58	78	116	117	163	194	216	307	345	424
	Electrical	Fan Mot Curre	or Runr ent @ H	ning	А	0.29	0.36	0.52	0.53	0.73	0.89	0.97	1.37	1.87	2.41
		Fan Mot Curre	or Start ent @ H	ing	А	0.87	1.07	1.57	1.60	2.18	2.66	2.90	4.10	5.61	7.23
		Cooline M		Н		200	241	319	400	454	634	714	835	1065	1207
		Elow Ba	ater	Μ	L/h	188	234	310	391	444	616	697	822	1034	1155
		11011110		L		180	225	283	347	413	562	650	796	987	1130
	Hydraulic			Н		7.2	11.19	20.18	10.82	14.69	15.71	20.76	28.77	17.05	22.94
		Dron	essure	M	kPa	6.52	10.64	19.21	10.42	14.13	14.96	19.93	28.01	16.2	21.31
		5.00		L		6.03	9.97	16.4	8.48	12.5	12.8	17.68	26.52	14.97	20.51
		Water	conter	it	L	0.96	1.16	1.36	1.56	1.76	2.56	2.76	2.96	3.45	3.79
		Wate	r	-	Туре				Soc	ket (Threa	aded Fema	ale)			
		Connecti	ons	In	_										
				Out	in					3.	/4				
Construe Packin	ction and Ig Data	Condensa Conr	te Drai	nage											
	•			L		755	855	955	1155	1255	1655	1755	1855	1755	1955
		Dimensi	ons	W	mm	550 620									
				Н					2	50				3	00
		Net V	Weight		kg	17	23	24	28	31	36	43	45	51	60

a. Cooling mode:

- Return air temperature: 24C DB/ 18C WB.

- Inlet/ outlet water temperature: 5.5C/ 14.5C.

A.2.2. 4-pipe Systems

Product range: PDWA(3+1R) Low Static Hydronic Ducted Fan Coil Unit

PDWA(3+1R)-P ^T Hydronic Ducted 4-pipe Unit with 3-row Colls and AC mot

		PDW	A(3+1R)	-[Size]-P~	200	300	400	500	600	800	1000	1200	1400	1600
		(Configur	ation						4-р	ipe				
		Numb	per Of Fa	In Blov	wers	Sin	gle		Twin	220 /	Three	Fo	our	Three	Four
Unit Co	onfiguration	Power	Supply		(V/Ph/Hz)					230 /	1/50				
						~S: Compl	ete functio	on onboard	PCB with	integrated	group cor	trol functi	onality.		
		Ор	eration	Contro	ol	~T: Termir	nal strip or	ly.			8.000				
			Н	3		442	553	742	868	1040	1294	1538	1832	2440	3046
		Air Flow	М	2	m3/hr	411	531	709	849	1010	1243	1485	1798	2342	2878
	Air		L	1		386	504	629	721	921	1103	1361	1706	2215	2782
		Available	Н	3	D.	58	54	59	55	62	56	52	60	60	57
		pressure		2	Ра	25	25	20	50	20	21	25	50	50	20
			н	3		2 72	3.29	4 16	4 94	5.65	8.07	846	9.9	13.06	14 97
		Cooling	M	2		2.56	3.19	4.03	4.87	5.55	7.82	8.24	9.75	12.67	14.28
		Capacity	L	1	1.3.67	2.45	3.07	3.69	4.27	5.14	7.15	7.73	9.43	12.18	13.94
	Cooling	Sensible	Н	3	ĸvv	1.95	2.34	3.01	3.54	4.01	5.73	6.09	7.14	9.4	10.71
	cooming	Cooling	М	2		1.83	2.27	2.92	3.48	3.93	5.53	5.92	7.01	9.09	10.16
		Capacity	L	1		1.74	2.17	2.64	3.02	3.63	5.03	5.53	6.76	8.7	9.89
		FCEER		Rati	ng	41.0	39.6	32.5	37.7	32.2	37.5	36.4	31.0	34.8	31.2
			н	3	>> 	2 16	2.69	3 / 9	4.06	J 71	6.18	7 13	8 25	10.52	12.69
		Heating	M	2		2.10	2.05	3 36	3.99	4.71	5.97	6.93	8.17	10.52	12.05
		Capacity	L	1	kW	1.94	2.5	3.07	3.52	4.31	5.48	6.51	7.78	9.79	11.92
	Heating	Max. Elec	tric Heat	ter		2.0 .	2.0	4	5.52		0110	0.01	-	5.75	11.01
		Сар	acity			2	3	4	5			t	2		
		FCCOP		Rati	ng	29.2	28.7	24.1	27.6	23.9	25.5	27.2	22.9	24.9	24.0
_		Sound Pressure Level		SS	D	D	D	D	D	D	D	D	D	D	
ata		Sound Pressi (Outlet)	ure Level			48/47/43	50/49/46	52/50/44	46/41/23	54/52/49	53/52/47	56/54/50	58/55/52	58/54/50	59/57/55
еD		Sound Pressi	ure Level			50/40/45	F2/F1/40	FA/F2/4C	F 4 /F 2 /40				CO/57/54	<u> </u>	C1/F0/F7
anc.	Sound	(Inlet + Radia	ated)		dB(A)	50/49/45	52/51/48	54/52/46	54/53/48	56/54/51	55/54/49	58/50/52	60/57/54	60/56/52	01/59/57
rforma	Sound	Sound Power	r Level		00(/1)	57/56/52	59/58/55	61/59/53	55/50/32	63/61/58	62/61/56	65/63/59	67/64/61	67/63/59	68/66/64
		Sound Power	r Level												
Pel		Inlet + Radiated)				59/58/54	61/60/57	63/61/55	63/62/57	65/63/60	64/63/58	67/65/61	69/66/63	69/65/61	70/68/66
		Fan Motor	Н	3		67	82	120	123	167	204	222	314	430	554
		Power	M	2	W	66	80	120	122	166	203	220	310	365	494
	Flectrical	Ean Moto		1		58	/8	116	117	163	194	216	307	345	424
		Current @ H		A	0.29	0.36	0.52	0.53	0.73	0.89	0.97	1.37	1.87	2.41	
		Fan Moto	or Startir	וg	۸	0.87	1 07	1 57	1 60	2 18	2 66	2 90	/ 10	5 61	7 23
		Curre	nt @ H		~	0.07	1.07	1.57	1.00	2.10	2.00	2.50	4.10	5.01	7.25
		Cooling W	ater	3	L/h	466	564	713	847	968	1384	1451	1698	2239	2566
		Flow Ra	te –	2		439	547	691	834	951	1340	1413	1671	2171	2448
				1		419	526	633	732	881	1226	1326	1617	2087	2389
		Cooling Pre	ssure	3	L.D.:	22.23	34.68	19.05	28.16	38.82	43.36	16.52	22.91	43.76	59.98
		Drop	⊢	2	кра	20.1	32.93	18.1	27.42	37.00	41.07	15.8 1/1 17	22.3	41.55 38 gc	52.39
	Hudroulia			3		165	205	267	311	360	473	545	632	800	968
	Hyuraulic	Heating W	ater	2	L/h	156	199	257	306	351	456	530	627	773	931
		FIOW Ka	ie	1		149	191	235	269	329	419	498	597	745	909
		Hosting Pro		3		7.73	12.83	22.89	33.51	6.82	14.81	20.64	28.44	3.94	5.95
		Drop	ssure	2	kPa	7.04	12.17	21.45	32.52	6.53	13.95	19.63	27.99	3.71	5.57
				1		6.45	11.36	18.34	26.2	5.87	12.07	17.65	25.76	3.49	5.35
		Looling Wa	ater cont	ent	L	0.72	0.87	1.02	1.1/	1.32	1.92	2.07	2.22	2.59	2.84 0.95
		Water		ent	L Type	0.24	0.29	0.34	<u>دد.ں</u> مک	cket (Three	o.o4 aded Fema	le)	0.74	0.00	0.95
		Connectio	ons	In					50						
				Out	mm [in]					<i>ر</i> د	۵"				
Const	ruction and	Condensa	te Draina	age						5/	-				
Pacl	king Data	Conn	ection			765	055	055	1155	1255	1655	1755	1055	1755	1055
		Dimensio	ns F	L W/	mm	/55	855	922	1122	1255	1022	1/55	1822	1/55	7922 1922
		Differisit	-	H					21	50				.30	00
		Net V	Veight		Kg	17	23	24	28	31	36	43	45	51	60
		-	~		. 0										

a. Cooling mode:

- Return air temperature: 27C DB/ 19C WB.

