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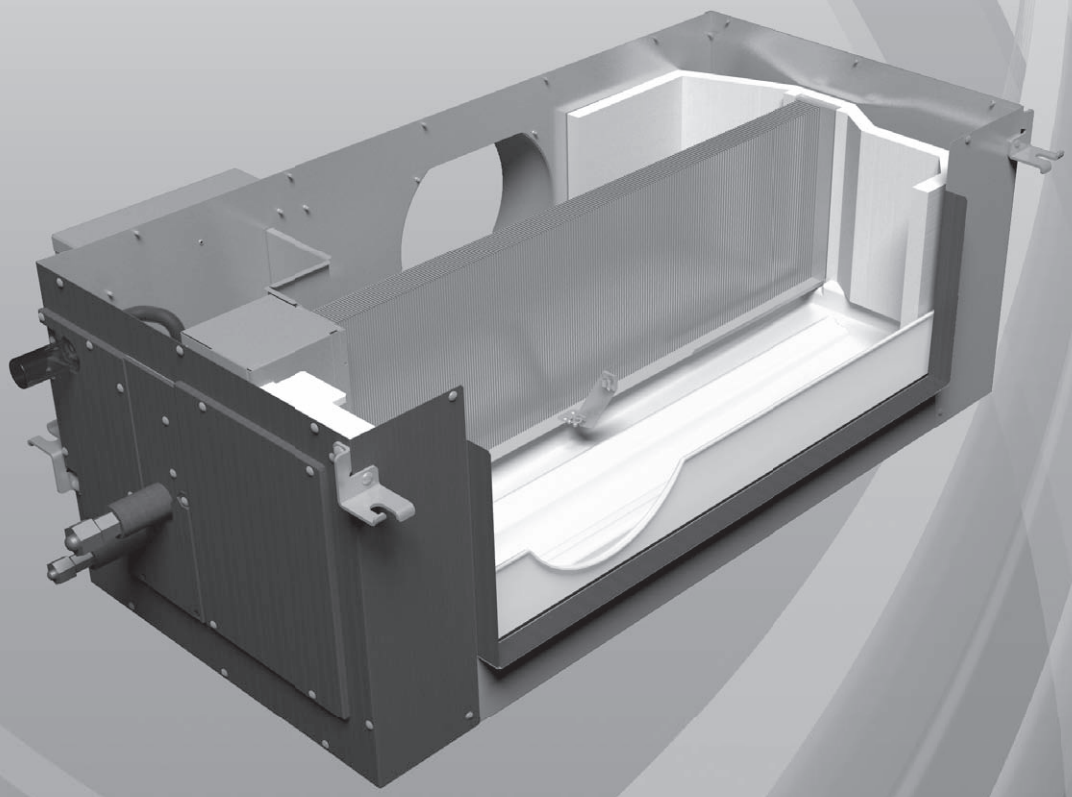
September. 2016

DIRECT EXPANSION COIL UNIT FOR LOSSNAY

TECHNICAL MANUAL

Model : GUG-01SL-E
GUG-02SL-E
GUG-03SL-E



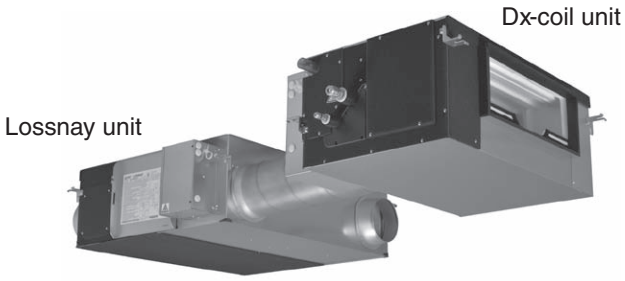
Lossnay Return Air and Supply Air Temperature Control

Now Possible!

— CONTENTS —

1. Basic function

Dx-coil (Direct Expansion Coil) unit is a kind of temperature control equipment working with Lossnay unit and Mr.Slim outdoor unit to control Return Air temperature or Supply Air temperature.

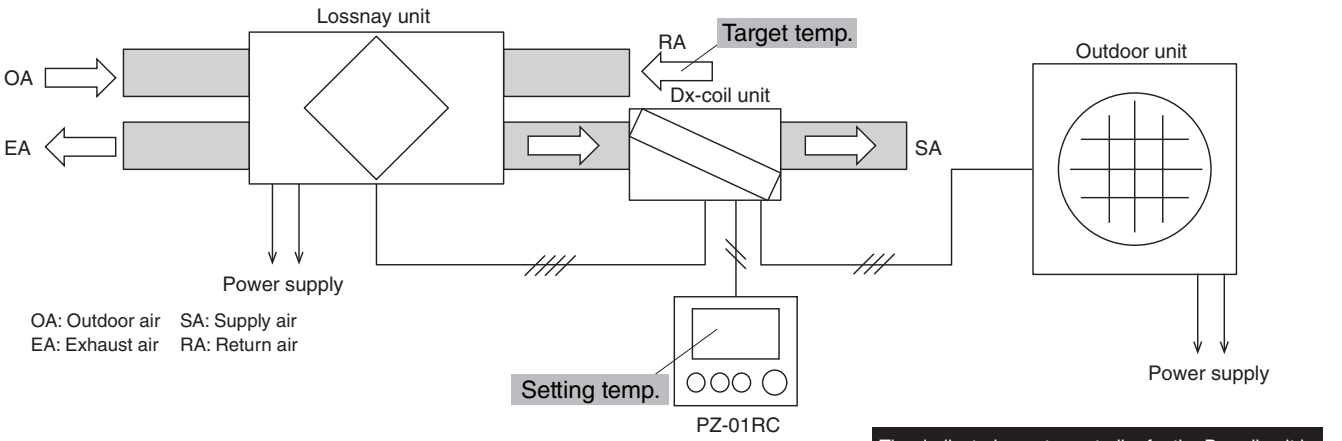


Connection image
This picture shows the system of LGH-100RVX-E and GUG-02SL-E as example.

2.Two temperature control method

2.1 RA (Return Air) temperature control

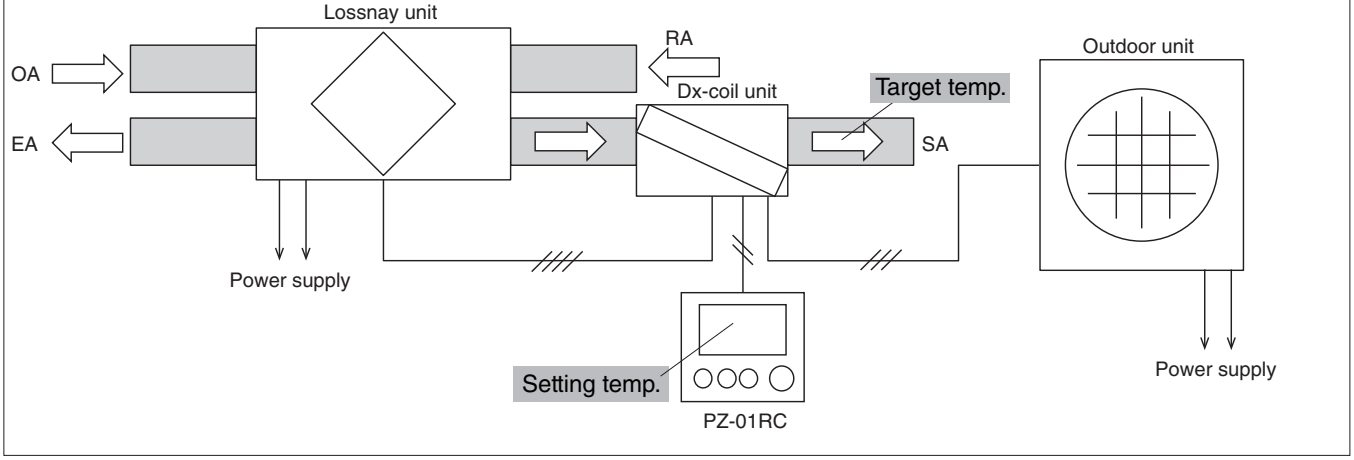
As same as air-conditioner, users set the target return air temperature on the remote controller and then Dx-coil unit will operate to heat up or cool down the room temperature.



The dedicated remote controller for the Dx-coil unit is described as “PZ-01RC” in this manual.
It is not an official model name.

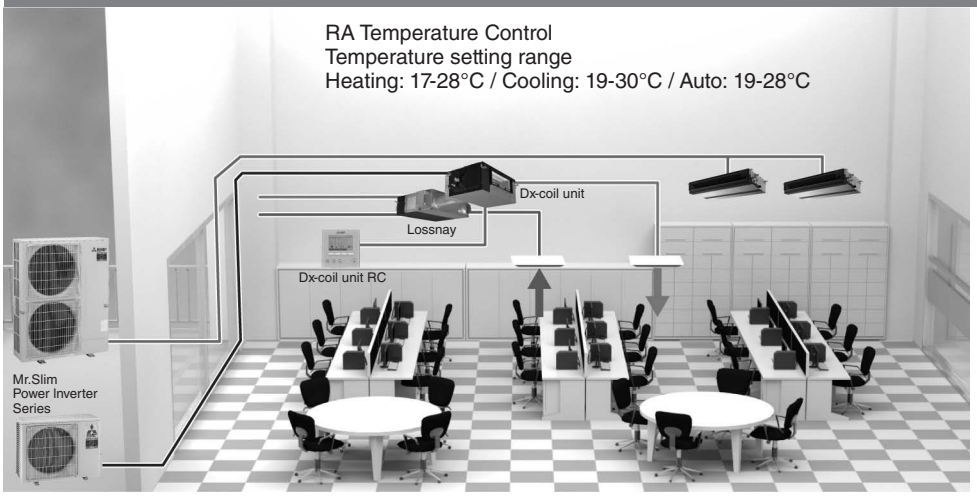
2.2 SA (Supply Air) temperature control

Users set the target supply air temperature on the remote controller and then Dx-coil unit will maintain the supply air temperature close to the setting temperature.



2.3 Application examples

Supplemental Air-conditioning System

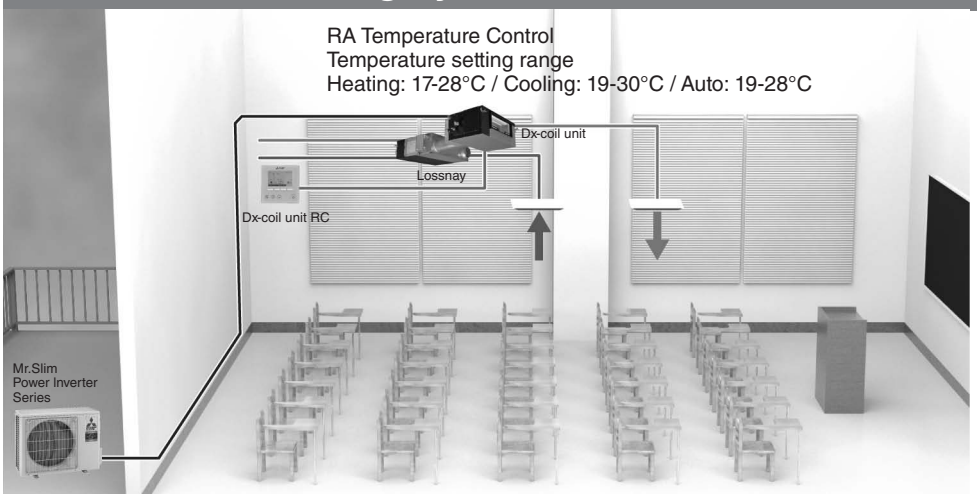


Supplemental air-conditioning systems that combine the use of Dx-coil and Lossnay units are now possible.

Necessary fresh air volume	Medium
Necessary Heating and Cooling capacity	Medium

Target Segment:

Main Air-conditioning System

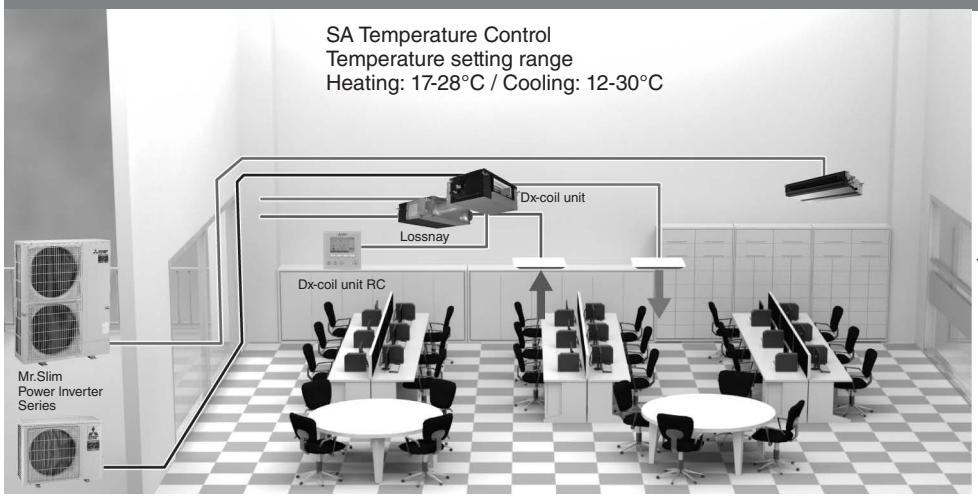


If the required heating and cooling capacity is not so high, a Dx-coil and Lossnay package solution is possible for air-conditioning and ventilation needs.

Necessary fresh air volume	Large
Necessary Heating and Cooling capacity	Small

Target Segment:

Outdoor Air Treatment



Controlling the temperature of outdoor-air supplied via the Dx-coil and Lossnay units simplifies air-conditioning design and control.

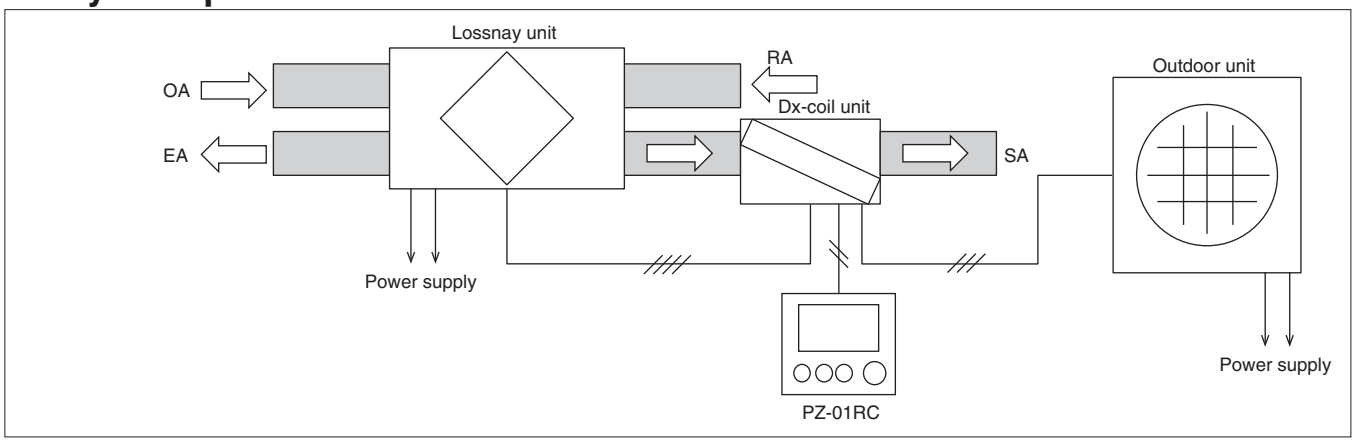
Necessary fresh air volume	Medium
Necessary Heating and Cooling capacity	Medium

Target Segment:

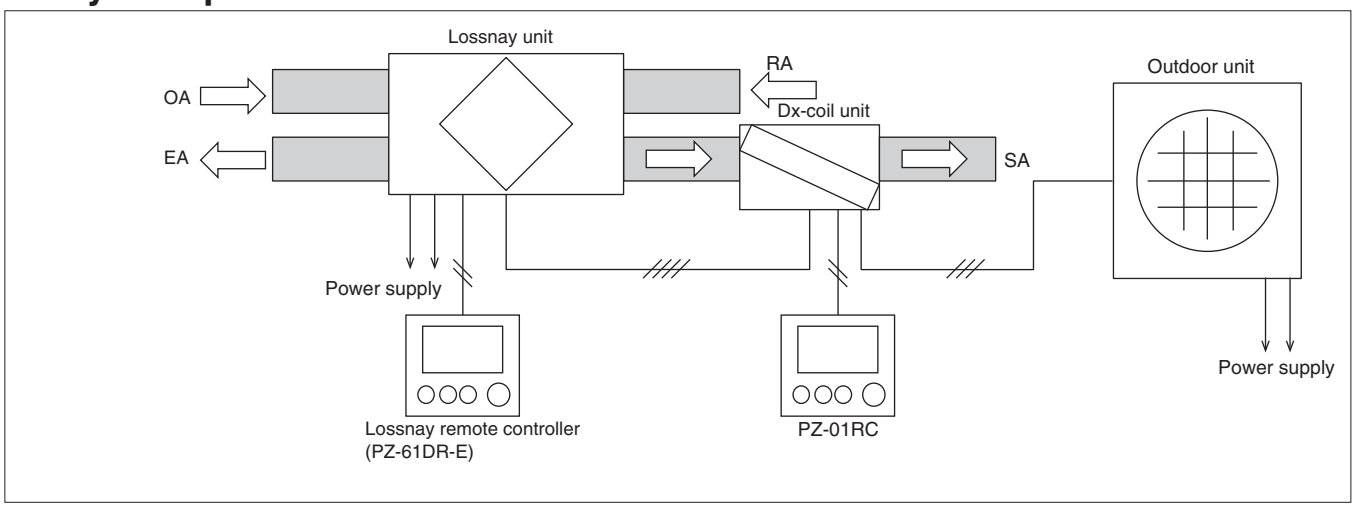
1. System pattern outline

The system of Lossnay unit and Dx-coil unit can be used as a few system patterns.
• System pattern X: One remote controller
• System pattern Y: Two remote controllers
• System pattern Z: M-NET connection
Depending on the pattern, the way to operate system, available functions, information can be monitored etc. are different. See the following figures and tables.

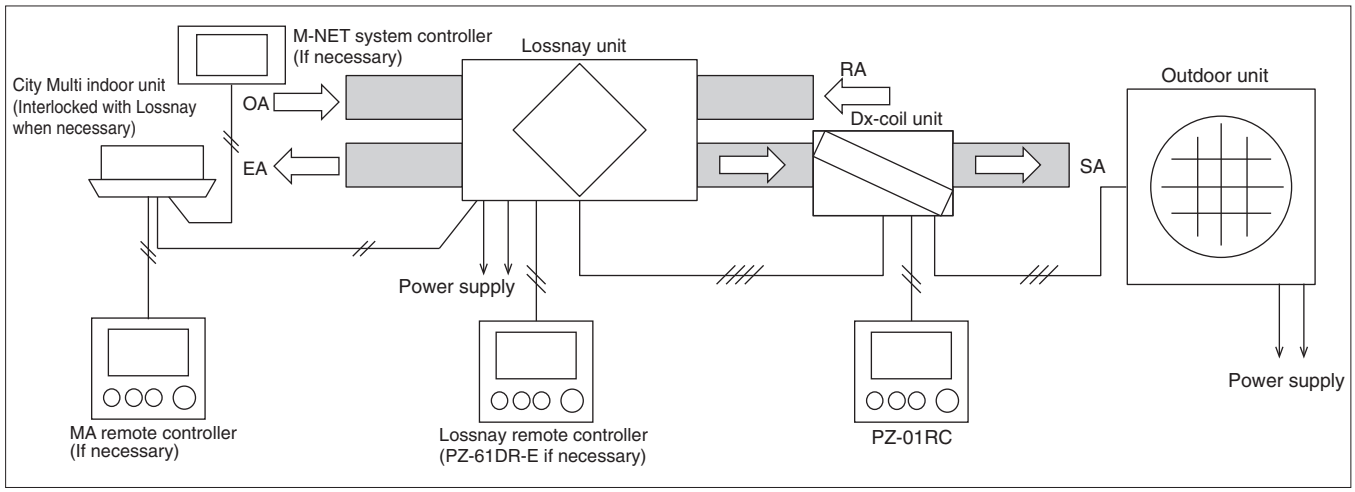
1.1 System pattern X: One remote controller



1.2 System pattern Y: Two remote controllers



1.3 System pattern Z: M-NET connection (Interlocked with City Multi indoor unit when necessary)



<CAUTION>
Dx-coil unit cannot be monitored nor operated from M-NET system controller.

1.4 Operation from each remote controller

	System pattern X	System pattern Y	System pattern Z
ON/OFF	From PZ-01RC	From PZ-01RC or PZ-61DR-E *1	From one of the remote controllers or when the indoor unit is switched ON/OFF *2
Operation mode [Heating/Cooling/Fan]	From PZ-01RC	From PZ-01RC	Only from PZ-01RC *3
Temp. setting	From PZ-01RC	From PZ-01RC	Only from PZ-01RC *3
Fan speed [FS1 / FS2 / FS3 / FS4]	Fixed at FS4 *4	Can be changed from PZ-61DR-E.	Can be changed from PZ-61DR-E, M-NET system controller or MA remote controller (for the indoor unit). The selectable fan speeds depend on the model of remote controller.
Ventilation mode [Heat recovery / Bypass / Auto]	Fixed at automatic mode *5	Can be changed from PZ-61DR-E.	Can be changed from PZ-61DR-E or M-NET system controller.
Remarks	-	-	Dx-coil unit cannot be monitored nor operated from M-NET system controller.*6

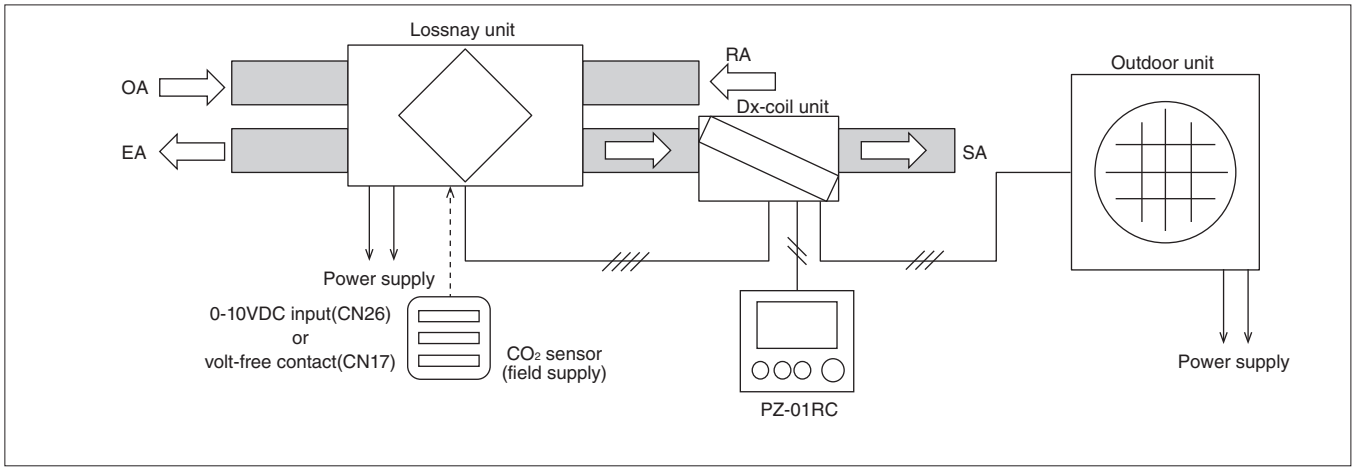
*1: When one of the two remote controllers is switched ON/OFF, the other remote controller switches ON/OFF synchronously.
*2: When one of the three remote controllers is switched ON/OFF, the other remote controllers switch ON/OFF synchronously.
Or when the indoor unit is switched ON/OFF, the system of the Lossnay unit and Dx-coil unit switches ON/OFF synchronously.
*3: Cannot be controlled by M-NET system controller nor MA remote controller of the indoor unit.
*4: Fan speeds can be changed by 0-10VDC input or a volt free contact and can be fixed at the fan speed 3 if necessary.
*5: The ventilation mode is set to the heat recovery mode during the heating and fan modes.
The ventilation mode can be set to the bypass ventilation mode by a volt-free contact if necessary.
*6: When Lossnay is interlocked with City Multi indoor unit, the target temperature information and the operation mode information from Dx-coil have a priority used for automatic ventilation mapping or Night-purge starting condition etc..

Basic operation	System pattern X	System pattern Y		Unit status	
	Dx-coil unit remote controller (PZ-01RC)	Lossnay unit remote controller (PZ-61DR-E)	Dx-coil unit remote controller (PZ-01RC)	Lossnay unit	Dx-coil unit
ON		 When one of the two remote controllers is switched ON, the other remote controller switches ON synchronously.		ON	ON
Heating Cooling Fan Auto		 Cannot be changed by PZ-61DR-E.	 Heating/Cooling/Fan/Auto	Ventilating	Heating and Cooling: Thermo-ON or thermo-OFF depending on temperature conditions Fan: Always thermo-OFF (ventilatio only) Auto: Only available at RA temp. control
Temperature setting		 Cannot be changed by PZ-61DR-E.			
Fan speed	Fixed at fan speed 4 (Fan speed can be changed by the external input to Lossnay and be fixed at fan speed 3 if necessary.)	 Fan speed 1, 2, 3 or 4	 Cannot be changed by PZ-01RC.	Operating at selected fan speed	When Lossnay unit goes to fan speed 1 or 2 during thermo-ON, Dx-coil unit becomes thermo-OFF forcibly.
Ventilation mode	Fixed at automatic mode (The ventilation mode is always the heat recovery mode during the heating and fan mode.)	 Heat recovery/Bypass/Auto	 Cannot be changed by PZ-01RC.	Operating at selected ventilation mode	The Dx-coil unit can be switched thermo-ON in any ventilation mode depending on temperature conditions.
OFF		 When one of the two remote controllers is switched OFF, the other remote controller switches OFF synchronously.		OFF	OFF

For system pattern Z, the functions that can be used depend on the model of remote controllers.

1.5 External fan speed control without Lossnay remote controller

When Lossnay remote controller (PZ-61DR-E) is not used in the system pattern X or Z, Lossnay fan speed can be controlled by external input like 0-10VDC (CN26) or volt-free contact (CN17).
Refer to the installation manual and the technical manual of Lossnay unit for more detailed information such as how to set, how to select.
The selection of Temp. priority mode or Fan speed priority mode can be set. Please refer to No.10 on page 25 and 26.



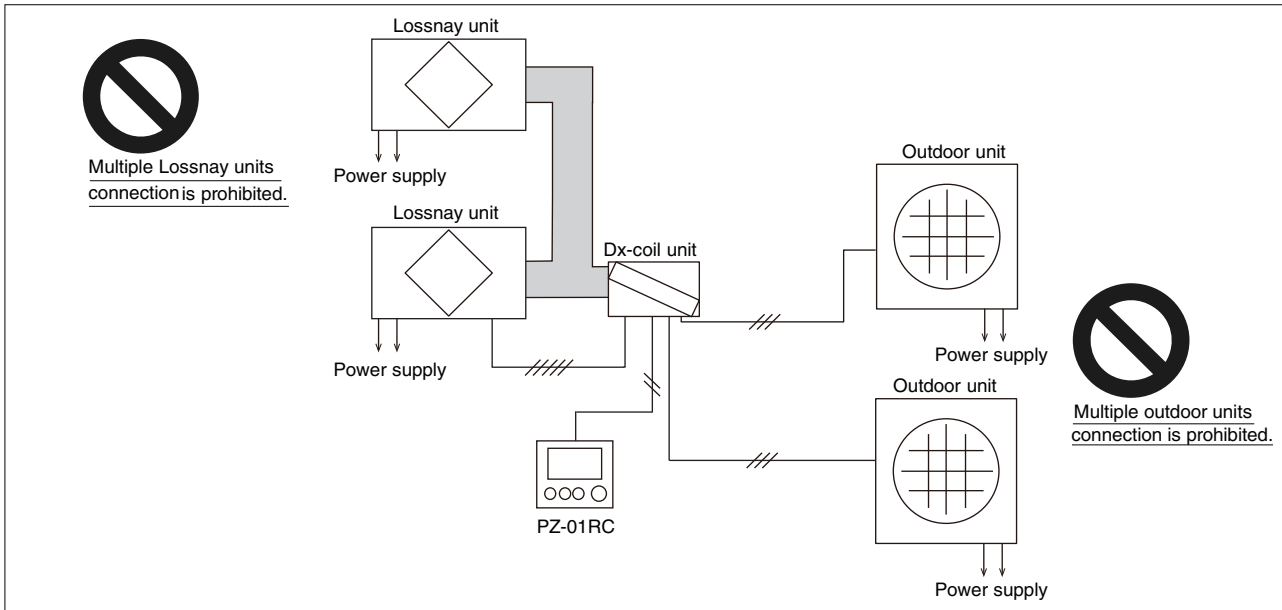
2. Technical notes

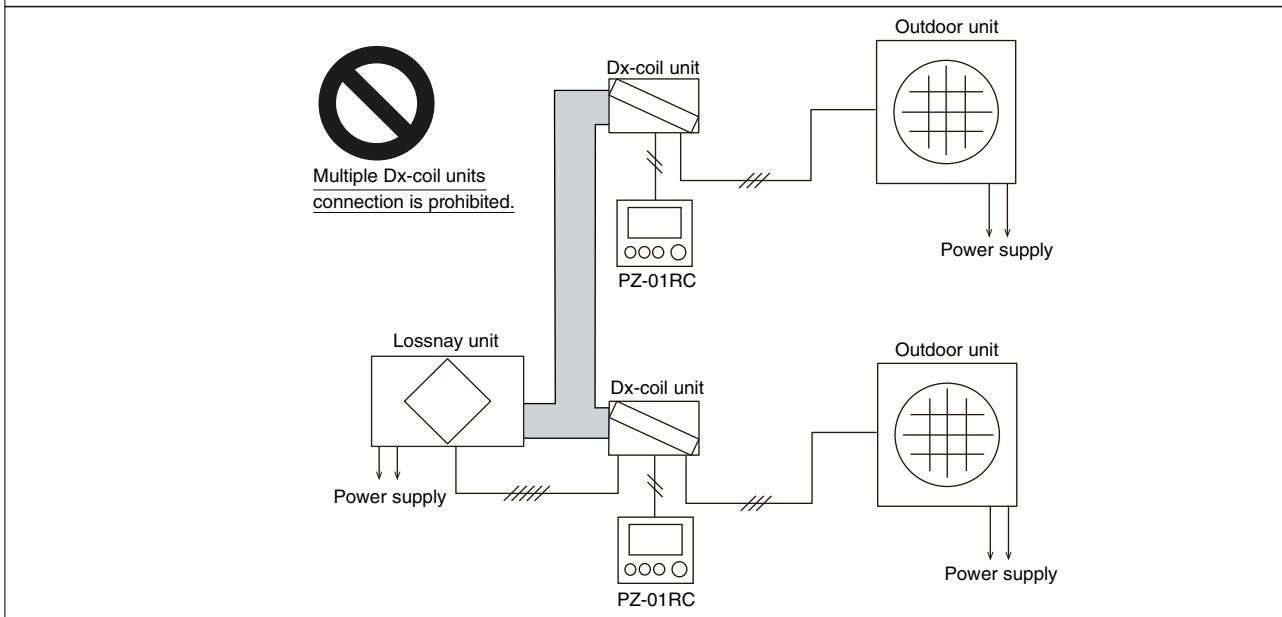
No.	Item	Contents
1	Fan speed 1 and 2	When Lossnay supply fan is the fan speed 1 or 2, Dx-coil unit always switches thermo-OFF.
2	Night purge	When Lossnay is in Night purge mode, Dx-coil unit always switches thermo-OFF and PZ-01RC is the same as the normal operation screen. PZ-61DR-E or AE-200E is required for the Night-purge function.
3	Heating stops when the OA temp. is 19 ˚C or higher	[GUG-03SL-E, SA temperature control and heating mode only] When the OA temperature is 19 ˚C or higher, Dx-coil unit switches thermo-OFF to protect the compressor of the outdoor unit.(This “OA temperature” is the detected temperature by outdoor unit. It is not the detected temperature by Lossnay unit.)
4	Intermittent operation	- When the OA temperature is between -10 ˚C and -15 ˚C, Lossnay oparates 60 minutes ON and 10 minutes OFF. During the ‘10 minutes OFF’, Dx-coil unit switches thermo-OFF. - When the OA temperature is lower than -15 ˚C, Lossnay operates 5 minutes ON and 55 minutes OFF. During the ‘5 minutes ON’, Dx-coil unit switches thermo-OFF.
5	Defrost and heating standby mode	During defrost and heating standby mode, Lossnay supply fan stops but exhaust fan continues to run as factory setting.
6	Error indication	During heating or cooling modes, PZ-01RC displays an error code on its screen. During fan mode, PZ-01RC changes to heating mode and displays an error code. If automatic change to heating mode is not required, please set the function No.7 to pattern B. Refer to page 24 for details.
7	Drain pump	The drain pump operates during cooling mode and operates for 6 minutes after Dx-coil unit stops. The drain pump will make a noise while operating.
8	One-to-one connection	For the system, the number of Lossnay unit, Dx-coil unit, PZ-01RC and outdoor unit must be one. Multiple-units connection is prohibited.
9	PZ-43SMF-E PZ-60DR-E	PZ-43SMF-E and PZ-60DR-E are prohibited to use in the system of Lossnay and the Dx-coil unit.
10	Interlocking with Mr. Slim indoor unit	Interlocking Mr. Slim indoor unit with Lossnay unit by using CN2L connector is prohibited.
11	One system in one group	If the system is on M-NET, only one system can be used within a group. Multiple systems in one group is prohibited. One system and Lossnay unit(s) in one group is also prohibited.
12	M-NET adapter	Do not use M-NET adapter for the outdoor unit.
13	Apportioned electricity charge function of AE-200E	Not available

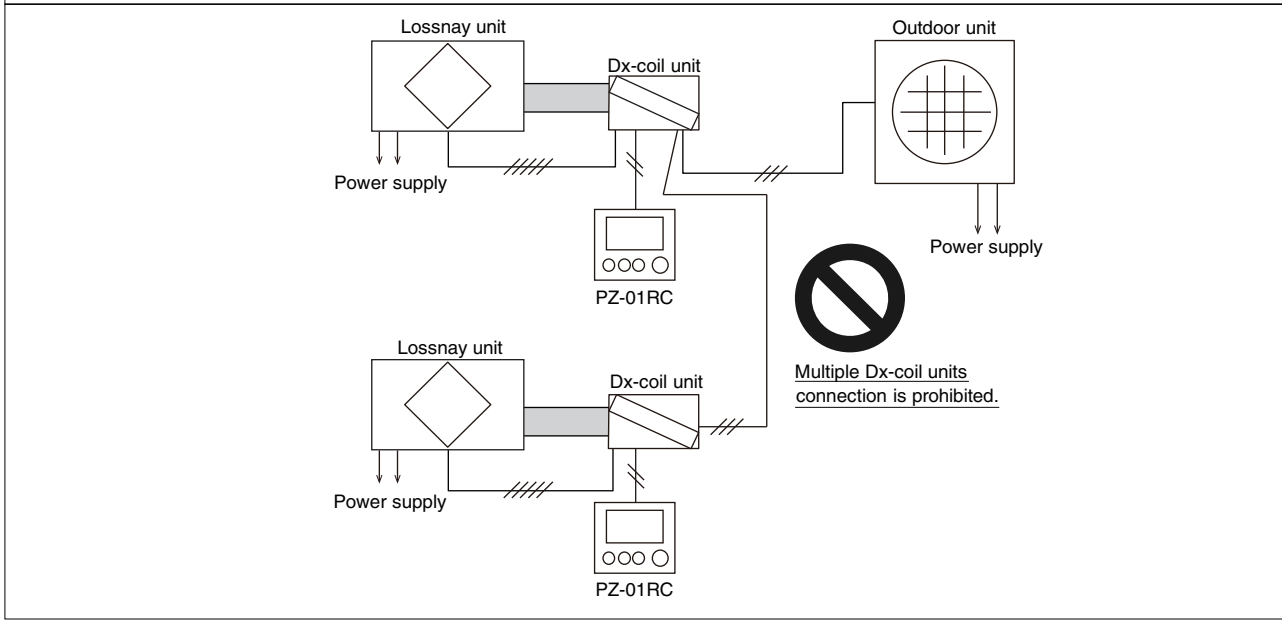
For the details of No.8, 9, 10, 11 and 12, see the following pages.

Prohibition for multiple connection.

Following configurations are bad examples. Do not construct systems same as below.

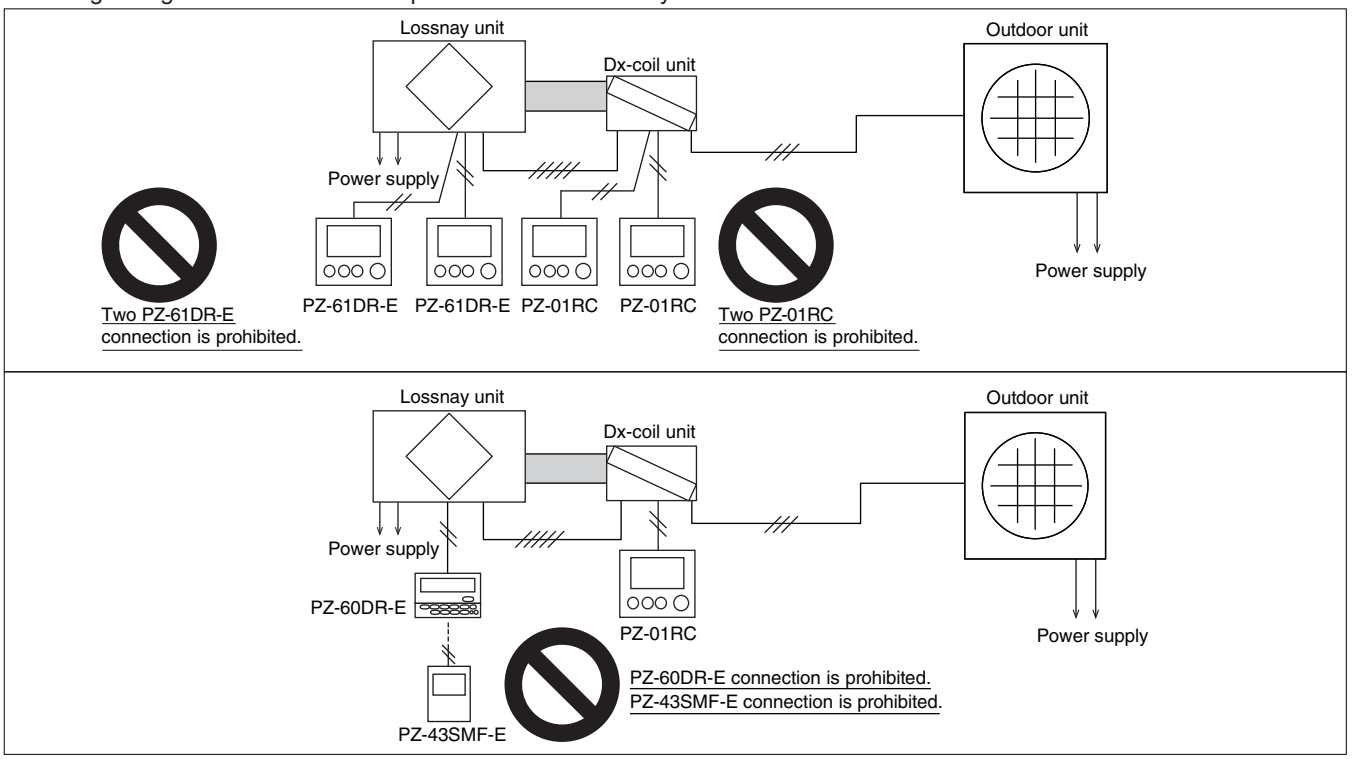




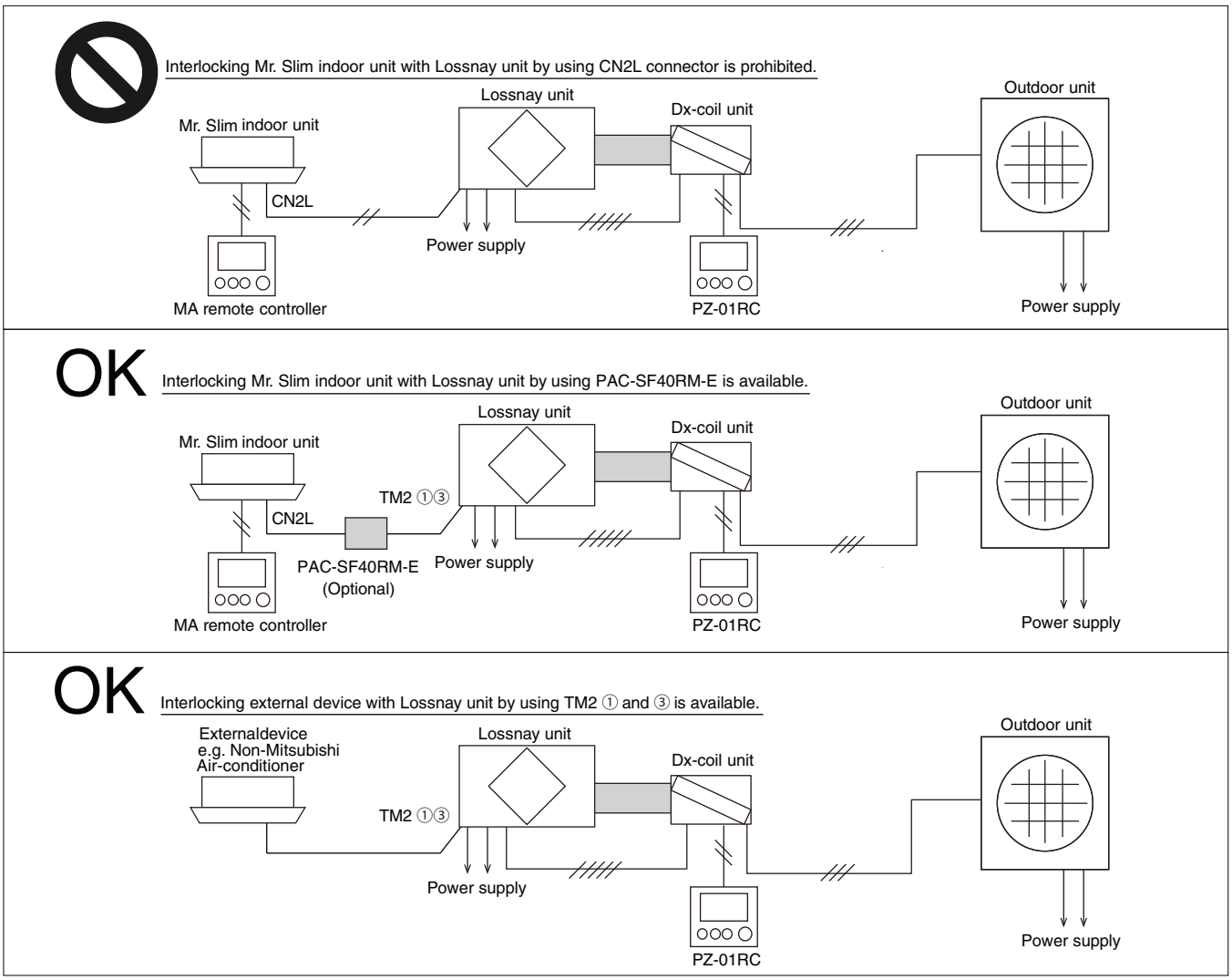


Prohibition for Lossnay remote controller.

Following configurations are bad examples. Do not construct systems same as below.



Prohibition for TM2 connection of Lossnay.

