

Destratification | AC fans

Destratification

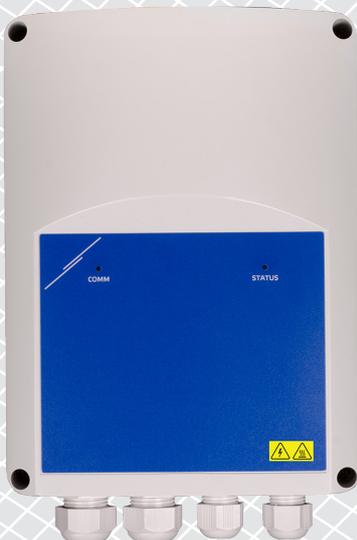


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SAFETY AND PRECAUTIONS



Read all the information, the datasheet, Modbus map, mounting and operating instructions and study the wiring and connection diagram before working with the product. For personal and equipment safety, and for optimum product performance, make sure you entirely understand the contents before installing, using, or maintaining this product.



For safety and licensing (CE) reasons, unauthorised conversion and / or modifications of the product are inadmissible.



The product should not be exposed to abnormal conditions, such as extreme temperatures, direct sunlight or vibrations. Long-term exposure to chemical vapours in high concentration can affect the product performance. Make sure the work environment is as dry as possible; avoid condensation.



All installations shall comply with local health and safety regulations and local electrical standards and approved codes. This product can only be installed by an engineer or a technician who has expert knowledge of the product and safety precautions.



Avoid contacts with energised electrical parts. Always disconnect the power supply before connecting, servicing or repairing the product.



Always verify that you apply appropriate power supply to the product and use appropriate wire size and characteristics. Make sure that all the screws and nuts are well tightened and fuses (if any) are fitted well.



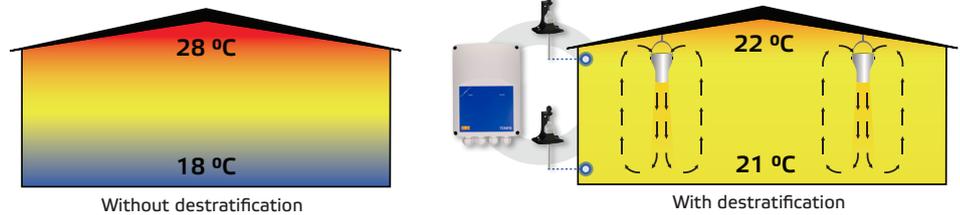
Recycling of equipment and packaging should be taken into consideration and these should be disposed of in accordance with local and national legislation / regulations.



In case there are any questions that are not answered, please contact your technical support or consult a professional.

SOLUTION DESCRIPTION

This solution controls ceiling fans for destratification. The controller regulates fan speed based on the difference between ceiling and floor temperatures. By mixing the air, the temperature under the ceiling and at the floor level is balanced. Typically, this solution is applied in large halls such as warehouses or manufacturing plants.



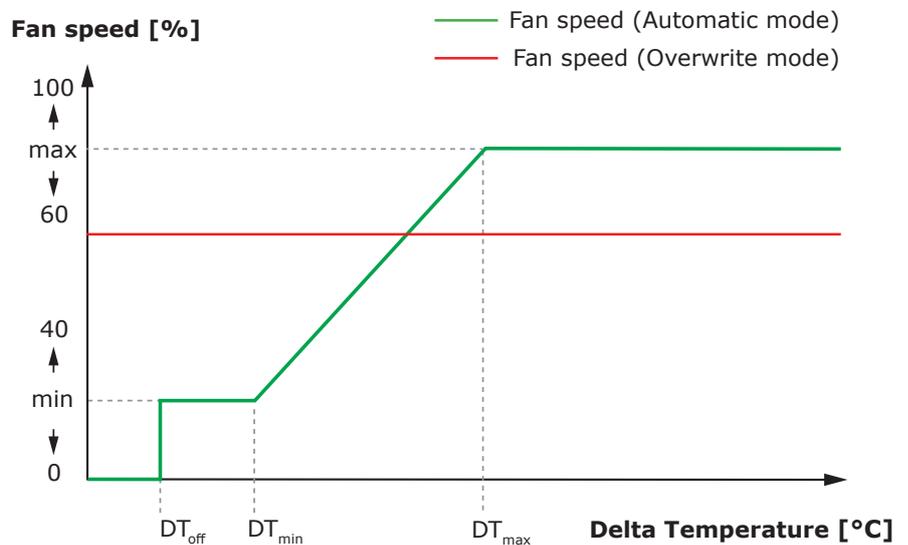
When the difference between ceiling and floor temperature is lower than DT_{OFF} , the fans are disabled.

When the temperature difference exceeds DT_{OFF} the fans will be activated at minimum speed.

When the difference between ceiling and floor temperature increases and becomes higher than DT_{min} , fan speed will increase.

