



Building & Industry

**NOVENCO**  
SCHAKO Group

# NOVENCO® NovAx™ Axial fans

## Standard, Hot smoke, ATEX and EX



# Product facts

Specifications depend on fan configuration.

## Product

The Novenco® NovAx™ series of axial fans are renowned in design, application and performance with fan efficiencies up to 83%.

## Environments and fan types

- **ATEX:** ACN-ACW
- **Hot-smoke:** ACN-ACW-ARN-ACG-ACP
- **Marine and marine EX:** ACW
- **Standard temperature:** ACN-ACW-ARN-ACG-ACP

## Applications

The NovAx fans are for comfort and industrial ventilation. Versions include types for temperatures between -20 to +50 °C and for extremely strenuous application areas.

## Ranges

Fans are for in-duct installation, attachment to inlets or outlets, or in-AHU and other closed compartment installations. A part of the ACN type fan range for standard and hot-smoke temperatures is available as Standard Range fans as a number of fixed size-airflow-pressure combinations.

## Fan specifications

**Air pressures:** Up to 2000 Pa

**Airflow rates:** 0.1 to 65 m<sup>3</sup>/s

**Blade angles:** Adjustable 25° to 70°

**Housing thicknesses:** 2, 2.5, 3, 4, 6 or 10 mm

**Enclosures:** IP55 to IP66

**Environments:** ATEX, hot-smoke, marine, marine EX, and standard temperatures

**Fan efficiencies, excl. motors:** Up to 83%

**Hub sizes:** ø160, ø230, ø280, ø330, ø380, ø403, or ø578 mm

**Impeller diameters:** ø250, ø315, ø400, ø500, ø560, ø630, ø710, ø800, ø900, ø1000, ø1120, ø1250, ø1400, or ø1600 mm

**Reverse operation:** Shorter periods up to max. allowable RPM for normal direction. Airflow is reduced to 50% and pressure to 25% for the same system characteristics.

## Motors

**Dimension standard:** IEC-72

**Efficiency classes:** IE1 to IE3

**Electrical standard:** IEC-34

**Insulation:** Class B, F or H

**Mounting:** Enclosed in motor mount or outside the mount through a long hub

**Speed control:** Direct or VFD

**Structural shape:** B5 or B14 for flanges

**Terminal boxes, standard temperature:**

Terminal boxes of steel or plastic on fan housing or motor

**Terminal boxes, ATEX:** Aluminium terminal boxes and shielded motor cables

**Terminal boxes, hot-smoke:** Steel terminal boxes and shielded motor cables

**Volts:** 3x220 - 3x690 V at 50 or 60 Hz

## Materials

**Blades:** Aluminium or glass-fibre reinforced polyester (GRP).

Impellers with hub sizes ø403 and ø578 mm have aluminium blades.

Hot-smoke fans have blades of aluminium.

**Fan housings:** Hot-rolled, hot-dip galvanised sheet steel

**Inner hubs:** Aluminium or hot-dip galvanised steel for most sizes. Hot-dip galvanised steel for ACN-ACW with motor size 280 and for ACP-ACG with hub size ø578

## Classifications

**Environments:** Unheated, low-corrosion environments in accordance with EN 12944-2 and corrosion category C3

For special cases, fans can be delivered according to corrosion class C4.

The fan housings are also available in stainless steel as AISI 316L and with aluminium impellers, all in corrosion class C5 high.

**Flange standards:** Eurovent 1/2, except for ACW which follows DIN 24154 R4

**Sound:** ANSI/AMCA 300-14; AMCA 311-16

**Technical capacity:** EN 5801; EN 21940-11; EN 21940-14

## Temperature ranges

**ATEX:** Classes T4 for gas and T135 for dust according to EN 60079-0

**Hot-smoke:** F200, F300 and F400 according to EN 12101-3 for all fans for at least

2 hours at 200 °C, 300 °C and 400 °C, respectively.

**Standard:** -20 to +50 °C and max. -40 to +120 °C; GRP-blades limited to max. +70 °C. At -40 to -20 °C and +40 to +120 °C, RPM are reduced and special motors required.

## Certifications

**ATEX:** According to directive 2014/34/EU and marked as

II 2G c Ex de IIB T4 (gas)

II 2 D Ex tD A21 T135°C (dust)

**Calculation software:** AirBox™ program is certified by TÜV.

**Marine EX:** According to IACS F29/2005

## Accessories

- Acoustic diffusers
- Anti-vibration mounts
- Certification options
- Counter flanges
- Dampers
- Diffusers
- Fan housing options
- Flexible connections (PERL / Maritex)
- Frequency converters
- Inlet cones
- Inspection hatches
- Kit for lubrication of motor
- Measuring pipes
- Outlet guide vane arrangement
- Roof hoods
- Silencers
- Spark-proof linings
- Spigots for ducts or welding
- Support frames
- Thermal motor options
- Vertical mounting plates
- Wire guards



# Description

NovAx are compact, robust, series produced axial fans with pre-settable blades. The fans are well-suited for ventilation and air-conditioning systems with varying airflow rate requirements.

The fans are installed in a wide range of ventilation systems on land and off-shore. These include systems for comfort, industrial, process, parking and tunnel ventilation as well as environment-enhancement systems. The fans require little space, are easy to install and offer high operational reliability. ATEX and marine EX versions are available for hazardous environments.

## Fan types

The NovAx impeller consists of a pressed, two-part, assembled hub with grooves in which the blades are fixed. The impeller has a hub boss for mounting onto the motor.

| Hub $\varnothing$ D [mm] | Number of blades |
|--------------------------|------------------|
| $\varnothing$ 160        | 4                |
| $\varnothing$ 230        | 6                |
| $\varnothing$ 280        | 8                |
| $\varnothing$ 330        | 10               |
| $\varnothing$ 380        | 12               |
| $\varnothing$ 403        | 6                |
| $\varnothing$ 578        | 10               |

Number of blades

The impeller blades are seamlessly adjustable from 25° to 70° and mounted according to fan size and desired performance.

The impeller is integrated with the motor in different designs of fan housings to constitute five fan types with several applications.

- ACN and ARN — duct installation
- ACW for heavy duty — duct installation
- ACG with inlet cone and outlet guide vane arrangement
  - duct connection
- ACP with inlet cone — duct connection

## Blade materials and motors

The impellers are fitted with blades of either aluminium or glass fibre reinforced polyester (GRP). Hot-smoke fans, however, are entirely made with blades of aluminium. The two blade types have identical performance characteristics.