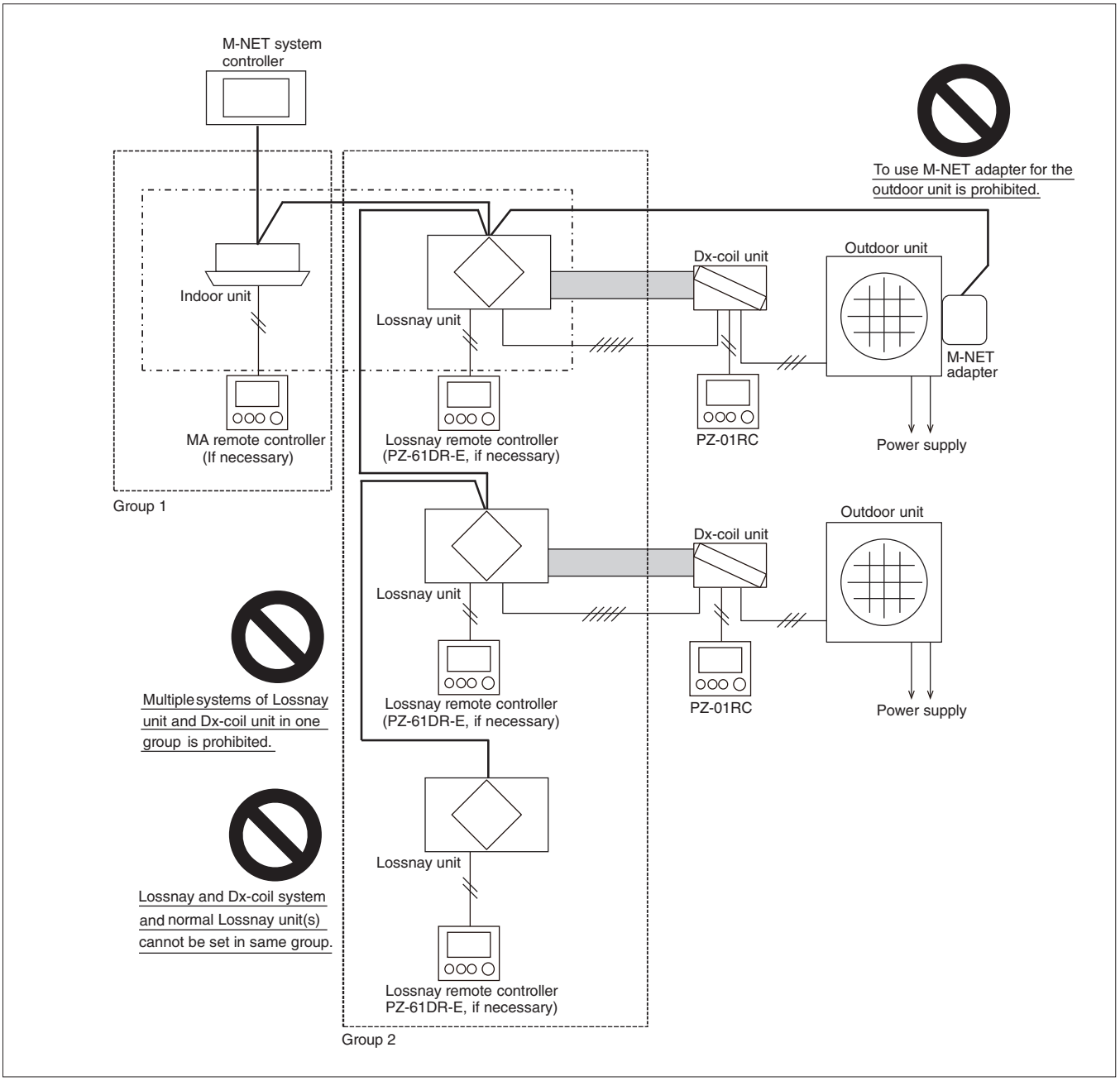


<CAUTION>
When interlocking with Mr.Slim or external device through TM2 ① and ③, there is a restriction to use “ON interlock mode”, “OFF interlock mode” and “External priority ON/OFF interlock mode” of Lossnay unit.

DIP-SW		PZ-61DR-E		Interlock setting	
SW No.	Setting	Function No.	Setting Data		
SW5-7 SW5-8	-	15	0 (Factory setting)	DIP-SW priority	
	5-7 OFF 5-8 OFF (Factory setting)		1	a) ON/OFF interlock mode	
	5-7 ON 5-8 OFF		2	b) ON interlock mode	Available only when PZ-61DR-E is connected or M-NET system controller is connected.
	5-7 OFF 5-8 ON		3	c) OFF interlock mode	
	5-7 ON 5-8 ON		4	d) External priority ON/ OFF interlock mode	Not available at anytime with Dx-coil unit.

Prohibition for M-NET system.

Following diagrams are bad examples. Do not construct systems same as below.



3. The conditions when Dx-coil unit is forcibly thermo-OFF

Under the conditions listed below, Dx-coil unit is always and forcibly thermo-OFF. Dx-coil unit cannot be thermo-ON for about 10 minutes after the condition is canceled.

- When the supply fan of Lossnay unit is stopping, fan speed 1 or fan speed 2.
- When the Lossnay unit is operating at Night-purge mode.
- When outdoor air temperature detected by a thermistor in Lossnay unit is less than -15˚C.
- When outdoor air temperature detected by a thermistor in Outdoor unit is more than 19˚C, if GUG-03SL-E is used at SA temperature control and heating mode.
- When the system (Lossnay unit, Dx-coil unit, Outdoor unit) has an error.

4. Water level sensor

The Dx-coil unit has a water sensor to detect the water level in the drain pan and has a drain pump to drain the condensation water during cooling mode.
If the drain pump cannot drain the water properly, the water level in the drain pan increases and the water sensor detects the water, and then finally an error occurs to avoid the water overflow.
During the error is occurring, the supply fan of Lossnay unit will continue to run at fan speed 2 or 1 to avoid that the water fly out from the product.

5. Drain pump operation

The drain pump becomes ON at the conditions listed below.

- When Dx-coil unit is cooling mode.
- When the water sensor is detecting the water.
- When the lead wire connector that should be connected CN10 of PCB B is disconnected.
- When the drain pump test run switch is ON.

The drain pump continues to run for six minutes after the condition is canceled except for the test run.

1. Operation range

	Lossnay	Dx-coil unit	PZ-01RC
Outdoor air	-15 ˚C to +40 ˚C *1	-	-
Return air *2	+40 ˚C, 80 %RH or less	-	-
Ambient the unit	0 ˚C to +40 ˚C, 80 %RH or less	0 ˚C to +40 ˚C, 80 %RH or less	0 ˚C to +40 ˚C

*1: -15 ˚C to -10 ˚C : Intermittent operation takes 60 min. for ON and 10 min. for OFF.
-15 ˚C or lower : Intermittent operation takes 55 min. for OFF and 5 min. for ON.
*2: Air conditioned room air.

Guaranteed operation ranges [Outdoor]	Outdoor unit	
	PUHZ-ZRP35 and 50	PUHZ-ZRP71, 100 and 125
Cooling *3	-15 ˚C to +46 ˚C	-15 ˚C to +46 ˚C
Heating	-11 ˚C to +21 ˚C	-20 ˚C to +21 ˚C

*3: The optional air protection guide is required where the ambient temperature is lower than -5 ˚C.

2. Connectable Lossnay unit and outdoor unit for each functions

Note:
Dx-coil unit is only connectable to the Lossnay unit manufactured later than June 2016. Serial number of Lossnay unit should be 16060001 or later.
The software version written in Lossnay PCB should be 05 or later.

[RA (Return Air) temperature control]

Dx-coil unit	GUG-01SL-E		GUG-02SL-E		GUG-03SL-E		
Connectable Lossnay	LGH-50RVX-E	LGH-65RVX-E	LGH-80RVX-E	LGH-100RVX-E	LGH-150RVX-E LGH-150RVXT-E	LGH-200RVX-E LGH-200RVXT-E	LGH-250RVXT-E
Connectable outdoor unit	PUHZ-ZRP35	PUHZ-ZRP35	PUHZ-ZRP50	PUHZ-ZRP71	PUHZ-ZRP100	PUHZ-ZRP100	PUHZ-ZRP125

[SA (Supply Air) temperature control]

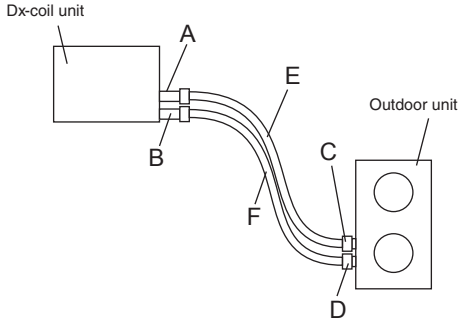
Dx-coil unit	GUG-02SL-E		GUG-03SL-E		
Connectable Lossnay	LGH-80RVX-E	LGH-100RVX-E	LGH-150RVX-E LGH-150RVXT-E	LGH-200RVX-E LGH-200RVXT-E	LGH-250RVXT-E
Connectable outdoor unit	PUHZ-ZRP50	PUHZ-ZRP50	PUHZ-ZRP71	PUHZ-ZRP71	PUHZ-ZRP71

Note:
GUG-01SL-E cannot be used for the SA temperature control function.

3. Refrigerant pipe size information

Dx-coil unit	-	GUG-01SL-E	GUG-02SL-E		GUG-03SL-E
Ref. pipe size of unit	A / B	6.35 / 12.7	9.52 / 15.88		9.52 / 15.88
Outdoor unit	-	PUHZ-ZRP35	PUHZ-ZRP50	PUHZ-ZRP71	PUHZ-ZRP71, 100, 125
Ref. pipe size of unit	C / D	6.35 / 12.7	6.35 / 12.7	9.52 / 15.88	9.52 / 15.88
Pipe size between Dx-coil unit and outdoor unit	E / F	6.35 / 12.7	6.35 / 12.7 *1	9.52 / 15.88	9.52 / 15.88

*1: To change the pipe size, PAC-SH30RJ and PAC-SH50RJ are needed to be installed at Dx-coil unit side.



4. Specifications

GUG-01SL-E (connection to LGH-50RVX-E or LGH-65RVX-E)

Refrigerant		R410A							
Electrical power supply		220-240V / 50Hz, 220V / 60Hz (Supplied from outdoor unit)							
Input power		Heating / Fan: 2.5W, Cooling: 12.4W							
Running current		Less than 0.1A							
Weight		21kg *Accessories: Approx. 1kg							
Function		Heating / Cooling / Auto / Fan							
		RA (Return Air) temperature control							
RA (Return Air) temperature control									
Connectable Lossnay unit		LGH-50RVX-E				LGH-65RVX-E			
Capacity [kW]	Heating	6.5 (2.4 + 4.1)				7.7 (3.2 + 4.5)			
	Cooling	5.6 (2.0 + 3.6)				6.6 (2.6 + 4.0)			
SHF		0.66				0.69			
Performance index	Heating	4.09				4.72			
	Cooling	4.69				5.03			
Air flow range at SP3 and SP4		350 - 695 m^3/h				350 - 900 m^3/h			
Connectable outdoor unit		PUHZ-ZRP35				PUHZ-ZRP35			
Ext. piping		Diameter Liquid / Gas: 6.35 / 12.7				Diameter Liquid / Gas: 6.35 / 12.7			
		Maximum length: 50m, Maximum height: 30m				Maximum length: 50m, Maximum height: 30m			
Ventilation specifications									
Fan speed		SP4	SP3	SP2	SP1	SP4	SP3	SP2	SP1
Air volume	[m^3/h]	500	375	250	125	650	488	325	163
	[L/s]	139	104	69	35	181	135	90	45
External static pressure [Pa]		105	59	26	7	95	53	24	6

GUG-02SL-E (Connection to LGH-80RVX-E or LGH-100RVX-E)

Refrigerant		R410A							
Electrical power supply		220-240V / 50Hz, 220V / 60Hz (Supplied from outdoor unit)							
Input power		Heating / Fan: 2.5W, Cooling: 12.4W							
Running current		Less than 0.1A							
Weight		26kg *Accessories: Approx. 1kg							
Function		Heating / Cooling / Auto / Fan *Auto is only available for RA temperature control							
		RA (Return Air) temperature control / SA (Supply Air) temperature control [Must be set at initial setting and not possible to change from remote controller]							
RA (Return Air) temperature control									
Connectable Lossnay unit		LGH-80RVX-E				LGH-100RVX-E			
Capacity [kW]	Heating	10.0 (4.0 + 6.0)				13.2 (5.1 + 8.1)			
	Cooling	8.3 (3.3 + 5.0)				11.3 (4.2 + 7.1)			
SHF		0.69				0.66			
Performance index	Heating	4.62				4.42			
	Cooling	4.76				4.98			
Air flow range at SP3 and SP4		560 - 1200 m^3/h				700 - 1200 m^3/h			
Connectable outdoor unit		PUHZ-ZRP50				PUHZ-ZRP71			
Ext. piping		Diameter Liquid / Gas: 6.35 / 12.7				Diameter Liquid / Gas: 9.52 / 15.88			
		Maximum length: 50m, Maximum height: 30m				Maximum length: 50m, Maximum height: 30m			
Required optional parts		PAC-SH30RJ-E and PAC-SH50RJ-E				-			
SA (Supply Air) temperature control									
Connectable Lossnay unit		LGH-80RVX-E				LGH-100RVX-E			
Capacity [kW]	Heating	10.0 (4.0 + 6.0)				11.4 (5.1 + 6.3)			
	Cooling	8.3 (3.3 + 5.0)				9.5 (4.2 + 5.3)			
SHF		0.69				0.73			
Performance index	Heating	4.62				5.09			
	Cooling	4.76				5.43			
Air flow range at SP3 and SP4		560 - 1200 m^3/h				700 - 1200 m^3/h			
Connectable outdoor unit		PUHZ-ZRP50				PUHZ-ZRP50			
Ext. piping		Diameter Liquid / Gas: 6.35 / 12.7				Diameter Liquid / Gas: 6.35 / 12.7			
		Maximum length: 50m, Maximum height: 30m				Maximum length: 50m, Maximum height: 30m			
Required optional parts		PAC-SH30RJ-E and PAC-SH50RJ-E				PAC-SH30RJ-E and PAC-SH50RJ-E			
Ventilation specifications									
Connectable Lossnay unit		LGH-80RVX-E				LGH-100RVX-E			
Fan speed		SP4	SP3	SP2	SP1	SP4	SP3	SP2	SP1
Air Volume	[m^3/h]	800	600	400	200	1,000	750	500	250
	[L/s]	222	167	111	56	278	208	139	69
External static pressure [Pa]		130	73	33	8	130	73	33	8

GUG-03SL-E (Connection to LGH-150RVX-E or LGH-200RVX-E)

Refrigerant		R410A						
Electrical power supply		220-240V / 50Hz, 220V / 60Hz (Supplied from outdoor unit)						
Input power		Heating / Fan: 2.5W, Cooling: 12.4W						
Running current		Less than 0.1A						
Weight		28kg *Accessories: Approx. 1kg						
Function		Heating / Cooling / Auto / Fan *Auto is only available for RA temperature control						
		RA (Return Air) temperature control / SA (Supply Air) temperature control [Must be set at initial setting and not possible to change from remote controller]						
RA (Return Air) temperature control								
Connectable Lossnay unit		LGH-150RVX-E				LGH-200RVX-E		
Capacity [kW]	Heating	20.7 (7.7 + 13.0)				23.8 (10.3 + 13.5)		
	Cooling	15.8 (6.3 + 9.5)				18.4 (8.4 + 10.0)		
SHF		0.68				0.76		
Performance index	Heating	4.24				5.02		
	Cooling	5.27				5.86		
Air flow range at SP3 and SP4		1050 - 2250 m^3/h				1050 - 2600 m^3/h		
Connectable outdoor unit		PUHZ-ZRP100				PUHZ-ZRP100		
Ext. piping		Diameter Liquid / Gas: 9.52 / 15.88				Diameter Liquid / Gas: 9.52 / 15.88		
		Maximum length: 75m, Maximum height: 30m				Maximum length: 75m, Maximum height: 30m		
SA (Supply Air) temperature control								
Connectable Lossnay unit		LGH-150RVX-E				LGH-200RVX-E		
Capacity [kW]	Heating	16.6 (7.7 + 8.9)				19.5 (10.3 + 9.2)		
	Cooling	13.4 (6.3 + 7.1)				15.9 (8.5 + 7.4)		
SHF		0.85				0.90		
Performance index	Heating	5.46				6.30		
	Cooling	5.32				5.85		
Air flow range at SP3 and SP4		1050 - 2250 m^3/h				1050 - 2600 m^3/h		
Connectable outdoor unit		PUHZ-ZRP71				PUHZ-ZRP71		
Ext. piping		Diameter Liquid / Gas: 9.52 / 15.88				Diameter Liquid / Gas: 9.52 / 15.88		
		Maximum length: 50m, Maximum height: 30m				Maximum length: 50m, Maximum height: 30m		
Ventilation specifications								
Connectable Lossnay unit		LGH-150RVX-E				LGH-200RVX-E		
Fan speed		SP4	SP3	SP2	SP1	SP4	SP3	SP2	SP1
Air Volume	[m^3/h]	1,500	1,125	750	375	2,000	1,500	1,000	500
	[L/s]	417	313	208	104	556	417	278	139
External static pressure [Pa]		150	84	38	9	105	59	26	7

GUG-03SL-E (Connection to LGH-150RVXT-E, LGH-200RVXT-E or LGH-250RVXT-E)

Refrigerant		R410A											
Electrical power supply		220-240V / 50Hz, 220V / 60Hz (Supplied from outdoor unit)											
Input power		Heating / Fan: 2.5W, Cooling: 12.4W											
Running current		Less than 0.1A											
Weight		28kg *Accessories: Approx. 1kg											
Function		Heating / Cooling / Auto / Fan *Auto is only available for RA temperature control											
		RA (Return Air) temperature control / SA (Supply Air) temperature control [Must be set at initial setting and not possible to change from remote controller]											
RA (Return Air) temperature control													
Connectable Lossnay unit		LGH-150RVXT-E				LGH-200RVXT-E				LGH-250RVXT-E			
Capacity [kW]	Heating	20.4 (7.4 + 13.0)				23.8 (10.3 + 13.5)				26.1 (12.1 + 14.0)			
	Cooling	15.7 (6.2 + 9.5)				18.4 (8.4 + 10.0)				22.3 (9.8 + 12.5)			
SHF		0.68				0.76				0.87			
Performance index	Heating	4.07				4.86				4.75			
	Cooling	5.03				5.59				4.59			
Air flow range at SP3 and SP4		1050 - 2250 m^3/h				1050 - 2600 m^3/h				1750 - 2880 m^3/h			
Connectable outdoor unit		PUHZ-ZRP100				PUHZ-ZRP100				PUHZ-ZRP125			
Ext. piping		Diameter Liquid / Gas: 9.52 / 15.88				Diameter Liquid / Gas: 9.52 / 15.88				Diameter Liquid / Gas: 9.52 / 15.88			
		Maximum length: 75m, Maximum height: 30m				Maximum length: 75m, Maximum height: 30m				Maximum length: 75m, Maximum height: 30m			
SA (Supply Air) temperature control													
Connectable Lossnay unit		LGH-150RVXT-E				LGH-200RVXT-E				LGH-250RVXT-E			
Capacity [kW]	Heating	16.3 (7.4 + 8.9)				19.5 (10.3 + 9.2)				21.6 (12.1 + 9.5)			
	Cooling	13.3 (6.2 + 7.1)				15.9 (8.5 + 7.4)				17.6 (9.8 + 7.8)			
SHF		0.86				0.90				0.95			
Performance index	Heating	5.16				6.01				5.97			
	Cooling	5.03				5.54				5.31			
Air flow range at SP3 and SP4		1050 - 2250 m^3/h				1050 - 2600 m^3/h				1000 - 2600 m^3/h			
Connectable outdoor unit		PUHZ-ZRP71				PUHZ-ZRP71				PUHZ-ZRP71			
Ext. piping		Diameter Liquid / Gas: 9.52 / 15.88				Diameter Liquid / Gas: 9.52 / 15.88				Diameter Liquid / Gas: 9.52 / 15.88			
		Maximum length: 50m, Maximum height: 30m				Maximum length: 50m, Maximum height: 30m				Maximum length: 50m, Maximum height: 30m			
Ventilation specifications													
Connectable Lossnay unit		LGH-150RVXT-E				LGH-200RVXT-E				LGH-250RVXT-E			
Fan speed		SP4	SP3	SP2	SP1	SP4	SP3	SP2	SP1	SP4	SP3	SP2	SP1
Air Volume	[m^3/h]	1,500	1,125	750	375	2,000	1,500	1,000	500	2,500	1,875	1,250	625
	[L/s]	417	313	208	104	556	417	278	139	694	521	347	174
External static pressure [Pa]		150	84	38	9	145	82	36	9	140	79	35	9

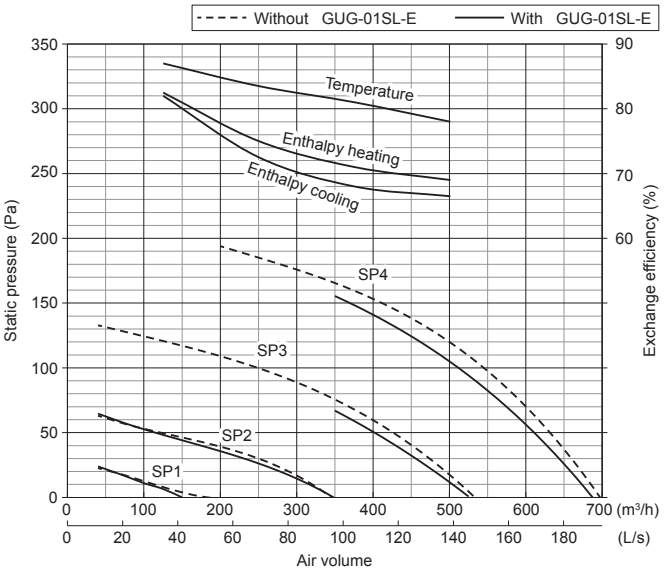
Attention

1. The running current and input power are based on 230V/50Hz.
2. The cooling and heating capacities are based on the air conditions listed below and the rated airflow of fan speed 4.
   Cooling Indoor: 27°CDB/19°CWB Outdoor: 35°CDB/24°CWB
   Heating Indoor: 20°CDB/15°CWB Outdoor: 7°CDB/6°CWB
3. The first figure in ( ) of the capacity specification is the heat recovery energy of the Lossnay unit. The second figure is the capacity specification for the Dx-coil connected to the outdoor unit.
4. "Performance index" is the calculated value at the temperature conditions above and is reference purpose only.
   Performance index = Total capacity ÷ total power consumption of outdoor unit and Lossnay unit
5. The external static pressure listed above includes the static pressure loss of the Dx-coil unit when using a 50cm straight duct between the Lossnay and Dx-coil units. When the duct work between the Lossnay and Dx-coil units is longer and/or bent, the pressure loss of the duct work should be included in the pressure loss calculation.
6. The designed airflow of the system (Lossnay, Dx-coil and duct work) at fan speed 3 and 4 should be kept within "Airflow range at SP3 and SP4" listed above. This range is shown as the solid line in graphs of the characteristics curve.
   If the Lossnay airflow is out of this range, the compressor of the outdoor unit may stop for self-protection purposes.
7. By installing the Dx-coil unit with a Lossnay unit, the air blow noise level is quieter at fan speed 4 as shown below.
   LGH-50RVX-E: about 4dB quieter, LGH-65RVX-E: about 7dB quieter
   LGH-80RVX-E: about 6dB quieter, LGH-100RVX-E: about 7dB quieter
   LGH-150,200RVX-E: about 3dB quieter
   LGH-150,200RVXT-E: about 3dB quieter, LGH-250RVXT-E: about 4dB quieter
8. Refrigerant leakage contributes to climate change. Refrigerant with lower global warming potential (GWP) would contribute less to global warming than a refrigerant with higher GWP, if leaked to the atmosphere.
   This appliance contains a refrigerant fluid with a GWP equal to 1975. This means that if 1kg of this refrigerant fluid would be leaked to the atmosphere, the impact on global warming would be 1975 times higher than 1kg of CO_2, over a period of 100 years. Never try to interfere with the refrigerant circuit yourself or disassemble the product yourself and always ask a professional.
9. On-site measurements by pitot tube method could be as much 20% difference from JIS test room conditions. If the measuring point is close to sources of turbulence like bends, contractions and dampers etc., it is difficult to measure air volume correctly. A straight duct length more than 10D (D=duct diameter or equivalent) from the source of turbulence is recommended for correct measurement.
   On-site measurement should therefore be measured in accordance with BSRIA guideline (Commissioning Air Systems. Application procedures for buildings AG3/89.3(2001)).

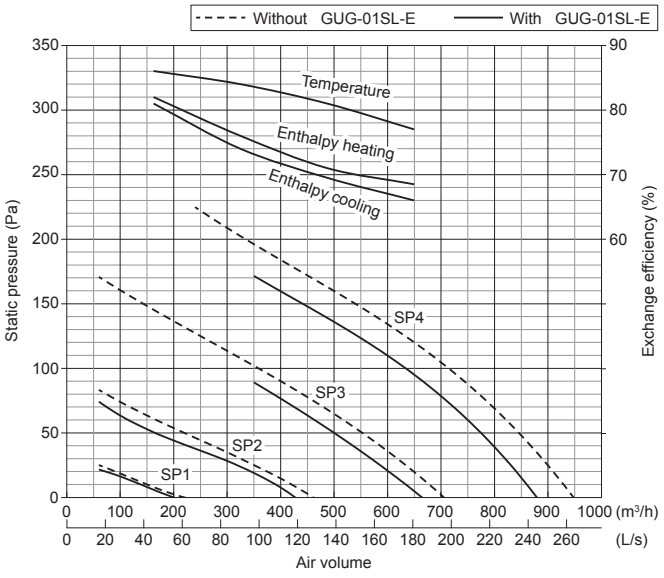
5. Characteristic curve

Following figures show air volume drop when connecting Dx-coil unit.
The air flow range is limited because of the protection for overload of outdoor unit when Dx-coil unit is connected.

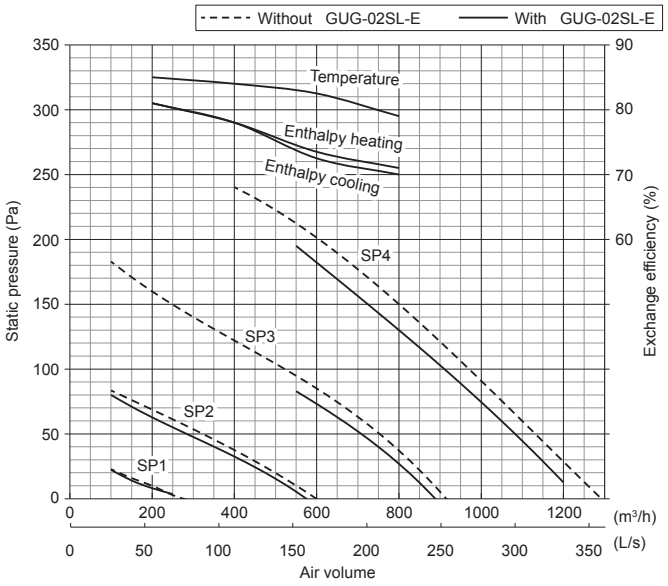
LGH-50RVX-E



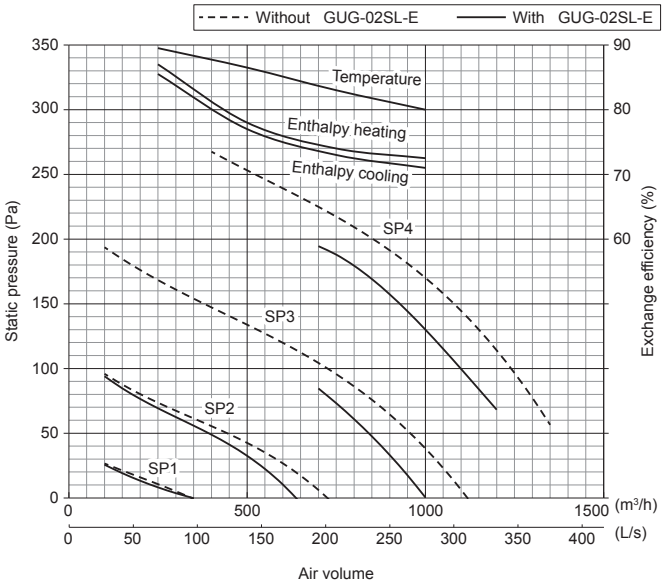
LGH-65RVX-E



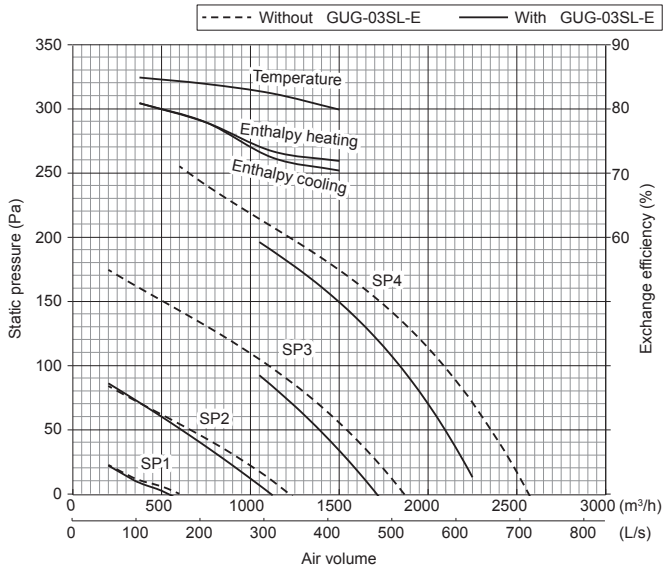
LGH-80RVX-E



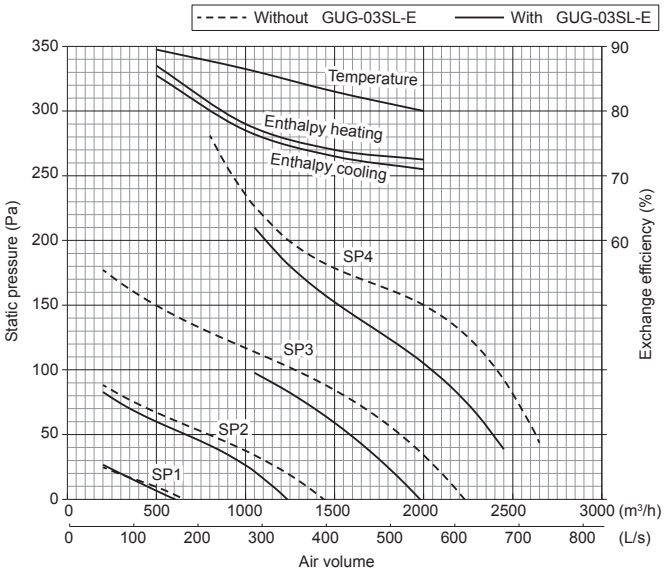
LGH-100RVX-E



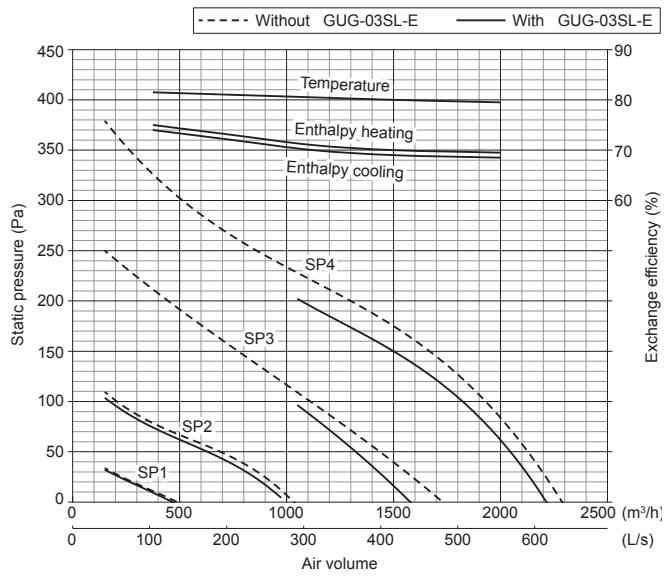
LGH-150RVX-E



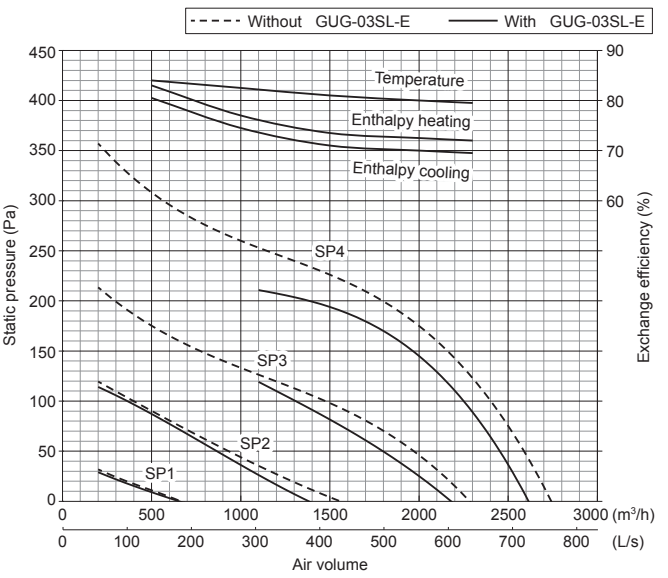
LGH-200RVX-E



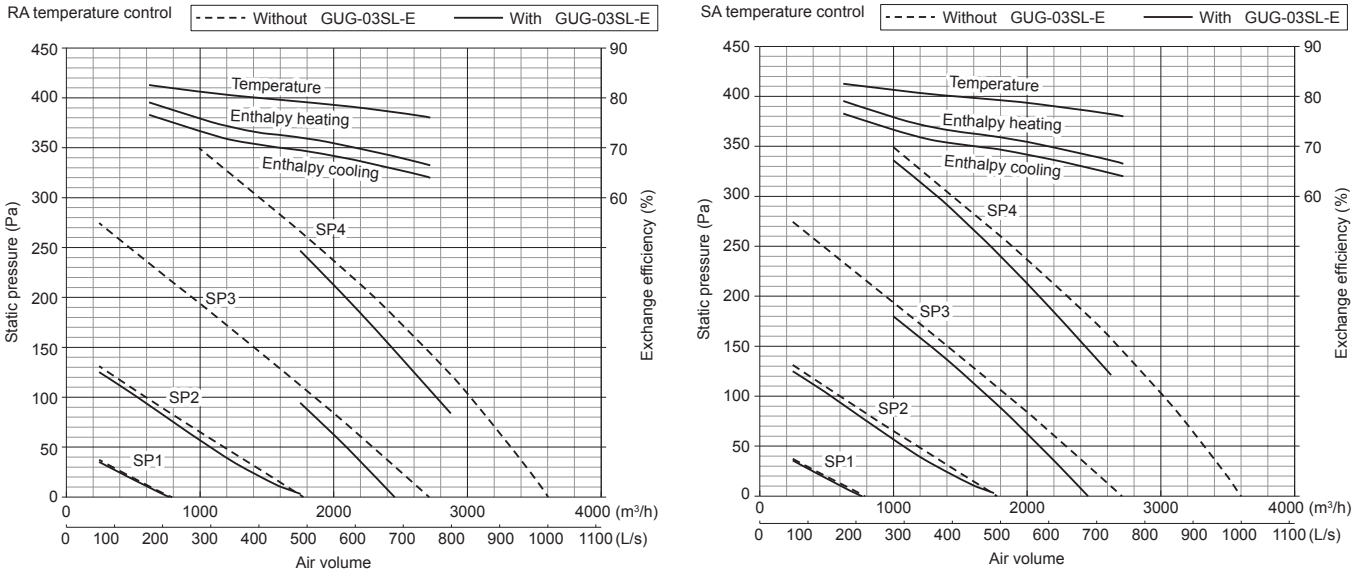
LGH-150RVXT-E



LGH-200RVXT-E

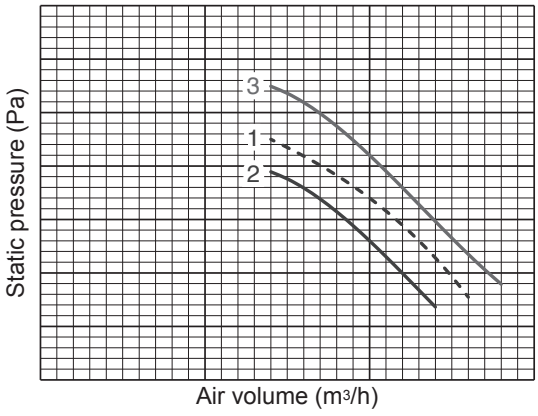


LGH-250RVXT-E



[Reference information]

Recovery of static pressure losing by Dx-coil unit.



*This graph is just for illustrative purposes.

P-Q curve image
1. Lossnay unit
2. Lossnay unit + Dx-coil unit
3. Lossnay unit (fan power up +4) + Dx-coil unit

When connecting Dx-coil unit to Lossnay unit, the original Lossnay P-Q curve (Curve.1) will decrease because of adding pressure loss by Dx-coil unit (Curve.2).
One solution to recover this static pressure decrease is setting fan power up function of Lossnay unit (Curve.3).

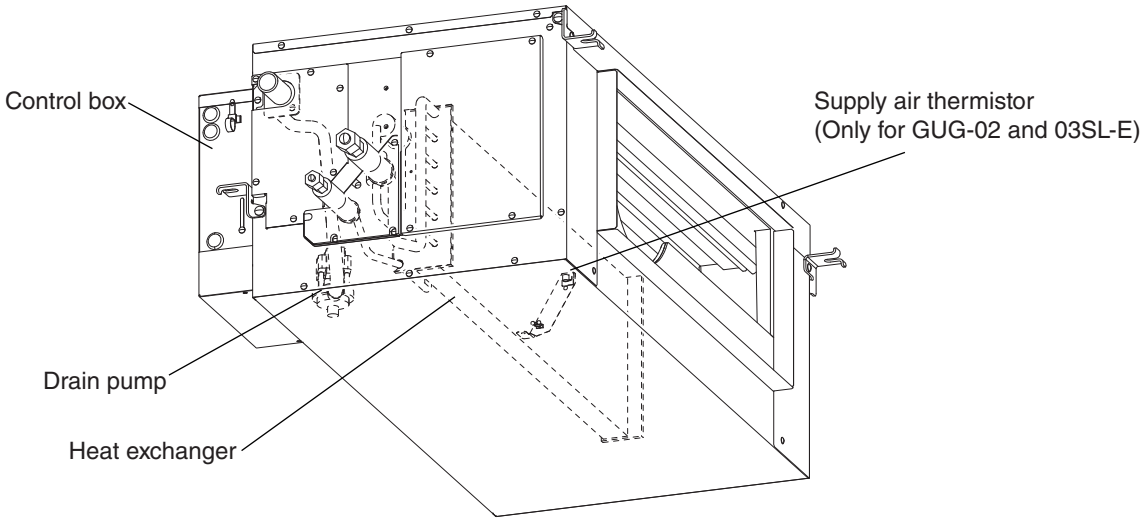
This fan power up function is only available when Lossnay remote controller PZ-61DR-E is used.
Select adequate setting data number which is associated with fan power up level shown in below table at the function setting page of PZ-61DR-E.

DIP-SW		Setting check	PZ-61DR-E		Setting check	Supply fan power up
SW No.	Setting		Function No.	Setting data		
N/A	-	-	55	0 (Factory setting)		N/A
	-	-		1		1 level up
	-	-		2		2 level up
	-	-		3		3 level up
	-	-		4		4 level up

Refer to Lossnay and PZ-61DR-E installation manual for more detailed information.

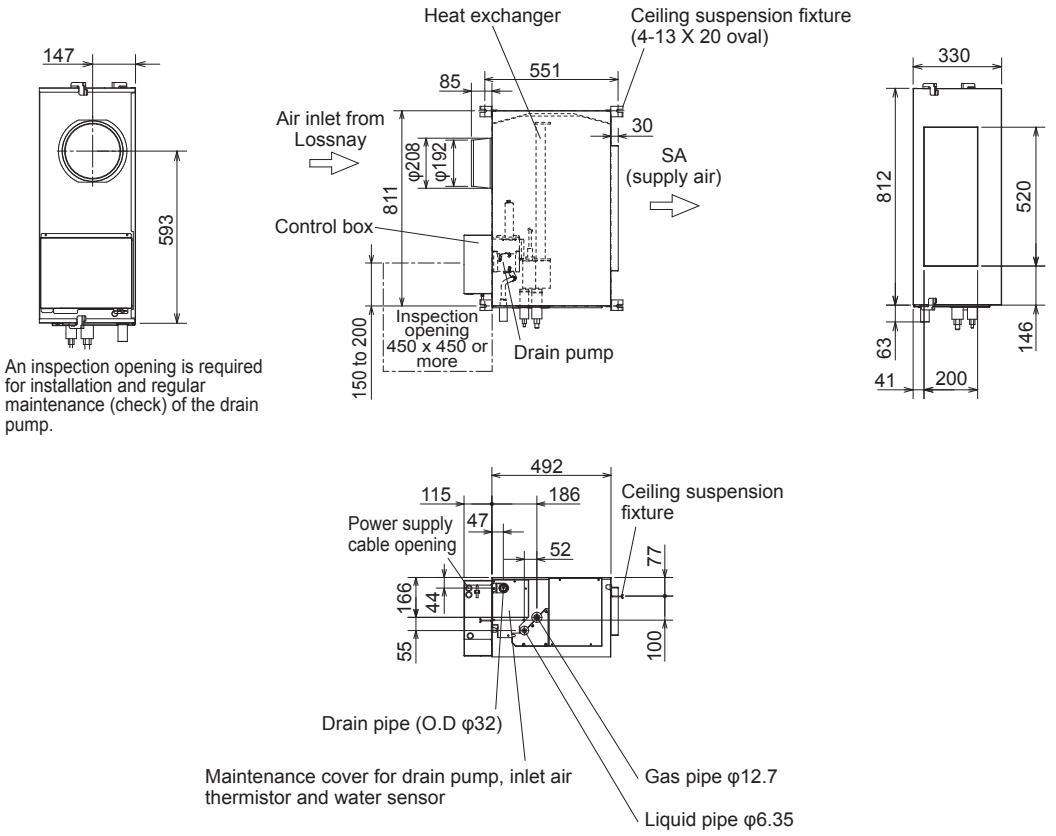
1. Outlines and dimensions

Names of the parts



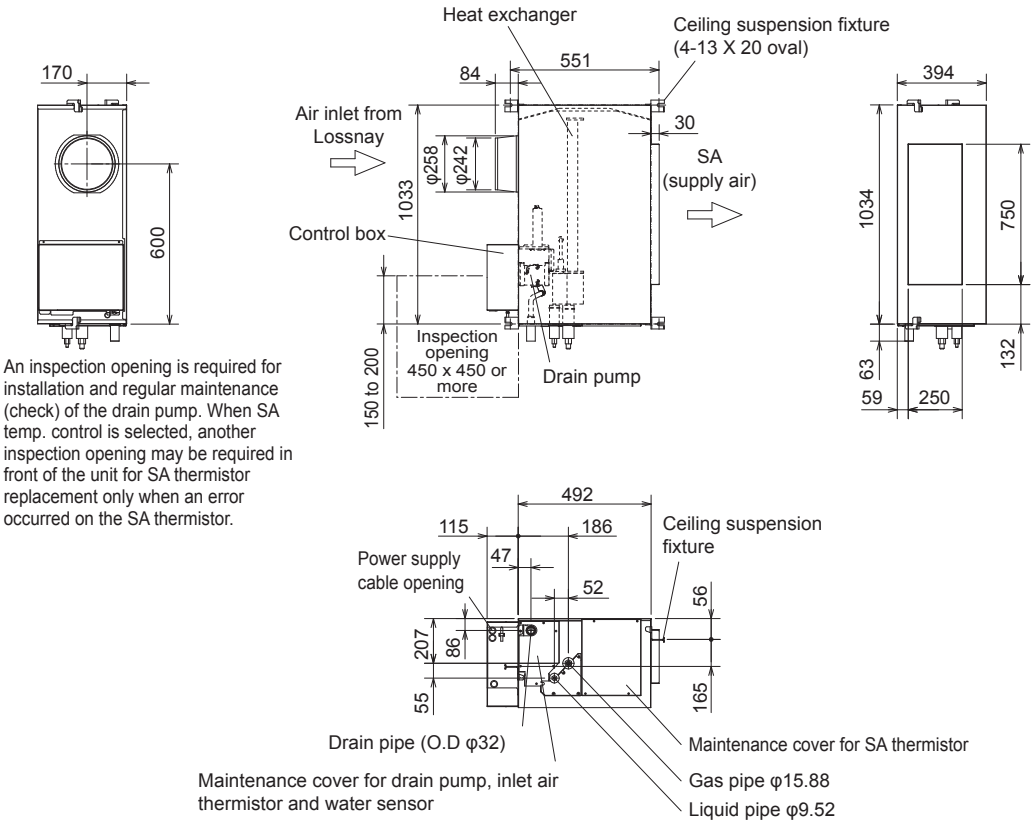
Note:
The drain pump always runs in the cooling mode and continues to run for six minutes after the unit stops.

