



VRV Selection

Project Report

Report details

Produced on: 10/23/2023

Application version: 2023.10.13.1

Project details

Project name: HELIX

Solution name: Unnamed solution (1)

Client Name: Arundell HVAC Ltd

Customer reference: Ultimate Air Ltd - Daikin 3-Pipe VRV

Quotation reference:

Project number: 1263056/1551985

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
REYQ20U	2	REYQ-U (VRV IV)
BS6Q14AV1B	1	Branch selector unit
BS8Q14AV1B	1	Branch selector unit
FXFQ63B	3	FXFQ-B - Round Flow Round flow cassette
FXFQ80B	1	FXFQ-B - Round Flow Round flow cassette
FXFQ100B	1	FXFQ-B - Round Flow Round flow cassette
FXFQ125B	4	FXFQ-B - Round Flow Round flow cassette
FXZQ25A	2	FXZQ-A - Fully flat cassette
FXZQ32A	1	FXZQ-A - Fully flat cassette
FXZQ40A	1	FXZQ-A - Fully flat cassette
KHRQ22M20T	1	Refnet branch piping kit
DCM601B51	1	Intelligent Touch Manager
BRC1H52W	12	Remote controller (white)
BYCQ140E	9	Standard decoration panel
BYFQ60CW	4	New decoration panel (white)



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
Max TC	Available total cooling capacity
Rq SC	Required sensible cooling capacity
Tevap	Evaporating temperature of indoor unit coil
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
PIH	Power input in heating mode @ 50Hz
Sound	Sound pressure level low and high
PS	Power supply (voltage and phases)
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
WxHxD	WidthxHeightxDepth
Weight	Weight of the device



1F SYSTEM B - REYQ20U

Capacity data at conditions and connection ratio (99) as entered

Name	FCU	Cooling						
		Tmp C	Rq TC	Max TC	Rq SC	Tevap	Max SC	PIC
		°C (DBT/RH)	kW	kW	kW	°C	kW	kW
Ind 1	FXZQ40A	26.0/50%	3.6	4.4	2.8	6.0	3.1	0.029
Ind 2	FXZQ25A	26.0/50%	2.3	2.7	1.8	6.0	1.9	0.020
Ind 3	FXFQ125B	26.0/50%	11.3	13.7	8.6	6.0	9.3	0.103
Ind 4	FXFQ125B	26.0/50%	11.3	13.7	8.6	6.0	9.3	0.103
Ind 5	FXZQ25A	26.0/50%	2.3	2.7	1.8	6.0	1.9	0.020
Ind 6	FXFQ125B	26.0/50%	11.3	13.7	8.6	6.0	9.3	0.103
Ind 7	FXZQ32A	26.0/50%	2.9	3.5	2.2	6.0	2.3	0.019
			45.0					

Name	FCU	Heating			
		Tmp H	Rq HC	Max HC	PIH
		°C	kW	kW	kW
Ind 1	FXZQ40A	20.0	n/a	5.0	0.029
Ind 2	FXZQ25A	20.0	n/a	3.2	0.020
Ind 3	FXFQ125B	20.0	n/a	16.0	0.103
Ind 4	FXFQ125B	20.0	n/a	16.0	0.103
Ind 5	FXZQ25A	20.0	n/a	3.2	0.020
Ind 6	FXFQ125B	20.0	n/a	16.0	0.103
Ind 7	FXZQ32A	20.0	n/a	4.0	0.019
			n/a		

Name	FCU	Room	Sound	PS	MCA	MFA	WxHxD	Weight
			dBA		A		mm	kg
Ind 1	FXZQ40A		28 - 37	220V 1ph	0.4	Factory Std	575 x 260 x 575	16.5
Ind 2	FXZQ25A		26 - 33	220V 1ph	0.3	Factory Std	575 x 260 x 575	15.5
Ind 3	FXFQ125B		36 - 45	220V 1ph	1.3	Factory Std	840 x 288 x 840	26.0
Ind 4	FXFQ125B		36 - 45	220V 1ph	1.3	Factory Std	840 x 288 x 840	26.0
Ind 5	FXZQ25A		26 - 33	220V 1ph	0.3	Factory Std	575 x 260 x 575	15.5
Ind 6	FXFQ125B		36 - 45	220V 1ph	1.3	Factory Std	840 x 288 x 840	26.0
Ind 7	FXZQ32A		26 - 34	220V 1ph	0.4	Factory Std	575 x 260 x 575	16.5

Remarks

Outdoor vs. indoor position

Outdoor unit placed at the same level as the indoor units.

