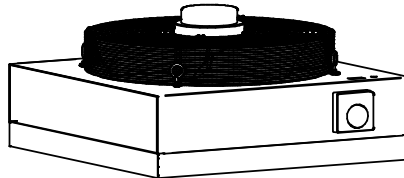


# Installation/user manual CIRCULATION UNIT WCU-EC

WCU\_EC\_EN\_V7



Read this document before installation / maintenance.  
Instruct the end user and leave this document with the end user.

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# 1 General

This user's guide is meant for the installer and if necessary for the user. It's a reference to operation and installation of the WCU destratification fan. For the sake of safety and to guarantee proper function, it is vital that you read this manual thoroughly before starting the installation, including all tips and warnings. Keep this manual with the appliance and see to it that it is included when the appliance is moved or sold, to ensure that during its life, all persons have been informed about the use and safety aspects of the device.

## 1.1 Warnings



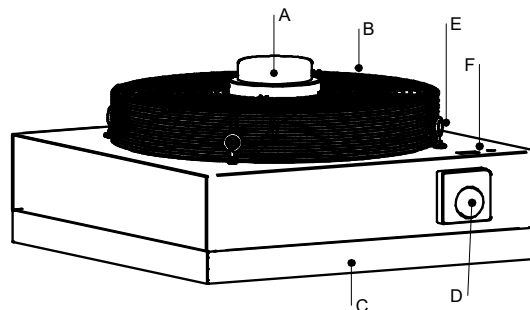
- This appliance may only be installed and maintained by a qualified and competent person.
- The minimum suspension height is 2.7 meters. That is because of safety reasons on touching rotating parts.
- Disconnect the appliance from the power supply before performing maintenance on this appliance.
- Caution, this appliance can start automatically!
  - Take care of a safe area when working on this appliance
  - Use certified access equipment.
  - Take care of your personal safety. Use safety gloves and safety shoes.
- This air heater can be used by children aged 8 years and above and by persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge, if they are supervised or instructed concerning use of the appliance in a safe way and understand the hazards involved.
- Children may not play with the air heater.
- Children may not clean and maintain this air heater without supervision..



## 1.2 Description

The Circulation Unit consists of:

- A. Fan
- B. Guard
- C. Outlet grill
- D. Thermostat
- E. Eye bolt (4X)
- F. Connector



## 1.3 Function

The WCU is applied to push down warm air that gathers on ceiling/roof level in order to create a more regular spreading of warm air in a space and to compensate a possible shortage of air refreshment in a building with tight insulation. If the room thermostat is set on 25 degree for an example, then it will switch the fan on as soon as a temperature of 25°C has been reached on ceiling/roof level. The fan will stop when the temperature on that level drops about 1,5 degrees. The fan speed can be controlled by:

- 0-10V regulator GA3955
- External power source (0-10V d.c.)

The throw length can be adjusted by turning the grill louvres.

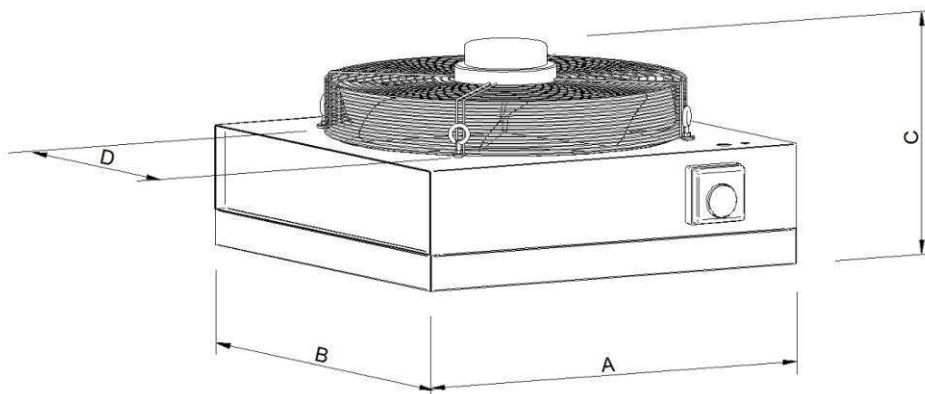
## 1.4 Warranty

Operation/installation of appliances not according to this manual can imply invalidation of warranty. It's not allowed to change the specifications or to make modifications of any kind, on this appliance.