GUG-01SL-E



Unit (mm)

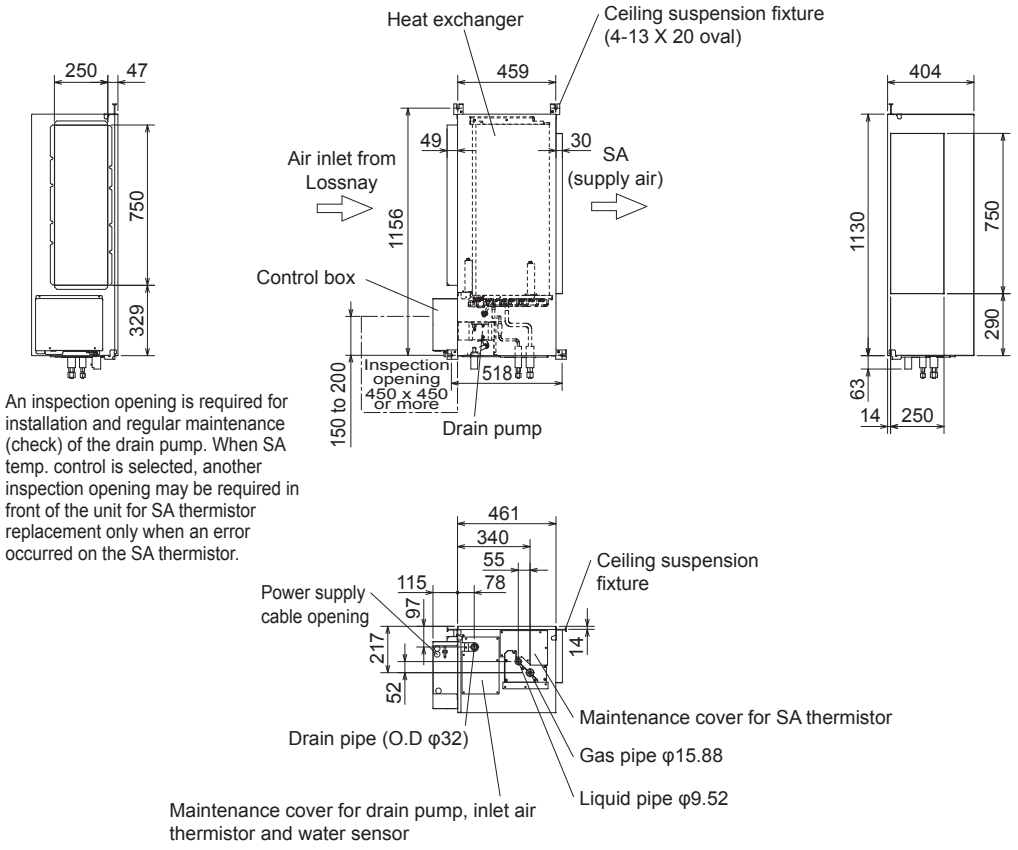
GUG-02SL-E



An inspection opening is required for installation and regular maintenance (check) of the drain pump. When SA temp. control is selected, another inspection opening may be required in front of the unit for SA thermistor replacement only when an error occurred on the SA thermistor.

Unit (mm)

GUG-03SL-E



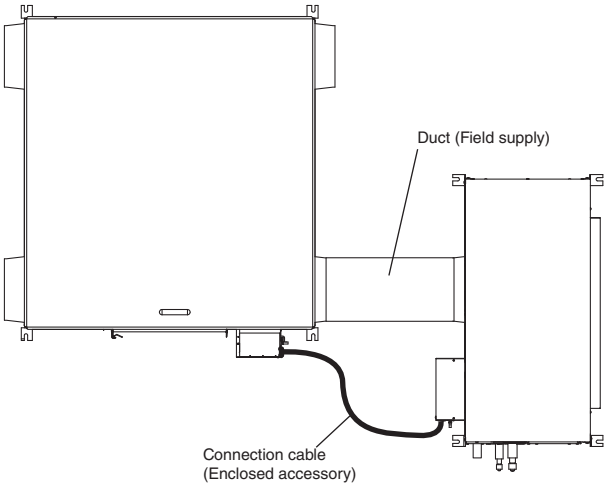
An inspection opening is required for installation and regular maintenance (check) of the drain pump. When SA temp. control is selected, another inspection opening may be required in front of the unit for SA thermistor replacement only when an error occurred on the SA thermistor.

Unit (mm)

2. Installation example

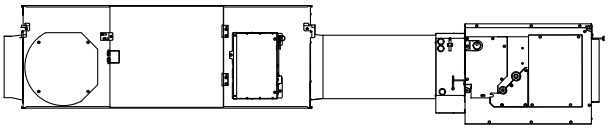
2.1 GUG-01SL-E and GUG-02SL-E

Top view (to install straight duct)

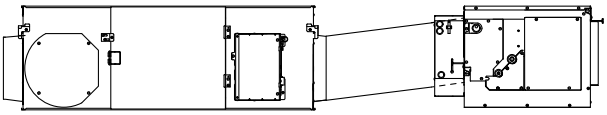


Note:
- The distance between the Lossnay unit and the Dx-coil unit must be between 25 cm and 5 m when the duct is straight.
- The length of the connection cable (enclosed accessory) between the Lossnay and Dx-coil units is about 6 m. Please install the two units so that the cable can be connected.

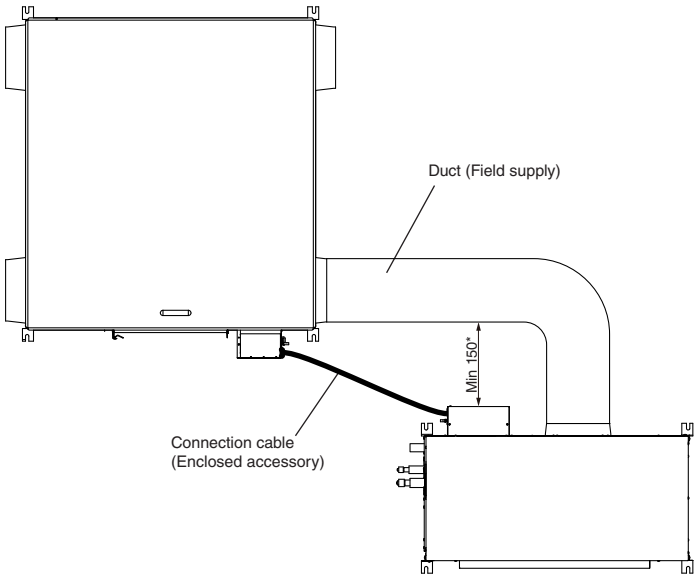
Side view (to install with straight duct)



Side view (to minimize the space with slope duct)



Top view (to install with bent duct)



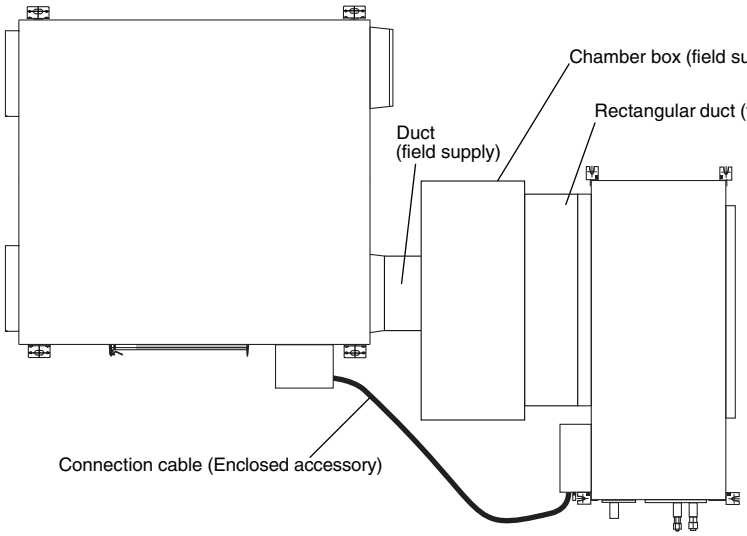
Note:
- The duct between the two units can be bent like the figure.

* To take the control cover off.

2.2 GUG-03SL-E with LGH-150/200RVX-E

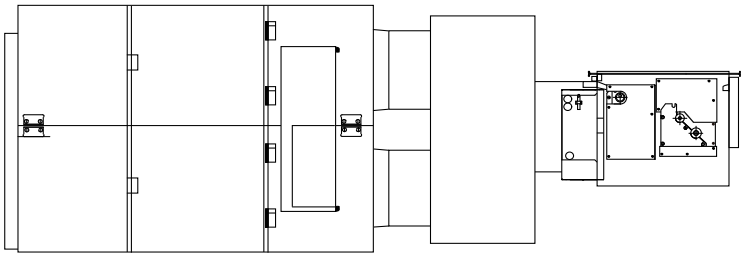
Following duct works is example using chamber box between LGH-150/200RVX-E and GUG-03SL-E.

Top view (with chamber box)



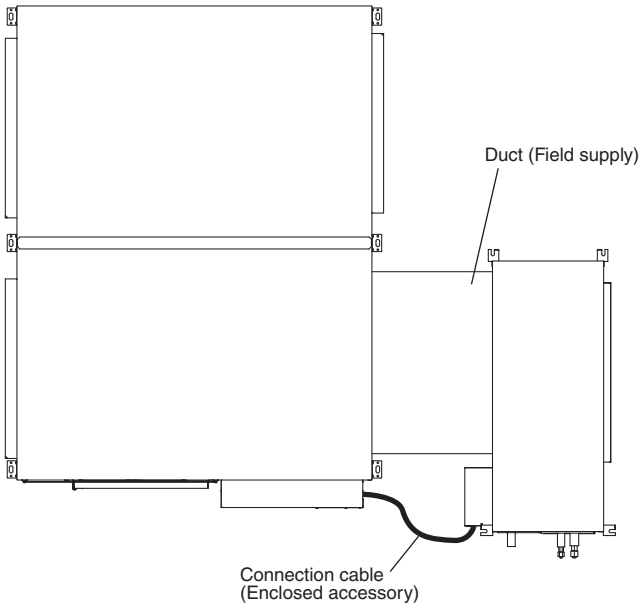
Note:
- The distance between the Lossnay unit and the Dx-coil unit must be between 25 cm and 5 m when the duct is straight.
- The length of the connection cable (enclosed accessory) between the Lossnay and Dx-coil units is about 6 m. Please install the two units so that the cable can be connected.

Side view (with chamber box)



2.3 GUG-03SL-E with LGH-150/200/250RVXT-E

Top view (to install with rectangular duct)

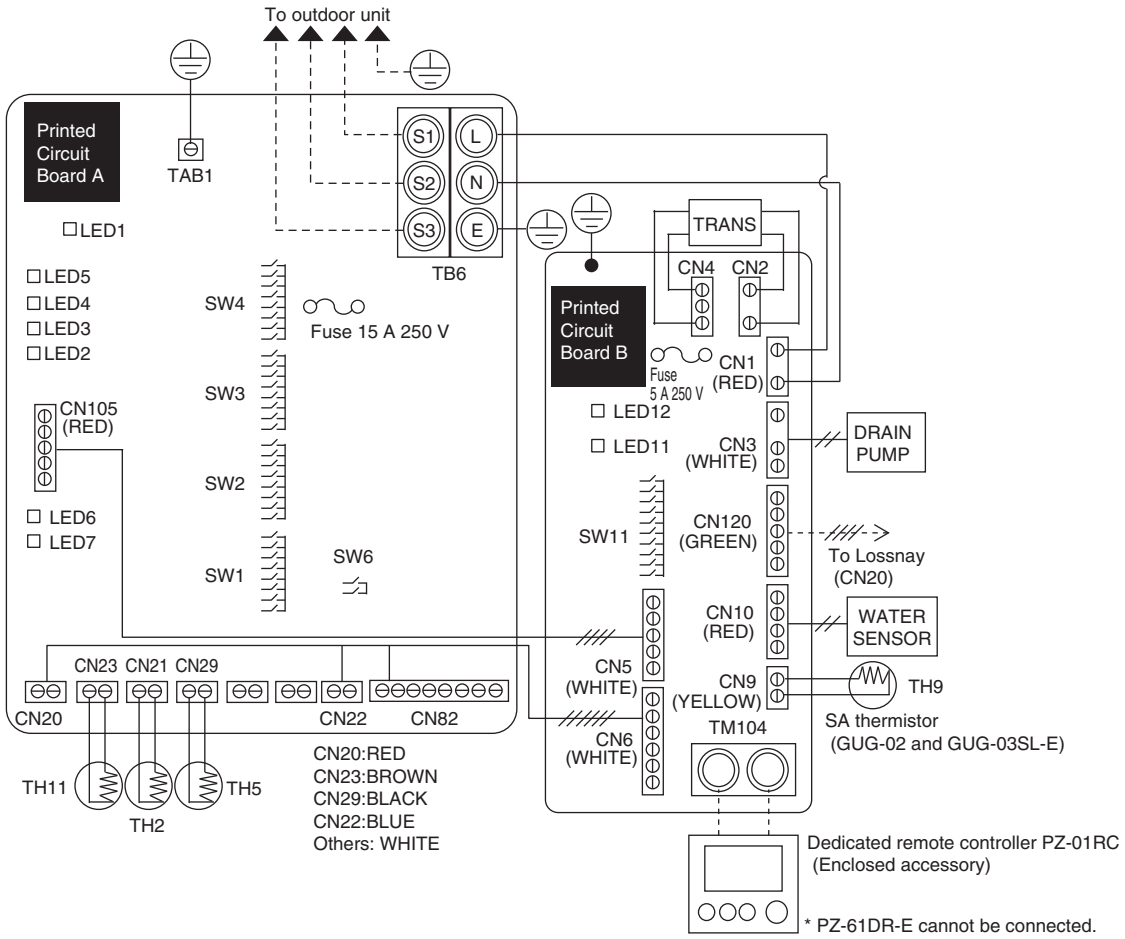


Note:
- The distance between the Lossnay unit and the Dx-coil unit must be between 25 cm and 5 m when the duct is straight.
- The length of the connection cable (enclosed accessory) between the Lossnay and Dx-coil units is about 6 m. Please install the two units so that the cable can be connected.

1. Wiring diagram

Note:

1. TB6, TM104 and CN120 shown in dotted lines are field work.
2. Make sure to connect the ground wire.
3. Prior to access the electrical parts cut off the power supply (all to Dx-coil unit, Lossnay unit and outdoor unit) more than five minutes.
4. The appliance shall be installed in accordance with national wiring regulations.



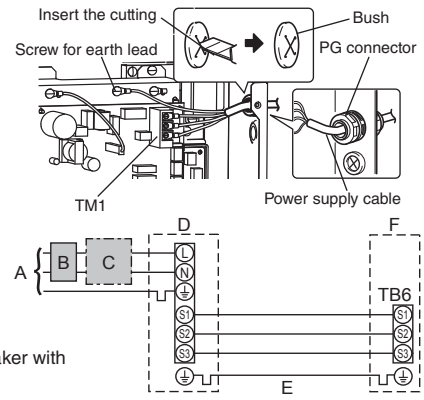
Definition of symbols

Printed circuit board A		Printed circuit board B	
TB6	: Terminal for power supply from the outdoor unit	TM104	: Terminal for remote controller PZ-01RC
TAB1	: Connector (Ground)	SW11	: Switch (Function selection)
SW1-SW4	: Switch (Function selection)	LED11	: Inspection indicator lamp
SW6	: Switch (Function selection)	LED12	: Power supply indicator lamp
LED1	: Power supply indicator lamp	CN1	: Connector (Power supply)
LED2-5	: Operation status	CN2	: Connector (Transformer primary)
LED6, 7	: Reading or writing data to SD card	CN3	: Connector (Drain pump)
CN105	: Connector (IT communication)	CN4	: Connector (Transformer secondary)
CN20	: Connector (TH1, software use)	CN5	: Connector (IT communication)
CN21	: Connector (TH2, liquid pipe temp.)	CN6	: Connector (Output to PCB A)
CN22	: Connector (Remote controller)	CN9	: Connector (TH9, supply air temp.)
CN23	: Connector (TH11, inlet air temp.)	CN10	: Connector (Water sensor)
CN29	: Connector (TH5, gas pipe temp.)	CN120	: Connector (Communication to Lossnay)
CN82	: Connector (Forced comp. OFF)	◎	: Terminal block
◎	: Terminal block	⊖	: Connector on PCB
⊖	: Connector on PCB		

Attention

1.With this product, the wiring installation method will vary according to the design of the system.
2.Perform electrical installation to meet local electrical regulations.
3.Always use double insulated PVC cable for the transmission cables.
4.Wiring work must be performed by qualified professionals.

2. Connecting the power supply cable



Pass the power supply cable through the bush* and connect to the TB6 terminal block using the round terminals. Connect the ground wire to the screw and secure tightening the bush.
(* Use an item that can firmly secure the cable such as a PG connector.)

A Outdoor unit power supply
B Earth leakage breaker *1, *2
C Wiring circuit breaker or isolating switch
D Outdoor unit
E Dx-coil unit/outdoor unit connecting cables
F Dx-coil unit

*1: If the installed earth leakage circuit breaker does not have a function to protect over-current, install a breaker with that function along the same power line.
*2: A breaker with at least 3.0 mm contact separation in each pole shall be provided. Use earth leakage breaker (NV). The breaker shall be provided to ensure disconnection of all active phase conductors of the supply.

Note:
In accordance with IEE regulations the circuit breaker/isolating switch located on the outdoor unit should be installed with lockable devices (health and safety).

Wiring Wire No. × size (mm²)	Dx-coil unit - Outdoor unit	*3	4 × 0.75 (polar)
	Dx-coil unit - Outdoor unit earth	*3	
Circuit ratingxx	Dx-coil unit - Outdoor unit S1-S2	*4	230 V AC
	Dx-coil unit - Outdoor unit S2-S3	*4	24 V DC

*3: Max. 45 m
*4: The values given in the table are not always measured against the ground value.

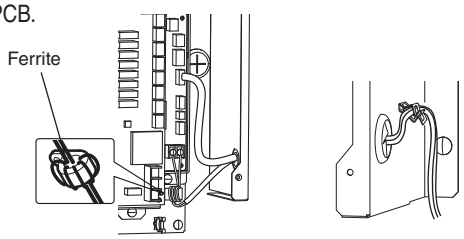
Notes:
1. Wiring size must comply with the applicable local and national code.
2. Dx-coil unit/outdoor unit connecting cords shall not be lighter than polychloroprene sheathed flexible cord. (Design 60245 IEC 57)
   Dx-coil unit power supply cords shall not be lighter than polychloroprene sheathed flexible cord. (Design 60227 IEC 53)
3. Install an earth longer than other cables.

<CAUTION>
- Always separate the power supply cable and transmission cable by 5 cm or more to prevent malfunctioning of the unit.
- If the length of the stripped Power supply cable is too long, the conductors may touch and short out.
- Do not tighten screws of terminal block with a torque larger than 0.5 Nm. It could damage the PCB.

3. Connecting PZ-01RC

Securely connect the transmission cable from the remote controller to the input terminal block (TM104). (No polarity)
Wire type: two-core sheathed cable
Wire diameter: 0.3 mm²
Keep the overall length of the transmission cable between Dx-coil unit and the remote controller within 200 m.

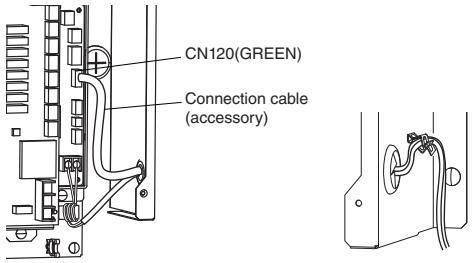
Note:
- Do not tighten screws of terminal block with a torque larger than 0.5 Nm. It could damage the PCB.
- Do not connect the power supply cable.
- Remote controller cable should be rotated 3 times around the ferrite.
- Single wires such as PVC wires cannot be connected.



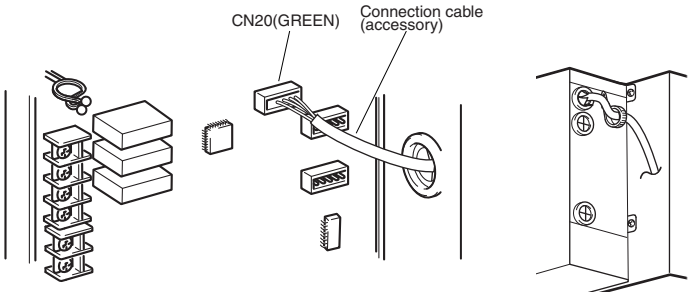
4. Connecting Lossnay unit

Connect the lead wire cable (accessory) to CN120 (GREEN) on PCB B of Dx-coil unit and CN20 (GREEN) on PCB of Lossnay unit.

Dx-coil unit side



Lossnay unit side



1. Function setting

Set the selection switches to perform the appropriate function.
Shut down the power supply before setting the switches except function No.5 No.6 .
Depending on system configuration, some functions might not be available.
When replacing to new PCB, set the same setting as old one.

No.	Function outline	PCB	Switch No.
1	Selecting of RA temp. control or SA temp. control	PCB A of Dx-coil unit	SW1-7
2	Fixed operation mode		SW2-1, 2-2
3	Fixed set temperature		SW2-3, 2-4, 2-5
4	Thermo OFF point by the inlet air temp. (Only in SA temp. control mode)		SW3-4, 3-5
5	Test run of the drain pump	PCB B of Dx-coil unit	SW11-1
6	Resetting the operation hour of the drain pump		SW11-2
7	Selecting of the operation when an error occurs		SW11-3
8	Model selection (For PCB replacement)		SW11-9, 11-10
9	Setting about whether or not Dx-coil unit is connected	PCB of Lossnay unit	SW7-1
10	Selecting of the operation mode from “Temp. priority mode” or “Fan speed priority mode”		SW7-2
	Selecting of the operation mode from “Temp. priority mode” , “Fan speed priority mode” or “Fan priority mode after temp. priority mode”.		SW7-2, 7-3

No. 1 Selecting of RA temp. control or SA temp. control

Set the SW1-7 as below.

PCB	SW1-7	Setting check	Contents
PCB A of Dx-coil unit	OFF		SA temp. control
	ON (Factory setting)		RA temp. control

[RA (Return Air) temperature control (Factory setting)]
The system of the Lossnay unit and Dx-coil unit is designed to maintain the return air temperature close to the setting temperature.

[SA (Supply Air) temperature control]
The system of the Lossnay unit and Dx-coil unit is designed to maintain the supply air temperature close to the setting temperature.
GUG-01SL-E cannot be used for SA temperature control.
The setting temperature is recommended to be the same as or close to the setting temperature of the air conditioning unit.

No. 2 Fixed operation mode

Set the SW2-1 and SW2-2 as below.

PCB	SW2-1	SW2-2	Setting check	Contents
PCB A of Dx-coil unit	OFF	OFF		Not fixed (Depending on remote controller) (Factory setting)
	ON	OFF		[Cooling] fixed
	OFF	ON		[Heating] fixed
	ON	ON		Do not set

When the operation mode is fixed, the mode cannot be changed from the remote controller PZ-01RC.

No. 3 Fixed set temperature

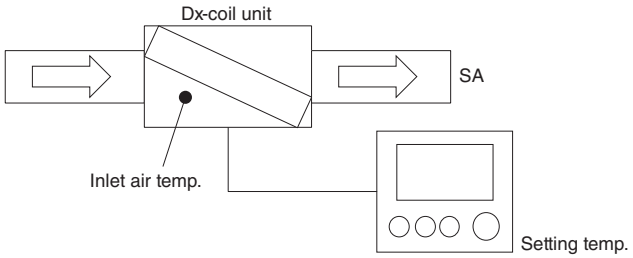
Set the SW2-3, SW2-4 and SW2-5 as below.

PCB	SW2-3	SW2-4	SW2-5	Setting check	Contents
PCB A of Dx-coil unit	OFF	OFF	OFF		Not fixed (Remote controller setting) (Factory setting)
	ON	OFF	OFF		Cooling, Auto 19 ˚C fixed Heating 17 ˚C fixed
	OFF	ON	OFF		20 ˚C fixed
	ON	ON	OFF		22 ˚C fixed
	OFF	OFF	ON		24 ˚C fixed
	ON	OFF	ON		26 ˚C fixed
	OFF	ON	ON		28 ˚C fixed
	ON	ON	ON		Cooling 30 ˚C fixed Heating, Auto 28 ˚C fixed

When the target temperature is fixed, the setting temp. cannot be changed from the remote controller PZ-01RC.

No. 4 Thermo OFF point by the inlet air temp. (Only in SA temp. control mode)

This setting is only activate when SA temperature control is selected. The compressor of outdoor unit is forced to stop when the inlet air temp. is close to the setting temp. to reduce frequent ON/OFF cycling under low heating/cooling load conditions.



The thermo OFF point can be set by the SW3-4 and SW3-5 as below.

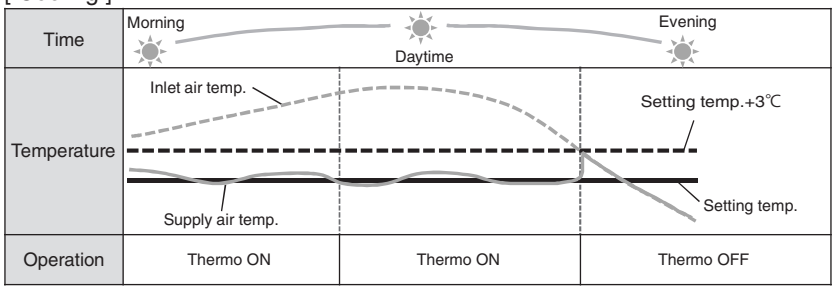
PCB	SW3-4	SW3-5	Setting check	Contents
PCB A of Dx-coil unit	OFF	OFF		1 ˚C
	OFF	ON		2 ˚C
	ON	OFF		3 ˚C (Factory setting)
	ON	ON		4 ˚C

When the differential is small, Dx-coil unit is likely to be thermo-ON but also the ON/OFF cycling is likely to happen.

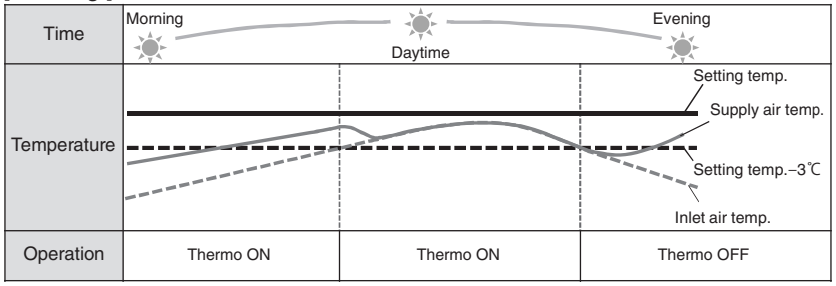
Usage example

Following example shows when set thermo OFF point as 3˚C, factory setting.

[Cooling]



[Heating]

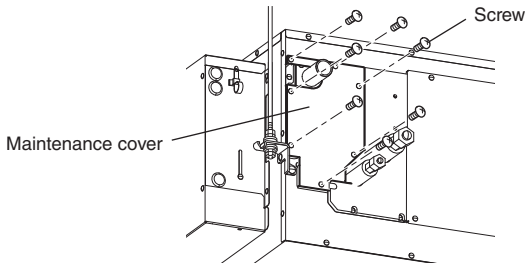


No. 5 Test run of the drain pump

This function is used for the test run of drain pump.
Follow the guidance below for the test run of drain pump.

[Test run]
Do the test run after electrical installation is complete.

1. Take off the maintenance cover for the drain pump.
   GUG-01, 02SL-E: 7 screws GUG-03SL-E: 6 screws
2. Put the water (1000 ml) into the drain pan.
   (Please do not pour water into the pump directly.)
3. Switch ON DIP-SW 11-1 of PCB B.
4. Check the drainage.
5. Switch OFF DIP-SW 11-1 of PCB B.
6. Replace the maintenance cover to its original position.



No. 6 Resetting the operation hour of the drain pump

After 2100 operation hours in the cooling mode, the LED11 will flash (flashes ten times).
If the drain pump is checked or replaced with a new one, please set the SW11-2 to ON and back to OFF to reset the operation hours.
Please refer to the operating manual for more detailed information about the requirement of inspection and replacement.

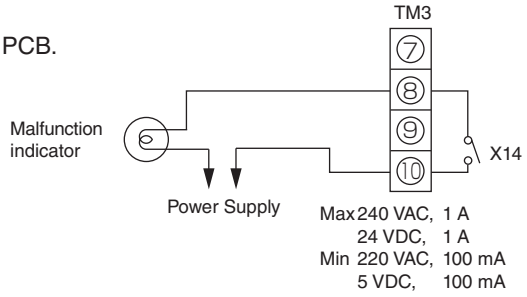
No. 7 Selecting of the pattern when an error occurs

Please choose the following pattern. This selection must be done for the system X (one remote controller system).
When the system is OFF (stopping), an error code will NOT be displayed on the remote controller PZ-01RC.
For system Y and Z, an error code will be displayed on PZ-61DR-E and/or M-NET system controller.

PCB	SW11-3	Setting check	Contents
PCB B of Dx-coil unit	OFF (Factory setting)		Pattern A
	ON		Pattern B

[Pattern A (Factory setting)]
When Lossnay unit, Dx-coil unit or Outdoor unit has an error during the Fan mode, the remote controller PZ-01RC display will be changed automatically to the Heating mode. Then the error code will be displayed about 3 minutes later.

[Pattern B]
Even when Lossnay unit, Dx-coil unit or Outdoor unit has an error during the Fan mode, the error code will NOT be displayed on the remote controller PZ-01RC.
Please prepare the error indicator by the following way.
To use external error indicator, connect it to TM3 ⑧,⑩ on Lossnay PCB.



No. 8 Model selection (For PCB replacement)

SW 11-9 and 11-10 on PCB B is to identify the model for PCB. When replacing to a new PCB, use the same setting as old one or an indicated below.

PCB	SW11-9	SW11-10	Setting check	Contents
PCB B of Dx-coil unit	OFF	OFF		New PCB for replacement
	ON	OFF		GUG-01SL-E
	OFF	ON		GUG-02SL-E
	ON	ON		GUG-03SL-E

*Do not change from factory setting.
If changed, please set as the factory setting.

No. 9 Setting whether or not the Dx-coil unit is connected

Set the SW7-1 as below.

DIP-SW		Setting check	PZ-61DR-E		Setting check	Contents
SW No.	Setting		Function No.	Setting data		
SW7-1 (PCB of Lossnay unit)	-	-	71	0 (Factory setting)		DIP-SW priority
	OFF (Factory setting)			1		When the Dx-coil unit is NOT connected to Lossnay
	ON			2		When the Dx-coil unit is connected to Lossnay

Please set SW7-1 ON.
This function can also be set from PZ-61DR-E. After setting it from PZ-61DR-E, please power off for more than two minutes. And then power on again.
When SW7-1 is ON but the lead wire cable (accessory) is not connected properly, error code 0206 will be displayed. Please check if the cable is connected properly.

No. 10 Selection of the operation mode from "Temp. priority mode" or "Fan speed priority mode"

This function is available for the Lossnay unit produced from June to August 2016, whose serial No. should be 1606**, 1607**** or 1608**** (**** means 4 digit numbers).**
And its software version indicated in Lossnay PCB should be 05.

Set the SW7-2, or PZ-61DR-E as below.

DIP-SW		Setting check	PZ-61DR-E		Setting check	Contents
SW No.	Setting		Function No.	Setting data		
SW7-2 (PCB of Lossnay unit)	-	-	72	0 (Factory setting)		DIP-SW priority
	OFF (Factory setting)			1		Temp. priority mode
	ON			2		Fan speed priority mode

This function can also be set from PZ-61DR-E.
This function needs to be set when Lossnay unit's fan speed is controlled by an external input (0-10VDC (CN26) or a volt-free contact (CN17)).

[Temp. priority mode (Factory setting)]
Only when operation mode is in the Fan mode, the external fan speed control can be used. The Dx-coil unit will keep thermo-ON as much as possible. In heating and cooling mode, the fan speed of Lossnay unit will not become fan speed 1 or 2.

[Fan speed priority mode]
External fan speed control is available. The ventilation airflow will be reduced to minimum.
During fan speed 1 or 2, Dx-coil unit is thermo-OFF.

Operation mode	Fan speed order from external input	Actual fan speed	
		Temp. priority mode	Fan speed priority mode
Heating or Cooling	FS4	FS4	FS4
	FS3	FS3	FS3
	FS2	FS3	FS2
	FS1	FS3	FS1
Fan	FS4	FS4	FS4
	FS3	FS3	FS3
	FS2	FS2	FS2
	FS1	FS1	FS1

Note:
When the indoor negative pressure setting (1 down) is selected, please use Fan speed priority mode.

Fan speed Display	Exhaust fan	Supply fan	Dx-coil unit
		1down	
4	4	3	Can be Thermo ON
3	3	2	Forced Thermo OFF
2	2	1	Forced Thermo OFF
1	1	1	Forced Thermo OFF

For the Lossnay unit produced after September (when serial No. shows after 16090001), see the next instructions.

No. 10 Selection of the operation mode from "Temp. priority mode", "Fan speed priority mode" or" Fan priority mode after temp. priority mode".

This function is only available for the Lossnay unit produced after September 2016, whose serial No. should be after 16090001. Or its software version indicated in Lossnay PCB should be more than 06.

Set the SW7-2 and SW7-3, or PZ-61DR-E as below.

DIP-SW		Setting check	PZ-61DR-E		Setting check	Contents
SW No.	Setting		Function No	Setting data		
SW7-2 SW7-3 (PCB of Lossnay unit)	-	-	72	0 (Factory setting)		DIP-SW priority
	7-2 OFF 7-3 OFF (Factory setting)			1		Temp. priority mode
	7-2 ON 7-3 OFF			2		Fan speed priority mode
	7-2 OFF 7-3 ON			3		Fan speed priority mode after 1 hour temp. priority mode
	-	-		4		Fan speed priority mode after 1.5 hours temp. priority mode
	7-2 ON 7-3 ON			5		Fan speed priority mode after 2 hours temp. priority mode
	-	-		6		Fan speed priority mode after 2.5 hours temp. priority mode
	-	-		7		Fan speed priority mode after 3 hours temp. priority mode
	-	-		8		Fan speed prioritymode after 3.5 hours temp. priority mode
	-	-		9		Fan speed prioritymode after 4 hours temp. priority mode

This function can also be set from PZ-61DR-E.
This function needs to be set when Lossnay unit's fan speed is controlled by an external input (0-10VDC (CN26) or a volt-free contact (CN17)).

[Temp. priority mode (Factory setting)]
Only when operation mode is in the Fan mode, the external fan speed control can be used. The Dx-coil unit will keep thermo-ON as much as possible. In heating and cooling mode, the fan speed of Lossnay unit will not become fan speed 1 or 2.

[Fan speed priority mode]
External fan speed control is available. The ventilation airflow will be reduced to minimum.
During fan speed 1 or 2, Dx-coil unit is thermo-OFF.

[Fan priority mode after temp. priority mode]
The Lossnay unit starts with "Temp. priority mode" for setting hours, and then changes to "Fan speed priority mode" automatically. This automatic change is only available after the system stops for more than 2 hours.

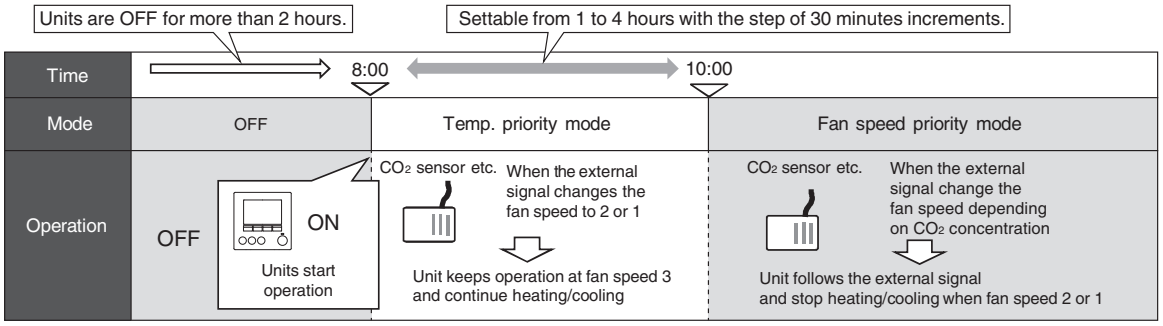
Operation mode	Fan speed order from external input	Actual fan speed	
		Temp. priority mode	Fan speed priority mode
Heating or Cooling	FS4	FS4	FS4
	FS3	FS3	FS3
	FS2	FS3	FS2
	FS1	FS3	FS1
Fan	FS4	FS4	FS4
	FS3	FS3	FS3
	FS2	FS2	FS2
	FS1	FS1	FS1

Note:
When the indoor negative pressure setting (1 down) is selected, please use Fan speed priority mode.

Fan speed Display	Exhaust fan	Supply fan 1down	Dx-coil unit
4	4	3	Can be Thermo ON
3	3	2	Forced Thermo OFF
2	2	1	Forced Thermo OFF
1	1	1	Forced Thermo OFF

Usage example

Following example shows using Fan priority mode after temp. priority mode for 2 hours; in the case of setting SW7-2 and SW7-3 both are ON.



2. Dip switch setting

The DIP-SW listed below must be set as the factory setting. If changed, please set to the factory setting.

PCB	Switch No.	Setting
PCB A of Dx-coil unit	SW1-2 SW1-3 SW1-6	Must be ON
	SW1-1 SW1-4 SW1-5 SW1-8 SW2-6~2-8 SW3-1~3-3 SW3-6~3-8 SW4-1~4-8 SW6-1~6-2	Must be OFF
PCB B of Dx-coil unit	SW11-4~11-8	Must be OFF
PCB of Lossnay unit	SW7-4~7-10	Must be OFF

3. Lossnay functions

The table below shows the Lossnay unit functions that cannot be used or restricted when the Dx-coil unit is connected.

No.	Function	Remarks
5	Automatic recovery setting after power interruption	Before setting this function, set function No.1 of PZ-01RC as Not available. Refer to page 31 for more details.
6	Indoor negative pressure setting [2 down]	Dx-coil unit can be set to thermo-ON when the supply fan is operating at FS3 or FS4. If “2 down” is activated, Dx-coil unit will NOT thermo-ON.
15	Interlock mode setting	“External input given priority” is prohibited to use. “ON interlock mode” and “OFF interlock mode” are available only when PZ-61DR-E is connected or M-NET controller is connected.
38	Calculated supply air temperature display setting	“Calculated supply air temperature” will be different from the supply air temperature from Dx-coil unit.
51	Automatic ventilation mode	Even when an indoor unit is interlocked with Lossnay unit, Lossnay unit uses the conditions of setting temp. and mode (cooling/heating/fan) of Dx-coil unit for automatic ventilation mode.
57	Prohibition of use of after-heater	By using the operation monitor output, Lossnay unit can be connected to after-heater. However, use of after-heater in conjunction with Dx-coil unit is prohibited.

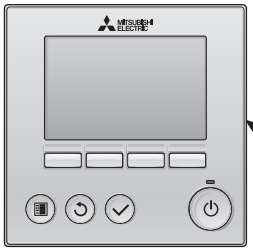
*No. in the table shows the function setting No. in Lossnay unit installation manual and the technical manual.

Cautions for using “Indoor negative pressure setting” to set exhaust fan speed bigger than supply fan speed.
When use “2 down” function, supply fan speed won’t go fan speed 3 and 4.
Therefore, Dx-coil will not be thermo ON.
Do NOT use this “2 down” function with Dx-coil unit.

Fan speed display	Exhaust fan	Supply fan	Dx-coil unit
		2down	
4	4	2	Always thermo-OFF
3	3	1	
2	2	1	
1	1	1	

1. Remote controller PZ-01RC

As an accessory, a remote controller is packaged in a carton box being delivered with Dx-coil unit.
The dedicated remote controller for Dx-coil unit is described as “PZ-01RC” in this manual. However it is not an official model name so that it is not possible to buy separately.
How to identify:



A name plate “BH00J360B01” is labeled on the bottom of PZ-01RC.
The last three letters are “B01” as of May 2016, but they may change without notice.

2. Menu list

The table below shows the function menu that can be used.

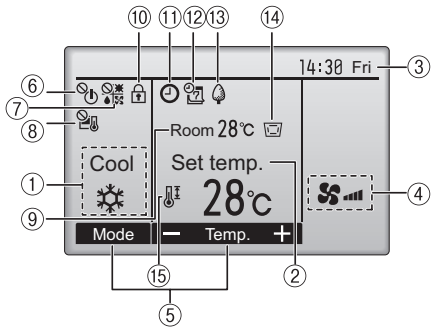
Main menu			Remarks
Vane/Louvre/Vent. (Lossnay)		Not available	-
High power		Not available	-
Timer			
	ON/OFF timer	Available	*4
	Auto-Off timer	Available	*4
Weekly timer		Available	*4
OU silent mode		Not available	-
Restriction			
	Temp. range	Available	*5
	Operation locked	Available	*5
Energy saving			
	Auto return	Available	*5
	Schedule	Not available	-
Filter information		Not available	*5
Error information		Available	*5
Maintenance			
	Auto descending panel	Not available	-
	Manual vane angle	Not available	-
Initial setting			
	Main/Sub	Available	*1
	Clock	Available	*5
	Main display	Available	*5
	Contrast	Available	*5
	Display details	Available	*3
	Auto mode	Available	*2
	Administrator password	Available	*5
	Language selection	Available	*5
Service			
	Test run	Available	*5
	Drain pump test run	Not available	-
	Input maintenance info.	Available	*5
	Function setting	Available	*5
	Check	Available	*5
	Request code	Available	*5
	Other than request code	Not available	-
	Self check	Available	*5
	Maintenance password	Available	*5
	Remote controller check	Available	*5

*1: Two remote controllers cannot be used in a system, so please do not change from the factory setting.
*2: Auto mode is only available for the RA temperature control.
*3: Setting change is required for the SA temperature control. Please see the next page.
*4: When PZ-61DR-E is also used, set the timer function from PZ-61DR-E.
*5: How to use and how to set are the same way as MA remote controller PAR-31MAA, so please refer to its installation manual and instruction book.

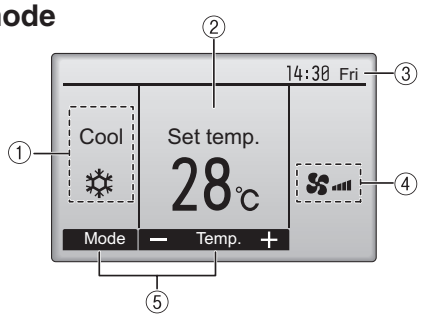
3. Appearance

Display The main display can be displayed in two different modes: “Full” and “Basic”. The factory setting is “Full”.

Full mode



Basic mode



* All icons are displayed for explanation.

① Operation mode
Dx-coil unit operation mode appears here.

② Preset temperature
Preset temperature appears here.

③ Clock
Current time appears here.

④ Fan speed
This function is not available.

⑤ Button function guide
Functions of the corresponding buttons appear here.

⑥
Appears when the ON/OFF operation is centrally controlled.

⑦
Appears when the operation mode is centrally controlled.

⑧
Appears when the preset temperature is centrally controlled.

⑨ Room temperature
Current room temperature appears here. Please erase room temperatures in the initial setting when the SA temp. control is selected.

⑩
Appears when the buttons are locked.

⑪
Appears when the ON/OFF timer function is enabled.

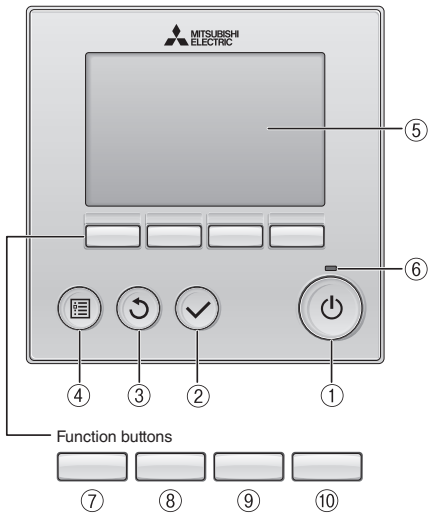
⑫
Appears when the Weekly timer is enabled.

⑬
Appears while power is ON.

⑭
Appears with room temperature.

⑮
Appears when the preset temperature range is restricted.

Controller interface



- When the backlight is off, pressing any button turns the backlight on and does not perform its function. (except for the ON/OFF button)
- Most settings (except ON/OFF, mode, temperature) can be made from the Menu screen.

① ON/OFF button
Press to turn ON/OFF the Dx-coil unit.

② SELECT button
Press to save the setting.

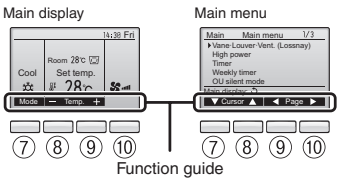
③ RETURN button
Press to return to the previous screen.

④ MENU button
Press to bring up the Main menu.

⑤ Backlit LCD
Operation settings will appear.
When the backlight is off, pressing any button turns the backlight on and it will stay lit for a certain period of time depending on the screen.

⑥ ON/OFF lamp
This lamp lights up in green while the unit is in operation. It blinks while the remote controller is starting up or when there is an error.

The functions of the function buttons change depending on the screen. Refer to the button function guide that appears at the bottom of the LCD for the functions they serve on a given screen. When the system is centrally controlled, the button function guide that corresponds to the locked button will not appear.



