

**COMUNE DI UTA**

PIANO STRAORDINARIO DI EDILIZIA SCOLASTICA ISCOL@ INTERVENTO IN ASSE I:
SCUOLE DEL NUOVO MILLENNIO CREAZIONE NUOVO POLO SCOLASTICO NEL
COMUNE DI UTA



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PROGETTO ESECUTIVO					
STATO DI PROGETTO - IMPIANTI MECCANICI				NOME FILE: UTA_PE_MEP.rvt	
Relazione di calcolo				SCALA: Come indicato	PE IM ET 02 1
AGG.:	DATA:	DESCRIZIONE:	AGG.:	DATA:	DESCRIZIONE:
0	18/03/2021	EMISSIONE			
1	05/2021	VALIDAZIONE			

FASCICOLO DEI CALCOLI

Le marche e i prodotti commerciali riportati nella seguente relazione di calcolo sono da considerarsi indicativi delle sole prestazioni richieste dai progettisti ai fini di calcolo.

Ogni prodotto equivalente può essere ritenuto idoneo ai fini progettuali.

IMPIANTO DI CLIMATIZZAZIONE ESTIVA ED INVERNALE

SCUOLA PRIMARIA

Di seguito verranno riportati i risultati dei calcoli ottenuti per la progettazione dell'impianto di climatizzazione estiva ed invernale del tipo VRF a servizio della scuola primaria

1. Project Information

Date	2020-7-22
Project name	
Project address	
Country	Italy
State	
City	Cagliari
Client name	
Client address	
Reference	
Revision	
Altitude(m)	0
Indoor DB temperature in cooling(°C)	26
Indoor WB temperature in cooling(°C)	19
Outdoor DB temperature in cooling(°C)	32
Outdoor WB temperature in cooling(°C)	24.1
Indoor DB temperature in heating(°C)	21
Indoor WB temperature in heating(°C)	18
Outdoor DB temperature in heating(°C)	3
Outdoor WB temperature in heating(°C)	-0.4

2. Overall Material List

2.1 Equipment List

Model	Quantity	Description
MV6-XMi 560T	1	VRF MV6, Heat Pump Outdoor Unit
MV6-XMi 730T	2	VRF MV6, Heat Pump Outdoor Unit
MV6-XMi 400T	2	VRF MV6, Heat Pump Outdoor Unit
MV6-XMi 615T	1	VRF MV6, Heat Pump Outdoor Unit
Q4AN-2-XMi D28	51	4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D22	29	4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D36	33	4-way Cassette Compact, Indoor Unit
CNT2-2-XMi D28	4	Mid Static Pressure Duct, Indoor Unit
FQZHN-03D	11	Branch joint
FQZHN-02D	11	Branch joint
FQZHN-01D	87	Branch joint
FQZHN-04D	2	Branch joint
CE-MBQ4-03B5	113	panel of compact four way cassette

Φ28.6<->Φ31.8	60	Reducer
Φ31.8<->Φ34.9	60	Reducer
Φ34.9<->Φ38.1	60	Reducer
Φ38.1<->Φ41.3	60	Reducer
Φ41.3<->Φ44.5	60	Reducer
Φ44.5<->Φ50.8	60	Reducer
Φ15.9<->Φ19.1	62	Reducer
Φ19.1<->Φ22.2	67	Reducer
Φ9.53<->Φ12.7	56	Reducer
Φ12.7<->Φ15.9	56	Reducer
Φ22.2<->Φ25.4	58	Reducer
Φ25.4<->Φ28.6	58	Reducer
CCM-270A/WS	1	2nd generation centralized controller
GW-MOD	6	2nd generation BMS gateway
MA-EK	6	extension kit
WDC-120G/WK	42	2nd generation group controller

2.2 Field Providing List

2.2.1 Refrigerant Piping Materials

Model	Quantity	Unit	Description
Φ9.53	274	m	Copper pipe
Φ19.1	147.5	m	Copper pipe
Φ12.7	490.5	m	Copper pipe
Φ22.2	65.5	m	Copper pipe
Φ6.35	333.5	m	Copper pipe
Φ25.4	22	m	Copper pipe
Φ15.9	258	m	Copper pipe
Φ28.6	32	m	Copper pipe
Φ31.8	44	m	Copper pipe
Φ38.1	30	m	Copper pipe
Insulation casing for piping			All refrigerant piping and branch joints should be completely insulated.

Recommended insulation casing thickness:

Piping size	Thickness	
	Humidity<80%RH	Humidity≥80%RH
Φ6.35~Φ38.1mm	≥15mm	≥20mm
Φ41.3~Φ38.1mm	≥20mm	≥25mm

2.2.2 Refrigerant charge

System name	Model	Quantity	Unit	Description
SP-PDC-CL-3	R410A	6.13	kg	Extra Refrigerant Added
SP-PDC-CL-4	R410A	15.87	kg	Extra Refrigerant Added
SP-PDC-CL-5	R410A	20.02	kg	Extra Refrigerant Added
SP-PDC-CL-6	R410A	7.24	kg	Extra Refrigerant Added
SP-PDC-CL-1	R410A	12.39	kg	Extra Refrigerant Added
SP-PDC-CL-2	R410A	22.45	kg	Extra Refrigerant Added
Total	R410A	84.1	kg	Extra Refrigerant Added

2.2.3 Electrical cables

Type	Size	Length
Power supply cable	Select based on MCA of each unit	According to the actual system design
Communication cable	0.75mm ² 3-core shielded	According to the actual system design

3. Overall Electrical Characteristics

Model	Quantity	Power supply	MCA(A)	MFA(A)	Power input in cooling(kW)	Power input in heating(kW)
MV6-XMi 560T	1	380-415V	43,90	50	15,000	12,000
MV6-XMi 730T	2	380-415V	52,90	63	21,000	18,000
MV6-XMi 400T	2	380-415V	33,10	40	9,000	8,000
MV6-XMi 615T	1	380-415V	47,90	63	18,000	15,000
Q4AN-2-XMi D28	51	220-240V	0,43	15	0,035	0,035
Q4AN-2-XMi D22	29	220-240V	0,43	15	0,035	0,035
Q4AN-2-XMi D36	33	220-240V	0,48	15	0,040	0,040
CNT2-2-XMi D28	4	220-240V	0,74	15	0,040	0,040
CE-MBQ4-03B5	113					

Notes:

1. MCA: Minimum Circuit Amps. MCA is used to select wire size. The value in above table is for one unit.
2. MFA: Maximum Fuse Amps. MFA is used to select overcurrent circuit breakers and residual-current circuit breakers. The value in above table is for one unit.
3. Power input in cooling and heating are based on below conditions (The value in above table is for one unit.):
Cooling: indoor air temperature 27°C DB/19°C WB; outdoor temperature 35°C DB;
Heating: indoor air temperature 20°C DB; outdoor temperature 7°C DB/6°C WB;
Equivalent refrigerant piping length 7.5m with zero level difference.

4. SP-PDC-CL-1

4.1 BOM List (SP-PDC-CL-1)

Model	Quantity	Unit	Description
MV6-XMi 560T	1		VRF MV6, Heat Pump Outdoor Unit
Q4AN-2-XMi D28	14		4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D22	8		4-way Cassette Compact, Indoor Unit
FQZHN-03D	2		Branch joint
FQZHN-02D	1		Branch joint
FQZHN-01D	18		Branch joint
WDC-120G/WK	9		2nd generation group controller
CE-MBQ4-03B5	22		panel of compact four way cassette
R410A	12.39	kg	Extra Refrigerant Added
Φ6.35	62	m	Copper pipe
Φ9.53	90	m	Copper pipe
Φ12.7	65	m	Copper pipe
Φ15.9	82	m	Copper pipe
Φ19.1	17	m	Copper pipe
Φ22.2	1	m	Copper pipe
Φ28.6	3	m	Copper pipe
Φ31.8	10	m	Copper pipe

4.2 Indoor Unit Details (SP-PDC-CL-1)

4.2.1 Indoor Unit Details Table

IDU Name	Model	Weight(kg)	Dimension(WxHxD)(mm)	Power supply	MCA(A)	MFA(A)
C2/SP-C2-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C2/SP-C2-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
D01/SP-D01-1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
C1/SP-C1-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C1/SP-C1-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
DOC1/SP-DOC-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
D01/SP-D01-2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
C3/SP-C3-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C3/SP-C3-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
D01/SP-D01-3	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
L1/SP-L1-3	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
L1/SP-L1-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
L1/SP-L1-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
D01/SP-D01-5	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
ATA/SP-ATA	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
D01/SP-D01-6	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
D01/SP-D01-4	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
D01/SP-SR1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
C4/SP-C4-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C4/SP-C4-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C5/SP-C5-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15

C5/SP-C5-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
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IDU Name	Model	Tmp-C(°C)	RTC(kW)	ATC(kW)	RSC(kW)	ASC(kW)	PI-C(W)	Tmp-H(°C)	RHC(kW)	AHC(kW)	PI-H(W)
C2/SP-C2-1	Q4AN-2-XMi D28	26		2,66		1,77	35	21		2,69	35
C2/SP-C2-2	Q4AN-2-XMi D28	26		2,66		1,77	35	21		2,69	35
D01/SP-D01-1	Q4AN-2-XMi D22	26		2,09		1,4	35	21		2,02	35
C1/SP-C1-1	Q4AN-2-XMi D28	26		2,62		1,75	35	21		2,69	35
C1/SP-C1-2	Q4AN-2-XMi D28	26		2,63		1,75	35	21		2,69	35
DOC1/SP-DOC-1	Q4AN-2-XMi D28	26		2,62		1,75	35	21		2,69	35
D01/SP-D01-2	Q4AN-2-XMi D22	26		2,1		1,41	35	21		2,02	35
C3/SP-C3-1	Q4AN-2-XMi D28	26		2,67		1,78	35	21		2,69	35
C3/SP-C3-2	Q4AN-2-XMi D28	26		2,67		1,78	35	21		2,69	35
D01/SP-D01-3	Q4AN-2-XMi D22	26		2,11		1,41	35	21		2,02	35
L1/SP-L1-3	Q4AN-2-XMi D28	26		2,68		1,79	35	21		2,69	35
L1/SP-L1-2	Q4AN-2-XMi D28	26		2,66		1,78	35	21		2,69	35
L1/SP-L1-1	Q4AN-2-XMi D28	26		2,65		1,77	35	21		2,69	35
D01/SP-D01-5	Q4AN-2-XMi D22	26		2,1		1,4	35	21		2,02	35
ATA/SP-ATA	Q4AN-2-XMi D22	26		2,06		1,38	35	21		2,02	35
D01/SP-D01-6	Q4AN-2-XMi D22	26		2,07		1,39	35	21		2,02	35
D01/SP-D01-4	Q4AN-2-XMi D22	26		2,08		1,39	35	21		2,02	35
D01/SP-SR1	Q4AN-2-XMi D22	26		2,05		1,38	35	21		2,02	35
C4/SP-C4-1	Q4AN-2-XMi D28	26		2,62		1,75	35	21		2,69	35
C4/SP-C4-2	Q4AN-2-XMi D28	26		2,61		1,74	35	21		2,69	35
C5/SP-C5-1	Q4AN-2-XMi D28	26		2,65		1,77	35	21		2,69	35
C5/SP-C5-2	Q4AN-2-XMi D28	26		2,64		1,76	35	21		2,69	35

IDU Name	Model	Airflow(m ³ /h)	Sound-Pr dB(A)	ESP(Pa)
C2/SP-C2-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0

C2/SP-C2-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D01/SP-D01-1	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C1/SP-C1-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C1/SP-C1-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
DOC1/SP-DOC-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D01/SP-D01-2	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C3/SP-C3-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C3/SP-C3-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D01/SP-D01-3	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
L1/SP-L1-3	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
L1/SP-L1-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
L1/SP-L1-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D01/SP-D01-5	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
ATA/SP-ATA	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D01/SP-D01-6	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D01/SP-D01-4	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D01/SP-SR1	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C4/SP-C4-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C4/SP-C4-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C5/SP-C5-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C5/SP-C5-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0

IDU Name	Model	Piping Length to 1st Y Joint(m)
C2/SP-C2-1	Q4AN-2-XMi D28	21,50
C2/SP-C2-2	Q4AN-2-XMi D28	20,00
D01/SP-D01-1	Q4AN-2-XMi D22	19,00
C1/SP-C1-1	Q4AN-2-XMi D28	31,00
C1/SP-C1-2	Q4AN-2-XMi D28	28,50
DOC1/SP-DOC-1	Q4AN-2-XMi D28	30,00
D01/SP-D01-2	Q4AN-2-XMi D22	15,50
C3/SP-C3-1	Q4AN-2-XMi D28	20,00
C3/SP-C3-2	Q4AN-2-XMi D28	18,50
D01/SP-D01-3	Q4AN-2-XMi D22	11,50
L1/SP-L1-3	Q4AN-2-XMi D28	16,50
L1/SP-L1-2	Q4AN-2-XMi D28	19,50
L1/SP-L1-1	Q4AN-2-XMi D28	21,50
D01/SP-D01-5	Q4AN-2-XMi D22	16,50
ATA/SP-ATA	Q4AN-2-XMi D22	27,50
D01/SP-D01-6	Q4AN-2-XMi D22	27,00
D01/SP-D01-4	Q4AN-2-XMi D22	21,50
D01/SP-SR1	Q4AN-2-XMi D22	30,50
C4/SP-C4-1	Q4AN-2-XMi D28	30,00
C4/SP-C4-2	Q4AN-2-XMi D28	31,50
C5/SP-C5-1	Q4AN-2-XMi D28	21,50
C5/SP-C5-2	Q4AN-2-XMi D28	22,50

4.2.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Indoor temperature in cooling (Dry bulb temp. / Wet bulb temp. / RH)
RTC	Required total cooling capacity
ATC	Available total cooling capacity
RSC	Required sensible cooling capacity
ASC	Available sensible cooling capacity
Tmp-H	Indoor temperature in heating (Dry bulb temp.)
RHC	Required heating capacity
AHC	Available heating capacity
Tdis-H	Indoor unit discharge air temperature in heating
Airflow	Indoor unit airflow (High/Medium/Low)
ESP	External static pressure
Sound-Pr	Sound pressure level (High/Medium/Low)
Sound-Po	Sound power level (High/Medium/Low)
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
PI-C	Power input in cooling
PI-H	Power input in heating
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

4.3 Outdoor Unit Details (SP-PDC-CL-1)

4.3.1 Outdoor Unit Details Table

Model		MV6-XMi 560T
Module		MV6-XMi 560T
Tmp-C	°C	32
RTC	kW	53,69
ATC	kW	54,39
PI-C	kW	13,82
Tmp-H	°C/°C	3/-0,4
RHC	kW	53,87
AHC	kW	53,87
PI-H	kW	13,66
CR		101,4
Airflow	m ³ /h	17000
Sound-Pr		63
Sound-Po		
Bas-Refr	kg	17,00
Ex-Refr	kg	12,39
TCO2 eq.		
MCA	A	43,9
MFA	A	50
Power supply	V/ph/Hz	380-415V
Dimension(WxHxD)	mm	1340*1635*825
Weight	kg	348

4.3.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Outdoor conditions in cooling (Dry bulb temp.)
RTC	Required cooling capacity
ATC	Available cooling capacity
PI-C	Power input in cooling
Tmp-H	Indoor conditions in heating (Dry bulb temp. / Wet bulb temp. / RH)
RHC	Required heating capacity
AHC	Available heating capacity
PI-H	Power input in heating
CR	Combination ratio
Airflow	Outdoor unit airflow
Sound-Pr	Sound pressure level
Sound-Po	Sound power level
Bas-Refr	Standard factory refrigerant charge
Ex-Refr	Extra refrigerant charge
TCO2 eq.	Tonnes of CO2 equivalent
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

4.4 Piping Limitations (SP-PDC-CL-1)

4.4.1 Piping Limitations

Item	Capability	Actual Value
Total piping length	1000,00(m)	220,00(m)
Longest actual length	175,00(m)	35,00(m)
Longest equivalent length	200,00(m)	44,50(m)
Longest equivalent length after first branch	90,00(m)	31,50(m)
Indoor unit to nearest branch length	40,00(m)	14,00(m)
Length difference between longest and shortest distance to indoor units	40,00(m)	20,00(m)
Height difference between indoor and outdoor unit(ODU up)	90,00(m)	5,00(m)
Height difference between indoor and outdoor unit(ODU down)	110,00(m)	0,00(m)
Height difference between indoor units	30,00(m)	0,00(m)
Combination ratio	50-130%	101,43%
IDU quantity	33	22

4.4.2 Correction Factors

Item	Correction factor
Altitude (indoor unit)	1,000
Altitude (outdoor unit)	1,000
Piping (cooling)	0,974
Piping (heating)	0,990
Defrost (heating)	1,000

4.4.3 Piping Details Table

No.	Length(m)	Piping diameter
(1)	10,00	Φ31.8/Φ19.1
(2)	3,00	Φ28.6/Φ12.7
(3)	7,00	Φ19.1/Φ9.53
(4)	1,00	Φ22.2/Φ9.53
(5)	2,00	Φ15.9/Φ9.53
(6)	4,00	Φ15.9/Φ9.53
(7)	0,50	Φ15.9/Φ9.53
(8)	3,50	Φ15.9/Φ9.53
(9)	5,00	Φ15.9/Φ9.53
(10)	4,00	Φ12.7/Φ6.35
(11)	3,00	Φ12.7/Φ6.35
(12)	1,00	Φ12.7/Φ6.35
(13)	6,00	Φ15.9/Φ9.53
(14)	5,00	Φ12.7/Φ6.35
(15)	3,00	Φ12.7/Φ6.35
(16)	5,00	Φ15.9/Φ9.53
(17)	5,00	Φ15.9/Φ9.53
(18)	14,00	Φ15.9/Φ9.53
(19)	1,00	Φ12.7/Φ6.35
(20)	4,00	Φ12.7/Φ6.35
(21)	3,00	Φ12.7/Φ6.35
(22)	2,00	Φ12.7/Φ6.35
(23)	4,00	Φ15.9/Φ9.53
(24)	2,00	Φ12.7/Φ6.35
(25)	3,00	Φ15.9/Φ9.53
(26)	2,00	Φ12.7/Φ6.35
(27)	4,00	Φ12.7/Φ6.35
(28)	4,00	Φ15.9/Φ9.53
(29)	4,00	Φ15.9/Φ9.53
(30)	2,00	Φ12.7/Φ6.35
(31)	6,00	Φ15.9/Φ9.53
(32)	5,00	Φ12.7/Φ6.35
(33)	3,00	Φ15.9/Φ9.53
(34)	1,00	Φ12.7/Φ6.35
(35)	5,00	Φ12.7/Φ6.35
(36)	6,00	Φ15.9/Φ9.53
(37)	3,00	Φ15.9/Φ9.53
(38)	1,00	Φ12.7/Φ6.35
(39)	4,00	Φ15.9/Φ9.53
(40)	3,00	Φ12.7/Φ6.35
(41)	4,00	Φ12.7/Φ6.35
(42)	3,00	Φ12.7/Φ6.35
(43)	4,00	Φ12.7/Φ6.35

4.4.4 Branch Joints Details Table

No.	Load(kW)	Model
(1)	56,8	FQZHN-03D
(2)	34,6	FQZHN-03D

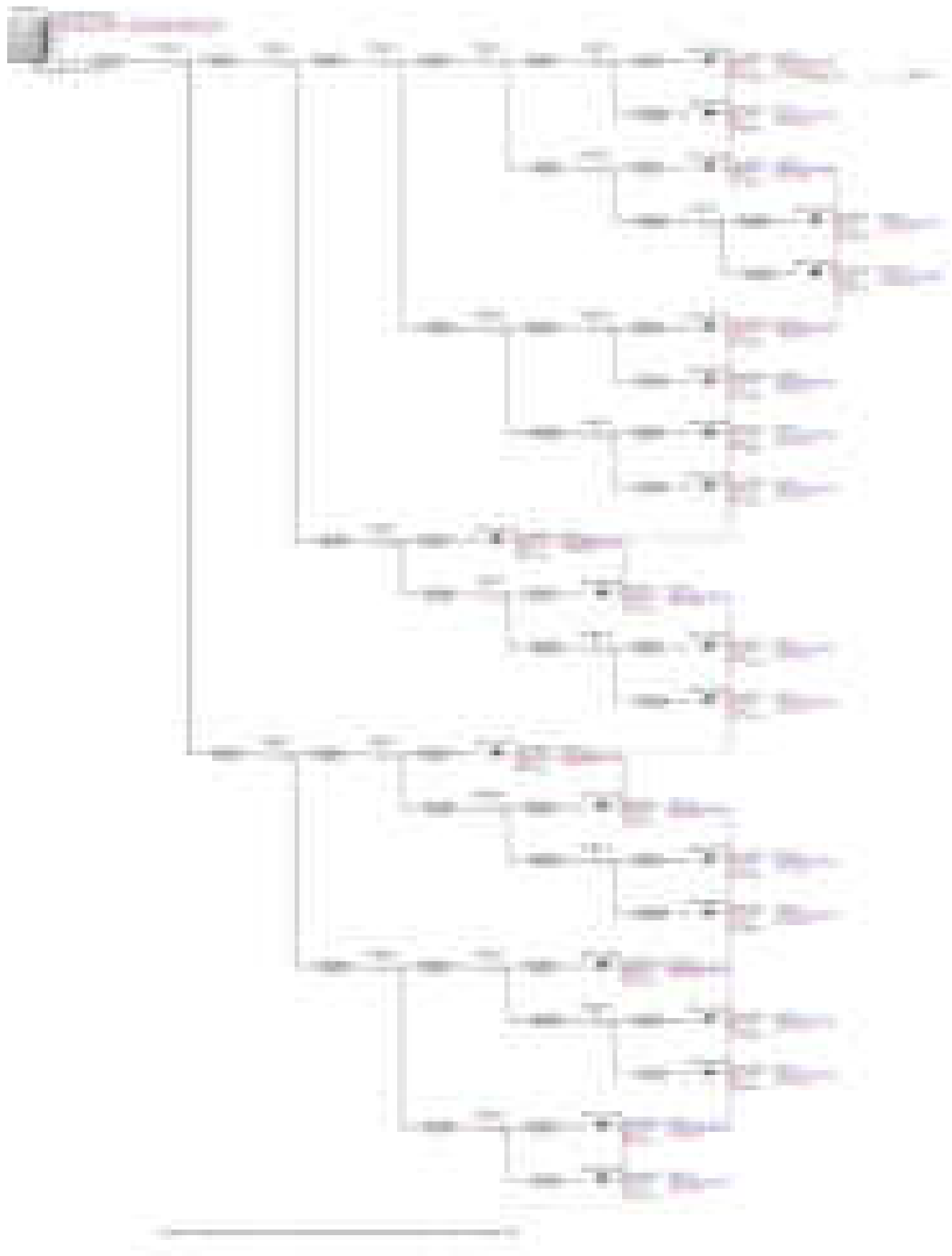
(3)	24	FQZHN-02D
(4)	13,4	FQZHN-01D
(5)	5,6	FQZHN-01D
(6)	7,8	FQZHN-01D
(7)	5,6	FQZHN-01D
(8)	10,6	FQZHN-01D
(9)	5	FQZHN-01D
(10)	5,6	FQZHN-01D
(11)	10,6	FQZHN-01D
(12)	8,4	FQZHN-01D
(13)	5,6	FQZHN-01D
(14)	22,2	FQZHN-01D
(15)	8,8	FQZHN-01D
(16)	6,6	FQZHN-01D
(17)	4,4	FQZHN-01D
(18)	13,4	FQZHN-01D
(19)	7,8	FQZHN-01D
(20)	5,6	FQZHN-01D
(21)	5,6	FQZHN-01D

4.4.5 Reducer Details Table

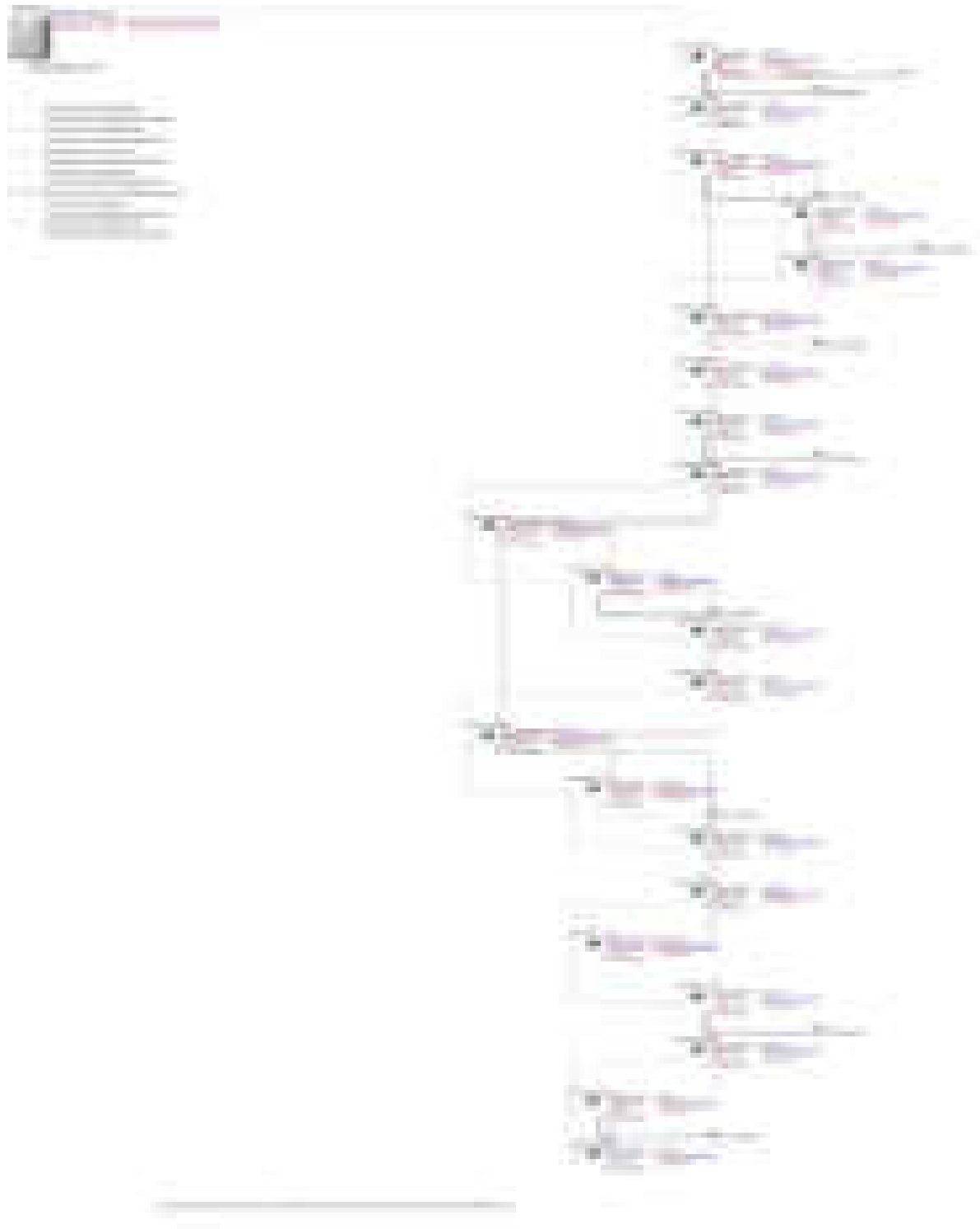
4.4.6 Bends Detailed Table

Quantity	Equivalent length(m)
89	44.5

4.5 Piping Diagrams (SP-PDC-CL-1)



4.6 Wiring Diagrams (SP-PDC-CL-1)



5. SP-PDC-CL-2

5.1 BOM List (SP-PDC-CL-2)

Model	Quantity	Unit	Description
MV6-XMi 730T	1		VRF MV6, Heat Pump Outdoor Unit
Q4AN-2-XMi D28	9		4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D22	5		4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D36	9		4-way Cassette Compact, Indoor Unit
FQZHN-04D	1		Branch joint
FQZHN-03D	2		Branch joint
FQZHN-02D	3		Branch joint
FQZHN-01D	16		Branch joint
WDC-120G/WK	8		2nd generation group controller
CE-MBQ4-03B5	23		panel of compact four way cassette
Φ28.6<->Φ31.8	31		Reducer
Φ31.8<->Φ34.9	31		Reducer
Φ34.9<->Φ38.1	31		Reducer
Φ38.1<->Φ41.3	31		Reducer
Φ41.3<->Φ44.5	31		Reducer
Φ44.5<->Φ50.8	31		Reducer
Φ15.9<->Φ19.1	32		Reducer
Φ19.1<->Φ22.2	34		Reducer
Φ9.53<->Φ12.7	29		Reducer
Φ12.7<->Φ15.9	29		Reducer
Φ22.2<->Φ25.4	30		Reducer
Φ25.4<->Φ28.6	30		Reducer
R410A	22.45	kg	Extra Refrigerant Added
Φ6.35	67	m	Copper pipe
Φ12.7	131.5	m	Copper pipe
Φ19.1	49	m	Copper pipe
Φ22.2	32.5	m	Copper pipe
Φ25.4	10	m	Copper pipe
Φ31.8	7	m	Copper pipe
Φ38.1	20	m	Copper pipe

5.2 Indoor Unit Details (SP-PDC-CL-2)

5.2.1 Indoor Unit Details Table

IDU Name	Model	Weight(kg)	Dimension(WxHxD)(mm)	Power supply	MCA(A)	MFA(A)
C8/SP-C08-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C8/SP-C08-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C6/SP-C06-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C6/SP-C06-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
D02/SP-D02-2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
C9/SP-C09-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C9/SP-C09-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C7/SP-C07-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15

C7/SP-C07-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
REF1/SP-REF1-1	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
REF1/SP-REF1-2	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
REF1/SP-REF1-3	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
REF1/SP-REF1-4	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
REF1/SP-REF1-5	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
SPOR/SP-SPOR	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
D02/SP-D02-1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
SINF1/SP-SR2-1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
D02/SP-D02-3	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
SINF2/SP-SR2-2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
REF2/SP-REF2-4	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
REF2/SP-REF2-3	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
REF2/SP-REF2-2	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
REF2/SP-REF2-1	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15

IDU Name	Model	Tmp-C(°C)	RTC(kW)	ATC(kW)	RSC(kW)	ASC(kW)	PI-C(W)	Tmp-H(°C)	RHC(kW)	AHC(kW)	PI-H(W)
C8/SP-C08-1	Q4AN-2-XMi D28	26		2,73		1,82	35	21		2,86	35
C8/SP-C08-2	Q4AN-2-XMi D28	26		2,72		1,82	35	21		2,86	35
C6/SP-C06-1	Q4AN-2-XMi D28	26		2,71		1,81	35	21		2,86	35
C6/SP-C06-2	Q4AN-2-XMi D28	26		2,72		1,81	35	21		2,86	35
D02/SP-D02-2	Q4AN-2-XMi D22	26		2,17		1,45	35	21		2,15	35
C9/SP-C09-1	Q4AN-2-XMi D28	26		2,77		1,85	35	21		2,86	35
C9/SP-C09-2	Q4AN-2-XMi D28	26		2,76		1,84	35	21		2,86	35
C7/SP-C07-1	Q4AN-2-XMi D28	26		2,75		1,84	35	21		2,86	35
C7/SP-C07-2	Q4AN-2-XMi D28	26		2,76		1,84	35	21		2,86	35
REF1/SP-REF1-1	Q4AN-2-XMi D36	26		3,46		2,26	40	21		3,58	40
REF1/SP-REF1-2	Q4AN-2-XMi D36	26		3,47		2,27	40	21		3,58	40
REF1/SP-REF1-3	Q4AN-2-XMi D36	26		3,47		2,28	40	21		3,58	40
REF1/SP-REF1-4	Q4AN-2-XMi D36	26		3,47		2,28	40	21		3,58	40
REF1/SP-REF1-5	Q4AN-2-XMi D36	26		3,49		2,29	40	21		3,58	40
SPOR/SP-SPOR	Q4AN-2-XMi D28	26		2,73		1,82	35	21		2,86	35
D02/SP-D02-1	Q4AN-2-XMi D22	26		2,18		1,46	35	21		2,15	35
SINF1/SP-SR2-1	Q4AN-2-XMi D22	26		2,18		1,46	35	21		2,15	35

D02/SP-D02-3	Q4AN-2-XMi D22	26		2,2		1,47	35	21		2,15	35
SINF2/SP-SR2-2	Q4AN-2-XMi D22	26		2,2		1,47	35	21		2,15	35
REF2/SP-REF2-4	Q4AN-2-XMi D36	26		3,6		2,36	40	21		3,58	40
REF2/SP-REF2-3	Q4AN-2-XMi D36	26		3,58		2,35	40	21		3,58	40
REF2/SP-REF2-2	Q4AN-2-XMi D36	26		3,57		2,34	40	21		3,58	40
REF2/SP-REF2-1	Q4AN-2-XMi D36	26		3,56		2,33	40	21		3,58	40

IDU Name	Model	Airflow(m ³ /h)			Sound-Pr dB(A)			ESP(Pa)		
C8/SP-C08-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
C8/SP-C08-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
C6/SP-C06-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
C6/SP-C06-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
D02/SP-D02-2	Q4AN-2-XMi D22	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
C9/SP-C09-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
C9/SP-C09-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
C7/SP-C07-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
C7/SP-C07-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
REF1/SP-REF1-1	Q4AN-2-XMi D36	521/485/450/409/380/350/314			41/38/35/32/30/29/28			0		
REF1/SP-REF1-2	Q4AN-2-XMi D36	521/485/450/409/380/350/314			41/38/35/32/30/29/28			0		
REF1/SP-REF1-3	Q4AN-2-XMi D36	521/485/450/409/380/350/314			41/38/35/32/30/29/28			0		
REF1/SP-REF1-4	Q4AN-2-XMi D36	521/485/450/409/380/350/314			41/38/35/32/30/29/28			0		
REF1/SP-REF1-5	Q4AN-2-XMi D36	521/485/450/409/380/350/314			41/38/35/32/30/29/28			0		
SPOR/SP-SPOR	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
D02/SP-D02-1	Q4AN-2-XMi D22	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
SINF1/SP-SR2-1	Q4AN-2-XMi D22	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
D02/SP-D02-3	Q4AN-2-XMi D22	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
SINF2/SP-SR2-2	Q4AN-2-XMi D22	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
REF2/SP-REF2-4	Q4AN-2-XMi D36	521/485/450/409/380/350/314			41/38/35/32/30/29/28			0		
REF2/SP-REF2-3	Q4AN-2-XMi D36	521/485/450/409/380/350/314			41/38/35/32/30/29/28			0		
REF2/SP-REF2-2	Q4AN-2-XMi D36	521/485/450/409/380/350/314			41/38/35/32/30/29/28			0		
REF2/SP-REF2-1	Q4AN-2-XMi D36	521/485/450/409/380/350/314			41/38/35/32/30/29/28			0		

IDU Name	Model	Piping Length to 1st Y Joint(m)
C8/SP-C08-1	Q4AN-2-XMi D28	34,00
C8/SP-C08-2	Q4AN-2-XMi D28	35,00
C6/SP-C06-1	Q4AN-2-XMi D28	38,00
C6/SP-C06-2	Q4AN-2-XMi D28	36,00
D02/SP-D02-2	Q4AN-2-XMi D22	24,50
C9/SP-C09-1	Q4AN-2-XMi D28	25,00
C9/SP-C09-2	Q4AN-2-XMi D28	26,50
C7/SP-C07-1	Q4AN-2-XMi D28	27,00
C7/SP-C07-2	Q4AN-2-XMi D28	26,00
REF1/SP-REF1-1	Q4AN-2-XMi D36	43,00

REF1/SP-REF1-2	Q4AN-2-XMi D36	41,00
REF1/SP-REF1-3	Q4AN-2-XMi D36	39,50
REF1/SP-REF1-4	Q4AN-2-XMi D36	39,00
REF1/SP-REF1-5	Q4AN-2-XMi D36	36,50
SPOR/SP-SPOR	Q4AN-2-XMi D28	31,00
D02/SP-D02-1	Q4AN-2-XMi D22	20,00
SINF1/SP-SR2-1	Q4AN-2-XMi D22	19,00
D02/SP-D02-3	Q4AN-2-XMi D22	9,00
SINF2/SP-SR2-2	Q4AN-2-XMi D22	11,00
REF2/SP-REF2-4	Q4AN-2-XMi D36	13,00
REF2/SP-REF2-3	Q4AN-2-XMi D36	15,00
REF2/SP-REF2-2	Q4AN-2-XMi D36	19,00
REF2/SP-REF2-1	Q4AN-2-XMi D36	19,50

5.2.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Indoor temperature in cooling (Dry bulb temp. / Wet bulb temp. / RH)
RTC	Required total cooling capacity
ATC	Available total cooling capacity
RSC	Required sensible cooling capacity
ASC	Available sensible cooling capacity
Tmp-H	Indoor temperature in heating (Dry bulb temp.)
RHC	Required heating capacity
AHC	Available heating capacity
Tdis-H	Indoor unit discharge air temperature in heating
Airflow	Indoor unit airflow (High/Medium/Low)
ESP	External static pressure
Sound-Pr	Sound pressure level (High/Medium/Low)
Sound-Po	Sound power level (High/Medium/Low)
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
PI-C	Power input in cooling
PI-H	Power input in heating
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

5.3 Outdoor Unit Details (SP-PDC-CL-2)

5.3.1 Outdoor Unit Details Table

Model		MV6-XMi 730T
Module		MV6-XMi 730T
Tmp-C	°C	32
RTC	kW	67,27
ATC	kW	68,6
PI-C	kW	17,33

Tmp-H	°C/°C	3/-0,4
RHC	kW	68,66
AHC	kW	68,66
PI-H	kW	18,49
CR		94,0
Airflow	m ³ /h	25000
Sound-Pr		64
Sound-Po		
Bas-Refr	kg	22,00
Ex-Refr	kg	22,45
TCO2 eq.		
MCA	A	52,9
MFA	A	63
Power supply	V/ph/Hz	380-415V
Dimension(WxHxD)	mm	1730*1830*850
Weight	kg	430

5.3.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Outdoor conditions in cooling (Dry bulb temp.)
RTC	Required cooling capacity
ATC	Available cooling capacity
PI-C	Power input in cooling
Tmp-H	Indoor conditions in heating (Dry bulb temp. / Wet bulb temp. / RH)
RHC	Required heating capacity
AHC	Available heating capacity
PI-H	Power input in heating
CR	Combination ratio
Airflow	Outdoor unit airflow
Sound-Pr	Sound pressure level
Sound-Po	Sound power level
Bas-Refr	Standard factory refrigerant charge
Ex-Refr	Extra refrigerant charge
TCO2 eq.	Tonnes of CO2 equivalent
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

5.4 Piping Limitations (SP-PDC-CL-2)

5.4.1 Piping Limitations

Item	Capability	Actual Value
Total piping length	1000,00(m)	210,50(m)
Longest actual length	175,00(m)	53,50(m)
Longest equivalent length	200,00(m)	67,00(m)
Longest equivalent length after first branch	90,00(m)	43,00(m)

Indoor unit to nearest branch length	40,00(m)	5,00(m)
Length difference between longest and shortest distance to indoor units	40,00(m)	34,00(m)
Height difference between indoor and outdoor unit(ODU up)	90,00(m)	5,00(m)
Height difference between indoor and outdoor unit(ODU down)	110,00(m)	0,00(m)
Height difference between indoor units	30,00(m)	0,00(m)
Combination ratio	50-130%	93,97%
IDU quantity	43	23

5.4.2 Correction Factors

Item	Correction factor
Altitude (indoor unit)	1,000
Altitude (outdoor unit)	1,000
Piping (cooling)	0,957
Piping (heating)	0,983
Defrost (heating)	1,000

5.4.3 Piping Details Table

No.	Length(m)	Piping diameter
(1)	20,00	Φ38.1/Φ22.2
(2)	4,00	Φ31.8/Φ19.1
(3)	4,00	Φ19.1/Φ12.7
(4)	3,00	Φ31.8/Φ19.1
(5)	2,00	Φ12.7/Φ6.35
(6)	3,00	Φ25.4/Φ12.7
(7)	5,00	Φ25.4/Φ12.7
(8)	0,50	Φ22.2/Φ12.7
(9)	5,50	Φ19.1/Φ12.7
(10)	5,50	Φ19.1/Φ12.7
(11)	3,50	Φ19.1/Φ12.7
(12)	3,00	Φ19.1/Φ12.7
(13)	2,00	Φ12.7/Φ6.35
(14)	3,00	Φ19.1/Φ12.7
(15)	5,00	Φ19.1/Φ12.7
(16)	3,00	Φ12.7/Φ6.35
(17)	4,00	Φ12.7/Φ6.35
(18)	5,00	Φ12.7/Φ6.35
(19)	3,00	Φ12.7/Φ6.35
(20)	3,00	Φ12.7/Φ6.35
(21)	4,00	Φ12.7/Φ6.35
(22)	4,00	Φ12.7/Φ6.35
(23)	3,00	Φ12.7/Φ6.35
(24)	2,00	Φ25.4/Φ12.7
(25)	3,50	Φ12.7/Φ6.35
(26)	7,00	Φ22.2/Φ12.7
(27)	2,00	Φ12.7/Φ6.35
(28)	5,00	Φ22.2/Φ12.7
(29)	3,00	Φ12.7/Φ6.35
(30)	0,50	Φ19.1/Φ12.7

(31)	2,00	Φ12.7/Φ6.35
(32)	1,00	Φ19.1/Φ12.7
(33)	4,00	Φ12.7/Φ6.35
(34)	2,00	Φ19.1/Φ12.7
(35)	3,00	Φ12.7/Φ6.35
(36)	4,00	Φ12.7/Φ6.35
(37)	2,00	Φ12.7/Φ6.35
(38)	4,00	Φ12.7/Φ6.35
(39)	5,00	Φ19.1/Φ12.7
(40)	1,00	Φ12.7/Φ6.35
(41)	3,00	Φ19.1/Φ12.7
(42)	0,50	Φ12.7/Φ6.35
(43)	1,00	Φ19.1/Φ12.7
(44)	2,00	Φ12.7/Φ6.35
(45)	3,00	Φ12.7/Φ6.35

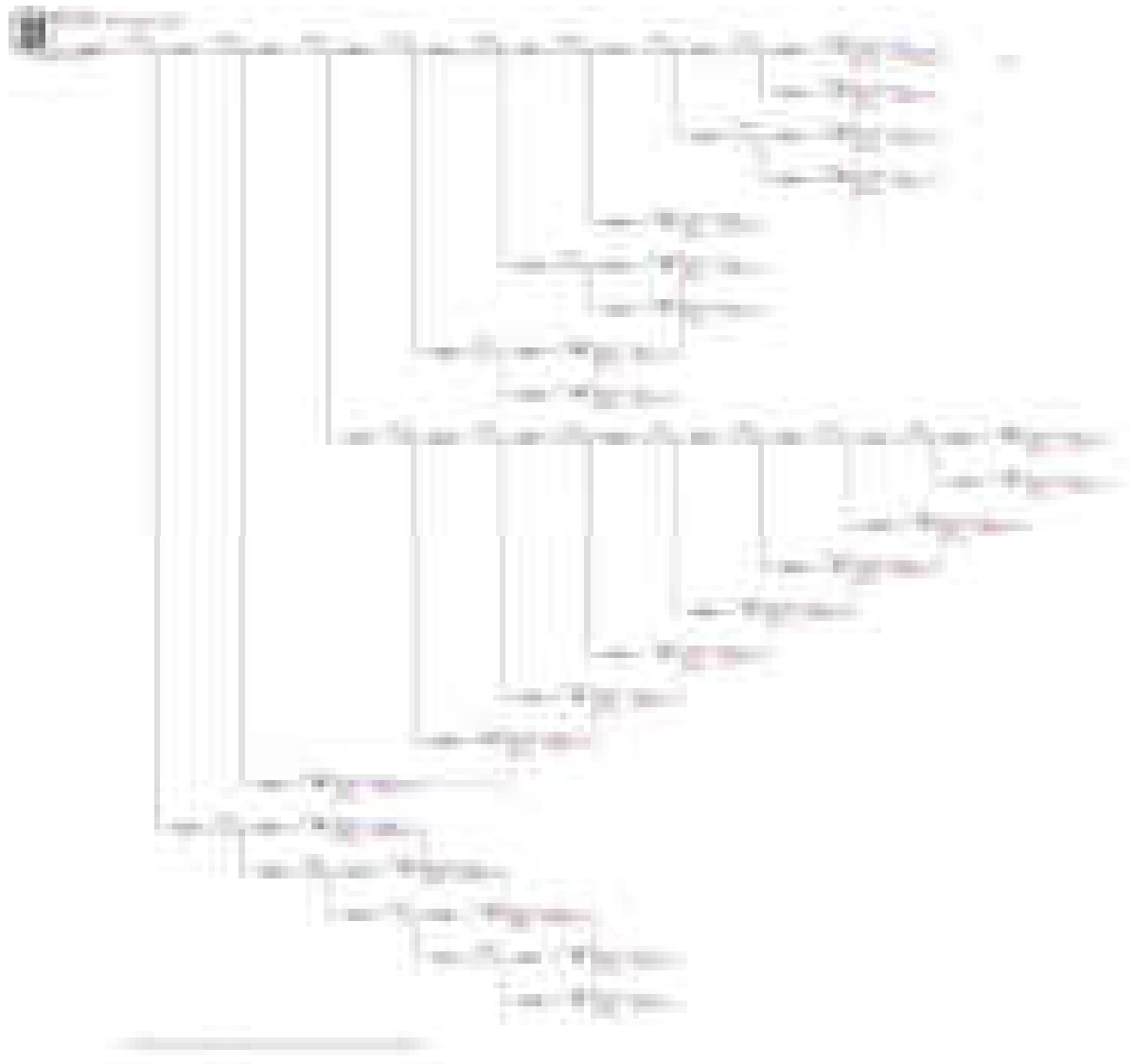
5.4.4 Branch Joints Details Table

No.	Load(kW)	Model
(1)	68,6	FQZHN-04D
(2)	52	FQZHN-03D
(3)	49,8	FQZHN-03D
(4)	24,6	FQZHN-02D
(5)	19	FQZHN-01D
(6)	13,4	FQZHN-01D
(7)	11,2	FQZHN-01D
(8)	5,6	FQZHN-01D
(9)	5,6	FQZHN-01D
(10)	5,6	FQZHN-01D
(11)	5,6	FQZHN-01D
(12)	25,2	FQZHN-02D
(13)	23	FQZHN-02D
(14)	20,8	FQZHN-01D
(15)	18	FQZHN-01D
(16)	14,4	FQZHN-01D
(17)	10,8	FQZHN-01D
(18)	7,2	FQZHN-01D
(19)	16,6	FQZHN-01D
(20)	14,4	FQZHN-01D
(21)	10,8	FQZHN-01D
(22)	7,2	FQZHN-01D

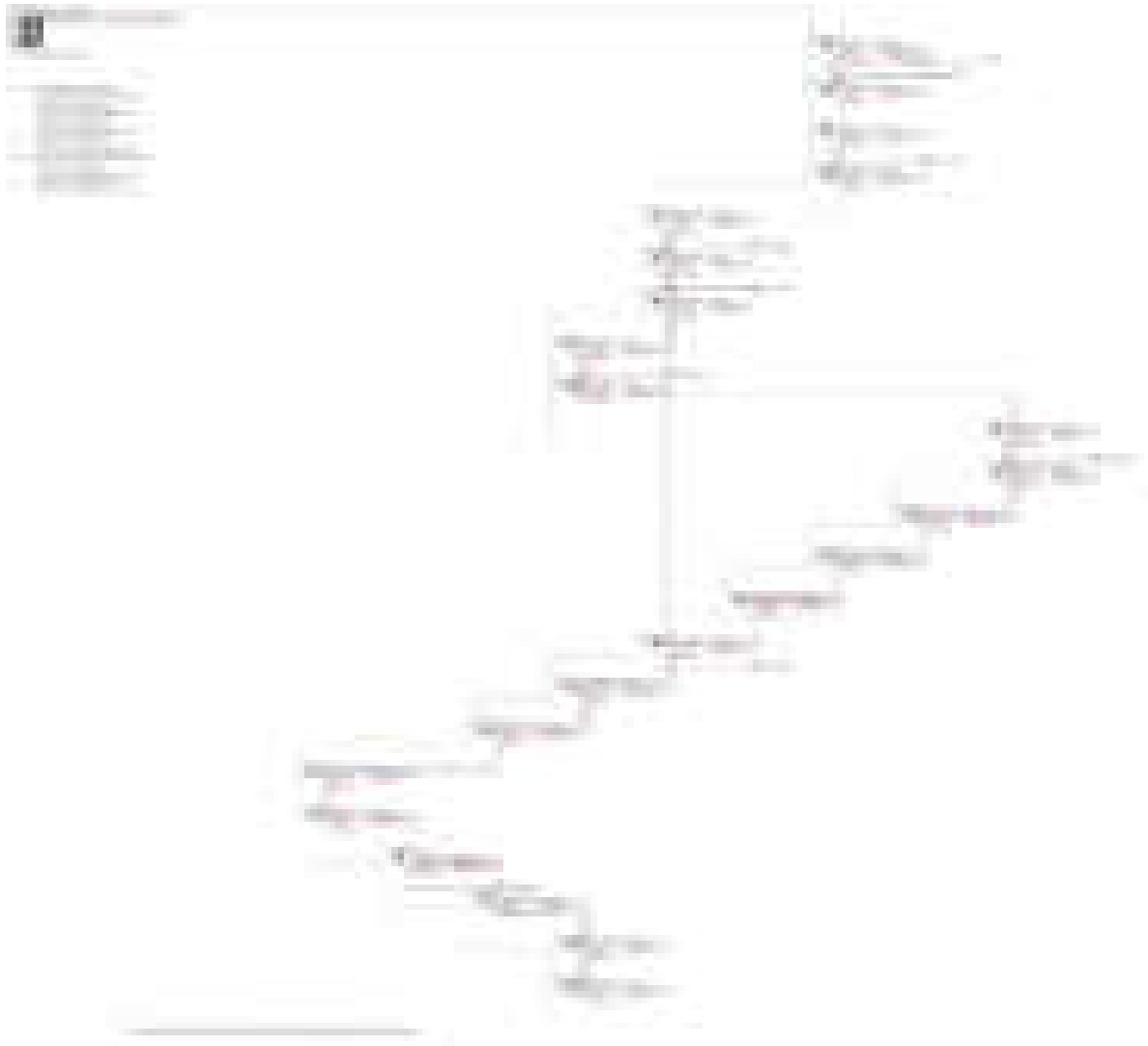
5.4.5 Reducer Details Table

Reducer Name	Description
J2-G1	Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J2-L1	Φ15.9<->Φ19.1
J4-G1	Φ19.1<->Φ22.2

5.5 Piping Diagrams (SP-PDC-CL-2)



5.6 Wiring Diagrams (SP-PDC-CL-2)



6. SP-PDC-CL-3

6.1 BOM List (SP-PDC-CL-3)

Model	Quantity	Unit	Description
MV6-XMi 400T	1		VRF MV6, Heat Pump Outdoor Unit
Q4AN-2-XMi D36	9		4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D22	3		4-way Cassette Compact, Indoor Unit
FQZHN-03D	2		Branch joint
FQZHN-01D	8		Branch joint
FQZHN-02D	1		Branch joint
WDC-120G/WK	4		2nd generation group controller
CE-MBQ4-03B5	12		panel of compact four way cassette
R410A	6.13	kg	Extra Refrigerant Added
Φ6.35	34	m	Copper pipe
Φ9.53	39	m	Copper pipe
Φ12.7	48	m	Copper pipe
Φ15.9	38	m	Copper pipe
Φ22.2	1	m	Copper pipe
Φ28.6	14	m	Copper pipe

6.2 Indoor Unit Details (SP-PDC-CL-3)

6.2.1 Indoor Unit Details Table

IDU Name	Model	Weight(kg)	Dimension(WxHxD)(mm)	Power supply	MCA(A)	MFA(A)
C11/SP-C11-1	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
C11/SP-C11-2	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
C10/SP-C10-1	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
C10/SP-C10-2	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
D02/SP-D02-5	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
L2/SP-L2-1	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
L2/SP-L2-2	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
L2/SP-L2-3	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
D02/SP-D02-6	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
D02/SP-D02-4	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
C12/SP-C12-1	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
C12/SP-C12-2	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15

IDU Name	Model	Tmp-C(°C)	RTC(kW)	ATC(kW)	RSC(kW)	ASC(kW)	PI-C(W)	Tmp-H(°C)	RHC(kW)	AHC(kW)	PI-H(W)
C11/SP-C11-1	Q4AN-2-XMi D36	26		3,53		2,31	40	21		3,51	40
C11/SP-C11-2	Q4AN-2-XMi D36	26		3,52		2,31	40	21		3,51	40
C10/SP-C10-1	Q4AN-2-XMi D36	26		3,48		2,28	40	21		3,51	40
C10/SP-	Q4AN-2-XMi	26		3,48		2,28	40	21		3,51	40

C10-2	D36										
D02/SP-D02-5	Q4AN-2-XMi D22	26		2,16		1,45	35	21		2,11	35
L2/SP-L2-1	Q4AN-2-XMi D36	26		3,47		2,27	40	21		3,51	40
L2/SP-L2-2	Q4AN-2-XMi D36	26		3,49		2,29	40	21		3,51	40
L2/SP-L2-3	Q4AN-2-XMi D36	26		3,5		2,3	40	21		3,51	40
D02/SP-D02-6	Q4AN-2-XMi D22	26		2,17		1,46	35	21		2,11	35
D02/SP-D02-4	Q4AN-2-XMi D22	26		2,17		1,46	35	21		2,11	35
C12/SP-C12-1	Q4AN-2-XMi D36	26		3,55		2,32	40	21		3,51	40
C12/SP-C12-2	Q4AN-2-XMi D36	26		3,54		2,32	40	21		3,51	40

IDU Name	Model	Airflow(m ³ /h)	Sound-Pr dB(A)	ESP(Pa)
C11/SP-C11-1	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
C11/SP-C11-2	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
C10/SP-C10-1	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
C10/SP-C10-2	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
D02/SP-D02-5	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
L2/SP-L2-1	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
L2/SP-L2-2	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
L2/SP-L2-3	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
D02/SP-D02-6	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D02/SP-D02-4	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C12/SP-C12-1	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
C12/SP-C12-2	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0

IDU Name	Model	Piping Length to 1st Y Joint(m)
C11/SP-C11-1	Q4AN-2-XMi D36	24,00
C11/SP-C11-2	Q4AN-2-XMi D36	24,50
C10/SP-C10-1	Q4AN-2-XMi D36	32,00
C10/SP-C10-2	Q4AN-2-XMi D36	33,50
D02/SP-D02-5	Q4AN-2-XMi D22	21,00
L2/SP-L2-1	Q4AN-2-XMi D36	31,00
L2/SP-L2-2	Q4AN-2-XMi D36	28,00
L2/SP-L2-3	Q4AN-2-XMi D36	24,50
D02/SP-D02-6	Q4AN-2-XMi D22	14,00
D02/SP-D02-4	Q4AN-2-XMi D22	3,00
C12/SP-C12-1	Q4AN-2-XMi D36	17,50
C12/SP-C12-2	Q4AN-2-XMi D36	18,50

6.2.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Indoor temperature in cooling (Dry bulb temp. / Wet bulb temp. / RH)
RTC	Required total cooling capacity
ATC	Available total cooling capacity
RSC	Required sensible cooling capacity
ASC	Available sensible cooling capacity
Tmp-H	Indoor temperature in heating (Dry bulb temp.)
RHC	Required heating capacity
AHC	Available heating capacity
Tdis-H	Indoor unit discharge air temperature in heating
Airflow	Indoor unit airflow (High/Medium/Low)
ESP	External static pressure
Sound-Pr	Sound pressure level (High/Medium/Low)
Sound-Po	Sound power level (High/Medium/Low)
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
PI-C	Power input in cooling
PI-H	Power input in heating
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

6.3 Outdoor Unit Details (SP-PDC-CL-3)

6.3.1 Outdoor Unit Details Table

Model		MV6-XMi 400T
Module		MV6-XMi 400T
Tmp-C	°C	32
RTC	kW	38,07
ATC	kW	38,54
PI-C	kW	8,65
Tmp-H	°C/°C	3/-0,4
RHC	kW	37,91
AHC	kW	37,91
PI-H	kW	8,90
CR		97,5
Airflow	m ³ /h	13000
Sound-Pr		60
Sound-Po		
Bas-Refr	kg	13,00
Ex-Refr	kg	6,13
TCO2 eq.		
MCA	A	33,1
MFA	A	40
Power supply	V/ph/Hz	380-415V
Dimension(WxHxD)	mm	1340*1635*850
Weight	kg	277

6.3.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Outdoor conditions in cooling (Dry bulb temp.)
RTC	Required cooling capacity
ATC	Available cooling capacity
PI-C	Power input in cooling
Tmp-H	Indoor conditions in heating (Dry bulb temp. / Wet bulb temp. / RH)
RHC	Required heating capacity
AHC	Available heating capacity
PI-H	Power input in heating
CR	Combination ratio
Airflow	Outdoor unit airflow
Sound-Pr	Sound pressure level
Sound-Po	Sound power level
Bas-Refr	Standard factory refrigerant charge
Ex-Refr	Extra refrigerant charge
TCO2 eq.	Tonnes of CO2 equivalent
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

6.4 Piping Limitations (SP-PDC-CL-3)

6.4.1 Piping Limitations

Item	Capability	Actual Value
Total piping length	1000,00(m)	117,00(m)
Longest actual length	175,00(m)	34,50(m)
Longest equivalent length	200,00(m)	46,50(m)
Longest equivalent length after first branch	90,00(m)	33,50(m)
Indoor unit to nearest branch length	40,00(m)	4,50(m)
Length difference between longest and shortest distance to indoor units	40,00(m)	30,50(m)
Height difference between indoor and outdoor unit(ODU up)	90,00(m)	5,00(m)
Height difference between indoor and outdoor unit(ODU down)	110,00(m)	0,00(m)
Height difference between indoor units	30,00(m)	0,00(m)
Combination ratio	50-130%	97,50%
IDU quantity	23	12

6.4.2 Correction Factors

Item	Correction factor
Altitude (indoor unit)	1,000
Altitude (outdoor unit)	1,000
Piping (cooling)	0,975
Piping (heating)	0,990
Defrost (heating)	1,000

6.4.3 Piping Details Table

No.	Length(m)	Piping diameter
(1)	10,00	Ø28.6/Ø12.7
(2)	4,00	Ø28.6/Ø12.7
(3)	3,00	Ø12.7/Ø6.35
(4)	1,00	Ø22.2/Ø9.53
(5)	5,00	Ø15.9/Ø9.53
(6)	4,00	Ø15.9/Ø9.53
(7)	4,00	Ø15.9/Ø9.53
(8)	3,00	Ø12.7/Ø6.35
(9)	4,00	Ø12.7/Ø6.35
(10)	7,00	Ø15.9/Ø9.53
(11)	1,00	Ø12.7/Ø6.35
(12)	3,00	Ø12.7/Ø6.35
(13)	4,00	Ø12.7/Ø6.35
(14)	8,00	Ø15.9/Ø9.53
(15)	1,00	Ø12.7/Ø6.35
(16)	3,00	Ø15.9/Ø9.53
(17)	2,00	Ø12.7/Ø6.35
(18)	4,50	Ø12.7/Ø6.35
(19)	1,50	Ø12.7/Ø6.35
(20)	3,00	Ø15.9/Ø9.53
(21)	4,00	Ø15.9/Ø9.53
(22)	3,00	Ø12.7/Ø6.35
(23)	4,00	Ø12.7/Ø6.35

6.4.4 Branch Joints Details Table

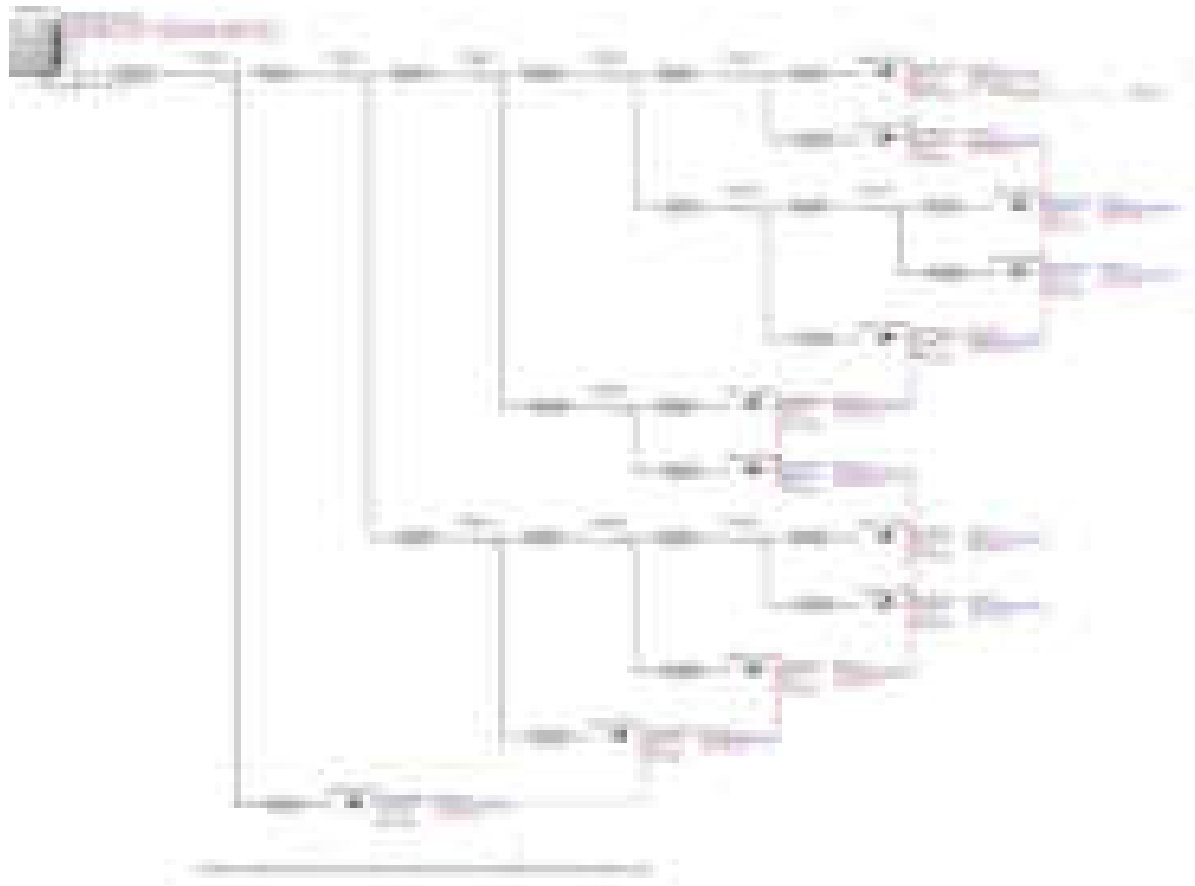
No.	Load(kW)	Model
(1)	39	FQZHN-03D
(2)	36,8	FQZHN-03D
(3)	16,6	FQZHN-01D
(4)	7,2	FQZHN-01D
(5)	9,4	FQZHN-01D
(6)	7,2	FQZHN-01D
(7)	13	FQZHN-01D
(8)	10,8	FQZHN-01D
(9)	7,2	FQZHN-01D
(10)	23,8	FQZHN-02D
(11)	7,2	FQZHN-01D