- Inlet/ outlet water temperature: 7C/ 12C.

b. Heating mode:

- Return air temperature: 20C.

- Inlet /outlet water temperature: 70C/60C.

A.3. Coil Data

3-row Coils

Model	Fin height	Fin Length	Fins per	No. of	Fin width	No. of	Tube Ø	
Model	(mm)	(mm)	Inch	Rows	(mm)	Circuits	(mm)	
PDWA(3R)-200		480				2		
PDWA(3R)-300		580				2		
PDWA(3R)-400		680				3		
PDWA(3R)-500	200	780				3		
PDWA(3R)-600	200	880	127	2	66	3	9.52	
PDWA(3R)-800		1280	12.7	5	00	4		
PDWA(3R)-1000		1380				6		
PDWA(3R)-1200		1480				6		
PDWA(3R)-1400	250	1380				6		
PDWA(3R)-1600	230	1480				6		

4-row Coils

Madal	Fin height	Fin Length	Fins per	No. of	Fin width	No. of	Tube Ø	
woder	(mm)	(mm)	Inch	Rows	(mm)	Circuits	(mm)	
PDWA(4R)-200		480 2						
PDWA(4R)-300		580				2		
PDWA(4R)-400		680				2		
PDWA(4R)-500	200	780				3		
PDWA(4R)-600	200	880	127	4	00	3	0.52	
PDWA(4R)-800		1280	12.7	4	00	4	9.52	
PDWA(4R)-1000		1380				4		
PDWA(4R)-1200		1480				4		
PDWA(4R)-1400	250	1380				6		
PDWA(4R)-1600	250	1480				6		

Heating Coil Data (4-pipe system 1-row heating coil)

Model	Fin height	Fin Length	Fins per	No. of	Fin width	No. of	Tube Ø	
	(mm)	(mm)	Inch	Rows	(mm)	Circuits	(mm)	
PDWA(1R)-200		480				1		
PDWA(1R)-300		580				1		
PDWA(1R)-400		680				1		
PDWA(1R)-500	200	780				1		
PDWA(1R)-600	200	880	10 7	2	22	2	0 5 2	
PDWA(1R)-800		1280	12.7	5	22	2	9.52	
PDWA(1R)-1000		1380				2		
PDWA(1R)-1200		1480				2		
PDWA(1R)-1400	250	1380				5		
PDWA(1R)-1600	250	1480				5		

A.4. Dimensional Drawings

2-pipe



Model	Α	В	С	D	E	F	G	н	I
PDWA-200	535	485	485	510	755	400	φ14	250	213
PDWA-300	635	585	585	610	855	400	φ14	250	213
PDWA-400	735	685	685	710	955	400	φ14	250	213
PDWA-500	835	785	785	810	1155	400	φ14	250	213
PDWA-600	935	885	885	910	1255	400	φ14	250	213
PDWA-800	1335	1285	1285	1310	1655	400	φ14	250	213
PDWA-1000	1435	1385	1385	1410	1755	400	φ14	250	213
PDWA-1200	1575	1525	1525	1550	1855	400	φ14	250	213
PDWA-1400	1435	1385	1385	1410	1755	470	φ14	300	263
PDWA-1600	1695	1645	1645	1670	1955	470	φ14	300	263
					••		-		
Model	J	К	L	M	N	D	0		
						r	<u>ч</u>	v	w
1 D WA-200	25	153	546	35	25	152	9 60	v 43.3	w 75
PDWA-200	25 25	153 153	546 546	35 35	25 25	152 152	60 60	43.3 43.3	w 75 75
PDWA-300 PDWA-400	25 25 25	153 153 153	546 546 546	35 35 35	25 25 25 25	152 152 152	60 60 60	43.3 43.3 43.3	75 75 75 75
PDWA-300 PDWA-400 PDWA-500	25 25 25 25	153 153 153 153	546 546 546 546	35 35 35 35 35	25 25 25 25 25	152 152 152 152 152	60 60 60 60	43.3 43.3 43.3 43.3	75 75 75 75 75
PDWA-200 PDWA-300 PDWA-400 PDWA-500 PDWA-600	25 25 25 25 25 25	153 153 153 153 153	546 546 546 546 546	35 35 35 35 35 35	25 25 25 25 25 25	152 152 152 152 152 152	60 60 60 60 60	43.3 43.3 43.3 43.3 43.3 43.3	75 75 75 75 75 75
PDWA-200 PDWA-300 PDWA-400 PDWA-500 PDWA-600 PDWA-800	25 25 25 25 25 25 25	153 153 153 153 153 153	546 546 546 546 546 546	35 35 35 35 35 35 35 35	25 25 25 25 25 25 25 25	152 152 152 152 152 152 152	60 60 60 60 60 60	43.3 43.3 43.3 43.3 43.3 43.3 43.3	75 75 75 75 75 75 75 75 75 75
PDWA-200 PDWA-300 PDWA-400 PDWA-500 PDWA-600 PDWA-800 PDWA-1000	25 25 25 25 25 25 25 25 25	153 153 153 153 153 153 153	546 546 546 546 546 546 546	35 35 35 35 35 35 35 35 35	25 25 25 25 25 25 25 25 25 25	152 152 152 152 152 152 152 152 152 152 152 152 152	4 60 60 60 60 60 60 60 60 60 60 60 60 60	43.3 43.3 43.3 43.3 43.3 43.3 43.3 43.3 43.3	75 75 75 75 75 75 75 75 75 75 75 75 75 75 75
PDWA-200 PDWA-300 PDWA-400 PDWA-500 PDWA-600 PDWA-600 PDWA-1200	25 25 25 25 25 25 25 25 25 25	153 153 153 153 153 153 153 153	546 546 546 546 546 546 546 546	35 35 35 35 35 35 35 35 35 35	25 25 25 25 25 25 25 25 25 25 25	152 152 152 152 152 152 152 152 152 152 152 152 152 152 152 152	4 60 60 60 60 60 60 60 60 60 60 60 60 60 60 60 60	43.3 43.3 43.3 43.3 43.3 43.3 43.3 43.3 43.3 43.3 43.3 43.3	W 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75
PDWA-200 PDWA-300 PDWA-400 PDWA-500 PDWA-600 PDWA-600 PDWA-1000 PDWA-1200 PDWA-1400	25 25 25 25 25 25 25 25 25 25 25	153 153 153 153 153 153 153 153 153 203	546 546 546 546 546 546 546 546 546 616	35 35 35 35 35 35 35 35 35 35 35 35	25 25 25 25 25 25 25 25 25 25 25 25	152 152 152 152 152 152 152 152 152 152 152 152 152 152 152 152 152 152 152 202	4 60 60 60 60 60 60 60 60 60 60 60 60 60	43.3 43.3 43.3 43.3 43.3 43.3 43.3 43.3 43.3 43.3 43.3 43.3 43.3 43.3 43.3	W 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75

(All dimensions shown in mm)

A.5. Sound Data

Sound Power (Inlet + Radiated)