1F SYSTEM A - REYQ20U

Capacity data at conditions and connection ratio (99) as entered

Name	FCU	Cooling						
		Tmp C	Rq TC	Max TC	Rq SC	Tevap	Max SC	PIC
		°C (DBT/RH)	kW	kW	kW	°C	kW	kW
Ind 8	FXFQ63B	26.0/50%	5.7	7.0	4.5	6.0	4.9	0.028
Ind 9	FXFQ125B	26.0/50%	11.3	13.7	8.6	6.0	9.3	0.103



Name	FCU	Cooling						
		Tmp C	Rq TC	Max TC	Rq SC	Tevap	Max SC	PIC
		°C (DBT/RH)	kW	kW	kW	°C	kW	kW
Ind 10	FXFQ63B	26.0/50%	5.7	7.0	4.5	6.0	4.9	0.028
Ind 11	FXFQ63B	26.0/50%	5.7	7.0	4.5	6.0	4.9	0.028
Ind 12	FXFQ100B	26.0/50%	9.0	11.0	6.9	6.0	7.5	0.071
Ind 13	FXFQ80B	26.0/50%	7.2	8.8	5.8	6.0	6.2	0.045
			44.6					

Name	FCU	Heating			
		Tmp H	Rq HC	Max HC	PIH
		°C	kW	kW	kW
Ind 8	FXFQ63B	20.0	n/a	8.0	0.028
Ind 9	FXFQ125B	20.0	n/a	16.0	0.103
Ind 10	FXFQ63B	20.0	n/a	8.0	0.028
Ind 11	FXFQ63B	20.0	n/a	8.0	0.028
Ind 12	FXFQ100B	20.0	n/a	12.5	0.071
Ind 13	FXFQ80B	20.0	n/a	10.0	0.045
			n/a		

Name	FCU	Room	Sound	PS	MCA	MFA	WxHxD	Weight
			dBA		A		mm	kg
Ind 8	FXFQ63B		30 - 35	220V 1ph	0.4	Factory Std	840 x 204 x 840	21.0
Ind 9	FXFQ125B		36 - 45	220V 1ph	1.3	Factory Std	840 x 288 x 840	26.0
Ind 10	FXFQ63B		30 - 35	220V 1ph	0.4	Factory Std	840 x 204 x 840	21.0
Ind 11	FXFQ63B		30 - 35	220V 1ph	0.4	Factory Std	840 x 204 x 840	21.0
Ind 12	FXFQ100B		30 - 43	220V 1ph	0.8	Factory Std	840 x 246 x 840	24.0
Ind 13	FXFQ80B		30 - 38	220V 1ph	0.6	Factory Std	840 x 246 x 840	24.0

Remarks

Outdoor vs. indoor position

Outdoor unit placed at the same level as the indoor units.



Outdoor unit details

Table of abbreviations

Abbreviation	Description
Name	Logical name of the device
Model	Device model name
CR	Connection ratio
Tmp C	Outdoor conditions in cooling
WFR	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
MFA	Maxium Fuse Amps
FLA	Fan Motor Input
RLA	Nominal Running Amps
WxHxD	WidthxHeightxDepth
Weight	Weight of the device
EER	EER value at nominal condition
EER2	EER2 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	
1F SYSTEM B	REYQ20U	99.3	29.0	54.7	48.1	0.0/86%	46.4	0.0	7.5
1F SYSTEM A	REYQ20U	98.5	29.0	54.7	47.4	0.0/86%	46.4	0.0	7.5

Name	Model	PS	MCA	MFA	RLA	FLA	WxHxD mm	Weight kg
			A	A	A	A		
1F SYSTEM B	REYQ20U	400V 3Nph	39.0	50.0	28.5	2.6	1,240 x 1,685 x 765	317.0
BS 1	BS8Q14AV1B	230V 1ph	0.8	15.0			580 x 298 x 430	31.0
1F SYSTEM A	REYQ20U	400V 3Nph	39.0	50.0	28.5	2.6	1,240 x 1,685 x 765	317.0
BS 2	BS6Q14AV1B	230V 1ph	0.6	15.0			580 x 298 x 430	28.0

