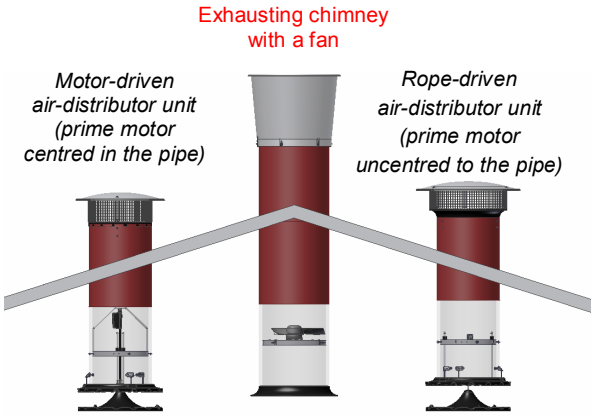
AIR DISTRIBUTOR



The air-distributor (AD) provides a steady fresh-air distribution in the livestock building. It is assembled just below the building roof and leads the fresh air from the outside through the roof area to the inside of the building. Here, the fresh air is subsequently delivered through the distributing disc and –ring.

Application area:

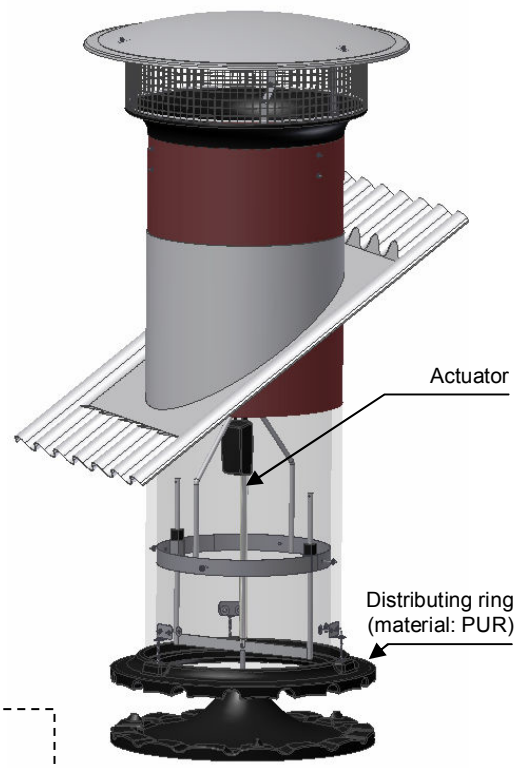
In principle, the AD can be used in all kinds of livestock houses. However, its application turns especially advantageous, if:

- … the usage takes place in especially cold areas.
- … the livestock building does not have an intermediate ceiling or an attic (roof=ceiling).
- … the building shows structural limitations, such as shown by very wide and long monoblock-design and block-design farms with several sections inside.
- … it is not possible or not desirable to apply a fresh-air supply through air inlets or air ceilings
- … an even-pressure or low-pressure ventilation through the roof shall be applied.

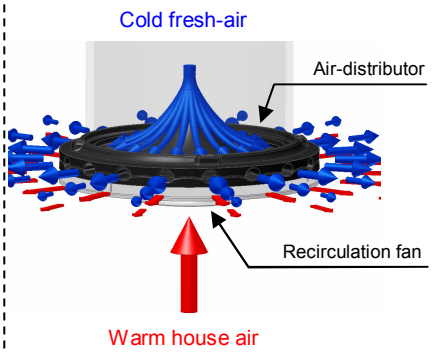
Advantages:

- The constructively advantageous form and functionality of the AD is perfectly suitable for climate zones which are especially cold.
- The aerodynamically beneficial cone design of the distributing disc, moreover, does hardly allow any losses caused by swirls – as contrary to other systems in the market.
- For the most part, the system can do without any recirculation fan due to the co-operation of the distributing disc and –ring (patent-registered system!)
  → Energy saving!
- The AD can be driven by a rope or a motor actuator.

Fig.: Air-distributor motor-driven



Air-distributor with recirculation fan



In extremely cold climate zones it can be advisable to use a recirculation fan. The latter can be ordered directly with the AD or be retrofitted any time.

Operation mode:

The recirculation fan builds a supporting air layer which absorbs the cold incoming air from the AD. Thus, through the combination AD-recirculation fan, the cold fresh air is mixed with the warm house air and optimally distributed in the building.