6.4.5 Reducer Details Table

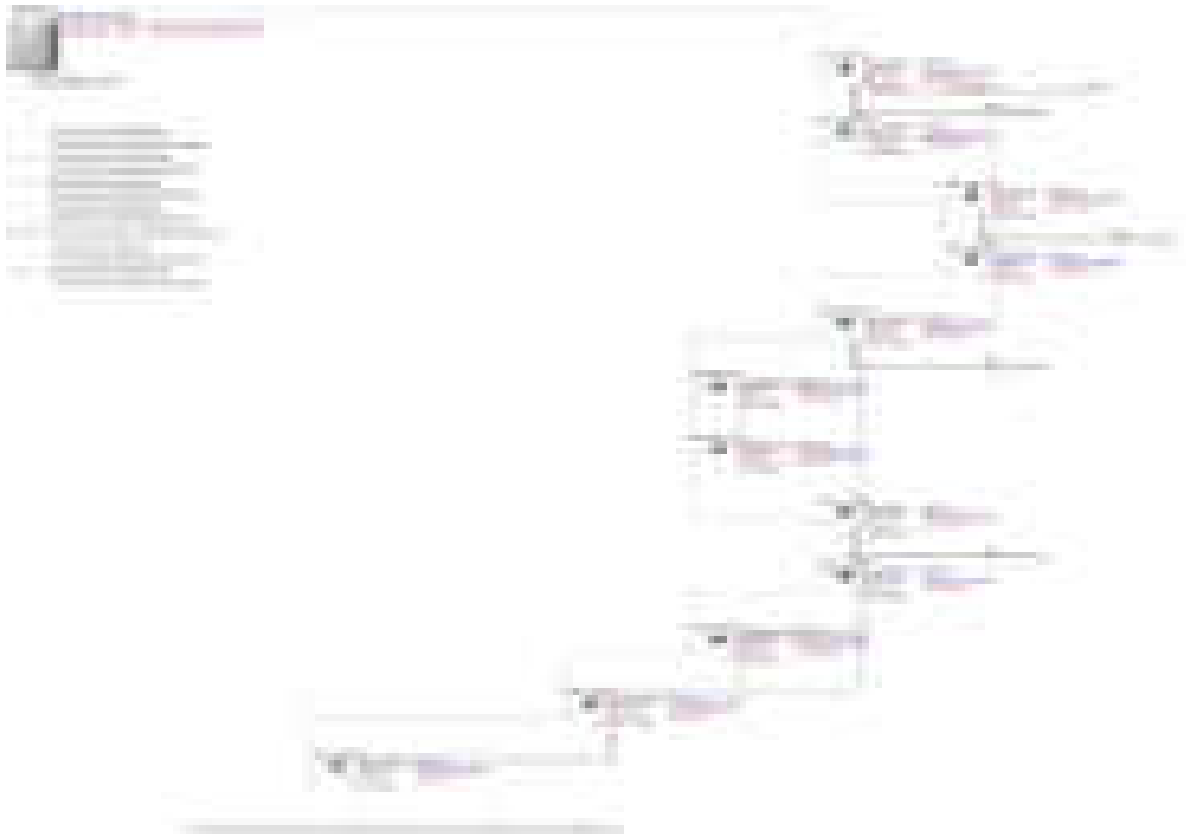
6.4.6 Bends Detailed Table

Quantity	Equivalent length(m)
49	24.5

6.5 Piping Diagrams (SP-PDC-CL-3)



6.6 Wiring Diagrams (SP-PDC-CL-3)



7. SP-PDC-CL-4

7.1 BOM List (SP-PDC-CL-4)

Model	Quantity	Unit	Description
MV6-XMi 730T	1		VRF MV6, Heat Pump Outdoor Unit
Q4AN-2-XMi D28	17		4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D22	6		4-way Cassette Compact, Indoor Unit
CNT2-2-XMi D28	4		Mid Static Pressure Duct, Indoor Unit
FQZHN-04D	1		Branch joint
FQZHN-03D	1		Branch joint
FQZHN-02D	2		Branch joint
FQZHN-01D	22		Branch joint
WDC-120G/WK	8		2nd generation group controller
CE-MBQ4-03B5	23		panel of compact four way cassette
R410A	15.87	kg	Extra Refrigerant Added
Φ6.35	73	m	Copper pipe
Φ9.53	106	m	Copper pipe
Φ12.7	74	m	Copper pipe
Φ15.9	90	m	Copper pipe
Φ19.1	5	m	Copper pipe
Φ22.2	21	m	Copper pipe
Φ28.6	1	m	Copper pipe
Φ38.1	10	m	Copper pipe

7.2 Indoor Unit Details (SP-PDC-CL-4)

7.2.1 Indoor Unit Details Table

IDU Name	Model	Weight(kg)	Dimension(WxHxD)(mm)	Power supply	MCA(A)	MFA(A)
C14/SP-C14-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C14/SP-C14-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
D11/SP-D11-1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
C13/SP-C13-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C13/SP-C13-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
D11/SP-D11-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
L3/SP-L3-3	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
L3/SP-L3-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
L3/SP-L3-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
D11/SP-D11-3	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
ATH/SP-ATH-3	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
ATH/SP-ATH-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
ATH/SP-ATH-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
INGR/SP-INGR-1	CNT2-2-XMi D28	18	780*210*500	220-240V	0,74	15
INGR/SP-INGR-2	CNT2-2-XMi D28	18	780*210*500	220-240V	0,74	15
INGR/SP-INGR-3	CNT2-2-XMi D28	18	780*210*500	220-240V	0,74	15
D11/SP-D11-5	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
D11/SP-D11-6	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
SR/SP-SR3	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15

D11/SP-D11-4	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
C16/SP-C16-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C16/SP-C16-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C17/SP-C17-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C17/SP-C17-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C15/SP-C15-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C15/SP-C15-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
INGR/SP-INGR-4	CNT2-2-XMi D28	18	780*210*500	220-240V	0,74	15

IDU Name	Model	Tmp-C(°C)	RTC(kW)	ATC(kW)	RSC(kW)	ASC(kW)	PI-C(W)	Tmp-H(°C)	RHC(kW)	AHC(kW)	PI-H(W)
C14/SP-C14-1	Q4AN-2-XMi D28	26		2,68		1,79	35	21		2,71	35
C14/SP-C14-2	Q4AN-2-XMi D28	26		2,69		1,79	35	21		2,71	35
D11/SP-D11-1	Q4AN-2-XMi D22	26		2,11		1,42	35	21		2,04	35
C13/SP-C13-1	Q4AN-2-XMi D28	26		2,65		1,77	35	21		2,71	35
C13/SP-C13-2	Q4AN-2-XMi D28	26		2,66		1,77	35	21		2,71	35
D11/SP-D11-2	Q4AN-2-XMi D28	26		2,72		1,81	35	21		2,71	35
L3/SP-L3-3	Q4AN-2-XMi D28	26		2,67		1,78	35	21		2,71	35
L3/SP-L3-2	Q4AN-2-XMi D28	26		2,65		1,77	35	21		2,71	35
L3/SP-L3-1	Q4AN-2-XMi D28	26		2,66		1,77	35	21		2,71	35
D11/SP-D11-3	Q4AN-2-XMi D22	26		2,14		1,43	35	21		2,04	35
ATH/SP-ATH-3	Q4AN-2-XMi D28	26		2,72		1,82	35	21		2,71	35
ATH/SP-ATH-2	Q4AN-2-XMi D28	26		2,71		1,81	35	21		2,71	35
ATH/SP-ATH-1	Q4AN-2-XMi D28	26		2,7		1,8	35	21		2,71	35
INGR/SP-INGR-1	CNT2-2-XMi D28	26		2,65		1,95	40	21		2,71	40
INGR/SP-INGR-2	CNT2-2-XMi D28	26		2,65		1,96	40	21		2,71	40
INGR/SP-INGR-3	CNT2-2-XMi D28	26		2,67		1,97	40	21		2,71	40
D11/SP-D11-5	Q4AN-2-XMi D22	26		2,12		1,42	35	21		2,04	35
D11/SP-D11-6	Q4AN-2-XMi D22	26		2,1		1,41	35	21		2,04	35
SR/SP-SR3	Q4AN-2-XMi D22	26		2,09		1,4	35	21		2,04	35
D11/SP-D11-4	Q4AN-2-XMi D22	26		2,1		1,41	35	21		2,04	35
C16/SP-C16-1	Q4AN-2-XMi D28	26		2,65		1,77	35	21		2,71	35

C16/SP-C16-2	Q4AN-2-XMi D28	26		2,65		1,77	35	21		2,71	35
C17/SP-C17-1	Q4AN-2-XMi D28	26		2,69		1,79	35	21		2,71	35
C17/SP-C17-2	Q4AN-2-XMi D28	26		2,69		1,79	35	21		2,71	35
C15/SP-C15-1	Q4AN-2-XMi D28	26		2,69		1,8	35	21		2,71	35
C15/SP-C15-2	Q4AN-2-XMi D28	26		2,7		1,8	35	21		2,71	35
INGR/SP-INGR-4	CNT2-2-XMi D28	26		2,69		1,98	40	21		2,71	40

IDU Name	Model	Airflow(m ³ /h)			Sound-Pr dB(A)			ESP(Pa)		
C14/SP-C14-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
C14/SP-C14-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
D11/SP-D11-1	Q4AN-2-XMi D22	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
C13/SP-C13-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
C13/SP-C13-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
D11/SP-D11-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
L3/SP-L3-3	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
L3/SP-L3-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
L3/SP-L3-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
D11/SP-D11-3	Q4AN-2-XMi D22	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
ATH/SP-ATH-3	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
ATH/SP-ATH-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
ATH/SP-ATH-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
INGR/SP-INGR-1	CNT2-2-XMi D28	520/480/440/400/360/330/300			32/31/29/28/26/25/23			10(0~70)		
INGR/SP-INGR-2	CNT2-2-XMi D28	520/480/440/400/360/330/300			32/31/29/28/26/25/23			10(0~70)		
INGR/SP-INGR-3	CNT2-2-XMi D28	520/480/440/400/360/330/300			32/31/29/28/26/25/23			10(0~70)		
D11/SP-D11-5	Q4AN-2-XMi D22	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
D11/SP-D11-6	Q4AN-2-XMi D22	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
SR/SP-SR3	Q4AN-2-XMi D22	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
D11/SP-D11-4	Q4AN-2-XMi D22	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
C16/SP-C16-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
C16/SP-C16-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
C17/SP-C17-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
C17/SP-C17-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
C15/SP-C15-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
C15/SP-C15-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238			35/34/33/29/26/23/22			0		
INGR/SP-INGR-4	CNT2-2-XMi D28	520/480/440/400/360/330/300			32/31/29/28/26/25/23			10(0~70)		

IDU Name	Model	Piping Length to 1st Y Joint(m)
C14/SP-C14-1	Q4AN-2-XMi D28	28,50
C14/SP-C14-2	Q4AN-2-XMi D28	26,50
D11/SP-D11-1	Q4AN-2-XMi D22	25,50
C13/SP-C13-1	Q4AN-2-XMi D28	37,00
C13/SP-C13-2	Q4AN-2-XMi D28	35,00
D11/SP-D11-2	Q4AN-2-XMi D28	16,00

L3/SP-L3-3	Q4AN-2-XMi D28	28,50
L3/SP-L3-2	Q4AN-2-XMi D28	34,00
L3/SP-L3-1	Q4AN-2-XMi D28	33,00
D11/SP-D11-3	Q4AN-2-XMi D22	8,00
ATH/SP-ATH-3	Q4AN-2-XMi D28	13,50
ATH/SP-ATH-2	Q4AN-2-XMi D28	18,00
ATH/SP-ATH-1	Q4AN-2-XMi D28	20,50
INGR/SP-INGR-1	CNT2-2-XMi D28	34,50
INGR/SP-INGR-2	CNT2-2-XMi D28	33,50
INGR/SP-INGR-3	CNT2-2-XMi D28	28,50
D11/SP-D11-5	Q4AN-2-XMi D22	21,50
D11/SP-D11-6	Q4AN-2-XMi D22	27,50
SR/SP-SR3	Q4AN-2-XMi D22	30,00
D11/SP-D11-4	Q4AN-2-XMi D22	28,00
C16/SP-C16-1	Q4AN-2-XMi D28	34,00
C16/SP-C16-2	Q4AN-2-XMi D28	35,00
C17/SP-C17-1	Q4AN-2-XMi D28	24,00
C17/SP-C17-2	Q4AN-2-XMi D28	25,00
C15/SP-C15-1	Q4AN-2-XMi D28	23,00
C15/SP-C15-2	Q4AN-2-XMi D28	21,00
INGR/SP-INGR-4	CNT2-2-XMi D28	24,00

7.2.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Indoor temperature in cooling (Dry bulb temp. / Wet bulb temp. / RH)
RTC	Required total cooling capacity
ATC	Available total cooling capacity
RSC	Required sensible cooling capacity
ASC	Available sensible cooling capacity
Tmp-H	Indoor temperature in heating (Dry bulb temp.)
RHC	Required heating capacity
AHC	Available heating capacity
Tdis-H	Indoor unit discharge air temperature in heating
Airflow	Indoor unit airflow (High/Medium/Low)
ESP	External static pressure
Sound-Pr	Sound pressure level (High/Medium/Low)
Sound-Po	Sound power level (High/Medium/Low)
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
PI-C	Power input in cooling
PI-H	Power input in heating
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

7.3 Outdoor Unit Details (SP-PDC-CL-4)

7.3.1 Outdoor Unit Details Table

Model		MV6-XMi 730T
Module		MV6-XMi 730T
Tmp-C	°C	32
RTC	kW	68,91
ATC	kW	70
PI-C	kW	18,61
Tmp-H	°C/°C	3/-0,4
RHC	kW	69,07
AHC	kW	69,07
PI-H	kW	19,08
CR		98,6
Airflow	m ³ /h	25000
Sound-Pr		64
Sound-Po		
Bas-Refr	kg	22,00
Ex-Refr	kg	15,87
TCO2 eq.		
MCA	A	52,9
MFA	A	63
Power supply	V/ph/Hz	380-415V
Dimension(WxHxD)	mm	1730*1830*850
Weight	kg	430

7.3.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Outdoor conditions in cooling (Dry bulb temp.)
RTC	Required cooling capacity
ATC	Available cooling capacity
PI-C	Power input in cooling
Tmp-H	Indoor conditions in heating (Dry bulb temp. / Wet bulb temp. / RH)
RHC	Required heating capacity
AHC	Available heating capacity
PI-H	Power input in heating
CR	Combination ratio
Airflow	Outdoor unit airflow
Sound-Pr	Sound pressure level
Sound-Po	Sound power level
Bas-Refr	Standard factory refrigerant charge
Ex-Refr	Extra refrigerant charge
TCO2 eq.	Tonnes of CO2 equivalent
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

7.4 Piping Limitations (SP-PDC-CL-4)

7.4.1 Piping Limitations

Item	Capability	Actual Value
Total piping length	1000,00(m)	266,50(m)
Longest actual length	175,00(m)	36,00(m)
Longest equivalent length	200,00(m)	51,00(m)
Longest equivalent length after first branch	90,00(m)	37,00(m)
Indoor unit to nearest branch length	40,00(m)	5,00(m)
Length difference between longest and shortest distance to indoor units	40,00(m)	29,00(m)
Height difference between indoor and outdoor unit(ODU up)	90,00(m)	6,00(m)
Height difference between indoor and outdoor unit(ODU down)	110,00(m)	0,00(m)
Height difference between indoor units	30,00(m)	0,00(m)
Combination ratio	50-130%	98,63%
IDU quantity	43	27

7.4.2 Correction Factors

Item	Correction factor
Altitude (indoor unit)	1,000
Altitude (outdoor unit)	1,000
Piping (cooling)	0,973
Piping (heating)	0,989
Defrost (heating)	1,000

7.4.3 Piping Details Table

No.	Length(m)	Piping diameter
(1)	10,00	Φ38.1/Φ22.2
(2)	1,00	Φ28.6/Φ12.7
(3)	7,00	Φ22.2/Φ9.53
(4)	4,00	Φ22.2/Φ9.53
(5)	2,00	Φ15.9/Φ9.53
(6)	2,00	Φ19.1/Φ9.53
(7)	5,00	Φ15.9/Φ9.53
(8)	4,00	Φ15.9/Φ9.53
(9)	6,00	Φ15.9/Φ9.53
(10)	5,00	Φ12.7/Φ6.35
(11)	3,00	Φ12.7/Φ6.35
(12)	1,00	Φ12.7/Φ6.35
(13)	5,00	Φ15.9/Φ9.53
(14)	5,00	Φ12.7/Φ6.35
(15)	3,00	Φ12.7/Φ6.35
(16)	1,00	Φ12.7/Φ6.35
(17)	10,00	Φ15.9/Φ9.53
(18)	1,00	Φ12.7/Φ6.35
(19)	3,00	Φ15.9/Φ9.53
(20)	2,00	Φ12.7/Φ6.35
(21)	1,00	Φ12.7/Φ6.35
(22)	2,00	Φ12.7/Φ6.35
(23)	4,00	Φ15.9/Φ9.53
(24)	2,00	Φ12.7/Φ6.35
(25)	3,00	Φ15.9/Φ9.53

(26)	2,00	Ø12.7/Ø6.35
(27)	4,00	Ø12.7/Ø6.35
(28)	3,00	Ø19.1/Ø9.53
(29)	4,00	Ø15.9/Ø9.53
(30)	5,00	Ø15.9/Ø9.53
(31)	3,00	Ø15.9/Ø9.53
(32)	5,00	Ø15.9/Ø9.53
(33)	3,00	Ø12.7/Ø6.35
(34)	3,00	Ø12.7/Ø6.35
(35)	2,00	Ø12.7/Ø6.35
(36)	2,00	Ø12.7/Ø6.35
(37)	7,00	Ø15.9/Ø9.53
(38)	1,00	Ø12.7/Ø6.35
(39)	4,00	Ø12.7/Ø6.35
(40)	8,00	Ø15.9/Ø9.53
(41)	3,00	Ø15.9/Ø9.53
(42)	2,00	Ø12.7/Ø6.35
(43)	3,00	Ø15.9/Ø9.53
(44)	3,00	Ø12.7/Ø6.35
(45)	4,00	Ø12.7/Ø6.35
(46)	3,00	Ø12.7/Ø6.35
(47)	4,00	Ø12.7/Ø6.35
(48)	3,00	Ø15.9/Ø9.53
(49)	4,00	Ø15.9/Ø9.53
(50)	5,00	Ø12.7/Ø6.35
(51)	3,00	Ø12.7/Ø6.35
(52)	3,00	Ø15.9/Ø9.53
(53)	2,00	Ø12.7/Ø6.35

7.4.4 Branch Joints Details Table

No.	Load(kW)	Model
(1)	72	FQZHN-04D
(2)	40,8	FQZHN-03D
(3)	30,2	FQZHN-02D
(4)	13,4	FQZHN-01D
(5)	5,6	FQZHN-01D
(6)	7,8	FQZHN-01D
(7)	5,6	FQZHN-01D
(8)	11,2	FQZHN-01D
(9)	8,4	FQZHN-01D
(10)	5,6	FQZHN-01D
(11)	10,6	FQZHN-01D
(12)	8,4	FQZHN-01D
(13)	5,6	FQZHN-01D
(14)	31,2	FQZHN-02D
(15)	17,8	FQZHN-01D
(16)	8,4	FQZHN-01D
(17)	5,6	FQZHN-01D
(18)	6,6	FQZHN-01D

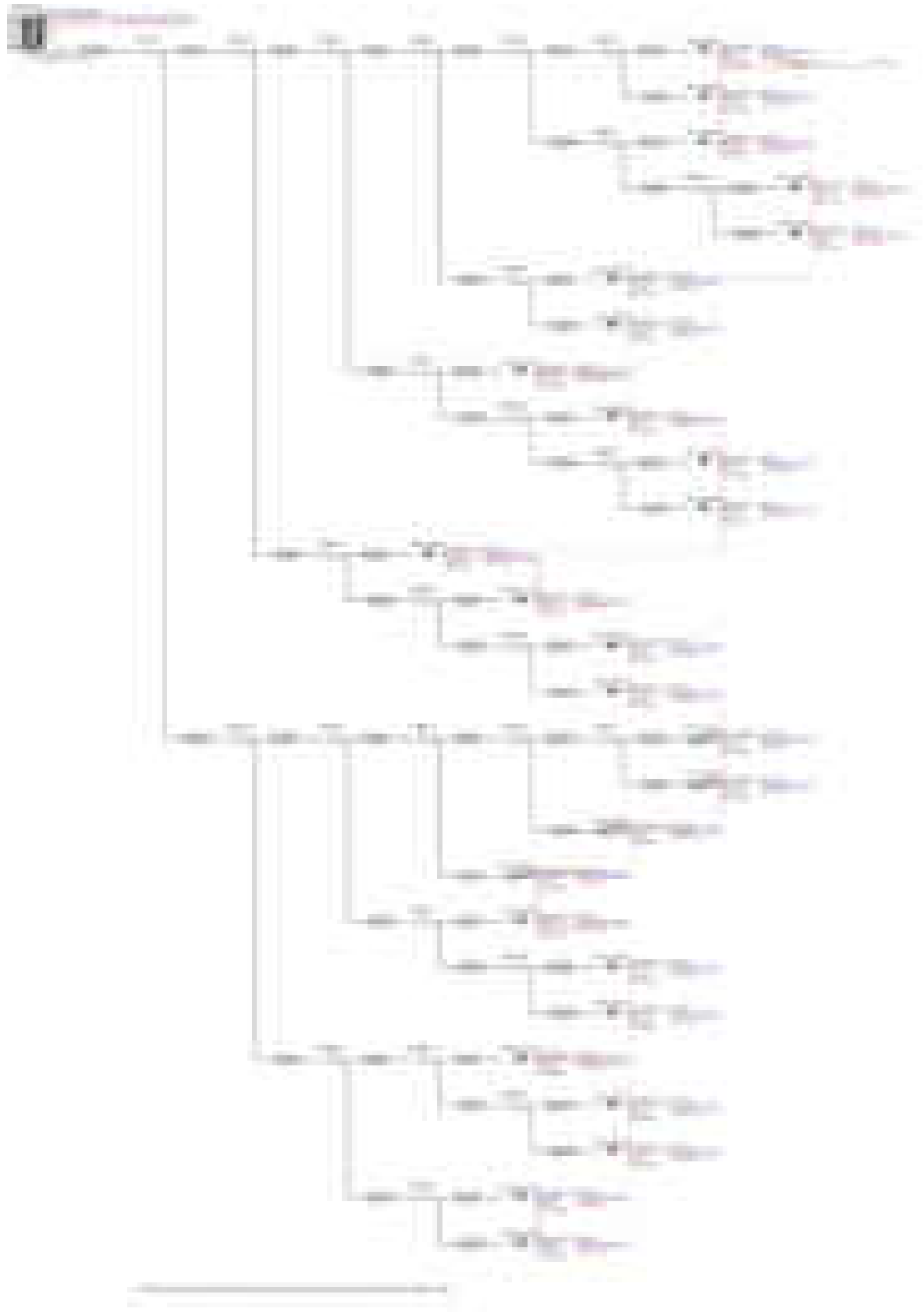
(19)	4,4	FQZHN-01D
(20)	13,4	FQZHN-01D
(21)	7,8	FQZHN-01D
(22)	5,6	FQZHN-01D
(23)	5,6	FQZHN-01D
(24)	19	FQZHN-01D
(25)	5,6	FQZHN-01D
(26)	11,2	FQZHN-01D

7.4.5 Reducer Details Table

7.4.6 Bends Detailed Table

Quantity	Equivalent length(m)
127	63.5

7.5 Piping Diagrams (SP-PDC-CL-4)



7.6 Wiring Diagrams (SP-PDC-CL-4)



8. SP-PDC-CL-5

8.1 BOM List (SP-PDC-CL-5)

Model	Quantity	Unit	Description
MV6-XMi 615T	1		VRF MV6, Heat Pump Outdoor Unit
Q4AN-2-XMi D28	11		4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D36	6		4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D22	4		4-way Cassette Compact, Indoor Unit
FQZHN-03D	2		Branch joint
FQZHN-02D	3		Branch joint
FQZHN-01D	15		Branch joint
WDC-120G/WK	8		2nd generation group controller
CE-MBQ4-03B5	21		panel of compact four way cassette
Φ28.6<->Φ31.8	29		Reducer
Φ31.8<->Φ34.9	29		Reducer
Φ34.9<->Φ38.1	29		Reducer
Φ38.1<->Φ41.3	29		Reducer
Φ41.3<->Φ44.5	29		Reducer
Φ44.5<->Φ50.8	29		Reducer
Φ15.9<->Φ19.1	30		Reducer
Φ19.1<->Φ22.2	33		Reducer
Φ9.53<->Φ12.7	27		Reducer
Φ12.7<->Φ15.9	27		Reducer
Φ22.2<->Φ25.4	28		Reducer
Φ25.4<->Φ28.6	28		Reducer
R410A	20.02	kg	Extra Refrigerant Added
Φ6.35	58.5	m	Copper pipe
Φ12.7	129	m	Copper pipe
Φ19.1	76.5	m	Copper pipe
Φ22.2	9	m	Copper pipe
Φ25.4	12	m	Copper pipe
Φ31.8	27	m	Copper pipe

8.2 Indoor Unit Details (SP-PDC-CL-5)

8.2.1 Indoor Unit Details Table

IDU Name	Model	Weight(kg)	Dimension(WxHxD)(mm)	Power supply	MCA(A)	MFA(A)
C20/SP-C20-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C20/SP-C20-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C18/SP-C18-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C18/SP-C18-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
D12/SP-D12-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C21/SP-C21-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C21/SP-C21-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C19/SP-C19-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C19/SP-C19-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
PAL/SP-PAL-1	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15

PAL/SP-PAL-2	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
PAL/SP-PAL-4	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
PAL/SP-PAL-3	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
PAL/SP-PAL-6	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
PAL/SP-PAL-6	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
D12/SP-D12-1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
SR4/SP-SR4	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
C25/SP-C25-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C25/SP-C25-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
AM/SP-AM-2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
AM/SP-AM-1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15

IDU Name	Model	Tmp-C(°C)	RTC(kW)	ATC(kW)	RSC(kW)	ASC(kW)	PI-C(W)	Tmp-H(°C)	RHC(kW)	AHC(kW)	PI-H(W)
C20/SP-C20-1	Q4AN-2-XMi D28	26		2,6		1,73	35	21		2,69	35
C20/SP-C20-2	Q4AN-2-XMi D28	26		2,59		1,73	35	21		2,69	35
C18/SP-C18-1	Q4AN-2-XMi D28	26		2,58		1,72	35	21		2,69	35
C18/SP-C18-2	Q4AN-2-XMi D28	26		2,59		1,73	35	21		2,69	35
D12/SP-D12-2	Q4AN-2-XMi D28	26		2,62		1,75	35	21		2,69	35
C21/SP-C21-1	Q4AN-2-XMi D28	26		2,63		1,75	35	21		2,69	35
C21/SP-C21-2	Q4AN-2-XMi D28	26		2,62		1,75	35	21		2,69	35
C19/SP-C19-1	Q4AN-2-XMi D28	26		2,61		1,74	35	21		2,69	35
C19/SP-C19-2	Q4AN-2-XMi D28	26		2,62		1,75	35	21		2,69	35
PAL/SP-PAL-1	Q4AN-2-XMi D36	26		3,27		2,14	40	21		3,36	40
PAL/SP-PAL-2	Q4AN-2-XMi D36	26		3,29		2,15	40	21		3,36	40
PAL/SP-PAL-4	Q4AN-2-XMi D36	26		3,31		2,17	40	21		3,36	40
PAL/SP-PAL-3	Q4AN-2-XMi D36	26		3,29		2,16	40	21		3,36	40
PAL/SP-PAL-6	Q4AN-2-XMi D36	26		3,33		2,18	40	21		3,36	40
PAL/SP-PAL-6	Q4AN-2-XMi D36	26		3,32		2,17	40	21		3,36	40
D12/SP-D12-1	Q4AN-2-XMi D22	26		2,07		1,38	35	21		2,02	35
SR4/SP-SR4	Q4AN-2-XMi D22	26		2,08		1,4	35	21		2,02	35
C25/SP-C25-1	Q4AN-2-XMi D28	26		2,63		1,75	35	21		2,69	35
C25/SP-C25-2	Q4AN-2-XMi D28	26		2,63		1,75	35	21		2,69	35
AM/SP-AM-	Q4AN-2-XMi	26		2,06		1,38	35	21		2,02	35

2	D22										
AM/SP-AM-1	Q4AN-2-XMi D22	26		2,07		1,39	35	21		2,02	35

IDU Name	Model	Airflow(m ³ /h)	Sound-Pr dB(A)	ESP(Pa)
C20/SP-C20-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C20/SP-C20-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C18/SP-C18-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C18/SP-C18-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D12/SP-D12-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C21/SP-C21-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C21/SP-C21-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C19/SP-C19-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C19/SP-C19-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
PAL/SP-PAL-1	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
PAL/SP-PAL-2	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
PAL/SP-PAL-4	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
PAL/SP-PAL-3	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
PAL/SP-PAL-6	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
PAL/SP-PAL-6	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
D12/SP-D12-1	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SR4/SP-SR4	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C25/SP-C25-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C25/SP-C25-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
AM/SP-AM-2	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
AM/SP-AM-1	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0

IDU Name	Model	Piping Length to 1st Y Joint(m)
C20/SP-C20-1	Q4AN-2-XMi D28	30,50
C20/SP-C20-2	Q4AN-2-XMi D28	32,50
C18/SP-C18-1	Q4AN-2-XMi D28	34,00
C18/SP-C18-2	Q4AN-2-XMi D28	32,00
D12/SP-D12-2	Q4AN-2-XMi D28	23,50
C21/SP-C21-1	Q4AN-2-XMi D28	21,50
C21/SP-C21-2	Q4AN-2-XMi D28	22,50
C19/SP-C19-1	Q4AN-2-XMi D28	24,50
C19/SP-C19-2	Q4AN-2-XMi D28	22,50
PAL/SP-PAL-1	Q4AN-2-XMi D36	43,00
PAL/SP-PAL-2	Q4AN-2-XMi D36	40,50
PAL/SP-PAL-4	Q4AN-2-XMi D36	36,00
PAL/SP-PAL-3	Q4AN-2-XMi D36	39,00
PAL/SP-PAL-6	Q4AN-2-XMi D36	31,00
PAL/SP-PAL-6	Q4AN-2-XMi D36	33,00
D12/SP-D12-1	Q4AN-2-XMi D22	19,00
SR4/SP-SR4	Q4AN-2-XMi D22	7,50
C25/SP-C25-1	Q4AN-2-XMi D28	17,50
C25/SP-C25-2	Q4AN-2-XMi D28	18,00
AM/SP-AM-2	Q4AN-2-XMi D22	20,50

AM/SP-AM-1	Q4AN-2-XMi D22	18,00
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8.2.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Indoor temperature in cooling (Dry bulb temp. / Wet bulb temp. / RH)
RTC	Required total cooling capacity
ATC	Available total cooling capacity
RSC	Required sensible cooling capacity
ASC	Available sensible cooling capacity
Tmp-H	Indoor temperature in heating (Dry bulb temp.)
RHC	Required heating capacity
AHC	Available heating capacity
Tdis-H	Indoor unit discharge air temperature in heating
Airflow	Indoor unit airflow (High/Medium/Low)
ESP	External static pressure
Sound-Pr	Sound pressure level (High/Medium/Low)
Sound-Po	Sound power level (High/Medium/Low)
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
PI-C	Power input in cooling
PI-H	Power input in heating
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

8.3 Outdoor Unit Details (SP-PDC-CL-5)

8.3.1 Outdoor Unit Details Table

Model		MV6-XMi 615T
Module		MV6-XMi 615T
Tmp-C	°C	32
RTC	kW	56,79
ATC	kW	57,96
PI-C	kW	16,60
Tmp-H	°C/°C	3/-0,4
RHC	kW	57,82
AHC	kW	57,82
PI-H	kW	15,89
CR		99,5
Airflow	m ³ /h	17000
Sound-Pr		63
Sound-Po		
Bas-Refr	kg	17,00
Ex-Refr	kg	20,02
TCO2 eq.		
MCA	A	47,9

MFA	A	63
Power supply	V/ph/Hz	380-415V
Dimension(WxHxD)	mm	1340*1635*825
Weight	kg	348

8.3.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Outdoor conditions in cooling (Dry bulb temp.)
RTC	Required cooling capacity
ATC	Available cooling capacity
PI-C	Power input in cooling
Tmp-H	Indoor conditions in heating (Dry bulb temp. / Wet bulb temp. / RH)
RHC	Required heating capacity
AHC	Available heating capacity
PI-H	Power input in heating
CR	Combination ratio
Airflow	Outdoor unit airflow
Sound-Pr	Sound pressure level
Sound-Po	Sound power level
Bas-Refr	Standard factory refrigerant charge
Ex-Refr	Extra refrigerant charge
TCO2 eq.	Tonnes of CO2 equivalent
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

8.4 Piping Limitations (SP-PDC-CL-5)

8.4.1 Piping Limitations

Item	Capability	Actual Value
Total piping length	1000,00(m)	208,50(m)
Longest actual length	175,00(m)	56,00(m)
Longest equivalent length	200,00(m)	68,50(m)
Longest equivalent length after first branch	90,00(m)	43,00(m)
Indoor unit to nearest branch length	40,00(m)	5,00(m)
Length difference between longest and shortest distance to indoor units	40,00(m)	35,50(m)
Height difference between indoor and outdoor unit(ODU up)	90,00(m)	6,00(m)
Height difference between indoor and outdoor unit(ODU down)	110,00(m)	0,00(m)
Height difference between indoor units	30,00(m)	0,00(m)
Combination ratio	50-130%	99,51%
IDU quantity	36	21

8.4.2 Correction Factors

Item	Correction factor
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Altitude (indoor unit)	1,000
Altitude (outdoor unit)	1,000
Piping (cooling)	0,954
Piping (heating)	0,982
Defrost (heating)	1,000

8.4.3 Piping Details Table

No.	Length(m)	Piping diameter
(1)	22,00	Φ31.8/Φ19.1
(2)	5,00	Φ31.8/Φ19.1
(3)	4,00	Φ19.1/Φ12.7
(4)	0,50	Φ22.2/Φ12.7
(5)	6,00	Φ19.1/Φ12.7
(6)	3,00	Φ25.4/Φ12.7
(7)	5,00	Φ25.4/Φ12.7
(8)	3,00	Φ12.7/Φ6.35
(9)	5,00	Φ12.7/Φ6.35
(10)	3,00	Φ19.1/Φ12.7
(11)	5,00	Φ19.1/Φ12.7
(12)	1,00	Φ19.1/Φ12.7
(13)	2,00	Φ12.7/Φ6.35
(14)	7,00	Φ19.1/Φ12.7
(15)	4,00	Φ19.1/Φ12.7
(16)	5,00	Φ12.7/Φ6.35
(17)	3,00	Φ12.7/Φ6.35
(18)	3,00	Φ12.7/Φ6.35
(19)	4,00	Φ12.7/Φ6.35
(20)	5,00	Φ12.7/Φ6.35
(21)	3,00	Φ12.7/Φ6.35
(22)	4,00	Φ25.4/Φ12.7
(23)	3,00	Φ19.1/Φ12.7
(24)	8,00	Φ22.2/Φ12.7
(25)	1,00	Φ12.7/Φ6.35
(26)	0,50	Φ22.2/Φ12.7
(27)	4,00	Φ12.7/Φ6.35
(28)	4,00	Φ19.1/Φ12.7
(29)	1,00	Φ12.7/Φ6.35
(30)	0,50	Φ19.1/Φ12.7
(31)	4,00	Φ12.7/Φ6.35
(32)	3,00	Φ19.1/Φ12.7
(33)	0,50	Φ12.7/Φ6.35
(34)	4,00	Φ12.7/Φ6.35
(35)	1,00	Φ12.7/Φ6.35
(36)	2,00	Φ12.7/Φ6.35
(37)	9,00	Φ19.1/Φ12.7
(38)	2,00	Φ12.7/Φ6.35
(39)	2,00	Φ12.7/Φ6.35
(40)	1,00	Φ12.7/Φ6.35
(41)	3,00	Φ12.7/Φ6.35

8.4.4 Branch Joints Details Table

No.	Load(kW)	Model
(1)	61,2	FQZHN-03D
(2)	25,2	FQZHN-02D
(3)	53,4	FQZHN-03D
(4)	5,6	FQZHN-01D
(5)	11,2	FQZHN-01D
(6)	14	FQZHN-01D
(7)	19,6	FQZHN-01D
(8)	5,6	FQZHN-01D
(9)	5,6	FQZHN-01D
(10)	5,6	FQZHN-01D
(11)	28,2	FQZHN-02D
(12)	23,8	FQZHN-02D
(13)	21,6	FQZHN-01D
(14)	18	FQZHN-01D
(15)	14,4	FQZHN-01D
(16)	10,8	FQZHN-01D
(17)	7,2	FQZHN-01D
(18)	7,8	FQZHN-01D
(19)	5,6	FQZHN-01D
(20)	4,4	FQZHN-01D

8.4.5 Reducer Details Table

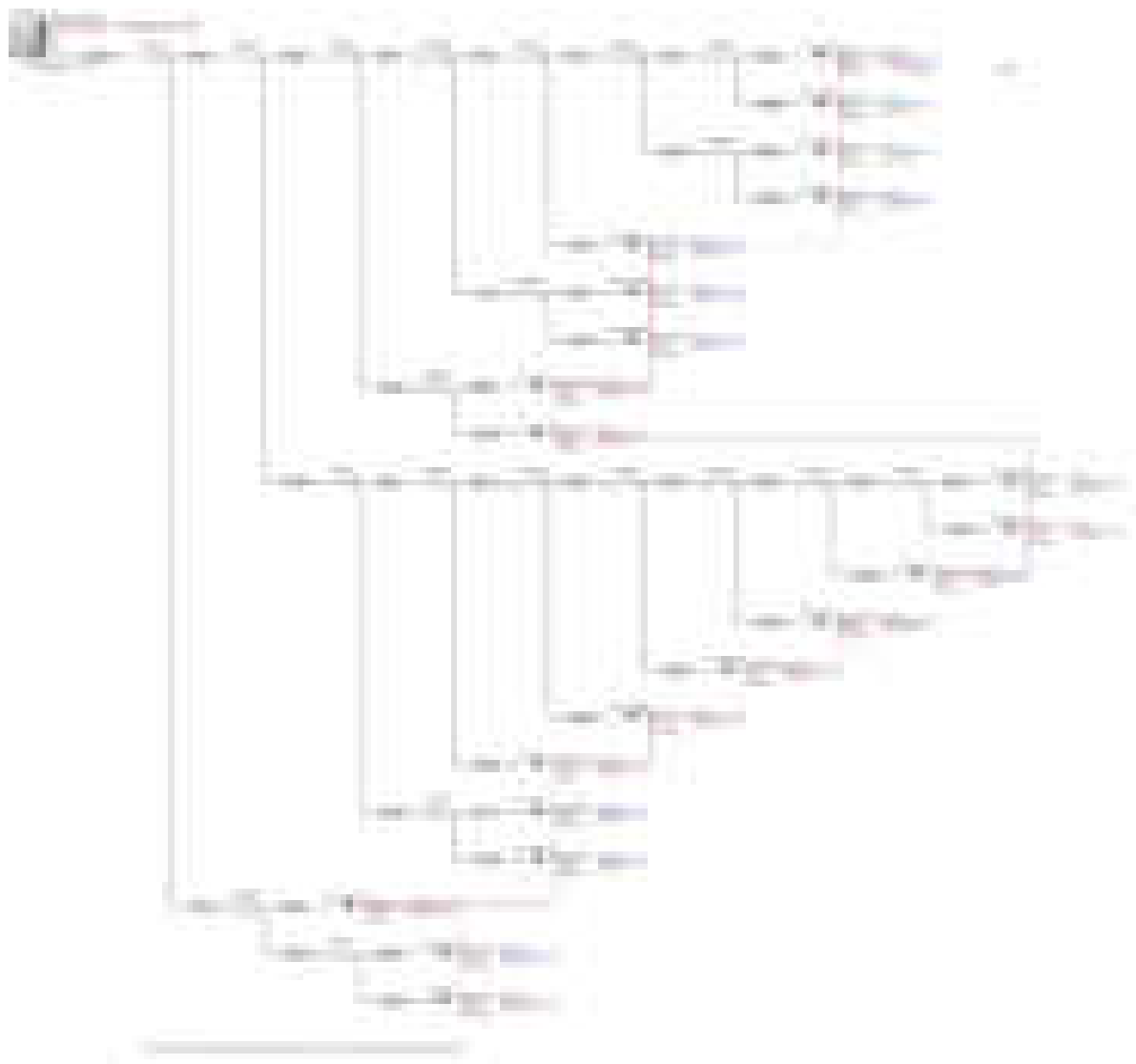
Reducer Name	Description
J1-G1	$\Phi 28.6 < - > \Phi 31.8 + \Phi 31.8 < - > \Phi 34.9 + \Phi 34.9 < - > \Phi 38.1 + \Phi 38.1 < - > \Phi 41.3 + \Phi 41.3 < - > \Phi 44.5 + \Phi 44.5 < - > \Phi 50.8$
J1-L1	$\Phi 15.9 < - > \Phi 19.1$
J2-G1	$\Phi 19.1 < - > \Phi 22.2$
J2-L1	$\Phi 9.53 < - > \Phi 12.7 + \Phi 12.7 < - > \Phi 15.9 + \Phi 15.9 < - > \Phi 19.1 + \Phi 19.1 < - > \Phi 22.2 + \Phi 22.2 < - > \Phi 25.4 + \Phi 25.4 < - > \Phi 28.6 + \Phi 28.6 < - > \Phi 31.8 + \Phi 31.8 < - > \Phi 34.9 + \Phi 34.9 < - > \Phi 38.1 + \Phi 38.1 < - > \Phi 41.3 + \Phi 41.3 < - > \Phi 44.5 + \Phi 44.5 < - > \Phi 50.8$
J4-L1	$\Phi 9.53 < - > \Phi 12.7 + \Phi 12.7 < - > \Phi 15.9 + \Phi 15.9 < - > \Phi 19.1 + \Phi 19.1 < - > \Phi 22.2 + \Phi 22.2 < - > \Phi 25.4 + \Phi 25.4 < - > \Phi 28.6 + \Phi 28.6 < - > \Phi 31.8 + \Phi 31.8 < - > \Phi 34.9 + \Phi 34.9 < - > \Phi 38.1 + \Phi 38.1 < - > \Phi 41.3 + \Phi 41.3 < - > \Phi 44.5 + \Phi 44.5 < - > \Phi 50.8$
J5-L1	$\Phi 9.53 < - > \Phi 12.7 + \Phi 12.7 < - > \Phi 15.9 + \Phi 15.9 < - > \Phi 19.1 + \Phi 19.1 < - > \Phi 22.2 + \Phi 22.2 < - > \Phi 25.4 + \Phi 25.4 < - > \Phi 28.6 + \Phi 28.6 < - > \Phi 31.8 + \Phi 31.8 < - > \Phi 34.9 + \Phi 34.9 < - > \Phi 38.1 + \Phi 38.1 < - > \Phi 41.3 + \Phi 41.3 < - > \Phi 44.5 + \Phi 44.5 < - > \Phi 50.8$
J5-G1	$\Phi 15.9 < - > \Phi 19.1$
J5-L2	$\Phi 9.53 < - > \Phi 12.7 + \Phi 12.7 < - > \Phi 15.9 + \Phi 15.9 < - > \Phi 19.1 + \Phi 19.1 < - > \Phi 22.2 + \Phi 22.2 < - > \Phi 25.4 + \Phi 25.4 < - > \Phi 28.6 + \Phi 28.6 < - > \Phi 31.8 + \Phi 31.8 < - > \Phi 34.9 + \Phi 34.9 < - > \Phi 38.1 + \Phi 38.1 < - > \Phi 41.3 + \Phi 41.3 < - > \Phi 44.5 + \Phi 44.5 < - > \Phi 50.8$
J5-L3	$\Phi 9.53 < - > \Phi 12.7 + \Phi 12.7 < - > \Phi 15.9 + \Phi 15.9 < - > \Phi 19.1 + \Phi 19.1 < - > \Phi 22.2 + \Phi 22.2 < - > \Phi 25.4 + \Phi 25.4 < - > \Phi 28.6 + \Phi 28.6 < - > \Phi 31.8 + \Phi 31.8 < - > \Phi 34.9 + \Phi 34.9 < - > \Phi 38.1 + \Phi 38.1 < - > \Phi 41.3 + \Phi 41.3 < - > \Phi 44.5 + \Phi 44.5 < - > \Phi 50.8$
J6-L1	$\Phi 9.53 < - > \Phi 12.7 + \Phi 12.7 < - > \Phi 15.9 + \Phi 15.9 < - > \Phi 19.1 + \Phi 19.1 < - > \Phi 22.2 + \Phi 22.2 < - > \Phi 25.4 + \Phi 25.4 < - > \Phi 28.6 + \Phi 28.6 < - > \Phi 31.8 + \Phi 31.8 < - > \Phi 34.9 + \Phi 34.9 < - > \Phi 38.1 + \Phi 38.1 < - > \Phi 41.3 + \Phi 41.3 < - > \Phi 44.5 + \Phi 44.5 < - > \Phi 50.8$
J6-L2	$\Phi 9.53 < - > \Phi 12.7 + \Phi 12.7 < - > \Phi 15.9 + \Phi 15.9 < - > \Phi 19.1 + \Phi 19.1 < - > \Phi 22.2 + \Phi 22.2 < - > \Phi 25.4 + \Phi 25.4 < - > \Phi 28.6 + \Phi 28.6 < - > \Phi 31.8 + \Phi 31.8 < - > \Phi 34.9 + \Phi 34.9 < - > \Phi 38.1 + \Phi 38.1 < - > \Phi 41.3 + \Phi 41.3 < - > \Phi 44.5 + \Phi 44.5 < - > \Phi 50.8$

J18-L1	$\Phi 9.53 < - > \Phi 12.7 + \Phi 12.7 < - > \Phi 15.9 + \Phi 15.9 < - > \Phi 19.1 + \Phi 19.1 < - > \Phi 22.2 + \Phi 22.2 < - > \Phi 25.4 + \Phi 25.4 < - > \Phi 28.6 + \Phi 28.6 < - > \Phi 31.8 + \Phi 31.8 < - > \Phi 34.9 + \Phi 34.9 < - > \Phi 38.1 + \Phi 38.1 < - > \Phi 41.3 + \Phi 41.3 < - > \Phi 44.5 + \Phi 44.5 < - > \Phi 50.8$
J18-L2	$\Phi 9.53 < - > \Phi 12.7 + \Phi 12.7 < - > \Phi 15.9 + \Phi 15.9 < - > \Phi 19.1 + \Phi 19.1 < - > \Phi 22.2 + \Phi 22.2 < - > \Phi 25.4 + \Phi 25.4 < - > \Phi 28.6 + \Phi 28.6 < - > \Phi 31.8 + \Phi 31.8 < - > \Phi 34.9 + \Phi 34.9 < - > \Phi 38.1 + \Phi 38.1 < - > \Phi 41.3 + \Phi 41.3 < - > \Phi 44.5 + \Phi 44.5 < - > \Phi 50.8$
J19-L1	$\Phi 9.53 < - > \Phi 12.7 + \Phi 12.7 < - > \Phi 15.9 + \Phi 15.9 < - > \Phi 19.1 + \Phi 19.1 < - > \Phi 22.2 + \Phi 22.2 < - > \Phi 25.4 + \Phi 25.4 < - > \Phi 28.6 + \Phi 28.6 < - > \Phi 31.8 + \Phi 31.8 < - > \Phi 34.9 + \Phi 34.9 < - > \Phi 38.1 + \Phi 38.1 < - > \Phi 41.3 + \Phi 41.3 < - > \Phi 44.5 + \Phi 44.5 < - > \Phi 50.8$
J20-L1	$\Phi 9.53 < - > \Phi 12.7 + \Phi 12.7 < - > \Phi 15.9 + \Phi 15.9 < - > \Phi 19.1 + \Phi 19.1 < - > \Phi 22.2 + \Phi 22.2 < - > \Phi 25.4 + \Phi 25.4 < - > \Phi 28.6 + \Phi 28.6 < - > \Phi 31.8 + \Phi 31.8 < - > \Phi 34.9 + \Phi 34.9 < - > \Phi 38.1 + \Phi 38.1 < - > \Phi 41.3 + \Phi 41.3 < - > \Phi 44.5 + \Phi 44.5 < - > \Phi 50.8$

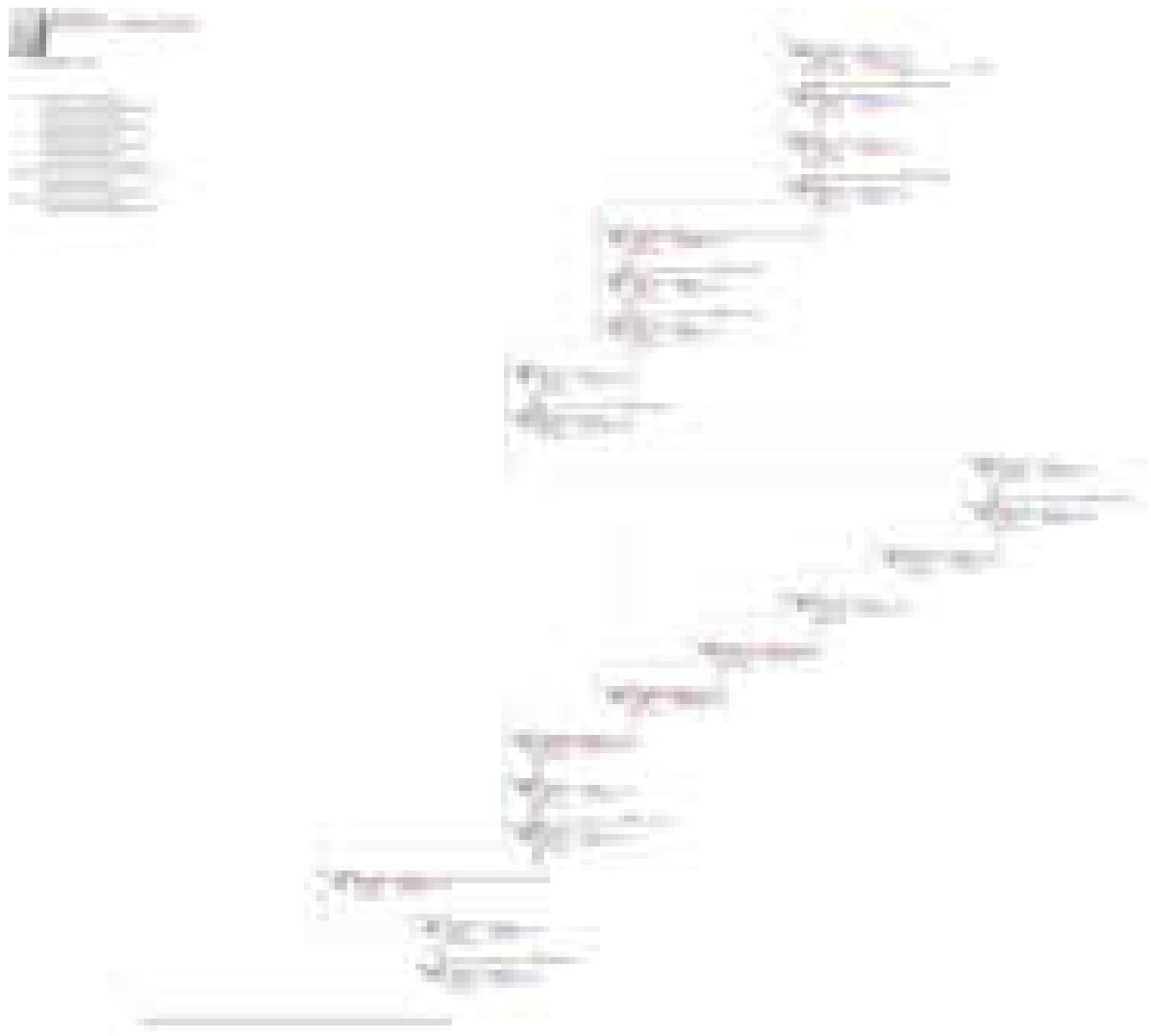
8.4.6 Bends Detailed Table

Quantity	Equivalent length(m)
85	42.5

8.5 Piping Diagrams (SP-PDC-CL-5)



8.6 Wiring Diagrams (SP-PDC-CL-5)



9. SP-PDC-CL-6

9.1 BOM List (SP-PDC-CL-6)

Model	Quantity	Unit	Description
MV6-XMi 400T	1		VRF MV6, Heat Pump Outdoor Unit
Q4AN-2-XMi D36	9		4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D22	3		4-way Cassette Compact, Indoor Unit
FQZHN-03D	2		Branch joint
FQZHN-01D	8		Branch joint
FQZHN-02D	1		Branch joint
WDC-120G/WK	5		2nd generation group controller
CE-MBQ4-03B5	12		panel of compact four way cassette
R410A	7.24	kg	Extra Refrigerant Added
Φ6.35	39	m	Copper pipe
Φ9.53	39	m	Copper pipe
Φ12.7	43	m	Copper pipe
Φ15.9	48	m	Copper pipe
Φ22.2	1	m	Copper pipe
Φ28.6	14	m	Copper pipe

9.2 Indoor Unit Details (SP-PDC-CL-6)

9.2.1 Indoor Unit Details Table

IDU Name	Model	Weight(kg)	Dimension(WxHxD)(mm)	Power supply	MCA(A)	MFA(A)
C23/SP-C23-1	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
C23/SP-C23-2	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
C22/SP-C22-1	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
C22/SP-C22-2	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
D13/SP-D13-1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
D13/SP-D13-2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
L4/SP-L4-1	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
L4/SP-L4-2	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
L4/SP-L4-3	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
D12/SP-D12-3	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
C24/SP-C24-1	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
C24/SP-C24-2	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15

IDU Name	Model	Tmp-C(°C)	RTC(kW)	ATC(kW)	RSC(kW)	ASC(kW)	PI-C(W)	Tmp-H(°C)	RHC(kW)	AHC(kW)	PI-H(W)
C23/SP-C23-1	Q4AN-2-XMi D36	26		3,2		1,98	40	21		3,19	40
C23/SP-C23-2	Q4AN-2-XMi D36	26		3,55		2,32	40	21		3,54	40
C22/SP-C22-1	Q4AN-2-XMi D36	26		3,51		2,3	40	21		3,54	40
C22/SP-	Q4AN-2-XMi	26		3,5		2,3	40	21		3,54	40

C22-2	D36										
D13/SP-D13-1	Q4AN-2-XMi D22	26		2,17		1,45	35	21		2,13	35
D13/SP-D13-2	Q4AN-2-XMi D22	26		2,19		1,47	35	21		2,13	35
L4/SP-L4-1	Q4AN-2-XMi D36	26		3,49		2,29	40	21		3,54	40
L4/SP-L4-2	Q4AN-2-XMi D36	26		3,51		2,3	40	21		3,54	40
L4/SP-L4-3	Q4AN-2-XMi D36	26		3,53		2,31	40	21		3,54	40
D12/SP-D12-3	Q4AN-2-XMi D22	26		2,19		1,47	35	21		2,13	35
C24/SP-C24-1	Q4AN-2-XMi D36	26		3,57		2,34	40	21		3,54	40
C24/SP-C24-2	Q4AN-2-XMi D36	26		3,56		2,33	40	21		3,54	40

IDU Name	Model	Airflow(m ³ /h)	Sound-Pr dB(A)	ESP(Pa)
C23/SP-C23-1	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
C23/SP-C23-2	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
C22/SP-C22-1	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
C22/SP-C22-2	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
D13/SP-D13-1	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D13/SP-D13-2	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
L4/SP-L4-1	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
L4/SP-L4-2	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
L4/SP-L4-3	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
D12/SP-D12-3	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C24/SP-C24-1	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
C24/SP-C24-2	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0

IDU Name	Model	Piping Length to 1st Y Joint(m)
C23/SP-C23-1	Q4AN-2-XMi D36	25,00
C23/SP-C23-2	Q4AN-2-XMi D36	26,50
C22/SP-C22-1	Q4AN-2-XMi D36	33,50
C22/SP-C22-2	Q4AN-2-XMi D36	35,00
D13/SP-D13-1	Q4AN-2-XMi D22	24,50
D13/SP-D13-2	Q4AN-2-XMi D22	14,00
L4/SP-L4-1	Q4AN-2-XMi D36	32,00
L4/SP-L4-2	Q4AN-2-XMi D36	28,50
L4/SP-L4-3	Q4AN-2-XMi D36	24,50
D12/SP-D12-3	Q4AN-2-XMi D22	7,50
C24/SP-C24-1	Q4AN-2-XMi D36	19,00
C24/SP-C24-2	Q4AN-2-XMi D36	21,00

9.2.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Indoor temperature in cooling (Dry bulb temp. / Wet bulb temp. / RH)
RTC	Required total cooling capacity
ATC	Available total cooling capacity
RSC	Required sensible cooling capacity
ASC	Available sensible cooling capacity
Tmp-H	Indoor temperature in heating (Dry bulb temp.)
RHC	Required heating capacity
AHC	Available heating capacity
Tdis-H	Indoor unit discharge air temperature in heating
Airflow	Indoor unit airflow (High/Medium/Low)
ESP	External static pressure
Sound-Pr	Sound pressure level (High/Medium/Low)
Sound-Po	Sound power level (High/Medium/Low)
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
PI-C	Power input in cooling
PI-H	Power input in heating
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

9.3 Outdoor Unit Details (SP-PDC-CL-6)

9.3.1 Outdoor Unit Details Table

Model		MV6-XMi 400T
Module		MV6-XMi 400T
Tmp-C	°C	32
RTC	kW	37,97
ATC	kW	38,47
PI-C	kW	8,65
Tmp-H	°C/°C	3/-0,4
RHC	kW	37,89
AHC	kW	37,89
PI-H	kW	8,90
CR		97,5
Airflow	m ³ /h	13000
Sound-Pr		60
Sound-Po		
Bas-Refr	kg	13,00
Ex-Refr	kg	7,24
TCO2 eq.		
MCA	A	33,1
MFA	A	40
Power supply	V/ph/Hz	380-415V
Dimension(WxHxD)	mm	1340*1635*850
Weight	kg	277

9.3.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Outdoor conditions in cooling (Dry bulb temp.)
RTC	Required cooling capacity
ATC	Available cooling capacity
PI-C	Power input in cooling
Tmp-H	Indoor conditions in heating (Dry bulb temp. / Wet bulb temp. / RH)
RHC	Required heating capacity
AHC	Available heating capacity
PI-H	Power input in heating
CR	Combination ratio
Airflow	Outdoor unit airflow
Sound-Pr	Sound pressure level
Sound-Po	Sound power level
Bas-Refr	Standard factory refrigerant charge
Ex-Refr	Extra refrigerant charge
TCO2 eq.	Tonnes of CO2 equivalent
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

9.4 Piping Limitations (SP-PDC-CL-6)

9.4.1 Piping Limitations

Item	Capability	Actual Value
Total piping length	1000,00(m)	130,50(m)
Longest actual length	175,00(m)	35,00(m)
Longest equivalent length	200,00(m)	48,00(m)
Longest equivalent length after first branch	90,00(m)	35,00(m)
Indoor unit to nearest branch length	40,00(m)	6,00(m)
Length difference between longest and shortest distance to indoor units	40,00(m)	27,50(m)
Height difference between indoor and outdoor unit(ODU up)	90,00(m)	6,00(m)
Height difference between indoor and outdoor unit(ODU down)	110,00(m)	0,00(m)
Height difference between indoor units	30,00(m)	0,00(m)
Combination ratio	50-130%	97,50%
IDU quantity	23	12

9.4.2 Correction Factors

Item	Correction factor
Altitude (indoor unit)	1,000
Altitude (outdoor unit)	1,000
Piping (cooling)	0,974
Piping (heating)	0,990
Defrost (heating)	1,000

