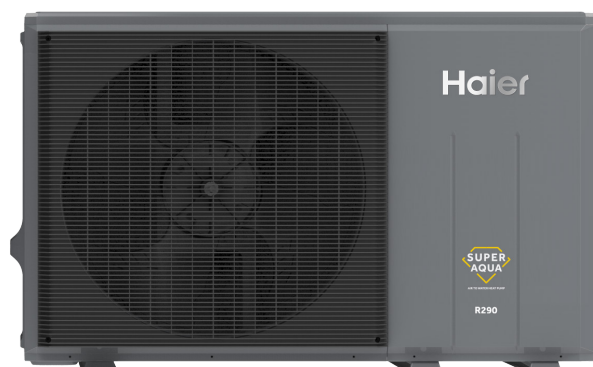


Haier

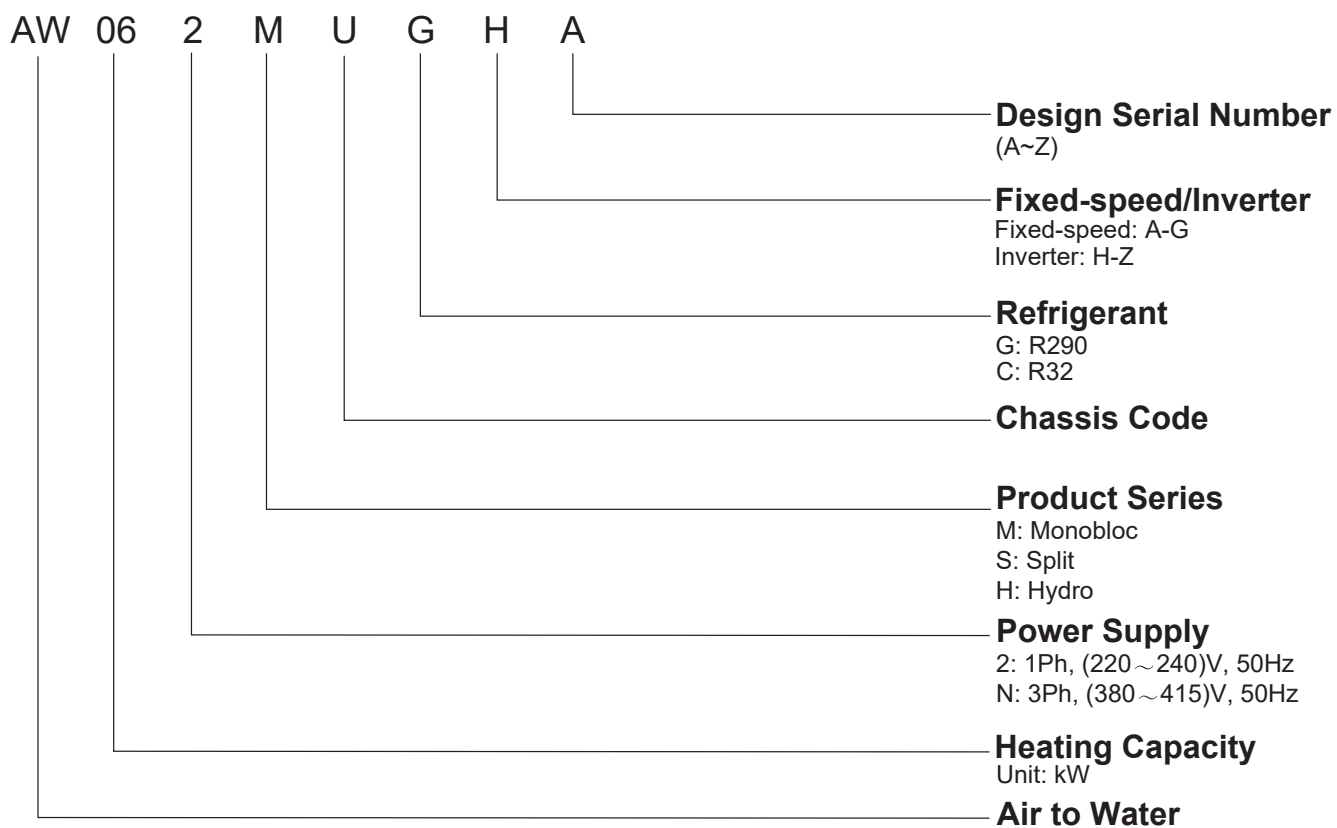
Engineering Data Book

R290 Super Aqua Monobloc GT



3. General Information

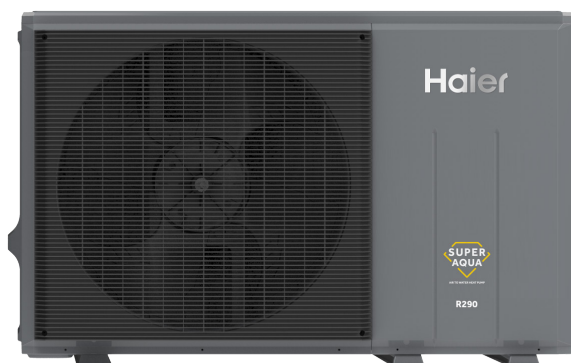
3.1 Nomenclature



3.2 Lineup



Model	Dimension W/D/H	Power Supply (V/Ph/Hz)	Capacity	Compressor type	Heat exchanger	A/C mode	Hydraulic module	Refrigerant
AW042MUGHA	1250*380*790	220~230/1/50	4KW	DC Inverter	Plate-heat Exchanger	Heat Pump	Built-in	R290
AW062MUGHA			6KW					
AW082MUGHA			8KW					
AW102MUGHA			10KW					
AW10NMUGHA		380~415V/3/50	10KW					



Model	Dimension W/D/H	Power Supply (V/Ph/Hz)	Capacity	Compressor type	Heat exchanger	A/C mode	Hydraulic module	Refrigerant
AW122MXGHA	1380*460*880	220~230/1/50	12KW	DC Inverter	Plate-heat Exchanger	Heat Pump	Built-in	R290
AW142MXGHA			14KW					
AW162MXGHA			16KW					
AW12NMXGHA		380~415V/3/50	12KW					
AW14NMXGHA			14KW					
AW16NMXGHA			16KW					
AW18NMXGHA			18KW					

3.3 Features and Benefits

Environmental-friendly

- **Natural refrigerant R290**

High-efficiency

- **Max COP up to 5.50**

The GT series has excellent performance. Higher compression ratio and lower oil compressors and the efficient internal thread regenerator is used in the appliance to increase the suction temperature and improve the energy efficiency of the unit. The maximum value of COP can reach 5.50.

- **SCOP A+++/A+++ (35°C/55°C)**

The SCOP at 35°C and 55°C water temperature both reach the top class A+++.

- **Hot water ERP class A+**

DHW efficiency level reaches the top class A+.

Ultimate Comfort

- **High leaving water temperature**

The max leaving water temperature can reach 80°C, leading in the industry. It is the best solution to replace the boiler heating.

- **Low sound level**

With excellent design, the Haier Super Aqua GT series sound pressure level is as low as 35dB(A) at 3 meters.

Super Convenience

- **Compact design**

All in one indoor unit covers an area of only 590*590mm, the smallest area in the industry, suitable for hidden installation of apartments.

- **Easy installation and easy maintenance**

From the convenience of installation and maintenance, the internal structure is optimized, the layout is more reasonable, and the components can be removed and assembled without interfering with each other.

High Reliability

- **Wide operating range**

The GT series can operate normally at minus 28°C, and the heating capacity does not decay at minus 10°C, providing a guarantee for users to warm in cold weather.

- **Silver brazing technology**

To deal with the R290 refrigerant which is combustible, optimize the system design by reducing welding joints and adopting silver brazing welding technology to ensure stronger welding and avoid leakage.

- **Refrigerant separator**

Refrigerant separator can quickly discharge the refrigerant from the water system in case of leakage and prevent it from entering the water system and indoor space.

- **Sealed electric control box**

Explosion-proof electric control design, more safety for R290 product, is used to avoid potential fire hazards and provide strong protection for user safety.

Intelligence

- **Smart control**

With Haier Wi-Fi control you can check the running state of heat and allows you to have flexibility and control of your heat pump. It delivers a simply life for you.

- **Selection software**

The system is built on the Cloud and authorized users to operate by browser. Users can visit the system by mobile terminals and computers. It can support all the ATW heat pump models to select and design. The system can finally output the corresponding selected results and the overall project plan report.

Model		Unit	AW102MUGHA
HP			3.6
Combination			
Cooling	Rated Capacity ※1	kW	9.5
	Rated Power Input ※1	kW	2.21
EER ※1			4.30
Heating	Rated Capacity ※2	kW	10.0
	Rated Power Input ※2	kW	1.96
COP ※2			5.10
SCOP			5.10
ηs,h		%	201
Power Supply		Ph/V/Hz	1/220~240/50
Rated Current(Cooling)		A	10.57
Rated Current(Heating)		A	9.38
Maximum Fuse Amps(MFA)		A	32
Minimum Circuit Amps(MCA)		A	18.0
Minimum Power Supply Cable		mm ²	6
Maximum Power Input (Cooling)		kW	4000
Maximum Power Input (Heating)		kW	4000
Maximum Outdoor Air Flow		m ³ /h	4700
Maximum External Static Pressure		Pa	0
Maximum Outdoor Sound Power Level		dB	
Maximum Outdoor Sound Pressure Level		dB(A)	/
Design Pressure		Mpa	3.5
Safety Devices			High Pressure switch, Fan driver overload protector, Overcurrent fuse, Inverter overload protector, Refrigerant separator, Safety valve, Expansion tank
Defrost Method			4WV reverse defrosting
Casing	Color		Slate Grey
	Material		Galvanized steel
Compressor	Brand		MITSUBISHI ELECTRIC
	Model		MPB42FJDMC-L
	Type		Hermetically sealed DC Inverter Rotary Type
	Compressor Quantity		1
	Rated Load Amps. (RLA)	A	7.5
	Crankcase Heater	W	27
		Quantity	1
	Compressor Oil Brand		IDEMITSUKOSAN CO.,LTD
	Compressor Oil Type		PZ46M
	Compressor Oil Charge(Compressor + Gas-liquid Separator)	ml	600
	Starting Method		Soft start