Impellers with hub sizes  $\varnothing$ 403 and  $\varnothing$ 578 mm are only made with aluminium blades.

In the temperature range -20 to +40 °C the lighter and more corrosion resistant GRP blades are standard. In the ranges -20 to -40 °C and +40 to +70 °C both blade types can be used. This is, however, with reduced RPM and special motor lubricant.

In the range 70° to 120°C, aluminium blades are used exclusively and at reduced RPM.

All fan types use flange motors.

## Classifications

The fans are as standard delivered for operation in unheated low corrosive environments according to EN 12944-2 and corrosion category C3. Versions in stainless steel for category C5 are optionally available.

The NovAx fan types ACN-ACG-ACP-ARN are approved for hot-smoke environments according to EN 12101-3.

The fan types ACN-ACW are certified in accordance with the ATEX directive 2014/34/EU.

## Adjustment of blade angles

The impeller blade angle that matches a specific capacity is calculated with the AirBox program. The blades are adjusted in the factory with a precision machine and the impeller is aligned and balanced.

## AirBox calculation program

The AirBox program is Novenco's calculation and configuration tool. Input to the program are requirements for airflow and pressure as well as specific characteristics of the operating environment. Further requirements for the fan, motor and accessories are also input and form the basis for calculation of possible solutions.

Novenco AirBox is free and available on [www.novenco-building.com](http://www.novenco-building.com). It is certified by TÜV Süd in Germany, requires registration and checks automatically for updates.



## Motors

The fans are fitted with 50 Hz motors as standard, and are available with 60 Hz motors also. Alternatively, fans can be speed controlled with frequency converters. See maximum RPM in the below table. Nominal RPM for 50 Hz motors are found in the performance curves on pages 9 through 14.

| Hub øD [mm]             | Motor sizes           |
|-------------------------|-----------------------|
| ø160 - ACN/W<br>- ACP/G | 71 - 80<br>71 - 100   |
| ø230                    | 71 - 100              |
| ø280                    | 71 - 112              |
| ø330                    | 80 - 132              |
| ø380                    | 90 - 180              |
| ø403                    | 112 - 180             |
| ø578                    | 132 - 250 / 280 (ACN) |

### Motor sizes

The motors are furthermore offered with a wide range of options for thermal protection, space heaters, lubrication, low temperature operation, marine classification and more.

## Frequency regulation

The fans are prepared for frequency converter operation with RFI filters according to the product standard EN 61800-3, class 2. The use of frequency converters removes the limitations caused by net frequencies of 50 or 60 Hz.

Axial fans can almost always be placed within the maximum efficiency of up to 83%, while it remains possible to regulate the air quantities.

Hot-smoke fans may, however, not run frequency regulated during fire. The frequency converter must in this case be bypassed, so that the motor runs at the maximum synchronous RPM. Selection of hot-smoke fans with frequency converters is done based on the synchronous RPM of the motors.

In most cases, the motors are run over-frequently in the range 70 - 80 Hz.

This is due to the non-existent fall in power output for the motors in the range 50 - 100 Hz. Additionally, the best performance for fans is often found in just the over-frequent area.

Fans for frequency converter operation require installation according to the EU standard for electromagnetic compatibility (EMC). The shielding and connection to ground eliminate interference and protect the fan motor bearings and windings.

Investment, operational cost as well as space requirements are lower for NovAx fans with frequency regulation compared to fans without.

| Hub øD [mm] | Fan sizes [mm] |      |      |      |      |      |      |      |      |       |       |       |       |
|-------------|----------------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|
|             | ø250           | ø315 | ø400 | ø500 | ø560 | ø630 | ø710 | ø800 | ø900 | ø1000 | ø1120 | ø1250 | ø1400 |
| ø160        | 3865           | 3865 | 3865 | 3865 |      |      |      |      |      |       |       |       |       |
| ø230        |                | 4000 | 4000 | 3865 | 3575 | 3275 | 2980 |      |      |       |       |       |       |
| ø280        |                |      | 4012 | 3755 | 3536 | 3230 | 2930 | 2571 |      |       |       |       |       |
| ø330        |                |      | 3977 | 3686 | 3448 | 3215 | 2973 | 2660 |      |       |       |       |       |
| ø380        |                |      |      | 3674 | 3397 | 3097 | 2859 | 2651 | 2324 |       |       |       |       |
| ø403        |                |      |      |      |      |      | 2179 | 2025 | 1885 | 1730  | 1575  |       |       |
| ø578        |                |      |      |      |      |      | 2128 | 1957 | 1804 | 1685  | 1595  | 1410  |       |

Maximum RPM for frequency regulated NovAx impellers <sup>1 2 3</sup>

1. All RPM are at 20 °C.

2. The maximum RPM is reduced at higher and lower temperatures.

3. The maximum RPM for the motors are considerably higher than those for the impellers – typically 3600 - 6000 RPM.

# Fan types

## ACN, ACW and ARN for ducts

The ACN, ACW and ARN fans are designed for duct installation.

The ACW has a thicker fan housing, is extra durable and made for heavy duty. The ARN has straight guide vanes for 100% reversible airflows and is otherwise identical to the ACN.



Front and rear of ACN axial fan

The ACN-ACW range of axial fans comprises 14 fan sizes with impeller diameters from  $\varnothing 250$  to  $\varnothing 1600$  mm for standard temperatures and ATEX. For hot-smoke applications there are 12 fan sizes with impeller diameters  $\varnothing 400$  to  $\varnothing 1600$  mm.

There are seven hub diameter sizes from  $\varnothing 160$  to  $\varnothing 578$  mm for the ACN and ACW. The ARN range of axial fans comprises six fan sizes with impeller diameters from  $\varnothing 900$  to  $\varnothing 1600$ . It has two hub diameter sizes;  $\varnothing 403$  and  $\varnothing 578$  mm.

The hot-smoke fan range is F200, F300 and F400 approved according to EN 12101-3 to run for at least 120 min. at 200 °C, 300 °C and 400 °C, respectively.

The fan housings are cylindrical with connection flanges at both ends. The fan housings have welded motor suspensions of sheet steel that also function as outlet guide vane arrangements. This produces extremely high efficiencies. The fan housings and motor suspensions are hot-dip galvanised. Each fan housing has an inspection hatch.

