

# INSTRUCTION MANUAL

## Modular air curtain

### ACM / ACM EC



THIS DOCUMENT MUST BE READ BEFORE STARTING THE INSTALLATION.

INSTRUCT USER AND LEAVE THIS DOCUMENT WITH APPLIANCE FOR REFERENCE

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## General

This user's guide is meant for the installer and for the end user. It's a reference to operation and installation of an ACM air curtain. For safety sake and to guarantee correct operation, it is essential 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 everyone is informed about the use and safety aspects of the device throughout its lifetime.

### 1.1 Description

The Air Curtain Module consists of a metal casing with a bladed fan and motor on top, secured by a fan guard. There is a discharge nozzle with louvers on the opposite side, which enables the airflow to be directed in the desired direction. An air curtain consists of multiple Air Curtain Modules with an assembly set.

### 1.2 Function

The air curtain functions as an invisible door/segregation and has insulation properties. This can reduce energy losses up to 80% compared to an open door. The air curtain can be used with chilled or heated spaces. In most circumstances an air curtain is used to minimise heat losses with an open door. It could also be used as a segregation between a non or limited heated space and warmer heated space. For example between a storage space and workshop.

The airspeed can be controlled by an optional 5 stage speed controller (Standard ACM version) or 0-10 regulator (ACM-EC version), which can be used to adjust airspeed for different heights (widths), difference in forced ventilation (negative pressure) within the building or for variation in weather influences. The 5 stage speed controller has a stage that cuts off power to the installation. (stage 0).

The air curtain can be activated through the use of a door switch, which triggers a relay which in turn sends the power to the air curtain.

### 1.3 Overview of products and accessories

The following products and accessories are available:

GVACM	ACM module 500mm with AC fan.
GVACMEC	ACM module 500mm with EC fan.
GA8700	ACM assembly kit for AC version with two end-plates and two 3-pole connection plugs, see §6.1.
GA8701	ACM assembly kit for EC version with two end-plates and two 6-pole connection plugs, see §6.2.
GA4100	Door switch relay box for AC version 20A, see §6.3.
GA4101	Door switch relay box for EC version, see §6.6.
GA8575	Console set for horizontal mounting (vertical downflow) for 10 units maximum.
GA8585	Console set for vertical mounting (horizontal sideflow).
IA8543	5-step switch for 5 units max (5A)
IA8544	5-step switch for 8 units max (8A)
IA8515	5-step switch for 11 units max (11A)
IA8516	5-step switch for 16 units max (16A)
GA3955	Speed regulator for EC version

### 1.4 Warranty

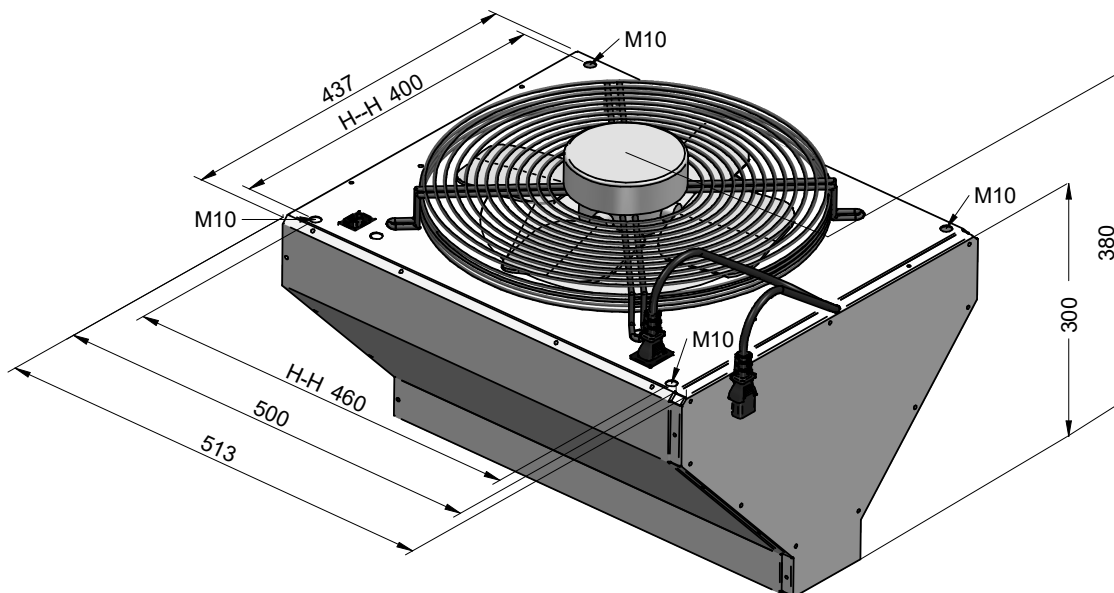
Operation/installation of appliances not according to this manual will void the warranty. It's not allowed to change the specifications or to make modifications of any kind, on this appliance.

## 2 Technical data

### 2.1 Table with data

Because the ACM air curtain consists of multiple modular sections, a variation of different widths or heights (vertical installation) can be constructed. Theoretical there isn't a limit to the amount of coupled modules, but every 10 connected modules must be succoured/supported at each end in case of the standard AC version. If more than 10 modules are used there needs to be a another power source, because the internal wiring is designed for a maximum current of 10A.

Number of modules	Unit	1	2	3	4	5	6	7	8	9	10
Length	mm	520	1020	1520	2020	2520	3020	3520	4020	4520	5020
Min. suspension height	m	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
Max. suspension height	m	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5
Air output (cold) (AC version)	m³/h	1900	3800	5700	7600	9500	11400	13300	15200	17100	19000
Air output (cold) (EC version)	m³/h	2250	4500	6750	9000	11350	13500	15750	18000	20250	22500
Voltage (50Hz)	V	230	230	230	230	230	230	230	230	230	230
Protection rating	IP	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20
Accumulated power consumption (AC version)	A	1,0	2,0	3,0	4,0	5,0	6,0	7,0	8,0	9,0	10,0
Accumulated power consumption (EC version)	A	0,9	1,9	2,8	3,8	4,7	5,6	6,6	7,6	8,5	9,4
Sound level 5m (AC version)	dB(A)	64	67	69	70	71	72	73	73	73	74
Sound level 5m (EC version)	dB(A)	34-53	35-54	36-56	37-58	38-58	38-58	38-59	39-59	39-60	39-60
Weight (AC version)	kg	12	24	36	48	60	72	84	96	108	120
Weight (EC version)	kg	10	20	30	40	50	60	70	80	90	100



### 2.2 Pre-check

Before installation, please check (i.e. on the data badge) if the appliance is in accordance with the order and whether it suites 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 can cause injuries to people.

