

ECOFLEX MINI VRF HIGH WALL INDOOR UNIT TECHNICAL SELECTION DATA



Model Numbers

MHW-015CS	MHW-045CS
MHW-022CS	MHW-056CS
MHW-028CS	MHW-071CS
MHW-035CS	MHW-080CS

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TECHNICAL SELECTION DATA

ECOFLEX - Mini VRF

01.Specification

Model		MHW-015CS	MHW-022CS	MHW-028CS	MHW-035CS	
Power supply		1-phase, 230V, 50Hz				
Cooling ¹	Capacity	kW	1.5	2.2	2.8	3.6
		kBtu/h	5.1	7.5	9.6	12.3
	Power Input	W	18	21	24	27
Heating ²	Capacity	kW	1.7	2.4	3.2	4.0
		kBtu/h	5.8	8.2	10.9	13.7
	Power Input	W	18	21	24	18
Fan motor	Model	ZKSN-20-8-5L	ZKSN-20-8-5L	ZKSN-20-8-5L	ZKSN-20-8-5L	
	Type	DC				
Indoor Coil	Number of rows		1	1	2&3	2&3
	Fin spacing	mm	1.3	1.3	1.33	1.33
	Fin Type		Hydrophilic aluminum			
	Tube OD and type	mm	Ø7 Inner-groove		Ø5 Inner-groove	
	Dimensions (L×H×W)	mm	530×170×95			
	Number of circuits		2	2	6	6
Air flow rate ³ (OPa) (Max / Min) ⁷		l/s	128 / 94	139 / 94	150 / 94	161 / 94
Sound pressure level ⁴ (OPa) (Max / Min) ⁷		dB(A)	32 / 27	33 / 27	35 / 28	37 / 28
Unit	Net dimensions ⁶ (W×H×D)	mm	750×295×265			
	Packed dimensions (W×H×D)	mm	875×385×360			
	Net/Gross weight	kg	9/11		10/12	
Refrigerant type		R-32				
Throttle	Type	Electronic expansion valve				
Design pressure (H/L)		MPa	4.4/2.6			
Pipe connections	Liquid/Gas pipe	Ø 6.35 mm / Ø 12.7 mm (1/4" / 1/2")				
	Drain pipe	mm	OD Ø 16			

Notes:

- Indoor temperature 27°C DB, 19°C WB; outdoor temperature 35°C DB; equivalent refrigerant piping length 5m with zero level difference.
- Indoor temperature 20°C DB; outdoor temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference.
- Air flow rates are from the highest speed to the lowest speed, total 7 rates for each model.
- Sound pressure level is from highest level to lowest level, total 7 levels for each model. Sound pressure level is measured 1.4m below the unit in a Sem-anechoic chamber.
- Sound power level is from highest level to lowest level, total 7 levels for each model.
- Unit body dimensions given are the largest external dimensions of the unit, including hanger attachments.
- Refer to the section Sound Levels for more details.

