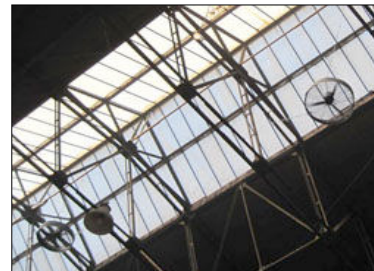
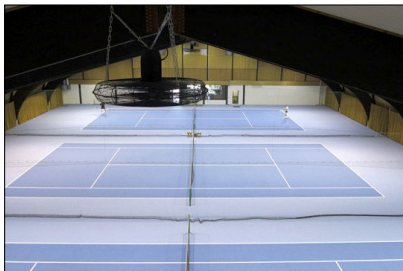
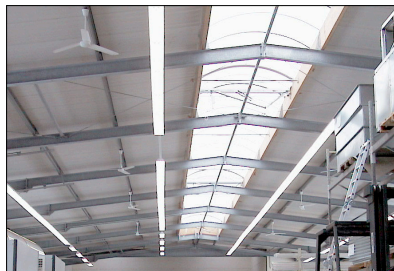


Planning instructions

Industrial ceiling fans for destratification



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.

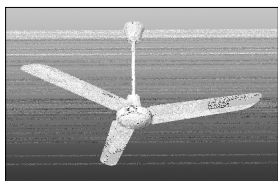
Other advantages are the prevention of mould and rust as well as having a dry floor.

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



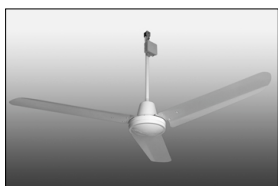
- **03.210** – Industrial-Ceiling-Fan, white
- **03.211** – Industrial-Ceiling-Fan, black

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 destratification

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



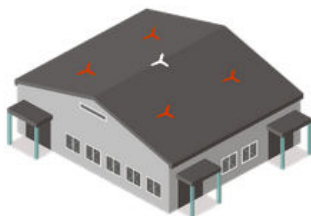
- **03.312** – Ceiling Fan with safety guard, IP protection IP54, up to 20m hall height, completely assembled

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 m² to 250 m² for the destratification.

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

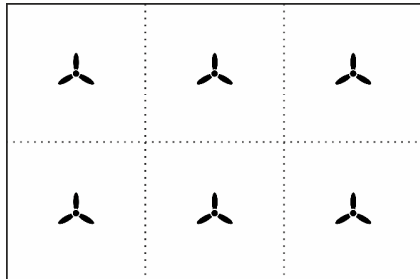
<http://fenne-kg.de/html/auslegungstool.html>

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

Planning instructions

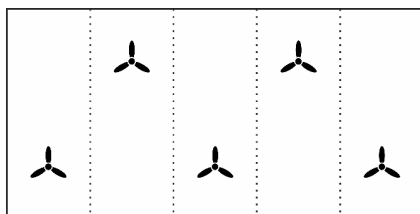
Industrial ceiling fans for destratification

Position of the ceiling fans



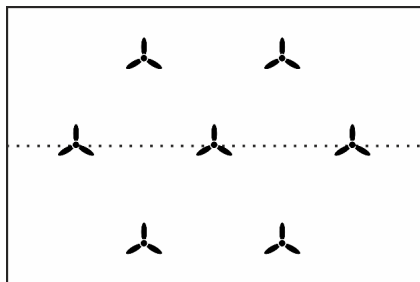
The fans are distributed equally on the surface. Ideally divide the room into rectangles, as equally sized as possible, for the number of fans to be installed. In the middle of each zone you can place one fan.

Img. 5



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

Img. 6



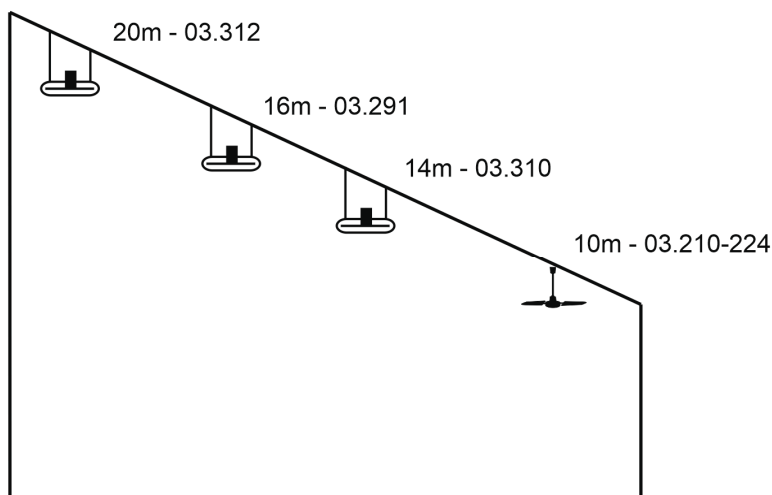
Important: You should always install some ceiling fans at the highest position of the room, to be sure no hot air remains under the ceiling (Img. 7).

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 advice you.

