

ECOFLEX MINI VRF FOUR-WAY COMPACT CASSETTE TECHNICAL SELECTION DATA



Model Numbers

MCC-015CS	MCC-045CS
MCC-022CS	MCC-056CS
MCC-028CS	MCC-063CS
MCC-036CS	

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TECHNICAL SELECTION DATA

ECOFLEX - Mini VRF

01.Specification

Model			MCC-015CS	MCC-022CS	MCC-028CS	MCC-036CS
Power supply			1-phase, 230, 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	14	14	16	18
Heating ²	Capacity	kW	1.8	2.4	3.2	4.0
		kBtu/h	6.1	8.2	10.9	13.7
	Power Input	W	14	14	16	18
Fan motor type			DC			
Indoor Coil	Number of rows		1	1	1	2
	Tube pitch × row pitch	mm	18×10.72			
	Fin spacing and type	mm	1.2 Hydrophilic aluminum			
	Tube OD and type	mm	Copper Ø5 Inner-groove			
	Dimensions (L×H×W)	mm	438×180×438			
	Number of circuits		1	1	1	2
Air flow rate ³ (OPa) (Max / Min) ⁷		l/s	125 / 82		142 / 94	147 / 96
Sound pressure level ⁴ (OPa) (Max / Min) ⁷		dB(A)	29 / 25		30 / 25	31 / 25.5
Sound power level ⁵ (OPa) (Max / Min) ⁷		dB(A)	40 / 38		42 / 38	42 / 38
Air flow rate ³ (30Pa) (Max / Min) ⁷		l/s	186 / 121		192 / 125	203 / 132
Sound pressure level ⁴ (30Pa) (Max / Min) ⁷		dB(A)	38 / 26		39 / 27	40 / 27
Sound power level ⁵ (30Pa) (Max / Min) ⁷		dB(A)	47 / 43		48 / 43	50 / 43
Main body	Net dimensions ⁶ (W×H×D)	mm	575×235×638			
	Packed dimensions (W×H×D)	mm	690×285×690			
	Net/Gross weight	kg	13.0/15.0		14.0/16.0	
Panel	Net dimensions ⁶ (W×H×D)	mm	620×65×620			
	Packed dimensions (W×H×D)	mm	680×80×665			
	Net/Gross weight	kg	2.4/3.2			
Refrigerant type			R-32			
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 25			

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			MCC-045CS	MCC-056CS	MCC-063CS
Power supply			1-phase, 230, 50Hz		
Cooling ¹	Capacity	kW	4.5	5.6	6.3
		kBtu/h	15.4	19.1	21.5
	Power Input	W	25	35	50
Heating ²	Capacity	kW	5.0	6.3	7.1
		kBtu/h	17.1	21.5	24.2
	Power Input	W	25	35	50
Fan motor type			DC		
Indoor Coil	Number of rows		2	3	3
	Tube pitch × row pitch	mm	18×10.72		
	Fin spacing and type	mm	1.2 Hydrophilic aluminum		
	Tube OD and type	mm	Copper Ø5 Inner-groove		
	Dimensions (L×H×W)	mm	438×180×438		
	Number of circuits		2	3	3
Air flow rate ³ (OPa) (Max / Min) ⁷		l/s	178 / 118	225 / 149	251 / 168
Sound pressure level ⁴ (OPa) (Max / Min) ⁷		dB(A)	36.5 / 26.5	39 / 32	43 / 33.5
Sound power level ⁵ (OPa) (Max / Min) ⁷		dB(A)	44 / 41	48 / 41	51 / 42
Air flow rate ³ (30Pa) (Max / Min) ⁷		l/s	225 / 147	256 / 167	283 / 185
Sound pressure level ⁴ (30Pa) (Max / Min) ⁷		dB(A)	43 / 30	45 / 32	48 / 35
Sound power level ⁵ (30Pa) (Max / Min) ⁷		dB(A)	53 / 46	56 / 48	59 / 51
Main body	Net dimensions ⁶ (W×H×D)	mm	575×235×638		
	Packed dimensions (W×H×D)	mm	690×285×690		
	Net/Gross weight	kg	14.0/16.0	15.0/17.0	
Panel	Net dimensions ⁶ (W×H×D)	mm	620×65×620		
	Packed dimensions (W×H×D)	mm	680×80×665		
	Net/Gross weight	kg	2.4/3.2		
Refrigerant type			R-32		
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 Ø 25		

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.

03. Unit Placement

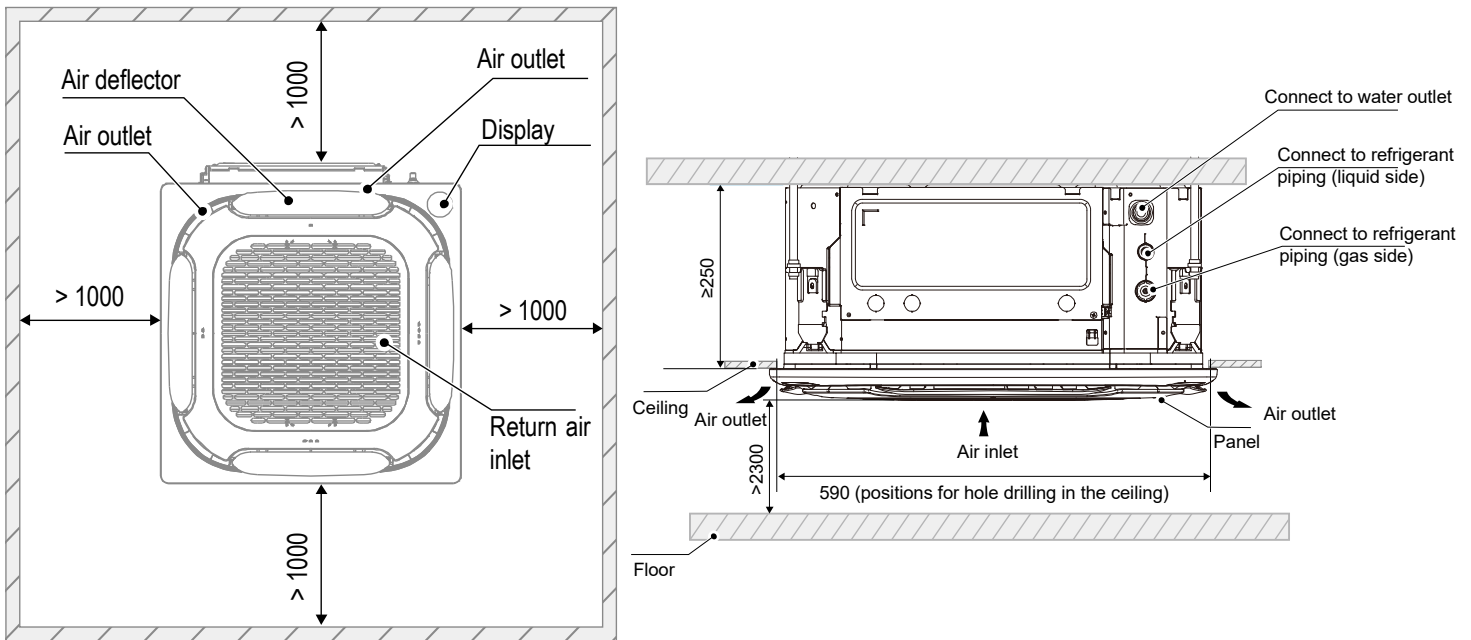
03.01. Placement Considerations

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: Compact Four-way Cassette space requirements (unit: mm)

