# Fan heater control|EC fans
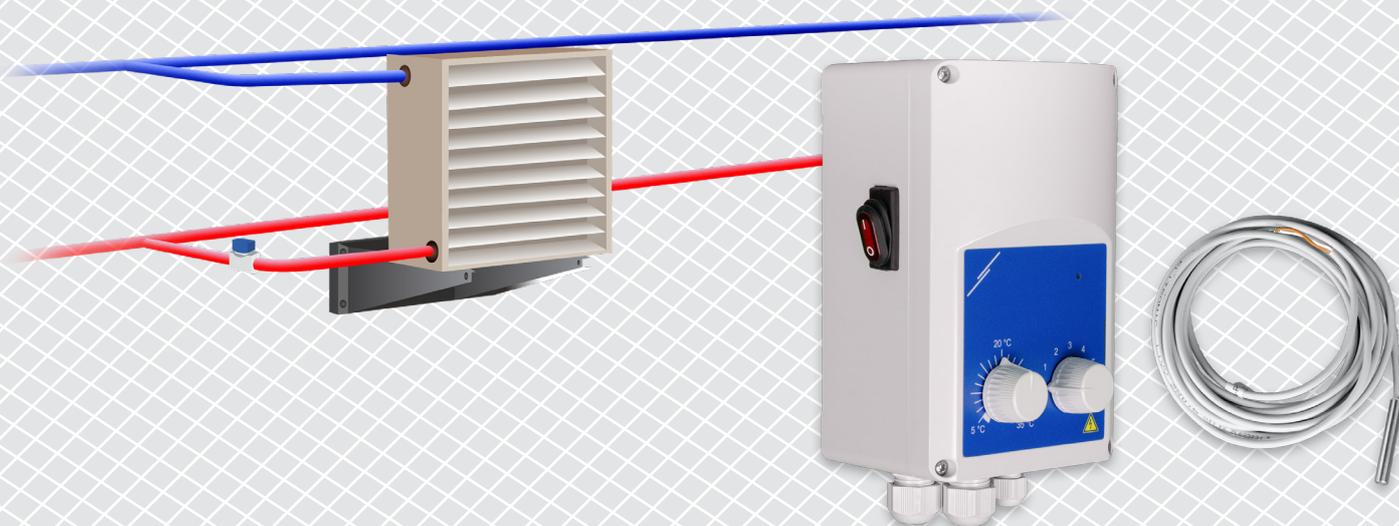
# SOLUTION DESCRIPTION

This solution controls fan heaters with an EC motor. The controller regulates fan speed based on ambient temperature. The higher the difference between the measured temperature value and the temperature setpoint, the higher the EC fan speed. The unregulated output controls a water valve or an electric heating element. This solution comes both with and without a Sentera Internet Gateway. The versions with a Sentera Internet Gateway (TA-W-00001 and TA-W-00002) can be managed remotely through SenteraWeb. The version without a Sentera Internet Gateway (TA-W-00003) can only be managed locally. Typically, this solution is applied in large halls such as warehouses or manufacturing plants.

## Operational diagrams
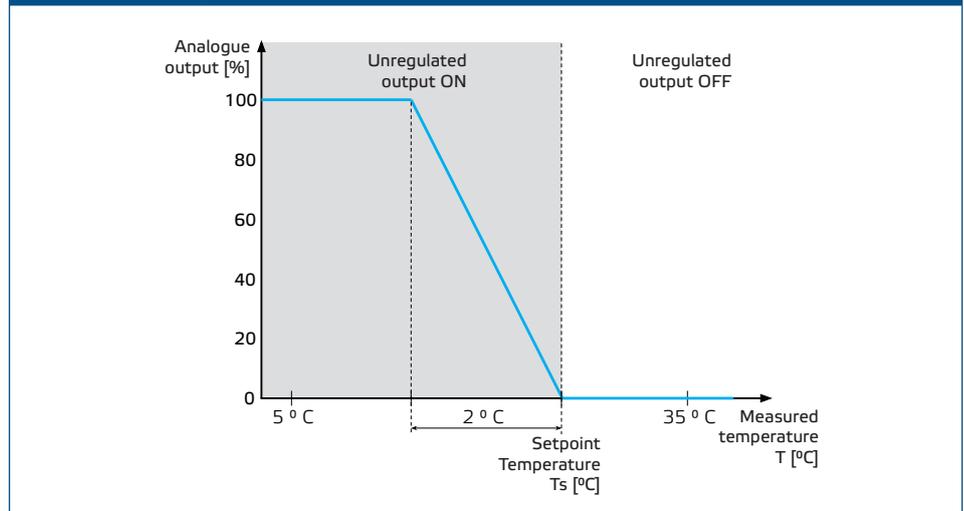


### Fan speed

When the ambient temperature is higher than the temperature setpoint, the fan is disabled.

When the ambient temperature drops below the temperature setpoint, the fan is activated. Fan speed can be set manually (5 possibilities) or automatically. In automatic mode, fan speed increases in continuously variable based on the temperature. The lower the temperature, the higher the fan speed.