TECHNICAL SELECTION DATA

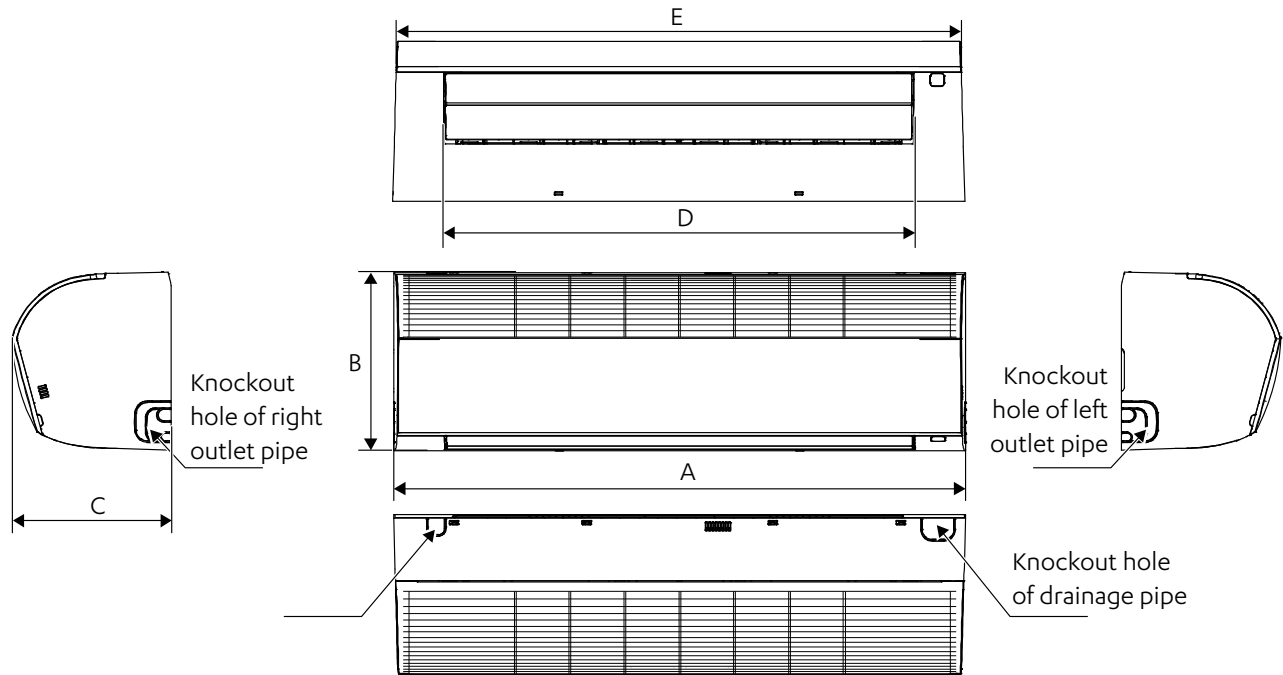
ECOFLEX - Mini VRF

Model		MHW-045CS	MHW-056CS	MHW-071CS	MHW-080CS	
Power supply		1-phase, 230V, 50Hz				
Cooling ¹	Capacity	kW	4.5	5.6	7.1	8.0
		kBtu/h	15.4	19.1	24.2	27.3
	Power Input	W	30	40	50	65
Heating ²	Capacity	kW	5.0	6.3	8.0	9.0
		kBtu/h	17.1	21.5	27.3	30.7
	Power Input	W	25	35	50	65
Fan motor	Model	ZKSN-20-8-5L	ZKSN-20-8-5L	ZKSN-50-8-17L	ZKSN-50-8-17L	
	Type	DC				
Indoor Coil	Number of rows		2&3	2&3	2&3	2&3
	Fin spacing	mm	1.33	1.33	1.33	1.33
	Fin Type		Hydrophilic aluminum			
	Tube OD and type	mm	Ø5 Inner-groove			
	Dimensions (L×H×W)	mm	530×170×95		980×170×95	
	Number of circuits		6	6	8	8
Air flow rate ³ (OPa) (Max / Min) ⁷		l/s	200 / 114	239 / 114	339 / 183	383 / 183
Sound pressure level ⁴ (OPa) (Max / Min) ⁷		dB(A)	37 / 29	41 / 29	58 / 46	60 / 46
Unit	Net dimensions ⁶ (W×H×D)	mm	950×295×265		1200×295×265	
	Packed dimensions (W×H×D)	mm	1075×385×360		1315×385×360	
	Net/Gross weight	kg	11.5/14		15/18	
Refrigerant type		R-32				
Throttle	Type	Electronic expansion valve				
Design pressure (H/L)		MPa				4.4/2.6
Pipe connections	Liquid/Gas pipe	Ø 6.35 mm / Ø 12.7 mm (1/4" / 1/2")		Ø 9.52 mm / Ø 15.9 mm (3/8" / 5/8")		
	Drain pipe	mm	OD Ø16			
Notes:						
1. Indoor temperature 27°C DB, 19°C WB; outdoor temperature 35°C DB; equivalent refrigerant piping length 5m with zero level difference.						
2. Indoor temperature 20°C DB; outdoor temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference.						
3. Air flow rates are from the highest speed to the lowest speed, total 7 rates for each model.						
4. Sound pressure level is from highest level to lowest level, total 7 levels for each model. Sound pressure level is measured 1.4m below the unit in a Sem-anechoic chamber.						
5. Sound power level is from highest level to lowest level, total 7 levels for each model.						
6. Unit body dimensions given are the largest external dimensions of the unit, including hanger attachments.						
7. Refer to the section Sound Levels for more details.						

02. Dimensions

02.01. Unit Dimensions

Figure 2.1: High Wall dimensions (unit: mm)



Model(kW)	A	B	C	D	E
1.5~3.6	750	295	265	581	736
4.5~5.6	950	295	265	781	936
7.1~8.0	1200	295	265	1025	1186

03. Unit Placement

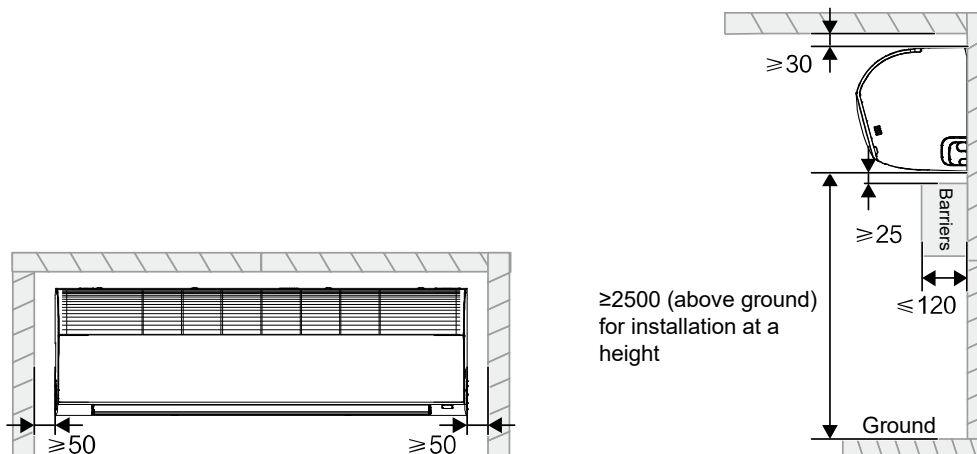
03.01. Placement Considerations

Unit placement should take account of the following considerations:

- Units should not be installed in the following locations:
 - A place filled with mineral oil, fumes or mist, like a kitchen.
 - A place where there are corrosive gases, such as acid or alkaline gases..
 - A place exposed to combustible gases and using volatile combustible gases such as diluent or gasoline.
 - A place where there is equipment emitting electromagnetic radiation.
 - A place where there is a high salt content in the air e.g. coastal environment.
 - Do not use the air conditioner in an environment where an explosion may occur.
 - Places like in vehicles or cabin rooms.
 - Factories with major voltage fluctuations in the power supplies.
 - Other special environmental conditions.
- Units should be installed in positions where:
 - Ensure that the airflow in and out of the IDU is reasonably organized to form an air circulation in the room.
 - Ensure IDU maintenance space.
 - The nearer the drainage pipe and copper pipe are to the ODU, the lower the pipe cost is.
 - Prevent the air conditioner from blowing directly to the human body.
 - The closer the wiring to the power cabinet, the lower the wiring cost is.
 - Keep the air-conditioning return air away from the setting sun of the room.
 - Be careful not to interfere with the light tank, fire pipe, gas pipe and other facilities.
 - The IDU should not be lifted in the places like load-bearing beam and columns that affect the structural safety of the house.
 - The wired controller and the IDU should be in the same installation space; otherwise, the sampling point setting of the wired controller need to be changed.

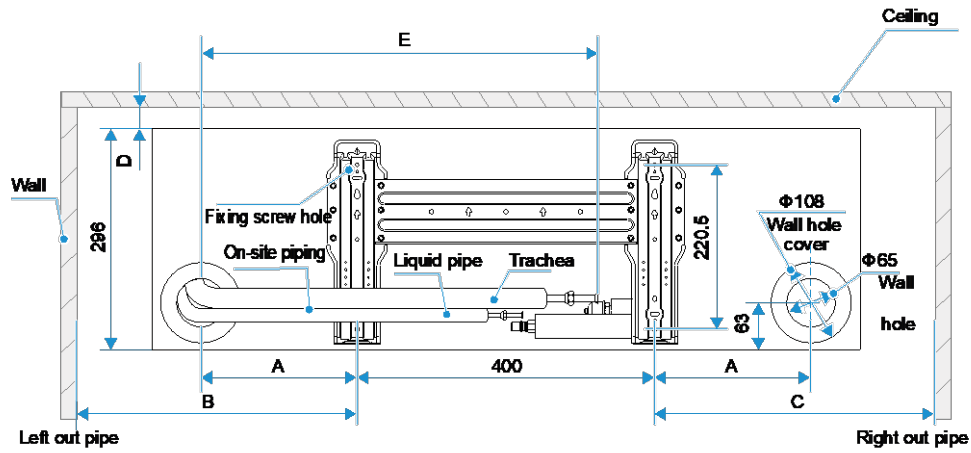
03.02. Space Requirements

Figure 3.1: High Wall space requirements (unit: mm)