The impeller unit is mounted directly on the motor shaft. If the motor cannot fit in the motor mount, it is displaced outside of this and connected to the impeller through a long hub.

The flange pitch diameters, number of holes and hole sizes are as standard in accordance with Eurovent 1/2 for ACN-ARN and according to DIN 24154 for ACW.

Mounting positions are in accordance with Eurovent for ACN-ARN – configuration D, motor position B. See also section "Calculation examples" on page 28.

The motors are flange motors, mounted on the outlet side, and provided with electrical cables that pass out through the fan housings to terminal boxes for electrical connection.

The direction of airflow for ACN-ACW-ARN fans is impeller - motor.

## ACG for duct connection

### ACP for wall mounting

The ACG is designed for connection to duct ends. The ACP is for direct air transport through walls.



ACP (left) and ACG axial fans

| Environments                         | Fan types                  |               |
|--------------------------------------|----------------------------|---------------|
|                                      | ACN-ACW                    | ARN           |
| Airflow rates<br>[m <sup>3</sup> /s] | Std. temp.,<br>ATEX and EX | 0.1 to 65     |
|                                      | Hot-smoke                  | 0.2 to 65     |
| Air pressures<br>[Pa]                | Std. temp.,<br>ATEX and EX | Up to<br>2000 |
|                                      | Hot-smoke                  | Up to<br>1800 |

Airflow and pressures

| Environments                         | Fan types  |            |
|--------------------------------------|------------|------------|
|                                      | ACG-ACP    |            |
| Airflow rates<br>[m <sup>3</sup> /s] | Std. temp. | 0.1 to 65  |
|                                      | Hot-smoke  | 0.2 to 65  |
| Air pressures<br>[Pa]                | Std. temp. | Up to 2000 |
|                                      | Hot-smoke  | Up to 2000 |

Airflow and pressures

The F300 hot-smoke range is approved according to EN 12101-3 to run for at least 60 min. at 300 °C.

The ACG-ACP fan housings are short and tubular and feature cone-shaped inlets for direct air intake. The motor in each fan is in the centre of and faces the inlet air intake. The motor suspension is welded with struts to form an inlet guide vane arrangement to the impeller. The fan outlet is flange-terminated.

The ACG is furthermore fitted with a short duct piece after the impeller that houses an outlet guide vane arrangement.

The inlets are fitted with wire guards. On the ACG, the outlet guide vane arrangement helps achieve a very high efficiency.

The flange pitch diameter, number of holes and hole sizes are as standard in accordance with Eurovent 1/2. Mounting positions are in accordance with Eurovent for ACG – configuration B, motor position A and for ACP – configuration A, motor position A. See section "Calculation examples" on page 28. The motors are flange motors with electrical connection in terminal boxes.

The direction of airflow for ACG-ACP fans is motor - impeller.

# Motor and fan combinations

The combinations of motors and fans are general.

Precise combinations of motors from specific suppliers and fans are available on direct request or via the AirBox calculation program.

ARN fans are available with hub sizes  $\phi 403$  and  $\phi 578$ .

• = Standard temperature and ATEX fans

! = Standard Range fans (ACN)

$\Delta$  = Hot-smoke fans

| Hub $\phi D$<br>[mm] | Motor<br>sizes | Fan sizes [mm] |            |              |               |              |              |              |              |              |               |              |              |              |
|----------------------|----------------|----------------|------------|--------------|---------------|--------------|--------------|--------------|--------------|--------------|---------------|--------------|--------------|--------------|
|                      |                | $\phi 250$     | $\phi 315$ | $\phi 400$   | $\phi 500$    | $\phi 560$   | $\phi 630$   | $\phi 710$   | $\phi 800$   | $\phi 900$   | $\phi 1000$   | $\phi 1120$  | $\phi 1250$  | $\phi 1400$  |
| $\phi 160$           | 71             | •              | •          | •            | •             |              |              |              |              |              |               |              |              |              |
|                      | 80             | •              | •          | •            | •             |              |              |              |              |              |               |              |              |              |
|                      | 90             |                | •          | •            |               |              |              |              |              |              |               |              |              |              |
| $\phi 230$           | 71             |                | •          | •            | •             | •            | •            | •            | •            |              |               |              |              |              |
|                      | 80             |                | •!         | •            | •             | •            | •            | •            | •            | •            |               |              |              |              |
|                      | 90             |                | $\Delta$   | • $\Delta$ ! | • $\Delta$    | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$   |               |              |              |              |
|                      | 100            |                | $\Delta$   | • $\Delta$   | • $\Delta$    | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$   |               |              |              |              |
| $\phi 280$           | 71             |                | •          | •            | •             | •            | •            | •            | •            | •            | •             |              |              |              |
|                      | 80             |                | •          | •            | •             | •            | •            | •            | •            | •            | •             |              |              |              |
|                      | 90             |                | • $\Delta$ | • $\Delta$ ! | • $\Delta$    | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$    |              |              |              |
|                      | 100            |                | • $\Delta$ | • $\Delta$   | • $\Delta$    | • $\Delta$   | • $\Delta$ ! | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$    |              |              |              |
|                      | 112            |                | • $\Delta$ | • $\Delta$ ! | • $\Delta$    | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$    |              |              |              |
| $\phi 330$           | 80             |                | •!         | •            | •             | •            | •            | •            | •            | •            | •             |              |              |              |
|                      | 90             |                | • $\Delta$ | • $\Delta$   | • $\Delta$    | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$    |              |              |              |
|                      | 100            |                | • $\Delta$ | • $\Delta$   | • $\Delta$ !  | • $\Delta$    |              |              |              |
|                      | 112            |                | • $\Delta$ | • $\Delta$   | • $\Delta$    | • $\Delta$   | • $\Delta$ ! | • $\Delta$ ! | • $\Delta$ ! | • $\Delta$ ! | • $\Delta$    |              |              |              |
|                      | 132            |                | • $\Delta$ | • $\Delta$   | • $\Delta$ !! | • $\Delta$ ! | • $\Delta$ ! | • $\Delta$ ! | • $\Delta$ ! | • $\Delta$   | • $\Delta$    |              |              |              |
| $\phi 380$           | 90             |                |            | • $\Delta$ ! | • $\Delta$    | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$    |              |              |              |
|                      | 100            |                |            | • $\Delta$   | • $\Delta$    | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$    |              |              |              |
|                      | 112            |                |            | • $\Delta$   | • $\Delta$    | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$    |              |              |              |
|                      | 132            |                |            | • $\Delta$   | • $\Delta$    | • $\Delta$   | • $\Delta$   | • $\Delta$ ! | • $\Delta$ ! | • $\Delta$ ! | • $\Delta$    |              |              |              |
|                      | 160            |                |            | • $\Delta$   | • $\Delta$    | • $\Delta$ ! | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$   | • $\Delta$ !  |              |              |              |
|                      | 180            |                |            |              | • $\Delta$    | • $\Delta$ ! | • $\Delta$    |              |              |              |
| $\phi 403$           | 112            |                |            |              |               |              |              |              |              |              | • $\Delta$    | • $\Delta$   |              |              |
|                      | 132            |                |            |              |               |              |              |              |              | • $\Delta$   | • $\Delta$    | • $\Delta$   | • $\Delta$   | • $\Delta$   |
|                      | 160            |                |            |              |               |              |              |              |              | • $\Delta$   | • $\Delta$    | • $\Delta$ ! | • $\Delta$   | • $\Delta$   |
|                      | 180            |                |            |              |               |              |              |              |              | • $\Delta$   | • $\Delta$ !  | • $\Delta$ ! | • $\Delta$ ! | • $\Delta$ ! |
| $\phi 578$           | 132            |                |            |              |               |              |              |              | • $\Delta$   | • $\Delta$   | • $\Delta$    |              |              |              |
|                      | 160            |                |            |              |               |              |              |              | • $\Delta$   | • $\Delta$   | • $\Delta$    | • $\Delta$   | • $\Delta$   |              |
|                      | 180            |                |            |              |               |              |              |              | • $\Delta$   | • $\Delta$   | • $\Delta$ !! | • $\Delta$   | • $\Delta$   |              |
|                      | 200            |                |            |              |               |              |              |              | • $\Delta$   | • $\Delta$ ! | • $\Delta$ !  | • $\Delta$ ! | • $\Delta$ ! | • $\Delta$   |
|                      | 225            |                |            |              |               |              |              |              |              | • $\Delta$   | • $\Delta$ !  | • $\Delta$   | • $\Delta$   | • $\Delta$   |
|                      | 250            |                |            |              |               |              |              |              |              |              | • $\Delta$ !  | • $\Delta$   | • $\Delta$   | • $\Delta$   |
|                      | 280 (ACN)      |                |            |              |               |              |              |              |              |              |               | • $\Delta$   | • $\Delta$   |              |

