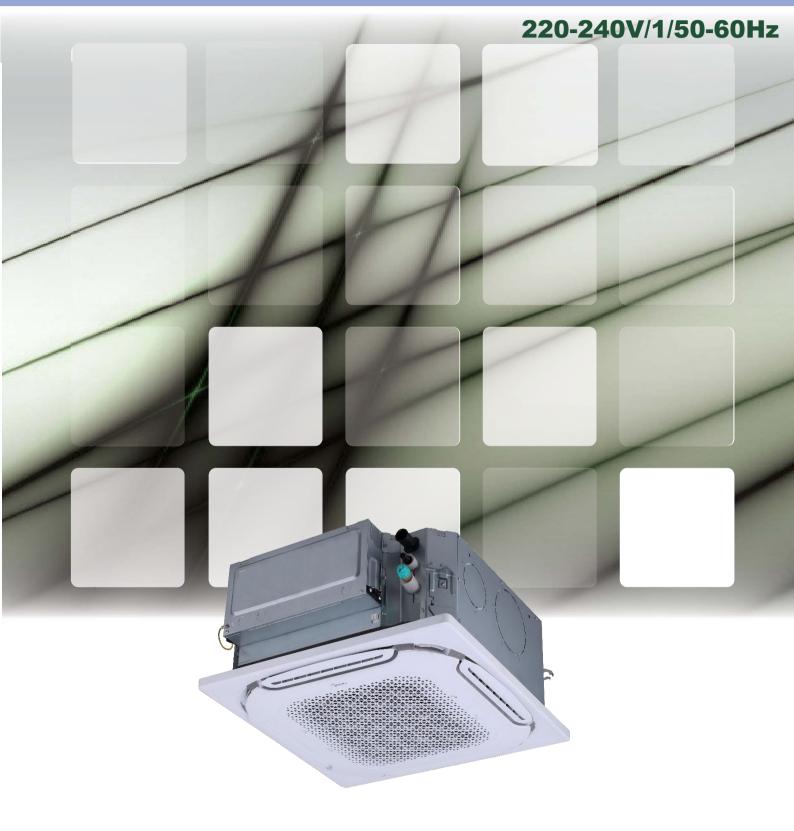




## **BECM Series**

**Compact Four-way Cassette VRF Indoor Unit** 

**Technical Manual** 





# **Compact Four-way Cassette**

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BECM006N0A-DWV018	BECM015N0A-DWV045
BECM008N0A-DWV022	BECM019N0A-DWV056
BECM010N0A-DWV028	BECM022N0A-DWV063
BECM012N0A-DWV036	



## **1** Specifications

Table 1.1: BECM006 (008,010,012) specifications

Model			BECM006N0A- DWV018	BECM008N0A- DWV022	BECM010N0A- DWV028	BECM012N0A- DWV036		
Power supply			1-phase, 220-240V, 50/60Hz					
	Conscitu	kW	1.5	2.2	2.8	3.6		
Cooling <sup>1</sup> Pc	Capacity	kBtu/h	5	7	9	12		
	Power input	W	14 14		16	18		
	Conacity	kW	1.8	2.4	3.2	4.0		
Heating <sup>2</sup>	Capacity	kBtu/h	6	8	10	13		
	Power input	W	14	14	16	18		
Fan motor type				·	DC			
	Number of rows		1	1	1	2		
	Tube pitch × row pitch	mm		1	8×10.72			
Indoor coil	Fin spacing and type	mm		1.2 Hydro	philic aluminum			
	Tube OD and type	mm						
	Dimensions (L×H×W)	mm		1333×180×21.44				
	Number of circuits		3	3	3	5		
Air flow rate <sup>3</sup>		m³/h	470/441/406/38	80/349/315/293	542/506/477/444/ 409/374/341	517/484/449/417/3 83/348/315		
Sound pressure le	vel <sup>4</sup>	dB(A)	30/28/26/24/22/20/19 4/21			32/30/29/27/25/23/ 20		
	Net dimensions <sup>6</sup> (W×H×D)	mm		575	×240×575			
Main body	Packed dimensions (W×H×D)	mm		690	×285×690			
	Net/Gross weight	kg		13/15		14/16		
	Net dimensions <sup>7</sup> (W×H×D)	mm		62	0×65×620			
Panel	Packed dimensions (W×H×D)	mm		680×80×665				
	Net/Gross weight	kg	2.3/3.0					
Refrigerant type			R410A					
Design pressure (H	H/L)	MPa	4.4/2.6					
Dine compositions	Liquid/Gas pipe	mm		Ф6	.35/Ф12.7			
Pipe connections	Drain pipe	mm		(	DD Φ25			

Notes:

1. Indoor temperature 27°C DB, 19°C WB; outdoor temperature 35°C DB; equivalent refrigerant piping length 7.5m with zero level difference.