Notes:

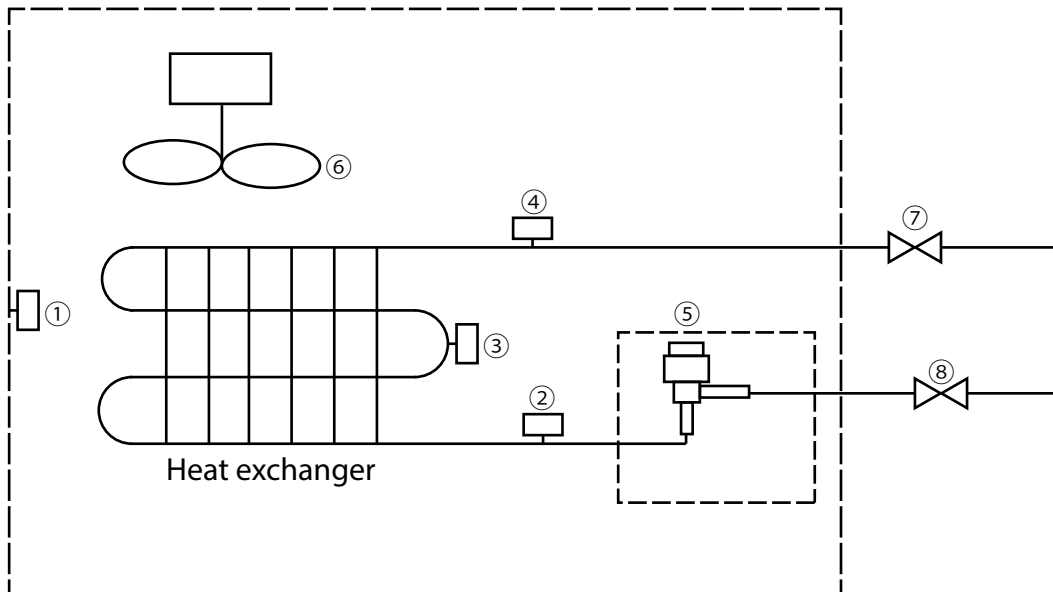
1. The centerline of the maintenance hole should be in the same position as the centerline of the indoor unit.



Model (kW)	Distance (mm)					Reserved lengths for power and signal cables	
	A	B	C	D	E	Left out pipe	Right out pipe
1.5~3.6	100	≥225	≥225	≥30	230	≥1115	≥415
4.5~5.6	180	≥325	≥325	≥30	412	≥1315	≥415
7.1~8.0	220	≥375	≥375	≥30	400	≥1565	≥415

04. Piping Diagram

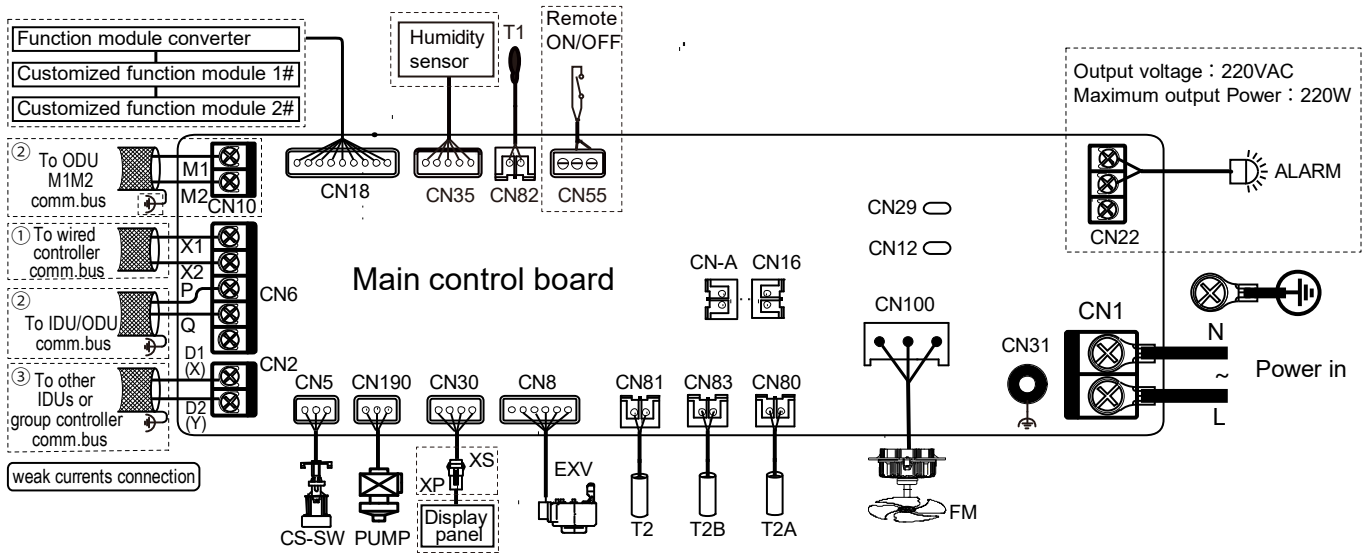
Figure 4.1: High Wall piping diagram



Legend		
①	T1	Inlet Air Temp. Sensor
②	T2A	Liquid Pipe Temp. Sensor
③	T2	Middle Pipe Temp. Sensor
④	T2B	Gas Pipe Temp. Sensor
⑤	EXV	Electronic expansion valve
⑥	FM	Fan motor
⑦	-	Gas side
⑧	-	Liquid side

05. Wiring Diagram

Figure 5.1: High Wall wiring diagram



Installation Notes

CAUTION

- All installation, servicing and maintenance must be carried out by competent and suitably qualified, certified and accredited professionals and in accordance with all applicable legislation.
- Units should be grounded in accordance with all applicable legislation. Metal and other conductive components should be insulated in accordance with all applicable legislation.
- Power supply wiring should be securely fastened at the power supply terminals – loose power supply wiring would represent a fire risk.
- After installation, servicing or maintenance, the electric control box cover should be closed. Failing to close the electric control box cover risks fire or electric shock.