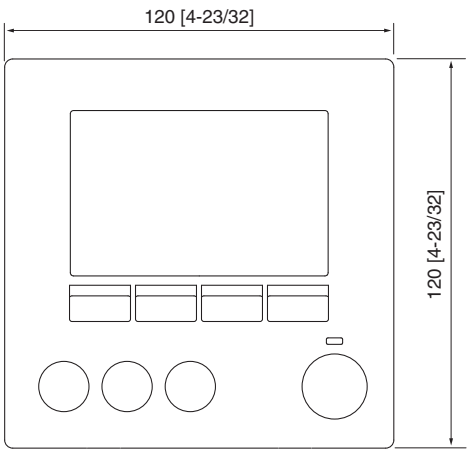
⑦ Function button F1
Main display : Press to change the operation mode.
Main menu : Press to move the cursor down.

⑧ Function button F2
Main display : Press to decrease temperature.
Main menu : Press to move the cursor up.

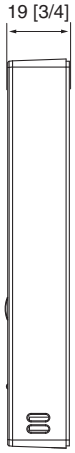
⑨ Function button F3
Main display : Press to increase temperature.
Main menu : Press to go to the previous page.

⑩ Function button F4
Main display: Not available.
Main menu: Press to go to the next page.

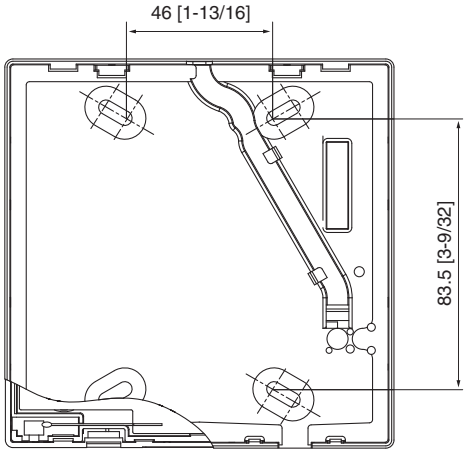
4. Outlines and dimensions



(Front view)



(Side view)



(Rear view)

<Specifications>

Product size	120(W) × 120(H) × 19(D)mm (4 3/4 × 4 3/4 × 3/4 [in]) (not including the protruding part)	
Net weight	0.25kg (9/16lb.)	
Rated power supply voltage	12V DC (supplied from Dx-coil unit)	
Power consumption	0.3W	
Usage environment	Temperature	0 - 40°C (32 - 104°F)
	Humidity	30 - 90%RH (with no dew condensation)
Material	Panel	PMMA
	Main body	PC + ABS

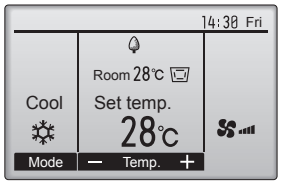
5. Initial setting

Before starting to operate of the system, the following setting are required.

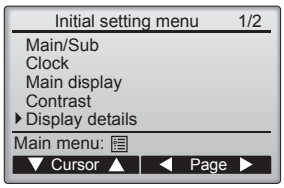
(1) For the SA temp. control, set the Room temperature not to be displayed using the following steps.

Note:
For the RA temp. control, if the display is necessary please skip this setting.

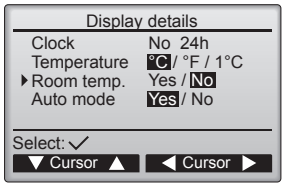
[Default display]



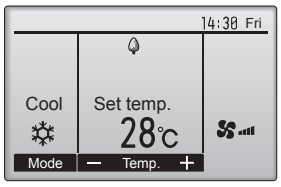
[Step1]
From the Main display, select “Main menu” -> ”Initial setting” -> “Display details”.



[Step2]
Move the cursor to the “Room temp”. on the display details setting screen, and select “No” with the F3 or F4 button. (Factory setting is “Yes”.)



[**Step3**]
Check that “Room temperature” is not displayed.



(2) Function setting from remote controller PZ-01RC.

(Automatic recovery setting)
[Function No.01]
Please change this function to “Not available”.
If automatic recovery needs to be used, set it from Lossnay unit. Refer to the Lossnay installation manual for details.

Function No.	Setting data	Setting check	Contents
01	1		Not available
	2 (Factory setting)		Available

The function setting below must be set as the factory setting.
If changed, please set to the factory setting.

No.	Factory setting data
02	1
03	1
04	2
05	2
06	2
07	3
15	1
16	1
17	1
21	1
24	2
28	2

Note:
The factory setting of No.08, 09, 10, 11, 12, 13, 14, 18, 19, 20, 22, 23, 25, 26 and 27 are not set and the function is not available.

(3)Initial settings from the menu

Press “MENU” button from the Main display and select “Initial setting”.
The following selections will be listed.

- Main/Sub
- Clock
- Main display
- Contrast
- Display details
  - -Clock
  - -Temperature
  - -Room temp.
  - -Auto mode (Auto cooling/heating operation)
- Auto mode (Auto cooling/heating operation)
- Administrator password
- Language selection

Make the initial setting for each if necessary.

• Main/Sub setting

Please do not change from the factory setting.
Using two remote controllers connecting to one Dx-coil unit is prohibited.

• Clock setting

Clock setting is necessary for time display, weekly timer, timer setting and error history.
Make sure to perform clock setting when the unit is used for the first time or has not used for a long time.

• Main display setting

Use the F3 or F4 button to select the display mode “Full” or “Basic”. (The factory setting is “Full”.)

• Remote controller display details setting

Make the settings for the remote-controller-related items as necessary.
Press the SELECT button to save the changes.

[1] Clock display

[2] Temperature unit setting

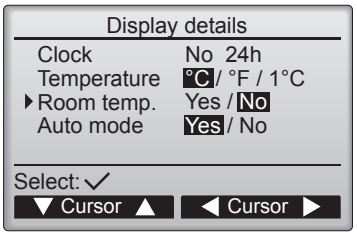
[3] Room temperature display

Please set to “No” for the SA temp. control.

[4] Auto mode (Auto cooling/heating operation) display setting (RA temp. control only)

(The factory setting is “Yes”.)

- Yes: “AUTO COOL” or “AUTO HEAT” is displayed during Auto mode (Auto cooling/heating operation).
- No : Only “AUTO” is displayed during Auto mode (Auto cooling/heating operation).



• Auto mode (Auto cooling/heating operation) setting (RA temp. control only)

- Yes: The Auto mode (Auto cooling/heating operation) can be selected in the operation mode setting.
- No : The Auto mode (Auto cooling/heating operation) cannot be selected in the operation mode setting.

(The factory setting is “Yes”.)

• Administrator password setting

- The initial administrator password is “0000”. Change the default password as necessary to prevent unauthorized access. Have the password available for those who need it.
- If you forget your administrator password, you can initialize the password to the default password “0000” by pressing and holding the F1 and F2 buttons simultaneously for three seconds on the administrator password setting screen.
- The administrator password is required to make the settings for the following items.
  - Timer setting
  - Weekly timer setting
  - Restriction setting

6. Basic operations

Operation mode icons

Cool Fan Auto Heat Auto cool Auto heat

Turning ON and selecting operation mode

1 Press button ① (ON/OFF).
2 Press button ⑦ (F1) to go through the operation modes.

The ON/OFF lamp and will light up.

Cool → Fan → Auto (Auto cooling/heating operation) *1 → Heat

*1 Operation mode is available when the RA temperature control is selected.

Preset temperature setting

Press button ⑧ (F2) to decrease the preset temperature.
Press button ⑨ (F3) to increase the preset temperature.
* Pressing once changes the value by 1˚C (1˚F).

Operation mode	Preset temperature range
Cool (Supply air temp. control)	12 – 30 ˚C (54 – 87 ˚F)
Cool (Return air temp. control)	19 – 30 ˚C (67 – 87 ˚F)
Heat	17 – 28 ˚C (63 – 83 ˚F)
Auto cooling/heating operation	19 – 28 ˚C (67 – 83 ˚F)
Fan	Not settable

* The temperature range restriction setting will be applied preferentially, if any. If the setting value is outside of the range, a message "Temp. range locked" will appear.

Automatic cooling/heating operation

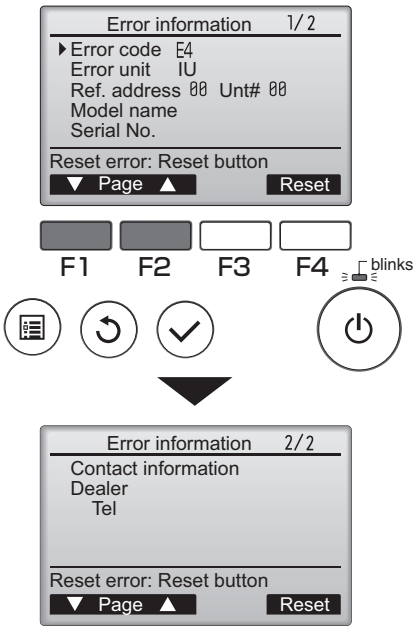
1 Press button ① (ON/OFF).
2 Press button ⑦ (F1) to display the operation mode "Auto".

When the room temperature is higher than the preset temperature, cooling operation starts.
When the room temperature is lower than the preset temperature, heating operation starts.

* The current operation mode ("Auto cool" or "Auto heat") will be displayed after the mode is determined.
If "Display/non-display of COOL/HEAT during AUTO mode" has been set to "Non-display" while making the initial settings, only "Auto" will be displayed.

7. Troubleshooting

When an error occurs, the following screen will appear.
Check the error status, stop the operation and consult your dealer.
Refer to the service handbook of Dx-coil unit for the detailed information of troubleshooting.



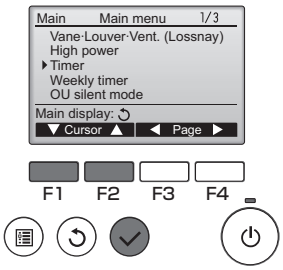
Error code, error unit, refrigerant address, unit model name, and serial number will appear.
The model name and serial number will appear only if the information have been registered.

Press button ⑦ (F1) or ⑧ (F2) to go to the next page.

Contact information (dealer's phone number) will appear if the information have been registered.

8. Timer and Weekly timer

The settings for Timer and Weekly timer operation can be made from the remote controller.
Press button ④ (MENU) to go to the Main menu, and move the cursor to the desired setting with button ⑦ (F1) or ⑧ (F2).



Timer

- ON/OFF timer
  Operation ON/OFF times can be set in 5-minute increments.
- Auto-Off timer
  Auto-Off time can be set to a value from 30 to 240 in 10-minute increments.

Weekly timer

Operation ON/OFF times for a week can be set. Up to eight operation patterns can be set for each day.

Note:
Please see the table below for the timer and the weekly timer functions.

Timer & Weekly timer	PZ-01RC	PZ-61DR-E	M-NET system controller
System pattern X	Available	-	-
System pattern Y	Do not use	Available	-
System pattern Z	Do not use	Available	Available
Settable contents in Timer	ON/OFF	ON/OFF	Depends on the type of controllers
Settable contents in Weekly timer	ON/OFF Setting temp. Mode	ON/OFF Fan speed Night-purge	Depends on the type of controllers

9. Service

Maintenance password setting

- The initial administrator password is "9999". Change the default password as necessary to prevent unauthorized access. Have the password available for those who need it.
- If you forget your administrator password, you can initialize the password to default password "9999" by pressing and holding the F1 and F2 buttons simultaneously for three seconds on the maintenance password setting screen.

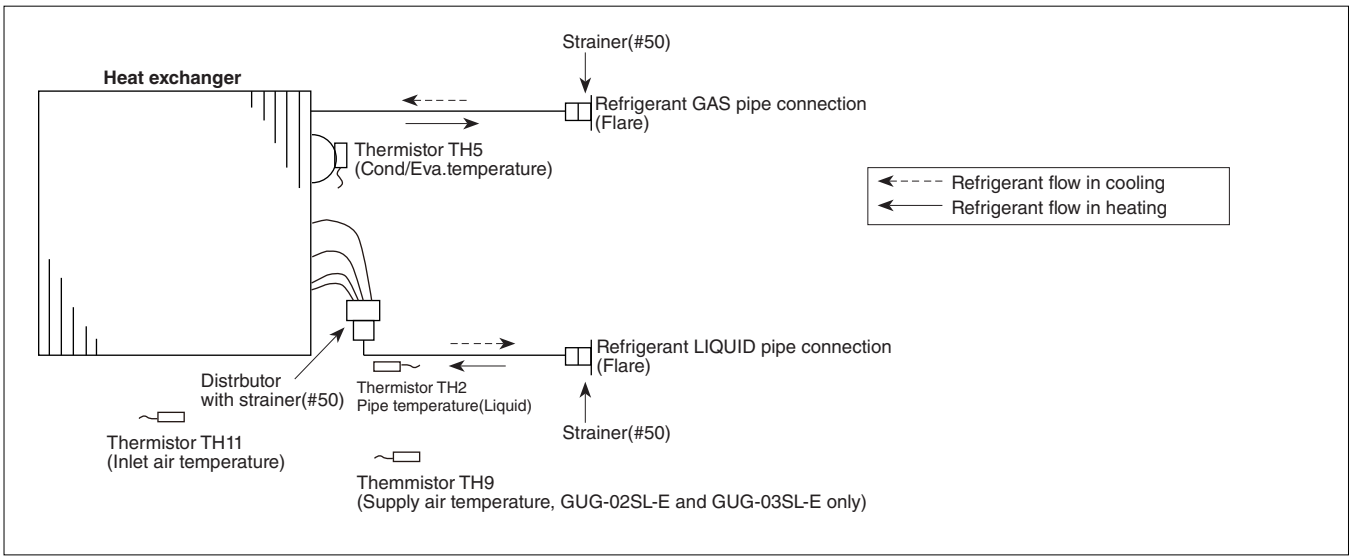
10. Others

The following functions are NOT available.
In main menu (Press button ④ (MENU), main menu appears.)

- "Vane Louver Vent (Lossnay)"
- "High power"
- "OU silent mode"
- In "Energy saving" menu, "schedule" function is NOT available.
- "Filter information"
- "Maintenance"
- In "Service" menu, "Drain pump test run", "Check" functions are NOT available, except for "Request code" in "Check" function.

Note:
Operating intsructions for the remote controller PZ-01RC has basically the same contents as PAR-31MAA.
Refer to the instruction book of PAR-31MAA when necessary.

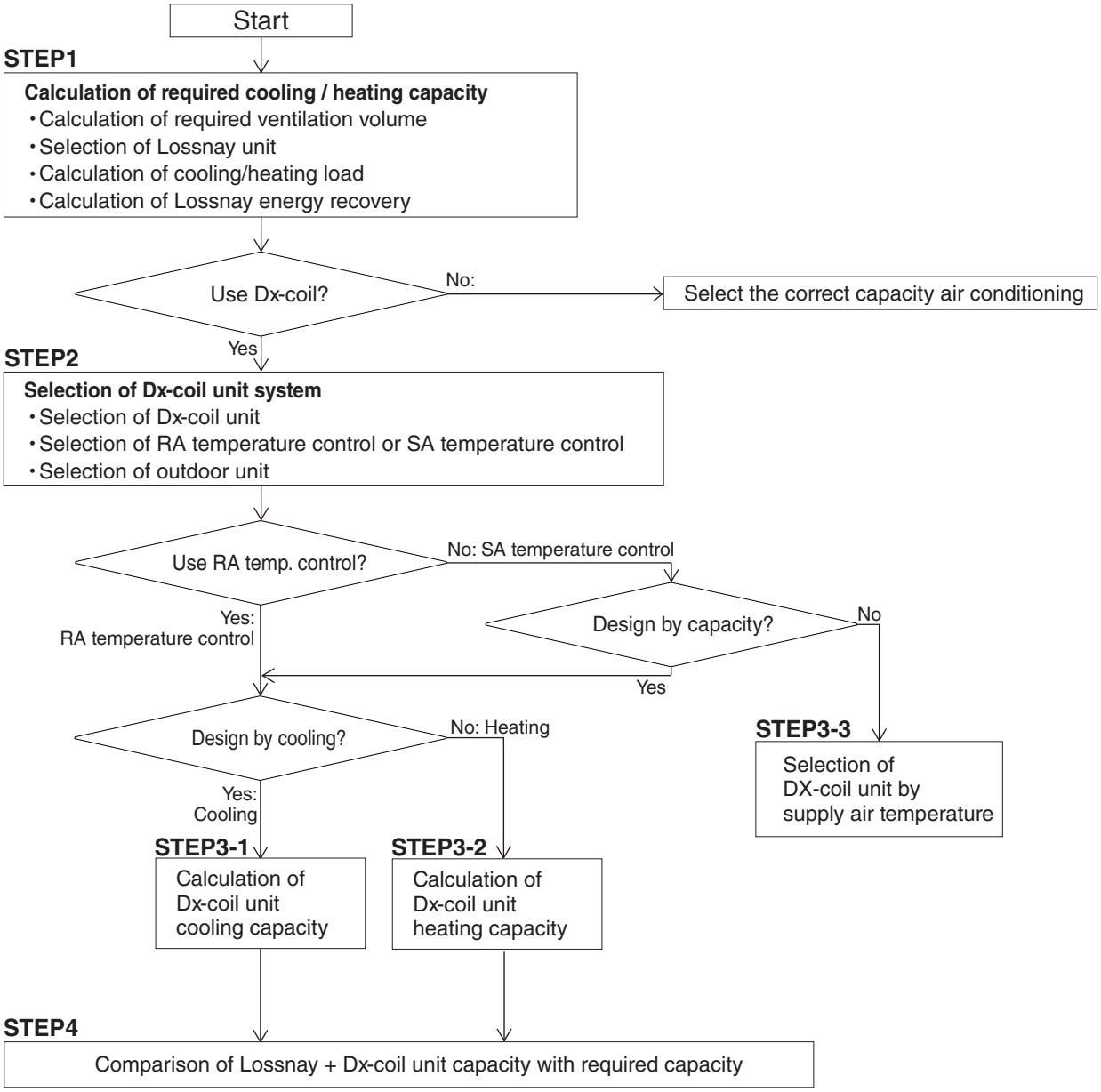
1. Refrigerant system diagram



CHAPTER 9 Model selection and capacity calculation

In this chapter, the calculation ways to select Lossnay unit, Dx-coil unit and outdoor unit are explained.
Follow each steps shown in the flow chart below to select adequate units.
The model selection and the capacity calculation are partly available on “New Design-Tool(version 1.70)”.

Flow chart for model selection



Application example 1: Supplemental Air-conditioning system for an office floor by RA temperature control

Example1-1 is for cooling, see page 37.
Example1-2 is for heating, see page 43.

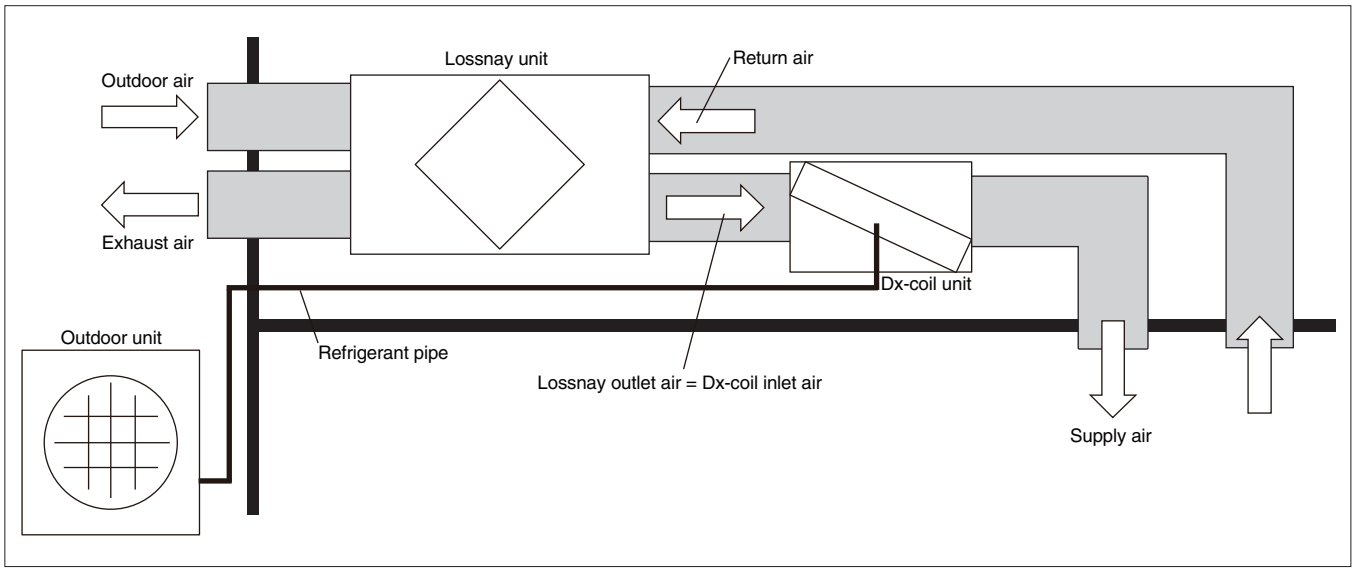
Application example 2: Main Air-conditioning system for a school classroom or a meeting room by RA temperature control

Example2-1 is for cooling, see page 47.
Example2-2 is for heating, see page 51.

Application example 3: Outdoor air treatment for an office floor by SA temperature control

Example3-1 is for cooling, see page 53.
Example3-2 is for heating, see page 55.

Definition of each air flow name used in following calculation



Definition of the text box

Example values are filled in this normal box for each situation.
Change each value for the actual designing.

Especially, hatching one indicates important value such as calculation result.

Dashed line one means fixed value e.g. physical property value.
Not necessary to change for the actual designing.

Example 1-1: Cooling for an office floor by RA temperature control

Following calculations are just examples.
The floor is assumed that it is south-facing middle floor of typical office building in Tokyo.
In the actual designing, please calculate in an appropriate way.

STEP1. Calculation of required cooling capacity

I: Calculation of required ventilation air volume and selection of Lossnay unit

(A) Floor space	200 m^2
(B) Required fresh air rates	25 $m^3/h \cdot person$
(C) Floor space per person	5 $m^2/person$
(D) The number of people per 1 m^2 = The reciprocal number of floor space per person	0.2 $person/m^2$
(E) The number of person in the floor = (A) / (C) = 200 / 5 = (A) x (D) = 200 x 0.2	40 people
(F) Required fresh air volume = (B) x (E) = 25 x 40	1000 m^3/h
(G) Required static pressure	170Pa

→ Adequate Lossnay model **LGH-100RVX-E**

II: Calculation of cooling load to determine the required capacity

Cooling Load Classifications

	Class	Heat Load
(a)	Indoor penetration heat	Heat generated from walls (qws) Heat generated from glass { from direct sunlight (q_{GS}) / from conduction and convection (q_{GS}) Accumulated heat load in walls (qss)
(b)	Indoor generated heat	Generated heat from occupants { Sensible heat (q_{HS}) / Latent heat (q_{HL}) Generated heat from electrical equipment { Sensible heat (q_{ES}) / Latent heat (q_{EL})
(c)	Reheating load	(q_{RL})
(d)	Ventilation load	{ Sensible heat (q_{FS}) / Latent heat (q_{FL})

(a) The heat penetrating into the room is often 30 to 40% of the total cooling load.
(b) It applies only when heat generated in the room.
(c) It applies only when reheating is necessary.

In this example, the outdoor and return air conditions are assumed as shown in table below.

		Dry Bulb Temp.	Relative Humidity	Wet Bulb Temp.	Enthalpy	Enthalpy difference
Cooling	Outdoor Air	33˚C	63%	27˚C	84.6 kJ/kg(DA)	31.8 kJ/kg(DA)
	Return Air	26˚C	50%	18.7˚C	52.8 kJ/kg(DA)	

(1) Calculation of ventilation load

Ventilation load = $\rho \times Q_f \times \Delta h$
= ρ [kg/m³] x Q_f [m³/h] x (h_O - h_R) [kJ/kg(DA)]
= ρ [kg/m³] x S [m²] x n [person/m²] x V_f [m³/h・person] x (h_O - h_R) [kJ/kg(DA)]

ρ : Density of air	1.2 kg/m³
Q_f : Ventilation air volume	1000 m³/h
h_o : Outdoor air enthalpy	84.6 kJ/kg(DA)
h_R : Return air enthalpy	52.8 kJ/kg(DA)
S : Area of floor space	200 m²
n : The number of people per unit area	0.2 person/m²
V_f : Required fresh air rates per person	25 m³/h/person

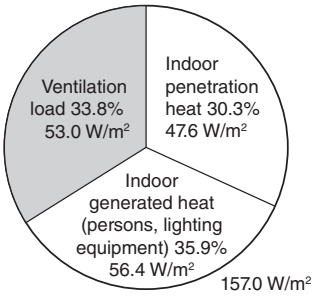
Here, calculate ventilation load per unit area for convenience to summate with other loads.

Ventilation load per unit area [W/m²] = ρ [kg/m³] x n [person/m²] x V_f [m³/h·person] x (h_O - h_R) [kJ/kg(DA)]
= 1.2 [kg/m³] x 0.2 [person/m²] x 25 [m³/h·person] x (84.6 – 52.8) [kJ/kg(DA)]
=190.8[kJ/h・m²] = 53.0[W/m²] → 53.0 W/m²

(2) Other cooling load

In this example, other cooling loads are regarded as a general value in Tokyo shown in the table below.
Calculate them in an appropriate way in the actual designing.

Typical load values during cooling



Load type		Load
Ventilation Load		53.0 W/m²
Indoor Generated Heat	Persons	26.4 W/m²
	Lighting Equipment	30.0 W/m²
Indoor Penetration Heat		47.6 W/m²
Total		157.0 W/m²

Conditions: Middle south-facing floor of a typical office building.

Cooling load per unit area

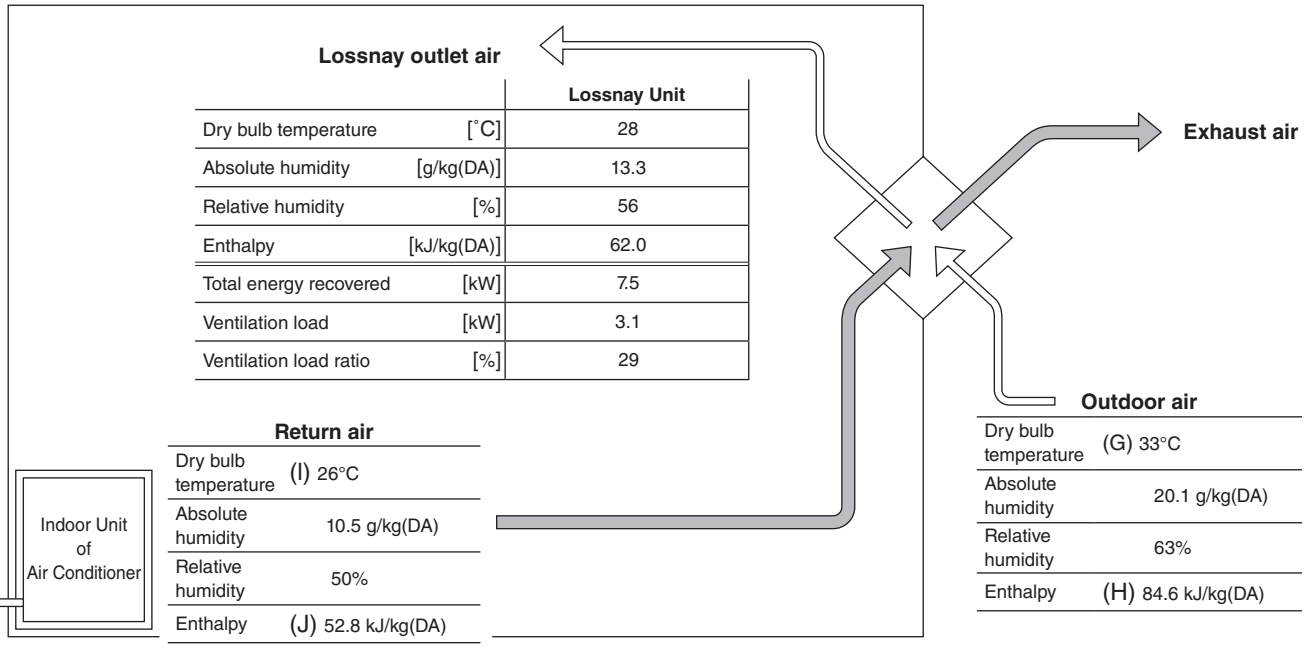
When the volume of ventilation air per persons is 25 m³/h, and the number of persons per 1 m² is 0.2, the cooling load will be approximately 157.0 W/m².

Required cooling capacity to make up for above cooling loads
= 157.0 [W/m2] × 200 [m2] = **31.4 [kW]**

III: Calculation of Lossnay energy recovery effect

(A) Lossnay model	LGH-100RVX-E
(B) Temperature exchange efficiency for summer (at 1000m³/h)	72%
(C) Enthalpy exchange efficiency on cooling (at 1000m³/h)	71%
(D) Lossnay outlet air temperature = (G) – ((G) - (I)) x (B) = 33˚C - (33˚C - 26˚C) x 0.72	28˚C
(E) Lossnay outlet air enthalpy = (H) – ((H) – (J)) x (C) = 84.6 - (84.6 – 52.8) x 0.71	62.0kJ/kg(DA)
(F) Energy recovered by Lossnay =((H) – (E)) x ρ x Q_f /3600 = (84.6 – 62.1) x 1.2 x 1000/3600	**7.5 kW**

Note: Please see the picture below to find (G) to (J)



STEP2. Selection of Dx-coil unit and outdoor unit

Dx-coil unit should be selected by connected Lossnay model shown in the table below.
Besides, outdoor unit is naturally selected by required temperature control, RA or SA.

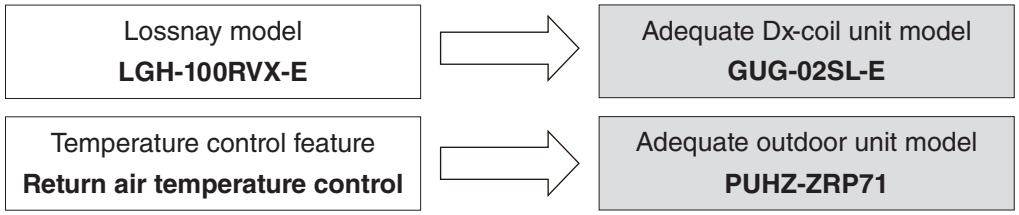
[RA (Return Air) temperature control]

Dx-coil unit	GUG-01SL-E		GUG-02SL-E		GUG-03SL-E		
Connectable Lossnay	LGH-50RVX-E	LGH-65RVX-E	LGH-80RVX-E	LGH-100RVX-E	LGH-150RVX-E LGH-150RVXT-E	LGH-200RVX-E LGH-200RVXT-E	LGH-250RVXT-E
Connectable outdoor unit	PUHZ-ZRP35	PUHZ-ZRP35	PUHZ-ZRP50	PUHZ-ZRP71	PUHZ-ZRP100	PUHZ-ZRP100	PUHZ-ZRP125

[SA (Supply Air) temperature control]

Dx-coil unit	GUG-02SL-E		GUG-03SL-E		
Connectable Lossnay	LGH-80RVX-E	LGH-100RVX-E	LGH-150RVX-E LGH-150RVXT-E	LGH-200RVX-E LGH-200RVXT-E	LGH-250RVXT-E
Connectable outdoor unit	PUHZ-ZRP50	PUHZ-ZRP50	PUHZ-ZRP71	PUHZ-ZRP71	PUHZ-ZRP71

Note:
GUG-01SL-E cannot be used for the SA temperature control function. Refer to page 10 for pipe size information.



STEP3-1. Calculation of Dx-coil unit cooling capacity

Calculation steps
I: Read out characteristics from the specification sheet
II: Calculate Dx-coil inlet air (Lossnay outlet air) condition
III: Calculate the capacity of Dx-coil unit
IV: Calculate supply air conditions from Dx-coil unit

I: Read out characteristics from the specification sheet

(1) Calculation conditions

(A) Lossnay + Dx-coil System configuration	LGH-100RVX-E + GUG-02SL-E + PUHZ-ZRP71
(B) Temperature control feature	RA Temp. control
(C) Ventilation air volume	1000m³/h
(D) Outdoor air condition	33˚CDB, 63%RH
(E) Indoor air condition	26˚CDB, 50%RH
(F) Refrigerant pipe length	7.5m

(2) Characteristics read out from specifications

(G) Cooling capacity under specification condition	11.3 kW
- Lossnay recovery	4.2 kW
- Cooling capacity of Dx-coil unit	7.1 kW

II: Calculate Dx-coil inlet air (Lossnay outlet air) condition

The conditions of Lossnay outlet air are already calculated in STEP1-III as shown below.

Example 1-1 condition		Outdoor air	Return air	Dx-coil inlet air (Lossnay outlet air)
Dry-bulb temperature	[˚C]	33	26	28
Wet-bulb temperature	[˚C]	27	18.7	21.4
Absolute humidity	[kg/kg(DA)]	0.0201	0.0105	0.0133
Relative humidity	[%]	63	50	56
Enthalpy	[kJ/kg(DA)]	84.6	52.9	62.0

III: Calculate the capacity of Dx-coil unit

Dx-coil unit capacity can be calculated by adjusting outdoor unit capacity from specification conditions to the actual designing conditions.

Adjusted Dx-coil unit capacity (cooling)
= Capacity under specification condition x Air volume factor C_1 x Air condition difference factor C_2 x Corrected refrigerant pipe length factor C_3

(1) Air volume factor

Read out the air volume factor C_1 by the ratio against related air volume at fan speed 4 of Lossnay unit using the graph on the page 62.

(A) Designing air volume	1000m³/h
(B) Related air volume of Lossnay unit at fan speed 4	1000m³/h
(C) Air volume ratio = (A) / (B)	1.0
(D) Air volume factor C_1 (Find C_1 from the graph on page 62.)	1.0

(2) Air condition difference factor

Characteristics written in the specification sheet are based on air conditions of outdoor air: 35˚CDB, 24˚CWB and return air: 27˚CDB, 19˚CWB.

Read out the air volume factor $C_{2\text{-}2}$ by outdoor air dry-bulb temperature and Dx-coil inlet air wet-bulb temperature using the performance curves on the page 62.

Specification condition		Outdoor air	Return air	Dx-coil inlet air (Lossnay outlet air)
Dry-bulb temperature	[˚C]	(A) 35	27	29.3
Wet-bulb temperature	[˚C]	24	19	(B) 20.6
Absolute humidity	[kg/kg(DA)]	0.0142	0.0104	0.0116
Relative humidity	[%]	40	47	45
Enthalpy	[kJ/kg(DA)]	71.7	53.8	59.0

Specification condition

(A) Outdoor air dry-bulb temperature — 35 ˚CDB

(B) Dx-coil inlet air wet-bulb temperature — 20.6 ˚CWB

(C) Air condition difference factor $C_{2\text{-}1}$ — 1.08

All of cooling specification for each Dx-coil unit are designed under above condition.

Therefore $C_{2\text{-}1}$ (= 1.08) is fixed value for all unit.

Designing condition

(D) Outdoor air dry-bulb temperature — 33 ˚CDB

(E) Dx-coil inlet air wet-bulb temperature — 21.4 ˚CWB

(F) Air condition difference factor $C_{2\text{-}2}$ — 1.12

(Find $C_{2\text{-}2}$ from the graph on the page 62.)

(G) Total air condition difference factor C_2

$= C_{2\text{-}2}/C_{2\text{-}1}$ = (F) / (C) = 1.12 / 1.08 — 1.04

For the quick reference of air condition difference factor C_2, see the page 63.

(3) Corrected refrigerant pipe length factor

Read out the refrigerant pipe length factor C_3 using the capacity correction ratio curve on the page 63.

(A) Refrigerant pipe length — 7.5 m

(B) Refrigerant pipe length factor C_3 — 1.0

(4) Adjusted Dx-coil unit capacity

(A) Dx-coil unit cooling capacity on the specification — 7.1 kW

(B) Adjusted Dx-coil unit cooling capacity

$= (A) \times C_1 \times C_2 \times C_3 = 7.1 \times 1.0 \times 1.04 \times 1.0$ — **7.4 kW**

IV: Calculate the supply air conditions from Dx-coil unit

Enthalpy of supply air from Dx-coil: $h_o = h_i - C_a / (\rho \times Q_f / 3600)$ [kJ/kg(DA)]

h_i : Enthalpy of Dx-coil inlet air (equal to Lossnay outlet air) [kJ/kg(DA)] — 62.0 kJ/kg(DA)

C_a: Adjusted capacity of Dx-coil unit [kW] — 7.4 kW

ρ : Density of air [kg/m^3] — 1.2 kg/m^3

Q_f: Ventilation air volume [m^3/h] — 1000 m^3/h

Enthalpy of supply air from Dx-coil:

$h_o = h_i - C_a / (\rho \times Q_f / 3600)$ [kJ/kg(DA)]

$= 62.0 - 7.4 / (1.2 \times 1000 / 3600)$ — 39.8 kJ/kg(DA)

Calculate supply air temperature using SHF (sensible heat factor) given in the table below.
SHF at the air condition of Outdoor air 33˚CDB, 63%RH (27˚CWB) and Return air 26˚CDB, 50%RH (18.7˚CWB).

[RA temperature control]

Dx-coil unit	GUG-01SL-E		GUG-02SL-E		GUG-03SL-E				
Connected Lossnay	LGH-50RVX-E	LGH-65RVX-E	LGH-80RVX-E	LGH-100RVX-E	LGH-150RVX-E	LGH-200RVX-E	LGH-150RVXT-E	LGH-200RVXT-E	LGH-250RVXT-E
Air volume [m^3/h]	500	650	800	1000	1500	2000	1500	2000	2500
Connected Outdoor unit	ZRP35	ZRP35	ZRP50	ZRP71	ZRP100	ZRP100	ZRP100	ZRP100	ZRP125
CA (kW)	3.80	4.22	5.09	7.36	9.68	10.19	9.68	10.19	13.19
SHC (kW)	2.17	2.45	3.05	4.2	5.71	6.62	5.71	6.62	9.36
SHF	0.57	0.58	0.60	0.57	0.59	0.65	0.59	0.65	0.71

[SA temperature control]

Dx-coil unit	-	-	GUG-02SL-E		GUG-03SL-E				
Connectable Lossnay	-	-	LGH-80RVX-E	LGH-100RVX-E	LGH-150RVX-E	LGH-200RVX-E	LGH-150RVXT-E	LGH-200RVXT-E	LGH-250RVXT-E
Air volume [m^3/h]	-	-	800	1000	1500	2000	1500	2000	2500
Connected Outdoor unit	-	-	ZRP50	ZRP50	ZRP71	ZRP71	ZRP71	ZRP71	ZRP71
CA (kW)	-	-	5.09	5.4	7.23	7.54	7.23	7.54	8.23
SHC (kW)	-	-	3.05	3.35	5.21	5.66	5.21	5.66	6.25
SHF	-	-	0.60	0.62	0.72	0.75	0.72	0.75	0.76

SHF is calculated by following formula.

$SHF = q_s / q_t = c \times \Delta T / \Delta h = c\ [kJ/kg \cdot K] \times (T_i - T_O)\ [K] / (h_i - h_O)\ [kJ/kg(DA)]$

From this, supply air temperature T_O can be calculated by following formula.

$T_O = T_i - SHF \times (h_i - h_O) / c$

q_s : Sensible Heat

q_t : Total Heat

SHF : Sensible heat factor (Read out from above table)	0.57
h_O : Enthalpy of supply air	39.8 kJ/kg(DA)
h_i : Enthalpy of Dx-coil inlet air	62.0 kJ/kg(DA)
c : Specific heat capacity of Air	1.006 kJ/kg·K
T_i : Dx-coil inlet air temperature	28.0 ˚C

Using these parameters,

T_O : Supply air temperature

$= 28.0 - 0.57 \times (62.0 - 39.8) / 1.006$ → 15.4 ˚C

Supply air condition from Dx-coil can be read out by the psychrometric chart.

Supply air from Dx-coil unit		
Dry-bulb temperature	[°C]	15.4
Wet-bulb temperature	[°C]	14.2
Absolute humidity	[kg/kg(DA)]	0.0096
Relative humidity	[%]	88
Enthalpy	[kJ/kg(DA)]	39.8

SHF depends on the designing conditions such as indoor / outdoor air conditions.
Use the adequate SHF for the actual designing by the table on page 65.

STEP4. Comparison of Lossnay + Dx-coil unit capacity with required capacity

By calculations from STEP 1 to 3, the capacity of Lossnay + Dx-coil unit is summate as shown below.

Capacity calculation result

(A) Required cooling capacity	31.4 kW
(B) Lossnay energy recovery	7.5 kW
(C) Dx-coil cooling capacity	7.4 kW
(D) Lossnay + DX-coil unit system cooling capacity = (B) + (C)	14.9 kW

As a result, (D) is smaller than (A). Therefore, consider to add other cooling equipment.
(In this example, air-conditioning equipment whose capacity is 16.5 kW (31.4 - 14.9) is necessary.)

Example 1-2 : Heating for an office floor by RA temperature control

STEP1. Calculation of required heating capacity

I: Calculation of required ventilation air volume and selection of Lossnay unit

See page 37 for the way to calculate required ventilation air volume.
In this Example 1-2, the floor is assumed the same room as Example 1-1.
Therefore, required air volume is also same as Example 1-1.

II: Calculation of heating load to determine the required capacity

Classification of Heating Load

	Class	Heat Load
(a)	Indoor heat loss	Heat escaping from walls (qws) Heat escaping from glass (q_{GS}) Heat loss from conduction and convection (q_{GS}) Accumulated heat load in walls (qss)
(b)	Ventilation load	Sensible heat (q_{FS}) Latent heat (q_{FL})

During heating, the heat generated by persons and electrical equipment in the room can be subtracted from the heating load.
If the warming-up time at the start of heating is short, however, the generated heat may be ignored in some cases.

In this example, the outdoor and return air conditions are assumed as shown in table below.

		Dry Bulb Temp.	Relative Humidity	Wet Bulb Temp.	Enthalpy	Enthalpy Difference
Heating	Outdoor Air	0 °C	50%	–3 °C	4.7kJ/kg(DA)	33.6kJ/kg(DA)
	Return Air	20 °C	50%	13.7 °C	38.3kJ/kg(DA)	

Ventilation load can be calculated by same formula as Example 1-1.
Ventilation load per unit area under above condition can be calculated as following.

Ventilation load per unit area = ρ [kg/m^3] x n [person/m^2] x V_f [m^3/h·person] x (h_R - h_O) [kJ/kg(DA)]

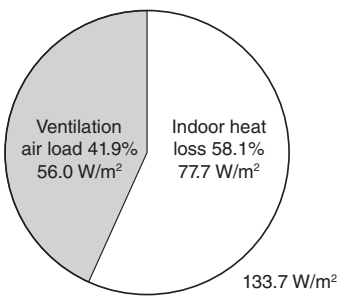
= 1.2 [kg/m^3] x 0.2 [person/m^2] x 25 [m^3/h·person] x 33.6 [kJ/kg(DA)]

= 201.6 [kJ/h·m^2]

= 56.0 [W/m^2]

In this example, other heating loads are regarded as a general value in Tokyo shown in the table below.
Calculate them in an appropriate way in the actual designing.

Percentage of load



Type of load	Load
Ventilation Air Load	56.0 W/m^2
Internal Heat	77.7 W/m^2
Total	133.7 W/m^2

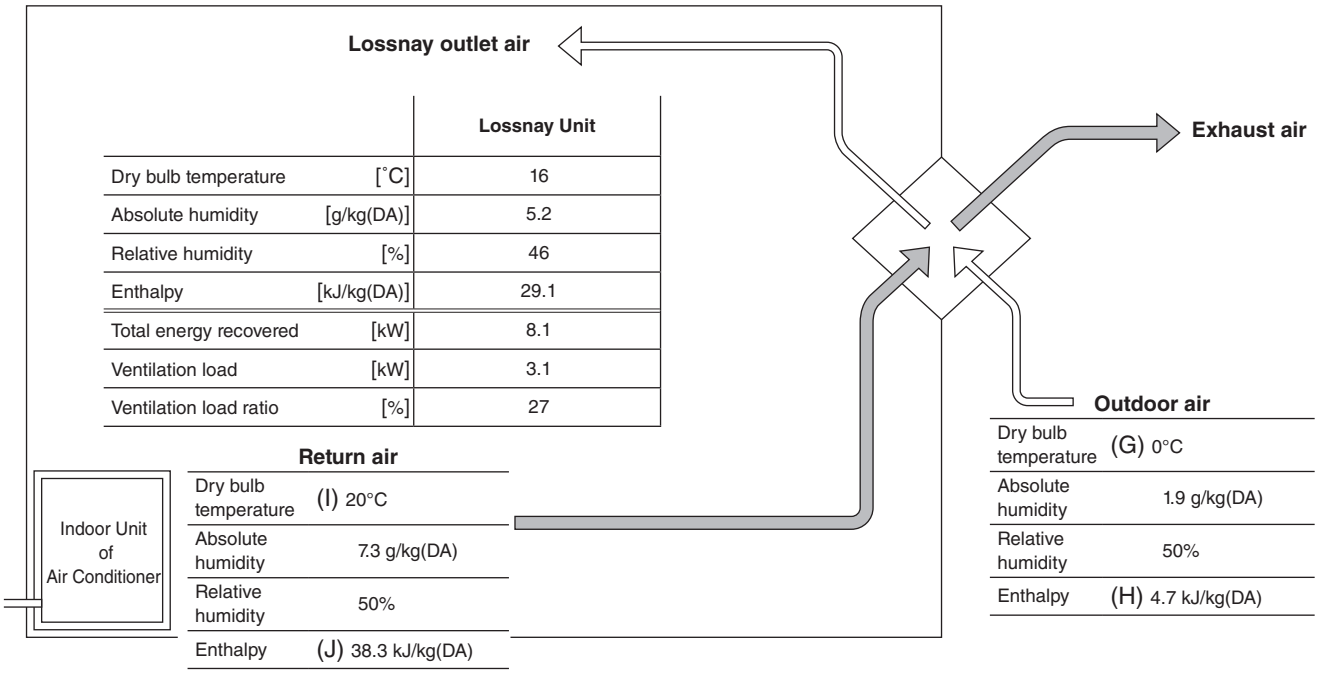
Conditions: Middle south-facing floor of a typical office building.