This controller is designed for EC fans that require a 0-10 Volt (or 0-6 Volt) control signal as speed reference.

### Heater control

The unregulated output controls the heater. This can be a water valve to control the flow of hot water or a relay to activate an electric heater.

The unregulated output is activated simultaneously with the fan. When the fan runs, the heater is activated.

### Ambient temperature

Ambient temperature is measured via the PT500 temperature sensor. This temperature sensor is available in different enclosure types. It is advisable to keep the sensor cable length limited. The longer the cable length, the higher the risk of faulty measurements and inaccuracies.

### Typical applications

- Fan heater control in warehouses
- Fan heater control in industrial areas

## TECHNICAL DATA

- IP54 protection for indoor installation
- 0-10 Volt (or 0-6 Volt) output to control EC fan speed
- Output for heater control: 230 VAC, Imax 2 A
- PT500 temperature sensor

## SENTERAWEB - YOUR PERSONAL HVAC CLOUD

Sentera products are delivered with standard firmware (standard functionality). In order for these products to function according to the solution, application specific firmware must be downloaded via SenteraWeb. Setpoints, ranges and other settings can be adjusted remotely. The measured values and the status of the connected devices can be monitored. Make sure you have the ID code of the desired application as well as the unique serial numbers of the products.

Via the SenteraWeb HVAC cloud, it is possible to:

- Easily adjust parameter settings of the connected devices remotely
- Define users and give them access to monitor the installation via a standard web browser
- Log data - create diagrams and export logged data
- Receive alerts or warnings when measured values exceed alert ranges or when errors occur
- Create different regimes for your ventilation system - e.g. day-night regime.

## SENTERA INTERNET GATEWAY

The Sentera Internet Gateway is used to connect your installation to the SenteraWeb HVAC cloud and to download the application specific firmware.

- When the firmware is downloaded, the internet gateway can be left installed or can be removed.
  - ▷ If the Gateway is left installed, the instalation remains connected to the SenteraWeb HVAC cloud and makes it possible to use the features described above. Installations that are inactive for more than one month will be deleted automatically. To prevent the installation from being deleted, it can be archived. Archived installations can be activated again at any moment.
  - ▷ If the Gateway is removed, it can be used to set up another installation. In that case, you have to disconnect the current installation from SenteraWeb as every internet gateway has a unique serial number. The Internet Gateway can be used to create one installation at a time.
- They are available with Wi-Fi connection only, or combined with LAN connection.
- There are versions for DIN rail mounting or surface mounting.
- It allows you to download the required application-specific firmware into the connected devices and to adjust the settings.

See chapter "How to connect your installation to SenteraWeb" for more information.

# WIRING AND CONNECTIONS

Two examples of the solution are shown in the connection diagram below. Different combinations are possible.

### Example 1: Stand-alone operation



ECH-8-DM

FLTSN-P500-040

EC fan

115-230 VAC
50-60 Hz
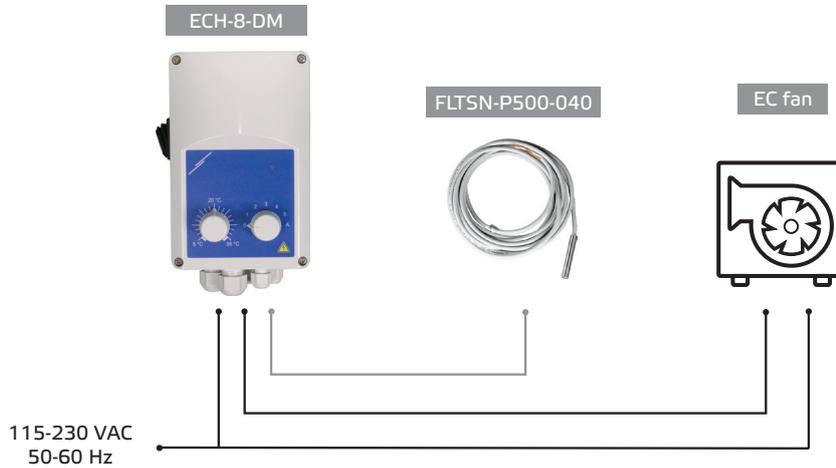
### Example 2: Connected to SenteraWeb



ECH-8-DM

SEPS8-24-40

ADPT-3RJ-TB

SIGWM

FLTSN-P500-040

Hot water valve (solenoid 230 VAC)