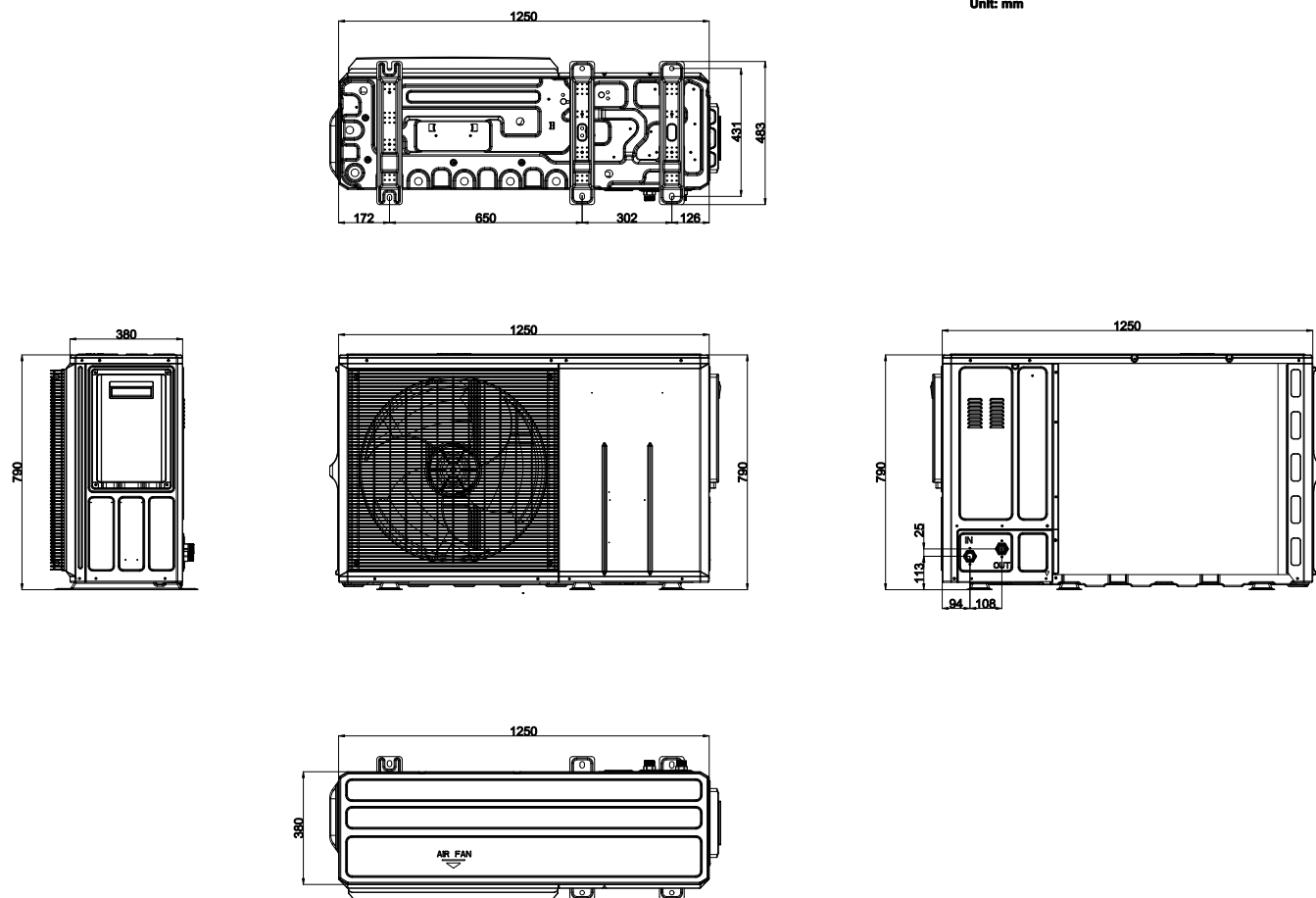
Model		Unit	AW102MUGHA
Fan Motor	Brand		BROAD-OCEAN
	Model		ZW511B500045
	IP Class		IP44
	Type		DC
	Quantity		1
	Insulation Class		E
	Safe Class		I
	Rated Power Input	W	200
	Rated Motor Output	W	160
	Speed	rpm	0~900
Fan	Brand		Shun wei
	Material		ABS+20%GF
	Type		Axial
	Diameter	mm	Φ604
	Height	mm	193
Heat Exchanger	Number of Rows		2
	Tube Pitch	mm	21
	Row Pitch	mm	18.186
	Fin Spacing	mm	1.45
	Fin Type		Hydrophilic aluminum
	Fin Coating Type	Optional	Clear lacquer
	Salt Spray Test Duration	hour	168
	Tube(ID)	mm	φ7
	Tube Type		INNERGROOVE TUBE
	Heat Exchanger Length	mm*mm	1069
	Heat Exchanger Height	mm*mm	756
	Number of Circuits		6
Plate Heat Exchanger	Model		64 piece
Water Pump	Model		7.5m head
Electronic Expansion Valve	LEVa	Brand	SANHUA
		Diameter	Ø2.4mm
		Model	DPF(TS1)2.4C-27
Four Way Valve		Brand	DANAN
		Model	DSF(S)-20-2230C
		Quantity	1
Pressure Sensor of Discharge	Brand		Sensata/SANHUA
	Model		35CP82-55-ENV/35CP82-08
Pressure Sensor of Suction	Brand		Sensata/SANHUA
	Model		35CP82-54-ENV/35CP82-07
Temp. Sensor	Temperature Sensor Type		discharge
	Value of Resistance @20°C /Ω		50K
	Temperature Sensor Type		Suction/Outdoor Ambient/Defrost/Liquid Pipe/ Gas Pipe/Inlet Water/Outlet Water
	Value of Resistance @20°C /Ω		10K

Model		Unit	AW102MUGHA
Cabinet Coating	Coating Type		Powder Coating
	Salt Spray Test Duration	hour	72
	Sheet Metal Material		Hot Zinc Plate
	Sheet Metal Thickness	mm	1
Electrical Control Box IP Class		Standard	IP24
Dimension	External Dimension (W*D*H)	mm	1250*380*790
	Packing Dimension (W*D*H)	mm	1022*1395*595
Weight	Net Weight	kg	85
	Gross Weight	kg	113
Refrigerant	Type		R290
	Charged Volume	kg	0.9
	Refrigerant Control		Electric expansion valve
Operation Range		°C	Cooling: 10~48 Heating: -28~35 DHW: -25~43
Standard Accessories			Drainage Elbow Wired Controller Water Filter ATW-A03
Note: 1. According to EN14511, EN14825 (EU) and No 811/2013(EU). 2. LWT: Leaving water temperature; OAT: Outdoor air temperature. 3. Sound level values are measured at a semi-anechoic room. And the sound power level values are based on measurement of EN12102-1 under conditions of EN14825. 4. The above data may be changed without notice for future improvement on quality and performance. ※1 OAT: 35°C DB/24°C WB, LWT: 18°C ※2 OAT: 7°C DB/6°C WB,LWT: 35°C			

5. Dimensions

AW042MUGHA AW062MUGHA AW082MUGHA AW102MUGHA AW10NMUGHA

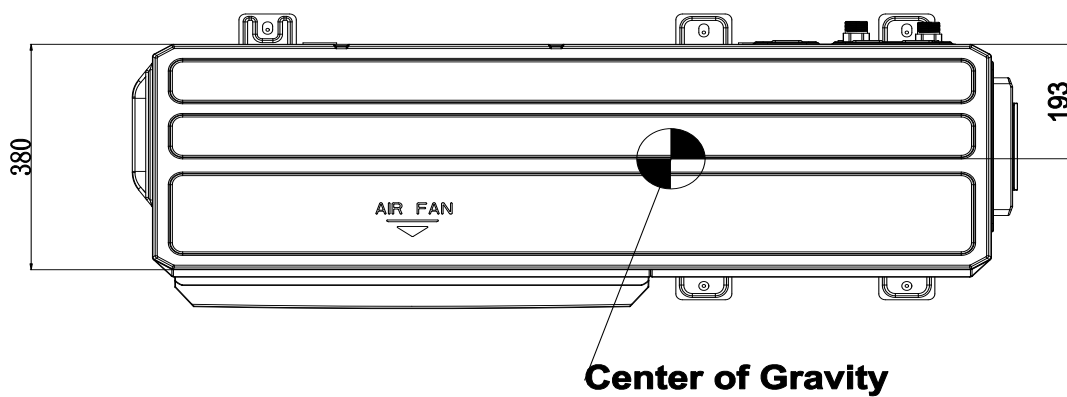
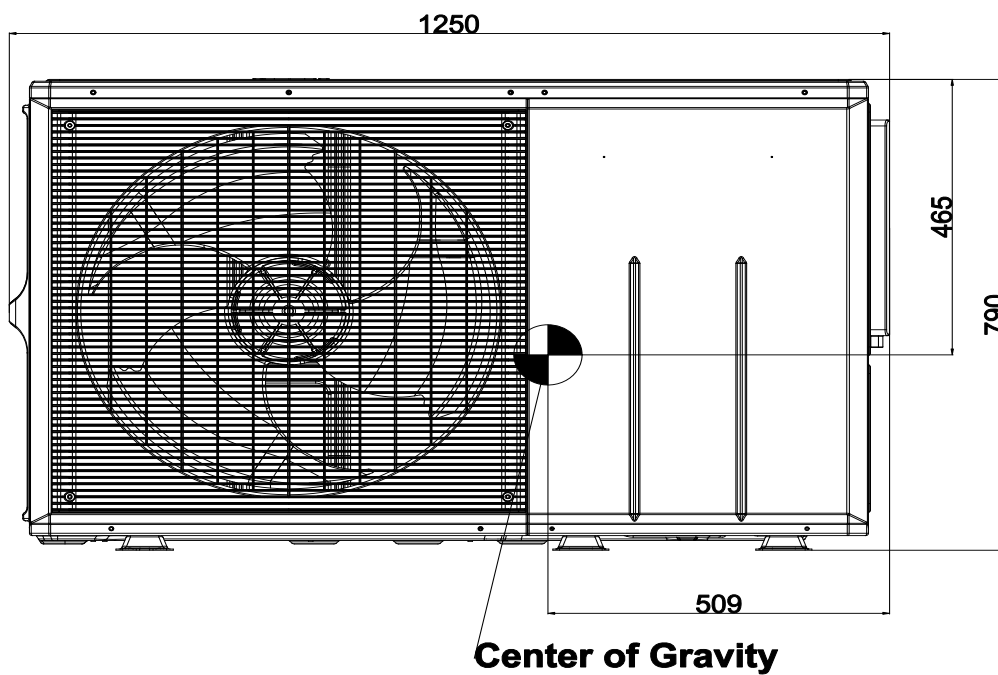
Unit: mm