N	1odel	PC	WA-2	00	P	DWA-30	00	P	DWA-4(00	P	DWA-50	00	P	DWA-60	00
S	peed	Н	М	L	Н	М	L	Н	М	L	Н	М	L	н м		L
Soun d	d Power lB(A)	59.5	58.2	54	60.8	60.5	56.7	63	61	55.3	62.6	61.6	56.8	65.4	63.7	60.5
	20Hz	17.3	17.9	18	14.6	17.7	20.4	23.8	21.8	23.2	18.8	20.6	25.5	22.7	24.8	13.9
	25Hz	20	16.1	12.7	15.7	17.8	19.7	27.9	22.7	23.4	22.4	22.1	18.1	20.2	19.4	18.9
	31.5Hz	17.7	17.9	11.7	20	20.2	16.4	22.4	19.7	15.9	19.9	16.8	14.4	19.7	17.4	16.2
	40Hz	18.8	16.6	11.7	15.9	14.7	15.8	17.8	14.6	13.4	16.6	18.9	14.9	17.8	20.2	16.7
	50Hz	18.8	18.2	15.5	18.5	19.7	17.4	20.2	19.7	18.9	22	20.5	19.8	21.2	21.4	21.2
	63Hz	20.6	22	19.3	25.6	22.9	19.1	21.2	17.5	19.5	26.3	23.1	24.9	23.2	22.7	22.4
	80Hz	25.4	22.7	21.1	25.9	26.3	24.6	27.4	28	21.8	29.6	28.3	23.8	29.9	28.6	27
dB)	100Hz	30.1	26.1	22.7	30	27.6	28.2	29.7	28	22	32	29.2	26.5	33.3	32.4	32.8
SP (125Hz	34.7	35.2	29.1	36.6	37.9	32	36.4	37.1	29.5	40	39.5	32.5	43.2	41.6	35.8
d G	160Hz	42.7	41.6	35.8	46.3	45.5	39.7	45.1	43	36.2	46.2	44.8	40.8	47.6	48.7	42
ate	200Hz	42.1	42.2	37.5	47	47.7	42.1	46.5	44	38.6	48.2	45.2	39.7	50.8	46.6	43.3
err	250Hz	43	42.8	36.9	46.2	46.7	42.2	45	44.6	36.6	46.6	45.6	40.8	49.9	47.8	44
pun	315Hz	44.5	43.8	39.9	45.6	44.9	41.6	48.7	48	42.2	48.4	47.3	43.7	53.4	50.2	47.4
spr	400Hz	49.9	47.7	43.7	49.6	49.3	45.5	51.3	49.5	45.1	52.3	50.8	45.8	54.3	52.8	50.8
-bar	500Hz	53.1	52.4	47.2	54.2	53.8	50.9	55.1	54.9	49.3	54.1	54.7	50.2	57.5	55.9	53.5
ave	630Hz	53.1	51.1	47	52.6	53.2	49.1	56.3	54.2	47.5	56.2	55	50	59	56.5	54.7
Oct	800Hz	48.7	46.2	43.7	51.9	50.4	47	53.3	51.1	45.2	51.6	50.8	46.1	55.2	53.1	49.4
1/3	1000Hz	50.3	48.7	43.8	50.2	48.8	45.1	54.7	52.6	46.3	52.8	51.8	46.9	54.8	54.4	50.5
. <u> </u>	1250Hz	45.8	44.4	40.6	48.1	46.9	42.6	50.1	47.8	41.3	49.5	48.2	43.7	52.7	50.9	47.5
wer	1600Hz	48	46.2	41.1	48.2	47.7	44	51.1	49.5	42.3	51.2	50.2	44.6	54	51.7	47.9
Po	2000Hz	44.9	43.4	39	47	46.3	42.3	49.2	46.9	39.9	49.3	47.7	42.3	52.8	49.8	46.1
pun	2500Hz	43.8	41.1	35.1	45.3	44.4	39.4	47.2	45.3	37.4	47.1	45.7	39.7	50.4	48.1	44.1
So	3150Hz	41.7	39.2	32.1	42.5	41.6	36.5	45.3	42.9	35.1	45.3	44	37.3	49.5	46.9	42.1
	4000Hz	38	37.2	28.4	39.4	39	33.5	42.6	39.6	31.8	41.4	39.5	32.6	46.1	43.1	38.1
	5000Hz	34.3	35.8	24.6	36.1	35.5	30	38.5	35.4	27.7	37.8	36.6	29.1	43.2	40	35.4
	6300Hz	29.6	34	21.4	32.5	31.3	25.5	36	32.9	24.6	34.2	32.3	25.3	38.3	35.5	30
	8000Hz	27.1	32.3	20.4	27.8	27.1	21.8	33.7	30.1	21.8	30.8	28.8	22.5	35.1	32.2	26.4
	10000Hz	22.6	28.7	17.1	23.2	22.2	18.6	29.6	25.6	19.1	25.7	23.7	19	30.5	27.2	22.1
	12500Hz	17	24.7	13.1	18.2	16.6	14.1	23.5	19.7	15.1	19.8	17.9	14.9	23.4	20.6	16.4
	16000Hz	11.9	24.1	9.7	19.2	11.1	13.5	15.9	13.3	11.6	13.3	12.3	11.3	15.8	13.8	11.7

SK2020 GLOBAL PDWA-V/P-AC-001

Model		PDWA-800		PDWA-1000		PDWA-1200		PDWA-1400		PDWA-1600						
s	peed	Н	М	L	Н	М	L	Н	М	L	Н	М	L	Н	М	L
Soun d	d Power B(A)	63.9	62.5	58.1	66.3	65.4	61.5	68.6	66.5	63.4	69.1	65.9	61.1	70.1	68.4	66.7
	20Hz	23	24.3	18.3	22.2	21.5	21.8	20	25.6	20.7	26.5	17.3	19.7	21.8	18.4	18.2
	25Hz	19.8	22.2	13.8	21.5	17.8	19.2	18.3	19.6	17.2	20.9	14.5	22	19.3	20.6	22.6
	31.5Hz	20.2	20.8	14.9	23	19.7	19.7	27.1	26.1	21.4	17.1	19	19.1	18.4	19.4	17.2
	40Hz	22.2	21.8	16.5	26	22.7	17.8	26.4	24.6	23.6	20.4	18.4	20.1	24.7	24.6	23.2
	50Hz	21.7	20.2	18.9	26.6	24.4	19.2	23.6	21.2	21.8	24.1	21.2	17.1	33.3	25.1	21.6
	63Hz	27.6	26.2	24.4	27.8	30.3	25.5	28.5	29.6	27.7	29.2	27.6	24.8	36.5	33.1	27.6
	80Hz	33.1	32.8	28	32.6	33.4	27.6	35.1	33.4	31.8	32.9	29.3	25.1	37.1	34.9	35.7
dB)	100Hz	35.9	37.9	37.4	37.5	34.9	32.1	38	36.3	35	36.7	35.7	32.1	43.6	46.5	49
SP (125Hz	45.3	43.6	44.3	41.1	41.3	38.5	46	44.3	39.5	46.5	38.5	40.7	48.4	44.5	44.8
й р	160Hz	49.7	46.6	42.2	46	45.9	43.6	50.8	48.1	44.1	52.6	47.9	43.1	52.3	50	49.7
rate	200Hz	50.1	46	43.4	48.9	48.7	45.1	51.5	50	47.6	53.2	50.2	45	53.2	52.3	51
eri	250Hz	49.3	48.3	43.6	50.1	49.6	43.8	54.2	51.3	47.7	55.5	50	45.6	55.7	52.6	52.6
oun	315Hz	50	48.8	44.5	51	52.3	47.2	55.7	54.9	50.4	55	50.3	46.8	57.9	56.4	56.2
spr	400Hz	53.2	53.4	48.3	54.5	53.9	49.9	57.3	56	52.2	58.7	55.5	51.9	59.7	59.4	57.6
-bai	500Hz	56.4	55	52.1	57.9	56.5	53.3	59.4	58.6	55.8	59.8	56.2	52.1	60.9	58.9	57.5
ave	630Hz	56.5	55.8	50.8	57.9	58.2	54.9	58.4	57.5	54.3	60.1	58.1	53	58.9	57.6	55.4
Oct	800Hz	54.6	52.3	46.6	57.3	58.2	53	59.8	56.7	52.7	60.9	57.1	51.9	61.2	60.3	57.8
1/3	1000Hz	52.5	51	47	55.5	54.6	50.9	60.2	57.6	54.7	58.4	54.2	49.6	59.8	57.5	55.2
L	1250Hz	51.1	49.9	44.4	55.1	54.6	50.8	56	54.2	50.6	59.3	56.2	50.1	59.3	57.9	55.7
wer	1600Hz	51.9	50.1	45.2	55.5	54.4	49.9	56.9	54.6	51.4	57.9	54.5	49	58.7	56.6	54.4
Ро	2000Hz	49.5	48.7	43.3	55.4	54.3	49	56.6	53.8	50.4	55.9	52.5	47.2	55.6	53.6	51.2
oun	2500Hz	48.4	46.9	41	52.4	50.9	45.5	54.9	52.4	48.4	55.6	52.3	46.3	55.2	53.4	50.8
So	3150Hz	46.4	44.9	38.7	50.5	49.1	44	53.2	50.7	46.1	54.4	50.2	44.2	54.6	52.9	49.7
	4000Hz	44	42.4	36	47.2	45.7	40.1	50.9	48.4	43.9	52.3	48.1	42.1	52.3	50.3	47
	5000Hz	39.5	38	30.9	43.8	42.6	36.1	47.3	44.8	40	49.6	45	38.9	50.3	48	44.6
	6300Hz	36.4	34.3	27.4	39.1	38.1	31.5	43.4	40.4	34.7	45.4	41.1	34.7	47.8	45.4	42.1
	8000Hz	32.9	31.3	24.3	35.5	34.3	27.9	39.9	36.4	30.8	43.6	39	31.9	46.5	43.8	40.2
	10000Hz	28.6	27.1	20.8	30.7	29.6	23.2	34.8	31.3	25.6	38.7	33.6	26.7	42.8	39.9	36
	12500Hz	22.5	20.6	16.3	23.7	22.5	17.3	28.8	25.4	20	32.1	26.6	22	36.2	33.3	29.3
	16000Hz	25.5	14.1	12.3	15.8	15	12	23.7	17.2	13.1	22.8	17.6	16.2	28	24.9	20.7