## 3 Installation

### 3.1 Suspension

Every unit has 4 popnuts at each corner, in the illustration on page 4 the dimensions are depicted with the notification H-H. By using these popnuts one can mount the air curtain to the wall or ceiling with our consoles (see §1.3 or M10 studs. These are not included (as standard). The coupled modules have to be suspended or supported at each end. The maximum non supported or suspended coupled units is set at 10 modules (5m) to prevent sagging.

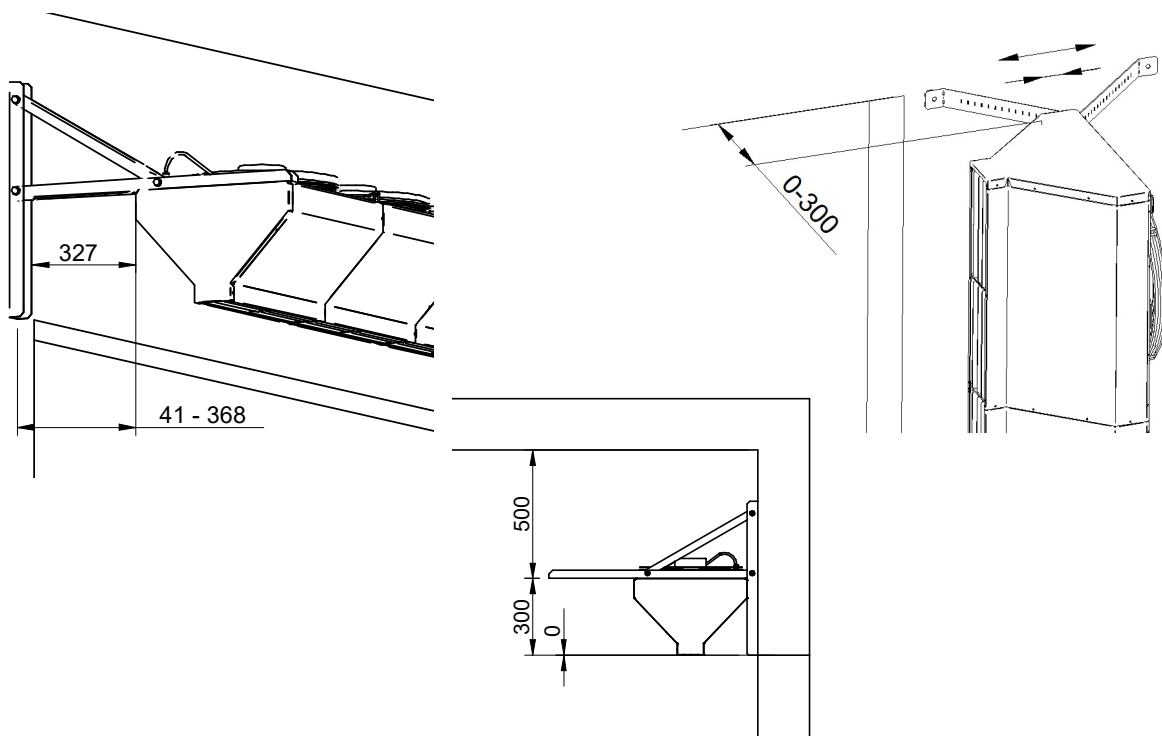
### 3.2 Calculating number of modules

Each module is 500mm long. One can find the number of modules with resulting length in table under §2.1. The air curtain has to be wider than the door opening, to accomplish as good as possible segregation.

*Calculation : Measure the width of the door in cm and divide with 50, the resulting number is the minimal number of modules. Almost always there is an extra module needed for enough overlay.*

### 3.3 Positioning

Make sure the air curtain has undisrupted flow of intake air and blown air, there should be a minimum distance of 0.5 meters between ceiling or overhead door. Horizontal mounting is preferred above vertical mounting, because that way the air curtain will also serve as a recirculation fan and the air stream will be warmer than on floor level. The side of the air stream should be as close as possible to the edge of the door opening, the further the air curtain is placed away from the door opening the less effective it becomes. The distance to the wall with our horizontal console is variable between 41-368 mm, with the vertical console this is between 0-300mm. The maximum mounting height is 4,5 meters. In case of vertical mounting the maximum door width for one air curtain is 4,5 meters. For other dimensions ask your reseller for advice. With use of the adjustable louvres, one can change the direction of the air stream, the louvres may not be set at extreme angles, because this has a negative effect on the efficiency of the fans.



## 4 Electrical connection

### **Warning:**

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

### 4.1 230Vac supply

The installation must comply with all applicable local and/or national standards e.g. NEN 1010. There should be a suitable electrical group with a main fuse. There is an electrical diagram further on in this guide. The supply is 230Vac (50 Hz) with earth.

#### 4.1.2 Isolation switch or power plug

The appliance has to be equipped with a 230 Volt isolation switch or power plug. This switch should be suitable for the maximum accumulated current. This switch should disconnect phase and neutral (not earth) and have at least an 3mm contact opening. Switches or power plugs must be accessible at all times.

For power supply the unit has been provided with a 3-pole power plug (female) for the standard (AC) version and a 6-pole plug for the EC version. The installer should connect a 3-wire mains cable and a power plug or switch to it.

## 4.2 Connection options

### 4.2.1 Connection without speed control

#### AC version

With the interference of an isolation switch or power plug the air curtain can be connected to the mains. If the connection is made the fans will always run at full speed.

**See chapter 6.2.**

#### EC version

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 full speed. T

**See chapter 6.4.**

### 4.2.2 Connection with door switch

#### AC version

The air curtain can be activated as the door opens. This can be done with the use of a door switch, which powers the relay of the relay box (article GA4100) and activates the air curtain.