6. Center of Gravity

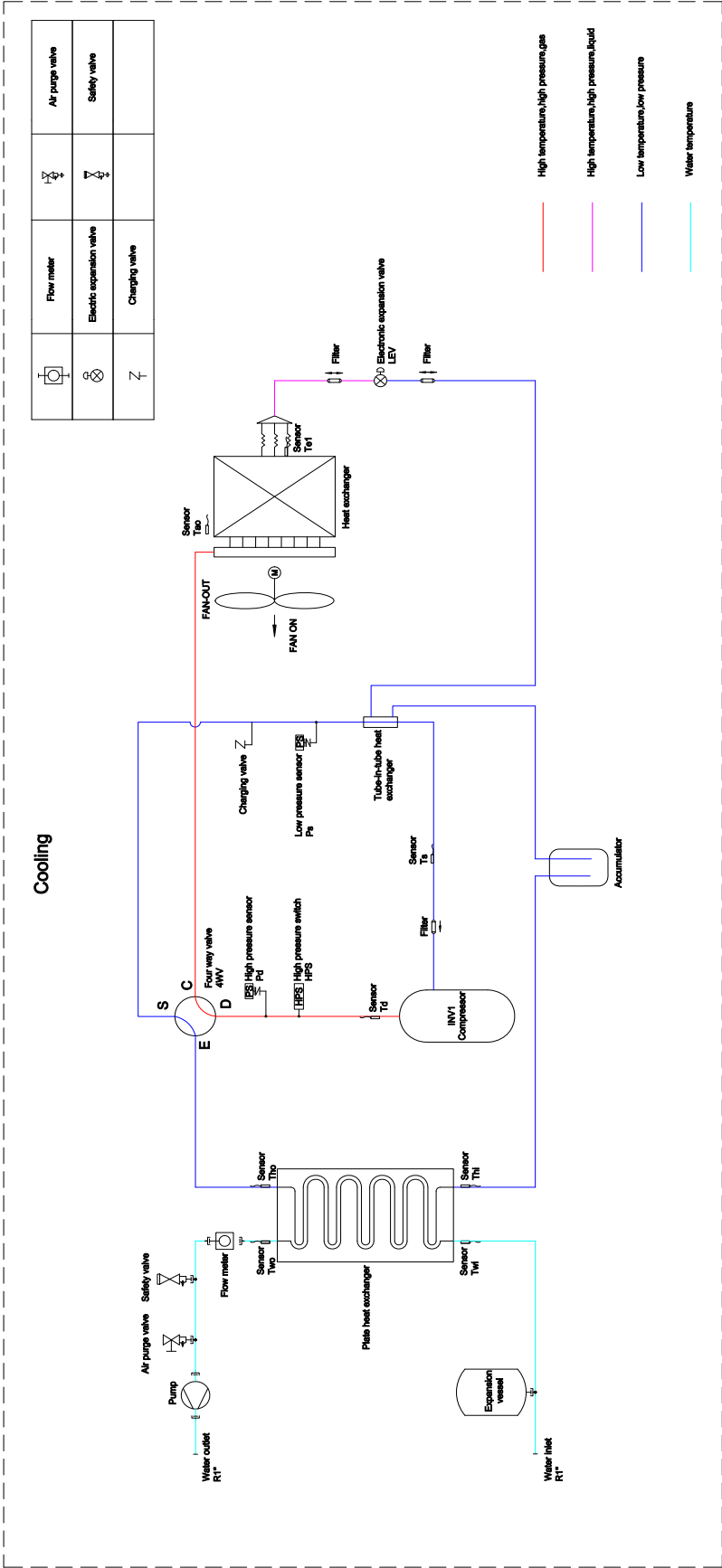
AW042MUGHA AW062MUGHA AW082MUGHA AW102MUGHA AW10NMUGHA

Unit: mm

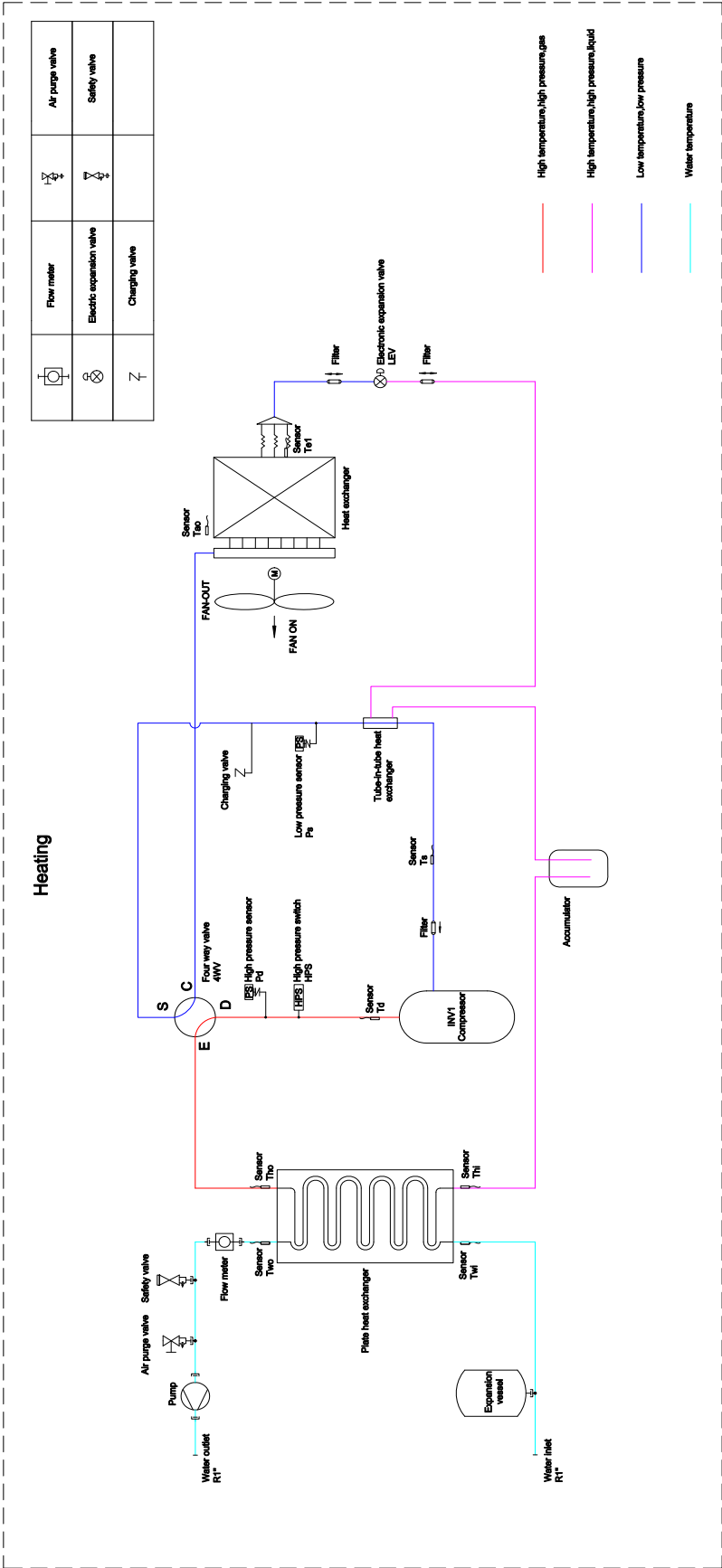


7. Piping Diagram

Cooling



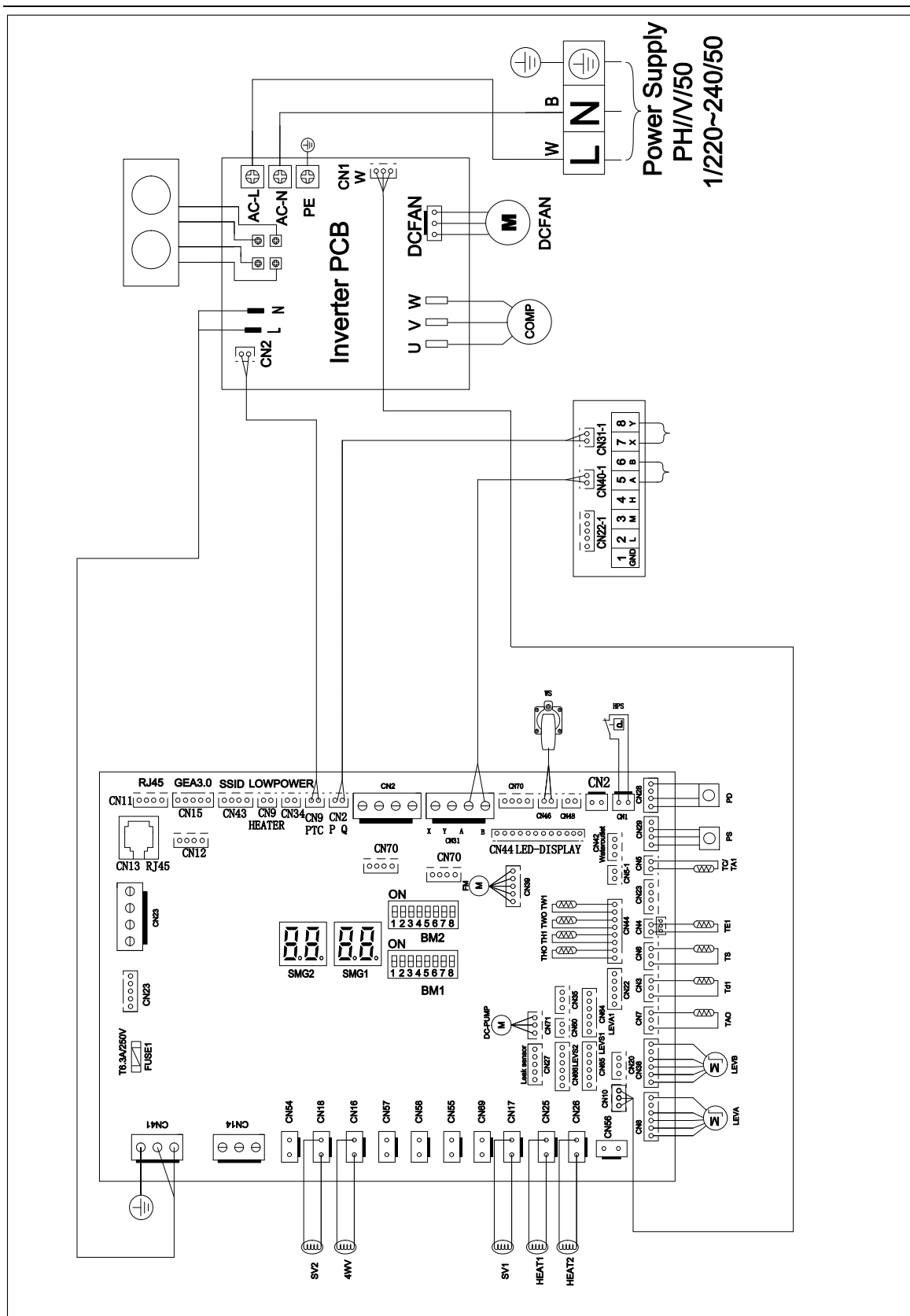
Heating



Part name	Model	abbr.	Function	Characteristics
Compressor	AW042MUGHA AW062MUGHA	Comp.	Capacity control, meet indoor load request by adjusting the frequency	Motor resistance(at 20°C):1.44±5%Ω
	AW082MUGHA AW102MUGHA AW10NMUGHA			Motor resistance(at 20°C):0.88±5%Ω
	AW122MXGHA AW142MXGHA AW12NMUGHA AW14NMUGHA			Motor resistance(at 20°C):0.54±5%Ω
	AW162MXGHA AW16NMUGHA AW18NMUGHA			Motor resistance(at 20°C):0.54±5%Ω
Pressure Sensor	All	Pd	High pressure detection	Pressure range: 0 to 41.5barG
		Ps	Low pressure detection	Pressure range: 0 to 17barG
Pressure Switch	All	Hps	High pressure protection	break:3.3MPa reset:2.65MPa
Electronic Expansion Valve1	AW042MUGHA AW062MUGHA	LEVA	In heating, refrigerant flow control	Ø1.8
	AW082MUGHA AW102MUGHA AW10NMUGHA AW122MXGHA AW142MXGHA AW12NMUGHA AW14NMUGHA			Ø2.4
	AW162MXGHA AW16NMUGHA AW18NMUGHA			Ø3.0
Four Way Valve	AW042MUGHA AW062MUGHA	4WV	Change over between cooling and heating	AC220V, electrified in heat; not electrified in cooling or defrosting
	AW082MUGHA AW102MUGHA AW10NMUGHA			
	AW122MXGHA AW142MXGHA AW12NMUGHA AW14NMUGHA AW162MXGHA AW16NMUGHA AW18NMUGHA			
Liquid Receiver	All	/	Used to storage the refrigerant	Volume:0.3L
Charging Valve	All	/	Used to charge the refrigerant to unit	Ø6.35
Flow Meter	All	/	Detect water flow	5~80 L/min
Pump	AW042MUGHA AW062MUGHA AW082MUGHA AW102MUGHA AW10NMUGHA	Pump	Transport liquid	Pumping head:7.5m
	AW122MXGHA AW142MXGHA AW12NMUGHA AW14NMUGHA AW162MXGHA AW16NMUGHA AW18NMUGHA			Pumping head:12.5m

Part name	Model	abbr.	Function	Characteristics
Expansion Vessel	AW042MUGHA AW062MUGHA AW082MUGHA AW102MUGHA AW10NMUGHA	/	Pressure fluctuation of buffer system	4.5L
	AW122MXGHA AW142MXGHA AW12NMUGHA AW14NMUGHA AW162MXGHA AW16NMUGHA AW18NMUGHA		Pressure fluctuation of buffer system	8L
Filter	All	/	Filter impurities	40 mesh
Refrigerant Separator	All	/	Release refrigerant from the water system	/
Plate Heat Exchanger	All	/	Used to exchange the heat from refrigerant to water	Design pressure of refrigerant side:4.5MPa
Pressure Relief Valve	All	/	Reduce system pressure	Operation pressure:0.3MPa
Air Purge Valve	All	/	Release gas from heating system and water supply pipeline	/
Temp. Sensor	All	Td	Discharge temp. of compressor	R80=50kΩ±3% B25/80=4450K±3%
		Ts	Suction temp. of compressor	R25=10KΩ±3%; B25/50=3700K±3%
		Te	Check frost condition of outdoor heat exchanger	R25=10KΩ±3%; B25/50=3700K±3%
		Tao	Detect ambient temp. set primary setting for fan speed target pressure and PMV open angle	R25=10KΩ±3%; B25/50=3700K±3%
