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MECHANICAL TECHNICAL SPECIFICATIONS
FOR THE CONTRACT
PREPARATION OF DESIGN AND SUPERVISION FOR REPAIR AND
RETROFITTING OF:
“ISMET NANUSHI JOINT HIGH SCHOOL”



LOT I
MUNICIPALITY OF DURRES

CLIENT



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CONSULTANT



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1 Regulation and Standards

European Regulations

EU 2281	2016	Lot 21
EU 327	2011	Lot 11
EU 1253	2014	EU 2014/1253 for HVAC systems
ErP Directive /125/EC	2009	Energy-related Products Directive

European standards

DIN EN ISO 1632	2000	Acoustic – Equipment installation and noise level inside buildings
DIN 4755	2001	Safety for heating systems
DIN EN 303	2003	Heating Equipment
DIN EN 442	2003	Indoor units
DIN EN 12170	2002	Heating and cooling Systems
DIN EN 12828	2003	Health and Safety
DIN EN 13831	2000	Expansion vessels
DIN EN 14336	2002	Installation of heating systems
VDI 2035	1996	Water cooled systems
DIN EN 1057	1996	Copper pipes for HVAC applications
DIN EN 12449	1999	Copper pipe installation
DIN 16892	2000	Polyethylene high density pipes (PE-X)
DIN 16893	2000	Polyethylene high density pipes (PE-X) for HVAC applications

2 General specifications for HVAC systems

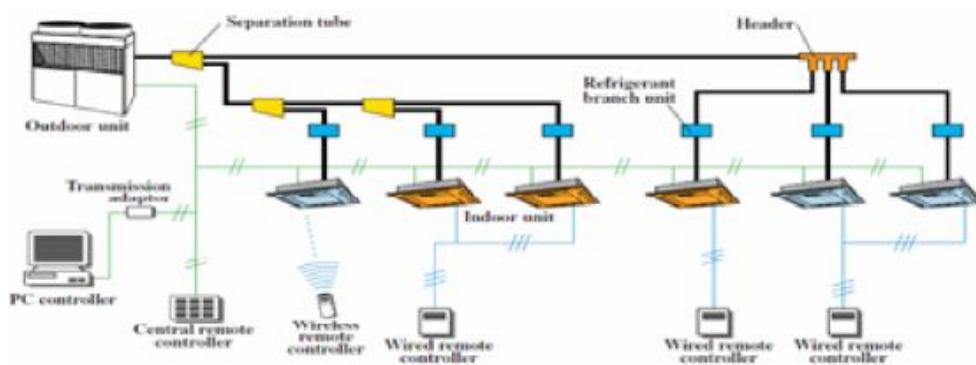
General

After careful consideration of all the possibilities, VRV central HVAC system is designed for Ismet Nanushi school.

VRV system can control circulating refrigerant for indoor units by selecting operating mode or changing air terminals configuration.

Using its modular valve, the system can apply requested need for refrigerant according to design and IOM.

All indoor units are connected in an addressed schedule with outdoor units, applying respective operating parameters for covering thermal needs during heating and cooling season.



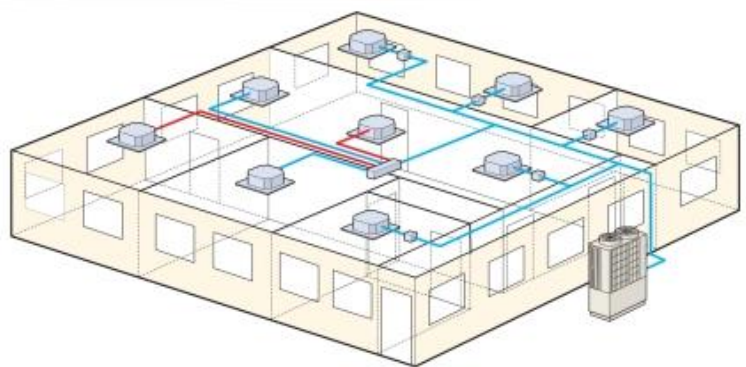
3 HVAC System Equipment

Outdoor Units

The outdoor unit leads the connection and control of indoor units by ensuring temperature and air quality based on technical norms. DC inverter technology ensures high efficiency and personalized control of each indoor unit.

Kindergarten and school facilities will have separate central units of the VRV system as the use of facilities is different and for different age groups. These central units control the system by providing individual control and minimize energy consumption by being classified as high energy efficiency devices. Inverter technology provides high coefficient of performance (COP).

The flexibility of these devices provides personalized installations for any type of environment.



Technical specifications of the central unit for the kindergarten:

Njesia e Jas... RXYQ18T



Outdoor details

Name	Model	CR	Cooling			Heating			Piping
			Tmp C	CC	Rq CC	Tmp H	HC	Rq HC	
			°C	kW	kW	°C (DBT/RH)	kW	kW	
Outdoor Unit Kindergarten	RXYQ18T	90.8	29.0	48.8	39.1	0.0/86%	41.7	38.0	7.5

Name	Model	PS	MCA	MOP	RLA	FLA	WxHxD mm	Weight kg
			A	A	A	A		
Outdoor unit Kindergarten	RXYQ18T	400V 3Nph	35.0	40.0	20.8		1,240 x 1,685 x 765	314.0

Refrigerant information

Name	Model	Refrigerant type	GWP	Base charge kg	Extra charge kg	TCO2 equivalent
Outdoor unit Kindergarten	RXYQ18T	R410A	2087.5	11.7	-	24.4

