BECW-D Ultima Series

60Hz One-Way Cassette VRF Indoor Unit
Technical Manual

208~230V/1/60Hz

R410A

Commercial Air Conditioners

Engineering Data

One-way Cassette VRF IDU

AC 60Hz

Ultima Series

BECW006Q2A-DWM018

BECW008Q2A-DWM022

BECW010Q2A-DWM028

BECW012Q2A-DWM036

BECW015Q2A-DWM045

BECW019Q2A-DWM056

BECW024Q2A-DWM071

One-way Cassette

1 Specifications

BECW006Q2A-DWM018/ BECW008Q2A-DWM022

Table 1.1: BECW06(08) specifications

Model			BECW006Q2A-DWM018	BECW008Q2A-DWM022
Power supply	BECW008Q2A-DWM022		1-phase, 220-240V, 60Hz	
Cooling[1]	Capacity	kBtu/h	6	7
	Input	W	41	41
Heating[2]	Capacity	kBtu/h	7	8
	Input	W	41	41
Indoor fan motor	Type		AC	
	Quantity		1	
Indoor coil	Number of rows		2	
	Tube pitch × row pitch	in.(mm)	53/64×17/32(21×13.37)	
	Fin spacing	in.(mm)	1/16(1.5)	
	Fin type		Hydrophilic aluminum	
	Diameter & type	in.(mm)	9/32(Φ7), inner-groove tube	
	Dimensions (L×H×W)	in.(mm)	29-59/64×9-15/16×1-3/64(760×252.4×26.74)	
	Number of circuits		2	
Indoor air flow (H/M/L)		m^3/h	523/404/275	
		CFM	308/238/162	
Sound pressure level[3]		dB(A)	37/34/30	
Indoor unit	Net dimensions[4](W×H×D)	in.(mm)	41-1/2×6-1/32×16-47/64(1054×153×425)	
	Packed dimensions (W×H×D)	in.(mm)	45-15/32×9-41/64×19-19/64(1155×245×490)	
	Net/Gross weight	lbs(kg)	27.8/35.3(12.5/16)	
Panel	Net dimensions (W×H×D)	in.(mm)	46-29/64×63/64×18-5/16(1180×25×465)	
	Packed dimensions (W×H×D)	in.(mm)	48-1/2×4-7/32×20-23/64(1232×107×517)	
	Net/Gross weight	lbs(kg)	7.7/11.5(3.5/5.2)	
Refrigerant type			R410A	
Pipe connections	Liquid pipe	in.(mm)	1/4(Φ6.35)	
	Gas pipe	in.(mm)	1/2(Φ12.7)	
	Drain pipe	in.(mm)	OD 63/64 (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. Sound pressure level is measured 1.4m below the unit in a semi-anechoic chamber.
4. Unit body dimensions given are the largest external dimensions of the unit, including hanger attachments.

BECW010Q2A-DWM028 / BECW012Q2A-DWM036

Table 1.2: BECW10(12) specifications

Model			BECW010Q2A-DWM028	BECW012Q2A-DWM036
Power supply			1-phase, 220-240V, 60Hz	
Cooling[1]	Capacity	kBtu/h	9	12
	Input	W	41	41
Heating[2]	Capacity	kBtu/h	10	13
	Input	W	41	41
Indoor fan motor	Type		AC	
	Quantity		1	
Indoor coil	Number of rows		2	
	Tube pitch × row pitch	in.(mm)	53/64×17/32(21×13.37)	
	Fin spacing	in.(mm)	1/16(1.5)	
	Fin type		Hydrophilic aluminum	
	Diameter & type	in.(mm)	9/32(Φ7), inner-groove tube	
	Dimensions (L×H×W)	in.(mm)	29-59/64×9-15/16×1-3/64(760×252.4×26.74)	
	Number of circuits		3	
Indoor air flow (H/M/L)		m^3/h	573/456/315	
		CFM	337/268/185	
Sound pressure level[3]		dB(A)	39/37/34	
Indoor unit	Net dimensions[4](W×H×D)	in.(mm)	41-1/2×6-1/32×16-47/64(1054×153×425)	
	Packed dimensions (W×H×D)	in.(mm)	45-15/32×9-41/64×19-19/64(1155×245×490)	
	Net/Gross weight	lbs(kg)	28.8/36.4(13/16.5)	
Panel	Net dimensions (W×H×D)	in.(mm)	46-29/64×63/64×18-5/16(1180×25×465)	
	Packed dimensions (W×H×D)	in.(mm)	48-1/2×4-7/32×20-23/64(1232×107×517)	
	Net/Gross weight	lbs(kg)	7.7/11.5(3.5/5.2)	
Refrigerant type			R410A	
Pipe connections	Liquid pipe	in.(mm)	1/4(Φ6.35)	
	Gas pipe	in.(mm)	1/2(Φ12.7)	
	Drain pipe	in.(mm)	OD 63/64 (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. Sound pressure level is measured 1.4m below the unit in a semi-anechoic chamber.
4. Unit body dimensions given are the largest external dimensions of the unit, including hanger attachments.