06.Capacity Tables

06.01. Cooling Capacity Table

Table 6.01: High Wall cooling capacity

Model	Indoor air temperature (°C WB/DB)													
	14/20		16/23		18/26		19/27		20/28		22/30		24/32	
	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC
MHW-015CS	1.4	1.3	1.5	1.3	1.5	1.2	1.5	1.1	1.6	1.1	1.6	1.0	1.6	0.9
MHW-022CS	2.0	1.9	2.1	1.8	2.2	1.8	2.2	1.7	2.3	1.6	2.3	1.5	2.4	1.4
MHW-028CS	2.5	2.2	2.7	2.3	2.8	2.2	2.8	2.1	2.9	2.0	2.9	1.8	3.0	1.7
MHW-035CS	3.2	2.9	3.4	2.9	3.6	2.8	3.6	2.7	3.7	2.6	3.8	2.4	3.9	2.2
MHW-045CS	4.0	3.7	4.3	3.6	4.5	3.5	4.5	3.3	4.6	3.2	4.7	2.9	4.8	2.7
MHW-056CS	5.0	4.6	5.3	4.6	5.6	4.5	5.6	4.2	5.7	4.0	5.8	3.7	6.0	3.4
MHW-071CS	6.3	5.8	6.7	5.7	7.0	5.6	7.1	5.3	7.2	5.1	7.4	4.6	7.6	4.3
MHW-080CS	7.1	6.5	7.6	6.5	7.9	6.3	8.0	6.0	8.1	5.7	8.3	5.2	8.5	4.8

Abbreviations:

TC: Total capacity (kW)

SC: Sensible capacity(kW)

Notes:

Shaded cells indicate rated conditions.

06.02. Heating Capacity Table

Table 6.02: High Wall heating capacity

Model	Indoor air temperature (°C DB)					
	16	18	20	21	22	24
	TC	TC	TC	TC	TC	TC
MHW-015CS	1.8	1.8	1.7	1.6	1.6	1.5
MHW-022CS	2.6	2.6	2.4	2.3	2.3	2.1
MHW-028CS	3.4	3.4	3.2	3.1	3.0	2.8
MHW-035CS	4.2	4.2	4.0	3.8	3.8	3.5
MHW-045CS	5.3	5.3	5.0	4.8	4.7	4.4
MHW-056CS	6.7	6.6	6.3	6.1	5.9	5.5
MHW-071CS	8.0	8.5	8.4	8.0	7.8	7.5
MHW-080CS	9.0	9.5	9.5	9.0	8.7	8.5

Abbreviations:

TC: Total capacity (kW)

Notes:

Shaded cells indicate rated conditions.

07. Electrical Characteristics

Table 7.1: High Wall electrical characteristics

Model	Power Supply						Indoor Fan Motors	
	Hz	Rated Volts	Min. volts	Max. volts	MCA	MFA	Rated motor output (kW)	FLA
MHW-015CS	50	230	206.8	254.4	0.28	15	18	0.22
MHW-022CS	50	230	206.8	254.4	0.29	15	21	0.23
MHW-028CS	50	230	206.8	254.4	0.36	15	24	0.29
MHW-035CS	50	230	206.8	254.4	0.39	15	27	0.31
MHW-045CS	50	230	206.8	254.4	0.41	15	30	0.33
MHW-056CS	50	230	206.8	254.4	0.51	15	40	0.33
MHW-071CS	50	230	206.8	254.4	0.69	15	50	0.55
MHW-080CS	50	230	206.8	254.4	0.98	15	65	0.78

Abbreviations:

MCA: Minimum Circuit Amps

MFA: Maximum Fuse Amps

FLA: Full Load Amps

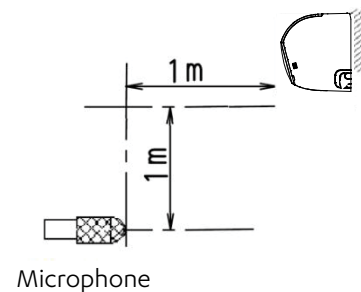
08. Sound Levels

08.01. Overall

Table 8.1.1: High Wall sound pressure levels¹

Model	Sound pressure levels dB						
	SSH	SH	H	M	L	SL	SSL
MHW-015CS	32.0	31.0	30.0	30.0	29.0	28.0	27.0
MHW-022CS	33.0	32.0	31.0	30.0	29.0	28.0	27.0
MHW-028CS	35.0	34.0	33.0	32.0	31.0	30.0	28.0
MHW-035CS	37.0	36.0	34.0	33.0	31.0	30.0	28.0
MHW-045CS	37.0	35.0	33.0	32.0	31.0	30.0	29.0
MHW-056CS	41	39	37	35	33	31	29
MHW-071CS	58	56	54	52	50	48	46
MHW-080CS	60	57	55	53	50	48	46

Figure 8.1.1: High Wall sound pressure level measurement



Notes:

- (1) Sound pressure levels are measured 1.4m below the unit in a semi-anechoic chamber at 0 Pa static pressure. During in-situ operation, sound pressure levels may be higher as a result of ambient noise.

Table 8.1.2: High Wall Air flow rate (OPa).

Model	Sound pressure levels dB						
	SSH	SH	H	M	L	SL	SSL
MHW-015CS	128	122	117	111	106	100	94
MHW-022CS	139	131	122	114	108	103	94
MHW-028CS	150	142	131	119	111	103	94
MHW-035CS	161	150	139	128	117	106	94
MHW-045CS	200	186	172	156	142	128	114
MHW-056CS	239	217	194	172	153	133	114
MHW-071CS	339	311	286	261	236	208	183
MHW-080CS	383	350	317	283	250	217	183