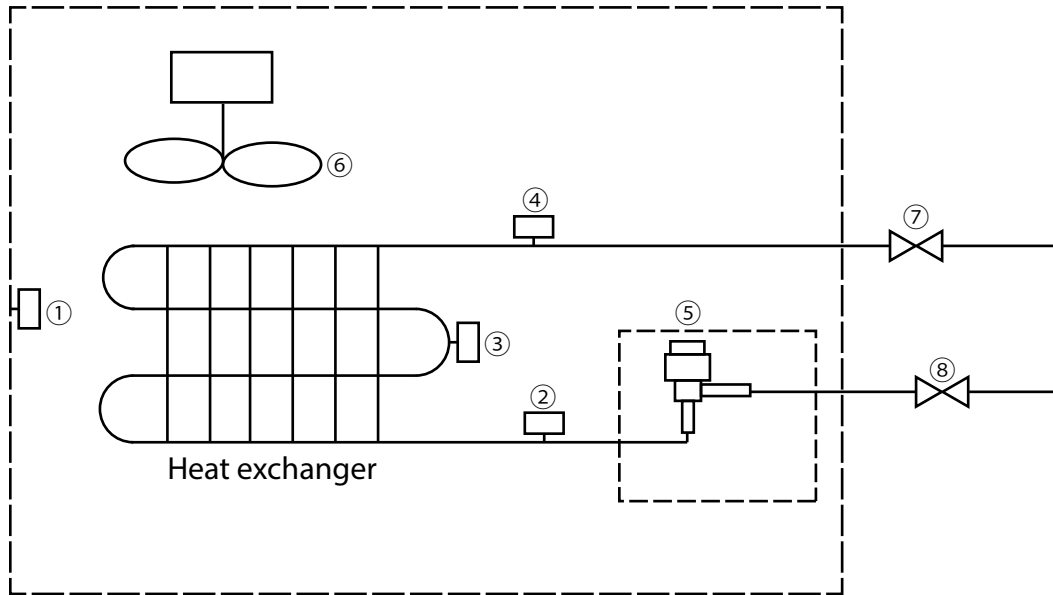


Notes:

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

04. Piping Diagram

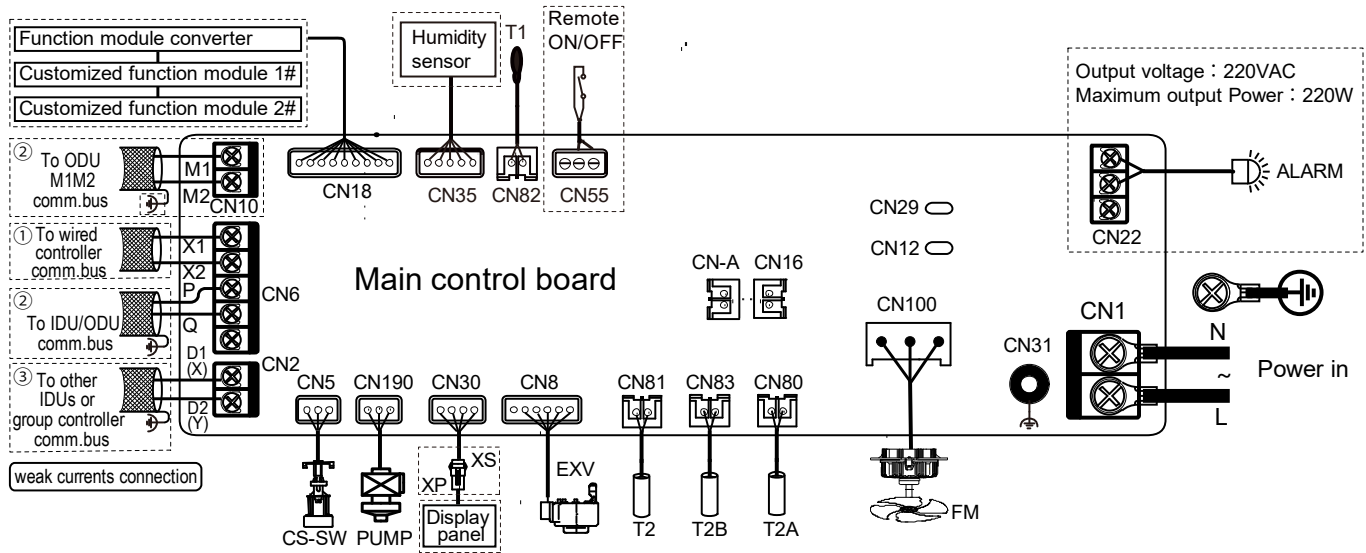
Figure 4.1: Compact Four-way Cassette piping diagram



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: Compact Four-way Cassette 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.
- The dotted lines indicate the field wiring or optional function.
- PQ and M1M2 communication ports both are used for indoor and outdoor communication, and only one of them can be used at a time. Meanwhile, be sure to connect the same communication ports (PQ to PQ; M1M2 to M1M2) in case of damage of the main control board.
- D1D2 communication ports are used for group control communication. When connecting the group controller, the D1D2 port of the indoor units that are to be group controlled must be connected in a daisy chain, and the group controller must be connected to the X1X2 port of one of the indoor units in the group control, and set to group control mode. In addition, D1D2 communication ports can also be connected to the central controller.