Ultima Series VRF Indoor Units

BECW015Q2A-DWM045 / BECW019Q2A-DWM056 / BECW024Q2A-DWM071

Table 1.3: BECW15(19,24) specifications

Model			BECW015Q2A-DWM045	BECW019Q2A-DWM056	BECW024Q2A-DWM071
Power supply			1-phase, 220-240V, 60Hz		
Cooling[1]	Capacity	kBtu/h	15	19	24
	Input	W	54	60	75
Heating[2]	Capacity	kBtu/h	17	21	27
	Input	W	54	60	75
Indoor fan motor	Type		AC		
	Quantity		1		
Indoor coil	Number of rows		2	2	2
	Tube pitch × row pitch	in.(mm)	53/64×17/32(21×13.37)		
	Fin spacing	in.(mm)	1/16(1.5)		
	Fin type		Hydrophilic aluminum		
	Diameter & type	in.(mm)	9/32(Φ7), inner-groove tube		
	Dimensions (L×H×W)	in.(mm)	37-19/32×9-3/32×1-3/64(955×231×26.74)		37-19/32×13-15/64×1-3/64 (955×336×26.74)
	Number of circuits		3	3	5
Indoor air flow (H/M/L)		m^3/h	693/600/476	792/688/549	933/749/592
		CFM	408/353/280	466/405/323	549/441/349
Sound pressure level[3]		dB(A)	41/39/35	42/40/36	44/41/37
Indoor unit	Net dimensions[4] (W×H×D)	in.(mm)	50-13/64×7-7/16×17-23/32(1275×189×450)		
	Packed dimensions (W×H×D)	in.(mm)	53-15/16×11-39/64×19-7/8(1370×295×505)		
	Net/Gross weight	lbs(kg)	40.8/50.2(18.5/22.8)	41.4/50.8(18.8/23.1)	43.0/52.4(19.5/23.8)
Panel	Net dimensions (W×H×D)	in.(mm)	53-5/32×63/64×19-7/8(1350×25×505)		
	Packed dimensions (W×H×D)	in.(mm)	55-33/64×3-47/64×22-3/64(1410×95×560)		
	Net/Gross weight	lbs(kg)	8.8/11.9(4/5.4)		
Refrigerant type			R410A		
Pipe connections	Liquid pipe	in.(mm)	1/4(Φ6.35)	3/8(Φ9.53)	3/8(Φ9.53)
	Gas pipe	in.(mm)	1/2(Φ12.7)	5/8(Φ15.9)	5/8(Φ15.9)
	Drain pipe	in.(mm)	OD 63/64 (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. Sound pressure level is measured 1.4m below the unit in a semi-anechoic chamber.
4. Unit body dimensions given are the largest external dimensions of the unit, including hanger attachments.

2 Dimensions

2.1 Unit Dimensions

Figure 2.1: BECW06(08,10,12) dimensions (unit: mm)