## 2 Technical data

The WCU range consists of 4 types and comes with 3 sizes. Each type is distinguished by the length of the throw and the air output.

Type		40-EC	60-EC	80-EC	100-EC
Air flow	m <sup>3</sup> /h	3.300	5.700	7.000	10.000
Fan diam.	mm	350	450	450	630
Min. distance to ceiling	cm	35	45	50	65
Throw vertical (warm)	m	5-9	7-11	8-12	12-15
Voltage (50Hz)	V	230	230	230	230
Electric power(max)	W	136	490	685	550
Electric current (max)	A	1,45	0,3-1,3	4,4	0,4-4,3
Speed max.	rpm	1.530	1.300	1.500	1.050
Sound level (6m)	dB(A)	33-55	33-61	33-59	37-61
Sound level (8m)	dB(A)	31-53	31-59	31-57	37-59
Weight	kg	11	18	18	43
Minimum suspension height	m	2,7	2,7	2,7	2,7
Protection class		IP20	IP20	IP20	IP20
<b>Dimensions</b>					
A	mm	470	600	600	800
B	mm	470	600	600	800
C	mm	255	269	269	396
D	mm	300	375	400	740
Connection diagrams		1, 3, 4, 5, 6	2, 3, 4, 5, 6	2, 3, 4, 5, 6	2, 3, 4, 5, 6



### 2.1 Pre-check

Before installation, please check (i.e. on the data badge) if the appliance is in accordance with the order and whether it suits the local and present provisions ( electrical supply etc.)

Also check after installation that operation of the appliance can't form any hazard caused by moisture and dust, or injuries of people.

## 3 Installation

### 3.1 Suspension

- The products used for suspension should be fit for purpose.
- The minimum suspension height is 2.7meters. That is because of safety reasons on touching rotating parts.
- Install the appliance with 2 persons, keep in mind, working on height and the weight of the appliance.
- Take care of a safe area when working on this appliance
  - Use certified access equipment.
  - Take care of your personal safety. Use safety gloves and safety shoes.

The unit is equipped with 4 suspension eyes for suspension by chains or steel wire. This is not included. Make sure the appliance has a free air supply and discharge, a minimal average distance of 0,5m should be observed. For exact distance for each specific unit consult the technical data



### 3.2 Calculation the number of fans required

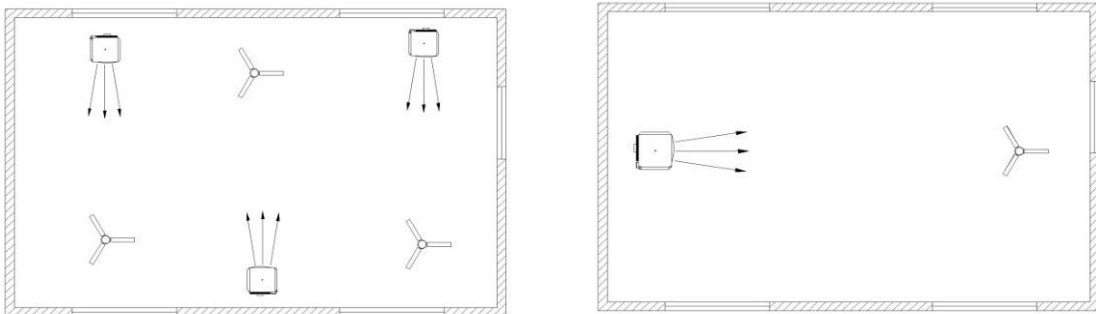
As a rule of thumb, choose one fan per 300m<sup>2</sup> floor surface. A more accurate method is based on circulation shortage. This is easy to calculate:

*Calculate the circulation shortage as follows: multiply the volume of the room with the ventilation rate (advise: not less than 3,5). Deduct from this result the air flow already present, for example supplied by heaters. This ventilation deficit (in m<sup>3</sup>/h) should be compensated with destratification units. Select the units based on air output, throw of the unit and height of the room.*

### 3.3 Positioning

Position the destratification fan preferably at the end of the throw or the corner that is not "blown" by the heater. In general, a higher number of fans provide a better spread of air. We advise to place 1 fan per 150 to 300 square meters floor surface, taking into account suspension height and fan type as well. The unit should be situated (+/- 1m.) beneath the roof or ceiling, but not closer than 0,35m to the ceiling; the distance between floor and fan may not exceed the length of the fan's throw. This will prevent the warm air from reaching the floor. Still do not mount the unit lower than the minimum throw, to avoid complaints about draft. Even with the louvers set under an angle, there will be severe draft when the unit is suspended too low. Do not place the unit above stands and other high obstacles.