06.Capacity Tables

06.01. Cooling Capacity Table

Table 6.01: Compact Four-way Cassette 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
MCC-015CS	1.4	1.4	1.5	1.5	1.5	1.4	1.5	1.3	1.6	1.3	1.6	1.2	1.6	1.1
MCC-022CS	2.0	2.0	2.1	2.1	2.2	2.0	2.2	1.9	2.3	1.9	2.3	1.8	2.4	1.7
MCC-028CS	2.5	2.5	2.7	2.7	2.8	2.6	2.8	2.4	2.9	2.4	2.9	2.2	3.0	2.1
MCC-036CS	3.2	3.2	3.4	3.2	3.6	3.2	3.6	3.0	3.7	3.0	3.8	2.8	3.9	2.7
MCC-045CS	4.0	4.0	4.3	4.1	4.5	4.0	4.5	3.8	4.6	3.7	4.7	3.5	4.8	3.3
MCC-056CS	5.0	4.9	5.3	4.9	5.6	4.9	5.6	4.6	5.7	4.5	5.8	4.3	6.0	4.1
MCC-063CS	5.6	5.5	6.0	5.6	6.3	5.5	6.3	5.2	6.4	5.1	6.6	4.9	6.7	4.6

Abbreviations:

TC: Total capacity (kW)

SC: Sensible capacity(kW)

Notes:

Shaded cells indicate rated conditions.

06.02. Heating Capacity Table

Table 6.02: Compact Four-way Cassette heating capacity

Model	Indoor air temperature (°C DB)					
	16	18	20	21	22	24
	TC	TC	TC	TC	TC	TC
MCC-015CS	1.8	1.8	1.7	1.6	1.6	1.5
MCC-022CS	2.6	2.6	2.4	2.3	2.3	2.1
MCC-028CS	3.4	3.4	3.2	3.1	3.0	2.8
MCC-036CS	4.2	4.2	4.0	3.8	3.8	3.5
MCC-045CS	5.3	5.3	5.0	4.8	4.7	4.4
MCC-056CS	6.7	6.6	6.3	6.1	5.9	5.5
MCC-063CS	7.5	7.5	7.1	6.9	6.7	6.2

Abbreviations:

TC: Total capacity (kW)

Notes:

Shaded cells indicate rated conditions.

07. Electrical Characteristics

Table 7.1: Compact Four-way Cassette electrical characteristics

Model	Power Supply						Indoor Fan Motors	
	Hz	Rated Volts	Min. volts	Max. volts	MCA	MFA	Rated motor output (kW)	FLA
MCC-015CS	50	230	217	243	0.46	15	0.045	0.37
MCC-022CS	50	230	217	243	0.46	15	0.045	0.37
MCC-028CS	50	230	217	243	0.54	15	0.045	0.43
MCC-036CS	50	230	217	243	0.54	15	0.045	0.43
MCC-045CS	50	230	217	243	0.61	15	0.045	0.49
MCC-056CS	50	230	217	243	0.65	15	0.045	0.52
MCC-063CS	50	230	217	243	0.81	15	0.045	0.65

Abbreviations:

MCA: Minimum Circuit Amps

MFA: Maximum Fuse Amps

FLA: Full Load Amps

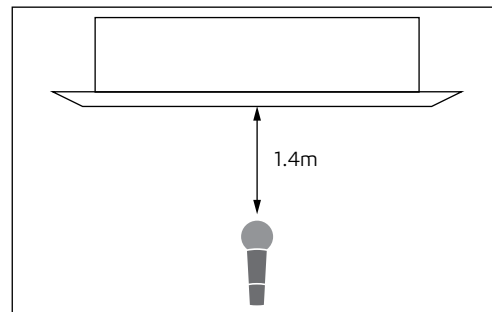
08. Sound Levels

08.01. Overall

Table 8.1.1: Compact Four-way Cassette sound pressure levels¹

Model	Sound pressure levels dB						
	SSH	SH	H	M	L	SL	SSL
MCC-015CS	29	28	27	27	26	26	25
MCC-022CS	29	28	27	27	26	26	25
MCC-028CS	30	29	28	27	26	26	25
MCC-036CS	31	30	29	28	27	26	25.5
MCC-045CS	36.5	35	33	31	29	28	26.5
MCC-056CS	39	38	37	36	35	34	32
MCC-063CS	43	42	40	38	36	35	33.5

Figure 8.1.1: Compact Four-way Cassette 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: Compact Four-way Cassette Air flow rate (OPa).

Model	Air flow rate (l/s)						
	SSH	SH	H	M	L	SL	SSL
MCC-015CS	125	118	111	103	96	89	82
MCC-022CS	125	118	111	103	96	89	82
MCC-028CS	142	133	126	118	110	103	94
MCC-036CS	147	139	131	122	113	104	96
MCC-045CS	178	168	158	147	138	128	118
MCC-056CS	225	213	200	186	174	161	149
MCC-063CS	251	238	224	210	196	182	168

Table 8.1.3: Compact Four-way Cassette Sound power level (OPa).

Model	Sound power level (dB)						
	SSH	SH	H	M	L	SL	SSL
MCC-015CS	40	39	39	39	38	38	38
MCC-022CS	40	39	39	39	38	38	38
MCC-028CS	42	41	40	39	39	38	38
MCC-036CS	42	40	39	38	38	38	38
MCC-045CS	44	44	43	42	41	41	41
MCC-056CS	48	46	45	43	42	42	41
MCC-063CS	51	50	48	46	45	44	42

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Table 8.1.4: Compact Four-way Cassette
Air flow rate (30Pa)

Model	Air flow rate (l/s)						
	SSH	SH	H	M	L	SL	SSL
MCC-015CS	186	175	164	153	141	131	121
MCC-022CS	186	175	164	153	141	131	121
MCC-028CS	192	180	169	157	146	135	125
MCC-036CS	203	190	178	166	154	142	132
MCC-045CS	225	211	199	185	171	158	147
MCC-056CS	256	240	225	210	194	179	167
MCC-063CS	283	267	250	232	215	199	185

Table 8.1.5: Compact Four-way Cassette
Sound pressure level (30Pa)

Model	Sound pressure level (dB)						
	SSH	SH	H	M	L	SL	SSL
MCC-015CS	38	36	34	33	31	27	26
MCC-022CS	38	36	34	33	31	27	26
MCC-028CS	39	37	36	33	32	29	27
MCC-036CS	40	38	36	34	32	29	27
MCC-045CS	43	41	39	37	35	32	30
MCC-056CS	45	43	41	39	37	34	32
MCC-063CS							

Table 8.1.6: Compact Four-way Cassette
Sound power level (30Pa)

Model	Sound power level (dB)						
	SSH	SH	H	M	L	SL	SSL
MCC-015CS	47	47	46	45	44	44	43
MCC-022CS	47	47	46	45	44	44	43
MCC-028CS	48	47	47	46	45	44	43
MCC-036CS	50	49	48	47	46	45	43
MCC-045CS	53	52	51	50	48	47	46
MCC-056CS	56	55	54	52	51	50	48
MCC-063CS	59	58	56	55	54	52	51