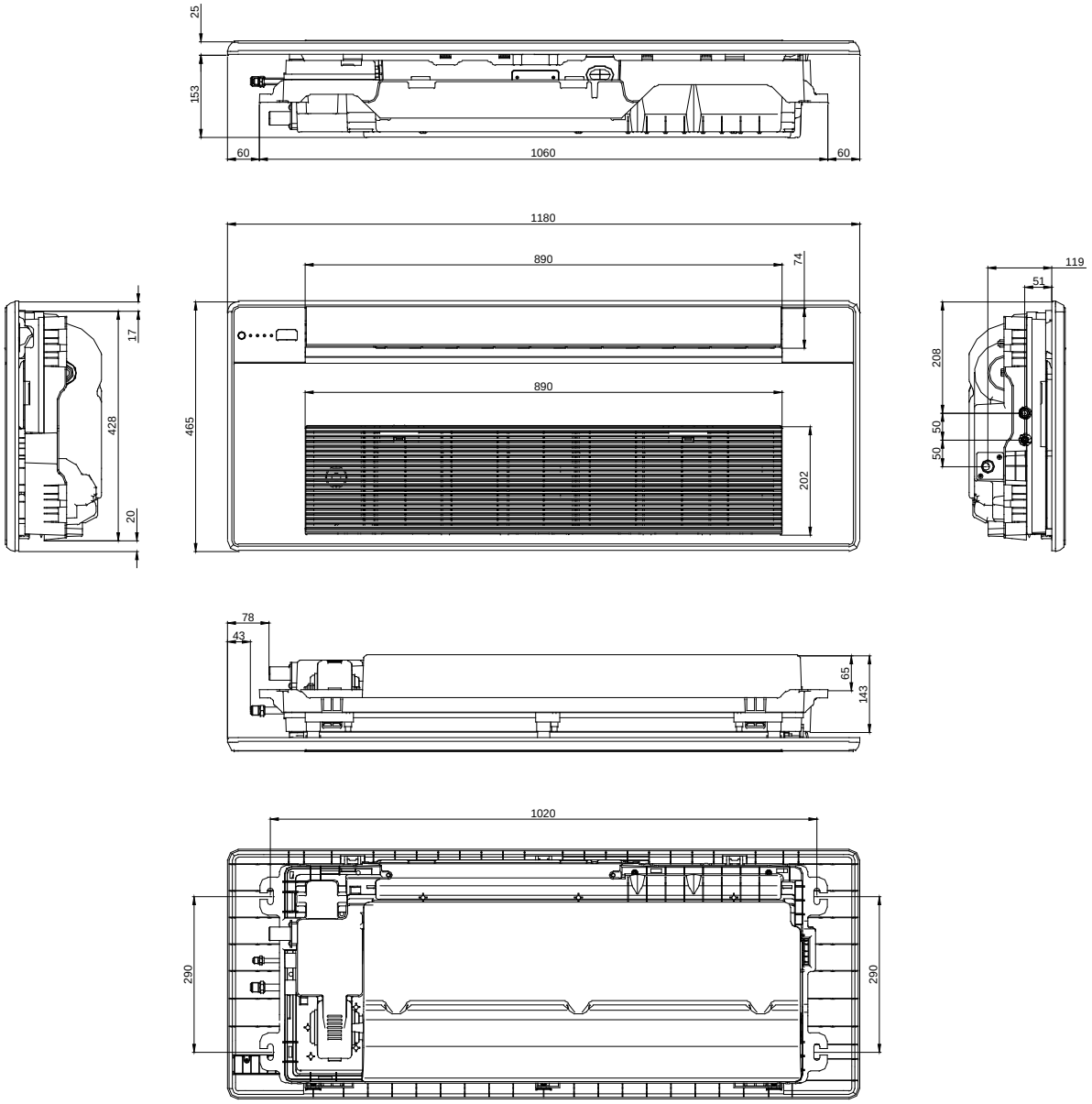
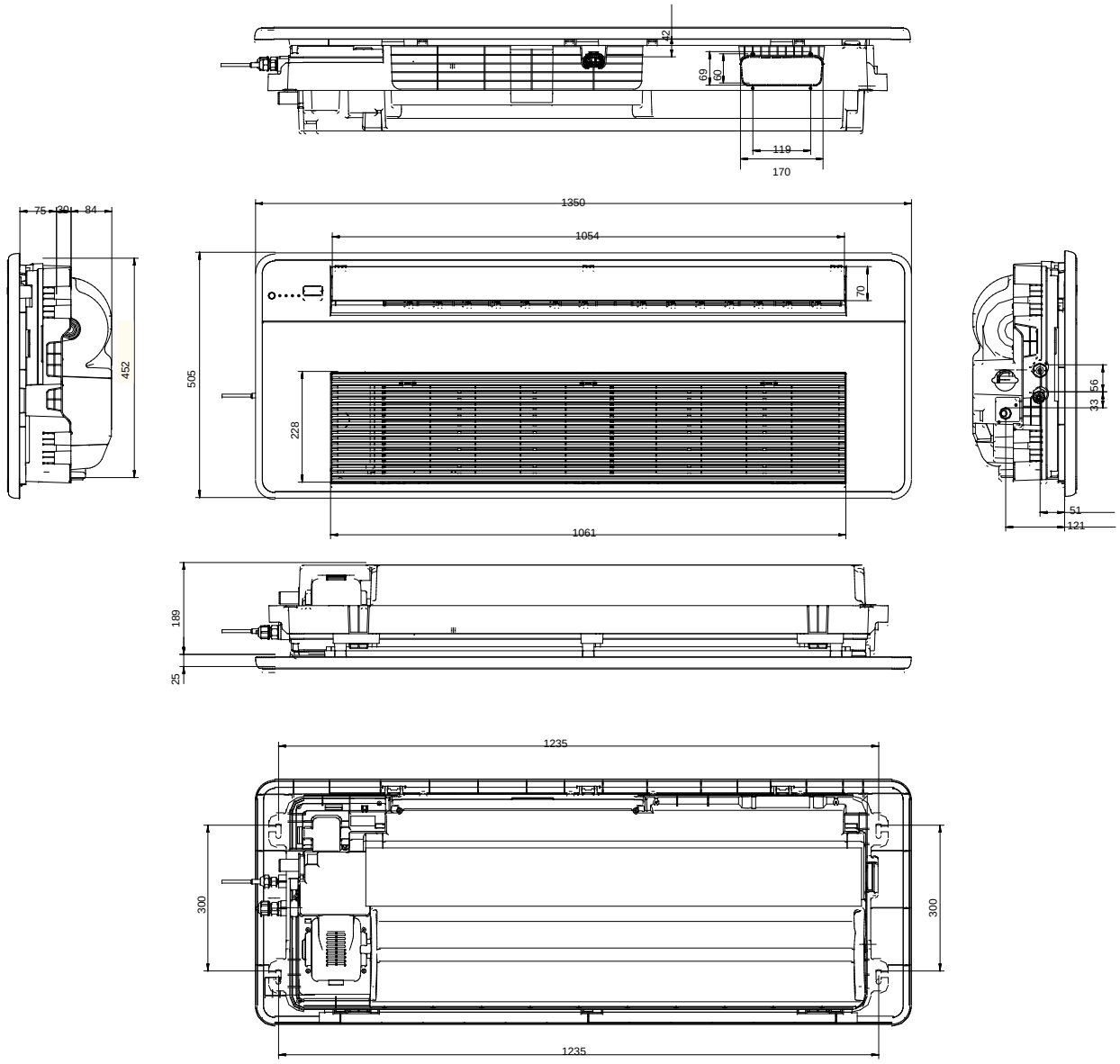


Figure 2.2: BECW15(19,24) dimensions (unit: mm)



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:
  - Where exposure to direct radiation from a high-temperature heat source or to interference from a source of electromagnetic radiation may occur.
  - Where dust or dirt may affect heat exchangers.
  - Where exposure to oil or to corrosive or harmful gases, such as acidic or alkaline gases, may occur.
  - Where exposure to salinity may occur, such as seaside locations.
  - Where highly flammable materials are present.
  - Where exposure to oily air may occur, such as a kitchen.
  - Where exposure to very high humidity may occur, such as a laundry.
- Units should be installed in positions where:
  - The ceiling is horizontal and is able to bear the unit's weight.
  - There are no obstructions that could impede the airflow into and out of the unit.
  - The airflow out of the unit can reach throughout the room.
  - There is sufficient space for access during installation, servicing and maintenance.
  - The refrigerant piping and drain piping can be easily connected to the refrigerant piping and drain piping systems.
  - Short-circuit ventilation (where outlet air returns quickly to a unit's air inlet) will not occur.

