

Space Input Data

HCPA CPE 17.10.2020
IAQ Projetos de Engenharia Ltda

11/01/2020
10:14

CT1.1

1. General Details:

Floor Area **15,0** m²
Avg. Ceiling Height **4,3** m
Building Weight **350,0** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
OA Requirement 1 **7,5** L/s/person
OA Requirement 2 **0,00** L/(s·m²)
Space Usage Defaults **ASHRAE Std 62.1-2016**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Recessed (Unvented)**
Wattage **10,00** W/m²
Ballast Multiplier **1,00**
Schedule **24h SCH**

2.4. People:

Occupancy **4,0** People
Activity Level **Office Work**
Sensible **71,8** W/person
Latent **60,1** W/person
Schedule **24h SCH**

2.2. Task Lighting:

Wattage **0,00** W/m²
Schedule **None**

2.5. Miscellaneous Loads:

Sensible **0** W
Schedule **24h SCH**
Latent **0** W
Schedule **24h SCH**

2.3. Electrical Equipment:

Wattage **2000,0** Watts
Schedule **24h SCH**

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
NE	17,0	1	0	0

3.1. Construction Types for Exposure NE

Wall Type **P30**
1st Window Type **JAN 2.70 x 1.30**

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling **555,00** L/s
Design Heating **0,00** L/s
Energy Analysis **0,00** L/s

Infiltration occurs at all hours.

6. Floors:

Type **Floor Above Unconditioned Space**
Floor Area **15,0** m²
Total Floor U-Value **1,000** W/(m²·K)
Unconditioned Space Max Temp. **30,0** °C
Ambient at Space Max Temp. **35,0** °C
Unconditioned Space Min Temp. **4,0** °C
Ambient at Space Min Temp. **2,0** °C

7. Partitions:

(No partition data).

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CT1.10

1. General Details:

Floor Area 10,0 m²
Avg. Ceiling Height 4,3 m
Building Weight 350,0 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 7,5 L/s/person
OA Requirement 2 0,00 L/(s·m²)
Space Usage Defaults ASHRAE Std 62.1-2016

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 10,00 W/m²
Ballast Multiplier 1,00
Schedule 24h SCH

2.2. Task Lighting:

Wattage 0,00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 0,0 Watts
Schedule 24h SCH

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling 0,00 L/s
Design Heating 0,00 L/s
Energy Analysis 0,00 L/s
Infiltration occurs at all hours.

6. Floors:

Type Floor Above Conditioned Space
(No additional input required for this floor type).

7. Partitions:

(No partition data).

2.4. People:

Occupancy 2,0 People
Activity Level Office Work
Sensible 71,8 W/person
Latent 60,1 W/person
Schedule 24h SCH

2.5. Miscellaneous Loads:

Sensible 0 W
Schedule 24h SCH
Latent 0 W
Schedule 24h SCH

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CT1.11

1. General Details:

Floor Area 13,0 m²
Avg. Ceiling Height 4,3 m
Building Weight 350,0 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 7,5 L/s/person
OA Requirement 2 0,00 L/(s·m²)
Space Usage Defaults ASHRAE Std 62.1-2016

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 10,00 W/m²
Ballast Multiplier 1,00
Schedule 24h SCH

2.2. Task Lighting:

Wattage 0,00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 500,0 Watts
Schedule 24h SCH

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling 0,00 L/s
Design Heating 0,00 L/s
Energy Analysis 0,00 L/s
Infiltration occurs at all hours.

6. Floors:

Type Floor Above Conditioned Space
(No additional input required for this floor type).

7. Partitions:

7.1. 1st Partition Details:

Partition Type Ceiling Partition
Area 13,0 m²
U-Value 1,500 W/(m²·K)
Uncondit. Space Max Temp 30,0 °C
Ambient at Space Max Temp 33,0 °C
Uncondit. Space Min Temp 4,0 °C
Ambient at Space Min Temp 2,0 °C

2.4. People:

Occupancy 1,0 Person
Activity Level Office Work
Sensible 71,8 W/person
Latent 60,1 W/person
Schedule 24h SCH

2.5. Miscellaneous Loads:

Sensible 0 W
Schedule 24h SCH
Latent 0 W
Schedule 24h SCH

7.2. 2nd Partition Details:

(No partition data).

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CT1.12

1. General Details:

Floor Area 17,0 m²
Avg. Ceiling Height 4,3 m
Building Weight 350,0 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 7,5 L/s/person
OA Requirement 2 0,00 L/(s·m²)
Space Usage Defaults ASHRAE Std 62.1-2016

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 10,00 W/m²
Ballast Multiplier 1,00
Schedule 24h SCH

2.2. Task Lighting:

Wattage 0,00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 1000,0 Watts
Schedule 24h SCH

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling 0,00 L/s
Design Heating 0,00 L/s
Energy Analysis 0,00 L/s
Infiltration occurs at all hours.

6. Floors:

Type Floor Above Unconditioned Space
Floor Area 17,0 m²
Total Floor U-Value 1,000 W/(m²·K)
Unconditioned Space Max Temp. 30,0 °C
Ambient at Space Max Temp. 35,0 °C
Unconditioned Space Min Temp. 4,0 °C
Ambient at Space Min Temp. 2,0 °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy 4,0 People
Activity Level Office Work
Sensible 71,8 W/person
Latent 60,1 W/person
Schedule 24h SCH

2.5. Miscellaneous Loads:

Sensible 0 W
Schedule 24h SCH
Latent 0 W
Schedule 24h SCH

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CT1.13

1. General Details:

Floor Area **12,0** m²
Avg. Ceiling Height **4,3** m
Building Weight **350,0** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
OA Requirement 1 **7,5** L/s/person
OA Requirement 2 **0,00** L/(s·m²)
Space Usage Defaults **ASHRAE Std 62.1-2016**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Recessed (Unvented)**
Wattage **10,00** W/m²
Ballast Multiplier **1,00**
Schedule **24h SCH**

2.2. Task Lighting:

Wattage **0,00** W/m²
Schedule **None**

2.3. Electrical Equipment:

Wattage **1000,0** Watts
Schedule **24h SCH**

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling **0,00** L/s
Design Heating **0,00** L/s
Energy Analysis **0,00** L/s
Infiltration occurs at all hours.

6. Floors:

Type **Floor Above Unconditioned Space**
Floor Area **12,0** m²
Total Floor U-Value **1,000** W/(m²·K)
Unconditioned Space Max Temp. **30,0** °C
Ambient at Space Max Temp. **35,0** °C
Unconditioned Space Min Temp. **4,0** °C
Ambient at Space Min Temp. **2,0** °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy **4,0** People
Activity Level **Office Work**
Sensible **71,8** W/person
Latent **60,1** W/person
Schedule **24h SCH**

2.5. Miscellaneous Loads:

Sensible **0** W
Schedule **24h SCH**
Latent **0** W
Schedule **24h SCH**

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CT1.14

1. General Details:

Floor Area **6,0** m²
Avg. Ceiling Height **4,3** m
Building Weight **350,0** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
OA Requirement 1 **7,5** L/s/person
OA Requirement 2 **0,00** L/(s·m²)
Space Usage Defaults **ASHRAE Std 62.1-2016**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Recessed (Unvented)**
Wattage **10,00** W/m²
Ballast Multiplier **1,00**
Schedule **24h SCH**

2.2. Task Lighting:

Wattage **0,00** W/m²
Schedule **None**

2.3. Electrical Equipment:

Wattage **500,0** Watts
Schedule **24h SCH**

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling **0,00** L/s
Design Heating **0,00** L/s
Energy Analysis **0,00** L/s
Infiltration occurs at all hours.

6. Floors:

Type **Floor Above Unconditioned Space**
Floor Area **6,0** m²
Total Floor U-Value **1,000** W/(m²·K)
Unconditioned Space Max Temp. **30,0** °C
Ambient at Space Max Temp. **35,0** °C
Unconditioned Space Min Temp. **4,0** °C
Ambient at Space Min Temp. **2,0** °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy **2,0** People
Activity Level **Office Work**
Sensible **71,8** W/person
Latent **60,1** W/person
Schedule **24h SCH**

2.5. Miscellaneous Loads:

Sensible **0** W
Schedule **24h SCH**
Latent **0** W
Schedule **24h SCH**

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CT1.15

1. General Details:

Floor Area **16,0** m²
Avg. Ceiling Height **4,3** m
Building Weight **350,0** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
OA Requirement 1 **7,5** L/s/person
OA Requirement 2 **0,00** L/(s·m²)
Space Usage Defaults **ASHRAE Std 62.1-2016**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Recessed (Unvented)**
Wattage **10,00** W/m²
Ballast Multiplier **1,00**
Schedule **24h SCH**

2.2. Task Lighting:

Wattage **0,00** W/m²
Schedule **None**

2.3. Electrical Equipment:

Wattage **1000,0** Watts
Schedule **24h SCH**

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling **0,00** L/s
Design Heating **0,00** L/s
Energy Analysis **0,00** L/s
Infiltration occurs at all hours.

6. Floors:

Type **Floor Above Unconditioned Space**
Floor Area **16,0** m²
Total Floor U-Value **1,000** W/(m²·K)
Unconditioned Space Max Temp. **30,0** °C
Ambient at Space Max Temp. **35,0** °C
Unconditioned Space Min Temp. **4,0** °C
Ambient at Space Min Temp. **2,0** °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy **4,0** People
Activity Level **Office Work**
Sensible **71,8** W/person
Latent **60,1** W/person
Schedule **24h SCH**

2.5. Miscellaneous Loads:

Sensible **0** W
Schedule **24h SCH**
Latent **0** W
Schedule **24h SCH**

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CT1.16

1. General Details:

Floor Area **66,0** m²
Avg. Ceiling Height **4,3** m
Building Weight **350,0** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
OA Requirement 1 **7,5** L/s/person
OA Requirement 2 **0,00** L/(s·m²)
Space Usage Defaults **ASHRAE Std 62.1-2016**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Recessed (Unvented)**
Wattage **10,00** W/m²
Ballast Multiplier **1,00**
Schedule **24h SCH**

2.2. Task Lighting:

Wattage **0,00** W/m²
Schedule **None**

2.3. Electrical Equipment:

Wattage **8000,0** Watts
Schedule **24h SCH**

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling **0,00** L/s
Design Heating **0,00** L/s
Energy Analysis **0,00** L/s
Infiltration occurs at all hours.

6. Floors:

Type **Floor Above Unconditioned Space**
Floor Area **66,0** m²
Total Floor U-Value **1,000** W/(m²·K)
Unconditioned Space Max Temp. **30,0** °C
Ambient at Space Max Temp. **35,0** °C
Unconditioned Space Min Temp. **4,0** °C
Ambient at Space Min Temp. **2,0** °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy **7,0** People
Activity Level **Office Work**
Sensible **71,8** W/person
Latent **60,1** W/person
Schedule **24h SCH**

2.5. Miscellaneous Loads:

Sensible **0** W
Schedule **24h SCH**
Latent **0** W
Schedule **24h SCH**

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CT1.17

1. General Details:

Floor Area **6,0** m²
Avg. Ceiling Height **4,3** m
Building Weight **350,0** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
OA Requirement 1 **7,5** L/s/person
OA Requirement 2 **0,00** L/(s·m²)
Space Usage Defaults **ASHRAE Std 62.1-2016**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Recessed (Unvented)**
Wattage **10,00** W/m²
Ballast Multiplier **1,00**
Schedule **24h SCH**

2.2. Task Lighting:

Wattage **0,00** W/m²
Schedule **None**

2.3. Electrical Equipment:

Wattage **500,0** Watts
Schedule **24h SCH**

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling **0,00** L/s
Design Heating **0,00** L/s
Energy Analysis **0,00** L/s
Infiltration occurs at all hours.

6. Floors:

Type **Floor Above Unconditioned Space**
Floor Area **6,0** m²
Total Floor U-Value **1,000** W/(m²·K)
Unconditioned Space Max Temp. **30,0** °C
Ambient at Space Max Temp. **35,0** °C
Unconditioned Space Min Temp. **4,0** °C
Ambient at Space Min Temp. **2,0** °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy **2,0** People
Activity Level **Office Work**
Sensible **71,8** W/person
Latent **60,1** W/person
Schedule **24h SCH**

2.5. Miscellaneous Loads:

Sensible **0** W
Schedule **24h SCH**
Latent **0** W
Schedule **24h SCH**

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CT1.18

1. General Details:

Floor Area 10,0 m²
Avg. Ceiling Height 4,3 m
Building Weight 350,0 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 7,5 L/s/person
OA Requirement 2 0,00 L/(s·m²)
Space Usage Defaults ASHRAE Std 62.1-2016

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 10,00 W/m²
Ballast Multiplier 1,00
Schedule 24h SCH

2.2. Task Lighting:

Wattage 0,00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 1000,0 Watts
Schedule 24h SCH

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling 0,00 L/s
Design Heating 0,00 L/s
Energy Analysis 0,00 L/s
Infiltration occurs at all hours.

6. Floors:

Type Floor Above Unconditioned Space
Floor Area 10,0 m²
Total Floor U-Value 1,000 W/(m²·K)
Unconditioned Space Max Temp. 30,0 °C
Ambient at Space Max Temp. 35,0 °C
Unconditioned Space Min Temp. 4,0 °C
Ambient at Space Min Temp. 2,0 °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy 4,0 People
Activity Level Office Work
Sensible 71,8 W/person
Latent 60,1 W/person
Schedule 24h SCH

2.5. Miscellaneous Loads:

Sensible 0 W
Schedule 24h SCH
Latent 0 W
Schedule 24h SCH

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CT1.19

1. General Details:

Floor Area 10,0 m²
Avg. Ceiling Height 4,3 m
Building Weight 350,0 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 7,5 L/s/person
OA Requirement 2 0,00 L/(s·m²)
Space Usage Defaults ASHRAE Std 62.1-2016

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 10,00 W/m²
Ballast Multiplier 1,00
Schedule 24h SCH

2.2. Task Lighting:

Wattage 0,00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 1000,0 Watts
Schedule 24h SCH

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling 0,00 L/s
Design Heating 0,00 L/s
Energy Analysis 0,00 L/s

Infiltration occurs at all hours.