#### Examples for positioning.



Position the destratification fans at the end of the throw or above areas that are not blown by the heater.

## 4 Electrical connection

#### Warning:

Before starting installation or maintenance, make sure that that electrical group you are working on, has been shut off. The appliance should have proper grounding!

The installation must comply with all applicable local and/or national standards i.e. NEN 1010.

There should be a suitable electrical group with a main fuse. There is an electrical diagram further on in this manual. The power supply is 230Vac (50 Hz) with earth.



### 4.1 230Vac power source connection (EC motor)

#### Isolation switch or power plug

The appliance must be installed by connecting the terminals in the 6-pole connector. See diagrams in chapter 6. The fan has to be equipped with a 230 Volt isolation switch or power plug. This switch should disconnect phase and neutral (not earth) and have a 3mm contact opening at least. Switches or power plugs must be accessible at all times.

### 4.2 EC motor connection options

The WCU has been equipped with an on/off thermostat. This thermostat is connected with the 0-10V control of the motor. The thermostat measures the temperature near the fan and switches on the motor when the set temperature has been reached. For proper setting of temperatures, see paragraph 5.1

Besides setting the temperature, the fan speed has to be set. This can be done in the following ways:

1. Maximum speed only (factory setting)
2. Speed regulator
3. External via 0-10V d.c.

#### Maximum speed only:

The maximum speed can be set by installing a wire between the contacts [T2] (Out) and [S3] (In) on the 6-pole connector. The fan will always run at the maximum speed. This feature is installed standard.

**See chapter 6, diagram 3.**

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### **Speed regulator (potentiometer)**

On contacts [T1], [T2] and [S3] of the 6-pole connector speed regulator GA3955 or a 3 wire potentiometer can be connected. Please make sure that the resistance of the potentiometer has a value of 10kΩ.

**See chapter 6, diagram 4.**

### **External via 0-10V d.c.**

On contacts [T1] and [S3] of the 6-pole connector an external voltage can be connected to control the speed.

**See chapter 6, diagram 5.**



**Attention**, the WCU needs 2 signals in order to run.

The thermostat contact on the WCU has to be closed and the speed setting has to be made.

If one of those signals is missing, the motor will not run. The feature according to chapter 6, diagram 3 (max. speed) is standard installed.

## **5 Setting, operation and maintenance**

### **Warning**

- The appliance shall be installed and maintained by qualified persons only.
- The appliance can start spontaneously. Please be aware of this.
- Disconnect the appliance from its power source before starting any service or maintenance.
  - Disconnect the 6-pole connector or switch off the insulation switch
- Make sure the working space is safe
  - Use proper climbing gear for working at heights
  - Use personal protective equipment (PPE), like safety gloves and safety shoes.



### **5.1 Setting the thermostat**

Set the thermostat of the unit 4 to 7°C higher than the temperature desired at 1,5 meters above the floor of the room. The smaller the difference between the setting of the room thermostat and the setting of the destratification fan, the longer the unit will be operative.

### **5.2 Operation**

The WCU does not need manual control, it is automatic. Generally the temperature setting has to be done by the installer. The user is allowed to do following settings:

- Set the temperature at which the fan should ventilate
- Turn ON/OFF the main switch
- Change the fan speed by adjusting the speed regulator

Attention: **do not set the louvers in an (sloping) angle bigger than 20°. This will block the air output.**

### **5.3 Maintenance**

In dusty environments it might be necessary to clean the fan grill with compressed air once a year. If the grill is covered with severe dust the fan will not perform optimal.