ACN, ACW and ARN

| Hub øD [mm] | Motor sizes | Fan sizes [mm] |      |      |                 |      |      |      |      |      |       |       |       |       |
|-------------|-------------|----------------|------|------|-----------------|------|------|------|------|------|-------|-------|-------|-------|
|             |             | ø250           | ø315 | ø400 | ø500            | ø560 | ø630 | ø710 | ø800 | ø900 | ø1000 | ø1120 | ø1250 | ø1400 |
| ø160        | 71          | •              | •    | •    | •               |      |      |      |      |      |       |       |       |       |
|             | 80          | •              | •    | •    | •               |      |      |      |      |      |       |       |       |       |
|             | 90          |                | •    | •Δ   | •Δ              |      |      |      |      |      |       |       |       |       |
|             | 100         |                |      | •Δ   | •Δ              |      |      |      |      |      |       |       |       |       |
| ø230        | 71          |                | •    | •    | •               | •    | •    | •    | •    |      |       |       |       |       |
|             | 80          |                | •    | •    | •               | •    | •    | •    | •    |      |       |       |       |       |
|             | 90          |                | •Δ   | •Δ   | •Δ              | •Δ   | •Δ   | •Δ   | •Δ   |      |       |       |       |       |
|             | 100         |                | •Δ   | •Δ   | •Δ              | •Δ   | •Δ   | •Δ   | •Δ   |      |       |       |       |       |
| ø280        | 71          |                | •    | •    | •               | •    | •    | •    | •    |      |       |       |       |       |
|             | 80          |                | •    | •    | •               | •    | •    | •    | •    |      |       |       |       |       |
|             | 90          |                | •Δ   | •Δ   | •Δ              | •Δ   | •Δ   | •Δ   | •Δ   |      |       |       |       |       |
|             | 100         |                | •Δ   | •Δ   | •Δ              | •Δ   | •Δ   | •Δ   | •Δ   |      |       |       |       |       |
| ø330        | 112         |                | •Δ   | •Δ   | •Δ              | •Δ   | •Δ   | •Δ   | •Δ   |      |       |       |       |       |
|             | 80          |                | •    | •    | •               | •    | •    | •    | •    |      |       |       |       |       |
|             | 90          |                | •Δ   | •Δ   | •Δ              | •Δ   | •Δ   | •Δ   | •Δ   |      |       |       |       |       |
|             | 100         |                | •Δ   | •Δ   | •Δ              | •Δ   | •Δ   | •Δ   | •Δ   |      |       |       |       |       |
| ø380        | 132         |                | •Δ   | •Δ   | •Δ              | •Δ   | •Δ   | •Δ   | •Δ   |      |       |       |       |       |
|             | 90          |                | •Δ   | •Δ   | •Δ              | •Δ   | •Δ   | •Δ   | •Δ   |      |       |       |       |       |
|             | 100         |                | •Δ   | •Δ   | •Δ              | •Δ   | •Δ   | •Δ   | •Δ   |      |       |       |       |       |
|             | 112         |                | •Δ   | •Δ   | •Δ              | •Δ   | •Δ   | •Δ   | •Δ   |      |       |       |       |       |
| ø403        | 132         |                | •Δ   | •Δ   | •Δ              | •Δ   | •Δ   | •Δ   | •Δ   |      |       |       |       |       |
|             | 160         |                |      | •Δ   | •Δ              | •Δ   | •Δ   | •Δ   | •Δ   |      |       |       |       |       |
|             | 180         |                |      |      | •Δ <sup>1</sup> | •Δ   | •Δ   | •Δ   | •Δ   |      |       |       |       |       |
|             | 112         |                |      |      |                 |      | Δ    | Δ    | •Δ   |      |       |       |       |       |
| ø578        | 132         |                |      |      |                 |      | •Δ   | •Δ   | •Δ   |      |       |       |       |       |
|             | 160         |                |      |      |                 |      | •Δ   | •Δ   | •Δ   |      |       |       |       | •     |
|             | 180         |                |      |      |                 |      | •Δ   | •Δ   | •Δ   |      |       |       |       | •     |
|             | 200         |                |      |      |                 |      |      | •Δ   | •Δ   | •Δ   |       |       |       |       |
| 225         |             |                |      |      |                 |      |      | •Δ   | •Δ   | •Δ   |       |       |       |       |
|             | 250         |                |      |      |                 |      |      |      | Δ    | •Δ   | •Δ    |       |       |       |

