



VRV Selection

Project Report

Report details

Produced on: 2/22/2021

Application version: 2021.2.10.2

Project details

Project name: 101 Princess Street

Solution name: 101 Princess Street - Indicative Selection v2.0

Client Name: Evora Edge

Customer reference:

Quotation reference: 623056

Project number: 728941/889604

The output of the VRV Xpress software is based on Daikin-genuine capacity tables that relate to the Japanese Industry Standard. The VRV Xpress software provides a selection of outdoor and indoor units with optimal efficiency to fit cooling and heating load requirements.



Material list

Model	Quantity	Description
REYQ18U	1	REYQ-U (VRV IV)
BS1Q10A	2	Branch selector unit
BS10Q14AV1B	1	Branch selector unit
FXSQ20A	1	FXSQ-A - Concealed ceiling unit with medium ESP
FXSQ40A	1	FXSQ-A - Concealed ceiling unit with medium ESP
FXSQ50A	9	FXSQ-A - Concealed ceiling unit with medium ESP
KHRQ23M20T	1	Refnet branch piping kit
KHRQ23M64T	1	Refnet branch piping kit
DCM601A51	1	Intelligent Touch Manager
DMS502A51	1	BACnet Interface - integrated control system connecting VRV system with BMS system
BRC1H52W	11	Remote controller (white)
KHFP26A100C	1	Pipe closing kit



Indoor unit details

Table of abbreviations

Abbreviation	Description
Name	Logical name of the device
FCU	Device model name
Tmp C	Indoor conditions in cooling
Rq TC	Required total cooling capacity
Rv TC	Revised total cooling capacity (asked from outdoor)
Max TC	Available total cooling capacity
Rq SC	Required sensible cooling capacity
Tevap	Evaporating temperature of indoor unit coil
Tdis C	Indoor unit discharge air temperature in cooling based on maximum capacities
Max SC	Available sensible cooling capacity
PIC	Power input in cooling mode @ 50Hz
Tmp H	Indoor temperature in heating
Rq HC	Required heating capacity
Max HC	Available heating capacity
Tdis H	Indoor unit discharge air temperature in heating based on maximum capacities
PIH	Power input in heating mode @ 50Hz
Sound	Sound pressure level low and high
PS	Power supply (voltage and phases)
MCA	Minimum Circuit Amps
MOP	Maximum Overcurrent Protection
WxHxD	WidthxHeightxD
Weight	Weight of the device
Min coil	Minimum coil volume
Max coil	Maximum coil volume
Air Flow Rate	Air Flow Rate

Capacity data at conditions and connection ratio (113) as entered

Name	FCU	Cooling								
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	PIC
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	kW
FCU 1	FXSQ50A	23.0/50%	3.7	3.7	4.6	n/a	6.0	11.6	3.6	0.095
FCU 2	FXSQ50A	23.0/50%	3.7	3.7	4.6	n/a	6.0	11.6	3.6	0.095
FCU 3	FXSQ50A	23.0/50%	3.7	3.7	4.6	n/a	6.0	11.6	3.6	0.095
FCU 4	FXSQ50A	23.0/50%	3.7	3.7	4.6	n/a	6.0	11.6	3.6	0.095
FCU 5	FXSQ50A	23.0/50%	3.7	3.7	4.6	n/a	6.0	11.6	3.6	0.095
FCU 6	FXSQ50A	23.0/50%	3.7	3.7	4.6	n/a	6.0	11.6	3.6	0.095
FCU 7	FXSQ50A	23.0/50%	3.7	3.7	4.6	n/a	6.0	11.6	3.6	0.095
FCU 8	FXSQ50A	23.0/50%	3.7	3.7	4.6	n/a	6.0	11.6	3.6	0.095
FCU 9	FXSQ50A	23.0/50%	3.7	3.7	4.6	n/a	6.0	11.6	3.6	0.095
FCU 10	FXSQ40A	23.0/50%	3.0	3.0	3.7	n/a	6.0	13.6	2.9	0.092
FCU 11	FXSQ20A	23.0/50%	1.7	1.7	1.8	n/a	6.0	15.5	1.4	0.041
			38.0							