**See chapter 6.4**

#### EC version

The air curtain can be activated as the door opens. This can be done with the use of a door switch, which powers the relay of the relay box (article GA4101) and activates the air curtain.

**See chapter 6.7**

### 4.2.3 Connection with speed control.

#### AC version

The airspeed can be adjusted with the 5-step switch for different heights (widths), difference in forced ventilation (negative pressure) within the building or for variation in weather influences. Step 0 can be used to shut off the power.

Function:

The 5-stage speed control is installed in between the power source. Depending on the chosen stage, the fan will turn fast or slowly. Before installation consult the manual of the 5-stages switch.

**See chapter 6.2 and 6.3**

#### EC version

The airspeed can be adjusted in two ways:

##### 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 6.5.**

##### *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 6.6**

## 5 Setting, operation and maintenance

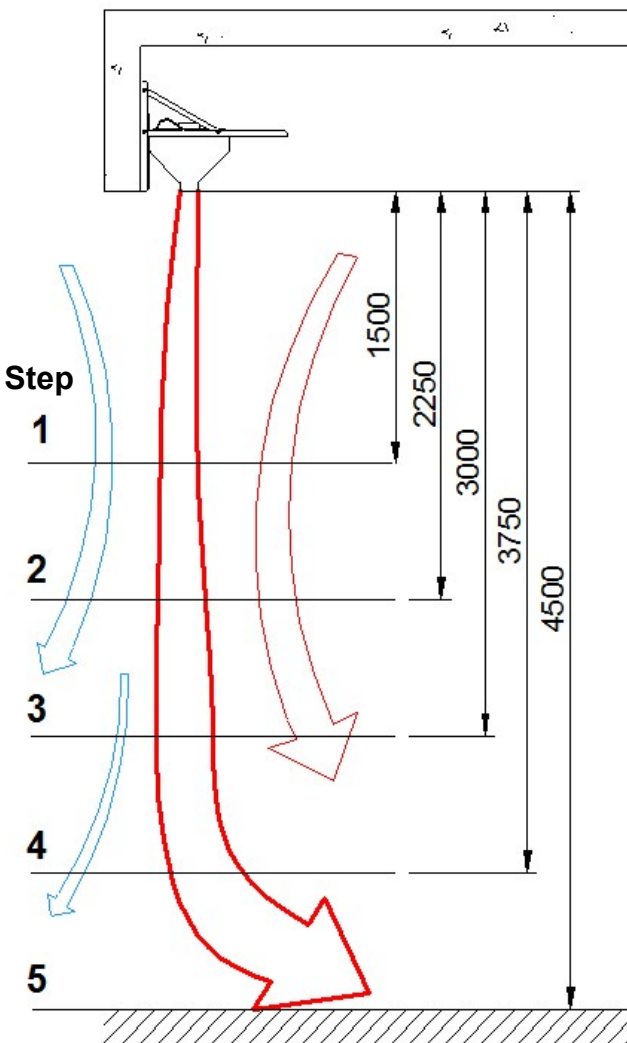
### **Warning:**

Before starting maintenance make sure that the power group you are working on has been shut off! The appliance should have earth!