VARIABLE REFRIGERANT VOLUME - AIR-COOLED CONDENSING UNIT SCHEDULE

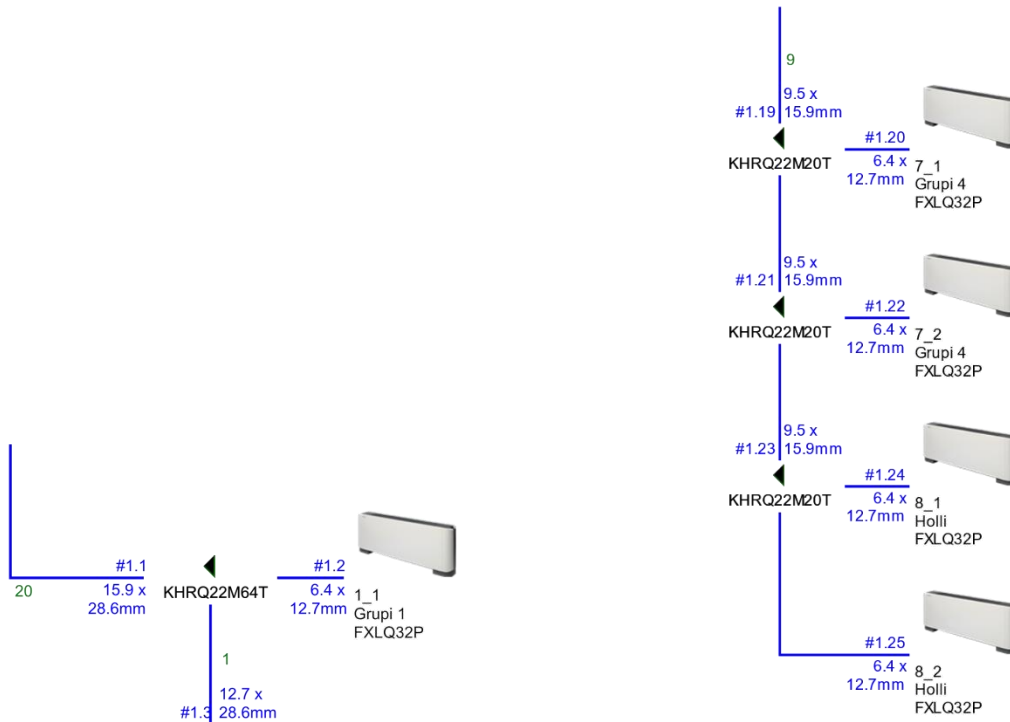
VARIABLE REFRIGERANT VOLUME - AIR-COOLED CONDENSING UNIT SCHEDULE							
TAG: ROOM	BASIS OF DESIGN	NOMINAL CAPACITY	DESCRIPTION	COOLING CAPACITY	HEATING CAPACITY		
				kW	AMBIENT DESIGN (°C DB)	kW	AMBIENT DESIGN (°C DB / WB)
Outdoor unit Kinder-	RXYQ18	18	Air cooled heat	48.8	29.0	41.	0.0 / -0.7

garten	T		pump (1)			7	
REFRIGERANT CHARGE		CONNECT ION RATIO (%)	ELECTRICAL				
Factory Charge (kg)	Add'l Refrigerant (kg)		VOLTAGE-PHASE	MIN CIRCUIT AMPS (MCA)	MAX OVERCURRENT PROTECTION (MOP)	RUNNING CURRENT(RL A)	
11.7	n/a		90.8	400V 3Nph	35.0	40.0	20.8
DIMENSIONS							
(WxHxD) (mm)	WEIGHT (kg)						
1,240 x 1,685 x 765	314.0						

4 HVAC System Air Terminals

■ Floor standing indoor unit VRV

For kindergarten rooms floor standing indoor units are selected. (Check piping and installation according to ground floor design)



VARIABLE REFRIGERANT VOLUME - INDOOR UNIT SCHEDULE						
TAG	ROOM	BASIS OF DESIGN (DAIKIN)	NOMINAL CAPACITY	TYPE	CONNECTED TO:	
					CONDENSING UNIT	ZONE CHANGEOVER DEVICE
1_1	Grupi 1	FXLQ32P	3	Floor stand- ing	Outdoor unit Kin- dergarten	No
1_2	Grupi 1	FXLQ32P	3	Floor stand- ing	Outdoor unit Kin- dergarten	No
2	Parents meeting room	FXLQ32P	3	Floor stand- ing	Outdoor unit Kin- dergarten	No
3_1	Grupi 2	FXLQ32P	3	Floor stand- ing	Outdoor unit Kin- dergarten	No
3_2	Grupi 2	FXLQ32P	3	Floor stand- ing	Outdoor unit Kin- dergarten	No
4_1	Grupi 3	FXLQ32P	3	Floor stand- ing	Outdoor unit Kin- dergarten	No
4_2	Grupi 3	FXLQ32P	3	Floor stand- ing	Outdoor unit Kin- dergarten	No
5	Psychology	FXLQ25P	3	Floor stand- ing	Outdoor unit Kin- dergarten	No
6	Director office	FXLQ40P	4	Floor stand- ing	Outdoor unit Kin- dergarten	No
7_1	Grupi 4	FXLQ32P	3	Floor stand- ing	Outdoor unit Kin- dergarten	No
7_2	Grupi 4	FXLQ32P	3	Floor stand- ing	Outdoor unit Kin- dergarten	No
8_1	Hallway	FXLQ32P	3	Floor stand- ing	Outdoor unit Kin- dergarten	No
8_2	Hallway	FXLQ32P	3	Floor stand- ing	Outdoor unit Kin- dergarten	No
SUPPLY FAN	COOLING CAPACITY				HEATING CAPACITY	
AIR FLOW RATE l/s	TOTAL kW	SENSIBLE kW	ENTERING AIR		TOTAL kW	ENTERING AIR °Cdb
			°C DB	°C WB		
133.33	3.5	2.4	26.0	18.7	4.0	20.0
133.33	3.5	2.4	26.0	18.7	4.0	20.0
133.33	3.5	2.4	26.0	18.7	4.0	20.0
133.33	3.5	2.4	26.0	18.7	4.0	20.0
133.33	3.5	2.4	26.0	18.7	4.0	20.0
133.33	3.5	2.4	26.0	18.7	4.0	20.0
133.33	3.5	2.4	26.0	18.7	4.0	20.0
116.67	2.7	2.0	26.0	18.7	3.2	20.0
183.33	4.4	3.0	26.0	18.7	5.0	20.0
133.33	3.5	2.4	26.0	18.7	4.0	20.0
133.33	3.5	2.4	26.0	18.7	4.0	20.0