B. Installation

B.1. Safety Precautions

- When installing, performing maintenance or servicing Polar Air fan coil units observe the precautions stated in this manual as well as those stated on the labels attached to the unit.
- Ensure all local and national safety codes, laws, regulations, as well as general electrical and mechanical safety guidelines are followed for installation, maintenance and service.
- The appliance is for indoor use only.
- Ensure the correct power supply is provided.
- If the power supply cord is damaged, it must be replaced by qualified personnel.
- Installing and servicing fan coil unit should be performed by qualified service personnel only.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or persons lacking in experience and knowledge of the appliance, unless they have been given supervision or instruction concerning it.
- User of this appliance is responsible for his/her own safety.
- Warranty shall be voided if installation instructions and safety precaution stated in this manual are not observed.
- The unit should only be switched off by using the ON-OFF button on the control interface.

CAUTIONS

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

DO NOT turn OFF the main power supply when the unit is operating. Turn off the unit BEFORE turning off the main power

B.2. Location

- Confirm there is enough space for unit installation and maintenance. Please refer to below figure for the unit's outlines and dimensions and for the minimum distance between the unit and the obstacle/ any obstructions/ its surroundings.
- Ensure there is enough space for piping connections and electrical wiring.
- Check whether the hanging rods can support the weight of the unit (see specification table for weight of the unit).
- Confirm the unit is installed horizontally to ensure proper operation and condensate draining.
- Confirm that the unit has been switched OFF before installing or servicing the unit.
- Confirm the filter is in place and clean. Replace filter if required.
- Confirm the installation procedures below were followed.



CAUTION

Make sure the top of the unit is level after installation. The drain pan is designed with a slight gradient to facilitate drainage.



CAUTIONS

Dimension M and N are determined by air duct design. Air duct should be fire-proof. Please refer to concerned country national and local regulation. Circulatory air pressure drop should be approximately equal to the External Static Pressure.

B.3. Insulation

- Confirm the Chilled water pipes and all parts on the pipes are insulated.
- Confirm insulation is installed on the supply air duct.

B.4. Service Connection

- Confirm duct connections are sealed.
- Confirm water piping INLET is at the BOTTOM, water OUTLET is at the TOP.
- Confirm no water leakage is observed at the piping and condensate drain connections.
- Confirm drain pipe slope is minimum 1:50.

Caution

When connecting pipe to fan coil unit, do not bend or reposition the coil header for alignment purposes. This could cause a tubing fracture resulting in a water leak when water pressure is applied to the system.

B.5. Unit Operation

- Confirm air has been properly bled from and there is waterflow through the coil.
- Confirm fan wheel is rotating and air is discharged at unit supply opening
- Confirm power voltage between Terminals L1 and N.
- Confirm thermostat voltage (if equipped).
- Verify desired fan speed is receiving power from the thermostat.
- Check functionality of motor with a call for heating or cooling.
- Confirm system ESP is per schedule.
- Confirm control valve(s) functionality.

B.6. Electrical Connection

- Confirm wiring connection is done according to the wiring diagram on the unit.
- Confirm the unit is GROUNDED properly.
- Confirm an appropriate strain relief device is used to attach the power wires to the terminal box.
- Confirm a main disconnect switch is incorporated in the fixed wiring in accordance with the relevant local and national legislation.
- Confirm the speed Setting: LOW, MED, HIGH.
- Confirm the controller wiring is adjusted to the correct terminals LOW: G0, MED: G1, HIGH: G2.

*S Control Wiring Diagram: Please refer to section D.





T2-24Vac Control Wiring Diagram:

Remark: 40VA 24Vac transformer is optional.

C. Maintenance

C.1. General Maintenance

- 1. Installation and maintenance should be performed by qualified personnel who are familiar with local codes and regulations, and are also experienced with this type of appliance.
- 2. Confirm that the unit has been switched OFF before installing or servicing the unit.
- 3. A good general maintenance plan will prevent damage to and unexpected shutting down of the equipment.
- 4. Dirty filters reduce air flow as well as unit performance. Therefore, changing or cleaning the filters is very important. Check the cleanliness of the filter and replace or clean as required monthly.
- 5. Coils should be cleaned with compressed air or water to remove dust, dirt or lint. They can be brushed with a soft brush or vacuumed with a vacuum cleaner.
- 6. If the water coil is not being used during the winter season it should be drained, or an anti-freezing solution should be added to the water circuit to avoid freezing.

C.2. Regular Maintenance

- 1. Inspect and clean the condensate drain pan to avoid any clogging of the drain by dirt, dust, etc. Inspect drainage piping to ensure the proper condensate flow.
- 2. Check and clean the coil. Clean the coils with low-pressure water jets or low-pressure air.
- 3. Clean and tighten all the wiring connections.
- 4. Drain out the water system and check for buildup of mineral deposits.

C.3. Filter Cleaning

- 1. Remove the filter from bottom or side.
- 2. Clean the filter with a brush, or with water.
- 3. Replace the filter by sliding it back into the flame.



C.4. Fan Motor Assembly Maintenance

- 1. Remove the screws from the bottom panel.
- 2. Remove 4 screws from the both sides of the unit.
- 3. The complete fan-motor assembly can then be taken out easily.



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C.5. Coil Direction Interchange

- 1. Remove 4 screws for to remove the drain pan.
- 2. Remove 6 screws on the both sides to remove drain guide.
- 3. Remove 4 screws on the both side of coil mounting brackets.
- 4. The complete coil assembly can be taken out easily.
- If the coil direction is exchanged on site, water inlet and water outlet need to be exchanged. After interchanged, the upper is water inlet and the bottom is water outlet.



C.6. Electric Heater Replacement



1. Unscrew the old PDWA-EH module from the unit. Prepare a new PDWA-EH module.



3. Screw PDWA discharge flange onto EH module and then install the EH module to the unit.



2. Remove PDWA discharge flange and install it on the EH module. (Skip this step if no removable flange.)



4. Connect "L" & "N" ports to PDWA terminal "L" & "N" connected to 230V/1Ph power supply. Connect "EH" port to related terminal on PDWA which is control signal from thermostat or S-type control board.

