Guide to the GOLD version E/F/G functions Humidity-optimised rotor controller

1. General

In order to achieve a good indoor climate, the function efficiently recovers and maintains indoor humidity in a controlled manner, or reduces the supply of moisture from the outdoor air.

In cases where additional humidification is required, the function can be supplemented with any of the GOLD air handling unit's humidification functions.

By controlling the speed of the heat exchanger in relation to the humidity and the temperature in the premises and outdoors, it is possible to optimise the recovery of moisture.

In winter, a drying function can be run to avoid temporarily high humidity indoors.

In the summer when humidity levels are high, the rotor is governed so as to avoid surplus moisture in the supply air.

To avoid freezing in heat exchangers, outdoor temperature compensation can be used. This is done by using the frost limit and limiting set points for humidity.

The function requires GOLD program version 2.47 or a later version.

This function guide describes only the functions, connections and settings that are specific to humidity-optimised rotor control..

For a description of additional functions, such as steam humidification 0-10 V and evaporative humidification, please refer to the operation and maintenance manuals and separate instructions.

2. Material specification

Air handling unit	**GOLD RXRX with rotary heat exchanger of the type RECOsorptic**
Humidity sensor, supply air	**TBLZ-4-31-1**
Humidity sensor, extract air	**TBLZ-4-31-2**
Humidity sensor, exhaust air	**TBLZ-4-31-4**
Humidity sensor, outdoor air	**TBLZ-4-31-5**
Humidity sensor, room	**TBLZ-4-31-6**

Winter operating mode requires humidity sensors for outdoor air and extract air or room. Summer operating mode requires humidity sensors for outdoor air, supply air and extract air.

Connection kit **TBLZ-1-64**
1-2 kits depending on other functions.

3. Function

3.1 Overview

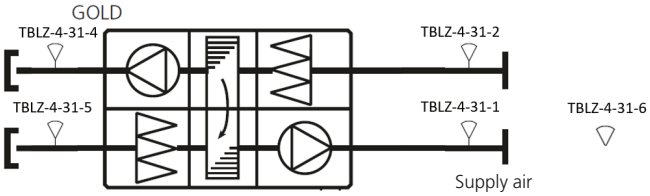
The function has humidity sensors that together with temperature sensors are used for controlling and regulating the rotary heat exchanger.

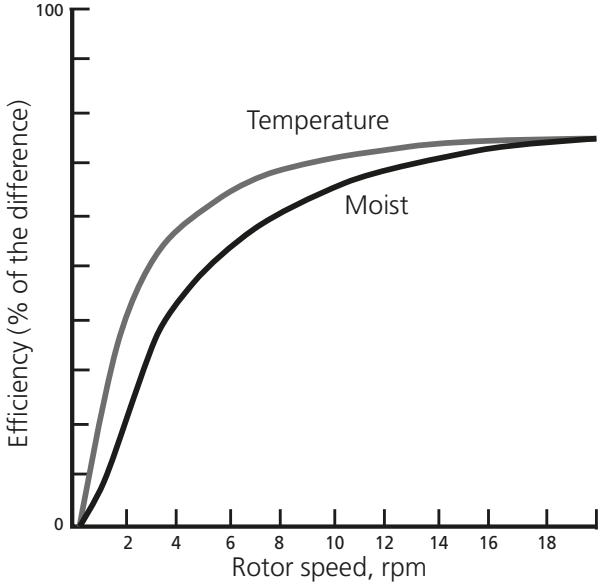
A rotary heat exchanger is normally temperature controlled, and the speed is controlled 0-100% as a sequence in the temperature control.With the humidity-optimised rotor controller function, the speed of the heat exchanger is also controlled taking into account the relative humidity of the room.

RECOsorptic is a sorption-treated heat exchanger that reaches a maximum degree of humidity efficiency at about 20 rpm. For the same heat exchanger, a maximum degree of temperature efficiency is reached at about 10 rpm. The efficiency/speed ratio is different for temperature and humidity. Even at low heat exchanger speeds, high temperature efficiency is achieved, while the humidity efficiency has a flatter efficiency curve.

In addition to normal operation, the winter function has two additional operating modes, while the summer function has one.

The functionality of the operating modes with factory-set limit values is described below. The limit values may be changed.





Schematic diagram of the temperature efficiency/moisture efficiency ratio

3.2 Normal operating mode

The rotary heat exchanger is controlled between 0-20 rpm, as a sequence in the temperature control.

3.3 Winter mode, moisture recovery (Function, winter ON)

If the outdoor temperature is below +5 °C (outdoor temperature start) and the relative humidity in the room is below 30% RH (humidity mode start), the heat exchanger is controlled up to 100% (20 rpm) for maximum humidity recovery.

If the outdoor temperature exceeds +7 °C (outdoor temperature stop) or the relative humidity in the room exceeds 47% RH (humidity recovery limit -3% RH), the function will stop and the heat exchanger will return to normal operation.