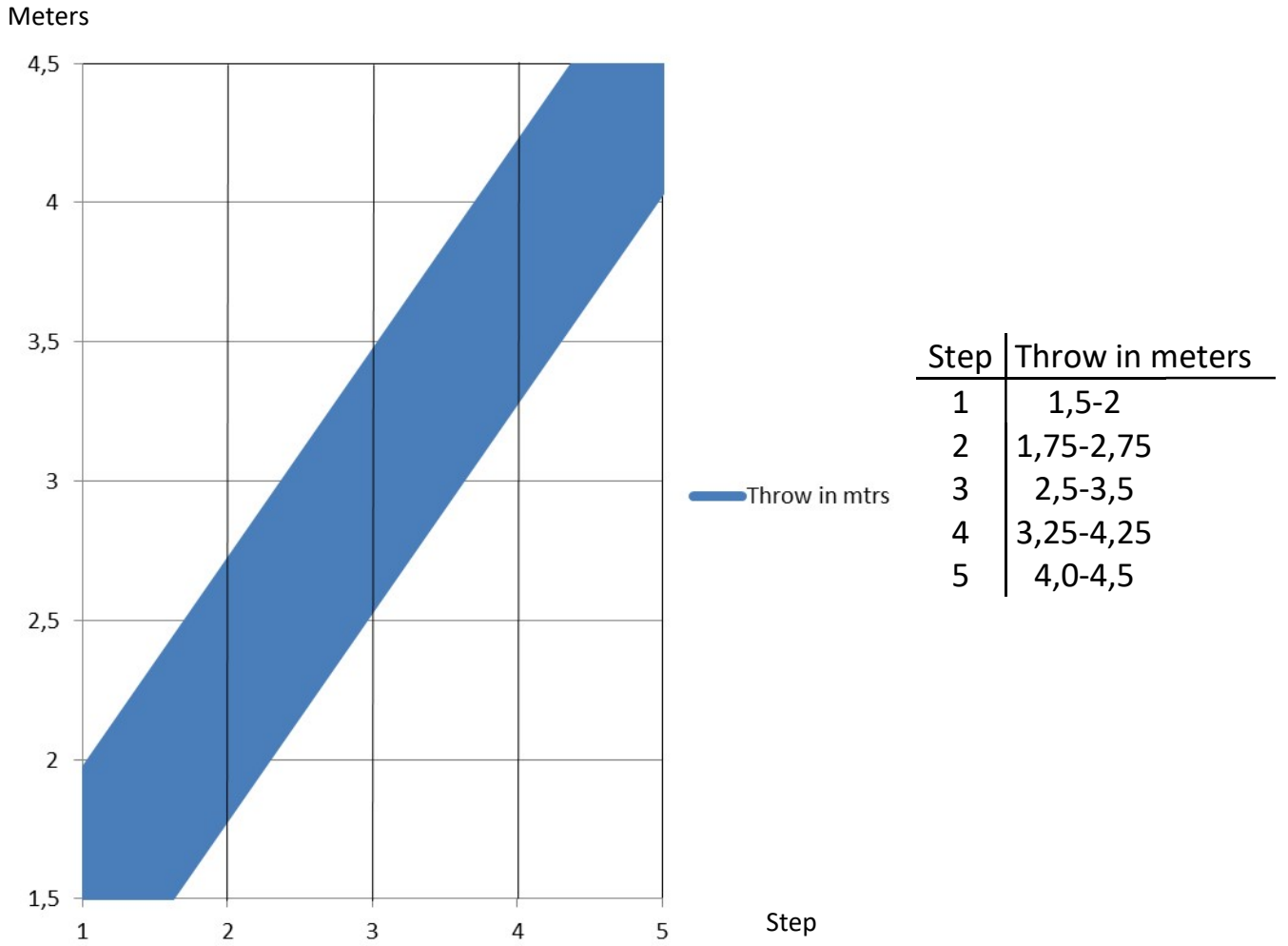
### 5.1 Operation

With the 5-step switch (AC version), 0-10V regulator or external 0-10V source (EC version) one can adjust the airspeed on ground level, as explained in §4.2. The airspeed on ground level may not be too low because the air curtain can't withstand any wind load. Too high airspeed at ground level will lead to unnecessary turbulence and excessive sound. The ideal flow profile is depicted in the illustration below. One can roughly check this by feeling with the hands, or tuft testing with a string of paper to visualise the airflow profile. But of course an anemometer would be the best. If there is a strong wind load on the door opening, one can turn up the airspeed. The air curtain isolates the interior space, thus it can be used in summer. Not only to repel the heat, but also to wear off flying insects who avoid higher airspeeds than their surroundings.

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







## 5.2 Maintenance

In spaces with heavy dust it might be necessary to clean the fan guard with compressed air once a year. If the fan guard is covered with severe dust the fan will have diminished suction capabilities.

## 6 Assembly and electrical instructions

### 6.1 Assembly GVACM+GA8700 (AC version)

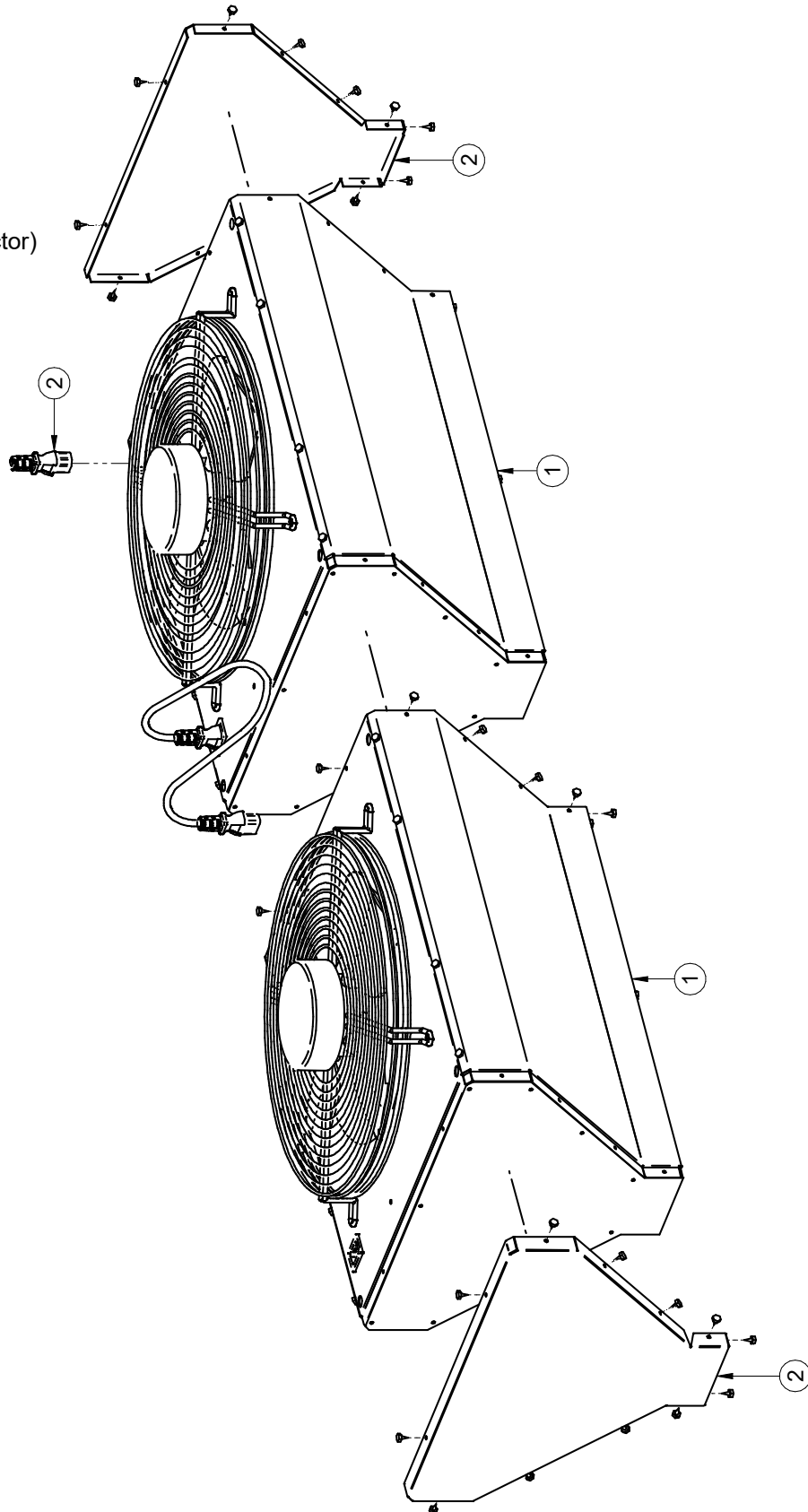
The ACM modules and assembly set have to be assembled as depicted with use of included parkers (key size 7).

Part no.