ACG and ACP<sup>2</sup>

1. Hot-smoke fans with hub diameter ø403, motor size 180 and fan size ø900 are only made as type ACP.

2. ACG and ACP fans are unavailable for ATEX environments.

# Standard Range

The fans in the Standard Range are based on sales statistics to include a number of the most sought after ACN type fans and are available with short delivery times. The analysis shows a demand for relatively small and high efficient fans. Bigger fans and fans with high air volumes are, however, also in the Standard Range.

The Standard Range comprises fans for temperatures from -20 to +50 °C as well as fans for hot-smoke applications.

Hub sizes are between ø230 and ø578, and fan sizes between ø400 and ø1400.

The standardisation encompass impeller diameters, hub sizes, blade angles and motors. The fan configurations are locked with

respect to these parameters. It is, however, possible to fit parts from the accessory programme.

The Standard Range configurations are available in AirBox and calculate the same way as custom configurations.

Fans in the Standard Range are marked in the ACN performance curves for 1470 and 2900 RPM on the next pages. Please note that not all Standard Range fans are shown for all RPM.

Refer to AirBox and our website for fan details.

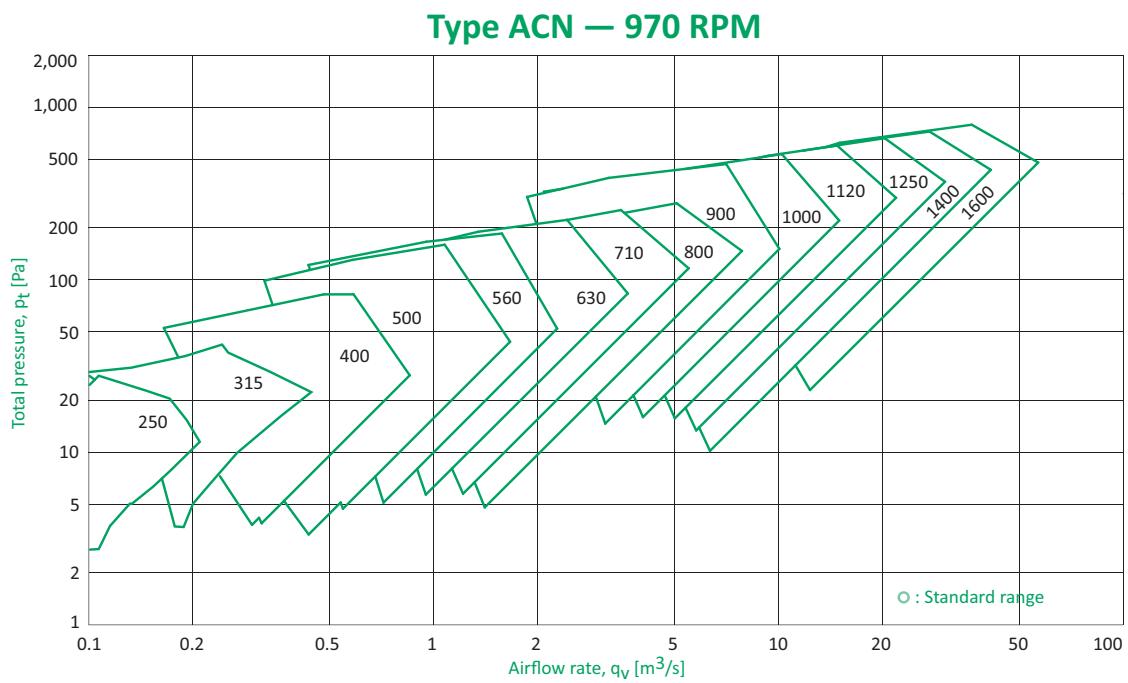
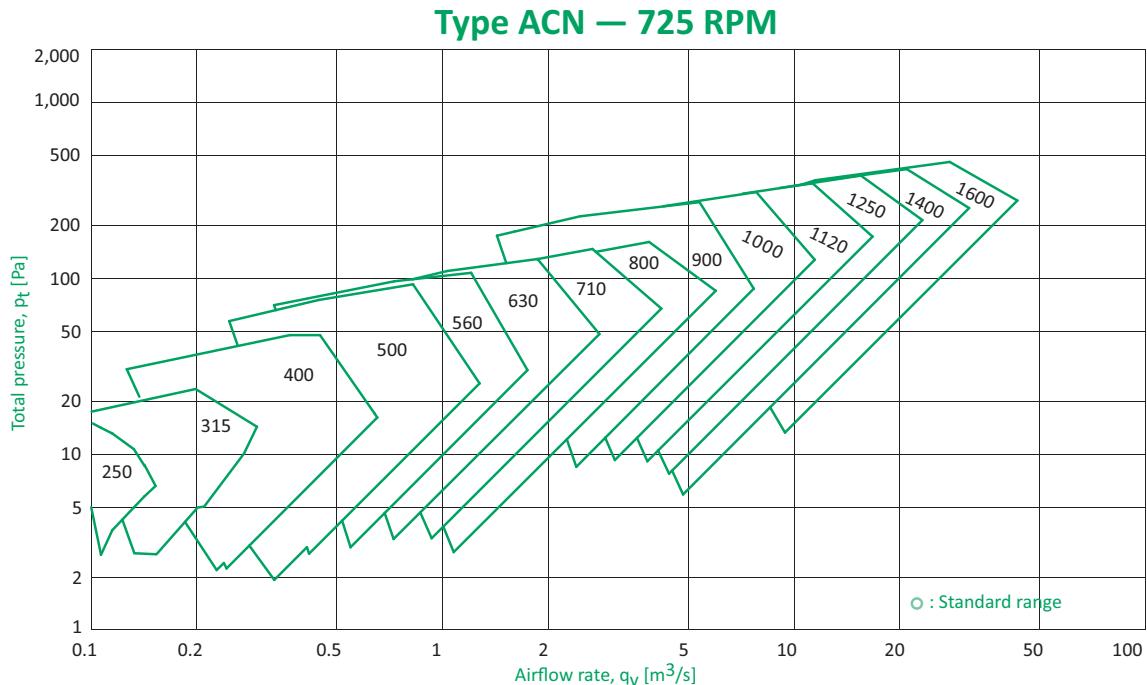
| Item no. | ACN fan type    | Airflow<br>[m <sup>3</sup> /s] | Airflow<br>[m <sup>3</sup> /h] | Total pressure<br>[Pa] | Static pressure<br>[Pa] | Fan eff. [%] | Power input<br>[kW] | Fan RPM | Fan max.<br>RPM |
|----------|-----------------|--------------------------------|--------------------------------|------------------------|-------------------------|--------------|---------------------|---------|-----------------|
| 30041558 | 500/330-10 50°  | 1.4                            | 5,000                          | 330                    | 300                     | 66.2         | 0.868               | 1420    | 3977            |
| 30041559 | 400/230-6 40°   | 1.4                            | 5,000                          | 473                    | 400                     | 71.0         | 1.144               | 2830    | 4000            |
| 30041561 | 560/380-12 47°  | 2.1                            | 7,500                          | 343                    | 300                     | 64.9         | 1.315               | 1450    | 3674            |
| 30041565 | 500/230-6 39°   | 2.8                            | 10,000                         | 521                    | 401                     | 75.0         | 2.348               | 2870    | 4000            |
| 30041560 | 560/280-8 51°   | 2.8                            | 10,000                         | 276                    | 200                     | 73.9         | 1.240               | 1455    | 3755            |
| 30041564 | 630/330-10 52°  | 4.2                            | 15,000                         | 307                    | 200                     | 70.4         | 2.145               | 1435    | 3448            |
| 30041563 | 560/280-8 39°   | 4.2                            | 15,000                         | 672                    | 500                     | 75.0         | 4.186               | 2900    | 3755            |
| 30041562 | 710/280-8 51°   | 5.6                            | 20,000                         | 318                    | 200                     | 80.3         | 2.486               | 1440    | 3230            |
| 30041568 | 630/330-10 38°  | 5.6                            | 20,000                         | 790                    | 600                     | 73.2         | 6.919               | 2930    | 3448            |
| 30041566 | 710/330-10 58°  | 6.9                            | 25,000                         | 384                    | 200                     | 71.1         | 4.425               | 1450    | 3215            |
| 30041567 | 800/330-10 49°  | 6.9                            | 25,000                         | 415                    | 301                     | 79.0         | 4.150               | 1450    | 2973            |
