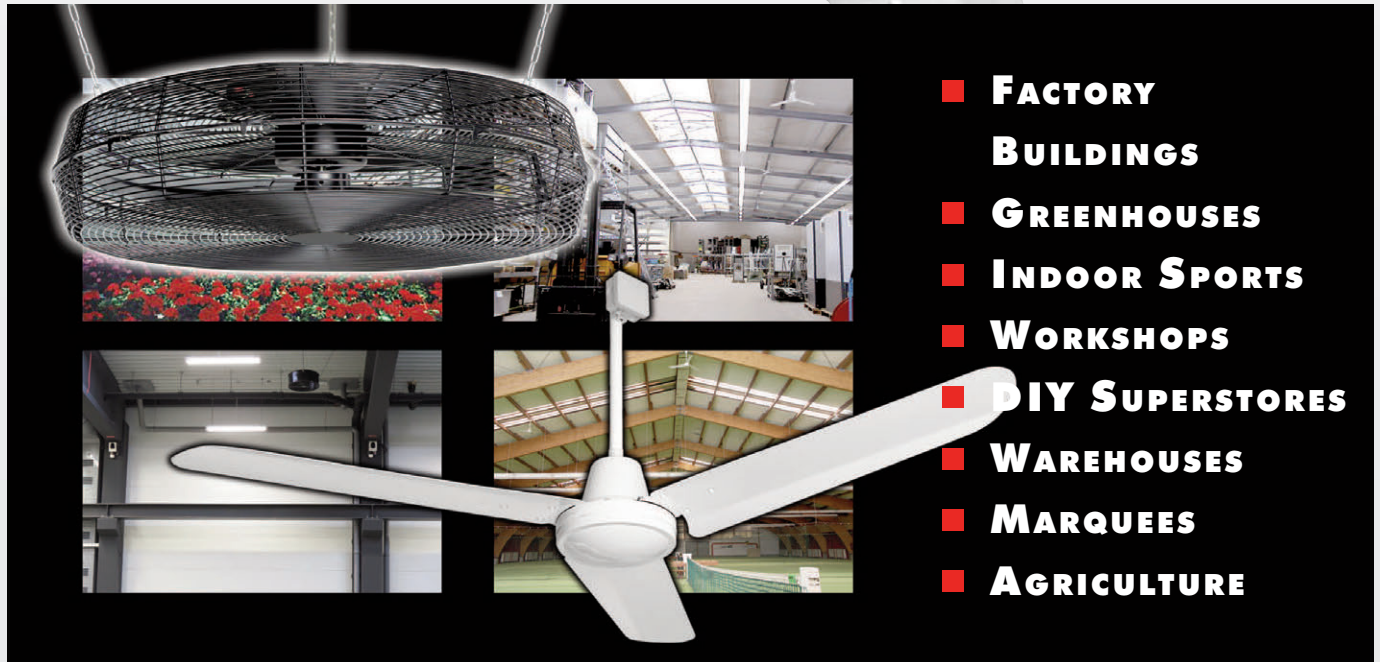
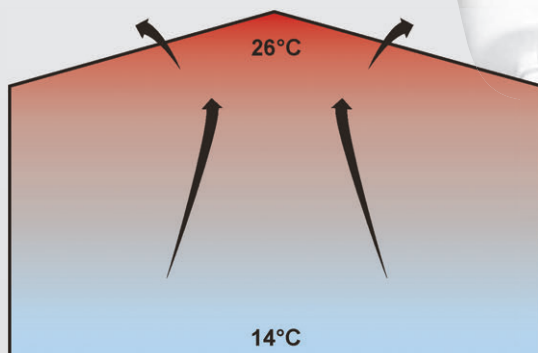


# Industrial ceiling fans

Push down the heat from the ceiling and get significant energy savings!



**BEFORE**



## Ceiling hot - floor cold

Warm air rises to the ceiling. To get the requested temperature at the floor, you have to heat again and again, even though the ceiling already has 26°C.