Required heating capacity to make up for above heating loads
= 133.7 [W/m^2] × 200 [m^2] = **26.7 [kW]**

III: Calculation of Lossnay energy recovery effect

(A) Lossnay model	LGH-100RVX-E
(B) Temperature exchange efficiency for winter (at 1000m³/h)	80 %
(C) Enthalpy exchange efficiency on heating (at 1000m³/h)	72.5 %
(D) Lossnay outlet air temperature = ((I) – (G)) x (B) + (G) = (20˚C - 0˚C) x 0.80 + 0˚C	16 ˚C
(E) Lossnay outlet air enthalpy = ((J) – (H)) x (C) + (H) = (38.3 – 4.7) x 0.725 + 4.7	29.1 kJ/kg(DA)
(F) Energy recovered by Lossnay = ((E) – (H)) x ρ x Q_f /3600 = (29.1 – 4.7) x 1.2 x 1000/3600	**8.1 kW**

Note: Please see the picture below to find (G) to (J).



		Lossnay Unit
Dry bulb temperature	[˚C]	16
Absolute humidity	[g/kg(DA)]	5.2
Relative humidity	[%]	46
Enthalpy	[kJ/kg(DA)]	29.1
Total energy recovered	[kW]	8.1
Ventilation load	[kW]	3.1
Ventilation load ratio	[%]	27

Return air	
Dry bulb temperature	(I) 20°C
Absolute humidity	7.3 g/kg(DA)
Relative humidity	50%
Enthalpy	(J) 38.3 kJ/kg(DA)

Outdoor air	
Dry bulb temperature	(G) 0°C
Absolute humidity	1.9 g/kg(DA)
Relative humidity	50%
Enthalpy	(H) 4.7 kJ/kg(DA)

STEP2. Selection of Dx-coil unit system

Please see Example 1-1 for details.
In this example, Lossnay + Dx-coil unit system is the same as Example 1-1 .

Lossnay model **LGH-100RVX-E**	⇒	Adequate Dx-coil unit model **GUG-02SL-E**
Temp. control feature **Return air temp. control**	⇒	Adequate outdoor unit model **PUHZ-ZRP71**

STEP3-2. Calculation of Dx-coil unit heating capacity

Calculation steps
I: Read out characteristics from the specification sheet
II: Calculate Dx-coil inlet air (Lossnay outlet air) condition
III: Calculate the capacity of Dx-coil unit
IV: Calculate supply air conditions from Dx-coil unit

I: Read out characteristics from the specification sheet

(1) Calculation conditions

(A) Lossnay + Dx-coil System configuration	LGH-100RVX-E + GUG-02SL-E + PUHZ-ZRP71
(B) Temperature control feature	RA Temp. control
(C) Ventilation air volume	1000 m^3/h
(D) Outdoor air condition	0 ˚CDB, 50 %RH
(E) Return air condition	20 ˚CDB, 50 %RH
(F) Refrigerant pipe length	7.5 m

(2) Characteristics read out from specifications

(G) Heating capacity under specification condition	13.2 kW
- Lossnay recovery	5.1 kW
- Heating capacity of Dx-coil unit	8.1 kW

II: Calculate Dx-coil inlet air (Lossnay outlet air) condition

The conditions of Lossnay outlet air are already calculated in STEP1-III as shown below.

Example 1-2 condition		Outdoor air	Return air	Dx-coil inlet air (Lossnay outlet air)
Dry-bulb temperature	[˚C]	0	20	16
Wet-bulb temperature	[˚C]	–3	13.8	10
Absolute humidity	[kg/kg(DA)]	0.0019	0.0073	0.0051
Relative humidity	[%]	50	50	46
Enthalpy	[kJ/kg(DA)]	4.7	38.3	29.1

III: Calculate the capacity of Dx-coil unit

Adjusted Dx-coil unit capacity (heating)
= Capacity under specification condition x Air volume factor C_1 x Air Condition difference factor C_2 x Corrected refrigerant pipe length factor C_3

(1) Air volume factor

Air volume factor C_1 is the same as Example1-1. 1.0

(2) Air condition difference factor

Characteristics for heating written in specification sheet are based on air conditions of outdoor air: 7°CDB, 6°CWB and return air: 20°CDB, 15°CWB.

Read out the air volume factor $C_{2\text{-}2}$ by outdoor air wet-bulb temperature and Lossnay outlet air dry-bulb temperature using the performance curves on the page 62.

Specification condition		Outdoor air	Return air	Dx-coil inlet air (Lossnay outlet air)
Dry-bulb temperature	[˚C]	7	20	(B)17.4
Wet-bulb temperature	[˚C]	(A)6	15	12.8
Absolute humidity	[kg/kg(DA)]	0.0054	0.0086	0.0073
Relative humidity	[%]	87	59	59
Enthalpy	[kJ/kg(DA)]	20.6	41.9	36.0

Specification condition

(A) Outdoor air wet-bulb temperature	6˚CWB
(B) Dx-coil inlet air dry-bulb temperature	17.4˚CDB
(C) Air condition difference factor $C_{2\text{-}1}$	1.02

All of cooling specification for each Dx-coil unit are designed under above condition.
Therefore $C_{2\text{-}1}$ (= 1.02) is fixed value for all unit.

Designing condition

(D) Outdoor air wet-bulb temperature	–3˚CWB
(E) Dx-coil inlet air dry-bulb temperature	16.0˚CDB
(F) Air condition difference factor $C_{2\text{-}2}$ (Find $C_{2\text{-}2}$ from the graph on page 62.)	0.72
(G) Total air condition difference factor C_2 = $C_{2\text{-}2}/C_{2\text{-}1}$ = (F) / (C) = 0.72 / 1.02	0.71

For the quick reference of air condition difference factor C_2 , see the page 63.

(3) Corrected refrigerant pipe length factor

(A) Refrigerant pipe length factor C_3 Same condition with Example 1-1.	1.0

(4) Adjusted Dx-coil unit capacity

(A) Dx-coil unit heating capacity on the specification	8.1 kW
(B) Adjusted Dx-coil unit heating capacity = (A) x C_1 x C_2 x C_3 = 8.1 x 1.0 x 0.71 x 1.0 = 5.75 ≒ 5.8	**5.8 kW**

IV: Calculate the supply air conditions from Dx-coil unit

Enthalpy of supply air from Dx-coil : $h_o = C_a / (\rho \times Q_f / 3600) + h_i$ [kJ/kg(DA)]

h_i : Enthalpy of Dx-coil inlet air (equal to Lossnay outlet air) [kJ/kg(DA)]	29.1 kJ/kg(DA)
C_a: Adjusted capacity of Dx-coil unit [kW]	5.8 kW

Enthalpy of supply air from Dx-coil :

$h_o = C_a / (\rho \times Q_f / 3600) + h_i$ [kJ/kg(DA)] = 5.75 / (1.2 x 1000 / 3600) + 29.2	46.4 kJ/kg(DA)

Absolute humidity, the ratio of water weight against the unit weight of dry air, is unchanged during heating.
Supply air condition from Dx-coil can be read out by psychrometric chart.

Supply air from Dx-coil unit		
Dry-bulb temperature	[°C]	33.2
Wet-bulb temperature	[°C]	16.7
Absolute humidity	[kg/kg(DA)]	0.0051
Relative humidity	[%]	16
Enthalpy	[kJkg(DA)]	46.4

STEP4. Comparison of Lossnay + Dx-coil unit capacity with required capacity

By calculations from STEP 1 to 3, the capacity of Lossnay + Dx-coil unit is summate as shown below.

Capacity calculation result

(A) Required cooling capacity	26.7 kW
(B) Lossnay energy recovery	8.1 kW
(C) Dx-coil heating capacity	5.8 kW
(D) Lossnay + DX-coil unit system cooling capacity = (B) + (C)	13.9 kW

As a result, (D) is smaller than (A). Therefore, consider to add other heating equipment.
(In this example, air-conditioning equipment whose capacity is 12.8 kW (26.7 - 13.9) is necessary.)

Example 2-1: Cooling for an school classroom by RA temperature control

Following calculations are just examples.
In the actual designing, please calculate in an appropriate way.

STEP1 . Calculation of required cooling capacity

I: Calculation of required ventilation air volume and selection of Lossnay unit

(A) Floor space	50 m^2
(B) Required fresh air rates	40 m^3/h·person
(C) Floor space per person	2 m^2/person
(D) The number of people per 1 m^2 = The reciprocal number of floor space per person	0.5 person/m^2
(E) The number of person in the floor = (A) / (C) = 50 / 2 = (A) x (D) = 50 x 0.5	25 people
(F) Required fresh air volume = (B) x (E) = 40 x 25	1000 m^3/h
(G) Required static pressure	170 Pa

⇨ Adequate Lossnay model **LGH-100RVX-E**

II: Calculation of cooling load to determine the required capacity

In this example, the outdoor and return air conditions are assumed that shown in the table below.

		Dry Bulb Temp.	Relative Humidity	Wet Bulb Temp.	Enthalpy	Enthalpy Difference
Cooling	Outdoor Air	27 °C	50%	19.5 °C	55.4 kJ/kg (DA)	13.6 kJ/kg (DA)
	Return Air	21 °C	53%	15 °C	41.8 kJ/kg (DA)	

Ventilation load can be calculated by same formula as Example 1-1.
Ventilation load per unit area under above condition can be calculated as following

Ventilation load per unit area = ρ [kg/m^3] x n [person/m^2] x V_f [m^3/h·person] x (h_O - h_R) [kJ/kg(DA)]
= 1.2 [kg/m^3] x 0.5 [person/m^2] x 40 [m^3/h·person] x (55.4 - 41.8) [kJ/kg(DA)]
= 326.4 [kJ/h·m^2]
= 90.7 [W/m^2]

In this example, other cooling loads are regarded as shown in the table below.
Calculate them in an appropriate way in the actual designing.

Load type		Load
Ventilation Air Load		90.7 W/m^2
Indoor Generated Heat	People	40.0 W/m^2
	Lightning Equipment	20.0 W/m^2
Indoor Penatration Heat		36.3 W/m^2
Total		187.0 W/m^2

Required cooling capacity to make up for above cooling loads
= 187.0 [W/m^2] × 50 [m^2] = **9.4 [kW]**

III: Calculation of Lossnay energy recovery effect

(A) Lossnay model	LGH-100RVX-E
(B) Temperature exchange efficiency for summer (at 1000m³/h)	72 %
(C) Enthalpy exchange efficiency on cooling (at 1000m³/h)	71 %
(D) Lossnay outlet air temperature = (G) – ((G) - (I)) x (B) = 27°C - (27°C - 21°C) ×0.72	22.7 °C
(E) Lossnay outlet air enthalpy = (H) – ((H) – (J)) x (C) = 55.4 - (55.4 – 41.8)×0.71	45.8 kJ/kg(DA)
(F) Energy recovered by Lossnay =((H) – (E)) x ρ x Q_f/3600 = (55.4 – 45.8)×1.2×1000/3600	**3.2 kW**

Example 2-1 condition	Outdoor air	Return air	Dx-coil inlet air (Lossnay outlet air)
Dry-bulb temperature [˚C]	(G) 27	(I) 21	22.7
Wet-bulb temperature [˚C]	19.5	15	16.4
Absolute humidity [kg/kg(DA)]	0.0111	0.0082	0.0090
Relative humidity [%]	50	53	53
Enthalpy [kJ/kg(DA)]	(H) 55.4	(J) 41.8	45.8

STEP2. Selection of Dx-coil unit system

Dx-coil unit and outdoor unit are selected as shown below.

Lossnay model **LGH-100RVX-E**	⇨	Adequate Dx-coil unit model **GUG-02SL-E**
Temperature control feature **Return air temperature control**	⇨	Adequate outdoor unit model **PUHZ-ZRP71**

STEP3-1. Calculation of Dx-coil unit cooling capacity

I: Read out characteristics from the specification sheet

(1) Calculation conditions

- See the parameters used so far.

(2) Characteristics read out from specifications

(B) Cooling capacity under specification condition	11.3 kW
- Lossnay recovery	4.2 kW
- Cooling capacity of Dx-coil unit	7.1 kW

II: Calculate Dx-coil inlet air (Lossnay outlet air) condition

See the calculations and table in STEP1- III.

III: Calculate the capacity of Dx-coil unit

(1) Air volume factor

(A) Designing air volume	1000 m³/h
(B) Related air volume of Lossnay unit at fan speed 4	1000 m³/h
(C) Air volume ratio = (A) / (B)	1.0
(D) Air volume factor C_1 (Find C_1 from the graph on the page 62.)	1.0

(2) Air condition difference factor
Specification condition
(A) Air condition difference factor $C_{2\text{-}1}$
Designing condition — 1.08
(B) Outdoor air dry-bulb temperature — 27 ˚CDB
(C) Dx-coil inlet air wet-bulb temperature — 16.4 ˚CWB
(D) Air condition difference factor $C_{2\text{-}2}$ — 0.94
(Find $C_{2\text{-}2}$ from the graph on page 62.)
(E) Total air condition difference factor C_2
$= C_{2\text{-}2}/C_{2\text{-}1}$ = (D) / (A) = 0.94 / 1.08 — 0.87

For the quick reference of air condition difference factor C_2, see the page 63.

(3) Corrected refrigerant pipe length factor
Read out the refrigerant pipe length factor C_3 using the capacity correction ratio curve on the page 63.
(A) Refrigerant pipe length — 7.5m
(B) Refrigerant pipe length factor C_3 — 1.0

(4) Adjusted Dx-coil unit capacity
(A) Dx-coil unit cooling capacity on the specification — 7.1kW
(B) Adjusted Dx-coil unit cooling capacity
C_a = (A) x C_1 x C_2 x C_3 = 7.1 x 1.0 x 0.87 x 1.0 — **6.2kW**

IV: Calculate the supply air conditions from Dx-coil unit

Calculate supply air temperature usig SHF(sensible heat factor) given in the table below.

SHF at the air condition of Outdoor air 27°CDB, 50%RH (19.5°CWB) and Return air 21°CDB, 53%RH (15°CWB).

[RA temperature control]

Dx-coil unit	GUG-01SL-E		GUG-02SL-E		GUG-03SL-E				
Connected Lossnay	LGH-50RVX-E	LGH-65RVX-E	LGH-80RVX-E	LGH-100RVX-E	LGH-150RVX-E	LGH-200RVX-E	LGH-150RVXT-E	LGH-200RVXT-E	LGH-250RVXT-E
Air volume [m³/h]	500	650	800	1000	1500	2000	1500	2000	2500
Connected Outdoor unit	ZRP35	ZRP35	ZRP50	ZRP71	ZRP100	ZRP100	ZRP100	ZRP100	ZRP125
CA (kW)	3.13	3.48	4.35	6.18	8.27	8.7	8.27	8.7	10.88
SHC (kW)	2.10	2.40	3.00	4.08	5.62	6.44	5.62	6.53	9.30
SHF	0.67	0.69	0.69	0.66	0.68	0.74	0.68	0.75	0.83

[SA temperature control]

Dx-coil unit	-	-	GUG-02SL-E		GUG-03SL-E				
Connectable Lossnay	-	-	LGH-80RVX-E	LGH-100RVX-E	LGH-150RVX-E	LGH-200RVX-E	LGH-150RVXT-E	LGH-200RVXT-E	LGH-250RVXT-E
Air volume [m³/h]	-	-	800	1000	1500	2000	1500	2000	2500
Connected Outdoor unit	-	-	ZRP50	ZRP50	ZRP71	ZRP71	ZRP71	ZRP71	ZRP71
CA (kW)	-	-	4.35	4.61	6.18	6.44	6.18	6.44	6.79
SHC (kW)	-	-	3.00	3.32	5.01	5.47	5.07	5.54	6.14
SHF	-	-	0.69	0.72	0.81	0.85	0.82	0.86	0.89

$T_O = T_i$ - SHF x (h_i - h_O) / c
q_s : Sensible Heat
q_t : Total Heat
SHF : Sensible heat factor (read out from table) — 0.66
h_i : Enthalpy of Dx-coil inlet air — 45.8 kJ/kg(DA)
h_O : Enthalpy of supply air from Dx-coil
$h_O = h_i - C_a / (\rho \times Q_f / 3600)$
$= 45.8 - 6.2 / (1.2 \times 1000 / 3600)$ — 27.2 kJ/kg(DA)
c : Specific heat capacity of Air — 1.006 kJ/kg·K
T_i : Dx-coil inlet air temperature — 22.7 °C
10.5 °C

Using these parameters,
T_O : Supply air temperature
$T_O = 22.7 - 0.66 \times (45.8 - 27.2) / 1.006$

Supply air condition from Dx-coil can be read out by psychrometric chart.

Supply Air from Dx-coil unit		
Dry-bulb temperature	[°C]	10.5
Wet-bulb temperature	[°C]	9.1
Absolute humidity	[kg/kg(DA)]	0.0066
Relative humidity	[%]	84
Enthalpy	[kJ/kg(DA)]	27.2

Because of supply air temperature is lower than dew point temperature of indoor air(11°C), there is a possibility of water condensation occurring around the outlet duct.

In this case, some countermeasures such as adding more insulation materials to supplying duct or setting target temperature high not to operate at maximum point are necessary.

SHF depends on the designing conditions such as return or outdoor air conditions.
Use the adequate SHF for the actual designing by the table in the page 65.

STEP4. Comparison of Lossnay + Dx-coil unit capacity with required capacity

By calculations from STEP 1 to 3, the capacity of Lossnay + Dx-coil unit is summate as shown below.

Capacity calculation result

(A) Required cooling capacity	9.4 kW
(B) Lossnay energy recovery	3.2 kW
(C) Dx-coil cooling capacity	6.2 kW
(D) Lossnay + DX-coil unit system cooling capacity = (B) + (C)	9.4 kW

As a result, (D) is nearly equal to (A).
Therefore, under this example condition, Lossnay + Dx-coil unit system has enough capacity as all-in-one air-conditioning system.

Example 2-2: Heating for a school classroom by RA temperature control

STEP1. Calculation of required heating capacity

I: Calculation of required ventilation air volume and selection of Lossnay unit

In this Example 2-2, the floor is assumed same room with Example 2-1.
Required air volume is same with Example 2-1.

II: Calculation of heating load to determine the required capacity

In this example, the outdoor and return air conditions are assumed that shown in table below.

		Dry Bulb Temp.	Relative Humidity	Wet Bulb Temp.	Enthalpy	Enthalpy Difference
Heating	Outdoor Air	0 °C	83%	–1 °C	7.8 kJ/kg(DA)	32.9 kJ/kg(DA)
	Return Air	21 °C	50%	14.6 °C	40.7 kJ/kg(DA)	

Ventilation load per unit area under above condition can be calculated as following.

Ventilation load per unit area $= \rho$ [kg/m^3] x n [person/m^2] x V_f [m^3/h·person] x (h_R - h_o) [kJ/kg(DA)]
$= 1.2$ [kg/m^3] x 0.5 [person/m^2] x 40 [m^3/h·person] x 32.9 [kJ/kg(DA)]
$= 789.6$ [kJ/h·m^2]
$= 219.3$ [W/m^2]

Load type	Load
Ventilation Load	219.4 W/m^2
Internal Heat	56.1 W/m^2
Total	275.5 W/m^2

Required heating capacity to make up for above heating loads
= 275.5 [W/m^2] × 50 [m^2] = **13.8 [kW]**

III: Calculation of Lossnay energy recovery effect

(A) Lossnay model — LGH-100RVX-E
(B) Temperature exchange efficiency for winter (at 1000m^3/h) — 80 %
(C) Enthalpy exchange efficiency on heating (at 1000m^3/h) — 72.5 %
(D) Lossnay outlet air temperature
= ((I) – (G)) x (B) + (G) = (21˚C – 0˚C) x 0.80 + 0˚C — 16.8 ˚C
(E) Lossnay outlet air enthalpy
= ((J) – (H)) x (C) + (H) = (40.7 – 7.8) x 0.725 + 7.8 — 31.7 kJ/kg(DA)
(F) Energy recovered by Lossnay
=((E) – (H)) x ρ x Q_f /3600 = (31.7 – 7.8) x 1.2 x 1000 / 3600 — **8.0 kW**

Example 2-2 condition		Outdoor air	Return air	Dx-coil inlet air (Lossnay outlet air)
Dry-bulb temperature	[˚C]	(G) 0	(I) 21	16.8
Wet-bulb temperature	[˚C]	–1	14.6	11.1
Absolute humidity	[kg/kg(DA)]	0.0031	0.0077	0.0058
Relative humidity	[%]	83	50	49
Enthalpy	[kJ/kg(DA)]	(H) 7.8	(J) 40.7	31.7

STEP2. Selection of Dx-coil unit system

Dx-coil unit and outdoor unit are selected as shown below.

Lossnay model **LGH-100RVX-E** → Adequate Dx-coil unit model **GUG-02SL-E**

Temperature control feature **Return air temperature control** → Adequate outdoor unit model **PUHZ-ZRP71**

STEP3-2. Calculation of Dx-coil unit heating capacity

I: Read out characteristics from the specification sheet

(1) Calculation conditions
- See the parameters used so far.

(2) Characteristics read out from specifications

(A) Heating capacity under specification condition — 13.2 kW
- Lossnay recovery — 5.1 kW
- Heating capacity of Dx-coil unit — 8.1 kW

II: Calculate Dx-coil inlet air (Lossnay outlet air) condition

See the calculations and table in STEP1-III.

III: Calculate the capacity of Dx-coil unit

(1) Air volume factor

(A) Designing air volume	1000 m^3/h
(B) Related air volume of Lossnay unit at fan speed 4	1000 m^3/h
(C) Air volume ratio = (A) / (B)	1.0
(D) Air volume factor C_1 (Find C_1 from the graph on page 62.)	1.0

(2) Air condition difference factor

Specification condition

(A) Air condition difference factor C_{2-1} Designing condition	1.02
(B) Outdoor air wet-bulb temperature	–1 ˚CWB
(C) Lossnay outlet air dry-bulb temperature	16.8 ˚CDB
(D) Air condition difference factor C_{2-2} (Find C_{2-2} from the graph on page 62.)	0.75
(E) Total air condition difference factor C_2 = C_{2-2}/C_{2-1} = (D) / (A) = 0.75/1.02	0.74

For the quick reference of air condition difference factor C_2 , see the page 63.

(3) Corrected refrigerant pipe length factor

Read out the refrigerant pipe length factor C_3 using the capacity correction ratio curve on the page 63.

(A) Refrigerant pipe length	7.5 m
(B) Refrigerant pipe length factor C_3	1.0

(4) Adjusted Dx-coil unit capacity

(A) Dx-coil unit cooling capacity on the specification	8.1 kW
(B) Adjusted Dx-coil unit cooling capacity = (A) x C_1 x C_2 x C_3 = 8.1 x 1.0 x 0.74 x 1.0	**6.0 kW**

IV: Calculate the supply air conditions from Dx-coil unit

Enthalpy of supply air from Dx-coil : $h_o = C_a / (\rho \times Q_f / 3600) + h_i$ [kJ/kg(DA)]

h_i : Enthalpy of Dx-coil inlet air (equal to Lossnay outlet air) [kJ/kg(DA)]	31.7 kJ/kg(DA)
C_a: Capacity of Dx-coil unit [kW]	6.0 kW

Enthalpy of supply air from Dx-coil :

$h_o = C_a / (\rho \times Q_f / 3600) + h_i$ [kJ/kg(DA)] = 6.0 / (1.2 x 1000 / 3600)+31.7 → 49.7 kJ/kg(DA)

Absolute humidity, the ratio of water weight against the unit weight of dry air, is unchanged during heating.
Supply air condition from Dx-coil can be read out by the psychrometric chart.

Supply Air from Dx-coil unit		
Dry-bulb temperature	[°C]	34.5
Wet-bulb temperature	[°C]	17.8
Absolute humidity	[kg/kg(DA)]	0.0058
Relative humidity	[%]	17
Enthalpy	[kJ/kg(DA)]	49.7

STEP4. Comparison of Lossnay + Dx-coil unit capacity with required capacity

By calculations from STEP 1 to 3, the capacity of Lossnay + Dx-coil unit is summate as shown below.

Capacity calculation result

(A) Required heating capacity	13.8 kW
(B) Lossnay energy recovery	8.0 kW
(C) Dx-coil heating capacity	6.0 kW
(D) Lossnay + DX-coil unit system heating capacity = (B) + (C)	14.0 kW

As a result, (D) is bigger than (A).
Therefore, under this example condition, Lossnay + Dx-coil unit system has enough capacity as all-in-one air-conditioning system.

Example 3-1: Cooling for an office floor by SA temperature control

For details of each calculation, see Example 1-1.

STEP1. Calculation of required cooling capacity

I: Calculation of required ventilation air volume and selection of Lossnay unit

The floor is assumed same room with Example 1-1.
Therefore, required air volume is also same with Example 1-1.

Required fresh air volume **1000m³/h** → Adequate Lossnay model **LGH-100RVX-E**

II: Calculation of cooling load to determine the required capacity

One of the main purposes of SA temperature control is to make up for ventilation load.
As written in Example 1-1, ventilation load is calculated as following under this conditions.

Ventilation load per unit area = ρ x n x V_f x (h_O - h_R) 190.8 kJ/m² = 53.0 W/m²

		Dry Bulb Temp.	Relative Humidity	Wet Bulb Temp.	Enthalpy	Enthalpy Difference
Cooling	Outdoor Air	33 °C	63%	27 °C	84.6 kJ/kg(DA)	31.8 kJ/kg(DA)
	Return Air	26 °C	50%	18.7 °C	52.8 kJ/kg(DA)	

Required cooling capacity to make up for above ventilation load (not total cooling load)
= 53.0 [W/m²] × 200 [m²] = **10.6 [kW]**

III: Calculation of Lossnay energy recovery effect

Lossnay energy recovery effect can also be calculated by the same way with Example1-1.

Energy recovered by Lossnay **7.5 kW**

Example 1-1 condition		Outdoor air	Return air	Dx-coil inlet air (Lossnay outlet air)
Dry-bulb temperature	[˚C]	33	26	28
Wet-bulb temperature	[˚C]	27	18.7	21.4
Absolute humidity	[kg/kg(DA)]	0.0201	0.0105	0.0133
Relative humidity	[%]	63	50	56
Enthalpy	[kJ/kg(DA)]	84.6	52.9	62.0

STEP2. Selection of Dx-coil unit system

Select Dx-coil unit and outdoor unit as shown below.

Lossnay model **LGH-100RVX-E** → Adequate Dx-coil unit model **GUG-02SL-E**

Temperature control feature **Supply air temperature control** → Adequate outdoor unit model **PUHZ-ZRP50**

STEP3-1. Calculation of Cooling capacity of Dx-coil unit

I: Read out characteristics from the specification sheet

(1) Calculation conditions
  (A) Lossnay + Dx-coil System configuration: LGH-100RVX-E + GUG-02SL-E + PUHZ-ZRP50
  (B) Temperature control feature: SA Temperature control
(2) Characteristics read out from specifications
  (D) Cooling capacity under specification condition: 9.5 kW
    - Lossnay recovery: 4.2 kW
    - Cooling capacity of Dx-coil unit: 5.3 kW

II: Calculate the capacity of Dx-coil unit

(1) Air volume factor

(A) Air volume factor C_1	1.0

(2) Air condition difference factor

(A) Total air condition difference factor C_2	1.04

For the quick reference of air condition difference factor C_2, see the page 63.

(3) Corrected refrigerant pipe length factor

(A) Corrected refrigerant pipe length factor C_3	1.0

(4) Adjusted Dx-coil unit capacity

(A) Dx-coil unit cooling capacity on the specification	5.3 kW
(B) Adjusted Dx-coil unit cooling capacity = (A) x C_1 x C_2 x C_3 = 5.3 x 1.0 x 1.04 x 1.0	**5.5 kW**

STEP4. Comparison of Lossnay + Dx-coil unit capacity with required capacity

By calculations from STEP 1 to 3, the capacity of Lossnay + Dx-coil unit is summate as shown below.

Capacity calculation result

(A) Required cooling capacity for ventilation load	10.6 kW
(B) Lossnay energy recovery	7.5 kW
(C) Dx-coil cooling capacity	5.5 kW
(D) Lossnay + DX-coil unit system cooling capacity = (B) + (C)	13.0 kW

As a result, (D) is bigger than (A).
Therefore, under this example condition, Lossnay + Dx-coil unit system has enough capacity for making up for ventilation load.
This result is based on when Dx-coil unit works at maximum capability point.
In the actual operation, Dx-coil unit changes its capability to follow the setting temperature.

For the “model selection of Dx-coil unit by supply air temperature”, see STEP3-3 on the page 57.

Example 3-2: Heating office floor by SA temperature control

For details of each calculation, see Example 1-2.

STEP1. Calculation of required heating capacity

I: Calculation of required ventilation air volume and selection of Lossnay unit

The floor is assumed same room with Example 1-1.
Therefore, required air volume is also same with Example 1-1.

Required fresh air volume **1000m³/h** → Adequate Lossnay model **LGH-100RVX-E**

II: Calculation of heating load to determine the required capacity

One of the main purpose of SA temperature control is to make up for ventilation load.
As written in Example 1-2, ventilation load is calculated as following under this conditions.

Ventilation load per unit area = ρ x n x V_f x (h_O - h_R) 201.6 kJ/m² = 56.0 W/m²

		Dry Bulb Temp.	Relative Humidity	Wet Bulb Temp.	Enthalpy	Enthalpy difference
Heating	Outdoor Air	0 °C	50%	–3 °C	4.7 kJ/kg(DA)	33.6 kJ/kg(DA)
	Return Air	20 °C	50%	13.7 °C	38.3 kJ/kg(DA)	

Required heating capacity to make up for above ventilation load (not total heating load)
= 56.0 [W/m²] × 200 [m²] = **11.2 [kW]**

III: Calculation of Lossnay energy recovery effect

Lossnay energy recovery effect can also be calculated by the same way with Example1-2.
Energy recovered by Lossnay **8.1 kW**

Example 1-2 condition		Outdoor air	Return air	Dx-coil inlet air (Lossnay outlet air)
Dry-bulb temperature	[˚C]	0	20	16
Wet-bulb temperature	[˚C]	–3	13.8	10
Absolute humidity	[kg/kg(DA)]	0.0019	0.0073	0.0052
Relative humidity	[%]	50	50	46
Enthalpy	[kJ/kg(DA)]	4.7	38.3	29.1

STEP2. Selection of Dx-coil unit system

Select Dx-coil unit and outdoor unit as shown below.

Lossnay model **LGH-100RVX-E** → Adequate Dx-coil unit model **GUG-02SL-E**

Temperature control feature **Supply air temperature control** → Adequate outdoor unit model **PUHZ-ZRP50**

STEP3-2. Calculation of Dx-coil unit heating capacity

I: Read out characteristics from the specification sheet

(1) Calculation conditions
(A) Lossnay + Dx-coil System configuration: LGH-100RVX-E + GUG-02SL-E + PUHZ-ZRP50
(B) Temperature control feature: SA Temperature control

(2) Characteristics read out from specifications
(A) Heating capacity under specification condition: 11.4 kW
- Lossnay recovery: 5.1 kW
- Heating capacity of Dx-coil unit: 6.3 kW

II: Calculate the capacity of Dx-coil unit

(1) Air volume factor

(A) Air volume factor C_1	1.0

(2) Air condition difference factor

(A) Total air condition difference factor C_2	0.71

For the quick reference of air condition difference factor C_2, see the page 63.

(3) Corrected refrigerant pipe length factor

(A) Corrected refrigerant pipe length factor C_3	1.0

(4) Adjusted Dx-coil unit capacity

(A) Dx-coil unit heating capacity on the specification	6.3 kW
(B) Adjusted Dx-coil unit cooling capacity = (A) x C_1 x C_2 x C_3 = 6.3 x 1.0 x 0.71 x 1.0	**4.5 kW**

STEP4. Comparison Lossnay + Dx-coil unit capacity to required capacity

By calculations from STEP 1 to 3, the capacity of Lossnay + Dx-coil unit is summate as shown below.

Capacity calculation result

(A) Required heating capacity for ventilation load	11.2kW
(B) Lossnay energy recovery	8.1kW
(C) Dx-coil heating capacity	4.5kW
(D) Lossnay + DX-coil unit system cooling capacity = (B) + (C)	12.6kW

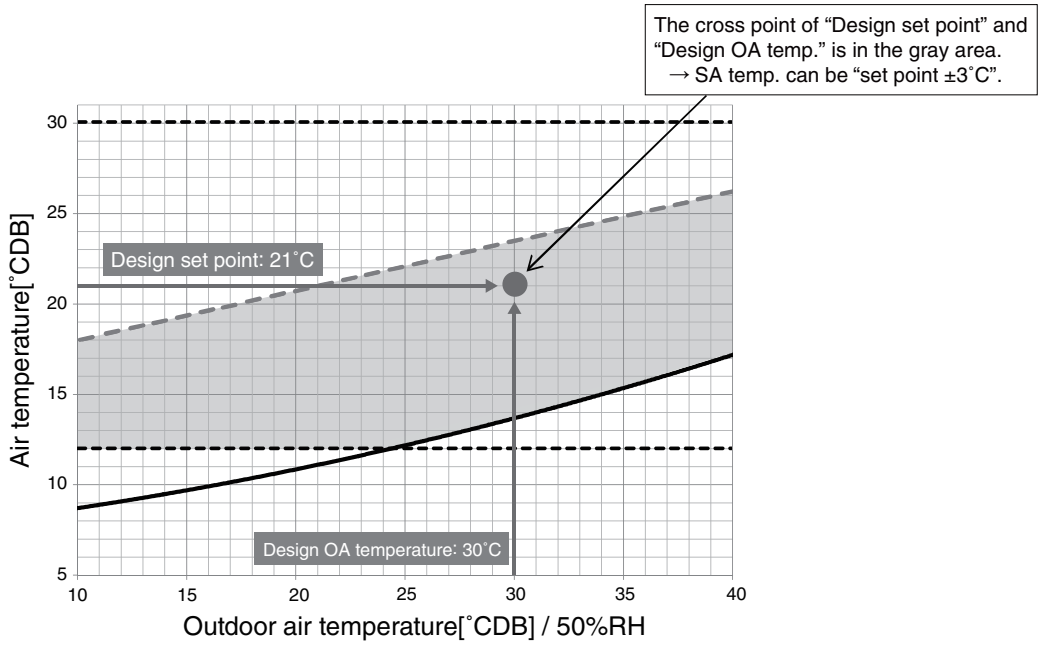
As a result, (D) is bigger than (A).
Therefore, under this example condition, Lossnay + Dx-coil unit system has enough capacity for making up for ventilation load.
This result is based on when Dx-coil unit works at maximum capability point.
In the actual operation, Dx-coil unit changes its capability to follow the setting temperature.

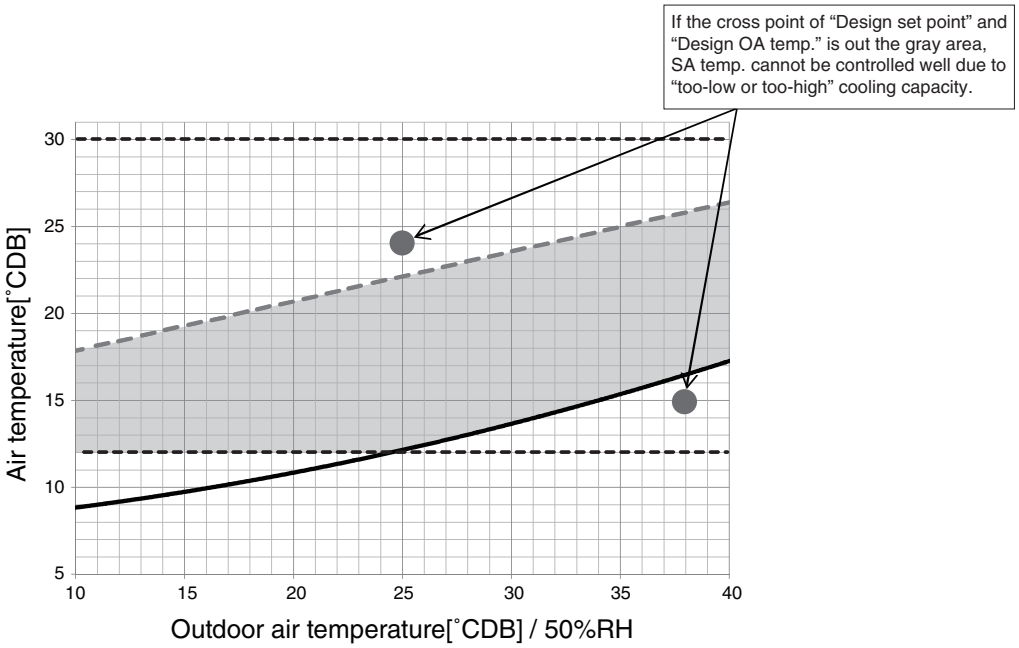
For the “model selection of Dx-coil unit by supply air temperature”, see STEP3-3 on the page 57.

STEP3-3. Selection of DX-coil unit by supply air temperature

In this step3-3, the outline graph of the average supply air temperature during SA temperature control operation is shown.
Following graph is just an example based on some theoretical conditions.
It might be different from the actual operation.