3.2 Space Requirements

Figure 3.1: BECW15(19,24) One-way Cassette space requirements (unit: mm)

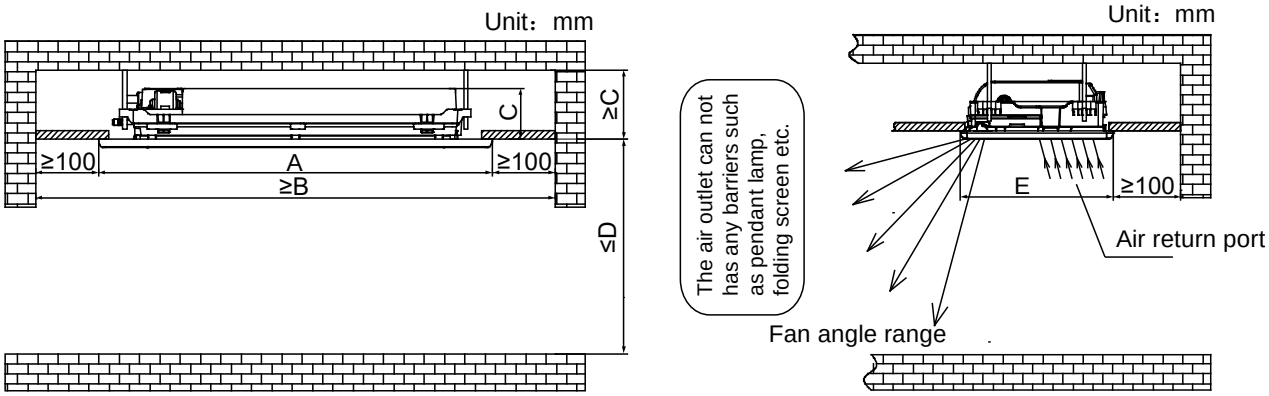
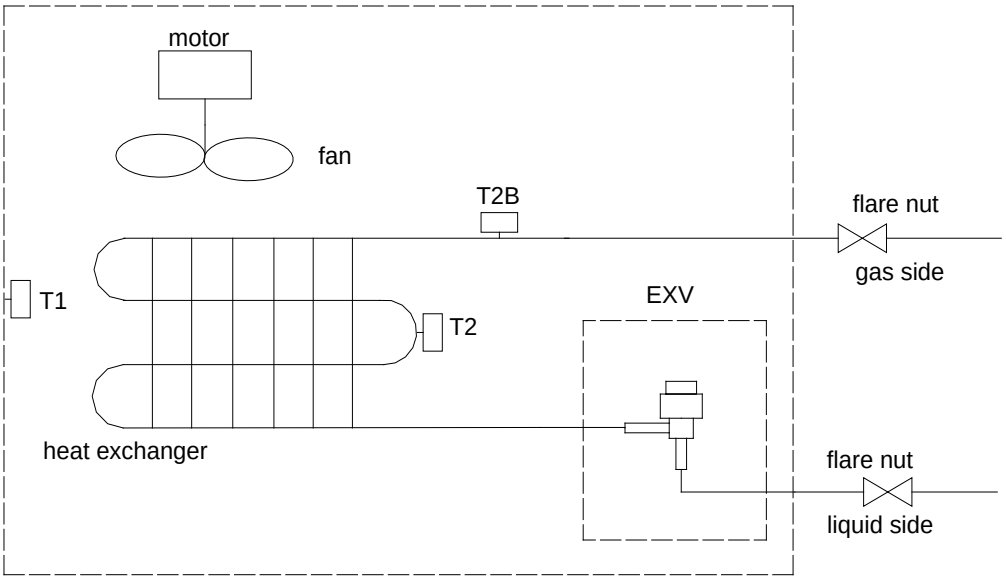


Table 3.1: One-way Cassette dimensions and space requirements

Model name	Dimensions / Requirements (mm)				
	A	B	C	D	E
BECW006Q2A-DWM018 BECW008Q2A-DWM022 BECW010Q2A-DWM028 BECW012Q2A-DWM036	1180	1380	153	3200	465
BECW015Q2A-DWM045 BECW019Q2A-DWM056 BECW024Q2A-DWM071	1350	1550	189	4000	505