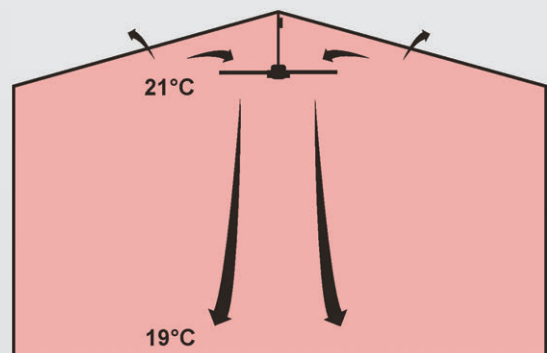
## Energy loss

The high temperature at the ceiling causes a corresponding high energy loss at the ceiling (transmission).

## Cold remote corners

Often some areas of the room stay cold after a long time heating.

**AFTER**



## Equalized temperature

Our industrial ceiling fans equalize the room temperature by pushing down and mixing the warm air. As the example above: For 5° higher temperature at the floor without additional heating we have 30% lower fuel costs.

## Energy savings

If we have an outer temperature of 0°C and a reduced temperature from 31°C to 21°C at the ceiling, the transmission is reduced by 32%.

## Allwhere steady warm

The complete room is comfortable warm now - fast and equal. The pre-heat time can be reduced.

# Industrial ceiling fans for recirculation of hot air

## Quality and reliability

Fans from Fenne KG are developed and produced especially for recirculation of hot air since over 25 years. Find out the outstanding characteristics (for example 03.210 to 03.260):

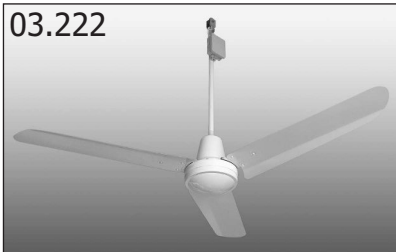
Facts	Advantages
Solid massive metal design	Wear-free as possible
Continuous operation is possible	Up to 24/7
Individually balanced	Wobble free running and optimized air flow
Safety wire	Highest safety...
Overtemperature protection	...in any circumstances
Completely assembled (except blades)	No delays/problems on building site
Energy-saving motor with high percentage of copper	Performance max. 10m with low consumption
Special blades for a tight cone of air	Recirculation of hot air without wide air draft

## Models

03.210



03.222



03.291



03.312



## Accessories

**Controller recirculation hot air:** Automatic and adjusted to the needs: The fans are controlled with two temperature sensors for the ceiling and the floor. The controller is also equipped with an integrated display.

**Speed controller:** Regulates the speed for ceiling fans. You can control up to 20 fans, same type, with one controller so that the hot air gets to the lounge area, draught-free and while saving energy.

## Installation

Depending on the local conditions and the model, you should install 1 fan per 125 to 300 m<sup>2</sup>. Ask for the full installation details for the ideal application or benefit from our free planning service.

## Specifications

Model	03.210/211/214	03.222/224	03.291	03.312
Color	white/black/white	white	black	black
Voltage	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz
Power	75 W	75 W	260 W	350 W
Max. Current	0,35 A	0,35 A	1,1 A	1,6 A
Speed	300 rpm	300 rpm	1260 rpm	1350 rpm
Air Volume	15.000 m <sup>3</sup> /h	15.000 m <sup>3</sup> /h	18.000 m <sup>3</sup> /h	21.300 m <sup>3</sup> /h
Performance max.	10 m	10 m	16 m	20 m
Sound level at 1m	52 dB(A)	52 dB(A)	65 dB(A)	64 dB(A)
Weight	9,5 kg	9,5 kg	12 kg	17,9 kg
Diameter	142 cm	142 cm	81 cm	83,5 cm
Height	69 cm / 69 cm / 44 cm	69cm / 44cm	34 cm	25,5 cm
IP protection	-	IP54	-	IP54
Test mark	GS CE	CE	CE	CE

Subject to alteration.

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# Controller recirculation hot air for destratification fans



## Controller recirculation hot air 03.431

The device records the temperature difference between the floor and the ceiling with two temperature sensors and compares this with user given values.

If the temperature difference between floor and the ceiling goes higher than the user value, the relay switches the ceiling fans on. There is second user value which handles the switch off point. The relay switching contact can handle for example up to 10 fans 03.210 (extendable with a contactor).