When the difference between ceiling and floor temperature reaches the maximum Delta Temperature level, fan speed will be at the maximum level. The ceiling fans will maintain high speed as long as the difference between ceiling and floor temperature remains higher than DT_{max} .

Operational diagram



The smaller the difference between DT_{min} and DT_{max} , the faster the fan speed will be adjusted. If the ceiling fans speed up too fast, increase the difference between DT_{min} and DT_{max} to make the ceiling fans accelerate slower.

Minimum and maximum fan speed can be adjusted via the Modbus Holding registers. In overwrite mode, the ceiling fans run at a fixed speed regardless of the temperature difference between floor and ceiling level. This speed level can be defined in Modbus holding register 20. By default, the controller works in automatic mode. Overwrite mode can be activated by writing value 1 in Modbus holding register 26.

Typical applications

- Destratification in warehouses
- Destratification in industrial areas

TECHNICAL DATA

- IP54 protection for indoor installation
- Single phase voltage controllable motors
- Maximum (combined) motor current: 3 A or 6 A per output, depending on the TCMF8 version
- TCMF8 controllers have 2 identical outputs

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

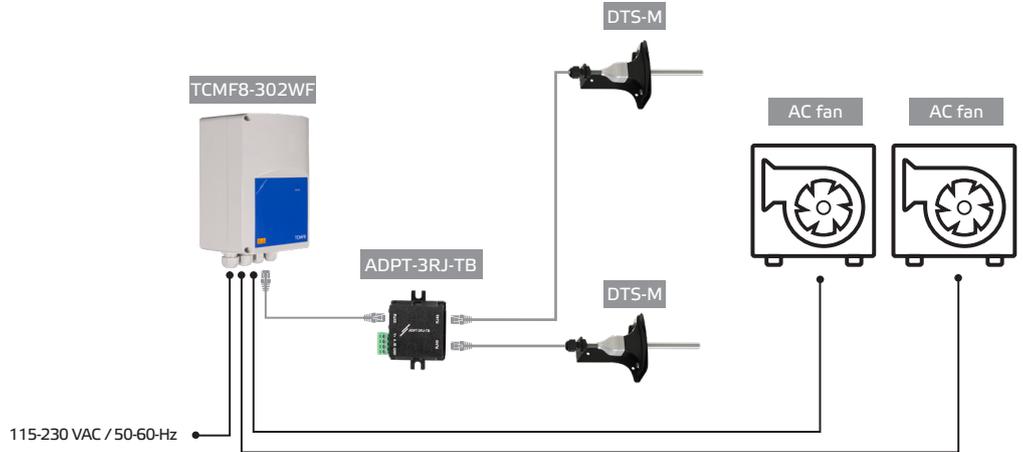
The Sentera Internet Gateway is used to connect your installation to the SenteraWeb HVAC cloud and to download the application specific firmware.

- When the firmware is downloaded, the internet gateway can be left installed or can be removed.
 - ▶ If the Gateway is left installed, the installation remains connected to the SenteraWeb HVAC cloud and makes it possible to use the above described features. 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 and it can be used to create one installation at a time.
- They are available with only Wi-Fi connection 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

One example of the solution is shown in the connection diagram below, different combinations are possible.



Install the products following the mounting instructions on the corresponding products' pages on sentera.eu.

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 lengths are possible
- Status and feedback from the connected frequency inverter and motor are available.

ADDITIONAL CABLING GUIDELINES

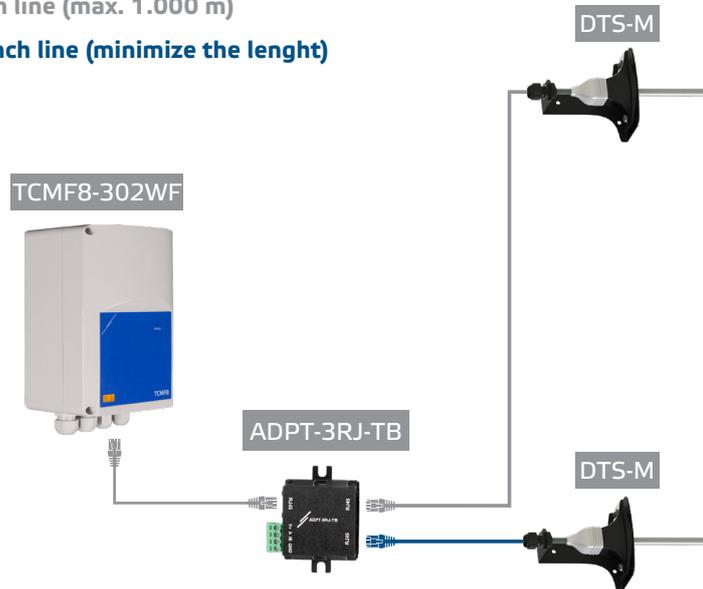
A Modbus RTU network should follow these topology guidelines:

- 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.

- In case of long cable lengths 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.

Main line (max. 1.000 m)

Branch line (minimize the lenght)



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).