9.4.3 Piping Details Table

No.	Length(m)	Piping diameter
(1)	10,00	Φ28.6/Φ15.9
(2)	4,00	Φ28.6/Φ12.7
(3)	6,00	Φ12.7/Φ6.35
(4)	1,00	Φ22.2/Φ9.53
(5)	5,00	Φ15.9/Φ9.53
(6)	4,00	Φ15.9/Φ9.53
(7)	7,00	Φ15.9/Φ9.53
(8)	3,00	Φ12.7/Φ6.35
(9)	4,00	Φ12.7/Φ6.35
(10)	4,00	Φ15.9/Φ9.53
(11)	1,00	Φ12.7/Φ6.35
(12)	3,00	Φ12.7/Φ6.35
(13)	4,00	Φ12.7/Φ6.35
(14)	8,00	Φ15.9/Φ9.53
(15)	1,00	Φ12.7/Φ6.35
(16)	3,00	Φ15.9/Φ9.53
(17)	2,00	Φ12.7/Φ6.35
(18)	5,00	Φ12.7/Φ6.35
(19)	2,00	Φ12.7/Φ6.35
(20)	3,00	Φ15.9/Φ9.53
(21)	4,00	Φ15.9/Φ9.53
(22)	3,00	Φ12.7/Φ6.35
(23)	5,00	Φ12.7/Φ6.35

9.4.4 Branch Joints Details Table

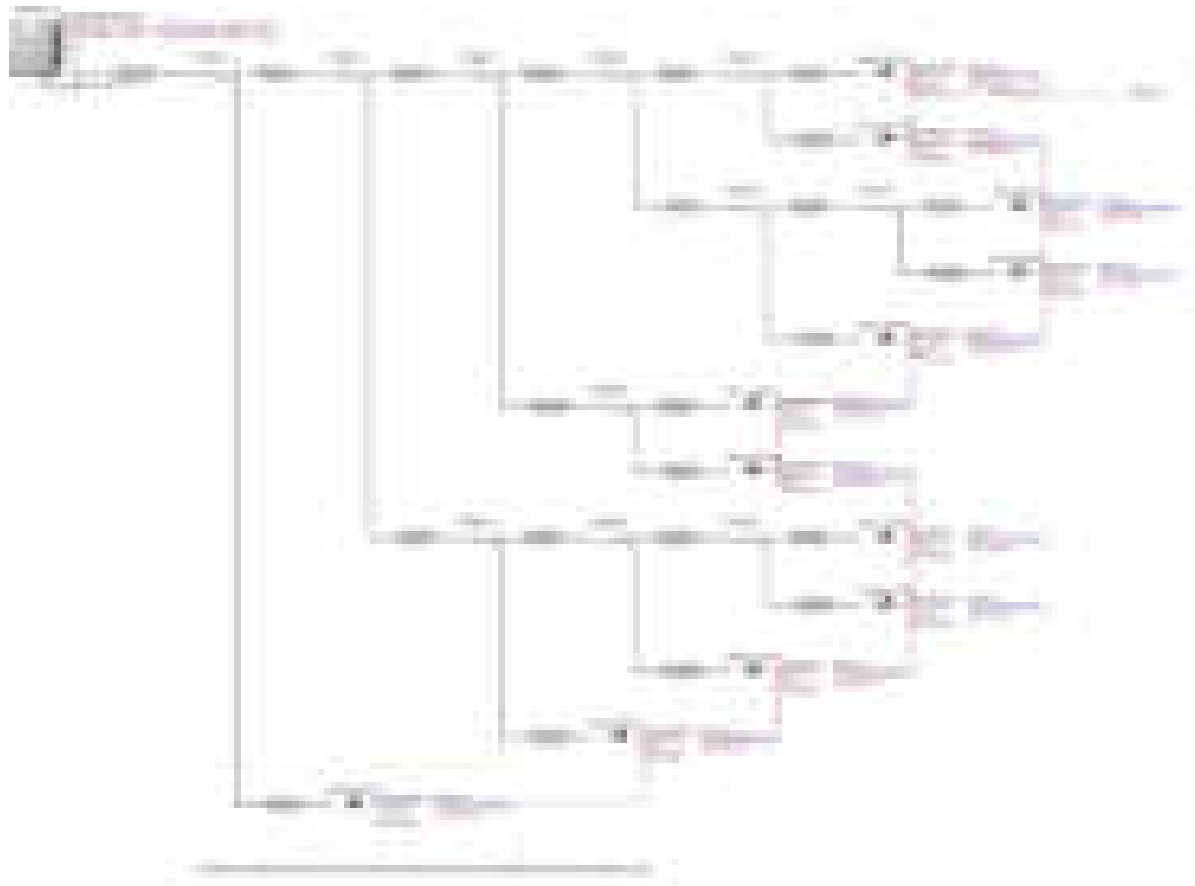
No.	Load(kW)	Model
(1)	39	FQZHN-03D
(2)	36,8	FQZHN-03D
(3)	16,6	FQZHN-01D
(4)	7,2	FQZHN-01D
(5)	9,4	FQZHN-01D
(6)	7,2	FQZHN-01D
(7)	13	FQZHN-01D
(8)	10,8	FQZHN-01D
(9)	7,2	FQZHN-01D
(10)	23,8	FQZHN-02D
(11)	7,2	FQZHN-01D

9.4.5 Reducer Details Table

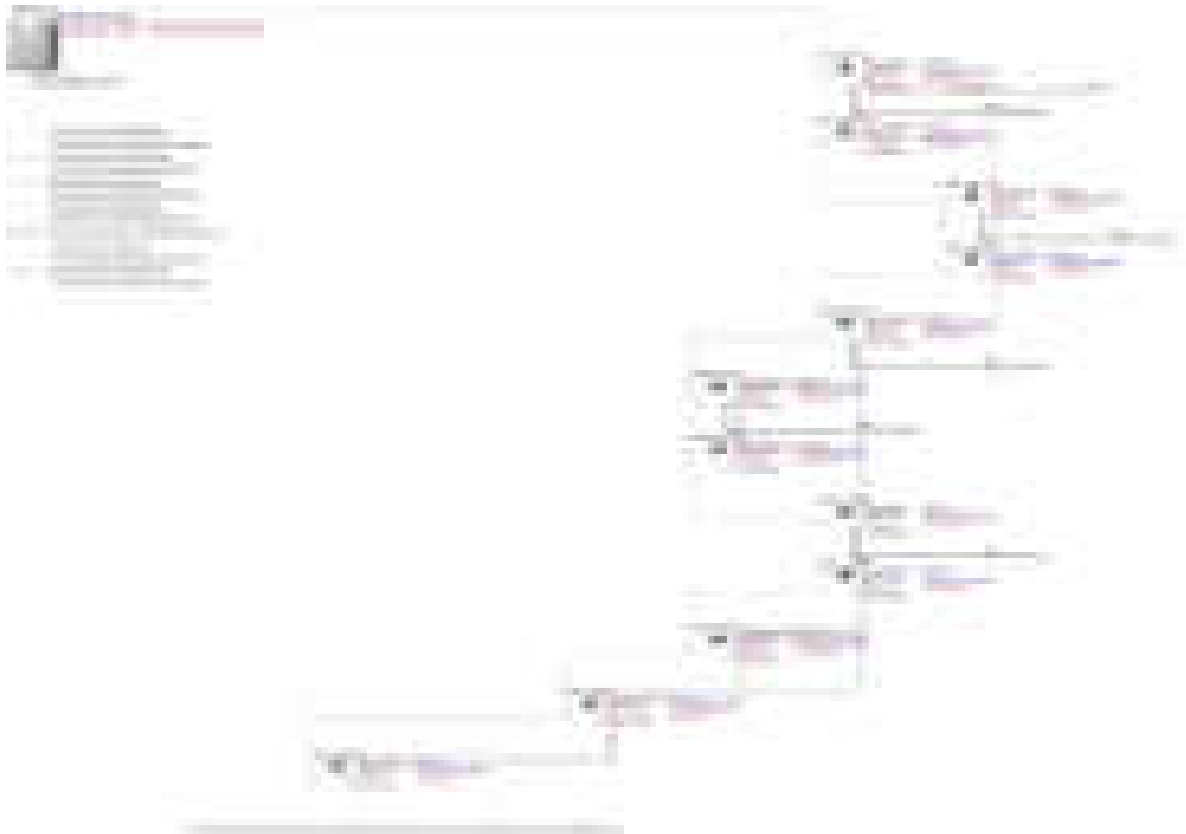
9.4.6 Bends Detailed Table

Quantity	Equivalent length(m)
66	33

9.5 Piping Diagrams (SP-PDC-CL-6)



9.6 Wiring Diagrams (SP-PDC-CL-6)



10. Centralized Control Solution

10.1 Centralized Controller List

Model	Quantity	Description
CCM-270A/WS	1	2nd generation centralized controller
GW-MOD	6	2nd generation BMS gateway

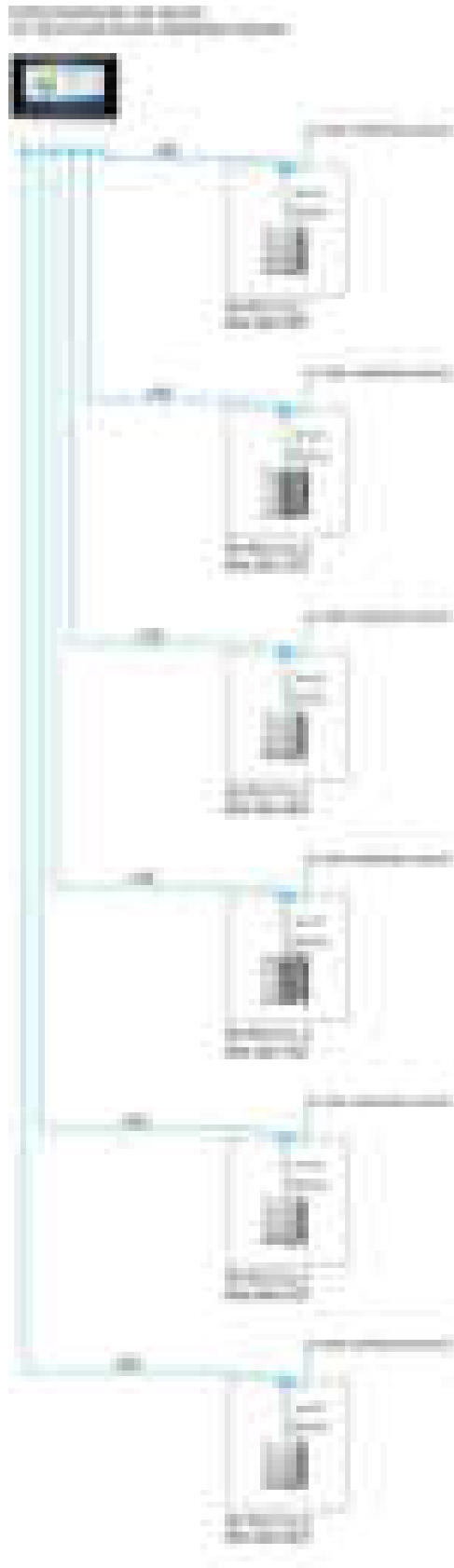
The centralized control system of this project is full output regardless of whether the system is selected.

10.2 Control Solution1 (centralizzatore)

10.2.1 Details

Controller model	Port no.	System
CCM-270A/WS 192.168.100.40 2nd generation centralized controller	1	SP-PDC-CL-1 Address:
	2	SP-PDC-CL-2 Address:
	3	SP-PDC-CL-3 Address:
	4	SP-PDC-CL-4 Address:
	5	SP-PDC-CL-5 Address:
	6	SP-PDC-CL-6 Address:

10.2.2 Wiring



10.3 Control Solution2 (Group1)

10.3.1 Details

Controller model	Port no.	System
GW-MOD 192.168.1.200 2nd generation BMS gateway	1	SP-PDC-CL-1 Address:

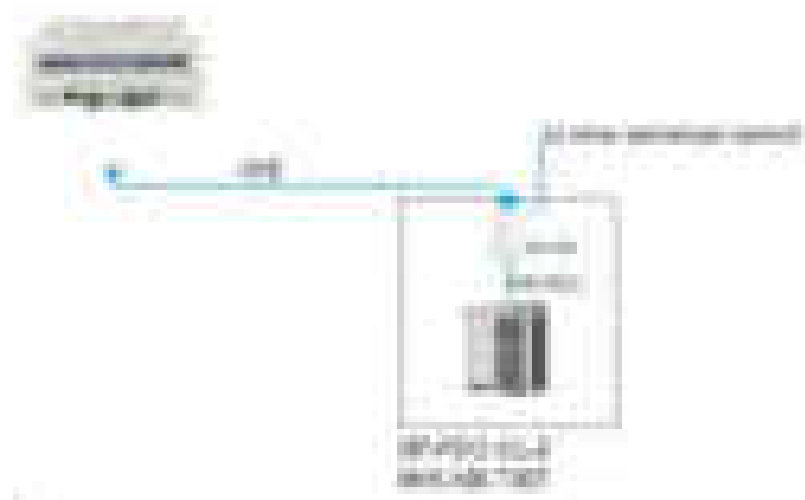
10.4 Control Solution3 (Group2)

10.4.1 Details

Controller model	Port no.	System
GW-MOD 192.168.1.200 2nd generation BMS gateway	1	SP-PDC-CL-2 Address:

10.4.2 Wiring

Now that we have the 4-pin module, we can wire it up.



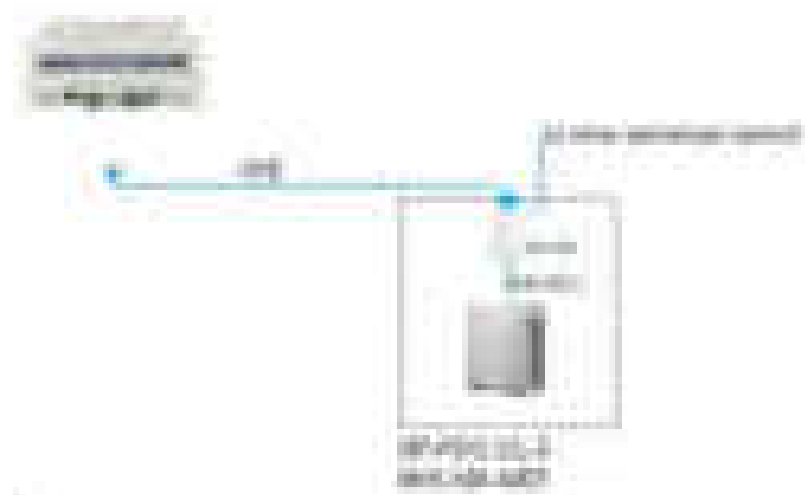
10.5 Control Solution4 (Group3)

10.5.1 Details

Controller model	Port no.	System
GW-MOD 192.168.1.200 2nd generation BMS gateway	1	SP-PDC-CL-3 Address:

10.5.2 Wiring

Now that we have the 4-pin module, we can wire it to the breadboard.



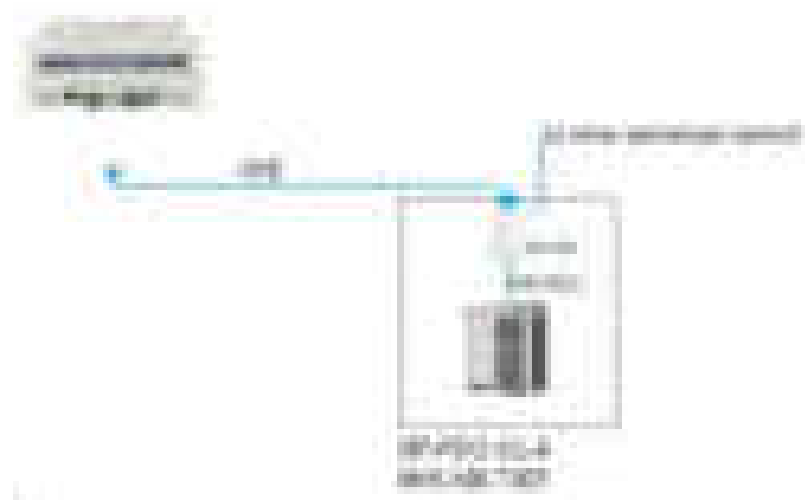
10.6 Control Solution5 (Group4)

10.6.1 Details

Controller model	Port no.	System
GW-MOD 192.168.1.200 2nd generation BMS gateway	1	SP-PDC-CL-4 Address:

10.6.2 Wiring

Now that we have the 4-pin module, we can wire it up.



10.7 Control Solution6 (Group5)

10.7.1 Details

Controller model	Port no.	System
GW-MOD 192.168.1.200 2nd generation BMS gateway	1	SP-PDC-CL-5 Address:

10.8 Control Solution7 (Group6)

10.8.1 Details

Controller model	Port no.	System
GW-MOD 192.168.1.200 2nd generation BMS gateway	1	SP-PDC-CL-6 Address:

SCUOLA SECONDARIA

Di seguito verranno riportati i risultati dei calcoli ottenuti per la progettazione dell'impianto di climatizzazione estiva ed invernale del tipo VRF a servizio della scuola secondaria.

1. Project Information

Date	2020-6-18
Project name	
Project address	
Country	Italy
State	
City	Cagliari
Client name	
Client address	
Reference	New Project
Revision	
Altitude(m)	0
Indoor DB temperature in cooling(°C)	26
Indoor WB temperature in cooling(°C)	19
Outdoor DB temperature in cooling(°C)	32
Outdoor WB temperature in cooling(°C)	24.1
Indoor DB temperature in heating(°C)	21
Indoor WB temperature in heating(°C)	18
Outdoor DB temperature in heating(°C)	3
Outdoor WB temperature in heating(°C)	-0.4

2. Overall Material List

2.1 Equipment List

Model	Quantity	Description
MV6-XMi 400T	2	VRF MV6, Heat Pump Outdoor Unit
MV6-XMi 280T	1	VRF MV6, Heat Pump Outdoor Unit
MV6-XMi 335T	2	VRF MV6, Heat Pump Outdoor Unit
MV6-XMi 670T	1	VRF MV6, Heat Pump Outdoor Unit
Q4AN-2-XMi D22	43	4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D28	41	4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D36	6	4-way Cassette Compact, Indoor Unit
CNT2-2-XMi D28	4	Mid Static Pressure Duct, Indoor Unit
FQZHN-03D	10	Branch joint
FQZHN-01D	58	Branch joint
FQZHN-02D	20	Branch joint
CE-MBQ4-03B5	90	panel of compact four way cassette
Φ9.53<->Φ12.7	77	Reducer
Φ12.7<->Φ15.9	78	Reducer
Φ15.9<->Φ19.1	86	Reducer
Φ19.1<->Φ22.2	82	Reducer
Φ22.2<->Φ25.4	86	Reducer
Φ25.4<->Φ28.6	87	Reducer
Φ28.6<->Φ31.8	89	Reducer
Φ31.8<->Φ34.9	89	Reducer
Φ34.9<->Φ38.1	89	Reducer
Φ38.1<->Φ41.3	89	Reducer
Φ41.3<->Φ44.5	89	Reducer

Φ44.5<->Φ50.8	89	Reducer
WDC-120G/WK	40	2nd generation group controller

2.2 Field Providing List

2.2.1 Refrigerant Piping Materials

Model	Quantity	Unit	Description
Φ6.35	282.5	m	Copper pipe
Φ9.53	101.2	m	Copper pipe
Φ12.7	521	m	Copper pipe
Φ15.9	139	m	Copper pipe
Φ19.1	174.5	m	Copper pipe
Φ22.2	33.2	m	Copper pipe
Φ25.4	65	m	Copper pipe
Φ28.6	63	m	Copper pipe
Φ31.8	31	m	Copper pipe
Insulation casing for piping			All refrigerant piping and branch joints should be completely insulated.

Recommended insulation casing thickness:

Piping size	Thickness	
	Humidity<80%RH	Humidity≥80%RH
Φ6.35~Φ38.1mm	≥15mm	≥20mm
Φ41.3~Φ38.1mm	≥20mm	≥25mm

2.2.2 Refrigerant charge

System name	Model	Quantity	Unit	Description
SS-PDC-CL-1	R410A	10.79	kg	Extra Refrigerant Added
SS-PDC-CL-2	R410A	13.11	kg	Extra Refrigerant Added
SS-PDC-CL-3	R410A	6.92	kg	Extra Refrigerant Added
SS-PDC-CL-4	R410A	5.9	kg	Extra Refrigerant Added
SS-PDC-CL-5	R410A	11.78	kg	Extra Refrigerant Added
SS-PDC-CL-6	R410A	20.96	kg	Extra Refrigerant Added
Total	R410A	69.46	kg	Extra Refrigerant Added

2.2.3 Electrical cables

Type	Size	Length
Power supply cable	Select based on MCA of each unit	According to the actual system design
Communication cable	0.75mm ² 3-core shielded	According to the actual system design

3. Overall Electrical Characteristics

Model	Quantity	Power supply	MCA(A)	MFA(A)	Power input in cooling(kW)	Power input in heating(kW)
MV6-XMi 400T	2	380-415V	33,10	40	9,000	8,000
MV6-XMi 280T	1	380-415V	25,20	32	6,000	5,000
MV6-XMi 335T	2	380-415V	26,40	32	8,000	6,000
MV6-XMi 670T	1	380-415V	48,40	63	18,000	15,000

Q4AN-2-XMi D22	43	220-240V	0,43	15	0,035	0,035
Q4AN-2-XMi D28	41	220-240V	0,43	15	0,035	0,035
Q4AN-2-XMi D36	6	220-240V	0,48	15	0,040	0,040
CNT2-2-XMi D28	4	220-240V	0,74	15	0,040	0,040
CE-MBQ4-03B5	90					

Notes:

1. MCA: Minimum Circuit Amps. MCA is used to select wire size. The value in above table is for one unit.
2. MFA: Maximum Fuse Amps. MFA is used to select overcurrent circuit breakers and residual-current circuit breakers. The value in above table is for one unit.
3. Power in put in cooling and heating are based on below conditions (The value in above table is for one unit.):
Cooling: indoor air temperature 27°C DB/19°C WB; outdoor temperature 35°C DB;
Heating: indoor air temperature 20°C DB; outdoor temperature 7°C DB/6°C WB;
Equivalent refrigerant piping length 7.5m with zero level difference.

4. SS-PDC-CL-1

4.1 BOM List (SS-PDC-CL-1)

Model	Quantity	Unit	Description
MV6-XMi 400T	1		VRF MV6, Heat Pump Outdoor Unit
Q4AN-2-XMi D22	5		4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D28	10		4-way Cassette Compact, Indoor Unit
FQZHN-03D	2		Branch joint
FQZHN-01D	8		Branch joint
FQZHN-02D	4		Branch joint
WDC-120G/WK	6		2nd generation group controller
CE-MBQ4-03B5	15		panel of compact four way cassette
Φ9.53<->Φ12.7	14		Reducer
Φ12.7<->Φ15.9	14		Reducer
Φ15.9<->Φ19.1	15		Reducer
Φ19.1<->Φ22.2	14		Reducer
Φ22.2<->Φ25.4	17		Reducer
Φ25.4<->Φ28.6	17		Reducer
Φ28.6<->Φ31.8	17		Reducer
Φ31.8<->Φ34.9	17		Reducer
Φ34.9<->Φ38.1	17		Reducer
Φ38.1<->Φ41.3	17		Reducer
Φ41.3<->Φ44.5	17		Reducer
Φ44.5<->Φ50.8	17		Reducer
R410A	10.79	kg	Extra Refrigerant Added
Φ6.35	43	m	Copper pipe
Φ12.7	91	m	Copper pipe
Φ15.9	10	m	Copper pipe
Φ19.1	28	m	Copper pipe
Φ25.4	20	m	Copper pipe
Φ28.6	10	m	Copper pipe

4.2 Indoor Unit Details (SS-PDC-CL-1)

4.2.1 Indoor Unit Details Table

IDU Name	Model	Weight(kg)	Dimension(WxHxD)(mm)	Power supply	MCA(A)	MFA(A)
INF/SS-IN	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
D01/SS-D01-1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
D01/SS-D01-3	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
D01/SS-D01-5	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
C1/SS-C1-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C1/SS-C1-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
D01/SS-D01-4	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
L1/SS-L1-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
L1/SS-L1-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
L1/SS-L1-3	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C2/SS-C2-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15

C2/SS-C2-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
L2/SS-L2-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
L2/SS-L2-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
L2/SS-L2-3	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15

IDU Name	Model	Tmp-C(°C)	RTC(kW)	ATC(kW)	RSC(kW)	ASC(kW)	PI-C(W)	Tmp-H(°C)	RHC(kW)	AHC(kW)	PI-H(W)
INF/SS-IN	Q4AN-2-XMi D22	26		2,16		1,45	35	21		2,07	35
D01/SS-D01-1	Q4AN-2-XMi D22	26		2,16		1,45	35	21		2,07	35
D01/SS-D01-3	Q4AN-2-XMi D22	26		2,16		1,45	35	21		2,07	35
D01/SS-D01-5	Q4AN-2-XMi D22	26		2,13		1,42	35	21		2,07	35
C1/SS-C1-1	Q4AN-2-XMi D28	26		2,68		1,79	35	21		2,75	35
C1/SS-C1-2	Q4AN-2-XMi D28	26		2,68		1,79	35	21		2,75	35
D01/SS-D01-4	Q4AN-2-XMi D22	26		2,11		1,41	35	21		2,07	35
L1/SS-L1-1	Q4AN-2-XMi D28	26		2,65		1,76	35	21		2,75	35
L1/SS-L1-2	Q4AN-2-XMi D28	26		2,64		1,76	35	21		2,75	35
L1/SS-L1-3	Q4AN-2-XMi D28	26		2,64		1,76	35	21		2,75	35
C2/SS-C2-1	Q4AN-2-XMi D28	26		2,65		1,77	35	21		2,75	35
C2/SS-C2-2	Q4AN-2-XMi D28	26		2,64		1,76	35	21		2,75	35
L2/SS-L2-1	Q4AN-2-XMi D28	26		2,64		1,76	35	21		2,75	35
L2/SS-L2-2	Q4AN-2-XMi D28	26		2,64		1,76	35	21		2,75	35
L2/SS-L2-3	Q4AN-2-XMi D28	26		2,65		1,77	35	21		2,75	35

IDU Name	Model	Airflow(m ³ /h)	Sound-Pr dB(A)	ESP(Pa)
INF/SS-IN	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D01/SS-D01-1	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D01/SS-D01-3	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D01/SS-D01-5	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C1/SS-C1-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C1/SS-C1-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D01/SS-D01-4	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
L1/SS-L1-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
L1/SS-L1-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
L1/SS-L1-3	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C2/SS-C2-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0

C2/SS-C2-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
L2/SS-L2-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
L2/SS-L2-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
L2/SS-L2-3	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0

IDU Name	Model	Piping Length to 1st Y Joint(m)
INF/SS-IN	Q4AN-2-XMi D22	6,50
D01/SS-D01-1	Q4AN-2-XMi D22	6,50
D01/SS-D01-3	Q4AN-2-XMi D22	7,00
D01/SS-D01-5	Q4AN-2-XMi D22	24,50
C1/SS-C1-1	Q4AN-2-XMi D28	31,50
C1/SS-C1-2	Q4AN-2-XMi D28	32,50
D01/SS-D01-4	Q4AN-2-XMi D22	31,00
L1/SS-L1-1	Q4AN-2-XMi D28	43,00
L1/SS-L1-2	Q4AN-2-XMi D28	44,00
L1/SS-L1-3	Q4AN-2-XMi D28	43,00
C2/SS-C2-1	Q4AN-2-XMi D28	41,50
C2/SS-C2-2	Q4AN-2-XMi D28	43,50
L2/SS-L2-1	Q4AN-2-XMi D28	46,50
L2/SS-L2-2	Q4AN-2-XMi D28	45,50
L2/SS-L2-3	Q4AN-2-XMi D28	42,00

4.2.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Indoor temperature in cooling (Dry bulb temp. / Wet bulb temp. / RH)
RTC	Required total cooling capacity
ATC	Available total cooling capacity
RSC	Required sensible cooling capacity
ASC	Available sensible cooling capacity
Tmp-H	Indoor temperature in heating (Dry bulb temp.)
RHC	Required heating capacity
AHC	Available heating capacity
Tdis-H	Indoor unit discharge air temperature in heating
Airflow	Indoor unit airflow (High/Medium/Low)
ESP	External static pressure
Sound-Pr	Sound pressure level (High/Medium/Low)
Sound-Po	Sound power level (High/Medium/Low)
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
PI-C	Power input in cooling
PI-H	Power input in heating
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

4.3 Outdoor Unit Details (SS-PDC-CL-1)

4.3.1 Outdoor Unit Details Table

Model		MV6-XMi 400T
Module		MV6-XMi 400T
Tmp-C	°C	32
RTC	kW	37,23
ATC	kW	38,34
PI-C	kW	8,65
Tmp-H	°C/°C	3/-0,4
RHC	kW	37,88
AHC	kW	37,88
PI-H	kW	8,90
CR		97,5
Airflow	m ³ /h	13000
Sound-Pr		60
Sound-Po		
Bas-Refr	kg	13,00
Ex-Refr	kg	10,79
TCO2 eq.		
MCA	A	33,1
MFA	A	40
Power supply	V/ph/Hz	380-415V
Dimension(WxHxD)	mm	1340*1635*850
Weight	kg	277

4.3.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Outdoor conditions in cooling (Dry bulb temp.)
RTC	Required cooling capacity
ATC	Available cooling capacity
PI-C	Power input in cooling
Tmp-H	Indoor conditions in heating (Dry bulb temp. / Wet bulb temp. / RH)
RHC	Required heating capacity
AHC	Available heating capacity
PI-H	Power input in heating
CR	Combination ratio
Airflow	Outdoor unit airflow
Sound-Pr	Sound pressure level
Sound-Po	Sound power level
Bas-Refr	Standard factory refrigerant charge
Ex-Refr	Extra refrigerant charge
TCO2 eq.	Tonnes of CO2 equivalent
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

4.4 Piping Limitations (SS-PDC-CL-1)

4.4.1 Piping Limitations

Item	Capability	Actual Value
Total piping length	1000,00(m)	139,50(m)
Longest actual length	175,00(m)	41,00(m)
Longest equivalent length	200,00(m)	55,50(m)
Longest equivalent length after first branch	90,00(m)	46,50(m)
Indoor unit to nearest branch length	40,00(m)	6,00(m)
Length difference between longest and shortest distance to indoor units	40,00(m)	40,00(m)
Height difference between indoor and outdoor unit(ODU up)	90,00(m)	0,00(m)
Height difference between indoor and outdoor unit(ODU down)	110,00(m)	0,00(m)
Height difference between indoor units	30,00(m)	0,00(m)
Combination ratio	50-130%	97,50%
IDU quantity	23	15

4.4.2 Correction Factors

Item	Correction factor
Altitude (indoor unit)	1,000
Altitude (outdoor unit)	1,000
Piping (cooling)	0,973
Piping (heating)	0,991
Defrost (heating)	1,000

4.4.3 Piping Details Table

No.	Length(m)	Piping diameter
(1)	6,00	Φ28.6/Φ15.9
(2)	3,00	Φ19.1/Φ12.7
(3)	4,00	Φ28.6/Φ15.9
(4)	2,00	Φ12.7/Φ6.35
(5)	2,00	Φ12.7/Φ6.35
(6)	1,00	Φ12.7/Φ6.35
(7)	11,00	Φ25.4/Φ12.7
(8)	5,00	Φ12.7/Φ6.35
(9)	2,00	Φ25.4/Φ12.7
(10)	4,00	Φ19.1/Φ12.7
(11)	5,00	Φ25.4/Φ12.7
(12)	4,00	Φ12.7/Φ6.35
(13)	5,00	Φ12.7/Φ6.35
(14)	2,00	Φ12.7/Φ6.35
(15)	2,00	Φ25.4/Φ12.7
(16)	4,00	Φ19.1/Φ12.7
(17)	1,00	Φ19.1/Φ12.7
(18)	4,00	Φ19.1/Φ12.7
(19)	6,00	Φ12.7/Φ6.35
(20)	1,00	Φ12.7/Φ6.35
(21)	2,00	Φ12.7/Φ6.35
(22)	4,00	Φ19.1/Φ12.7

(23)	5,00	Φ19.1/Φ12.7
(24)	3,00	Φ12.7/Φ6.35
(25)	5,00	Φ12.7/Φ6.35
(26)	3,00	Φ19.1/Φ12.7
(27)	2,00	Φ12.7/Φ6.35
(28)	2,00	Φ12.7/Φ6.35
(29)	1,00	Φ12.7/Φ6.35

4.4.4 Branch Joints Details Table

No.	Load(kW)	Model
(1)	39	FQZHN-03D
(2)	4,4	FQZHN-01D
(3)	34,6	FQZHN-03D
(4)	32,4	FQZHN-02D
(5)	30,2	FQZHN-02D
(6)	5,6	FQZHN-01D
(7)	24,6	FQZHN-02D
(8)	22,4	FQZHN-02D
(9)	8,4	FQZHN-01D
(10)	5,6	FQZHN-01D
(11)	14	FQZHN-01D
(12)	5,6	FQZHN-01D
(13)	8,4	FQZHN-01D
(14)	5,6	FQZHN-01D

4.4.5 Reducer Details Table

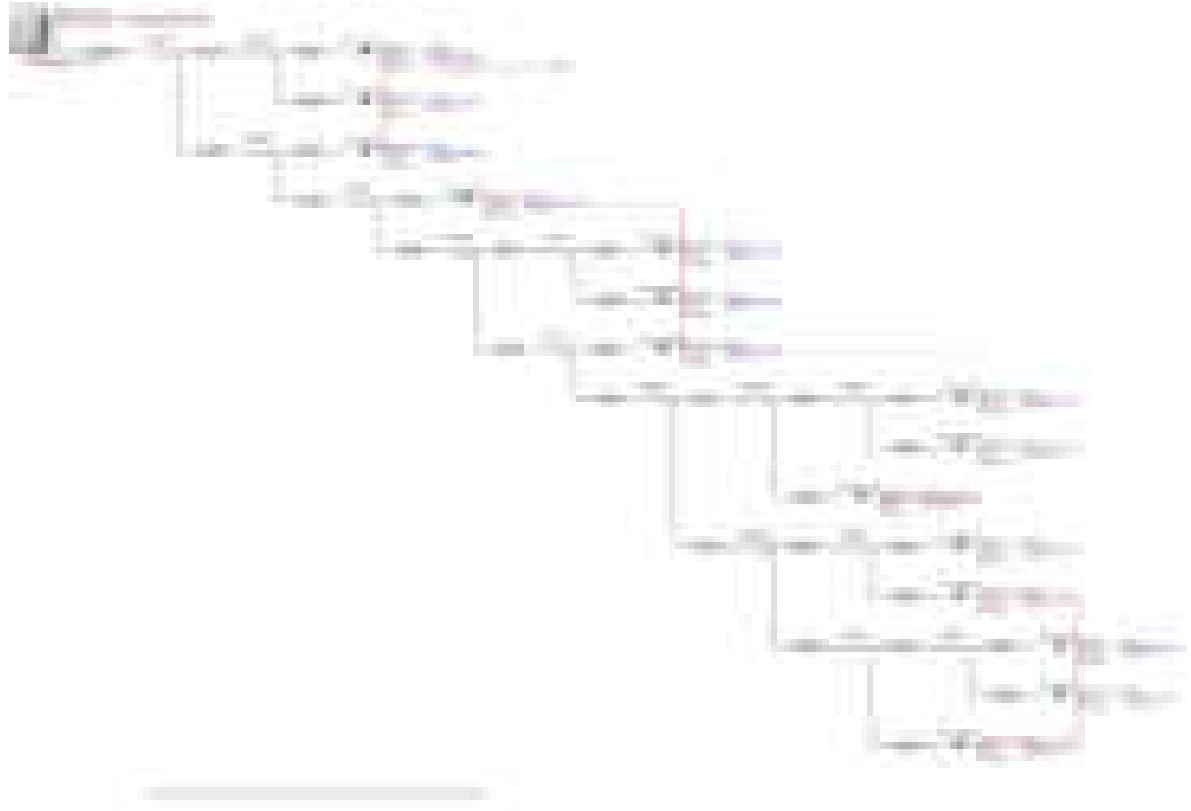
Reducer Name	Description
J2-L1	Φ9.53<->Φ12.7+Φ12.7<->Φ15.9+Φ15.9<->Φ19.1+Φ19.1<->Φ22.2+Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J4-G1	Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J5-L1	Φ9.53<->Φ12.7+Φ12.7<->Φ15.9+Φ15.9<->Φ19.1+Φ19.1<->Φ22.2+Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J5-G1	Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J6-L1	Φ9.53<->Φ12.7+Φ12.7<->Φ15.9+Φ15.9<->Φ19.1+Φ19.1<->Φ22.2+Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J7-G1	Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J8-L1	Φ9.53<->Φ12.7+Φ12.7<->Φ15.9+Φ15.9<->Φ19.1+Φ19.1<->Φ22.2+Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J9-L1	Φ9.53<->Φ12.7+Φ12.7<->Φ15.9+Φ15.9<->Φ19.1+Φ19.1<->Φ22.2+Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J9-L2	Φ9.53<->Φ12.7+Φ12.7<->Φ15.9+Φ15.9<->Φ19.1+Φ19.1<->Φ22.2+Φ22.2<->Φ25.4+Φ25.4<->

	>Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J10-L1	Φ9.53<->Φ12.7+Φ12.7<->Φ15.9+Φ15.9<->Φ19.1+Φ19.1<->Φ22.2+Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J11-L1	Φ9.53<->Φ12.7+Φ12.7<->Φ15.9+Φ15.9<->Φ19.1+Φ19.1<->Φ22.2+Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J11-G1	Φ15.9<->Φ19.1
J11-L2	Φ9.53<->Φ12.7+Φ12.7<->Φ15.9+Φ15.9<->Φ19.1+Φ19.1<->Φ22.2+Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J11-L3	Φ9.53<->Φ12.7+Φ12.7<->Φ15.9+Φ15.9<->Φ19.1+Φ19.1<->Φ22.2+Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J12-L1	Φ9.53<->Φ12.7+Φ12.7<->Φ15.9+Φ15.9<->Φ19.1+Φ19.1<->Φ22.2+Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J13-L1	Φ9.53<->Φ12.7+Φ12.7<->Φ15.9+Φ15.9<->Φ19.1+Φ19.1<->Φ22.2+Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J13-L2	Φ9.53<->Φ12.7+Φ12.7<->Φ15.9+Φ15.9<->Φ19.1+Φ19.1<->Φ22.2+Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J14-L1	Φ9.53<->Φ12.7+Φ12.7<->Φ15.9+Φ15.9<->Φ19.1+Φ19.1<->Φ22.2+Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8

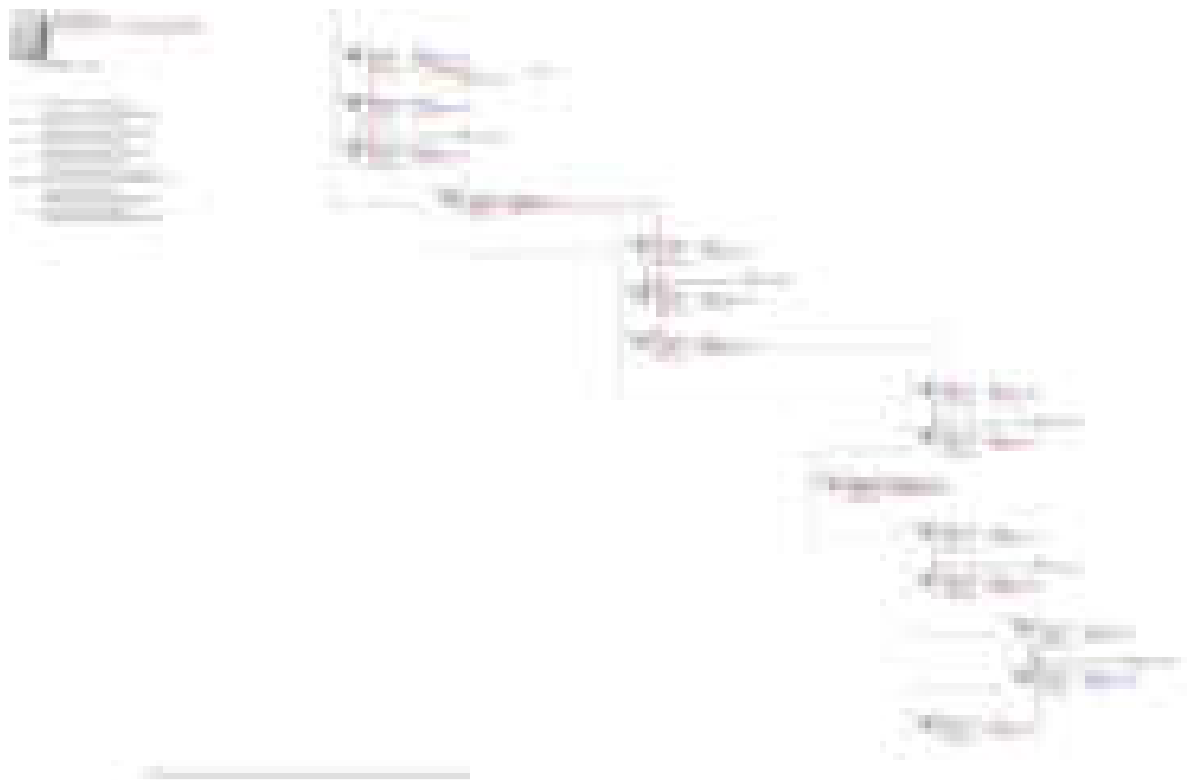
4.4.6 Bends Detailed Table

Quantity	Equivalent length(m)
63	31.5

4.5 Piping Diagrams (SS-PDC-CL-1)



4.6 Wiring Diagrams (SS-PDC-CL-1)



5. SS-PDC-CL-2

5.1 BOM List (SS-PDC-CL-2)

Model	Quantity	Unit	Description
MV6-XMi 400T	1		VRF MV6, Heat Pump Outdoor Unit
Q4AN-2-XMi D22	11		4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D28	5		4-way Cassette Compact, Indoor Unit
FQZHN-03D	2		Branch joint
FQZHN-01D	10		Branch joint
FQZHN-02D	3		Branch joint
WDC-120G/WK	7		2nd generation group controller
CE-MBQ4-03B5	16		panel of compact four way cassette
Φ9.53<->Φ12.7	18		Reducer
Φ12.7<->Φ15.9	18		Reducer
Φ15.9<->Φ19.1	20		Reducer
Φ19.1<->Φ22.2	20		Reducer
Φ22.2<->Φ25.4	20		Reducer
Φ25.4<->Φ28.6	20		Reducer
Φ28.6<->Φ31.8	20		Reducer
Φ31.8<->Φ34.9	20		Reducer
Φ34.9<->Φ38.1	20		Reducer
Φ38.1<->Φ41.3	20		Reducer
Φ41.3<->Φ44.5	20		Reducer
Φ44.5<->Φ50.8	20		Reducer
R410A	13.11	kg	Extra Refrigerant Added
Φ6.35	50	m	Copper pipe
Φ12.7	100	m	Copper pipe
Φ15.9	22	m	Copper pipe
Φ19.1	37	m	Copper pipe
Φ22.2	0.5	m	Copper pipe
Φ25.4	12.5	m	Copper pipe
Φ28.6	22	m	Copper pipe

5.2 Indoor Unit Details (SS-PDC-CL-2)

5.2.1 Indoor Unit Details Table

IDU Name	Model	Weight(kg)	Dimension(WxHxD)(mm)	Power supply	MCA(A)	MFA(A)
SS-DOC/SS-DOC-1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
SS-DOC/SS-DOC-2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
SS-SR1/SS-SR1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
SS-MOB/SS-MOB-1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
SS-MOB/SS-MOB-2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
SS-MOB/SS-MOB-3	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
SS-C3/SS-C3-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
SS-C3/SS-C3-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
SS-C5/SS-C5-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
SS-C5/SS-C5-2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15

SS-D01/SS-D01-6	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
SS-C6/SS-C6-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
SS-C6/SS-C6-2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
SS-C4/SS-C4-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
SS-C4/SS-C4-2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
SS-SR2/SS-SR2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15

IDU Name	Model	Tmp-C(°C)	RTC(kW)	ATC(kW)	RSC(kW)	ASC(kW)	PI-C(W)	Tmp-H(°C)	RHC(kW)	AHC(kW)	PI-H(W)
SS-DOC/SS-DOC-1	Q4AN-2-XMi D22	26		2,18		1,46	35	21		2,14	35
SS-DOC/SS-DOC-2	Q4AN-2-XMi D22	26		2,18		1,46	35	21		2,14	35
SS-SR1/SS-SR1	Q4AN-2-XMi D22	26		2,18		1,46	35	21		2,14	35
SS-MOB/SS-MOB-1	Q4AN-2-XMi D22	26		2,14		1,43	35	21		2,14	35
SS-MOB/SS-MOB-2	Q4AN-2-XMi D22	26		2,15		1,44	35	21		2,14	35
SS-MOB/SS-MOB-3	Q4AN-2-XMi D22	26		2,16		1,45	35	21		2,14	35
SS-C3/SS-C3-1	Q4AN-2-XMi D28	26		2,72		1,81	35	21		2,84	35
SS-C3/SS-C3-2	Q4AN-2-XMi D28	26		2,72		1,82	35	21		2,84	35
SS-C5/SS-C5-1	Q4AN-2-XMi D28	26		2,7		1,8	35	21		2,84	35
SS-C5/SS-C5-2	Q4AN-2-XMi D22	26		2,12		1,42	35	21		2,14	35
SS-D01/SS-D01-6	Q4AN-2-XMi D22	26		2,13		1,43	35	21		2,14	35
SS-C6/SS-C6-1	Q4AN-2-XMi D28	26		2,67		1,78	35	21		2,84	35
SS-C6/SS-C6-2	Q4AN-2-XMi D22	26		2,09		1,4	35	21		2,14	35
SS-C4/SS-C4-1	Q4AN-2-XMi D28	26		2,68		1,79	35	21		2,84	35
SS-C4/SS-C4-2	Q4AN-2-XMi D22	26		2,11		1,41	35	21		2,14	35
SS-SR2/SS-SR2	Q4AN-2-XMi D22	26		2,18		1,46	35	21		2,14	35

IDU Name	Model	Airflow(m ³ /h)	Sound-Pr dB(A)	ESP(Pa)
SS-DOC/SS-DOC-1	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SS-DOC/SS-DOC-2	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SS-SR1/SS-SR1	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SS-MOB/SS-MOB-1	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SS-MOB/SS-MOB-2	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SS-MOB/SS-MOB-3	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SS-C3/SS-C3-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0

SS-C3/SS-C3-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SS-C5/SS-C5-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SS-C5/SS-C5-2	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SS-D01/SS-D01-6	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SS-C6/SS-C6-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SS-C6/SS-C6-2	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SS-C4/SS-C4-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SS-C4/SS-C4-2	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SS-SR2/SS-SR2	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0

IDU Name	Model	Piping Length to 1st Y Joint(m)
SS-DOC/SS-DOC-1	Q4AN-2-XMi D22	11,50
SS-DOC/SS-DOC-2	Q4AN-2-XMi D22	13,50
SS-SR1/SS-SR1	Q4AN-2-XMi D22	11,50
SS-MOB/SS-MOB-1	Q4AN-2-XMi D22	26,50
SS-MOB/SS-MOB-2	Q4AN-2-XMi D22	25,00
SS-MOB/SS-MOB-3	Q4AN-2-XMi D22	21,50
SS-C3/SS-C3-1	Q4AN-2-XMi D28	30,50
SS-C3/SS-C3-2	Q4AN-2-XMi D28	29,50
SS-C5/SS-C5-1	Q4AN-2-XMi D28	33,50
SS-C5/SS-C5-2	Q4AN-2-XMi D22	35,50
SS-D01/SS-D01-6	Q4AN-2-XMi D22	31,00
SS-C6/SS-C6-1	Q4AN-2-XMi D28	43,00
SS-C6/SS-C6-2	Q4AN-2-XMi D22	45,00
SS-C4/SS-C4-1	Q4AN-2-XMi D28	41,50
SS-C4/SS-C4-2	Q4AN-2-XMi D22	40,50
SS-SR2/SS-SR2	Q4AN-2-XMi D22	5,50

5.2.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Indoor temperature in cooling (Dry bulb temp. / Wet bulb temp. / RH)
RTC	Required total cooling capacity
ATC	Available total cooling capacity
RSC	Required sensible cooling capacity
ASC	Available sensible cooling capacity
Tmp-H	Indoor temperature in heating (Dry bulb temp.)
RHC	Required heating capacity
AHC	Available heating capacity
Tdis-H	Indoor unit discharge air temperature in heating
Airflow	Indoor unit airflow (High/Medium/Low)
ESP	External static pressure
Sound-Pr	Sound pressure level (High/Medium/Low)
Sound-Po	Sound power level (High/Medium/Low)
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
PI-C	Power input in cooling
PI-H	Power input in heating

Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

5.3 Outdoor Unit Details (SS-PDC-CL-2)

5.3.1 Outdoor Unit Details Table

Model		MV6-XMi 400T
Module		MV6-XMi 400T
Tmp-C	°C	32
RTC	kW	37,13
ATC	kW	37,93
PI-C	kW	8,39
Tmp-H	°C/°C	3/-0,4
RHC	kW	37,71
AHC	kW	37,71
PI-H	kW	8,78
CR		95,5
Airflow	m ³ /h	13000
Sound-Pr		60
Sound-Po		
Bas-Refr	kg	13,00
Ex-Refr	kg	13,11
TCO2 eq.		
MCA	A	33,1
MFA	A	40
Power supply	V/ph/Hz	380-415V
Dimension(WxHxD)	mm	1340*1635*850
Weight	kg	277

5.3.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Outdoor conditions in cooling (Dry bulb temp.)
RTC	Required cooling capacity
ATC	Available cooling capacity
PI-C	Power input in cooling
Tmp-H	Indoor conditions in heating (Dry bulb temp. / Wet bulb temp. / RH)
RHC	Required heating capacity
AHC	Available heating capacity
PI-H	Power input in heating
CR	Combination ratio
Airflow	Outdoor unit airflow
Sound-Pr	Sound pressure level
Sound-Po	Sound power level
Bas-Refr	Standard factory refrigerant charge
Ex-Refr	Extra refrigerant charge
TCO2 eq.	Tonnes of CO2 equivalent
MCA	Minimum Circuit Amps

MFA	Maximum Fuse Amps
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

5.4 Piping Limitations (SS-PDC-CL-2)

5.4.1 Piping Limitations

Item	Capability	Actual Value
Total piping length	1000,00(m)	157,50(m)
Longest actual length	175,00(m)	52,50(m)
Longest equivalent length	200,00(m)	66,00(m)
Longest equivalent length after first branch	90,00(m)	45,00(m)
Indoor unit to nearest branch length	40,00(m)	5,00(m)
Length difference between longest and shortest distance to indoor units	40,00(m)	39,50(m)
Height difference between indoor and outdoor unit(ODU up)	90,00(m)	0,00(m)
Height difference between indoor and outdoor unit(ODU down)	110,00(m)	0,00(m)
Height difference between indoor units	30,00(m)	0,00(m)
Combination ratio	50-130%	95,50%
IDU quantity	23	16

5.4.2 Correction Factors

Item	Correction factor
Altitude (indoor unit)	1,000
Altitude (outdoor unit)	1,000
Piping (cooling)	0,961
Piping (heating)	0,986
Defrost (heating)	1,000

5.4.3 Piping Details Table

No.	Length(m)	Piping diameter
(1)	18,00	Φ28.6/Φ15.9
(2)	4,00	Φ28.6/Φ15.9
(3)	4,50	Φ12.7/Φ6.35
(3)	3,50	Φ19.1/Φ12.7
(4)	1,50	Φ25.4/Φ12.7
(5)	1,00	Φ12.7/Φ6.35
(6)	3,00	Φ12.7/Φ6.35
(7)	2,50	Φ12.7/Φ6.35
(8)	4,00	Φ25.4/Φ12.7
(9)	6,00	Φ19.1/Φ12.7
(10)	7,00	Φ25.4/Φ12.7
(11)	3,00	Φ19.1/Φ12.7
(12)	2,00	Φ12.7/Φ6.35
(13)	4,00	Φ12.7/Φ6.35
(14)	2,00	Φ12.7/Φ6.35

(15)	0,50	Φ22.2/Φ12.7
(16)	3,00	Φ19.1/Φ12.7
(17)	4,00	Φ12.7/Φ6.35
(19)	3,00	Φ12.7/Φ6.35
(18)	6,00	Φ19.1/Φ12.7
(19)	6,00	Φ19.1/Φ12.7
(20)	3,00	Φ12.7/Φ6.35
(21)	5,00	Φ12.7/Φ6.35
(22)	1,00	Φ12.7/Φ6.35
(23)	1,50	Φ19.1/Φ12.7
(24)	5,00	Φ19.1/Φ12.7
(25)	3,00	Φ19.1/Φ12.7
(26)	3,00	Φ12.7/Φ6.35
(27)	5,00	Φ12.7/Φ6.35
(28)	4,00	Φ12.7/Φ6.35
(31)	3,00	Φ12.7/Φ6.35

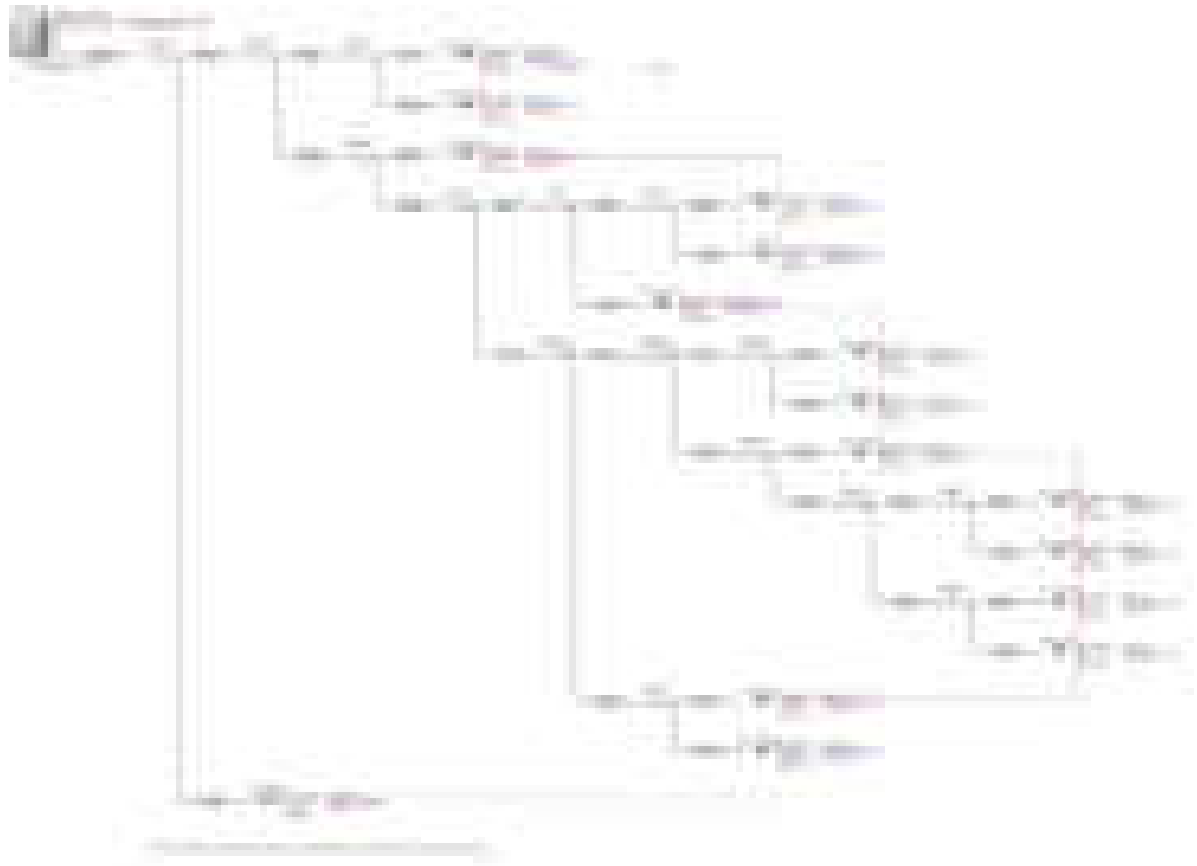
5.4.4 Branch Joints Details Table

No.	Load(kW)	Model
(1)	38,2	FQZHN-03D
(2)	36	FQZHN-03D
(3)	4,4	FQZHN-01D
(4)	31,6	FQZHN-02D
(5)	29,4	FQZHN-02D
(6)	6,6	FQZHN-01D
(7)	4,4	FQZHN-01D
(8)	22,8	FQZHN-02D
(9)	5,6	FQZHN-01D
(10)	17,2	FQZHN-01D
(11)	5	FQZHN-01D
(12)	12,2	FQZHN-01D
(13)	10	FQZHN-01D
(14)	5	FQZHN-01D
(15)	5	FQZHN-01D

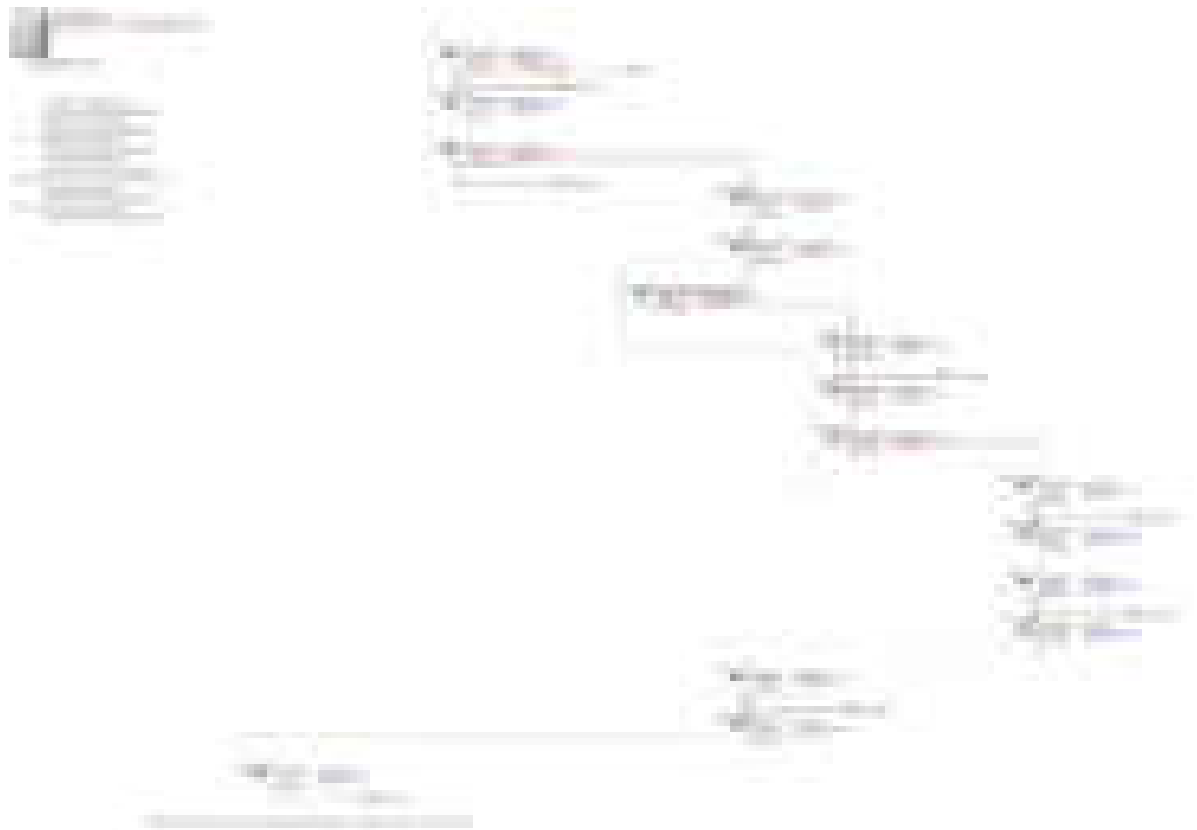
5.4.5 Reducer Details Table

Reducer Name	Description
J3-L1	Φ9.53<->Φ12.7+Φ12.7<->Φ15.9+Φ15.9<->Φ19.1+Φ19.1<->Φ22.2+Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J4-G1	Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J5-L1	Φ9.53<->Φ12.7+Φ12.7<->Φ15.9+Φ15.9<->Φ19.1+Φ19.1<->Φ22.2+Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J5-G1	Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8
J6-L1	Φ9.53<->Φ12.7+Φ12.7<->Φ15.9+Φ15.9<->Φ19.1+Φ19.1<->Φ22.2+Φ22.2<->Φ25.4+Φ25.4<->Φ28.6+Φ28.6<->Φ31.8+Φ31.8<->Φ34.9+Φ34.9<->Φ38.1+Φ38.1<->Φ41.3+Φ41.3<->Φ44.5+Φ44.5<->Φ50.8

5.5 Piping Diagrams (SS-PDC-CL-2)



5.6 Wiring Diagrams (SS-PDC-CL-2)



6. SS-PDC-CL-3

6.1 BOM List (SS-PDC-CL-3)

Model	Quantity	Unit	Description
MV6-XMi 280T	1		VRF MV6, Heat Pump Outdoor Unit
Q4AN-2-XMi D22	11		4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D36	1		4-way Cassette Compact, Indoor Unit
FQZHN-02D	3		Branch joint
FQZHN-01D	8		Branch joint
WDC-120G/WK	8		2nd generation group controller
CE-MBQ4-03B5	12		panel of compact four way cassette
Φ15.9<->Φ19.1	1		Reducer
R410A	6.92	kg	Extra Refrigerant Added
Φ6.35	35.5	m	Copper pipe
Φ9.53	60.5	m	Copper pipe
Φ12.7	45.5	m	Copper pipe
Φ15.9	42.5	m	Copper pipe
Φ19.1	3	m	Copper pipe
Φ22.2	15	m	Copper pipe
Φ25.4	10	m	Copper pipe