6. Floors:

Type Floor Above Unconditioned Space
Floor Area 10,0 m²
Total Floor U-Value 1,000 W/(m²·K)
Unconditioned Space Max Temp. 30,0 °C
Ambient at Space Max Temp. 35,0 °C
Unconditioned Space Min Temp. 4,0 °C
Ambient at Space Min Temp. 2,0 °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy 3,0 People
Activity Level Office Work
Sensible 71,8 W/person
Latent 60,1 W/person
Schedule 24h SCH

2.5. Miscellaneous Loads:

Sensible 0 W
Schedule 24h SCH
Latent 0 W
Schedule 24h SCH

Space Input Data

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CT1.2

1. General Details:

Floor Area 17,0 m²
Avg. Ceiling Height 4,3 m
Building Weight 350,0 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 7,5 L/s/person
OA Requirement 2 0,00 L/(s·m²)
Space Usage Defaults ASHRAE Std 62.1-2016

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 10,00 W/m²
Ballast Multiplier 1,00
Schedule 24h SCH

2.2. Task Lighting:

Wattage 0,00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 3000,0 Watts
Schedule 24h SCH

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
NE	17,0	1	0	0

3.1. Construction Types for Exposure NE

Wall Type P30
1st Window Type JAN 2.70 x 1.30

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling 0,00 L/s
Design Heating 0,00 L/s
Energy Analysis 0,00 L/s
Infiltration occurs at all hours.

6. Floors:

Type Floor Above Unconditioned Space
Floor Area 17,0 m²
Total Floor U-Value 1,000 W/(m²·K)
Unconditioned Space Max Temp. 30,0 °C
Ambient at Space Max Temp. 35,0 °C
Unconditioned Space Min Temp. 4,0 °C
Ambient at Space Min Temp. 2,0 °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy 4,0 People
Activity Level Office Work
Sensible 71,8 W/person
Latent 60,1 W/person
Schedule 24h SCH

2.5. Miscellaneous Loads:

Sensible 0 W
Schedule 24h SCH
Latent 0 W
Schedule 24h SCH

Space Input Data

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CT1.20

1. General Details:

Floor Area **6,0** m²
Avg. Ceiling Height **4,3** m
Building Weight **350,0** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
OA Requirement 1 **7,5** L/s/person
OA Requirement 2 **0,00** L/(s·m²)
Space Usage Defaults **ASHRAE Std 62.1-2016**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Recessed (Unvented)**
Wattage **10,00** W/m²
Ballast Multiplier **1,00**
Schedule **24h SCH**

2.2. Task Lighting:

Wattage **0,00** W/m²
Schedule **None**

2.3. Electrical Equipment:

Wattage **0,0** Watts
Schedule **24h SCH**

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling **0,00** L/s
Design Heating **0,00** L/s
Energy Analysis **0,00** L/s
Infiltration occurs at all hours.

6. Floors:

Type **Floor Above Unconditioned Space**
Floor Area **6,0** m²
Total Floor U-Value **1,000** W/(m²·K)
Unconditioned Space Max Temp. **30,0** °C
Ambient at Space Max Temp. **35,0** °C
Unconditioned Space Min Temp. **4,0** °C
Ambient at Space Min Temp. **2,0** °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy **2,0** People
Activity Level **Office Work**
Sensible **71,8** W/person
Latent **60,1** W/person
Schedule **24h SCH**

2.5. Miscellaneous Loads:

Sensible **0** W
Schedule **24h SCH**
Latent **0** W
Schedule **24h SCH**

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CT1.21

1. General Details:

Floor Area **4,0** m²
Avg. Ceiling Height **4,3** m
Building Weight **350,0** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
OA Requirement 1 **7,5** L/s/person
OA Requirement 2 **0,00** L/(s·m²)
Space Usage Defaults **ASHRAE Std 62.1-2016**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Recessed (Unvented)**
Wattage **10,00** W/m²
Ballast Multiplier **1,00**
Schedule **24h SCH**

2.2. Task Lighting:

Wattage **0,00** W/m²
Schedule **None**

2.3. Electrical Equipment:

Wattage **500,0** Watts
Schedule **24h SCH**

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling **0,00** L/s
Design Heating **0,00** L/s
Energy Analysis **0,00** L/s
Infiltration occurs at all hours.

6. Floors:

Type **Floor Above Unconditioned Space**
Floor Area **4,0** m²
Total Floor U-Value **1,000** W/(m²·K)
Unconditioned Space Max Temp. **30,0** °C
Ambient at Space Max Temp. **35,0** °C
Unconditioned Space Min Temp. **4,0** °C
Ambient at Space Min Temp. **2,0** °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy **1,0** Person
Activity Level **Office Work**
Sensible **71,8** W/person
Latent **60,1** W/person
Schedule **24h SCH**

2.5. Miscellaneous Loads:

Sensible **0** W
Schedule **24h SCH**
Latent **0** W
Schedule **24h SCH**

Space Input Data

HCPA CPE 17.10.2020
IAQ Projetos de Engenharia Ltda

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CT1.22

1. General Details:

Floor Area 10,0 m²
Avg. Ceiling Height 4,3 m
Building Weight 350,0 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 7,5 L/s/person
OA Requirement 2 0,00 L/(s·m²)
Space Usage Defaults ASHRAE Std 62.1-2016

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 10,00 W/m²
Ballast Multiplier 1,00
Schedule 24h SCH

2.2. Task Lighting:

Wattage 0,00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 500,0 Watts
Schedule 24h SCH

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
NE	10,0	1	0	0

3.1. Construction Types for Exposure NE

Wall Type P30
1st Window Type JAN 2.70 x 1.30

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling 0,00 L/s
Design Heating 0,00 L/s
Energy Analysis 0,00 L/s
Infiltration occurs at all hours.

6. Floors:

Type Floor Above Unconditioned Space
Floor Area 10,0 m²
Total Floor U-Value 1,000 W/(m²·K)
Unconditioned Space Max Temp. 30,0 °C
Ambient at Space Max Temp. 35,0 °C
Unconditioned Space Min Temp. 4,0 °C
Ambient at Space Min Temp. 2,0 °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy 1,0 Person
Activity Level Office Work
Sensible 71,8 W/person
Latent 60,1 W/person
Schedule 24h SCH

2.5. Miscellaneous Loads:

Sensible 0 W
Schedule 24h SCH
Latent 0 W
Schedule 24h SCH

Space Input Data

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IAQ Projetos de Engenharia Ltda

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10:14

CT1.23

1. General Details:

Floor Area **15,0** m²
Avg. Ceiling Height **4,3** m
Building Weight **350,0** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
OA Requirement 1 **7,5** L/s/person
OA Requirement 2 **0,00** L/(s·m²)
Space Usage Defaults **ASHRAE Std 62.1-2016**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Recessed (Unvented)**
Wattage **10,00** W/m²
Ballast Multiplier **1,00**
Schedule **24h SCH**

2.2. Task Lighting:

Wattage **0,00** W/m²
Schedule **None**

2.3. Electrical Equipment:

Wattage **3000,0** Watts
Schedule **24h SCH**

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
NE	20,0	3	0	0

3.1. Construction Types for Exposure NE

Wall Type **P30**
1st Window Type **JAN 2.70 x 1.30**

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling **0,00** L/s
Design Heating **0,00** L/s
Energy Analysis **0,00** L/s
Infiltration occurs at all hours.

6. Floors:

Type **Floor Above Unconditioned Space**
Floor Area **15,0** m²
Total Floor U-Value **1,000** W/(m²·K)
Unconditioned Space Max Temp. **30,0** °C
Ambient at Space Max Temp. **35,0** °C
Unconditioned Space Min Temp. **4,0** °C
Ambient at Space Min Temp. **2,0** °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy **4,0** People
Activity Level **Office Work**
Sensible **71,8** W/person
Latent **60,1** W/person
Schedule **24h SCH**

2.5. Miscellaneous Loads:

Sensible **0** W
Schedule **24h SCH**
Latent **0** W
Schedule **24h SCH**

Space Input Data

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CT1.24

1. General Details:

Floor Area **43,0** m²
Avg. Ceiling Height **4,3** m
Building Weight **350,0** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
OA Requirement 1 **7,5** L/s/person
OA Requirement 2 **0,00** L/(s·m²)
Space Usage Defaults **ASHRAE Std 62.1-2016**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Recessed (Unvented)**
Wattage **10,00** W/m²
Ballast Multiplier **1,00**
Schedule **24h SCH**

2.2. Task Lighting:

Wattage **0,00** W/m²
Schedule **None**

2.3. Electrical Equipment:

Wattage **3000,0** Watts
Schedule **24h SCH**

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
NE	30,0	3	0	0

3.1. Construction Types for Exposure NE

Wall Type **P30**
1st Window Type **JAN 2.70 x 1.30**

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling **0,00** L/s
Design Heating **0,00** L/s
Energy Analysis **0,00** L/s
Infiltration occurs at all hours.

6. Floors:

Type **Floor Above Unconditioned Space**
Floor Area **43,0** m²
Total Floor U-Value **1,000** W/(m²·K)
Unconditioned Space Max Temp. **30,0** °C
Ambient at Space Max Temp. **35,0** °C
Unconditioned Space Min Temp. **4,0** °C
Ambient at Space Min Temp. **2,0** °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy **8,0** People
Activity Level **Office Work**
Sensible **71,8** W/person
Latent **60,1** W/person
Schedule **24h SCH**

2.5. Miscellaneous Loads:

Sensible **0** W
Schedule **24h SCH**
Latent **0** W
Schedule **24h SCH**

Space Input Data

HCPA CPE 17.10.2020
IAQ Projetos de Engenharia Ltda

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10:14

CT1.3

1. General Details:

Floor Area **25,0** m²
Avg. Ceiling Height **4,3** m
Building Weight **350,0** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
OA Requirement 1 **7,5** L/s/person
OA Requirement 2 **0,00** L/(s·m²)
Space Usage Defaults **ASHRAE Std 62.1-2016**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Recessed (Unvented)**
Wattage **10,00** W/m²
Ballast Multiplier **1,00**
Schedule **24h SCH**

2.2. Task Lighting:

Wattage **0,00** W/m²
Schedule **None**

2.3. Electrical Equipment:

Wattage **2000,0** Watts
Schedule **24h SCH**

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
NE	23,0	3	0	0

3.1. Construction Types for Exposure NE

Wall Type **P30**
1st Window Type **JAN 2.70 x 1.30**

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling **0,00** L/s
Design Heating **0,00** L/s
Energy Analysis **0,00** L/s
Infiltration occurs at all hours.

6. Floors:

Type **Floor Above Unconditioned Space**
Floor Area **25,0** m²
Total Floor U-Value **1,000** W/(m²·K)
Unconditioned Space Max Temp. **30,0** °C
Ambient at Space Max Temp. **35,0** °C
Unconditioned Space Min Temp. **4,0** °C
Ambient at Space Min Temp. **2,0** °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy **7,0** People
Activity Level **Office Work**
Sensible **71,8** W/person
Latent **60,1** W/person
Schedule **24h SCH**

2.5. Miscellaneous Loads:

Sensible **0** W
Schedule **24h SCH**
Latent **0** W
Schedule **24h SCH**

Space Input Data

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IAQ Projetos de Engenharia Ltda

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CT1.4

1. General Details:

Floor Area 7,0 m²
Avg. Ceiling Height 4,3 m
Building Weight 350,0 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 7,5 L/s/person
OA Requirement 2 0,00 L/(s·m²)
Space Usage Defaults ASHRAE Std 62.1-2016

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 10,00 W/m²
Ballast Multiplier 1,00
Schedule 24h SCH

2.2. Task Lighting:

Wattage 0,00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 500,0 Watts
Schedule 24h SCH

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
NE	13,0	2	0	0

3.1. Construction Types for Exposure NE

Wall Type P30
1st Window Type JAN 2.70 x 1.30

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling 0,00 L/s
Design Heating 0,00 L/s
Energy Analysis 0,00 L/s
Infiltration occurs at all hours.

6. Floors:

Type Floor Above Unconditioned Space
Floor Area 7,0 m²
Total Floor U-Value 1,000 W/(m²·K)
Unconditioned Space Max Temp. 30,0 °C
Ambient at Space Max Temp. 35,0 °C
Unconditioned Space Min Temp. 4,0 °C
Ambient at Space Min Temp. 2,0 °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy 3,0 People
Activity Level Office Work
Sensible 71,8 W/person
Latent 60,1 W/person
Schedule 24h SCH

2.5. Miscellaneous Loads:

Sensible 0 W
Schedule 24h SCH
Latent 0 W
Schedule 24h SCH

Space Input Data

HCPA CPE 17.10.2020
IAQ Projetos de Engenharia Ltda

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10:14

CT1.5

1. General Details:

Floor Area 11,0 m²
Avg. Ceiling Height 4,3 m
Building Weight 350,0 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 7,5 L/s/person
OA Requirement 2 0,00 L/(s·m²)
Space Usage Defaults ASHRAE Std 62.1-2016

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 10,00 W/m²
Ballast Multiplier 1,00
Schedule 24h SCH

2.2. Task Lighting:

Wattage 0,00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 1000,0 Watts
Schedule 24h SCH

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
NE	24,0	2	0	0
SE	11,0	1	0	0

3.1. Construction Types for Exposure NE

Wall Type P30
1st Window Type JAN 2.70 x 1.30

3.2. Construction Types for Exposure SE

Wall Type P30
1st Window Type JAN 2.70 x 1.30

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling 0,00 L/s
Design Heating 0,00 L/s
Energy Analysis 0,00 L/s

Infiltration occurs at all hours.

6. Floors:

Type Floor Above Unconditioned Space
Floor Area 11,0 m²
Total Floor U-Value 1,000 W/(m²·K)
Unconditioned Space Max Temp. 30,0 °C
Ambient at Space Max Temp. 35,0 °C
Unconditioned Space Min Temp. 4,0 °C
Ambient at Space Min Temp. 2,0 °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy 3,0 People
Activity Level Office Work
Sensible 71,8 W/person
Latent 60,1 W/person
Schedule 24h SCH

2.5. Miscellaneous Loads:

Sensible 0 W
Schedule 24h SCH
Latent 0 W
Schedule 24h SCH

Space Input Data

HCPA CPE 17.10.2020
IAQ Projetos de Engenharia Ltda

11/01/2020
10:14

CT1.6

1. General Details:

Floor Area 17,0 m²
Avg. Ceiling Height 4,3 m
Building Weight 350,0 kg/m²

1.1. OA Ventilation Requirements:

Space Usage User-Defined
OA Requirement 1 7,5 L/s/person
OA Requirement 2 0,00 L/(s·m²)
Space Usage Defaults ASHRAE Std 62.1-2016

2. Internals:

2.1. Overhead Lighting:

Fixture Type Recessed (Unvented)
Wattage 10,00 W/m²
Ballast Multiplier 1,00
Schedule 24h SCH

2.2. Task Lighting:

Wattage 0,00 W/m²
Schedule None

2.3. Electrical Equipment:

Wattage 1000,0 Watts
Schedule 24h SCH

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
SE	26,0	4	0	0

3.1. Construction Types for Exposure SE

Wall Type P30
1st Window Type JAN 2.70 x 1.30

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling 0,00 L/s
Design Heating 0,00 L/s
Energy Analysis 0,00 L/s
Infiltration occurs at all hours.