08.02. Octave Band Levels

Figure 8.2: MCC-015CS octave band levels

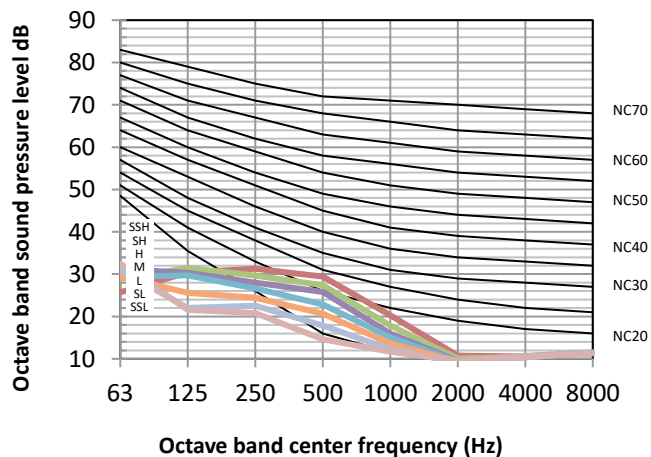
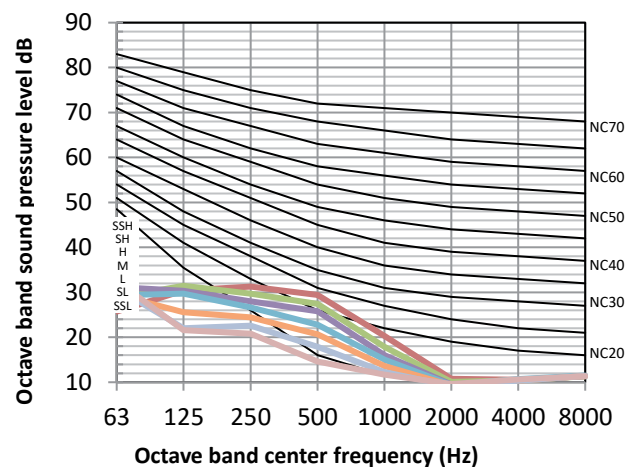


Figure 8.3: MCC-022CS octave band levels



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Figure 8.4: MCC-028CS octave band levels

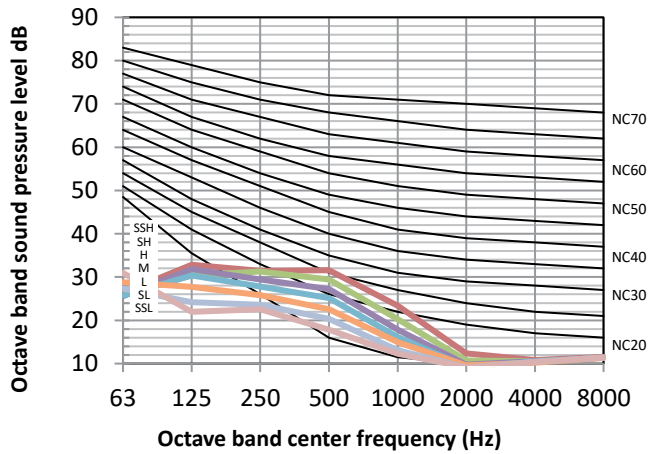


Figure 8.5: MCC-036CS octave band levels

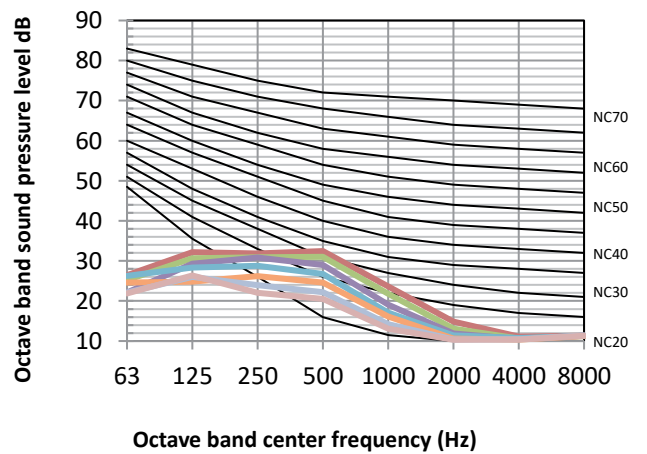


Figure 8.6: MCC-045CS octave band levels

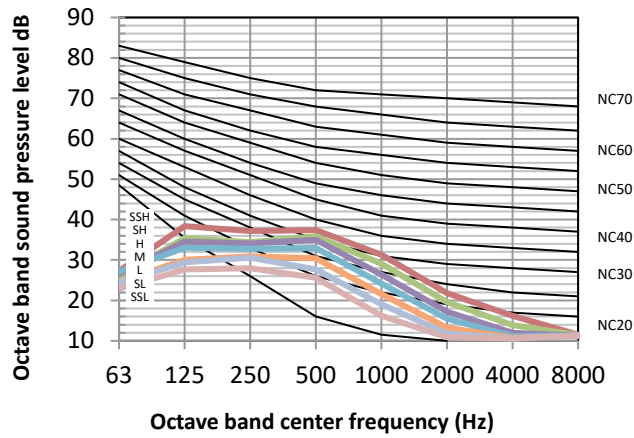


Figure 8.7: MCC-056CS octave band levels

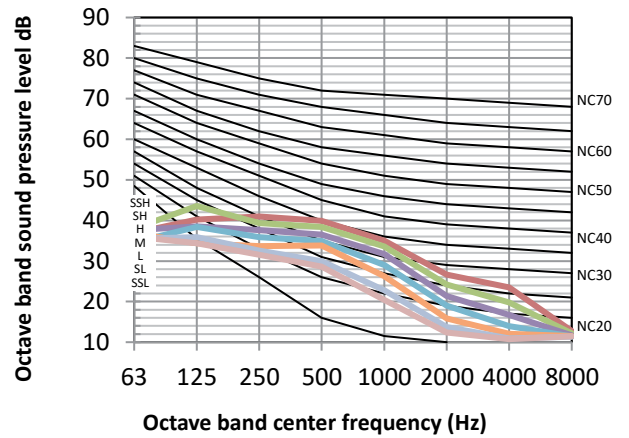
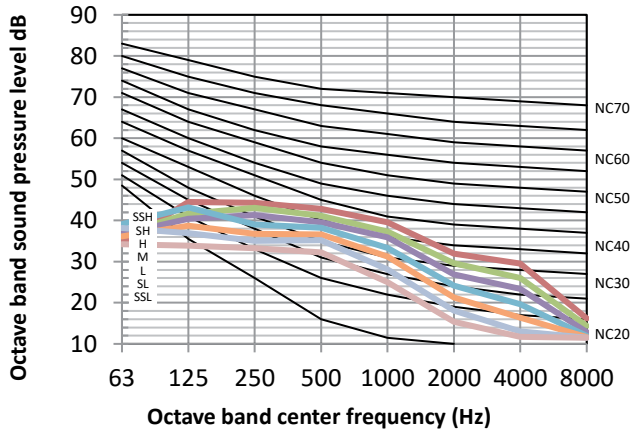