133.33	3.5	2.4	26.0	18.7	4.0	20.0
133.33	3.5	2.4	26.0	18.7	4.0	20.0
ELECTRICAL			DIMENSIONS	WEIGHT	NOTES	Options and Accessories
POWER SUPPLY	Min Circuit Amps	Max Over-current Protection	WxHxD	Net		
Voltage - Phase	MCA	MOP	mm	kg		
230V 1ph	0.6	15.0	1,140 x 600 x 232	30.0		BRC1H52W (1)
230V 1ph	0.6	15.0	1,140 x 600 x 232	30.0		BRC1H52W (1)
230V 1ph	0.6	15.0	1,140 x 600 x 232	30.0		BRC1H52W (1)
230V 1ph	0.6	15.0	1,140 x 600 x 232	30.0		BRC1H52W (1)
230V 1ph	0.6	15.0	1,140 x 600 x 232	30.0		BRC1H52W (1)
230V 1ph	0.6	15.0	1,140 x 600 x 232	30.0		BRC1H52W (1)
230V 1ph	0.6	15.0	1,140 x 600 x 232	30.0		BRC1H52W (1)
230V 1ph	0.3	15.0	1,000 x 600 x 232	25.0		BRC1H52W (1)
230V 1ph	0.6	15.0	1,140 x 600 x 232	30.0		BRC1H52W (1)
230V 1ph	0.6	15.0	1,140 x 600 x 232	30.0		BRC1H52W (1)
230V 1ph	0.6	15.0	1,140 x 600 x 232	30.0		BRC1H52W (1)
230V 1ph	0.6	15.0	1,140 x 600 x 232	30.0		BRC1H52W (1)
230V 1ph	0.6	15.0	1,140 x 600 x 232	30.0		BRC1H52W (1)

Indoor ducted air terminal VRV

For classrooms, ducted indoor ceiling mounted units are selected.



Indoor Cassette air terminals VRV

For Specificimet teknike per njesite e perdorura ne projekt jane si me poshte: offices and hallways cassette units are selected



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Below technical specifications for all the units included in the design:

5 Ground Floor

Capacity data at conditions and connection ratio

Name	FCU	Cooling								Heating				Min coil	Max coil	Air Flow Rate
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	Tmp H	Rq HC	Max HC	Tdis H			
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	°C	kW	kW	°C			
1	FXFQ20A	26.0/50%	2.0	2.0	2.2	0.5	6.0	19.4	1.7	20.0	2.5	2.5	29.8	n/a	n/a	208.33
2	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00
3_1	FXSQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	15.8	3.2	20.0	5.0	5.0	36.3	n/a	n/a	250.00
3_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
4_1	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
4_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
5_1	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
5_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
2_1	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00
2_2	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00
6_1	FXSQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	15.8	3.2	20.0	5.0	5.0	36.3	n/a	n/a	250.00
6_2	FXSQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	15.8	3.2	20.0	5.0	5.0	36.3	n/a	n/a	250.00
6_3	FXSQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	15.8	3.2	20.0	5.0	5.0	36.3	n/a	n/a	250.00
7	FXSQ32A	26.0/50%	3.0	3.0	3.5	0.5	6.0	13.2	2.5	20.0	4.0	4.0	40.5	n/a	n/a	158.33
2_3	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00

Name	FCU	Cooling								Heating				Min coil	Max coil	Air Flow Rate
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	Tmp H	Rq HC	Max HC	Tdis H			
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	°C	kW	kW	°C	m³	m³	l/s
2_4	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00
8_1	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
Ind 46	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
			76.0								84.0					

Name	Room	Sound	PS	MCA	MOP	WxHxD	Weight
		dBA		A		mm	kg
1	Medical Room	28 - 31	220V 1ph	0.3	Factory Std	840 x 204 x 840	19.0
2	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
3_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	28.5
3_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
4_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
4_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
5_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
5_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
2_1	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
2_2	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
6_1	IT room	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	28.5
6_2	IT room	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	28.5
6_3	IT room	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	28.5
7	Secretary	26 - 31	220V 1ph	0.8	Factory Std	550 x 245 x 800	24.0
2_3	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0

Name	Room	Sound dBA	PS	MCA A	MOP	WxHxD mm	Weight kg
2_4	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
8_1	IT room 2	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
Ind 46	IT room 2	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0