		Thi	Detect the refrigerant inlet temp. of heat exchanger	R25=10KΩ±3%; B25/50=3700K±3%
		Tho	Detect the refrigerant outlet temp. of heat exchanger	R25=10KΩ±3%; B25/50=3700K±3%
		TwI	Detect the water inlet temp. of heat exchanger	R25=10KΩ±3%; B25/50=3700K±3%
		Two	Detect the water outlet temp. of heat exchanger	R25=10KΩ±3%; B25/50=3700K±3%

AW082MUGHA AW102MUGHA AW122MXGHA AW142MXGHA AW162MXGHA
AW082HUGHA AW102HUGHA AW122HVGHA AW142HVGHA AW162HVGHA



9. Electric Characteristics

Monobloc	Power Supply					MCA (A)	MFA (A)	MSC(A)	OFM	
	Hz	Voltage	Phase	Min	Max				Kw	FLA (A)
AW042MUGHA	50Hz	220-240V	1Ph	198V	264V	13.0	16	2	0.16	1.1
AW062MUGHA	50Hz	220-240V	1Ph	198V	264V	13.0	16	2	0.16	1.1
AW082MUGHA	50Hz	220-240V	1Ph	198V	264V	18.0	25	2	0.16	1.1
AW102MUGHA	50Hz	220-240V	1Ph	198V	264V	18.0	25	2	0.16	1.1
AW122MXGHA	50Hz	220-240V	1Ph	198V	264V	31.0	40	2	0.375	2.3
AW142MXGHA	50Hz	220-240V	1Ph	198V	264V	31.0	40	2	0.375	2.3
AW162MXGHA	50Hz	220-240V	1Ph	198V	264V	35.0	45	2	0.375	2.3
AW10NMUGHA	50Hz	380-415V	3Ph	342V	456.5V	7.0	10	2	0.375	0.8
AW12NMUGHA	50Hz	380-415V	3Ph	342V	456.5V	11.0	16	2	0.375	0.8
AW14NMUGHA	50Hz	380-415V	3Ph	342V	456.5V	11.0	16	2	0.375	0.8
AW16NMUGHA	50Hz	380-415V	3Ph	342V	456.5V	12.5	16	2	0.375	0.8
AW18NMUGHA	50Hz	380-415V	3Ph	342V	456.5V	12.5	16	2	0.375	0.8

Remark:

MCA: Min. Current Amps. (A)

MFA: Max. Fuse Amps. (A)

MSC: Max. Starting Amps. (A)

OFM: Outdoor Fan Motor

FLA: Full Load Amps. (A)

kW: Rated Motor Output (kW)

AW082											
Water Out(°C)		5		7		14		18		25	
Ambient Temperature(°C)		Capacity	EER	Capacity	EER	Capacity	EER	Capacity	EER	Capacity	EER
Max.	10	5248	2.64	7497	4.32	8251	5.64	8682	6.64	8943	7.28
	15	5022	2.48	7426	4.08	8123	5.21	8521	6.05	8371	6.77
	25	4571	2.18	7283	3.65	7865	4.49	8198	5.08	7226	5.76
	35	4121	1.90	7140	3.29	7608	3.91	7875	4.34	6082	4.78
	48	3534	1.56	3927	2.26	4267	2.83	4461	3.23	4595	3.55
Nom.	10	4998	3.02	7140	4.53	7858	6.06	8269	7.27	8517	8.32
	15	4783	2.84	7072	4.27	7736	5.60	8115	6.62	7972	7.74
	25	4354	2.49	6936	3.83	7491	4.83	7808	5.57	6882	6.58
	35	3924	2.17	6800	3.45	7245	4.21	7500	4.75	5793	5.46
	48	3366	1.78	3740	2.37	4064	3.04	4249	3.54	4376	4.05
Mid.	10	2729	3.19	3749	5.09	4126	6.68	4341	7.91	4471	8.78
	15	2612	3.00	3713	4.80	4061	6.17	4260	7.20	4185	8.15
	25	2377	2.63	3641	4.30	3933	5.32	4099	6.05	3613	6.94
	35	2143	2.29	3570	3.87	3804	4.64	3938	5.16	3041	5.76
	48	1838	1.88	1964	2.66	2133	3.35	2231	3.85	2298	4.27
Min.	10	1312	3.30	1874	5.69	2063	7.42	2171	8.74	2280	10.04
	15	1256	3.10	1856	5.36	2031	6.86	2130	7.96	2135	9.33
	25	1143	2.72	1821	4.80	1966	5.91	2049	6.69	1843	7.94
	35	1030	2.37	1785	4.33	1902	5.15	1969	5.71	1551	6.59
	48	884	1.95	982	2.98	1067	3.72	1115	4.25	1172	4.89