D. Control Specifications: Complete Function PCB

Abbreviations

Ts = Setting temperature

- Tr = Room air temperature
- Ti1 = Chilled water coil temperature
- Ti2 = Hot water coil temperature

AUX1 = Hot water free contact AUX2 = Chilled water free contact MTV1 = Chilled water valve MTV2 = Hot water valve

D.1. I/O Port Definitions

I/O		Code	2-Pipe 4-Pipe				
	Return air Sensor	Al1	Return air temperature (Tr)				
Analogue Input	Chilled water Sensor	AI2	Chilled / hot water coil circuit (Ti1)	Chilled water coil circuit (Ti1)			
	Hot water Sensor	AI3	N/A	Hot water coil circuit (Ti2)			
laput	IR receiver	X-DIS 1	Digital communication port to LED display/IR receiver board.				
input	Wired wall pad	TTL1	Digital communication port to	wired wall-pad board.			
Digital input	Occupancy contact	PR1/PR2	This contact can be connected to occupancy sensor or BMS system. DIP-SWITCH IS ON. (Window contact) The contact is normally open. If the contact has been closed for 10 minutes, the unit will be shut down. When the contact is open again, the unit restarts. DIP-SWITCH IS OFF. (Economy contact) Cooling operation will only be activated when Tr - Ts \geq 4°C. If Tr <ts, be="" cool="" operation="" terminated.<br="" will="">Heating operation will only be activated when Tr-Ts\leq -4°C. If Tr>Ts, heating operation will be terminated.</ts,>				
	Float switch	Float	Voltage-free (NC). The contact is closed before the float switch is turned on.				
	Electrical heater safety switch	EH	Voltage-free (NC). The contact is closed before the EH is turned on.				
	Phase	L	Power supply to the PCB and all the loads connected to the voltage outputs.				
Power input	Neutral	Ν	Power supply to the PCB and all the loads connected to the voltage outputs.				
	Earth	G	Power supply to the PCB and all the loads connected to the voltage outputs.				
	High fan speed	HF	Voltage output (L)				
	Medium fan speed	MF	Voltage output (L)				
	Low fan speed	LF	Voltage output (L)				
Voltage output	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), Power supply to condensate pump.				
	Voltage of electrical heater (Live)	L-EH	Voltage output (L), maximum 30A.				
	Stepping motor	CN1, CN2	Power supply to louver stepping motors. (Not available)				
	Cold water free contact.	AUX2	Voltage free contact. Maximum load 5A.				
Output	Hot water free contact.	AUX1	Voltage free contact. Maximum	n load 5A.			
	In Modbus signal	AB	Toursian la fau la salue dura l				
	Out Modbus signal	AB	Terminals for local network serial connection				

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D.2. Wiring Diagrams

D.2.1. Standard AC-S1 Control PCB



D.3. Configuration Settings



D.3.1. Fan Coil Unit ON/OFF

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

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

D.3.2. Auto Restart

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

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

a) Handset only user interface:

When the power ON signal is received by the fan coil unit and no wired wall-pad is installed, the Mode, Fan Speed, Set temperature will be the same as the handset setting before the last power OFF.

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

When the power ON signal is received by the fan coil unit and a wired wall-pad is installed, the Mode, Fan Speed, Set temperature and Timer ON/OFF weekly program will be the same as the wall pad setting before the last power OFF.

D.4. Control Logics for 2-Pipe System

D.4.1. With Valve Configuration

COOL MODE

- a) MTV2, AUX1 and electric heater are always off.
- b) If Tr ≥ Ts + 1^oC (or + 4^oC if economy contact is activated), then cool operation is activated and MTV1 and AUX2 are turned on. Indoor fan runs at set speed.
- c) If Tr < Ts, then cool operation is terminated and MTV1 and AUX2 are turned off. Indoor fan runs at set speed.
- d) The range of Ts is 16 30°C
- e) Indoor fan speed can be adjusted to low, medium, high and auto.
- f) When turned on, MTV1 requires 30 seconds before it is fully open.
- g) When turned off, MTV1 requires 120 seconds before it is fully closed.
- h) When the unit is turned off, the indoor fan will shut down after 5 seconds.

LOW TEMPERATURE PROTECTION OF INDOOR COIL

- a) If Ti1 ≤ 2 °C for 2 minutes, then MTV1 and AUX2 are turned off. If indoor fan is set for low speed, then it will run at medium speed. If it is set at medium or high speed, then it will keep running at the same speed.
- b) If $Ti1 \ge 5$ C for 2 minutes, then MTV1 and AUX2 are turned on. Indoor fan runs at set speed.

FAN MODE

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

HEAT MODE

Heat mode without electrical heater

- a) MTV2, AUX2 and electric heater are always off.
- b) If Tr ≤ Ts 1 °C (or 4°C if economy contact is activated), then heat operation is activated and MTV1 and AUX1 are turned on. Indoor fan runs at the set speed.
- c) If Tr > Ts, then heat operation is terminated and MTV1 and AUX1 are turned off. Indoor fan repeatedly runs at low fan speed for 30 seconds and then stops for 3 minutes.
- d) The range of Ts is 16 30°C.
- e) Indoor fan speed can be adjusted to low, medium, high and auto.
- f) When turned on, MTV1 requires 30 seconds before it is fully open.
- g) When turned off, MTV1 requires 120 seconds before it is fully closed.

Heat mode with electrical heater as booster

- a) MTV2 and AUX2 are always off.
- b) If Tr ≤ Ts 1°C (or 4°C if economy contact is activated), then heat operation is activated and MTV1 and AUX1 are turned on. Indoor fan runs at the set speed.
- c) If Tr > Ts, then heat operation is terminated and MTV1 and AUX1 are turned off. Indoor fan repeatedly runs at low fan speed for 30 seconds and then stops for 3 minutes.
- d) If Ti1 < 40°C, then the electrical heater is turned on. If 40°C ≤ Ti1 < 45°C, then the electrical heater maintains its original state. If Ti1 ≥ 45°C, then the electrical heater is turned off.</p>
- e) The range of Ts is 16 30°C
- f) Indoor fan speed can be adjusted to low, medium, high and auto.
- g) When turned on, MTV1 requires 30 seconds before it is fully open.
- h) When turned off, MTV1 requires 120 seconds before it is fully closed.

Heat mode with electrical heater as primary heat source

- a) MTV1, MTV2, and AUX2 are always off
- b) If Ti2 ≤ 30°C (or Ti2 is damaged or disconnected), AND if Tr ≤ Ts-1°C (or -4°C if economy contact is activated), heat operation is activated, electrical heater and AUX1 are turned on. Indoor fan runs at set speed.
- c) If Tr > Ts, then heat operation is terminated and the electrical heater and AUX1 are turned off. Indoor fan repeatedly runs at low fan speed for 30 seconds and then stops for 3 minutes.
- d) The range of Ts is 16-30 °C
- e) Indoor fan speed can be adjusted to low, medium, high and auto.

PRE-HEAT

Pre-heat without electrical heater

- a) If Ti1 < 36°C [or < 28°C is selected by DIPB-S2 position SW4], then MTV1 and AUX1 are turned on, indoor fan remains off.
- b) If Ti1 ≥ 38°C [or ≥ 30°C is selected by DIPB-S2 position SW4], then MTV1 and AUX1 are turned on, indoor fan runs at set speed.
- c) If the indoor coil temperature sensor is damaged, then pre-heat time is set for 2 minutes. Indoor fan runs at set speed.

Pre-heat with electrical heater

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

POST-HEAT

Post-heat without electrical heater

- a) If $Ti1 \ge 38^{\circ}C$, then MTV1 and AUX 1 are off, then indoor fan continues to run at set speed.
- b) If $36^{\circ}C \le Ti1 \le 38^{\circ}C$, then MTV1 and AUX1 are turned off. Then indoor fan maintains its original state.
- c) If Ti1 < 36°C, then MTV1 and AUX1 are turned off. Then indoor fan repeatedly runs for 30 seconds and then stops for 3 minutes.
- d) If the indoor coil temperature sensor is damaged, then post-heat time is set for 3 minutes. Indoor fan runs at set speed.