Sound Data

Name	Model	Sound Power		Sound Pressure	
		Cooling	Heating	Cooling	Heating
		dBA	dBA	dBA	dBA
1F SYSTEM B	REYQ20U	88	67	65	-
1F SYSTEM A	REYQ20U	88	67	65	-

Seasonal Efficiency

Name	Model	$\eta_{s,h}$ heating	$\eta_{s,c}$ cooling	SCOP	SEER	CSPF
		%	%			
1F SYSTEM B	REYQ20U	162.7	246.7	4.10	6.20	-
1F SYSTEM A	REYQ20U	162.7	246.7	4.10	6.20	-



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

Refrigerant information

Name	Model	Refrigerant type	GWP	Base charge kg	Extra charge kg	Total refrigerant charge kg	Total CO2 equivalent tonnes
1F SYSTEM B	REYQ20U	R410A	2087.5	11.80	unknown	unknown	24.63
1F SYSTEM A	REYQ20U	R410A	2087.5	11.80	unknown	unknown	24.63

The system(s) contain fluorinated greenhouse gases.

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.

1F SYSTEM B - REYQ20U

Model	Quantity	Description
REYQ20U	1	REYQ-U (VRV IV)
BS8Q14AV1B	1	Branch selector unit
FXFQ125B	3	FXFQ-B - Round Flow Round flow cassette
FXZQ25A	2	FXZQ-A - Fully flat cassette
FXZQ32A	1	FXZQ-A - Fully flat cassette
FXZQ40A	1	FXZQ-A - Fully flat cassette
BRC1H52W	6	Remote controller (white)
BYCQ140E	3	Standard decoration panel
BYFQ60CW	4	New decoration panel (white)

Refrigerant information

Refrigerant type	GWP	Base charge kg	Extra charge kg	Total refrigerant charge kg	Total CO2 equivalent tonnes
R410A	2087.5	11.80	unknown	unknown	24.63

The system(s) contain fluorinated greenhouse gases.

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.

Pipe capacities

Maximum Connection Index	Diameters
149.9	3/8"x5/8"x1/2"



Maximum Connection Index	Diameters
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"x1 1/8"

Remarks

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



Piping limitations

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 1 1/8" (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	-

1F SYSTEM A - REYQ20U

Model	Quantity	Description
REYQ20U	1	REYQ-U (VRV IV)
BS6Q14AV1B	1	Branch selector unit
FXFQ63B	3	FXFQ-B - Round Flow Round flow cassette
FXFQ80B	1	FXFQ-B - Round Flow Round flow cassette
FXFQ100B	1	FXFQ-B - Round Flow Round flow cassette
FXFQ125B	1	FXFQ-B - Round Flow Round flow cassette
KHRQ22M20T	1	Refnet branch piping kit
BRC1H52W	6	Remote controller (white)
BYCQ140E	6	Standard decoration panel

Refrigerant information

Refrigerant type	GWP	Base charge kg	Extra charge kg	Total refrigerant charge kg	Total CO2 equivalent tonnes
R410A	2087.5	11.80	unknown	unknown	24.63



The system(s) contain fluorinated greenhouse gases.

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.

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"x1 1/8"