2. Indoor temperature 20°C DB; outdoor temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 7.5m with zero level difference.

3. Air flow rate 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 semianechoic chamber.

5. Sound power level is from highest level to lowest level, total 7 levels for each model.

6. The dimension is only the body size, excluding the size of the installation lug, connecting copper pipe, etc. For detailed dimensions, please refer to the installation manual.

7. Exposed height of the panel after being installed on the ceiling.



Table 1.2: BECM015 (019,022,) specifications

## **Ultima VRF Indoor Units**

Model			BECM015N0A-DWV045	BECM019N0A-DWV056	BECM022N0A-DWV063			
Power supply			1-phase, 220-240V, 50/60Hz					
		kW	4.5	5.6	6.3			
Cooling <sup>1</sup>	Capacity	kBtu/h	15	18	21			
	Power input	w	25	35	50			
Heating <sup>2</sup>	kW	5.0	6.3	7.1				
	Capacity	kBtu/h	17	21	24			
	Power input	w	25	35	50			
Fan motor type	·	•		DC				
	Number of rows		2	3	3			
Tube pitch × row pitch		mm		18×10.72				
	Fin spacing and type	mm		1.2 Hydrophilic aluminum				
Dimensions	Tube OD and type	mm	Φ5 Inner-groove					
	Dimensions (L×H×W)	mm	1333×180×21.44	80×32.16				
	Number of circuits	•	5	5	5			
			650/608/569/526/	794/741/692/641/591/	901/848/790/736/678/6			
Air flow rate <sup>3</sup>		m³/h	484/444/405	540/490	23/569			
Sound pressure lev	vel <sup>4</sup>	dB(A)	37/36/34/32/30/28/26	43/41/40/38/36/34/31	46/45/43/42/39/37/35			
	Net dimensions <sup>6</sup> (W×H×D)	mm		575×240×575				
Main body	Packed dimensions		C00205C00					
Main body	(W×H×D)	mm		690×285×690				
	Net/Gross weight	kg	14/16	15	/17			
	Net dimensions (W×H×D)	mm		620×65×620				
Panel	Packed dimensions		680×80×665					
Panel	(W×H×D)	mm						
	Net/Gross weight	kg	2.3/3.0					
Refrigerant type			R410A					
Design pressure (H	H/L)	MPa	4.4/2.6					
	Liquid/Gas pipe	mm	Ф6.35/	Ф12.7	Ф9.52/Ф15.9			
Pipe connections	Drain pipe	mm		OD				

Notes:

1. Indoor temperature 27°C DB, 19°C WB; outdoor temperature 35°C DB; equivalent refrigerant piping length 7.5m with zero level difference.

2. Indoor temperature 20°C DB; outdoor temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 7.5m with zero level difference.

3. Air flow rate 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 semianechoic chamber.

5. Sound power level is from highest level to lowest level, total 7 levels for each model.

6. The dimension is only the body size, excluding the size of the installation lug, connecting copper pipe, etc. For detailed dimensions, please refer to the installation manual.