Post-heat with electrical heater

a) Indoor fan will shut down after the unit has been turned off for 20 seconds.

OVER-HEAT PROTECTION OF INDOOR COIL

- a) If $Ti1 \ge 75$ °C, then MTV1 and AUX1 are turned off. Indoor fan remains on and runs at high speed.
- b) If Ti1 < 70°C, then MTV1 and AUX1 are turned on. Indoor fan remains on and runs at set speed.
- c) If the indoor coil temperature sensor is damaged, then the protection mode will be overridden and the unit will work according to the pre-heat and post-heat program.

DEHUMIDIFICATION MODE

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

AUTOMODE

Auto cool/heat/heat with electric heater as booster

Every time the unit is turned on, MTV1 is on, AUX1, AUX2 and fan are off. MTV2 and heater are always off. After 120secs, the subsequent operation mode is decided according to the following programs:

- a) If the coil temperature sensor (Ti1) ≥ 36°C, then MTV1, AUX1 and fan turn on or off according to HEAT mode.
- b) If Ti1 < 36°C, then MTV1, then AUX2 and fan turn on or off according to COOL mode.

Unit remains in AUTO COOL or AUTO HEAT mode throughout the operating cycle until the user changes the mode manually or restarts the unit.

Should the Ti1 sensor be damaged, auto mode will not function.

Auto heat with electric heater as primary heat source / all configuration auto changeover

If current running mode is auto cool mode, then the control Logics will change over to auto heat mode when all the following conditions are met:

- a) Ts-Tr \geq 1.0°C (or 4 $^{\circ}$ C if economy contact is activated)
- b) MTV1 has stop \geq 10 min.

If current running mode is auto heat mode, then the control Logics will change over to auto cool mode when all the following conditions are met:

- a) Tr-Ts \geq 1.0°C (or 4 °C if economy contact is activated)
- b) MTV1 has stop \geq 10 min.

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

D.4.2. Without Valve Configuration

COOL MODE

- a) Electric heater, AUX1, MTV1 and MTV2 are always off.
- b) If Tr ≥ Ts + 1°C (or + 4°C if economy contact is activated), then cool operation is activated and AUX2 is turned on. Indoor fan runs at set speed.
- c) If Tr < Ts, then cool operation is terminated and AUX2 is turned off. Indoor fan is turned off.
- d) The range of Ts is 16 30°C
- e) Indoor fan speed can be adjusted to low, medium, high and auto. Note: When the unit is turned off, the indoor fan shut down after 5 seconds.

LOW TEMPERATURE PROTECTION OF INDOOR COIL

- a) If Ti1 ≤ 2°C for 2 minutes, then AUX2 is turned off. If low speed is selected via user interface, then indoor fan runs at medium speed. If medium or high speed is selected via user interface, then indoor fan runs at set speed.
- b) If $Ti1 \ge 5$ °C for 2 minutes, then AUX2 is turned on. Indoor fan runs at set speed.

FAN MODE

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

HEAT MODE

Heat mode without electrical heater

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

PRE-HEAT

Pre-heat without electrical heater

- a) MTV1, MTV2 and AUX2 are off.
- b) If Ti1 < 36 °C [or 28 °C depending on DIP setting], AUX1 is on while indoor fan remains off.
- c) If Ti1 \ge 38 °C [or 30 °C depending on DIP setting], AUX1 is on while indoor fan runs at set speed.
- d) If indoor coil temperature sensor is damaged, pre-heat time is set for 2 minutes and indoor fan runs at set speed.

OVERHEAT PROTECTION OF INDOOR COIL

- a) If Ti1 \ge 75°C, then AUX1 is turned off, indoor fan remains on and runs at high speed.
- b) If Ti1 < 70°C, then AUX1 is turned on, indoor fan remains on and runs at set speed.
- c) If the indoor coil temperature sensor is damaged, then the protection mode will be overridden and the unit will work according to the pre-heat and post-heat program.

DEHUMIDIFICATION MODE

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

AUTOMODE

Not available.

D.5. Control Logics for 4-Pipe System

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

COOL MODE

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

LOW TEMPERATURE PROTECTION OF INDOOR COIL

- a) If Ti1 ≤ 2°C for 2 minutes, then MTV1 and AUX2 are turned off. If indoor fan is set for low speed, then it will run at medium speed. If it is set at medium or high speed, then it will keep running at the same speed.
- b) If $Ti1 \ge 5^{\circ}C$ for 2 minutes, then MTV1 and AUX2 are turned on. Indoor fan runs at set speed.

FAN MODE

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

HEAT MODE

Without Electrical Heater

- a) MTV1, AUX2 and are heater always off.
- b) If Tr ≤ Ts 1°C (or 4°C if economy contact is activated), then heat operation is activated, MTV2 and AUX1 are turned on. Indoor fan runs at the set speed.
- c) If Tr > Ts, then heat operation is terminated, MTV2 and AUX1 are turned off. Indoor fan repeatedly runs at low fan speed for 30 seconds and then stops for 3 minutes.
- d) The range of Ts is 16 30°C.
- e) Indoor fan speed can be adjusted to low, medium, high and auto.
- f) When turned on, MTV2 requires 30 seconds before it is fully open.
- g) When turned off, MTV2 requires 120 seconds before it is fully closed.

With Electrical Heater as Booster

- a) MTV1 and AUX2 are always off.
- b) If Tr ≤ Ts 1°C (or 4°C if economy contact is activated), then heat operation is activated, MTV2 and AUX1 are turned on. Indoor fan runs at the set speed.
- c) If Tr > Ts, then heat operation is terminated, MTV2 and AUX1 are turned off. Indoor fan repeatedly runs at low fan speed for 30 seconds and then stops for 3 minutes.
- d) If Ti2 < 40°C, then the electrical heater is turned on. If 40°C ≤ Ti2 < 45°C, then the electrical heater maintains its original state. If Ti2 ≥ 45°C, then the electrical heater is turned off.</p>
- e) The range of Ts is 16 30°C
- f) Indoor fan speed can be adjusted to low, medium, high and auto.
- g) When turned on, MTV2 requires 30 seconds before it is fully open.
- h) When turned off, MTV2 requires 120 seconds before it is full closed.

PRE-HEAT

Without Electrical Heater

- a) If Ti2 < 36°C [or 28°C depends on DIP setting], then MTV2 and AUX1 are on, then indoor fan remains off.
- b) If Ti2 ≥ 38°C [or 30°C depends on DIP setting], then MTV2 and AUX1 are on, then indoor fan runs at set speed.
- c) If indoor coil temperature sensor is damaged, then pre-heat time is set for 2 minutes and indoor fan runs at set speed.

With Electrical Heater

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

POST HEAT

Without Electrical Heater

- a) If $Ti2 \ge 38^{\circ}C$, then MTV2 and AUX 1 are turned off. Indoor fan continues to run at set speed.
- b) If $36^{\circ}C \le Ti2 \le 38^{\circ}C$, then MTV2and AUX1 are turned off. Indoor fan maintains its original state.
- c) If Ti2 < 36°C, then MTV2 and AUX1 are turned off. Indoor fan repeatedly runs for 30 seconds and then stops for 3 minutes.
- d) If the indoor coil temperature coil is damaged, then post-heat time is set for 3 minutes .Indoor fan runs at set speed.

With Electrical Heater

a) Indoor fan will shut down after the unit has been turned off for 20 seconds.

OVER HEAT PROTECTION OF INDOOR COIL

- a) If $Ti2 \ge 75^{\circ}C$, then MTV2 and AUX1 are turned off, indoor fan remains on and runs at high speed.
- b) If Ti2 < 70°C, then MTV2 and AUX1 are turned on, indoor fan remains on and runs at set speed.
- c) If the indoor coil temperature sensor is damaged, then the protection mode will be overridden and the unit will work according to the pre-heat and post heat set times.

