



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΔΗΜΟΣ ΛΕΒΑΔΕΩΝ
ΑΡΙΘΜ. ΜΕΛΕΤΗΣ 105 / 2017

ΥΠΟΕΡΓΟ : ΑΠΟΠΕΡΑΤΩΣΗ ΤΗΣ ΑΙΘΟΥΣΑΣ ΠΟΛΛΑΠΛΩΝ ΧΡΗΣΕΩΝ ΚΑΙ ΜΕΡΙΚΗ
ΑΝΑΔΙΑΡΡΥΘΜΙΣΗ ΣΤΟ ΥΠΑΡΧΟΝ ΚΤΙΡΙΟ ΣΤΗ ΘΕΣΗ ΤΗΣ ΥΠΟ ΚΑΤΑΡΓΗΣΗ ΑΠΧ ΤΟΥ
6ΟΥ ΔΗΜΟΤΙΚΟΥ ΣΧΟΛΕΙΟΥ ΛΙΒΑΔΕΙΑΣ

**ΜΕΛΕΤΗ ΠΟΛΥΖΩΝΙΚΟΥ ΣΥΣΤΗΜΑΤΟΣ
ΑΙΘΟΥΣΑΣ ΠΟΛΛΑΠΛΩΝ ΧΡΗΣΕΩΝ**

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Λιβαδειά 23-05-2017

Θεωρήθηκε

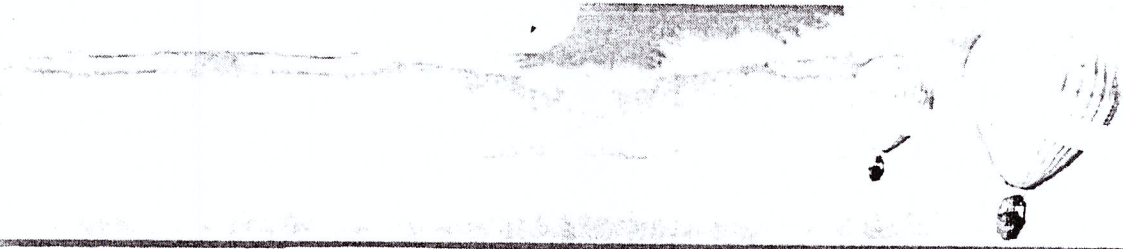
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Design - Project Notes

ΑΙΘΟΥΣΑ ΤΕΛΕΤΩΝ 01

Notes: Equivalent length is calculated by coefficients:

□* 1,2: System 1

The user is responsible for ensuring that all data entered is correct.

It is the responsibility of the consultant or contractor, to verify and confirm that the equipment selection and system design is correct before installation.

Please note that in the event of future system expansion being allowed for in the system design or a change in cooling/heating requirements, a re-evaluation of the air conditioning system must be made prior to final installation.

Design - Project Equipment List

ΑΙΘΟΥΣΑ ΤΕΛΕΤΩΝ 01 Equipment List

Outdoor Units

Model name	Description	Quantity
MMY-AP1814HT8-E	18HP SMMSI	1

Indoor Units

Model name	Description	Quantity
MMU-AP0184MH-E	2,0HP Compact 4-Way Cassette	6
MMD-AP0481HFE	5,0HP Fresh Air	1

Y joints

Model name	Description	Quantity
RBM-BY55E	Y Joint	3
RBM-BY105E	Y Joint	2
RBM-BY205E	Y Joint	1
RBM-BT14E	Outdoor Unit Branch Kit	1

Accessories

Model name	Description	Quantity
RBC-UM11PG(W)E	Panel	6
RBC-AMT32E	Main Wired RC	6

Piping Length

Pipe Diameter	Gas side (m)	Discharge side (m)	Liquid side (m)	Total Length (m)
6.4 mm	0	0	12	12
9.5 mm	0	0	14	14
12.7 mm	12	0	3	15
15.9 mm	14	0	12	26
19.1 mm	0	0	0	0
22.2 mm	3	0	0	3
28.6 mm	12	0	0	12
34.9 mm	0	0	0	0
41.3 mm	0	0	0	0