PATENTED SYSTEM

Geschäftsführer: Martin Soethe und Kay Heinker
401 640 24 Volksbank Gronau – Ahaus eG – Konto 306 295 200 – IBAN: DE17 4016 4024 0306 2952 00 – SWIFT/BIC: GENODEM1GRN
HRA 5653 Amtsgericht Coesfeld –Ust-IdNr.: DE814712977

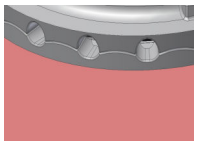
AIR DISTRIBUTOR

Mode of operation

The elements of the air-distributor can be moved vertically by an actuator (Fig. A – C). Starting from the closed position of the AD, the elements can be moved down together up to 30 mm. Thereby, a gap to the ventilation pipe is formed – the AD begins to open and the air streams-in through nozzles on the AD.
The opening degree of the AD regulates the volume flow which varies depending on the climatic condition and the livestock allocation.
Through the «nozzles-effect» (Fig. B), the patented system by HSI guarantees an excellent mixing of the incoming fresh air with the consisting building air, even with extremely cold weather conditions and low incoming air volumes.
When further opening the AD for increasing air volumes, the distributing disc can additionally be moved down up to 270 mm. In this case, an additional gap is formed on the entire area between the distributing ring and the distributing disc, and the AD can let-in higher volumes of the incoming air while keeping the inlet velocity (Fig. C).

The distributing ring and the distributing disc can be moved vertically

Fig. A – AD closed

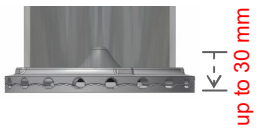


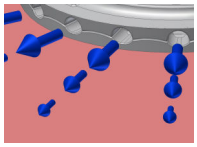
0 % Volume flow

Gap between ventilation pipe and distributing disc is closed

The distributing disc lies against the bottom edge of the ventilation pipe. The ventilation channel is closed completely.

Fig. B – Nozzles-effect



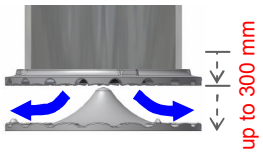


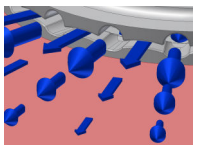
0% - 10% Volume flow (air-inflow exclusively through nozzles)

Gap between ventilation pipe and distributing disc: up to 30 mm

The distributing ring and the distributing disc move down together up to 30 mm. Thereby, a gap is formed between the distributing disc and the bottom edge of the ventilation pipe. This gap enables an inflow of the air through the nozzles.

Fig. C – additional gap between the distributing ring and distributing disc





10% - 100% Volume flow (air-inflow through the entire area of the AD)

Gap between ventilation pipe and distributing disc: to 300 mm

The distributing disc moves further down, while the ring keeps its position. The air streams-in through the whole are between the distributing ring and the distributing disc.

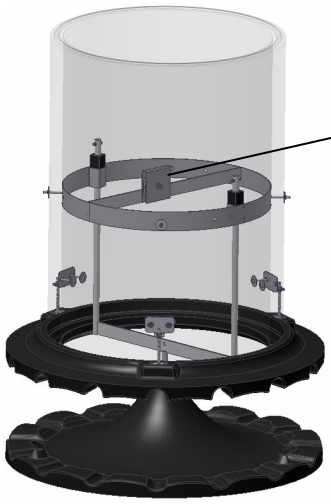
Actuation

The air-distribution can be activated individually by a motor drive or in groups (decentrally) by a wire drive.

Fig. D: air-distributor, motor drive

Linear actuator 1000 N 24 DC
(Item no. 11 54 02) *see page 31*

Fig. E: air-distributor, wire drive



Diverter pulley for the wire,
you can find further diverter pulleys on p. 30

AIR DISTRIBUTOR

The air-distributor distributes the fresh air evenly and spaciously in a 360°-angle. To a large extend, its air capacity is regulated by the air capacity of the exhausting fan and by its opening level (distance of the distributing disc from the pipe bottom).

Air capacity (m³/h) at maximum opening level:

Pressure difference [Pa]	Ø 92 [m³/h]	Ø 82 [m³/h]	Ø 73 [m³/h]	Ø 65 [m³/h]
0	0	0	0	0
5	5262	4180	3313	2627
10	8133	6461	5120	4060
15	10046	7981	6325	5015
20	11481	9121	7229	5731
25	12916	10261	8132	6448
30	14352	11401	9036	7164
35	15906	12636	10015	7940
40	17102	13586	10768	8537
45	17939	14252	11295	8955
50	18490	14689	11641	9230