DEHUMIDIFICATION MODE

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

AUTOMODE

- a) If the current running mode is AUTO COOL mode, it will change over to AUTO HEAT mode when all the following conditions are met:
 - i. $Ts Tr \ge 1^{\circ}C$ (or 4°C if economy contact is activated)
 - ii. MTV1 has closed \geq 10 min.
- b) If the current running mode is AUTO HEAT mode, it will change over to AUTO COOL mode when all the following conditions are met:
 - i. $Tr Ts \ge 1^{\circ}C$ (or + 4°C if economy contact is activated)
 - ii. MTV2 has closed \geq 10 min.

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

D.6. Sleep Mode

- a) The sleep mode can only be set when the unit is in cool mode or heat mode.
- b) If the sleep mode is activated when the unit is in cool mode, then the indoor fan will run at low speed and Ts will increase by 2°C over 2 hours.
- c) If the sleep mode is activated when the unit is in heat mode, then the indoor fan will run at set speed and Ts will decrease by 2°C over 2 hours.
- d) Changing the mode of operation will cancel the sleep mode.





D.7. Auto Fan Speed

COOL MODE

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

Fan speed is regulated according to the profile below.



HEAT MODE

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

Fan speed is regulated according to the profile below.



D.8. Buzzer

If a command is received by the fan coil unit, the master unit will respond with 2 beeps for each setting, while the slave unit will respond with 1 beep.

D.9. 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 and the fan speed. When power supply resumes or the system is switched on again, the same operations as previously set will function.

D.10. On/Off Switch on LED Display Panel

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

NOTE

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

D.11. Electric Heater Safety Switch

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

D.12. Low Temperature Protection of Indoor Coil in Winter

This is frost protection when the unit is off to prevent water from freezing in the coil.

If Unit with SW2=0 (2-pipe system), it is in Standby Mode

If $Tr \leq 2 \ \text{eC}$ for 2 minutes, MTV1 is turned on. AUX1 is on. If Ti1 < 5 \expression C for 2 minutes, EH (if present) is switched on. Indoor fan is turned on at low speed. If $Tr \geq 5 \ \text{eC}$ for 2 minutes, MTV1 is turned off. AUX1 is off. Electric Heater is turned off. Indoor fan is switched off.

If Unit with SW2=1 (4-pipe system), it is in Standby Mode

If $Tr \leq 2 \ \text{eC}$ for 2 minutes, MTV2 is turned on. AUX1 is on. If $Ti2 < 5\ \text{eC}$ for 2 minutes EH (if present) is switched on. Indoor fan is turned on at low speed. If $Tr \geq 5\ \text{eC}$ for 2 minutes, MTV2 is turned off. AUX1 is off. Electric Heater is turned off. Indoor fan is switched off.

D.13. LED Display and Error Description

LED receiver in ABS housing with 0.5m (SGS14HFCA-01010101) or 1.8m (SGS14HFCA-01010102) pre-wiring



Complete Function PCB – S Type Control						
Fan speed setting	LED Display	Condition				
High speed	Red LED On	Normal				
Medium speed	Yellow LED On	Normal				
Low speed	Green LED On	Normal				

For all units - Green LED						
Error Description	Blink	Reason	Remedy			
Electrical heater failure	Green LED blinks 1 times, stops for 3s	Only for unit with EH. EH safety switch is opened.	 Change fan speed to high. Replace the damaged EH safety switch. 			
Indoor coil sensor 2 failure	Green LED blinks 2 times, stops for 3s	Ti2 sensor unplugged or damaged.	 Check if Ti2 plug is connected or not. Check if sensor's resistance is correct or not. 			
Return air sensor failure Green LED blinks 3 tim stops for 3s		Room sensor unplugged or damaged.	 Check if Tr plug is connected or not. Check if sensor's resistance is correct or not. 			
Indoor coil sensor 1 failure	Green LED blinks 4 times, stops for 3s	Ti1 sensor unplugged or damaged.	 Check if Ti1 plug is connected or not. Check if sensor's resistance is correct or not. 			
Indoor coil low temperature protection	Green LED blinks 5 times, stops for 3s	Water temperature is lower than 3 ºC.	Check the water temperature.			
Indoor coil over heat protection	Green LED blinks 6 times, stops for 3s	Water temperature is higher than 70 °C.	Check the water temperature.			
Anti-frozen protection	Green LED blinks 11 times, stops for 3s	When unit is standby, Tr<2ºC.	Turn on unit to keep Tr higher than 5ºC.			

D.14. LED Display on Master/Slave Connection

The error message indicating the defect status of all slave units will be shown in LED lights on the master unit.

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

D.15. Master-Slave Network

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

Mater Unit Function

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

Slave Unit Function

- a) The slave unit receives data regarding 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/OFF function by handset or wall pad. The handset cannot override the wall pad timer and clock setting.

D.15.1. Master Unit Control Settings

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

Using Remote Control Handset to Set Master Control Unit:

- 1. Connect all the units PCBs according to the wire color and type of connector.
- 2. Select the master unit by setting DIPA-S1 SW6 to ON (=1) in the PCB.
- 3. Ensure the DIPA-S1 SW6 is set to OFF (=0) in the PCB on each slave unit.
- 4. Switch on the units by connecting the main power supply.
- 5. Using the handset, set the operation parameters for the master unit which will automatically send the settings to the slave unit.
- 6. Master unit will beep twice confirming receipt of commands while the slave unit will beep once.

Using Wall pad to Set Master Control Unit:

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

D.15.2. Master Slave Network Setup

1) Disconnect the communication plug from the control box



2) Communication plug

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



3) Connection wire

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

ii. Complete wire connection





iii. Wire connection check

- a) After the wire connection is completed, please check that the wire colours correspond.
- b) Check the wire contact by using a multimeter.



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

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

4) Reconnect the communication plug to the control box

D.15.3. Master Slave Communication Method

There are two modes for the master-slave structure.

Global Control communication

The master unit 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 receiving the master global commands, all slave unit settings will be replaced by the master settings.

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

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

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

D.16. Open Modbus Protocol

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

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

Supported Functions:

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

Valid Error code table:

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

Coils table:

Description	Address	Type*	Remark
Unit ON/OFF	100000	R/W	
Sleep mode	100001	R/W	
Louver swing	100002	R/W	
Reserved	100003 to 100015		

Discrete table:

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

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

Holding Register table:

Description	Address	Type*	Remark
			Cooling mode = 01(H)
			Humidify mode = 02(H)
Mode setting	300000	R/W	Fan mode = 04(H)
			Heating mode = 08(H)
			Auto mode = 10(H)
			Low speed = 04(H)
For croad catting	200001	DAA	Medium speed = 02(H)
Fan speed setting	300001	K/ VV	High speed = 01(H)
			Auto fan speed = 07(H)
			Position $1 = 01(H)$
			Position 2 = 02(H)
Louwer swing setting	200002	D/M	Position 3 = 03(H)
Louver swing setting	500002	r, vv	Position 4 = 04(H)
			Auto = 0F(H)
			Stop = 00(H)
Setting temperature	300003	R/W	16~30 degree C (actual*10 format)
Address setting	300004	R	Set by dip-switch, reading only
Reset	300005	W	=0x33 reset error
Week	200006	14/	Calibration wired wall pad and set timer
Week	300000	vv	function
Hour	300007	w	Calibration wired wall pad and set timer
	300007		function
Minute	300008	w	Calibration wired wall pad and set timer
	300008		function
Second	300009	\M/	Calibration wired wall pad and set timer
50010	300003	••	function
Hours in Timer on	300010	R/W	Timer ON
Minute in Timer on	300011	R/W	Timer ON
Hours in Timer off	300012	R/W	Timer OFF
Minute in Timer off	300013	R/W	Timer OFF
			BITO = Icon of Timer ON
Icon of Timer ON or OFF	300014	R/W/	BIT1 = Icon of Timer OFF
	500014	1.7 00	1 = enable
			0 = disable
Super low speed rpm	310000	R/W	200~1500
Low speed rpm	310001	R/W	200~1500
Medium speed rpm	310002	R/W	200~1500
High speed rpm	310003	R/W	200~1500
RPM setting	310004	R/W	0^{2000} (used to test , 0 = disable)
Temperature sampling time	310005	R/W	2~100, default:5S
Factor of auto fan speed	310006	R/W	2~150, default:20
Factor of modulating valve	310007	R/W	2~250, default:150

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

Input Register table:

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

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

Remark:

The above protocol address is in Base 0.