6. Floors:

Type Floor Above Unconditioned Space
Floor Area 17,0 m²
Total Floor U-Value 1,000 W/(m²·K)
Unconditioned Space Max Temp. 30,0 °C
Ambient at Space Max Temp. 35,0 °C
Unconditioned Space Min Temp. 4,0 °C
Ambient at Space Min Temp. 2,0 °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy 4,0 People
Activity Level Office Work
Sensible 71,8 W/person
Latent 60,1 W/person
Schedule 24h SCH

2.5. Miscellaneous Loads:

Sensible 0 W
Schedule 24h SCH
Latent 0 W
Schedule 24h SCH

Space Input Data

HCPA CPE 17.10.2020
IAQ Projetos de Engenharia Ltda

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10:14

CT1.7

1. General Details:

Floor Area **12,0** m²
Avg. Ceiling Height **4,3** m
Building Weight **350,0** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
OA Requirement 1 **7,5** L/s/person
OA Requirement 2 **0,00** L/(s·m²)
Space Usage Defaults **ASHRAE Std 62.1-2016**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Recessed (Unvented)**
Wattage **10,00** W/m²
Ballast Multiplier **1,00**
Schedule **24h SCH**

2.2. Task Lighting:

Wattage **0,00** W/m²
Schedule **None**

2.3. Electrical Equipment:

Wattage **500,0** Watts
Schedule **24h SCH**

3. Walls, Windows, Doors:

Exp.	Wall Gross Area (m ²)	Window 1 Qty.	Window 2 Qty.	Door 1 Qty.
SE	13,0	2	0	0

3.1. Construction Types for Exposure SE

Wall Type **P30**
1st Window Type **JAN 2.70 x 1.30**

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling **0,00** L/s
Design Heating **0,00** L/s
Energy Analysis **0,00** L/s
Infiltration occurs at all hours.

6. Floors:

Type **Floor Above Unconditioned Space**
Floor Area **12,0** m²
Total Floor U-Value **1,000** W/(m²·K)
Unconditioned Space Max Temp. **30,0** °C
Ambient at Space Max Temp. **35,0** °C
Unconditioned Space Min Temp. **4,0** °C
Ambient at Space Min Temp. **2,0** °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy **3,0** People
Activity Level **Office Work**
Sensible **71,8** W/person
Latent **60,1** W/person
Schedule **24h SCH**

2.5. Miscellaneous Loads:

Sensible **0** W
Schedule **24h SCH**
Latent **0** W
Schedule **24h SCH**

Space Input Data

HCPA CPE 17.10.2020
IAQ Projetos de Engenharia Ltda

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10:14

CT1.8

1. General Details:

Floor Area **5,0** m²
Avg. Ceiling Height **4,3** m
Building Weight **350,0** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
OA Requirement 1 **7,5** L/s/person
OA Requirement 2 **0,00** L/(s·m²)
Space Usage Defaults **ASHRAE Std 62.1-2016**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Recessed (Unvented)**
Wattage **10,00** W/m²
Ballast Multiplier **1,00**
Schedule **24h SCH**

2.2. Task Lighting:

Wattage **0,00** W/m²
Schedule **None**

2.3. Electrical Equipment:

Wattage **500,0** Watts
Schedule **24h SCH**

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling **0,00** L/s
Design Heating **0,00** L/s
Energy Analysis **0,00** L/s
Infiltration occurs at all hours.

6. Floors:

Type **Floor Above Unconditioned Space**
Floor Area **5,0** m²
Total Floor U-Value **1,000** W/(m²·K)
Unconditioned Space Max Temp. **30,0** °C
Ambient at Space Max Temp. **35,0** °C
Unconditioned Space Min Temp. **4,0** °C
Ambient at Space Min Temp. **2,0** °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy **1,0** Person
Activity Level **Office Work**
Sensible **71,8** W/person
Latent **60,1** W/person
Schedule **24h SCH**

2.5. Miscellaneous Loads:

Sensible **0** W
Schedule **24h SCH**
Latent **0** W
Schedule **24h SCH**

Space Input Data

HCPA CPE 17.10.2020
IAQ Projetos de Engenharia Ltda

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10:14

CT1.9

1. General Details:

Floor Area **11,0** m²
Avg. Ceiling Height **4,3** m
Building Weight **350,0** kg/m²

1.1. OA Ventilation Requirements:

Space Usage **User-Defined**
OA Requirement 1 **7,5** L/s/person
OA Requirement 2 **0,00** L/(s·m²)
Space Usage Defaults **ASHRAE Std 62.1-2016**

2. Internals:

2.1. Overhead Lighting:

Fixture Type **Recessed (Unvented)**
Wattage **10,00** W/m²
Ballast Multiplier **1,00**
Schedule **24h SCH**

2.2. Task Lighting:

Wattage **0,00** W/m²
Schedule **None**

2.3. Electrical Equipment:

Wattage **500,0** Watts
Schedule **24h SCH**

3. Walls, Windows, Doors:

(No Wall, Window, Door data).

4. Roofs, Skylights:

(No Roof or Skylight data).

5. Infiltration:

Design Cooling **0,00** L/s
Design Heating **0,00** L/s
Energy Analysis **0,00** L/s
Infiltration occurs at all hours.

6. Floors:

Type **Floor Above Unconditioned Space**
Floor Area **11,0** m²
Total Floor U-Value **1,000** W/(m²·K)
Unconditioned Space Max Temp. **30,0** °C
Ambient at Space Max Temp. **35,0** °C
Unconditioned Space Min Temp. **4,0** °C
Ambient at Space Min Temp. **2,0** °C

7. Partitions:

(No partition data).

2.4. People:

Occupancy **2,0** People
Activity Level **Office Work**
Sensible **71,8** W/person
Latent **60,1** W/person
Schedule **24h SCH**

2.5. Miscellaneous Loads:

Sensible **0** W
Schedule **24h SCH**
Latent **0** W
Schedule **24h SCH**

Air System Sizing Summary for FC06 CPE HCPA CENTRO

Project Name: HCPA CPE 17.10.2020
Prepared by: IAQ Projetos de Engenharia Ltda

11/01/2020
10:16

Air System Information

Air System Name **FC06 CPE HCPA CENTRO**
Equipment Class **CW AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **121,0** m²
Location **Porto Alegre, Brazil**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone L/s Sizing **Sum of space airflow rates**
Space L/s Sizing **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load **22,7** kW
Sensible coil load **18,6** kW
Coil L/s at Jan 1600 **1702** L/s
Max block L/s **1702** L/s
Sum of peak zone L/s **1702** L/s
Sensible heat ratio **0,818**
L/(s kW) **75,1**
m²/kW **5,3**
W/m² **187,4**
Water flow @ 9,0 K rise **0,60** L/s

Load occurs at **Jan 1600**
OA DB / WB **34,7 / 24,4** °C
Entering DB / WB **24,2 / 18,5** °C
Leaving DB / WB **15,1 / 14,6** °C
Coil ADP **14,1** °C
Bypass Factor **0,100**
Resulting RH **60** %
Design supply temp. **14,0** °C
Zone T-stat Check **0 of 1** OK
Max zone temperature deviation **0,0** K

Supply Fan Sizing Data

Actual max L/s **1702** L/s
Standard L/s **1701** L/s
Actual max L/(s·m²) **14,07** L/(s·m²)

Fan motor BHP **0,00** BHP
Fan motor kW **0,00** kW
Fan static **0** Pa

Outdoor Ventilation Air Data

Design airflow L/s **188** L/s
L/(s·m²) **1,55** L/(s·m²)

L/s/person **7,50** L/s/person

Ventilation Sizing Summary for FC06 CPE HCPA CENTRO

Project Name: HCPA CPE 17.10.2020
 Prepared by: IAQ Projetos de Engenharia Ltda

11/01/2020
 10:16

1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
 Design Ventilation Airflow Rate **188** L/s

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
Zone 1									
CT1.12	1	17,0	4,0	161,6	7,50	0,00	0,0	0,0	30,0
CT1.13	1	12,0	4,0	153,5	7,50	0,00	0,0	0,0	30,0
CT1.16	1	66,0	7,0	1009,6	7,50	0,00	0,0	0,0	52,5
CT1.18	2	10,0	4,0	150,3	7,50	0,00	0,0	0,0	30,0
CT1.17	1	6,0	2,0	76,7	7,50	0,00	0,0	0,0	15,0
Totals (incl. Space Multipliers)				1701,9					187,5

Air System Sizing Summary for FC06 CPE HCPA NE

Project Name: HCPA CPE 17.10.2020
Prepared by: IAQ Projetos de Engenharia Ltda

11/01/2020
10:16

Air System Information

Air System Name **FC06 CPE HCPA NE**
Equipment Class **CW AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **231,0** m²
Location **Porto Alegre, Brazil**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone L/s Sizing **Sum of space airflow rates**
Space L/s Sizing **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load **69,9** kW
Sensible coil load **53,4** kW
Coil L/s at Dec 1400 **5223** L/s
Max block L/s **5223** L/s
Sum of peak zone L/s **5223** L/s
Sensible heat ratio **0,763**
L/(s kW) **74,7**
m²/kW **3,3**
W/m² **302,7**
Water flow @ 9,0 K rise **1,86** L/s

Load occurs at **Dec 1400**
OA DB / WB **34,2 / 24,4** °C
Entering DB / WB **23,4 / 18,4** °C
Leaving DB / WB **15,0 / 14,5** °C
Coil ADP **14,0** °C
Bypass Factor **0,100**
Resulting RH **64** %
Design supply temp. **14,0** °C
Zone T-stat Check **1 of 1** OK
Max zone temperature deviation **0,0** K

Supply Fan Sizing Data

Actual max L/s **5223** L/s
Standard L/s **5222** L/s
Actual max L/(s·m²) **22,61** L/(s·m²)

Fan motor BHP **0,00** BHP
Fan motor kW **0,00** kW
Fan static **0** Pa

Outdoor Ventilation Air Data

Design airflow L/s **405** L/s
L/(s·m²) **1,75** L/(s·m²)

L/s/person **7,50** L/s/person

Ventilation Sizing Summary for FC06 CPE HCPA NE

Project Name: HCPA CPE 17.10.2020
Prepared by: IAQ Projetos de Engenharia Ltda

11/01/2020
10:16

1. Summary

Ventilation Sizing Method Sum of Space OA Airflows
Design Ventilation Airflow Rate 405 L/s

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
Zone 1									
CT1.24	1	43,0	8,0	635,2	7,50	0,00	0,0	0,0	60,0
CT1.23	1	15,0	4,0	529,7	7,50	0,00	0,0	0,0	30,0
CT1.22	1	10,0	1,0	140,6	7,50	0,00	0,0	0,0	7,5
CT1.1	1	15,0	4,0	1339,3	7,50	0,00	0,0	0,0	30,0
CT1.2	1	17,0	4,0	459,8	7,50	0,00	0,0	0,0	30,0
CT1.3	1	25,0	7,0	469,9	7,50	0,00	0,0	0,0	52,5
CT1.4	1	7,0	3,0	191,4	7,50	0,00	0,0	0,0	22,5
CT1.11	1	13,0	1,0	88,8	7,50	0,00	0,0	0,0	7,5
CT1.5	1	11,0	3,0	342,4	7,50	0,00	0,0	0,0	22,5
CT1.6	1	17,0	4,0	362,3	7,50	0,00	0,0	0,0	30,0
CT1.7	1	12,0	3,0	193,5	7,50	0,00	0,0	0,0	22,5
CT1.8	1	5,0	1,0	68,3	7,50	0,00	0,0	0,0	7,5
CT1.9	1	11,0	2,0	84,9	7,50	0,00	0,0	0,0	15,0
CT1.10	1	10,0	2,0	23,5	7,50	0,00	0,0	0,0	15,0
CT1.21	1	4,0	1,0	66,7	7,50	0,00	0,0	0,0	7,5
CT1.18	1	10,0	4,0	150,3	7,50	0,00	0,0	0,0	30,0
CT1.17	1	6,0	2,0	76,7	7,50	0,00	0,0	0,0	15,0
Totals (incl. Space Multipliers)				5223,4					405,0

Air System Sizing Summary for FC06 CPE HCPA NE final

Project Name: HCPA CPE 17.10.2020
Prepared by: IAQ Projetos de Engenharia Ltda

11/01/2020
10:16

Air System Information

Air System Name **FC06 CPE HCPA NE final**
Equipment Class **CW AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **86,0** m²
Location **Porto Alegre, Brazil**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone L/s Sizing **Sum of space airflow rates**
Space L/s Sizing **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load **17,8** kW
Sensible coil load **14,7** kW
Coil L/s at Jan 1500 **1355** L/s
Max block L/s **1355** L/s
Sum of peak zone L/s **1355** L/s
Sensible heat ratio **0,824**
L/(s kW) **76,0**
m²/kW **4,8**
W/m² **207,4**
Water flow @ 9,0 K rise **0,47** L/s

Load occurs at **Jan 1500**
OA DB / WB **35,0 / 24,4** °C
Entering DB / WB **24,1 / 18,4** °C
Leaving DB / WB **15,1 / 14,6** °C
Coil ADP **14,1** °C
Bypass Factor **0,100**
Resulting RH **60** %
Design supply temp. **14,0** °C
Zone T-stat Check **1 of 1** OK
Max zone temperature deviation **0,0** K

Supply Fan Sizing Data

Actual max L/s **1355** L/s
Standard L/s **1355** L/s
Actual max L/(s·m²) **15,76** L/(s·m²)

Fan motor BHP **0,00** BHP
Fan motor kW **0,00** kW
Fan static **0** Pa

Outdoor Ventilation Air Data

Design airflow L/s **143** L/s
L/(s·m²) **1,66** L/(s·m²)

