Multiple control options for SupraBox compact air handling units

Both the SupraBox COMFORT and SupraBox MODULAR compact air handling units come standard with an integrated control system. All internal components are pre-assembled and pre-wired. A wide range of control functions are integrated into the software and can be activated later if needed. The control panel for making adjustments is included as standard.

Standard Features/Sensors

Temperature sensors built into the SupraBox enable operation with basic temperature control functions—even without additional accessories.

- Outdoor Air Temperature Sensor (AUL_TF)
- Exhaust Air Temperature Sensor (ABL_TF)
- Supply Air Temperature Sensor (ZUL_TF)

Thanks to continuous monitoring of filter pressure drops, an alarm is automatically triggered if the set maximum value is exceeded. This alerts the operator in a timely manner that the filter needs to be replaced.

- Outside Air Filter Pressure Sensor
- Exhaust Air Filter Pressure Sensor

The pressure sensors on the fans are used to calculate the current flow rate. This means that the volume of air being moved is known at all times and can be kept constant by the integrated PI controller.

- Supply Air Fan Pressure Sensor
- Exhaust Air Fan Pressure Sensor

By measuring the differential pressure on the exhaust air side of the counterflow heat exchanger, icing caused by high humidity can be detected early. In this case, the control system automatically initiates appropriate countermeasures.

- WRG Anti-Icing Pressure Switch (PWT)

Features Included by Default

Filter Monitoring

Internal pressure sensors continuously monitor pressure drops across the filters, and if the pressure rises, an alarm is triggered on the control panel.

Supply Air Temperature Control / Exhaust Air Temperature Control

Outdoor air, supply air, and exhaust air temperature sensors are located at the air connections inside the unit and measure the temperature of the corresponding air flow so that temperature control can operate with optimal efficiency. All three readings are shown on the display.
The built-in heat recovery system is used to adjust the supply air temperature in order to achieve the setpoint as closely as possible. This function is essential for energy savings.
In summer and winter, heat recovery remains active as long as conditions are not suitable for bypass operation. The supply and exhaust air streams are directed through the heat recovery heat exchanger, thereby achieving high thermodynamic energy recovery.
Optimal results can be achieved using the heating and cooling accessories.

Anti-icing Plate Heat Exchanger

During cold winter months, the low air temperature at the heat exchanger outlet can cause condensation to form, which freezes and thereby significantly increases the heat exchanger's pressure drop. This increases the exhaust fan's energy consumption and reduces the efficiency of heat recovery. To prevent this, we have preprogrammed three different defrosting scenarios:

1. Reduced supply air volume
The supply air flow rate is reduced to 70% of the specified operating flow rate, but the exhaust air flow rate remains unchanged. As a result, more warm exhaust air is passed through the heat recovery system than cold outside air. This causes the plate heat exchanger to warm up, which in turn melts the ice.

2.1 Activating the Preheating Function (SupraBox Comfort only)
If it is not possible or sufficient to create an imbalance between the supply air volume and the exhaust air volume, the optionally available electric preheating coil is activated to perform the defrosting process. In this case, the outside air is heated to raise the exhaust air temperature after the heat exchanger, allowing the heat exchanger to defrost.

2.2 Bypass Defrosting (SupraBox Modular only)
If the plate heat exchanger ices up on cold winter days and reducing the supply air flow rate by 30% does not prevent icing, the bypass damper opens and the supply air flow is routed through the bypass. During the defrost phase, the exhaust air flow continues to pass through the plate heat exchanger, ensuring that it defrosts. This feature is available exclusively on the SupraBox MODULAR with a counterflow heat exchanger.

3. Turn Off
If this is still not enough, the device will automatically shut off to prevent further power consumption. After 10 minutes, it will automatically restart and begin the defrosting sequence again from the beginning.