08.02. Octave Band Levels

Figure 8.2.1: MHW-015CS octave band levels

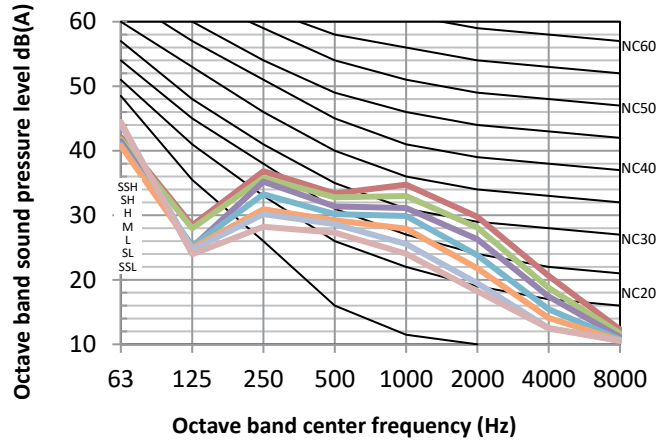


Figure 8.2.2: MHW-022CS octave band levels

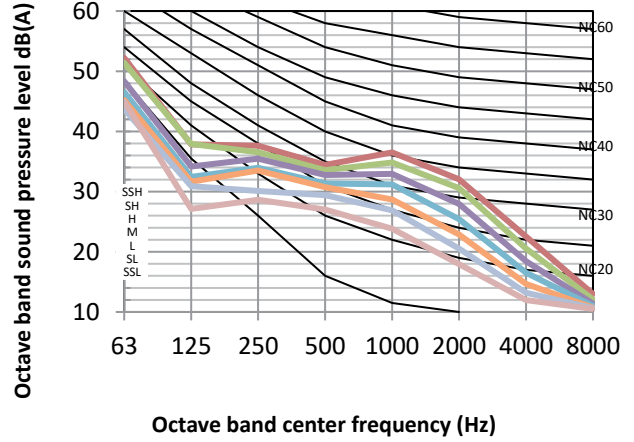


Figure 8.2.3: MHW-028CS octave band levels

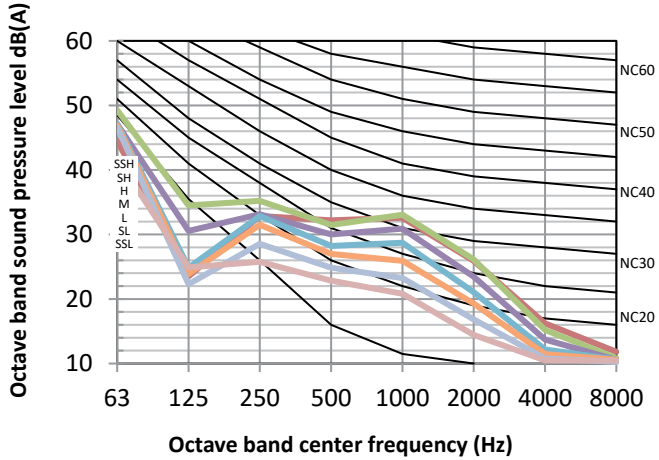


Figure 8.2.4: MHW-035CS octave band levels

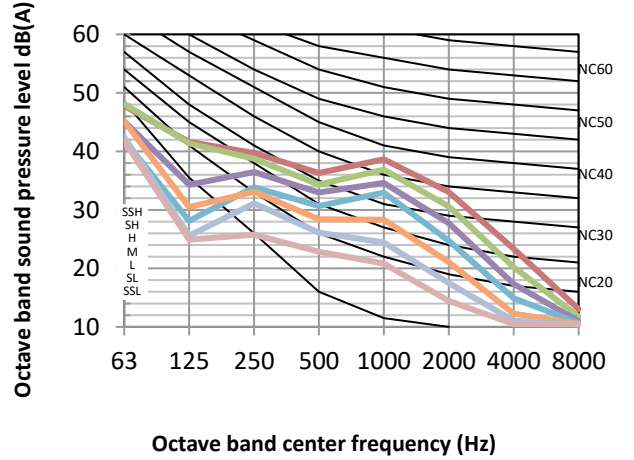


Figure 8.2.5: MHW-045CS octave band levels

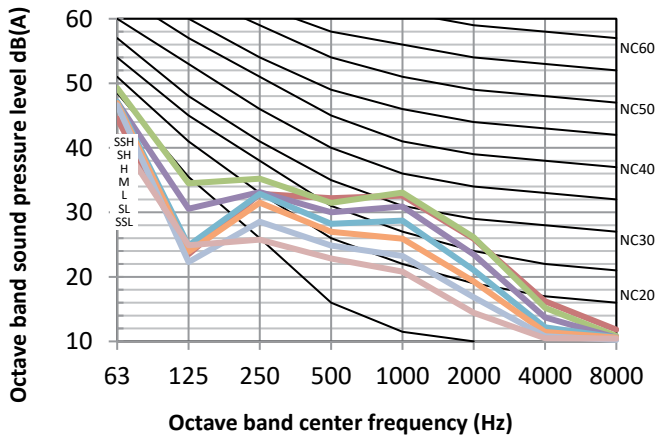


Figure 8.2.6: MHW-056CS octave band levels

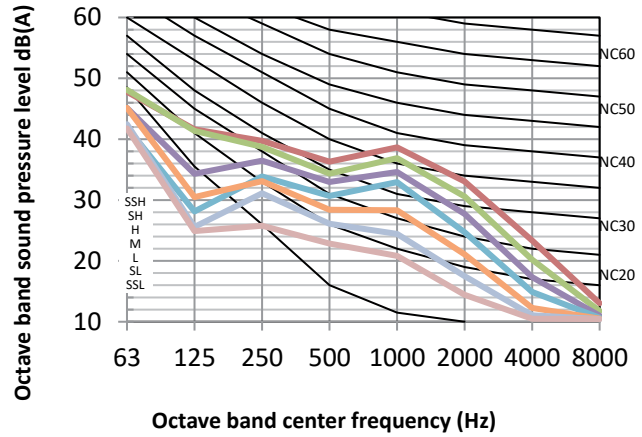


Figure 8.2.7: MHW-071CS octave band levels

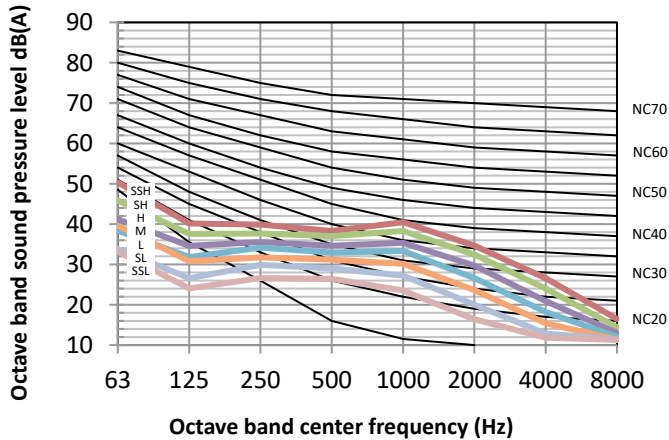
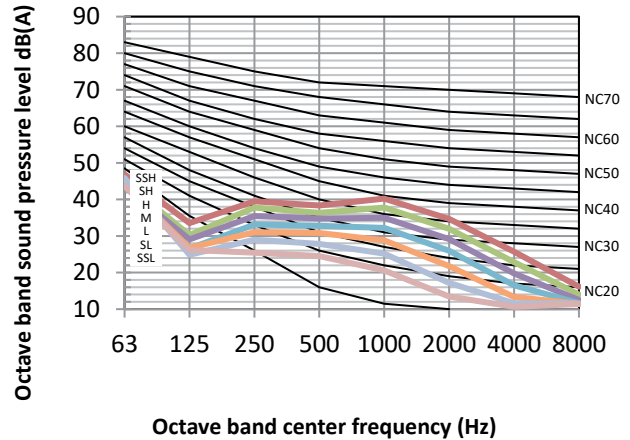