6.2 Indoor Unit Details (SS-PDC-CL-3)

6.2.1 Indoor Unit Details Table

IDU Name	Model	Weight(kg)	Dimension(WxHxD)(mm)	Power supply	MCA(A)	MFA(A)
ATA/SS-ATA	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
D02/SS-D02-1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
D02/SS-D02-2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
SEGR/SS-SEGR-1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
SEGR/SS-SEGR-2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
D02/SS-D02-3	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
DIR/SS-DIR	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
DSGA/SS-DSGA	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
CE/SS-CE	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
ST/SS-ST	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
RIU1/SS-RIU1-1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
RIU1/SS-RIU1-2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15

IDU Name	Model	Tmp-C(°C)	RTC(kW)	ATC(kW)	RSC(kW)	ASC(kW)	PI-C(W)	Tmp-H(°C)	RHC(kW)	AHC(kW)	PI-H(W)
ATA/SS-ATA	Q4AN-2-XMi D22	26		2,07		1,39	35	21		2,09	35
D02/SS-D02-1	Q4AN-2-XMi D22	26		2,11		1,42	35	21		2,09	35
D02/SS-D02-2	Q4AN-2-XMi D22	26		2,09		1,4	35	21		2,09	35

SEGR/SS-SEGR-1	Q4AN-2-XMi D22	26		2,06		1,38	35	21		2,09	35
SEGR/SS-SEGR-2	Q4AN-2-XMi D22	26		2,06		1,38	35	21		2,09	35
D02/SS-D02-3	Q4AN-2-XMi D22	26		2,06		1,38	35	21		2,09	35
DIR/SS-DIR	Q4AN-2-XMi D22	26		2,04		1,37	35	21		2,09	35
DSGA/SS-DSGA	Q4AN-2-XMi D22	26		2,03		1,36	35	21		2,09	35
CE/SS-CE	Q4AN-2-XMi D36	26		3,33		2,18	40	21		3,48	40
ST/SS-ST	Q4AN-2-XMi D22	26		2,05		1,37	35	21		2,09	35
RIU1/SS-RIU1-1	Q4AN-2-XMi D22	26		2,06		1,38	35	21		2,09	35
RIU1/SS-RIU1-2	Q4AN-2-XMi D22	26		2,06		1,38	35	21		2,09	35

IDU Name	Model	Airflow(m ³ /h)	Sound-Pr dB(A)	ESP(Pa)
ATA/SS-ATA	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D02/SS-D02-1	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D02/SS-D02-2	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SEGR/SS-SEGR-1	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SEGR/SS-SEGR-2	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D02/SS-D02-3	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
DIR/SS-DIR	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
DSGA/SS-DSGA	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
CE/SS-CE	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
ST/SS-ST	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
RIU1/SS-RIU1-1	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
RIU1/SS-RIU1-2	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0

IDU Name	Model	Piping Length to 1st Y Joint(m)
ATA/SS-ATA	Q4AN-2-XMi D22	25,50
D02/SS-D02-1	Q4AN-2-XMi D22	9,50
D02/SS-D02-2	Q4AN-2-XMi D22	21,00
SEGR/SS-SEGR-1	Q4AN-2-XMi D22	33,00
SEGR/SS-SEGR-2	Q4AN-2-XMi D22	31,50
D02/SS-D02-3	Q4AN-2-XMi D22	32,00
DIR/SS-DIR	Q4AN-2-XMi D22	38,50
DSGA/SS-DSGA	Q4AN-2-XMi D22	42,50
CE/SS-CE	Q4AN-2-XMi D36	40,50
ST/SS-ST	Q4AN-2-XMi D22	37,50
RIU1/SS-RIU1-1	Q4AN-2-XMi D22	32,50
RIU1/SS-RIU1-2	Q4AN-2-XMi D22	34,00

6.2.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Indoor temperature in cooling (Dry bulb temp. / Wet bulb temp. / RH)
RTC	Required total cooling capacity
ATC	Available total cooling capacity
RSC	Required sensible cooling capacity
ASC	Available sensible cooling capacity
Tmp-H	Indoor temperature in heating (Dry bulb temp.)
RHC	Required heating capacity
AHC	Available heating capacity
Tdis-H	Indoor unit discharge air temperature in heating
Airflow	Indoor unit airflow (High/Medium/Low)
ESP	External static pressure
Sound-Pr	Sound pressure level (High/Medium/Low)
Sound-Po	Sound power level (High/Medium/Low)
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
PI-C	Power input in cooling
PI-H	Power input in heating
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

6.3 Outdoor Unit Details (SS-PDC-CL-3)

6.3.1 Outdoor Unit Details Table

Model		MV6-XMi 280T
Module		MV6-XMi 280T
Tmp-C	°C	32
RTC	kW	26,02
ATC	kW	26,71
PI-C	kW	6,07
Tmp-H	°C/°C	3/-0,4
RHC	kW	26,43
AHC	kW	26,43
PI-H	kW	5,77
CR		99,3
Airflow	m ³ /h	11000
Sound-Pr		58
Sound-Po		
Bas-Refr	kg	11,00
Ex-Refr	kg	6,92
TCO2 eq.		
MCA	A	25,2
MFA	A	32
Power supply	V/ph/Hz	380-415V
Dimension(WxHxD)	mm	990*1635*790
Weight	kg	227

6.3.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Outdoor conditions in cooling (Dry bulb temp.)
RTC	Required cooling capacity
ATC	Available cooling capacity
PI-C	Power input in cooling
Tmp-H	Indoor conditions in heating (Dry bulb temp. / Wet bulb temp. / RH)
RHC	Required heating capacity
AHC	Available heating capacity
PI-H	Power input in heating
CR	Combination ratio
Airflow	Outdoor unit airflow
Sound-Pr	Sound pressure level
Sound-Po	Sound power level
Bas-Refr	Standard factory refrigerant charge
Ex-Refr	Extra refrigerant charge
TCO2 eq.	Tonnes of CO2 equivalent
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

6.4 Piping Limitations (SS-PDC-CL-3)

6.4.1 Piping Limitations

Item	Capability	Actual Value
Total piping length	1000,00(m)	140,00(m)
Longest actual length	175,00(m)	43,50(m)
Longest equivalent length	200,00(m)	56,50(m)
Longest equivalent length after first branch	90,00(m)	42,50(m)
Indoor unit to nearest branch length	40,00(m)	22,00(m)
Length difference between longest and shortest distance to indoor units	40,00(m)	33,00(m)
Height difference between indoor and outdoor unit(ODU up)	90,00(m)	5,00(m)
Height difference between indoor and outdoor unit(ODU down)	110,00(m)	0,00(m)
Height difference between indoor units	30,00(m)	0,00(m)
Combination ratio	50-130%	99,29%
IDU quantity	16	12

6.4.2 Correction Factors

Item	Correction factor
Altitude (indoor unit)	1,000
Altitude (outdoor unit)	1,000
Piping (cooling)	0,966
Piping (heating)	0,987
Defrost (heating)	1,000

6.4.3 Piping Details Table

No.	Length(m)	Piping diameter
(1)	10,00	Φ25.4/Φ12.7
(2)	22,00	Φ15.9/Φ9.53
(1)	6,00	Φ22.2/Φ9.53
(1)	1,00	Φ12.7/Φ6.35
(2)	9,00	Φ22.2/Φ9.53
(2)	1,00	Φ12.7/Φ6.35
(3)	1,00	Φ19.1/Φ9.53
(4)	2,00	Φ19.1/Φ9.53
(5)	5,00	Φ15.9/Φ9.53
(6)	4,00	Φ15.9/Φ9.53
(7)	4,00	Φ15.9/Φ9.53
(8)	4,00	Φ12.7/Φ6.35
(9)	3,00	Φ12.7/Φ6.35
(10)	1,50	Φ15.9/Φ9.53
(15)	7,00	Φ12.7/Φ6.35
(11)	1,00	Φ12.7/Φ6.35
(12)	2,50	Φ15.9/Φ9.53
(13)	5,00	Φ12.7/Φ6.35
(14)	3,50	Φ15.9/Φ9.53
(15)	4,00	Φ12.7/Φ6.35
(16)	2,50	Φ12.7/Φ6.35
(17)	3,00	Φ12.7/Φ6.35
(18)	4,00	Φ12.7/Φ6.35

6.4.4 Branch Joints Details Table

No.	Load(kW)	Model
(1)	27,8	FQZHN-02D
(2)	25,6	FQZHN-02D
(3)	23,4	FQZHN-02D
(4)	21,2	FQZHN-01D
(5)	16,8	FQZHN-01D
(6)	4,4	FQZHN-01D
(7)	12,4	FQZHN-01D
(8)	10,2	FQZHN-01D
(9)	8	FQZHN-01D
(10)	5,8	FQZHN-01D
(11)	4,4	FQZHN-01D

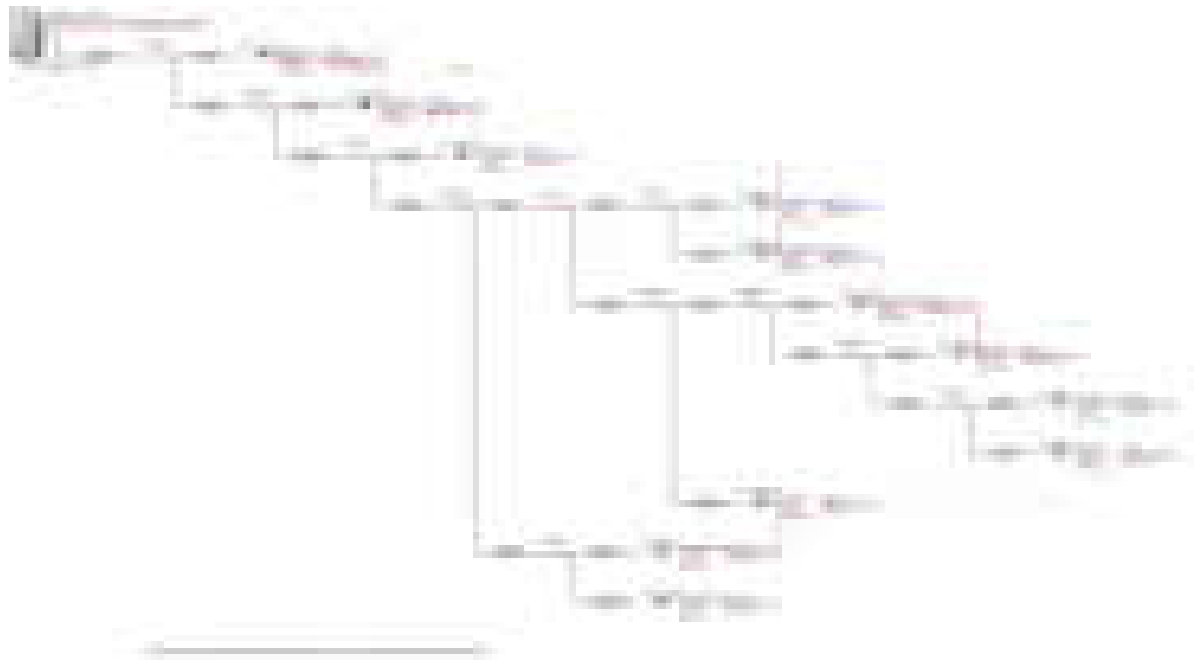
6.4.5 Reducer Details Table

Reducer Name	Description
J4-G1	Φ15.9<->Φ19.1

6.4.6 Bends Detailed Table

Quantity	Equivalent length(m)
57	28.5

6.5 Piping Diagrams (SS-PDC-CL-3)



6.6 Wiring Diagrams (SS-PDC-CL-3)



7. SS-PDC-CL-4

7.1 BOM List (SS-PDC-CL-4)

Model	Quantity	Unit	Description
MV6-XMi 335T	1		VRF MV6, Heat Pump Outdoor Unit
Q4AN-2-XMi D22	3		4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D28	10		4-way Cassette Compact, Indoor Unit
FQZHN-03D	1		Branch joint
FQZHN-02D	4		Branch joint
FQZHN-01D	7		Branch joint
WDC-120G/WK	5		2nd generation group controller
CE-MBQ4-03B5	13		panel of compact four way cassette
R410A	5.9	kg	Extra Refrigerant Added
Φ6.35	36	m	Copper pipe
Φ9.53	40.7	m	Copper pipe
Φ12.7	47	m	Copper pipe
Φ15.9	23.5	m	Copper pipe
Φ22.2	17.2	m	Copper pipe
Φ28.6	11	m	Copper pipe

7.2 Indoor Unit Details (SS-PDC-CL-4)

7.2.1 Indoor Unit Details Table

IDU Name	Model	Weight(kg)	Dimension(WxHxD)(mm)	Power supply	MCA(A)	MFA(A)
D11/SS-D11-1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
D11/SS-D11-3	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
C7/SS-C7-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C7/SS-C7-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
D11/SS-D11-2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
L4/SS-L4-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
L4/SS-L4-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
L4/SS-L4-3	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C8/SS-C8-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C8/SS-C8-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
L3/SS-L3-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
L3/SS-L3-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
L3/SS-L3-3	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15

IDU Name	Model	Tmp-C(°C)	RTC(kW)	ATC(kW)	RSC(kW)	ASC(kW)	PI-C(W)	Tmp-H(°C)	RHC(kW)	AHC(kW)	PI-H(W)
D11/SS-D11-1	Q4AN-2-XMi D22	26		2,07		1,39	35	21		2,01	35
D11/SS-D11-3	Q4AN-2-XMi D22	26		2,06		1,38	35	21		2,01	35
C7/SS-C7-1	Q4AN-2-XMi D28	26		2,61		1,74	35	21		2,67	35

C7/SS-C7-2	Q4AN-2-XMi D28	26		2,6		1,73	35	21		2,67	35
D11/SS-D11-2	Q4AN-2-XMi D22	26		2,05		1,37	35	21		2,01	35
L4/SS-L4-1	Q4AN-2-XMi D28	26		2,56		1,71	35	21		2,67	35
L4/SS-L4-2	Q4AN-2-XMi D28	26		2,57		1,71	35	21		2,67	35
L4/SS-L4-3	Q4AN-2-XMi D28	26		2,58		1,72	35	21		2,67	35
C8/SS-C8-1	Q4AN-2-XMi D28	26		2,57		1,71	35	21		2,67	35
C8/SS-C8-2	Q4AN-2-XMi D28	26		2,56		1,71	35	21		2,67	35
L3/SS-L3-1	Q4AN-2-XMi D28	26		2,57		1,71	35	21		2,67	35
L3/SS-L3-2	Q4AN-2-XMi D28	26		2,56		1,71	35	21		2,67	35
L3/SS-L3-3	Q4AN-2-XMi D28	26		2,56		1,71	35	21		2,67	35

IDU Name	Model	Airflow(m ³ /h)	Sound-Pr dB(A)	ESP(Pa)
D11/SS-D11-1	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D11/SS-D11-3	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C7/SS-C7-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C7/SS-C7-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D11/SS-D11-2	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
L4/SS-L4-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
L4/SS-L4-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
L4/SS-L4-3	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C8/SS-C8-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C8/SS-C8-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
L3/SS-L3-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
L3/SS-L3-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
L3/SS-L3-3	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0

IDU Name	Model	Piping Length to 1st Y Joint(m)
D11/SS-D11-1	Q4AN-2-XMi D22	2,50
D11/SS-D11-3	Q4AN-2-XMi D22	19,00
C7/SS-C7-1	Q4AN-2-XMi D28	22,20
C7/SS-C7-2	Q4AN-2-XMi D28	24,70
D11/SS-D11-2	Q4AN-2-XMi D22	21,20
L4/SS-L4-1	Q4AN-2-XMi D28	35,70
L4/SS-L4-2	Q4AN-2-XMi D28	34,70
L4/SS-L4-3	Q4AN-2-XMi D28	31,20
C8/SS-C8-1	Q4AN-2-XMi D28	32,70
C8/SS-C8-2	Q4AN-2-XMi D28	35,20
L3/SS-L3-1	Q4AN-2-XMi D28	34,20
L3/SS-L3-2	Q4AN-2-XMi D28	35,20

L3/SS-L3-3	Q4AN-2-XMi D28	33,70
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7.2.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Indoor temperature in cooling (Dry bulb temp. / Wet bulb temp. / RH)
RTC	Required total cooling capacity
ATC	Available total cooling capacity
RSC	Required sensible cooling capacity
ASC	Available sensible cooling capacity
Tmp-H	Indoor temperature in heating (Dry bulb temp.)
RHC	Required heating capacity
AHC	Available heating capacity
Tdis-H	Indoor unit discharge air temperature in heating
Airflow	Indoor unit airflow (High/Medium/Low)
ESP	External static pressure
Sound-Pr	Sound pressure level (High/Medium/Low)
Sound-Po	Sound power level (High/Medium/Low)
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
PI-C	Power input in cooling
PI-H	Power input in heating
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

7.3 Outdoor Unit Details (SS-PDC-CL-4)

7.3.1 Outdoor Unit Details Table

Model		MV6-XMi 335T
Module		MV6-XMi 335T
Tmp-C	°C	32
RTC	kW	31,92
ATC	kW	32,61
PI-C	kW	8,03
Tmp-H	°C/°C	3/-0,4
RHC	kW	32,74
AHC	kW	32,74
PI-H	kW	7,18
CR		103,3
Airflow	m ³ /h	11000
Sound-Pr		60
Sound-Po		
Bas-Refr	kg	11,00
Ex-Refr	kg	5,90
TCO2 eq.		
MCA	A	26,4

MFA	A	32
Power supply	V/ph/Hz	380-415V
Dimension(WxHxD)	mm	990*1635*790
Weight	kg	227

7.3.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Outdoor conditions in cooling (Dry bulb temp.)
RTC	Required cooling capacity
ATC	Available cooling capacity
PI-C	Power input in cooling
Tmp-H	Indoor conditions in heating (Dry bulb temp. / Wet bulb temp. / RH)
RHC	Required heating capacity
AHC	Available heating capacity
PI-H	Power input in heating
CR	Combination ratio
Airflow	Outdoor unit airflow
Sound-Pr	Sound pressure level
Sound-Po	Sound power level
Bas-Refr	Standard factory refrigerant charge
Ex-Refr	Extra refrigerant charge
TCO2 eq.	Tonnes of CO2 equivalent
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

7.4 Piping Limitations (SS-PDC-CL-4)

7.4.1 Piping Limitations

Item	Capability	Actual Value
Total piping length	1000,00(m)	121,70(m)
Longest actual length	175,00(m)	38,20(m)
Longest equivalent length	200,00(m)	50,20(m)
Longest equivalent length after first branch	90,00(m)	35,70(m)
Indoor unit to nearest branch length	40,00(m)	6,00(m)
Length difference between longest and shortest distance to indoor units	40,00(m)	33,20(m)
Height difference between indoor and outdoor unit(ODU up)	90,00(m)	5,00(m)
Height difference between indoor and outdoor unit(ODU down)	110,00(m)	0,00(m)
Height difference between indoor units	30,00(m)	0,00(m)
Combination ratio	50-130%	103,28%
IDU quantity	20	13

7.4.2 Correction Factors

Item	Correction factor
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Altitude (indoor unit)	1,000
Altitude (outdoor unit)	1,000
Piping (cooling)	0,971
Piping (heating)	0,989
Defrost (heating)	1,000

7.4.3 Piping Details Table

No.	Length(m)	Piping diameter
(1)	11,00	Φ28.6/Φ12.7
(2)	1,00	Φ12.7/Φ6.35
(3)	9,00	Φ22.2/Φ9.53
(4)	6,00	Φ12.7/Φ6.35
(5)	1,20	Φ22.2/Φ9.53
(5)	4,00	Φ15.9/Φ9.53
(6)	5,50	Φ22.2/Φ9.53
(7)	3,00	Φ12.7/Φ6.35
(8)	5,00	Φ12.7/Φ6.35
(9)	1,00	Φ12.7/Φ6.35
(4)	1,50	Φ22.2/Φ9.53
(10)	1,00	Φ15.9/Φ9.53
(11)	4,00	Φ15.9/Φ9.53
(12)	4,00	Φ15.9/Φ9.53
(13)	4,00	Φ15.9/Φ9.53
(14)	3,00	Φ15.9/Φ9.53
(15)	1,50	Φ12.7/Φ6.35
(18)	1,50	Φ12.7/Φ6.35
(16)	0,50	Φ12.7/Φ6.35
(17)	3,00	Φ12.7/Φ6.35
(18)	5,00	Φ12.7/Φ6.35
(19)	3,50	Φ15.9/Φ9.53
(20)	5,50	Φ12.7/Φ6.35
(21)	1,00	Φ12.7/Φ6.35
(22)	2,00	Φ12.7/Φ6.35

7.4.4 Branch Joints Details Table

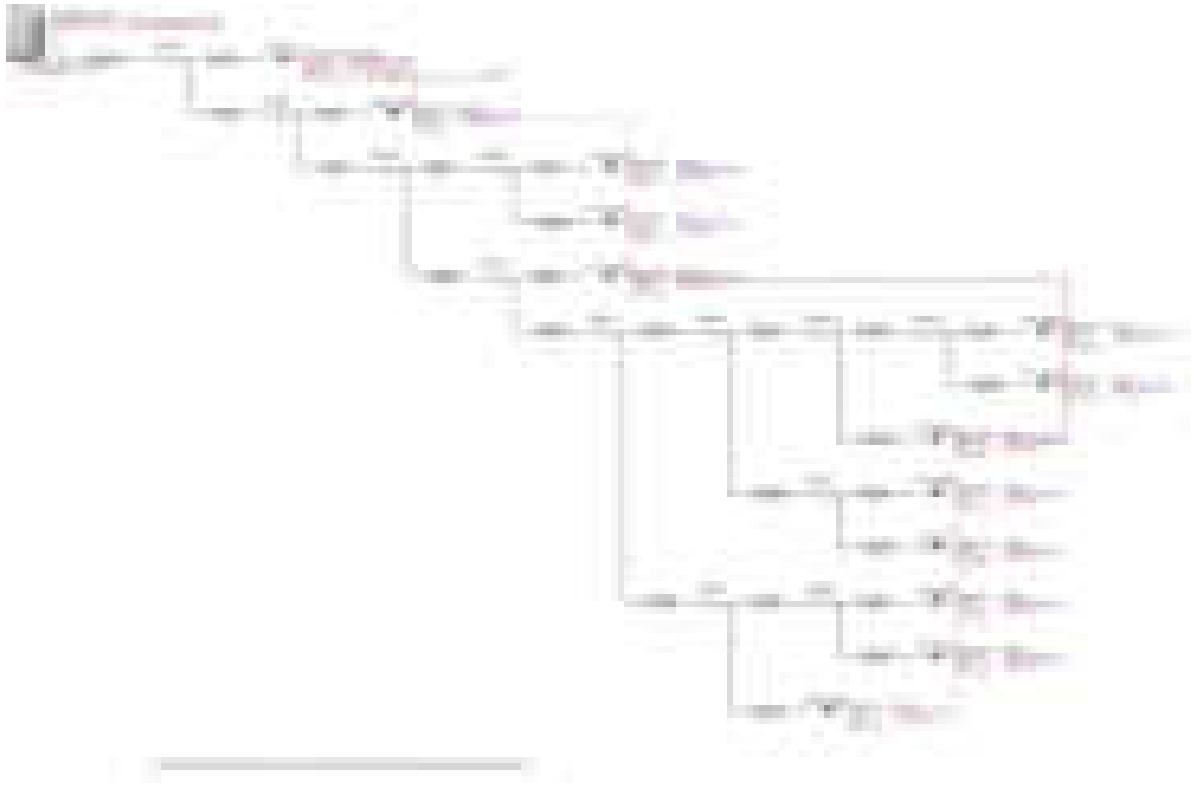
No.	Load(kW)	Model
(1)	34,6	FQZHN-03D
(2)	32,4	FQZHN-02D
(3)	30,2	FQZHN-02D
(4)	5,6	FQZHN-01D
(5)	24,6	FQZHN-02D
(6)	22,4	FQZHN-02D
(7)	14	FQZHN-01D
(8)	8,4	FQZHN-01D
(9)	5,6	FQZHN-01D
(10)	5,6	FQZHN-01D
(11)	8,4	FQZHN-01D
(12)	5,6	FQZHN-01D

7.4.5 Reducer Details Table

7.4.6 Bends Detailed Table

Quantity	Equivalent length(m)
56	28

7.5 Piping Diagrams (SS-PDC-CL-4)



7.6 Wiring Diagrams (SS-PDC-CL-4)



8. SS-PDC-CL-5

8.1 BOM List (SS-PDC-CL-5)

Model	Quantity	Unit	Description
MV6-XMi 335T	1		VRF MV6, Heat Pump Outdoor Unit
Q4AN-2-XMi D22	4		4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D28	8		4-way Cassette Compact, Indoor Unit
FQZHN-03D	1		Branch joint
FQZHN-02D	2		Branch joint
FQZHN-01D	8		Branch joint
WDC-120G/WK	5		2nd generation group controller
CE-MBQ4-03B5	12		panel of compact four way cassette
Φ22.2<->Φ25.4	15		Reducer
Φ25.4<->Φ28.6	15		Reducer
Φ28.6<->Φ31.8	15		Reducer
Φ31.8<->Φ34.9	15		Reducer
Φ34.9<->Φ38.1	15		Reducer
Φ38.1<->Φ41.3	15		Reducer
Φ41.3<->Φ44.5	15		Reducer
Φ44.5<->Φ50.8	15		Reducer
Φ9.53<->Φ12.7	14		Reducer
Φ12.7<->Φ15.9	14		Reducer
Φ15.9<->Φ19.1	16		Reducer
Φ19.1<->Φ22.2	15		Reducer
R410A	11.78	kg	Extra Refrigerant Added
Φ6.35	38.5	m	Copper pipe
Φ12.7	81	m	Copper pipe
Φ15.9	20	m	Copper pipe
Φ19.1	30	m	Copper pipe
Φ22.2	0.5	m	Copper pipe
Φ25.4	12	m	Copper pipe
Φ28.6	20	m	Copper pipe

8.2 Indoor Unit Details (SS-PDC-CL-5)

8.2.1 Indoor Unit Details Table

IDU Name	Model	Weight(kg)	Dimension(WxHxD)(mm)	Power supply	MCA(A)	MFA(A)
D11/SS-D11-6	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
C9/SS-C9-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C9/SS-C9-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
D11/SS-D11-7	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
C10/SS-C10-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C10/SS-C10-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C12/SS-C12-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C12/SS-C12-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C11/SS-C11-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C11/SS-C11-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15

D11/SS-D11-5	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
D11/SS-D11-4	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15

IDU Name	Model	Tmp-C(°C)	RTC(kW)	ATC(kW)	RSC(kW)	ASC(kW)	PI-C(W)	Tmp-H(°C)	RHC(kW)	AHC(kW)	PI-H(W)
D11/SS-D11-6	Q4AN-2-XMi D22	26		2,2		1,47	35	21		2,15	35
C9/SS-C9-1	Q4AN-2-XMi D28	26		2,75		1,84	35	21		2,86	35
C9/SS-C9-2	Q4AN-2-XMi D28	26		2,76		1,84	35	21		2,86	35
D11/SS-D11-7	Q4AN-2-XMi D22	26		2,17		1,46	35	21		2,15	35
C10/SS-C10-1	Q4AN-2-XMi D28	26		2,72		1,81	35	21		2,86	35
C10/SS-C10-2	Q4AN-2-XMi D28	26		2,72		1,82	35	21		2,86	35
C12/SS-C12-1	Q4AN-2-XMi D28	26		2,71		1,81	35	21		2,86	35
C12/SS-C12-2	Q4AN-2-XMi D28	26		2,7		1,8	35	21		2,86	35
C11/SS-C11-1	Q4AN-2-XMi D28	26		2,75		1,83	35	21		2,86	35
C11/SS-C11-2	Q4AN-2-XMi D28	26		2,74		1,82	35	21		2,86	35
D11/SS-D11-5	Q4AN-2-XMi D22	26		2,2		1,47	35	21		2,15	35
D11/SS-D11-4	Q4AN-2-XMi D22	26		2,2		1,47	35	21		2,15	35

IDU Name	Model	Airflow(m³/h)	Sound-Pr dB(A)	ESP(Pa)
D11/SS-D11-6	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C9/SS-C9-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C9/SS-C9-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D11/SS-D11-7	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C10/SS-C10-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C10/SS-C10-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C12/SS-C12-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C12/SS-C12-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C11/SS-C11-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C11/SS-C11-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D11/SS-D11-5	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D11/SS-D11-4	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0

IDU Name	Model	Piping Length to 1st Y Joint(m)
D11/SS-D11-6	Q4AN-2-XMi D22	8,00
C9/SS-C9-1	Q4AN-2-XMi D28	26,50
C9/SS-C9-2	Q4AN-2-XMi D28	25,00

D11/SS-D11-7	Q4AN-2-XMi D22	25,50
C10/SS-C10-1	Q4AN-2-XMi D28	37,50
C10/SS-C10-2	Q4AN-2-XMi D28	36,50
C12/SS-C12-1	Q4AN-2-XMi D28	39,00
C12/SS-C12-2	Q4AN-2-XMi D28	41,00
C11/SS-C11-1	Q4AN-2-XMi D28	29,50
C11/SS-C11-2	Q4AN-2-XMi D28	31,50
D11/SS-D11-5	Q4AN-2-XMi D22	10,50
D11/SS-D11-4	Q4AN-2-XMi D22	11,50

8.2.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Indoor temperature in cooling (Dry bulb temp. / Wet bulb temp. / RH)
RTC	Required total cooling capacity
ATC	Available total cooling capacity
RSC	Required sensible cooling capacity
ASC	Available sensible cooling capacity
Tmp-H	Indoor temperature in heating (Dry bulb temp.)
RHC	Required heating capacity
AHC	Available heating capacity
Tdis-H	Indoor unit discharge air temperature in heating
Airflow	Indoor unit airflow (High/Medium/Low)
ESP	External static pressure
Sound-Pr	Sound pressure level (High/Medium/Low)
Sound-Po	Sound power level (High/Medium/Low)
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
PI-C	Power input in cooling
PI-H	Power input in heating
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

8.3 Outdoor Unit Details (SS-PDC-CL-5)

8.3.1 Outdoor Unit Details Table

Model		MV6-XMi 335T
Module		MV6-XMi 335T
Tmp-C	°C	32
RTC	kW	30,63
ATC	kW	31,2
PI-C	kW	7,12
Tmp-H	°C/°C	3/-0,4
RHC	kW	31,53
AHC	kW	31,53
PI-H	kW	6,67

CR		93,1
Airflow	m ³ /h	11000
Sound-Pr		60
Sound-Po		
Bas-Refr	kg	11,00
Ex-Refr	kg	11,78
TCO2 eq.		
MCA	A	26,4
MFA	A	32
Power supply	V/ph/Hz	380-415V
Dimension(WxHxD)	mm	990*1635*790
Weight	kg	227

8.3.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Outdoor conditions in cooling (Dry bulb temp.)
RTC	Required cooling capacity
ATC	Available cooling capacity
PI-C	Power input in cooling
Tmp-H	Indoor conditions in heating (Dry bulb temp. / Wet bulb temp. / RH)
RHC	Required heating capacity
AHC	Available heating capacity
PI-H	Power input in heating
CR	Combination ratio
Airflow	Outdoor unit airflow
Sound-Pr	Sound pressure level
Sound-Po	Sound power level
Bas-Refr	Standard factory refrigerant charge
Ex-Refr	Extra refrigerant charge
TCO2 eq.	Tonnes of CO2 equivalent
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

8.4 Piping Limitations (SS-PDC-CL-5)

8.4.1 Piping Limitations

Item	Capability	Actual Value
Total piping length	1000,00(m)	136,50(m)
Longest actual length	175,00(m)	50,00(m)
Longest equivalent length	200,00(m)	65,50(m)
Longest equivalent length after first branch	90,00(m)	41,00(m)
Indoor unit to nearest branch length	40,00(m)	5,00(m)
Length difference between longest and shortest distance to indoor units	40,00(m)	33,00(m)
Height difference between indoor and outdoor unit(ODU up)	90,00(m)	5,00(m)
Height difference between indoor and outdoor unit(ODU down)	110,00(m)	0,00(m)

Height difference between indoor units	30,00(m)	0,00(m)
Combination ratio	50-130%	93,13%
IDU quantity	20	12

8.4.2 Correction Factors

Item	Correction factor
Altitude (indoor unit)	1,000
Altitude (outdoor unit)	1,000
Piping (cooling)	0,960
Piping (heating)	0,984
Defrost (heating)	1,000

8.4.3 Piping Details Table

No.	Length(m)	Piping diameter
(1)	20,00	Φ28.6/Φ15.9
(2)	5,00	Φ19.1/Φ12.7
(3)	5,00	Φ25.4/Φ12.7
(2)	0,50	Φ12.7/Φ6.35
(3)	7,00	Φ25.4/Φ12.7
(4)	3,50	Φ19.1/Φ12.7
(5)	0,50	Φ22.2/Φ12.7
(3)	4,00	Φ12.7/Φ6.35
(6)	3,00	Φ12.7/Φ6.35
(7)	4,00	Φ19.1/Φ12.7
(8)	6,00	Φ19.1/Φ12.7
(9)	1,00	Φ12.7/Φ6.35
(10)	3,50	Φ19.1/Φ12.7
(14)	3,00	Φ19.1/Φ12.7
(11)	5,00	Φ19.1/Φ12.7
(12)	4,00	Φ12.7/Φ6.35
(13)	3,00	Φ12.7/Φ6.35
(18)	3,00	Φ12.7/Φ6.35
(14)	5,00	Φ12.7/Φ6.35
(7)	3,00	Φ12.7/Φ6.35
(21)	5,00	Φ12.7/Φ6.35
(15)	4,00	Φ12.7/Φ6.35
(16)	3,00	Φ12.7/Φ6.35

8.4.4 Branch Joints Details Table

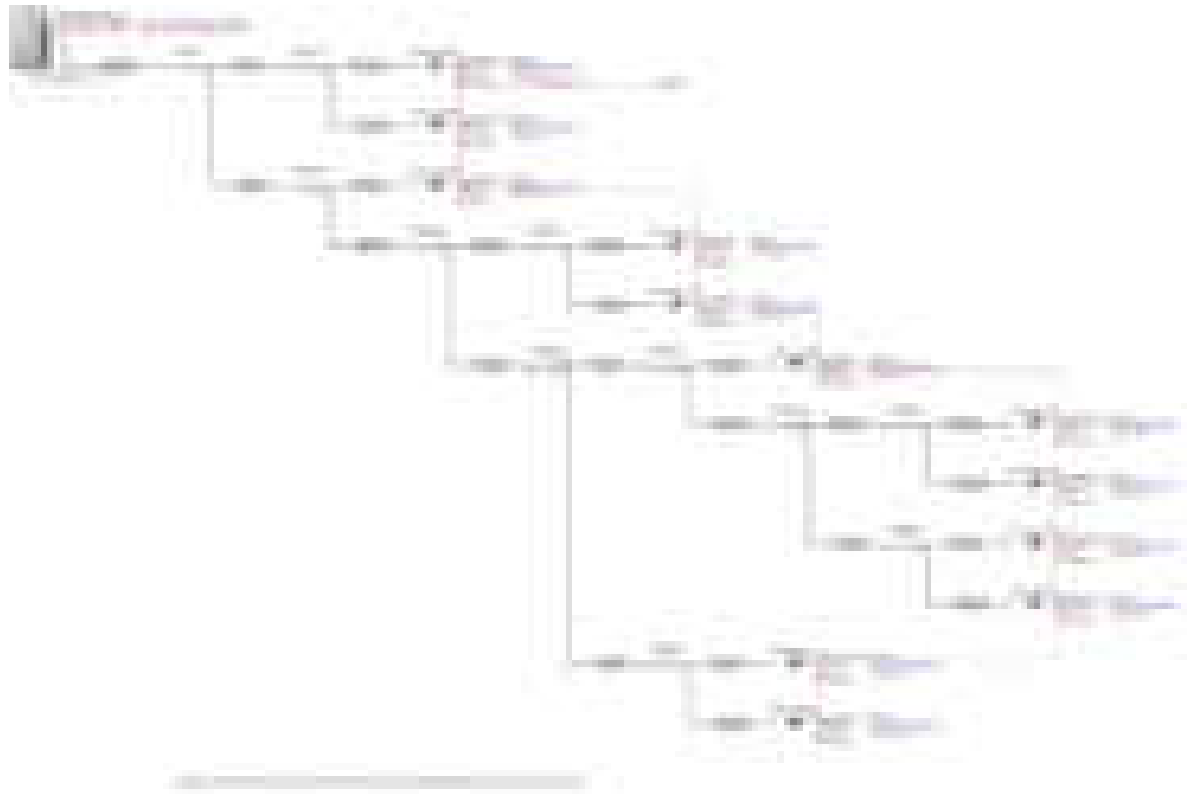
No.	Load(kW)	Model
(1)	31,2	FQZHN-03D
(2)	26,8	FQZHN-02D
(3)	24,6	FQZHN-02D
(4)	5,6	FQZHN-01D
(5)	19	FQZHN-01D
(6)	13,4	FQZHN-01D

	$\phi 28.6 + \phi 28.6 < - > \phi 31.8 + \phi 31.8 < - > \phi 34.9 + \phi 34.9 < - > \phi 38.1 + \phi 38.1 < - > \phi 41.3 + \phi 41.3 < - > \phi 44.5 + \phi 44.5 < - > \phi 50.8$
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8.4.6 Bends Detailed Table

Quantity	Equivalent length(m)
60	30

8.5 Piping Diagrams (SS-PDC-CL-5)



8.6 Wiring Diagrams (SS-PDC-CL-5)



9. SS-PDC-CL-6

9.1 BOM List (SS-PDC-CL-6)

Model	Quantity	Unit	Description
MV6-XMi 670T	1		VRF MV6, Heat Pump Outdoor Unit
Q4AN-2-XMi D28	8		4-way Cassette Compact, Indoor Unit
CNT2-2-XMi D28	4		Mid Static Pressure Duct, Indoor Unit
Q4AN-2-XMi D22	9		4-way Cassette Compact, Indoor Unit
Q4AN-2-XMi D36	5		4-way Cassette Compact, Indoor Unit
FQZHN-03D	4		Branch joint
FQZHN-01D	17		Branch joint
FQZHN-02D	4		Branch joint
WDC-120G/WK	9		2nd generation group controller
CE-MBQ4-03B5	22		panel of compact four way cassette
Φ25.4<->Φ28.6	35		Reducer
Φ28.6<->Φ31.8	37		Reducer
Φ31.8<->Φ34.9	37		Reducer
Φ34.9<->Φ38.1	37		Reducer
Φ38.1<->Φ41.3	37		Reducer
Φ41.3<->Φ44.5	37		Reducer
Φ44.5<->Φ50.8	37		Reducer
Φ12.7<->Φ15.9	32		Reducer
Φ15.9<->Φ19.1	34		Reducer
Φ19.1<->Φ22.2	33		Reducer
Φ22.2<->Φ25.4	34		Reducer
Φ9.53<->Φ12.7	31		Reducer
R410A	20.96	kg	Extra Refrigerant Added
Φ6.35	79.5	m	Copper pipe
Φ12.7	156.5	m	Copper pipe
Φ15.9	21	m	Copper pipe
Φ19.1	76.5	m	Copper pipe
Φ25.4	10.5	m	Copper pipe
Φ31.8	31	m	Copper pipe

9.2 Indoor Unit Details (SS-PDC-CL-6)

9.2.1 Indoor Unit Details Table

IDU Name	Model	Weight(kg)	Dimension(WxHxD)(mm)	Power supply	MCA(A)	MFA(A)
RIU2/SS-RIU2-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
RIU2/SS-RIU2-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
RIU2/SS-RIU2-3	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
SR3/SS-SR3	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
INGR/SS-INGR-1	CNT2-2-XMi D28	18	780*210*500	220-240V	0,74	15
INGR/SS-INGR-2	CNT2-2-XMi D28	18	780*210*500	220-240V	0,74	15
INGR/SS-INGR-3	CNT2-2-XMi D28	18	780*210*500	220-240V	0,74	15
D12/SS-D12-1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
D12/SS-D12-2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15

BIB/SS-BIB-1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
BIB/SS-BIB-2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
BIB/SS-BIB-3	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
BIB/SS-BIB-4	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
D12/SS-D12-3	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
SR4/SS-SR4	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
C14/SS-C14-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C14/SS-C14-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C15/SS-C15-1	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
C15/SS-C15-2	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
L5/SS-L5-1	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
L5/SS-L5-2	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
L5/SS-L5-3	Q4AN-2-XMi D36	19.2	630*260*570	220-240V	0,48	15
C13/SS-C13-1	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
C13/SS-C13-2	Q4AN-2-XMi D28	18	630*260*570	220-240V	0,43	15
D12/SS-D12-4	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
INGR/SS-INGR-4	CNT2-2-XMi D28	18	780*210*500	220-240V	0,74	15

IDU Name	Model	Tmp-C(°C)	RTC(kW)	ATC(kW)	RSC(kW)	ASC(kW)	PI-C(W)	Tmp-H(°C)	RHC(kW)	AHC(kW)	PI-H(W)
RIU2/SS-RIU2-1	Q4AN-2-XMi D28	26		2,52		1,68	35	21		2,69	35
RIU2/SS-RIU2-2	Q4AN-2-XMi D28	26		2,53		1,69	35	21		2,69	35
RIU2/SS-RIU2-3	Q4AN-2-XMi D28	26		2,54		1,69	35	21		2,69	35
SR3/SS-SR3	Q4AN-2-XMi D28	26		2,57		1,71	35	21		2,69	35
INGR/SS-INGR-1	CNT2-2-XMi D28	26		2,5		1,84	40	21		2,69	40
INGR/SS-INGR-2	CNT2-2-XMi D28	26		2,52		1,86	40	21		2,69	40
INGR/SS-INGR-3	CNT2-2-XMi D28	26		2,53		1,87	40	21		2,69	40
D12/SS-D12-1	Q4AN-2-XMi D22	26		2,01		1,35	35	21		2,02	35
D12/SS-D12-2	Q4AN-2-XMi D22	26		2,01		1,34	35	21		2,02	35
BIB/SS-BIB-1	Q4AN-2-XMi D22	26		1,97		1,32	35	21		2,02	35
BIB/SS-BIB-2	Q4AN-2-XMi D22	26		1,97		1,32	35	21		2,02	35
BIB/SS-BIB-3	Q4AN-2-XMi D22	26		1,99		1,33	35	21		2,02	35
BIB/SS-BIB-4	Q4AN-2-XMi D22	26		1,99		1,33	35	21		2,02	35
D12/SS-D12-3	Q4AN-2-XMi D22	26		2,01		1,35	35	21		2,02	35
SR4/SS-SR4	Q4AN-2-XMi D22	26		1,97		1,32	35	21		2,02	35
C14/SS-C14-1	Q4AN-2-XMi D28	26		2,45		1,63	35	21		2,69	35

C14/SS-C14-2	Q4AN-2-XMi D28	26		2,45		1,63	35	21		2,69	35
C15/SS-C15-1	Q4AN-2-XMi D36	26		3,15		2,06	40	21		3,36	40
C15/SS-C15-2	Q4AN-2-XMi D36	26		3,14		2,06	40	21		3,36	40
L5/SS-L5-1	Q4AN-2-XMi D36	26		3,14		2,06	40	21		3,36	40
L5/SS-L5-2	Q4AN-2-XMi D36	26		3,16		2,07	40	21		3,36	40
L5/SS-L5-3	Q4AN-2-XMi D36	26		3,15		2,06	40	21		3,36	40
C13/SS-C13-1	Q4AN-2-XMi D28	26		2,49		1,66	35	21		2,69	35
C13/SS-C13-2	Q4AN-2-XMi D28	26		2,49		1,66	35	21		2,69	35
D12/SS-D12-4	Q4AN-2-XMi D22	26		1,96		1,31	35	21		2,02	35
INGR/SS-INGR-4	CNT2-2-XMi D28	26		2,56		1,88	40	21		2,69	40

IDU Name	Model	Airflow(m ³ /h)	Sound-Pr dB(A)	ESP(Pa)
RIU2/SS-RIU2-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
RIU2/SS-RIU2-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
RIU2/SS-RIU2-3	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SR3/SS-SR3	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
INGR/SS-INGR-1	CNT2-2-XMi D28	520/480/440/400/360/330/300	32/31/29/28/26/25/23	10(0~70)
INGR/SS-INGR-2	CNT2-2-XMi D28	520/480/440/400/360/330/300	32/31/29/28/26/25/23	10(0~70)
INGR/SS-INGR-3	CNT2-2-XMi D28	520/480/440/400/360/330/300	32/31/29/28/26/25/23	10(0~70)
D12/SS-D12-1	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D12/SS-D12-2	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
BIB/SS-BIB-1	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
BIB/SS-BIB-2	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
BIB/SS-BIB-3	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
BIB/SS-BIB-4	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D12/SS-D12-3	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
SR4/SS-SR4	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C14/SS-C14-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C14/SS-C14-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C15/SS-C15-1	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
C15/SS-C15-2	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
L5/SS-L5-1	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
L5/SS-L5-2	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
L5/SS-L5-3	Q4AN-2-XMi D36	521/485/450/409/380/350/314	41/38/35/32/30/29/28	0
C13/SS-C13-1	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
C13/SS-C13-2	Q4AN-2-XMi D28	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
D12/SS-D12-4	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
INGR/SS-INGR-4	CNT2-2-XMi D28	520/480/440/400/360/330/300	32/31/29/28/26/25/23	10(0~70)

IDU Name	Model	Piping Length to 1st Y Joint(m)
RIU2/SS-RIU2-1	Q4AN-2-XMi D28	24,50
RIU2/SS-RIU2-2	Q4AN-2-XMi D28	22,00
RIU2/SS-RIU2-3	Q4AN-2-XMi D28	21,00
SR3/SS-SR3	Q4AN-2-XMi D28	11,50
INGR/SS-INGR-1	CNT2-2-XMi D28	30,00
INGR/SS-INGR-2	CNT2-2-XMi D28	24,50
INGR/SS-INGR-3	CNT2-2-XMi D28	22,50
D12/SS-D12-1	Q4AN-2-XMi D22	17,50
D12/SS-D12-2	Q4AN-2-XMi D22	19,00
BIB/SS-BIB-1	Q4AN-2-XMi D22	31,00
BIB/SS-BIB-2	Q4AN-2-XMi D22	31,00
BIB/SS-BIB-3	Q4AN-2-XMi D22	25,50
BIB/SS-BIB-4	Q4AN-2-XMi D22	25,00
D12/SS-D12-3	Q4AN-2-XMi D22	15,00
SR4/SS-SR4	Q4AN-2-XMi D22	28,50
C14/SS-C14-1	Q4AN-2-XMi D28	46,50
C14/SS-C14-2	Q4AN-2-XMi D28	45,50
C15/SS-C15-1	Q4AN-2-XMi D36	43,50
C15/SS-C15-2	Q4AN-2-XMi D36	45,50
L5/SS-L5-1	Q4AN-2-XMi D36	45,50
L5/SS-L5-2	Q4AN-2-XMi D36	44,00
L5/SS-L5-3	Q4AN-2-XMi D36	45,50
C13/SS-C13-1	Q4AN-2-XMi D28	34,50
C13/SS-C13-2	Q4AN-2-XMi D28	33,50
D12/SS-D12-4	Q4AN-2-XMi D22	32,00
INGR/SS-INGR-4	CNT2-2-XMi D28	16,00

9.2.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Indoor temperature in cooling (Dry bulb temp. / Wet bulb temp. / RH)
RTC	Required total cooling capacity
ATC	Available total cooling capacity
RSC	Required sensible cooling capacity
ASC	Available sensible cooling capacity
Tmp-H	Indoor temperature in heating (Dry bulb temp.)
RHC	Required heating capacity
AHC	Available heating capacity
Tdis-H	Indoor unit discharge air temperature in heating
Airflow	Indoor unit airflow (High/Medium/Low)
ESP	External static pressure
Sound-Pr	Sound pressure level (High/Medium/Low)
Sound-Po	Sound power level (High/Medium/Low)
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
PI-C	Power input in cooling
PI-H	Power input in heating
Power supply	Power supply

Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

9.3 Outdoor Unit Details (SS-PDC-CL-6)

9.3.1 Outdoor Unit Details Table

Model		MV6-XMi 670T
Module		MV6-XMi 670T
Tmp-C	°C	32
RTC	kW	63,74
ATC	kW	65,42
PI-C	kW	16,99
Tmp-H	°C/°C	3/-0,4
RHC	kW	67,26
AHC	kW	67,26
PI-H	kW	17,20
CR		106,6
Airflow	m ³ /h	25000
Sound-Pr		64
Sound-Po		
Bas-Refr	kg	22,00
Ex-Refr	kg	20,96
TCO2 eq.		
MCA	A	48,4
MFA	A	63
Power supply	V/ph/Hz	380-415V
Dimension(WxHxD)	mm	1730*1830*850
Weight	kg	430

9.3.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Outdoor conditions in cooling (Dry bulb temp.)
RTC	Required cooling capacity
ATC	Available cooling capacity
PI-C	Power input in cooling
Tmp-H	Indoor conditions in heating (Dry bulb temp. / Wet bulb temp. / RH)
RHC	Required heating capacity
AHC	Available heating capacity
PI-H	Power input in heating
CR	Combination ratio
Airflow	Outdoor unit airflow
Sound-Pr	Sound pressure level
Sound-Po	Sound power level
Bas-Refr	Standard factory refrigerant charge
Ex-Refr	Extra refrigerant charge
TCO2 eq.	Tonnes of CO2 equivalent
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps

Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

9.4 Piping Limitations (SS-PDC-CL-6)

9.4.1 Piping Limitations

Item	Capability	Actual Value
Total piping length	1000,00(m)	242,50(m)
Longest actual length	175,00(m)	49,00(m)
Longest equivalent length	200,00(m)	61,00(m)
Longest equivalent length after first branch	90,00(m)	46,50(m)
Indoor unit to nearest branch length	40,00(m)	8,00(m)
Length difference between longest and shortest distance to indoor units	40,00(m)	35,00(m)
Height difference between indoor and outdoor unit(ODU up)	90,00(m)	5,00(m)
Height difference between indoor and outdoor unit(ODU down)	110,00(m)	0,00(m)
Height difference between indoor units	30,00(m)	0,00(m)
Combination ratio	50-130%	106,57%
IDU quantity	39	26

9.4.2 Correction Factors

Item	Correction factor
Altitude (indoor unit)	1,000
Altitude (outdoor unit)	1,000
Piping (cooling)	0,961
Piping (heating)	0,984
Defrost (heating)	1,000

9.4.3 Piping Details Table

No.	Length(m)	Piping diameter
(1)	10,00	Φ31.8/Φ19.1
(2)	2,50	Φ31.8/Φ15.9
(3)	11,00	Φ31.8/Φ15.9
(4)	5,50	Φ19.1/Φ12.7
(5)	1,00	Φ25.4/Φ12.7
(6)	6,00	Φ19.1/Φ12.7
(7)	1,00	Φ12.7/Φ6.35
(8)	3,00	Φ19.1/Φ12.7
(9)	3,00	Φ12.7/Φ6.35
(10)	3,00	Φ12.7/Φ6.35
(11)	0,50	Φ12.7/Φ6.35
(12)	5,50	Φ19.1/Φ12.7
(13)	5,00	Φ19.1/Φ12.7
(14)	3,50	Φ19.1/Φ12.7
(15)	4,50	Φ12.7/Φ6.35
(16)	8,00	Φ12.7/Φ6.35

(17)	3,00	Φ12.7/Φ6.35
(18)	2,00	Φ19.1/Φ12.7
(19)	6,50	Φ19.1/Φ12.7
(20)	1,00	Φ12.7/Φ6.35
(21)	2,50	Φ12.7/Φ6.35
(22)	2,50	Φ19.1/Φ12.7
(23)	4,00	Φ12.7/Φ6.35
(24)	2,50	Φ19.1/Φ12.7
(25)	1,50	Φ12.7/Φ6.35
(26)	4,00	Φ12.7/Φ6.35
(27)	4,00	Φ12.7/Φ6.35
(28)	1,00	Φ12.7/Φ6.35
(29)	7,50	Φ31.8/Φ15.9
(30)	5,00	Φ12.7/Φ6.35
(31)	1,50	Φ25.4/Φ12.7
(32)	5,00	Φ25.4/Φ12.7
(33)	4,00	Φ19.1/Φ12.7
(34)	1,00	Φ12.7/Φ6.35
(35)	3,00	Φ25.4/Φ12.7
(36)	2,00	Φ19.1/Φ12.7
(37)	4,50	Φ19.1/Φ12.7
(38)	3,50	Φ19.1/Φ12.7
(39)	4,00	Φ19.1/Φ12.7
(40)	4,00	Φ12.7/Φ6.35
(41)	3,00	Φ12.7/Φ6.35
(42)	4,00	Φ12.7/Φ6.35
(43)	3,00	Φ12.7/Φ6.35
(44)	3,00	Φ12.7/Φ6.35
(45)	5,00	Φ12.7/Φ6.35
(46)	5,00	Φ12.7/Φ6.35
(47)	2,50	Φ19.1/Φ12.7
(48)	0,50	Φ12.7/Φ6.35
(49)	2,00	Φ12.7/Φ6.35
(50)	4,00	Φ19.1/Φ12.7
(51)	3,00	Φ12.7/Φ6.35

9.4.4 Branch Joints Details Table

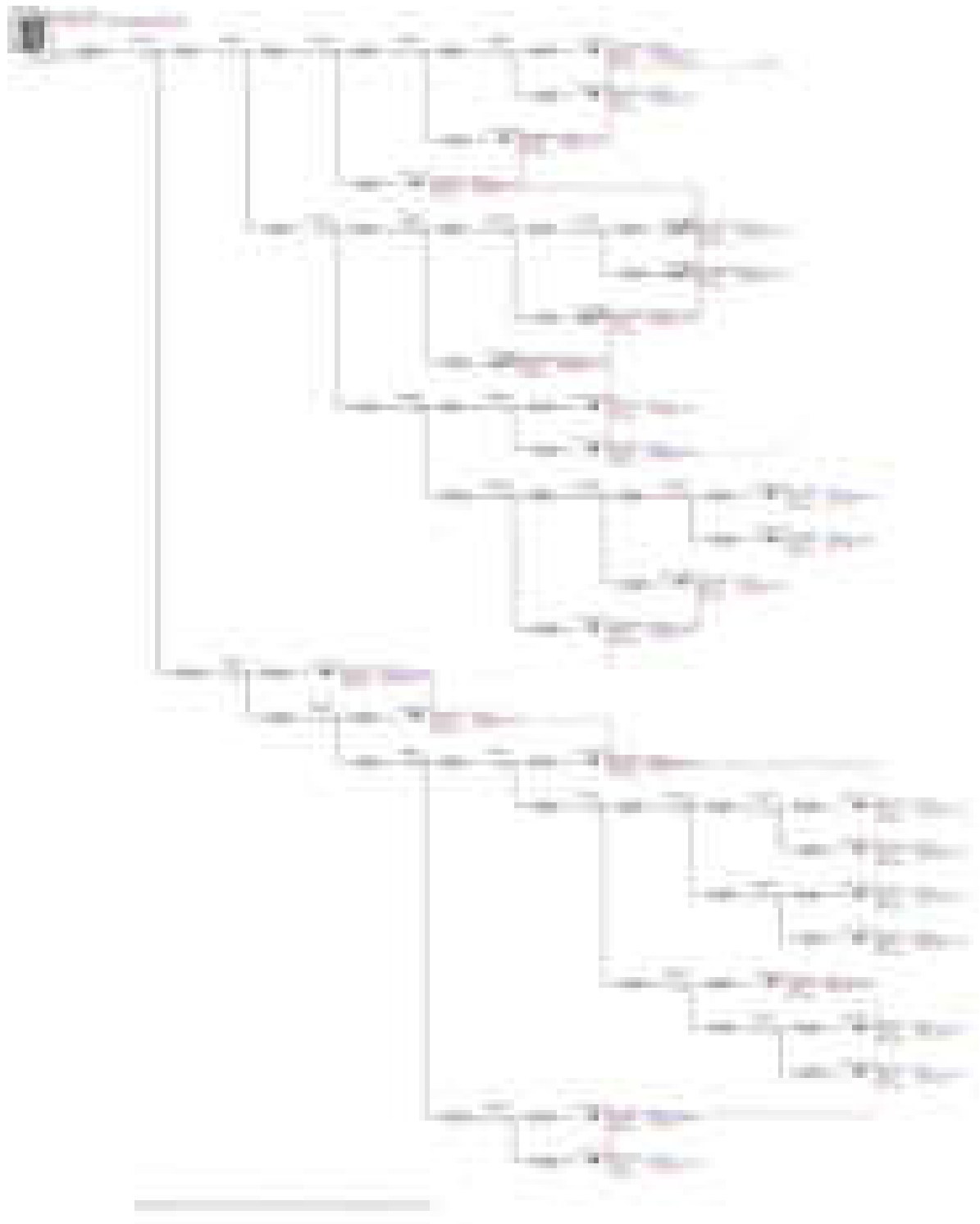
No.	Load(kW)	Model
(1)	71,4	FQZHN-03D
(2)	35,6	FQZHN-03D
(3)	11,2	FQZHN-01D
(4)	8,4	FQZHN-01D
(5)	5,6	FQZHN-01D
(6)	24,4	FQZHN-02D
(7)	8,4	FQZHN-01D
(8)	5,6	FQZHN-01D
(9)	13,2	FQZHN-01D
(10)	4,4	FQZHN-01D
(11)	8,8	FQZHN-01D

J23-L1	$\Phi 9.53 < - > \Phi 12.7 + \Phi 12.7 < - > \Phi 15.9 + \Phi 15.9 < - > \Phi 19.1 + \Phi 19.1 < - > \Phi 22.2 + \Phi 22.2 < - > \Phi 25.4 + \Phi 25.4 < - > \Phi 28.6 + \Phi 28.6 < - > \Phi 31.8 + \Phi 31.8 < - > \Phi 34.9 + \Phi 34.9 < - > \Phi 38.1 + \Phi 38.1 < - > \Phi 41.3 + \Phi 41.3 < - > \Phi 44.5 + \Phi 44.5 < - > \Phi 50.8$
J23-L2	$\Phi 9.53 < - > \Phi 12.7 + \Phi 12.7 < - > \Phi 15.9 + \Phi 15.9 < - > \Phi 19.1 + \Phi 19.1 < - > \Phi 22.2 + \Phi 22.2 < - > \Phi 25.4 + \Phi 25.4 < - > \Phi 28.6 + \Phi 28.6 < - > \Phi 31.8 + \Phi 31.8 < - > \Phi 34.9 + \Phi 34.9 < - > \Phi 38.1 + \Phi 38.1 < - > \Phi 41.3 + \Phi 41.3 < - > \Phi 44.5 + \Phi 44.5 < - > \Phi 50.8$
J24-L1	$\Phi 9.53 < - > \Phi 12.7 + \Phi 12.7 < - > \Phi 15.9 + \Phi 15.9 < - > \Phi 19.1 + \Phi 19.1 < - > \Phi 22.2 + \Phi 22.2 < - > \Phi 25.4 + \Phi 25.4 < - > \Phi 28.6 + \Phi 28.6 < - > \Phi 31.8 + \Phi 31.8 < - > \Phi 34.9 + \Phi 34.9 < - > \Phi 38.1 + \Phi 38.1 < - > \Phi 41.3 + \Phi 41.3 < - > \Phi 44.5 + \Phi 44.5 < - > \Phi 50.8$
J25-L1	$\Phi 9.53 < - > \Phi 12.7 + \Phi 12.7 < - > \Phi 15.9 + \Phi 15.9 < - > \Phi 19.1 + \Phi 19.1 < - > \Phi 22.2 + \Phi 22.2 < - > \Phi 25.4 + \Phi 25.4 < - > \Phi 28.6 + \Phi 28.6 < - > \Phi 31.8 + \Phi 31.8 < - > \Phi 34.9 + \Phi 34.9 < - > \Phi 38.1 + \Phi 38.1 < - > \Phi 41.3 + \Phi 41.3 < - > \Phi 44.5 + \Phi 44.5 < - > \Phi 50.8$
J25-L2	$\Phi 9.53 < - > \Phi 12.7 + \Phi 12.7 < - > \Phi 15.9 + \Phi 15.9 < - > \Phi 19.1 + \Phi 19.1 < - > \Phi 22.2 + \Phi 22.2 < - > \Phi 25.4 + \Phi 25.4 < - > \Phi 28.6 + \Phi 28.6 < - > \Phi 31.8 + \Phi 31.8 < - > \Phi 34.9 + \Phi 34.9 < - > \Phi 38.1 + \Phi 38.1 < - > \Phi 41.3 + \Phi 41.3 < - > \Phi 44.5 + \Phi 44.5 < - > \Phi 50.8$

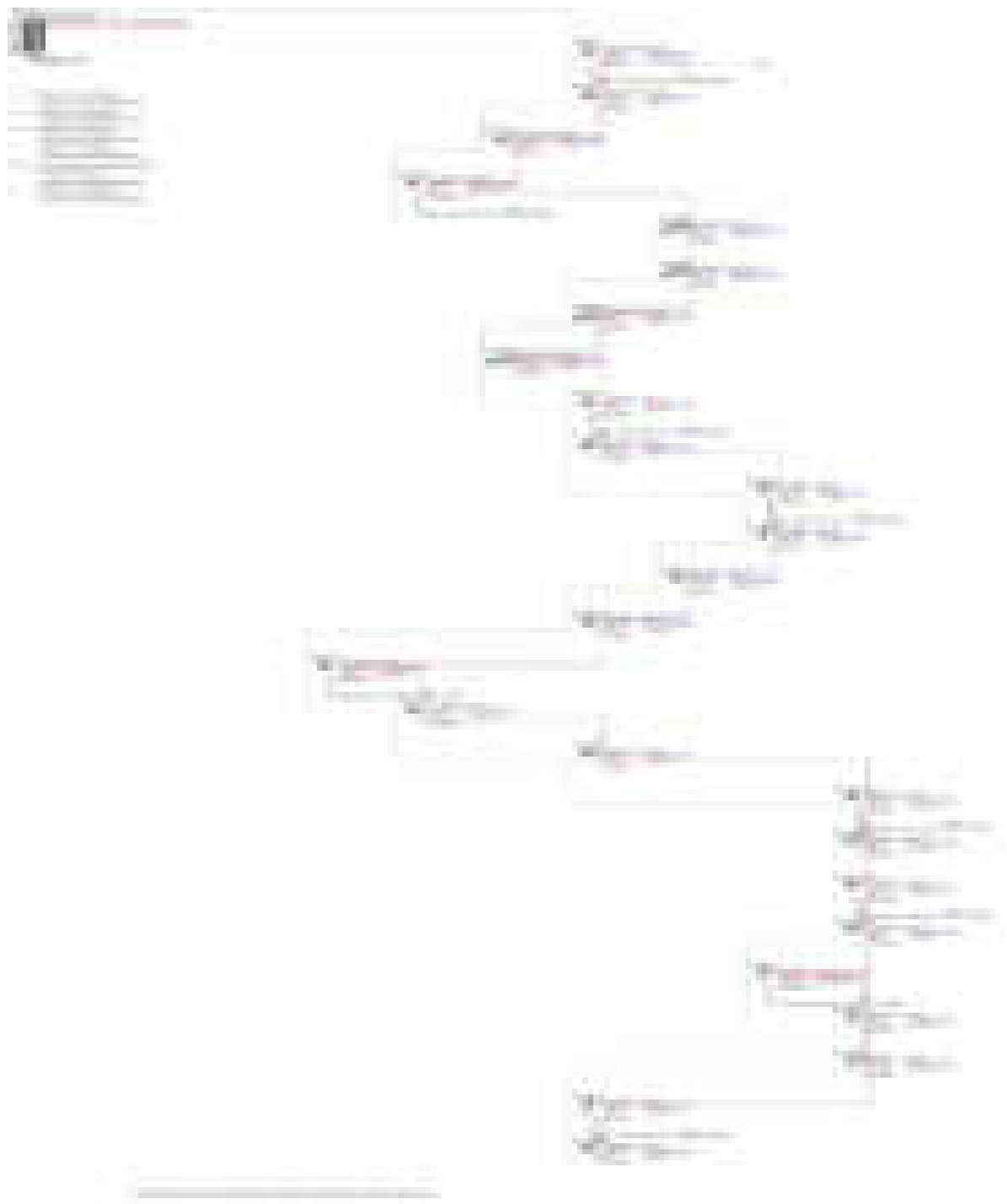
9.4.6 Bends Detailed Table

Quantity	Equivalent length(m)
85	42.5

9.5 Piping Diagrams (SS-PDC-CL-6)



9.6 Wiring Diagrams (SS-PDC-CL-6)



10. Centralized Control Solution

10.1 Centralized Controller List

The centralized control system of this project is full output regardless of whether the system is selected.