EC fan

115-230 VAC
50-60 Hz
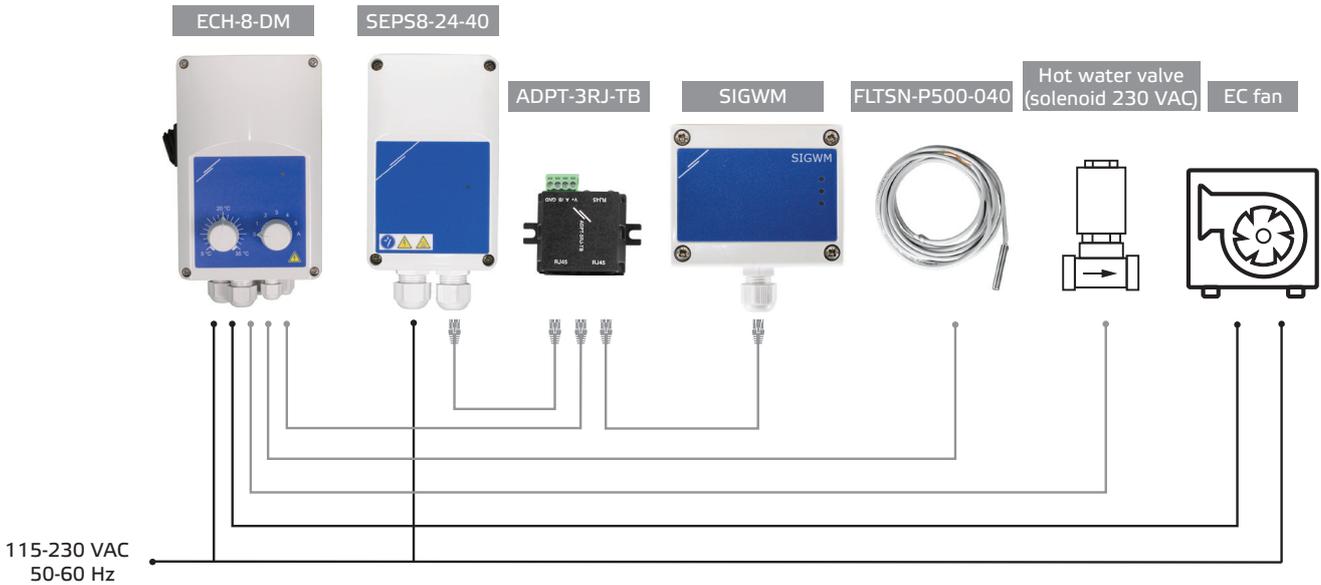
### Supply voltage

The HVAC sensor and the internet gateway require a supply voltage of 24 VDC. We recommend using Sentera 24 VDC power supply, as it offers overload and overvoltage protection.

### UTP cabling for data (Modbus) and power distribution (24 VDC)

Sentera devices communicate via Modbus RTU. To facilitate wiring, some Sentera devices (-M and -H series) are available with RJ45 connectors to connect 24 VDC power and Modbus data communication. These devices can be connected via one single UTP cable. This simplifies wiring and connection.
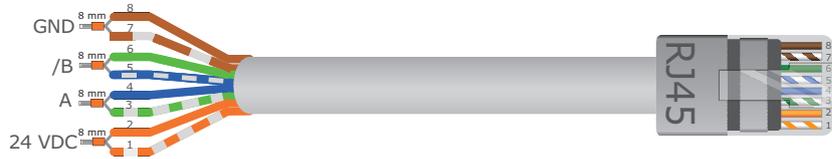


The advantages of Modbus communication over an analogue (0-10 Volt) control signal are:

- Higher reliability
- Reduced risk of disturbances and data loss
- Longer cables lenghts are possible
- Status and feedback from the connected frequency inverter and motor are available.

## ADDITIONAL CABLING GUIDELINES

A Modbus RTU network should follow these topology guidelines:

- The maximum length of the main line should be limited to 1.000 m. If a longer main line is necessary, we advise to use Modbus RTU repeaters.
- It is advisable to minimise the length of the branches. The use of a 3-way splitter (type ADPT-3RJ-TB) can be helpful.
- In case of long cable lenghts or strong electrical pollution, we advise to activate the Network Bus Terminator (NBT) on two devices in the Modbus network. These NBTs reduce electrical reflections. Every Sentera device features an NBT that can be activated via the parameter settings. NBT is deactivated by default.

## HOW TO CONNECT YOUR INSTALLATION TO SENTERAWEB

### 1. Create an account on SenteraWeb

First create an account on SenteraWeb.
Go to https://www.senteraweb.eu/en/Account/Login. Here you can register or log in.

### 2. Create your installation

- Once logged in, add a new installation;
- Make sure that the internet gateway is powered and connected to the internet (green LED);
- Register the internet gateway via its serial number;
- Once the internet gateway is registered, your installation is created;
- Register the other connected devices. To add a device, use its serial number.

### 3. Download your application specific firmware

When all the devices have been added to your SenteraWeb installation, you can download the required firmware for this solution via the solution ID code:

- Select your installation in SenteraWeb and click "Link to solution";
- Enter the solution ID code and click "Submit";
- The solution specific firmware will be downloaded into the connected devices (this download can take up to two minutes);
- After the download, check the functionality of all devices
- When the solution is operational, you can choose to leave the internet gateway connected or to remove (check chapter "*Sentera Internet Gateway*" for more information).