- 1. GVACM
- 2. GA8700

Spare parts:

- IX4200 Fan Ø350
- IW5903 Internal wiring
- IW5904 Power plug (connector)
- IW5405 Appliance plug



## 6.2 Assembly GVACMEC+GA8700 (EC version)

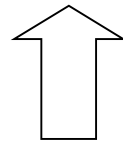
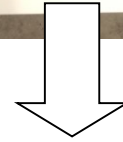
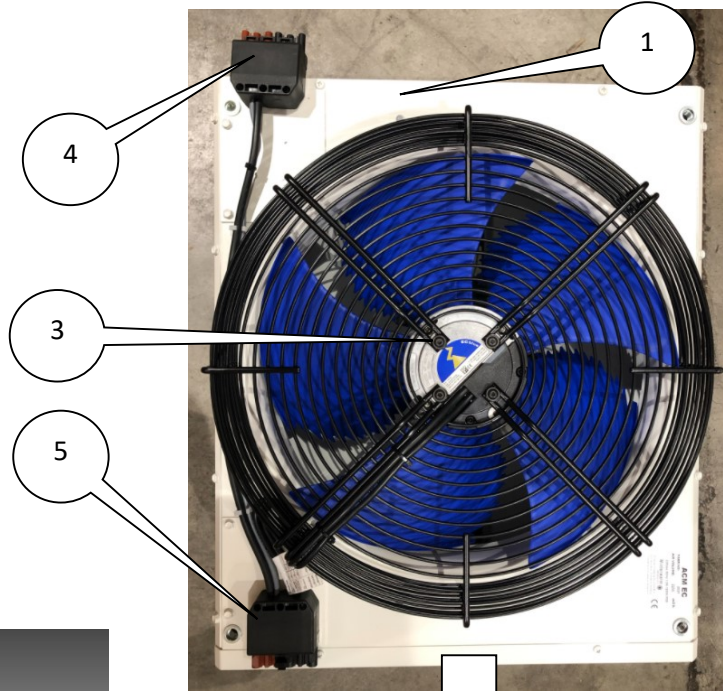
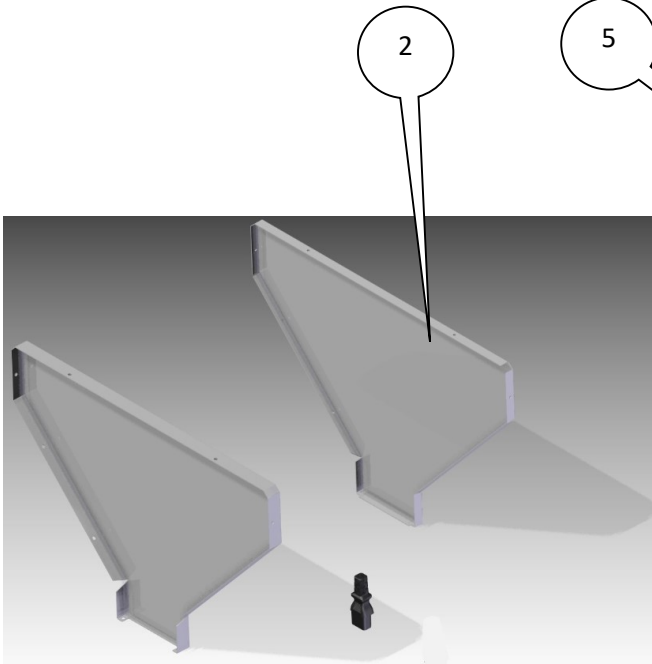
The ACM modules and assembly set have to be assembled as depicted with use of included screws.