AUDITORIUM

1. Project Information

Date	2020-6-15
Project name	Auditorium UTA
Project address	
Country	Italy
State	
City	Cagliari
Client name	
Client address	
Reference	New Project
Revision	
Altitude(m)	0
Indoor DB temperature in cooling(°C)	26
Indoor WB temperature in cooling(°C)	19
Outdoor DB temperature in cooling(°C)	32
Outdoor WB temperature in cooling(°C)	24.1
Indoor DB temperature in heating(°C)	21
Indoor WB temperature in heating(°C)	18
Outdoor DB temperature in heating(°C)	3
Outdoor WB temperature in heating(°C)	-0.4

2. Overall Material List

2.1 Equipment List

Model	Quantity	Description
MV6i-XMi 252T	1	VRF MV6i, Heat Pump Outdoor Unit
Q4AN-2-XMi D22	6	4-way Cassette Compact, Indoor Unit
DZDF4-2-XMi D36	2	Floor Standing F4, Indoor Unit
GWMN-2-XMi D22	2	Wall-mounted, Indoor Unit
FQZHN-02D	1	Branch joint
FQZHN-01D	6	Branch joint
DXFQT4-01	1	Branch header
CE-MBQ4-03B5	6	panel of compact four way cassette
Φ9.53<->Φ12.7	12	Reducer
Φ12.7<->Φ15.9	12	Reducer
Φ15.9<->Φ19.1	13	Reducer
Φ19.1<->Φ22.2	12	Reducer
Φ22.2<->Φ25.4	12	Reducer
Φ25.4<->Φ28.6	12	Reducer
Φ28.6<->Φ31.8	12	Reducer
Φ31.8<->Φ34.9	12	Reducer
Φ34.9<->Φ38.1	12	Reducer
Φ38.1<->Φ41.3	12	Reducer

Φ41.3<->Φ44.5	12	Reducer
Φ44.5<->Φ50.8	12	Reducer
WDC-120G/WK	6	2nd generation group controller

2.2 Field Providing List

2.2.1 Refrigerant Piping Materials

Model	Quantity	Unit	Description
Φ6.35	34	m	Copper pipe
Φ9.53	14	m	Copper pipe
Φ12.7	82	m	Copper pipe
Φ15.9	14	m	Copper pipe
Φ19.1	45	m	Copper pipe
Φ22.2	3	m	Copper pipe
Insulation casing for piping			All refrigerant piping and branch joints should be completely insulated.

Recommended insulation casing thickness:

Piping size	Thickness	
	Humidity<80%RH	Humidity≥80%RH
Φ6.35~Φ38.1mm	≥15mm	≥20mm
Φ41.3~Φ38.1mm	≥20mm	≥25mm

2.2.2 Refrigerant charge

System name	Model	Quantity	Unit	Description
Auditorium	R410A	8.37	kg	Extra Refrigerant Added

2.2.3 Electrical cables

Type	Size	Length
Power supply cable	Select based on MCA of each unit	According to the actual system design
Communication cable	0.75mm ² 3-core shielded	According to the actual system design

3. Overall Electrical Characteristics

Model	Quantity	Power supply	MCA(A)	MFA(A)	Power input in cooling(kW)	Power input in heating(kW)
MV6i-XMi 252T	1	380-415V	24,00	32	6,000	5,000
Q4AN-2-XMi D22	6	220-240V	0,43	15	0,035	0,035
DZDF4-2-XMi D36	2	220-240V	0,55	15	0,055	0,055
GWMN-2-XMi D22	2	220-240V	0,32	15	0,028	0,028
CE-MBQ4-03B5	6					

Notes:

1. MCA: Minimum Circuit Amps. MCA is used to select wire size. The value in above table is for one unit.
2. MFA: Maximum Fuse Amps. MFA is used to select overcurrent circuit breakers and residual-current circuit breakers. The value in above table is for one unit.
3. Power in put in cooling and heating are based on below conditions(The value in above table is for one unit.):

Cooling: indoor air temperature 27°C DB/19°C WB; outdoor temperature 35°C DB;
Heating: indoor air temperature 20°C DB; outdoor temperature 7°C DB/6°C WB;
Equivalent refrigerant piping length 7.5m with zero level difference.

4. Auditorium

4.1 BOM List (Auditorium)

Model	Quantity	Unit	Description
MV6i-XMi 252T	1		VRF MV6i, Heat Pump Outdoor Unit
Q4AN-2-XMi D22	6		4-way Cassette Compact, Indoor Unit
DZDF4-2-XMi D36	2		Floor Standing F4, Indoor Unit
GWMN-2-XMi D22	2		Wall-mounted, Indoor Unit
FQZHN-02D	1		Branch joint
FQZHN-01D	6		Branch joint
DXFQT4-01	1		Branch header
WDC-120G/WK	6		2nd generation group controller
CE-MBQ4-03B5	6		panel of compact four way cassette
Φ9.53<->Φ12.7	12		Reducer
Φ12.7<->Φ15.9	12		Reducer
Φ15.9<->Φ19.1	13		Reducer
Φ19.1<->Φ22.2	12		Reducer
Φ22.2<->Φ25.4	12		Reducer
Φ25.4<->Φ28.6	12		Reducer
Φ28.6<->Φ31.8	12		Reducer
Φ31.8<->Φ34.9	12		Reducer
Φ34.9<->Φ38.1	12		Reducer
Φ38.1<->Φ41.3	12		Reducer
Φ41.3<->Φ44.5	12		Reducer
Φ44.5<->Φ50.8	12		Reducer
R410A	8.37	kg	Extra Refrigerant Added
Φ6.35	34	m	Copper pipe
Φ9.53	14	m	Copper pipe
Φ12.7	82	m	Copper pipe
Φ15.9	14	m	Copper pipe
Φ19.1	45	m	Copper pipe
Φ22.2	3	m	Copper pipe

4.2 Indoor Unit Details (Auditorium)

4.2.1 Indoor Unit Details Table

IDU Name	Model	Weight(kg)	Dimension(WxHxD)(mm)	Power supply	MCA(A)	MFA(A)
Foyer/AUD-FOY-1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
Foyer/AUD-FOY-2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
Foyer/AUD-FOY-3	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
Palco/AUD-PAL-3	DZDF4-2-XMi D36	33	1200*596*225	220-240V	0,55	15
REGIA/AUD-REG	GWMN-2-XMi D22	8.4	835*280*203	220-240V	0,32	15
Vano scala/AUD-SCP0	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
Palco/AUD-PAL-1	DZDF4-2-XMi D36	33	1200*596*225	220-240V	0,55	15
Palco/AUD-PAL-2	GWMN-2-XMi D22	8.4	835*280*203	220-240V	0,32	15
Spogliatoio 2/AUD-SP2	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15
Spogliatoio 1/AUD-SP1	Q4AN-2-XMi D22	18	630*260*570	220-240V	0,43	15

IDU Name	Model	Tmp-C(°C)	RTC(kW)	ATC(kW)	RSC(kW)	ASC(kW)	PI-C(W)	Tmp-H(°C)	RHC(kW)	AHC(kW)	PI-H(W)
Foyer/AUD-FOY-1	Q4AN-2-XMi D22	26		2,03		1,36	35	21		2,1	35
Foyer/AUD-FOY-2	Q4AN-2-XMi D22	26		2,03		1,36	35	21		2,1	35
Foyer/AUD-FOY-3	Q4AN-2-XMi D22	26		2,03		1,36	35	21		2,1	35
Palco/AUD-PAL-3	DZDF4-2-XMi D36	26		3,44		2,25	55	21		3,5	55
REGIA/AUD-REG	GWMN-2-XMi D22	26		2,02		1,35	28	21		2,1	28
Vano scala/AUD-SCP0	Q4AN-2-XMi D22	26		2,14		1,43	35	21		2,1	35
Palco/AUD-PAL-1	DZDF4-2-XMi D36	26		3,44		2,25	55	21		3,5	55
Palco/AUD-PAL-2	GWMN-2-XMi D22	26		2,14		1,43	28	21		2,1	28
Spogliatoio 2/AUD-SP2	Q4AN-2-XMi D22	26		2,14		1,43	35	21		2,1	35
Spogliatoio 1/AUD-SP1	Q4AN-2-XMi D22	26		2,14		1,43	35	21		2,1	35

IDU Name	Model	Airflow(m ³ /h)	Sound-Pr dB(A)	ESP(Pa)
Foyer/AUD-FOY-1	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
Foyer/AUD-FOY-2	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
Foyer/AUD-FOY-3	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
Palco/AUD-PAL-3	DZDF4-2-XMi D36	624/591/557/522/473/420/375	37/36/35/34/32/31/30	0
REGIA/AUD-REG	GWMN-2-XMi D22	422/411/402/393/380/368/356	31/30/30/30/29/29/29	0
Vano scala/AUD-SCP0	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
Palco/AUD-PAL-1	DZDF4-2-XMi D36	624/591/557/522/473/420/375	37/36/35/34/32/31/30	0
Palco/AUD-PAL-2	GWMN-2-XMi D22	422/411/402/393/380/368/356	31/30/30/30/29/29/29	0
Spogliatoio 2/AUD-SP2	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0
Spogliatoio 1/AUD-SP1	Q4AN-2-XMi D22	414/380/345/313/288/268/238	35/34/33/29/26/23/22	0

IDU Name	Model	Piping Length to 1st Y Joint(m)
Foyer/AUD-FOY-1	Q4AN-2-XMi D22	46,50
Foyer/AUD-FOY-2	Q4AN-2-XMi D22	46,50
Foyer/AUD-FOY-3	Q4AN-2-XMi D22	46,50
Palco/AUD-PAL-3	DZDF4-2-XMi D36	24,00
REGIA/AUD-REG	GWMN-2-XMi D22	47,00
Vano scala/AUD-SCP0	Q4AN-2-XMi D22	9,50
Palco/AUD-PAL-1	DZDF4-2-XMi D36	25,50
Palco/AUD-PAL-2	GWMN-2-XMi D22	14,50
Spogliatoio 2/AUD-SP2	Q4AN-2-XMi D22	11,50
Spogliatoio 1/AUD-SP1	Q4AN-2-XMi D22	11,50

4.2.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Indoor temperature in cooling (Dry bulb temp. / Wet bulb temp. / RH)
RTC	Required total cooling capacity
ATC	Available total cooling capacity
RSC	Required sensible cooling capacity
ASC	Available sensible cooling capacity
Tmp-H	Indoor temperature in heating (Dry bulb temp.)
RHC	Required heating capacity
AHC	Available heating capacity
Tdis-H	Indoor unit discharge air temperature in heating
Airflow	Indoor unit airflow (High/Medium/Low)
ESP	External static pressure
Sound-Pr	Sound pressure level (High/Medium/Low)
Sound-Po	Sound power level (High/Medium/Low)
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
PI-C	Power input in cooling
PI-H	Power input in heating
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

4.3 Outdoor Unit Details (Auditorium)

4.3.1 Outdoor Unit Details Table

Model		MV6i-XMi 252T
Module		MV6i-XMi 252T
Tmp-C	°C	32
RTC	kW	23,55
ATC	kW	24,13
PI-C	kW	5,49
Tmp-H	°C/°C	3/-0,4
RHC	kW	23,84
AHC	kW	23,84
PI-H	kW	5,36
CR		98,4
Airflow	m ³ /h	11000
Sound-Pr		58
Sound-Po		
Bas-Refr	kg	11,00
Ex-Refr	kg	8,37
TCO2 eq.		
MCA	A	24
MFA	A	32
Power supply	V/ph/Hz	380-415V
Dimension(WxHxD)	mm	990*1635*790
Weight	kg	227

4.3.2 Table of Abbreviations

Abbreviation code	Description
Tmp-C	Outdoor conditions in cooling (Dry bulb temp.)
RTC	Required cooling capacity
ATC	Available cooling capacity
PI-C	Power input in cooling
Tmp-H	Indoor conditions in heating (Dry bulb temp. / Wet bulb temp. / RH)
RHC	Required heating capacity
AHC	Available heating capacity
PI-H	Power input in heating
CR	Combination ratio
Airflow	Outdoor unit airflow
Sound-Pr	Sound pressure level
Sound-Po	Sound power level
Bas-Refr	Standard factory refrigerant charge
Ex-Refr	Extra refrigerant charge
TCO2 eq.	Tonnes of CO2 equivalent
MCA	Minimum Circuit Amps
MFA	Maximum Fuse Amps
Power supply	Power supply
Dimension(WxHxD)	Net Dimension (WxHxD) mm
Weight	Weight

4.4 Piping Limitations (Auditorium)

4.4.1 Piping Limitations

Item	Capability	Actual Value
Total piping length	1000,00(m)	116,50(m)
Longest actual length	175,00(m)	46,00(m)
Longest equivalent length	200,00(m)	52,00(m)
Longest equivalent length after first branch	90,00(m)	47,00(m)
Indoor unit to nearest branch length	40,00(m)	14,00(m)
Length difference between longest and shortest distance to indoor units	40,00(m)	37,50(m)
Height difference between indoor and outdoor unit(ODU up)	90,00(m)	8,00(m)
Height difference between indoor and outdoor unit(ODU down)	110,00(m)	0,00(m)
Height difference between indoor units	30,00(m)	6,00(m)
Combination ratio	50-130%	98,41%
IDU quantity	13	10

4.4.2 Correction Factors

Item	Correction factor
Altitude (indoor unit)	1,000
Altitude (outdoor unit)	1,000
Piping (cooling)	0,963
Piping (heating)	0,986
Defrost (heating)	1,000

4.4.3 Piping Details Table

No.	Length(m)	Piping diameter
(1)	3,00	Ø22.2/Ø12.7
(2)	3,00	Ø12.7/Ø6.35
(3)	3,00	Ø12.7/Ø6.35
(4)	3,00	Ø12.7/Ø6.35
(5)	3,00	Ø19.1/Ø12.7
(6)	18,00	Ø19.1/Ø12.7
(7)	3,00	Ø12.7/Ø6.35
(8)	17,00	Ø19.1/Ø12.7
(9)	8,00	Ø12.7/Ø6.35
(10)	2,00	Ø19.1/Ø12.7
(11)	1,00	Ø19.1/Ø12.7
(12)	3,00	Ø19.1/Ø12.7
(13)	3,00	Ø12.7/Ø6.35
(14)	14,00	Ø15.9/Ø9.53
(15)	1,00	Ø12.7/Ø6.35
(16)	1,00	Ø19.1/Ø12.7
(17)	5,00	Ø12.7/Ø6.35
(18)	5,00	Ø12.7/Ø6.35

4.4.4 Branch Joints Details Table

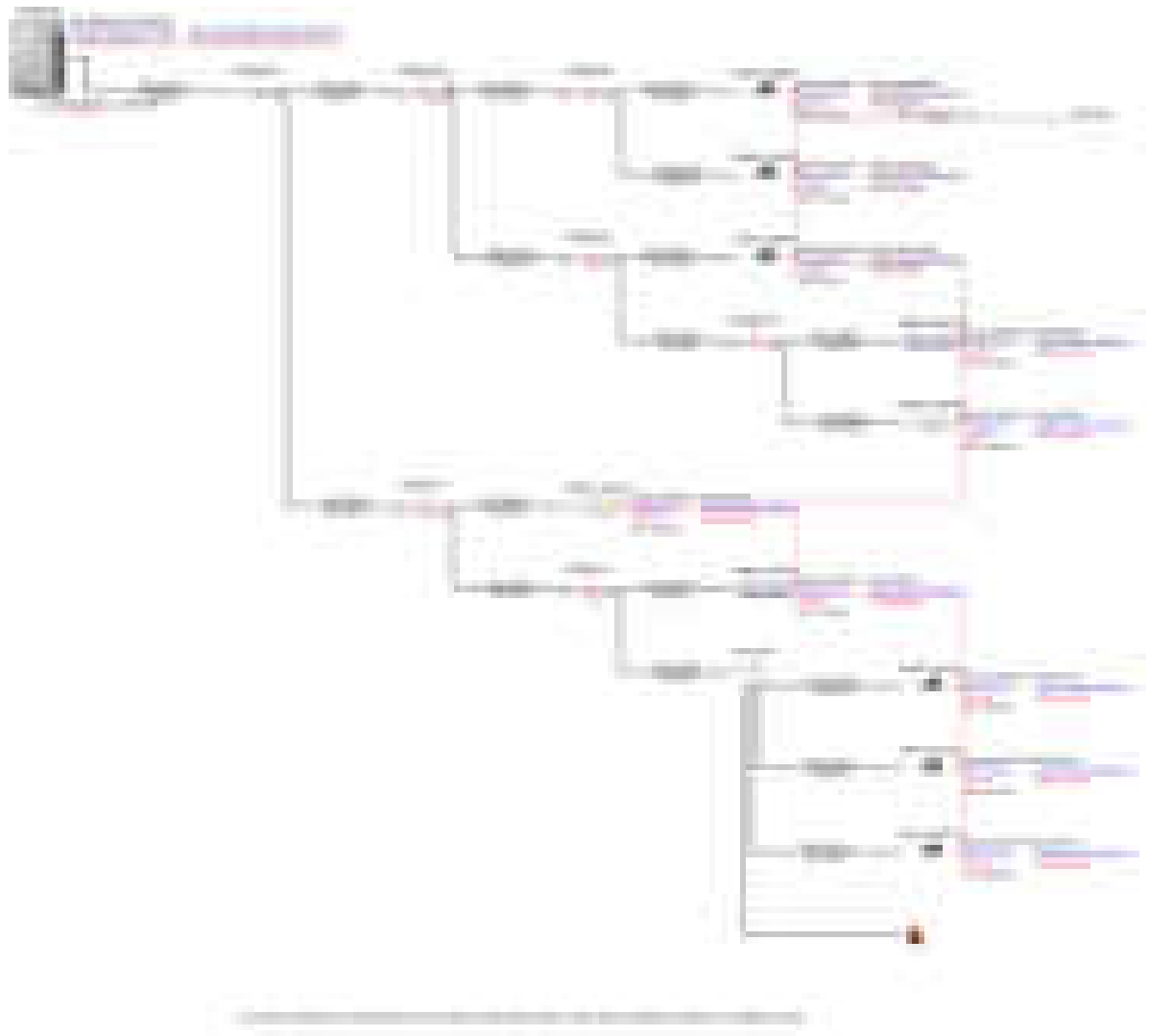
No.	Load(kW)	Model
(1)	24,8	FQZHN-02D
(2)	12,4	FQZHN-01D
(3)	8,8	FQZHN-01D
(4)	12,4	FQZHN-01D
(5)	5,8	FQZHN-01D
(6)	8	FQZHN-01D
(7)	4,4	FQZHN-01D

No.	Load(kW)	Model
(1)	6,6	DXFQT4-01

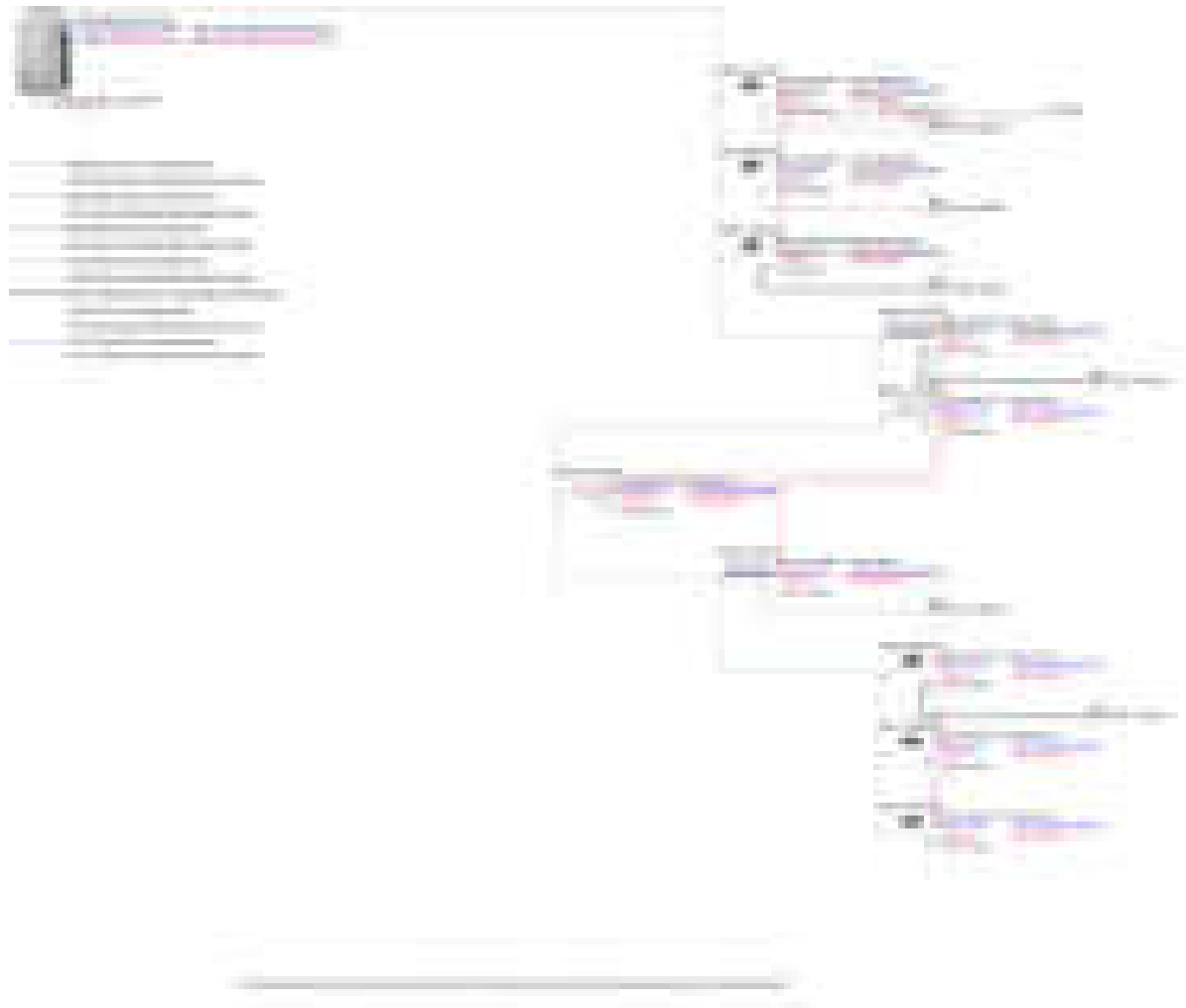
4.4.5 Reducer Details Table

Reducer Name	Description
J1-L1	Ø9.53<->Ø12.7+Ø12.7<->Ø15.9+Ø15.9<->Ø19.1+Ø19.1<->Ø22.2+Ø22.2<->Ø25.4+Ø25.4<->Ø28.6+Ø28.6<->Ø31.8+Ø31.8<->Ø34.9+Ø34.9<->Ø38.1+Ø38.1<->Ø41.3+Ø41.3<->Ø44.5+Ø44.5<->Ø50.8
J2-L1	Ø9.53<->Ø12.7+Ø12.7<->Ø15.9+Ø15.9<->Ø19.1+Ø19.1<->Ø22.2+Ø22.2<->Ø25.4+Ø25.4<->Ø28.6+Ø28.6<->Ø31.8+Ø31.8<->Ø34.9+Ø34.9<->Ø38.1+Ø38.1<->Ø41.3+Ø41.3<->Ø44.5+Ø44.5<->Ø50.8
J2-L2	Ø9.53<->Ø12.7+Ø12.7<->Ø15.9+Ø15.9<->Ø19.1+Ø19.1<->Ø22.2+Ø22.2<->Ø25.4+Ø25.4<->Ø28.6+Ø28.6<->Ø31.8+Ø31.8<->Ø34.9+Ø34.9<->Ø38.1+Ø38.1<->Ø41.3+Ø41.3<->Ø44.5+Ø44.5<->Ø50.8

4.5 Piping Diagrams (Auditorium)



4.6 Wiring Diagrams (Auditorium)



5. Centralized Control Solution

5.1 Centralized Controller List

The centralized control system of this project is full output regardless of whether the system is selected.

VERIFICHE UNI EN 378 CONCENTRAZIONE MASSIMA AMMESSA PER R-410A

Nelle tabelle sono riportati i locali per i quali è stata condotta la verifica in oggetto poiché caratterizzati da volume ridotto, escludendo quindi i locali appartenenti alla cosiddetta distribuzione o connettivo.

SCUOLA PRIMARIA - PIANO TERRA

PdC	kg refr	Locale	Sup (mq)	H (mq)	Vol (mc)	Q max R410A ammessa (kg/mc)	kg/mc	Verifica	Misure compensative	
SP-PDC-CL-1	33,25	SP-L1	64,14	3,00	192,42	84,66	17,95	Non soddisfatta	GRIGLIA SU PORTA oppure SOGLIA PORTA RIALZATA	Poiché nel caso in cui si verificasse una perdita di gas refrigerante per alcuni locali la verifica in oggetto non avrebbe esito positivo, in fase di progetto esecutivo verranno predisposte misure atte a rimuovere tale problematica. In particolare, in base alla scelta della committenza, sulle porte dei seguenti locali verranno installate delle griglie di transito o alternatively verranno realizzate porte di separazione con soglia rialzata affinché questi siano messi in comunicazione con il connettivo:
		SP-DOC	27,74	3,00	83,22	36,62				
		SP-ATA	13,60	3,00	40,80	17,95				
		SP-C1	45,69	3,00	137,07	60,31				
		SP-C2	45,79	3,00	137,37	60,44				
		SP-C3	45,64	3,00	136,92	60,24				
		SP-C4	46,87	3,00	140,61	61,87				
		SP-C5	47,04	3,00	141,12	62,09				
PdC	kg refr	Locale	Sup (mq)	H (mq)	Vol (mc)	Q max R410A ammessa (kg/mc)	kg/mc	Verifica		
SP-PDC-CL-2	46,48	SP-SPOR	20,11	3,00	60,33	26,55	26,55	Non soddisfatta	GRIGLIA SU PORTA oppure SOGLIA PORTA RIALZATA	- SP-ATA (Personale ATA) - SP-SPOR (Sporzionamento)
		SP-REF1	90,6	3,00	271,80	119,59				
		SP-REF2	66,86	3,00	200,58	88,26				
		SP-C6	46,62	3,00	139,86	61,54				
		SP-C7	47,03	3,00	141,09	62,08				
		SP-C8	46,21	3,00	138,63	61,00				
		SP-C9	46,96	3,00	140,88	61,99				
PdC	kg refr	Locale	Sup	H	Vol	Q max R410A	kg/mc	Verifica		

			(mq)	(mq)	(mc)	ammessa (kg/mc)			
SP-PDC-CL-3	18,60	SP-C10	46,8	3,00	140,40	61,78	61,62	Soddisfatta	Non necessarie
		SP-C11	46,77	3,00	140,31	61,74			
		SP-C12	46,68	3,00	140,04	61,62			
		SP-L2	47,34	3,00	142,02	62,49			

SCUOLA PRIMARIA - PIANO PRIMO

PdC	kg refr	Locale	Sup (mq)	H (mq)	Vol (mc)	Q max R410A ammessa (kg/mc)	kg/mc	Verifica	Misure compensative
SP-PDC-CL-4	40,44	SP-C13	45,74	3,00	137,22	60,38	60,09	Soddisfatta	Non necessarie
		SP-C14	46,27	3,00	138,81	61,08			
		SP-C15	45,52	3,00	136,56	60,09			
		SP-C16	46,58	3,00	139,74	61,49			
		SP-C17	47,03	3,00	141,09	62,08			
		SP-ATH	64,56	3,00	193,68	85,22			
		SP-L3	46,8	3,00	140,40	61,78			
PdC	kg refr	Locale	Sup (mq)	H (mq)	Vol (mc)	Q max R410A ammessa (kg/mc)	kg/mc	Verifica	Misure compensative
SP-PDC-CL-5	40,97	SP-C18	46,62	3,00	139,86	61,54	42,40	Soddisfatta	Non necessarie
		SP-C19	47,04	3,00	141,12	62,09			
		SP-C20	47,02	3,00	141,06	62,07			
		SP-C21	46,35	3,00	139,05	61,18			
		SP-C25	46,4	3,00	139,20	61,25			
		SP-AM	32,12	3,00	96,36	42,40			
		SP-PAL	123,43	3,00	370,29	162,93			

PdC	kg refr	Locale	Sup (mq)	H (mq)	Vol (mc)	Q max R410A ammessa (kg/mc)	kg/mc	Verifica	Misure compensative
SP-PDC-CL- 6	18,6	SP-C22	45,58	3,00	136,74	60,17	60,10	Soddisfatta	Non necessarie
		SP-C23	47,71	3,00	143,13	62,98			
		SP-C24	45,53	3,00	136,59	60,10			
		SP-L4	46,48	3,00	139,44	61,35			

SCUOLA SECONDARIA - PIANO TERRA

PdC	kg refr	Locale	Sup (mq)	H (mq)	Vol (mc)	Q max R410A ammessa (kg/mc)	kg/mc	Verifica	Misure compensative
SS-PDC-CL-1	24,04	SS-IN	14,06	3,00	42,18	18,56	18,56	Non soddisfatta	GRIGLIA SU PORTA oppure SOGLIA PORTA RIALZATA
		SS-L1	58,06	3,00	174,18	76,64			
		SS-L2	39,69	3,00	119,07	52,39			
		SS-C1	47,16	3,00	141,48	62,25			
		SS-C2	46,79	3,00	140,37	61,76			
PdC	kg refr	Locale	Sup (mq)	H (mq)	Vol (mc)	Q max R410A ammessa (kg/mc)	kg/mc	Verifica	Misure compensative
SS-PDC-CL-2	21,62	SS-C3	47,16	3,00	141,48	62,25	60,63	Soddisfatta	Non necessarie
		SS-C4	46,79	3,00	140,37	61,76			
		SS-C5	47,03	3,00	141,09	62,08			
		SS-C6	46,79	3,00	140,37	61,76			
		SS-DOC	45,93	3,00	137,79	60,63			
PdC	kg refr	Locale	Sup (mq)	H (mq)	Vol (mc)	Q max R410A ammessa (kg/mc)	kg/mc	Verifica	Misure compensative
SS-PDC-CL-3	20,36	SS-ATA	12,37	3,00	37,11	16,33	16,33	Non soddisfatta	GRIGLIA SU PORTA oppure SOGLIA PORTA RIALZATA
		SS-SEGR	49,67	3,00	149,01	65,56			
		SS-DIR	25,34	3,00	76,02	33,45			
		SS-DSGA	20,91	3,00	62,73	27,60			
		SS-RIU1	44,71	3,00	134,13	59,02			
		SS-ST	19,77	3,00	59,31	26,10			
		SS-CE	26,68	3,00	80,04	35,22			

Poiché nel caso in cui si verificasse una perdita di gas refrigerante per alcuni locali la verifica in oggetto non avrebbe esito positivo, in fase di progetto esecutivo verranno predisposte misure atte a rimuovere tale problematica. In particolare, in base alla scelta della committenza, sulle porte dei seguenti locali verranno installate delle griglie di transito o alternatively verranno realizzate porte di separazione con soglia rialzata affinché questi siano messi in comunicazione con il connettivo:

- SP-IN (Infermeria)
- SP-ATA (Personale ATA Front-Office)

SCUOLA SECONDARIA - PIANO PRIMO

PdC	kg refr	Locale	Sup (mq)	H (mq)	Vol (mc)	Q max R410A ammessa (kg/mc)	kg/mc	Verifica	Misure compensative
SS-PDC-CL-4	22,33	SS-L3	58,05	3,00	174,15	76,63	52,22	Soddisfatta	Non necessarie
		SS-L4	39,56	3,00	118,68	52,22			
		SS-C7	47,03	3,00	141,09	62,08			
		SS-C8	46,79	3,00	140,37	61,76			
PdC	kg refr	Locale	Sup (mq)	H (mq)	Vol (mc)	Q max R410A ammessa (kg/mc)	kg/mc	Verifica	Misure compensative
SS-PDC-CL-5	19,43	SS-C9	47,4	3,00	142,20	62,57	61,76	Soddisfatta	Non necessarie
		SS-C10	46,98	3,00	140,94	62,01			
		SS-C11	47,24	3,00	141,72	62,36			
		SS-C12	46,79	3,00	140,37	61,76			
PdC	kg refr	Locale	Sup (mq)	H (mq)	Vol (mc)	Q max R410A ammessa (kg/mc)	kg/mc	Verifica	Misure compensative
SS-PDC-CL-6	29,68	SS-RIU2	73,47	3,00	220,41	96,98	61,09	Soddisfatta	Non necessarie
		SS-BIB	94,56	3,00	283,68	124,82			
		SS-C13	47,03	3,00	141,09	62,08			
		SS-C14	46,28	3,00	138,84	61,09			
		SS-C15	47,75	3,00	143,25	63,03			
		SS-L5	52,12	3,00	156,36	68,80			

AUDITORIUM

PdC	kg refr	Locale	Sup (mq)	H (mq)	Vol (mc)	Q max R410A ammessa (kg/mc)	kg/mc	Verifica	Misure compensative
AUD-PDC-CL-1	21,17	AUD-FOY	45,38	3,00	136,14	59,90	18,73	Non soddisfatta	GRIGLIA SU PORTA oppure SOGLIA PORTA RIALZATA
		AUD-SP1	14,19	3,00	42,57	18,73			
		AUD-SP2	14,19	3,00	42,57	18,73			

Poiché nel caso in cui si verificasse una perdita di gas refrigerante per alcuni locali la verifica in oggetto non avrebbe esito positivo, in fase di progetto esecutivo verranno predisposte misure atte a rimuovere tale problematica. In particolare, in base alla scelta della committenza, sulle porte dei seguenti locali verranno installate delle griglie di transito o alternatively verranno realizzate porte di separazione con soglia rialzata affinché questi siano messi in comunicazione con il connettivo:

- AUD-SP1 (Spogliatoio 1)
- AUD-SP2 (Spogliatoio 2)

IMPIANTO IDRICO SANITARIO

DIMENSIONAMENTO AFS – PIANO PRIMO

P1	ZONE	Lavabo	Bidet	Vaso	Doccia	Vasca	Lavello	Lavatrice	Lavastoviglie	numero apparecchi	AFS l/s	contemp	portata effettiva AFS l/s	portata effettiva l/min	Diametro nom. tubo polietilene
PRIMARIA	Coll.11P-F	7	0	5	0	0	0	0	0	12	1,2	0,49	0,59	35,18	28
	Coll.10P-F	7	0	6	0	0	0	0	0	13	1,3	0,48	0,62	37,23	32
	F-003'	14	0	11	0	0	0	0	0	25	2,5	0,40	1,00	60,00	32
	Coll.8P-E	7	0	5	0	0	0	0	0	12	1,2	0,49	0,59	35,18	28
	Coll.9P-E	7	0	6	0	0	0	0	0	13	1,3	0,48	0,62	37,23	32
	E-003'	14	0	11	0	0	0	0	0	25	2,5	0,40	1,00	60,00	32
	CTP (ACS)-003''	74	0	0	0	0	2	0	0	76	7,8	0,31	2,45	147,28	50
	003''-003'	88	0	11	0	0	2	0	0	101	10,3	0,30	3,08	185,09	63
	003'-003	102	0	22	0	0	2	0	0	126	12,8	0,29	3,70	222,02	63
SECONDARIA	Coll.16S-D	2	0	1	2	0	0	0	0	5	0,6	0,65	0,39	23,30	28
	Coll.15S-D	2	0	1	2	0	0	0	0	5	0,6	0,65	0,39	23,30	28
	D-002'	4	0	2	4	0	0	0	0	10	1,2	0,52	0,62	37,17	32
	002'-002-X	4	0	2	4	0	0	0	0	10	1,2	0,52	0,62	37,17	32
	Coll.13S-C	7	0	6	0	0	0	0	0	13	1,3	0,48	0,62	37,23	32
	Coll.12S-C	7	0	5	0	0	0	0	0	12	1,2	0,49	0,59	35,18	28
	C-001'	14	0	11	0	0	0	0	0	25	2,5	0,40	1,00	60,00	32
	CTS-B	70	0	0	15	0	0	0	0	85	9,3	0,31	2,85	171,20	50
	Coll.11S-B	7	0	6	0	0	0	0	0	13	1,3	0,48	0,62	37,23	32
	B-A	77	0	6	15	0	0	0	0	98	10,6	0,30	3,18	190,54	63
	Coll.10S-A	7	0	5	0	0	0	0	0	12	1,2	0,49	0,59	35,18	28
	A-001'	84	0	11	15	0	0	0	0	110	11,8	0,30	3,47	208,22	63
	001'-001	98	0	22	15	0	0	0	0	135	14,3	0,29	4,08	244,59	63

DIMENSIONAMENTO AFS – PIANO TERRA

PT	ZONE	Lavabo	Bidet	Vaso	Doccia	Vasca	Lavello	Lavatrice	Lavastoviglie	numero apparecchi	AFS l/s	contemp	portata effettiva AFS l/s	portata effettiva l/min	Diametro nom. tubo polietilene
PRIMARIA	Coll.7P-R	7	0	5	0	0	0	0	0	12	1,2	0,49	0,59	35,18	28
	Coll.6P-R	7	0	6	0	0	0	0	0	13	1,3	0,48	0,62	37,23	32
	R-Q	14	0	11	0	0	0	0	0	25	2,5	0,40	1,00	60,00	32
	Coll.5P-Q	10	0	1	0	0	0	0	0	11	1,1	0,50	0,55	33,10	28
	Q-P	24	0	12	0	0	0	0	0	36	3,6	0,37	1,32	79,20	40
	Coll.4P-P	5	0	0	0	0	2	1	1	9	1,2	0,53	0,64	38,40	32
	P-003	29	0	12	0	0	2	1	1	45	4,8	0,35	1,68	100,53	40
	003'-003	102	0	22	0	0	2	0	0	126	12,8	0,29	3,70	222,02	63
	003-O	131	0	34	0	0	4	1	1	171	17,6	0,28	4,87	291,95	63
	Coll.3P-O	7	0	6	0	0	0	0	0	13	1,3	0,48	0,62	37,23	32
	O-N	138	0	40	0	0	4	1	1	184	18,9	0,27	5,17	310,40	63
	Coll.2P-N	7	0	5	0	0	0	0	0	12	1,2	0,49	0,59	35,18	28
	N-M	145	0	45	0	0	4	1	1	196	20,1	0,27	5,46	327,34	75
	Coll.1P-M	3	0	2	0	0	0	0	0	5	0,5	0,65	0,32	19,42	20
SECONDARIA	M-D	148	0	47	0	0	4	1	1	201	20,6	0,27	5,57	334,38	75
	002'-002-X	4	0	2	4	0	0	0	0	10	1,2	0,52	0,62	37,17	32
	Coll.14S-X	1	0	1	1	0	0	0	0	3	0,4	0,78	0,27	16,32	20
	X-I	5	0	3	5	0	0	0	0	13	1,6	0,48	0,74	44,39	32
	Coll.7S-I	2	0	6	0	0	0	0	0	8	0,8	0,55	0,44	26,57	28
	I-H	7	0	9	5	0	0	0	0	21	2,4	0,42	0,98	58,97	32
	Coll.6S-H	4	0	2	0	0	0	0	0	6	0,6	0,61	0,36	21,90	28
	H-G	11	0	11	5	0	0	0	0	27	3,0	0,39	1,16	69,46	40
	Coll.9S-L	3	0	2	0	0	0	0	0	5	0,5	0,65	0,32	19,42	20
	Coll.8S-L	3	0	3	0	0	0	0	0	6	0,6	0,61	0,36	21,90	28
	L-G	6	0	5	0	0	0	0	0	11	1,1	0,50	0,55	33,10	28
	G-A	17	0	16	5	0	0	0	0	38	4,1	0,36	1,47	88,02	40

001'-001	98	0	22	15	0	0	0	0	135	14,3	0,29	4,08	244,59	63
Coll.5S-F	3	0	1	4	0	0	0	0	8	1,0	0,55	0,55	33,21	28
Coll.4S-F	3	0	1	4	0	0	0	0	8	1,0	0,55	0,55	33,21	28
F-E'	6	0	2	8	0	0	0	0	16	2,0	0,45	0,90	54,00	32
Coll.3aS-E'	2	0	2	1	0	0	0	0	5	0,6	0,65	0,36	21,36	20
E'-E''	8	0	4	9	0	0	0	0	21	2,6	0,42	1,07	63,99	32
Coll.3bS-E''	3	0	3	1	0	0	0	0	7	0,8	0,58	0,43	26,01	28
E''-D	11	0	7	10	0	0	0	0	28	3,3	0,39	1,28	77,02	40
D-C	159	0	54	10	0	4	1	1	229	23,9	0,27	6,36	381,56	75
Coll.2S-C	7	0	5	0	0	0	0	0	12	1,2	0,49	0,59	35,18	28
C-B	166	0	59	10	0	4	1	1	241	25,1	0,26	6,64	398,21	75
Coll.1S-B	7	0	6	0	0	0	0	0	13	1,3	0,48	0,62	37,23	32
B-001	173	0	65	10	0	4	1	1	254	26,4	0,26	6,94	416,19	75
001-A	271	0	87	25	0	4	1	1	389	40,7	0,25	10,19	611,46	90
A-Cisterne	288	0	103	30	0	4	1	1	427	44,7	0,25	11,10	666,19	90

DIMENSIONAMENTO ACS – PIANO TERRA

PT	ZONE	Lavabo	Bidet	Vaso	Doccia	Vasca	Lavello	Lavatrice	Lavastoviglie	numero apparecchi	ACS l/s	contemp	portata effettiva ACS l/s	portata effettiva l/min	Diametro nom. tubo polietilene
PRIMARIA	Coll.7P-R	7	0	0	0	0	0	0	0	7	0,7	0,58	0,40	24,27	28
	Coll.6P-R	7	0	0	0	0	0	0	0	7	0,7	0,58	0,40	24,27	28
	R-Q	14	0	0	0	0	0	0	0	14	1,4	0,47	0,65	39,25	32
	Coll.5P-Q	10	0	0	0	0	0	0	0	10	1,0	0,52	0,52	30,97	28
	Q-P	24	0	0	0	0	0	0	0	24	2,4	0,40	0,97	58,19	32
	Coll.4P-P	5	0	0	0	0	2	0	0	7	0,9	0,58	0,52	31,21	28
	P-003	29	0	0	0	0	2	0	0	31	3,3	0,38	1,25	75,16	40
	Coll.1P-N	3	0	0	0	0	0	0	0	3	0,3	0,78	0,23	13,99	20
	Coll.2P-N	7	0	0	0	0	0	0	0	7	0,7	0,58	0,40	24,27	28
	N-O	10	0	0	0	0	0	0	0	10	1,0	0,52	0,52	30,97	28
	Coll.3P-O	7	0	0	0	0	0	0	0	7	0,7	0,58	0,40	24,27	28
	0-003	17	0	0	0	0	0	0	0	17	1,7	0,44	0,75	45,14	32
SECONDIARIA	003-003'	46	0	0	0	0	2	0	0	48	5,0	0,34	1,72	103,30	40
	002-002'-X	4	0	0	4	0	0	0	0	8	1,0	0,55	0,55	33,21	28
	Coll.14S-X	1	0	0	1	0	0	0	0	2	0,3	0,91	0,23	13,61	20
	X-I	5	0	0	5	0	0	0	0	10	1,3	0,52	0,65	38,72	32
	Coll.7S-I	2	0	0	0	0	0	0	0	2	0,2	0,91	0,18	10,89	18
	I-H	7	0	0	5	0	0	0	0	12	1,5	0,49	0,71	42,51	32
	Coll.6S-H	4	0	0	0	0	0	0	0	4	0,4	0,70	0,28	16,80	20
	H-G	11	0	0	5	0	0	0	0	16	1,9	0,45	0,83	49,95	32
	Coll.9S-L	3	0	0	0	0	0	0	0	3	0,3	0,78	0,23	13,99	20
	Coll.8S-L	3	0	0	0	0	0	0	0	3	0,3	0,78	0,23	13,99	20
	L-G	6	0	0	0	0	0	0	0	6	0,6	0,61	0,36	21,90	28
	G-001	17	0	0	5	0	0	0	0	22	2,5	0,41	1,01	60,74	32
	Coll.5S-F	3	0	0	4	0	0	0	0	7	0,9	0,58	0,52	31,21	28

Coll.4S-F	3	0	0	4	0	0	0	0	7	0,9	0,58	0,52	31,21	28
F-E'	6	0	0	8	0	0	0	0	14	1,8	0,47	0,84	50,46	32
Coll.3aS-E'	2	0	0	1	0	0	0	0	3	0,4	0,78	0,27	16,32	20
E'-E''	8	0	0	9	0	0	0	0	17	2,2	0,44	0,95	57,09	32
Coll.3bS-E''	3	0	0	1	0	0	0	0	4	0,5	0,70	0,32	18,90	20
E''-D-C	11	0	0	10	0	0	0	0	21	2,6	0,42	1,09	65,24	32
Coll.2S-C	7	0	0	0	0	0	0	0	7	0,7	0,58	0,40	24,27	28
C-B	18	0	0	10	0	0	0	0	28	3,3	0,39	1,28	77,02	40
Coll.1S-B	7	0	0	0	0	0	0	0	7	0,7	0,58	0,40	24,27	28
B-A-001	25	0	0	10	0	0	0	0	35	4,0	0,37	1,48	88,57	40
001-001'	42	0	0	15	0	0	0	0	57	6,5	0,33	2,14	128,66	50

DIMENSIONAMENTO ACS – PIANO PRIMO

P1	ZONE	Lavabo	Bidet	Vaso	Doccia	Vasca	Lavello	Lavatrice	Lavastoviglie	numero apparecchi	ACS l/s	contemp	portata effettiva ACS l/s	portata effettiva l/min	Diametro nom. tubo polietilene
PRIMARIA	003-003'	46	0	0	0	0	2	0	0	48	5,0	0,34	1,72	103,30	40
	Coll.11P-F	7	0	0	0	0	0	0	0	7	0,7	0,58	0,40	24,27	28
	Coll.10P-F	7	0	0	0	0	0	0	0	7	0,7	0,58	0,40	24,27	28
	F-003'	14	0	0	0	0	0	0	0	14	1,4	0,47	0,65	39,25	32
	Coll.8P-E	7	0	0	0	0	0	0	0	7	0,7	0,58	0,40	24,27	28
	Coll.9P-E	7	0	0	0	0	0	0	0	7	0,7	0,58	0,40	24,27	28
	E-003''	14	0	0	0	0	0	0	0	14	1,4	0,47	0,65	39,25	32
	003''-003'	60	0	0	0	0	2	0	0	62	6,4	0,33	2,09	125,57	50
SECONDARIA	003''- CTP (ACS)	74	0	0	0	0	2	0	0	76	7,8	0,31	2,45	147,28	50
	Coll.16S-D	2	0	0	2	0	0	0	0	4	0,5	0,70	0,35	21,00	20
	Coll.15S-D	2	0	0	2	0	0	0	0	4	0,5	0,70	0,35	21,00	20
	D-002'	4	0	0	4	0	0	0	0	8	1,0	0,55	0,55	33,21	28
	002'-002	4	0	0	4	0	0	0	0	8	1,0	0,55	0,55	33,21	28
	Coll.13S-C	7	0	0	0	0	0	0	0	7	0,7	0,58	0,40	24,27	28
	Coll.12S-C	7	0	0	0	0	0	0	0	7	0,7	0,58	0,40	24,27	28
	C-001'	14	0	0	0	0	0	0	0	14	1,4	0,47	0,65	39,25	32
	001-001'	42	0	0	15	0	0	0	0	57	6,5	0,33	2,14	128,66	50
	001'-A	56	0	0	15	0	0	0	0	71	7,9	0,32	2,50	150,10	50
	Coll.10S-A	7	0	0	0	0	0	0	0	7	0,7	0,58	0,40	24,27	28
	A-B	63	0	0	15	0	0	0	0	78	8,6	0,31	2,68	160,69	50
	Coll.11S-B	7	0	0	0	0	0	0	0	7	0,7	0,58	0,40	24,27	28
	B-CTS (ACS)	70	0	0	15	0	0	0	0	85	9,3	0,31	2,85	171,20	50

	TOTALE UTENZE	Lavabo	Bidet	Vaso	Doccia	Vasca	Lavello	Lavatrice	Lavastoviglie	TOTALE
ACS	Scuola Primaria	74	0	0	0	0	2	0	0	76
	Scuola Secondaria	70	0	0	15	0	0	0	0	85
	Totale	144	0	0	15	0	2	0	0	161
AFS	Scuola Primaria + Secondaria	144	0	103	15	0	2	1	1	266
	Totale	144	0	103	15	0	2	1	1	266
										427

VOLUME D'ACQUA NELLE RETII ACS - PIANO TERRA					
DN (polietilene) UTILIZZATO	Lunghezza [m]	S tubazione (m ²)	V acqua RIC (m ³)	V TOTALE (m ³)	V TOTALE (litri)
32	7	0,0008	0,0056	0,097	96,706
32	4,5	0,0008	0,0036		
32	20	0,0008	0,0161		
32	4,5	0,0008	0,0036		
32	20	0,0008	0,0161		
32	4,5	0,0008	0,0036		
40	2,5	0,0013	0,0031		
20	7,5	0,0003	0,0024		
32	6	0,0008	0,0048		
32	2,5	0,0008	0,0020		
32	6	0,0008	0,0048		
32	33	0,0008	0,0265		
40	3,5	0,0013	0,0044		
32	3,5	0,0008	0,0028	0,145	144,583
20	3,5	0,0003	0,0011		
32	31	0,0008	0,0249		
18	8	0,0003	0,0020		
32	10	0,0008	0,0080		
20	4,5	0,0003	0,0014		
32	1	0,0008	0,0008		
20	9	0,0003	0,0028		
20	4,5	0,0003	0,0014		
32	10,5	0,0008	0,0084		
32	33	0,0008	0,0265		
32	5,5	0,0008	0,0044		
32	4,5	0,0008	0,0036		
32	6	0,0008	0,0048		
20	4,5	0,0003	0,0014		
32	5,5	0,0008	0,0044		
20	6,5	0,0003	0,0020		
32	15,5	0,0008	0,0125		
32	4,5	0,0008	0,0036		
40	3	0,0013	0,0038		
32	4,5	0,0008	0,0036		
40	10,5	0,0013	0,0132		
50	3,5	0,0020	0,0069		

VOLUME D'ACQUA NELLE RETII ACS - PIANO PRIMO					
DN (polietilene) UTILIZZATO	Lunghezza [m]	S tubazione (m ²)	V acqua RIC (m ³)	V TOTALE (m ³)	V TOTALE (litri)
40	3,5	0,0013	0,0044		
32	7	0,0008	0,0056	0,158	157,631
32	4,5	0,0008	0,0036		
32	40	0,0008	0,0322		
32	7	0,0008	0,0056		
32	4,5	0,0008	0,0036		
32	33	0,0008	0,0265		
50	34	0,0020	0,0667		
50	7	0,0020	0,0137		
20	14	0,0003	0,0044	0,007	6,877
20	1,5	0,0003	0,0005		
32	2,5	0,0008	0,0020		
32	3,5	0,0008	0,0028		
32	6,5	0,0008	0,0052	0,049	49,034
32	4,5	0,0008	0,0036		
32	50	0,0008	0,0402		
50	3,5	0,0020	0,0069		
50	10	0,0020	0,0196	0,082	81,810
32	4,5	0,0008	0,0036		
50	3	0,0020	0,0059		
32	4,5	0,0008	0,0036		
50	25	0,0020	0,0491		

	PT	P1	TOT	
PRIMARIA	96,706	157,631	254,337	litri
SECONDARIA	144,583	137,720	282,303	litri

CALCOLO DELLA PORTATA DI RICIRCOLO

Salto termico max ammesso	ΔT	2	°C
Disperzione termica lineare	q	6	kcal/h m
La portata mediamente richiesta da ogni metro di tubo: $g=q/\Delta T$	g	3	l/h m

METODO DI DISTRIBUZIONE SEMPLIFICATA

	Tratto	Lunghezza [m]	Portata specifica utile a garantire il ΔT di ogni singolo tratto [l/h]	Portata specifica [l/s]	Portata circolatore [m³/h]	Portata effettiva nei tratti [l/s]	DN (polietilene)
PRIMARIA	Coll.1P-003	43,5	130,5	0,036	0,1305	0,036	12
	Coll.7P-003	48,5	145,5	0,040	0,1455	0,040	12
	003-003'	3,5	10,5	0,003	0,0105	0,080	15
	Coll.8P-003'	41,5	124,5	0,035	0,1245	0,035	12
	Coll.11P-003'	48,5	145,5	0,040	0,1455	0,040	12
	003'-CTP	8,5	25,5	0,007	0,0255	0,162	18
SECONDARIA	Coll.16S-002'	17	51	0,014	0,051	0,014	12
	002'-002	3,5	10,5	0,003	0,0105	0,017	12
	002-I	34,5	103,5	0,029	0,1035	0,046	12
	Coll.7S-I	9,5	28,5	0,008	0,0285	0,008	12
	I-G	11	33	0,009	0,033	0,063	12
	Coll.9-G	20,5	61,5	0,017	0,0615	0,017	12
	G-001	31	93	0,026	0,093	0,106	15
	Coll.5S-B	29,5	88,5	0,025	0,0885	0,025	12
	Coll.1S-B	4,5	13,5	0,004	0,0135	0,004	12
	B-001	10	30	0,008	0,03	0,037	12
	001-001'	3,5	10,5	0,003	0,0105	0,145	18
	Coll.13S-001'	55,5	166,5	0,046	0,1665	0,046	12
	001'-A	10	30	0,008	0,03	0,200	18
	Coll.10S-A	4,5	13,5	0,004	0,0135	0,004	12
	A-CTS	26,5	79,5	0,022	0,0795	0,226	20

VOLUME D'ACQUA NELLE RETI DI RICIRCOLO					
DN (polietilene) UTILIZZATO	Lunghezza [m]	S tubazione (m ²)	V acqua RIC (m ³)	V TOTALE (m ³)	V TOTALE (litri)
16	43,5	0,0002	0,0087	0,040	39,9
16	48,5	0,0002	0,0097		
16	3,5	0,0002	0,0007		
16	41,5	0,0002	0,0083		
16	48,5	0,0002	0,0097		
20	8,5	0,0003	0,0027		
16	17	0,0002	0,0034	0,059	59,0
16	3,5	0,0002	0,0007		
16	34,5	0,0002	0,0069		
16	9,5	0,0002	0,0019		
16	11	0,0002	0,0022		
16	20,5	0,0002	0,0041		
16	31	0,0002	0,0062		
16	29,5	0,0002	0,0059		
16	4,5	0,0002	0,0009		
16	10	0,0002	0,0020		
20	3,5	0,0003	0,0011		
16	55,5	0,0002	0,0112		
20	10	0,0003	0,0031		
16	4,5	0,0002	0,0009		
20	26,5	0,0003	0,0083		

DIMENSIONAMENTO GENERATORE ED ACCUMOLO ACS

SCUOLA PRIMARIA

PT PRIM	BLOCCO BAGNI NORD - Calcolo LAVABI	
	Lavabi	17 n°
	Litri necessari	204 litri
	Temperatura AFS	12 °C
	Temperatura di utilizzo ACS	40 °C
	Temperatura di accumulo ACS	50 °C
	Calcolo del calore necessario per riscaldare l'acqua	5712,0 Kcal
	Periodo di Punta	1,5 ore
	Periodo di preriscaldamento	2 ore
	Calcolo del calore orario richiesto	1632,0 Kcal/h
	Calcolo del calore da accumulare nella fase di preriscaldamento	3264,0 Kcal
	Determinazione del Volume del bollitore	85,9 litri
	Calcolo della Potenza del Generatore	1632,0 Kcal/h
	Calcolo della Potenza del Generatore	1,9 kW

P1 PRIM	BLOCCO BAGNI NORD - Calcolo LAVABI	
	Lavabi	13 n°
	Litri necessari	156 litri
	Temperatura AFS	12 °C
	Temperatura di utilizzo ACS	40 °C
	Temperatura di accumulo ACS	50 °C
	Calcolo del calore necessario per riscaldare l'acqua	4368,0 Kcal
	Periodo di Punta	1,5 ore
	Periodo di preriscaldamento	2 ore
	Calcolo del calore orario richiesto	1248,0 Kcal/h
	Calcolo del calore da accumulare nella fase di preriscaldamento	2496,0 Kcal
	Determinazione del Volume del bollitore	65,7 litri
	Calcolo della Potenza del Generatore	1248,0 Kcal/h
	Calcolo della Potenza del Generatore	1,5 kW

PT PRIM	BLOCCO BAGNI MENSA - Calcolo LAVABI	
	Lavabi	15 n°
	Lavelli	2 n.
	Litri necessari	220 litri
	Temperatura AFS	12 °C
	Temperatura di utilizzo ACS	40 °C
	Temperatura di accumulo ACS	50 °C
	Calcolo del calore necessario per riscaldare l'acqua	6160,0 Kcal
	Periodo di Punta	1,5 ore
	Periodo di preriscaldamento	2 ore
	Calcolo del calore orario richiesto	1760,0 Kcal/h
	Calcolo del calore da accumulare nella fase di preriscaldamento	3520,0 Kcal
	Determinazione del Volume del bollitore	92,6 litri
	Calcolo della Potenza del Generatore	1760,0 Kcal/h

	Calcolo della Potenza del Generatore	2,0 kW
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PT PRIM	BLOCCO BAGNI SUD - Calcolo LAVABI		
	Lavabi	13	n°
	Litri necessari	156	litri
	Temperatura AFS	12	°C
	Temperatura di utilizzo ACS	40	°C
	Temperatura di accumulo ACS	50	°C
	Calcolo del calore necessario per riscaldare l'acqua	4368,0	Kcal
	Periodo di Punta	1,5	ore
	Periodo di preriscaldamento	2	ore
	Calcolo del calore orario richiesto	1248,0	Kcal/h
	Calcolo del calore da accumulare nella fase di preriscaldamento	2496,0	Kcal
	Determinazione del Volume del bollitore	65,7	litri
	Calcolo della Potenza del Generatore	1248,0	Kcal/h
	Calcolo della Potenza del Generatore	1,5	kW

P1 PRIM	BLOCCO BAGNI SUD - Calcolo LAVABI		
	Lavabi	13	n°
	Litri necessari	156	litri
	Temperatura AFS	12	°C
	Temperatura di utilizzo ACS	40	°C
	Temperatura di accumulo ACS	50	°C
	Calcolo del calore necessario per riscaldare l'acqua	4368,0	Kcal
	Periodo di Punta	1,5	ore
	Periodo di preriscaldamento	2	ore
	Calcolo del calore orario richiesto	1248,0	Kcal/h
	Calcolo del calore da accumulare nella fase di preriscaldamento	2496,0	Kcal
	Determinazione del Volume del bollitore	65,7	litri
	Calcolo della Potenza del Generatore	1248,0	Kcal/h
	Calcolo della Potenza del Generatore	1,5	kW