Figure 8.8: MCC-063CS octave band levels



09. Temperature and Airflow Distributions

09.01. Simulate condition

Table 9.1: Compact Four-way Cassette simulate condition

Models	Room size (m)	Ceiling height (m)	Flow angle (Cooling/Heating)	Placing
MCC-015CS	5X5	2.7	40°/70°	Center
MCC-022CS	5X5	2.7	40°/70°	Center
MCC-028CS	6X6	2.7	40°/70°	Center
MCC-036CS	6X6	2.7	40°/70°	Center
MCC-045CS	6X6	2.7	40°/70°	Center
MCC-056CS	6X6	2.7	40°/70°	Center
MCC-063CS	6X6	2.7	40°/70°	Center

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 9.2.1: MCC-015CS, Cooling at 300s Louvre at 40 degrees angle

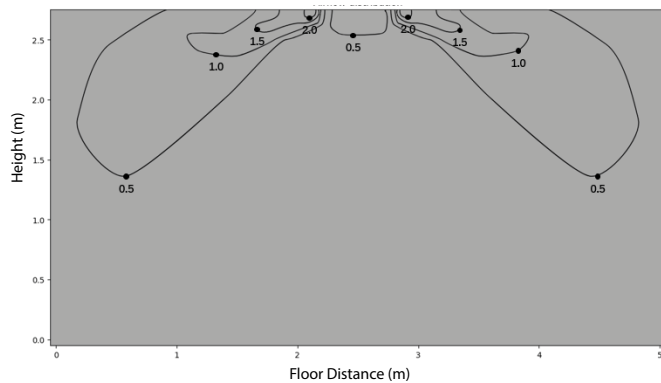


Figure 9.2.2: MCC-015CS, Heating at 300s Louvre at 70 degrees angle

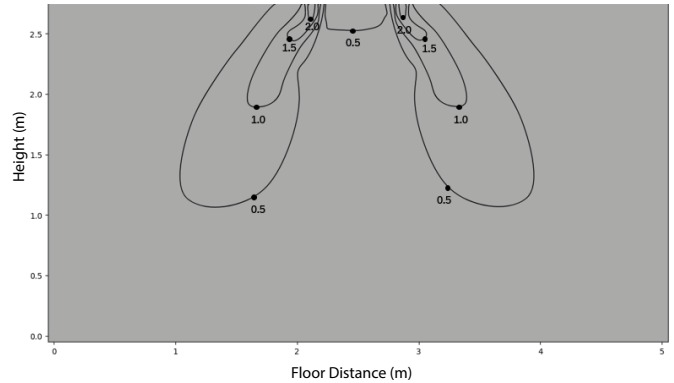


Figure 9.2.3: MCC-022CS, Cooling at 300s Louvre at 40 degrees angle

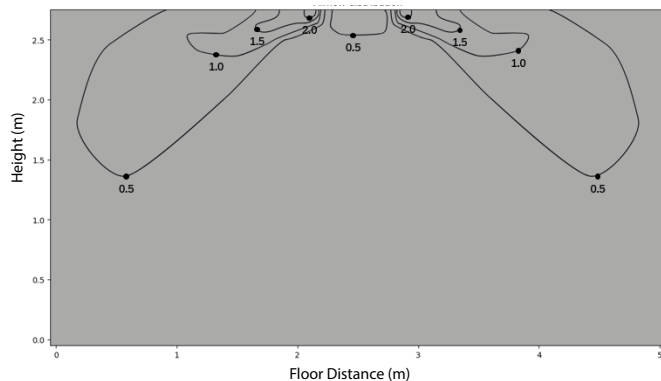
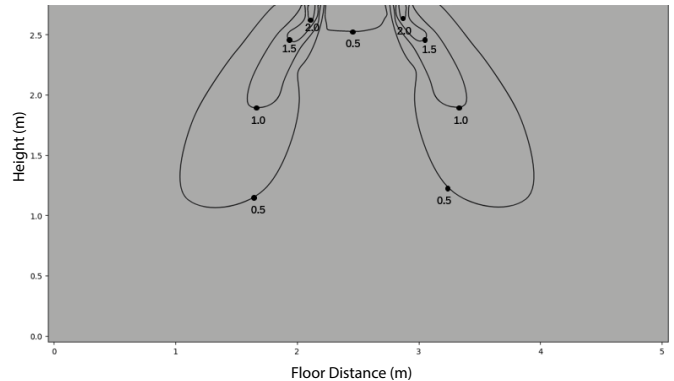


Figure 9.2.4: MCC-022CS, Heating at 300s Louvre at 70 degrees angle



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Figure 9.2.5: MCC-028CS, Cooling at 300s Louvre at 40 degrees angle