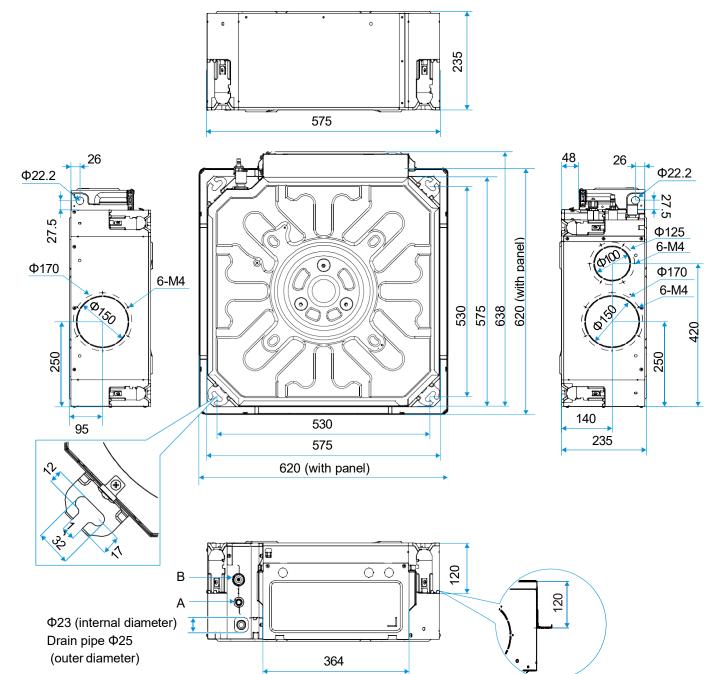
7. Exposed height of the panel after being installed on the ceiling.



## 2 Dimensions

#### 2.1 Unit Dimensions

Figure 2.1: Compact Four-way Cassette dimensions (unit: mm)



Capacity (kBtu/h)	A: Connect to refrigerant piping (liquid side)	B: Connect to refrigerant piping (gas side)
<mark>kB</mark> tu/h≤18	Ф6.35	Ф12.7
18 <kbtu h≤21<="" th=""><td>Ф9.52</td><td>Ф15.9</td></kbtu>	Ф9.52	Ф15.9



#### **3 Unit Placement**

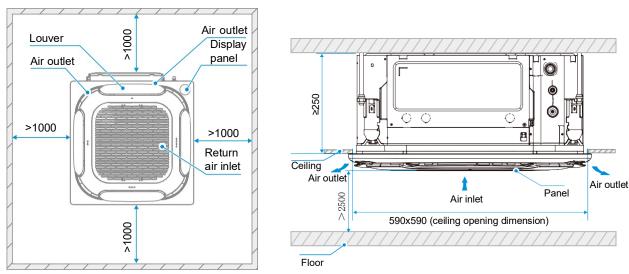
#### **3.1 Placement Considerations**

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 like a coast.
  - 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.

#### **3.2 Space Requirements**

Figure 3.1: Compact Four-way Cassette space requirements (unit: mm)



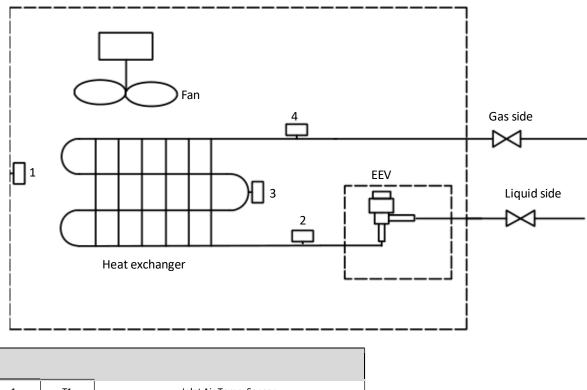
#### Notes:

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



## 4 Piping Diagram

Figure 4.1: Compact Four-way Cassette piping diagram

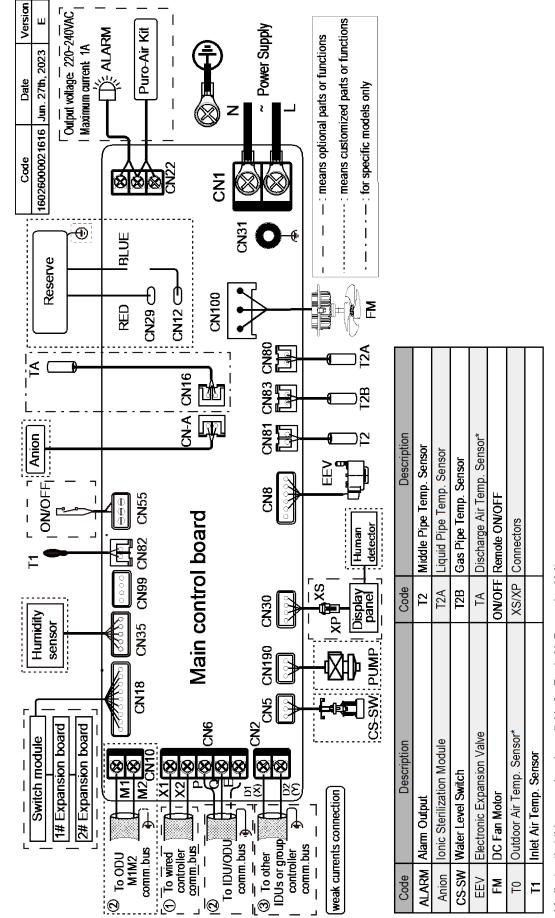


1	T1	Inlet Air Temp. Sensor
2	T2A	Liquid Pipe Temp. Sensor
3	T2	Middle Pipe Temp. Sensor
4	T2B	Gas Pipe Temp. Sensor



## **5** Wiring Diagram

Figure 5.1: Compact Four-way Cassette piping diagram wiring diagram



\* Indicates that this sensor is only available for Fresh Air Processing Unit

#### Notes for installers and service engineers 🛠

#### 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 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.



## 6 Capacity Tables

#### 6.1 Cooling Capacity Table

Table 6.1: Compact Four-way Cassette cooling capacity

	Indoor air temperature (°C WB/DB)													
Model	14/20		16/23		18/26		19/27		20/28		22/30		24/32	
	тс	SHC	тс	SHC	тс	SHC	тс	SHC	тс	SHC	тс	SHC	тс	SHC
BECM006N0A-DWV018	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
BECM008N0A-DWV022	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
BECM010N0A-DWV028	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
BECM012N0A-DWV036	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
BECM015N0A-DWV045	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
BECM019N0A-DWV056	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
BECM022N0A-DWV063	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:

1.Shaded cells indicate rating condition.

#### 6.2 Heating Capacity Table

Table 6.2: Compact Four-way Cassette heating capacity

	Indoor air temperature (°C DB)										
Model	16	18	20	21	22	24					
	SHC	SHC	SHC	SHC	SHC	SHC					
BECM006N0A-DWV018	1.8	1.8	1.7	1.6	1.6	1.5					
BECM008N0A-DWV022	2.6	2.6	2.4	2.3	2.3	2.1					
BECM010N0A-DWV028	3.4	3.4	3.2	3.1	3.0	2.8					
BECM012N0A-DWV036	4.2	4.2	4.0	3.8	3.8	3.5					
BECM015N0A-DWV045	5.3	5.3	5.0	4.8	4.7	4.4					
BECM019N0A-DWV056	6.7	6.6	6.3	6.1	5.9	5.5					
BECM022N0A-DWV063	7.5	7.5	7.1	68.9	66.7	6.2					

Abbreviations:

TC: Total capacity (kW)

Notes:

1.Shaded cells indicate rating condition.

## **7** Electrical Characteristics

Table 7.1: Compact Four-way Cassette electrical characteristics

			Indoor fan motors					
Model name	Hz	Volts	Min. volts	Max. volts	MCA	MFA	Rated motor output (kW)	FLA
BECM006N0A-DWV018	50/60	220-240	198	264	0.46	15	0.045	0.37
BECM008N0A-DWV022	50/60	220-240	198	264	0.46	15	0.045	0.37
BECM010N0A-DWV028	50/60	220-240	198	264	0.54	15	0.045	0.43
BECM012N0A-DWV036	50/60	220-240	198	264	0.54	15	0.045	0.43
BECM015N0A-DWV045	50/60	220-240	198	264	0.61	15	0.045	0.49
BECM019N0A-DWV056	50/60	220-240	198	264	0.65	15	0.045	0.52
BECM022N0A-DWV063	50/60	220-240	198	264	0.81	15	0.045	0.65

Abbreviations:

MCA: Minimum Circuit Amps

MFA: Maximum Fuse Amps

FLA: Full Load Amps



#### 8 Sound Levels

#### 8.1 Overall

Table 8.1: Compact Four-way Cassette sound pressure levels<sup>1</sup>

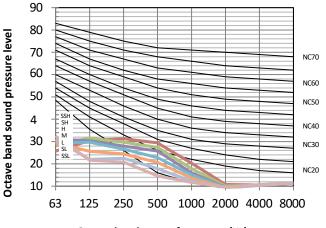
Model name	Sound pressure levels dB							
Wodername	SSH	SH	Н	м	L	SL	SSL	
BECM006N0A-DWV018	30	28	26	24	22	20	19	
BECM008N0A-DWV022	30	28	26	24	22	20	19	
BECM010N0A-DWV028	33	31	30	28	26	24	21	
BECM012N0A-DWV036	32	30	29	27	25	23	20	
BECM015N0A-DWV045	37	36	34	32	30	28	26	
BECM019N0A-DWV056	43	41	40	38	36	34	31	
BECM022N0A-DWV063	46	45	43	42	39	37	35	

Notes:

 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.

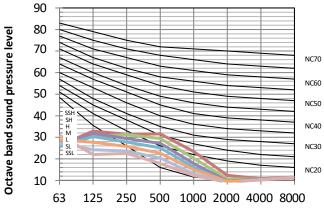
#### 8.2 Octave Band Levels

Figure 8.2: BECM006N0A-DWV018 octave band levels



Octave band center frequency (Hz)

Figure 8.4: BECM010N0A-DWV028 octave band levels



Octave band center frequency (Hz)

Figure 8.1: Compact Four-way Cassette sound pressure level measurement

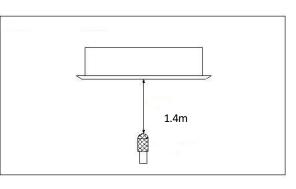
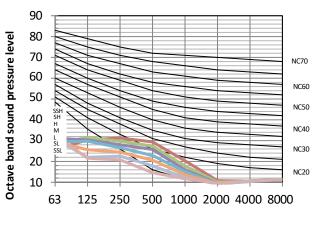
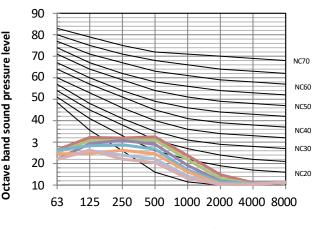


Figure 8.3: BECM008N0A-DWV022octave band levels



Octave band center frequency (Hz)

Figure 8.5: BECM012N0A-DWV036 octave band levels



Octave band center frequency (Hz)

Figure 8.6: BECM015N0A-DWV045 octave band levels

Figure 8.7: BECM019N0A-DWV056 octave band levels

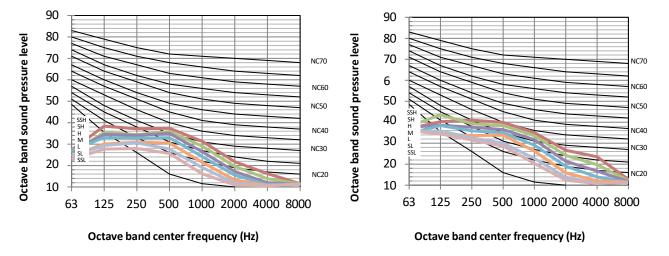
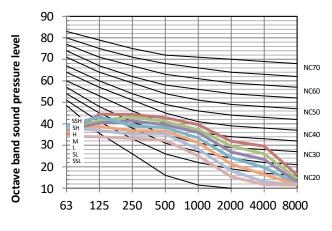


Figure 8.8: BECM022N0A-DWV063 octave band levels



Octave band center frequency (Hz)

## 9 Temperature and Airflow Distributions

#### 9.1 Simulate condition

Table 9.1: Compact Four-way Cassette simulate condition

Model name	Room size (m)	Ceiling height (m)	Flow angle (Cooling/Heating)	Placing
BECM006N0A-DWV018	5*5	2.7	40° /70°	Center
BECM008N0A-DWV022	5*5	2.7	40° /70°	Center
BECM010N0A-DWV028	6*6	2.7	40° /70°	Center
BECM012N0A-DWV036	6*6	2.7	40°/70°	Center
BECM015N0A-DWV045	6*6	2.7	40°/70°	Center
BECM019N0A-DWV056	6*6	2.7	40° /70°	Center
BECM022N0A-DWV063	6*6	2.7	$40^\circ$ /70 $^\circ$	Center

Note:

1. These figures and videos 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 and videos under the influence of air temperature conditions, ceiling height, cooling/heating load, obstacles, etc.