Remarks

Outdoor vs. indoor position

Outdoor unit placed 10.0m above the indoor units

Outdoor unit details

5.3.1 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 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	WidthxHeightxDepth
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
			Tmp C	CC	Rq CC	Tmp H	HC	Rq HC	
		%	°C	kW	kW	°C (DBT/RH)	kW	kW	m
Outdoor Unit	RXYQ38T8	80.1	29.0	103.7	76.0	0.0/86%	90.8	84.0	7.5

Name	Model	PS	MCA	MOP	RLA	FLA	WxHxD	Weight
			A	A	A	A	mm	kg
Outdoor Unit	RXYQ38T8	400V 3Nph						
A	- RXYQ20T		39.0	50.0	26.9		1,240 x 1,685 x 765	314.0
B	- RXYQ10T		22.0	25.0	10.2		930 x 1,685 x 765	194.0
C	- RXYQ8T8		16.1	20.0	7.2		930 x 1,685 x 765	187.0

Model	Quantity	Description
RXYQ8T8	1	RXYQ-T (VRV IV Non Continuous Heating)
RXYQ10T	1	RXYQ-T (VRV IV Non Continuous Heating)
RXYQ20T	1	RXYQ-T (VRV IV Non Continuous Heating)
FXFQ20A	1	FXFQ-A - Round Flow Round flow cassette
FXFQ40A	5	FXFQ-A - Round Flow Round flow cassette
FXSQ32A	1	FXSQ-A - Concealed ceiling unit with medium ESP
FXSQ40A	4	FXSQ-A - Concealed ceiling unit with medium ESP
FXSQ50A	7	FXSQ-A - Concealed ceiling unit with medium ESP

Name	Model	PS	MCA A	MOP A	RLA A	FLA A	WxHxD mm	Weight kg
KHRQ22M20T		1						Refnet branch piping kit
KHRQ22M64T		2						Refnet branch piping kit
KHRQ22M75T		2						Refnet branch piping kit
KHRQ22M29H		5						Refnet branch piping kit
BHFQ22P1517		1						Outdoor unit multi connection piping kit for 3 modules
BRC1H52W		18						Remote controller (white)
BYCQ140D		6						Standard decoration panel

5.4.1 Refrigerant information

Name	Model	Refrigerant type	GWP	Base charge kg	Extra charge kg	TCO2 equivalent
Outdoor Unit	RXYQ38T8	R410A	2087.5	23.7	-	49.5
Refrigerant type	GWP	Base charge kg	Extra charge kg	TCO2 equivalent		
R410A	2087.5	23.7	-	49.5		

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.

5.4.2 Pipe capacities

Maximum Connection Index	Diameters
149.9	9.5mmx15.9mm
199.9	9.5mmx19.1mm
289.9	9.5mmx22.2mm
419.9	12.7mmx28.6mm
639.9	15.9mmx28.6mm
919.9	19.1mmx34.9mm
> 919.9	19.1mmx41.3mm
Main pipe size up	22.2mmx41.3mm

5.4.3 Remarks

Sufficient distance should be respected between the modules according to the service & operation space rules as per producer instructions.

5.4.4 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% - 130.0%
Refrigerant pipe diameters	22.2mm (liquid) x 41.3mm (gas)
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

6 First Floor

Capacity data at conditions and connection ratio

Name	FCU	Cooling								Heating				Min coil	Max coil	Air Flow Rate
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	Tmp H	Rq HC	Max HC	Tdis H			
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	°C	kW	kW	°C	m³	m³	l/s
15_1	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
15_2	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
16_1	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
16_2	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33

Name	FCU	Cooling								Heating				Min coil	Max coil	Air Flow Rate
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	Tmp H	Rq HC	Max HC	Tdis H			
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	°C	kW	kW	°C	m³	m³	l/s
13_1	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
13_2	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
14_1	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
14_2	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
1	FXFQ40A	26.0/50 %	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	5.0	5.0	38.1	n/a	n/a	225.00
2	FXFQ40A	26.0/50 %	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00
12_1	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
11_1	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
11_2	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
12_2	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
3_1	FXSQ40A	26.0/50 %	4.0	4.0	4.4	0.5	6.0	15.8	3.2	20.0	5.0	5.0	36.3	n/a	n/a	250.00
3_2	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
4_1	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
4_2	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
5_1	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
5_2	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
2_1	FXFQ40A	26.0/50 %	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00
2_2	FXFQ40A	26.0/50 %	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00

Name	FCU	Cooling								Heating				Min coil	Max coil	Air Flow Rate
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	Tmp H	Rq HC	Max HC	Tdis H			
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	°C	kW	kW	°C			
		%														
6_1	FXSQ40A	26.0/50 %	4.0	4.0	4.4	0.5	6.0	15.8	3.2	20.0	5.0	5.0	36.3	n/a	n/a	250.00
6_2	FXSQ40A	26.0/50 %	4.0	4.0	4.4	0.5	6.0	15.8	3.2	20.0	5.0	5.0	36.3	n/a	n/a	250.00
6_3	FXSQ40A	26.0/50 %	4.0	4.0	4.4	0.5	6.0	15.8	3.2	20.0	5.0	5.0	36.3	n/a	n/a	250.00
7	FXFQ32A	26.0/50 %	3.0	3.0	3.5	0.5	6.0	15.6	2.7	20.0	4.0	4.0	35.6	n/a	n/a	208.33
2_3	FXFQ40A	26.0/50 %	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00
2_4	FXFQ40A	26.0/50 %	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00
8_1	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
8_2	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
9_1	FXFQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.3	3.9	20.0	5.0	6.3	40.5	n/a	n/a	250.00
9_2	FXFQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.3	3.9	20.0	5.0	6.3	40.5	n/a	n/a	250.00
10_1	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
10_2	FXSQ50A	26.0/50 %	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
			158.0								166.5					

