

Air System Sizing Summary for Perrera

Project Name: CargasCanera
Prepared by: ...

05/16/2021
11:02

Air System Information

Air System Name **Perrera**
Equipment Class **UNDEF**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **525.0** m²
Location **Palma de Mallorca, Spain**

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 **53.3** kW
Sensible coil load **53.3** kW
Coil L/s at Jul 1700 **4981** L/s
Max block L/s **4981** L/s
Sum of peak zone L/s **4981** L/s
Sensible heat ratio **1.000**
L/(s kW) **93.4**
m²/kW **9.8**
W/m² **101.6**
Water flow @ 5.6 K rise **2.30** L/s

Load occurs at **Jul 1700**
OA DB / WB **31.5 / 23.0** °C
Entering DB / WB **24.6 / 8.1** °C
Leaving DB / WB **15.7 / 3.6** °C
Coil ADP **14.8** °C
Bypass Factor **0.100**
Resulting RH **0** %
Design supply temp. **14.4** °C
Zone T-stat Check **1 of 1** OK
Max zone temperature deviation **0.0** K

Central Heating Coil Sizing Data

Max coil load **63.5** kW
Coil L/s at Des Htg **4981** L/s
Max coil L/s **4981** L/s
Water flow @ 11.1 K drop **1.37** L/s

Load occurs at **Des Htg**
W/m² **121.0**
Ent. DB / Lvg DB **17.4 / 28.0** °C

Supply Fan Sizing Data

Actual max L/s **4981** L/s
Standard L/s **4976** L/s
Actual max L/(s·m²) **9.49** 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 **0** L/s
L/(s·m²) **0.00** L/(s·m²)

L/s/person **0.00** L/s/person

Zone Sizing Summary for Perrera

Project Name: CargasCanera
Prepared by: ...

05/16/2021
11:02

Air System Information

Air System Name **Perrera**
Equipment Class **UNDEF**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **525.0** m²
Location **Palma de Mallorca, Spain**

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**

Zone Terminal Sizing Data

| Zone Name | Design Supply Airflow (L/s) | Minimum Supply Airflow (L/s) | Zone L/(s·m ²) | Reheat Coil Load (kW) | Reheat Coil Water L/s @ 11.1 K | Zone Htg Unit Coil Load (kW) | Zone Htg Unit Water L/s @ 11.1 K | Mixing Box Fan Airflow (L/s) |
|-----------|-----------------------------|------------------------------|----------------------------|-----------------------|--------------------------------|------------------------------|----------------------------------|------------------------------|
| Zone 1 | 4981 | 4981 | 9.49 | 0.0 | 0.00 | 0.0 | 0.00 | 0 |

Zone Peak Sensible Loads

| Zone Name | Zone Cooling Sensible (kW) | Time of Peak Sensible Cooling Load | Zone Heating Load (kW) | Zone Floor Area (m ²) |
|-----------|----------------------------|------------------------------------|------------------------|-----------------------------------|
| Zone 1 | 56.7 | Jul 1700 | 65.1 | 525.0 |

Space Loads and Airflows

| Zone Name / Space Name | Mult. | Cooling Sensible (kW) | Time of Peak Sensible Load | Air Flow (L/s) | Heating Load (kW) | Floor Area (m ²) | Space L/(s·m ²) |
|------------------------|-------|-----------------------|----------------------------|----------------|-------------------|------------------------------|-----------------------------|
| Zone 1 | | | | | | | |
| Perrera | 3 | 18.9 | Jul 1700 | 1660 | 21.7 | 175.0 | 9.49 |

Air System Design Load Summary for Perrera

Project Name: CargasCanera
Prepared by: ...