L/s/person **7,50** L/s/person

Ventilation Sizing Summary for FC06 CPE HCPA NE final

Project Name: HCPA CPE 17.10.2020
Prepared by: IAQ Projetos de Engenharia Ltda

11/01/2020
10:16

1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **143** L/s

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
Zone 1									
CT1.10	1	10,0	2,0	23,5	7,50	0,00	0,0	0,0	15,0
CT1.11	1	13,0	1,0	88,8	7,50	0,00	0,0	0,0	7,5
CT1.4	1	7,0	3,0	191,4	7,50	0,00	0,0	0,0	22,5
CT1.5	1	11,0	3,0	342,4	7,50	0,00	0,0	0,0	22,5
CT1.6	1	17,0	4,0	362,3	7,50	0,00	0,0	0,0	30,0
CT1.7	1	12,0	3,0	193,5	7,50	0,00	0,0	0,0	22,5
CT1.8	1	5,0	1,0	68,3	7,50	0,00	0,0	0,0	7,5
CT1.9	1	11,0	2,0	84,9	7,50	0,00	0,0	0,0	15,0
Totals (incl. Space Multipliers)				1355,3					142,5

Air System Sizing Summary for FC06 GERAL

Project Name: HCPA CPE 17.10.2020
Prepared by: IAQ Projetos de Engenharia Ltda

11/01/2020
10:16

Air System Information

Air System Name **FC06 GERAL**
Equipment Class **CW AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **373,0** m²
Location **Porto Alegre, Brazil**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone L/s Sizing **Sum of space airflow rates**
Space L/s Sizing **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load **96,6** kW
Sensible coil load **74,7** kW
Coil L/s at Dec 1500 **7047** L/s
Max block L/s **7047** L/s
Sum of peak zone L/s **7047** L/s
Sensible heat ratio **0,773**
L/(s kW) **73,0**
m²/kW **3,9**
W/m² **259,0**
Water flow @ 9,0 K rise **2,57** L/s

Load occurs at **Dec 1500**
OA DB / WB **34,4 / 24,4** °C
Entering DB / WB **23,5 / 18,3** °C
Leaving DB / WB **14,8 / 14,3** °C
Coil ADP **13,8** °C
Bypass Factor **0,100**
Resulting RH **62** %
Design supply temp. **14,0** °C
Zone T-stat Check **1 of 1** OK
Max zone temperature deviation **0,0** K

Supply Fan Sizing Data

Actual max L/s **7047** L/s
Standard L/s **7045** L/s
Actual max L/(s·m²) **18,89** L/(s·m²)

Fan motor BHP **0,00** BHP
Fan motor kW **0,00** kW
Fan static **0** Pa

Outdoor Ventilation Air Data

Design airflow L/s **618** L/s
L/(s·m²) **1,66** L/(s·m²)

L/s/person **7,63** L/s/person

Ventilation Sizing Summary for FC06 GERAL

Project Name: HCPA CPE 17.10.2020
Prepared by: IAQ Projetos de Engenharia Ltda

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10:16

1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **618 L/s**

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
Zone 1									
CT1.1	1	15,0	4,0	1339,3	7,50	0,00	0,0	0,0	30,0
CT1.2	1	17,0	4,0	459,8	7,50	0,00	0,0	0,0	30,0
CT1.3	1	25,0	7,0	469,9	7,50	0,00	0,0	0,0	52,5
CT1.4	1	7,0	3,0	191,4	7,50	0,00	0,0	0,0	22,5
CT1.5	1	11,0	3,0	342,4	7,50	0,00	0,0	0,0	22,5
CT1.6	1	17,0	4,0	362,3	7,50	0,00	0,0	0,0	30,0
CT1.7	1	12,0	3,0	193,5	7,50	0,00	0,0	0,0	22,5
CT1.8	1	5,0	1,0	68,3	7,50	0,00	0,0	0,0	7,5
CT1.9	1	11,0	2,0	84,9	7,50	0,00	0,0	0,0	15,0
CT1.10	1	10,0	2,0	23,5	7,50	0,00	0,0	0,0	15,0
CT1.11	1	13,0	1,0	88,8	7,50	0,00	0,0	0,0	7,5
CT1.12	1	17,0	4,0	161,6	7,50	0,00	0,0	0,0	30,0
CT1.13	1	12,0	4,0	153,5	7,50	0,00	0,0	0,0	30,0
CT1.16	1	66,0	7,0	1009,6	7,50	0,00	0,0	0,0	52,5
CT1.17	1	6,0	2,0	76,7	7,50	0,00	0,0	0,0	15,0
CT1.18	1	10,0	4,0	150,3	7,50	0,00	0,0	0,0	30,0
CT1.21	1	4,0	1,0	66,7	7,50	0,00	0,0	0,0	7,5
CT1.22	1	10,0	1,0	140,6	7,50	0,00	0,0	0,0	7,5
CT1.23	1	15,0	4,0	529,7	7,50	0,00	0,0	0,0	30,0
CT1.24	1	43,0	8,0	635,2	7,50	0,00	0,0	0,0	60,0
CT1.14	1	6,0	2,0	76,7	7,50	0,00	0,0	0,0	15,0
CT1.15	1	16,0	4,0	159,9	7,50	0,00	0,0	0,0	30,0
CT1.19	1	10,0	3,0	143,5	7,50	0,00	0,0	0,0	22,5
CT1.20	1	6,0	2,0	23,4	7,50	0,00	0,0	0,0	15,0
CT2.25	1	9,0	1,0	95,3	0,00	1,97	0,0	0,0	17,7
Totals (incl. Space Multipliers)				7046,8					617,7

Air System Sizing Summary for FC1 CPE 3º RAMAL 1 2 3

Project Name: HCPA CPE 17.10.2020
Prepared by: IAQ Projetos de Engenharia Ltda

11/01/2020
10:16

Air System Information

Air System Name **FC1 CPE 3º RAMAL 1 2 3**
Equipment Class **CW AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **190,0** m²
Location **Porto Alegre, Brazil**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone L/s Sizing **Sum of space airflow rates**
Space L/s Sizing **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load **42,4** kW
Sensible coil load **31,3** kW
Coil L/s at Dec 1700 **2801** L/s
Max block L/s **2801** L/s
Sum of peak zone L/s **2801** L/s
Sensible heat ratio **0,737**
L/(s kW) **66,0**
m²/kW **4,5**
W/m² **223,4**
Water flow @ 9,0 K rise **1,13** L/s

Load occurs at **Dec 1700**
OA DB / WB **33,5 / 24,2** °C
Entering DB / WB **24,1 / 18,8** °C
Leaving DB / WB **14,8 / 14,4** °C
Coil ADP **13,8** °C
Bypass Factor **0,100**
Resulting RH **63** %
Design supply temp. **14,0** °C
Zone T-stat Check **1 of 1** OK
Max zone temperature deviation **0,0** K

Supply Fan Sizing Data

Actual max L/s **2801** L/s
Standard L/s **2800** L/s
Actual max L/(s·m²) **14,74** L/(s·m²)

Fan motor BHP **0,00** BHP
Fan motor kW **0,00** kW
Fan static **0** Pa

Outdoor Ventilation Air Data

Design airflow L/s **374** L/s
L/(s·m²) **1,97** L/(s·m²)

L/s/person **3,94** L/s/person

Ventilation Sizing Summary for FC1 CPE 3º RAMAL 1 2 3

Project Name: HCPA CPE 17.10.2020
Prepared by: IAQ Projetos de Engenharia Ltda

11/01/2020
10:16

1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **374** L/s

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
Zone 1									
CT2.23	1	115,0	25,0	1468,2	0,00	1,97	0,0	0,0	226,6
CT2.24	1	75,0	70,0	1333,0	0,00	1,97	0,0	0,0	147,8
Totals (incl. Space Multipliers)				2801,2					374,3

Air System Sizing Summary for FC1 CPE 3º RAMAL 4

Project Name: HCPA CPE 17.10.2020
Prepared by: IAQ Projetos de Engenharia Ltda

11/01/2020
10:16

Air System Information

Air System Name **FC1 CPE 3º RAMAL 4**
Equipment Class **CW AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **104,0** m²
Location **Porto Alegre, Brazil**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone L/s Sizing **Sum of space airflow rates**
Space L/s Sizing **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load **33,4** kW
Sensible coil load **27,4** kW
Coil L/s at Jan 1700 **2639** L/s
Max block L/s **2639** L/s
Sum of peak zone L/s **2639** L/s
Sensible heat ratio **0,820**
L/(s kW) **78,9**
m²/kW **3,1**
W/m² **321,6**
Water flow @ 9,0 K rise **0,89** L/s

Load occurs at **Jan 1700**
OA DB / WB **34,1 / 24,2** °C
Entering DB / WB **23,9 / 18,5** °C
Leaving DB / WB **15,3 / 14,8** °C
Coil ADP **14,3** °C
Bypass Factor **0,100**
Resulting RH **61** %
Design supply temp. **14,0** °C
Zone T-stat Check **0 of 1** OK
Max zone temperature deviation **0,2** K

Supply Fan Sizing Data

Actual max L/s **2639** L/s
Standard L/s **2638** L/s
Actual max L/(s·m²) **25,37** L/(s·m²)

Fan motor BHP **0,00** BHP
Fan motor kW **0,00** kW
Fan static **0** Pa

Outdoor Ventilation Air Data

Design airflow L/s **214** L/s
L/(s·m²) **2,06** L/(s·m²)

L/s/person **8,93** L/s/person

Ventilation Sizing Summary for FC1 CPE 3º RAMAL 4

Project Name: HCPA CPE 17.10.2020
Prepared by: IAQ Projetos de Engenharia Ltda

11/01/2020
10:16

1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **214 L/s**

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
Zone 1									
CT2.1	1	5,0	2,0	234,0	7,50	0,00	0,0	0,0	15,0
CT2.2	1	40,0	5,0	1126,0	0,00	1,67	0,0	0,0	66,8
CT2.3	1	4,0	2,0	79,5	7,50	0,00	0,0	0,0	15,0
CT2.4	1	8,0	3,0	221,4	7,50	0,00	0,0	0,0	22,5
CT2.5	1	8,0	4,0	229,4	7,50	0,00	0,0	0,0	30,0
CT2.6	1	30,0	6,0	656,4	0,00	1,67	0,0	0,0	50,1
CT2.7	1	9,0	2,0	91,9	7,50	0,00	0,0	0,0	15,0
Totals (incl. Space Multipliers)				2638,7					214,4

Air System Sizing Summary for FC2 I2 I3 I5 R2 R3 R5

Project Name: HCPA CPE 17.10.2020
Prepared by: IAQ Projetos de Engenharia Ltda

11/01/2020
10:16

Air System Information

Air System Name **FC2 I2 I3 I5 R2 R3 R5**
Equipment Class **CW AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **168,0** m²
Location **Porto Alegre, Brazil**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone L/s Sizing **Sum of space airflow rates**
Space L/s Sizing **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load **27,6** kW
Sensible coil load **21,0** kW
Coil L/s at Feb 1600 **1728** L/s
Max block L/s **1728** L/s
Sum of peak zone L/s **1728** L/s
Sensible heat ratio **0,761**
L/(s kW) **62,7**
m²/kW **6,1**
W/m² **164,2**
Water flow @ 9,0 K rise **0,73** L/s

Load occurs at **Feb 1600**
OA DB / WB **34,7 / 24,4** °C
Entering DB / WB **24,9 / 18,9** °C
Leaving DB / WB **14,8 / 14,3** °C
Coil ADP **13,7** °C
Bypass Factor **0,100**
Resulting RH **61** %
Design supply temp. **14,0** °C
Zone T-stat Check **1 of 1** OK
Max zone temperature deviation **0,0** K

Supply Fan Sizing Data

Actual max L/s **1728** L/s
Standard L/s **1728** L/s
Actual max L/(s·m²) **10,29** L/(s·m²)

Fan motor BHP **0,00** BHP
Fan motor kW **0,00** kW
Fan static **0** Pa

Outdoor Ventilation Air Data

Design airflow L/s **331** L/s
L/(s·m²) **1,97** L/(s·m²)

L/s/person **10,03** L/s/person

Ventilation Sizing Summary for FC2 I2 I3 I5 R2 R3 R5

Project Name: HCPA CPE 17.10.2020
Prepared by: IAQ Projetos de Engenharia Ltda

11/01/2020
10:16

1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **331** L/s

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
Zone 1									
CT2.21	1	40,0	8,0	726,3	0,00	1,97	0,0	0,0	78,8
CT2.22	1	128,0	25,0	1002,1	0,00	1,97	0,0	0,0	252,2
Totals (incl. Space Multipliers)				1728,4					331,0

Air System Sizing Summary for FC2 CPE 3º HCPA I1 - R1

Project Name: HCPA CPE 17.10.2020
Prepared by: IAQ Projetos de Engenharia Ltda

11/01/2020
10:16

Air System Information

Air System Name **FC2 CPE 3º HCPA I1 - R1**
Equipment Class **CW AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **106,0** m²
Location **Porto Alegre, Brazil**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone L/s Sizing **Sum of space airflow rates**
Space L/s Sizing **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load **22,6** kW
Sensible coil load **17,6** kW
Coil L/s at Feb 1600 **1568** L/s
Max block L/s **1568** L/s
Sum of peak zone L/s **1568** L/s
Sensible heat ratio **0,778**
L/(s kW) **69,3**
m²/kW **4,7**
W/m² **213,5**
Water flow @ 9,0 K rise **0,60** L/s

Load occurs at **Feb 1600**
OA DB / WB **34,7 / 24,4** °C
Entering DB / WB **24,4 / 18,8** °C
Leaving DB / WB **15,1 / 14,6** °C
Coil ADP **14,1** °C
Bypass Factor **0,100**
Resulting RH **61** %
Design supply temp. **14,0** °C
Zone T-stat Check **0 of 1** OK
Max zone temperature deviation **0,0** K

Supply Fan Sizing Data

Actual max L/s **1568** L/s
Standard L/s **1567** L/s
Actual max L/(s·m²) **14,79** L/(s·m²)

Fan motor BHP **0,00** BHP
Fan motor kW **0,00** kW
Fan static **0** Pa

Outdoor Ventilation Air Data

Design airflow L/s **209** L/s
L/(s·m²) **1,97** L/(s·m²)

L/s/person **8,03** L/s/person

Ventilation Sizing Summary for FC2 CPE 3º HCPA I1 - R1

Project Name: HCPA CPE 17.10.2020
Prepared by: IAQ Projetos de Engenharia Ltda

11/01/2020
10:16

1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **209** L/s

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
Zone 1									
CT2.16	1	17,0	8,0	149,7	0,00	1,97	0,0	0,0	33,5
CT2.17	1	14,0	8,0	142,6	0,00	1,97	0,0	0,0	27,6
CT2.18	1	17,0	4,0	321,6	0,00	1,97	0,0	0,0	33,5
CT2.19	1	11,0	2,0	257,5	0,00	1,97	0,0	0,0	21,7
CT2.20	1	47,0	4,0	696,3	0,00	1,97	0,0	0,0	92,6
Totals (incl. Space Multipliers)				1567,7					208,8