AW102/10N											
Water Out(°C)		5		7		14		18		25	
Ambient Temperature(°C)		Capacity	EER	Capacity	EER	Capacity	EER	Capacity	EER	Capacity	EER
Max.	10	6560	2.49	9371	4.07	10406	5.20	10997	6.01	11327	6.59
	15	6278	2.34	9282	3.84	10244	4.80	10793	5.47	10603	6.13
	25	5714	2.05	9104	3.44	9918	4.14	10384	4.60	9154	5.21
	35	5151	1.79	8925	3.10	9593	3.60	9975	3.93	7704	4.33
	48	4418	1.47	4909	2.13	5381	2.60	5651	2.93	5820	3.21
Nom.	10	6248	2.84	8925	4.27	9911	5.59	10474	6.58	10788	7.54
	15	5979	2.67	8840	4.02	9756	5.16	10279	6.00	10098	7.00
	25	5442	2.34	8670	3.60	9446	4.45	9890	5.04	8718	5.96
	35	4905	2.04	8500	3.25	9136	3.88	9500	4.30	7337	4.94
	48	4208	1.68	4675	2.23	5125	2.80	5382	3.21	5543	3.67
Mid.	10	3411	3.01	4686	4.79	5203	6.16	5499	7.16	5664	7.94
	15	3265	2.83	4641	4.52	5122	5.69	5396	6.52	5301	7.38
	25	2971	2.48	4552	4.05	4959	4.90	5192	5.48	4577	6.28
	35	2678	2.16	4463	3.65	4797	4.27	4988	4.67	3852	5.21
	48	2297	1.77	2454	2.51	2690	3.09	2825	3.48	2910	3.87
Min.	10	1640	3.11	2343	5.36	2602	6.84	2749	7.91	2888	9.09
	15	1570	2.92	2321	5.05	2561	6.32	2698	7.20	2704	8.45
	25	1429	2.56	2276	4.53	2480	5.44	2596	6.06	2334	7.19
	35	1288	2.23	2231	4.08	2398	4.74	2494	5.17	1965	5.96
	48	1104	1.83	1227	2.81	1345	3.43	1413	3.85	1484	4.42

AW102/AW10N									
Water Out(°C)		20		25		30		35	
Ambient Temperature(°C)		Capacity	COP	Capacity	COP	Capacity	COP	Capacity	COP
Max.	-28	8663	4.72	8400	4.48	8138	4.26	7875	4.04
	-25	9019	4.82	8746	4.58	8474	4.36	8201	4.14
	-20	9613	4.98	9324	4.74	9035	4.51	8745	4.29
	-15	10207	5.14	9901	4.89	9595	4.66	9289	4.44
	-10	10802	5.28	10479	5.04	10156	4.80	9833	4.57
	-7	11158	5.36	10825	5.12	10493	4.88	10160	4.65
	-2	11752	5.49	11403	5.25	11053	5.01	10704	4.78
	2	12228	5.59	11865	5.35	11502	5.11	11139	4.88
	7	12822	5.71	12442	5.47	12063	5.23	11683	4.99
	12	13416	5.83	13020	5.58	12623	5.34	12227	5.11
	15	13773	5.89	13366	5.65	12960	5.40	12554	5.17
	20	14367	6.00	13944	5.75	13521	5.51	13098	5.27
	25	14961	6.10	14521	5.85	14081	5.61	13642	5.37
	30	15555	6.19	15099	5.94	14642	5.70	14186	5.47
	35	16149	6.28	15676	6.04	15203	5.79	14730	5.56
	43	17100	6.42	16600	6.17	16100	5.93	15600	5.70
Nom.	-28	8250	5.26	8000	5.00	7750	4.74	7500	4.50
	-25	8443	5.30	8200	5.04	7957	4.80	7714	4.56
	-20	8764	5.36	8533	5.11	8302	4.88	8071	4.66
	-15	9086	5.42	8867	5.18	8648	4.96	8429	4.75
	-10	9407	5.47	9200	5.25	8993	5.04	8786	4.83
	-7	9600	5.50	9400	5.29	9200	5.08	9000	4.88
	-2	9921	5.55	9733	5.35	9545	5.15	9357	4.96
	2	10179	5.59	10000	5.40	9821	5.21	9643	5.03
	7	10500	5.64	10333	5.45	10167	5.27	10000	5.10
	12	11125	5.87	10889	5.65	10653	5.44	10417	5.24
	15	11500	6.01	11222	5.77	10944	5.54	10667	5.32
	20	12125	6.23	11778	5.96	11431	5.70	11083	5.46
	25	12750	6.44	12333	6.15	11917	5.86	11500	5.59
	30	13375	6.64	12889	6.33	12403	6.02	11917	5.71
	35	14000	6.84	13444	6.50	12889	6.16	12333	5.84
	43	15000	7.15	14333	6.77	13667	6.39	13000	6.03

AW102/AW10N									
Water Out(°C)		20		25		30		35	
Ambient Temperature(°C)		Capacity	COP	Capacity	COP	Capacity	COP	Capacity	COP
Mid.	-28	4331	5.24	4174	4.95	4016	4.67	3859	4.40
	-25	4546	5.38	4381	5.08	4216	4.79	4052	4.52
	-20	4903	5.59	4726	5.28	4550	4.99	4373	4.70
	-15	5260	5.79	5072	5.47	4883	5.17	4695	4.88
	-10	5618	5.97	5417	5.65	5217	5.34	5016	5.04
	-7	5832	6.08	5624	5.75	5417	5.44	5209	5.13
	-2	6189	6.24	5970	5.91	5750	5.59	5531	5.28
	2	6475	6.36	6246	6.03	6017	5.70	5788	5.39
	7	6832	6.51	6591	6.17	6350	5.84	6109	5.52
	12	7190	6.65	6937	6.30	6684	5.97	6431	5.64
	15	7404	6.73	7144	6.38	6884	6.04	6624	5.72
	20	7761	6.86	7489	6.50	7217	6.16	6945	5.83
	25	8119	6.97	7835	6.62	7551	6.27	7267	5.93
	30	8476	7.09	8180	6.72	7884	6.37	7588	6.04
	35	8833	7.19	8525	6.83	8218	6.47	7910	6.13
	43	9405	7.35	9078	6.98	8751	6.62	8424	6.28
Min.	-28	2252	6.82	2158	6.40	2063	6.00	1969	5.61
	-25	2362	6.95	2264	6.53	2167	6.13	2070	5.74
	-20	2544	7.14	2442	6.73	2341	6.33	2239	5.95
	-15	2726	7.32	2620	6.91	2514	6.52	2408	6.14
	-10	2908	7.49	2798	7.08	2687	6.70	2577	6.32
	-7	3017	7.58	2904	7.18	2791	6.79	2678	6.42
	-2	3200	7.72	3082	7.33	2965	6.95	2847	6.57
	2	3345	7.83	3224	7.44	3103	7.06	2983	6.69
	7	3528	7.96	3402	7.57	3277	7.19	3151	6.83
	12	3710	8.07	3580	7.69	3450	7.32	3320	6.96
	15	3819	8.14	3687	7.76	3554	7.39	3422	7.03
	20	4001	8.24	3864	7.87	3728	7.50	3591	7.14
	25	4183	8.34	4042	7.97	3901	7.61	3760	7.25
	30	4366	8.43	4220	8.07	4074	7.71	3929	7.35
	35	4548	8.52	4398	8.16	4248	7.80	4098	7.45
	43	4839	8.65	4682	8.29	4525	7.94	4368	7.59

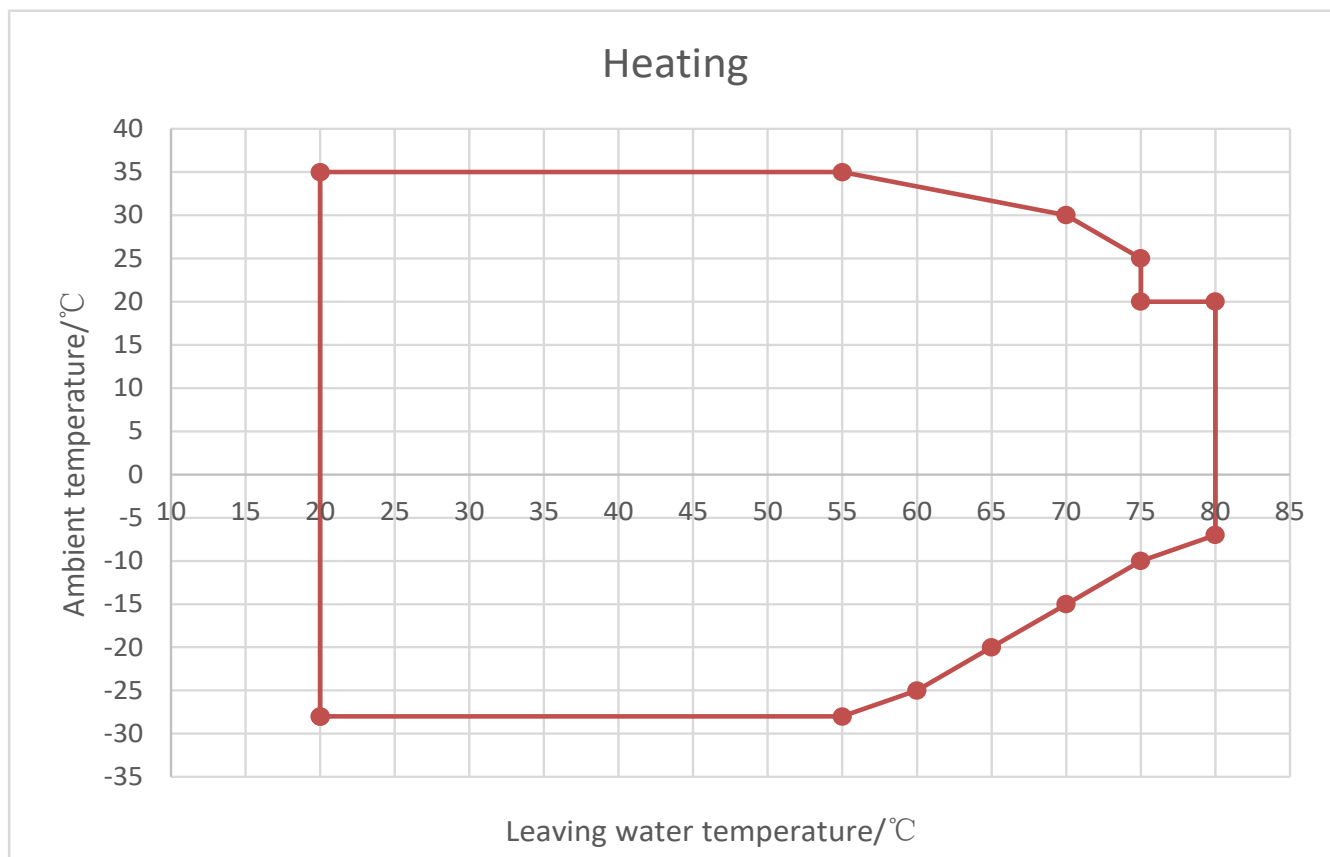
AW102/AW10N									
Water Out(°C)		40		45		50		55	
Ambient Temperature(°C)		Capacity	COP	Capacity	COP	Capacity	COP	Capacity	COP
Max.	-28	7737	3.63	7599	3.21	7462	2.80	7324	2.39
	-25	8050	3.71	7898	3.29	7747	2.87	7595	2.45
	-20	8571	3.85	8397	3.41	8222	2.98	8048	2.54
	-15	9092	3.98	8895	3.53	8698	3.08	8500	2.63
	-10	9613	4.11	9393	3.65	9173	3.18	8953	2.72
	-7	9926	4.18	9692	3.71	9458	3.24	9224	2.77
	-2	10447	4.30	10190	3.82	9934	3.33	9677	2.85
	2	10864	4.39	10589	3.90	10314	3.41	10039	2.92
	7	11385	4.49	11087	3.99	10789	3.49	10492	2.99
	12	11906	4.60	11586	4.09	11265	3.58	10944	3.07
	15	12219	4.66	11885	4.14	11550	3.63	11216	3.11
	20	12740	4.75	12383	4.23	12026	3.71	11668	3.18
	25	13261	4.84	12881	4.31	12501	3.78	12121	3.25
	30	13783	4.93	13379	4.39	12976	3.85	12573	3.32
	35	14304	5.01	13878	4.47	13452	3.92	13026	3.38
	43	15138	5.14	14675	4.59	14213	4.03	13750	3.48
Nom.	-28	7313	3.95	7125	3.41	6938	2.86	6750	2.31
	-25	7543	4.02	7371	3.48	7200	2.93	7029	2.39
	-20	7927	4.12	7782	3.59	7638	3.06	7493	2.52
	-15	8311	4.22	8193	3.70	8075	3.18	7957	2.65
	-10	8695	4.32	8604	3.81	8513	3.30	8421	2.78
	-7	8925	4.38	8850	3.87	8775	3.36	8700	2.86
	-2	9309	4.47	9261	3.97	9213	3.48	9164	2.98
	2	9616	4.54	9589	4.05	9563	3.57	9536	3.08
	7	10000	4.63	10000	4.15	10000	3.68	10000	3.20
	12	10399	4.74	10382	4.24	10365	3.74	10347	3.24
	15	10639	4.81	10611	4.30	10583	3.78	10556	3.27
	20	11038	4.92	10993	4.38	10948	3.85	10903	3.31
	25	11438	5.03	11375	4.47	11313	3.91	11250	3.35
	30	11837	5.13	11757	4.55	11677	3.97	11597	3.39
	35	12236	5.23	12139	4.63	12042	4.03	11944	3.42
	43	12875	5.39	12750	4.75	12625	4.12	12500	3.48