How to read the graph

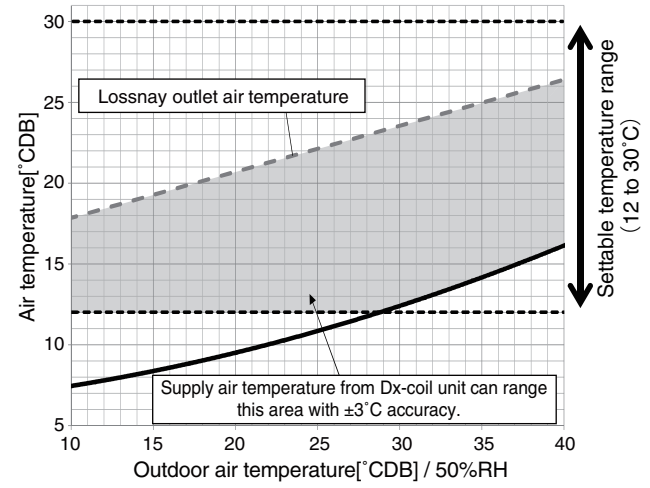




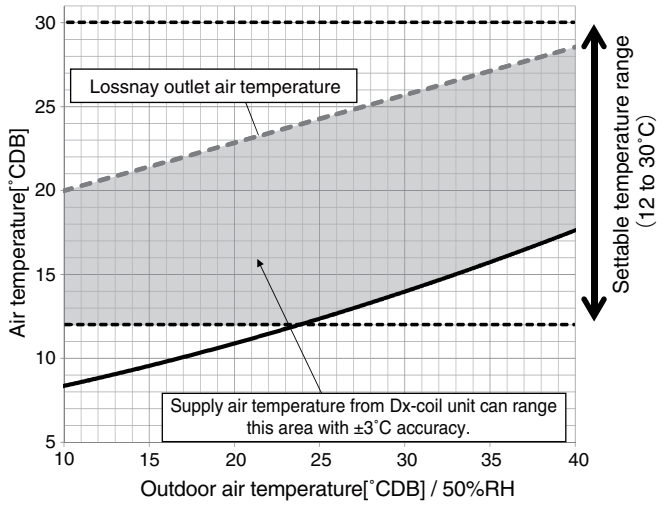
I: Cooling

LGH-80RVX-E + GUG-02SL-E + PUHZ-ZRP50

Return air condition: 21˚CDB, 50%RH

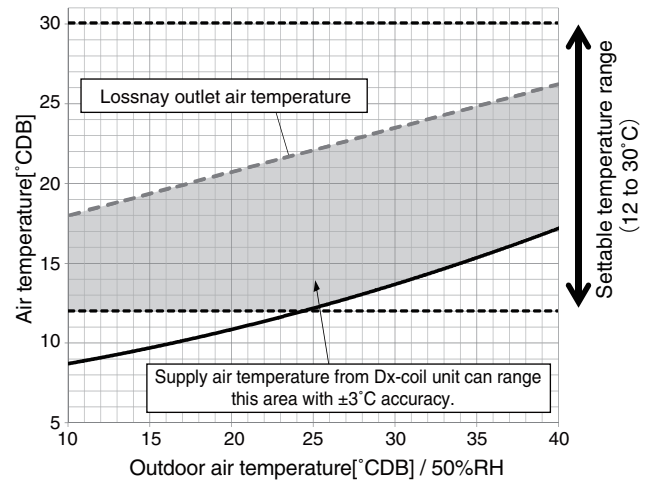


Return air condition: 24˚CDB, 50%RH

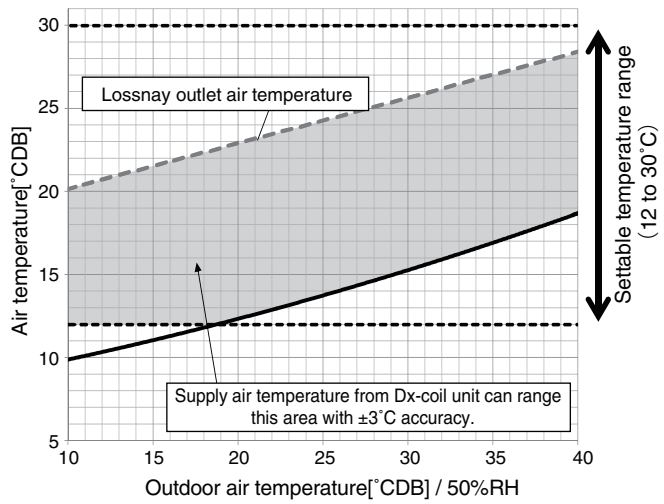


LGH-100RVX-E + GUG-02SL-E + PUHZ-ZRP50

Return air condition: 21˚CDB, 50%RH

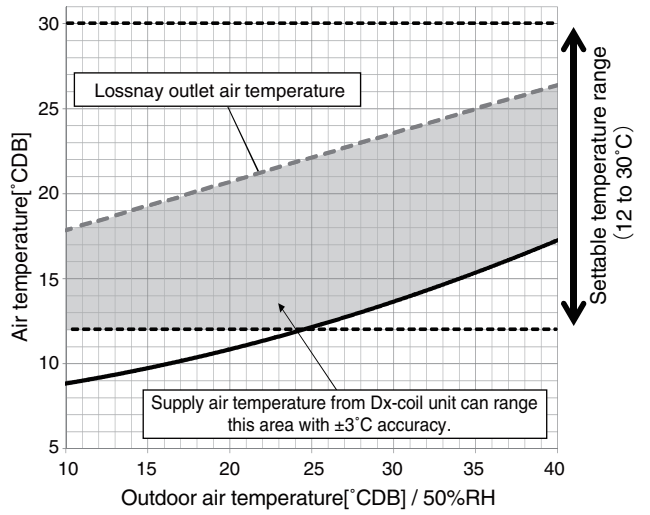


Return air condition: 24˚CDB, 50%RH

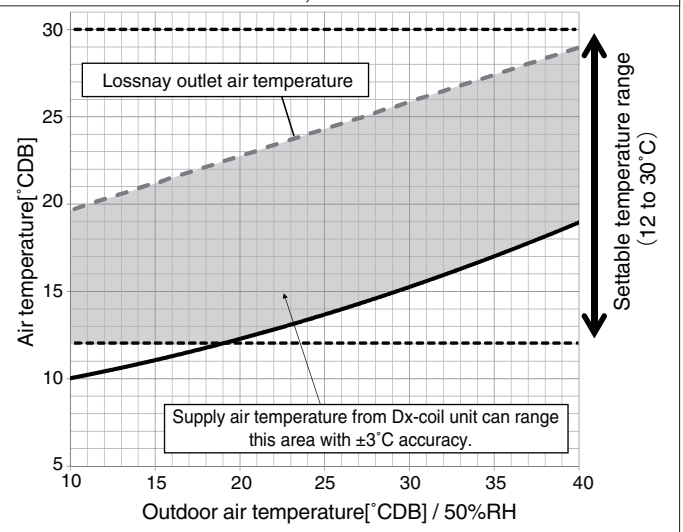


LGH-150RVX-E or LGH-150RVXT-E + GUG-03SL-E + PUHZ-ZRP71

Return air condition: 21˚CDB, 50%RH

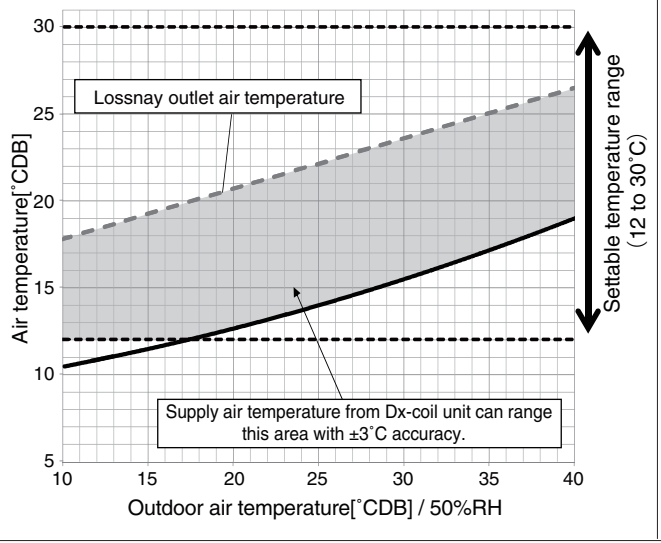


Return air condition: 24˚CDB, 50%RH

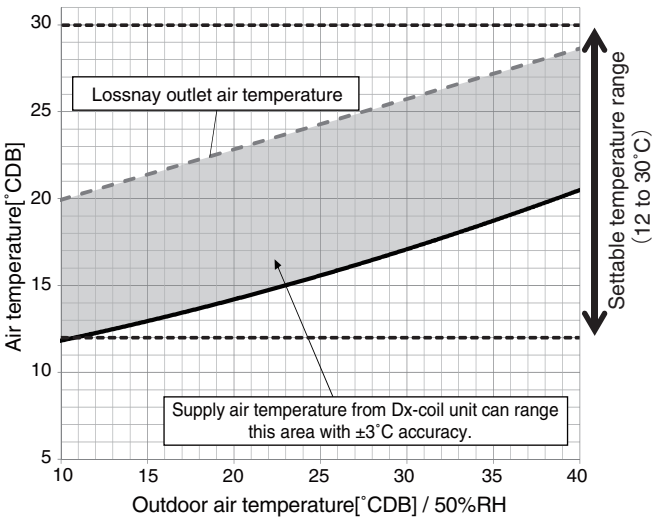


LGH-200RVX-E or LGH-200RVXT-E + GUG-03SL-E + PUHZ-ZRP71

Return air condition: 21˚CDB, 50%RH

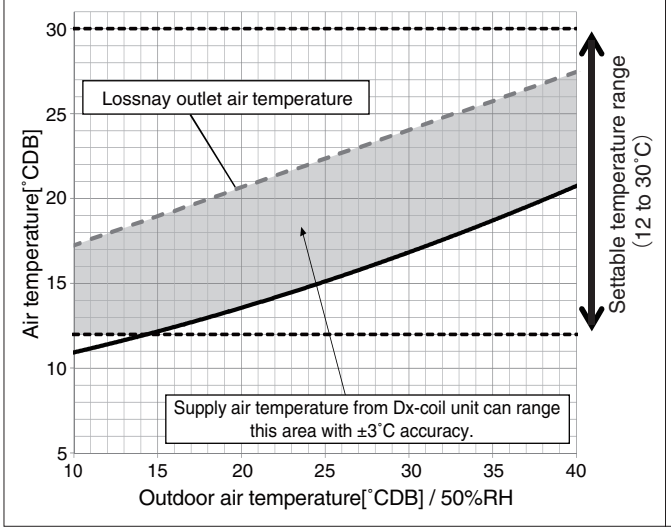


Return air condition: 24˚CDB, 50%RH

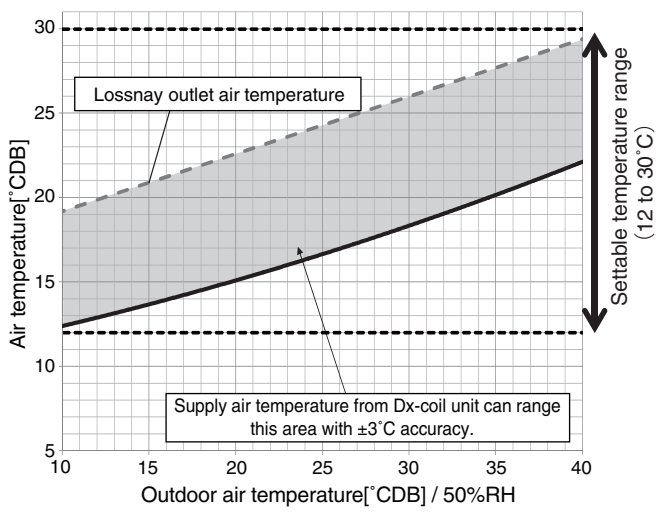


LGH-250RVXT-E + GUG-03SL-E + PUHZ-ZRP71

Return air condition: 21˚CDB, 50%RH



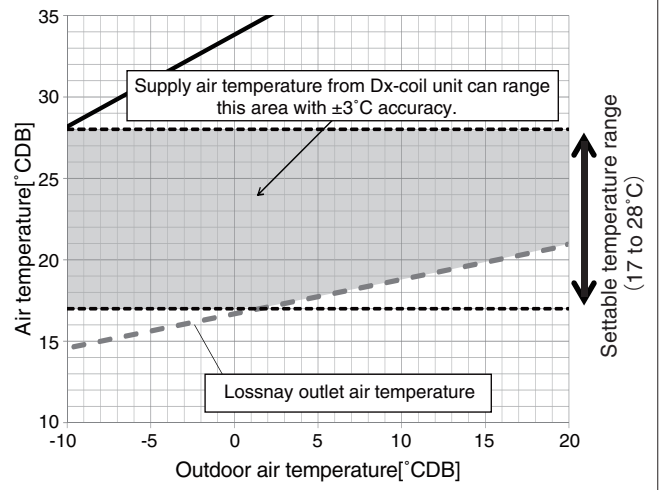
Return air condition: 24˚CDB, 50%RH



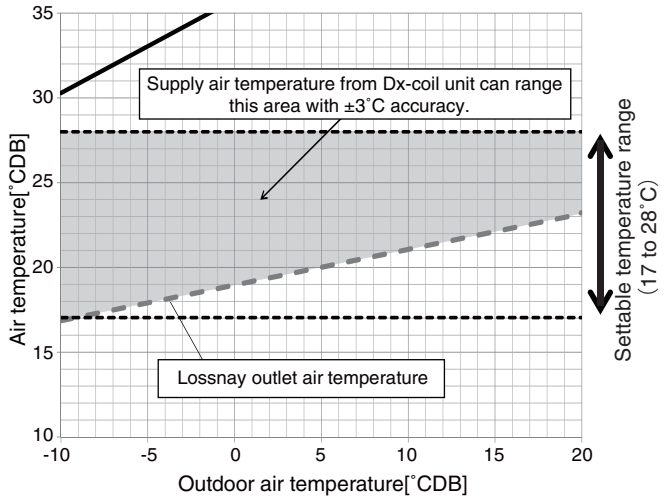
II: Heating

LGH-80RVX-E + GUG-02SL-E + PUHZ-ZRP50

Return air condition: 21˚CDB, 50%RH

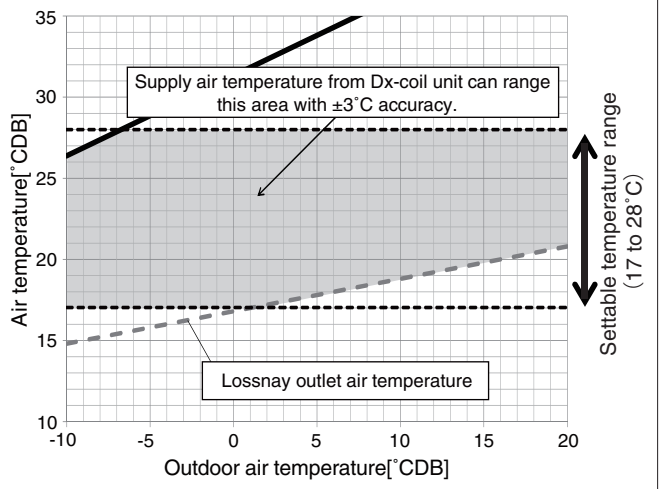


Return air condition: 24˚CDB, 50%RH

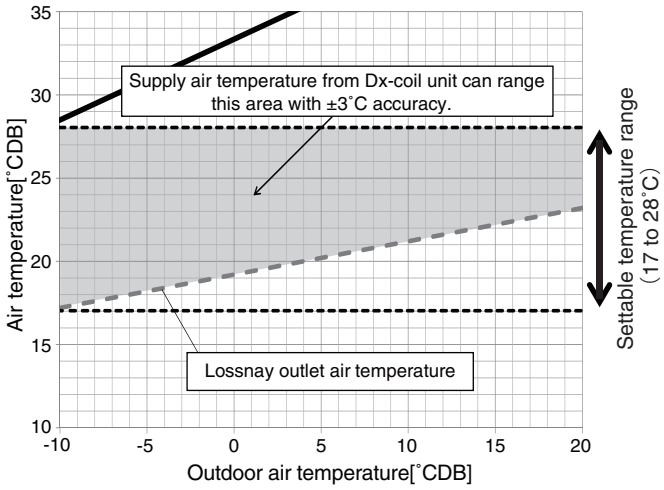


LGH-100RVX-E + GUG-02SL-E + PUHZ-ZRP50

Return air condition: 21˚CDB, 50%RH

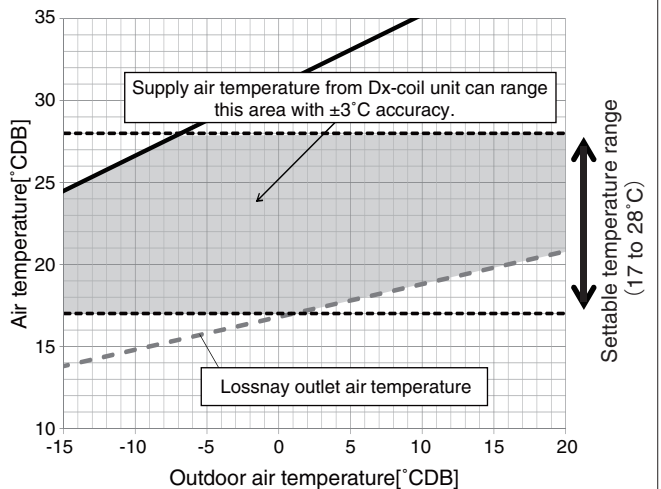


Return air condition: 24˚CDB, 50%RH

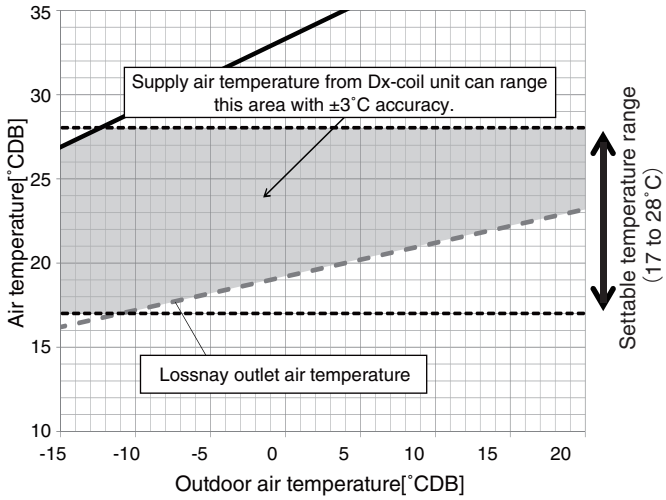


LGH-150RVX-E or LGH-150RVXT-E + GUG-03SL-E + PUHZ-ZRP71

Return air condition: 21˚CDB, 50%RH

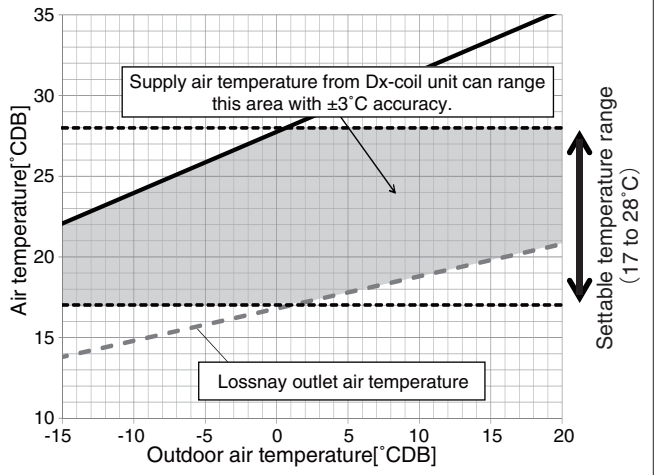


Return air condition: 24˚CDB, 50%RH

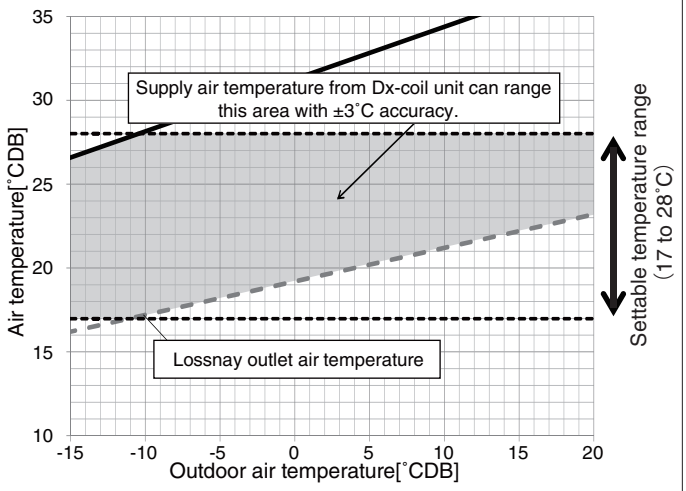


LGH-200RVX-E or LGH-200RVXT-E + GUG-03SL-E + PUHZ-ZRP71

Return air condition: 21˚CDB, 50%RH

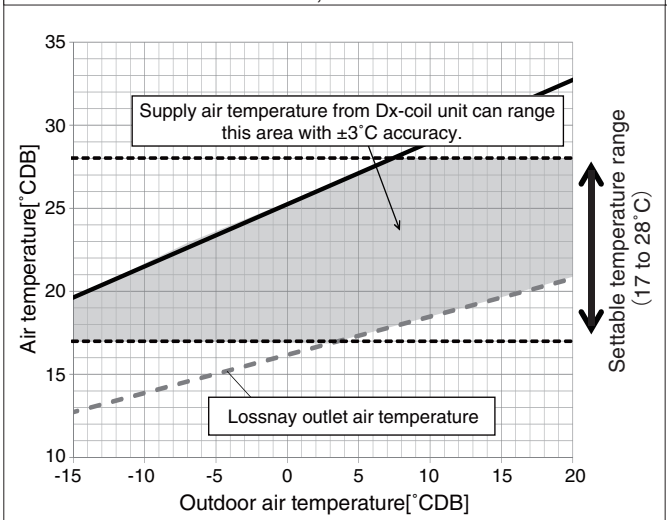


Return air condition: 24˚CDB, 50%RH

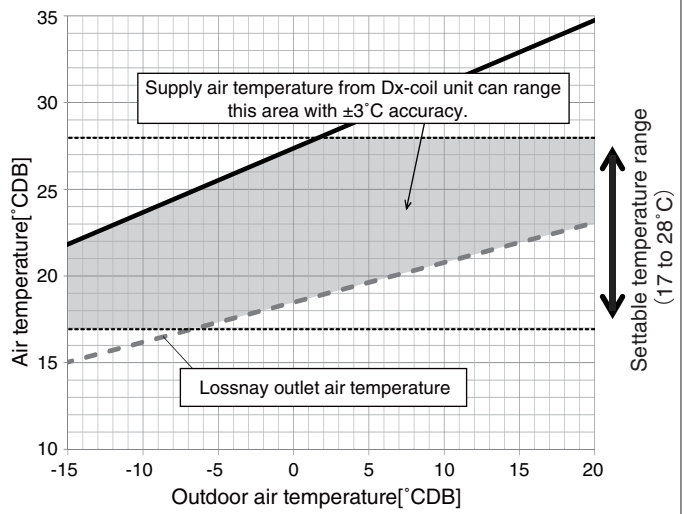


LGH-250RVXT-E + GUG-03SL-E + PUHZ-ZRP71

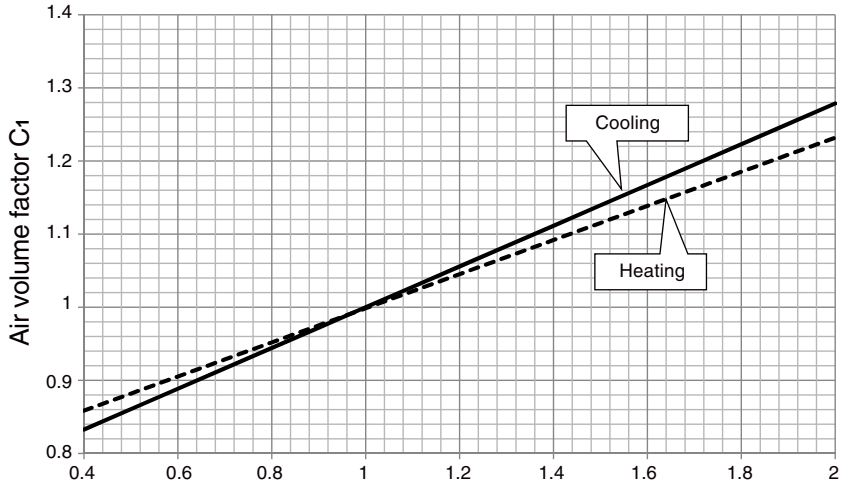
Return air condition: 21˚CDB, 50%RH



Return air condition: 24˚CDB, 50%RH

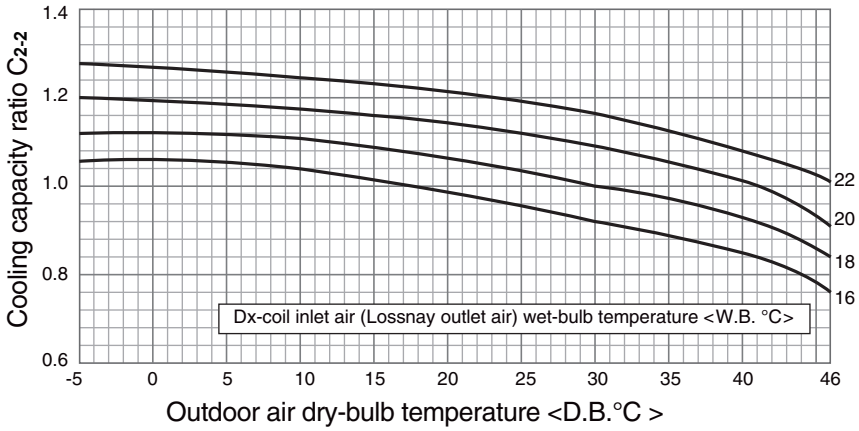


1. Air volume factor

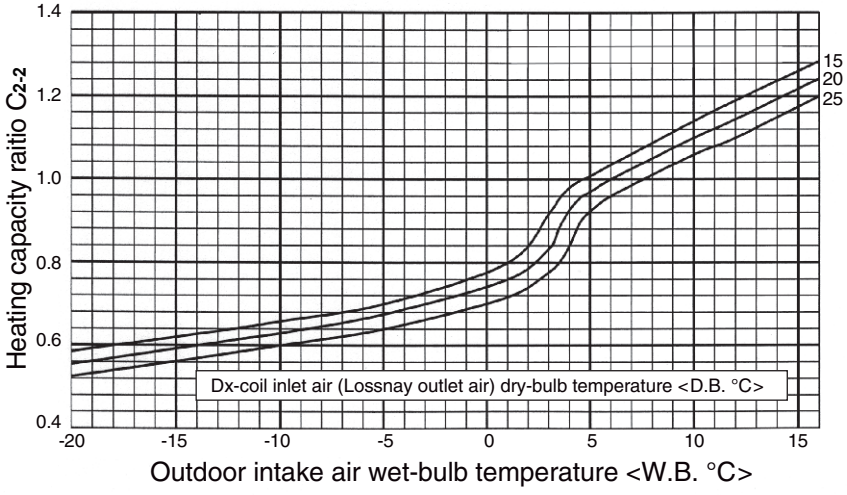


2. Performance curves

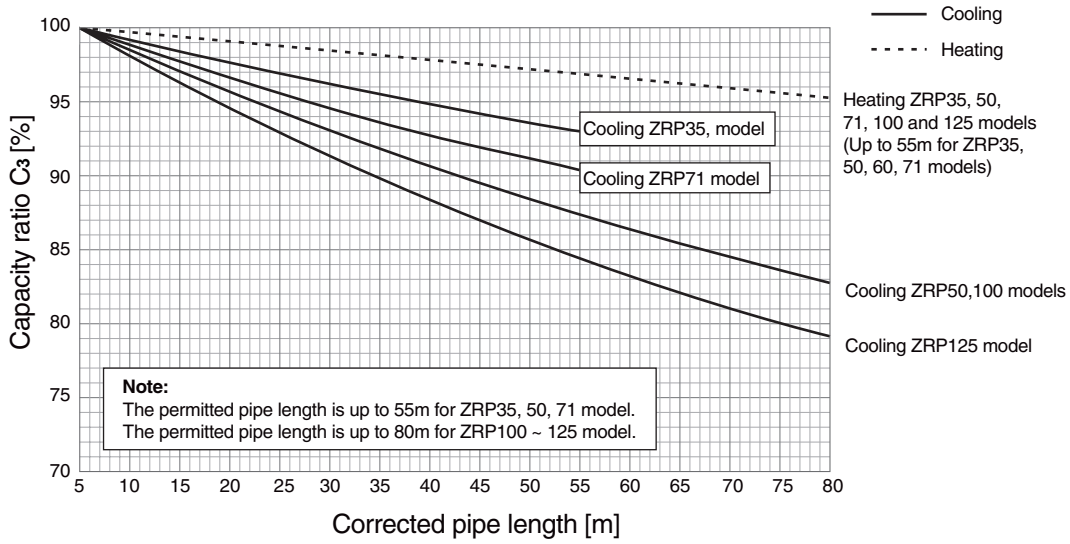
Cooling capacity



Heating capacity



3. Capacity ratio against corrected refrigerant pipe length



4. Quick reference for the air condition difference factor C_2

The following table shows the air condition difference factor C_2 of each models against some outdoor air temperature range.
Return air conditions are assumed that is stable at 21°CDB, 50%RH or 24°CDB, 50%RH.
And outdoor air relative humidity is also assumed that is stable.

(1) Cooling

Return air 21°CDB, 50%RH	Outdoor air dry-bulb temperature [°CDB] / 50%RH										
	30	31	32	33	34	35	36	37	38	39	40
LGH-50RVX-E + GUG-01SL-E	0.90	0.91	0.92	0.92	0.93	0.94	0.95	0.95	0.96	0.97	0.97
LGH-65RVX-E + GUG-01SL-E	0.90	0.91	0.92	0.93	0.93	0.94	0.95	0.96	0.96	0.97	0.98
LGH-80RVX-E + GUG-02SL-E	0.89	0.90	0.90	0.91	0.92	0.92	0.93	0.94	0.94	0.95	0.95
LGH-100RVX-E + GUG-02SL-E	0.89	0.89	0.90	0.91	0.91	0.92	0.92	0.93	0.94	0.94	0.95
LGH-150RVX-E + GUG-03SL-E	0.89	0.90	0.90	0.91	0.91	0.92	0.93	0.93	0.94	0.94	0.95
LGH-150RVXT-E + GUG-03SL-E	0.89	0.90	0.91	0.91	0.92	0.93	0.93	0.94	0.95	0.95	0.96
LGH-200RVX-E + GUG-03SL-E	0.89	0.89	0.90	0.91	0.91	0.92	0.92	0.93	0.94	0.94	0.95
LGH-200RVXT-E + GUG-03SL-E	0.89	0.90	0.90	0.91	0.92	0.92	0.93	0.94	0.94	0.95	0.95
LGH-250RVXT-E + GUG-03SL-E	0.90	0.91	0.92	0.93	0.94	0.94	0.95	0.96	0.97	0.97	0.98

Return air 24°CDB, 50%RH	Outdoor air dry-bulb temperature [°CDB] / 50%RH										
	30	31	32	33	34	35	36	37	38	39	40
LGH-50RVX-E + GUG-01SL-E	0.96	0.96	0.97	0.98	0.98	0.99	1.00	1.00	1.01	1.02	1.02
LGH-65RVX-E + GUG-01SL-E	0.96	0.96	0.97	0.98	0.99	0.99	1.00	1.01	1.01	1.02	1.02
LGH-80RVX-E + GUG-02SL-E	0.95	0.96	0.96	0.97	0.97	0.98	0.98	0.99	0.99	1.00	1.00
LGH-100RVX-E + GUG-02SL-E	0.95	0.96	0.96	0.96	0.97	0.97	0.98	0.98	0.99	0.99	1.00
LGH-150RVX-E + GUG-03SL-E	0.95	0.96	0.96	0.97	0.97	0.98	0.98	0.99	0.99	1.00	1.00
LGH-150RVXT-E + GUG-03SL-E	0.95	0.96	0.96	0.97	0.98	0.98	0.99	0.99	1.00	1.00	1.01
LGH-200RVX-E + GUG-03SL-E	0.95	0.95	0.96	0.96	0.97	0.97	0.98	0.98	0.99	0.99	1.00
LGH-200RVXT-E + GUG-03SL-E	0.95	0.96	0.96	0.97	0.97	0.98	0.98	0.99	0.99	1.00	1.00
LGH-250RVXT-E + GUG-03SL-E	0.96	0.97	0.97	0.98	0.99	0.99	1.00	1.01	1.01	1.02	1.03

Return air 27°CDB, 50%RH	Outdoor air dry-bulb temperature [°CDB] / 50%RH										
	30	31	32	33	34	35	36	37	38	39	40
LGH-50RVX-E + GUG-01SL-E	1.02	1.02	1.03	1.03	1.04	1.04	1.05	1.06	1.06	1.07	1.07
LGH-65RVX-E + GUG-01SL-E	1.02	1.02	1.03	1.03	1.04	1.05	1.05	1.06	1.06	1.07	1.07
LGH-80RVX-E + GUG-02SL-E	1.01	1.02	1.02	1.03	1.03	1.04	1.04	1.05	1.05	1.05	1.06
LGH-100RVX-E + GUG-02SL-E	1.01	1.02	1.02	1.02	1.03	1.03	1.04	1.04	1.05	1.05	1.05
LGH-150RVX-E + GUG-03SL-E	1.01	1.02	1.02	1.02	1.03	1.03	1.04	1.04	1.05	1.05	1.05
LGH-150RVXT-E + GUG-03SL-E	1.01	1.02	1.02	1.03	1.03	1.04	1.04	1.05	1.05	1.06	1.06
LGH-200RVX-E + GUG-03SL-E	1.01	1.02	1.02	1.02	1.03	1.03	1.04	1.04	1.05	1.05	1.05
LGH-200RVXT-E + GUG-03SL-E	1.01	1.02	1.02	1.03	1.03	1.04	1.04	1.05	1.05	1.05	1.06
LGH-250RVXT-E + GUG-03SL-E	1.02	1.02	1.03	1.03	1.04	1.05	1.05	1.06	1.07	1.07	1.08

(2) Heating

Return air 21°CDB, 50%RH	Outdoor air dry-bulb temperature [°CDB] / 83%RH										
	-5	-4	-3	-2	-1	0	1	2	3	4	5
LGH-50RVX-E + GUG-01SL-E	0.68	0.69	0.70	0.71	0.73	0.74	0.75	0.77	0.81	0.87	0.93
LGH-65RVX-E + GUG-01SL-E	0.68	0.69	0.70	0.72	0.73	0.74	0.75	0.77	0.81	0.87	0.93
LGH-80RVX-E + GUG-02SL-E	0.68	0.69	0.70	0.71	0.73	0.74	0.75	0.76	0.81	0.87	0.93
LGH-100RVX-E + GUG-02SL-E	0.68	0.69	0.70	0.71	0.72	0.74	0.75	0.76	0.80	0.87	0.93
LGH-150RVX-E + GUG-03SL-E	0.68	0.69	0.70	0.71	0.72	0.74	0.75	0.76	0.80	0.87	0.93
LGH-150RVXT-E + GUG-03SL-E	0.68	0.69	0.70	0.71	0.72	0.74	0.75	0.76	0.80	0.87	0.93
LGH-200RVX-E + GUG-03SL-E	0.68	0.69	0.70	0.71	0.72	0.74	0.75	0.76	0.80	0.87	0.93
LGH-200RVXT-E + GUG-03SL-E	0.68	0.69	0.70	0.71	0.72	0.74	0.75	0.76	0.80	0.87	0.93
LGH-250RVXT-E + GUG-03SL-E	0.68	0.69	0.70	0.72	0.73	0.74	0.75	0.77	0.81	0.87	0.93

Return air 24°CDB, 50%RH	Outdoor air dry-bulb temperature [°CDB] / 83%RH										
	-5	-4	-3	-2	-1	0	1	2	3	4	5
LGH-50RVX-E + GUG-01SL-E	0.67	0.68	0.69	0.70	0.72	0.73	0.74	0.75	0.79	0.85	0.91
LGH-65RVX-E + GUG-01SL-E	0.67	0.68	0.69	0.70	0.72	0.73	0.74	0.75	0.79	0.85	0.91
LGH-80RVX-E + GUG-02SL-E	0.67	0.68	0.69	0.70	0.71	0.73	0.74	0.75	0.79	0.85	0.91
LGH-100RVX-E + GUG-02SL-E	0.67	0.68	0.69	0.70	0.71	0.73	0.74	0.74	0.79	0.85	0.91
LGH-150RVX-E + GUG-03SL-E	0.67	0.68	0.69	0.70	0.71	0.73	0.74	0.74	0.79	0.85	0.91
LGH-150RVXT-E + GUG-03SL-E	0.67	0.68	0.69	0.70	0.71	0.73	0.74	0.74	0.79	0.85	0.91
LGH-200RVX-E + GUG-03SL-E	0.67	0.68	0.69	0.70	0.71	0.73	0.74	0.74	0.79	0.85	0.91
LGH-200RVXT-E + GUG-03SL-E	0.67	0.68	0.69	0.70	0.71	0.73	0.74	0.74	0.79	0.85	0.91
LGH-250RVXT-E + GUG-03SL-E	0.67	0.68	0.69	0.70	0.72	0.73	0.74	0.75	0.79	0.85	0.91

5. Cooling capacity and SHF (sensible heat factor) table against return and outdoor air temperature.

(1)RA temperature control

System	Return air		Outdoor air temperature [DB(°C)]																	
			20			25			30			**35**			40			45		
	DB ( )	WB ( )	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF
LGH-50RVX-E	20	16	3.30	2.06	0.63	3.33	2.01	0.60	3.33	1.92	0.58	3.33	1.97	0.59	3.50	1.93	0.55	3.40	1.74	0.51
GUG-01SL-E	20	18	3.40	1.85	0.54	3.47	1.83	0.53	3.50	1.77	0.50	3.47	1.80	0.52	3.60	1.76	0.49	3.40	1.55	0.46
PUHZ-ZRP35	22	16	3.30	2.25	0.68	3.33	2.20	0.66	3.33	2.11	0.63	3.33	2.15	0.65	3.50	2.11	0.60	3.40	1.92	0.57
	22	18	3.40	2.04	0.60	3.47	2.02	0.58	3.50	1.95	0.56	3.47	1.99	0.57	3.60	1.94	0.54	3.40	1.74	0.51
RA temp. control	22	20	3.53	1.83	0.52	3.60	1.82	0.51	3.77	1.83	0.48	3.60	1.81	0.50	3.60	1.73	0.48	3.40	1.55	0.45
	24	16	3.30	2.43	0.74	3.33	2.38	0.71	3.33	2.29	0.69	3.33	2.34	0.70	3.50	2.30	0.66	3.40	2.11	0.62
	24	18	3.40	2.22	0.65	3.47	2.20	0.63	3.50	2.14	0.61	3.47	2.17	0.63	3.60	2.13	0.59	3.40	1.92	0.57
	24	20	3.53	2.02	0.57	3.60	2.01	0.56	3.77	2.01	0.53	3.60	2.00	0.56	3.60	1.92	0.53	3.40	1.73	0.51
	24	22	3.80	1.86	0.49	3.87	1.86	0.48	3.90	1.82	0.47	3.77	1.83	0.48	3.60	1.70	0.47	3.40	1.53	0.45
	26	16	3.30	2.61	0.79	3.33	2.56	0.77	3.33	2.47	0.74	3.33	2.52	0.76	3.50	2.48	0.71	3.40	2.29	0.67
	26	18	3.40	2.40	0.71	3.47	2.38	0.69	3.50	2.32	0.66	3.47	2.36	0.68	3.60	2.31	0.64	3.40	2.11	0.62
	26	20	3.53	2.20	0.62	3.60	2.19	0.61	3.77	2.20	0.58	3.60	2.18	0.61	3.60	2.10	0.58	3.40	1.92	0.56
	26	22	3.80	2.05	0.54	3.87	2.04	0.53	3.90	2.00	0.51	3.77	2.01	0.53	3.60	1.88	0.52	3.40	1.72	0.51
	27	16	3.30	2.70	0.82	3.33	2.66	0.80	3.33	2.56	0.77	3.33	2.61	0.78	3.50	2.57	0.73	3.40	2.38	0.70
	27	18	3.40	2.50	0.73	3.47	2.48	0.71	3.50	2.41	0.69	3.47	2.45	0.71	3.60	2.41	0.67	3.40	2.20	0.65
	27	**19**	3.40	2.36	0.69	3.60	2.41	0.67	3.63	2.35	0.65	**3.60**	2.39	**0.66**	3.60	2.30	0.64	3.40	2.10	0.62
	27	20	3.53	2.29	0.65	3.60	2.28	0.63	3.77	2.29	0.61	3.60	2.27	0.63	3.60	2.19	0.61	3.40	2.01	0.59
	27	22	3.80	2.14	0.56	3.87	2.14	0.55	3.90	2.09	0.54	3.77	2.10	0.56	3.60	1.97	0.55	3.40	1.81	0.53
	28	16	3.30	2.80	0.85	3.33	2.75	0.82	3.33	2.66	0.80	3.33	2.70	0.81	3.50	2.66	0.76	3.40	2.48	0.73
	28	18	3.40	2.59	0.76	3.47	2.57	0.74	3.50	2.50	0.72	3.47	2.54	0.73	3.60	2.50	0.69	3.40	2.29	0.67
	28	20	3.53	2.38	0.67	3.60	2.37	0.66	3.77	2.38	0.63	3.60	2.37	0.66	3.60	2.28	0.63	3.40	2.10	0.62
	28	22	3.80	2.23	0.59	3.87	2.23	0.58	3.90	2.19	0.56	3.77	2.20	0.58	3.60	2.07	0.57	3.40	1.91	0.56
	30	16	3.30	2.98	0.90	3.33	2.93	0.88	3.33	2.84	0.85	3.33	2.89	0.87	3.50	2.85	0.81	3.40	2.66	0.78
	30	18	3.40	2.77	0.81	3.47	2.75	0.79	3.50	2.69	0.77	3.47	2.72	0.79	3.60	2.68	0.74	3.40	2.48	0.73
	30	20	3.53	2.57	0.73	3.60	2.56	0.71	3.77	2.56	0.68	3.60	2.55	0.71	3.60	2.47	0.69	3.40	2.29	0.67
	30	22	3.80	2.41	0.64	3.87	2.41	0.62	3.90	2.37	0.61	3.77	2.38	0.63	3.60	2.25	0.63	3.40	2.09	0.62
	32	16	3.30	3.16	0.96	3.33	3.11	0.93	3.33	3.02	0.91	3.33	3.07	0.92	3.50	3.03	0.87	3.40	2.84	0.84
	32	18	3.40	2.95	0.87	3.47	2.93	0.85	3.50	2.87	0.82	3.47	2.91	0.84	3.60	2.87	0.80	3.40	2.66	0.78
	32	20	3.53	2.75	0.78	3.60	2.74	0.76	3.77	2.75	0.73	3.60	2.74	0.76	3.60	2.65	0.74	3.40	2.47	0.73
	32	22	3.80	2.60	0.68	3.87	2.60	0.67	3.90	2.55	0.66	3.77	2.57	0.68	3.60	2.44	0.68	3.40	2.28	0.67
	34	16	3.30	3.30	1.00	3.33	3.30	0.99	3.33	3.21	0.96	3.33	3.25	0.98	3.50	3.21	0.92	3.40	3.03	0.89
	34	18	3.40	3.14	0.92	3.47	3.12	0.90	3.50	3.05	0.87	3.47	3.09	0.89	3.60	3.05	0.85	3.40	2.85	0.84
	34	20	3.53	2.94	0.83	3.60	2.93	0.81	3.77	2.93	0.78	3.60	2.92	0.81	3.60	2.84	0.79	3.40	2.66	0.78
	34	22	3.80	2.78	0.73	3.87	2.78	0.72	3.90	2.74	0.70	3.77	2.75	0.73	3.60	2.62	0.73	3.40	2.46	0.72

System	Return air		Outdoor air temperature [DB(°C)]																	
			20			25			30			**35**			40			45		
	DB ( )	WB ( )	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF
LGH-65RVX-E	20	16	3.67	2.33	0.64	3.70	2.29	0.62	3.70	2.19	0.59	3.70	2.27	0.61	3.89	2.23	0.57	3.78	2.02	0.54
GUG-01SL-E	20	18	3.78	2.08	0.55	3.85	2.07	0.54	3.89	2.01	0.52	3.85	2.07	0.54	4.00	2.03	0.51	3.78	1.81	0.48
PUHZ-ZRP35	22	16	3.67	2.55	0.70	3.70	2.51	0.68	3.70	2.41	0.65	3.70	2.48	0.67	3.89	2.44	0.63	3.78	2.24	0.59
	22	18	3.78	2.30	0.61	3.85	2.29	0.59	3.89	2.23	0.57	3.85	2.29	0.59	4.00	2.25	0.56	3.78	2.03	0.54
RA temp. control	22	20	3.93	2.06	0.52	4.00	2.06	0.51	4.19	2.07	0.49	4.00	2.08	0.52	4.00	2.00	0.50	3.78	1.80	0.48
	24	16	3.67	2.77	0.75	3.70	2.72	0.74	3.70	2.63	0.71	3.70	2.70	0.73	3.89	2.66	0.68	3.78	2.46	0.65
	24	18	3.78	2.52	0.67	3.85	2.51	0.65	3.89	2.44	0.63	3.85	2.51	0.65	4.00	2.47	0.62	3.78	2.25	0.59
	24	20	3.93	2.27	0.58	4.00	2.28	0.57	4.19	2.29	0.55	4.00	2.30	0.57	4.00	2.22	0.55	3.78	2.02	0.54
	24	22	4.22	2.08	0.49	4.30	2.09	0.49	4.33	2.06	0.47	4.19	2.09	0.50	4.00	1.96	0.49	3.78	1.79	0.47
	26	16	3.67	2.98	0.81	3.70	2.94	0.79	3.70	2.85	0.77	3.70	2.92	0.79	3.89	2.88	0.74	3.78	2.68	0.71
	26	18	3.78	2.74	0.72	3.85	2.73	0.71	3.89	2.66	0.68	3.85	2.73	0.71	4.00	2.69	0.67	3.78	2.47	0.65
	26	20	3.93	2.49	0.64	4.00	2.49	0.62	4.19	2.51	0.60	4.00	2.52	0.63	4.00	2.44	0.61	3.78	2.24	0.59
	26	22	4.22	2.30	0.55	4.30	2.31	0.54	4.33	2.28	0.53	4.19	2.31	0.55	4.00	2.18	0.55	3.78	2.02	0.53
	27	16	3.67	3.09	0.84	3.70	3.05	0.82	3.70	2.96	0.80	3.70	3.03	0.82	3.89	2.99	0.77	3.78	2.79	0.74
	27	18	3.78	2.85	0.75	3.85	2.83	0.74	3.89	2.77	0.71	3.85	2.84	0.74	4.00	2.80	0.70	3.78	2.58	0.68
	27	**19**	3.78	2.69	0.71	4.00	2.75	0.69	4.04	2.70	0.67	**4.00**	2.76	**0.69**	4.00	2.67	0.67	3.78	2.47	0.65
	27	20	3.93	2.60	0.66	4.00	2.60	0.65	4.19	2.62	0.63	4.00	2.63	0.66	4.00	2.55	0.64	3.78	2.35	0.62
	27	22	4.22	2.41	0.57	4.30	2.42	0.56	4.33	2.39	0.55	4.19	2.42	0.58	4.00	2.29	0.57	3.78	2.13	0.56
	28	16	3.67	3.20	0.87	3.70	3.16	0.85	3.70	3.07	0.83	3.70	3.14	0.85	3.89	3.10	0.80	3.78	2.90	0.77
	28	18	3.78	2.95	0.78	3.85	2.94	0.76	3.89	2.88	0.74	3.85	2.94	0.76	4.00	2.90	0.73	3.78	2.69	0.71
	28	20	3.93	2.71	0.69	4.00	2.71	0.68	4.19	2.73	0.65	4.00	2.74	0.68	4.00	2.66	0.66	3.78	2.46	0.65
	28	22	4.22	2.52	0.60	4.30	2.53	0.59	4.33	2.50	0.58	4.19	2.53	0.61	4.00	2.40	0.60	3.78	2.24	0.59
	30	16	3.67	3.42	0.93	3.70	3.38	0.91	3.70	3.29	0.89	3.70	3.36	0.91	3.89	3.32	0.85	3.78	3.12	0.83
	30	18	3.78	3.17	0.84	3.85	3.16	0.82	3.89	3.10	0.80	3.85	3.16	0.82	4.00	3.12	0.78	3.78	2.90	0.77
	30	20	3.93	2.93	0.75	4.00	2.93	0.73	4.19	2.95	0.70	4.00	2.96	0.74	4.00	2.88	0.72	3.78	2.68	0.71
	30	22	4.22	2.74	0.65	4.30	2.75	0.64	4.33	2.72	0.63	4.19	2.75	0.66	4.00	2.62	0.66	3.78	2.46	0.65
	32	16	3.67	3.64	0.99	3.70	3.59	0.97	3.70	3.50	0.95	3.70	3.57	0.97	3.89	3.54	0.91	3.78	3.34	0.88
	32	18	3.78	3.39	0.90	3.85	3.38	0.88	3.89	3.32	0.85	3.85	3.38	0.88	4.00	3.34	0.84	3.78	3.12	0.83
	32	20	3.93	3.15	0.80	4.00	3.15	0.79	4.19	3.17	0.76	4.00	3.18	0.79	4.00	3.10	0.77	3.78	2.90	0.77
	32	22	4.22	2.96	0.70	4.30	2.97	0.69	4.33	2.94	0.68	4.19	2.97	0.71	4.00	2.84	0.71	3.78	2.68	0.71
	34	16	3.67	3.67	1.00	3.70	3.70	1.00	3.70	3.72	1.00	3.70	3.70	1.00	3.89	3.75	0.97	3.78	3.56	0.94
	34	18	3.78	3.61	0.96	3.85	3.60	0.93	3.89	3.54	0.91	3.85	3.60	0.93	4.00	3.56	0.89	3.78	3.34	0.89
	34	20	3.93	3.37	0.86	4.00	3.37	0.84	4.19	3.39	0.81	4.00	3.40	0.85	4.00	3.32	0.83	3.78	3.12	0.83
	34	22	4.07	3.11	0.76	4.30	3.19	0.74	4.33	3.16	0.73	4.19	3.19	0.76	4.00	3.06	0.77	3.78	2.90	0.77