Total Refrigerant Charge Amount

Refrigerant (R410A)	Description	Amount (kg)
Outdoor	Refrigerant amount charged in factory	23
Additional Refrigerant	Amount needed for the pipes at the site	3.31

Outdoor Design Temperature

System	Mode	Description	Temperature
System 1	Cooling	Dry bulb Temperature	35°C
	Heating	Wet bulb Temperature	-2,4°C

Design - Project Compliance

AΙΘΟΥΣΑ ΤΕΛΕΤΩΝ 01 Compliance

System 1

Rules	Specification	Design	OK
Height between outdoor units in range	5 m	0 m	✓
Max number of indoor units	30	7	✓
Height between indoor units in range	40 m	3 m	✓
Indoor unit below outdoor unit heights in range	40 m		✓
Indoor unit above outdoor unit heights in range	70 m		✓
Header Maximum Total Downstream Capacity Code	25,2		✓
Header Maximum Pipeline Downstream Capacity Code	6		✓
PVM to indoor unit in range	2 m - 10 m	-	✓
Concentration limit exceeded	0,44 kg/m ³	0,04 kg/m ³	✓
Indoor DB (Cooling) temperature range	18°C - 32°C	26°C	✓
Indoor DB (Cooling) temperature range	15°C - 24°C	19°C	✓
Indoor RH (Cooling) temperature range	20 - 80	51	✓
Indoor DB (Heating) temperature range	15°C - 28°C	23°C	✓
Outdoor DB (Cooling) temperature range	-5°C - 43°C	35°C	✓
Outdoor WB (Heating) temperature range	-20°C - 15,5°C	-2,4°C	✓
Capacity ratio in range	80,0% - 100,0%	94,4%	✓
Main piping equivalent length	120 m	7,2 m	✓
Main piping real length	100 m	6 m	✓
Piping between branches equivalent length	50 m	7,2 m	✓
Total pipe length	300 m	41 m	✓
Farthest Equivalent Piping Length	195 m	28,8 m	✓
Farthest Real Piping Length	155 m	24 m	✓
Farthest Equivalent Piping Length From First Branch	65 m	21,6 m	✓
Farthest Equivalent Piping Length Between Outdoor_Units	25 m	0 m	✓
Greatest Outdoor Unit Connecting Piping Equivalent Length	10 m	0 m	✓
Central Controls			✓

Overall System 1 ✓

Design - System Equipment List

System 1 Equipment List

Outdoor Unit

Model name	Header	Follower 1	Follower 2	Follower 3
MMY-AP1814HT8-E	MMY-MAP1004HT8-E	MMY-MAP0804HT8-E		

Indoor Units

Model name	Description	Quantity
MMU-AP0184MH-E	2.0HP Compact 4-Way Cassette	6
MMD-AP0481HFE	5.0HP Fresh Air	1

Y joints

Model name	Description	Quantity
RBM-BY55E	Y Joint	3
RBM-BY105E	Y Joint	2
RBM-BY205E	Y Joint	1
RBM-BT14E	Outdoor Unit Branch Kit	1

Accessories

Model name	Description	Quantity
RBC-UM11PG(W)E	Panel	6
RBC-AMT32E	Main Wired RC	6

Piping Length

Pipe Diameter	Gas side (m)	Discharge side (m)	Liquid side (m)	Total Length (m)
6,4 mm	0	0	12	12
9,5 mm	0	0	14	14
12,7 mm	12	0	3	15
15,9 mm	14	0	12	26
22,2 mm	3	0	0	3
28,6 mm	12	0	0	12

Refrigerant Charge Amount

Refrigerant (R410A)	Description	Amount (kg)
Outdoor	Refrigerant amount charged in factory	23
Additional Refrigerant	Amount needed for the pipes at the site	3,31

Outdoor Design Temperature

Mode	Description	Temperature
Cooling	Dry bulb Temperature	35°C
Heating	Wet bulb Temperature	-2,4°C

Electric information (Outdoor Units)