Remarks

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

Piping limitations

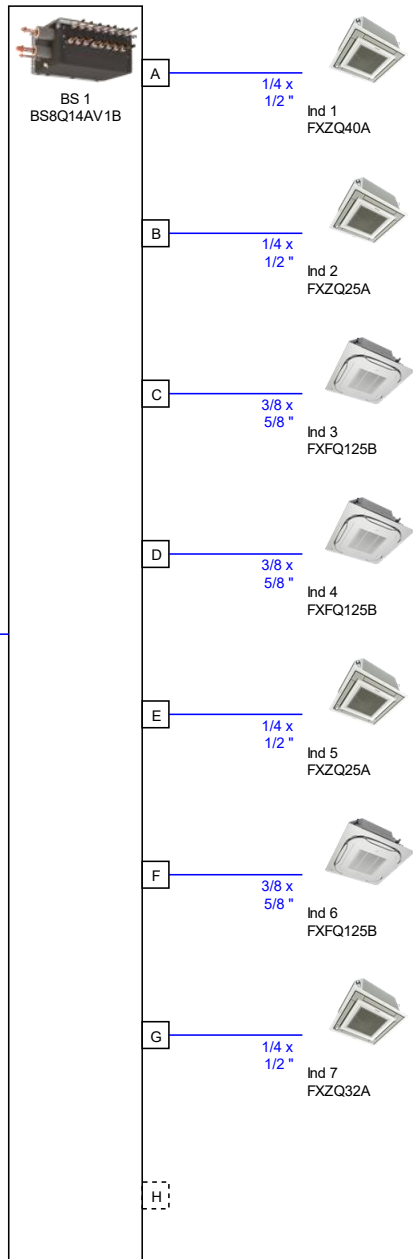
Description	Value
Maximum total length	1,000.0m
Maximum longest actual length	165.0m
Maximum longest equivalent length	190.0m
Maximum main pipe length (size up of main pipe required if longer)	-
Maximum length first branch to indoor unit(size up of intermediate pipes required if longer)	40.0m
Maximum 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 1 1/8" (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 1F SYSTEM B