3.4 Winter mode, reduced moisture (Function, winter ON)

If the outdoor temperature is below +5 °C (outdoor temperature start) and the relative humidity in the room exceeds 50% RH (humidity recovery limit), the heat exchanger is reduced to 25% of the maximum rotor speed (5 rpm, drying mode).

When the relative humidity in the room has dropped to 47% RH (humidity recovery limit -3% RH), or if the outdoor temperature is above +7°C (outdoor temperature stop), or after 120 minutes (time limit), the function stops and the heat exchanger returns to normal operation.

Swegon reserves the right to alter specifications.

3.5 Summer mode, reduced moisture (Function, summer ON)

At an outdoor temperature above +16°C (outdoor temperature, start), and if the humidity in the outdoor air exceeds the humidity in the extract air by 0.5 g/kg (neutral zone), the rotor is set to 100% (20 rpm) to avoid additional moisture in the supply air.

Further conditions for starting the function are that cooling recovery is not active, and that the supply air is not more than 4°C warmer than the supply air's set point (does not apply if the extract air is max. 2°C warmer than the outdoor air).

The function stops when the outdoor temperature drops below +14°C (outdoor temperature, stop) or when other conditions are not satisfied.

3.6 Outdoor air compensation

With the help of the outdoor temperature, a frost limit can be calculated. The frost limit is the extract air's maximum humidity content at which freezing on the rotor can be avoided.

The frost limit is used to limit the set points for humidification and humidity-optimised rotor control.

4. Connection.

4.1 Electrical connection

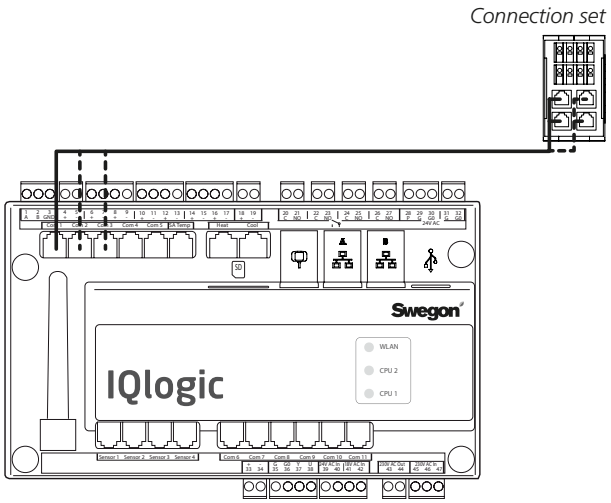
All component parts of the system must be wired and connected according to the installation instructions, manuals and product sheets that are available for each component part.

Electrical connection must be performed in accordance applicable provisions.

4.2 Connection of the humidity sensors

Current humidity sensors for the required function must be connected to COM1-3 on the IQlogic control unit.

Depending on the other connected functions, 1 or 2 connection kits TBLZ-1-64 must be used.



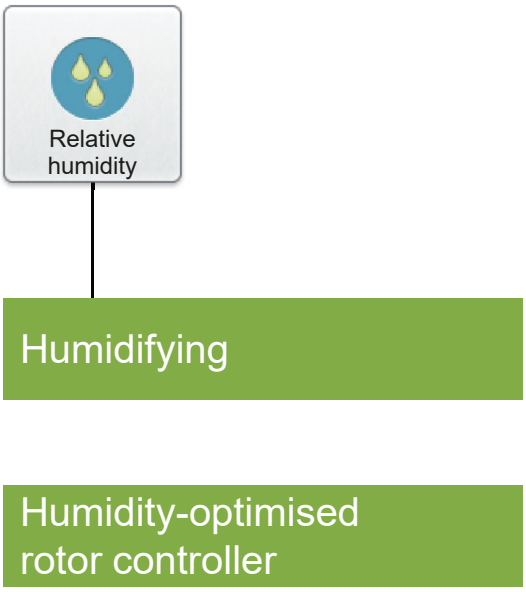
GOLD control unit

5. Settings

5.1 General

The humidity-optimised rotor controller function can only be activated and configured by personnel accredited by Swegon. Activation of the function and all settings are made on the service level.

Only specific settings for the humidity-optimised rotor controller function are described below.



5.2 Humidity-optimised rotor controller settings

Activate the winter function.

Set the following values:
- Humidity mode start
- Humidity recovery limit
- Reduced humidity recovery, max. rotor speed
- Reduced humidity recovery, time limit
- Outdoor temperature start
- Outdoor temperature stop
- Frost limit displacement
- Frost limit margin
- Min. margin, humidity recovery limit/start

Activate the summer function.

Set the following values:
- Neutral zone
- Max. temperature difference
- Outdoor temperature start
- Outdoor temperature stop

Swegon reserves the right to alter specifications.