AW102/AW10N									
Water Out(°C)		40		45		50		55	
Ambient Temperature(°C)		Capacity	COP	Capacity	COP	Capacity	COP	Capacity	COP
Mid.	-28	3791	3.99	3724	3.59	3656	3.19	3589	2.79
	-25	3975	4.10	3898	3.69	3822	3.28	3745	2.87
	-20	4281	4.28	4189	3.85	4097	3.43	4005	3.01
	-15	4587	4.44	4480	4.01	4373	3.57	4266	3.14
	-10	4894	4.60	4771	4.15	4649	3.71	4526	3.26
	-7	5077	4.68	4946	4.23	4814	3.78	4683	3.33
	-2	5384	4.82	5237	4.37	5090	3.91	4943	3.45
	2	5629	4.93	5470	4.47	5311	4.00	5152	3.54
	7	5935	5.05	5761	4.59	5586	4.12	5412	3.65
	12	6241	5.17	6052	4.70	5862	4.23	5673	3.76
	15	6425	5.24	6226	4.77	6028	4.29	5829	3.82
	20	6731	5.35	6517	4.87	6303	4.40	6089	3.92
	25	7037	5.46	6808	4.98	6579	4.50	6350	4.02
	30	7344	5.55	7099	5.07	6855	4.59	6610	4.11
	35	7650	5.65	7390	5.17	7130	4.68	6871	4.20
	43	8140	5.79	7856	5.31	7572	4.82	7288	4.34
Min.	-28	1916	5.00	1863	4.40	1810	3.79	1758	3.18
	-25	2014	5.13	1958	4.51	1902	3.89	1846	3.27
	-20	2178	5.32	2116	4.68	2055	4.05	1993	3.42
	-15	2341	5.49	2274	4.85	2208	4.20	2141	3.55
	-10	2505	5.66	2433	5.00	2360	4.34	2288	3.67
	-7	2603	5.75	2527	5.08	2452	4.41	2377	3.75
	-2	2766	5.90	2686	5.22	2605	4.54	2524	3.86
	2	2897	6.00	2812	5.32	2727	4.63	2642	3.94
	7	3061	6.13	2970	5.44	2880	4.74	2789	4.05
	12	3224	6.25	3128	5.55	3032	4.85	2936	4.14
	15	3323	6.32	3223	5.61	3124	4.91	3025	4.20
	20	3486	6.43	3381	5.72	3277	5.00	3172	4.29
	25	3650	6.53	3540	5.81	3430	5.09	3320	4.37
	30	3813	6.63	3698	5.90	3582	5.18	3467	4.45
	35	3977	6.72	3856	5.99	3735	5.26	3614	4.52
	43	4239	6.85	4109	6.12	3980	5.38	3850	4.64

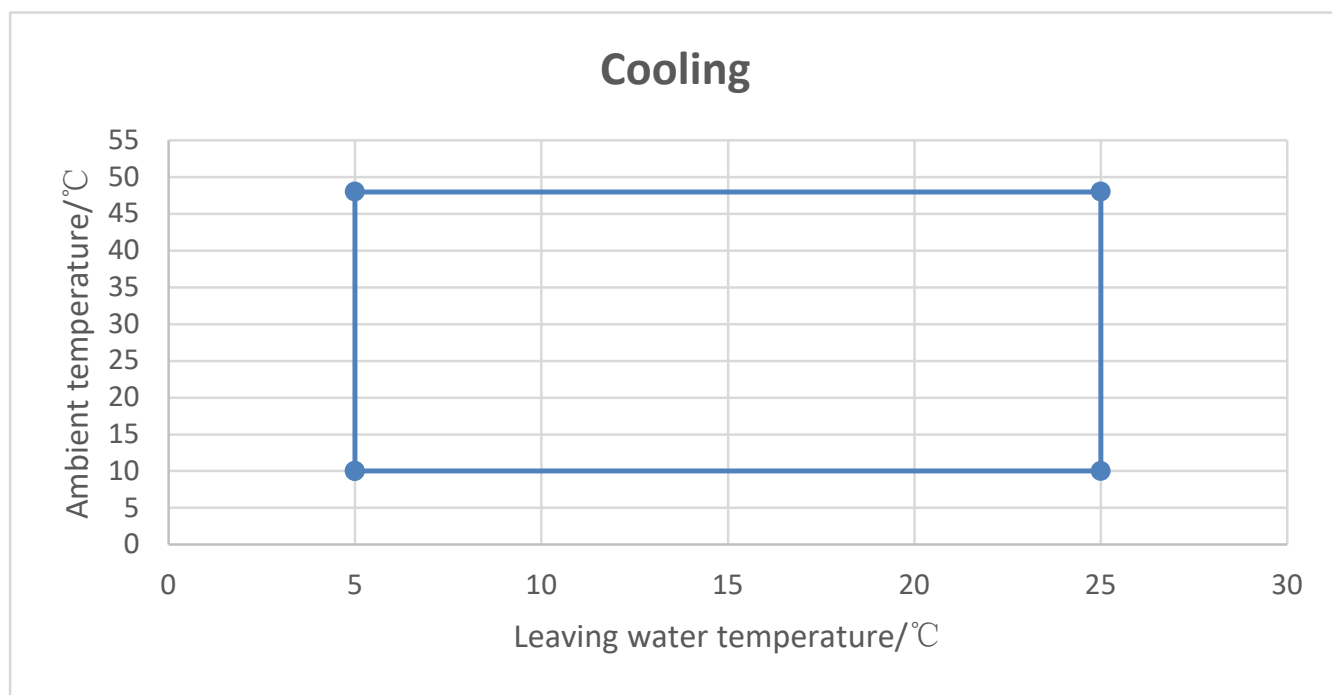
AW102/AW10N											
Water Out(°C)		60		65		70		75		80	
Ambient Temperature(°C)		Capacity	COP	Capacity	COP	Capacity	COP	Capacity	COP	Capacity	COP
Max.	-28	—	—	—	—	—	—	—	—	—	—
	-25	6766	2.15	—	—	—	—	—	—	—	—
	-20	7178	2.24	6308	1.94	—	—	—	—	—	—
	-15	7591	2.32	6681	2.01	5771	1.72	—	—	—	—
	-10	8003	2.40	7053	2.08	6103	1.78	5153	1.48	—	—
	-7	8250	2.44	7276	2.12	6302	1.81	5328	1.51	4354	1.22
	-2	8663	2.52	7649	2.19	6635	1.87	5621	1.56	4606	1.26
	2	8993	2.57	7947	2.24	6900	1.91	5854	1.60	4808	1.29
	7	9405	2.64	8319	2.30	7233	1.97	6146	1.65	5060	1.33
	12	9818	2.71	8691	2.36	7565	2.02	6439	1.69	5312	1.37
	15	10065	2.75	8915	2.39	7764	2.05	6614	1.72	5463	1.40
	20	10478	2.81	9287	2.45	8097	2.10	6906	1.76	5716	1.43
	25	10890	2.87	9660	2.50	8429	2.14	7198	1.80	—	—
	30	11303	2.93	10032	2.55	8761	2.19	—	—	—	—
	35	—	—	—	—	—	—	—	—	—	—
	43	—	—	—	—	—	—	—	—	—	—
Nom.	-28	—	—	—	—	—	—	—	—	—	—
	-25	6258	2.12	—	—	—	—	—	—	—	—
	-20	6674	2.23	5856	1.95	—	—	—	—	—	—
	-15	7091	2.35	6225	2.04	5358	1.74	—	—	—	—
	-10	7508	2.46	6594	2.13	5680	1.82	4766	1.51	—	—
	-7	7758	2.52	6815	2.19	5873	1.87	4930	1.55	3988	1.24
	-2	8174	2.63	7184	2.28	6194	1.94	5204	1.61	4214	1.29
	2	8508	2.71	7479	2.35	6451	2.00	5423	1.66	4395	1.33
	7	8924	2.81	7848	2.43	6773	2.07	5697	1.71	4621	1.37
	12	9247	2.86	8147	2.48	7047	2.11	5947	1.76	4847	1.41
	15	9441	2.88	8327	2.51	7212	2.14	6098	1.79	4983	1.44
	20	9764	2.92	8625	2.55	7487	2.18	6348	1.83	5209	1.48
	25	10087	2.97	8924	2.59	7761	2.23	6598	1.87	—	—
	30	10410	3.00	9223	2.63	8036	2.27	—	—	—	—
	35	—	—	—	—	—	—	—	—	—	—
	43	—	—	—	—	—	—	—	—	—	—