Name	FCU	Heating					Min coil	Max coil	Air Flow Rate
		Tmp H	Rq HC	Max HC	Tdis H	PIH			
		°C	kW	kW	°C	kW			
FCU 1	FXSQ50A	20.0	n/a	6.3	40.3	0.092	n/a	n/a	253.33
FCU 2	FXSQ50A	20.0	n/a	6.3	40.3	0.092	n/a	n/a	253.33
FCU 3	FXSQ50A	20.0	n/a	6.3	40.3	0.092	n/a	n/a	253.33
FCU 4	FXSQ50A	20.0	n/a	6.3	40.3	0.092	n/a	n/a	253.33
FCU 5	FXSQ50A	20.0	n/a	6.3	40.3	0.092	n/a	n/a	253.33
FCU 6	FXSQ50A	20.0	n/a	6.3	40.3	0.092	n/a	n/a	253.33
FCU 7	FXSQ50A	20.0	n/a	6.3	40.3	0.092	n/a	n/a	253.33
FCU 8	FXSQ50A	20.0	n/a	6.3	40.3	0.092	n/a	n/a	253.33
FCU 9	FXSQ50A	20.0	n/a	6.3	40.3	0.092	n/a	n/a	253.33
FCU 10	FXSQ40A	20.0	n/a	5.0	36.3	0.089	n/a	n/a	250.00
FCU 11	FXSQ20A	20.0	n/a	2.5	33.6	0.038	n/a	n/a	150.00
			n/a						

Name	Room	Sound	PS	MCA	MOP	WxHxD	Weight
		dBA		A		inch	kg
FCU 1	Open Plan Area	29 - 35	220V 1ph	1.1	Factory Std	27.6 x 9.6 x 31.5	29.0
FCU 2	Open Plan Area	29 - 35	220V 1ph	1.1	Factory Std	27.6 x 9.6 x 31.5	29.0
FCU 3	Open Plan Area	29 - 35	220V 1ph	1.1	Factory Std	27.6 x 9.6 x 31.5	29.0
FCU 4	Open Plan Area	29 - 35	220V 1ph	1.1	Factory Std	27.6 x 9.6 x 31.5	29.0
FCU 5	Open Plan Area	29 - 35	220V 1ph	1.1	Factory Std	27.6 x 9.6 x 31.5	29.0
FCU 6	Open Plan Area	29 - 35	220V 1ph	1.1	Factory Std	27.6 x 9.6 x 31.5	29.0
FCU 7	Open Plan Area	29 - 35	220V 1ph	1.1	Factory Std	27.6 x 9.6 x 31.5	29.0



Name	Room	Sound	PS	MCA	MOP	WxHxD	Weight
		dBA		A		inch	kg
FCU 8	Open Plan Area	29 - 35	220V 1ph	1.1	Factory Std	27.6 x 9.6 x 31.5	29.0
FCU 9	Open Plan Area	29 - 35	220V 1ph	1.1	Factory Std	27.6 x 9.6 x 31.5	29.0
FCU 10	Conference Room	29 - 35	220V 1ph	1.1	Factory Std	27.6 x 9.6 x 31.5	28.5
FCU 11	Meeting Room	25 - 30	220V 1ph	0.8	Factory Std	21.7 x 9.6 x 31.5	23.5

Remarks

Outdoor vs. indoor position

Outdoor unit placed 0.0m above the indoor units.

Outdoor unit details

Table of abbreviations

Abbreviation	Description
Name	Logical name of the device
Model	Device model name
▲	Optimized selection: Larger outdoor model selected than standard proposed model
CR	Connection ratio
Tmp C	Outdoor conditions in cooling
WFR per module	Water flow per outdoor unit module
CC	Available cooling capacity
Rq CC	Required cooling capacity
PIC	Power input in cooling mode
InC	Water inlet temperature in cooling mode
OutC	Water outlet temperature in cooling mode
Tmp H	Outdoor conditions in heating (dry bulb temp. / RH)
HC	Available heating capacity (integrated heating capacity)
Rq HC	Required heating capacity
PIH	Power input in heating mode
InH	Water inlet temperature in heating mode
OutH	Water outlet temperature in heating mode
Piping	Largest distance from indoor unit to outdoor unit
Bse Refr	Standard factory refrigerant charge (16.4ft actual piping length) excluding extra refrigerant charge. For calculation of extra refrigerant charge refer to the databook
Ex Refr	Extra refrigerant charge
PS	Power supply (voltage and phases)
MCA	Minimum Circuit Amps
MOP	Maximum Overcurrent Protection
FLA	Fan Motor Input
RLA	Nominal Running Amps
WxHxD	WidthxHeightxD
Weight	Weight of the device
EER	EER value at nominal condition
IEER	IEER value at nominal condition
COP47	COP value at nominal condition and at ambient temperature of 8°C
COP17	COP value at nominal condition and at ambient temperature of -8°C