#### 9.2 Airflow distributions

Figure 9.1: BECM006N0A-DWV018 cooling at 300s

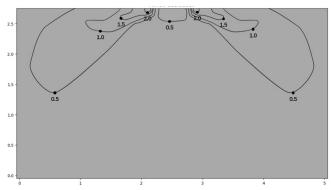


Figure 9.3: BECM008N0A-DWV022cooling at 300s

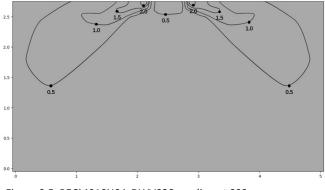


Figure 9.5: BECM010N0A-DWV028 cooling at 300s

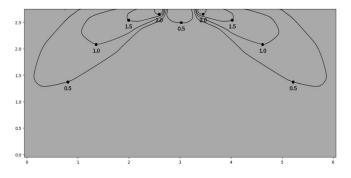


Figure 9.2: BECM006N0A-DWV018 heating at 300s

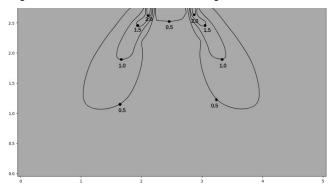


Figure 9.4: BECM008N0A-DWV022heating at 300s

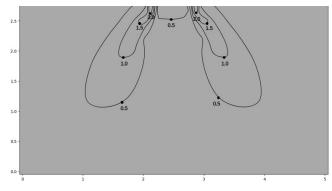


Figure 9.6: BECM010N0A-DWV028 heating at 300s

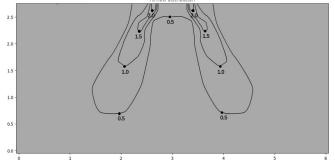




Figure 9.7: BECM012N0A-DWV036 cooling at 300s

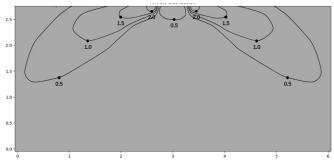


Figure 9.9: BECM015N0A-DWV045cooling at 300s

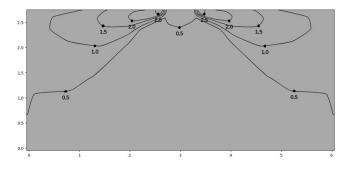


Figure 9.11: BECM019N0A-DWV056 cooling at 300s

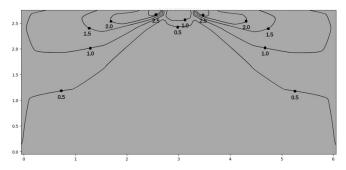


Figure 9.13: BECM022N0A-DWV063 cooling at 300s

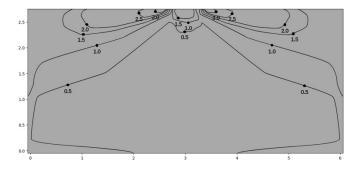


Figure 9.8: BECM012N0A-DWV036 heating at 300s

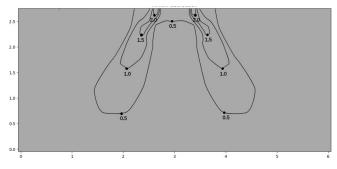


Figure 9.10: BECM015N0A-DWV045heating at 300s

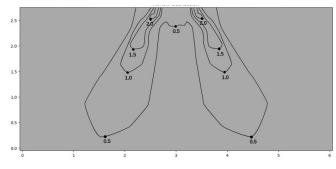


Figure 9.12: BECM019N0A-DWV056 heating at 300s

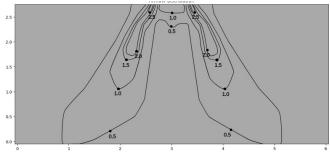
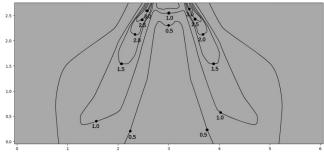