### Part no.

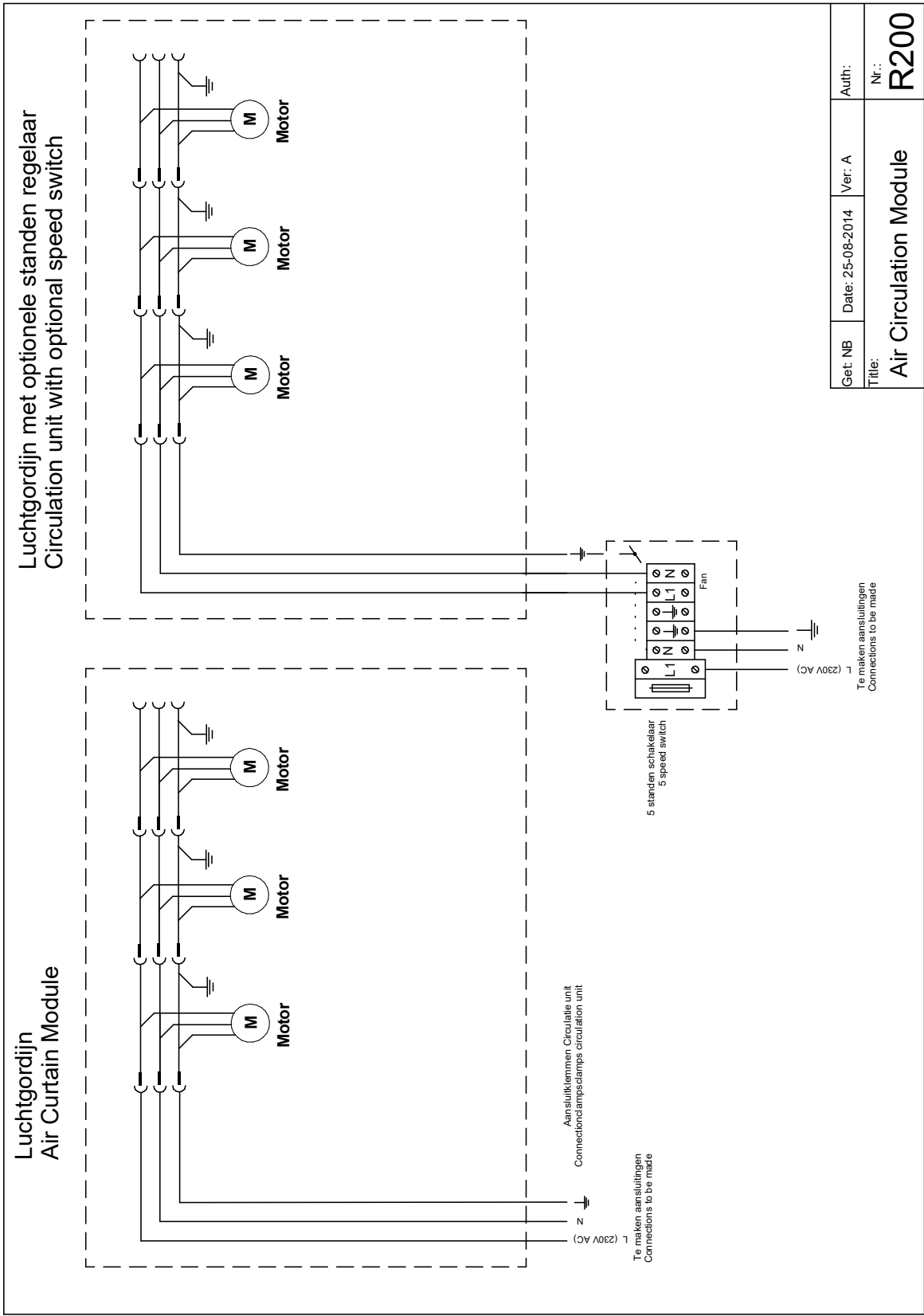
- 1. GVACMEC
- 2. GA8701

### Spare parts:

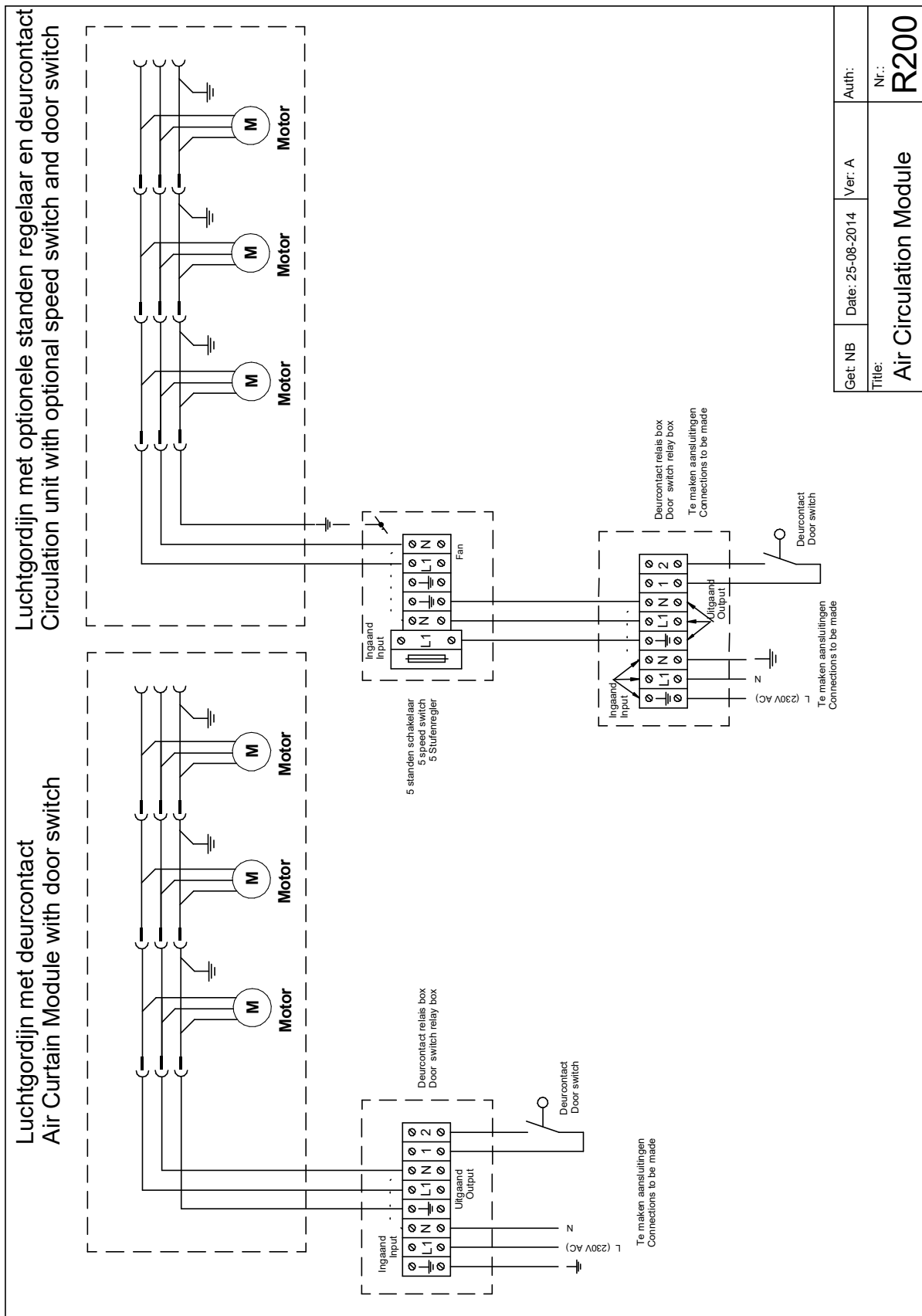
- 3. IX4202 Fan Ø350 EC
- 4. IC5486 Male connector
- 5. IC5488 Appliance plug



### 6.3 Electrical connections with and without speed controller (AC version)

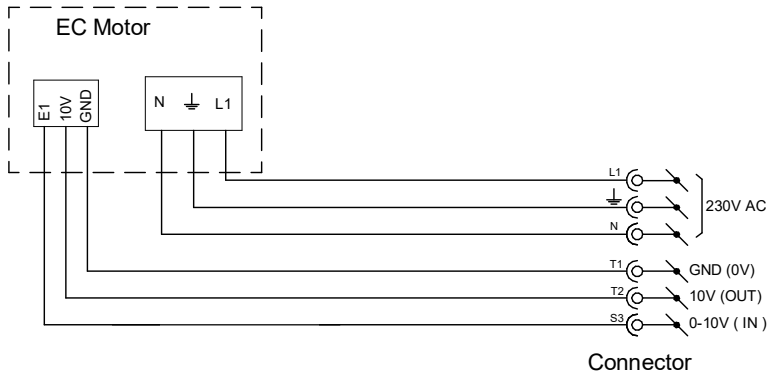


## 6.4 Electrical connections door switch with and without speed controller (AC version)



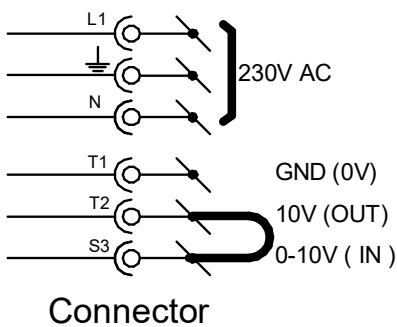
Get: NB	Date: 25-08-2014	Ver: A	Auth:
Title: Air Circulation Module		Nr.: R200	