Name	Room	Sound	PS	MCA	MOP	WxHxD	Weight
		dBA		A		mm	
15_1	Chemistry Lab	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
15_2	Chemistry Lab	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
16_1	Physics Biology Lab	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0

Name	Room	Sound	PS	MCA	MOP	WxHxD	Weight
		dBA		A		mm	
16_2	Physics Bi-ology Lab	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
13_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
13_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
14_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
14_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
1	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
2	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
12_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
11_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
11_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
12_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
3_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	28.5
3_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
4_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
4_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
5_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
5_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
2_1	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
2_2	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
6_1	IT room	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	28.5
6_2	IT room	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	28.5
6_3	IT room	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	28.5
7	School principal	28 - 31	220V 1ph	0.3	Factory Std	840 x 204 x 840	19.0
2_3	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
2_4	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
8_1	Chemistry Lab	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
8_2	Chemistry	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0

Name	Room	Sound dBA	PS	MCA A	MOP	WxHxD mm	Weight kg
	Lab						
9_1	Teachers Room	29 - 33	220V 1ph	0.4	Factory Std	840 x 204 x 840	21.0
9_2	Teachers Room	29 - 33	220V 1ph	0.4	Factory Std	840 x 204 x 840	21.0
10_1	Physics Biology Lab	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
10_2	Physics Biology Lab	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0

Outdoor vs. indoor position

Outdoor unit placed 7.0m above the indoor units.

Outdoor unit 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	
Outdoor Unit	RXYQ54T	117.1	29.0	162.6	158.0	0.0/86%	127.2	166.5	7.5

Name	Model	PS	MCA A	MOP A	RLA A	FLA A	WxHxD mm	Weight kg
Outdoor Unit	RXYQ54T	400V 3Nph						
A	- RXYQ20T		39.0	50.0	26.9		1,240 x 1,685 x 765	314.0
B	- RXYQ20T		39.0	50.0	26.9		1,240 x 1,685 x 765	314.0
C	- RXYQ14T		27.0	32.0	15.4		1,240 x 1,685 x 765	305.0

Model	Quantity	Description
RXYQ14T	1	RXYQ-T (VRV IV Non Continuous Heating)
RXYQ20T	2	RXYQ-T (VRV IV Non Continuous Heating)
FXFQ32A	1	FXFQ-A - Round Flow Round flow cassette
FXFQ40A	6	FXFQ-A - Round Flow Round flow cassette
FXFQ50A	2	FXFQ-A - Round Flow Round flow cassette
FXSQ40A	4	FXSQ-A - Concealed ceiling unit with medium ESP
FXSQ50A	21	FXSQ-A - Concealed ceiling unit with medium ESP
KHRQ22M20T	1	Refnet branch piping kit
KHRQ22M29T9	1	Refnet branch piping kit

KHRQ22M64T	3	Refnet branch piping kit
KHRQ22M75T	4	Refnet branch piping kit
KHRQ22M29H	8	Refnet branch piping kit
BHFQ22P1517	1	Outdoor unit multi connection piping kit for 3 modules
BRC1H52W	34	Remote controller (white)
BYCQ140D	9	Standard decoration panel

6.3.1 Refrigerant information

Name	Model	Refrigerant type	GWP	Base charge kg	Extra charge kg	TCO2 equivalent
Outdoor Unit	RXYQ54T	R410A	2087.5	33.9	unknown	70.8
Refrigerant type	GWP		Base charge kg		Extra charge kg	TCO2 equivalent
R410A	2087.5		33.9		unknown	70.8

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.

6.3.2 Pipe capacities

Maximum Connection Index	Diameters
149.9	9.5mmx15.9mm
199.9	9.5mmx19.1mm
289.9	9.5mmx22.2mm
419.9	12.7mmx28.6mm
639.9	15.9mmx28.6mm
919.9	19.1mmx34.9mm
> 919.9	19.1mmx41.3mm
Main pipe size up	22.2mmx41.3mm

6.3.3 Piping limitations

Description	Value
Maximum total length	500.0m
Maximum longest actual length	135.0m
Maximum longest equivalent length	160.0m
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% - 130.0%
Refrigerant pipe diameters	22.2mm (liquid) x 41.3mm (gas)
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

7 Second Floor

Capacity data at conditions and connection ratio

Name	FCU	Cooling								Heating				Min coil	Max coil	Air Flow Rate
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	Tmp H	Rq HC	Max HC	Tdis H			
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	°C	kW	kW	°C	m³	m³	l/s
15_1	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
15_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
16_1	FXFQ20A	26.0/50%	2.0	2.0	2.2	0.5	6.0	19.4	1.7	20.0	2.0	2.5	29.8	n/a	n/a	208.33
16_2	FXFQ20A	26.0/50%	2.0	2.0	2.2	0.5	6.0	19.4	1.7	20.0	2.0	2.5	29.8	n/a	n/a	208.33
17_1	FXFQ25A	26.0/50%	2.5	2.5	2.7	0.5	6.0	18.3	2.0	20.0	2.0	3.2	32.5	n/a	n/a	208.33
17_2	FXFQ25A	26.0/50%	2.5	2.5	2.7	0.5	6.0	18.3	2.0	20.0	2.0	3.2	32.5	n/a	n/a	208.33