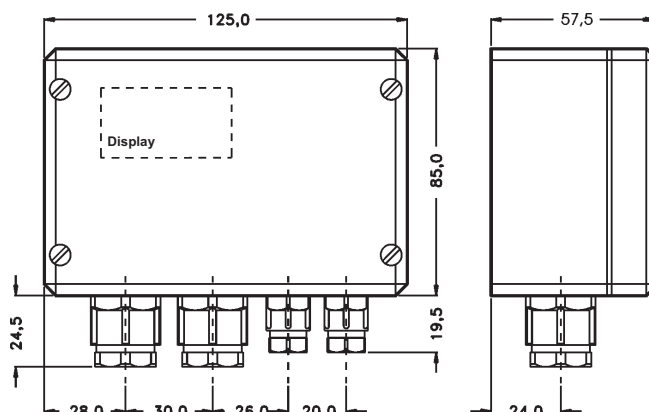
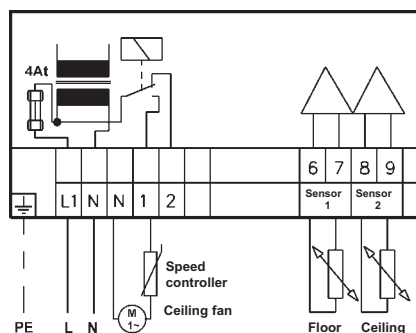
The current temperatures of the ceiling and the floor are constantly shown in an alternating display.

The two sensors are checked and monitored via display for convenient installation and performance check.

## Technical data

Product no.	03.431	
Permissible ambient temperature	-10° C to +50° C	
Switch off temperature difference	liniar 1 K to 10 K	
Switching distance	liniar 1 K to 10 K	
Temperature measurement range	-20° C to +120° C	
Operating voltage	230 V / 50 Hz	
Contact	1 changer, relay contact, not potential-free	
Max. permissible current	4 A motor power, 230 V / 50 Hz	
Operating life as VDE 0631	min. 2 x 10 <sup>5</sup> switching operations	
Housing	Fastening	Surface mounted
	Material	Plastic
	IP protection	IP 54 according to DIN 40050
	Protection class	Protection class II as VDE 0700 (protective insulation)
Weight	app. 380 g	
Sensor	Type	KTY 10-5, semiconductor sensor +- 1 %
	Design	Plastic housing IP 54, without cable
	Cable connection	2-conductor cable 0,5 mm <sup>2</sup> till 30 m; 0,75 mm <sup>2</sup> till 45 m
Subject to alteration		

## Connection diagram / dimentions



# Industrial Ceiling Fans

Recirculation hot air / drying / cooling / fresh breeze



## Technical data

Product no.	<b>03.210</b>	<b>03.222</b>
Voltage	230 V / 50 Hz	
Input Power	75 W	
Current	0,35 A	
Speed	300 rpm	
Air volume	15.000 m <sup>3</sup> /h	
Performance max	10 m	
Thermal fuse	included	
Diameter	142 cm	
Height	69 cm	
Sound level at 1 m	52 dB(A)	
Mounting	vertical, decoupled	
	safety wire included	
Color	white	
Packaging	Single carton polystyrene free 690x255x235 mm	
Weight	9,5 kg	
Marks	CE	CE
IP protection	IP20	IP54

Subject to alterations

Industrial ceiling fans from Fenne are particularly constructed and manufactured regarding performance, material loading and safety for the industrial permanent use, since 1985.



The additional safety wire, triple motor shaft bolts and overtemperature protection are samples of our safety requirements.

The high performance energy saving motor with high content of copper, as well as the concerted components are e.g. leading in the recirculation of hot air to reliable 10m though distance and long durability.

The fans are completely assembled (except blades), which means: No delays and no safety risks on building site.

## Variations

03.210	Color white, height 69 cm
03.211	Color black
03.214	Height 44 cm
03.215	Blades curved
03.222-225	Dust and splash water protection IP54 (TÜV Hanover)
03.260	Mounting: Clamp for 2" tube

## Accessories

Continuously speed regulator for synchronous regulation of 3, 6, 10 or 20 fans.

Temperature difference control for automatic switching according to the difference. Two temperature sensors included (ceiling and floor).