Property	Description	Value
MOCAP (A)	Maximum Overcurrent Protection	63
MCA (A)	Minimum Circuit Amps	49
Protection Device size (A)		0
Wire (cable size) (mm ²) or AWG(#)		0

Electric information (Indoor Units)

Property	Description	Value
Total MCA (A)		3.95
Protection Devices size (A)		0
Wire (cable size) (mm ²) or AWG(#)		0

Design - System Details

System 1 Details

Outdoor Unit Models

Model Name	Header	Follower 1	Follower 2	Follower 3
MMY-AP1814HT8-E	MMY-MAP1004HT8-E	MMY-MAP0804HT8-E		

Outdoor Unit

Model Name	Cooling (kW)		Heating (kW)		Diversity	
	Rated	Corrected	Rated	Corrected	System	Building
MMY-AP1814HT8-E	50.40	47.43	56.50	40.58	94.4%	0%

Indoor Units

Model Name	Unit Name & Room	Capacity Code	Fan Speed	Mode	Capacity (Total/Sensible) [kW]		
					Rated	Corrected	Required
MMU-AP0184MH-E	ΑΙΘΟΥΣΑ ΤΕΛΕΤΩ..	2.0HP	High	Cooling	5.60/3.60	5.51/3.48	
				Heating	6.30	5.51	
MMU-AP0184MH-E	ΑΙΘΟΥΣΑ ΤΕΛΕΤΩ..	2.0HP	High	Cooling	5.60/3.60	5.48/3.47	
				Heating	6.30	5.50	19.00/16.00
MMU-AP0184MH-E	ΑΙΘΟΥΣΑ ΤΕΛΕΤΩ..	2.0HP	High	Cooling	5.60/3.60	5.43/3.43	
				Heating	6.30	5.48	
MMU-AP0184MH-E	ΑΙΘΟΥΣΑ ΤΕΛΕΤΩ..	2.0HP	High	Cooling	5.60/3.60	5.39/3.41	
				Heating	6.30	5.47	
MMU-AP0184MH-E	ΑΙΘΟΥΣΑ ΤΕΛΕΤΩ..	2.0HP	High	Cooling	5.60/3.60	5.31/3.36	
				Heating	6.30	5.45	
MMU-AP0184MH-E	ΑΙΘΟΥΣΑ ΤΕΛΕΤΩ..	2.0HP	High	Cooling	5.60/3.60	5.27/3.33	27.00
				Heating	6.30	5.44	
MMD-AP0481HFE	ΑΙΘΟΥΣΑ ΤΕΛΕΤΩ..	5.0HP	High	Cooling	14.00/0.00	13.54/0.00	
				Heating	8.90	7.73	

Floor Information

Floors	Room Name	Indoor Units			Design Conditions		
		Name	Model	Mode	DB [°C]	WB [°C]	RH [%]
ΙΣΟΓΕΙΟ	ΑΙΘΟΥΣΑ ΤΕΛΕΤΩ..	IN1	MMU-AP0184MH-E	Cooling	26	19	51
		IN2	MMU-AP0184MH-E	Heating	23		
		IN3	MMU-AP0184MH-E				
		IN4	MMU-AP0184MH-E				
		IN5	MMU-AP0184MH-E				
		IN6	MMU-AP0184MH-E				
		AO1	MMD-AP0481HFE				

Design - System Details

Room Information

Room Name	Dimensions		Limit Density	Rule of Thumb	Capacity (Total/Sensible)	Mode	Capacity (Total/Sensible)		
	Area [m ²]	Volume [m ³]					Density Check	Applied?	[W/m ²]
ΑΙΘΟΥΣΑ ΤΕΛΕΤΩ.200		710	0,04 kg/m ³	✓	No	0,12	Cooling	45,94 / 20,47	19,00 / 16,00
						0,11	Heating	40,58	27,00