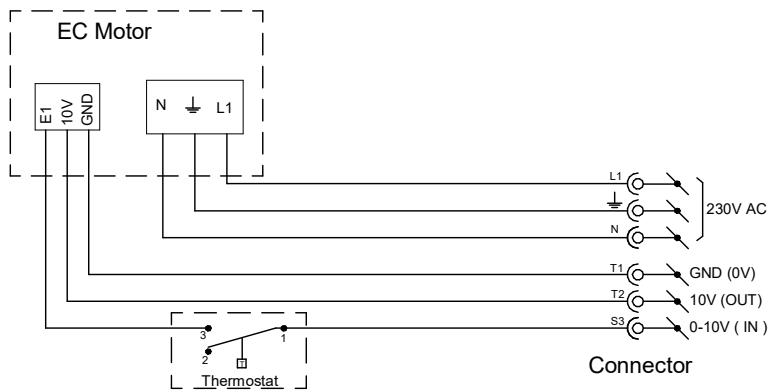
Check if the appliance turns ON and OFF as it should with the thermostat.

Pay attention to:

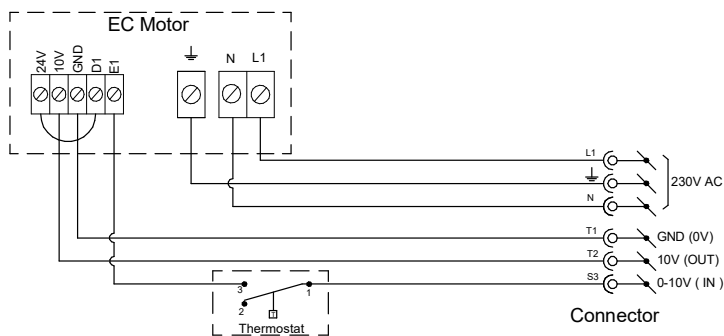
- The ON and OFF switching on the thermostat
- Smooth rotation of the fan
- Remove dust from the appliance
- Check that the fan does not have severe vibration because of unbalance on the fan blades

## 6 Example diagrams

**Diagram 1 WCU-EC without internal connections on the motor (WCU 40).**



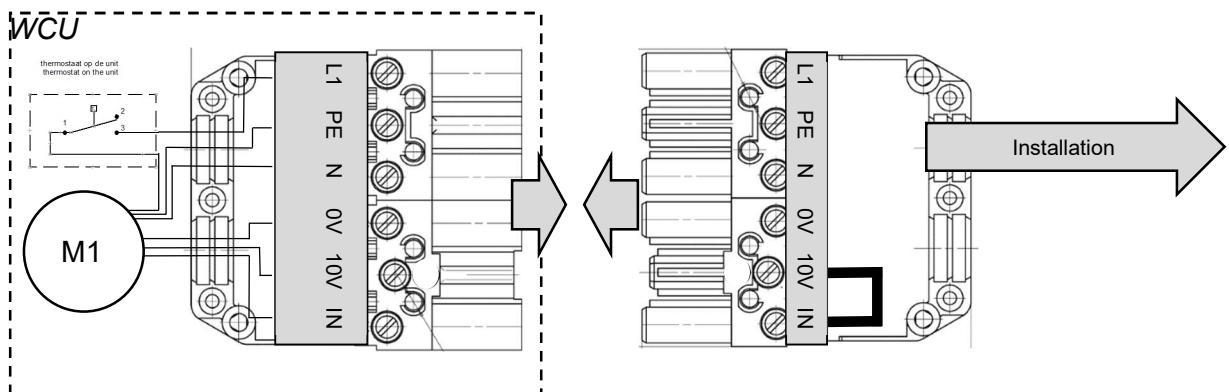
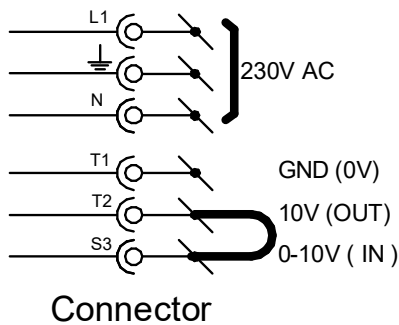
**Diagram 2 WCU-EC with internal connections on the motor (WCU60, 80 and 100).**



**Diagram 3 Connection with fixed maximum speed:**

Connect the 230V supply in the 6-pole connector.