Interval switch for easy adjust automatic on/off (time) interval.



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# Industrial Circulation Fans

Recirculation of hot air / drying / cooling / fresh breeze



Circulation fans from Fenne are intended to offer the least possible resistance to the air flow. Construction and design are providing best performance, also high energy efficiency with particularly smooth running.



The flexible chain suspension and the smooth running enables an operation in every desired position.

## Technical data

Product no.	03.291	03.310	03.312
Voltage	230 V / 50 Hz	230 V / 50 Hz	230 V / 50 Hz
Input Power	260 W	265 W	350 W
Current	1,1 A	1,2 A	1,6 A
Speed	1.260 rpm	1.350 rpm	1.350 rpm
Air volume	18.000 m <sup>3</sup> /h	13.600 m <sup>3</sup> /h	21.300 m <sup>3</sup> /h
Performance max	16 m	14 m	20 m
Switch on device	-	3 steps	2 steps
Thermal fuse	included	included	included
Diameter	81 cm	69 cm	83,5 cm
Height	34 cm	20 cm	25,5 cm
Sound level at 1m	65 dB(A)	71 dB(A)	64 dB(A)
Mounting	ceiling hooks and chains included		
Color	black	black	black
Packaging	83x83x40cm	76x70x23 cm	88x85x26 cm
Weight	12 kg	10,2 kg	17,9 kg
Marks	CE	CE	CE
IP protection	IP20	IP54	IP54

Subject to alterations



Guard and chains provide a perfect safety even for ball sports or an unexpected contact of a folklift.

Successful in several industrial applications like drying, cooling, temperature equalization and fresh breeze at the workplace.

Ideal for double use: Recirculation of hot air in winter and fresh breeze in summer.

## Accessories

Speed regulator 1,5A till 10A - you can control up to 8 fans with one regulator.

Controller recirculation hot air: The fans are controlled with two temperature sensors for the ceiling and the floor.

Interval switch for easy adjust automatic on/off (time) interval



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# Industrial Ceiling Fan

## for industrial drying and special applications



### Industrial ceiling fan 03.260

This fan is special made and certificated for fixed clamp at a 2"-tube. Extra strong material and safety features allows permanent work in slant position up to 45°.

So a battery of fans, grouped at one tube, can be adjusted in angle in one step.



### Technical data

Product no.	03.260
Voltage	230 V / 50 Hz
Power	65 W
Max. speed	340 rpm
Air speed at 1 m	3,8 m/sec
Certificated environment temp.	50° C
Temperature control	2 temp. fuses 110°C/130°C
Diameter	95 cm
Height	42 cm
Hanging	clamp for 2" tube
	half clamp for flat mount
	additional safety wire
Certificated slant	max. 45°
Color	white ca. RAL 9016
Packaging	single carton, Styrofoam free
	28x25x42 cm
Test mark	CE
QC	ISO 9002

Subject to alteration

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The special made strong and cold motor and the higher angled blades results in powerful air delivery, needing small space and minimum power consumption. The fan is certificated for higher environment temperature up to 50°C, so warm air drying is possible. The fan temperature is controlled by two temperature fuses.

There are a lot of applications for this fan in the climate industry, the ceramic industry, the timber industry, the chemical industry and the building sector.

### Accessories

- Continuously speed regulator for synchronous regulation of 3, 6, 10 or 20 fans.
- Temperature difference control
- Interval switch for simple adjust automatic on/off



### Fenne KG

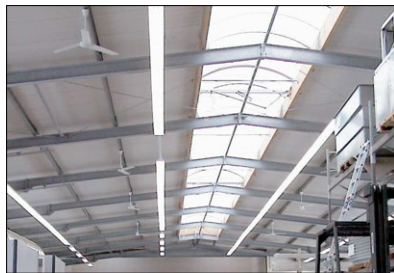
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# Planning instructions

## Industrial ceiling fans for recirculation of hot air



### Character

You can equalize the room temperature in high halls and rooms with the help of our ceiling fans by pushing down the hot air you provide. Air stratification with temperature differences with 10 and more degrees will be entirely eliminated and you can reduce the fuel costs up to 30%.