| 30041570 | 630/330-10 44°  | 6.9                            | 25,000                         | 897                    | 600                     | 71.2         | 10.306              | 2925    | 3448            |
| 30041572 | 800/330-10 55°  | 8.3                            | 30,000                         | 465                    | 300                     | 74.7         | 5.925               | 1460    | 2973            |
| 30041569 | 800/380-12 56°  | 8.3                            | 30,000                         | 565                    | 400                     | 70.9         | 7.418               | 1460    | 2859            |
| 30041574 | 710/330-10 41°  | 8.3                            | 30,000                         | 966                    | 700                     | 77.5         | 11.950              | 2925    | 3215            |
| 30041571 | 710/380-12 40°  | 8.3                            | 30,000                         | 1,066                  | 800                     | 72.1         | 14.258              | 2945    | 3097            |
| 30041573 | 900/380-12 54°  | 11.1                           | 40,000                         | 583                    | 400                     | 74.7         | 9.861               | 1465    | 2651            |
| 30041576 | 710/380-12 47°  | 11.1                           | 40,000                         | 1,272                  | 800                     | 68.8         | 22.114              | 2950    | 3097            |
| 30041575 | 1000/380-12 52° | 13.9                           | 50,000                         | 587                    | 400                     | 75.6         | 11.972              | 1465    | 2324            |
| 30041579 | 1120/578-10 40° | 13.9                           | 50,000                         | 1,019                  | 900                     | 77.2         | 20.252              | 1470    | 1804            |
| 30041577 | 1120/403-6 45°  | 16.7                           | 60,000                         | 672                    | 500                     | 80.6         | 15.953              | 1465    | 1885            |
| 30041578 | 1120/403-6 47°  | 16.7                           | 60,000                         | 772                    | 600                     | 78.9         | 18.571              | 1470    | 1885            |
| 30041580 | 1120/578-10 47° | 19.4                           | 70,000                         | 1,033                  | 800                     | 75.5         | 29.679              | 1470    | 1804            |
| 30041582 | 1120/578-10 51° | 22.2                           | 80,000                         | 1,105                  | 800                     | 73.1         | 36.921              | 1480    | 1804            |
| 30041581 | 1250/403-6 49°  | 25.0                           | 90,000                         | 849                    | 600                     | 80.1         | 28.736              | 1470    | 1730            |
| 30041584 | 1400/403-6 45°  | 27.8                           | 100,000                        | 795                    | 600                     | 79.9         | 30.222              | 1470    | 1575            |
| 30041585 | 1400/578-10 41° | 27.8                           | 100,000                        | 995                    | 800                     | 81.4         | 38.211              | 1480    | 1595            |
| 30041583 | 1250/578-10 46° | 27.8                           | 100,000                        | 1,007                  | 700                     | 77.7         | 37.881              | 1480    | 1685            |
| 30041586 | 1250/578-10 49° | 27.8                           | 100,000                        | 1,207                  | 900                     | 77.3         | 47.194              | 1475    | 1685            |
| 30041587 | 1250/578-10 50° | 27.8                           | 100,000                        | 1,307                  | 1,000                   | 76.5         | 51.339              | 1480    | 1685            |