ESEER

ESEER	EER @ 100%	EER @ 75%	EER @ 50%	EER @ 25%
6,77	3,93 A = 0,03	5,88 B = 0,33	7,92 C = 0,41	6,36 D = 0,23

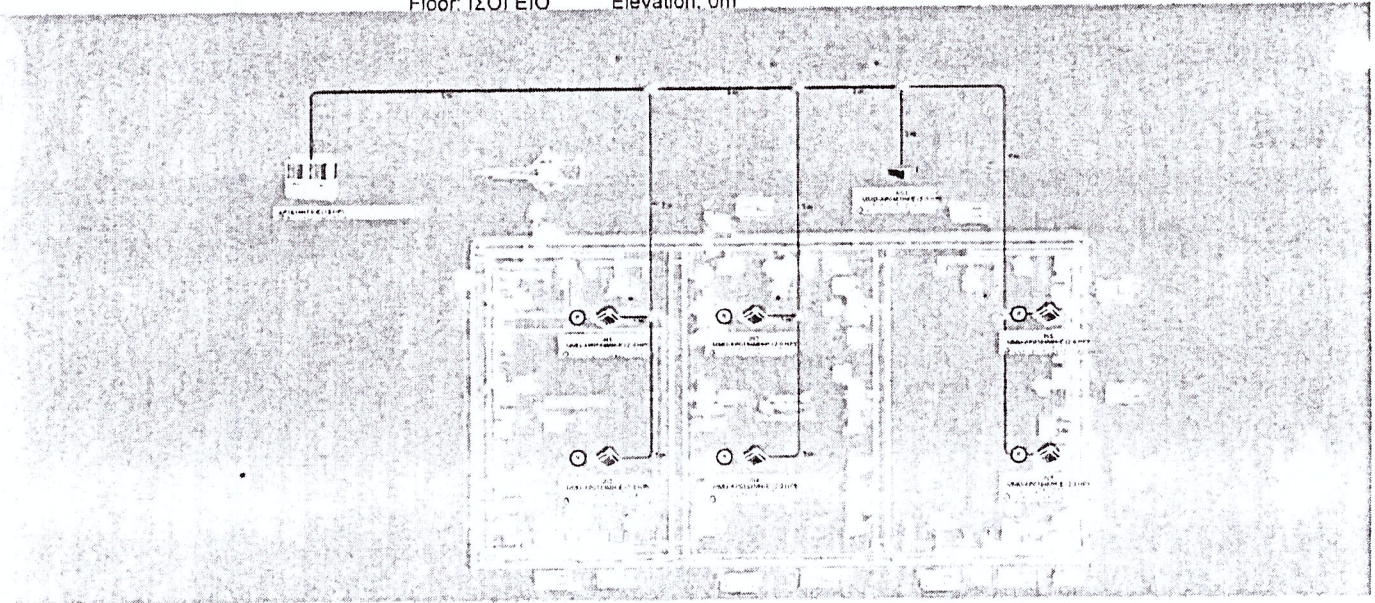
SCOP

SCOP	COP @ 100%	COP @ 75%	COP @ 50%	COP @ 25%
5,55	3,62 A = 0,12	5,25 B = 0,32	6,15 C = 0,36	6,13 D = 0,20

Design - Schematic Overview

System 1

Floor: ΙΣΟΓΕΙΟ Elevation: 0m



System Information

Indoor Units	7 of 30
Capacity	94.4%
Total Pipe Length	41 m
Indoor Cap. Tot./Sen.	45.94 kW/20.47 kW
Indoor Cap. Heat	40.53 kW
Building diversity	0%

Outdoor/Indoor Legend

Model Name (Capacity Code)
 ① Corrected Capacity Tot./Sens. / Heat

Piping Legend

Actual Length
 Liquid / Suction Gas diameters
 Note: It is the responsibility of the consultant or contractor to verify and confirm that the equipment selection and system design is correct before installation.