Figure 8.2.8: MHW-080CS octave band levels



09. Temperature and Airflow Distributions

09.01. Simulate condition

Table 9.1: High Wall simulate condition

Models	Room size (m)	Ceiling height (m)	Flow angle (Cooling/Heating)	Placing
MHW-015CS	4×4	2.7	58°/88°	Wall mounted
MHW-022CS	4.5×4.5	2.7	58°/88°	Wall mounted
MHW-028CS	5×5	2.7	58°/88°	Wall mounted
MHW-035CS	5.5×5.5	2.7	58°/88°	Wall mounted
MHW-045CS	6×6	2.7	58°/88°	Wall mounted
MHW-056CS	8×8	2.7	58°/88°	Wall mounted

Note:

These figures are based on software simulation. They show typical temperature and airflow distributions in the conditions above. In the actual installation, they may differ from these figures under the influence of air temperature conditions, ceiling height, cooling/heating load, obstacles, etc.

09.02. Airflow distributions

In the below charts, Y-Axis represents the height in meters (charts shows the installation height at 2.5m) and the X-Axis represents the floor distance in meters. These chart shows the air speed distribution 300s after the machine is turned on. The data in the curves shows air speed in meter per seconds (eg: 0.5 means the air speed in that area is 0.5m/s).

Figure 9.1.1: MHW-015CS cooling at 300S

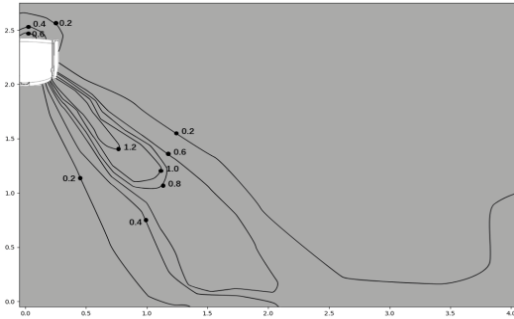


Figure 9.1.2: MHW-015CS heating at 300S

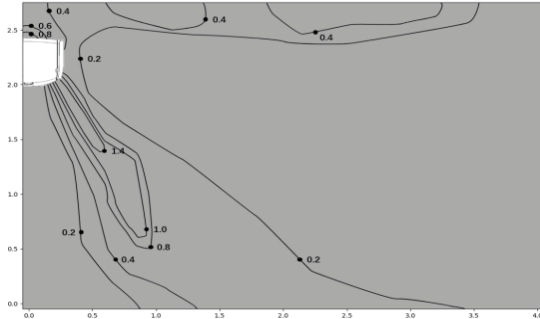


Figure 9.1.3: MHW-022CS cooling at 300S

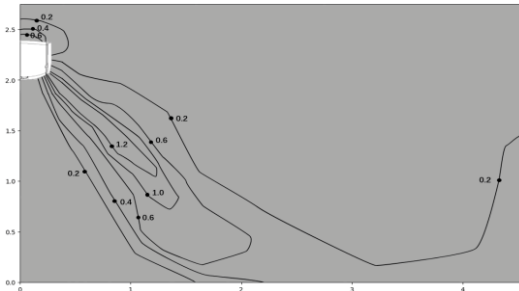