# Performance curves — ACN

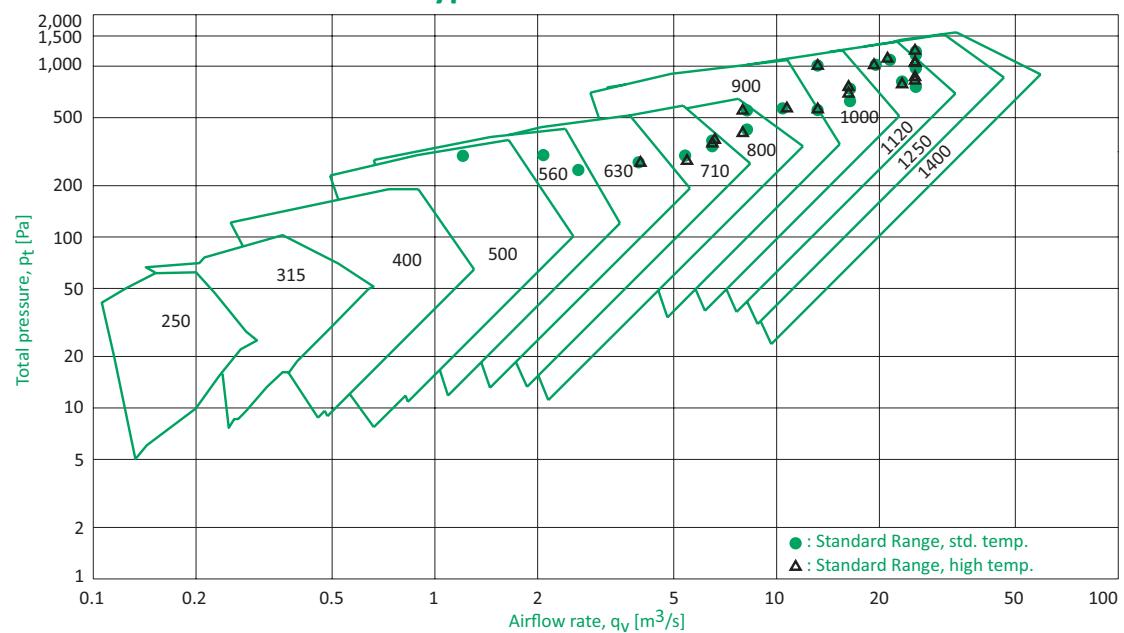
The diagrams show the coverage for each fan size without consideration of the hub diameter.

The capacities are based on fan installation in accordance with EN 5801, category D configuration, i.e. with an inlet duct and an outlet duct. Other installation types yield other data. The air density is  $\rho = 1.20 \text{ kg/m}^3$ .

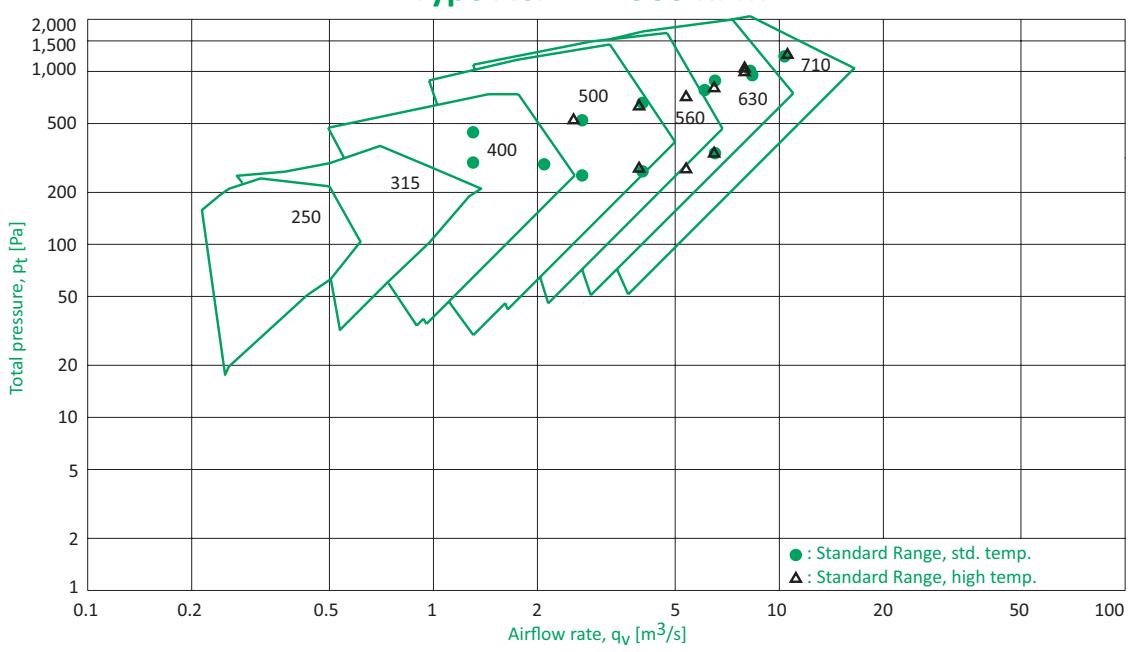
Final dimensioning, including calculation of blade angles, choice of motor, power consumption and sound calculation, is done with AirBox. See section "AirBox calculation program" on page 3.