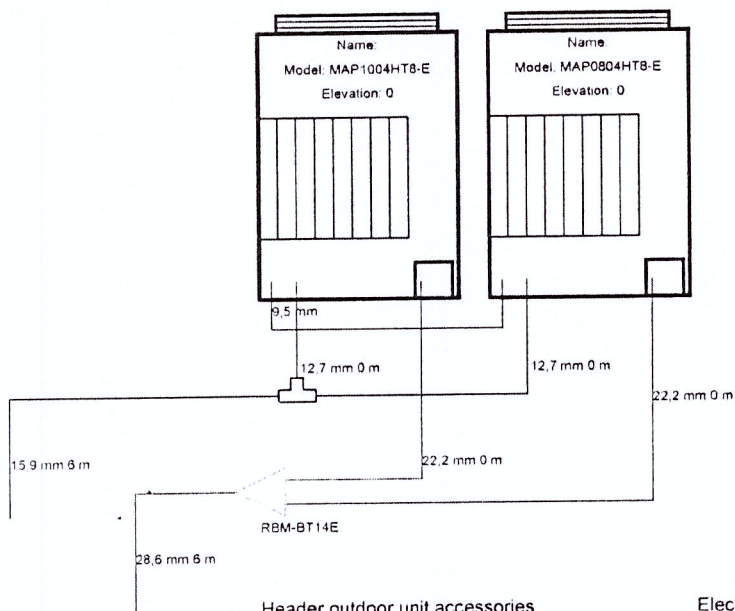
Branches Legend

a	RBM-BY55E	(x3)
b	RBM-BY105E	(x2)
c	RBM-BY205E	(x1)

Design - Outdoor Unit Details

System 1

MMY-AP1814HT8-E



Header outdoor unit accessories

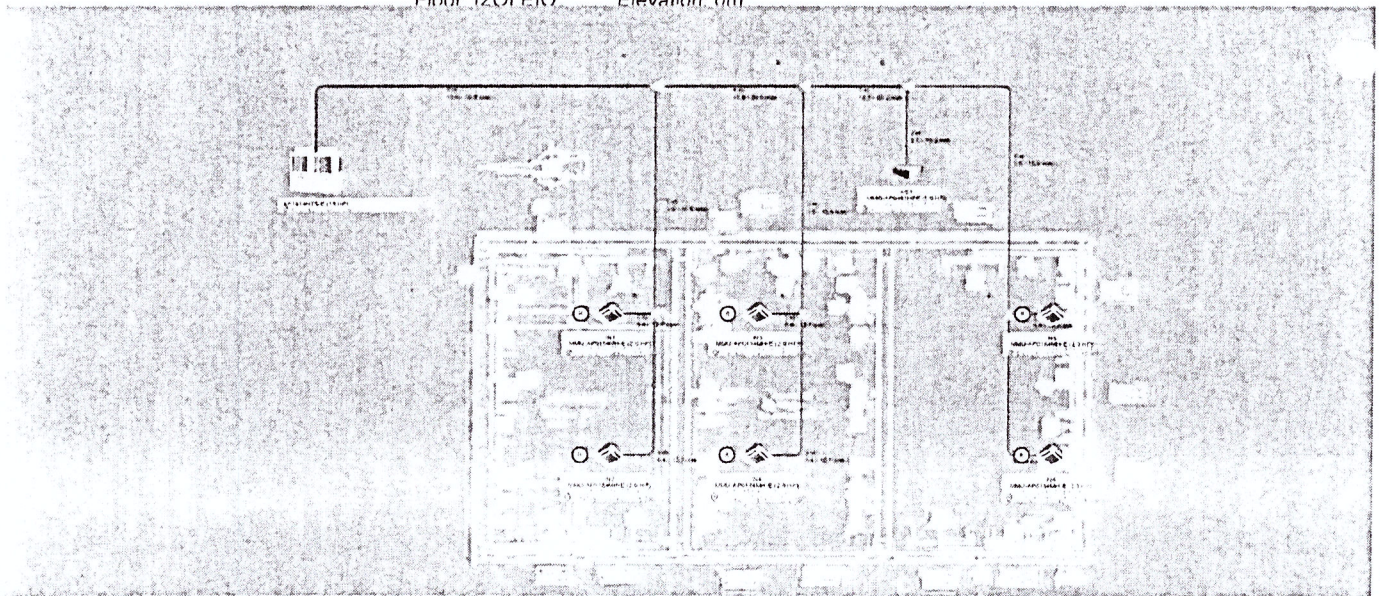
- Slot 1
- Slot 2
- Slot 3
- Slot 4
- Slot 5