Img. 7

Height of the hall

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

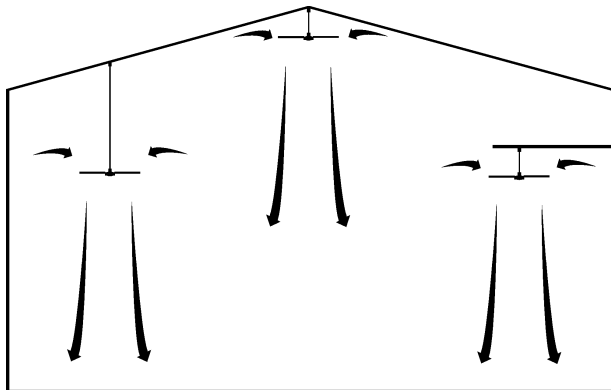


Img. 8

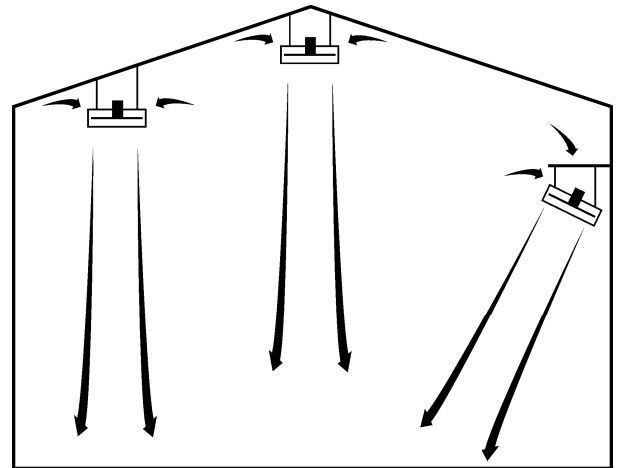
Planning instructions

Industrial ceiling fans for destratification

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).

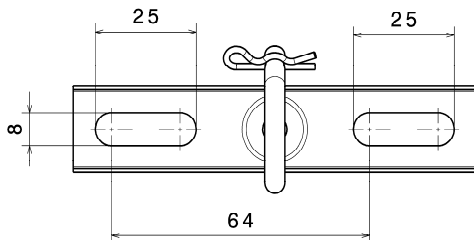


Img. 9



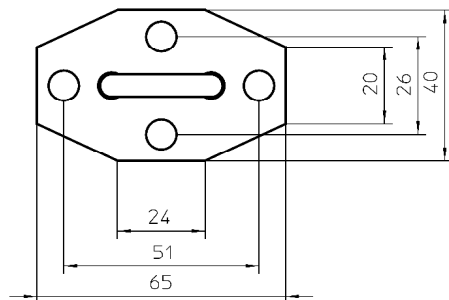
Img. 10

Planning for mounting the devices



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 destratification

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.

Control: Run the fans together with the air heater

In this case, the fans will rotate automatically during the heating cycle. You can use this kind of control only or in combination 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 destratification

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	03.284-285	03.291-293
03.403 Speed controller, stepless, 0,3 - 1,5A	1-4	1-2	1
03.404 Speed controller, stepless, 0,8 - 3,0A	3-8	2-4	1-2
03.405 Speed controller, stepless, 1,3 - 5,0A	4-12	2-7	2-4
03.406 Speed controller, stepless, 2,6 - 10A	8-24	3-14	3-8



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

	03.210-260	03.284-285	03.291-293	03.310	03.312
03.423 Speed controller, 5-steps, 2,2A	1- 5	1-3	1	1	1
03.425 Speed controller, 5-steps, 5,0A	1-10	1-7	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

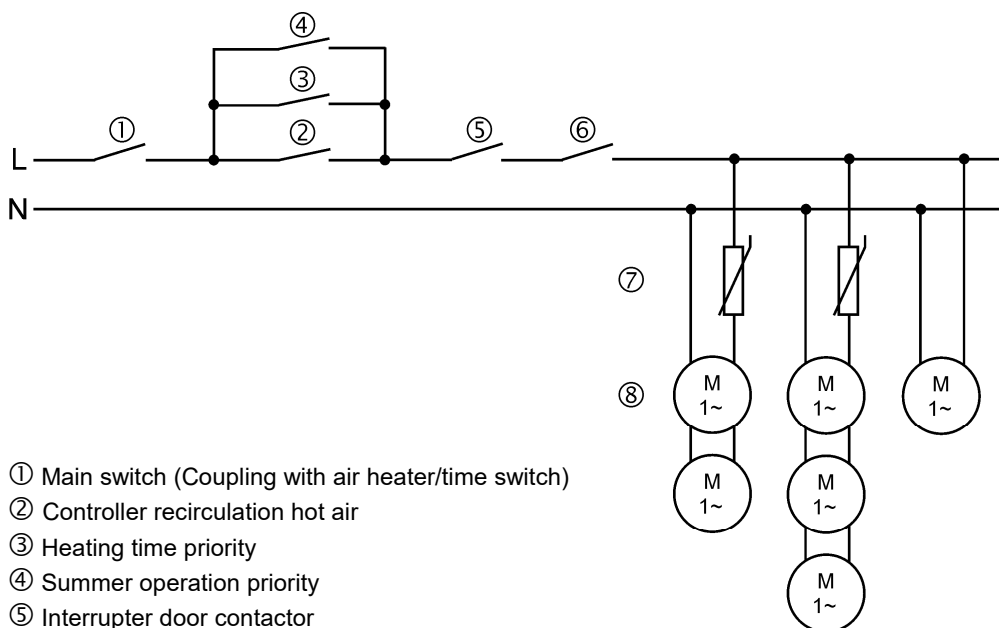
Industrial ceiling fans for destratification

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

Planning instructions

Industrial ceiling fans for destratification

Cabling

The drawing shows some main parts only.



Subject to alterations
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