1F SYSTEM B
REYQ20U

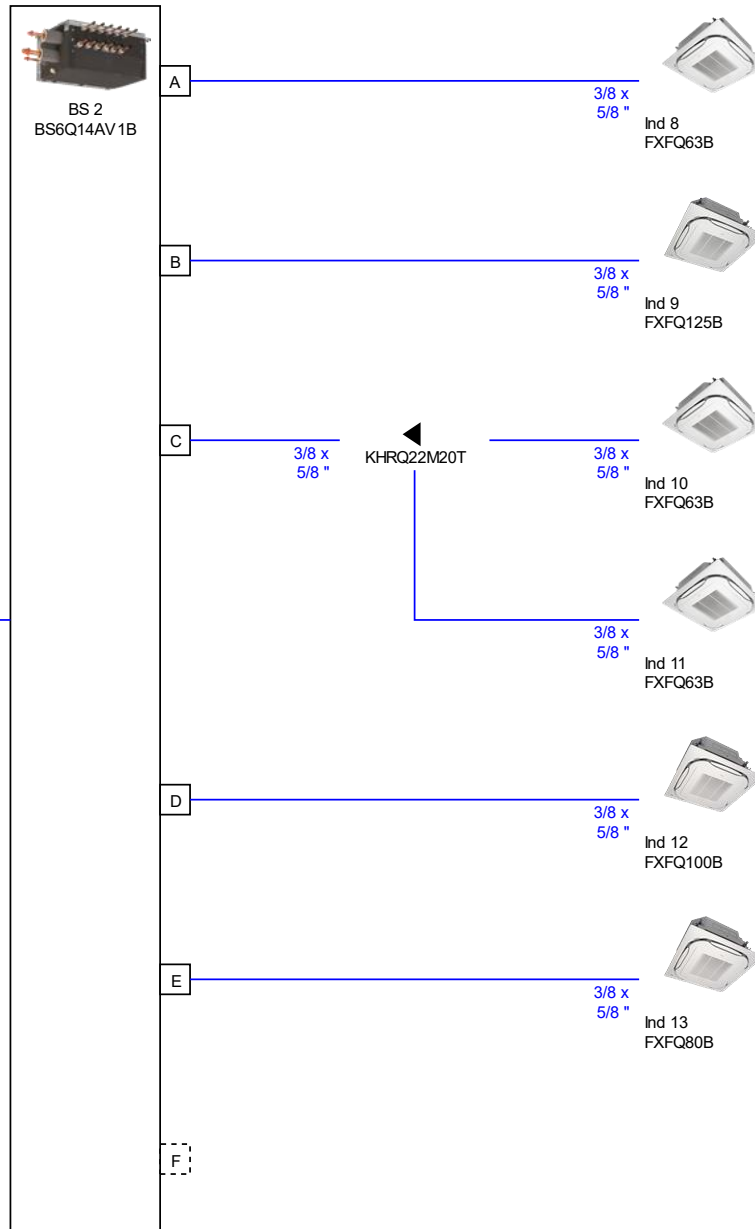


Piping

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

Piping 1F SYSTEM A

1F SYSTEMA
REYQ20U



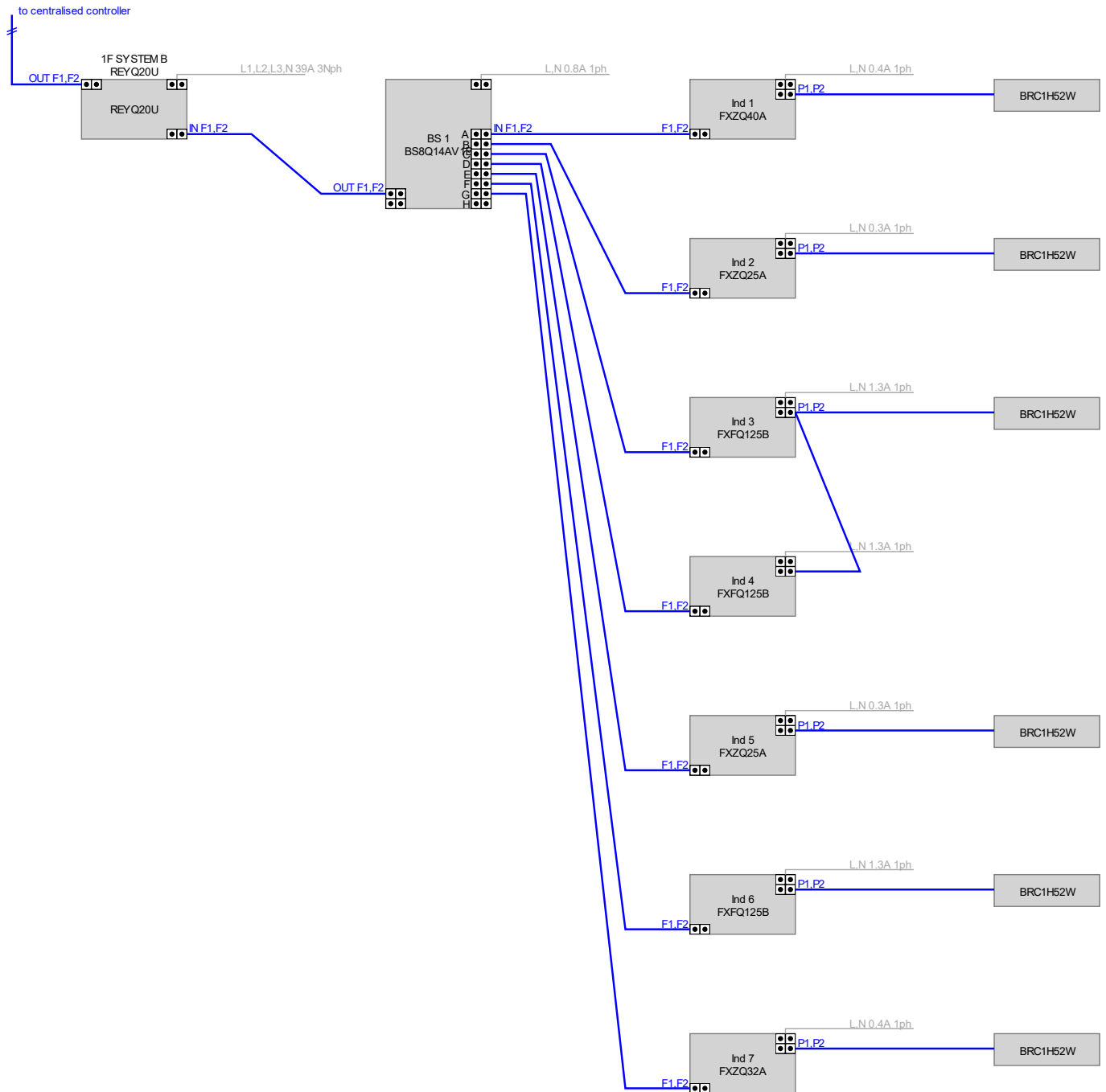
Piping

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



Wiring diagrams