Figure 9.14: BECM022N0A-DWV063 heating at 300s





#### 9.3 Temperature distributions

Figure 9.15: BECM006N0A-DWV018 cooling at 300s

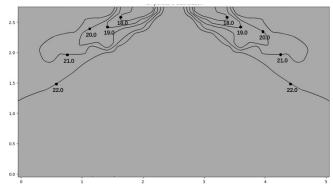


Figure 9.17: BECM008N0A-DWV022cooling at 300s

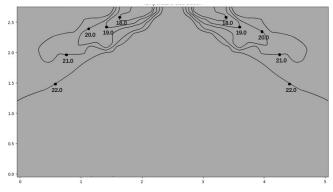


Figure 9.19: BECM010N0A-DWV028 cooling at 300s

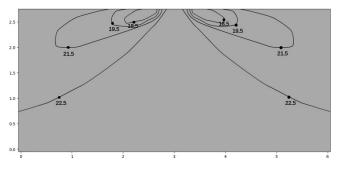


Figure 9.21: BECM012N0A-DWV036 cooling at 300s

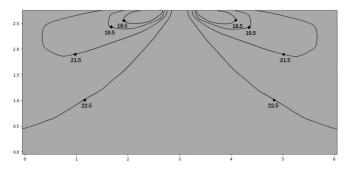
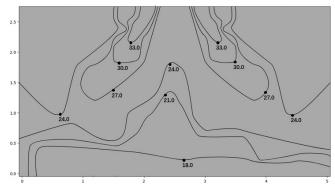
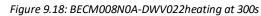


Figure 9.16: BECM006N0A-DWV018 heating at 300s





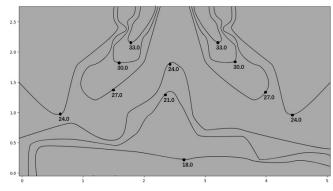


Figure 9.20: BECM010N0A-DWV028 heating at 300s

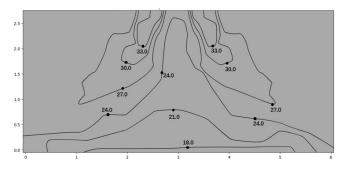


Figure 9.22: BECM012N0A-DWV036 heating at 300s

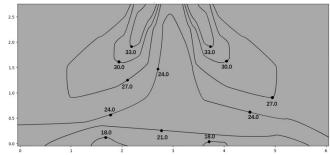


Figure 9.23: BECM015N0A-DWV045cooling at 300s

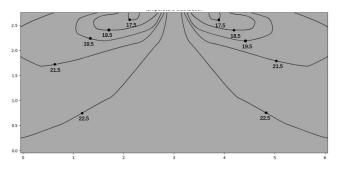


Figure 9.25: BECM019N0A-DWV056 cooling at 300s

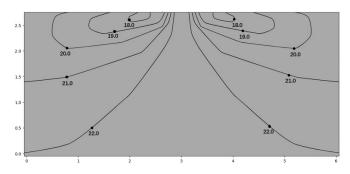


Figure 9.27: BECM022N0A-DWV063 cooling at 300s

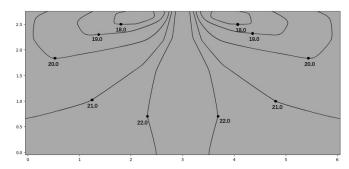


Figure 9.24: BECM015N0A-DWV045heating at 300s

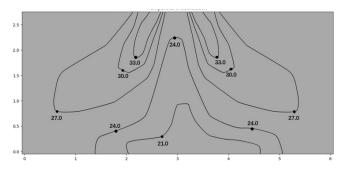


Figure 9.26: BECM019N0A-DWV056 heating at 300s

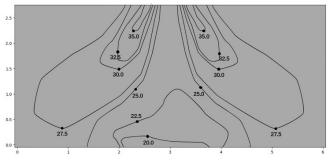
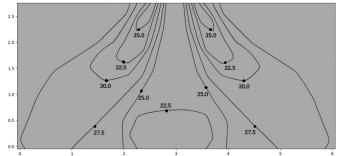


Figure 9.28: BECM022N0A-DWV063 heating at 300s







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