## 6.5 Electrical connections with maximum speed (EC version)



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

Connect a wire between terminals T2 and S3, see diagram below

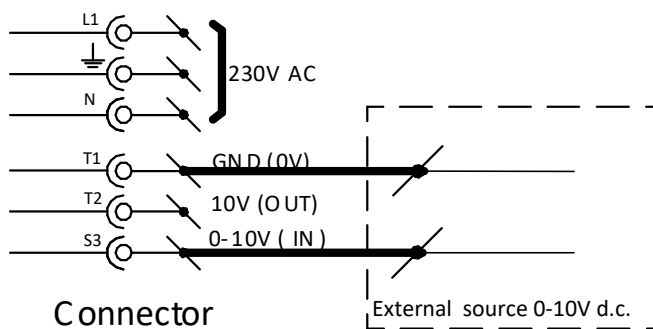
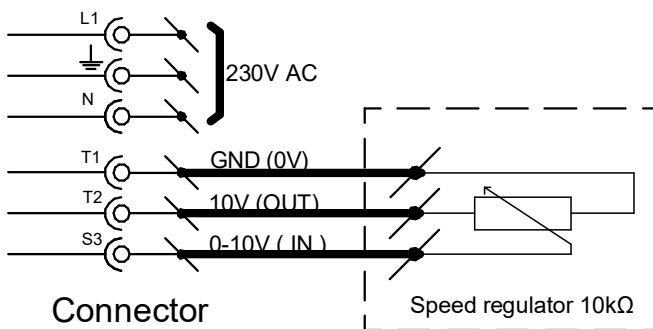


## 6.6 Electrical connections with speed control 0-10V (EC version)

Control setting via speed regulator GA3955 10kΩ or external source 0-10V:

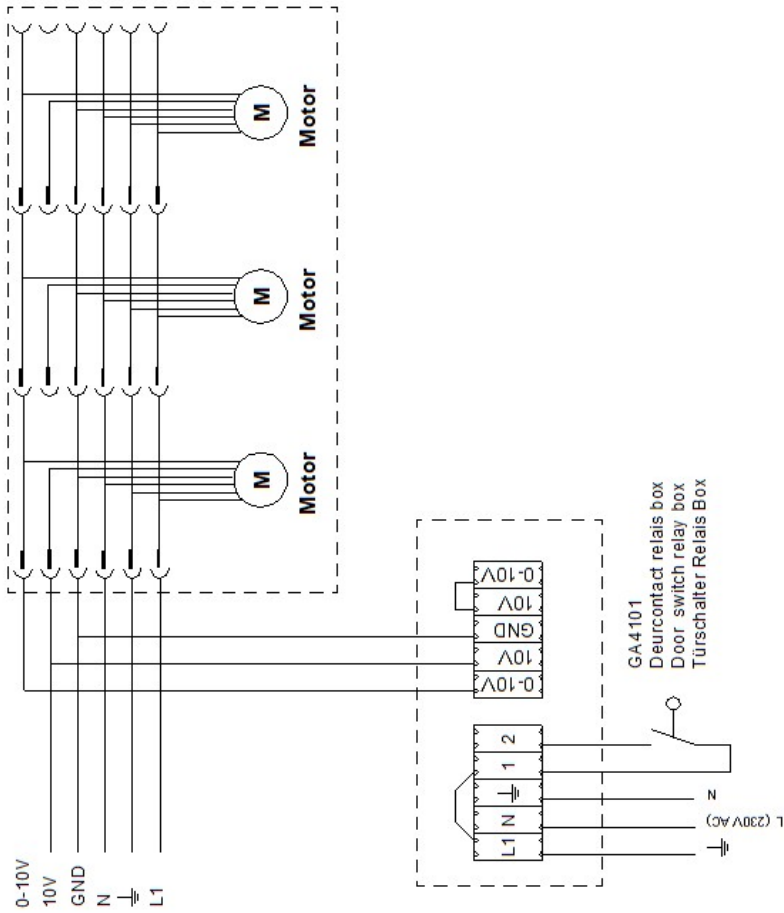
Connect the 230V supply in the 6-pole connector.

Connect the speed regulator as stated in the diagram below:



## 6.7 Electrical connections door switch with/without speed controller (EC version)

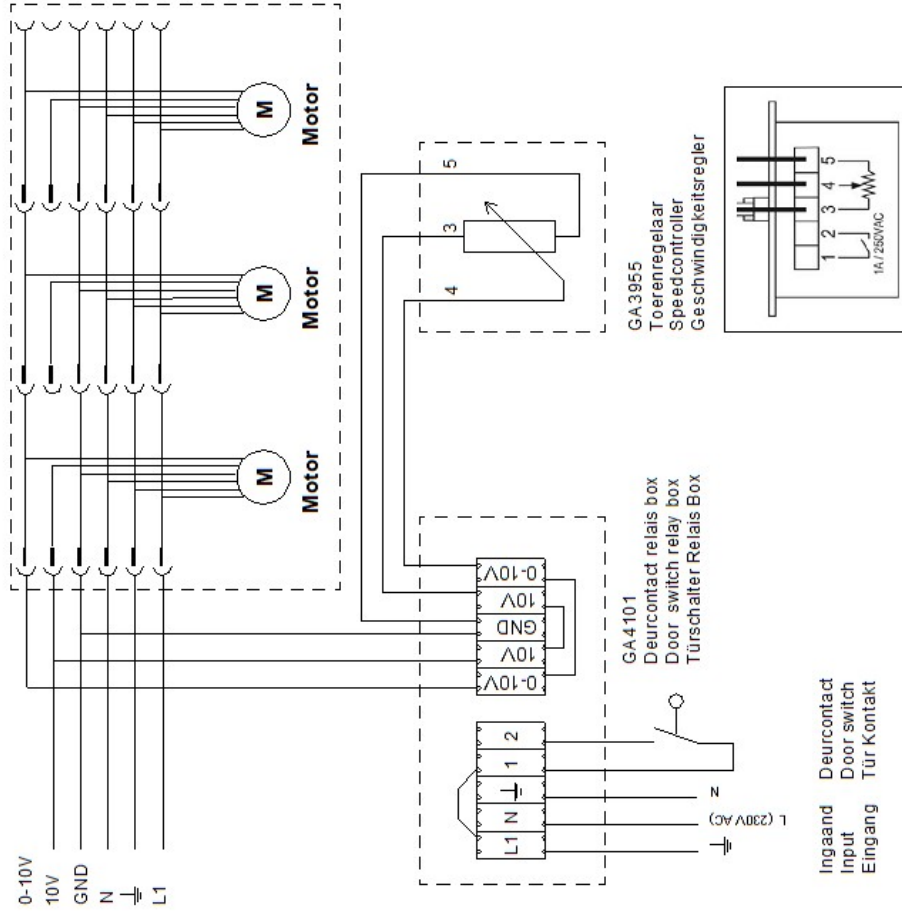
Luchtgordijn met deurcontact  
 Air Curtain Module with door switch  
 Luftschleier Modul mit Türschalter



Ingaand  
 Input  
 Eingang

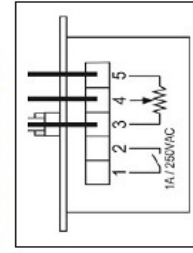
Deurcontact  
 Door switch  
 Tür Kontakt

Luchtgordijn met optionele standen regelaar en deurcontact  
 Circulation unit with optional speed switch and door switch  
 Luftschleier mit optioneller Stufenregler und Türschalter



Ingaand  
 Input  
 Eingang

Deurcontact  
 Door switch  
 Tür Kontakt



## 7 Installation with mounting kits

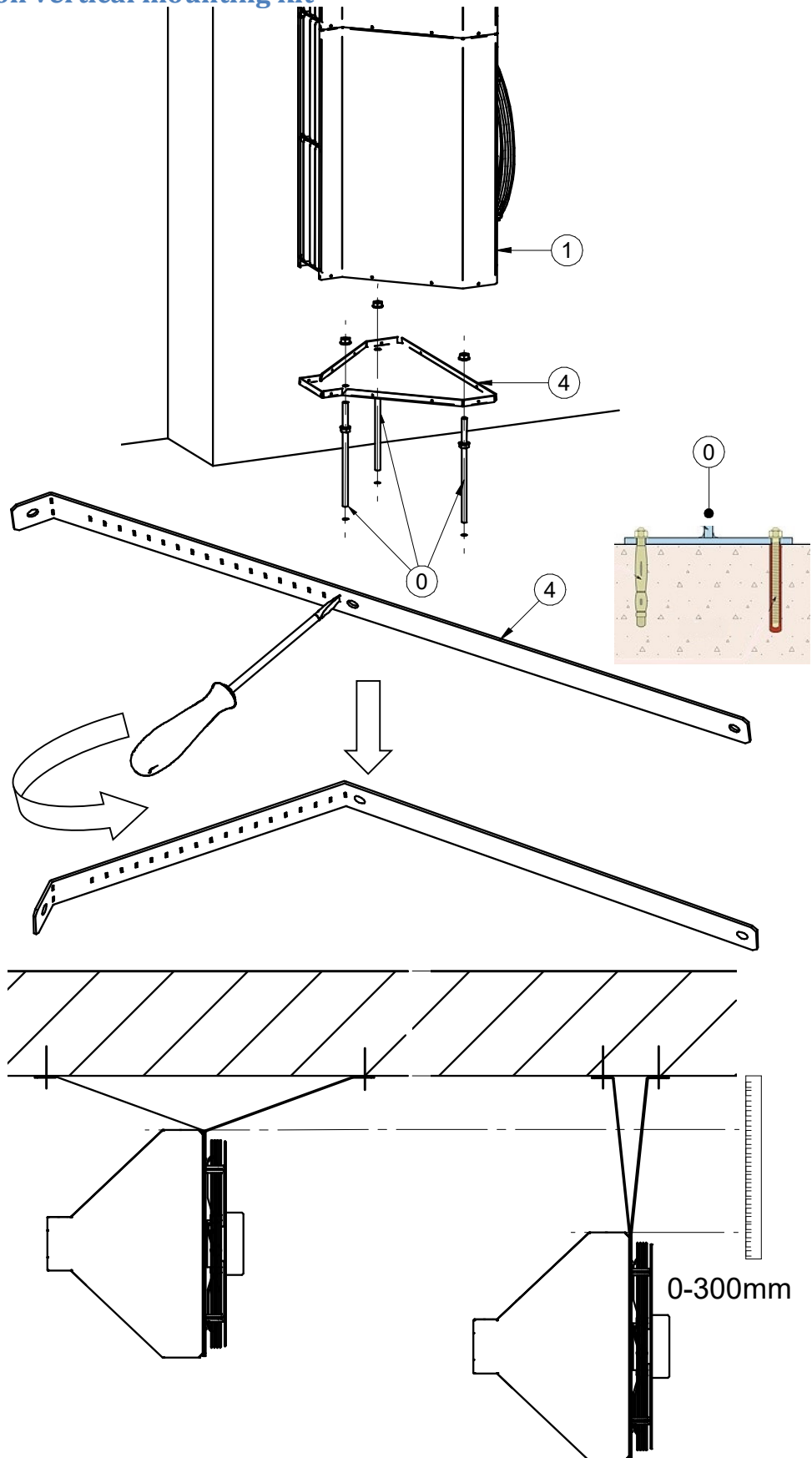
### 7.1 Installation vertical mounting kit

Part no.

1. GVACM

4. GA8585

0. Not Included





## 7.2 Installation horizontal mounting kit