System	Return air		Outdoor air temperature [DB(°C)]																	
			20			25			30			**35**			40			45		
	DB ( )	WB ( )	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF
LGH-80RVX-E	20	16	4.58	2.89	0.63	4.63	2.86	0.62	4.63	2.76	0.60	4.63	2.85	0.61	4.68	2.74	0.59	4.72	2.59	0.55
GUG-02SL-E	20	18	4.72	2.56	0.54	4.81	2.56	0.53	4.86	2.50	0.51	4.81	2.58	0.54	4.86	2.49	0.51	4.72	2.29	0.48
PUHZ-ZRP50	22	16	4.58	3.17	0.69	4.63	3.14	0.68	4.63	3.04	0.66	4.63	3.13	0.68	4.68	3.03	0.65	4.72	2.87	0.61
	22	18	4.72	2.84	0.60	4.81	2.84	0.59	4.86	2.79	0.57	4.81	2.86	0.59	4.86	2.78	0.57	4.72	2.57	0.54
RA temp. control	22	20	4.91	2.51	0.51	5.00	2.53	0.51	5.23	2.57	0.49	5.00	2.58	0.52	5.00	2.49	0.50	4.72	2.27	0.48
	24	16	4.58	3.45	0.75	4.63	3.42	0.74	4.63	3.33	0.72	4.63	3.41	0.74	4.68	3.31	0.71	4.72	3.15	0.67
	24	18	4.72	3.12	0.66	4.81	3.13	0.65	4.86	3.07	0.63	4.81	3.14	0.65	4.86	3.06	0.63	4.72	2.86	0.60
	24	20	4.91	2.80	0.57	5.00	2.82	0.56	5.23	2.85	0.55	5.00	2.86	0.57	5.00	2.78	0.56	4.72	2.55	0.54
	24	22	5.28	2.54	0.48	5.37	2.57	0.48	5.42	2.54	0.47	5.23	2.58	0.49	5.00	2.44	0.49	4.72	2.24	0.47
	26	16	4.58	3.73	0.81	4.63	3.70	0.80	4.63	3.61	0.78	4.63	3.69	0.80	4.68	3.59	0.77	4.72	3.44	0.73
	26	18	4.72	3.40	0.72	4.81	3.41	0.71	4.86	3.35	0.69	4.81	3.43	0.71	4.86	3.34	0.69	4.72	3.14	0.67
	26	20	4.91	3.08	0.63	5.00	3.10	0.62	5.23	3.14	0.60	5.00	3.15	0.63	5.00	3.06	0.61	4.72	2.84	0.60
	26	22	5.28	2.82	0.53	5.37	2.85	0.53	5.42	2.83	0.52	5.23	2.87	0.55	5.00	2.72	0.54	4.72	2.53	0.54
	27	16	4.58	3.88	0.85	4.63	3.84	0.83	4.63	3.75	0.81	4.63	3.83	0.83	4.68	3.73	0.80	4.72	3.58	0.76
	27	18	4.72	3.54	0.75	4.81	3.55	0.74	4.86	3.49	0.72	4.81	3.57	0.74	4.86	3.48	0.72	4.72	3.28	0.70
	27	**19**	4.91	3.43	0.70	5.00	3.44	0.69	5.05	3.39	0.67	**5.00**	3.47	**0.69**	5.00	3.37	0.67	4.72	3.13	0.66
	27	20	4.91	3.22	0.66	5.00	3.24	0.65	5.23	3.28	0.63	5.00	3.29	0.66	5.00	3.21	0.64	4.72	2.98	0.63
	27	22	5.28	2.96	0.56	5.37	2.99	0.56	5.42	2.97	0.55	5.23	3.01	0.58	5.00	2.86	0.57	4.72	2.67	0.57
	28	16	4.58	4.02	0.88	4.63	3.98	0.86	4.63	3.89	0.84	4.63	3.98	0.86	4.68	3.87	0.83	4.72	3.72	0.79
	28	18	4.72	3.69	0.78	4.81	3.69	0.77	4.86	3.64	0.75	4.81	3.71	0.77	4.86	3.63	0.75	4.72	3.42	0.73
	28	20	4.91	3.36	0.69	5.00	3.38	0.68	5.23	3.42	0.65	5.00	3.43	0.69	5.00	3.35	0.67	4.72	3.12	0.66
	28	22	5.28	3.10	0.59	5.37	3.13	0.58	5.42	3.11	0.57	5.23	3.15	0.60	5.00	3.01	0.60	4.72	2.81	0.60
	30	16	4.58	4.30	0.94	4.63	4.26	0.92	4.63	4.17	0.90	4.63	4.26	0.92	4.68	4.16	0.89	4.72	4.00	0.85
	30	18	4.72	3.97	0.84	4.81	3.97	0.83	4.86	3.92	0.81	4.81	3.99	0.83	4.86	3.91	0.80	4.72	3.71	0.79
	30	20	4.91	3.65	0.74	5.00	3.67	0.73	5.23	3.70	0.71	5.00	3.71	0.74	5.00	3.63	0.73	4.72	3.41	0.72
	30	22	5.28	3.39	0.64	5.37	3.42	0.64	5.42	3.40	0.63	5.23	3.44	0.66	5.00	3.29	0.66	4.72	3.10	0.66
	32	16	4.58	4.58	1.00	4.63	4.55	0.98	4.63	4.45	0.96	4.63	4.54	0.98	4.68	4.44	0.95	4.72	4.28	0.91
	32	18	4.72	4.25	0.90	4.81	4.26	0.88	4.86	4.20	0.86	4.81	4.28	0.89	4.86	4.19	0.86	4.72	3.99	0.85
	32	20	4.91	3.93	0.80	5.00	3.95	0.79	5.23	3.99	0.76	5.00	4.00	0.80	5.00	3.92	0.78	4.72	3.69	0.78
	32	22	5.28	3.67	0.70	5.37	3.70	0.69	5.42	3.68	0.68	5.23	3.72	0.71	5.00	3.58	0.72	4.72	3.39	0.72
	34	16	4.58	4.58	1.00	4.63	4.63	1.00	4.63	4.63	1.00	4.63	4.63	1.00	4.68	4.68	1.00	4.72	4.57	0.97
	34	18	4.72	4.53	0.96	4.81	4.54	0.94	4.86	4.48	0.92	4.81	4.56	0.95	4.86	4.48	0.92	4.72	4.28	0.91
	34	20	4.91	4.21	0.86	5.00	4.23	0.85	5.23	4.27	0.82	5.00	4.28	0.86	5.00	4.20	0.84	4.72	3.98	0.84
	34	22	5.28	3.95	0.75	5.37	3.99	0.74	5.42	3.96	0.73	5.23	4.01	0.77	5.00	3.86	0.77	4.72	3.67	0.78

System	Return air		Outdoor air temperature [DB(°C)]																	
			20			25			30			**35**			40			45		
	DB ( )	WB ( )	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF
LGH-100RVX-E	20	16	6.51	4.00	0.61	6.57	3.95	0.60	6.57	3.82	0.58	6.57	3.92	0.60	6.64	3.78	0.57	6.71	3.58	0.53
GUG-02SL-E	20	18	6.71	3.57	0.53	6.84	3.58	0.52	6.90	3.50	0.51	6.84	3.58	0.52	6.90	3.47	0.50	6.71	3.19	0.48
PUHZ-ZRP71	22	16	6.51	4.34	0.67	6.57	4.29	0.65	6.57	4.16	0.63	6.57	4.26	0.65	6.64	4.13	0.62	6.71	3.92	0.59
	22	18	6.71	3.92	0.58	6.84	3.92	0.57	6.90	3.85	0.56	6.84	3.93	0.57	6.90	3.81	0.55	6.71	3.53	0.53
RA temp. control	22	20	6.97	3.51	0.50	7.10	3.53	0.50	7.43	3.59	0.48	7.10	3.57	0.50	7.10	3.45	0.49	6.71	3.13	0.47
	24	16	6.51	4.68	0.72	6.57	4.64	0.71	6.57	4.51	0.69	6.57	4.60	0.70	6.64	4.47	0.67	6.71	4.27	0.64
	24	18	6.71	4.26	0.64	6.84	4.27	0.62	6.90	4.19	0.61	6.84	4.27	0.62	6.90	4.16	0.60	6.71	3.88	0.58
	24	20	6.97	3.85	0.55	7.10	3.88	0.55	7.43	3.94	0.53	7.10	3.91	0.55	7.10	3.80	0.53	6.71	3.48	0.52
	24	22	7.49	3.54	0.47	7.63	3.58	0.47	7.69	3.54	0.46	7.43	3.57	0.48	7.10	3.35	0.47	6.71	3.07	0.46
	26	16	6.51	5.02	0.77	6.57	4.98	0.76	6.57	4.85	0.74	6.57	4.95	0.75	6.64	4.81	0.72	6.71	4.61	0.69
	26	18	6.71	4.60	0.69	6.84	4.61	0.67	6.90	4.54	0.66	6.84	4.61	0.67	6.90	4.50	0.65	6.71	4.22	0.63
	26	20	6.97	4.20	0.60	7.10	4.22	0.59	7.43	4.28	0.58	7.10	4.26	0.60	7.10	4.14	0.58	6.71	3.83	0.57
	26	22	7.49	3.89	0.52	7.63	3.93	0.51	7.69	3.89	0.51	7.43	3.91	0.53	7.10	3.70	0.52	6.71	3.42	0.51
	27	16	6.51	5.20	0.80	6.57	5.15	0.78	6.57	5.02	0.76	6.57	5.12	0.78	6.64	4.98	0.75	6.71	4.78	0.71
	27	18	6.71	4.78	0.71	6.84	4.78	0.70	6.90	4.71	0.68	6.84	4.79	0.70	6.90	4.67	0.68	6.71	4.39	0.66
	27	**19**	6.97	4.64	0.67	7.10	4.65	0.66	7.17	4.59	0.64	**7.10**	4.67	**0.66**	7.10	4.54	0.64	6.71	4.20	0.63
	27	20	6.97	4.37	0.63	7.10	4.39	0.62	7.43	4.46	0.60	7.10	4.43	0.62	7.10	4.32	0.61	6.71	4.00	0.60
	27	22	7.49	4.06	0.54	7.63	4.10	0.54	7.69	4.06	0.53	7.43	4.08	0.55	7.10	3.87	0.54	6.71	3.59	0.54
	28	16	6.51	5.37	0.82	6.57	5.32	0.81	6.57	5.19	0.79	6.57	5.29	0.80	6.64	5.16	0.78	6.71	4.95	0.74
	28	18	6.71	4.95	0.74	6.84	4.95	0.72	6.90	4.88	0.71	6.84	4.96	0.73	6.90	4.84	0.70	6.71	4.57	0.68
	28	20	6.97	4.54	0.65	7.10	4.57	0.64	7.43	4.63	0.62	7.10	4.60	0.65	7.10	4.49	0.63	6.71	4.17	0.62
	28	22	7.49	4.23	0.56	7.63	4.27	0.56	7.69	4.23	0.55	7.43	4.26	0.57	7.10	4.04	0.57	6.71	3.77	0.56
	30	16	6.51	5.71	0.88	6.57	5.66	0.86	6.57	5.53	0.84	6.57	5.63	0.86	6.64	5.50	0.83	6.71	5.30	0.79
	30	18	6.71	5.29	0.79	6.84	5.30	0.77	6.90	5.22	0.76	6.84	5.30	0.78	6.90	5.19	0.75	6.71	4.91	0.73
	30	20	6.97	4.88	0.70	7.10	4.91	0.69	7.43	4.97	0.67	7.10	4.95	0.70	7.10	4.83	0.68	6.71	4.52	0.67
	30	22	7.49	4.58	0.61	7.63	4.62	0.61	7.69	4.58	0.60	7.43	4.60	0.62	7.10	4.39	0.62	6.71	4.11	0.61
	32	16	6.51	6.05	0.93	6.57	6.00	0.91	6.57	5.88	0.89	6.57	5.97	0.91	6.64	5.84	0.88	6.71	5.64	0.84
	32	18	6.71	5.63	0.84	6.84	5.64	0.82	6.90	5.56	0.81	6.84	5.64	0.83	6.90	5.53	0.80	6.71	5.26	0.78
	32	20	6.97	5.23	0.75	7.10	5.25	0.74	7.43	5.32	0.72	7.10	5.29	0.75	7.10	5.18	0.73	6.71	4.86	0.73
	32	22	7.49	4.92	0.66	7.63	4.96	0.65	7.69	4.92	0.64	7.43	4.95	0.67	7.10	4.73	0.67	6.71	4.46	0.67
	34	16	6.51	6.39	0.98	6.57	6.35	0.97	6.57	6.22	0.95	6.57	6.32	0.96	6.64	6.18	0.93	6.71	5.98	0.89
	34	18	6.71	5.97	0.89	6.84	5.98	0.87	6.90	5.91	0.86	6.84	5.99	0.88	6.90	5.87	0.85	6.71	5.60	0.84
	34	20	6.97	5.57	0.80	7.10	5.60	0.79	7.43	5.66	0.76	7.10	5.64	0.79	7.10	5.52	0.78	6.71	5.21	0.78
	34	22	7.49	5.27	0.70	7.63	5.31	0.70	7.69	5.27	0.69	7.43	5.29	0.71	7.10	5.08	0.72	6.71	4.81	0.72

System	Return air		Outdoor air temperature [DB(°C)]																	
			20			25			30			**35**			40			45		
	DB ( )	WB ( )	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF
LGH-150RVX-E	20	16	8.71	5.42	0.62	8.80	5.36	0.61	8.80	5.18	0.59	8.80	5.33	0.61	8.88	5.14	0.58	8.97	4.86	0.54
GUG-03SL-E	20	18	8.97	4.82	0.54	9.15	4.82	0.53	9.24	4.72	0.51	9.15	4.85	0.53	9.24	4.69	0.51	8.97	4.31	0.48
PUHZ-ZRP100	22	16	8.71	5.92	0.68	8.80	5.86	0.67	8.80	5.68	0.65	8.80	5.83	0.66	8.88	5.64	0.64	8.97	5.36	0.60
	22	18	8.97	5.32	0.59	9.15	5.33	0.58	9.24	5.22	0.57	9.15	5.35	0.58	9.24	5.19	0.56	8.97	4.81	0.54
RA temp. control	22	20	9.32	4.73	0.51	9.50	4.77	0.50	9.94	4.84	0.49	9.50	4.84	0.51	9.50	4.68	0.49	8.97	4.26	0.47
	24	16	8.71	6.42	0.74	8.80	6.35	0.72	8.80	6.18	0.70	8.80	6.33	0.72	8.88	6.14	0.69	8.97	5.86	0.65
	24	18	8.97	5.82	0.65	9.15	5.83	0.64	9.24	5.72	0.62	9.15	5.85	0.64	9.24	5.69	0.62	8.97	5.32	0.59
	24	20	9.32	5.23	0.56	9.50	5.27	0.55	9.94	5.35	0.54	9.50	5.34	0.56	9.50	5.19	0.55	8.97	4.76	0.53
	24	22	10.03	4.77	0.48	10.20	4.83	0.47	10.29	4.78	0.46	9.94	4.84	0.49	9.50	4.56	0.48	8.97	4.19	0.47
	26	16	8.71	6.91	0.79	8.80	6.85	0.78	8.80	6.68	0.76	8.80	6.83	0.78	8.88	6.64	0.75	8.97	6.36	0.71
	26	18	8.97	6.32	0.70	9.15	6.33	0.69	9.24	6.22	0.67	9.15	6.35	0.69	9.24	6.20	0.67	8.97	5.82	0.65
	26	20	9.32	5.73	0.61	9.50	5.77	0.61	9.94	5.85	0.59	9.50	5.84	0.62	9.50	5.69	0.60	8.97	5.27	0.59
	26	22	10.03	5.28	0.53	10.20	5.33	0.52	10.29	5.29	0.51	9.94	5.34	0.54	9.50	5.06	0.53	8.97	4.70	0.52
	27	16	8.71	7.16	0.82	8.80	7.10	0.81	8.80	6.93	0.79	8.80	7.08	0.80	8.88	6.89	0.78	8.97	6.61	0.74
	27	18	8.97	6.57	0.73	9.15	6.58	0.72	9.24	6.48	0.70	9.15	6.60	0.72	9.24	6.45	0.70	8.97	6.07	0.68
	27	**19**	9.32	6.36	0.68	9.50	6.38	0.67	9.59	6.29	0.66	**9.50**	6.43	**0.68**	9.50	6.25	0.66	8.97	5.80	0.65
	27	20	9.32	5.98	0.64	9.50	6.02	0.63	9.94	6.10	0.61	9.50	6.10	0.64	9.50	5.94	0.63	8.97	5.52	0.61
	27	22	10.03	5.53	0.55	10.20	5.59	0.55	10.29	5.54	0.54	9.94	5.60	0.56	9.50	5.32	0.56	8.97	4.95	0.55
	28	16	8.71	7.41	0.85	8.80	7.35	0.84	8.80	7.18	0.82	8.80	7.33	0.83	8.88	7.14	0.80	8.97	6.86	0.76
	28	18	8.97	6.82	0.76	9.15	6.83	0.75	9.24	6.73	0.73	9.15	6.85	0.75	9.24	6.70	0.73	8.97	6.32	0.70
	28	20	9.32	6.24	0.67	9.50	6.27	0.66	9.94	6.35	0.64	9.50	6.35	0.67	9.50	6.19	0.65	8.97	5.77	0.64
	28	22	10.03	5.78	0.58	10.20	5.84	0.57	10.29	5.79	0.56	9.94	5.85	0.59	9.50	5.57	0.59	8.97	5.20	0.58
	30	16	8.71	7.91	0.91	8.80	7.85	0.89	8.80	7.68	0.87	8.80	7.83	0.89	8.88	7.64	0.86	8.97	7.36	0.82
	30	18	8.97	7.32	0.82	9.15	7.33	0.80	9.24	7.23	0.78	9.15	7.35	0.80	9.24	7.20	0.78	8.97	6.82	0.76
	30	20	9.32	6.74	0.72	9.50	6.77	0.71	9.94	6.85	0.69	9.50	6.85	0.72	9.50	6.69	0.70	8.97	6.27	0.70
	30	22	10.03	6.28	0.63	10.20	6.34	0.62	10.29	6.29	0.61	9.94	6.35	0.64	9.50	6.07	0.64	8.97	5.71	0.64
	32	16	8.71	8.41	0.97	8.80	8.35	0.95	8.80	8.18	0.93	8.80	8.32	0.95	8.88	8.14	0.92	8.97	7.86	0.88
	32	18	8.97	7.82	0.87	9.15	7.83	0.86	9.24	7.73	0.84	9.15	7.85	0.86	9.24	7.70	0.83	8.97	7.33	0.82
	32	20	9.32	7.24	0.78	9.50	7.27	0.77	9.94	7.35	0.74	9.50	7.35	0.77	9.50	7.20	0.76	8.97	6.78	0.76
	32	22	10.03	6.79	0.68	10.20	6.84	0.67	10.29	6.80	0.66	9.94	6.86	0.69	9.50	6.58	0.69	8.97	6.21	0.69
	34	16	8.71	8.71	1.00	8.80	8.80	1.00	8.80	8.67	0.99	8.80	8.82	1.00	8.88	8.64	0.97	8.97	8.36	0.93
	34	18	8.97	8.31	0.93	9.15	8.32	0.91	9.24	8.22	0.89	9.15	8.35	0.91	9.24	8.20	0.89	8.97	7.83	0.87
	34	20	9.32	7.74	0.83	9.50	7.77	0.82	9.94	7.86	0.79	9.50	7.85	0.83	9.50	7.70	0.81	8.97	7.28	0.81
	34	22	10.03	7.29	0.73	10.20	7.34	0.72	10.29	7.30	0.71	9.94	7.36	0.74	9.50	7.08	0.75	8.97	6.72	0.75

System	Return air		Outdoor air temperature [DB(°C)]																	
			20			25			30			**35**			40			45		
	DB ( )	WB ( )	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF
LGH-200RVX-E	20	16	9.17	6.05	0.66	9.26	6.02	0.65	9.26	5.83	0.63	9.26	6.11	0.66	9.35	5.98	0.64	9.44	5.66	0.60
GUG-03SL-E	20	18	9.44	5.29	0.56	9.63	5.30	0.55	9.72	5.29	0.54	9.63	5.49	0.57	9.72	5.35	0.55	9.44	4.91	0.52
PUHZ-ZRP100	22	16	9.17	6.69	0.73	9.26	6.67	0.72	9.26	6.57	0.71	9.26	6.85	0.74	9.35	6.64	0.71	9.44	6.32	0.67
	22	18	9.44	5.95	0.63	9.63	5.97	0.62	9.72	5.93	0.61	9.63	6.16	0.64	9.72	6.03	0.62	9.44	5.66	0.60
RA temp. control	22	20	9.81	5.10	0.52	10.00	5.20	0.52	10.46	5.33	0.51	10.00	5.50	0.55	10.00	5.30	0.53	9.44	4.91	0.52
	24	16	9.17	7.43	0.81	9.26	7.41	0.80	9.26	7.22	0.78	9.26	7.50	0.81	9.35	7.29	0.78	9.44	6.99	0.74
	24	18	9.44	6.61	0.70	9.63	6.64	0.69	9.72	6.61	0.68	9.63	6.84	0.71	9.72	6.71	0.69	9.44	6.32	0.67
	24	20	9.81	5.79	0.59	10.00	5.90	0.59	10.46	6.07	0.58	10.00	6.20	0.62	10.00	6.00	0.60	9.44	5.57	0.59
	24	22	10.56	5.20	0.49	10.74	5.26	0.49	10.83	5.31	0.49	10.46	5.44	0.52	10.00	5.20	0.52	9.44	4.91	0.52
	26	16	9.17	8.07	0.88	9.26	8.06	0.87	9.26	7.96	0.86	9.26	8.15	0.88	9.35	8.04	0.86	9.44	7.74	0.82
	26	18	9.44	7.27	0.77	9.63	7.32	0.76	9.72	7.29	0.75	9.63	7.51	0.78	9.72	7.39	0.76	9.44	6.99	0.74
	26	20	9.81	6.47	0.66	10.00	6.60	0.66	10.46	6.69	0.64	10.00	6.80	0.68	10.00	6.70	0.67	9.44	6.32	0.67
	26	22	10.56	5.81	0.55	10.74	6.07	0.56	10.83	5.96	0.55	10.46	6.17	0.59	10.00	5.90	0.59	9.44	5.57	0.59
	27	16	9.17	8.44	0.92	9.26	8.43	0.91	9.26	8.24	0.89	9.26	8.52	0.92	9.35	8.32	0.89	9.44	8.02	0.85
	27	18	9.44	7.65	0.81	9.63	7.70	0.80	9.72	7.68	0.79	9.63	7.90	0.82	9.72	7.78	0.80	9.44	7.36	0.78
	27	**19**	9.81	7.36	0.75	10.00	7.40	0.74	10.09	7.37	0.73	**10.00**	7.60	**0.76**	10.00	7.50	0.75	9.44	6.99	0.74
	27	20	9.81	6.87	0.70	10.00	7.00	0.70	10.46	7.11	0.68	10.00	7.20	0.72	10.00	7.10	0.71	9.44	6.61	0.70
	27	22	10.56	6.23	0.59	10.74	6.34	0.59	10.83	6.28	0.58	10.46	6.49	0.62	10.00	6.30	0.63	9.44	5.95	0.63
	28	16	9.17	8.80	0.96	9.26	8.80	0.95	9.26	8.61	0.93	9.26	8.89	0.96	9.35	8.70	0.93	9.44	8.40	0.89
	28	18	9.44	8.02	0.85	9.63	8.09	0.84	9.72	7.97	0.82	9.63	8.19	0.85	9.72	8.07	0.83	9.44	7.74	0.82
	28	20	9.81	7.16	0.73	10.00	7.30	0.73	10.46	7.43	0.71	10.00	7.50	0.75	10.00	7.40	0.74	9.44	6.99	0.74
	28	22	10.56	6.55	0.62	10.74	6.66	0.62	10.83	6.71	0.62	10.46	6.90	0.66	10.00	6.60	0.66	9.44	6.23	0.66
	30	16	9.17	9.45	1.00	9.26	9.45	1.00	9.26	9.26	1.00	9.26	9.54	1.00	9.35	9.35	1.00	9.44	9.06	0.96
	30	18	9.44	8.68	0.92	9.63	8.76	0.91	9.72	8.65	0.89	9.63	8.86	0.92	9.72	8.75	0.90	9.44	8.40	0.89
	30	20	9.81	7.85	0.80	10.00	8.00	0.80	10.46	8.16	0.78	10.00	8.20	0.82	10.00	8.10	0.81	9.44	7.65	0.81
	30	22	10.56	7.18	0.68	10.74	7.30	0.68	10.83	7.36	0.68	10.46	7.53	0.72	10.00	7.30	0.73	9.44	6.99	0.74
	32	16	9.17	10.18	1.00	9.26	10.09	1.00	9.26	10.00	1.00	9.26	10.28	1.00	9.35	10.10	1.00	9.44	9.82	1.00
	32	18	9.44	9.35	1.00	9.63	9.44	0.98	9.72	9.33	0.96	9.63	9.63	1.00	9.72	9.43	1.00	9.44	9.06	0.96
	32	20	9.81	8.53	0.87	10.00	8.70	0.87	10.46	8.79	0.84	10.00	8.90	0.89	10.00	8.80	0.88	9.44	8.40	0.89
	32	22	10.56	7.92	0.75	10.74	8.06	0.75	10.83	8.01	0.74	10.46	8.26	0.79	10.00	8.00	0.80	9.44	7.65	0.81
	34	16	9.17	10.82	1.00	9.26	10.83	1.00	9.26	10.65	1.00	9.26	10.93	1.00	9.35	10.75	1.00	9.44	10.48	1.00
	34	18	9.44	10.01	1.00	9.63	10.11	1.00	9.72	10.01	1.00	9.63	10.30	1.00	9.72	10.11	1.00	9.44	9.82	1.00
	34	20	9.81	9.22	0.94	10.00	9.40	0.94	10.46	9.52	0.91	10.00	9.60	0.96	10.00	9.50	0.95	9.44	9.06	0.96
	34	22	10.56	8.66	0.82	10.74	8.70	0.81	10.83	8.77	0.81	10.46	8.89	0.85	10.00	8.70	0.87	9.44	8.40	0.89

System	Return air		Outdoor air temperature [DB(°C)]																	
			20			25			30			**35**			40			45		
	DB ( )	WB ( )	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF
LGH-150RVXT-E	20	16	8.71	5.43	0.62	8.80	5.39	0.61	8.80	5.22	0.59	8.80	5.40	0.61	8.88	5.22	0.59	8.97	4.95	0.55
GUG-03SL-E	20	18	8.97	4.85	0.54	9.15	4.87	0.53	9.24	4.78	0.52	9.15	4.93	0.54	9.50	4.89	0.52	8.97	4.42	0.49
PUHZ-ZRP100	22	16	8.71	5.92	0.68	8.80	5.87	0.67	8.80	5.70	0.65	8.80	5.88	0.67	8.88	5.70	0.64	8.97	5.43	0.61
	22	18	8.97	5.33	0.59	9.15	5.35	0.59	9.24	5.26	0.57	9.15	5.42	0.59	9.50	5.38	0.57	8.97	4.91	0.55
RA temp. control	22	20	9.32	4.76	0.51	9.50	4.81	0.51	9.94	4.90	0.49	9.50	4.92	0.52	9.50	4.78	0.50	8.97	4.37	0.49
	24	16	8.71	6.40	0.73	8.80	6.35	0.72	8.80	6.19	0.70	8.80	6.36	0.72	8.88	6.19	0.70	8.97	5.92	0.66
	24	18	8.97	5.81	0.65	9.15	5.84	0.64	9.24	5.75	0.62	9.15	5.90	0.64	9.50	5.86	0.62	8.97	5.39	0.60
	24	20	9.32	5.24	0.56	9.50	5.29	0.56	9.94	5.38	0.54	9.50	5.41	0.57	9.50	5.27	0.55	8.97	4.85	0.54
	24	22	10.03	4.80	0.48	10.20	4.87	0.48	10.29	4.84	0.47	9.94	4.92	0.50	9.50	4.66	0.49	8.97	4.30	0.48
	26	16	8.71	6.88	0.79	8.80	6.83	0.78	8.80	6.67	0.76	8.80	6.84	0.78	8.88	6.67	0.75	8.97	6.40	0.71
	26	18	8.97	6.30	0.70	9.15	6.32	0.69	9.24	6.23	0.67	9.15	6.38	0.70	9.50	6.35	0.67	8.97	5.88	0.66
	26	20	9.32	5.73	0.61	9.50	5.78	0.61	9.94	5.87	0.59	9.50	5.89	0.62	9.50	5.75	0.61	8.97	5.34	0.60
	26	22	10.03	5.28	0.53	10.20	5.36	0.52	10.29	5.32	0.52	9.94	5.41	0.54	9.50	5.14	0.54	8.97	4.79	0.53
	27	16	8.71	7.12	0.82	8.80	7.07	0.80	8.80	6.91	0.79	8.80	7.09	0.81	8.88	6.91	0.78	8.97	6.64	0.74
	27	18	8.97	6.54	0.73	9.15	6.56	0.72	9.24	6.47	0.70	9.15	6.62	0.72	9.24	6.48	0.70	8.97	6.12	0.68
	27	**19**	8.97	6.17	0.69	9.50	6.38	0.67	9.59	6.30	0.66	**9.50**	6.46	**0.68**	9.50	6.29	0.66	8.97	5.85	0.65
	27	20	9.32	5.97	0.64	9.50	6.02	0.63	9.94	6.11	0.61	9.50	6.14	0.65	9.50	5.99	0.63	8.97	5.59	0.62
	27	22	10.03	5.53	0.55	10.20	5.60	0.55	10.29	5.57	0.54	9.94	5.65	0.57	9.50	5.39	0.57	8.97	5.04	0.56
	28	16	8.71	7.36	0.85	8.80	7.31	0.83	8.80	7.15	0.81	8.80	7.33	0.83	8.88	7.15	0.81	8.97	6.88	0.77
	28	18	8.97	6.78	0.76	9.15	6.80	0.74	9.24	6.71	0.73	9.15	6.87	0.75	9.50	6.83	0.72	8.97	6.36	0.71
	28	20	9.32	6.21	0.67	9.50	6.26	0.66	9.94	6.35	0.64	9.50	6.38	0.67	9.50	6.24	0.66	8.97	5.83	0.65
	28	22	10.03	5.77	0.58	10.20	5.84	0.57	10.29	5.81	0.56	9.94	5.89	0.59	9.50	5.63	0.59	8.97	5.28	0.59
	30	16	8.71	7.84	0.90	8.80	7.79	0.89	8.80	7.63	0.87	8.80	7.81	0.89	8.88	7.64	0.86	8.97	7.37	0.82
	30	18	8.97	7.26	0.81	9.15	7.28	0.80	9.24	7.19	0.78	9.15	7.35	0.80	9.50	7.31	0.77	8.97	6.85	0.76
	30	20	9.32	6.69	0.72	9.50	6.75	0.71	9.94	6.84	0.69	9.50	6.86	0.72	9.50	6.72	0.71	8.97	6.31	0.70
	30	22	10.03	6.26	0.62	10.20	6.33	0.62	10.29	6.29	0.61	9.94	6.38	0.64	9.50	6.12	0.64	8.97	5.77	0.64
	32	16	8.71	8.32	0.96	8.80	8.27	0.94	8.80	8.11	0.92	8.80	8.29	0.94	8.88	8.12	0.91	8.97	7.85	0.87
	32	18	8.97	7.74	0.86	9.15	7.77	0.85	9.24	7.68	0.83	9.15	7.83	0.86	9.50	7.80	0.82	8.97	7.33	0.82
	32	20	9.32	7.18	0.77	9.50	7.23	0.76	9.94	7.32	0.74	9.50	7.35	0.77	9.50	7.21	0.76	8.97	6.80	0.76
	32	22	10.03	6.74	0.67	10.20	6.81	0.67	10.29	6.78	0.66	9.94	6.87	0.69	9.50	6.60	0.70	8.97	6.26	0.70
	34	16	8.71	8.71	1.00	8.80	8.75	1.00	8.80	8.59	0.98	8.80	8.77	1.00	8.88	8.60	0.97	8.97	8.33	0.93
	34	18	8.97	8.22	0.92	9.15	8.25	0.90	9.24	8.16	0.88	9.15	8.31	0.91	9.50	8.28	0.87	8.97	7.82	0.87
	34	20	9.32	7.66	0.82	9.50	7.71	0.81	9.94	7.81	0.79	9.50	7.83	0.82	9.50	7.69	0.81	8.97	7.29	0.81
	34	22	10.03	7.22	0.72	10.20	7.30	0.72	10.29	7.27	0.71	9.94	7.35	0.74	9.50	7.09	0.75	8.97	6.74	0.75

System	Return air		Outdoor air temperature [DB(°C)]																	
			20			25			30			**35**			40			45		
	DB ( )	WB ( )	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF
LGH-200RVXT-E	20	16	9.17	6.05	0.66	9.26	6.02	0.65	9.26	5.93	0.64	9.26	6.24	0.67	9.35	5.98	0.64	9.44	5.76	0.61
GUG-03SL-E	20	18	9.44	5.29	0.56	9.63	5.36	0.56	9.72	5.29	0.54	9.63	5.55	0.58	10.00	5.50	0.55	9.44	5.10	0.54
PUHZ-ZRP100	22	16	9.17	6.69	0.73	9.26	6.76	0.73	9.26	6.57	0.71	9.26	6.85	0.74	9.35	6.73	0.72	9.44	6.42	0.68
	22	18	9.44	5.95	0.63	9.63	6.08	0.63	9.72	5.93	0.61	9.63	6.28	0.65	10.00	6.20	0.62	9.44	5.76	0.61
RA temp. control	22	20	9.81	5.20	0.53	10.00	5.29	0.53	10.46	5.41	0.52	10.00	5.56	0.56	10.00	5.50	0.55	9.44	5.02	0.53
	24	16	9.17	7.43	0.81	9.26	7.41	0.80	9.26	7.22	0.78	9.26	7.50	0.81	9.35	7.39	0.79	9.44	7.08	0.75
	24	18	9.44	6.61	0.70	9.63	6.64	0.69	9.72	6.61	0.68	9.63	6.93	0.72	10.00	6.90	0.69	9.44	6.42	0.68
	24	20	9.81	5.91	0.60	10.00	6.02	0.60	10.46	6.07	0.58	10.00	6.20	0.62	10.00	6.10	0.61	9.44	5.75	0.61
	24	22	10.56	5.20	0.49	10.74	5.34	0.50	10.83	5.31	0.49	10.46	5.56	0.53	10.00	5.40	0.54	9.44	4.99	0.53
	26	16	9.17	8.07	0.88	9.26	8.06	0.87	9.26	7.87	0.85	9.26	8.15	0.88	9.35	8.04	0.86	9.44	7.74	0.82
	26	18	9.44	7.27	0.77	9.63	7.32	0.76	9.72	7.29	0.75	9.63	7.61	0.79	10.00	7.50	0.75	9.44	7.08	0.75
	26	20	9.81	6.47	0.66	10.00	6.60	0.66	10.46	6.80	0.65	10.00	6.90	0.69	10.00	6.80	0.68	9.44	6.42	0.68
	26	22	10.56	5.93	0.56	10.74	6.07	0.56	10.83	6.08	0.56	10.46	6.28	0.60	10.00	6.00	0.60	9.44	5.66	0.60
	27	16	9.17	8.34	0.91	9.26	8.33	0.90	9.26	8.24	0.89	9.26	8.52	0.92	9.35	8.32	0.89	9.44	8.02	0.85
	27	18	9.44	7.65	0.81	9.63	7.70	0.80	9.72	7.58	0.78	9.63	7.90	0.82	9.72	7.78	0.80	9.44	7.36	0.78
	27	**19**	9.44	7.21	0.76	10.00	7.40	0.74	10.09	7.37	0.73	**10.00**	7.60	**0.76**	10.00	7.50	0.75	9.44	7.08	0.75
	27	20	9.81	6.87	0.70	10.00	7.00	0.70	10.46	7.11	0.68	10.00	7.20	0.72	10.00	7.10	0.71	9.44	6.70	0.71
	27	22	10.56	6.23	0.59	10.74	6.34	0.59	10.83	6.39	0.59	10.46	6.59	0.63	10.00	6.40	0.64	9.44	6.09	0.64
	28	16	9.17	8.71	0.95	9.26	8.70	0.94	9.26	8.52	0.92	9.26	8.89	0.96	9.35	8.70	0.93	9.44	8.40	0.89
	28	18	9.44	7.93	0.84	9.63	7.99	0.83	9.72	7.97	0.82	9.63	8.19	0.85	10.00	8.20	0.82	9.44	7.74	0.82
	28	20	9.81	7.16	0.73	10.00	7.30	0.73	10.46	8.05	0.77	10.00	7.60	0.76	10.00	7.50	0.75	9.44	7.08	0.75
	28	22	10.56	6.55	0.62	10.74	6.66	0.62	10.83	7.36	0.68	10.46	6.90	0.66	10.00	6.70	0.67	9.44	6.32	0.67
	30	16	9.17	9.17	1.00	9.26	9.26	1.00	9.26	9.26	1.00	9.26	9.26	1.00	9.35	9.35	1.00	9.44	9.06	0.96
	30	18	9.44	8.59	0.91	9.63	8.67	0.90	9.72	8.65	0.89	9.63	8.86	0.92	10.00	8.90	0.89	9.44	8.40	0.89
	30	20	9.81	7.85	0.80	10.00	8.00	0.80	10.46	8.05	0.77	10.00	8.20	0.82	10.00	8.10	0.81	9.44	7.74	0.82
	30	22	10.56	7.18	0.68	10.74	7.30	0.68	10.83	7.36	0.68	10.46	7.53	0.72	10.00	7.40	0.74	9.44	6.99	0.74
	32	16	9.17	9.17	1.00	9.26	9.26	1.00	9.26	9.26	1.00	9.26	9.26	1.00	9.35	9.35	1.00	9.44	9.44	1.00
	32	18	9.44	9.25	0.98	9.63	9.34	0.97	9.72	9.23	0.95	9.63	9.53	0.99	10.00	9.50	0.95	9.44	9.06	0.96
	32	20	9.81	8.53	0.87	10.00	8.60	0.86	10.46	8.79	0.84	10.00	8.90	0.89	10.00	8.80	0.88	9.44	8.40	0.89
	32	22	10.56	7.92	0.75	10.74	8.06	0.75	10.83	8.01	0.74	10.46	8.26	0.79	10.00	8.00	0.80	9.44	7.74	0.82
	34	16	9.17	9.17	1.00	9.26	9.26	1.00	9.26	9.26	1.00	9.26	9.26	1.00	9.35	9.35	1.00	9.44	9.44	1.00
	34	18	9.44	9.44	1.00	9.63	9.63	1.00	9.72	9.72	1.00	9.63	9.63	1.00	10.00	10.00	1.00	9.44	9.44	1.00
	34	20	9.81	9.12	0.93	10.00	9.30	0.93	10.46	9.41	0.90	10.00	9.60	0.96	10.00	9.50	0.95	9.44	9.06	0.96
	34	22	10.56	8.55	0.81	10.74	8.70	0.81	10.83	8.66	0.80	10.46	8.89	0.85	10.00	8.70	0.87	9.44	8.40	0.89

System	Return air		Outdoor air temperature [DB(°C)]																	
			20			25			30			**35**			40			45		
	DB ( )	WB ( )	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF
LGH-250RVXT-E	20	16	11.46	8.26	0.72	11.57	8.29	0.72	11.57	8.12	0.70	11.57	8.66	0.75	12.15	8.61	0.71	11.81	8.03	0.68
GUG-03SL-E	20	18	11.81	7.12	0.60	12.04	7.26	0.60	12.15	7.21	0.59	12.04	7.74	0.64	12.50	7.70	0.62	11.81	7.10	0.60
PUHZ-ZRP125	22	16	11.46	9.27	0.81	11.57	9.30	0.80	11.57	9.13	0.79	11.57	9.67	0.84	12.15	9.62	0.79	11.81	9.05	0.77
	22	18	11.81	8.14	0.69	12.04	8.27	0.69	12.15	8.22	0.68	12.04	8.75	0.73	12.50	8.72	0.70	11.81	8.12	0.69
RA temp. control	22	20	12.27	7.00	0.57	12.50	7.20	0.58	13.08	7.38	0.56	12.50	7.78	0.62	12.50	7.66	0.61	11.81	7.16	0.61
	24	16	11.46	10.28	0.90	11.57	10.30	0.89	11.57	10.14	0.88	11.57	10.69	0.92	12.15	10.63	0.88	11.81	10.06	0.85
	24	18	11.81	9.15	0.77	12.04	9.28	0.77	12.15	9.23	0.76	12.04	9.77	0.81	12.50	9.73	0.78	11.81	9.14	0.77
	24	20	12.27	8.01	0.65	12.50	8.21	0.66	13.08	8.39	0.64	12.50	8.80	0.70	12.50	8.68	0.69	11.81	8.18	0.69
	24	22	12.73	6.83	0.54	13.43	7.26	0.54	13.54	7.33	0.54	13.08	7.82	0.60	12.50	7.59	0.61	11.81	7.19	0.61
	26	16	11.46	11.29	0.98	11.57	11.31	0.98	11.57	11.15	0.96	11.57	11.57	1.00	12.15	11.65	0.96	11.81	11.08	0.94
	26	18	11.81	10.16	0.86	12.04	10.29	0.86	12.15	10.24	0.84	12.04	10.78	0.90	12.50	10.75	0.86	11.81	10.15	0.86
	26	20	12.27	9.03	0.74	12.50	9.22	0.74	13.08	9.41	0.72	12.50	9.81	0.79	12.50	9.70	0.78	11.81	9.20	0.78
	26	22	12.73	7.85	0.62	13.43	8.28	0.62	13.54	8.35	0.62	13.08	8.84	0.68	12.50	8.61	0.69	11.81	8.21	0.70
	27	16	11.46	11.46	1.00	11.57	11.57	1.00	11.57	11.57	1.00	11.57	11.57	1.00	12.15	12.15	1.00	11.81	11.59	0.98
	27	18	11.81	10.66	0.90	12.04	10.80	0.90	12.15	10.75	0.88	12.04	11.28	0.94	12.50	11.26	0.90	11.81	10.66	0.90
	27	**19**	11.81	10.01	0.85	12.50	10.36	0.83	12.62	10.34	0.82	**12.50**	10.89	**0.87**	12.50	10.73	0.86	11.81	10.19	0.86
	27	20	12.27	9.53	0.78	12.50	9.73	0.78	13.08	9.92	0.76	12.50	10.32	0.83	12.50	10.21	0.82	11.81	9.71	0.82
	27	22	12.73	8.36	0.66	13.43	8.78	0.65	13.54	8.86	0.65	13.08	9.35	0.71	12.50	9.12	0.73	11.81	8.72	0.74
	28	16	11.46	11.46	1.00	11.57	11.57	1.00	11.57	11.57	1.00	11.57	11.57	1.00	12.15	12.15	1.00	11.81	11.81	1.00
	28	18	11.81	11.17	0.95	12.04	11.30	0.94	12.15	11.26	0.93	12.04	11.79	0.98	12.50	11.76	0.94	11.81	11.17	0.95
	28	20	12.27	10.04	0.82	12.50	10.24	0.82	13.08	10.42	0.80	12.50	10.83	0.87	12.50	10.71	0.86	11.81	10.22	0.87
	28	22	12.73	8.87	0.70	13.43	9.29	0.69	13.54	9.37	0.69	13.08	9.86	0.75	12.50	9.63	0.77	11.81	9.24	0.78
	30	16	11.46	11.46	1.00	11.57	11.57	1.00	11.57	11.57	1.00	11.57	11.57	1.00	12.15	12.15	1.00	11.81	11.81	1.00
	30	18	11.81	11.81	1.00	12.04	12.04	1.00	12.15	12.15	1.00	12.04	12.04	1.00	12.50	12.50	1.00	11.81	11.81	1.00
	30	20	12.27	11.05	0.90	12.50	11.25	0.90	13.08	11.44	0.87	12.50	11.85	0.95	12.50	11.73	0.94	11.81	11.24	0.95
	30	22	12.73	9.88	0.78	13.43	10.31	0.77	13.54	10.39	0.77	13.08	10.88	0.83	12.50	10.65	0.85	11.81	10.26	0.87
	32	16	11.46	11.46	1.00	11.57	11.57	1.00	11.57	11.57	1.00	11.57	11.57	1.00	12.15	12.15	1.00	11.81	11.81	1.00
	32	18	11.81	11.81	1.00	12.04	12.04	1.00	12.15	12.15	1.00	12.04	12.04	1.00	12.50	12.50	1.00	11.81	11.81	1.00
	32	20	12.27	12.06	0.98	12.50	12.26	0.98	13.08	12.45	0.95	12.50	12.50	1.00	12.50	12.50	1.00	11.81	11.81	1.00
	32	22	12.73	10.90	0.86	13.43	11.32	0.84	13.54	11.40	0.84	13.08	11.90	0.91	12.50	11.67	0.93	11.81	11.28	0.96
	34	16	11.46	11.46	1.00	11.57	11.57	1.00	11.57	11.57	1.00	11.57	11.57	1.00	12.15	12.15	1.00	11.81	11.81	1.00
	34	18	11.81	11.81	1.00	12.04	12.04	1.00	12.15	12.15	1.00	12.04	12.04	1.00	12.50	12.50	1.00	11.81	11.81	1.00
	34	20	12.27	12.27	1.00	12.50	12.50	1.00	13.08	13.08	1.00	12.50	12.50	1.00	12.50	12.50	1.00	11.81	11.81	1.00
	34	22	12.73	11.91	0.94	13.43	12.34	0.92	13.54	12.42	0.92	13.08	12.91	0.99	12.50	12.50	1.00	11.81	11.81	1.00