Fig.3a: Table: air capacity of the AD at maximum opening level

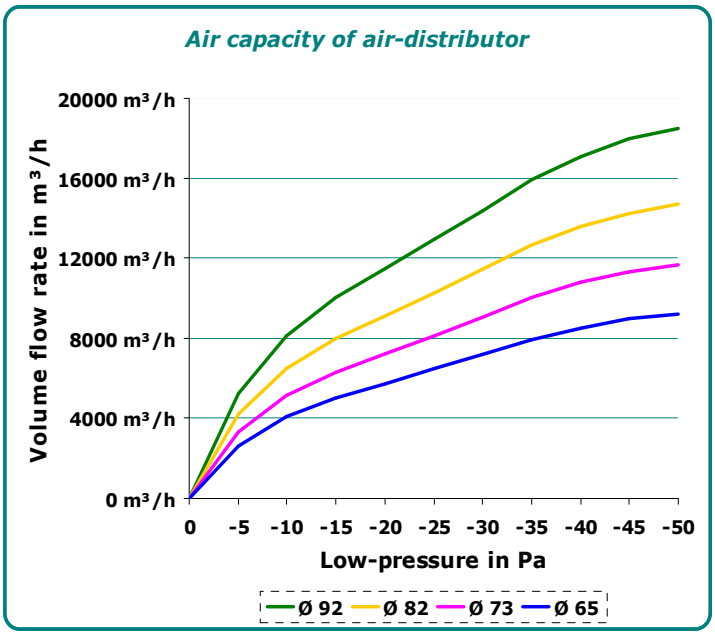


Fig. 1b: Diagram: air capacity of the AD at maximum opening level

Calculation and positioning

In order to achieve a balanced supply of fresh air, it is important to evenly position the supplying chimneys in the building. Thereto, the house shall be divided in preferably equal and equilateral rectangles. The air-distributor shall be placed in the middle of each such rectangle (see Fig. 4, distances “a” and “b”).
The side dimensions of the rectangles shall be between 5 m and 18 m.

Ideally, the ‘length-to-width-ratio’ of the rectangles should be (almost) equal (see Fig. 4). In the worst case, this ratio should not exceed 1:1.5 – meaning that an 18 m long rectangle shall have a width of minimum 12 m (see Fig. 5).

Note:

In the case that the distance between two air-distributors is less than 7 m we recommend to assemble them vertically offset!

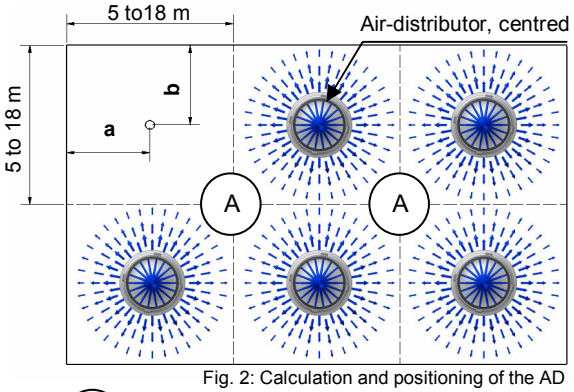


Fig. 2: Calculation and positioning of the AD

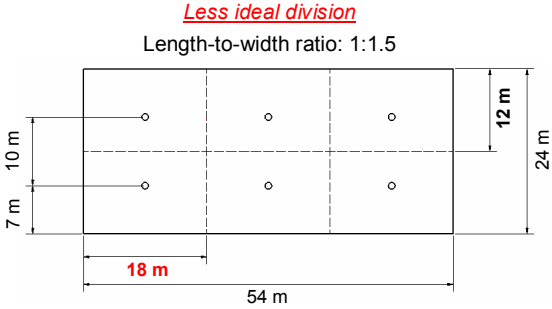


Fig. 3: Less ideal division of the building for AD

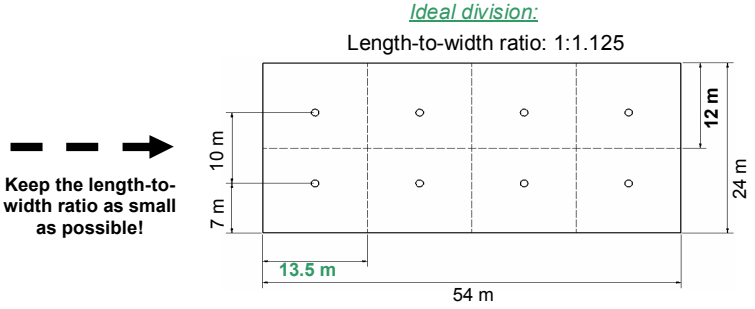


Fig. 4: Ideal division of the building for AD

AIR DISTRIBUTOR

Mounting

If the distance between two air-distributors is less than 7 m, we advise to position them vertically offset.