Figure 9.1.4: MHW-022CS heating at 300S

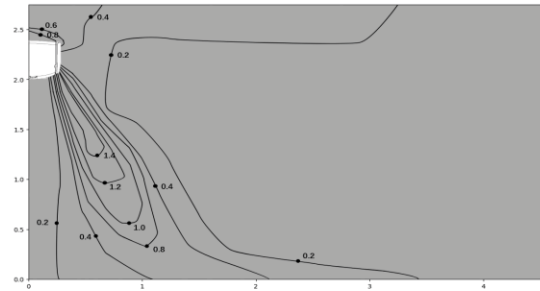


Figure 9.1.5: MHW-028CS cooling at 300S

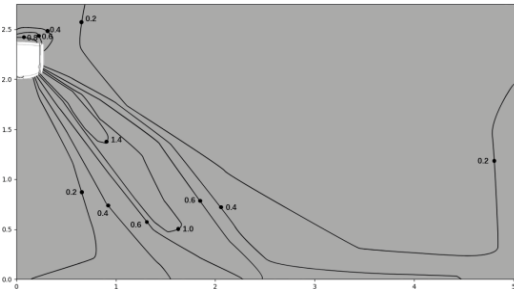


Figure 9.1.6: MHW-028CS heating at 300S

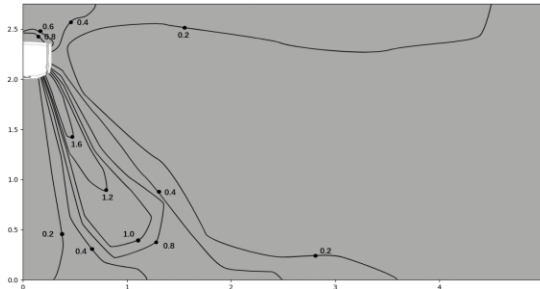


Figure 9.1.7: MHW-035CS cooling at 300S

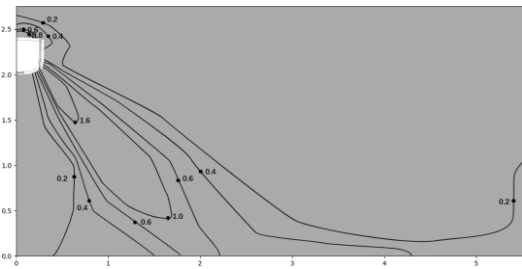


Figure 9.1.8: MHW-035CS heating at 300S

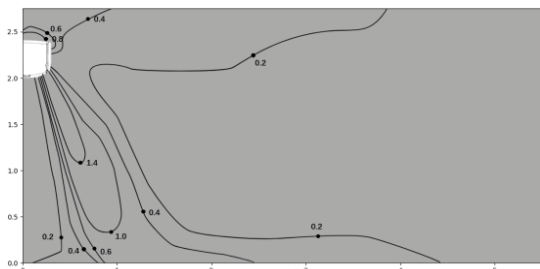


Figure 9.1.9: MHW-045CS cooling at 300S

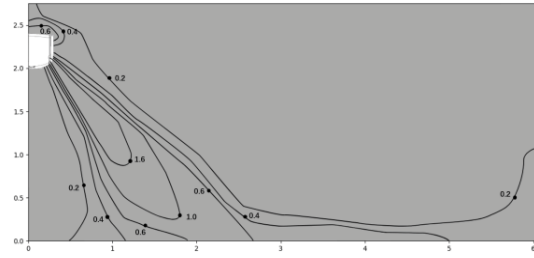


Figure 9.1.10: MHW-045CS heating at 300S

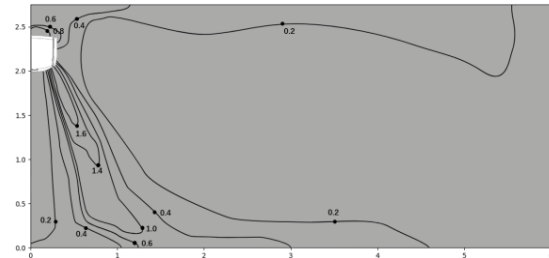


Figure 9.1.11: MHW-056CS cooling at 300S

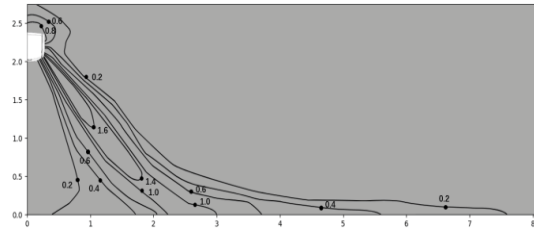


Figure 9.1.12: MHW-056CS heating at 300S

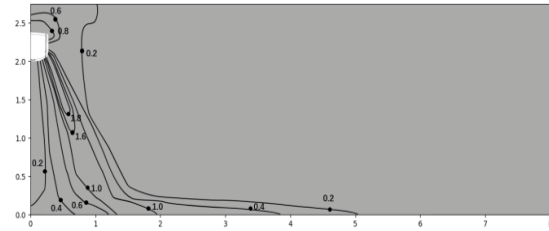


Figure 9.1.13: MHW-071CS cooling at 300S

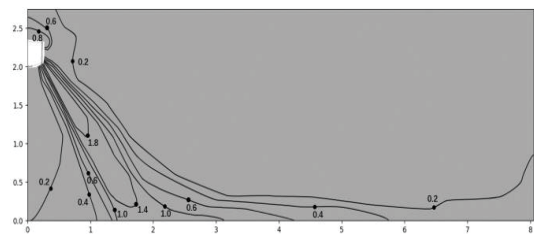


Figure 9.1.14: MHW-071CS heating at 300S

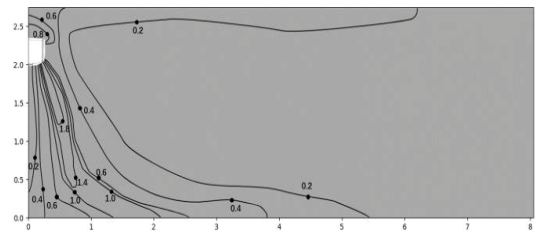


Figure 9.1.15: MHW-080CS cooling at 300S

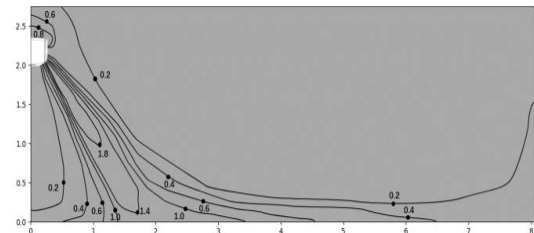
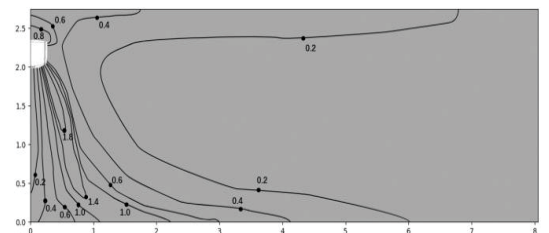


Figure 9.1.16: MHW-080CS heating at 300S



09.03. Temperature distributions

In the below charts, Y-Axis represents the height in meters (charts shows the installation height at 2.5m) and the X-Axis represents the floor distance in meters. These chart shows the air speed distribution 300s after the machine is turned on. The data in the curves shows temperature distribution.