Air System Sizing Summary for FC2 CPE 3º HCPA I4 - R4

Project Name: HCPA CPE 17.10.2020
Prepared by: IAQ Projetos de Engenharia Ltda

11/01/2020
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Air System Information

Air System Name **FC2 CPE 3º HCPA I4 - R4**
Equipment Class **CW AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **73,0** m²
Location **Porto Alegre, Brazil**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone L/s Sizing **Sum of space airflow rates**
Space L/s Sizing **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load **24,6** kW
Sensible coil load **20,5** kW
Coil L/s at Feb 1500 **1902** L/s
Max block L/s **1902** L/s
Sum of peak zone L/s **1902** L/s
Sensible heat ratio **0,835**
L/(s kW) **77,4**
m²/kW **3,0**
W/m² **336,6**
Water flow @ 9,0 K rise **0,65** L/s

Load occurs at **Feb 1500**
OA DB / WB **35,0 / 24,4** °C
Entering DB / WB **23,4 / 17,8** °C
Leaving DB / WB **14,4 / 13,9** °C
Coil ADP **13,4** °C
Bypass Factor **0,100**
Resulting RH **59** %
Design supply temp. **14,0** °C
Zone T-stat Check **1 of 1** OK
Max zone temperature deviation **0,0** K

Supply Fan Sizing Data

Actual max L/s **1902** L/s
Standard L/s **1902** L/s
Actual max L/(s·m²) **26,06** L/(s·m²)

Fan motor BHP **0,00** BHP
Fan motor kW **0,00** kW
Fan static **0** Pa

Outdoor Ventilation Air Data

Design airflow L/s **144** L/s
L/(s·m²) **1,97** L/(s·m²)

L/s/person **13,07** L/s/person

Ventilation Sizing Summary for FC2 CPE 3º HCPA I4 - R4

Project Name: HCPA CPE 17.10.2020
Prepared by: IAQ Projetos de Engenharia Ltda

11/01/2020
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1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **144** L/s

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
Zone 1									
CT2.8	1	7,0	1,0	75,2	0,00	1,97	0,0	0,0	13,8
CT2.9	1	8,0	2,0	85,3	0,00	1,97	0,0	0,0	15,8
CT2.10	1	5,0	1,0	70,4	0,00	1,97	0,0	0,0	9,9
CT2.11	1	13,0	1,0	344,2	0,00	1,97	0,0	0,0	25,6
CT2.12	1	10,0	2,0	191,8	0,00	1,97	0,0	0,0	19,7
CT2.13	1	7,0	1,0	279,5	0,00	1,97	0,0	0,0	13,8
CT2.14	1	12,0	2,0	411,8	0,00	1,97	0,0	0,0	23,6
CT2.15	1	11,0	1,0	444,2	0,00	1,97	0,0	0,0	21,7
Totals (incl. Space Multipliers)				1902,5					143,8

Design Weather Parameters & MSHGs

HCPA CPE 17.10.2020
IAQ Projetos de Engenharia Ltda

11/01/2020
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Design Parameters:

City Name **Porto Alegre**
 Location **Brazil**
 Latitude **-30,0** Deg.
 Longitude **51,2** Deg.
 Elevation **2,7** m
 Summer Design Dry-Bulb **35,0** °C
 Summer Coincident Wet-Bulb **24,4** °C
 Summer Daily Range **9,5** K
 Winter Design Dry-Bulb **4,4** °C
 Winter Design Wet-Bulb **0,9** °C
 Atmospheric Clearness Number **1,00**
 Average Ground Reflectance **0,20**
 Soil Conductivity **1,385** W/(m K)
 Local Time Zone (GMT +/- N hours) **3,0** hours
 Consider Daylight Savings Time **Não**
 Simulation Weather Data **N/A**
 Current Data is **2001 ASHRAE Handbook**
 Design Cooling Months **January to December**

Design Day Maximum Solar Heat Gains

(The MSHG values are expressed in W/m²)

Month	N	NNE	NE	ENE	E	ESE	SE	SSE	S
January	235,6	325,2	529,4	688,3	771,1	738,6	597,3	391,2	144,2
February	374,8	466,5	626,5	722,4	752,8	673,9	494,4	254,5	128,9
March	528,7	594,9	700,4	738,9	703,9	573,4	350,2	116,9	107,9
April	636,1	674,1	721,9	699,5	596,2	429,1	180,8	85,7	85,7
May	682,8	701,4	703,5	648,7	492,9	314,7	85,1	70,4	70,4
June	693,5	700,9	686,7	620,8	463,0	260,6	63,4	63,4	63,4
July	678,3	692,7	691,9	642,2	494,4	299,6	84,6	67,3	67,3
August	629,9	667,4	715,1	693,9	588,2	422,2	175,0	79,3	79,3
September	509,2	576,8	683,8	737,0	701,8	558,6	354,5	116,2	98,2
October	362,5	451,4	607,9	729,1	741,0	656,2	497,0	249,9	117,9
November	228,8	315,0	521,4	689,8	755,2	730,0	606,2	388,1	137,2
December	192,3	266,9	475,0	668,2	762,1	743,6	638,1	442,8	178,3
Month	SSW	SW	WSW	W	WNW	NW	NNW	HOR	Mult
January	395,3	599,5	729,5	768,4	693,4	524,8	323,6	980,0	1,00
February	261,7	486,5	664,5	755,4	732,8	623,7	465,3	920,2	1,00
March	118,9	343,6	572,1	707,1	733,7	700,8	595,3	812,5	1,00
April	85,7	193,6	424,4	587,8	706,2	715,7	671,0	650,5	1,00
May	70,4	93,9	295,1	509,2	648,8	704,2	696,5	524,7	1,00
June	63,4	63,4	249,6	468,4	619,0	691,3	698,8	470,3	1,00
July	67,3	83,7	301,4	492,8	642,2	690,7	693,4	510,1	1,00
August	79,3	180,5	421,2	581,5	696,9	713,1	666,4	630,0	1,00
September	111,0	356,5	570,7	692,6	733,3	684,7	576,2	790,2	1,00
October	239,8	495,6	669,4	741,4	722,3	616,7	455,5	898,8	1,00
November	378,4	602,0	739,1	765,6	677,2	527,1	320,5	968,3	1,00
December	439,3	630,5	754,2	766,4	664,9	480,9	268,5	991,3	1,00

Mult. = User-defined solar multiplier factor.

Cooling Design Temperature Profiles

HCPA CPE 17.10.2020
IAQ Projetos de Engenharia Ltda

11/01/2020
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Location: Porto Alegre, Brazil

(Dry and Wet Bulb temperatures are expressed in °C)

Hr	January		February		March		April		May		June	
	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB
0000	27,2	22,3	27,2	22,3	26,1	21,7	25,0	21,1	22,8	19,9	21,7	18,7
0100	26,7	22,2	26,7	22,2	25,6	21,6	24,5	21,0	22,3	19,8	21,2	18,5
0200	26,3	22,1	26,3	22,1	25,1	21,4	24,0	20,8	21,8	19,6	20,7	18,4
0300	25,9	21,9	25,9	21,9	24,8	21,3	23,7	20,7	21,4	19,5	20,3	18,2
0400	25,6	21,9	25,6	21,9	24,5	21,2	23,4	20,6	21,2	19,4	20,0	18,2
0500	25,5	21,8	25,5	21,8	24,4	21,2	23,3	20,6	21,1	19,4	19,9	18,1
0600	25,7	21,9	25,7	21,9	24,6	21,3	23,5	20,7	21,2	19,4	20,1	18,2
0700	26,2	22,0	26,2	22,0	25,1	21,4	23,9	20,8	21,7	19,6	20,6	18,3
0800	27,0	22,3	27,0	22,3	25,9	21,7	24,8	21,1	22,6	19,8	21,5	18,6
0900	28,3	22,6	28,3	22,6	27,1	22,0	26,0	21,4	23,8	20,2	22,7	19,0
1000	29,7	23,0	29,7	23,0	28,6	22,4	27,5	21,8	25,2	20,7	24,1	19,5
1100	31,3	23,5	31,3	23,5	30,2	22,9	29,1	22,3	26,9	21,1	25,7	20,0
1200	32,8	23,9	32,8	23,9	31,7	23,3	30,6	22,7	28,4	21,6	27,3	20,5
1300	34,0	24,2	34,0	24,2	32,8	23,6	31,7	23,1	29,5	21,9	28,4	20,8
1400	34,7	24,4	34,7	24,4	33,6	23,8	32,5	23,3	30,3	22,1	29,2	21,0
1500	35,0	24,4	35,0	24,4	33,9	23,9	32,8	23,3	30,6	22,2	29,4	21,1
1600	34,7	24,4	34,7	24,4	33,6	23,8	32,5	23,3	30,3	22,1	29,2	21,0
1700	34,1	24,2	34,1	24,2	32,9	23,6	31,8	23,1	29,6	22,0	28,5	20,8
1800	33,0	23,9	33,0	23,9	31,9	23,4	30,8	22,8	28,6	21,6	27,4	20,5
1900	31,8	23,6	31,8	23,6	30,7	23,0	29,5	22,4	27,3	21,3	26,2	20,1
2000	30,5	23,3	30,5	23,3	29,4	22,7	28,3	22,1	26,1	20,9	25,0	19,7
2100	29,5	23,0	29,5	23,0	28,4	22,4	27,3	21,8	25,0	20,6	23,9	19,4
2200	28,5	22,7	28,5	22,7	27,4	22,1	26,3	21,5	24,1	20,3	23,0	19,1
2300	27,8	22,5	27,8	22,5	26,7	21,9	25,6	21,3	23,3	20,1	22,2	18,9

Hr	July		August		September		October		November		December	
	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB
0000	21,1	18,1	22,2	18,7	23,9	20,5	24,4	20,5	25,5	21,1	26,7	22,3
0100	20,6	17,9	21,7	18,5	23,4	20,4	24,0	20,4	25,1	21,0	26,2	22,2
0200	20,1	17,8	21,3	18,4	22,9	20,2	23,5	20,2	24,6	20,8	25,7	22,1
0300	19,8	17,6	20,9	18,2	22,5	20,1	23,1	20,1	24,2	20,7	25,3	21,9
0400	19,5	17,5	20,6	18,2	22,3	20,0	22,8	20,0	23,9	20,6	25,0	21,9
0500	19,4	17,5	20,5	18,1	22,2	20,0	22,7	20,0	23,8	20,6	24,9	21,8
0600	19,6	17,6	20,7	18,2	22,4	20,0	22,9	20,0	24,0	20,7	25,1	21,9
0700	20,1	17,7	21,2	18,3	22,8	20,2	23,4	20,2	24,5	20,8	25,6	22,0
0800	20,9	18,0	22,0	18,6	23,7	20,4	24,2	20,5	25,4	21,1	26,5	22,3
0900	22,1	18,4	23,3	19,0	24,9	20,8	25,5	20,8	26,6	21,4	27,7	22,6
1000	23,6	18,9	24,7	19,5	26,3	21,2	26,9	21,2	28,0	21,8	29,1	23,0
1100	25,2	19,4	26,3	20,0	28,0	21,7	28,5	21,7	29,6	22,3	30,7	23,5
1200	26,7	19,9	27,8	20,5	29,5	22,2	30,0	22,2	31,1	22,7	32,3	23,9
1300	27,8	20,2	29,0	20,8	30,6	22,5	31,2	22,5	32,3	23,1	33,4	24,2
1400	28,6	20,5	29,7	21,0	31,4	22,7	31,9	22,7	33,0	23,3	34,2	24,4
1500	28,9	20,6	30,0	21,1	31,7	22,8	32,2	22,8	33,3	23,3	34,4	24,4
1600	28,6	20,5	29,7	21,0	31,4	22,7	31,9	22,7	33,0	23,3	34,2	24,4
1700	27,9	20,3	29,1	20,8	30,7	22,5	31,3	22,5	32,4	23,1	33,5	24,2
1800	26,9	19,9	28,0	20,5	29,7	22,2	30,2	22,2	31,3	22,8	32,4	23,9
1900	25,7	19,6	26,8	20,1	28,4	21,9	29,0	21,9	30,1	22,4	31,2	23,6
2000	24,4	19,2	25,5	19,7	27,2	21,5	27,8	21,5	28,9	22,1	30,0	23,3
2100	23,4	18,8	24,5	19,4	26,2	21,2	26,7	21,2	27,8	21,8	28,9	23,0
2200	22,4	18,5	23,5	19,1	25,2	20,9	25,8	20,9	26,9	21,5	28,0	22,7
2300	21,7	18,3	22,8	18,9	24,4	20,7	25,0	20,7	26,1	21,3	27,2	22,5

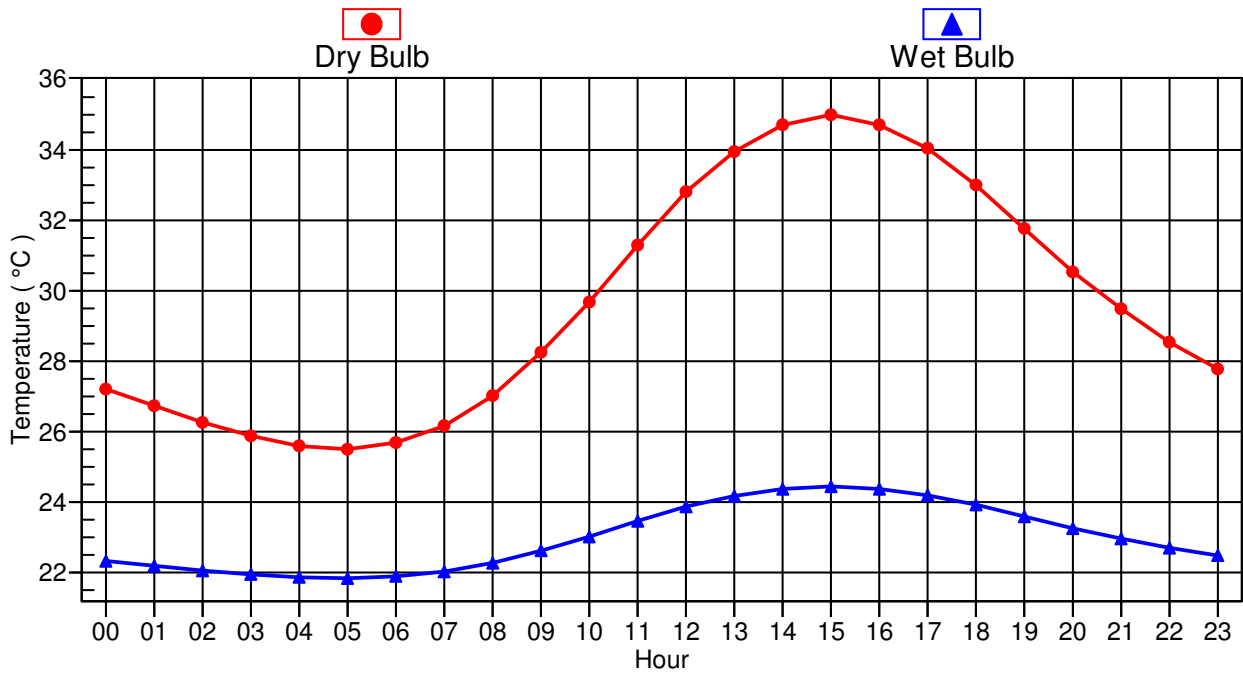
Design Temperature Profile

HCPA CPE 17.10.2020
IAQ Projetos de Engenharia Ltda

11/01/2020
10:17

Location: Porto Alegre, Brazil

Design Temperature Profiles for February



Design Solar Flux and Heat Gain Profiles

HCPA CPE 17.10.2020
IAQ Projetos de Engenharia Ltda

11/01/2020
10:17

Location: Porto Alegre, Brazil

Design Solar Fluxes for December

(Values for each exposure are expressed in W/m²)