Wiring 1F SYSTEM B

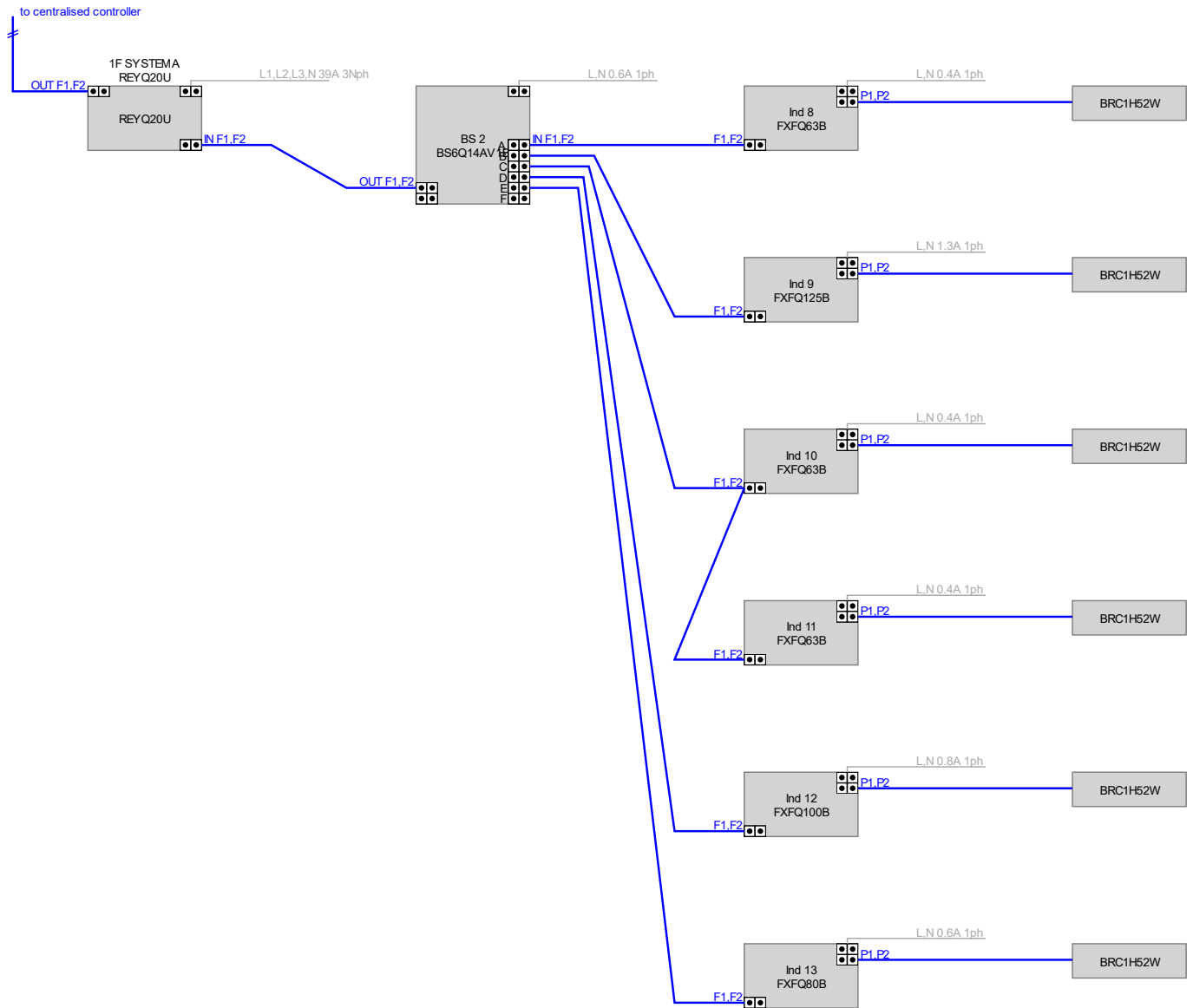


Remarks

P1P2 = 0,75 - 1,25 mm², max 500m length - 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!



Remarks

P1P2 = 0,75 - 1,25 mm², max 500m length - always refer to local code for further information.