Furthermore, this works against the heat loss at the ceiling (transmission). The low temperature difference between the inside temperature at the ceiling and the outer temperature has a direct proportional impact on the transmission. E.g.: If you have an outer temperature of 0°C and a reduced temperature from 34°C to 22°C at the ceiling, the transmission is reduced by 35%.

A third advantage of the recirculation is the fast and equal heating of the complete room. Previous cold sections are distributed immediately with warm air. The staff appreciates the constant and comfortable temperature in the complete room. If the hall is used temporarily, the pre-heat time can be reduced strongly (or stretch the night reduction), this produces further economies.

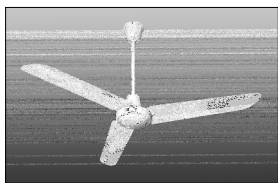
Other advantages are the prevention of mould and rust as well as having a dry floor.

Please note the following advices to ensure an optimal operation:

### Choice of type

#### **For recirculation of hot air - hall height up to 10m**

use our open industrial ceiling fans 03.210 to 03.224



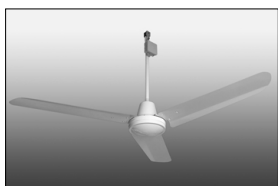
- **03.210** – Industrial-Ceiling-Fan, white
- **03.211** – Industrial-Ceiling-Fan, black

In case of barriers concerning the height (e.g. overhead crane runway):

- **03.214** – height 44cm
- Heights under 44cm and over 69cm on demand.

Hanging the fans 03.210-03.260 with a chain is technical not possible and not permitted !

The following fans with IP protection IP54 are special splash-water proof and dust proof (certificated by the German Technical Control Board TÜV). IPx4 = splash-water proof, IP5x = dust proof



- **03.222** – protection IP54, height 69 cm
- **03.224** – protection IP54, height 44 cm

# Planning instructions

## Industrial ceiling fans for recirculation of hot air

### For recirculation of hot air - hall height higher than 10m



- **03.310** – Ceiling Fan with safety guard, IP protection IP54, up to 14m hall height, completely assembled



- **03.291** – Ceiling Fan with safety guard, up to 16m hall height, completely assembled
- **03.293** – as 03.291, flat packed for export



- **03.312** – Ceiling Fan with safety guard, IP protection IP54, up to 20m hall height, completely assembled

## Number of ceiling fans

### Neu: Online-Auslegungstool

#### Ihr individueller Gerätevorschlag zur Warmluftrückführung

- Direkt und ohne Registrierung:
- individueller Gerätevorschlag
  - Stromverbrauch hierzu
  - Platzierungsbeispiele hierzu



Start

Depending on the circumstances, you should install one fan for 125 m<sup>2</sup> to 250 m<sup>2</sup> for the destratification.

To determine the exact number of fans, use our planning tool which you can find on our german website:

<http://fenne-kg.de/html/auslegungstool.html>

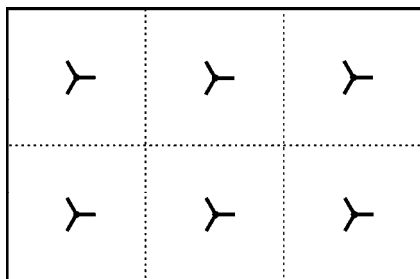
Enter ground space (Grundfläche) and hall height (Hallenhöhe) and you'll get a recommendation.



# Planning instructions

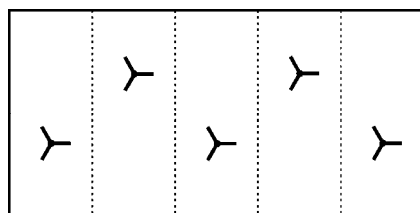
## Industrial ceiling fans for recirculation of hot air

### Position of the ceiling fans



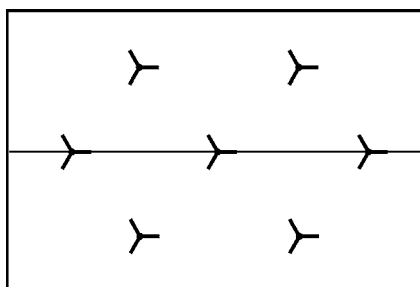
The fans are distributed equally on the surface. Ideally divide the room into rectangles, as equally sized as possible, for the number of fans to be installed. In the middle of each zone you can place one fan. (Img. 5).