SCUOLA SECONDARIA

PT SECOND	BLOCCO BAGNI PALESTRA - Calcolo DOCCE E LAVABI		
	Doccia	10	n°
	Lavabi	11	n°
	Litri necessari	2160	litri
	Temperatura AFS	12	°C
	Temperatura di utilizzo ACS	40	°C
	Temperatura di accumulo ACS	50	°C
	Calcolo del calore necessario per riscaldare l'acqua	60480,0	KCal
	Periodo di Punta	0,3	ore
	Periodo di preriscaldamento	1,5	ore
	Calcolo del calore orario richiesto	33600,0	KCal/h
	Calcolo del calore da accumulare nella fase di preriscaldamento	50400,0	KCal
	Determinazione del Volume del bollitore	1326,3	litri
	Calcolo della Potenza del Generatore	33600,0	KCal/h
	Calcolo della Potenza del Generatore	39,1	kW

PT SECOND	BLOCCO BAGNI NORD - Calcolo LAVABI		
	Lavabi	13	n°
	Litri necessari	156	litri
	Temperatura AFS	12	°C
	Temperatura di utilizzo ACS	40	°C
	Temperatura di accumulo ACS	50	°C
	Calcolo del calore necessario per riscaldare l'acqua	4368,0	Kcal
	Periodo di Punta	1,5	ore
	Periodo di preriscaldamento	2	ore
	Calcolo del calore orario richiesto	1248,0	Kcal/h
	Calcolo del calore da accumulare nella fase di preriscaldamento	2496,0	Kcal
	Determinazione del Volume del bollitore	65,7	litri
	Calcolo della Potenza del Generatore	1248,0	Kcal/h
	Calcolo della Potenza del Generatore	1,5	kW

P1 SECOND	BLOCCO BAGNI NORD - Calcolo LAVABI		
	Lavabi	13	n°
	Litri necessari	156	litri
	Temperatura AFS	12	°C
	Temperatura di utilizzo ACS	40	°C
	Temperatura di accumulo ACS	50	°C
	Calcolo del calore necessario per riscaldare l'acqua	4368,0	Kcal
	Periodo di Punta	1,5	ore
	Periodo di preriscaldamento	2	ore
	Calcolo del calore orario richiesto	1248,0	Kcal/h
	Calcolo del calore da accumulare nella fase di preriscaldamento	2496,0	Kcal
	Determinazione del Volume del bollitore	65,7	litri

	Calcolo della Potenza del Generatore	1248,0	Kcal/h
	Calcolo della Potenza del Generatore	1,5	kW
PT SECOND	BLOCCO BAGNI CENTARLI - Calcolo LAVABI		
	Lavabi	4	n°
	Litri necessari	48	litri
	Temperatura AFS	12	°C
	Temperatura di utilizzo ACS	40	°C
	Temperatura di accumulo ACS	50	°C
	Calcolo del calore necessario per riscaldare l'acqua	1344,0	Kcal
	Periodo di Punta	1,5	ore
	Periodo di preriscaldamento	2	ore
	Calcolo del calore orario richiesto	384,0	Kcal/h
	Calcolo del calore da accumulare nella fase di preriscaldamento	768,0	Kcal
	Determinazione del Volume del bollitore	20,2	litri
	Calcolo della Potenza del Generatore	384,0	Kcal/h
	Calcolo della Potenza del Generatore	0,4	kW

PT + P1 SECOND	BLOCCO BAGNI TEATRO - Calcolo DOCCE E LAVABI		
	Doccia	5	n°
	Lavabi	5	n°
	Litri necessari	1050	litri
	Temperatura AFS	12	°C
	Temperatura di utilizzo ACS	40	°C
	Temperatura di accumulo ACS	50	°C
	Calcolo del calore necessario per riscaldare l'acqua	29400,0	KCal
	Periodo di Punta	0,3	ore
	Periodo di preriscaldamento	1,5	ore
	Calcolo del calore orario richiesto	16333,3	KCal/h
	Calcolo del calore da accumulare nella fase di preriscaldamento	24500,0	KCal
	Determinazione del Volume del bollitore	644,7	litri
	Calcolo della Potenza del Generatore	16333,3	KCal/h
	Calcolo della Potenza del Generatore	19,0	kW

PT SECOND	BLOCCO BAGNI SUD - Calcolo LAVABI	
	Lavabi	5 n°
	Litri necessari	60 litri
	Temperatura AFS	12 °C
	Temperatura di utilizzo ACS	40 °C
	Temperatura di accumulo ACS	50 °C
	Calcolo del calore necessario per riscaldare l'acqua	1680,0 Kcal
	Periodo di Punta	1,5 ore
	Periodo di preriscaldamento	2 ore
	Calcolo del calore orario richiesto	480,0 Kcal/h
	Calcolo del calore da accumulare nella fase di preriscaldamento	960,0 Kcal
	Determinazione del Volume del bollitore	25,3 litri
	Calcolo della Potenza del Generatore	480,0 Kcal/h
	Calcolo della Potenza del Generatore	0,6 kW

PT SECOND	BLOCCO BAGNI SUD - Calcolo LAVABI	
	Lavabi	13 n°
	Litri necessari	156 litri
	Temperatura AFS	12 °C
	Temperatura di utilizzo ACS	40 °C
	Temperatura di accumulo ACS	50 °C
	Calcolo del calore necessario per riscaldare l'acqua	4368,0 Kcal
	Periodo di Punta	1,5 ore
	Periodo di preriscaldamento	2 ore
	Calcolo del calore orario richiesto	1248,0 Kcal/h
	Calcolo del calore da accumulare nella fase di preriscaldamento	2496,0 Kcal
	Determinazione del Volume del bollitore	65,7 litri
	Calcolo della Potenza del Generatore	1248,0 Kcal/h
	Calcolo della Potenza del Generatore	1,5 kW

DIMENSIONAMENTO VASO D'ESPANSIONE PER CIRCUITO ACQUA CALDA SANITARIA SCUOLA PRIMARIA			
Volume del bollitore	V_b	400	Litri
Volume d'acqua nelle reti ACS	V_{ACS}	255	Litri
Volume d'acqua nelle reti di RICIRCOLO	V_{RIC}	40	Litri
Volume totale d'acqua	V_{TOT}	695	Litri
Coefficiente di espansione dell'acqua alla temperatura di accumulo	e_b	0,0121	
Coefficiente di espansione dell'acqua alla temperatura dell'acqua fredda	e_0	0,0003	
Pressione assoluta di alimentazione del bollitore	P_a	2	bar
Pressione assoluta di esercizio massima dell'impianto	P_e	3	bar
Volume del vaso di espansione	V_v	24,603	Litri

DIMENSIONAMENTO VASO D'ESPANSIONE PER CIRCUITO ACQUA CALDA SANITARIA SCUOLA SECONDARIA			
Volume del bollitore	V_b	2500	Litri
Volume d'acqua nelle reti ACS	V_{ACS}	283	Litri
Volume d'acqua nelle reti di RICIRCOLO	V_{RIC}	60	Litri
Volume totale d'acqua	V_{TOT}	2843	Litri
Coefficiente di espansione dell'acqua alla temperatura di accumulo	e_b	0,017	
Coefficiente di espansione dell'acqua alla temperatura dell'acqua fredda	e_0	0,0003	
Pressione assoluta di alimentazione del bollitore	P_a	2	bar
Pressione assoluta di esercizio massima dell'impianto	P_e	3	bar
Volume del vaso di espansione	V_v	142,4343	Litri

[illegible]

PERDITE DI CARICO CIRCUITO IDRAULICO: Circolatore AFS (Scuola Primaria + Secondaria)

Tubazione bassa rugosità - PERDITE DI CARICO DISTRIBUITE

Tratto	L [m]	Portata effettiva G [l/s]	Portata effettiva G [l/h]	T [°C]	viscosità	ρ	D [mm]	r [mm c.a] al metro	r Totale [m c.a]
Coll.11P-F	7	0,590	2124	12	0,0000013	999,6	32	23,340	0,163
F-003'	45	1,000	3600	12	0,0000013	999,6	32	58,763	2,644
003'-003	3,5	3,700	13320	12	0,0000013	999,6	63	23,230	0,081
003-O	34	4,870	17532	12	0,0000013	999,6	63	37,573	1,277
O-N	2,5	5,170	18612	12	0,0000013	999,6	63	41,717	0,104
N-M	4	5,460	19656	12	0,0000013	999,6	75	20,050	0,080
M-D	29	5,570	20052	12	0,0000013	999,6	75	20,762	0,602
D-C	14	6,520	23472	12	0,0000013	999,6	75	27,350	0,383
C-B	3	6,820	24552	12	0,0000013	999,6	75	29,590	0,089
B-001	8	7,090	25524	12	0,0000013	999,6	75	31,671	0,253
001-A	1	10,500	37800	12	0,0000013	999,6	90	26,485	0,026
A-Cisterne	5	11,430	41148	12	0,0000013	999,6	90	30,725	0,154
									5,858

Tubazione bassa rugosità - PERDITE DI CARICO CONCENTRATE

Tratto	T [°C]	Portata effettiva G [l/s]	Portata effettiva G [l/h]	D [mm]	Velocità [m/s]	Coeff. Conv. T	Perdita	ϵ	Numero	r t [mm c.a]	r t [m c.a]
Coll.11P-F	12	0,590	2124	32	0,70	1,029	Curva normale 90°	1	4	98,784	0,099
							Valvola intercettazione	7	1	172,872	0,173
F-003'	12	1,000	3600	32	1,20	1,029	Curva normale 90°	1	3	219,177	0,219
							Diramazione a T	3	2	438,354	0,438
							Valvola intercettazione	7	1	511,413	0,511
							Allargamento	1	1	73,059	0,073
003'-003	12	3,700	13320	63	1,20	1,029	Curva normale 90°	1	2	146,118	0,146

							Diramazione a T	3	1	219,177	0,219
003-O	12	4,870	17532	63	1,60	1,029	Curva normale 90°	1	3	392,049	0,392
							Diramazione a T	3	1	392,049	0,392
							Valvola intercettazione	7	1	914,781	0,915
O-N	12	5,170	18612	63	1,70	1,029	Diramazione a T	3	1	441,441	0,441
N-M	12	5,460	19656	75	1,20	1,029	Diramazione a T	3	1	219,177	0,219
M-D	12	5,570	20052	75	1,30	1,029	Curva normale 90°	1	6	518,616	0,519
							Diramazione a T	3	1	259,308	0,259
							Valvola intercettazione	7	2	1210,104	1,210
							Allargamento	1	1	86,436	0,086
D-C	12	6,520	23472	75	1,50	1,029	Diramazione a T	3	1	342,657	0,343
C-B	12	6,820	24552	75	1,50	1,029	Diramazione a T	3	1	342,657	0,343
B-001	12	7,090	25524	75	1,60	1,029	Curva normale 90°	1	2	261,366	0,261
							Diramazione a T	3	1	392,049	0,392
							Valvola intercettazione	7	1	914,781	0,915
							Allargamento	1	1	130,683	0,131
001-A	12	10,500	37800	90	1,70	1,029	Curva normale 90°	1	2	331,338	0,331
							Diramazione a T	3	1	497,007	0,497
							Valvola intercettazione	7	1	1159,683	1,160
A-Cisterne	12	11,430	41148	90	1,80	1,029	Curva normale 90°	1	4	662,676	0,663
							Diramazione a T	3	1	497,007	0,497
							Valvola intercettazione	7	3	3479,049	3,479
											15,324

PERDITE DI CARICO CIRCUITO IDRAULICO: Ricircolo Scuola Primaria

Tubazione bassa rugosità - PERDITE DI CARICO DISTRIBUITE

Tratto	L [m]	Portata effettiva G [l/s]	Portata effettiva G [l/h]	T [°C]	viscosità	ρ	D [mm]	r [mm c.a] al metro	r Totale [m c.a]
Coll.7P-003	48,5	0,040	144	55	0,00000054	987,7	20	1,555	0,075
003-003'	3,5	0,080	288	55	0,00000054	987,7	20	5,230	0,018
003'-CTP	8,5	0,162	583,2	55	0,00000054	987,7	20	17,978	0,153
									0,247

Tubazione bassa rugosità - PERDITE DI CARICOCONCENTRATE

Tratto	T [°C]	Portata effettiva G [l/s]	Portata effettiva G [l/h]	D [mm]	Velocità [m/s]	Coeff. Conv. T	Perdita	ε	Numero	r t [mm c.a]	r t [m c.a]
Coll.7P-003	55	0,040	144	20	0,13	1,017	Valvola intercettazione	10	2	16,272	0,016
							Curva normale 90°	2	5	8,136	0,008
							Diramazione a T	3	1	2,441	0,002
003-003'	55	0,080	288	20	0,25	1,017	Diramazione a T	3	2	18,916	0,019
							Curva normale 90°	2	4	25,222	0,025
003'-CTP	55	0,162	583,2	20	0,52	1,017	Diramazione a T	3	1	39,663	0,040
							Curva normale 90°	2	6	158,652	0,159
							Valvola intercettazione	10	2	264,420	0,264
							Valvola non ritorno	3	1	39,663	0,040
							Allargamento	1	1	13,221	0,013
											0,587

PERDITE DI CARICO CIRCUITO IDRAULICO: Ricircolo Scuola Secondaria

Tubazione bassa rugosità - PERDITE DI CARICO DISTRIBUITE

Tratto	L [m]	Portata effettiva G [l/s]	Portata effettiva G [l/h]	T [°C]	viscosità	ρ	D [mm]	r [mm c.a] al metro	r Totale [m c.a]
Coll.15S-002'	17	0,014	50,4	55	0,00000054	987,7	20	0,248	0,004
002'-002	3,5	0,017	61,2	55	0,00000054	987,7	20	0,348	0,001
002-I	34,5	0,046	165,6	55	0,00000054	987,7	20	1,986	0,069
I-G	11	0,063	226,8	55	0,00000054	987,7	20	3,443	0,038
G-001	31	0,106	381,6	55	0,00000054	987,7	20	8,558	0,265
001-001'	3,5	0,145	522	55	0,00000054	987,7	20	14,807	0,052
001'-CTS	0,5	0,226	813,6	55	0,00000054	987,7	20	32,194	0,016
									0,445

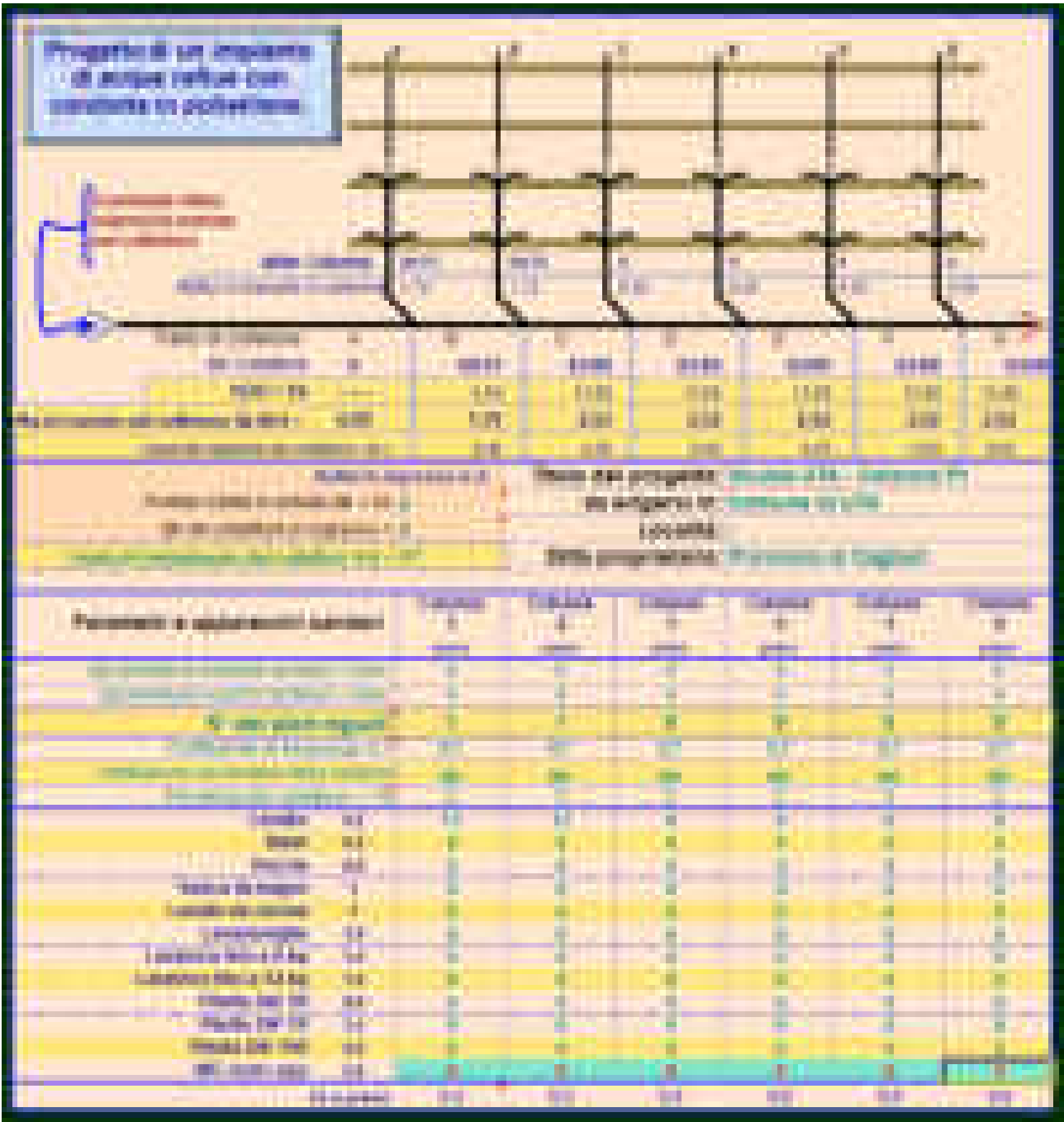
Tubazione bassa rugosità - PERDITE DI CARICO CONCENTRATE

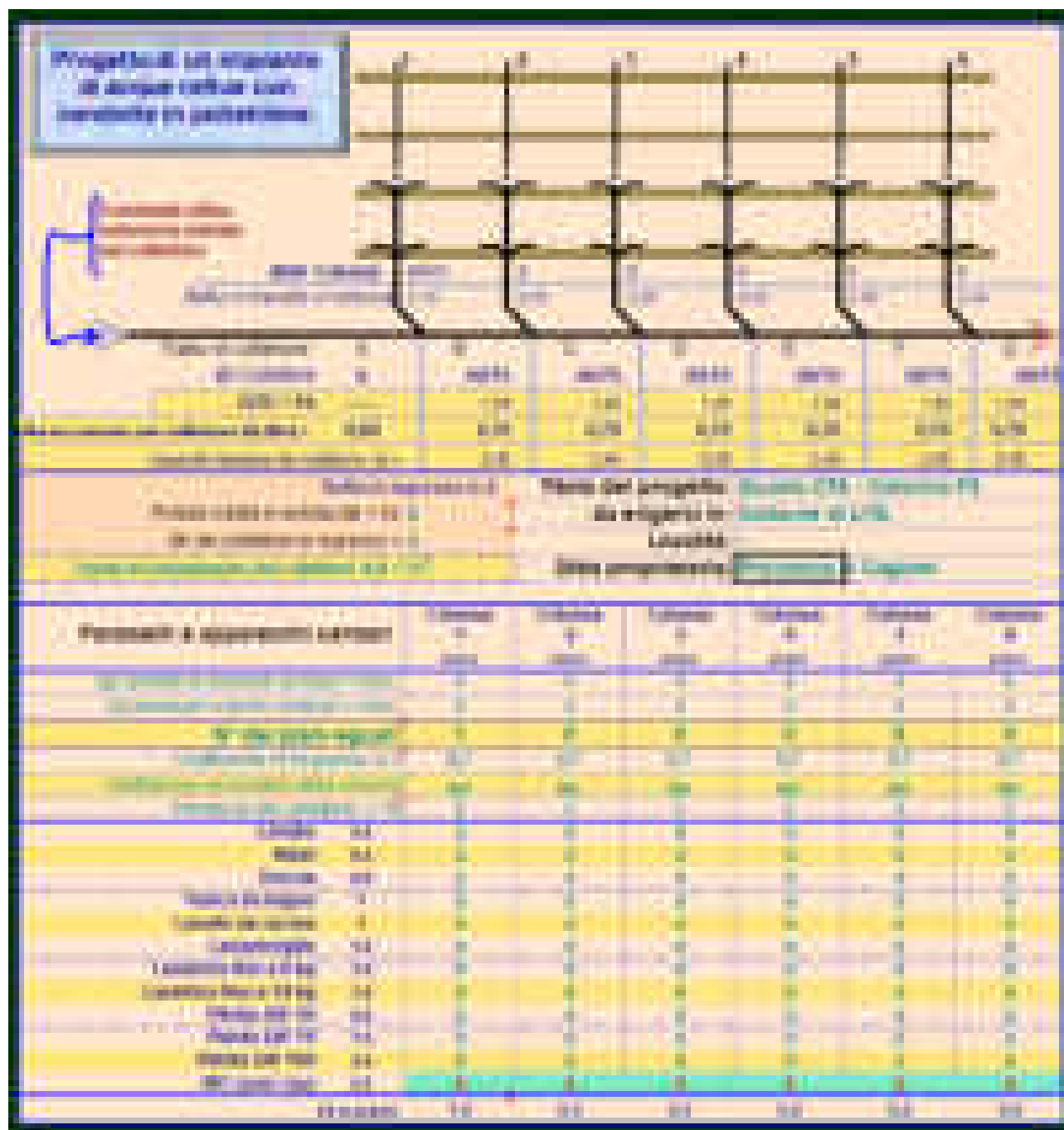
Tratto	T [°C]	Portata effettiva G [l/s]	Portata effettiva G [l/h]	D [mm]	Velocità [m/s]	Coeff. Conv. T	Perdita	ε	Numero	r t [mm c.a]	r t [m c.a]
Coll.15S-002'	55	0,014	50,4	20	0,10	1,017	Valvola intercettazione	10	2	10,170	0,010
							Curva normale 90°	2	7	7,119	0,007
002'-002	55	0,017	61,2	20	0,14	1,017	Curva normale 90°	2	6	12,204	0,012
002-I	55	0,046	165,6	20	0,15	1,017	Curva normale 90°	2	4	8,950	0,009
							Valvola intercettazione	10	1	11,187	0,011
							Diramazione a T	3	1	3,356	0,003
I-G	55	0,063	226,8	20	0,20	1,017	Diramazione a T	3	1	6,102	0,006
							Valvola intercettazione	10	1	20,340	0,020
G-001	55	0,106	381,6	20	0,34	1,017	Diramazione a T	3	1	17,391	0,017
							Valvola intercettazione	10	1	57,969	0,058
001-001'	55	0,145	522	20	0,46	1,017	Diramazione a T	3	1	30,510	0,031
							Curva normale 90°	2	5	101,700	0,102
							Allargamento	1	1	10,170	0,010
001'-CTS	55	0,226	813,6	20	0,72	1,017	Diramazione a T	3	1	79,326	0,079
							Curva normale 90°	2	7	370,188	0,370
							Valvola intercettazione	10	3	793,260	0,793

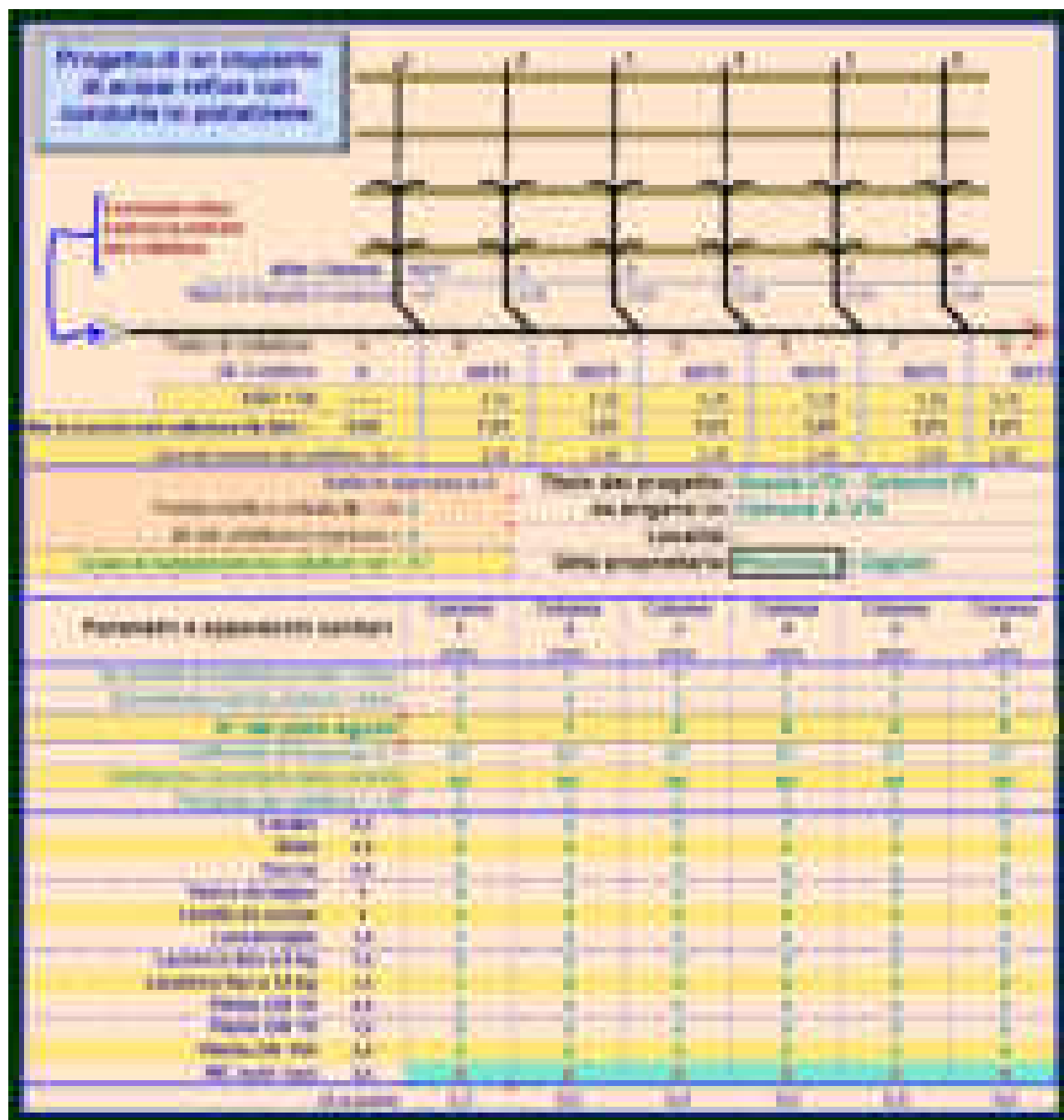
							Valvola non ritorno	3	1	79,326	0,079
											1,590

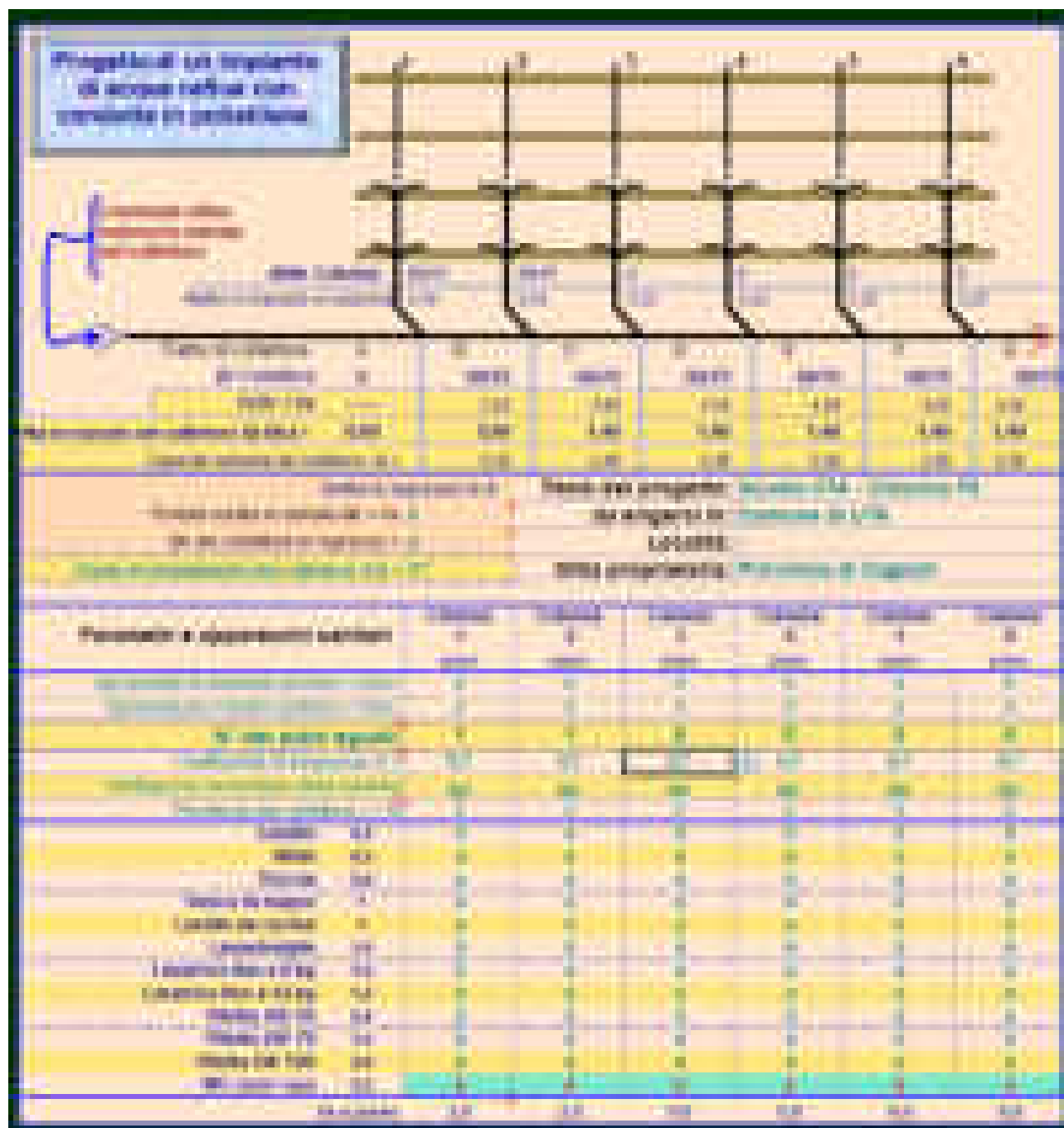
IMPIANTO DI SMALTIMENTO ACQUE REFLUE

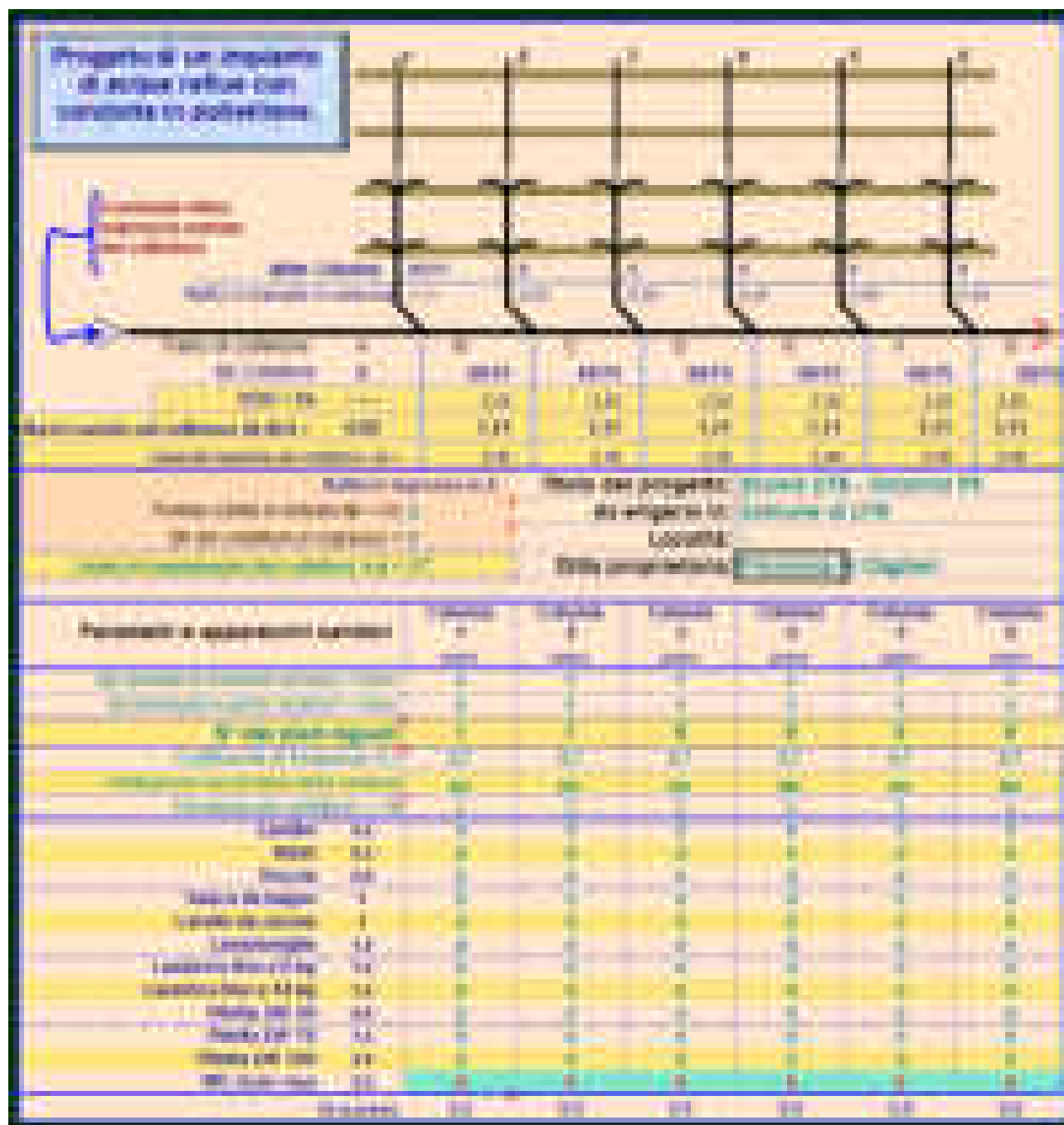
ACQUE GRIGIE – SCUOLA PRIMARIA – Colonna P1

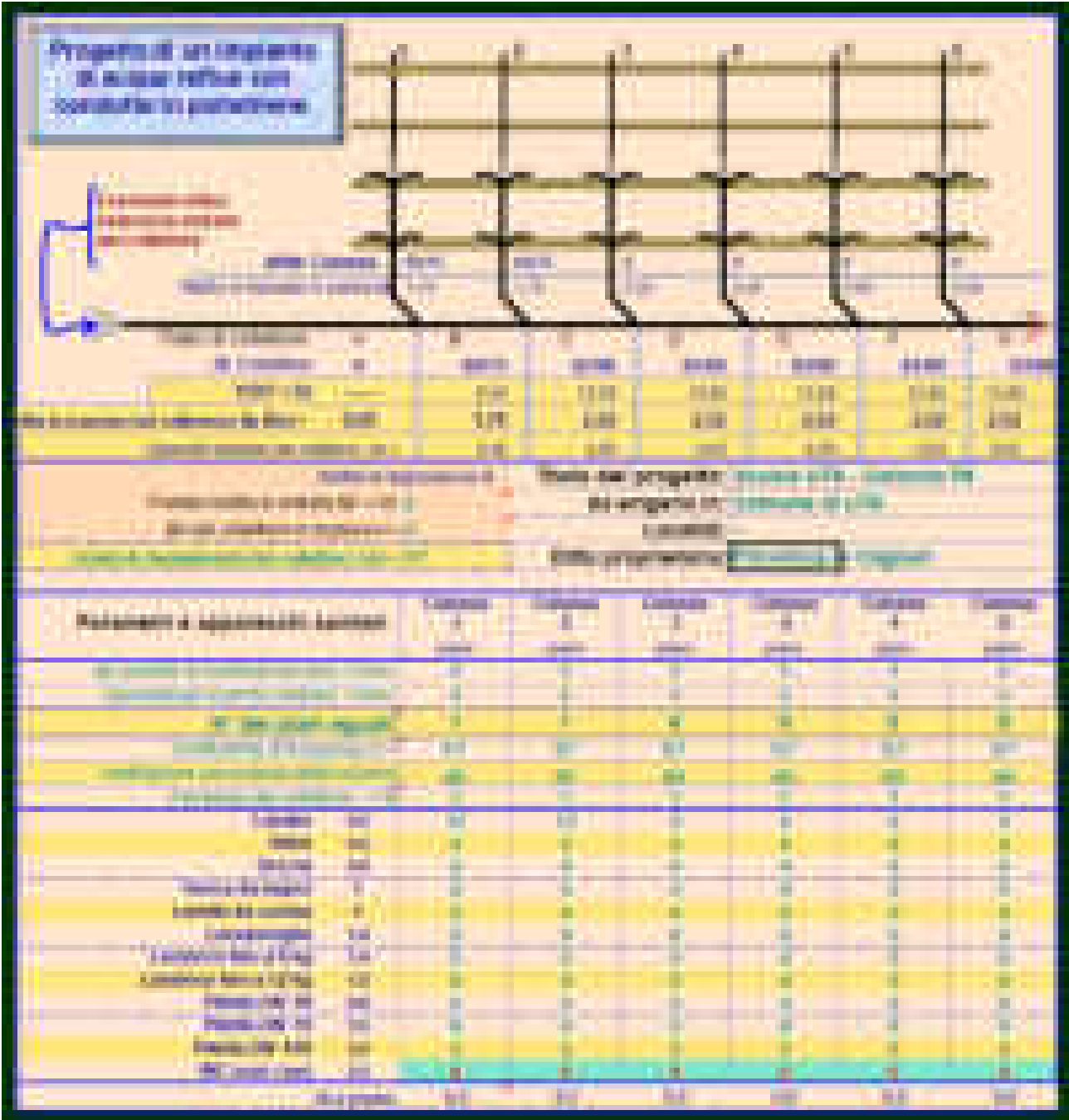




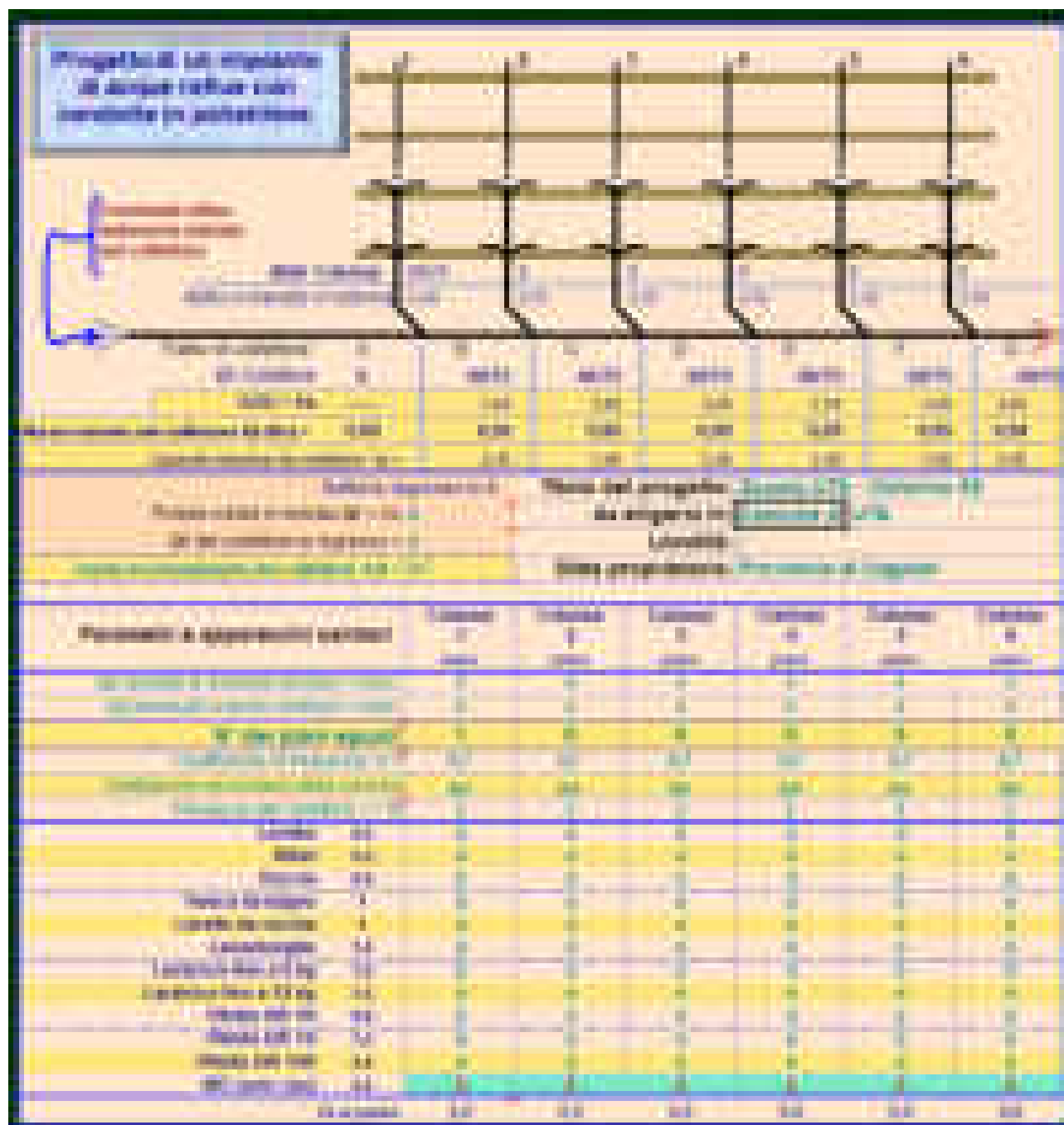


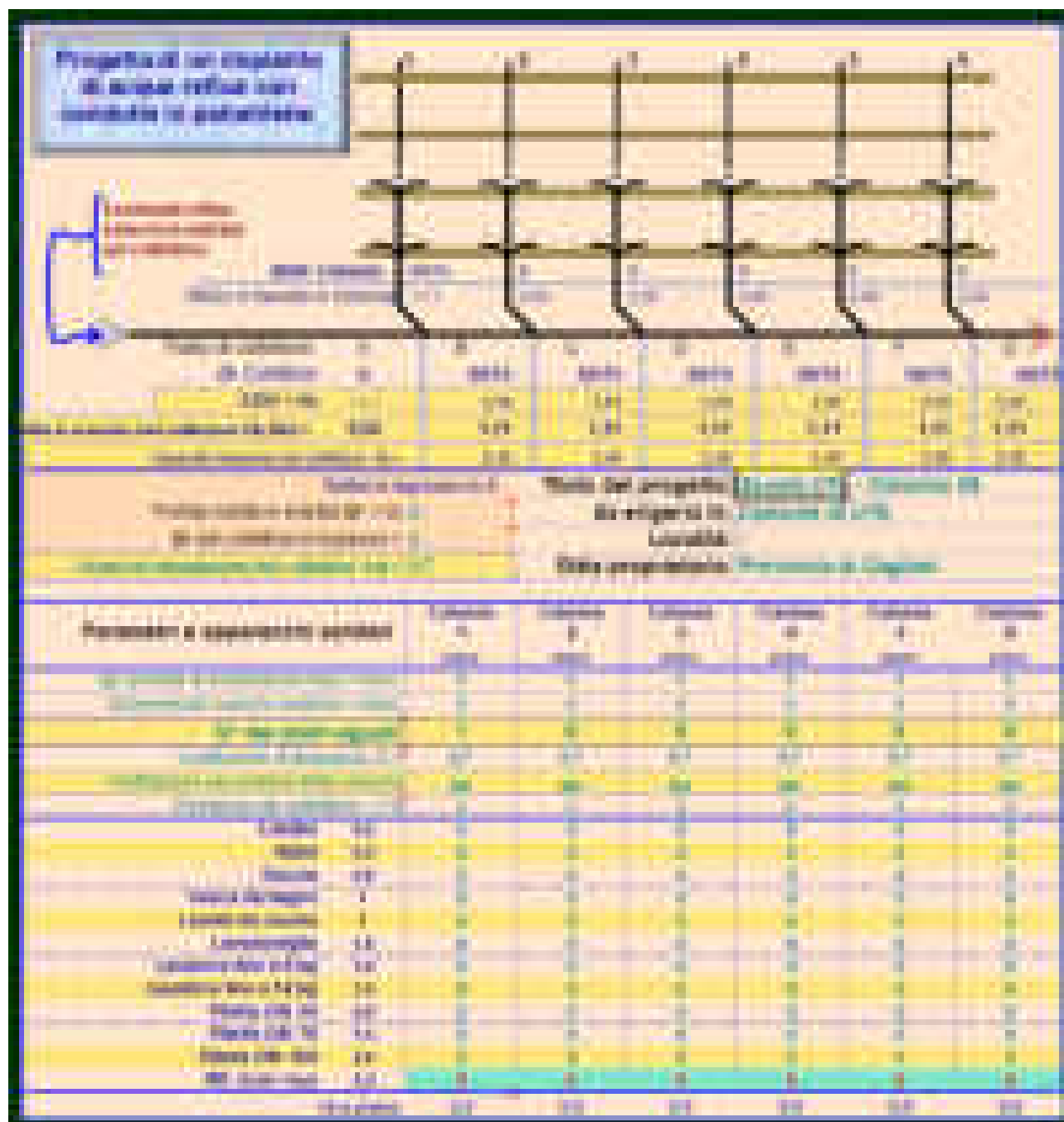


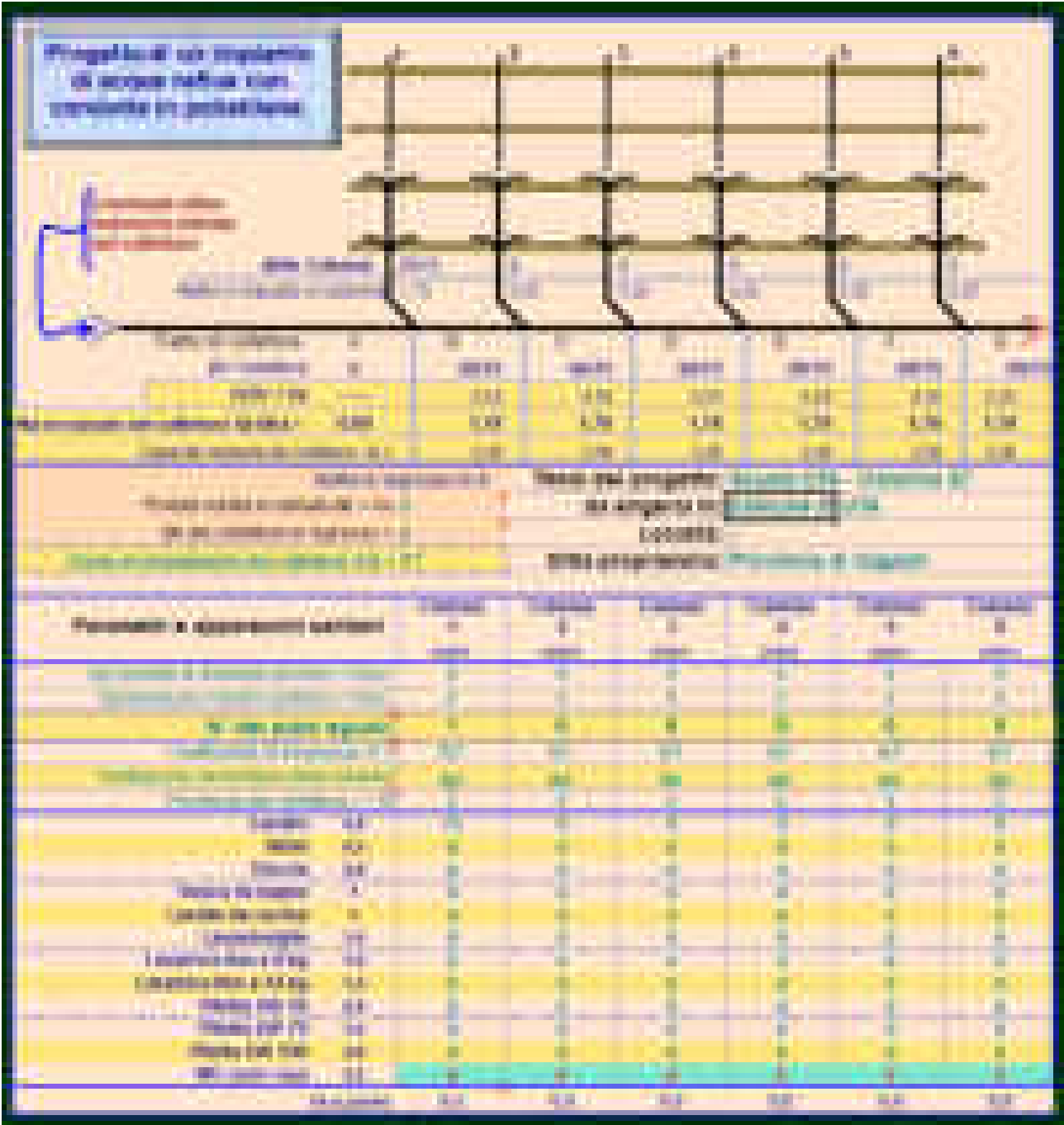


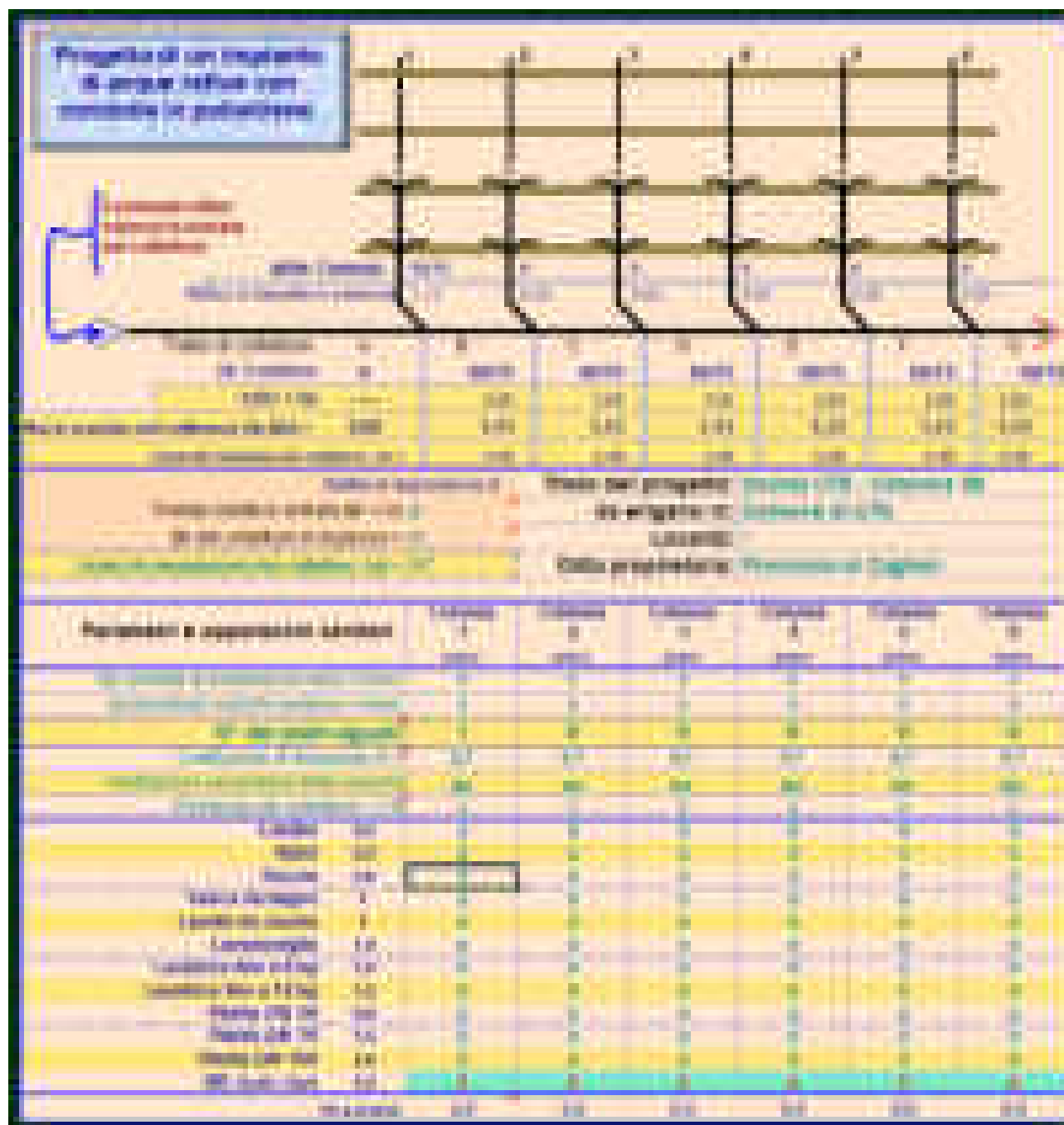


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Programme de traitement de l'air neuf entrant dans le bâtiment

Données de l'air neuf entrant :

- Température : 10°C
- Densité : 0.95 kg/m³

Données de l'air traité :

- Température : 18°C
- Densité : 0.95 kg/m³

Données des équipements :

- Préchauffeur : 1000 W
- Chauffage : 2000 W
- Refroidissement : 1500 W

Données des locaux :

- Local 1 : 100 m³
- Local 2 : 200 m³
- Local 3 : 300 m³
- Local 4 : 400 m³
- Local 5 : 500 m³
- Local 6 : 600 m³
- Local 7 : 700 m³
- Local 8 : 800 m³
- Local 9 : 900 m³
- Local 10 : 1000 m³

Données des équipements de chauffage :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

Données des équipements de refroidissement :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

Données des équipements de ventilation :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

Données des équipements de climatisation :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

Données des équipements de chauffage par rayonnement :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

Données des équipements de refroidissement par rayonnement :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

Données des équipements de ventilation mécanique contrôlée (VMC) :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

Données des équipements de climatisation split :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

Données des équipements de chauffage par pompe à chaleur (PAC) :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

Données des équipements de refroidissement par pompe à chaleur (PAC) :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

Données des équipements de ventilation naturelle :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

Données des équipements de climatisation par évaporation :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

Données des équipements de chauffage par radiateur à eau chaude :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

Données des équipements de refroidissement par radiateur à eau froide :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

Données des équipements de ventilation par puits canadien :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

Données des équipements de climatisation par système à eau glacée :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

Données des équipements de chauffage par système à eau chaude :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

Données des équipements de refroidissement par système à eau froide :

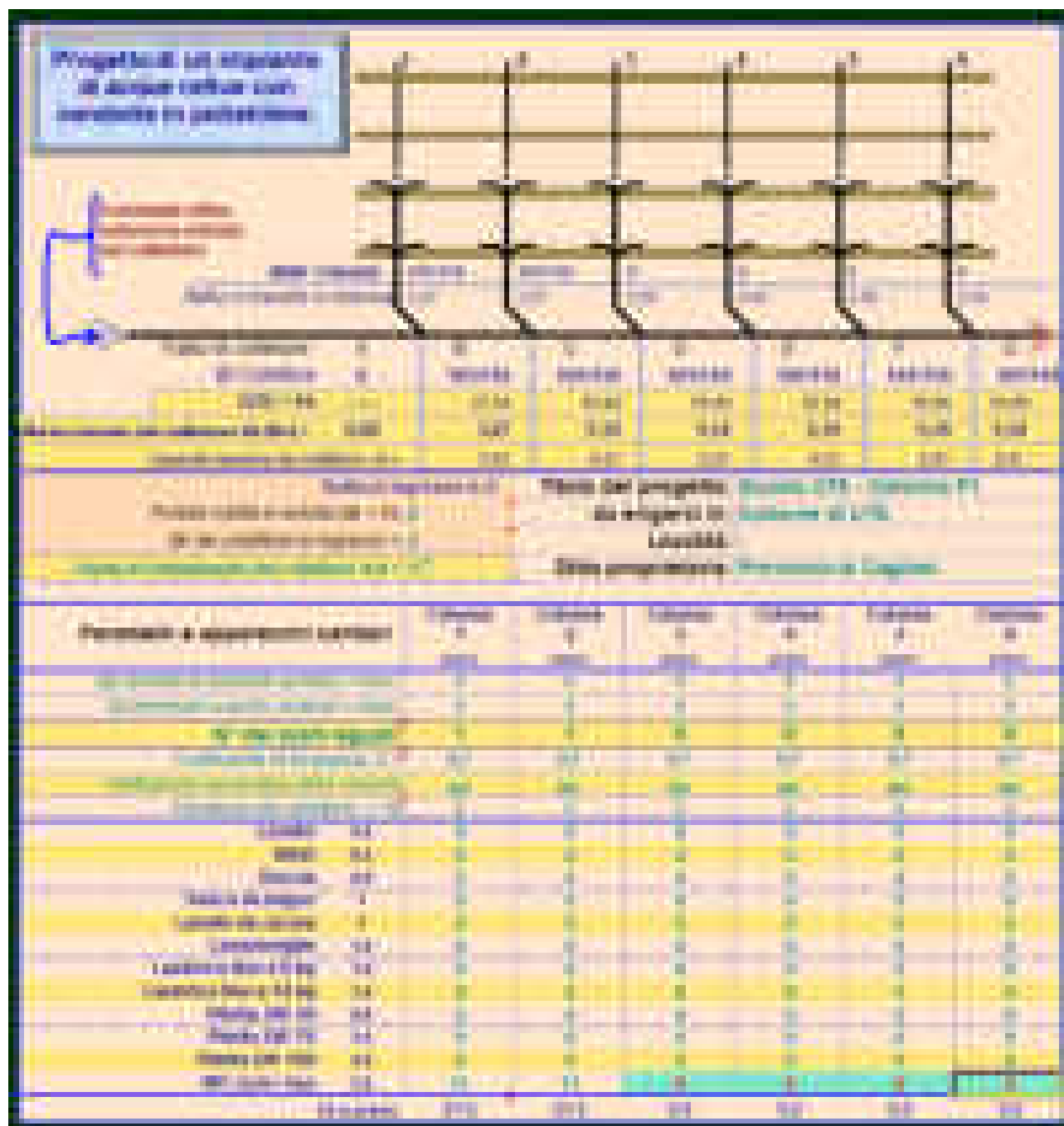
- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

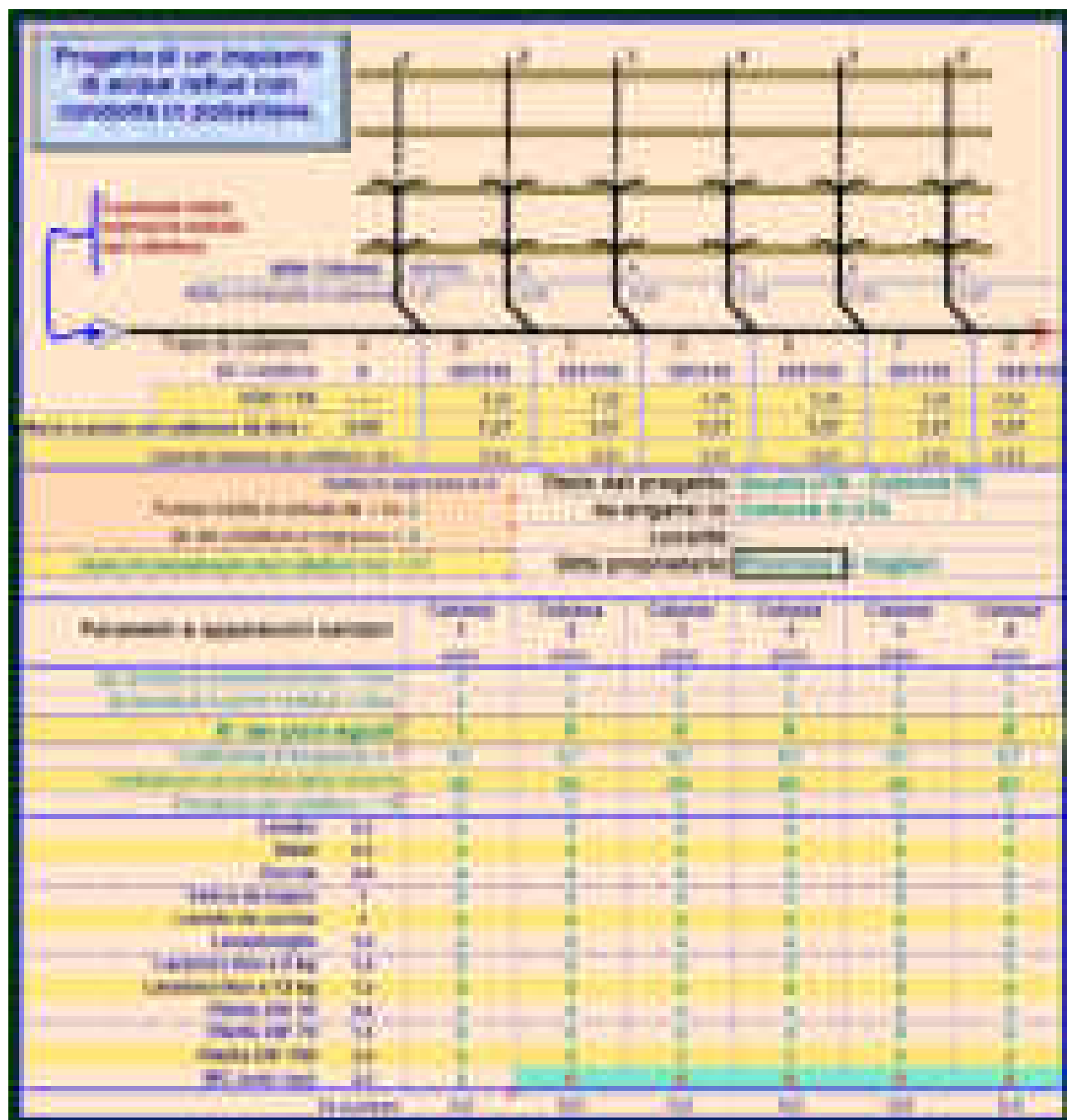
Données des équipements de ventilation par système à eau glacée :

- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local 7 : 700 W
- Local 8 : 800 W
- Local 9 : 900 W
- Local 10 : 1000 W

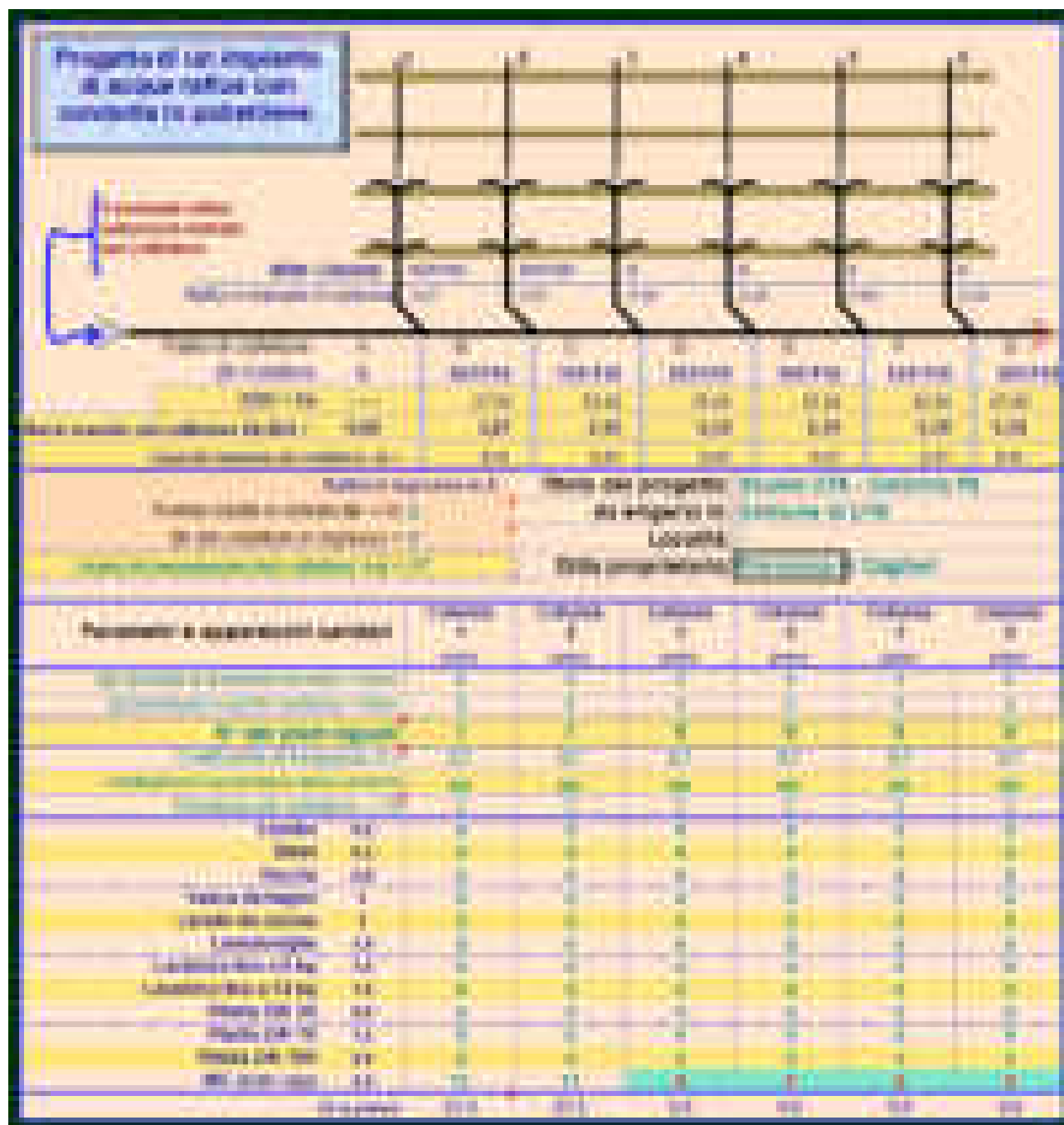
Données des équipements de chauffage par système à eau chaude :

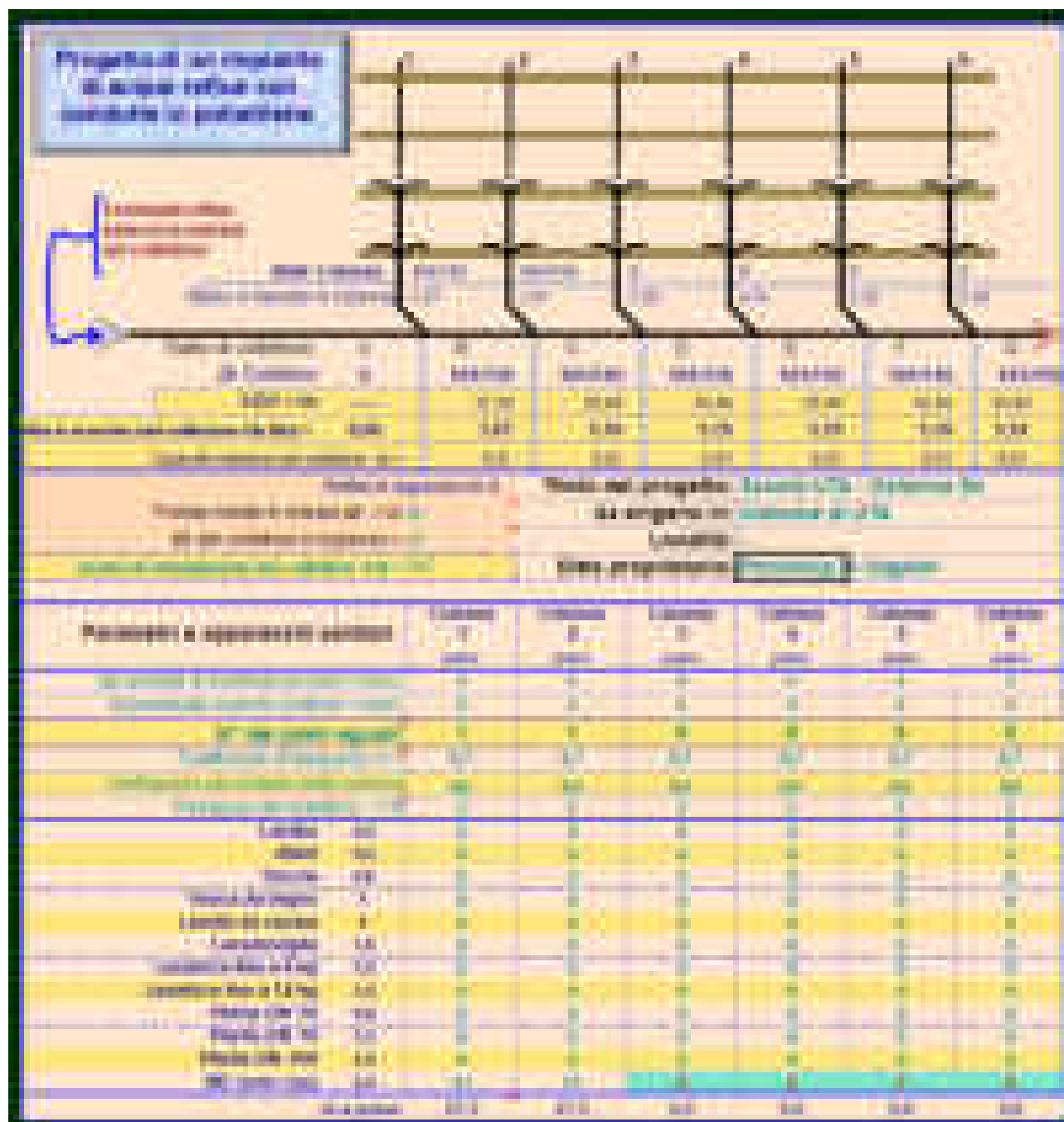
- Local 1 : 100 W
- Local 2 : 200 W
- Local 3 : 300 W
- Local 4 : 400 W
- Local 5 : 500 W
- Local 6 : 600 W
- Local

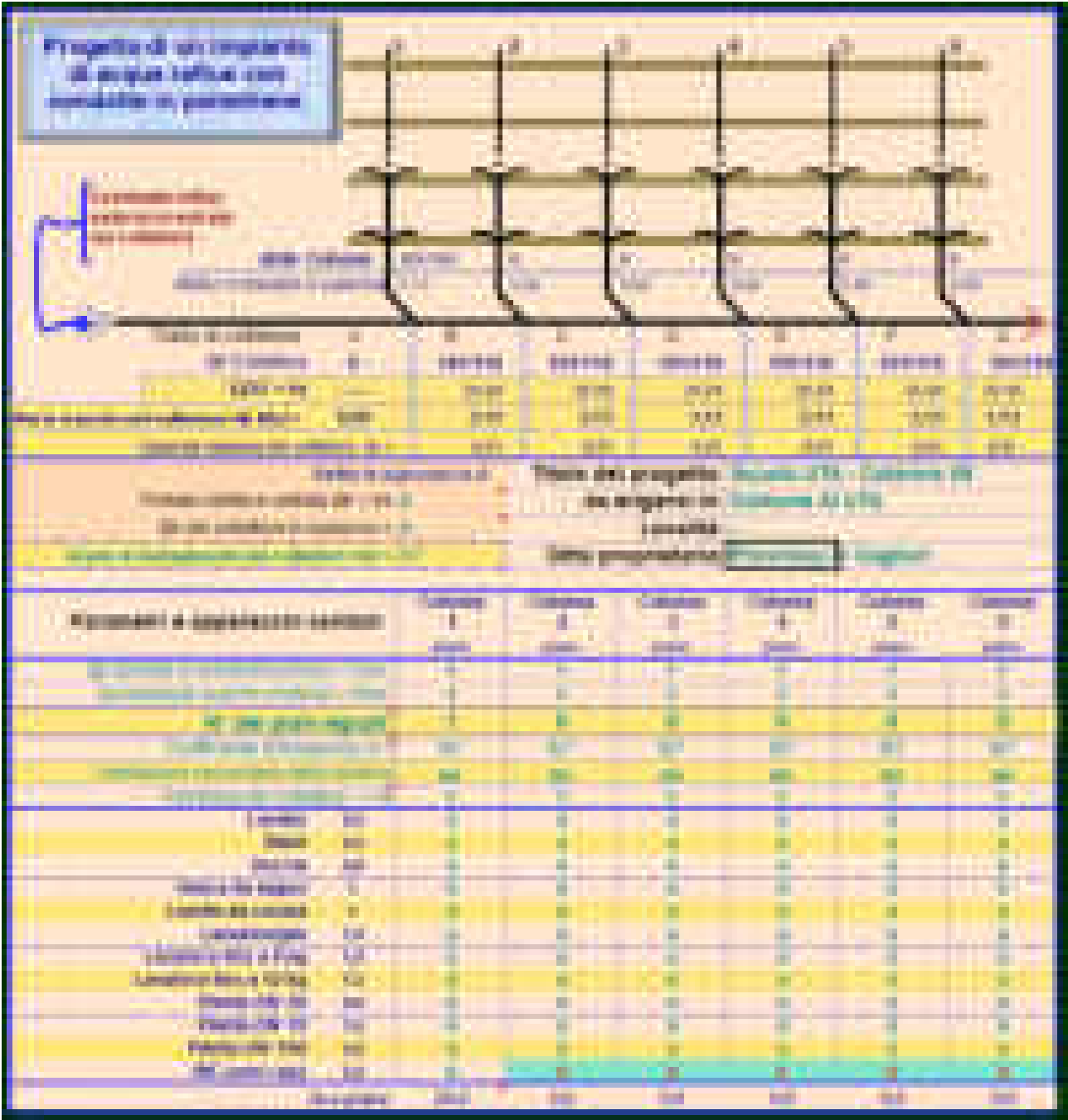


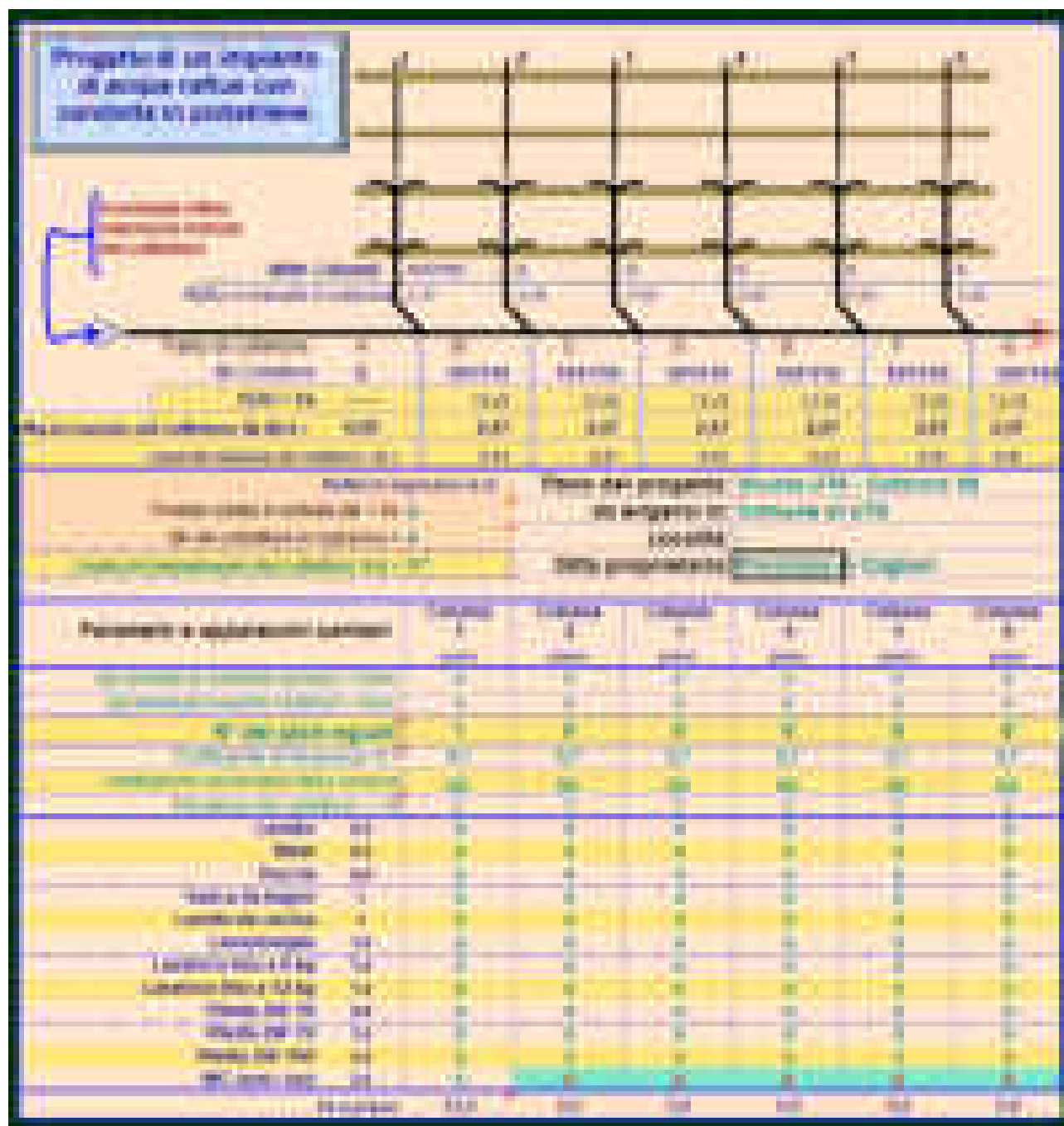


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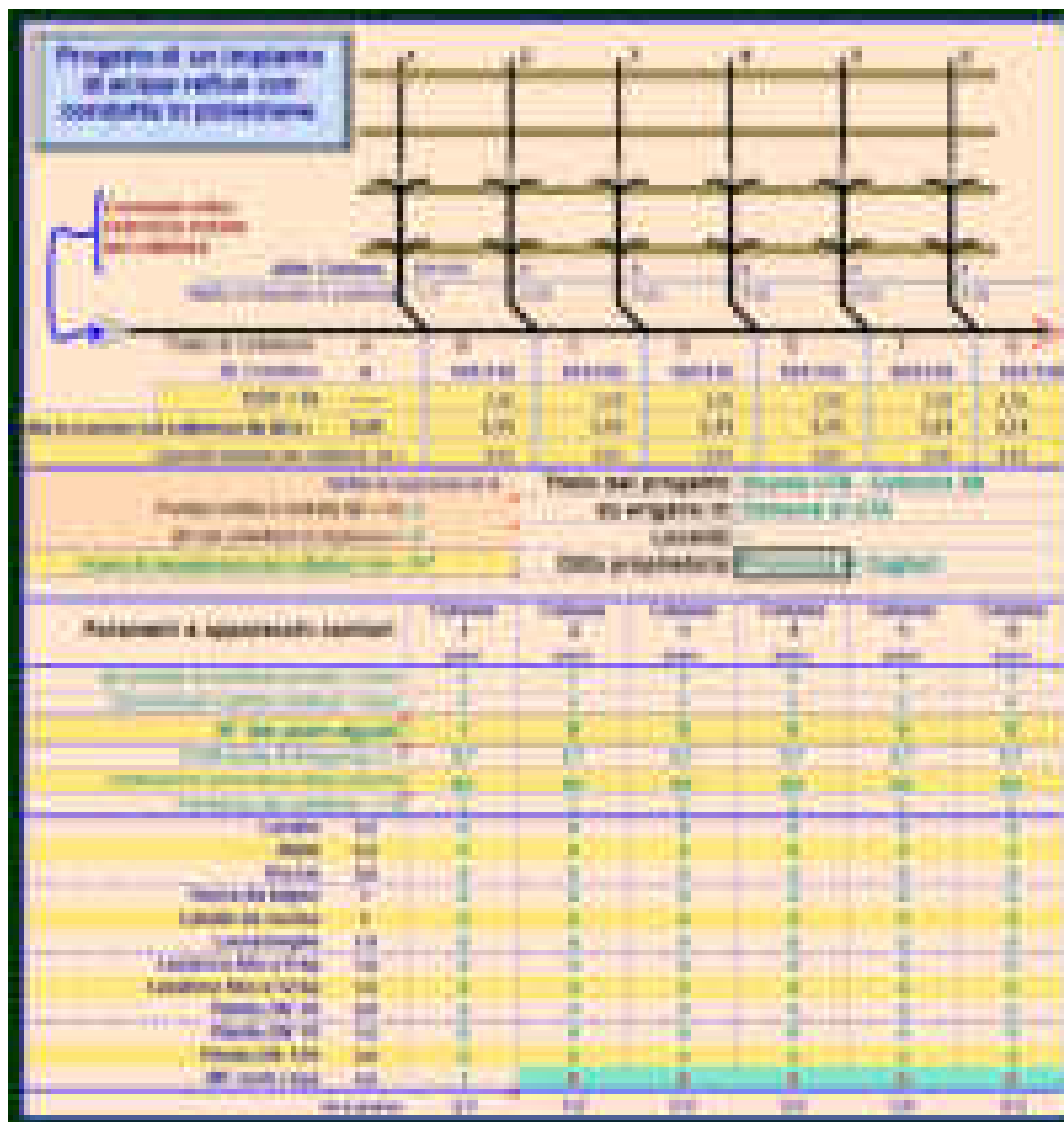








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Dati utili per calcolo prevalenza:

Perdite accidentali	
Nome	k
Uscita diffusore	1
Curva tonda	1
Curva rettangolare	1,4
Biforcazione T	1,4
Biforcazione Y	1
Derivazione T	1,2
Derivazione Y 60°	0,7
Derivazione Y curva	1
Derivazione Y curva e riduzione sezione	1,1
Riduzione di sezione 45°	0,1
Aumento di sezione 45°	0,9
Riduzione di sezione 90°	0,45
Aumento di sezione 90°	1
Uscita diff. + Curva Tonda	2
Uscita diff. + Curva rettang.	2,4
Uscita diff. + Deriv. T	2,2
Uscita diff. + Deriv. Y 60°	1,7
Uscita diff. + Deriv. Y curva	1
Canale microforato	5

dps Perdite di carico distribuite (mm H₂O)

dpd Perdite di carico localizzate (mm H₂O)

CALCOLO RICAMBI ORARI SERVIZI IGIENICI						
Piano terra- SP-P0						
Ambiente	Area [m²]	Altezza [m]	Volume [m³]	Ricambi [Vol/h]	Portata estrazione [m³/h]	
WC - 1	16,5	2,5	41,25	8	330	SP-ESTR-P0-1
WC - 2	16,5	2,5	41,25	8	330	
WC - 3	4	2,5	10	8	80	SP-ESTR-P0-2
WC - 4	3,5	2,5	8,75	8	70	SP-ESTR-P0-3
Servizi mensa	7	2,5	17,5	8	140	SP-ESTR-P0-4
WC - 5	4	2,5	10	8	80	SP-ESTR-P0-5
WC - 6	16,5	2,5	41,25	8	330	SP-ESTR-P0-6
WC - 7	16,5	2,5	41,25	8	330	
CALCOLO RICAMBI ORARI SERVIZI IGIENICI						
Piano primo- SP-P1						
Ambiente	Area [m²]	Altezza [m]	Volume [m³]	Ricambi [Vol/h]	Portata estrazione [m³/h]	
WC - 1	16,5	2,5	41,25	8	330	SP-ESTR-P1-1
WC - 2	16,5	2,5	41,25	8	330	
WC - 3	4	2,5	10	8	80	SP-ESTR-P1-2
WC - 4	4	2,5	10	8	80	SP-ESTR-P1-3
WC - 5	16,5	2,5	41,25	8	330	SP-ESTR-P1-4
WC - 7	16,5	2,5	41,25	8	330	

SP-P0										
TRATTO	Portata richiesta ramo utenza (mc/h)	Portata complessiva ramo (mc/h)	L(m) lunghezza ramo	Didraulico (mm)	D. equivalente (mm)	V (m/s)	K	Sez.	dps (mm c.a.)	dpd (mm c.a.)
1-T	330	330	1,6	200	200	2,92	2,00	3,1	0,1	1,1
2-T	330	330	1,6	200	200	2,92	2,00	3,1		
T-Copertura		660	7,6	260	315	2,35	5,10	7,8	0,2	1,8
									3,1	
3-Copertura	80	80	9,0	117	125	1,81	4,00	1,2	0,4	0,8
									1,2	
4-Copertura	70	70	13,4	111	125	1,58	5,00	1,2	0,4	0,8
									1,2	
Serv. mensa- Copertura	140	140	21,0	145	160	1,93	5,00	2,0	0,8	1,2
									1,9	
5-Copertura	80	80	7,1	117	125	1,81	4,00	1,2	0,3	0,8
									1,1	
6-T	330	330	1,6	200	200	2,92	2,00	3,1	0,1	1,1
7-T	330	330	1,6	200	200	2,92	2,00	3,1		
T-Copertura		660	7,6	260	315	2,35	5,10	7,8	0,2	1,8
									3,1	

SP-ESTR-P0-1

SP-ESTR-P0-2

SP-ESTR-P0-3

SP-ESTR-P0-4

SP-ESTR-P0-5

SP-ESTR-P0-6

SP-P1										
TRATTO	Portata richiesta ramo utenza (mc/h)	Portata complessiva ramo (mc/h)	L(m) lunghezza ramo	Didraulico (mm)	D. equivalente (mm)	V (m/s)	K	Sez.	dps (mm c.a.)	dpd (mm c.a.)
1-T	330	330	1,6	200	200	2,92	2,00	3,1	0,1	1,1
2-T	330	330	1,6	200	200	2,92	2,00	3,1		
T-Copertura		660	3,0	260	315	2,35	5,10	7,8	0,1	1,8
									3,0	
3-Copertura	80	80	3,0	117	125	1,81	4,00	1,2	0,1	0,8
									0,9	
4-Copertura	80	80	3,2	117	125	1,81	4,00	1,2	0,1	0,8
									1,0	
5-T	330	330	1,6	200	200	2,92	2,00	3,1	0,1	1,1
6-T	330	330	1,6	200	200	2,92	2,00	3,1		
T-Copertura		660	4,2	260	315	2,35	5,10	7,8	0,1	1,8
									3,0	

SP-ESTR-P1-1

SP-ESTR-P1-2

SP-ESTR-P1-3

SP-ESTR-P1-4

CALCOLO RICAMBI ORARI SERVIZI IGIENICI					
Piano terra- SS-P0					
Ambiente	Area [m²]	Altezza [m]	Volume [m³]	Ricambi [Vol/h]	Portata estrazione [m³/h]
WC - 1	16,5	2,5	41,25	8	330
WC - 2	16,5	2,5	41,25	8	330
WC - 3	4	2,5	10	8	80
WC - 4	8,5	2,5	21,25	8	170
WC - 5	8,5	2,5	21,25	8	170
WC - 6	9	2,5	22,5	8	180
WC - 7	9	2,5	22,5	8	180
WC - 8	4	2,5	10	8	80
CALCOLO RICAMBI ORARI SERVIZI IGIENICI					
Piano primo- SS-P1					
Ambiente	Area [m²]	Altezza [m]	Volume [m³]	Ricambi [Vol/h]	Portata estrazione [m³/h]
WC - 1	16,5	2,5	41,25	8	330
WC - 2	16,5	2,5	41,25	8	330
WC - 3	4	2,5	10	8	80
WC - 4	4	2,5	10	8	80
WC - 5	16,5	2,5	41,25	8	330
WC - 7	16,5	2,5	41,25	8	330

SS-P0										
TRATTO	Portata richiesta ramo utenza (mc/h)	Portata complessiva ramo (mc/h)	L(m) lunghezza ramo	Didraulico (mm)	D. equivalente (mm)	V (m/s)	K	Sez.	dps (mm c.a.)	dpd (mm c.a.)
1-T	330	330	1,6	200	200	2,92	2,00	3,1	0,1	1,1
2-T	330	330	1,6	200	200	2,92	2,00	3,1		
T-Copertura		660	7,5	260	315	2,35	5,10	7,8	0,2	1,8
									3,1	
3-Copertura	80	80	7,0	117	125	1,81	5,00	1,2	0,3	1,0
									1,3	
4-Copertura	170	170	19,9	156	160	2,35	5,00	2,0	1,0	1,7
									2,8	
5-Copertura	170	170	23,7	156	160	2,35	5,00	2,0	1,2	1,7
									3,0	
6-T	180	180	1,6	159	160	2,49	2,00	2,0	0,1	0,8
7-T	180	180	1,6	159	160	2,49	2,00	2,0		
T-Copertura		360	20,0	207	250	2,04	5,10	4,9	0,5	1,3
									2,7	
8-Copertura	80	80	11,0	117	125	1,81	4,00	1,2	0,5	0,8
									1,3	

SS-ESTR-P0-1

SS-ESTR-P0-2

SS-ESTR-P0-3

SS-ESTR-P0-4

SS-ESTR-P0-5

SS-ESTR-P0-6

SS-P1										
TRATTO	Portata richiesta ramo utenza (mc/h)	Portata complessiva ramo (mc/h)	L(m) lunghezza ramo	Didraulico (mm)	D. equivalente (mm)	V (m/s)	K	Sez.	dps (mm c.a.)	dpd (mm c.a.)
1-T	330	330	1,6	200	200	2,92	2,00	3,1	0,1	1,1
2-T	330	330	1,6	200	200	2,92	2,00	3,1		
T-Copertura		660	3,7	260	315	2,35	5,10	7,8	0,1	1,8
									3,0	
3-Copertura	80	80	3,0	117	125	1,81	5,00	1,2	0,1	1,0
									1,2	
4-Copertura	80	80	3,1	117	125	1,81	5,00	1,2	0,1	1,0
									1,2	
5-T	330	330	1,6	200	200	2,92	2,00	3,1	0,1	1,1
6-T	330	330	1,6	200	200	2,92	2,00	3,1		
T-Copertura		660	3,7	260	315	2,35	3,90	7,8	0,1	1,3
									2,6	

SS-ESTR-P1-1

SS-ESTR-P1-2

SS-ESTR-P1-3

SS-ESTR-P1-4

ESTRAZIONE BAGNI – AUDITORIUM

CALCOLO RICAMBI ORARI SERVIZI IGIENICI					
Piano terra- SS-Auditorium					
Ambiente	Area [m²]	Altezza [m]	Volume [m³]	Ricambi [Vol/h]	Portata estrazione [m³/h]
1 WC disabili	4,5	2,5	11,25	8	90
2 Spogliatoio disabili	4	2,5	10	8	80
Piano Primo- SS-Auditorium					
3 WC destra	8,5	2,5	21,25	8	170
4 WC sinistra	8,5	2,5	21,25	8	170

SS-ESTR-AUD-P0-1
SS-ESTR-AUD-P1-2
SS-ESTR-AUD-P1-1

Auditorium										
TRATTO	Portata richiesta ramo utenza (mc/h)	Portata complessiva ramo (mc/h)	L (m) lunghezza ramo	Didraulico (mm)	D. equivalente (mm)	V (m/s)	K	Sez.	dps (mm c.a.)	dpd (mm c.a.)
1	90	90	3,0	122	125	2,04	2,00	1,2	0,2	0,5
2	80	80	2,0	117	125	1,81	2,00	1,2		
P0-P1		170	4,0	156	160	2,35	5,10	2,0	0,2	1,8
									2,6	
3	170	170	2,5	156	160	2,35	2,00	2,0	0,1	0,7
									0,8	
4	170	170	4,5	156	160	2,35	2,00	2,0	0,2	0,7
									0,9	

SS-ESTR-AUD-P0-1
SS-ESTR-AUD-P1-2
SS-ESTR-AUD-P1-1

ESTRAZIONE BAGNI – PALESTRA

CALCOLO RICAMBI ORARI SERVIZI IGIENICI					
<i>Piano terra- SS-Palestra</i>					
Ambiente	Area [m ²]	Altezza [m]	Volume [m ³]	Ricambi [Vol/h]	Portata estrazione [m ³ /h]
Spogliatoio 1	21	2,5	52,5	8	420
Spogliatoio disabili 2	4	2,5	10	8	80
Spogliatoio 3	21	2,5	52,5	8	420
Spogliatoio disabili 4	5,5	2,5	13,75	8	110
Spogliatoio arbitri 5	9	2,5	22,5	8	180
Servizi disabili 6	6,5	2,5	16,25	8	130

SS-ESTR-PAL-1

SS-ESTR-PAL-2

Palestra										
TRATTO	Portata richiesta ramo utenza (mc/h)	Portata complessiva ramo (mc/h)	L(m) lunghezza ramo	Didraulico (mm)	D. equivalente (mm)	V (m/s)	K	Sez.	dps (mm c.a.)	dpd (mm c.a.)
1	420	420	2,0	219	250	2,38	2,00	4,9	0,1	0,7
2	80	80	4,0	117	125	1,81	2,00	1,2		
T		500	4,0	234	250	2,83	6,10	4,9	0,2	3,1
3	420	420	2,0	219	250	2,38	2,00	4,9		
4	110	110	4,0	132	160	1,52	2,00	2,0		
T		530	4,0	239	250	3,00	6,10	4,9		
T-Copertura		1 030	4,5	308	315	3,67	2,10	7,8	0,2	1,8
									6,0	
5-T	180	180	3,0	159	160	2,49	2,00	2,0	0,2	0,8
6-T	130	130	2,5	141	160	1,80	2,00	2,0		
T-Copertura		310	4,5	195	200	2,74	4,10	3,1	0,2	1,9
									3,1	

SS-ESTR-PAL-P0-1

SS-ESTR-PAL-P0-2

CALCOLO RICAMBI ARIA AMBIENTE ORARI- UNI 16798-1

Come si evince dalle tabelle di seguito riportate, il calcolo dei ricambi aria ambiente secondo la UNI 16798-1 risulta più restrittivo a confronto con il DM 18 dicembre 1975 e la UNI 10339; la UNI 16798-1 peraltro garantisce il rispetto dei Criteri Ambientali Minimi CAM e pertanto il progetto è stato portato avanti seguendo quest'ultima.

DM 18 dicembre 1975				
Locale tipo	Sup	H (m)	Coeff (1/h)	PORTATA (mc/h)
Aula scuola primaria	48	3	2,5	360
Aula scuola secondaria	48	3	3,5	504

UNI 10339			
Locale tipo	N°occupanti (pers)	Qop (mc/(s*pers))	PORTATA (mc/h)
Aula scuola primaria	26	0,005	468
Aula scuola secondaria	26	0,006	561,6

UNI 16798-1					
Locale tipo	Sup (mq)	N°occupanti (pers)	Qb (l/(s*mq))	Qp (l/(s*pers))	PORTATA (mc/h)
Aula scuola primaria	48	26	0,7	7	776,16
Aula scuola secondaria	48	26	0,7	7	776,16

SCUOLA PRIMARIA

SP-VMC1

L'unità è posta in copertura in corrispondenza del cavedio SP-CAV1

Piano terra- SP						
Ambiente	Area [m²]	Occupanti [n°]	q _p [l/s pers]	q _b [l/s m²]	q _T [l/s]	q _T [m³/h]
SP- C1	47	26	7	0,7	214,9	773,64
SP- C2	47	26	7	0,7	214,9	773,64
SP- C3	47	26	7	0,7	214,9	773,64
SP- L1	65	26	7	0,7	227,5	819
SP- DOC	28	12	7	0,7	103,6	372,96
SP- C4	47	26	7	0,7	214,9	773,64
SP- C5	47	26	7	0,7	214,9	773,64
SP- INC	95	0	0	0,7	66,5	239,4
						5299,56
Piano primo- SP						
Ambiente	Area [m²]	Occupanti [n°]	q _p [l/s pers]	q _b [l/s m²]	q _T [l/s]	q _T [m³/h]
SP- C13	47	26	7	0,7	214,9	773,64
SP- C14	47	26	7	0,7	214,9	773,64
SP- C15	47	26	7	0,7	214,9	773,64
SP- L3	47	26	7	0,7	214,9	773,64
SP- ATH	39	26	7	0,7	209,3	753,48
SP- INGR	43	0	0	0,7	30,1	108,36
SP- C16	47	26	7	0,7	214,9	773,64
SP- C17	47	26	7	0,7	214,9	773,64
						5503,68
					Totale	10803,24

SP-VMC2

L'unità è posta in copertura in corrispondenza del cavedio SP-CAV2

<i>Piano terra- SP</i>						
Ambiente	Area [m²]	Occupanti [n°]	q _p [l/s pers]	q _b [l/s m²]	q _T [l/s]	q _T [m³/h]
SP-SR2-1	53	0	0	0,7	37,1	133,56
SP-C6	47	26	7	0,7	214,9	773,64
SP-C7	47	26	7	0,7	214,9	773,64
SP-C8	47	26	7	0,7	214,9	773,64
SP-C9	47	26	7	0,7	214,9	773,64
SP-SR2-2	55	0	0	0,7	38,5	138,6
						3366,72
<i>Piano primo- SP</i>						
Ambiente	Area [m²]	Occupanti [n°]	q _p [l/s pers]	q _b [l/s m²]	q _T [l/s]	q _T [m³/h]
SP-C18	47	26	7	0,7	214,9	773,64
SP-C19	47	26	7	0,7	214,9	773,64
SP-AM	30	6	7	0,7	63,0	226,80
SP-SR4	70	0	0	0,7	49,0	176,40
SP-C20	47	26	7	0,7	214,9	773,64
SP-C21	47	26	7	0,7	214,9	773,64
SP-C25	47	26	7	0,7	214,9	773,64
						4271,4
					Totale	7638,12

SP-VMC3

L'unità è posta in copertura in corrispondenza del cavedio SP-CAV3

Piano terra- SP						
Ambiente	Area [m²]	Occupanti [n°]	q _p [l/s pers]	q _b [l/s m²]	q _T [l/s]	q _T [m³/h]
SP-C10	47	26	7	0,7	214,9	773,64
SP-C11	47	26	7	0,7	214,9	773,64
SP-C12	47	26	7	0,7	214,9	773,64
SP-L2	47	26	7	0,7	214,9	773,64
						3094,56
Piano primo- SP						
Ambiente	Area [m²]	Occupanti [n°]	q _p [l/s pers]	q _b [l/s m²]	q _T [l/s]	q _T [m³/h]
SP-C22	47	26	7	0,7	214,9	773,64
SP-C23	47	26	7	0,7	214,9	773,64
SP-C24	47	26	7	0,7	214,9	773,64
SP-L4	47	26	7	0,7	214,9	773,64
						3094,56
					Totale	6189,12

SP-VMC_REF

L'unità è posta in copertura in corrispondenza del cavedio SP-CAV2 ed è a servizio dei locali dedicati ai refettori

Piano terra- SP						
Ambiente	Area [m²]	Occupanti [n°]	q _p [l/s pers]	q _b [l/s m²]	q _T [l/s]	q _T [m³/h]
SP-SPOR	26	4	7	0,7	46,2	166,32
SP-REF1	91	96	7	0,7	735,7	2648,52
SP-REF2	67	72	7	0,7	550,9	1983,24
					Totale	4798,08

SP-VMC_PAL

L'unità è posta in copertura in corrispondenza del cavedio SP-CAV2 ed è a servizio dei locali dedicati alla palestra (aula attività motorie)

Piano primo- SP						
Ambiente	Area [m²]	Occupanti [n°]	q _p [l/s pers]	q _b [l/s m²]	q _T [l/s]	q _T [m³/h]
SP-PAL	122	52	7	0,7	449,4	1617,84
						1617,84

SCUOLA SECONDARIA

SS-VMC1

L'unità è posta in copertura in corrispondenza del cavedio SS-CAV1

Piano terra- SS						
Ambiente	Area [m²]	Occupanti [n°]	q _p [l/s pers]	q _b [l/s m²]	q _T [l/s]	q _T [m³/h]
SS-L1	65	26	7	0,7	227,5	819
SS-L2	40	26	7	0,7	210	756
SS-C1	47	26	7	0,7	214,9	773,64
SS-C2	47	26	7	0,7	214,9	773,64
SS-AM1	43	0	0	0,7	30,1	108,36
						3230,64

Piano primo- SS						
Ambiente	Area [m²]	Occupanti [n°]	q _p [l/s pers]	q _b [l/s m²]	q _T [l/s]	q _T [m³/h]
SS-L1	58	26	7	0,7	222,6	801,36
SS-L2	40	26	7	0,7	210	756
SS-C7	47	26	7	0,7	214,9	773,64
SS-C8	47	26	7	0,7	214,9	773,64
SS-AM2	43	0	0	0,7	30,1	108,36
SS-C9	47	26	7	0,7	214,9	773,64
SS-C10	47	26	7	0,7	214,9	773,64
SS-RIU2	74	60	7	0,7	471,8	1698,48
SS-C11	47	26	7	0,7	214,9	773,64
SS-C12	47	26	7	0,7	214,9	773,64
						8006,04
					Totale	11236,68

SS-VMC2

L'unità è posta in copertura in corrispondenza del cavedio SS-CAV2

Piano terra- SS						
Ambiente	Area [m ²]	Occupanti [n°]	q _p [l/s pers]	q _b [l/s m ²]	q _T [l/s]	q _T [m ³ /h]
SS-C3	47	26	7	0,7	214,9	773,64
SS-C4	47	26	7	0,7	214,9	773,64
SS-DOC	46	6	7	0,7	74,2	267,12
SS-SR1	32	0	0	0,7	22,4	80,64
SS-C6	47	26	7	0,7	214,9	773,64
SS-C5	47	26	7	0,7	214,9	773,64
SS-SR2	165	0	0	0,7	115,5	415,8
SS-SEGR	49	8	7	0,7	90,3	325,08
SS-RIU1	43	6	7	0,7	72,1	259,56
SS-DSGA	19	2	7	0,7	27,3	98,28
SS-DIR	21	2	7	0,7	28,7	103,32
						4644,36
Piano primo- SS						
Ambiente	Area [m ²]	Occupanti [n°]	q _p [l/s pers]	q _b [l/s m ²]	q _T [l/s]	q _T [m ³ /h]
SS-SR3	50	0	0	0,7	35	126
SS-BIB	102	24	7	0,7	239,4	861,84
SS-D12	43	0	7	0,7	30,1	108,36
SS-C13	47	26	7	0,7	214,9	773,64
SS-C14	47	26	7	0,7	214,9	773,64
SS-SR4	24	0	0	0,7	16,8	60,48
SS-L5	52	26	7	0,7	218,4	786,24
SS-C15	46	26	7	0,7	214,2	771,12
						4261,32
					Totale	8905,68

SS-AUD

L'unità è posta in copertura in corrispondenza del cavedio SS-CAV2 ed è a servizio del solo Auditorium.

Il valore di 9922 mc/h è stato definito in funzione della massima percentuale dell'aria di rinnovo che il rooftop preso in esame per i calcoli può utilizzare. Questa percentuale è pari all'80%

Piano primo- SS						
Ambiente	Area [m ²]	Occupanti [n°]	q _p [l/s pers]	q _b [l/s m ²]	q _T [l/s]	q _T [m ³ /h]
SP - AUDITORIUM	346	250	7,85	0,7	2204,7	7936,92
						9921,15

SS-PAL

L'unità è posta nello spazio aperto al primo piano della scuola secondaria ed è a servizio della sola palestra.

Il valore di portata di aria di ricambio è stato fissato in 7000 mc/h

Non essendo presente, all'interno della normativa UNI 16798-1, in merito ad ambienti con questa funzione è stata presa in considerazione la norma UNI 10339.

Sulla base degli affollamenti stabiliti dal gruppo di progettisti nella palestra sono previste 85 persone tra atleti e pubblico. Il numero di posti sugli spalti è 48 unità e pertanto abbiamo considerato per il calcolo dei ricambi d'aria una suddivisione dell'utenza in questo modo:

40 atleti

45 spettatori.

Tale numero sembra cautelativo in quanto per "atleti" si intendono le persone che svolgono attivamente una attività fisica all'interno dell'ambiente.

La norma UNI 10339 stabilisce questi ricambi d'aria:

atleti $16,5 \times 10^{-3}$ mc/s a persona

spettatori $6,5 \times 10^{-3}$ mc/s a persona

pertanto sulla base di tali valori si arriva ad un totale di 3429 mc/h.

tale valore, diviso per un coefficiente di 0,8 (percentuale dell'aria di rinnovo che il rooftop preso in esame per i calcoli può utilizzare), ci fornisce come valore 4287 mc/h.

prevedendo che l'attività della palestra possa essere estesa in un futuro ed aumentarne la capienza, abbiamo tuttavia deciso di utilizzare il valore di 7000mc/h come valore di progetto.

Dati utili per calcolo prevalenza:

Perdite accidentali		
Nome		k
Uscita diffusore		1
Curva tonda		1
Curva rettangolare		1,4
Biforcazione T		1,4
Biforcazione Y		1
Derivazione T		1,2
Derivazione Y 60°		0,7
Derivazione Y curva		1
Derivazione Y curva e riduzione sezione		1,1
Riduzione di sezione 45°		0,1
Aumento di sezione 45°		0,9
Riduzione di sezione 90°		0,45
Aumento di sezione 90°		1
Uscita diff. + Curva Tonda		2
Uscita diff. + Curva rettang.		2,4
Uscita diff. + Deriv. T		2,2
Uscita diff. + Deriv. Y 60°		1,7
Uscita diff. + Deriv. Y curva		1
Canale microforato		5

dps Perdite di carico distribuite (mm H₂O)

dpd Perdite di carico localizzate (mm H₂O)

SCUOLA PRIMARIA

SP-VMC1

L'unità è posta in copertura in corrispondenza del cavedio SP-CAV1

IMPIANTO DI MANDATA																
	TRATTO	Portata richiesta (m³/h)	Portata complessiva del tratto (m³/h)	L ramo (m)	L tot (m)	Didraulico (mm)	b (mm)	a (H mm)	D. equivalente (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H2O)	dpd (mm H2O)	
P0	SP-C1 - (1)	774	774	12,00	13,00	276	350	200	286	✓	3,33	8,4	6,44	0,65	5,8	
	SP-C2 - (1)	774	774	5,00	6,00	276	350	200	286	✓	3,33		6,44			
	tratto 1-2		1547	2,00	2,00	359	400	300	378	✓	3,84	0,1	11,20	0,09	0,1	
	SP-DOC - (2)	373	373	8,00	9,00	210	200	200	219	✓	2,76		3,75			
	SP-C3 - (2)	774	774	8,00	9,00	276	350	200	286	✓	3,33		6,44			
	tratto 2-6		2694	8,00	8,00	443	600	300	457	✓	4,56	1,5	16,40	0,41	2,0	
	SP-L1 - (3)	819	819	8,00	9,00	282	350	200	286	✓	3,53		6,44			
	SP-C4 - (3)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44			
	tratto 3-4		1593	5,00	5,00	363	400	300	378	✓	3,95		11,20			
	SP-C5 - (4)	774	774	5,00	6,00	276	350	200	286	✓	3,33		6,44			
	tratto 4-5		2366	5,00	5,00	422	550	300	439	✓	4,34		15,14			
	SP-INC - (5)	239	239	5,00	6,00	177	200	150	189	✓	2,37		2,80			
P1	tratto 5-6		2606	5,00	5,00	437	600	300	457	✓	4,41		16,40			
	tratto 6-		5300	10,00	10,00	572	600	600	656	✓	4,36	4,5	33,79	0,30	5,3	
	SP-C13 - (1)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44			
	SP-C14 - (1)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44			
	tratto 1-2		1547	5,00	5,00	359	400	300	378	✓	3,84		11,20			
	SP-C15 - (2)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44			
	SP-L3 - (2)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44			
	tratto 2-3		3095	5,00	5,00	467	650	300	474	✓	4,87		17,65			
	SP-INGR - (3)	108	108	10,00	11,00	131	150	150	164	✓	1,43		2,11			
	tratto 3-4		3203	5,00	5,00	473	650	300	474	✓	5,04		17,65			
	SP-ATH - (4)	753	753	10,00	11,00	273	350	200	286	✓	3,25		6,44			
	tratto 4-6		3956	5,00	5,00	512	650	350	515	✓	5,27		20,85			
	SP-C16 - (5)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44			
	SP-C17 - (5)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44			
	tratto 5-6		1547	5,00	5,00	359	400	300	378	✓	3,84		11,20			
	tratto 6-		5504	5,00	5,00	580	600	600	656	✓	4,52		33,79			
	SP-VMC1		10803	5,00	5,00	749	1200	600	914	✓	4,57	5,1	65,62	0,11	6,67	
														21,45		

IMPIANTO DI RIPRESA															
	TRATTO	Portata richiesta (m³/h)	Portata complessiva del tratto (m³/h)	L ramo (m)	L tot (m)	Didraulic o (mm)	b (mm)	a (H mm)	D. equivale nte (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H2O)	dpd (mm H2O)
P0	SP-C1 - (1)	774	774	12,00	13,00	276	350	200	286	✓	3,33	1,1	6,44	0,65	0,8
	SP-C2 - (1)	774	774	5,00	6,00	276	350	200	286	✓	3,33		6,44		
	tratto 1-2		1547	2,00	2,00	359	400	300	378	✓	3,84	0,1	11,20	0,09	0,1
	SP-DOC - (1b)	373	373	8,00	9,00	210	200	200	219	✓	2,76		3,75		
	SP-C3 - (1b)	774	774	8,00	9,00	276	350	200	286	✓	3,33		6,44		
	tratto 1b-2		1147	5,00	6,00	321	400	300	378	✓	2,84		11,20		
	tratto 2-6		2694	8,00	8,00	443	600	300	457	✓	4,56	1,5	16,40	0,41	2,0
	SP-L1 - (3)	819	819	8,00	9,00	282	350	200	286	✓	3,53		6,44		
	SP-C4 - (3)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44		
	tratto 3-4		1593	5,00	5,00	363	400	300	378	✓	3,95		11,20		
	SP-C5 - (4)	774	774	5,00	6,00	276	350	200	286	✓	3,33		6,44		
	tratto 4-5		2366	5,00	5,00	422	550	300	439	✓	4,34		15,14		
P1	SP-INC - (5)	239	239	5,00	6,00	177	200	150	189	✓	2,37		2,80		
	tratto 5-6		2606	5,00	5,00	437	600	300	457	✓	4,41		16,40		
	tratto 6-		5300	10,00	10,00	572	600	600	656	✓	4,36	4,5	33,79	0,30	5,3
	SP-C13 - (1)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44		
	SP-C14 - (1)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44		
	tratto 1-2		1547	5,00	5,00	359	400	300	378	✓	3,84		11,20		
	SP-C15 - (2)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44		
	SP-L3 - (2)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44		
	tratto 2-3		3095	5,00	5,00	467	650	300	474	✓	4,87		17,65		
	SP-INGR - (3)	108	108	10,00	11,00	131	150	150	164	✓	1,43		2,11		
	tratto 3-4		3203	5,00	5,00	473	650	300	474	✓	5,04		17,65		
	SP-ATH - (4)	753	753	10,00	11,00	273	350	200	286	✓	3,25		6,44		
	tratto 4-6		3956	5,00	5,00	512	650	350	515	✓	5,27		20,85		
	SP-C 16 - (5)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44		
	SP-C 17 - (5)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44		
	tratto 5-6		1547	5,00	5,00	359	400	300	378	✓	3,84		11,20		
	tratto 6-		5504	5,00	5,00	580	600	600	656	✓	4,52		33,79		
	SP-VMC1		10803	5,00	5,00	749	1200	600	914	✓	4,57	5,1	65,62	0,11	6,67
														16,38	

SP-VMC2

L'unità è posta in copertura in corrispondenza del cavedio SP-CAV2

IMPIANTO DI MANDATA															
	TRATTO	Portata richiesta (m³/h)	Portata complessiva del tratto (m³/h)	L ramo (m)	L tot (m)	Idraulico (mm)	b (mm)	a (H mm)	D. equivalente (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H2O)	dPd (mm H2O)
P0	SP-C8 - (1)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	SP-C6 - (1)	774	774	9,00	10,00	276	350	200	286	✓	3,33	8,4	6,44	0,50	5,8
	tratto 1-2		1547	10,00	10,00	359	400	300	378	✓	3,84	1,5	11,20	0,47	1,4
	SP-C9 - (2)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	SP-C7 - (2)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	tratto 2-3		3095	8,00	8,00	467	650	300	474	✓	4,87	1,5	17,65	0,44	2,2
	SP-SR2-2 - (3)	139	139	15,00	16,00	144	150	150	164	✓	1,82		2,11		
	tratto 3-4		3233	8,00	8,00	475	700	300	490	✓	4,76	1,5	18,87	0,41	2,1
P1	SP-SR2-1 - (4)	134	134	7,00	8,00	142	150	150	164	✓	1,76		2,11		
	tratto 4 -		3367	15,00	15,00	482	700	300	490	✓	4,96	2,1	18,87	0,83	3,2
	SP-C18 - (1)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	SP-C20 - (1)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	tratto 1-2		1547	5,00	5,00	359	400	300	378	✓	3,84		11,20		
	SP-C19 - (2)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	SP-C21 - (2)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	tratto 2-4		3095	8,00	8,00	467	650	300	474	✓	4,87		17,65		
	SP-C25 - (3)	774	774	7,00	8,00	276	350	200	286	✓	3,33		6,44		
	SP-SR4- (3)	176	176	5,00	6,00	158	150	150	164	✓	2,32		2,11		
	tratto 3-4		950	12,00	12,00	299	350	250	322	✓	3,24		8,15		
	SP-AM - (4)	227	227	6,00	7,00	174	200	150	189	✓	2,25		2,80		
	tratto 4-		4271	10,00	10,00	527	700	350	533	✓	5,31		22,33		
	SP-VMC2		7638	10,00	10,00	657	700	550	677	✓	5,89	1,1	36,00	0,52	2,39
														20,34	

IMPIANTO DI RIPRESA															
	TRATTO	Portata richiesta (m ³ /h)	Portata complessiva del tratto (m ³ /h)	L ramo (m)	L tot (m)	Didraulic o (mm)	b (mm)	a (H mm)	D. equivale nte (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H2O)	dpd (mm H2O)
P0	SP-C8 - (1)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	SP-C6 - (1)	774	774	9,00	10,00	276	350	200	286	✓	3,33	2,1	6,44	0,50	1,5
	tratto 1-2		1547	10,00	10,00	359	400	300	378	✓	3,84	1,5	11,20	0,47	1,4
	SP-C9 - (2)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	SP-C7 - (2)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	tratto 2-3		3095	8,00	8,00	467	650	300	474	✓	4,87	1,5	17,65	0,44	2,2
	SP-SR2-2 - (3)	139	139	15,00	16,00	144	150	150	164	✓	1,82		2,11		
	tratto 3-4		3233	8,00	8,00	475	700	300	490	✓	4,76	1,5	18,87	0,41	2,1
	SP-SR2-1 - (4)	134	134	7,00	8,00	142	150	150	164	✓	1,76		2,11		
	tratto 4-		3367	15,00	15,00	482	700	300	490	✓	4,96	2,1	18,87	0,83	3,2
P1	SP-C18 - (1)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	SP-C20 - (1)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	tratto 1-2		1547	5,00	5,00	359	400	300	378	✓	3,84		11,20		
	SP-C19 - (2)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	SP-C21 - (2)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	tratto 2-4		3095	8,00	8,00	467	650	300	474	✓	4,87		17,65		
	SP-C25 - (3)	774	774	7,00	8,00	276	350	200	286	✓	3,33		6,44		
	SP-SR4- (3)	176	176	5,00	6,00	158	150	150	164	✓	2,32		2,11		
	tratto 3-4		950	12,00	12,00	299	350	250	322	✓	3,24		8,15		
	SP-AM- (4)	227	227	6,00	7,00	174	200	150	189	✓	2,25		2,80		
	tratto 4-		4271	10,00	10,00	527	700	350	533	✓	5,31		22,33		
	SP-VMC2		7638	10,00	10,00	657	700	550	677	✓	5,89	1,1	36,00	0,52	2,39
														15,96	

SP-VMC3

L'unità è posta in copertura in corrispondenza del cavedio SP-CAV3

IMPIANTO DI MANDATA															
	TRATTO	Portata richiesta (m³/h)	Portata complessiva del tratto (m³/h)	L ramo (m)	L tot (m)	Idraulico (mm)	b (mm)	a (H mm)	D. equivalente (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H2O)	dPd (mm H2O)
P0	SP-C10 - (1)	774	774	15,00	16,00	276	350	200	286	✓	3,33	8,4	6,44	0,80	5,8
	SP-C11 - (1)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	tratto 1-2		1547	2,00	2,00	359	400	300	378	✓	3,84	1,6	11,20	0,09	1,5
	SP-C12 - (2)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	SP-L2 - (2)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	tratto 2- 10		3095	8,00	8,00	467	650	300	474	✓	4,87	3,5	17,65	0,44	5,2
P1	SP-C22 - (1)	774	774	11,00	12,00	276	350	200	286	✓	3,33		6,44		
	SP-C23 - (1)	774	774	11,00	12,00	276	350	200	286	✓	3,33		6,44		
	tratto 1-2		1547	3,00	3,00	359	400	300	378	✓	3,84		11,20		
	SP-C24 - (2)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	tratto 2-3		2321	3,00	4,00	419	500	300	420	✓	4,65		13,85		
	SP-L4 - (3)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	tratto 3- 10		3095	8,00	8,00	467	650	300	474	✓	4,87		17,65		
	SP-VMC3		6189		8,00	607	650	600	683	✓	4,70	6,6	36,59	0,27	9,11
														23,21	
IMPIANTO DI RIPRESA da fare															
	TRATTO	Portata richiesta (m³/h)	Portata complessiva del tratto (m³/h)	L ramo (m)	L tot (m)	Idraulico (mm)	b (mm)	a (H mm)	D. equivalente (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H2O)	dPd (mm H2O)
P0	SP-C10 - (1)	774	774	15,00	16,00	276	350	200	286	✓	3,33	2,1	6,44	0,80	1,5
	SP-C11 - (1)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	tratto 1-2		1547	2,00	2,00	359	400	300	378	✓	3,84	1,6	11,20	0,09	1,5
	SP-C12 - (3)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	tratto 2-3		2321	3,00	4,00	419	500	300	420	✓	4,65	1,6	13,85	0,24	2,2
	SP-L2 - (3)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
P1	tratto 3- 10		3095	8,00	8,00	467	650	300	474	✓	4,87	3,5	17,65	0,44	5,2
	SP-C22 - (1)	774	774	11,00	12,00	276	350	200	286	✓	3,33		6,44		
	SP-C23 - (1)	774	774	11,00	12,00	276	350	200	286	✓	3,33		6,44		
	tratto 1-2		1547	9,00	10,00	359	500	300	420	✓	3,10		13,85		
	SP-C24 - (2)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	tratto 2-3		2321	9,00	10,00	419	500	300	420	✓	4,65		13,85		
	SP-L4 - (3)	774	774	9,00	10,00	276	350	200	286	✓	3,33		6,44		
	tratto 3- 10		3095	8,00	8,00	467	650	300	474	✓	4,87		17,65		
	SP-VMC3		6189		8,00	607	650	600	683	✓	4,70	6,6	36,59	0,27	9,11
														21,23	

SP-VMC_REF

L'unità è posta in copertura in corrispondenza del cavedio SP-CAV2 ed è a servizio dei locali dedicati ai refettori

IMPIANTO DI MANDATA														
TRATTO	Portata richiesta (m³/h)	Portata complessiva del tratto (m³/h)	L ramo (m)	L tot (m)	Didraulico (mm)	b (mm)	a (H mm)	D. equivalente (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H2O)	dpd (mm H2O)
SP-REF2 - (1)	661	661	3,00	4,00	260			300	✓	2,60		7,07		
	661	1322	3,00	4,00	338			350	✓	3,82		9,62		
	661	1983	28,00	29,00	394	400	350	409	✓	4,20		13,13		
SP-REF1 - (1)	662	662	3,00	4,00	260			300	✓	2,60	1,1	7,07	0,12	0,5
	662	1324	3,00	4,00	338			350	✓	3,82	1,1	9,62	0,20	1,0
	662	1986	3,00	4,00	395			400	✓	4,39	1,1	12,57	0,22	1,3
	662	2649	5,00	6,00	440	450	400	464	✓	4,36	4,1	16,88	0,28	4,9
(1)-(2)		4632	7,00	7,00	544	700	400	573	✓	4,99	3,1	25,78	0,32	4,8
SP-SPOR - (2)	166	4798	1,00	2,00	551	700	400	573	✓	5,17	1	25,78	0,10	1,7
SP-VMC-REF		4798	10,00	10,00	551	700	400	573	✓	5,17	6,1	25,78	0,49	10,19
													26,09	
IMPIANTO DI RIPRESA														
TRATTO	Portata richiesta (m³/h)	Portata complessiva del tratto (m³/h)	L ramo (m)	L tot (m)	Didraulico (mm)	b (mm)	a (H mm)	D. equivalente (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H2O)	dpd (mm H2O)
SP-REF2 - (1)	661	661	1,00	2,00	260	200	300	266	✓	3,29	1,1	5,57	0,11	0,7
	661	1322	1,00	2,00	338	250	400	343	✓	3,97	1,1	9,26	0,11	1,1
	661	1983	28,00	29,00	394	600	250	414	✓	4,10	1,1	13,44	1,37	1,2
SP-REF1 - (1)	662	2645	1,00	2,00	440	350	500	455	✓	4,51	3,1	16,30	0,10	3,9
	662	3308	1,00	2,00	479	350	600	496	✓	4,75	1,1	19,36	0,10	1,5
	662	3970	1,00	2,00	513	350	700	533	✓	4,94	1,1	22,33	0,10	1,7
	662	4632	5,00	6,00	544	350	800	567	✓	5,10	1,1	25,21	0,29	1,8
SP-SPOR - (2)	166	4798	1,00	2,00	551	350	800	567	✓	5,29	1	25,21	0,10	1,7
SP-VMC-REF		4798	10,00	10,00	551	700	400	573	✓	5,17	6,1	25,78	0,49	10,19
													26,66	

SP-VMC_PAL

L'unità è posta in copertura in corrispondenza del cavedio SP-CAV2 ed è a servizio dei locali dedicati alla palestra (aula attività motorie)

IMPIANTO DI MANDATA														
TRATTO	Portata richiesta (m ³ /h)	Portata complessiva del tratto (m ³ /h)	L ramo (m)	L tot (m)	Idraulico (mm)	b (mm)	a (H mm)	D. equivalente (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H2O)	dpd (mm H2O)
SP-PAL	404	404	3,00	4,00	216	200	200	219	✓	2,99	1,1	3,75	0,23	0,6
	404	809	3,00	4,00	281	300	250	299	✓	3,20	1,1	7,02	0,18	0,7
	404	1213	3,00	3,00	327	400	250	343	✓	3,64	1,1	9,26	0,14	0,9
SP-VMC-PAL	404	1618	20,00	20,00	365	500	250	381	✓	3,95	6,1	11,39	0,97	5,93
													9,68	
IMPIANTO DI RIPRESA														
TRATTO	Portata richiesta (m ³ /h)	Portata complessiva del tratto (m ³ /h)	L ramo (m)	L tot (m)	Idraulico (mm)	b (mm)	a (H mm)	D. equivalente (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H2O)	dpd (mm H2O)
SP-PAL	404	404	3,00	4,00	216	200	200	219	✓	2,99	6	3,75	0,23	3,4
	404	809	3,00	4,00	281	300	250	299	✓	3,20	6	7,02	0,18	3,8
	404	1213	3,00	3,00	327	400	250	343	✓	3,64	6	9,26	0,14	5,0
SP-VMC-PAL	404	1618	30,00	30,00	365	500	250	381	✓	3,95	8,1	11,39	1,46	7,88
													22,04	