4 Piping Diagram

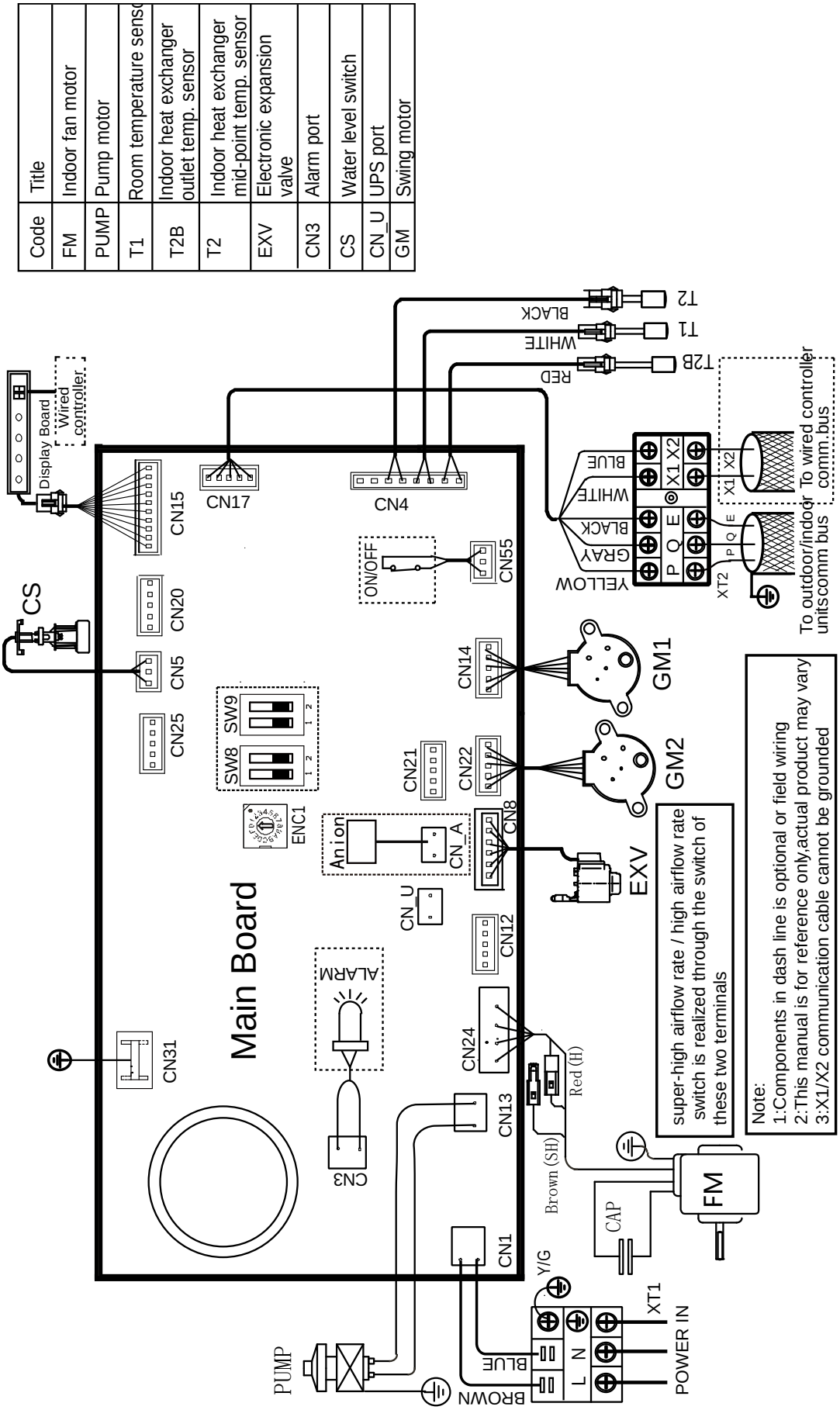
Figure 4.1: One-way Cassette piping diagram



Legend	
T1	Indoor ambient temperature sensor
T2	Indoor heat exchanger mid-point temperature sensor
T2B	Indoor heat exchanger outlet temperature sensor

5 Wiring Diagram

Figure 5.1: One-way Cassette wiring diagram



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.
- Switch ENC1 (indoor unit capacity setting) is factory-set and its setting should normally not be changed. The only circumstances in which a switch ENC1 might need to be set in the field is when replacing a main PCB. When replacing a main PCB, ensure that the capacity setting on switch ENC1 on the new PCB is consistent with the unit capacity given on the unit's nameplate.

6 Capacity Tables

6.1 Cooling Capacity Table

Table 6.1: One-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
BECW006Q2A-DWM018	1.6	1.6	1.7	1.6	1.8	1.6	1.8	1.5	1.9	1.5	1.9	1.4	2.0	1.4
BECW008Q2A-DWM022	2.0	2.0	2.1	1.9	2.2	1.9	2.2	1.8	2.3	1.8	2.3	1.7	2.4	1.7
BECW010Q2A-DWM02	2.5	2.4	2.7	2.5	2.8	2.4	2.8	2.3	2.9	2.3	2.9	2.1	3.0	2.1
BECW012Q2A-DWM036	3.2	3.1	3.4	3.1	3.6	3.1	3.6	3.0	3.7	2.9	3.8	2.8	3.9	2.7
BECW015Q2A-DWM045	4.0	3.9	4.3	3.9	4.5	3.9	4.5	3.7	4.6	3.6	4.7	3.4	4.8	3.3
BECW019Q2A-DWM056	5.0	4.9	5.3	4.8	5.6	4.8	5.6	4.6	5.7	4.5	5.8	4.3	6.0	4.1
BECW024Q2A-DWM071	6.3	6.0	6.7	6.0	7.0	6.0	7.1	5.8	7.2	5.7	7.4	5.4	7.6	5.2

Abbreviations:
TC: Total capacity (kW)
SC: Sensible capacity(kW)

Notes:
1.Shaded cells indicate rating condition

6.2 Heating Capacity Table

Table 6.2: One-way Cassette heating capacity

Model	Indoor air temperature (°C DB)					
	16	18	20	21	22	24
	TC	TC	TC	TC	TC	TC
BECW006Q2A-DWM018	2.4	2.4	2.2	2.1	2.1	1.9
BECW008Q2A-DWM022	2.8	2.8	2.6	2.5	2.4	2.3
BECW010Q2A-DWM028	3.4	3.4	3.2	3.1	3.0	2.8
BECW012Q2A-DWM036	4.2	4.2	4.0	3.8	3.8	3.5
BECW015Q2A-DWM045	5.3	5.3	5.0	4.8	4.7	4.4
BECW019Q2A-DWM056	6.7	6.6	6.3	6.1	5.9	5.5
BECW024Q2A-DWM071	8.5	8.4	8.0	7.8	7.5	7.0

Abbreviations:
TC: Total capacity (kW)