Name	FCU	Cooling								Heating				Min coil	Max coil	Air Flow Rate
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	Tmp H	Rq HC	Max HC	Tdis H			
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	°C	kW	kW	°C			
13_1	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
13_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
14_1	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
14_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
1	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	5.0	5.0	38.1	n/a	n/a	225.00
2	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00
12_1	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
11_1	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
11_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
12_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
3_1	FXSQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	15.8	3.2	20.0	5.0	5.0	36.3	n/a	n/a	250.00
3_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
4_1	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
4_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
5_1	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
5_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
2_1	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00
2_2	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00

Name	FCU	Cooling								Heating				Min coil	Max coil	Air Flow Rate
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	Tmp H	Rq HC	Max HC	Tdis H			
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	°C	kW	kW	°C			
		0%														
6_1	FXSQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	15.8	3.2	20.0	5.0	5.0	36.3	n/a	n/a	250.00
6_2	FXSQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	15.8	3.2	20.0	5.0	5.0	36.3	n/a	n/a	250.00
6_3	FXSQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	15.8	3.2	20.0	5.0	5.0	36.3	n/a	n/a	250.00
7	FXSQ32A	26.0/50%	3.0	3.0	3.5	0.5	6.0	13.2	2.5	20.0	4.0	4.0	40.5	n/a	n/a	158.33
2_3	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00
2_4	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00
8_1	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
8_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
			137.0								144.5					

Name	Room	Sound	PS	MCA	MOP	WxHxD	Weight
		dBA		A		mm	
15_1	Library	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
15_2	Library	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
16_1	Deputy Director	28 - 31	220V 1ph	0.3	Factory Std	840 x 204 x 840	19.0
16_2	Deputy Director	28 - 31	220V 1ph	0.3	Factory Std	840 x 204 x 840	19.0
17_1	Teachers Room	28 - 31	220V 1ph	0.3	Factory Std	840 x 204 x 840	19.0
17_2	Teachers Room	28 - 31	220V 1ph	0.3	Factory Std	840 x 204 x 840	19.0
13_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
13_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
14_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0

Name	Room	Sound dBA	PS	MCA A	MOP	WxHxD mm	Weight kg
14_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
1	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
2	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
12_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
11_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
11_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
12_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
3_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	28.5
3_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
4_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
4_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
5_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
5_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
2_1	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
2_2	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
6_1	IT room	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	28.5
6_2	IT room	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	28.5
6_3	IT room	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	28.5
7	Secretary	26 - 31	220V 1ph	0.8	Factory Std	550 x 245 x 800	24.0
2_3	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
2_4	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
8_1	IT room 2	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
8_2	IT room 2	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0

Outdoor vs. indoor position

Outdoor unit placed 4.0m above the indoor units.

Outdoor unit details

Name	Model	CR %	Cooling			Heating			Piping m
			Tmp C °C	CC kW	Rq CC kW	Tmp H °C (DBT/RH)	HC kW	Rq HC kW	
Outdoor Unit	RXYQ54T	101.6	29.0	149.9	137.0	0.0/86%	126.5	144.5	7.5

Name	Model	PS	MCA A	MOP A	RLA A	FLA A	WxHxD mm	Weight kg
Outdoor Unit	RXYQ54T	400V 3Nph						
A	- RXYQ20T		39.0	50.0	26.9		1,240 x 1,685 x 765	314.0
B	- RXYQ20T		39.0	50.0	26.9		1,240 x 1,685 x 765	314.0
C	- RXYQ14T		27.0	32.0	15.4		1,240 x 1,685 x 765	305.0

Model	Quantity	Description
RXYQ14T	1	RXYQ-T (VRV IV Non Continuous Heating)
RXYQ20T	2	RXYQ-T (VRV IV Non Continuous Heating)
FXFQ20A	2	FXFQ-A - Round Flow Round flow cassette
FXFQ25A	2	FXFQ-A - Round Flow Round flow cassette
FXFQ40A	6	FXFQ-A - Round Flow Round flow cassette
FXSQ32A	1	FXSQ-A - Concealed ceiling unit with medium ESP
FXSQ40A	4	FXSQ-A - Concealed ceiling unit with medium ESP
FXSQ50A	17	FXSQ-A - Concealed ceiling unit with medium ESP
KHRQ22M20T	1	Refnet branch piping kit
KHRQ22M29T9	1	Refnet branch piping kit
KHRQ22M64T	3	Refnet branch piping kit
KHRQ22M75T	3	Refnet branch piping kit
KHRQ22M29H	7	Refnet branch piping kit
BHFQ22P1517	1	Outdoor unit multi connection piping kit for 3 modules
BRC1H52W	32	Remote controller (white)
BYCQ140D	10	Standard decoration panel

7.3.1 Refrigerant information

Name	Model	Refrigerant type	GWP	Base charge kg	Extra charge kg	TCO2 equivalent
Outdoor Unit	RXYQ54T	R410A	2087.5	33.9	unknown	70.8
Refrigerant type			GWP	Base charge kg	Extra charge kg	TCO2 equivalent
R410A			2087.5	33.9	unknown	70.8

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.

7.3.2 Pipe capacities

Maximum Connection Index	Diameters
149.9	9.5mmx15.9mm
199.9	9.5mmx19.1mm
289.9	9.5mmx22.2mm
419.9	12.7mmx28.6mm
639.9	15.9mmx28.6mm
919.9	19.1mmx34.9mm
> 919.9	19.1mmx41.3mm
Main pipe size up	22.2mmx41.3mm

7.3.3 Remarks

Sufficient distance should be respected between the modules according to the service & operation space rules as mentioned in the databook.