Outdoor details

Name	Model	CR	Cooling			Heating			Piping m
			Tmp C	CC	Rq CC	Tmp H	HC	Rq HC	
			°C	kW	kW	°C (DBT/RH)	kW	kW	
OU 1	REYQ18U ▲	113.3	35.0	39.3	38.0	-5.0/86%	39.3	0.0	70.0

Name	Model	PS	MCA	MOP	RLA	FLA	WxHxD	Weight
			A	A	A	A	inch	kg
OU 1	REYQ18U	400V 3Nph	35.0	40.0	22.0	2.6	48.8 x 66.3 x 30.1	317.0
BS 1	BS10Q14AV1B	230V 1ph					32.3 x 11.7 x 16.9	42.0
BS 2	BS1Q10A	230V 1ph					15.3 x 8.1 x 12.8	12.0
BS 3	BS1Q10A	230V 1ph					15.3 x 8.1 x 12.8	12.0

LOT21 - information

Name	Model	$\eta_{s,h}$ heating	$\eta_{s,c}$ cooling	SCOP	SEER
		%	%		
OU 1	REYQ18U	172.5	250.6	4.40	6.30

For more information go to: <https://energylabel.daikin.eu/>.

Refrigerant information

Name	Model	Refrigerant type	GWP	Base charge kg	Extra charge kg	TCO2 equivalent
OU 1	REYQ18U	R410A	2087.5	11.8	unknown	24.6

The system(s) contain fluorinated greenhouse gases.

When extra refrigerant charge requirements are not calculated, TCO2 equivalent is calculated only considering the base refrigerant charge. Depending on the field pipe length extra refrigerant needs to be added which will increase the TCO2 equivalent.

Model	Quantity	Description
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Refrigerant information

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R410A	2087.5	11.8	unknown	24.6

The system(s) contain fluorinated greenhouse gases.

Remarks

Chosen outdoor unit size differs from default proposed size. Be aware that this might lead to reduced comfort levels, increased noise levels, wear and tear. In case of doubt, contact your sales representative.

Pipe capacities

Maximum Connection Index	Diameters
149.9	3/8"x5/8"x1/2"
199.9	3/8"x3/4"x5/8"
289.9	3/8"x7/8"x3/4"
419.9	1/2"x1 1/8"x3/4"
639.9	5/8"x1 1/8"x1 1/8"
919.9	3/4"x1 3/8"x1 1/8"
> 919.9	3/4"x1 5/8"x1 1/8"
Main pipe size up	3/4"x1 1/8"x7/8"