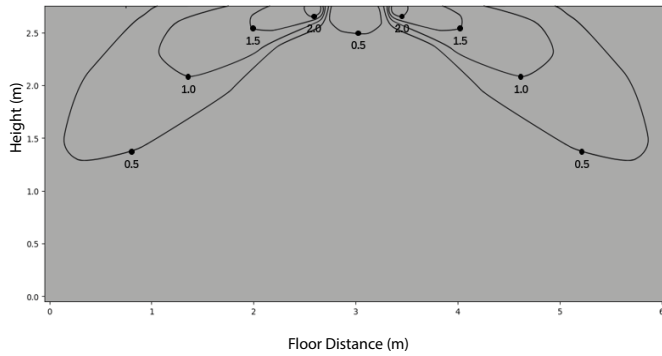


Figure 9.2.6: MCC-028CS, Heating at 300s Louvre at 70 degrees angle

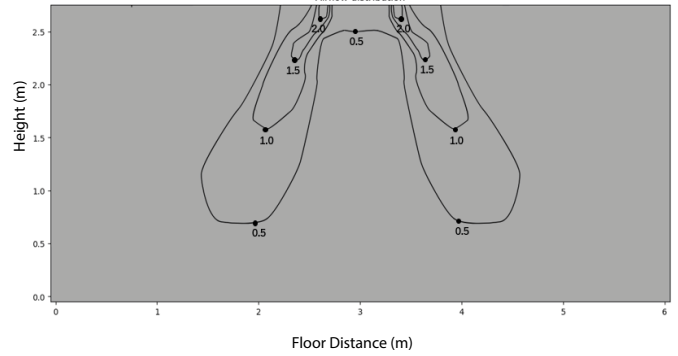


Figure 9.2.7: MCC-036CS, Cooling at 300s Louvre at 40 degrees angle

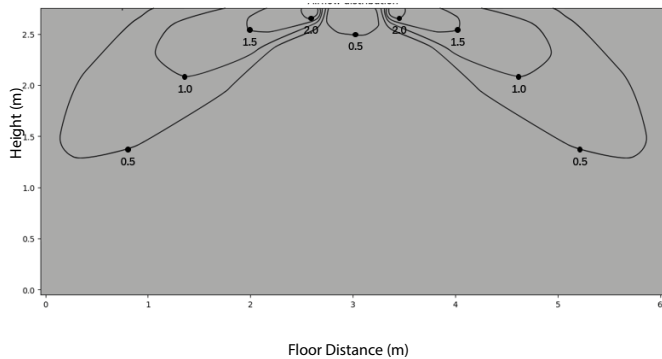


Figure 9.2.8: MCC-036CS, Heating at 300s Louvre at 70 degrees angle

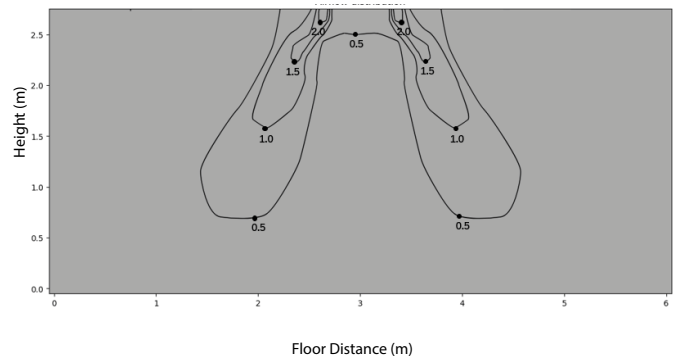


Figure 9.2.9: MCC-045CS, Cooling at 300s Louvre at 40 degrees angle

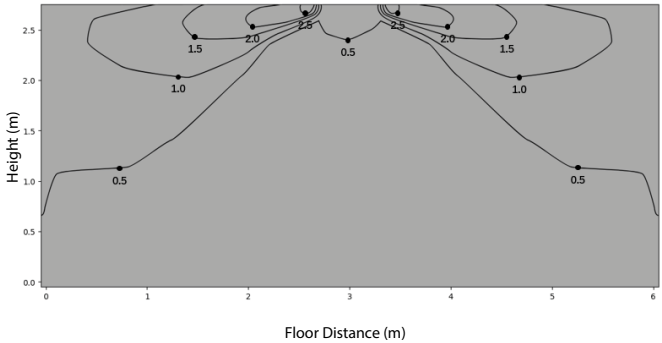


Figure 9.2.10: MCC-045CS, Heating at 300s Louvre at 70 degrees angle

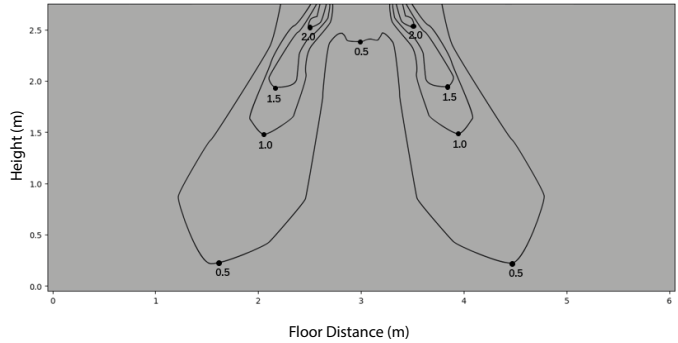


Figure 9.2.11: MCC-056CS, Cooling at 300s Louvre at 40 degrees angle

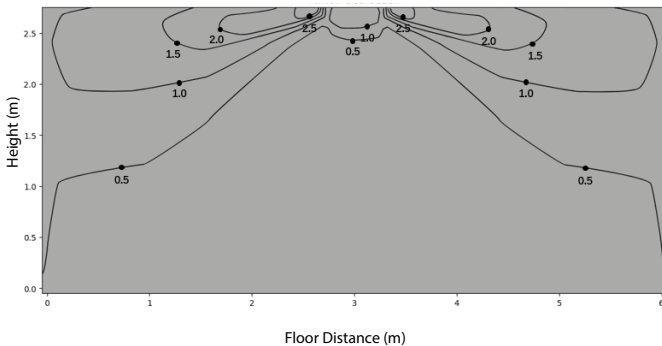


Figure 9.2.12: MCC-056CS, Heating at 300s Louvre at 70 degrees angle

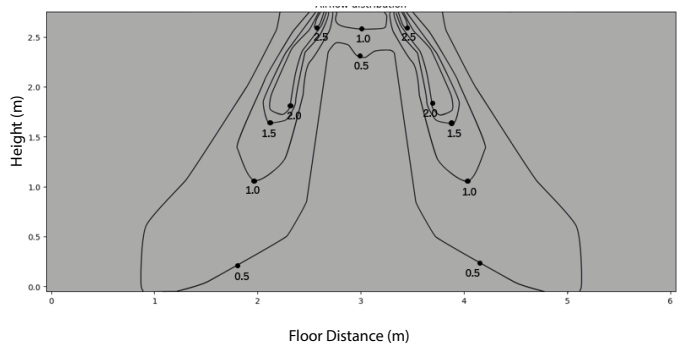


Figure 9.2.13: MCC-063CS , Cooling at 300s Louvre at 40 degrees angle

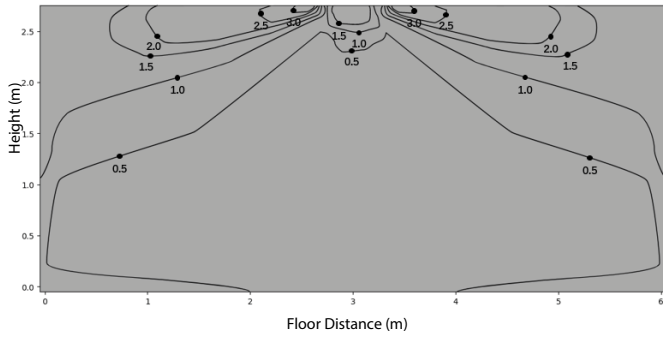
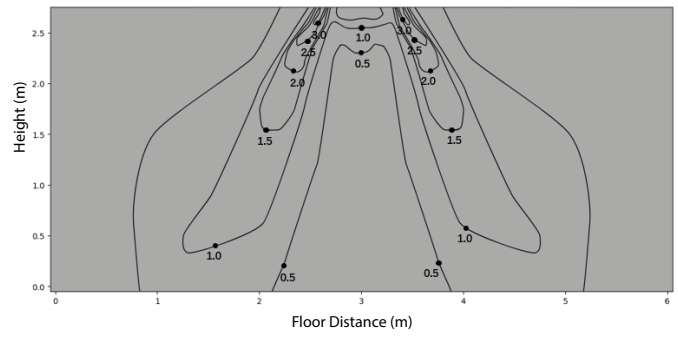