Hour	N	NNE	NE	ENE	E	ESE	SE	SSE	
0000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0100	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0200	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0300	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0400	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0500	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0600	46,6	75,9	269,8	434,9	543,0	574,8	524,4	401,1	
0700	88,5	211,4	485,3	704,9	832,6	845,4	741,2	538,6	
0800	126,3	322,3	587,7	786,7	885,2	865,9	732,1	507,3	
0900	155,3	389,4	602,5	749,1	804,2	758,4	619,5	411,2	
1000	234,7	405,7	542,8	623,9	635,5	575,7	454,5	291,5	
1100	291,8	370,8	421,5	435,8	411,5	352,4	267,9	183,4	
1200	308,6	289,1	254,0	208,9	185,6	183,3	181,7	180,9	
1300	283,1	181,8	176,2	169,1	169,1	169,1	169,1	173,0	
1400	218,4	163,3	157,4	157,4	157,4	157,4	157,4	157,4	
1500	149,9	138,9	138,9	138,9	138,9	138,9	138,9	138,9	
1600	119,4	113,7	113,7	113,7	113,7	113,7	113,7	116,9	
1700	81,0	81,0	81,0	81,0	81,0	81,0	81,0	86,0	
1800	35,5	35,5	35,5	35,5	35,5	35,5	35,5	40,2	
1900	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
2000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
2100	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
2200	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
2300	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
Hour	S	SSW	SW	WSW	W	WNW	NW	NNW	HOR
0000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0100	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0200	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0300	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0400	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0500	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0600	226,6	51,9	46,6	46,6	46,6	46,6	46,6	46,6	172,7
0700	272,7	93,2	88,5	88,5	88,5	88,5	88,5	88,5	426,1
0800	229,5	119,5	119,5	119,5	119,5	119,5	119,5	119,5	661,7
0900	167,6	143,3	143,3	143,3	143,3	143,3	143,3	143,3	861,6
1000	170,4	160,4	160,4	160,4	160,4	160,4	160,4	167,6	1012,6
1100	178,6	175,1	170,7	170,7	170,7	175,9	179,7	196,9	1104,4
1200	180,9	181,8	183,5	185,9	213,6	258,0	291,7	309,5	1131,0
1300	177,3	195,4	307,2	400,6	461,1	478,8	451,0	382,1	1090,6
1400	168,0	317,0	491,4	618,0	676,0	655,8	560,8	406,6	985,8
1500	180,4	434,1	648,5	788,2	829,4	765,0	606,0	379,5	823,8
1600	241,3	521,1	744,9	874,6	887,3	780,9	574,2	302,5	615,2
1700	274,5	529,8	721,6	816,6	797,6	668,1	451,2	184,2	374,2
1800	189,6	328,2	424,3	460,9	431,4	341,1	206,0	49,4	120,9
1900	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2100	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2200	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2300	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

Design Solar Flux and Heat Gain Profiles

HCPA CPE 17.10.2020
IAQ Projetos de Engenharia Ltda

11/01/2020
10:17

Location: Porto Alegre, Brazil

Design Beam Solar Heat Gains for December

(Values for each exposure are expressed in W/m²)

Hour	N	NNE	NE	ENE	E	ESE	SE	SSE	
0000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0100	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0200	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0300	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0400	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0500	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0600	0,0	2,6	153,0	303,7	396,4	420,9	380,9	274,3	
0700	0,0	37,8	285,5	482,7	593,0	603,9	514,2	335,7	
0800	0,0	87,5	338,9	518,6	603,9	587,2	470,9	260,7	
0900	0,0	117,8	322,1	459,5	508,5	467,9	338,6	137,2	
1000	9,2	113,7	241,9	321,6	332,9	274,3	157,0	32,9	
1100	27,3	76,3	116,8	129,1	108,3	63,2	16,8	0,0	
1200	34,2	24,5	10,7	1,1	0,0	0,0	0,0	0,0	
1300	24,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
1400	5,7	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
1500	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
1600	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
1700	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
1800	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
1900	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
2000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
2100	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
2200	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
2300	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
Hour	S	SSW	SW	WSW	W	WNW	NW	NNW	HOR
0000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0100	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0200	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0300	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0400	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0500	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0600	110,5	0,0	0,0	0,0	0,0	0,0	0,0	0,0	56,0
0700	83,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	249,0
0800	25,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	460,6
0900	0,3	0,0	0,0	0,0	0,0	0,0	0,0	0,0	641,8
1000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	781,2
1100	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,4	861,1
1200	0,0	0,0	0,0	0,0	1,6	12,0	25,7	34,7	881,9
1300	0,0	0,4	36,1	100,9	153,4	169,9	144,3	86,2	849,8
1400	0,0	49,8	195,4	319,5	375,6	356,3	263,3	117,6	756,7
1500	2,1	163,5	371,8	499,1	535,2	478,5	331,1	114,1	607,1
1600	35,8	282,5	488,6	601,0	612,1	519,9	333,8	77,9	418,8
1700	94,9	338,4	506,4	587,4	571,7	460,0	264,9	27,9	203,9
1800	98,4	227,4	310,3	338,6	316,2	238,6	114,7	0,4	30,3
1900	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2100	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2200	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2300	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

Design Solar Flux and Heat Gain Profiles

HCPA CPE 17.10.2020
IAQ Projetos de Engenharia Ltda

11/01/2020
10:17

Location: Porto Alegre, Brazil

Design Diffuse Solar Heat Gains for December

(Values for each exposure are expressed in W/m²)

Hour	N	NNE	NE	ENE	E	ESE	SE	SSE	
0000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0100	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0200	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0300	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0400	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0500	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0600	37,9	44,3	55,7	68,6	78,5	81,6	76,7	65,7	
0700	72,0	85,9	103,2	120,7	132,3	133,6	123,9	107,1	
0800	102,7	116,6	133,9	149,6	158,1	156,4	145,0	128,2	
0900	126,4	139,0	152,8	163,8	168,2	164,5	154,0	140,3	
1000	144,1	153,2	161,7	167,2	168,1	163,9	156,1	146,9	
1100	154,9	159,1	162,0	162,9	161,4	158,1	153,7	149,2	
1200	158,1	157,1	155,3	153,2	151,0	149,1	147,8	147,1	
1300	153,3	147,9	143,3	137,6	137,6	137,6	137,6	140,7	
1400	140,9	132,8	128,1	128,1	128,1	128,1	128,1	128,1	
1500	121,9	113,0	113,0	113,0	113,0	113,0	113,0	113,0	
1600	97,2	92,5	92,5	92,5	92,5	92,5	92,5	95,1	
1700	65,9	65,9	65,9	65,9	65,9	65,9	65,9	70,0	
1800	28,9	28,9	28,9	28,9	28,9	28,9	28,9	32,7	
1900	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
2000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
2100	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
2200	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
2300	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
Hour	S	SSW	SW	WSW	W	WNW	NW	NNW	HOR
0000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0100	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0200	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0300	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0400	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0500	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0600	52,8	42,3	37,9	37,9	37,9	37,9	37,9	37,9	53,1
0700	89,3	75,8	72,0	72,0	72,0	72,0	72,0	72,0	83,0
0800	111,5	97,2	97,2	97,2	97,2	97,2	97,2	97,2	96,3
0900	127,4	116,6	116,6	116,6	116,6	116,6	116,6	116,6	103,2
1000	138,6	130,5	130,5	130,5	130,5	130,5	130,5	136,4	107,0
1100	145,3	142,4	138,8	138,8	138,8	143,1	146,2	150,3	108,9
1200	147,2	147,9	149,3	151,2	153,4	155,5	157,2	158,1	109,4
1300	144,3	149,0	154,5	159,6	163,2	164,3	162,6	158,6	108,6
1400	136,6	145,9	156,1	164,6	168,7	167,3	160,6	151,0	106,4
1500	124,5	138,3	152,9	163,7	167,1	161,8	149,8	135,0	102,1
1600	107,6	124,8	141,9	153,2	154,3	144,9	128,6	110,9	94,3
1700	83,4	100,9	117,1	126,0	124,1	112,3	95,0	78,3	78,8
1800	41,4	51,9	60,5	64,1	61,2	53,0	42,5	33,5	42,3
1900	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2100	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2200	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2300	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

Design Solar Flux and Heat Gain Profiles

HCPA CPE 17.10.2020
IAQ Projetos de Engenharia Ltda

11/01/2020
10:17

Location: Porto Alegre, Brazil

Design Total Solar Heat Gains for December

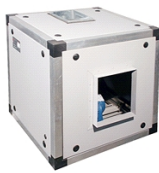
(Values for each exposure are expressed in W/m²)

Hour	N	NNE	NE	ENE	E	ESE	SE	SSE	
0000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0100	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0200	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0300	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0400	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0500	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
0600	37,9	46,9	208,7	372,2	474,9	502,5	457,6	340,0	
0700	72,0	123,7	388,7	603,5	725,4	737,5	638,1	442,8	
0800	102,7	204,1	472,8	668,2	762,1	743,6	616,0	388,9	
0900	126,4	256,8	475,0	623,3	676,7	632,4	492,7	277,5	
1000	153,3	267,0	403,6	488,9	501,0	438,2	313,2	179,9	
1100	182,2	235,4	278,8	292,0	269,8	221,3	170,5	149,2	
1200	192,3	181,5	166,1	154,3	151,0	149,1	147,8	147,1	
1300	177,3	147,9	143,4	137,6	137,6	137,6	137,6	140,7	
1400	146,6	132,8	128,1	128,1	128,1	128,1	128,1	128,1	
1500	121,9	113,0	113,0	113,0	113,0	113,0	113,0	113,0	
1600	97,2	92,5	92,5	92,5	92,5	92,5	92,5	95,1	
1700	65,9	65,9	65,9	65,9	65,9	65,9	65,9	70,0	
1800	28,9	28,9	28,9	28,9	28,9	28,9	28,9	32,7	
1900	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
2000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
2100	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
2200	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
2300	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
Hour	S	SSW	SW	WSW	W	WNW	NW	NNW	HOR
0000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0100	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0200	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0300	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0400	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0500	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
0600	163,3	42,3	37,9	37,9	37,9	37,9	37,9	37,9	109,1
0700	172,4	75,8	72,0	72,0	72,0	72,0	72,0	72,0	332,0
0800	137,1	97,2	97,2	97,2	97,2	97,2	97,2	97,2	556,9
0900	127,7	116,6	116,6	116,6	116,6	116,6	116,6	116,6	745,0
1000	138,6	130,5	130,5	130,5	130,5	130,5	130,5	136,4	888,2
1100	145,3	142,4	138,8	138,8	138,8	143,1	146,2	150,7	970,0
1200	147,2	147,9	149,3	151,2	155,0	167,5	182,9	192,8	991,3
1300	144,3	149,4	190,6	260,6	316,6	334,1	306,9	244,8	958,4
1400	136,6	195,8	351,5	484,1	544,3	523,5	423,9	268,5	863,1
1500	126,7	301,8	524,7	662,8	702,3	640,4	480,9	249,1	709,2
1600	143,4	407,3	630,5	754,2	766,4	664,9	462,3	188,8	513,0
1700	178,3	439,3	623,4	713,4	695,8	572,3	359,9	106,2	282,7
1800	139,9	279,3	370,8	402,7	377,4	291,5	157,2	34,0	72,6
1900	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2100	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2200	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2300	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0



GVS-SF ARRANJO 3

GVS-SF 12/9 ARR.3 CLI 1300rpm - 7.5cv 4POLOS 3-220/380V-60Hz



Gabinete de exaustão com ventilador do tipo sirocco, estrutura de perfis de alumínio, painéis de aço carbono galvanizado e pintado, com acionamento por transmissão marca S&P modelo GVS-SF 12/9 ARR.3 CLI 1300rpm - 7.5cv 4POLOS 3-220/380V-60Hz para uma vazão 10.714 m³/h e uma pressão estática 291 Pa.