05/16/2021
11:02

| | DESIGN COOLING | | | DESIGN HEATING | | |
|------------------------------------|--|--------------|------------|--|--------------|------------|
| | COOLING DATA AT Jul 1700 | | | HEATING DATA AT DES HTG | | |
| | COOLING OA DB / WB 31.5 °C / 23.0 °C | | | HEATING OA DB / WB -0.6 °C / -3.2 °C | | |
| ZONE LOADS | Details | Sensible (W) | Latent (W) | Details | Sensible (W) | Latent (W) |
| Window & Skylight Solar Loads | 0 m ² | 0 | - | 0 m ² | - | - |
| Wall Transmission | 618 m ² | 41482 | - | 618 m ² | 37694 | - |
| Roof Transmission | 525 m ² | 3966 | - | 525 m ² | 2156 | - |
| Window Transmission | 0 m ² | 0 | - | 0 m ² | 0 | - |
| Skylight Transmission | 0 m ² | 0 | - | 0 m ² | 0 | - |
| Door Loads | 120 m ² | 1830 | - | 120 m ² | 5567 | - |
| Floor Transmission | 525 m ² | 0 | - | 525 m ² | 2145 | - |
| Partitions | 0 m ² | 0 | - | 0 m ² | 0 | - |
| Ceiling | 0 m ² | 0 | - | 0 m ² | 0 | - |
| Overhead Lighting | 0 W | 0 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 6714 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 20% / 20% | 9456 | 0 | 20% | 10855 | 0 |
| >> Total Zone Loads | - | 56733 | 0 | - | 65131 | 0 |
| Zone Conditioning | - | 53324 | 0 | - | 63501 | 0 |
| Plenum Wall Load | 0% | 0 | - | 0 | 0 | - |
| Plenum Roof Load | 0% | 0 | - | 0 | 0 | - |
| Plenum Lighting Load | 0% | 0 | - | 0 | 0 | - |
| Return Fan Load | 4981 L/s | 0 | - | 4981 L/s | 0 | - |
| Ventilation Load | 0 L/s | 0 | 0 | 0 L/s | 0 | 0 |
| Supply Fan Load | 4981 L/s | 0 | - | 4981 L/s | 0 | - |
| Space Fan Coil Fans | - | 0 | - | - | 0 | - |
| Duct Heat Gain / Loss | 0% | 0 | - | 0% | 0 | - |
| >> Total System Loads | - | 53324 | 0 | - | 63501 | 0 |
| Central Cooling Coil | - | 53324 | 0 | - | 0 | 0 |
| Central Heating Coil | - | 0 | - | - | 63501 | - |
| >> Total Conditioning | - | 53324 | 0 | - | 63501 | 0 |
| Key: | Positive values are clg loads Negative values are htg loads | | | Positive values are htg loads Negative values are clg loads | | |

System Psychrometrics for Perrera

Project Name: CargasCanera
Prepared by: ...

05/16/2021
11:02

July DESIGN COOLING DAY, 1700

TABLE 1: SYSTEM DATA

| Component | Location | Dry-Bulb Temp (°C) | Specific Humidity (kg/kg) | Airflow (L/s) | CO2 Level (ppm) | Sensible Heat (W) | Latent Heat (W) |
|----------------------|----------|--------------------|---------------------------|---------------|-----------------|-------------------|-----------------|
| Ventilation Air | Inlet | 31.5 | 0.01414 | 0 | 400 | 0 | 0 |
| Vent - Return Mixing | Outlet | 24.6 | 0.00000 | 4981 | 800 | - | - |
| Central Cooling Coil | Outlet | 15.7 | 0.00000 | 4981 | 800 | 53324 | 0 |
| Central Heating Coil | Outlet | 15.7 | 0.00000 | 4981 | 800 | 0 | - |
| Supply Fan | Outlet | 15.7 | 0.00000 | 4981 | 800 | 0 | - |
| Cold Supply Duct | Outlet | 15.7 | 0.00000 | 4981 | 800 | - | - |
| Zone Air | - | 24.6 | 0.00000 | 4981 | 800 | 53324 | 0 |
| Return Plenum | Outlet | 24.6 | 0.00000 | 4981 | 800 | 0 | - |

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.207; At site altitude = 1.206 W/(L/s-K)

Air Density x Heat of Vaporization x Conversion Factor: At sea level = 2947.6; At site altitude = 2944.8 W/(L/s)

Site Altitude = 7.9 m

TABLE 2: ZONE DATA

| Zone Name | Zone Sensible Load (W) | T-stat Mode | Zone Cond (W) | Zone Temp (°C) | Zone Airflow (L/s) | CO2 Level (ppm) | Terminal Heating Coil (W) | Zone Heating Unit (W) |
|-----------|------------------------|-------------|---------------|----------------|--------------------|-----------------|---------------------------|-----------------------|
| Zone 1 | 56733 | Cooling | 53324 | 24.6 | 4981 | 800 | 0 | 0 |

System Psychrometrics for Perrera

Project Name: CargasCanera
Prepared by: ...

05/16/2021
11:02

WINTER DESIGN HEATING

TABLE 1: SYSTEM DATA

| Component | Location | Dry-Bulb Temp (°C) | Specific Humidity (kg/kg) | Airflow (L/s) | CO2 Level (ppm) | Sensible Heat (W) | Latent Heat (W) |
|----------------------|----------|--------------------|---------------------------|---------------|-----------------|-------------------|-----------------|
| Ventilation Air | Inlet | -0.6 | 0.00181 | 0 | 400 | 0 | 0 |
| Vent - Return Mixing | Outlet | 17.4 | 0.00181 | 4981 | 800 | - | - |
| Central Cooling Coil | Outlet | 17.4 | 0.00181 | 4981 | 800 | 0 | 0 |
| Central Heating Coil | Outlet | 28.0 | 0.00181 | 4981 | 800 | 63501 | - |
| Supply Fan | Outlet | 28.0 | 0.00181 | 4981 | 800 | 0 | - |
| Cold Supply Duct | Outlet | 28.0 | 0.00181 | 4981 | 800 | - | - |
| Zone Air | - | 17.4 | 0.00181 | 4981 | 800 | -63501 | 0 |
| Return Plenum | Outlet | 17.4 | 0.00181 | 4981 | 800 | 0 | - |