Img. 5



If it is not possible to create equilateral rectangles, you can take another shape, as e.g. in image 6 and 7.

Img. 6



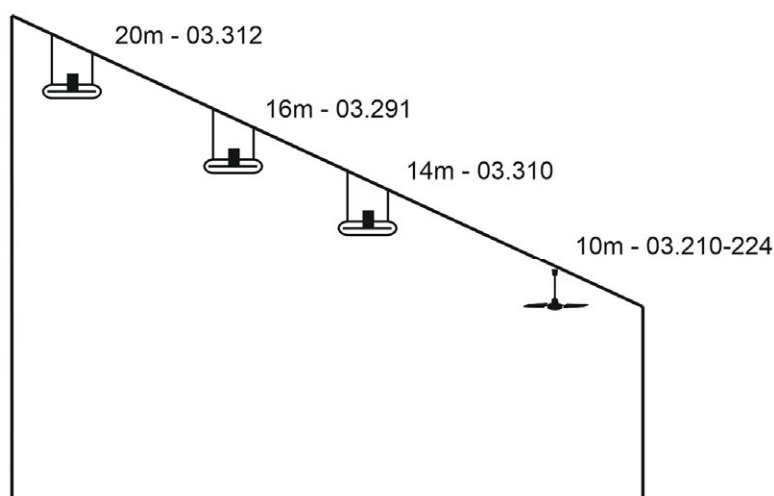
Important: You should always install some ceiling fans at the highest position of the room, to be sure no hot air remains under the ceiling (Img. 7).

If it is not possible to install the fans above working places or shelves, it is possible to have an unequal distribution. If the differences are not that large, this will not cause problems. We will gladly consult and advise you.

Img. 7

### Height of the hall

The performance of the ceiling fans is about (without temperature stratification)

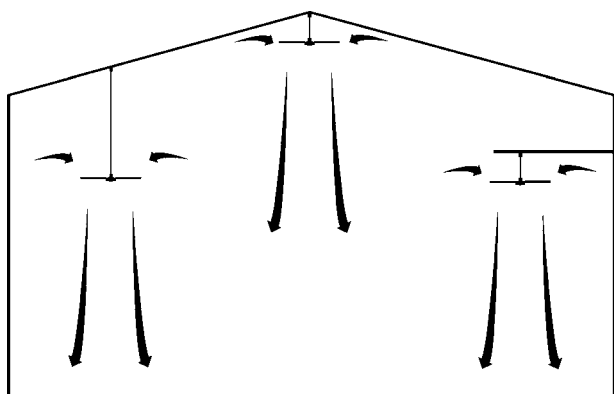


Img. 8

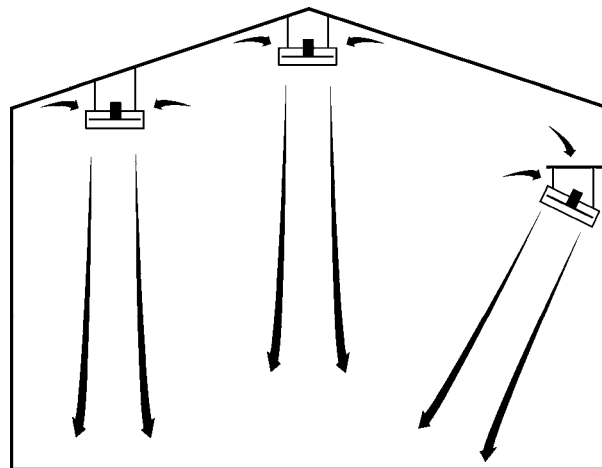
# Planning instructions

## Industrial ceiling fans for recirculation of hot air

A complete destratification from top to ground is possible in higher halls, if you install the fans at two levels. Just use the local conditions. If the installation at different levels is not possible (e.g. because of a high-bay warehouse), you can eventually install the fan 03.291 at the side wall in slant position (Img 10).