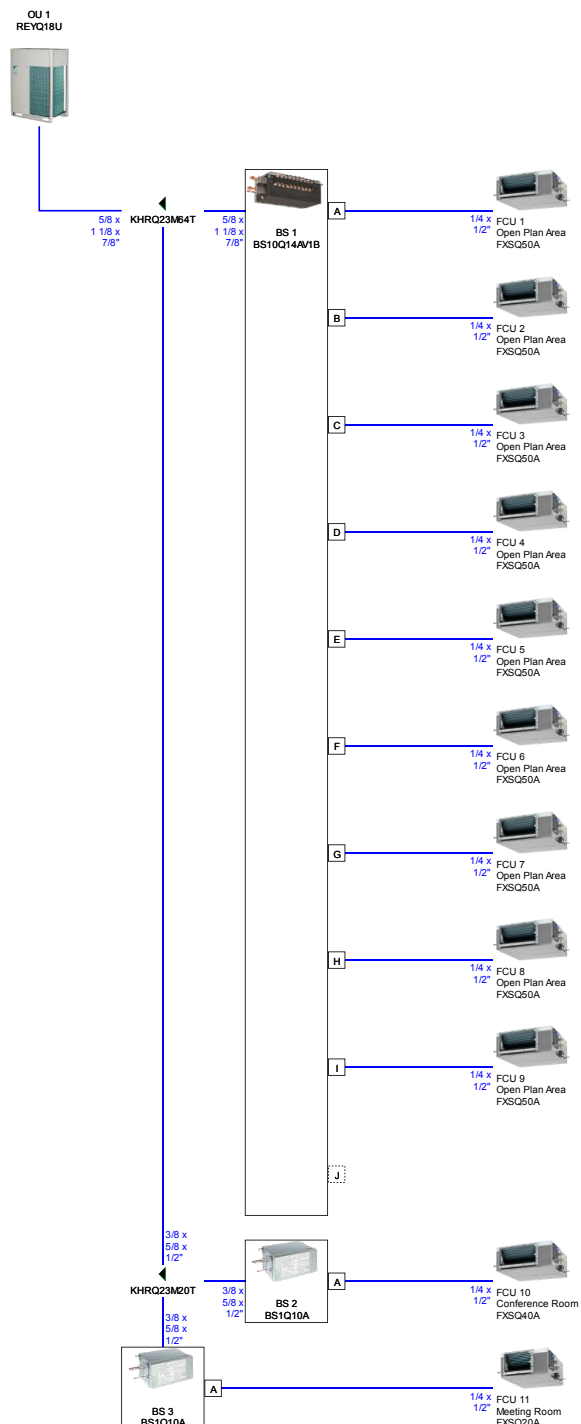
Remarks

Please make sure to provide a drain pipe connection to each multi BS-box in the system.

Description	Value
Maximum total length	1,000.0m
Maximum longest actual length	165.0m
Maximum longest equivalent length	190.0m
Maximum main pipe length (size up of main pipe required if longer)	-
Maximum length first branch to indoor unit(size up of intermediate pipes required if longer)	40.0m
Maximum length first branch to indoor unit	90.0m
Maximum length of indoor units to nearest branch	40.0m
Maximum length difference between longest and shortest distance to indoor units	40.0m
Maximum height difference, outdoor unit below indoor units	90.0m
Minimum connection ratio, outdoor unit below indoor units	-
Maximum height difference, outdoor unit above indoor units	90.0m
Minimum connection ratio, outdoor unit above indoor units	-
Maximum height difference in technical cooling, outdoor unit below indoor units	90.0m
Maximum height difference in technical cooling, outdoor unit above indoor units	90.0m
Maximum height difference between indoor units	30.0m
Connection ratio range	50.0% - 200.0%
Refrigerant pipe diameters	3/4" (liquid) x 1 1/8" (gas) x 7/8" (discharge)
Maximum equivalent length from BP unit or VRV indoor to VRV REFNET (size up of intermediate pipes required if longer)	-
Maximum equivalent length from BP unit or VRV indoor to VRV REFNET	90.0m
Maximum actual length between CM and HM	-
Maximum height difference between CM and HM	-