Figure 9.2.14: MCC-063CS , Heating at 300s Louvre at 70 degrees angle



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 9.3.1: MCC-015CS, Cooling at 300s Louvre at 40 degrees angle

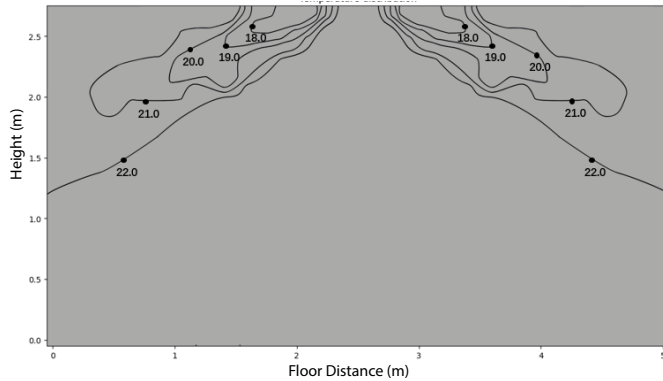


Figure 9.3.2: MCC-015CS, Heating at 300s Louvre at 70 degrees angle

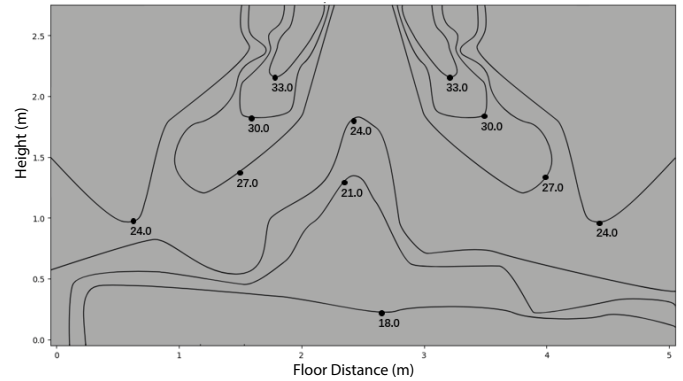


Figure 9.3.3: MCC-022CS, Cooling at 300s Louvre at 40 degrees angle

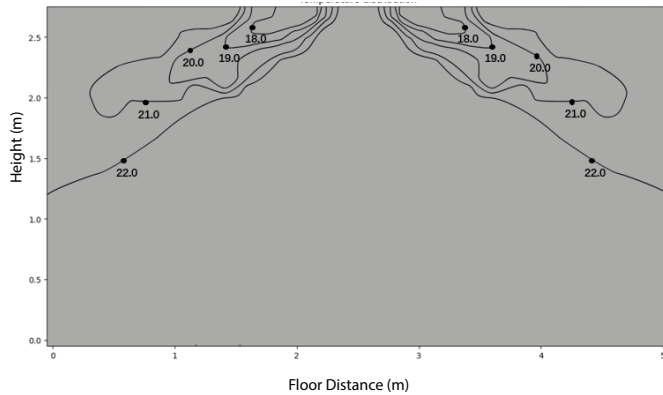
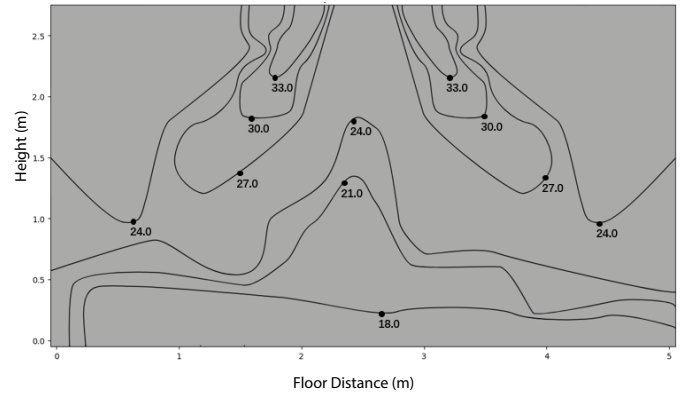