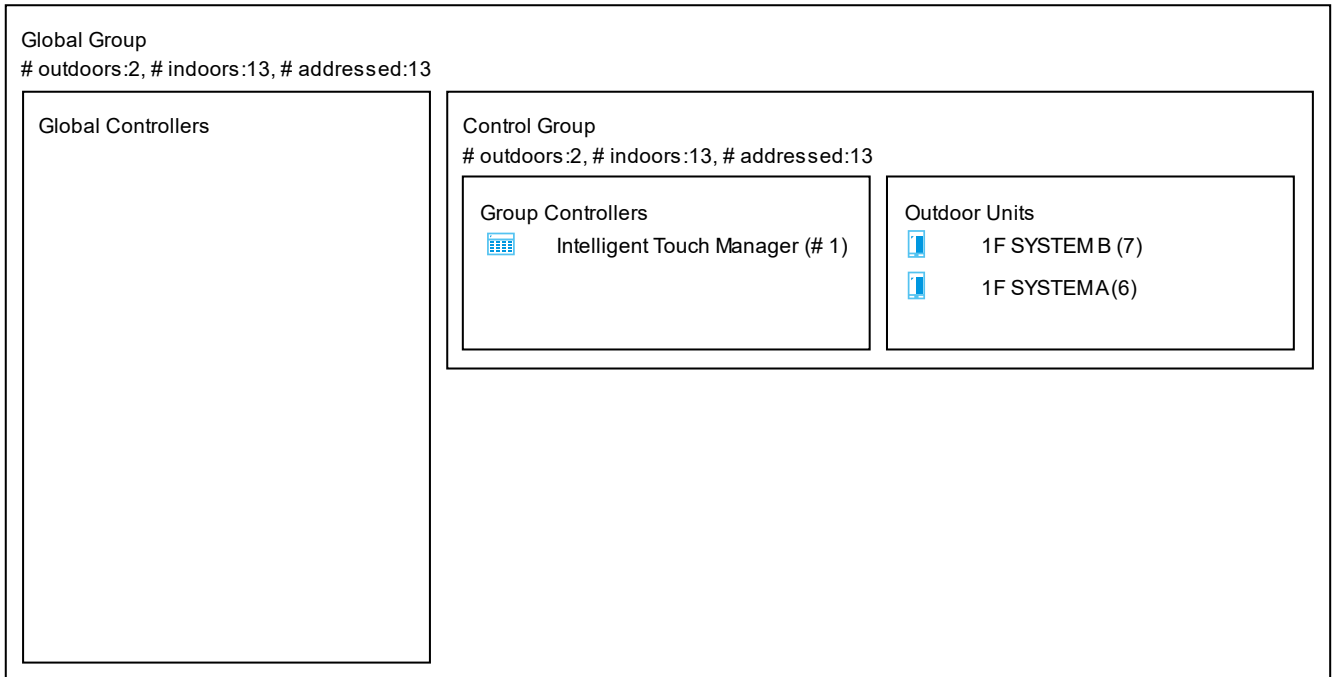
F1F2 IN/OUT transmission wiring, use 2-core wires of 0,75 to 1,25 mm² size cables, without shield (but shielded cable can be used if required by local regulations and standards).

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



Centralised controllers

Concept





Controller wiring diagrams

Control Group

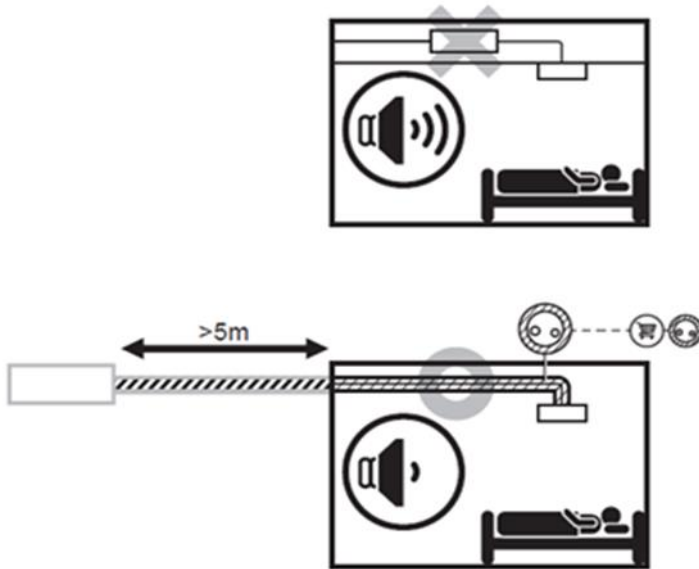




Best Practices

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.