Electrical Information

Summary:	3N AC 380-415V 50Hz
Voltage:	400
Frequency:	50
Phase:	3

n - Schematic

Floor: ΙΣΟΓΕΙΟ Elevation: 0m



System Information

Indoor Units 7 of 30
 Capacity 94.4%
 Total Pipe Length 41 m
 Indoor Cap. Tot./Sen 45.94 kW/29.17 kW
 Indoor Cap. Heat 10.33 kW
 Building diversity 0%

Outdoor/Indoor Legend

Model Name (Capacity Code)
 Pump name
 ⊕ Corrected Capacity Total Gas / Heat

Piping Legend

Actual Length
 Liquid / Suction Gas diameters
 Note: It is the responsibility of the consultant or contractor to verify and confirm that the equipment selection and system design is correct before installation.

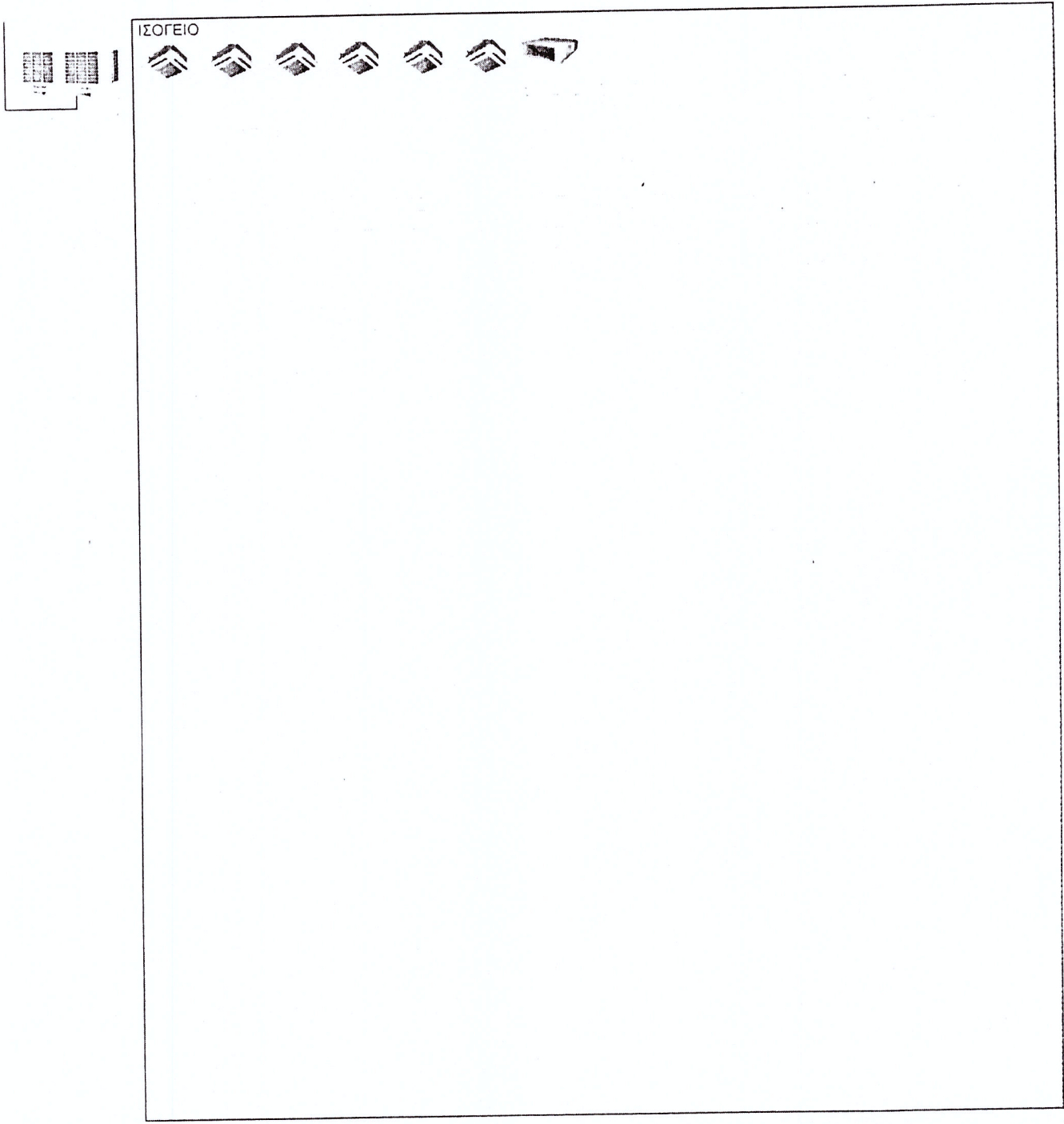
Branches Legend

a RBM-BY55E (x3)
 b RBM-BY105E (x2)
 c RBM-BY205E (x1)



Design - Floor Perspective





System 1

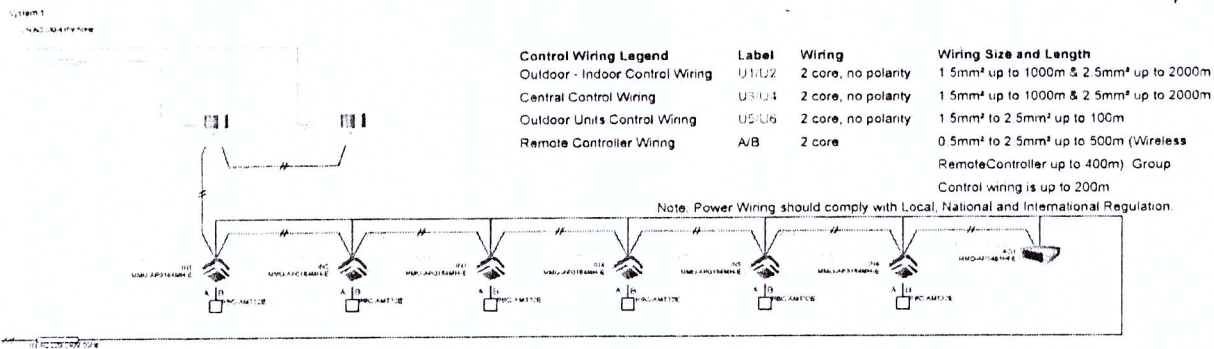


1 - Wiring Diagram

System 1

Symbol Legend

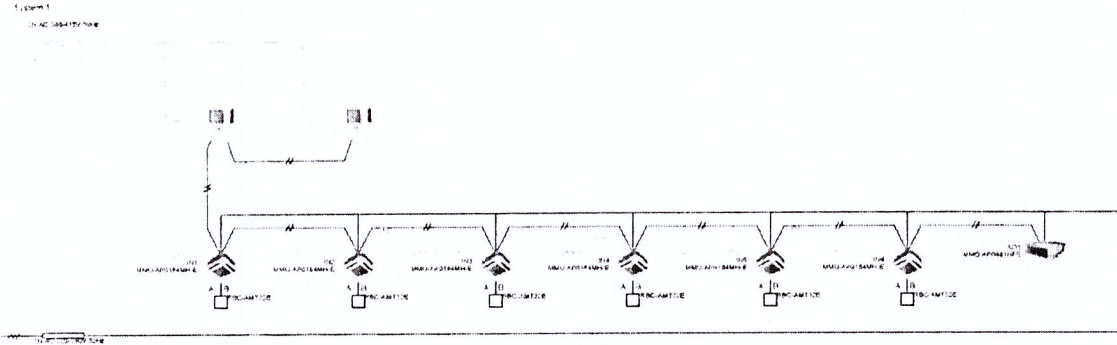
	Flow Selector
	PMV Kit
	Remote Controller
	Electrical Isolator

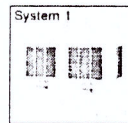


- Wiring Diagram

ΑΙΘΟΥΣΑ ΤΕΛΕΤΩΝ 01

- Symbol Legend
- ⊗ Flow Selector
 - ⊗ PMV Kit
 - Remote Controller
 - ⏏ Electrical Isolator





Connection Legend

- Ethernet
- TCC Link
- 0 - 10V