Notes:
1.Shaded cells indicate rating condition

7 Electrical Characteristics

Table 7.1: One-way Cassette electrical characteristics

Model	Power supply						Indoor fan motors	
	Hz	Volts	Min. volts	Max. volts	MCA	MFA	Rated motor output (kW)	FLA
BECW006Q2A-DWM018	60	220-240	198	264	0.2	15	0.04	0.16
BECW008Q2A-DWM022	60	220-240	198	264	0.2	15	0.04	0.16
BECW010Q2A-DWM028	60	220-240	198	264	0.3	15	0.04	0.24
BECW012Q2A-DWM036	60	220-240	198	264	0.3	15	0.04	0.24
BECW015Q2A-DWM045	60	220-240	198	264	0.3	15	0.05	0.24
BECW019Q2A-DWM056	60	220-240	198	264	0.3	15	0.06	0.24
BECW024Q2A-DWM071	60	220-240	198	264	0.4	15	0.08	0.32

Abbreviations:
MCA: Minimum Circuit Amps
MFA: Maximum Fuse Amps
FLA: Full Load Amps

8 Sound Levels

8.1 Overall

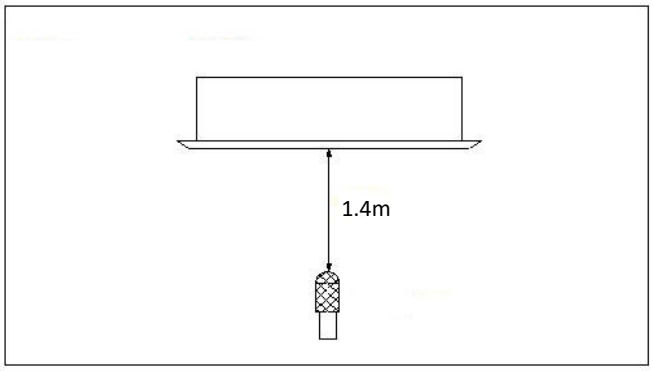
Table 8.1: One-way Cassette sound pressure levels[1]

Model name	Sound pressure levels dB(A)		
	H	M	L
BECW006Q2A-DWM018	37	34	30
BECW008Q2A-DWM022	37	34	30
BECW010Q2A-DWM028	38	34	30
BECW012Q2A-DWM036	38	34	30
BECW015Q2A-DWM045	41	39	35
BECW019Q2A-DWM056	42	40	36
BECW024Q2A-DWM071	44	41	37

Notes:

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

Figure 8.1: One-way Cassette sound pressure level measurement



8.2 Octave Band Levels

Figure 8.2: BECW06(08) octave band levels

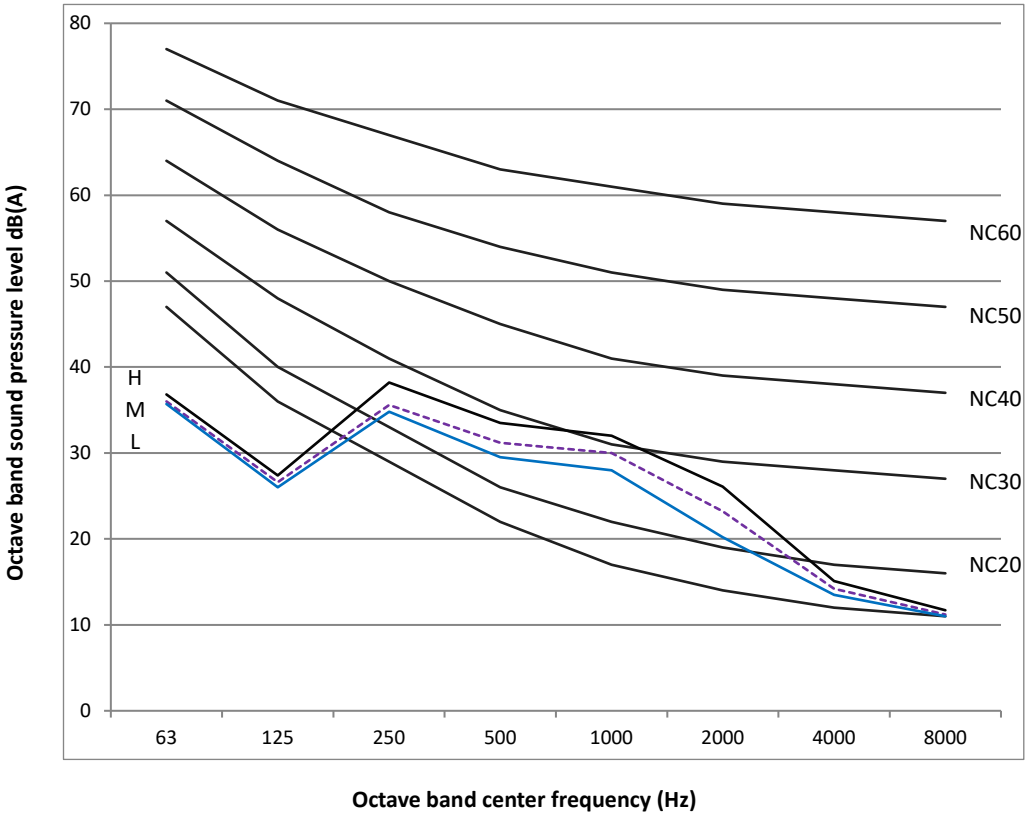


Figure 8.3: BECW010Q2A-DWM028 octave band levels

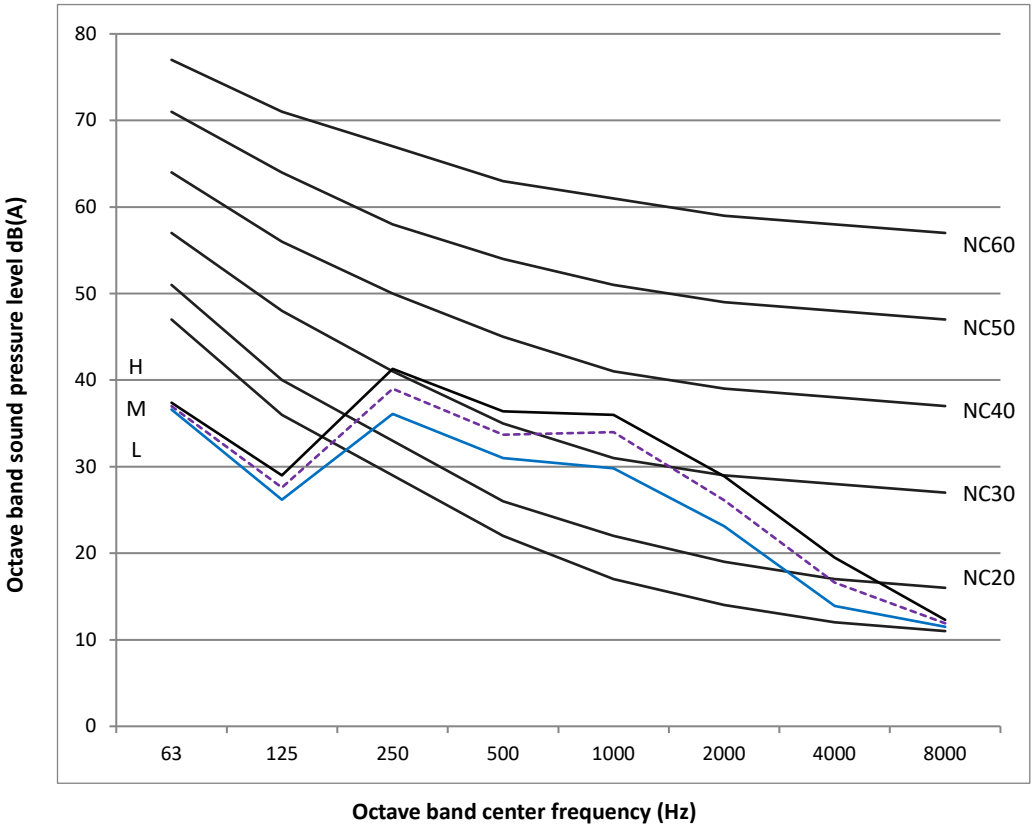