Piping diagrams

Piping OU 1



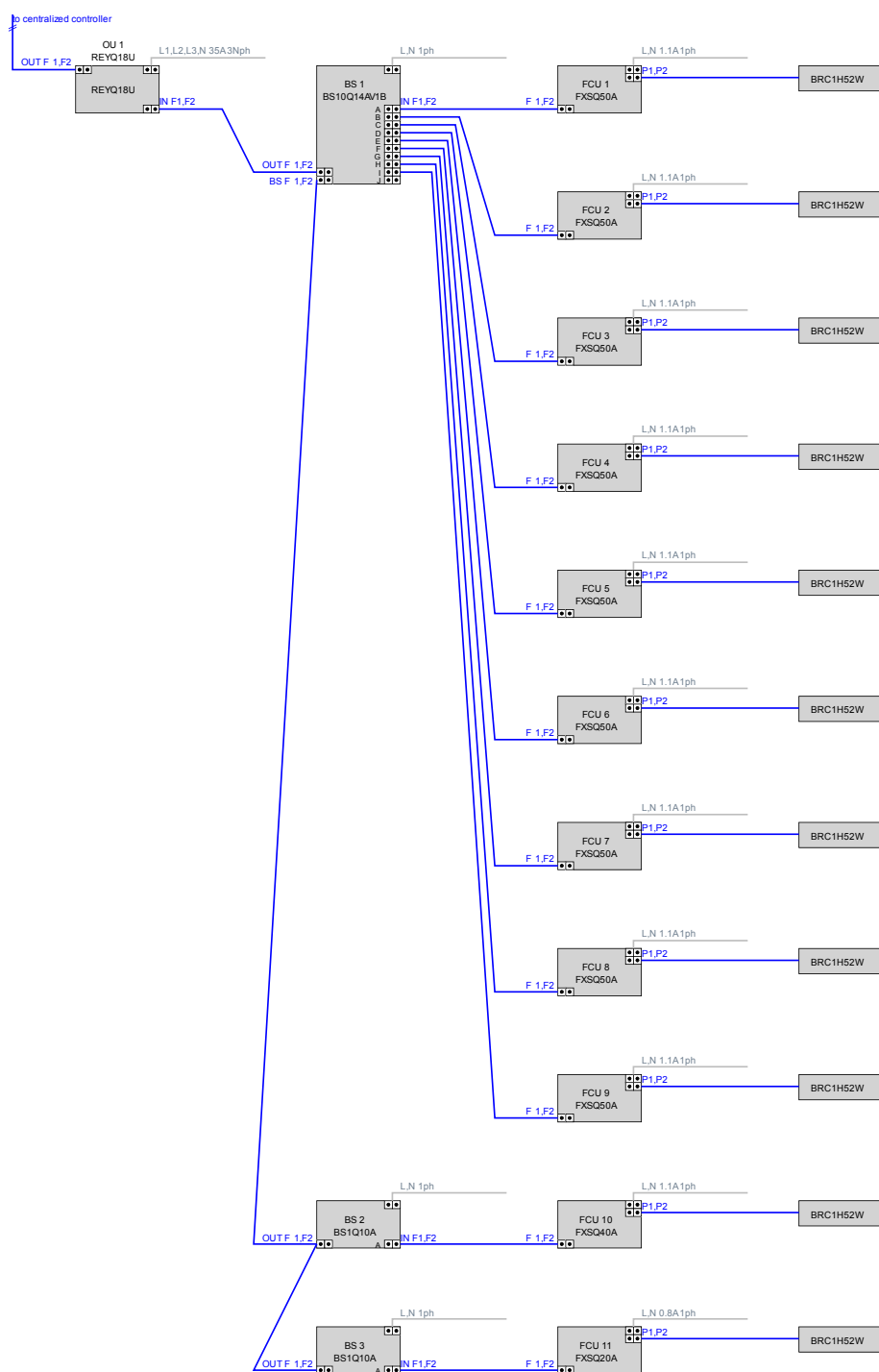
Piping

Warning: The pipe diameter values are purely indicative. Depending on the required pipe lengths, a different pipe diameter might be required.



Wiring diagrams

Wiring OU 1



Remarks

F1F2 = AWG 18-2 is required - however always refer to local code for further information.

P1P2 = AWG 18-2 is required - however always refer to local code for further information.



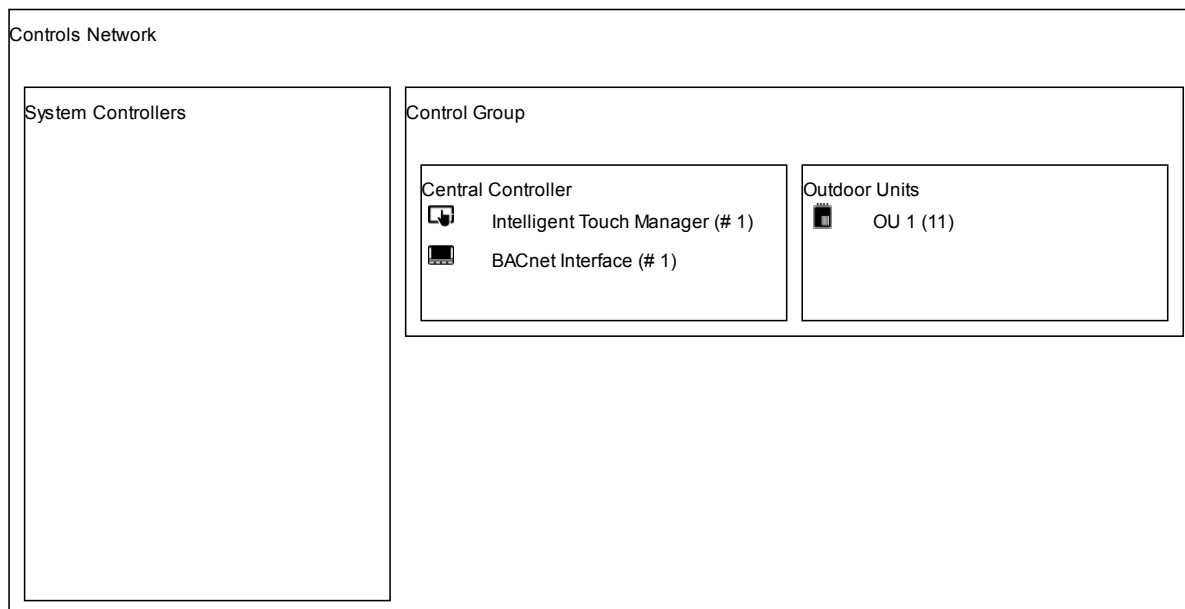
F1F2 IN/OUT transmission wiring, use 2-core wires of 0,75 to 1,25 mm² size cables, without shield (but shielded cable can be used if required by local regulations and standards).