AW102/AW10N											
Water Out(°C)		60		65		70		75		80	
Ambient Temperature(°C)		Capacity	COP	Capacity	COP	Capacity	COP	Capacity	COP	Capacity	COP
Mid.	-28	—	—	—	—	—	—	—	—	—	—
	-25	3322	2.67	—	—	—	—	—	—	—	—
	-20	3557	2.80	3108	2.58	—	—	—	—	—	—
	-15	3792	2.93	3317	2.70	2843	2.44	—	—	—	—
	-10	4027	3.05	3527	2.81	3027	2.54	2527	2.25	—	—
	-7	4168	3.11	3653	2.87	3138	2.60	2623	2.30	2108	1.96
	-2	4403	3.23	3862	2.98	3322	2.70	2781	2.39	2241	2.04
	2	4591	3.31	4030	3.06	3469	2.77	2908	2.46	2347	2.11
	7	4826	3.42	4239	3.15	3653	2.86	3066	2.54	2480	2.18
	12	5061	3.52	4449	3.25	3837	2.95	3225	2.62	2613	2.25
	15	5202	3.57	4574	3.30	3947	3.00	3320	2.67	2693	2.29
	20	5437	3.67	4784	3.39	4131	3.08	3478	2.74	2826	2.36
	25	5672	3.76	4993	3.47	4315	3.16	3637	2.81	—	—
	30	5907	3.85	5203	3.56	4499	3.24	—	—	—	—
	35	—	—	—	—	—	—	—	—	—	—
	43	—	—	—	—	—	—	—	—	—	—
Min.	-28	—	—	—	—	—	—	—	—	—	—
	-25	1642	3.09	—	—	—	—	—	—	—	—
	-20	1772	3.23	1551	3.02	—	—	—	—	—	—
	-15	1902	3.36	1664	3.13	1425	2.88	—	—	—	—
	-10	2032	3.47	1776	3.24	1521	2.98	1265	2.68	—	—
	-7	2110	3.54	1844	3.31	1578	3.04	1311	2.73	1045	2.36
	-2	2240	3.65	1957	3.41	1673	3.13	1389	2.81	1106	2.43
	2	2344	3.73	2047	3.48	1749	3.20	1452	2.87	1154	2.49
	7	2474	3.83	2159	3.57	1844	3.28	1529	2.95	1214	2.55
	12	2604	3.92	2272	3.66	1940	3.36	1607	3.02	1275	2.61
	15	2682	3.97	2339	3.71	1997	3.41	1654	3.06	1311	2.64
	20	2812	4.05	2452	3.79	2092	3.48	1732	3.12	1372	2.70
	25	2942	4.13	2565	3.86	2187	3.55	1810	3.18	—	—
	30	3072	4.21	2677	3.93	2282	3.61	—	—	—	—
	35	—	—	—	—	—	—	—	—	—	—
	43	—	—	—	—	—	—	—	—	—	—

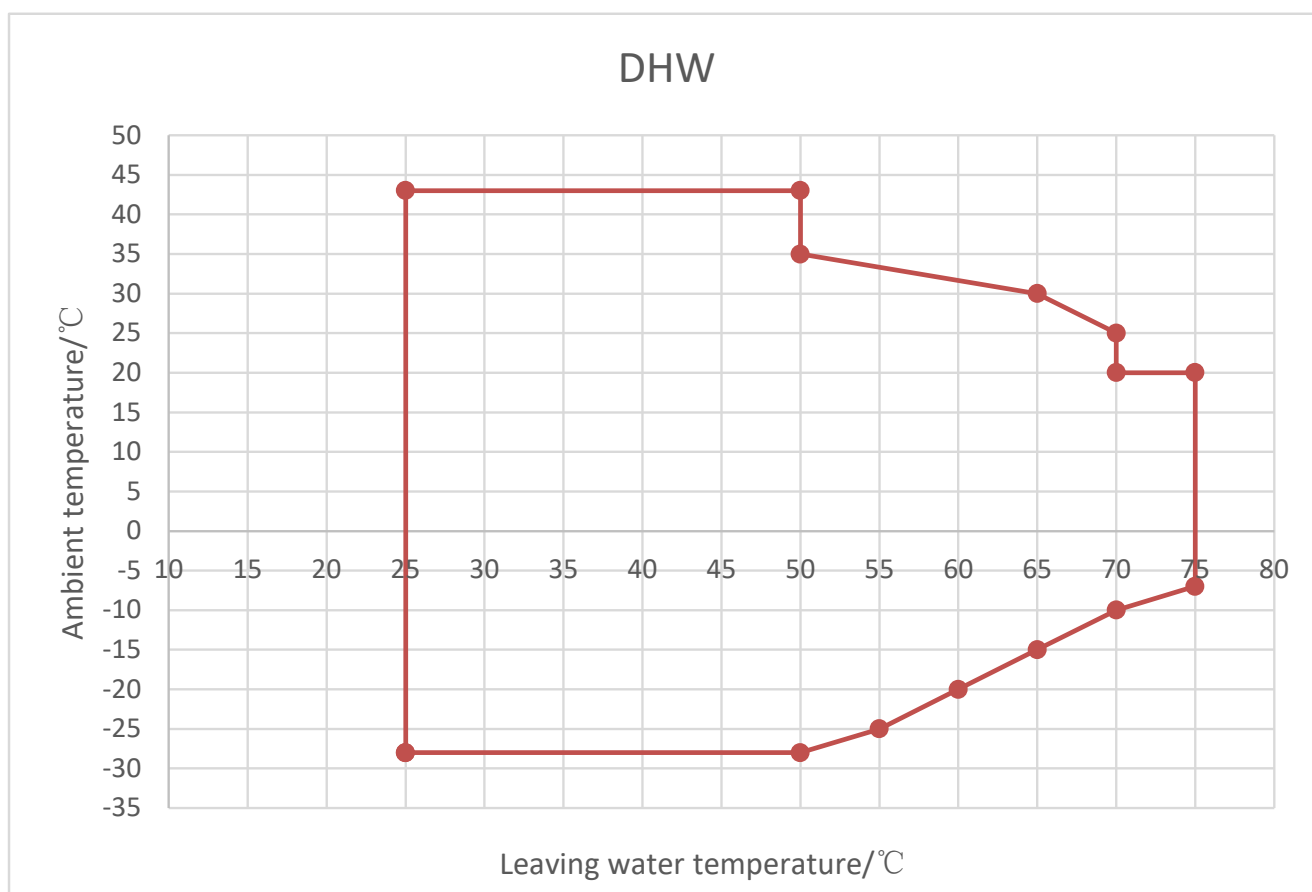
11. Operation Limits Delivery-Leaving



Heating	
Leaving water temperature	Ambient temperature
20	-28
20	35
55	35
70	30
75	25
75	20
80	20
80	-7
75	-10
70	-15
65	-20
60	-25
55	-28
20	-28

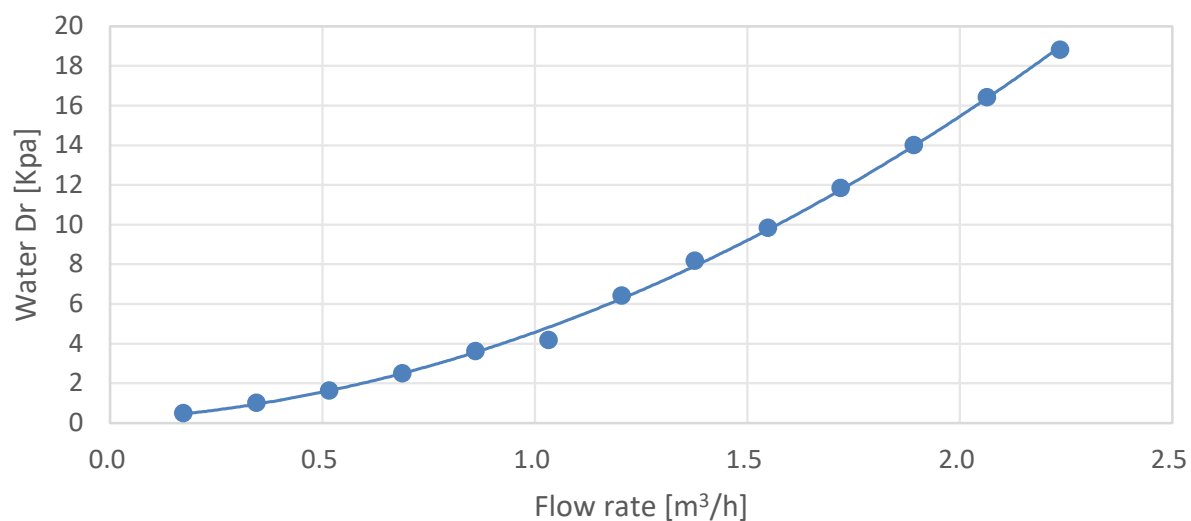


Cooling	
Leaving water temperature	Ambient temperature
5	10
5	48
25	48
25	10
5	10