7.3.4 Piping limitations

Description	Value
Maximum total length	500.0m
Maximum longest actual length	135.0m
Maximum longest equivalent length	160.0m
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% - 130.0%
Refrigerant pipe diameters	22.2mm (liquid) x 41.3mm (gas)

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

8 Third Floor

Capacity data at conditions and connection ratio

Name	FCU	Cooling								Heating				Min coil	Max coil	Air Flow Rate
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	Tmp H	Rq HC	Max HC	Tdis H			
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	°C	kW	kW	°C	m³	m³	l/s
1	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	5.0	5.0	38.1	n/a	n/a	225.00
2	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00
11_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
11_1	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
12_1	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
12_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
13_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
13_1	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
1_1	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	5.0	5.0	38.1	n/a	n/a	225.00
3_1	FXSQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	15.8	3.2	20.0	5.0	5.0	36.3	n/a	n/a	250.00
3_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
4_1	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
4_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
5_1	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
5_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33

Name	FCU	Cooling								Heating				Min coil	Max coil	Air Flow Rate
		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	Tmp H	Rq HC	Max HC	Tdis H			
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	°C	kW	kW	°C	m³	m³	l/s
		0%														
2_1	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00
2_2	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00
6_1	FXSQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	15.8	3.2	20.0	5.0	5.0	36.3	n/a	n/a	250.00
6_2	FXSQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	15.8	3.2	20.0	5.0	5.0	36.3	n/a	n/a	250.00
6_3	FXSQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	15.8	3.2	20.0	5.0	5.0	36.3	n/a	n/a	250.00
7	FXSQ32A	26.0/50%	3.0	3.0	3.5	0.5	6.0	13.2	2.5	20.0	4.0	4.0	40.5	n/a	n/a	158.33
2_3	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00
2_4	FXFQ40A	26.0/50%	4.0	4.0	4.4	0.5	6.0	14.4	3.2	20.0	4.5	5.0	38.1	n/a	n/a	225.00
8_1	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
8_2	FXSQ50A	26.0/50%	5.0	5.0	5.5	0.5	6.0	13.5	3.9	20.0	5.0	6.3	40.2	n/a	n/a	253.33
			112.0								121.5					

Name	Room	Sound	PS	MCA	MOP	WxHxD	Weight
		dBA		A		mm	
1	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
2	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
11_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
11_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
12_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
12_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
13_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
13_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0

Name	Room	Sound dBA	PS	MCA A	MOP	WxHxD mm	Weight kg
1_1	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
3_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	28.5
3_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
4_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
4_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
5_1	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
5_2	Classroom	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
2_1	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
2_2	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
6_1	IT room	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	28.5
6_2	IT room	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	28.5
6_3	IT room	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	28.5
7	Secretary	26 - 31	220V 1ph	0.8	Factory Std	550 x 245 x 800	24.0
2_3	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
2_4	Hallway	29 - 33	220V 1ph	0.3	Factory Std	840 x 204 x 840	20.0
8_1	IT room 2	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0
8_2	IT room 2	29 - 35	220V 1ph	1.1	Factory Std	700 x 245 x 800	29.0

Remarks

Outdoor unit placed 1.0m above the indoor units.

Outdoor unit details

Name	Model	CR %	Cooling			Heating			Piping m
			Tmp C °C	CC kW	Rq CC kW	Tmp H °C (DBT/RH)	HC kW	Rq HC kW	
Outdoor Unit	RXYQ54T	83.1	29.0	146.2	112.0	0.0/86%	125.2	121.5	7.5

Name	Model	PS	MCA A	MOP A	RLA A	FLA A	WxHxD mm	Weight kg
Outdoor Unit	RXYQ54T	400V 3Nph						
A	- RXYQ18T		35.0	40.0	20.8		1,240 x 1,685 x 765	314.0
B	- RXYQ18T		35.0	40.0	20.8		1,240 x 1,685 x 765	314.0
C	- RXYQ18T		35.0	40.0	20.8		1,240 x 1,685 x 765	314.0

Name	Model	$\eta_{s,h}$ heating	$\eta_{s,c}$ cooling	SCOP	SEER
		%	%		
Outdoor Unit	RXYQ54T	142.0	216.0	3.60	5.50
Model	Quantity	Description			
RXYQ18T	3	RXYQ-T (VRV IV Non Continuous Heating)			
FXFQ40A	7	FXFQ-A - Round Flow Round flow cassette			
FXSQ32A	1	FXSQ-A - Concealed ceiling unit with medium ESP			
FXSQ40A	4	FXSQ-A - Concealed ceiling unit with medium ESP			
FXSQ50A	13	FXSQ-A - Concealed ceiling unit with medium ESP			
KHRQ22M20T	1	Refnet branch piping kit			
KHRQ22M64T	3	Refnet branch piping kit			
KHRQ22M75T	2	Refnet branch piping kit			
KHRQ22M29H	4	Refnet branch piping kit			
KHRQ22M64H	1	Refnet branch piping kit			
BHFQ22P1517	1	Outdoor unit multi connection piping kit for 3 modules			
BRC1H52W	25	Remote controller (white)			
BYCQ140D	7	Standard decoration panel			

8.3.1 Refrigerant information

Name	Model	Refrigerant type	GWP	Base charge kg	Extra charge kg	TCO2 equivalent
Outdoor Unit	RXYQ54T	R410A	2087.5	35.1	unknown	73.3
Refrigerant type			GWP	Base charge kg	Extra charge kg	TCO2 equivalent
R410A			2087.5	35.1	unknown	73.3

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.