Note: The shield should only be earthed at outdoor unit side, not at the indoor units!



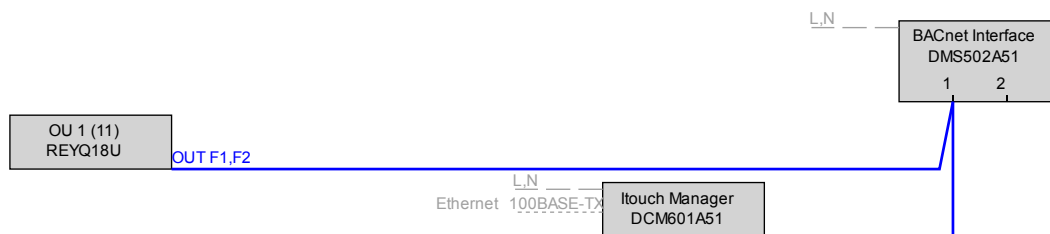
Centralized controllers

Concept



Controller wiring diagrams

Control Group

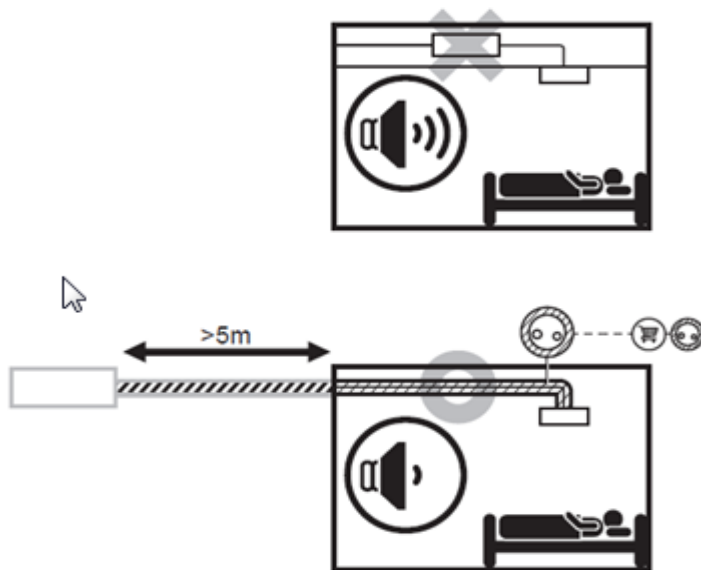




Best Practices

Multi BS-box

- Install the multi BS-box on a location where the refrigerant noise cannot disturb the room occupants
- To avoid that refrigerant noise disturbs the people in the room, keep at least 5m piping length between the occupied room and the multi BS unit (See figure)
- If there is no false ceiling in the occupied room, please add sound insulation around the piping between the multi BS-box and indoor unit, or keep much longer length between multi BS-box unit and occupied room (See figure)



Residual Current Circuit Breaker

For better protection of installations against the risk of fire, power supply of indoor and outdoor units must be protected with a Residual Current Circuit Breaker. For protection against fire, we recommend a sensitivity of 300mA. The selected RCCB should be of the type B, suitable for inverter devices and indicated by the symbols here below. Further electrical characteristics of the RCCB must be selected in accordance with local regulation.



For a complete list of all required safety precautions, warnings and attention points, please consult the “general safety precautions manual” delivered with the unit.