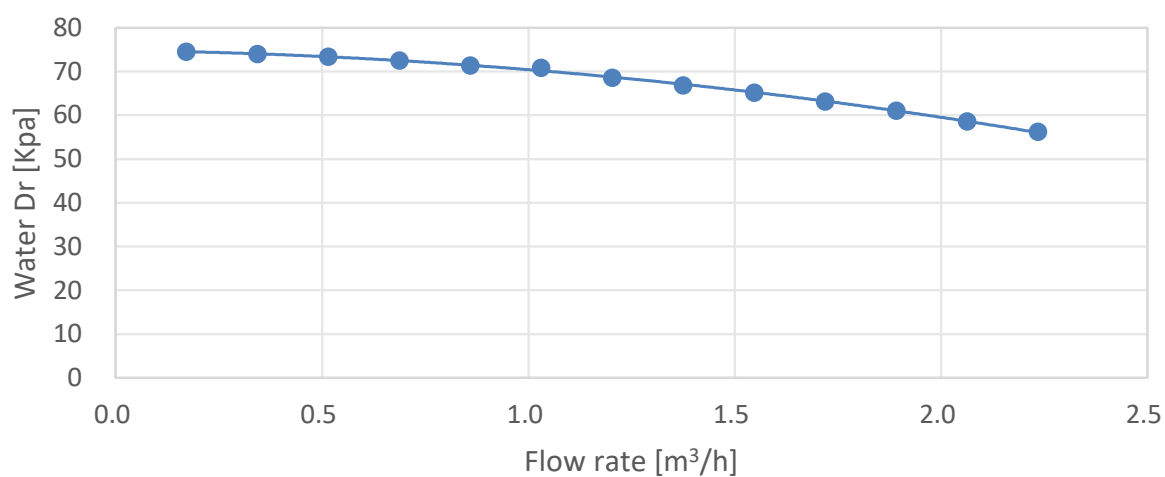


Heating	
Leaving water temperature	Ambient temperature
25	-28
25	43
50	43
50	35
65	30
70	25
70	20
75	20
75	-7
70	-10
65	-15
60	-20
55	-25
50	-28
25	-28

AW102MUGHA/AW10NMUGHA Water Pressure Drop

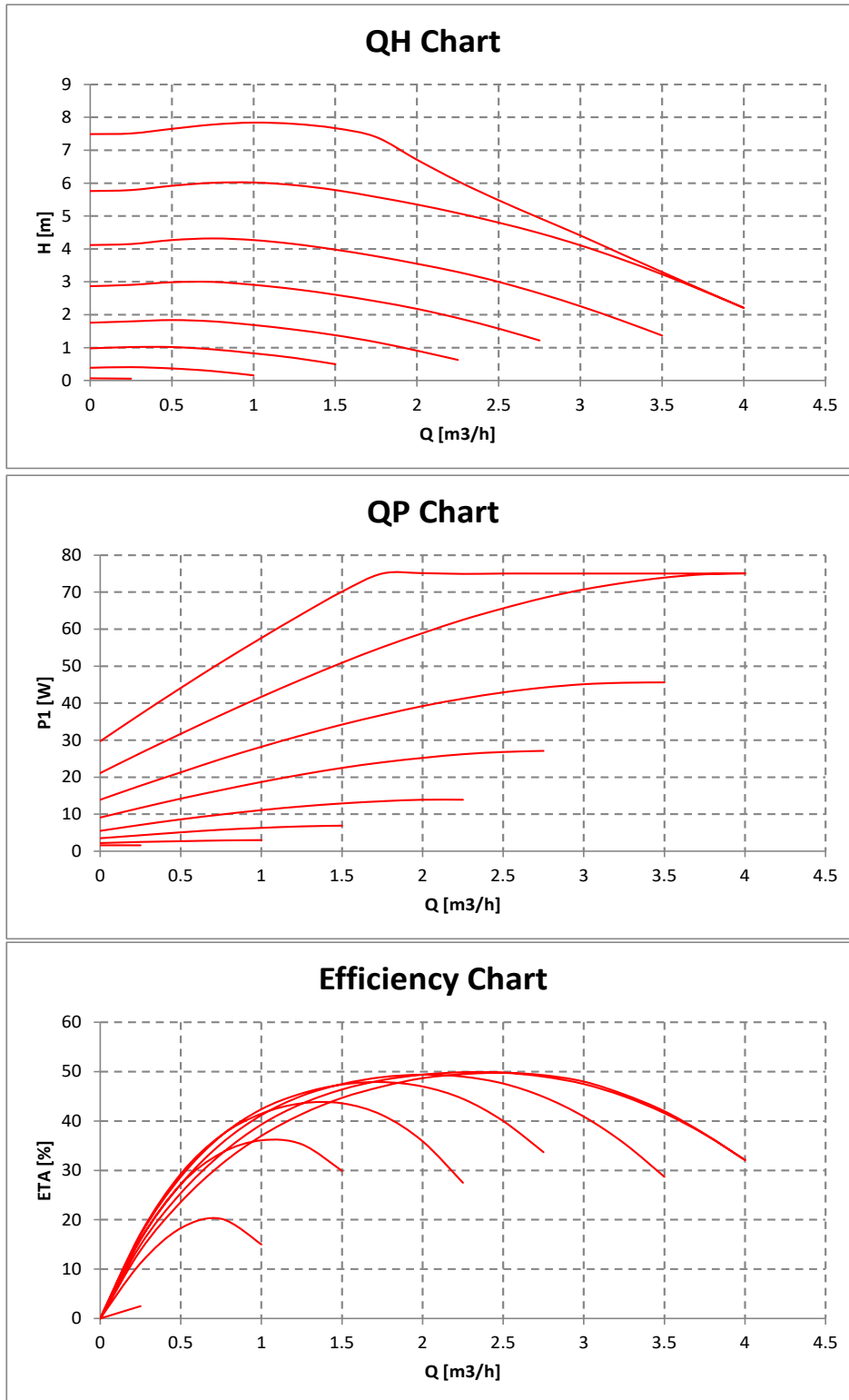


**AW102MUGHA/AW10NMUGHA
Water Pressure External Residual Pressure**



13. Water Pump Characteristic Curve

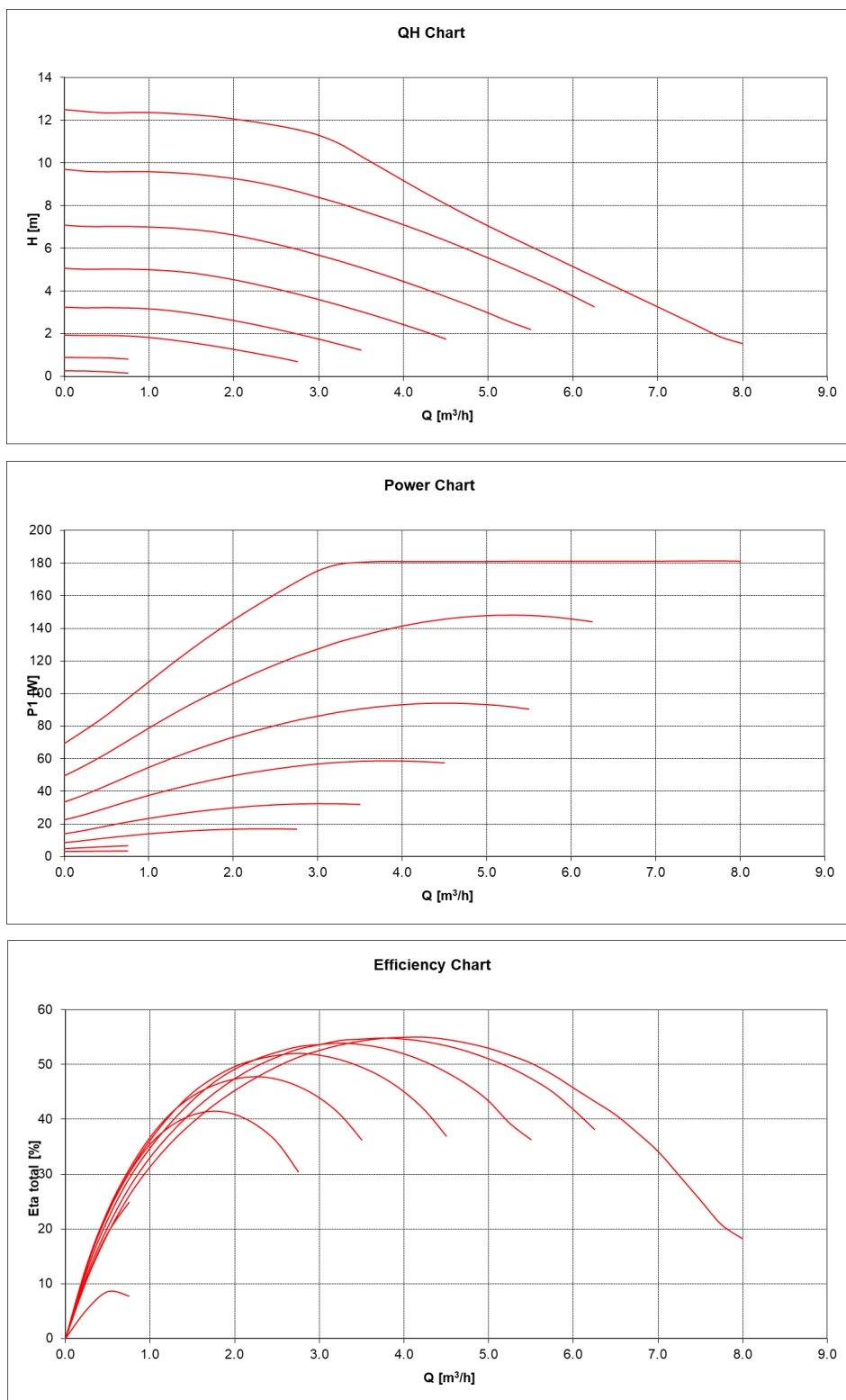
Performance Curve



The Performance of PWM was measured under 8 PWM value (heating). 5 % (max.), 20 %, 31 %, 41 %, 52 %, 62 %, 73 %, 88 % (min.).

According to ISO 9906, system 2.0 bar, water temperature 20 °C

Performance Curve



The Performance of PWM was measured under 8 PWM value (heating). 5 % (max.), 20 %, 31 %, 41 %, 52 %, 62 %, 73 %, 88 % (min.).

According to ISO 9906, system 2.0 bar, water temperature 20°C

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