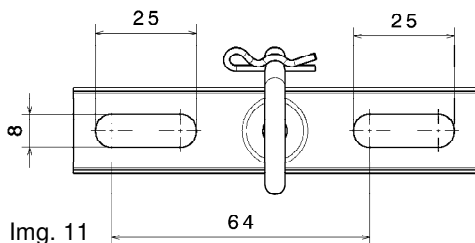


Img. 9



Img. 10

## Planning for mounting the devices



Img. 11

Models 03.210 - 03.260:

You'll find enclosed to the fans one ceiling j-hook with safety pin (Img. 11). To mount the extra safety wire with the noose at the ending, you'll need a suitable fixation for the kind of ceiling.

Models 03.291, 03.293, 03.310 und 03.312:

You'll find enclosed to the fans 3 ceiling j-hooks with safety pin and 3 chains with 1m length.

The ceiling j-hooks are installed preferably at the ceiling in the corners of a triangle whose sides are 120cm till 150cm long. Alternatively you can choose the three fastening points at a straight line with a distance of 80-100cm.

## Main switch of the ceiling fan area

The activation of the whole fan area can be realized via an own main switch, via the main switch of the heating system and/or via time switch.

# Planning instructions

## Industrial ceiling fans for recirculation of hot air

### Control of the fans

The temperature difference will be balanced a short period after switching on the fans. You should therefore switch the fans completely off in order to reduce power wastage and air movement. You can use the following solutions:

- Controller recirculation hot air
- Coupling with the blower of the warm air heater
- Interval switch

### Controller: Controller recirculation hot air



The controller recirculation hot air for an appropriate control of the fans. The device records the temperature near the floor and the ceiling with two temperature sensors in order to switch on or off the recirculation equipment (speed controller and fans).

If the temperature difference goes higher, the relay switches the ceiling fans on. The switch off temperature can be defined separately. The throw distance of the air is declining with the force of the air stratification. It is therefore recommendable to switch on the fans before the temperature difference is too big. A reasonable modulation could be: e.g. a temperature difference of 3 degrees for switching on and 2 degrees for switching off.

The positioning of the sensors and the testing of the adjustment in practice is decisive for a maximum reduction of the heating costs while having the lowest possible power consumption. It is important that the sensors record the average temperature. The sensors should not be

installed near to perturbations as for example gates, windows, water lines as well as strong air circulations. It is possible to extend the maximum amperage of 4A by an electric contactor.

### Controller: Coupling with the blower of the warm air heater

In this case, the fans will rotate automatically during the heating cycle and the inserted warm air will be distributed immediately in the room. It is no more possible to achieve a high temperature difference and the fans can have the maximum performance also in very high rooms. You can use this sort of control sole or couple it with the controller recirculation hot air.

### Controller: Interval switch



The interval switch is a useful and cost-efficient solution for switching automatically the working and break time of the fans. The manually on/off switching by the staff is no more necessary.

The working time and break time can be defined between 3 and 60 minutes. The two setting potentiometers can be adjusted comfortably and directly by hand. The housing is a surface mounted IP55-DIN rail-box (EN 50022). The enclosure has additional space for e.g. main switch, weekly timer or switch for permanent operation.

The maximum amperage of the interval switch is 8A and it is extendable by an electric contactor.

# Planning instructions

## Industrial ceiling fans for recirculation of hot air

### Regulation of the air flow



#### Speed controller, stepless

You can regulate the air flow with the following speed controller in such a way that you reach the occupied area without any potentially undesirable airflows. Especially next to standing working spaces it is necessary to regulate stepless the speed. The installation of the fans in close proximity to sitting working places must be prevented.

You should control the fans separately if you have one of the following cases:

- Areas of the room are used differently (construction, storage, customer area...)
- Different levels of mounting for the fans
- Different kind of fans

The speed controller is equipped with an internal trimpot to adjust the minimum speed.

It is recommended to connect the stepless speed controller near the maximum of the allowed amperage (e.g. 4A fans with a 5A speed controller), especially on lower speed, stepless regulators can create as a matter of principle a slight humming sound.