Ponto de Operação Teórico

Vazão de Ar	10.870 m³/h
Pressão Estática	300 Pa
Temperatura	20 °C
Altitude	0 m
Densidade	1,2 kg/m³
Frequência	60 Hz

Ponto de Operação

Vazão de Ar	10.714 m³/h
Pressão Estática	291 Pa
Pressão Total	775 Pa
Velocidade de descarga	28,3 m/s
Rendimento Total	51,8 %
Velocidade do ventilador (rpm)	1300 rpm
Potência	6,05 cv
Fator de Serviço Req	10
Velocidade periférica	21,4 m/s

Construção

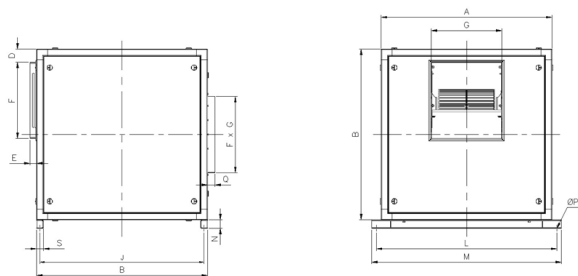
Peso

-

Características do Motor

Potência motor	7,5 hp
Número de Polos	4
Velocidade do motor (rpm)	1740 rpm
Grau de proteção	IP55
Classe do motor	F
Tensão	3-220/380V-60Hz
Corrente absorvida máxima	20,2 A / 11,7 A

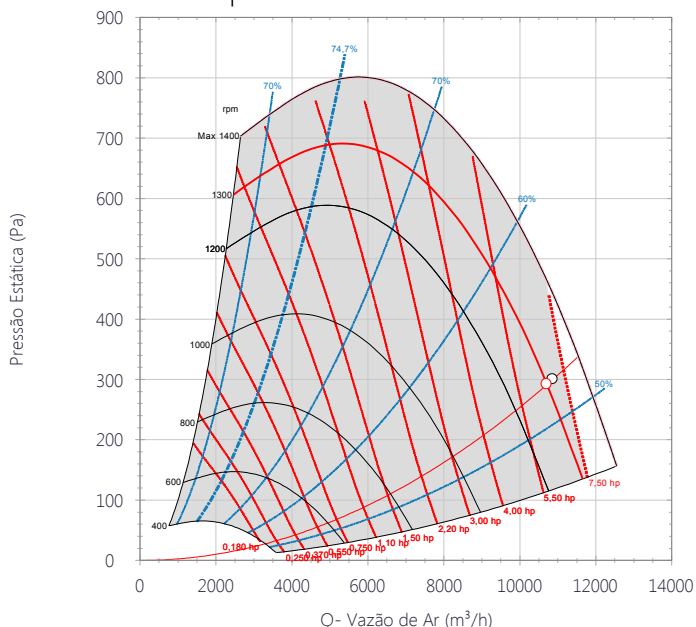
Desenho



A	B	D	E	F	G	H	J	L
710	800	70	30	341	309	786	764	760

M	N	ØP	Q	S
810	45	12	40	36

Gráfico de Desempenho



Desempenho de Ruído

	63	125	250	500	1k	2k	4k	8k	Global
Aspiração (LwA)	80	86	88	89	89	85	83	78	95
Aspiração LpA @ 1,5m	65	71	74	74	74	71	68	63	81
Descarga (LwA)	80	86	88	89	89	85	83	78	95
Descarga LpA @ 1,5m	65	71	74	74	74	71	68	63	81
Escape (LwA)	83	89	91	92	92	88	86	81	98
Escape LpA @ 1,5m	68	74	77	77	77	74	71	66	84





GVS-SF ARRANJO 3

GVS-SF 12/9 ARR.3 CL.I 1300rpm - 7.5cv 4POLOS 3-220/380V-60Hz

Alertas

Este esquema de dimensões pode não coincidir com o equipamento selecionado, especialmente com respeito à posição da descarga

MEMORIAL DESCRITIVO CLIMATIZAÇÃO

- PROJETO LABORATÓRIOS DE PESQUISA -
 - HOSPITAL DE CLINICAS PORTO ALEGRE RS –
 - CPE – PAVIMENTOS Térreo e 2
 - REVISÃO R01 -
-

Maio 2021

LOCAL: *HCPA - CPE*

ENDEREÇO: *Rua Ramiro Barcelos 2.350, Porto Alegre - RS, CEP: 90035-903*

RESPONSÁVEL TÉCNICO DO PROJETO:

Engº Timóteo Fernandes de Souza – CREA RS 122.869

CONTATOS: (51) 99122-0623 / 99773-7550

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1 INTRODUÇÃO

O presente memorial descritivo visa estabelecer orientações técnicas dos serviços serem realizados para as futuras acomodações do novo layout do HCPA-CPE.

Este baseia-se nas orientações dadas em reuniões no local juntamente com material do novo projeto arquitetônico a nós enviado via correio eletrônico.

Este memorial será apresentado e dividido conforme abaixo:

- 1) Relação de Pranchas;
- 2) Premissas de Cálculos;
- 3) Descrição Resumida do Sistema Adotado;
- 4) Especificações Técnicas dos Equipamentos;
- 5) Instalações, Montagens e Materiais.

1.1 1 RELAÇÃO DE PRANCHAS

Tabela 01

Pranchas - Descrição	Escala	Folha
HCPA-AC-PB-01-CPE-TER-PLB-02 A0 DEMOLIR	1:50	A0
HCPA-AC-PB-01-CPE-TER-PLB-02 A0 EXECUTAR	1:50	A0
HCPA-AC-PB-02-CPE-2PAV-PLB-02 A0 DEMOLIR	1:50	A0
HCPA-AC-PB-02-CPE-2PAV-PLB-02 A0 EXECUTAR	1:50	A0

2 PREMISSAS DE CÁLCULOS

- 2.1 FORAM CONSIDERADAS AS SEGUINTES NORMAS E RECOMENDAÇÕES PARA O DESENVOLVIMENTO DO PROJETO:
- 2.2 ABNT NBR 16101:2012- FILTROS PARA PARTÍCULAS EM SUSPENSÃO NO AR
- 2.3 ABNT NBR 16401-1 – INSTALAÇÕES DE AR CONDICIONADO – SISTEMAS CENTRAIS E UNITÁRIOS – PARTE 1: PROJETOS E INSTALAÇÕES

- 2.4 ABNT NBR16401-2 – INSTALAÇÕES DE AR CONDICIONADO – SISTEMAS CENTRAIS E UNITÁRIOS – PARTE 2: PARÂMETROS DE CONFORTO TÉRMICO
- 2.5 ABNT NBR 16401-3 – INSTALAÇÕES DE AR CONDICIONADO – SISTEMAS CENTRAIS E UNITÁRIOS – PARTE 3: QUALIDADE DO AR INTERIOR
- 2.6 ABNT NBR 5410 – INSTALAÇÕES ELÉTRICAS DE BAIXA TENSÃO
- 2.7 ABNT NBR 7256:2005 - TRATAMENTO DE AR EM ESTABELECIMENTOS ASSISTENCIAIS DE SAÚDE (EAS) - REQUISITOS PARA PROJETO E EXECUÇÃO DAS INSTALAÇÕES
- 2.8 ASHRAE – STANDARD 62.1 – VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY
- 2.9 NR-10 – SEGURANÇA EM INSTALAÇÕES E SERVIÇOS EM ELETRICIDADE.
- 2.10 SMACNA – HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE
- 2.11 SMACNA – SYSTEMS DUCT DESIGN

3 CONDIÇÕES ADOTADAS PARA O CÁLCULO

3.1 EXTERNAS

Cidade: Porto Alegre - RS;

Latitude: -30,0

Longitude: 51,2

(TBS) Temperatura de bulbo seco do ar = 35,0°C;

(TBU) Temperatura de bulbo úmido do ar = 24,4°C

3.2 INTERNAS

(TBS) Temperatura de bulbo seco do ar = 23°C +/- 1°C;

(UR) Umidade relativa do ar = +/-50% não controlada.

3.3 ILUMINAÇÃO

Considerou-se para os ambientes climatizados taxa média de 20W/m², conforme projeto luminotécnico a nós fornecidos.

3.4 EQUIPAMENTOS

Considerou-se para o ambiente, uma taxa média de 50W/m².

3.5 TAXA DE AR EXTERIOR (AE)

Baseando-se nas recomendações NBR 16401:2008-3, o volume de ar externo utilizado para o cálculo da carga térmica foi de 7,5 l/s/pessoa.

3.6 OCUPAÇÃO

A taxa de ocupação de pessoas foi adotada conforme informado na pasta técnica e informações contidas na norma NBR16.401 – 5,0 m²/pessoa –

3.7 COMUNICAÇÕES INTERNAS E EXTERNAS

Considerou-se que as portas que se comunicam com o exterior ou com ambientes não condicionados estejam normalmente fechadas e que o ar do ambiente entorno (circulação) estará climatizado pelo mesmo sistema.

3.8 PAREDES INTERNAS, EXTERNAS E TELHADOS

Foram considerados perdas de calor entre paredes e janelas externas.

3.9 RESULTADOS RESUMIDOS DO CÁLCULO DE CARGA TÉRMICA (VAZÕES)

Na tabela 02 temos a planilha das cargas térmicas em vazões de ar divididas por áreas.

Pavimento Térreo – FC6 e FC7

CARGA TÉRMICA	ÁREA (m ²)	POTÊNCIA (kW)	VAZÃO (m ³ /h)
1.1	15	18,7	2 x 2.400
1.2	17	5,5	2 x 850
1.3	25	6,3	2 x 850
1.4	7	2,6	1 x 700
1.5	11	4,0	2 x 600
1.6	17	4,5	2 x 650
1.7	12	2,6	1 x 700
1.8	5	0,9	1 x 500
1.9	11	1,4	2 x 500
1.10	10	0,7	1 x 500
1.11	9	1,1	1 x 500
1.12	17	2,6	1 x 600

1.13	12	2,5	1 x 600
1.14	6	1,3	1 x 500
1.15	16	2,6	2 x 500
1.16	66	11,4	4 x 700
1.17	6	1,3	1 x 500
1.18	10	2,5	1 x 400
1.19	10	2,2	1 x 500
1.20	6	0,7	1 x 500
1.21	4	0,9	1 x 400
1.22	10	1,6	1 x 500
1.23	15	21,8	1 x 1.500
1.24	43	8,1	2 x 600 1 x 1.200
1.25	9	1,4	1 x 1.500
TOTAL	369	96,6	27.300

Pavimento 2

FC1: I4 / R4 - Ramais de insuflamento e retorno, respectivamente.

CARGA TÉRMICA	ÁREA (m²)	POTÊNCIA (kW)	VAZÃO (m³/h)
2.1	5	2,8	1 x 850
2.2	40	13,5	4 x 1.000
2.3	4	1,4	1 x 350
2.4	8	3,1	1 x 800
2.5	8	3,5	1 x 800
2.6	30	8,6	2 x 1.150
2.7	9	1,6	1 x 400
TOTAL	104	34,5	9.500

FC2: I4 / R4 - Ramais de insuflamento e retorno, respectivamente.

2.8	7	1,3	1 x 500
2.9	8	1,5	1 x 350
2.10	5	1,1	1 x 300
2.11	13	4,3	2 x 650
2.12	10	2,7	1 x 650
2.13	7	3,4	1 x 900
2.14	12	5,4	1 x 1.400
2.15	11	5,4	1 x 1.400
TOTAL	73	25,1	6.800

- RESUMO DAS VAZÕES POR FANCOIL -

	RAMAL	VAZÃO ATUAL (m³/h)	VAZÃO NOVA (m³/h)	VAZÃO ADMISSÍVEL
FC1	1	2.800	2.800	(13.260-20.620)m³/h REF.: Mode. 39V25 Vortex Carrier
	2	6.000	5.400	
	3	2.800	2.800	
	4	5.900	9.500	
TOTAL		17.500	20.500	
FC2	1	5.100	5.600	(13.260-20.620)m³/h REF.: Mode. 39V25 Vortex Carrier
	2	3.300	3.000	
	3	3.300	3.000	
	4	4.200	6.800	
	5	2.100	2.100	
TOTAL		18.000	20.500	

RAMAL COM VAZÃO AJUSTADA

ob:

Ver notas técnicas nas pranchas do projeto.

4 DESCRIÇÃO RESUMIDA DOS SERVIÇOS A SEREM REALIZADOS

4.1 SISTEMA DE CLIMATIZAÇÃO

Serão reutilizados os equipamentos atuais do tipo “fan-coil”, conforme indicados e localizados nas pranchas do projeto, estes não são objeto desse memorial.

4.2 SISTEMA DE DUTOS DE AR

Os dutos deverão ser rearranjados conforme ilustrado as pranchas do projeto, seguindo a legenda identificado por cores, sendo:

-  Ciano: DUTOS A EXCLUIR;
-  Verde: DUTOS A EXECUTAR;
-  Magenta: DUTOS A MANTER.

4.3 DESMONTAGEM DOS DUTOS DE AR

Os dutos principais e ramais deverão ser desmontados cuidadosamente de maneira a não danificar ou deformar os dutos e ramais que serão reutilizados, estes deverão ser limpos e envolvidos com plásticos até a instalação das partes novas. Os dutos retirados deverão ser descartados, o instalador deverá preservar a limpeza dos ambientes envolvidos, ensacando e retirando todos os restos do isolamento térmico e elementos não utilizados pertinentes ao serviço.

4.4 SISTEMA DE MONTAGEM DOS DUTOS DE AR

A execução dos dutos obedecerá rigorosamente às normas estabelecidas na NBR-16.401 da ABNT, edição 2008, e as recomendações da ASHRAE (American Society of Heating Refrigerating and Air Conditioning Engineers) e da SMACNA.

Poderão ser fabricados de forma artesanal ou industrial, os dutos deverão ser totalmente estanques, deverão seguir de maneira fiel ao padrão de união atual.

A montagem dos troncos e ramais e a posição das bocas de distribuição de ar obedecerão aos desenhos e especificações.

Serão utilizadas chapas de aço galvanizado com procedência certificada e teor de zinco mínimo 250g/m² nas bitolas correspondentes a maior dimensão da seção transversal do duto, conforme exigido na norma NBR-16.401 da ABNT.

As junções laterais dos dutos deverão ser perfeitamente vedadas, sendo, para isso, executadas com chavetas em “S” ou “C”, de forma a se obter a estanqueidade necessária, o que igualmente deverá ser observado nas costuras internas.

Todas as junções e costuras deverão ter tratamento anticorrosivo a base de “primer”, rico em zinco com veículo epóxi.

Todos os joelhos e curvas de pequeno raio deverão ser dotados de veios defletores projetados e executados de acordo com as normas da ASHRAE ou da BUFALLO COMPANY.

Todas as derivações e mudança de direção deverão conter captosres internos de fabricação artesanal dispostos conforme projeto.

Os suportes de sustentação dos dutos deverão ser em perfis tratados contra a corrosão. As seções com largura maior que um metro, deverão ser reforçadas com cantoneiras de chapa #26 protegidas com aplicação de “primer”, anticorrosivo.

Todas as superfícies visíveis dos dutos, através das bocas de insuflamento de ar, devem ser pintadas com tinta, cor preta fosco.

Os colarinhos de ligação dos dutos com as aberturas de insuflação deverão possuir captosres para facilitar a saída do ar.

As ligações dos dutos com as bocas de descarga dos ventiladores do condicionador deverão ser feitas com conexões flexíveis de lona impermeáveis, fixas com flanges aparafusadas.

Todos os dutos, depois de construídos e montados, terão as costuras calafetadas, utilizando-se silicone asséptico, tipo Sicaflex ou equivalente.

As superfícies internas dos dutos devem ser lisas, eliminando-se assim, a possibilidade de acúmulo de resíduo.

Durante a montagem, deverão ser tomados cuidados especiais com a assepsia, procedendo-se a devida limpeza de componentes, antes da instalação e ao fechamento provisório, das aberturas, para impedir a penetração de sujeira nos trechos já concluídos.