8.3.2 Pipe capacities

Maximum Connection Index	Diameters
149.9	9.5mmx15.9mm
199.9	9.5mmx19.1mm
289.9	9.5mmx22.2mm

Maximum Connection Index	Diameters
419.9	12.7mmx28.6mm
639.9	15.9mmx28.6mm
919.9	19.1mmx34.9mm
> 919.9	19.1mmx41.3mm
Main pipe size up	22.2mmx41.3mm

8.3.3 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% - 130.0%
Refrigerant pipe diameters	22.2mm (liquid) x 41.3mm (gas)
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

9 Gym

Capacity data at conditions and connection ratio

Name	FCU	Cooling	Heating				
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		Tmp C	Rq TC	Rv TC	Max TC	Rq SC	Tevap	Tdis C	Max SC	Tmp H	Rq HC	Max HC	Tdis H	Min coil	Max coil	Air Flow Rate
		°C (DBT/RH)	kW	kW	kW	kW	°C	°C	kW	°C	kW	kW	°C	m³	m³	l/s
1	FXMQ250 MB	26.0/5 0%	27.0	27.0	27.5	1.0	6.0	12.6	19.8	20.0	30.0	31.5	41.3	n/a	n/a	1,200.0 0
2	FXMQ250 MB	26.0/5 0%	27.0	27.0	27.5	1.0	6.0	12.6	19.8	20.0	30.0	31.5	41.3	n/a	n/a	1,200.0 0
3	FXMQ250 MB	26.0/5 0%	27.0	27.0	27.5	1.0	6.0	12.6	19.8	20.0	30.0	31.5	41.3	n/a	n/a	1,200.0 0
4	FXMQ250 MB	26.0/5 0%	27.0	27.0	27.5	1.0	6.0	12.6	19.8	20.0	30.0	31.5	41.3	n/a	n/a	1,200.0 0
			108.0								120.0					

Name	Room	Sound dBA	PS	MCA A	MOP	WxHxD mm	Weight kg
1	Gym	45 - 48	220V 1ph	10.3	Factory Std	1,380 x 470 x 1,100	132.0
2	Gym	45 - 48	220V 1ph	10.3	Factory Std	1,380 x 470 x 1,100	132.0
3	Gym	45 - 48	220V 1ph	10.3	Factory Std	1,380 x 470 x 1,100	132.0
4	Gym	45 - 48	220V 1ph	10.3	Factory Std	1,380 x 470 x 1,100	132.0

Outdoor unit details

Name	Model	CR	Cooling			Heating			Piping
			Tmp C °C	CC kW	Rq CC kW	Tmp H °C (DBT/RH)	HC kW	Rq HC kW	
Outdoor Unit Gym	RXYQ52T	76.9	29.0	141.4	108.0	0.0/86%	120.9	120.0	7.5

Name	Model	PS	MCA A	MOP A	RLA A	FLA A	WxHxD mm	Weight kg
Outdoor Unit Gym	RXYQ52T	400V 3Nph						
A	- RXYQ18T		35.0	40.0	20.8		1,240 x 1,685 x 765	314.0
B	- RXYQ18T		35.0	40.0	20.8		1,240 x 1,685 x 765	314.0
C	- RXYQ16T		31.0	40.0	18.0		1,240 x 1,685 x 765	305.0
Model		Quantity	Description					
RXYQ16T		1	RXYQ-T (VRV IV Non Continuous Heating)					
RXYQ18T		2	RXYQ-T (VRV IV Non Continuous Heating)					

Name	Model	PS	MCA A	MOP A	RLA A	FLA A	WxHxD mm	Weight kg
FXMQ250MB		4	FXMQ-MB - Concealed ceiling unit with high ESP					
KHRQ22M64T		1	Refnet branch piping kit					
KHRQ22M75T		2	Refnet branch piping kit					
BHFQ22P1517		1	Outdoor unit multi connection piping kit for 3 modules					
BRC1H52W		4	Remote controller (white)					

9.2.1 Refrigerant information

Name	Model	Refrigerant type	GWP	Base charge kg	Extra charge kg	TCO2 equivalent
Outdoor Unit Gym	RXYQ52T	R410A	2087.5	33.8	-	70.6
Refrigerant type	GWP	Base charge kg			Extra charge kg	TCO2 equivalent
R410A	2087.5	33.8			-	70.6

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.

9.2.2 Pipe capacities

Maximum Connection Index	Diameters
149.9	9.5mmx15.9mm
199.9	9.5mmx19.1mm
289.9	9.5mmx22.2mm
419.9	12.7mmx28.6mm
639.9	15.9mmx28.6mm
919.9	19.1mmx34.9mm
> 919.9	19.1mmx41.3mm
Main pipe size up	22.2mmx41.3mm

9.2.3 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% - 130.0%
Refrigerant pipe diameters	22.2mm (liquid) x 41.3mm (gas)
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

10 Piping Materials

Refrigerant piping for VRV systems

10.1.1 Copper pipe

Copper pipes should be according to EN6507-69 B series

10.1.2 Joints

All joints should be made with copper or bronze materials

10.1.3 Pipe fixing and support

Supports and fixing elements for piping works should be done with galvanized materials and with iron profiles in the case of large pipes where special constructions will be installed and painted with anti-rust paint.

10.1.4 Thermal Insulation

Thermal insulation layers should be similar to:

- Glass wool, minimum density 60 Kg/mc
- polystyrene, minimum density 35 kg/mc
- pipe thermal insulation, density 40 kg/mc



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