Figure 9.1.13: MHW-015CS cooling at 300S

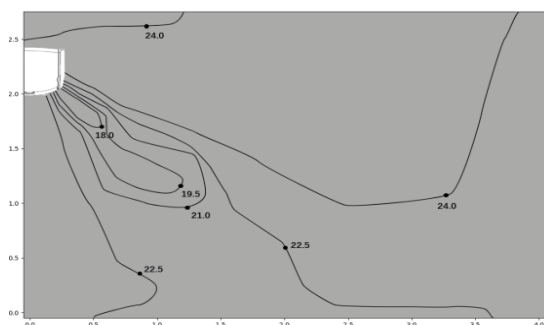


Figure 9.1.14: MHW-015CS heating at 300S

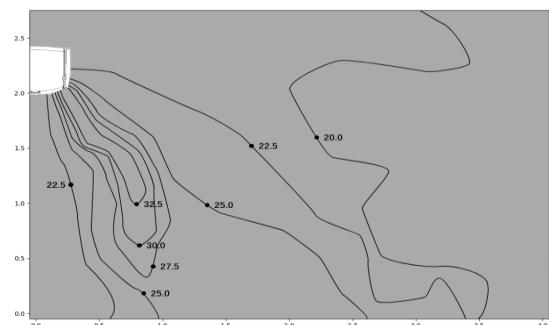


Figure 9.1.15: MHW-022CS cooling at 300S

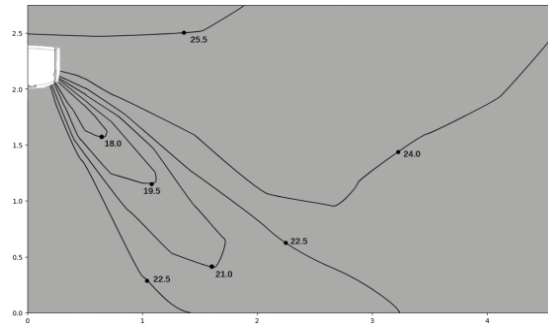


Figure 9.1.16: MHW-022CS heating at 300S

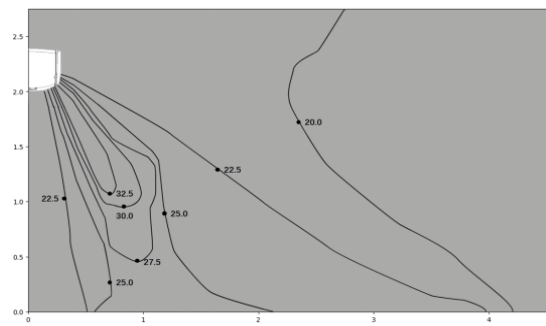


Figure 9.1.17: MHW-028CS cooling at 300S

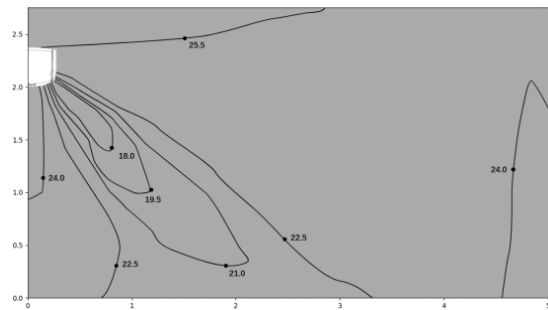


Figure 9.1.18: MHW-028CS heating at 300S

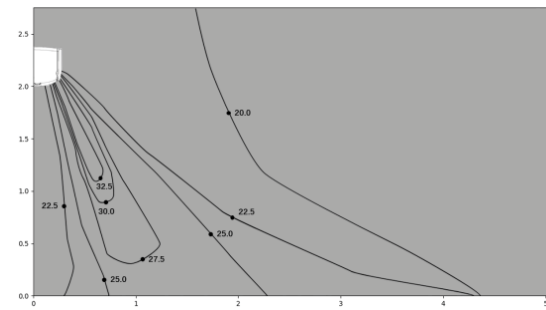


Figure 9.1.19: MHW-035CS cooling at 300S

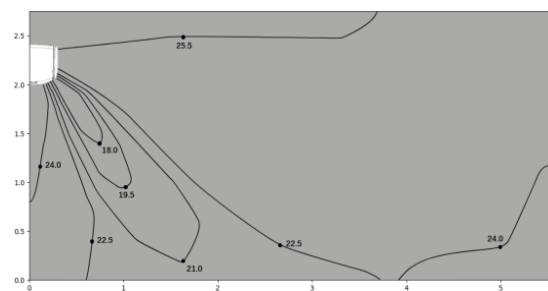


Figure 9.1.20: MHW-035CS heating at 300S

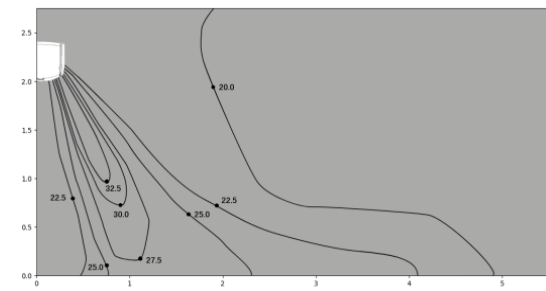


Figure 9.1.21: MHW-045CS cooling at 300S

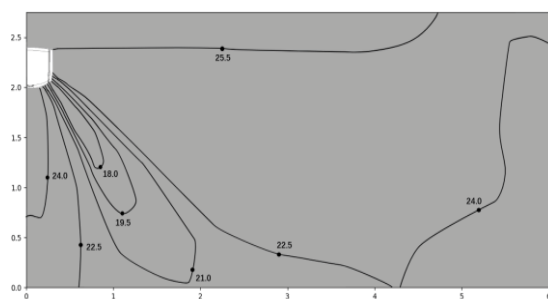
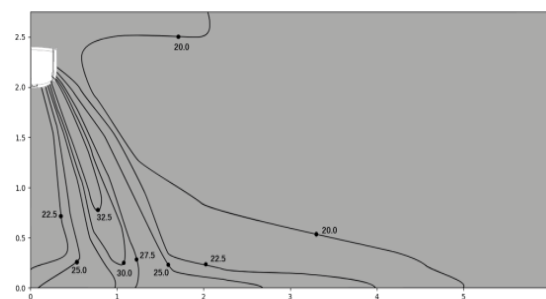


Figure 9.1.22: MHW-045CS heating at 300S



TECHNICAL SELECTION DATA

ECOFLEX - Mini VRF

Figure 9.1.23: MHW-056CS cooling at 300S

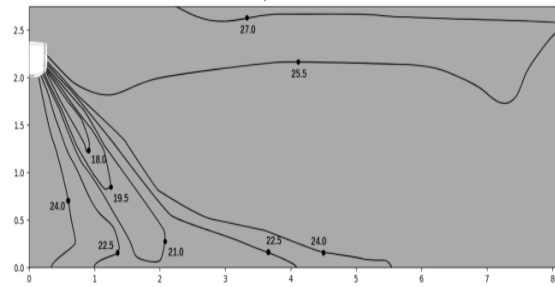


Figure 9.1.24: MHW-056CS heating at 300S

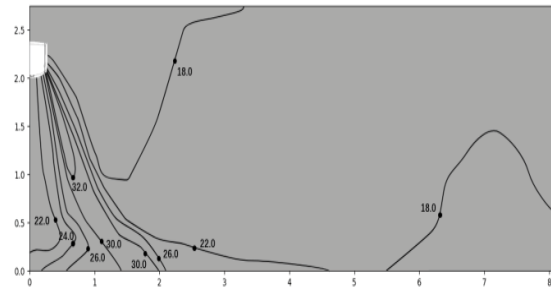


Figure 9.1.25: MHW-071CS cooling at 300S

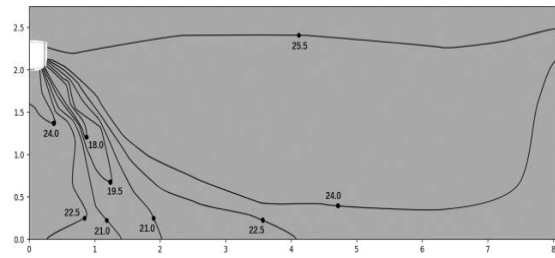
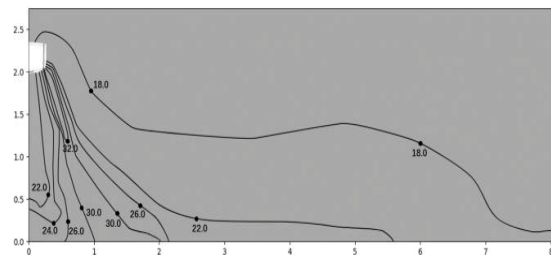
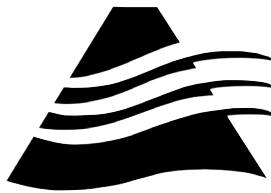


Figure 9.1.26: MHW-071CS heating at 300S





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