Figure 8.4: BECW015Q2A-DWM045 octave band levels

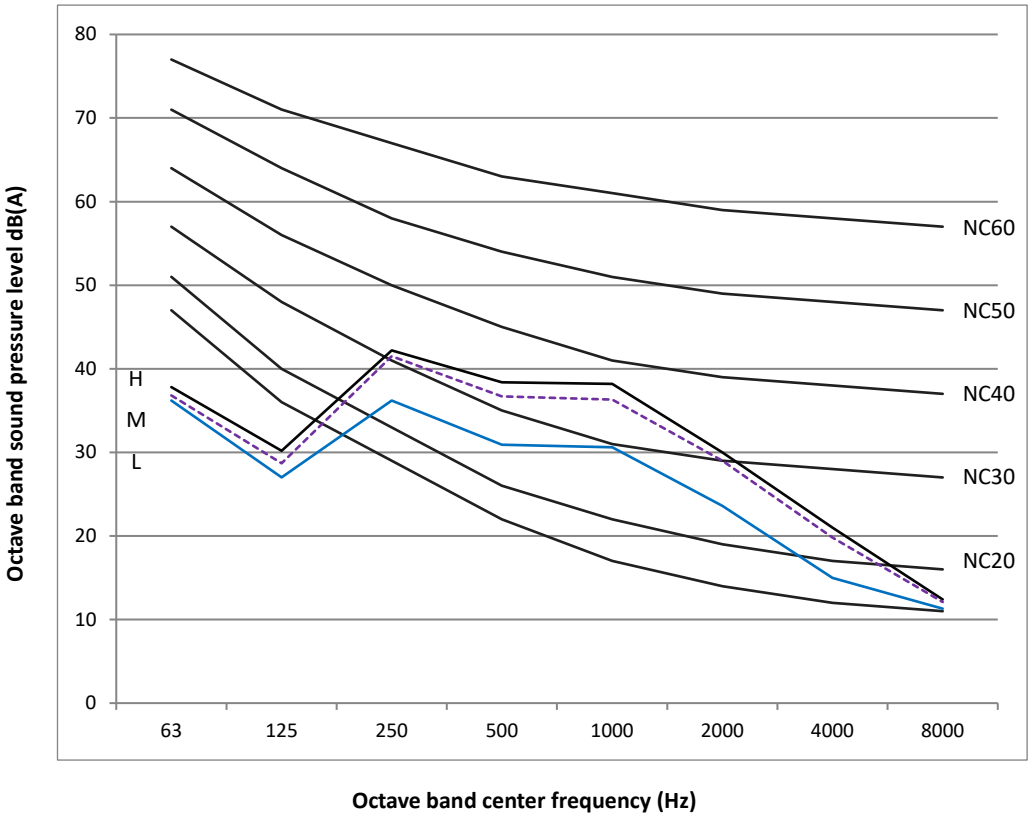


Figure 8.5: BECW019Q2A-DWM056 octave band levels

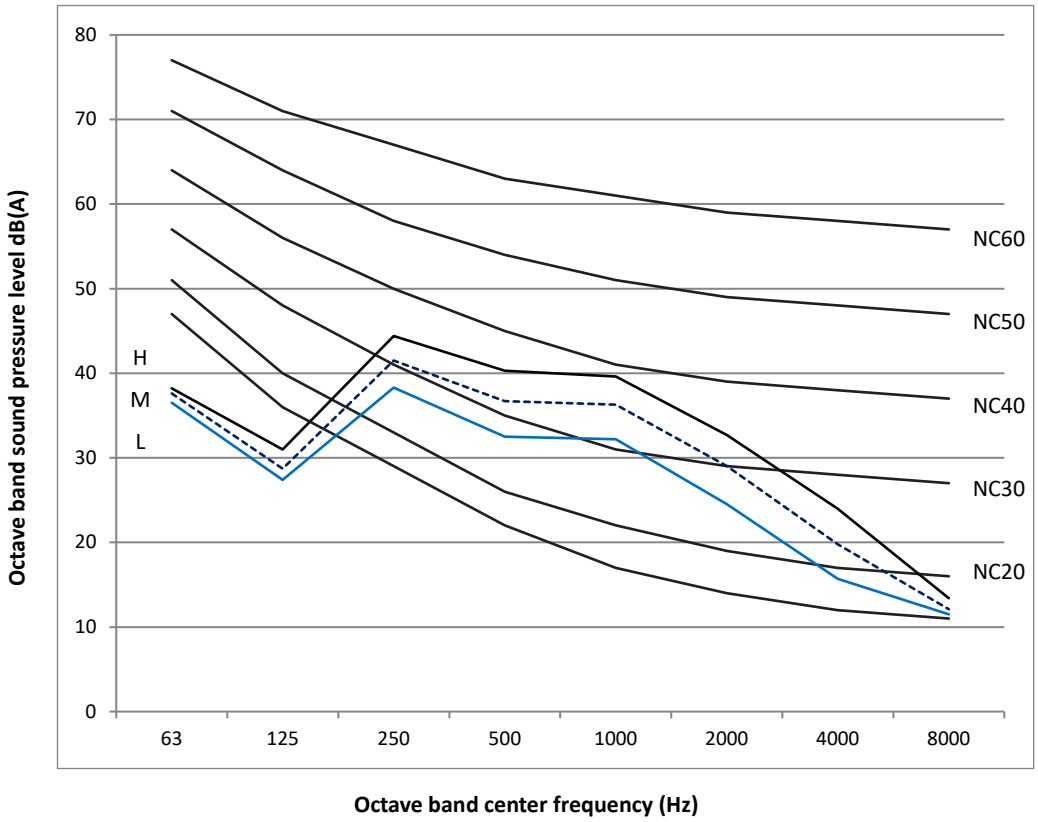
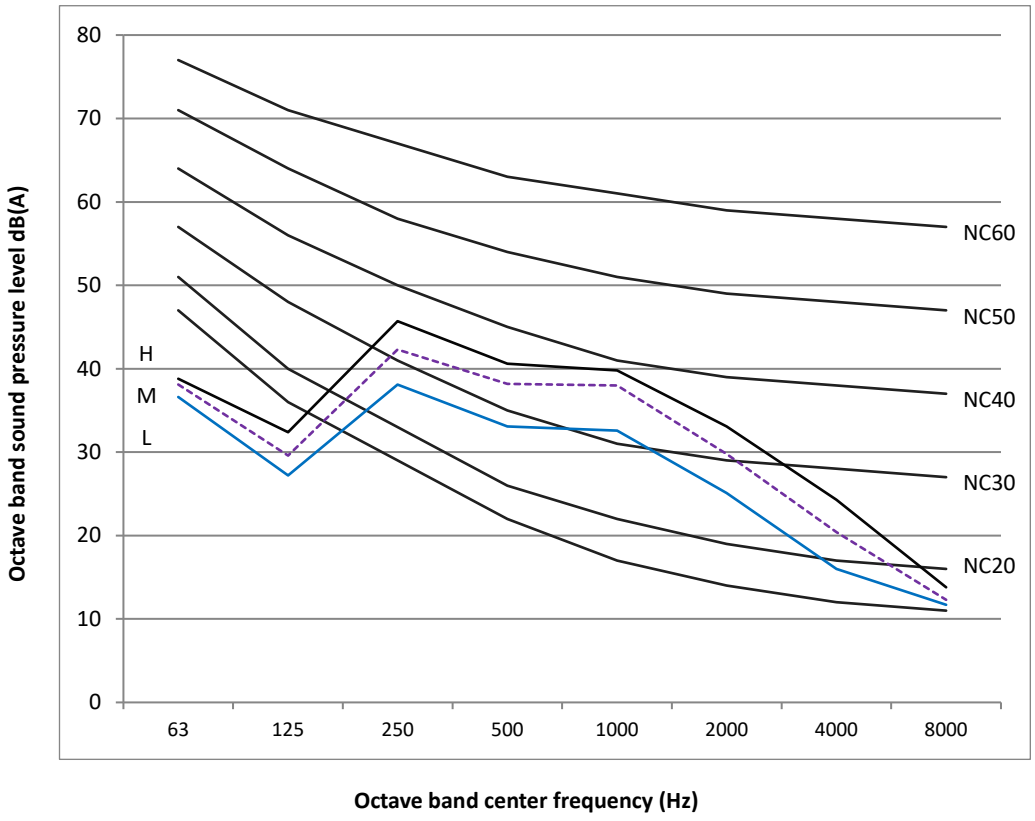


Figure 8.6: BECW024Q2A-DWM071 octave band levels



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