Connect a wire between terminals T2 en S3, see diagram below. This is standard installed.



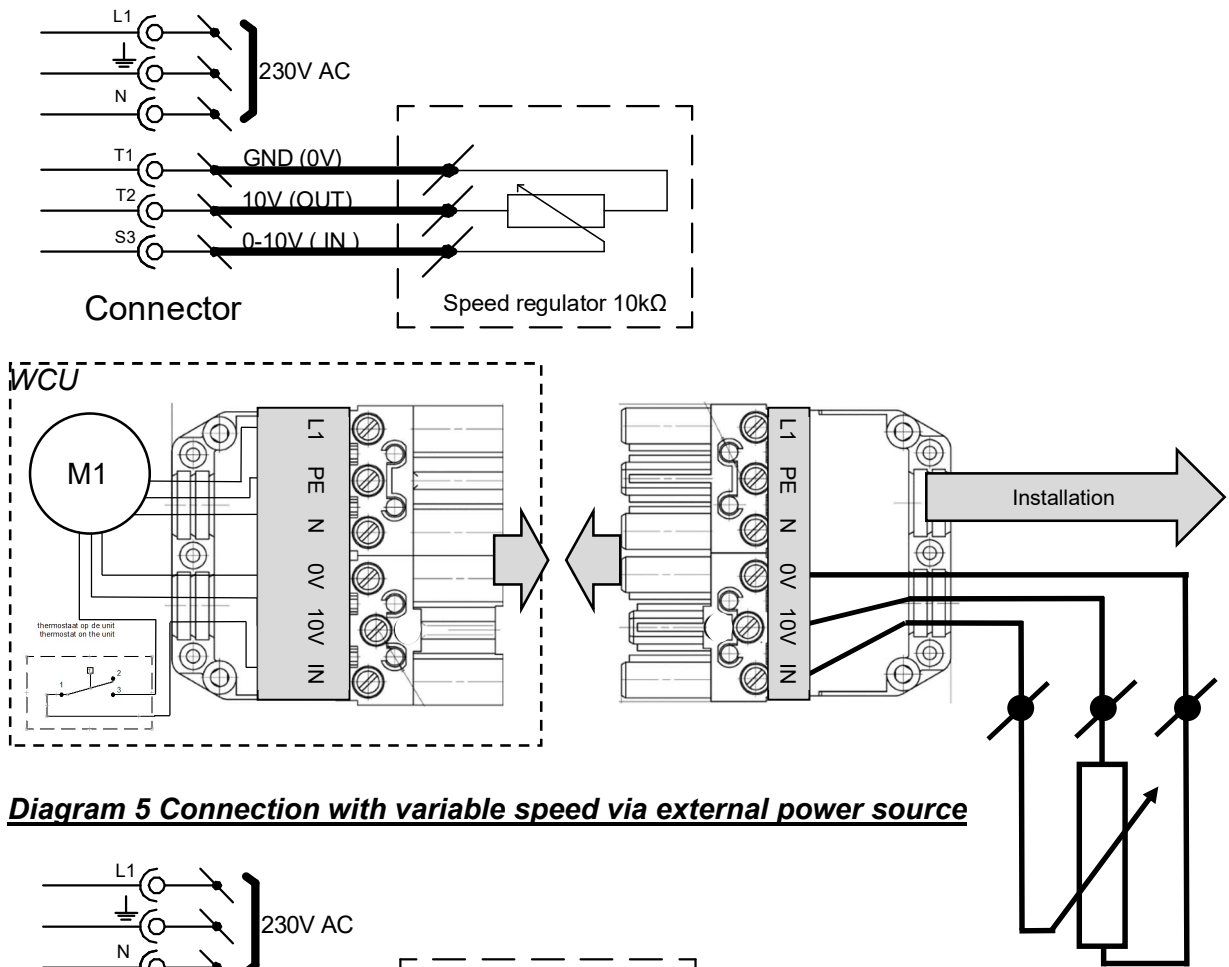
Mount wire between 10V and IN in the 6-pole connector.