Fan Control and Monitoring

Precise airflow control is achieved via the ring measuring lines, which are installed as standard on our fans. Motor protection is already built into the Rosenberg EC fans. If a fan's motor overheats, this triggers an alarm on the control panel and the unit automatically shuts down until the temperature returns to normal.

Communication

All SupraBox devices come standard with a Modbus RTU interface.

Aggregated Fault Report

As soon as a malfunction occurs in the system, it is indicated by the alarm relay. This way, you can always be sure that the device is working properly.

Shutdown triggered by a smoke detector / fire alarm control panel

An optional smoke detector, fire thermostat, or external fire alarm signal can be connected to automatically shut down the device in the event of a fire.

Timer for Weekly Schedule

The operating times of the devices can be controlled using programs that have been set up individually in advance. This feature is available as standard on all SupraBox devices. It simply needs to be activated.

Control Unit

All SupraBox compact ventilation units come with a built-in control system. There are three different user levels: User, Service, and Technical. The control panel comes with a 10-meter-long connection cable. An additional control panel can be ordered upon request. This allows the same unit to be controlled from multiple locations.

External Shutdown / Override

There is one connection available for each function: to shut down the SupraBox or to override it. This feature can be used to turn the system on and off remotely without having to use the control panel. The override function allows the fans to be temporarily operated at a higher setpoint.

Features that can be enabled but require additional accessories

Air Damper Control

Our air dampers are available either as standard models without spring return or with spring return, which can be purchased from us as needed. They isolate the unit from the outside when it is not in operation and protect the interior of the unit from external influences. The appropriate actuator is included with the unit.

Room Temperature Control

With the help of an optional room temperature sensor, the unit can regulate the room temperature. This is a room/supply air temperature cascade control system with a minimum limit on the supply air temperature to prevent drafts.

Natural Night Cooling

If the appropriate temperature conditions between the outdoor air and the indoor air are met, the unit turns on automatically at night, regulates the room temperature without additional energy consumption, prepares the room for the next day, and at the same time ensures maximum energy efficiency of the unit. To use this feature, a room temperature sensor and an outdoor temperature sensor are required.

Support Operations

By preventing the room temperature from rising above or falling below the preset value, both your comfort and the environment are protected through reduced energy consumption.

Heater and Radiator Control

A hot water pump, cold water pump, electric heating coil, or direct evaporator ensures that the desired setpoint temperature is reached. To use this feature, an additional supply air duct temperature sensor must be connected.

Duct Pressure Control

Duct pressure control allows the fan output to be adjusted as needed to maintain a preset duct pressure. This requires the use of pressure sensors, which are sold separately.

BACnet Communication

This feature allows the device to use the BACnet protocol via an optional interface card.

Preheating (SupraBox Comfort only)

If the outside air temperature drops significantly below normal, the preheater ensures that the air is warmed before it enters the heat recovery system.

Sensor-controlled airflow

The SupraBox's operation is controlled based on the respective sensor reading. Depending on the model used, the fans' power is automatically increased or decreased based on the measured CO_2 or relF value.

External Airflow Setting

The operation of the SupraBox devices is manually adjusted to your current needs using an external 0-10V signal.

Advanced Fire Safety Features

With the help of an additional fire protection control panel, the end-position monitoring of multiple fire/smoke dampers can be implemented. When connected to the SupraBox's smoke detector input, the SupraBox is shut down if a fire damper closes.

Hot Water Coil Antifreeze Function

To protect the hot-water coil from freezing, a minimum temperature can be set when using an outdoor temperature sensor. If the temperature falls below this setting, the heating valve does not close completely, so that warm heating fluid continues to flow through the heating coil.

List of Accessories

- Duct temperature sensor
- Outdoor air temperature sensor
- Room air temperature sensor
- Air quality CO2 sensor
- RelF sensor (Hygrostat)
- Fire protection control panel
- Smoke detector
- BACnet card
- PWW heating coil with three-way valve
- PKW cooling coil with three-way valve
- EEH heating coil
- DX cooling coil