



Architecture style typical of the end of the 19th century in France.



Thanks to its compact design, SET FREE Σ could be placed in a small attic under a sloped roof.

# CARRYING HISTORY INTO THE PRESENT WITH A COMPACT SOLUTION



## Multi-tenant Commercial Building in Lyon, France

Located in the center of Lyon, a city abundant with historical architecture, this building was built at the end of the 19th century. Today it houses a multi-tenant operation — home to several offices and retail outlets.

When the time came to replace the existing HVAC installation, care and preservation of the architecture was integral. With its compact floor footprint, SET FREE Σ was selected, enabling a 100% indoor installation with no significant retrofit works needed. This kept the integrity of the historical building intact.

### Solution & Application



VRF

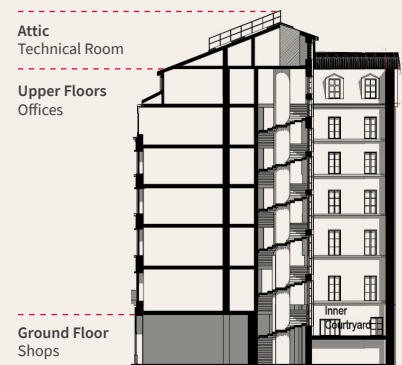


COMMERCIAL BUILDING

*“We needed to address the space restrictions in a building listed in France’s National Registry of Historical Monuments.”*

*“The compact design and high performance of the SET FREE system was a key advantage for us.”*

**Mr Philippe RODET**  
BARBANEL  
Engineering Consulting



## Key outcomes

- ✓ **Compliance with Regulations** — A non-invasive installation with zero reconstruction was achieved, keeping the visual and historical integrity of the architecture.
- ✓ **Respecting the Neighborhood** — Acoustic specialists worked to ensure there was zero noise pollution to the surrounding historical neighborhood.
- ✓ **Improved Installation** — Outdoor equipment was no longer installed outside as it was previously, instead it was cleverly concealed within the attic.
- ✓ **Tenant Benefits** — Each tenant now receives individualized and accurate billing, reflecting their actual usage of the air conditioning.
- ✓ **Customized Comfort** — With simultaneous cooling and heating options permitted during autumn and spring, each tenant can now satisfy their own specific needs.

## Issues to be addressed

- The previous HVAC system in this building consisted of a hydraulic system which was heated by a gas boiler in winter and cooled by chiller units, located on the roof, in summer. Not only did this system disrupt the urban architectural landscape, it was also aging, facing significant water leakage and resulting in high maintenance costs.
- During autumn and spring, tenants' cooling and heating needs were conflicting. Due to the nature of their different businesses and varying exposures to sunlight in the building, some tenants required cooling while others desired heating to achieve comfort.

## Key stakeholder requirements

**SET FREE Σ system addressed all stakeholder requirements.**

- **Tenants** — required the ability to pay for only the energy they consume — no more, no less.
- **Building Owner** — required a low installation cost and to avoid retrofitting of the existing layout.
- **Local Urban Authorities** — required equipment to be installed indoors, as outdoor installations are prohibited for classified historical monuments. Additionally, it was specified that the air conditioning was to add no more than 3dB to the pre-existing ambient noise level in the neighborhood.
- **HVAC System Designer** — wished to install the outdoor equipment in the attic which was previously unused, converting it into a technical room and providing easy access to an ambient air source.

## Our solution

**After analysis of the building constraints and requirements, SET FREE Σ was found to be the only suitable system available on the market:**

- **Compact Floor Footprint** — The small width of the 18HP and 24HP outdoor units (1,219mm and 1,609mm) made SET FREE Σ **the only solution on the market small enough** to fit within the limited floor space in the building attic. Without SET FREE Σ outdoor units, this whole retrofit project would not have been possible.
- **Reduction to Outdoor Noise** — To prevent noise pollution in the surrounding historical neighborhood, acoustic specialists integrated noise reduction equipment with the louvers of the ambient air inlets and outlets. This created a new challenge, affecting access to outdoor air. To solve this, the external static of the SET FREE Σ outdoor units was set up at 80Pa. This solution allowed for sufficient heat exchange and preserved performance.
- **Flexible Piping** — Due to the building's layout, a distance of 50m between the first multi-branch kit and the furthest indoor unit was required. SET FREE Σ could easily accommodate this, with a capability of up to 90m distance between the two.
- **Back-up Operation** — In case of failure in one module of an outdoor unit, SET FREE Σ has a back-up system which automatically kicks in to operate the remaining modules, giving building owners reassurance.
- **Centralized Monitoring** — Through the use of CS-Net Web, the building owner is able to monitor the entire SET FREE Σ installation from a remote computer. The building owner can also visualize each tenant's total energy consumption, enabling accurate invoicing.

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## GENERAL INFORMATION

### Customer

A multi-tenant commercial building

### Location

Lyon, France

### Project

Retrofitting an 8-storey office building

### Date of installation

2018

## SYSTEM DESCRIPTION

### Outdoor Units

#### SET FREE Σ

FSXNSE Series

### Heat Recovery Type

Total Capacity: 106HP

- Floors 1, 2, 3:  
54HP – 3x18HP



- Floors 4, 5:  
24HP – 1x24HP



- Floors 6, 7:  
28HP – 1x16HP 1x12HP



### CH-box

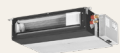
Single-port + multi-ports



### Indoor Units

#### Office Area

79 x Ducted units



#### 1st Floor Shops

2 x HYDRO FREE  
water modules



#### Other Spaces

3 x Wall-mounted units



### Controllers

#### Individual

85 x PC-ARFPE



#### Central Station

CS-NET Manager



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