SCUOLA SECONDARIA

SS-VMC1

L'unità è posta in copertura in corrispondenza del cavedio SS-CAV1

IMPIANTO DI MANDATA															
	TRATTO	Portata richiesta (m³/h)	Portata complessiva del tratto (m³/h)	L ramo (m)	L tot (m)	Idraulico (mm)	b (mm)	a (H mm)	D. equivalente (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H2O)	dpd (mm H2O)
P0	SS-L2 - (1)	756	756	10,00	11,00	274	350	200	286	✓	3,26	8,4	6,44	0,53	5,6
	SS-C2 - (1)	774	774	5,00	6,00	276	350	200	286	✓	3,33		6,44		
	tratto 1-2		1530	5,00	5,00	357	400	300	378	✓	3,79		11,20		
	SS-L1 - (2)	819	819	8,00	9,00	282	350	200	286	✓	3,53		6,44		
	tratto 2-3		2349	10,00	10,00	420	550	300	439	✓	4,31	1,5	15,14	0,48	1,7
	SS-C1 - (3)	774	774	8,00	9,00	276	350	200	286	✓	3,33		6,44		
	tratto 3-4		3122	8,00	15,00	468	650	300	474	✓	4,91	2,5	17,65	0,85	3,8
	SS-AM1 - (4)	108	108	8,00	9,00	131	150	150	164	✓	1,43		2,11		
P1	tratto 4P0- 9P1		3231	8,00	5,00	474	700	300	490	✓	4,76	2,5	18,87	0,25	3,5
	SS-L2 - (1)	756	756	10,00	11,00	274	350	200	286	✓	3,26		6,44		
	SS-C8 - (1)	774	774	5,00	6,00	276	350	200	286	✓	3,33		6,44		
	tratto 1-2		1530	5,00	5,00	357	400	300	378	✓	3,79		11,20		
	SS-L1 - (2)	801	801	8,00	9,00	280	350	200	286	✓	3,45		6,44		
	tratto 2-3		2331	8,00	8,00	419	500	300	420	✓	4,67		13,85		
	SS-C7 - (3)	774	774	8,00	9,00	276	350	200	286	✓	3,33		6,44		
	tratto 3-9P1		3105	8,00	8,00	467	650	300	474	✓	4,89		17,65		
	SS-C11 - (4)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44		
	SS-C10 - (4)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44		
	tratto 4-5		1547	5,00	5,00	359	400	300	378	✓	3,84		11,20		
	SS-C9 - (5)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44		
	SS-C12 - (5)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44		
	tratto 5-6		3095	5,00	5,00	467	650	300	474	✓	4,87		17,65		
	SS-RIU2 - (6)	1698	1698	10,00	11,00	372	650	200	378	✓	4,20		11,24		
	tratto 6-7		4793	10,00	11,00	551	600	450	567	✓	5,28		25,21		
	SS-AM2 - (7)	108	108	0,00	1,00	131	150	150	164	✓	1,43		2,11		
	tratto 7-1P2		4901	5,00	5,00	555	600	450	567	✓	5,40		25,21		
	tratto 9P1-1P2		6335	5,00	5,00	612	650	600	683	✓	4,81	2,5	36,59	0,17	3,6
	1P2 - VMC1		11237	5,00	5,00	760	850	600	778	✓	6,57	4,5	47,51	0,27	12,14
														32,93	

IMPIANTO DI RIPRESA															
	TRATTO	Portata richiesta (m³/h)	Portata complessiva del tratto (m³/h)	L ramo (m)	L tot (m)	Didraulic o (mm)	b (mm)	a (H mm)	D. equivale nte (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H2O)	dpd (mm H2O)
P0	SS-L2 - (1)	756	756	10,00	11,00	274	350	200	286	✓	3,26	2,1	6,44	0,53	1,4
	SS-C2 - (1)	774	774	5,00	6,00	276	350	200	286	✓	3,33		6,44		
	tratto 1-2		1530	5,00	5,00	357	400	300	378	✓	3,79		11,20		
	SS-L1 - (2)	819	819	8,00	9,00	282	350	200	286	✓	3,53		6,44		
	tratto 2-3		2349	8,00	8,00	420	550	300	439	✓	4,31	1,5	15,14		
	SS-C1 - (3)	774	774	8,00	9,00	276	350	200	286	✓	3,33		6,44		
	tratto 3-4		3122	8,00	8,00	468	650	300	474	✓	4,91	2,5	17,65		
	SS-AM1 - (4)	108	108	8,00	9,00	131	150	150	164	✓	1,43		2,11		
tratto 4P0- 9P1		3231	8,00	8,00	474	700	300	490	✓	4,76	2,5	18,87			
P1	SS-L2 - (1)	756	756	10,00	11,00	274	350	200	286	✓	3,26		6,44		
	SS-C8 - (1)	774	774	5,00	6,00	276	350	200	286	✓	3,33		6,44		
	tratto 1-2		1530	5,00	5,00	357	400	300	378	✓	3,79		11,20		
	SS-L1 - (2)	801	801	8,00	9,00	280	350	200	286	✓	3,45		6,44		
	tratto 2-3		2331	8,00	8,00	419	500	300	420	✓	4,67		13,85		
	SS-C7 - (3)	774	774	8,00	9,00	276	350	200	286	✓	3,33		6,44		
	tratto 3-8		3105	8,00	8,00	467	650	300	474	✓	4,89		17,65		
	SS-C11 - (4)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44		
	SS-C10 - (4)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44		
	tratto 4-5		1547	5,00	5,00	359	400	300	378	✓	3,84		11,20		
	SS-C9 - (5)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44		
	SS-C12 - (5)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44		
	tratto 5-6		3095	5,00	5,00	467	650	300	474	✓	4,87		17,65		
	SS-RIU2 - (6)	1698	1698	10,00	11,00	372	650	200	378	✓	4,20		11,24		
	tratto 6-7		4793	10,00	11,00	551	600	450	567	✓	5,28		25,21		
	SS-AM2 - (7)	108	108	0,00	1,00	131	150	150	164	✓	1,43		2,11		
tratto 7-8		4901	5,00	5,00	555	600	450	567	✓	5,40		25,21			
tratto 8P1-9		8006	5,00	5,00	669	650	600	683	✓	6,08	2,5	36,59			
	9 - VMC1		11237	10,00	10,00	760	850	600	778	✓	6,57	4,5	47,51	0,54	12,14
														14,60	

SS-VMC2

L'unità è posta in copertura in corrispondenza del cavedio SS-CAV2

IMPIANTO DI MANDATA															
	TRATTO	Portata richiesta (m³/h)	Portata complessiva del tratto (m³/h)	L ramo (m)	L tot (m)	Didraulico (mm)	b (mm)	a (H mm)	D. equivalente (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H2O)	dpd (mm H2O)
P0	SS-DIR - (1)	103	103	10,00	11,00	129	150	150	164	✓	1,36		2,11		0,0
	SS-DSGA - (1)	98	98	5,00	6,00	126	150	150	164	✓	1,29		2,11		0,0
	tratto 1-2		202	5,00	5,00	166	200	150	189	✓	2,00		2,80		0,0
	SS-RIU1 - (2)	260	260	8,00	9,00	183	200	150	189	✓	2,57		2,80		0,0
	tratto 2-3		461	8,00	8,00	227	250	200	244	✓	2,74		4,68		0,0
	SS-SEGR - (3)	325	325	8,00	9,00	199	200	200	219	✓	2,41		3,75		0,0
	tratto 3-9		786	8,00	8,00	278	300	250	299	✓	3,11		7,02		0,0
	SS-C4 - (4)	774	774	8,00	9,00	276	350	200	286	✓	3,33		6,44		0,0
	SS-C5 - (4)	774	774	8,00	9,00	276	350	200	286	✓	3,33	8,4	6,44	0,45	5,8
	tratto 4-5		1547	10,00	11,00	359	400	300	378	✓	3,84	1,85	11,20	0,51	1,7
	SS-C3 - (5)	774	774	5,00	6,00	276	350	200	286	✓	3,33		6,44		0,0
	SS-C6 - (5)	774	774	5,00	6,00	276	350	200	286	✓	3,33		6,44		0,0
	tratto 5-6		3095	8,00	9,00	467	650	300	474	✓	4,87	1,6	17,65	0,50	2,4
	SS-DOC - (6)	267	267	5,00	6,00	185	200	150	189	✓	2,65		2,80		0,0
	tratto 6-7		3362	3,00	4,00	482	700	300	490	✓	4,95	0,1	18,87	0,22	0,2
P1	SS-SR1 - (7)	81	81	2,00	3,00	117	150	150	164	✓	1,06		2,11		0,0
	tratto 7-8		3442	8,00	9,00	486	700	300	490	✓	5,07	0,1	18,87	0,52	0,2
	SS-SR2 - (8)	416	416	3,00	4,00	218	200	200	219	✓	3,08		3,75		0,0
	tratto 8-9		3858	7,00	7,00	507	550	400	511	✓	5,22	0,1	20,52	0,40	0,2
	tratto 9- 7P1		4644	2,00	3,00	544	650	400	553	✓	5,36	2,5	24,05	0,17	4,5
	SS-C14 - (1)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44		0,0
	SS-C15 - (1)	771	771	10,00	11,00	276	350	200	286	✓	3,32		6,44		0,0
	tratto 1-2		1545	10,00	11,00	359	400	300	378	✓	3,83		11,20		0,0
	SS-C13 - (2)	774	774	5,00	6,00	276	350	200	286	✓	3,33		6,44		0,0
	SS-L5 - (2)	786	786	5,00	6,00	278	350	200	286	✓	3,39		6,44		0,0
	tratto 2-3		3105	8,00	9,00	467	650	300	474	✓	4,89		17,65		0,0
	SS-SR4 - (3)	60	60	10,00	11,00	105	150	150	164	✓	0,80		2,11		0,0
	tratto 3-4		3165	8,00	9,00	471	650	300	474	✓	4,98		17,65		0,0
	SS-SR3 - (4)	126	126	10,00	11,00	139	150	150	164	✓	1,66		2,11		0,0
	tratto 4-6		3291	8,00	9,00	478	700	300	490	✓	4,84		18,87		0,0
	SS-BIB - (5)	862	862	10,00	11,00	288	400	200	305	✓	3,28		7,29		0,0
	SS-D12- (5)	108	108	10,00	11,00	131	150	150	164	✓	1,43		2,11		0,0
	tratto 5-6		970	10,00	11,00	301	400	200	305	✓	3,70		7,29		0,0
	tratto 6-7P1		4261	8,00	9,00	527	600	400	533	✓	5,31		22,30		0,0
7P1 - VMC2			8906	7,00	7,00	696	650	650	711	✓	6,24	4,5	39,65	0,38	10,95
														28,99	

IMPIANTO DI RIPRESA															
	TRATTO	Portata richiesta (m³/h)	Portata complessiva del tratto (m³/h)	L ramo (m)	L tot (m)	Idraulic o (mm)	b (mm)	a (H mm)	D. equivale nte (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H2O)	dPd (mm H2O)
P0	SS-DIR - (1)	103	103	10,00	11,00	129	150	150	164	✓	1,36		2,11		0,0
	SS-DSGA - (1)	98	98	5,00	6,00	126	150	150	164	✓	1,29		2,11		0,0
	tratto 1-2		202	5,00	5,00	166	200	150	189	✓	2,00		2,80		0,0
	SS-RIU1 - (2)	260	260	8,00	9,00	183	200	150	189	✓	2,57		2,80		0,0
	tratto 2-3		461	8,00	8,00	227	250	200	244	✓	2,74		4,68		0,0
	SS-SEGR - (3)	325	325	8,00	9,00	199	200	200	219	✓	2,41		3,75		0,0
	tratto 3-9		786	8,00	8,00	278	300	250	299	✓	3,11		7,02		0,0
	SS-C4 - (4)	774	774	8,00	9,00	276	350	200	286	✓	3,33		6,44		0,0
	SS-C5 - (4)	774	774	8,00	9,00	276	350	200	286	✓	3,33	2,1	6,44	0,45	1,5
	tratto 4-5		1547	10,00	11,00	359	400	300	378	✓	3,84	1,85	11,20	0,51	1,7
	SS-C3 - (5)	774	774	5,00	6,00	276	350	200	286	✓	3,33		6,44		0,0
	SS-C6 - (5)	774	774	5,00	6,00	276	350	200	286	✓	3,33		6,44		0,0
	tratto 5-6		3095	8,00	9,00	467	650	300	474	✓	4,87	1,6	17,65	0,50	2,4
	SS-DOC - (6)	267	267	5,00	6,00	185	200	150	189	✓	2,65		2,80		0,0
	tratto 6-7		3362	3,00	4,00	482	700	300	490	✓	4,95	0,1	18,87	0,22	0,2
	SS-SR1 - (7)	81	81	2,00	3,00	117	150	150	164	✓	1,06		2,11		0,0
	tratto 7-8		3442	8,00	9,00	486	700	300	490	✓	5,07	0,1	18,87	0,52	0,2
P1	SS-SR2 - (8)	416	416	3,00	4,00	218	200	200	219	✓	3,08		3,75		0,0
	tratto 8-9		3858	7,00	7,00	507	550	400	511	✓	5,22	0,1	20,52	0,40	0,2
	tratto 9- 7P1		4644	2,00	3,00	544	650	400	553	✓	5,36	2,5	24,05	0,17	4,5
	SS-C14 - (1)	774	774	10,00	11,00	276	350	200	286	✓	3,33		6,44		0,0
	SS-C15 - (1)	771	771	10,00	11,00	276	350	200	286	✓	3,32		6,44		0,0
	tratto 1-2		1545	10,00	11,00	359	400	300	378	✓	3,83		11,20		0,0
	SS-C13 - (2)	774	774	5,00	6,00	276	350	200	286	✓	3,33		6,44		0,0
	SS-L5 - (2)	786	786	5,00	6,00	278	350	200	286	✓	3,39		6,44		0,0
	tratto 2-3		3105	8,00	9,00	467	650	300	474	✓	4,89		17,65		0,0
	SS-SR4 - (3)	60	60	10,00	11,00	105	150	150	164	✓	0,80		2,11		0,0
	tratto 3-4		3165	8,00	9,00	471	650	300	474	✓	4,98		17,65		0,0
	SS-SR3 - (4)	126	126	10,00	11,00	139	150	150	164	✓	1,66		2,11		0,0
	tratto 4-6		3291	8,00	9,00	478	700	300	490	✓	4,84		18,87		0,0
	SS-BIB - (5)	862	862	10,00	11,00	288	400	200	305	✓	3,28		7,29		0,0
	SS-D12 - (5)	108	108	10,00	11,00	131	150	150	164	✓	1,43		2,11		0,0
	tratto 5-6		970	10,00	11,00	301	400	200	305	✓	3,70		7,29		0,0
	tratto 6-7P1		4261	8,00	9,00	527	600	400	533	✓	5,31		22,30		0,0
	7P1 - VMC2		8906	7,00	7,00	696	650	650	711	✓	6,24	4,5	39,65	0,38	10,95
														24,61	

SS-AUD

L'unità è posta in copertura in corrispondenza del cavedio SS-CAV2 ed è a servizio del solo Auditorium.

IMPIANTO DI MANDATA														
TRATTO	Portata richiesta (m³/h)	Portata complessiva del tratto (m³/h)	L ramo (m)	L tot (m)	Didraulico (mm)	b (mm)	a (H mm)	D. equivalente (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H2O)	dpd (mm H2O)
ramo sinistro	1240	1240	2,00	3,00	330	350	300	354	✓	3,50	1,1	9,84	0,13	0,8
	1240	2480	2,00	3,00	429	550	300	439	✓	4,55	1,1	15,14	0,16	1,4
	1240	3720	2,00	2,00	500	750	300	506	✓	5,15	1,1	20,07	0,11	1,8
	1240	4961	15,00	16,00	558	950	300	561	✓	5,57	4,1	24,72	0,93	8,0
ramo destro	1240	1240	2,00	3,00	330	350	300	354	✓	3,50		9,84		
	1240	2480	2,00	3,00	429	550	300	439	✓	4,55		15,14		
	1240	3720	2,00	2,00	500	750	300	506	✓	5,15		20,07		
	1240	4961	8,00	9,00	558	950	300	561	✓	5,57		24,72		
RFT-AUD		9921	25,00	25,00	725	700	650	737	✓	6,46	7,5	42,69	1,38	19,53
													34,30	
IMPIANTO DI RIPRESA														
TRATTO	Portata richiesta (m³/h)	Portata complessiva del tratto (m³/h)	L ramo (m)	L tot (m)	Didraulico (mm)	b (mm)	a (H mm)	D. equivalente (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H2O)	dpd (mm H2O)
	2480	2480	5,00	6,00	429	550	300	439	✓	4,55	3,1	15,14	0,32	4,0
	2480	2480	3,00	4,00	429	550	300	439	✓	4,55		15,14		
		4961	2,00	2,00	558	550	500	573	✓	5,34	1,5	25,80	0,10	2,7
	2480	2480	3,00	4,00	429	550	300	439	✓	4,55		15,14		
		7441	2,00	2,00	651	750	500	666	✓	5,93	1,5	34,84	0,11	3,3
	2480	2480	3,00	4,00	429	550	300	439	✓	4,55		15,14		
RFT-AUD		9921	25,00	25,00	725	700	650	737	✓	6,46	6,9	42,69	1,38	17,97
													29,87	

SS-PAL

L'unità è posta nello spazio aperto al primo piano della scuola secondaria ed è a servizio della sola palestra.

IMPIANTO DI MANDATA														
TRATTO	Portata richiesta (m ³ /h)	Portata complessiva del tratto (m ³ /h)	L ramo (m)	L tot (m)	Idraulico (mm)	b (mm)	a (H mm)	D. equivalente (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H ₂ O)	dpd (mm H ₂ O)
1	1167	1167	4,00	5,00	323	250	450	363	✓	3,14	1,1	10,34	0,17	0,7
2	2333	2333	4	5,00	419	350	450	433	✓	4,40	1,1	14,72	0,26	1,3
3	3500	3500	4	5,00	489	450	450	492	✓	5,12	1,1	19,01	0,29	1,8
4	4667	4667	4	5,00	545	600	450	567	✓	5,14	1,1	25,21	0,25	1,8
5	5833	5833	4	5,00	593	700	450	610	✓	5,55	1,1	29,21	0,26	2,1
RFT-PAL	7000	7000	15	16,00	636	800	450	649	✓	5,87	5,1	33,11	0,86	11,0
													20,82	
IMPIANTO DI RIPRESA														
TRATTO	Portata richiesta (m ³ /h)	Portata complessiva del tratto (m ³ /h)	L ramo (m)	L tot (m)	Idraulico (mm)	b (mm)	a (H mm)	D. equivalente (mm)		v (m/s)	K (Perdite)	Sez. (dmq)	dps (mm H ₂ O)	dpd (mm H ₂ O)
1	1167	1167	4,00	5,00	323	250	450	363	✓	3,14	1,1	10,34	0,17	0,7
2	2333	2333	4	5,00	419	350	450	433	✓	4,40	1,1	14,72	0,26	1,3
3	3500	3500	4	5,00	489	450	450	492	✓	5,12	1,1	19,01	0,29	1,8
4	4667	4667	4	5,00	545	600	450	567	✓	5,14	1,1	25,21	0,25	1,8
5	5833	5833	4	5,00	593	700	450	610	✓	5,55	1,1	29,21	0,26	2,1
RFT-PAL	7000	7000	25,00	25,00	636	800	450	649	✓	5,87	5,1	33,11	1,35	11,00
													21,31	

Il calcolo idraulico della rete di tubazioni consente di dimensionare ogni tratto di tubazione in base alle perdite di carico distribuite e localizzate in quei tratti.

Il calcolo è stato eseguito sulla base dei dati geometrici (lunghezze dei tratti della rete, dislivelli geodetici, diametri nominali delle tubazioni), arrivando alla determinazione di tutte le caratteristiche idrauliche dei tratti quali portata, perdite distribuite e perdite concentrate, e, quindi, della prevalenza e della portata totali necessari al calcolo della potenza minima della pompa da installare a monte rete (Appendice C della Norma UNI EN 10779).

È stata eseguita, infine, la verifica della velocità massima raggiunta dall'acqua in tutti i tratti della rete; in particolare, sarà verificato che essa non superi in nessun tratto il valore di 10.00 m/s.

Perdite di carico distribuite

Le perdite di tipo distribuito sono state valutate secondo la seguente formula di Hazen-Williams:

$$p = \frac{10.67 \times Q^{1.852}}{C^{1.49} \times D^{4.754}}$$

dove:

- p= perdita di carico unitaria in millimetri di colonna d'acqua al metro di tubazione.
- Q= portata attraverso la tubazioni, in litri al minuto.
- D= diametro medio interno della tubazione, in millimetri.
- C= costante dipendente dal tipo e dalla condizione della tubazione.

Perdite di carico localizzate

Le perdite di carico localizzate dovute a raccordi, curve, pezzi a T e raccordi a croce, attraverso i quali la direzione di flusso subisce una variazione di 45° o maggiore, e alle valvole di intercettazione e di non ritorno, sono trasformate in "lunghezza di tubazione equivalente", come mostrato nel prospetto che segue, ed aggiunte alla lunghezza reale della tubazione di uguale diametro e natura.

Tipo di accessorio	DN *											
	25	32	40	50	65	80	100	125	150	200	250	300
	Lunghezza tubazione equivalente (m)											
Curva 45°	0.3	0.3	0.6	0.6	0.9	0.9	1.2	1.5	2.1	2.7	3.3	3.9
Curva 90°	0.6	0.9	1.2	1.5	1.8	2.1	3.0	3.6	4.2	5.4	6.6	8.1
Curva 90° a largo raggio	0.6	0.6	0.6	0.9	1.2	1.5	1.8	2.4	2.7	3.9	4.8	5.4
Giunto T o Croce	1.5	1.8	2.4	3.0	3.6	4.5	6.0	7.5	9.0	10.5	15.0	18.0
Saracinesca	-	-	-	0.3	0.3	0.3	0.6	0.6	0.9	1.2	1.5	1.8
Valvola di non ritorno	1.5	2.1	2.7	3.3	4.2	4.8	6.6	8.3	10.4	13.5	16.5	19.5

Nella determinazione delle perdite di carico localizzate si tiene presente che:

- quando il flusso attraversa un pezzo a T o un raccordo a croce senza cambio di direzione, le relative perdite di carico possono essere trascurate;
- quando il flusso attraversa un pezzo a T o un raccordo a croce in cui, senza cambio di direzione, si ha una riduzione della sezione di passaggio, deve essere presa in considerazione la "lunghezza equivalente" relativa alla sezione di uscita (la minore) del raccordo medesimo;
- quando il flusso subisce un cambio di direzione (curva, pezzo a T o raccordo a croce), deve essere presa in conto la "lunghezza equivalente" relativa alla sezione di uscita.

Calcolo delle perdite lungo la manichetta

I terminali di tipo naspo o idrante presentano una perdita di carico al bocchello della manichetta dovuta all'attrito dell'acqua con le pareti della tubazione. Tali perdite sono computate secondo la formula attribuita a Marchetti di seguito riportata:



dove:

J= perdita di carico (m.c.a./m).

Q= portata (m³/s).

D= diametro (m).

con β pari a 0.0017 nel caso di tubazioni con rivestimento gommato liscio, oppure con β pari a 0.0021 nel caso di tubazioni con rivestimento gommato non liscio.

Nella seguente tabella si riportano i valori delle perdite di carico nelle manichette internamente gommate.

Perdita di carico in m di H2O per 100 m di stendimento		
Portata (l/min)	Rivestimento gommato	
	liscio $\beta = 0.0017$	non liscio $\beta = 0.0021$

	DN45	DN70	DN45	DN70
100	2.6		3.2	
125	4		4.9	
150	5.8		7.1	
200	10.2	1.1	12.6	1.4
250	16	1.8	20	2.2
300	23	2.5	28.4	3.1
350		3.4		4.3
400		4.5		5.5
450		5.7		7
500		7		8.7
550		8.5		10.5
600		10.1		12.5
650		11.9		14.7
700		13.8		17
750		15.8		19.5
800		18		22.2

Procedura e dati utilizzati nel calcolo

La procedura di calcolo procede per passi successivi. Inizialmente, si considera una portata nominale alla pressione di scarica minima per ciascun terminale attivo ai fini del calcolo.

Se l'impianto è ramificato e non magliato, si procede per correzioni successive bilanciando la pressione su ciascun terminale e considerando le portate correttive sugli archi che collegano il terminale alla sorgente. Si raggiunge così in pochi passi una situazione in cui ogni nodo intermedio ha portata in ingresso pari alla portata in uscita e le perdite di carico, lungo i tratti di tubazione, rispecchiano effettivamente la differenza di carico fra gli estremi delle tubazioni stesse, nel rispetto delle tolleranze ammesse dalla normativa.

Se, invece, nell'impianto sono presenti delle maglie, dopo aver completato un primo bilanciamento in termini di pressione e portata come già indicato nel caso di impianto ramificato, si individuano gli anelli e si bilanciano, con il metodo iterativo proposto dal professor Hardy-Cross, le portate e le perdite di carico sui rami degli anelli stessi. L'iterazione procede fino a che la portata correttiva di Hardy-Cross si è ridotta a tal punto da non apportare modifiche alle pressioni nei nodi degli anelli.

Nella seguente tabella sono indicate l'accuratezza nei calcoli idraulici e le tolleranze utilizzate:

Pressione	0.1 kPa (1mbar)
Perdita di carico	0.1 kPa/m (1mbar/m)
Portate	1 l/min
Portata nella giunzioni	± 0.1 l/min
Perdita di carico anello	± 0.1 kPa

Le tubazioni utilizzate nell'impianto antincendio sono:

Codice	Tubazione	Materiale	C nuovo	C usato
ACSM255	UNI EN 10255 - ACCIAIO non legato S. Media	ACCIAIO	120	84.0
PE100PN16	Polietilene PE 100 - PN 16 SDR 11 - UNI 12201	POLIETILE NE	150	140.0

Nella tabella seguente sono indicati i terminali utilizzati e il loro posizionamento:

Terminali attivi Impianto

Rif.nodo	Terminale	Codice	Piano	Alt. (cm)	Rete di appartenenza
Naspo N.2.T1	UNI EN 671-1 - 200 kPa - DN25 - 35 l/min	NA.002	Piano Primo	100	Rete Naspi
Naspo N.3.T1	UNI EN 671-1 - 200 kPa - DN25 - 35 l/min	NA.002	Piano Primo	100	Rete Naspi
Naspo N.4.T1	UNI EN 671-1 - 200 kPa - DN25 - 35 l/min	NA.002	Piano Primo	100	Rete Naspi
Naspo N.5.T1	UNI EN 671-1 - 200 kPa - DN25 - 35 l/min	NA.002	Piano Primo	100	Rete Naspi

Di seguito sono riportati la tipologia e il numero dei pezzi speciali inseriti nella rete:

- N° 8 Curva DN50x2
- N° 7 Giunto lineare DN40x2
- N° 4 Giunto a 'T' DN25, DN40x2
- N° 11 Giunto lineare DN25x2
- N° 6 Curva DN25
- N° 9 Curva DN32x2
- N° 3 Curva DN32, DN25
- N° 3 Giunto lineare DN50, DN65
- N° 2 Curva DN65x2
- N° 1 Giunto a 'T' DN50x2, DN25
- N° 2 Curva DN32
- N° 1 Curva DN65, DN40
- N° 1 Giunto a 'T' DN40, DN32x2
- N° 1 Giunto a 'T' DN50x2, DN40

Risultati calcolo impianto

La tabella seguente mostra i risultati del calcolo sulle tubazioni dell'impianto (per indicare gli elementi della rete si è proceduto alla numerazione dei nodi):

Arco	Codice	Lungh.	L.eq.	DN	Ø int.	ΔH_d	ΔH_c	ΔH_q	ΔH	Q	V
------	--------	--------	-------	----	--------	--------------	--------------	--------------	------------	---	---

		(m)	(m)		(mm)	(kPa)	(kPa)	(kPa)	(kPa)	(l/min)	(m/s)
Rete Naspi --> Curva G.22.T0	ACSM255	0.55	0.00	DN50	53.10	0.20	0.00	0.00	0.20	163.62	1.23
Giunto a 'T' G.6.T0 - -> Giunto lineare G.7.T0	ACSM255	9.15	0.00	DN25	27.30	0.00	0.00	0.00	0.00	---	0.00
Giunto lineare G.7.T0 --> Curva G.31.T0	ACSM255	2.10	0.00	DN25	27.30	0.00	0.00	- 20.59	- 20.59	---	0.00
Giunto a 'T' G.6.T0 - -> Giunto a 'T' G.10.T0	ACSM255	6.70	1.20	DN40	41.90	2.45	0.39	0.00	2.84	80.75	0.98
Giunto a 'T' G.10.T0 --> Curva G.11.T0	ACSM255	13.60	1.20	DN40	41.90	4.90	0.39	0.00	5.29	80.75	0.98
Curva G.11.T0 --> Curva G.12.T0	ACSM255	3.50	1.20	DN40	41.90	1.27	0.39	0.00	1.66	80.75	0.98
Curva G.12.T0 --> Colonna montante 0.39	ACSM255	0.80	1.20	DN40	41.90	0.29	0.39	0.00	0.68	80.75	0.98
Colonna montante 0.39 --> Colonna montante 1.1	ACSM255	3.62	0.60	DN40	41.90	1.28	0.20	35.30	36.77	80.75	0.98
Colonna montante 1.1 --> Giunto a 'T' G.1.T1	ACSM255	1.05	0.60	DN40	41.90	0.69	0.39	0.00	1.08	80.75	0.98
Giunto a 'T' G.1.T1 - -> Curva G.2.T1	ACSM255	8.20	0.00	DN25	27.30	0.00	0.00	0.00	0.00	---	0.00
Curva	ACSM255	0.95	0.00	DN25	27.30	0.00	0.00	0.00	0.00	---	0.00

G.2.T1 --> Curva G.3.T1											
Curva G.3.T1 --> Curva G.4.T1	ACSM255	2.10	0.00	DN25	27.30	0.00	0.00	- 20.59	- 20.59	---	0.00
Curva G.5.T1 --> Naspo N.1.T1	ACSM255	0.20	0.00	DN25	27.30	0.00	0.00	0.00	0.00	---	0.00
Curva G.4.T1 --> Curva G.5.T1	ACSM255	0.00	0.00	DN25	27.30	0.00	0.00	0.00	0.00	---	0.00
Giunto a 'T' G.1.T1 - -> Curva G.6.T1	ACSM255	3.45	1.20	DN40	41.90	2.35	0.78	0.00	3.13	80.75	0.98
Curva G.6.T1 --> Giunto a 'T' G.10.T1	ACSM255	19.99	1.20	DN40	41.90	13.83	0.78	0.00	14.61	80.75	0.98
Curva G.7.T1 --> Giunto lineare G.8.T1	ACSM255	2.10	0.60	DN25	27.30	1.76	0.49	- 20.59	- 18.33	41.06	1.17
Curva G.9.T1 --> Naspo N.2.T1	ACSM255	0.20	0.60	DN25	27.30	0.20	0.49	0.00	0.69	41.06	1.17
Giunto lineare G.8.T1 --> Curva G.9.T1	ACSM255	0.00	0.00	DN25	27.30	0.00	0.00	0.00	0.00	41.06	1.17
Giunto a 'T' G.10.T1 --> Curva G.7.T1	ACSM255	0.31	0.00	DN25	27.30	0.29	0.00	0.00	0.29	41.06	1.17
Giunto a 'T' G.10.T1 --> Curva G.12.T1	ACSM255	0.15	1.80	DN32	36.00	0.00	0.39	0.00	0.39	39.69	0.65
Curva G.12.T1 --> Curva	ACSM255	25.30	0.90	DN32	36.00	9.90	0.39	0.00	10.29	39.69	0.65

G.13.T1											
Curva G.13.T1 --> Curva G.14.T1	ACSM255	9.35	0.90	DN32	36.00	3.63	0.39	0.00	4.02	39.69	0.65
Curva G.14.T1 --> Curva G.15.T1	ACSM255	2.10	0.60	DN25	27.30	1.66	0.49	- 20.59	- 18.43	39.69	1.13
Curva G.16.T1 --> Naspo N.3.T1	ACSM255	0.20	0.60	DN25	27.30	0.20	0.49	0.00	0.69	39.69	1.13
Curva G.15.T1 --> Curva G.16.T1	ACSM255	0.00	0.00	DN25	27.30	0.00	0.00	0.00	0.00	39.69	1.13
Giunto lineare G.27.T0 -- >Giunto lineare G.13.T0	ACSM255	3.00	0.60	DN50	53.10	0.39	0.10	- 29.32	- 28.83	82.87	0.62
Giunto lineare G.13.T0 --> Curva G.15.T0	PE100PN16	9.40	1.36	DN65	51.40	0.98	0.10	0.00	1.08	82.87	0.67
Curva G.15.T0 --> Curva G.16.T0	PE100PN16	50.75	2.72	DN65	51.40	5.30	0.29	0.00	5.59	82.87	0.67
Curva G.16.T0 --> Giunto lineare G.17.T0	PE100PN16	6.10	2.72	DN65	51.40	0.69	0.29	0.00	0.98	82.87	0.67
Giunto lineare G.17.T0 --> Giunto lineare G.30.T0	ACSM255	5.10	0.60	DN50	53.10	1.18	0.10	49.91	51.19	82.87	0.62
Giunto lineare G.18.T0 --> Curva G.19.T0	ACSM255	7.40	0.00	DN50	53.10	1.67	0.00	0.00	1.67	82.87	0.62

Curva G.19.T0 --> Giunto a 'T' G.20.T0	ACSM255	2.00	1.50	DN50	53.10	0.49	0.39	0.00	0.88	82.87	0.62
Giunto a 'T' G.20.T0 --> Curva G.21.T0	ACSM255	1.20	0.00	DN25	27.30	0.00	0.00	0.00	0.00	---	0.00
Curva G.32.T0 --> Naspo N.1.T0	PE100PN16	0.20	0.00	DN32	26.00	0.00	0.00	0.00	0.00	---	0.00
Curva G.31.T0 --> Curva G.32.T0	PE100PN16	0.00	0.00	DN32	26.00	0.00	0.00	0.00	0.00	---	0.00
Curva G.21.T0 --> Giunto lineare G.33.T0	ACSM255	2.10	0.00	DN25	27.30	0.00	0.00	- 20.59	- 20.59	---	0.00
Curva G.34.T0 --> Naspo N.2.T0	PE100PN16	0.20	0.00	DN32	26.00	0.00	0.00	0.00	0.00	---	0.00
Giunto lineare G.33.T0 --> Curva G.34.T0	PE100PN16	0.00	0.00	DN32	26.00	0.00	0.00	0.00	0.00	---	0.00
Giunto a 'T' G.20.T0 --> Curva G.35.T0	ACSM255	6.00	0.00	DN50	53.10	1.37	0.00	0.00	1.37	82.87	0.62
Curva G.35.T0 --> Curva G.36.T0	ACSM255	33.25	1.50	DN50	53.10	7.65	0.39	0.00	8.04	82.87	0.62
Curva G.36.T0 --> Colonna montante 0.102	ACSM255	0.90	1.50	DN50	53.10	0.20	0.39	0.00	0.59	82.87	0.62
Colonna montante 0.102 --> Colonna montante	PE100PN16	3.60	1.36	DN65	51.40	0.30	0.10	35.30	35.69	82.87	0.67

1.42											
Colonna montante 1.42 -- >Giunto a 'T' G.17.T1	ACSM255	1.30	0.60	DN40	41.90	0.98	0.39	0.00	1.37	82.87	1.00
Giunto a 'T' G.17.T1 --> Curva G.18.T1	ACSM255	8.95	1.80	DN32	36.00	3.82	0.78	0.00	4.60	41.42	0.68
Curva G.18.T1 --> Giunto lineare G.19.T1	ACSM255	4.80	0.90	DN32	36.00	2.06	0.39	0.00	2.45	41.42	0.68
Giunto lineare G.19.T1 --> Giunto lineare G.20.T1	PE100PN16	2.10	1.36	DN32	26.00	1.47	0.98	- 20.59	- 18.14	41.42	1.30
Curva G.21.T1 --> Naspo N.4.T1	PE100PN16	0.20	1.36	DN32	26.00	0.10	0.98	0.00	1.08	41.42	1.30
Giunto lineare G.20.T1 --> Curva G.21.T1	PE100PN16	0.00	0.00	DN32	26.00	0.00	0.00	0.00	0.00	41.42	1.30
Giunto a 'T' G.17.T1 --> Curva G.22.T1	ACSM255	5.00	1.80	DN32	36.00	2.16	0.78	0.00	2.94	41.45	0.68
Curva G.22.T1 --> Curva G.23.T1	ACSM255	4.40	0.90	DN32	36.00	1.86	0.39	0.00	2.25	41.45	0.68
Curva G.23.T1 --> Curva G.24.T1	ACSM255	0.30	0.60	DN25	27.30	0.49	0.98	0.00	1.47	41.45	1.18
Curva G.24.T1 --> Curva G.25.T1	PE100PN16	2.10	1.36	DN32	26.00	1.47	0.98	- 20.59	- 18.14	41.45	1.30
Curva G.26.T1 -->	PE100PN16	0.20	1.36	DN32	26.00	0.10	0.98	0.00	1.08	41.45	1.30

Naspo N.5.T1											
Curva G.25.T1 --> Curva G.26.T1	PE100PN16	0.00	0.00	DN32	26.00	0.00	0.00	0.00	0.00	41.45	1.30
Gruppo pompaggio --> Rete Naspi	ACSM255	1.01	0.00	DN50	53.10	0.39	0.00	0.00	0.39	163.62	1.23
Curva G.22.T0 --> Giunto a 'T' G.44.T0	ACSM255	1.27	1.50	DN50	53.10	0.49	0.59	0.00	1.08	163.62	1.23
Giunto a 'T' G.44.T0 --> Giunto lineare G.43.T0	ACSM255	0.26	2.40	DN40	41.90	0.10	0.88	0.00	0.98	80.75	0.98
Giunto a 'T' G.44.T0 --> Giunto lineare G.27.T0	ACSM255	0.49	3.00	DN50	53.10	0.10	0.39	0.00	0.49	82.87	0.62
Giunto lineare G.43.T0 --> Giunto lineare G.45.T0	ACSM255	2.11	0.60	DN40	41.90	0.79	0.20	20.59	21.57	80.75	0.98
Giunto lineare G.45.T0 --> Giunto lineare G.4.T0	ACSM255	0.70	0.60	DN40	41.90	0.29	0.20	0.00	0.49	80.75	0.98
Giunto lineare G.4.T0 --> Giunto a 'T' G.6.T0	ACSM255	5.00	0.00	DN40	41.90	1.77	0.00	0.00	1.77	80.75	0.98
Giunto lineare G.30.T0 --> Giunto lineare G.18.T0	ACSM255	0.30	0.60	DN50	53.10	0.10	0.10	0.00	0.20	82.87	0.62
Giunto a	ACSM255	5.30	0.00	DN25	27.30	0.00	0.00	0.00	0.00	---	0.00

'T' G.10.T0 --> Curva G.46.T0											
Curva G.46.T0 --> Curva G.47.T0	ACSM255	1.90	0.00	DN25	27.30	0.00	0.00	0.00	0.00	---	0.00
Curva G.47.T0 -- >Curva G.48.T0	ACSM255	2.00	0.00	DN25	27.30	0.00	0.00	- 19.61	- 19.61	---	0.00
Curva G.49.T0 --> Naspo N.3.T0	ACSM255	0.20	0.00	DN25	27.30	0.00	0.00	0.00	0.00	---	0.00
Curva G.48.T0 --> Curva G.49.T0	ACSM255	0.00	0.00	DN25	27.30	0.00	0.00	0.00	0.00	---	0.00

Legenda

L.eq.: lunghezza equivalente dovuta alle giunzioni (curva, gomito, TEE, croce, ecc.) (m)

ΔH_d : Perdita di carico distribuita (kPa)

ΔH_c : Perdita di carico concentrata (kPa)

ΔH_q : Perdita di carico per differenza di quota (kPa)

ΔH : Perdita di carico complessiva (kPa)

Q: Portata (l/min)

V: Velocità (m/s)

Tabella risultati del calcolo sui nodi dell'impianto:

Rif.nodo	Tipo	Quota (m)	Q (l/min)	P (kPa)	Perdite totali (kPa) *
Gruppo pompaggio	Gruppo pompaggio	1.00	163.62	290.74	-
Rete Naspi	Rete naspi	1.00	163.62	290.32	-
Giunto lineare G.4.T0	Giunto lineare	3.10	80.75	265.95	-
Giunto a 'T' G.6.T0	Giunto a 'T'	3.10	80.75	264.16	-
Giunto lineare G.7.T0	Giunto lineare	3.10	0.00	264.16	-
Giunto a 'T' G.10.T0	Giunto a 'T'	3.10	80.75	261.32	-
Curva G.11.T0	Curva	3.10	80.75	256.02	-
Curva G.12.T0	Curva	3.10	80.75	254.33	-
Colonna montante 0.39	Colonna montante	3.10	80.75	253.62	-
Colonna montante 1.1	Colonna montante	6.70	80.75	216.80	-
Giunto a 'T' G.1.T1	Giunto a 'T'	6.70	80.75	215.66	-
Curva G.2.T1	Curva	6.70	0.00	215.66	-
Curva G.3.T1	Curva	6.70	0.00	215.66	-
Naspo N.1.T1	Naspo	4.60	43.04	236.25	-
Curva G.4.T1	Curva	4.60	0.00	236.25	-
Curva G.5.T1	Curva	4.60	0.00	236.25	-
Curva G.6.T1	Curva	6.70	80.75	212.43	-
Curva G.7.T1	Curva	6.70	41.06	197.46	-
Naspo N.2.T1	Naspo	4.60	41.06	215.16	75.58 + 0.08
Giunto lineare G.8.T1	Giunto lineare	4.60	41.06	215.82	-
Curva G.9.T1	Curva	4.60	41.06	215.82	-
Giunto a 'T' G.10.T1	Giunto a 'T'	6.70	80.75	197.72	-
Curva G.12.T1	Curva	6.70	39.69	197.33	-
Curva G.13.T1	Curva	6.70	39.69	187.10	-
Curva G.14.T1	Curva	6.70	39.69	183.10	-
Naspo N.3.T1	Naspo	4.60	39.69	200.98	89.76 + 0.07
Curva G.15.T1	Curva	4.60	39.69	201.59	-
Curva G.16.T1	Curva	4.60	39.69	201.59	-
Giunto lineare G.13.T0	Giunto lineare	-1.99	82.87	317.42	-
Curva G.15.T0	Curva	-1.99	82.87	316.29	-
Curva G.16.T0	Curva	-1.99	82.87	310.70	-
Giunto lineare G.17.T0	Giunto lineare	-1.99	82.87	309.78	-
Giunto lineare G.18.T0	Giunto lineare	3.10	82.87	258.34	-
Curva G.19.T0	Curva	3.10	82.87	256.64	-
Giunto a 'T' G.20.T0	Giunto a 'T'	3.10	82.87	255.84	-
Curva G.21.T0	Curva	3.10	0.00	255.84	-
Curva G.22.T0	Curva	1.00	163.62	290.10	-
Giunto lineare G.27.T0	Giunto lineare	1.00	82.87	288.53	-
Giunto lineare G.30.T0	Giunto lineare	3.10	82.87	258.55	-
Naspo N.1.T0	Naspo	1.00	47.25	284.75	-
Curva G.31.T0	Curva	1.00	0.00	284.75	-
Curva G.32.T0	Curva	1.00	0.00	284.75	-

Naspo N.2.T0	Naspo	1.00	46.55	276.43	-
Giunto lineare G.33.T0	Giunto lineare	1.00	0.00	276.43	-
Curva G.34.T0	Curva	1.00	0.00	276.43	-
Curva G.35.T0	Curva	3.10	82.87	254.46	-
Curva G.36.T0	Curva	3.10	82.87	246.48	-
Colonna montante 0.102	Colonna montante	3.10	82.87	245.93	-
Colonna montante 1.42	Colonna montante	6.70	82.87	210.16	-
Giunto a 'T' G.17.T1	Giunto a 'T'	6.70	82.87	208.78	-
Curva G.18.T1	Curva	6.70	41.42	204.24	-
Giunto lineare G.19.T1	Giunto lineare	6.70	41.42	201.83	-
Naspo N.4.T1	Naspo	4.60	41.42	218.88	71.86 + 0.08
Giunto lineare G.20.T1	Giunto lineare	4.60	41.42	219.98	-
Curva G.21.T1	Curva	4.60	41.42	219.98	-
Curva G.22.T1	Curva	6.70	41.45	205.90	-
Curva G.23.T1	Curva	6.70	41.45	203.65	-
Curva G.24.T1	Curva	6.70	41.45	202.19	-
Naspo N.5.T1	Naspo	4.60	41.45	219.24	71.50 + 0.08
Curva G.25.T1	Curva	4.60	41.45	220.34	-
Curva G.26.T1	Curva	4.60	41.45	220.34	-
Giunto lineare G.43.T0	Giunto lineare	1.00	80.75	287.99	-
Giunto a 'T' G.44.T0	Giunto a 'T'	1.00	163.62	288.94	-
Giunto lineare G.45.T0	Giunto lineare	3.10	80.75	266.42	-
Curva G.46.T0	Curva	3.10	0.00	261.32	-
Curva G.47.T0	Curva	3.10	0.00	261.32	-
Naspo N.3.T0	Naspo	1.10	46.93	280.94	-
Curva G.48.T0	Curva	1.10	0.00	280.94	-
Curva G.49.T0	Curva	1.10	0.00	280.94	-

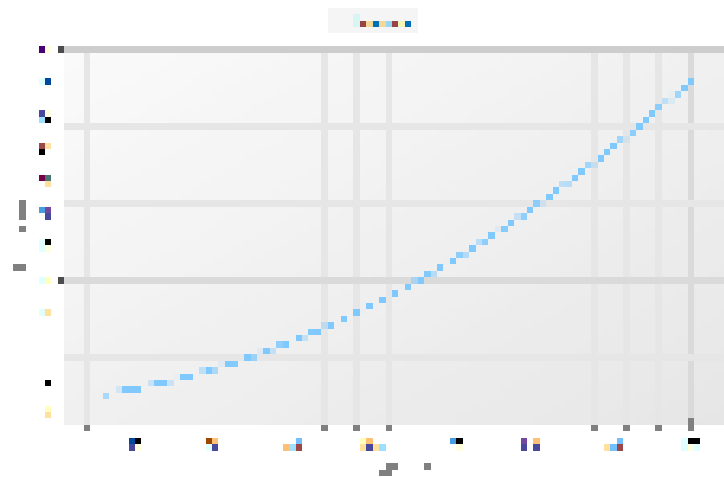
* Valorizzato se il nodo corrisponde a un terminale attivo dell'impianto. Se sono presenti perdite al bocchello o alla manichetta i relativi valori sono riportati nella colonna.

Tabella delle tubazioni con i diametri utilizzati:

Tubazione	Materiale	DN	Lunghezza (m)
UNI EN 10255 - ACCIAIO non legato S. Media	ACCIAIO	DN50	61.27
UNI EN 10255 - ACCIAIO non legato S. Media	ACCIAIO	DN25	40.61
UNI EN 10255 - ACCIAIO non legato S. Media	ACCIAIO	DN40	62.08
UNI EN 10255 - ACCIAIO non legato S. Media	ACCIAIO	DN32	57.95
Polietilene PE 100 - PN 16 SDR 11 - UNI 12201	POLIETILENE	DN65	69.85
Polietilene PE 100 - PN 16 SDR 11 - UNI 12201	POLIETILENE	DN32	5.00

Per soddisfare i requisiti necessari al bilanciamento dell'impianto, la Prevalenza dell'impianto H deve essere pari almeno a: 28.06 m c.a. (275.13 kPa), a cui corrisponde una Portata dell'impianto Q di: 163.62 l/min.

Nell'immagine seguente è riportata la curva caratteristica dell'impianto H(Q):



Gruppo di serbatoi con pompe

L'alimentazione idrica a servizio dell'impianto antincendio è realizzata tramite un serbatoio da 5000 litri con pompe.

Il punto di lavoro dell'Impianto con il Gruppo di pompaggio è pari a:

Portata Q: 179.10 l/min

Prevalenza H: 32.89 m c.a.

Il gruppo di pressurizzazione è provvisto di una pompa pilota ad avviamento elettrico.

Le immagini che seguono illustrano la caratteristica $H(Q)$, prevalenza al variare della portata e il punto di lavoro individuato:

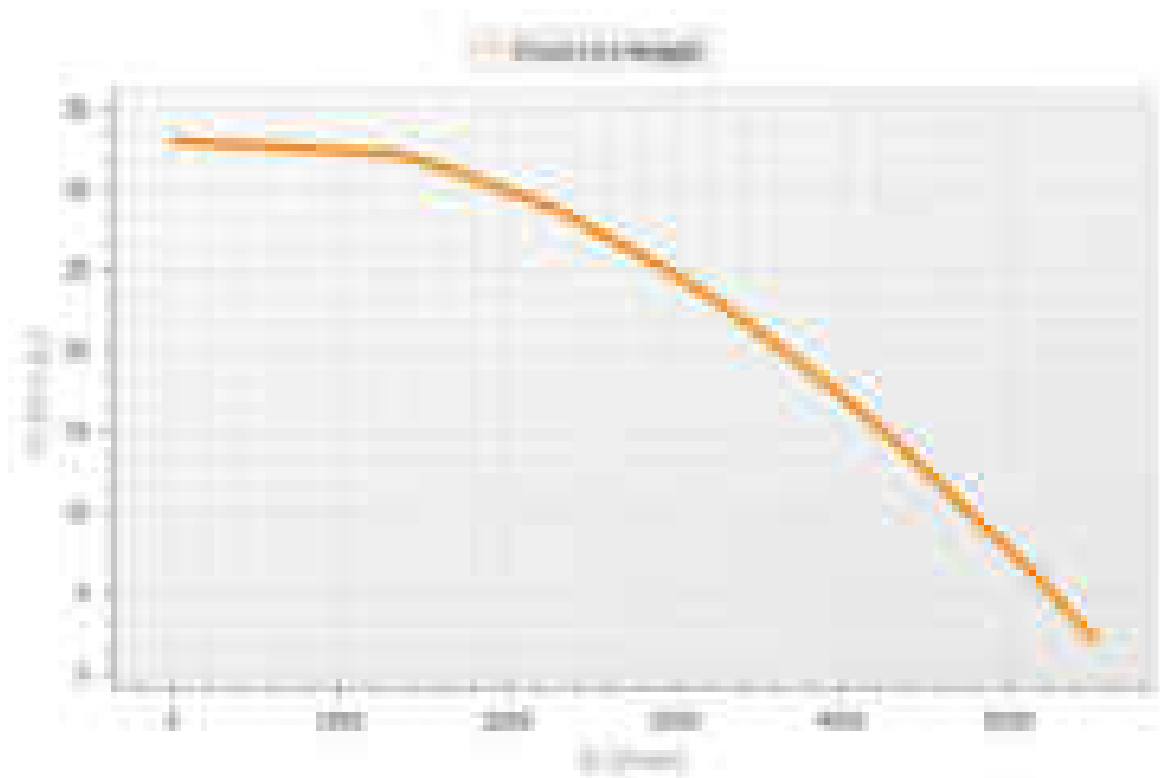


Fig. 2: Caratteristica $H(Q)$ del gruppo di pompaggio

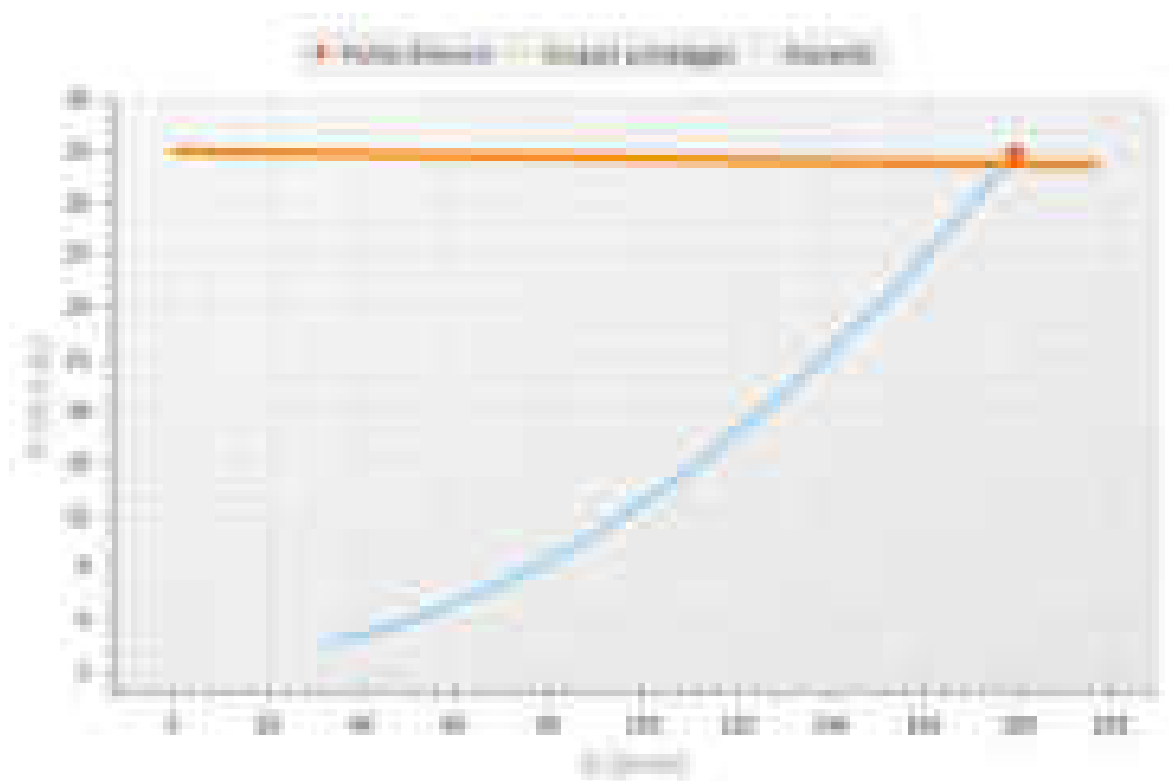


Fig. 3: Caratteristica $H(Q)$ Impianto e Gruppo di pompaggio – Punto di lavoro

Condizioni di aspirazione

La tubazione di aspirazione, comprese tutte le valvole e raccordi, è progettata in modo da assicurare che l' $NPSH_a$ disponibile (calcolato alla massima temperatura prevista dell'acqua) all'ingresso della pompa superi l' $NPSH_r$ richiesto di almeno 1 m alla portata massima della pompa. Le tubazioni di aspirazione sono poste orizzontalmente o con pendenza continua in salita verso la pompa per prevenire la possibilità di formazione di sacche d'aria nella tubazione.

È utilizzata una valvola di fondo qualora l'asse della pompa si trovi al di sopra del livello minimo dell'acqua.

Il tratto di condotta che collega la pompa alla struttura di raccolta ha le seguenti caratteristiche:

- UNI EN 10255 - ACCIAIO non legato S. Media.
- Classe DN65 per N° 1 attacchi.
- Lunghezza complessiva 2.00 m.
- Dislivello 2.00 m.
- $NPSH_a$ 11.77 m.c.a.
- Pressione atmosferica: 10.00 m.c.a.
- Tensione di vapore: 0.17 m.c.a..

L'aspirazione della pompa è collegata ad una tubazione conica, lunga almeno due volte il diametro. La tubazione conica eccentrica ha la parte superiore orizzontale ed un angolo di apertura massimo non maggiore di 20° . Le valvole non sono posizionate direttamente sulla bocca di entrata della pompa.

Impianti Termomeccanici - Elenco Punti BMS

CENTRALE CLIMA 01 - SP-CAV1

TESTO ELEMENTO	TESTO FUNZIONE	DI	DO	AI	AO
SCUOLA PRIMARIA					
RECUPERATORE - SP-VMC1					
Ventilatori	Stato	2			
Ventilatori	Allarme	2			
Ventilatori	Comando Stato locale		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	
SP-PDC-CL-1					
Gruppo Frigo	Stato	1			
Gruppo Frigo	Allarme	1			
Gruppo Frigo	Comando Stato locale		1		
Gruppo Frigo	Comando Estate/Inverno		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	
SP-PDC-CL-4					
Gruppo Frigo	Stato	1			
Gruppo Frigo	Allarme	1			
Gruppo Frigo	Comando Stato locale		1		
Gruppo Frigo	Comando Estate/Inverno		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	

Impianti Termomeccanici - Elenco Punti BMS

CENTRALE CLIMA 02 - SP-CAV2

TESTO ELEMENTO	TESTO FUNZIONE	DI	DO	AI	AO
RECUPERATORE - SP-VMC_Ref					
Ventilatori	Stato	2			
Ventilatori	Allarme	2			
Ventilatori	Comando Stato locale		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	
RECUPERATORE - SP-VMC_Pal					
Ventilatori	Stato	2			
Ventilatori	Allarme	2			
Ventilatori	Comando Stato locale		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	
RECUPERATORE - SP-VMC2					
Ventilatori	Stato	2			
Ventilatori	Allarme	2			
Ventilatori	Comando Stato locale		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	
SP-PDC-CL-2					
Gruppo Frigo	Stato	1			
Gruppo Frigo	Allarme	1			
Gruppo Frigo	Comando Stato locale		1		
Gruppo Frigo	Comando Estate/Inverno		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	
SP-PDC-CL-5					
Gruppo Frigo	Stato	1			
Gruppo Frigo	Allarme	1			
Gruppo Frigo	Comando Stato locale		1		
Gruppo Frigo	Comando Estate/Inverno		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	

Impianti Termomeccanici - Elenco Punti BMS

CENTRALE CLIMA 03 - SP-CAV3

TESTO ELEMENTO	TESTO FUNZIONE	DI	DO	AI	AO
RECUPERATORE - SP-VMC3					
Ventilatori	Stato	2			
Ventilatori	Allarme	2			
Ventilatori	Comando Stato locale		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	
SP-PDC-CL-3					
Gruppo Frigo	Stato	1			
Gruppo Frigo	Allarme	1			
Gruppo Frigo	Comando Stato locale		1		
Gruppo Frigo	Comando Estate/Inverno		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	
SP-PDC-CL-6					
Gruppo Frigo	Stato	1			
Gruppo Frigo	Allarme	1			
Gruppo Frigo	Comando Stato locale		1		
Gruppo Frigo	Comando Estate/Inverno		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	

Impianti Termomeccanici - Elenco Punti BMS

CENTRALE CLIMA 04 - PALESTRA

TESTO ELEMENTO	TESTO FUNZIONE	DI	DO	AI	AO
SS-PDC-CL-1					
Gruppo Frigo	Stato	1			
Gruppo Frigo	Allarme	1			
Gruppo Frigo	Comando Stato locale		1		
Gruppo Frigo	Comando Estate/Inverno		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	
SS-PDC-CL-4					
Gruppo Frigo	Stato	1			
Gruppo Frigo	Allarme	1			
Gruppo Frigo	Comando Stato locale		1		
Gruppo Frigo	Comando Estate/Inverno		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	
RFT_Pal					
Gruppo Frigo	Stato	1			
Gruppo Frigo	Allarme	1			
Gruppo Frigo	Comando Estate/Inverno		1		
Ventilatori	Comando Stato locale		1		
Ventilatori	Stato	2			
Ventilatori	Allarme	2			
Temperatura	Mandata			1	
Temperatura	Ripresa			1	
SS-PDC-ACS1					
Gruppo Frigo	Stato	1			
Gruppo Frigo	Allarme	1			
Gruppo Frigo	Comando Stato locale		1		
Gruppo Frigo	Comando Estate/Inverno		1		
Temperatura	Accumulo			1	

Impianti Termomeccanici - Elenco Punti BMS					
CENTRALE CLIMA 05 - SS CAV1					
TESTO ELEMENTO	TESTO FUNZIONE	DI	DO	AI	AO
RECUPERATORE - SS-VMC1					
Ventilatori	Stato	2			
Ventilatori	Allarme	2			
Ventilatori	Comando Stato locale		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	
SS-PDC-CL-5					
Gruppo Frigo	Stato	1			
Gruppo Frigo	Allarme	1			
Gruppo Frigo	Comando Stato locale		1		
Gruppo Frigo	Comando Estate/Inverno		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	

Impianti Termomeccanici - Elenco Punti BMS

CENTRALE CLIMA 06 - SS CAV2

TESTO ELEMENTO	TESTO FUNZIONE	DI	DO	AI	AO
RECUPERATORE - SS-VMC2					
Ventilatori	Stato	2			
Ventilatori	Allarme	2			
Ventilatori	Comando Stato locale		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	
SS-PDC-CL-2					
Gruppo Frigo	Stato	1			
Gruppo Frigo	Allarme	1			
Gruppo Frigo	Comando Stato locale		1		
Gruppo Frigo	Comando Estate/Inverno		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	
SS-PDC-CL-3					
Gruppo Frigo	Stato	1			
Gruppo Frigo	Allarme	1			
Gruppo Frigo	Comando Stato locale		1		
Gruppo Frigo	Comando Estate/Inverno		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	
SS-PDC-CL-6					
Gruppo Frigo	Stato	1			
Gruppo Frigo	Allarme	1			
Gruppo Frigo	Comando Stato locale		1		
Gruppo Frigo	Comando Estate/Inverno		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	
RFT_Aud					
Gruppo Frigo	Stato	1			
Gruppo Frigo	Allarme	1			
Gruppo Frigo	Comando Estate/Inverno		1		
Ventilatori	Comando Stato locale		1		
Ventilatori	Stato	2			
Ventilatori	Allarme	2			
Temperatura	Mandata			1	
Temperatura	Ripresa			1	
AUD-PDC-CL					
Gruppo Frigo	Stato	1			
Gruppo Frigo	Allarme	1			
Gruppo Frigo	Comando Stato locale		1		
Gruppo Frigo	Comando Estate/Inverno		1		
Temperatura	Mandata			1	
Temperatura	Ripresa			1	

Impianti Termomeccanici - Elenco Punti BMS					
CENTRALE IDRICA					
TESTO ELEMENTO	TESTO FUNZIONE	DI	DO	AI	AO
Gruppo pressurizzazione	Stato	1			
Gruppo pressurizzazione	Allarme	1			
Addolcitore	Stato	1			
Addolcitore	Allarme	1			
Totale Impianti Termomeccanici		72	39	45	0