E. User Interface

E.1. Remote Handset



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E.2. Wired Wall Pad Controller





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Dimensions 1.



Buttons function 2.

Button	G	\mathbf{N}	55	*	>	~
Name	ONOFF	MODE	FAN	SET	DOWN	UP
Function	Switch on or off	Switch between	Change Fan	Switch	Modify	Modify
	the unit	modes	Speed	interfaces	parameters	parameters

to change function setting: (CNT stands for pressing times) Press

- (1)CNT=0 : No function
- (2) CNT=1 : Real time setting
- (3) CNT=2 : Timer On/Off setting
- (4) CNT=3 : Sleep, swing and sensor settings
- CNT=4 : Network control (Single control) mode setting (5)
- (6) CNT=5 : Global control
- (7) CNT=6 : Parameters checking

Real time setting 3.

":" blinks for every second when real time is shown. Press once to enter Real Time setting interface. When ":" is on,

then press

▶ or ▶ to adjust the current time. Press 🔟 to adjust date. Press ॐ to adjust hour or minute.

to confirm settings and exit. If no operation within 6 seconds, it will automatically exit and the setting will not be Press saved.

4. Time On/Off setting

If the master unit is in global control mode and the ON/OFF timer setting is selected, the master unit will command the whole network to be ON or OFF. Otherwise, the ON/OFF timer affects the local unit only. The system supports ON/OFF timer settings for each day of the week.

📧 twice to enter Timer setting interface and timer icon is on. When "ON" blinks, press 💵 to set timer date Press

to set hour and minute of timer-on or timer-off alternately. "ON" blinks when timer is (from Monday to Sunday). Press

set to on and "OFF" blinks when timer is set to off. Press \wedge or \vee to set timer on/off time.

to confirm settings and exit. If no operation within 6 seconds, it will automatically exit and the setting will not be Press saved. Timer on/off icon is on when timer on/off is set on that day.

Swing, Sleep and Sensor setting 5.

three times to enter Swing or Sleep setting interface and key lock icon blinks. Press

- a) Press IVVI to turn the sleep function on or off. Sleep icon is on or off when sleep function is turned on or off.
- b) Press \checkmark to turn on or off the swing function. \bowtie is on when swing function is on.
- c) Press for set "∩" in fan speed display area to activate the wall pad sensor or set "F" in fan speed display area to isolate the wall pad sensor.

Press with to confirm settings and exit. If no operation within 6 seconds, it will automatically exit but will not save settings.

6. Temperature setting

Press

to set temperature. Set point temperature is shown on temperature display area.

Press to confirm settings and exit. If no operation within 6 seconds, it will automatically exit and the setting will not be saved.

When DIP SW1=ON, set point temperature is fixed. In cooling mode, set point temperature is 24°C. In heating mode, set point temperature is 21°C.

When DIP SW1=OFF, temperature can be set from 16°C to 30°C.

When DIP SW2=ON, set point temperature is shown on temperature display area.

When DIP SW2=OFF, room temperature is shown on temperature display area.

7. Mode setting

Press **I** to set COOL, HEAT, FAN, DRY or AUTO (Display both COOL and HEAT icons) mode alternatively.

8. Key Lock

u and 🖤 to set key lock function. Key lock icon is on or off when key lock function is set to on or off.

9. Fan speed setting

Press 🖤 to set LOW, MEDIUM, HIGH or AUTO speed.

10. ON/OFF setting

Press 💴 to turn on or off the unit.

10. Temperature unit setting

Press

and \checkmark at the same time to change temperature unit between Celsius and Fahrenheit.

11. Network control (Only master unit can control slave units)

 Press area.
 four times to set network control and "Network" icon is on. The slave unit number is blinking in real time display area.

 Press or or to select slave unit which is online. The offline slave unit number is not shown.

 Press or select parameters: ON/OFF unit, temperature, mode, fan speed, swing and sleep.

 Press or set the selected parameter.

1) ON/OFF unit: Press button once, "H" blinks in master-slave display area, then press to turn on unit ("H" blinks) or turn OFF unit ("S" blinks).

2) Temperature: Press IVI twice, temperature blinks in temperature display area, then press \land or \checkmark to set temperature.

3) Mode: Press III three times, Mode icon blinks in mode display area, then press 🖤 to select mode.

4) FAN SPEED: Press IMI four times, fan speed icon blinks in fan speed display area, then press 🕉 to set fan speed.

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5) Sleep: Press IVI five times, sleep icon blinks then press IVI to set sleep mode.

Press to confirm settings and exit. If no operation within 6 seconds, it will automatically exit and the setting will not be saved.

12. Global control setting

1) Press IVI, timer on/off icon blinks and all slave units' timer on/off function setting are cancelled.

2) Press **D**, all slave units time are set to the same as master units.

Press Master unit sends commands to all online slave units. "NETWORK" icon is off. If timer on/off function is set on mater unit, "NETWORK" icon blinks until Timer on/off disappears.

13. Parameter checking

Press six times to enter parameter checking interface. Local unit parameter is shown in temperature display area. Unit number is shown in real time hour area and parameter number is shown in real time minute area. For example, 2:03 stands

for No.2 unit and No.3 parameter. Press

neter. Press **Lett** and **•**

to exit parameter checking interface.

d **v** to select the specific parameter. Press

unit number. Press Parameters shown below:

Temp. area	Time area
C0	Return air temperature
C1	Indoor coil 1 temperature
C2	DIP switch setting
C3	Indoor coil 2 temperature

14. Error codes

When unit error is detected, unit number blinks on real time hour area and Error code blinks on real time minute area. The Error codes display alternately if more than one error is detected.

If there is no slave unit online, only error code is shown in real time minute area.

Error code table:

Error reason	Error code	
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	EC0	

15. EC motor RPM setting (Not available in AC motor unit)

DIP SW3 is used to set EC motor RPM.

When DIP SW3=ON, wired wall pad enters setting interface. D1/D2/D3 is shown in temperature display area and EC motor RPM is shown in real time display area.





to set EC motor RPM. After 3 seconds,

and

to select

the setting is valid.

When DIP SW3=OFF, wired wall pad resumes normal display.

F. Sensor Resistance R-T Conversion Table

Resistance: R (25°C) = $10K\Omega \pm 1\%$ Beta Constant : B (25/85) = $3977 \pm 1\%$

Т	Rmin	Rnom	Rmax	Т	Rmin	Rnom	Rmax
(°C)	(ΚΩ)	(ΚΩ)	(ΚΩ)	(°C)	(ΚΩ)	(ΚΩ)	(ΚΩ)
-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	9.3/4	9.57	9.765
-/	45.98	47.66	49.37	27	8.969	9.16	9.351
-b	43.61	45.1/	46.//	28	8.584	8.//	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	33.0	34./1	35.85	33	6.92	6 704	7.251
1	31.93	32.97	3402	34	6.033	6.794	6.950
2	30.35	20.76	32.5	35	6.099	6 252	6.073
2	20.05	29.70	30.00	30	0.099 E 9E	6.232	6.407
3	27.44	28.29	29.15	57	5.65	0	0.151
т	Pmin	Pnom	Pmay	т	Pmin	Pnom	Pmay
(°C)	(KO)	(KO)	(KO)	(°C)	(KO)	(KO)	(KO)
38	5 614	5 759	5 907	75	1 417	1 474	1 532
39	5 387	5.53	5.507	75	1 37	1.474	1.332
40	5.172	5.33	5.675	77	1 326	1 379	1 434
40	4 966	5 101	5 238	78	1.320	1 335	1 389
41	4.500	4 901	5.034	70	1.202	1.335	1.305
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	4			
/2	1.569	1.63	1.692	4			
/3	1.516	1.576	1.63/	4			
/4	1.466	1.524	1.585	J			

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G. Troubleshooting





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