Os dutos retangulares serão dobrados em “X”, para garantir melhoria da rigidez e deverão ter um trecho 50 cm de comprimento com conexões flangeadas em ambos os lados, pelo menos a cada 5m de extensão, para permitir a retirada, em caso de limpeza dos dutos.

As bitolas de chapas dos dutos convencionais estão listadas na tabela 04.

LADO MAIOR (cm)	BITOLA DE CHAPA	Peso (kg) aproximado por m ²
Até 30	#26 (0,50mm)	4,0
De 31 a 75	#24 (0,65mm)	5,2
De 76 a 140	#22 (0,80mm)	6,4
De 141 a 210	#20 (0,95mm)	7,6

Espessura de chapa p/ dimensão de duto.

4.5 MONTAGEM DO ISOLAMENTO TÉRMICO DOS DUTOS DE AR

Os dutos de insuflamento e retorno deverão ser isolados termicamente com manta de lã de vidro, sem aglutinante combustível e espessura mínima de 38mm, densidade média 25Kg/m², recoberta com papel aluminizado tipo Kraft com película de alumínio na face externa.

****É vedado o uso de poliestireno expandido (isopor® ou similar).**

O isolamento será colado aos dutos e o acabamento deverá ser com cantoneiras de plástico ou chapa galvanizada #26 de 1" de largura em toda sua extensão, deverá ser utilizado para junção do isolamento fita adesiva aluminizada, deve-se tomar muito cuidado na montagem para não haver trecho com isolamento rasgado ou faltando.

Na execução das curvas, deverão ser instalados veios internos, conforme tabela 05 abaixo:

LADO MAIOR (cm)	NÚMERO DE VEIOS
Até 29	Sem veios
De 30 a 69	01 veio
De 70 a 149	02 veios
De 150 a 210	03 veios

Número de veios conforme curvas.

Registros para controle de vazão tipo dâmpers de lâminas ou quadrantes "splitters", deverão ser colocados em ramais e bifurcações de dutos, conforme indicado nas pranchas do projeto.

Os dutos de ar isolados externamente não poderão ter descontinuidade no isolamento térmico e não poderão ter elementos de fixação da sustentação transpassando o isolamento.

Após a montagem dos dutos e condicionadores deverá ser realizado a regulagem final através dos registros para correção da vazão de ar e o correto balanceamento dos dispositivos conforme indicado no projeto.

A montagem dos difusores aos respectivos colarinhos deverá ser e forma a não permitir o vazamento de ar. A conexão deverá receber vedação tipo Veda Calha.

O anexo 2 apresenta o resultado do cálculo de dimensionamento do conjunto, calculado através do método de recuperação de pressão estática.

4.5.1 Difusores e grelhas de insuflamento e retorno

Todos os acessórios de distribuição de ar deverão ser fabricados em perfis de alumínio extrudado, anodizado na cor a ser definida na obra.

Referência TROPICAL AR e/ou similar equivalente em qualidade ou superior. Ver especificações dimensionais e detalhadas nas pranchas do projeto.

4.6- Equipamentos

Ventilador de retorno (VRET):

Deverão ser instalados no conjunto de dutos de retorno do pavimento térreo atendidos pelo “fan-coil” FC-06 dois gabinetes de ventilação modelo GVS-SF 12/9 ARR.3 CL.I 1300rpm - 7.5cv 4POLOS 3-220/380V-60Hz; vazão de insuflamento 10.870m³/h (cada), pressão 291Pa, disposto conforme projeto.

Ventilador ar exterior (VAE):

Deverá ser instalado no interior da casa de máquina acoplado ao duto de ar exterior existente um ventilador GVS-SF 12/9 ARR.3 CL.I 1300rpm - 7.5cv 4POLOS 3-220/380V-60Hz, vazão 1.860m³/h e pressão 50Pa disposto conforme projeto.

Os ventiladores deverão ser suportados e fixados através de suporte construído com cantoneiras metálicas de 1.1/2”.

4.7- Quadro de comando e força dos Ventiladores (QCF)

Deverá ser instalado um quadro de comando metálico dimensões 300x400x200mm (LxAxP) fabricante eletropoll ou similar. Este deverá ser composto por:

- 2 pç. – DISJUNTOR TRIPOLAR CURVA C - 25A - 5SX1 - SIEMENS;
- 1 pç. - DISJUNTOR MONOPOLAR CURVA C - 6A - 5SX1 – SIEMENS;
- 2pç - CONTATOR DE POTÊNCIA RT10 - 21A – SIEMENS;
- 1pç – CONTATOR DE POTÊNCIA RT10 – 5A – SIEMENS;

1pç- RELÊ DE SOBRECARGA 3RU11 - 17 ~ 22A – SIEMENS

1pç - RELÊ DE SOBRECARGA 3RU11 - 2,8 ~ 4A – SIEMENS

1pç - RELÊ FALTA E SEQUÊNCIA DE FASE 220V - WEG RMW17-FSF01D65

CABO FLEXÍVEL PARA INTERLIGAÇÃO COMANDO 1,5mm² COR PRETO;

CABO DE FORÇA TIPO PP 1kV – 4x 4,0mm² – IDENTIFICADO (3F+T);

CONECTORES, ETIQUETAS DE IDENTIFICAÇÃO E ACESSÓRIOS PARA CORRETA MONTAGEM E IDENTIFICAÇÃO DO QUADRO

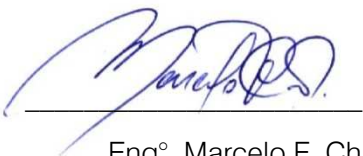
* o comando de liga/desliga dos três ventiladores deverá vir do contato NO da controladora principal do FC-06, ou seja, quando o “*fan-coil*” for acionado acionará de maneira automática os três ventiladores.

**Toda instalação deverá estar em conformidade a NBR5410.

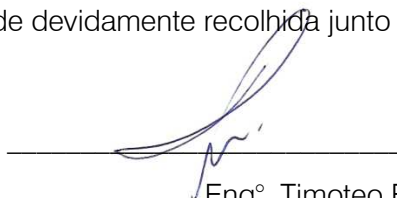
5 NOTAS TÉCNICAS

- 1- COMO TRATA-SE DE UM PROJETO PROPOSTA DE ADEQUAÇÃO DA REDE DE DUTOS, FAZ-SE NECESSÁRIO REALIZAR, MEDIANTE TÉCNICO ESPECIALIZADO; O BALANCEAMENTO DAS VAZÕES ATRAVÉS DO ACIONAMENTO MANUAL DE CAPTORES E DEFLETORES QUADRANTES;
- 2- EM FUNÇÃO DAS NOVAS CARGAS TÉRMICAS, FAZ-SE NECESSÁRIO O AJUSTE DAS VAZÕES DOS FANCOIL'S PARA ATENDER OS PADRÕES DESTE PROJETO, MEDIANTE AJUSTE DA ROTAÇÃO DO ROTOR, ATRAVÉS DA REGULAGEM DE POLIAS E CORREIAS E/OU SUBSTITUIÇÃO DESTAS;
- 3- DEVERÃO SER MANTIDAS TODAS AS GRELHAS DE RETORNO DE PORTA DE AMBIENTES QUE NÃO SOFRERAM ALTERAÇÃO DE LAYOUT;
- 4- PARA A INTERPRETAÇÃO GRÁFICA CORRETA, É IMPRESCINDÍVEL A IMPRESSÃO NO FORMATO COLORIDO, DESTA PROPOSTA DE PROJETO;

Deverá ser emitido um relatório final de entrega da obra, contemplando as vazões finais por difusores e emissão da ART de execução, assinada e devidamente recolhida junto ao CREA-RS.



Eng.º Marcelo F. Christini
CREA-RS 133.491
F. (51) 99773-7550



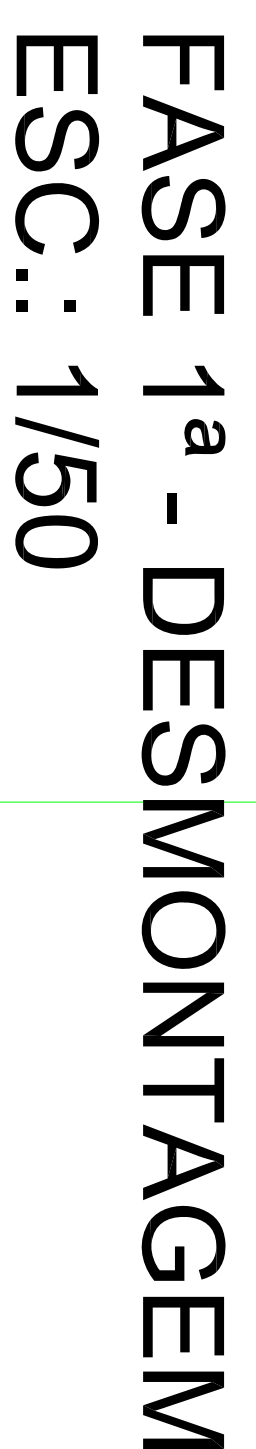
Eng.º Timoteo F. de Souza
CREA-RS 122.869
F. (51) 98122-0623

ANEXO – 1

- RESULTADOS CARGA TÉRMICA DOS AMBIENTES -

ANEXO – 2

- MEMÓRIA DE CÁLCULO DIMENSIONAMENTO DE DUTOS -
- RECUPERAÇÃO DE PRESSÃO ESTÁTICA-



CT		ÁREA	POTÊNCIA	VAZÃO
		[m³]	[kW]	[m³/s]
F064-PC2				
1.1	15	16.7	2+2.400	
1.2	17	5.5	2+4.650	
1.3	26	6.3	2+4.600	
1.4	7	2.6	1+700	
1.5	11	4.0	2+4.600	
1.6	17	4.5	2+4.650	
1.7	12	2.6	1+700	
1.8	5	0.9	1+500	
1.9	11	1.4	2+4.600	
1.10	10	0.7	1+600	
1.11	13	1.1	1+500	
1.12	17	2.6	1+600	
1.13	12	2.5	1+600	
1.14	6	1.3	1+500	
1.15	16	2.6	2+300	
1.16	66	11.4	4+700	
1.17	6	1.3	1+500	
1.18	10	2.5	1+400	
1.19	10	2.5	1+600	
1.20	6	0.7	1+300	
1.21	4	0.9	0	
1.22	10	1.6	1+400	
1.23	16	21.6	1+1.500	
1.24	43	6.1	2+600 1+4.000 1+1.000	
1.25	9	1.4	1+300	

[illegible]



TD-SILENT-127V-60HZ

5211856000 - TD-2000/315 SILENT (127V60HZ) BRA VZ - EXAUSTORES IN-LINE.

Ventiladores helicocentrífugos in-line de baixo perfil, **extremamente silenciosos**. Certificados pela "Noise Abatement Society" (Associação para a redução do ruído).

Corpomotor desmontável sem necessidade de manuseio dos dutos, caixa de bornes externa, motor de 2 velocidades, reguláveis por variação de tensão, IP44, classe F, com rotor exterior de injeção de alumínio, rolamentos de esfera de lubrificação permanente, condensador e protetor térmico incorporado.

Marca S&P modelo TD-2000/315 SILENT (127V60HZ) BRA VZ para a taxa de fluxo 1.888 m³/h e pressão estática 52 Pa.



Ponto de Operação Teórico

Vazão de Ar	1.860 m³/h
Pressão Estática	50 Pa
Temperatura	20 °C
Altitude	0 m
Densidade	1,2 kg/m³
Frequência	60 Hz

Ponto de Operação

Vazão de Ar	1.888 m³/h
Pressão Estática	52 Pa
Pressão Dinâmica	27,3 Pa
Pressão Total	79 Pa
Potência	0,466 cv
Velocidade de descarga	6,7 m/s
Velocidade do ventilador (rpm)	2860 rpm
Potência Específica do Ventilador	0,65 W/l/s

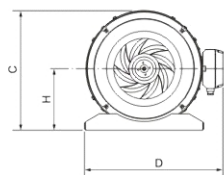
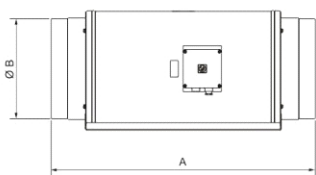
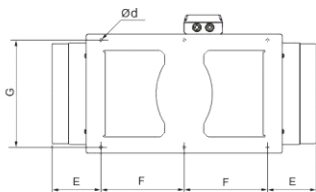
Construção

Diâmetro da boca de descarga	315 mm
Tamanho do ventilador	315
Peso	25,00 kg

Características do Motor

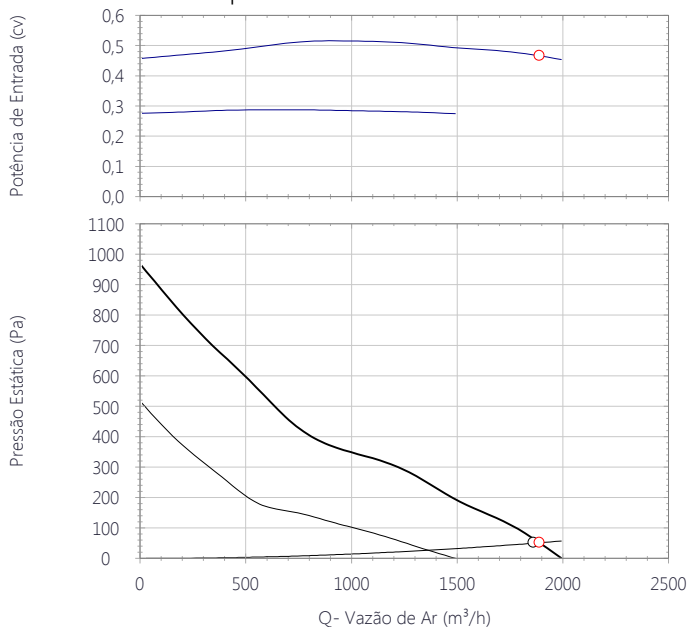
Número de Polos	2
Tensão	1-127V-60Hz
Corrente absorvida máxima	3,0 A
Grau de proteção	IP44
Classe do motor	F

Desenho



A	B	C	D	E	F	G	H
825	312	373	432	152	260	335	192

Gráfico de Desempenho





TD-SILENT-127V-60HZ

5211856000 - TD-2000/315 SILENT (127V60HZ) BRA VZ - EXAUSTORES IN-LINE.

Alertas

Este esquema de dimensões pode não coincidir com o equipamento selecionado, especialmente com respeito à posição da descarga