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.207; At site altitude = 1.206 W/(L/s-K)

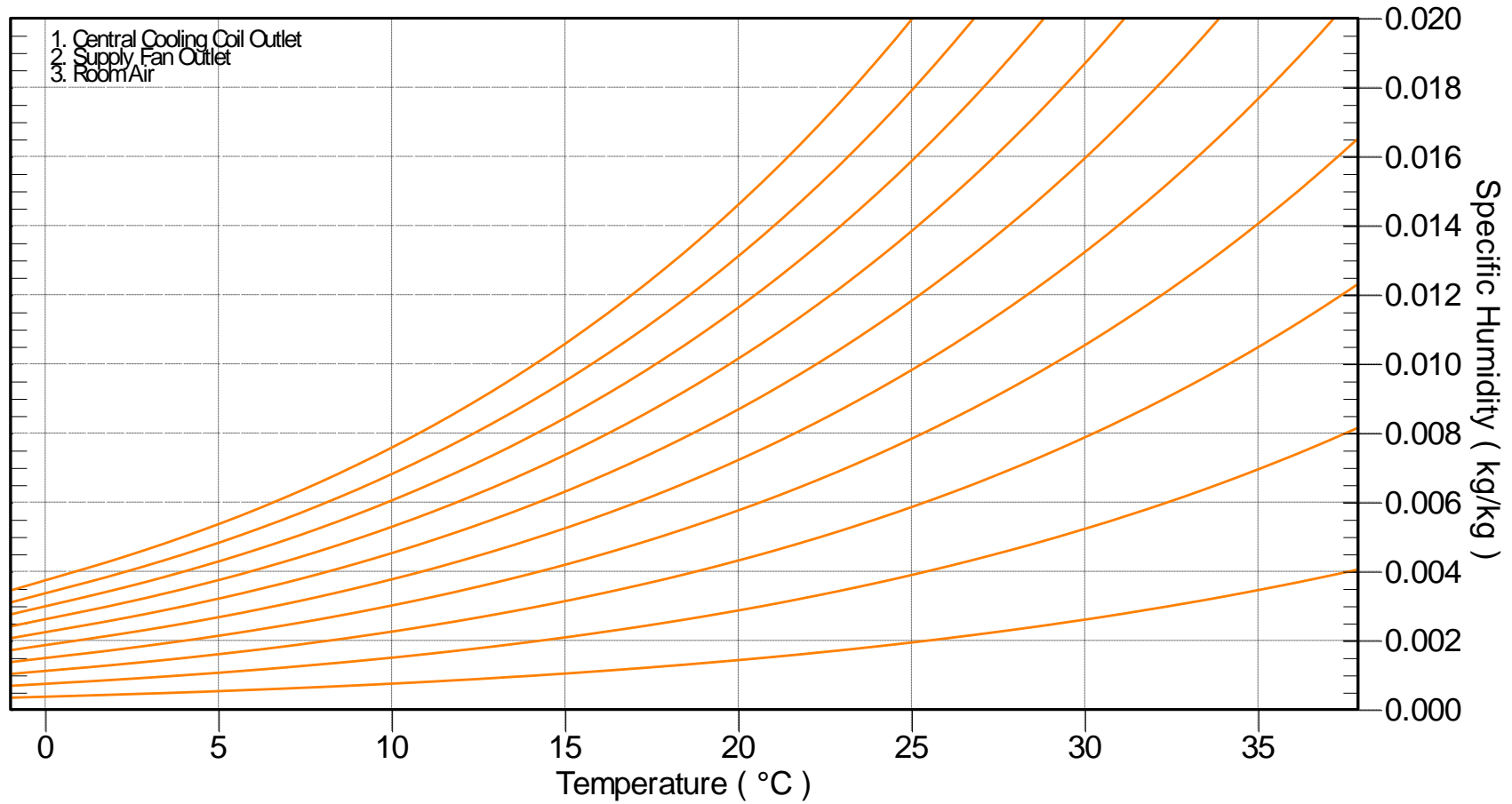
Air Density x Heat of Vaporization x Conversion Factor: At sea level = 2947.6; At site altitude = 2944.8 W/(L/s)

Site Altitude = 7.9 m

TABLE 2: ZONE DATA

| Zone Name | Zone Sensible Load (W) | T-stat Mode | Zone Cond (W) | Zone Temp (°C) | Zone Airflow (L/s) | CO2 Level (ppm) | Terminal Heating Coil (W) | Zone Heating Unit (W) |
|-----------|------------------------|-------------|---------------|----------------|--------------------|-----------------|---------------------------|-----------------------|
| Zone 1 | -65131 | Heating | -63501 | 17.4 | 4981 | 800 | 0 | 0 |

Location: Palma de Mallorca, Spain
Altitude: 7.9 m.
Data for: July DESIGN COOLING DAY, 1700



Location: Palma de Mallorca, Spain
Altitude: 7.9 m.
Data for: WINTER DESIGN HEATING