(2)SA temperature control

System	Return air		Outdoor air temperature [DB(°C)]																	
			20			25			30			**35**			40			45		
	DB ( )	WB ( )	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF
LGH-80RVX-E	20	16	4.58	2.89	0.63	4.63	2.86	0.62	4.63	2.76	0.60	4.63	2.85	0.61	4.68	2.74	0.59	4.72	2.59	0.55
GUG-02SL-E	20	18	4.72	2.56	0.54	4.81	2.56	0.53	4.86	2.50	0.51	4.81	2.58	0.54	4.86	2.49	0.51	4.72	2.29	0.48
PUHZ-ZRP50	22	16	4.58	3.17	0.69	4.63	3.14	0.68	4.63	3.04	0.66	4.63	3.13	0.68	4.68	3.03	0.65	4.72	2.87	0.61
	22	18	4.72	2.84	0.60	4.81	2.84	0.59	4.86	2.79	0.57	4.81	2.86	0.59	4.86	2.78	0.57	4.72	2.57	0.54
SA temp. control	22	20	4.91	2.51	0.51	5.00	2.53	0.51	5.23	2.57	0.49	5.00	2.58	0.52	5.00	2.49	0.50	4.72	2.27	0.48
	24	16	4.58	3.45	0.75	4.63	3.42	0.74	4.63	3.33	0.72	4.63	3.41	0.74	4.68	3.31	0.71	4.72	3.15	0.67
	24	18	4.72	3.12	0.66	4.81	3.13	0.65	4.86	3.07	0.63	4.81	3.14	0.65	4.86	3.06	0.63	4.72	2.86	0.60
	24	20	4.91	2.80	0.57	5.00	2.82	0.56	5.23	2.85	0.55	5.00	2.86	0.57	5.00	2.78	0.56	4.72	2.55	0.54
	24	22	5.28	2.54	0.48	5.37	2.57	0.48	5.42	2.54	0.47	5.23	2.58	0.49	5.00	2.44	0.49	4.72	2.24	0.47
	26	16	4.58	3.73	0.81	4.63	3.70	0.80	4.63	3.61	0.78	4.63	3.69	0.80	4.68	3.59	0.77	4.72	3.44	0.73
	26	18	4.72	3.40	0.72	4.81	3.41	0.71	4.86	3.35	0.69	4.81	3.43	0.71	4.86	3.34	0.69	4.72	3.14	0.67
	26	20	4.91	3.08	0.63	5.00	3.10	0.62	5.23	3.14	0.60	5.00	3.15	0.63	5.00	3.06	0.61	4.72	2.84	0.60
	26	22	5.28	2.82	0.53	5.37	2.85	0.53	5.42	2.83	0.52	5.23	2.87	0.55	5.00	2.72	0.54	4.72	2.53	0.54
	27	16	4.58	3.88	0.85	4.63	3.84	0.83	4.63	3.75	0.81	4.63	3.83	0.83	4.68	3.73	0.80	4.72	3.58	0.76
	27	18	4.72	3.54	0.75	4.81	3.55	0.74	4.86	3.49	0.72	4.81	3.57	0.74	4.86	3.48	0.72	4.72	3.28	0.70
	27	**19**	4.91	3.43	0.70	5.00	3.44	0.69	5.05	3.39	0.67	**5.00**	3.47	**0.69**	5.00	3.37	0.67	4.72	3.13	0.66
	27	20	4.91	3.22	0.66	5.00	3.24	0.65	5.23	3.28	0.63	5.00	3.29	0.66	5.00	3.21	0.64	4.72	2.98	0.63
	27	22	5.28	2.96	0.56	5.37	2.99	0.56	5.42	2.97	0.55	5.23	3.01	0.58	5.00	2.86	0.57	4.72	2.67	0.57
	28	16	4.58	4.02	0.88	4.63	3.98	0.86	4.63	3.89	0.84	4.63	3.98	0.86	4.68	3.87	0.83	4.72	3.72	0.79
	28	18	4.72	3.69	0.78	4.81	3.69	0.77	4.86	3.64	0.75	4.81	3.71	0.77	4.86	3.63	0.75	4.72	3.42	0.73
	28	20	4.91	3.36	0.69	5.00	3.38	0.68	5.23	3.42	0.65	5.00	3.43	0.69	5.00	3.35	0.67	4.72	3.12	0.66
	28	22	5.28	3.10	0.59	5.37	3.13	0.58	5.42	3.11	0.57	5.23	3.15	0.60	5.00	3.01	0.60	4.72	2.81	0.60
	30	16	4.58	4.30	0.94	4.63	4.26	0.92	4.63	4.17	0.90	4.63	4.26	0.92	4.68	4.16	0.89	4.72	4.00	0.85
	30	18	4.72	3.97	0.84	4.81	3.97	0.83	4.86	3.92	0.81	4.81	3.99	0.83	4.86	3.91	0.80	4.72	3.71	0.79
	30	20	4.91	3.65	0.74	5.00	3.67	0.73	5.23	3.70	0.71	5.00	3.71	0.74	5.00	3.63	0.73	4.72	3.41	0.72
	30	22	5.28	3.39	0.64	5.37	3.42	0.64	5.42	3.40	0.63	5.23	3.44	0.66	5.00	3.29	0.66	4.72	3.10	0.66
	32	16	4.58	4.58	1.00	4.63	4.55	0.98	4.63	4.45	0.96	4.63	4.54	0.98	4.68	4.44	0.95	4.72	4.28	0.91
	32	18	4.72	4.25	0.90	4.81	4.26	0.88	4.86	4.20	0.86	4.81	4.28	0.89	4.86	4.19	0.86	4.72	3.99	0.85
	32	20	4.91	3.93	0.80	5.00	3.95	0.79	5.23	3.99	0.76	5.00	4.00	0.80	5.00	3.92	0.78	4.72	3.69	0.78
	32	22	5.28	3.67	0.70	5.37	3.70	0.69	5.42	3.68	0.68	5.23	3.72	0.71	5.00	3.58	0.72	4.72	3.39	0.72
	34	16	4.58	4.58	1.00	4.63	4.63	1.00	4.63	4.63	1.00	4.63	4.63	1.00	4.68	4.68	1.00	4.72	4.57	0.97
	34	18	4.72	4.53	0.96	4.81	4.54	0.94	4.86	4.48	0.92	4.81	4.56	0.95	4.86	4.48	0.92	4.72	4.28	0.91
	34	20	4.91	4.21	0.86	5.00	4.23	0.85	5.23	4.27	0.82	5.00	4.28	0.86	5.00	4.20	0.84	4.72	3.98	0.84
	34	22	5.28	3.95	0.75	5.37	3.99	0.74	5.42	3.96	0.73	5.23	4.01	0.77	5.00	3.86	0.77	4.72	3.67	0.78

System	Return air		Outdoor air temperature [DB(°C)]																	
			20			25			30			**35**			40			45		
	DB ( )	WB ( )	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF
LGH-100RVX-E GUG-03SL-E PUHZ-ZRP50 SA temp. control	20	16	4.86	3.14	0.65	4.91	3.12	0.64	4.91	3.04	0.62	4.91	3.16	0.64	4.96	3.07	0.62	5.01	2.91	0.58
	20	18	5.01	2.74	0.55	5.10	2.77	0.54	5.15	2.73	0.53	5.10	2.84	0.56	5.15	2.76	0.54	5.01	2.56	0.51
	22	16	4.86	3.48	0.72	4.91	3.46	0.71	4.91	3.38	0.69	4.91	3.50	0.71	4.96	3.41	0.69	5.01	3.25	0.65
	22	18	5.01	3.08	0.62	5.10	3.11	0.61	5.15	3.07	0.60	5.10	3.18	0.62	5.15	3.10	0.60	5.01	2.90	0.58
	22	20	5.20	2.69	0.52	5.30	2.73	0.52	5.55	2.79	0.50	5.30	2.83	0.53	5.30	2.76	0.52	5.01	2.54	0.51
	24	16	4.86	3.81	0.79	4.91	3.80	0.77	4.91	3.72	0.76	4.91	3.84	0.78	4.96	3.74	0.76	5.01	3.59	0.72
	24	18	5.01	3.42	0.68	5.10	3.44	0.67	5.15	3.41	0.66	5.10	3.51	0.69	5.15	3.44	0.67	5.01	3.24	0.65
	24	20	5.20	3.03	0.58	5.30	3.07	0.58	5.55	3.13	0.56	5.30	3.17	0.60	5.30	3.10	0.59	5.01	2.88	0.58
	24	22	5.59	2.70	0.48	5.69	2.76	0.48	5.74	2.76	0.48	5.55	2.83	0.51	5.30	2.70	0.51	5.01	2.51	0.50
	26	16	4.86	4.15	0.85	4.91	4.14	0.84	4.91	4.06	0.83	4.91	4.18	0.85	4.96	4.08	0.82	5.01	3.93	0.78
	26	18	5.01	3.76	0.75	5.10	3.78	0.74	5.15	3.74	0.73	5.10	3.85	0.76	5.15	3.78	0.73	5.01	3.58	0.72
	26	20	5.20	3.37	0.65	5.30	3.41	0.64	5.55	3.47	0.63	5.30	3.51	0.66	5.30	3.44	0.65	5.01	3.22	0.64
	26	22	5.59	3.04	0.54	5.69	3.10	0.54	5.74	3.10	0.54	5.55	3.18	0.57	5.30	3.04	0.57	5.01	2.86	0.57
	27	16	4.86	4.32	0.89	4.91	4.31	0.88	4.91	4.23	0.86	4.91	4.35	0.89	4.96	4.25	0.86	5.01	4.10	0.82
	27	18	5.01	3.93	0.78	5.10	3.95	0.77	5.15	3.91	0.76	5.10	4.02	0.79	5.15	3.95	0.77	5.01	3.75	0.75
	27	**19**	5.20	3.78	0.73	5.30	3.81	0.72	5.35	3.78	0.71	**5.30**	3.89	**0.73**	5.30	3.81	0.72	5.01	3.57	0.71
	27	20	5.20	3.54	0.68	5.30	3.58	0.68	5.55	3.64	0.66	5.30	3.68	0.70	5.30	3.61	0.68	5.01	3.39	0.68
	27	22	5.59	3.21	0.57	5.69	3.27	0.57	5.74	3.27	0.57	5.55	3.35	0.60	5.30	3.22	0.61	5.01	3.03	0.61
	28	16	4.86	4.49	0.92	4.91	4.48	0.91	4.91	4.40	0.90	4.91	4.51	0.92	4.96	4.42	0.89	5.01	4.27	0.85
	28	18	5.01	4.10	0.82	5.10	4.12	0.81	5.15	4.08	0.79	5.10	4.19	0.82	5.15	4.12	0.80	5.01	3.92	0.78
	28	20	5.20	3.71	0.71	5.30	3.75	0.71	5.55	3.81	0.69	5.30	3.85	0.73	5.30	3.79	0.71	5.01	3.56	0.71
	28	22	5.59	3.38	0.60	5.69	3.44	0.60	5.74	3.44	0.60	5.55	3.52	0.63	5.30	3.39	0.64	5.01	3.20	0.64
	30	16	4.86	4.83	0.99	4.91	4.81	0.98	4.91	4.73	0.96	4.91	4.85	0.99	4.96	4.76	0.96	5.01	4.61	0.92
	30	18	5.01	4.43	0.89	5.10	4.46	0.87	5.15	4.42	0.86	5.10	4.53	0.89	5.15	4.46	0.87	5.01	4.26	0.85
	30	20	5.20	4.05	0.78	5.30	4.09	0.77	5.55	4.15	0.75	5.30	4.19	0.79	5.30	4.13	0.78	5.01	3.91	0.78
	30	22	5.59	3.72	0.67	5.69	3.78	0.66	5.74	3.78	0.66	5.55	3.86	0.70	5.30	3.73	0.70	5.01	3.54	0.71
	32	16	4.86	4.86	1.00	4.91	4.91	1.00	4.91	4.91	1.00	4.91	4.91	1.00	4.96	4.96	1.00	5.01	4.95	0.99
	32	18	5.01	4.77	0.95	5.10	4.80	0.94	5.15	4.76	0.92	5.10	4.87	0.95	5.15	4.80	0.93	5.01	4.60	0.92
	32	20	5.20	4.39	0.84	5.30	4.43	0.84	5.55	4.49	0.81	5.30	4.53	0.86	5.30	4.47	0.84	5.01	4.25	0.85
	32	22	5.59	4.06	0.73	5.69	4.12	0.72	5.74	4.12	0.72	5.55	4.20	0.76	5.30	4.07	0.77	5.01	3.88	0.78
	34	16	4.86	4.86	1.00	4.91	4.91	1.00	4.91	4.91	1.00	4.91	4.91	1.00	4.96	4.96	1.00	5.01	5.01	1.00
	34	18	5.01	5.01	1.00	5.10	5.10	1.00	5.15	5.10	0.99	5.10	5.10	1.00	5.15	5.14	1.00	5.01	4.94	0.99
	34	20	5.20	4.72	0.91	5.30	4.77	0.90	5.55	4.83	0.87	5.30	4.87	0.92	5.30	4.81	0.91	5.01	4.59	0.92
	34	22	5.59	4.40	0.79	5.69	4.46	0.78	5.74	4.46	0.78	5.55	4.54	0.82	5.30	4.41	0.83	5.01	4.23	0.84

System	Return air		Outdoor air temperature [DB(°C)]																	
			20			25			30			**35**			40			45		
	DB ( )	WB ( )	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF
LGH-150RVX-E GUG-03SL-E PUHZ-ZRP71 SA temp. control	20	16	6.51	4.59	0.71	6.57	4.59	0.70	6.57	4.49	0.68	6.57	4.73	0.72	6.64	4.59	0.69	6.71	4.35	0.65
	20	18	6.71	3.91	0.58	6.84	3.97	0.58	6.90	3.93	0.57	6.84	4.16	0.61	6.90	4.06	0.59	6.71	3.78	0.56
	22	16	6.51	5.19	0.80	6.57	5.19	0.79	6.57	5.09	0.77	6.57	5.33	0.81	6.64	5.20	0.78	6.71	4.96	0.74
	22	18	6.71	4.51	0.67	6.84	4.57	0.67	6.90	4.54	0.66	6.84	4.76	0.70	6.90	4.67	0.68	6.71	4.38	0.65
	22	20	6.97	3.84	0.55	7.10	3.93	0.55	7.43	4.02	0.54	7.10	4.17	0.59	7.10	4.09	0.58	6.71	3.79	0.57
	24	16	6.51	5.80	0.89	6.57	5.80	0.88	6.57	5.70	0.87	6.57	5.93	0.90	6.64	5.80	0.87	6.71	5.57	0.83
	24	18	6.71	5.12	0.76	6.84	5.18	0.76	6.90	5.14	0.74	6.84	5.37	0.79	6.90	5.27	0.76	6.71	4.99	0.74
	24	20	6.97	4.44	0.64	7.10	4.54	0.64	7.43	4.63	0.62	7.10	4.78	0.67	7.10	4.70	0.66	6.71	4.40	0.66
	24	22	7.49	3.84	0.51	7.63	3.96	0.52	7.69	3.99	0.52	7.43	4.19	0.56	7.10	4.04	0.57	6.71	3.79	0.57
	26	16	6.51	6.40	0.98	6.57	6.40	0.97	6.57	6.30	0.96	6.57	6.54	0.99	6.64	6.41	0.97	6.71	6.18	0.92
	26	18	6.71	5.72	0.85	6.84	5.79	0.85	6.90	5.75	0.83	6.84	5.98	0.87	6.90	5.88	0.85	6.71	5.60	0.84
	26	20	6.97	5.05	0.72	7.10	5.14	0.72	7.43	5.24	0.70	7.10	5.39	0.76	7.10	5.31	0.75	6.71	5.01	0.75
	26	22	7.49	4.45	0.59	7.63	4.57	0.60	7.69	4.60	0.60	7.43	4.80	0.65	7.10	4.65	0.65	6.71	4.40	0.66
	27	16	6.51	6.51	1.00	6.57	6.57	1.00	6.57	6.60	1.00	6.57	6.57	1.00	6.64	6.64	1.00	6.71	6.48	0.97
	27	18	6.71	6.03	0.90	6.84	6.09	0.89	6.90	6.05	0.88	6.84	6.28	0.92	6.90	6.18	0.90	6.71	5.91	0.88
	27	**19**	6.97	5.75	0.82	7.10	5.82	0.82	7.17	5.80	0.81	**7.10**	6.04	**0.85**	7.10	5.93	0.84	6.71	5.61	0.84
	27	20	6.97	5.35	0.77	7.10	5.45	0.77	7.43	5.54	0.75	7.10	5.69	0.80	7.10	5.61	0.79	6.71	5.32	0.79
	27	22	7.49	4.76	0.63	7.63	4.87	0.64	7.69	4.90	0.64	7.43	5.10	0.69	7.10	4.95	0.70	6.71	4.71	0.70
	28	16	6.51	6.51	1.00	6.57	6.57	1.00	6.57	6.57	1.00	6.57	6.57	1.00	6.64	6.64	1.00	6.71	6.71	1.00
	28	18	6.71	6.33	0.94	6.84	6.39	0.93	6.90	6.35	0.92	6.84	6.58	0.96	6.90	6.49	0.94	6.71	6.21	0.93
	28	20	6.97	5.66	0.81	7.10	5.75	0.81	7.43	5.84	0.79	7.10	6.00	0.84	7.10	5.92	0.83	6.71	5.62	0.84
	28	22	7.49	5.06	0.68	7.63	5.18	0.68	7.69	5.20	0.68	7.43	5.41	0.73	7.10	5.26	0.74	6.71	5.02	0.75
	30	16	6.51	6.51	1.00	6.57	6.57	1.00	6.57	6.57	1.00	6.57	6.57	1.00	6.64	6.64	1.00	6.71	6.71	1.00
	30	18	6.71	6.71	1.00	6.84	6.84	1.00	6.90	6.90	1.00	6.84	6.84	1.00	6.90	6.90	1.00	6.71	6.71	1.00
	30	20	6.97	6.26	0.90	7.10	6.36	0.90	7.43	6.45	0.87	7.10	6.60	0.93	7.10	6.52	0.92	6.71	6.23	0.93
	30	22	7.49	5.67	0.76	7.63	5.79	0.76	7.69	5.81	0.76	7.43	6.02	0.81	7.10	5.87	0.83	6.71	5.63	0.84
	32	16	6.51	6.51	1.00	6.57	6.57	1.00	6.57	6.57	1.00	6.57	6.57	1.00	6.64	6.64	1.00	6.71	6.71	1.00
	32	18	6.71	6.71	1.00	6.84	6.84	1.00	6.90	6.90	1.00	6.84	6.84	1.00	6.90	6.90	1.00	6.71	6.71	1.00
	32	20	6.97	6.87	0.99	7.10	6.96	0.98	7.43	7.06	0.95	7.10	7.10	1.00	7.10	7.13	1.00	6.71	6.71	1.00
	32	22	7.49	6.28	0.84	7.63	6.39	0.84	7.69	6.42	0.83	7.43	6.62	0.89	7.10	6.48	0.91	6.71	6.24	0.93
	34	16	6.51	6.51	1.00	6.57	6.57	1.00	6.57	6.57	1.00	6.57	6.57	1.00	6.64	6.64	1.00	6.71	6.71	1.00
	34	18	6.71	6.71	1.00	6.84	6.84	1.00	6.90	6.90	1.00	6.84	6.84	1.00	6.90	6.90	1.00	6.71	6.71	1.00
	34	20	6.97	6.97	1.00	7.10	7.10	1.00	7.43	7.43	1.00	7.10	7.10	1.00	7.10	7.10	1.00	6.71	6.71	1.00
	34	22	7.49	6.88	0.92	7.63	7.00	0.92	7.69	7.03	0.91	7.43	7.23	0.97	7.10	7.09	1.00	6.71	6.71	1.00

System	Return air		Outdoor air temperature [DB(°C)]																	
			20			25			30			**35**			40			45		
	DB ( )	WB ( )	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF
LGH-200RVX-E GUG-03SL-E PUHZ-ZRP71 SA temp. control	20	16	6.78	4.94	0.73	6.85	4.96	0.72	6.85	4.88	0.71	6.85	5.16	0.75	6.92	5.03	0.73	6.99	4.79	0.69
	20	18	6.99	4.17	0.60	7.13	4.25	0.60	7.19	4.23	0.59	7.13	4.51	0.63	7.19	4.42	0.61	6.99	4.14	0.59
	22	16	6.78	5.63	0.83	6.85	5.65	0.82	6.85	5.57	0.81	6.85	5.85	0.85	6.92	5.72	0.83	6.99	5.48	0.78
	22	18	6.99	4.86	0.69	7.13	4.94	0.69	7.19	4.92	0.68	7.13	5.20	0.73	7.19	5.11	0.71	6.99	4.83	0.69
	22	20	7.26	4.09	0.56	7.40	4.21	0.57	7.74	4.32	0.56	7.40	4.52	0.61	7.40	4.46	0.60	6.99	4.16	0.59
	24	16	6.78	6.31	0.93	6.85	6.34	0.92	6.85	6.25	0.91	6.85	6.54	0.95	6.92	6.41	0.93	6.99	6.17	0.88
	24	18	6.99	5.55	0.79	7.13	5.63	0.79	7.19	5.61	0.78	7.13	5.89	0.83	7.19	5.81	0.81	6.99	5.52	0.79
	24	20	7.26	4.78	0.66	7.40	4.90	0.66	7.74	5.02	0.65	7.40	5.22	0.70	7.40	5.15	0.70	6.99	4.85	0.69
	24	22	7.81	4.08	0.52	7.95	4.23	0.53	8.02	4.29	0.53	7.74	4.54	0.59	7.40	4.40	0.59	6.99	4.16	0.60
	26	16	6.78	6.78	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.92	6.92	1.00	6.99	6.86	0.98
	26	18	6.99	6.23	0.89	7.13	6.32	0.89	7.19	6.30	0.88	7.13	6.58	0.92	7.19	6.50	0.90	6.99	6.21	0.89
	26	20	7.26	5.47	0.75	7.40	5.59	0.76	7.74	5.71	0.74	7.40	5.91	0.80	7.40	5.84	0.79	6.99	5.55	0.79
	26	22	7.81	4.78	0.61	7.95	4.93	0.62	8.02	4.98	0.62	7.74	5.23	0.68	7.40	5.10	0.69	6.99	4.86	0.70
	27	16	6.78	6.78	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.92	6.92	1.00	6.99	6.99	1.00
	27	18	6.99	6.58	0.94	7.13	6.67	0.94	7.19	6.65	0.92	7.13	6.92	0.97	7.19	6.84	0.95	6.99	6.56	0.94
	27	**19**	7.26	6.25	0.86	7.40	6.36	0.86	7.47	6.35	0.85	**7.40**	6.64	**0.90**	7.40	6.55	0.89	6.99	6.23	0.89
	27	20	7.26	5.81	0.80	7.40	5.93	0.80	7.74	6.05	0.78	7.40	6.25	0.85	7.40	6.19	0.84	6.99	5.89	0.84
	27	22	7.81	5.12	0.66	7.95	5.27	0.66	8.02	5.33	0.66	7.74	5.58	0.72	7.40	5.45	0.74	6.99	5.21	0.75
	28	16	6.78	6.78	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.92	6.92	1.00	6.99	6.99	1.00
	28	18	6.99	6.92	0.99	7.13	7.01	0.98	7.19	6.99	0.97	7.13	7.13	1.00	7.19	7.19	1.00	6.99	6.91	0.99
	28	20	7.26	6.16	0.85	7.40	6.28	0.85	7.74	6.40	0.83	7.40	6.60	0.89	7.40	6.53	0.88	6.99	6.24	0.89
	28	22	7.81	5.47	0.70	7.95	5.62	0.71	8.02	5.67	0.71	7.74	5.92	0.77	7.40	5.79	0.78	6.99	5.56	0.80
	30	16	6.78	6.78	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.92	6.92	1.00	6.99	6.99	1.00
	30	18	6.99	6.99	1.00	7.13	7.13	1.00	7.19	7.19	1.00	7.13	7.13	1.00	7.19	7.19	1.00	6.99	6.99	1.00
	30	20	7.26	6.85	0.94	7.40	6.97	0.94	7.74	7.09	0.92	7.40	7.29	0.99	7.40	7.23	0.98	6.99	6.93	0.99
	30	22	7.81	6.16	0.79	7.95	6.31	0.79	8.02	6.37	0.79	7.74	6.62	0.85	7.40	6.49	0.88	6.99	6.25	0.89
	32	16	6.78	6.78	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.92	6.92	1.00	6.99	6.99	1.00
	32	18	6.99	6.99	1.00	7.13	7.13	1.00	7.19	7.19	1.00	7.13	7.13	1.00	7.19	7.19	1.00	6.99	6.99	1.00
	32	20	7.26	7.26	1.00	7.40	7.40	1.00	7.74	7.78	1.00	7.40	7.40	1.00	7.40	7.40	1.00	6.99	6.99	1.00
	32	22	7.81	6.85	0.88	7.95	7.00	0.88	8.02	7.06	0.88	7.74	7.31	0.94	7.40	7.18	0.97	6.99	6.95	0.99
	34	16	6.78	6.78	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.92	6.92	1.00	6.99	6.99	1.00
	34	18	6.99	6.99	1.00	7.13	7.13	1.00	7.19	7.19	1.00	7.13	7.13	1.00	7.19	7.19	1.00	6.99	6.99	1.00
	34	20	7.26	7.26	1.00	7.40	7.40	1.00	7.74	7.74	1.00	7.40	7.40	1.00	7.40	7.40	1.00	6.99	6.99	1.00
	34	22	7.81	7.54	0.97	7.95	7.69	0.97	8.02	7.75	0.97	7.74	7.74	1.00	7.40	7.40	1.00	6.99	6.99	1.00

System	Return air		Outdoor air temperature [DB(°C)]																	
			20			25			30			**35**			40			45		
	DB ( )	WB ( )	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF
LGH-150RVXT-E GUG-03SL-E PUHZ-ZRP71 SA temp. control	20	16	6.51	4.61	0.71	6.57	4.63	0.70	6.57	4.55	0.69	6.57	4.82	0.73	6.64	4.70	0.71	6.71	4.49	0.67
	20	18	6.71	3.94	0.59	6.84	4.02	0.59	6.90	4.00	0.58	6.84	4.27	0.62	7.10	4.26	0.60	6.71	3.93	0.59
	22	16	6.51	5.19	0.80	6.57	5.21	0.79	6.57	5.13	0.78	6.57	5.40	0.82	6.64	5.29	0.80	6.71	5.07	0.76
	22	18	6.71	4.53	0.67	6.84	4.61	0.67	6.90	4.59	0.66	6.84	4.85	0.71	7.10	4.84	0.68	6.71	4.51	0.67
	22	20	6.97	3.86	0.55	7.10	3.98	0.56	7.43	4.09	0.55	7.10	4.28	0.60	7.10	4.22	0.59	6.71	3.94	0.59
	24	16	6.51	5.77	0.89	6.57	5.79	0.88	6.57	5.71	0.87	6.57	5.99	0.91	6.64	5.87	0.88	6.71	5.66	0.84
	24	18	6.71	5.11	0.76	6.84	5.19	0.76	6.90	5.17	0.75	6.84	5.44	0.80	7.10	5.43	0.76	6.71	5.10	0.76
	24	20	6.97	4.45	0.64	7.10	4.56	0.64	7.43	4.68	0.63	7.10	4.87	0.69	7.10	4.80	0.68	6.71	4.53	0.68
	24	22	7.49	3.86	0.52	7.63	4.00	0.52	7.69	4.05	0.53	7.43	4.29	0.58	7.10	4.16	0.59	6.71	3.94	0.59
	26	16	6.51	6.35	0.98	6.57	6.38	0.97	6.57	6.30	0.96	6.57	6.57	1.00	6.64	6.46	0.97	6.71	6.24	0.93
	26	18	6.71	5.69	0.85	6.84	5.78	0.84	6.90	5.76	0.83	6.84	6.02	0.88	7.10	6.02	0.85	6.71	5.69	0.85
	26	20	6.97	5.03	0.72	7.10	5.15	0.73	7.43	5.26	0.71	7.10	5.45	0.77	7.10	5.39	0.76	6.71	5.12	0.76
	26	22	7.49	4.45	0.59	7.63	4.59	0.60	7.69	4.64	0.60	7.43	4.88	0.66	7.10	4.75	0.67	6.71	4.53	0.68
	27	16	6.51	6.51	1.00	6.57	6.57	1.00	6.57	6.59	1.00	6.57	6.57	1.00	6.64	6.64	1.00	6.71	6.54	0.97
	27	18	6.71	5.98	0.89	6.84	6.07	0.89	6.90	6.05	0.88	6.84	6.32	0.92	6.90	6.24	0.90	6.71	5.98	0.89
	27	**19**	6.71	5.60	0.84	7.10	5.81	0.82	7.17	5.81	0.81	**7.10**	6.08	**0.86**	7.10	6.00	0.84	6.71	5.70	0.85
	27	20	6.97	5.33	0.76	7.10	5.44	0.77	7.43	5.55	0.75	7.10	5.75	0.81	7.10	5.69	0.80	6.71	5.41	0.81
	27	22	7.49	4.74	0.63	7.63	4.88	0.64	7.69	4.93	0.64	7.43	5.17	0.70	7.10	5.04	0.71	6.71	4.82	0.72
	28	16	6.51	6.51	1.00	6.57	6.57	1.00	6.57	6.57	1.00	6.57	6.57	1.00	6.64	6.64	1.00	6.71	6.71	1.00
	28	18	6.71	6.28	0.94	6.84	6.36	0.93	6.90	6.34	0.92	6.84	6.61	0.97	7.10	6.60	0.93	6.71	6.28	0.94
	28	20	6.97	5.62	0.81	7.10	5.73	0.81	7.43	5.85	0.79	7.10	6.04	0.85	7.10	5.98	0.84	6.71	5.71	0.85
	28	22	7.49	5.04	0.67	7.63	5.18	0.68	7.69	5.23	0.68	7.43	5.46	0.74	7.10	5.34	0.75	6.71	5.12	0.76
	30	16	6.51	6.51	1.00	6.57	6.57	1.00	6.57	6.57	1.00	6.57	6.57	1.00	6.64	6.64	1.00	6.71	6.71	1.00
	30	18	6.71	6.71	1.00	6.84	6.84	1.00	6.90	6.93	1.00	6.84	6.84	1.00	7.10	7.10	1.00	6.71	6.71	1.00
	30	20	6.97	6.20	0.89	7.10	6.32	0.89	7.43	6.43	0.87	7.10	6.62	0.93	7.10	6.57	0.92	6.71	6.29	0.94
	30	22	7.49	5.62	0.75	7.63	5.76	0.76	7.69	5.81	0.76	7.43	6.05	0.81	7.10	5.93	0.83	6.71	5.71	0.85
	32	16	6.51	6.51	1.00	6.57	6.57	1.00	6.57	6.57	1.00	6.57	6.57	1.00	6.64	6.64	1.00	6.71	6.71	1.00
	32	18	6.71	6.71	1.00	6.84	6.84	1.00	6.90	6.90	1.00	6.84	6.84	1.00	7.10	7.10	1.00	6.71	6.71	1.00
	32	20	6.97	6.79	0.97	7.10	6.90	0.97	7.43	7.02	0.94	7.10	7.10	1.00	7.10	7.10	1.00	6.71	6.71	1.00
	32	22	7.49	6.21	0.83	7.63	6.35	0.83	7.69	6.40	0.83	7.43	6.64	0.89	7.10	6.52	0.92	6.71	6.30	0.94
	34	16	6.51	6.51	1.00	6.57	6.57	1.00	6.57	6.57	1.00	6.57	6.57	1.00	6.64	6.64	1.00	6.71	6.71	1.00
	34	18	6.71	6.71	1.00	6.84	6.84	1.00	6.90	6.90	1.00	6.84	6.84	1.00	7.10	7.10	1.00	6.71	6.71	1.00
	34	20	6.97	6.97	1.00	7.10	7.10	1.00	7.43	7.43	1.00	7.10	7.10	1.00	7.10	7.10	1.00	6.71	6.71	1.00
	34	22	7.49	6.80	0.91	7.63	6.94	0.91	7.69	6.99	0.91	7.43	7.23	0.97	7.10	7.11	1.00	6.71	6.71	1.00

System	Return air		Outdoor air temperature [DB(°C)]																	
			20			25			30			**35**			40			45		
	DB ( )	WB ( )	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF
LGH-200RVXT-E GUG-03SL-E PUHZ-ZRP71 SA temp. control	20	16	6.78	4.97	0.73	6.85	5.00	0.73	6.85	4.92	0.72	6.85	5.24	0.77	6.92	5.13	0.74	6.99	4.89	0.70
	20	18	6.99	4.22	0.60	7.13	4.32	0.61	7.19	4.31	0.60	7.13	4.62	0.65	7.40	4.61	0.62	6.99	4.27	0.61
	22	16	6.78	5.63	0.83	6.85	5.66	0.83	6.85	5.59	0.82	6.85	5.91	0.86	6.92	5.79	0.84	6.99	5.56	0.80
	22	18	6.99	4.88	0.70	7.13	4.98	0.70	7.19	4.97	0.69	7.13	5.28	0.74	7.40	5.28	0.71	6.99	4.94	0.71
	22	20	7.26	4.13	0.57	7.40	4.27	0.58	7.74	4.40	0.57	7.40	4.63	0.63	7.40	4.58	0.62	6.99	4.29	0.61
	24	16	6.78	6.29	0.93	6.85	6.33	0.92	6.85	6.25	0.91	6.85	6.57	0.96	6.92	6.46	0.93	6.99	6.23	0.89
	24	18	6.99	5.54	0.79	7.13	5.65	0.79	7.19	5.64	0.78	7.13	5.95	0.84	7.40	5.95	0.80	6.99	5.60	0.80
	24	20	7.26	4.80	0.66	7.40	4.94	0.67	7.74	5.06	0.65	7.40	5.30	0.72	7.40	5.25	0.71	6.99	4.96	0.71
	24	22	7.81	4.13	0.53	7.95	4.29	0.54	8.02	4.36	0.54	7.74	4.65	0.60	7.40	4.53	0.61	6.99	4.30	0.62
	26	16	6.78	6.78	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.92	6.92	1.00	6.99	6.89	0.99
	26	18	6.99	6.21	0.89	7.13	6.31	0.89	7.19	6.30	0.88	7.13	6.62	0.93	7.40	6.61	0.89	6.99	6.27	0.90
	26	20	7.26	5.46	0.75	7.40	5.60	0.76	7.74	5.73	0.74	7.40	5.97	0.81	7.40	5.92	0.80	6.99	5.63	0.81
	26	22	7.81	4.79	0.61	7.95	4.96	0.62	8.02	5.03	0.63	7.74	5.32	0.69	7.40	5.20	0.70	6.99	4.97	0.71
	27	16	6.78	6.78	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.92	6.92	1.00	6.99	6.99	1.00
	27	18	6.99	6.54	0.94	7.13	6.64	0.93	7.19	6.64	0.92	7.13	6.95	0.98	7.19	6.88	0.96	6.99	6.61	0.95
	27	**19**	6.99	6.12	0.88	7.40	6.35	0.86	7.47	6.36	0.85	**7.40**	6.68	**0.90**	7.40	6.60	0.89	6.99	6.29	0.90
	27	20	7.26	5.80	0.80	7.40	5.94	0.80	7.74	6.07	0.78	7.40	6.30	0.85	7.40	6.25	0.84	6.99	5.97	0.85
	27	22	7.81	5.13	0.66	7.95	5.30	0.67	8.02	5.36	0.67	7.74	5.65	0.73	7.40	5.53	0.75	6.99	5.31	0.76
	28	16	6.78	6.78	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.92	6.92	1.00	6.99	6.99	1.00
	28	18	6.99	6.87	0.98	7.13	6.97	0.98	7.19	6.97	0.97	7.13	7.13	1.00	7.40	7.28	0.98	6.99	6.94	0.99
	28	20	7.26	6.13	0.84	7.40	6.27	0.85	7.74	6.40	0.83	7.40	6.64	0.90	7.40	6.58	0.89	6.99	6.30	0.90
	28	22	7.81	5.46	0.70	7.95	5.63	0.71	8.02	5.70	0.71	7.74	5.99	0.77	7.40	5.87	0.79	6.99	5.65	0.81
	30	16	6.78	6.78	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.92	6.92	1.00	6.99	6.99	1.00
	30	18	6.99	6.99	1.00	7.13	7.13	1.00	7.19	7.19	1.00	7.13	7.13	1.00	7.40	7.40	1.00	6.99	6.99	1.00
	30	20	7.26	6.80	0.94	7.40	6.93	0.94	7.74	7.06	0.91	7.40	7.30	0.99	7.40	7.25	0.98	6.99	6.97	1.00
	30	22	7.81	6.13	0.78	7.95	6.30	0.79	8.02	6.37	0.79	7.74	6.65	0.86	7.40	6.54	0.88	6.99	6.32	0.90
	32	16	6.78	6.78	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.92	6.92	1.00	6.99	6.99	1.00
	32	18	6.99	6.99	1.00	7.13	7.13	1.00	7.19	7.19	1.00	7.13	7.13	1.00	7.40	7.40	1.00	6.99	6.99	1.00
	32	20	7.26	7.26	1.00	7.40	7.40	1.00	7.74	7.73	1.00	7.40	7.40	1.00	7.40	7.40	1.00	6.99	6.99	1.00
	32	22	7.81	6.80	0.87	7.95	6.97	0.88	8.02	7.03	0.88	7.74	7.32	0.95	7.40	7.21	0.97	6.99	6.99	1.00
	34	16	6.78	6.78	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.85	6.85	1.00	6.92	6.92	1.00	6.99	6.99	1.00
	34	18	6.99	6.99	1.00	7.13	7.13	1.00	7.19	7.19	1.00	7.13	7.13	1.00	7.40	7.40	1.00	6.99	6.99	1.00
	34	20	7.26	7.26	1.00	7.40	7.40	1.00	7.74	7.74	1.00	7.40	7.40	1.00	7.40	7.40	1.00	6.99	6.99	1.00
	34	22	7.81	7.46	0.96	7.95	7.63	0.96	8.02	7.70	0.96	7.74	7.74	1.00	7.40	7.40	1.00	6.99	6.99	1.00

System	Return air		Outdoor air temperature [DB(°C)]																	
			20			25			30			**35**			40			45		
	DB ( )	WB ( )	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF	CA (kW)	SHC (kW)	SHF
LGH-250RVXT-E GUG-03SL-E PUHZ-ZRP71 SA temp. control	20	16	7.15	5.46	0.76	7.22	5.50	0.76	7.22	5.41	0.75	7.22	5.82	0.81	7.58	5.79	0.76	7.37	5.42	0.74
	20	18	7.37	4.66	0.63	7.51	4.77	0.63	7.58	4.75	0.63	7.51	5.16	0.69	7.80	5.14	0.66	7.37	4.77	0.65
	22	16	7.15	6.19	0.87	7.22	6.23	0.86	7.22	6.14	0.85	7.22	6.54	0.91	7.58	6.52	0.86	7.37	6.15	0.83
	22	18	7.37	5.38	0.73	7.51	5.50	0.73	7.58	5.48	0.72	7.51	5.89	0.78	7.80	5.87	0.75	7.37	5.50	0.75
	22	20	7.66	4.57	0.60	7.80	4.73	0.61	8.16	4.87	0.60	7.80	5.19	0.67	7.80	5.13	0.66	7.37	4.82	0.65
	24	16	7.15	6.91	0.97	7.22	6.95	0.96	7.22	6.87	0.95	7.22	7.22	1.00	7.58	7.24	0.96	7.37	6.88	0.93
	24	18	7.37	6.11	0.83	7.51	6.22	0.83	7.58	6.21	0.82	7.51	6.61	0.88	7.80	6.60	0.85	7.37	6.23	0.85
	24	20	7.66	5.30	0.69	7.80	5.46	0.70	8.16	5.60	0.69	7.80	5.92	0.76	7.80	5.87	0.75	7.37	5.56	0.75
	24	22	7.94	4.46	0.56	8.38	4.76	0.57	8.45	4.84	0.57	8.16	5.22	0.64	7.80	5.11	0.65	7.37	4.86	0.66
	26	16	7.15	7.15	1.00	7.22	7.22	1.00	7.22	7.22	1.00	7.22	7.22	1.00	7.58	7.58	1.00	7.37	7.37	1.00
	26	18	7.37	6.83	0.93	7.51	6.95	0.93	7.58	6.94	0.91	7.51	7.34	0.98	7.80	7.33	0.94	7.37	6.96	0.94
	26	20	7.66	6.03	0.79	7.80	6.19	0.79	8.16	6.33	0.78	7.80	6.65	0.85	7.80	6.60	0.85	7.37	6.29	0.85
	26	22	7.94	5.19	0.65	8.38	5.50	0.66	8.45	5.57	0.66	8.16	5.96	0.73	7.80	5.84	0.75	7.37	5.60	0.76
	27	16	7.15	7.15	1.00	7.22	7.22	1.00	7.22	7.22	1.00	7.22	7.22	1.00	7.58	7.58	1.00	7.37	7.37	1.00
	27	18	7.37	7.20	0.98	7.51	7.31	0.97	7.58	7.30	0.96	7.51	7.51	1.00	7.80	7.70	0.99	7.37	7.33	0.99
	27	**19**	7.37	6.74	0.92	7.80	6.99	0.90	7.87	7.00	0.89	**7.80**	7.42	**0.95**	7.80	7.33	0.94	7.37	7.00	0.95
	27	20	7.66	6.39	0.84	7.80	6.55	0.84	8.16	6.69	0.82	7.80	7.02	0.90	7.80	6.96	0.89	7.37	6.66	0.90
	27	22	7.94	5.56	0.70	8.38	5.86	0.70	8.45	5.94	0.70	8.16	6.32	0.77	7.80	6.21	0.80	7.37	5.97	0.81
	28	16	7.15	7.15	1.00	7.22	7.22	1.00	7.22	7.22	1.00	7.22	7.22	1.00	7.58	7.58	1.00	7.37	7.37	1.00
	28	18	7.37	7.37	1.00	7.51	7.51	1.00	7.58	7.58	1.00	7.51	7.51	1.00	7.80	7.80	1.00	7.37	7.37	1.00
	28	20	7.66	6.76	0.88	7.80	6.92	0.89	8.16	7.05	0.86	7.80	7.38	0.95	7.80	7.33	0.94	7.37	7.02	0.95
	28	22	7.94	5.92	0.75	8.38	6.23	0.74	8.45	6.30	0.75	8.16	6.69	0.82	7.80	6.57	0.84	7.37	6.33	0.86
	30	16	7.15	7.15	1.00	7.22	7.22	1.00	7.22	7.22	1.00	7.22	7.22	1.00	7.58	7.58	1.00	7.37	7.37	1.00
	30	18	7.37	7.37	1.00	7.51	7.51	1.00	7.58	7.58	1.00	7.51	7.51	1.00	7.80	7.80	1.00	7.37	7.37	1.00
	30	20	7.66	7.48	0.98	7.80	7.64	0.98	8.16	7.78	0.95	7.80	7.80	1.00	7.80	7.80	1.00	7.37	7.37	1.00
	30	22	7.94	6.65	0.84	8.38	6.96	0.83	8.45	7.04	0.83	8.16	7.42	0.91	7.80	7.31	0.94	7.37	7.07	0.96
	32	16	7.15	7.15	1.00	7.22	7.22	1.00	7.22	7.22	1.00	7.22	7.22	1.00	7.58	7.58	1.00	7.37	7.37	1.00
	32	18	7.37	7.37	1.00	7.51	7.51	1.00	7.58	7.58	1.00	7.51	7.51	1.00	7.80	7.80	1.00	7.37	7.37	1.00
	32	20	7.66	7.66	1.00	7.80	7.80	1.00	8.16	8.16	1.00	7.80	7.80	1.00	7.80	7.80	1.00	7.37	7.37	1.00
	32	22	7.94	7.38	0.93	8.38	7.69	0.92	8.45	7.77	0.92	8.16	8.15	1.00	7.80	7.80	1.00	7.37	7.37	1.00

MITSUBISHI ELECTRIC CORPORATION

Y16-005 Sep.2016 <MEE>