**Diagram 4 Connection with variable speed**

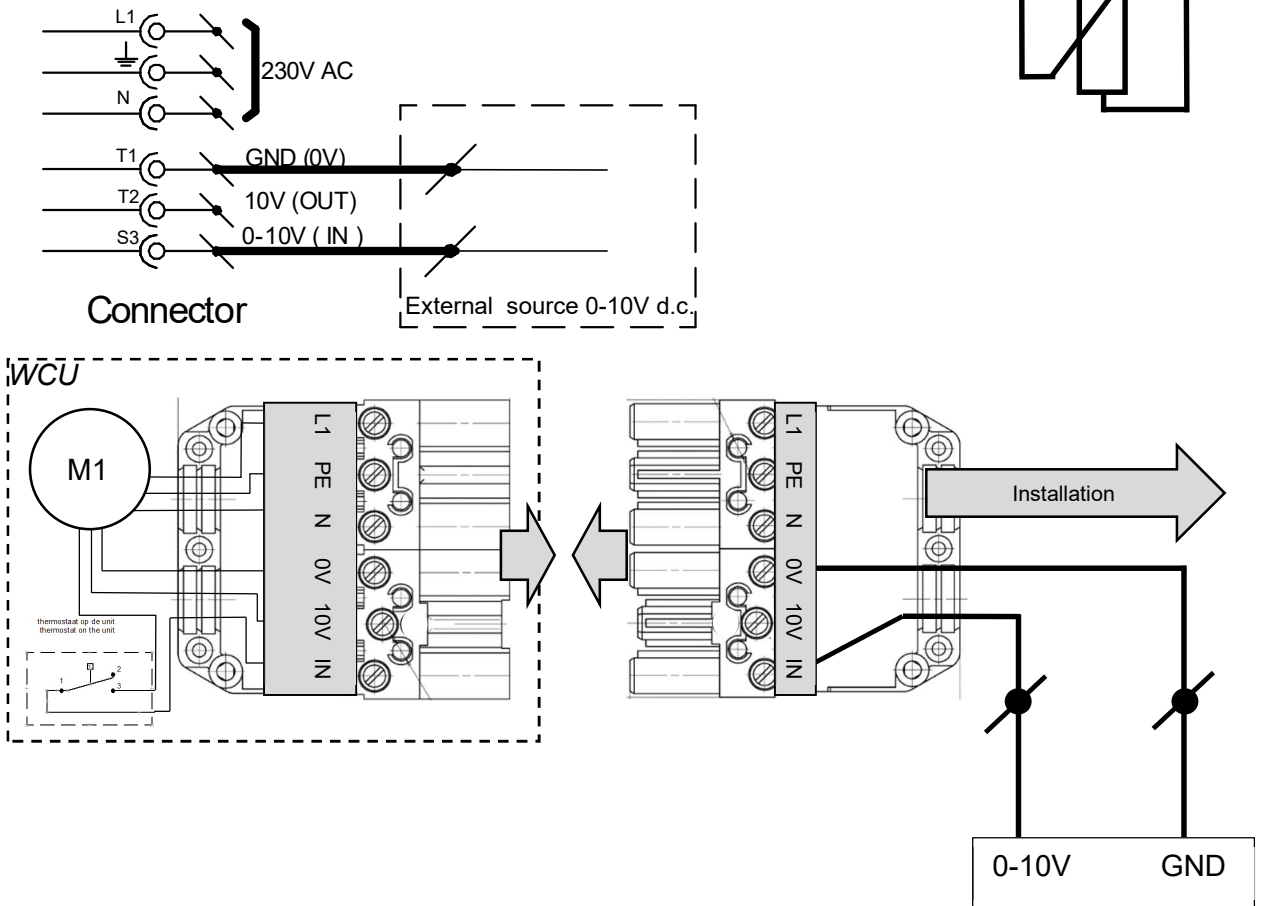
Control setting via speed regulator GA3955:

Connect the 230V supply in the 6-pole connector.

Connect the speed regulator as stated in the diagram below:



**Diagram 5 Connection with variable speed via external power source**



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**Diagram 6 Several WCUs controlled by 1 speed regulator**

If more than one WCU needs to be connected to one speed regulator, please make sure that the 10V supply of the different units are NOT connected to each other. So all WCUs get their 0-10V supply (10V out, T2) from one WCU. In the diagram below this is WCU No. 1.