#### Number of ceiling fans per speed controller

	03.210-260	03.291-293	03.310	03.312
03.403 Speed controller, stepless, 1,5A	1-3	1	1	0
03.404 Speed controller, stepless, 3,0A	2-6	1-2	1-2	1
03.405 Speed controller, stepless, 5,0A	3-10	2-4	2-4	2-3
03.406 Speed controller, stepless, 10A	6-20	4-8	4-8	4-6



#### Speed controller, transformer regulator, 5-steps

As a matter of principle, stepless regulators can create a slight humming sound especially on lower speed. Regulators based on transformer are not concerned and regulate the fans extra silent.

Another advantage is the fact that you do not need to consider a minimum load. You can e.g. regulate with a 5A regulator a 0,1A motor.

#### Number of ceiling fans per speed controller

	03.210-225	03.230-260	03.291-293	03.310	03.312
03.423 Speed controller, 5-steps, 2,2A	1- 5	1- 7	1	1	1
03.425 Speed controller, 5-steps, 5,0A	1-10	1-12	1-4	1-4	1-3

### Interruption per door contactor

You can keep the warm air better inside the building, when you switch off the fans during the short period of open hall doors.

# Planning instructions

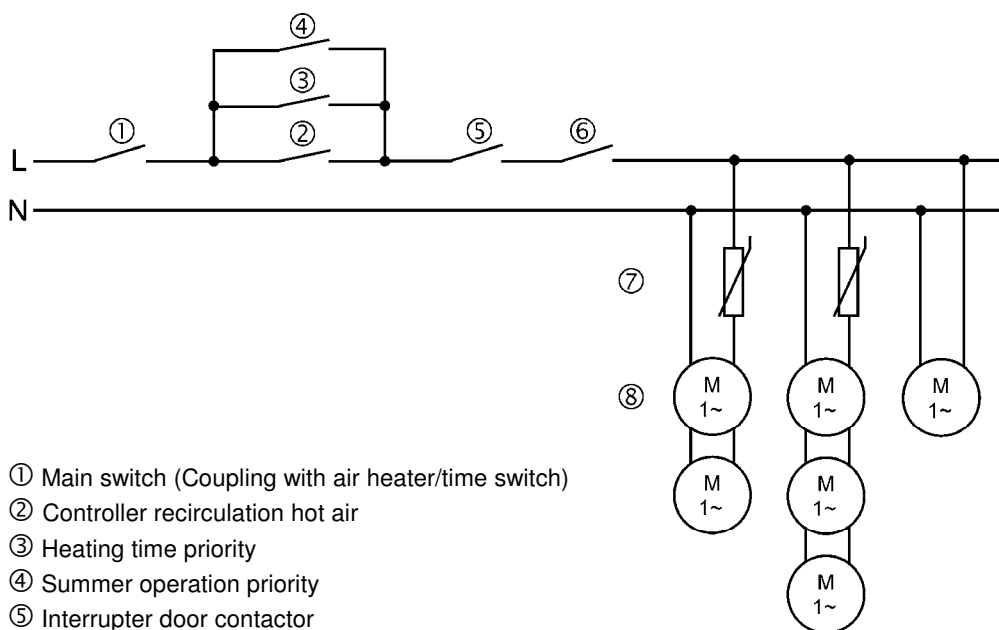
## Industrial ceiling fans for recirculation of hot air

### Summer operation

You can use the ceiling fans without any changes on the installation also in summer in order to refresh the air. In halls and high room is it also recommended to have an air flow from above to below. Any changes of the running direction or on the position of the blades is therefore not necessary and would not make sense. During the summer period, it is possible to bridge the controller recirculation hot air with a customary switch (take it out of operation). The speed will be regulated with the speed controller.

The above notes concerning the amount of fans are valid for a winter operation while at the same time using them in summer. If you plan to use them primarily in summer, we would be happy to draft you a proposal.

### Connection scheme



- ① Main switch (Coupling with air heater/time switch)
- ② Controller recirculation hot air
- ③ Heating time priority
- ④ Summer operation priority
- ⑤ Interrupter door contactor
- ⑥ Interval switch
- ⑦ Speed controller
- ⑧ Ceiling fans

### Cabling

The drawing shows some main parts only.



# Planning instructions

Industrial ceiling fans for recirculation of hot air

Subject to alterations

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