Figure 9.3.4: MCC-022CS, Heating at 300s Louvre at 70 degrees angle



TECHNICAL SELECTION DATA

ECOFLEX - Mini VRF

Figure 9.3.5: MCC-028CS, Cooling at 300s Louvre at 40 degrees angle

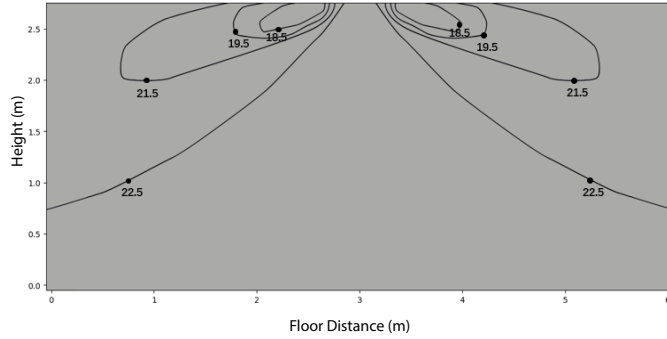


Figure 9.3.6: MCC-028CS, Heating at 300s Louvre at 70 degrees angle

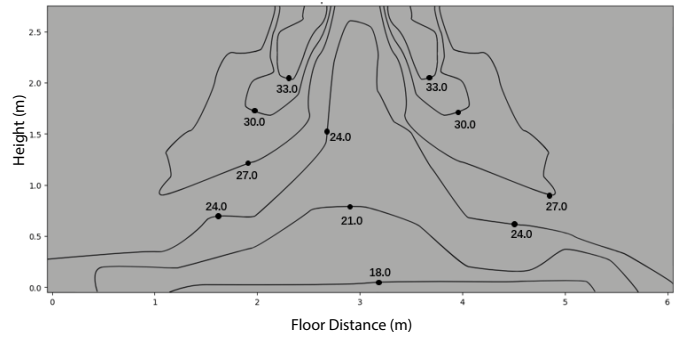


Figure 9.3.7: MCC-036CS, Cooling at 300s Louvre at 40 degrees angle

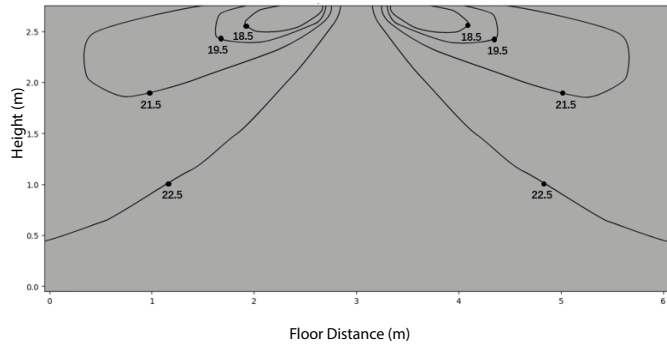


Figure 9.3.8: MCC-036CS, Heating at 300s Louvre at 70 degrees angle

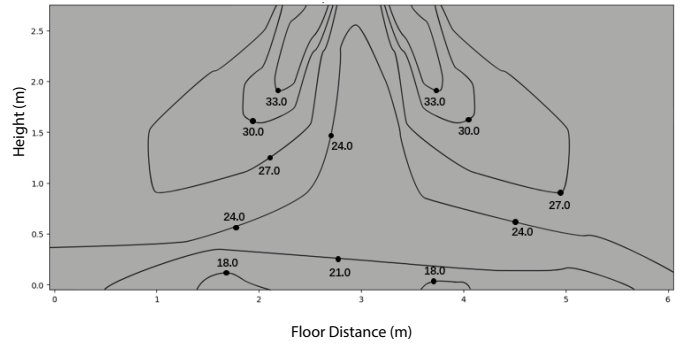


Figure 9.3.9: MCC-045CS, Cooling at 300s Louvre at 40 degrees angle

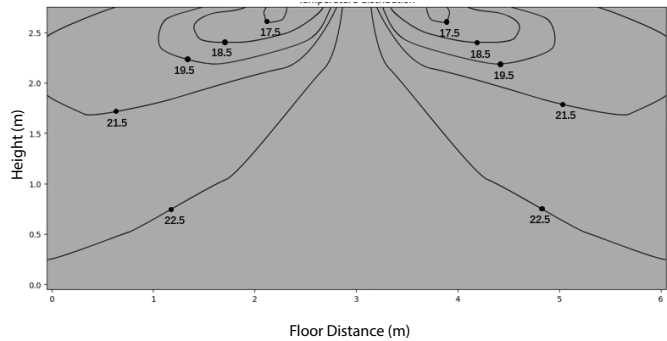


Figure 9.3.10: MCC-045CS, Heating at 300s Louvre at 70 degrees angle

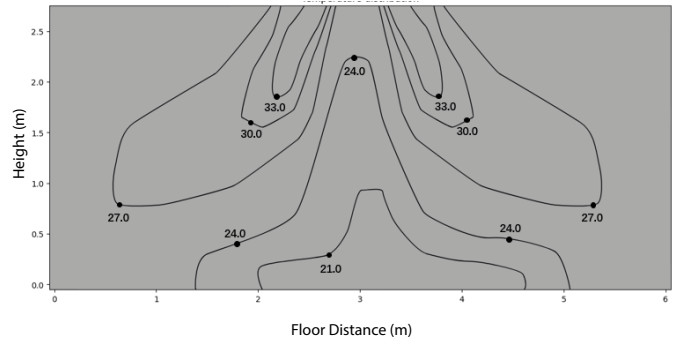


Figure 9.3.11: MCC-056CS, Cooling at 300s Louvre at 40 degrees angle

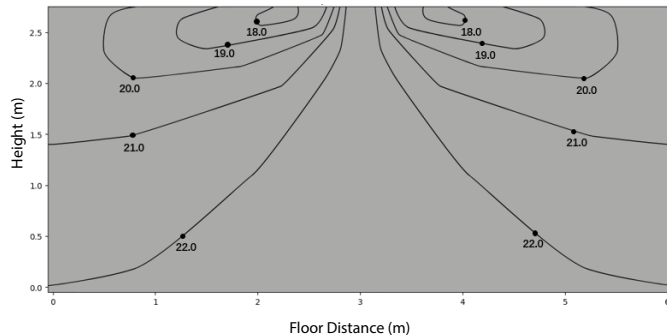
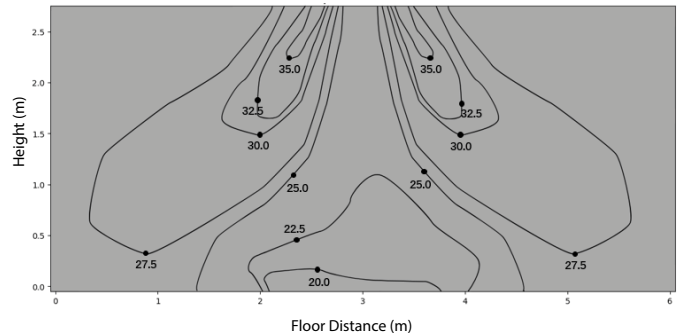


Figure 9.3.12: MCC-056CS, Heating at 300s Louvre at 70 degrees angle



TECHNICAL SELECTION DATA

ECOFLEX - Mini VRF

Figure 9.3.13: MCC-063CS , Cooling at 300s Louvre at 40 degrees angle

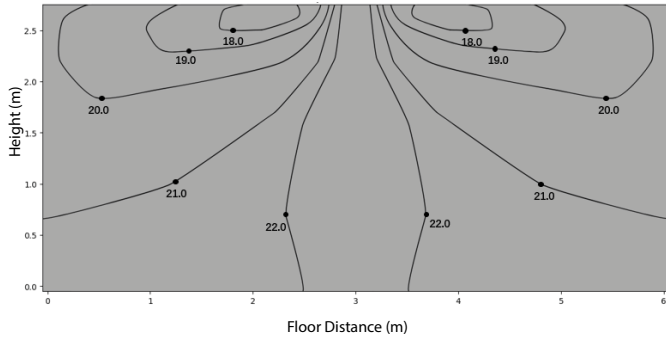
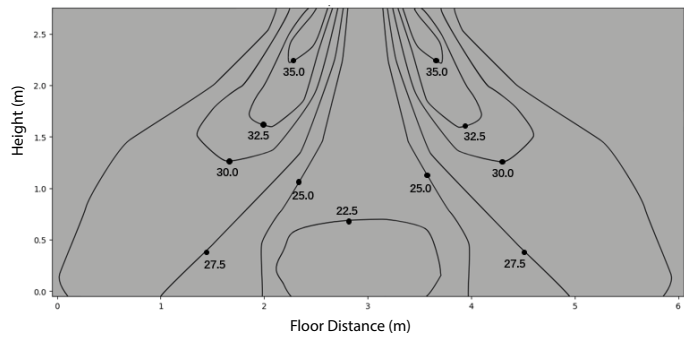


Figure 9.3.14: MCC-063CS , Heating at 300s Louvre at 70 degrees angle





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