### Type ACN — 1470 RPM



### Type ACN — 2900 RPM

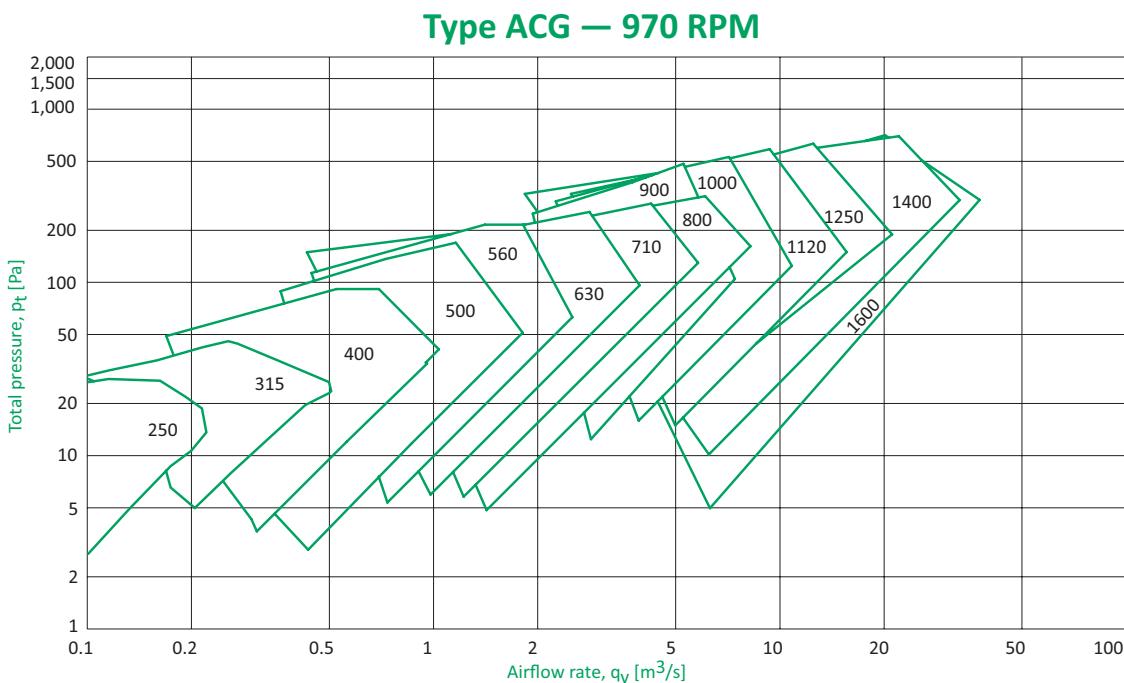
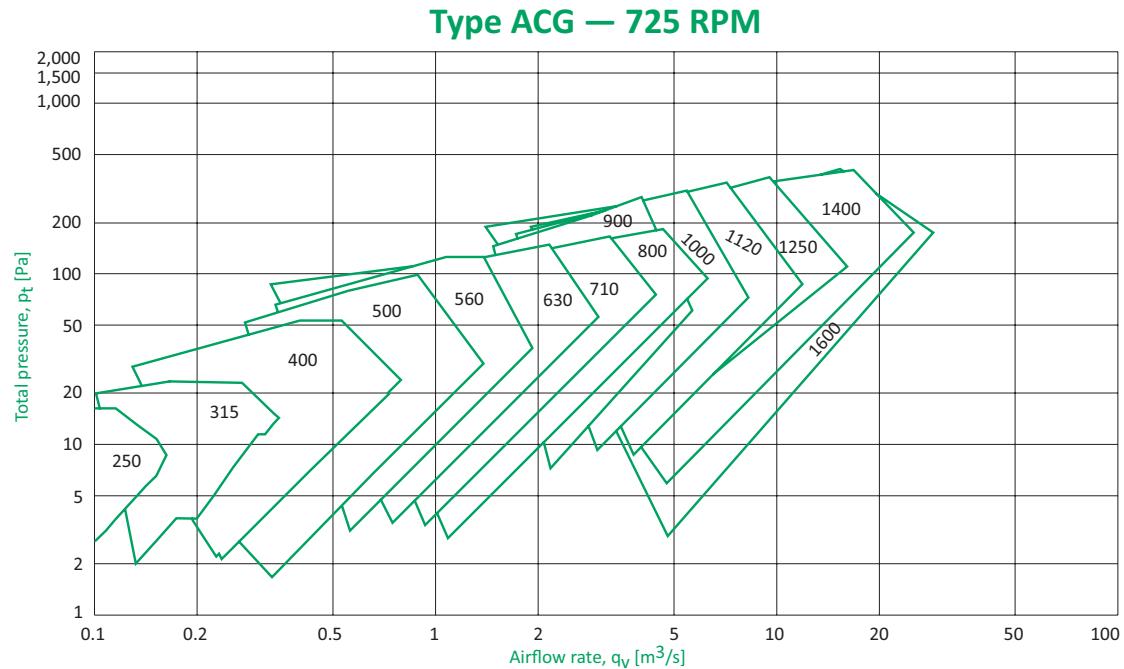


# Performance curves — ACG

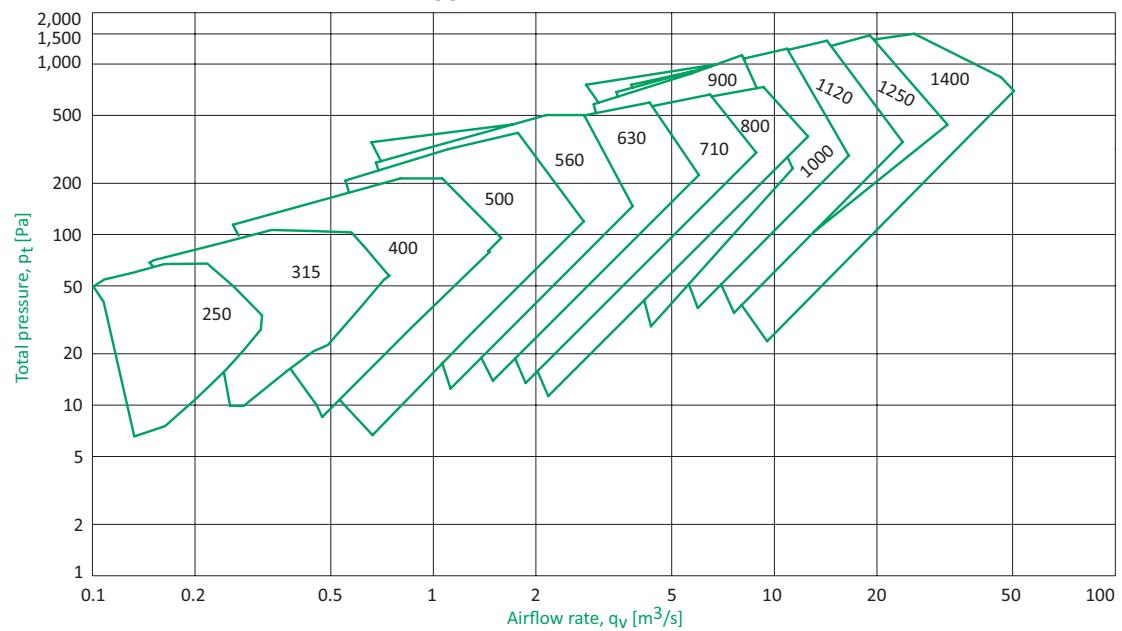
The diagrams show the coverage for each fan size without consideration of the hub diameter.

The capacities are based on fan installation in accordance with EN 5801, category B configuration, i.e. with free inlet and an outlet duct. Other installation types yield other data. The air density is  $\rho = 1.20 \text{ kg/m}^3$ .

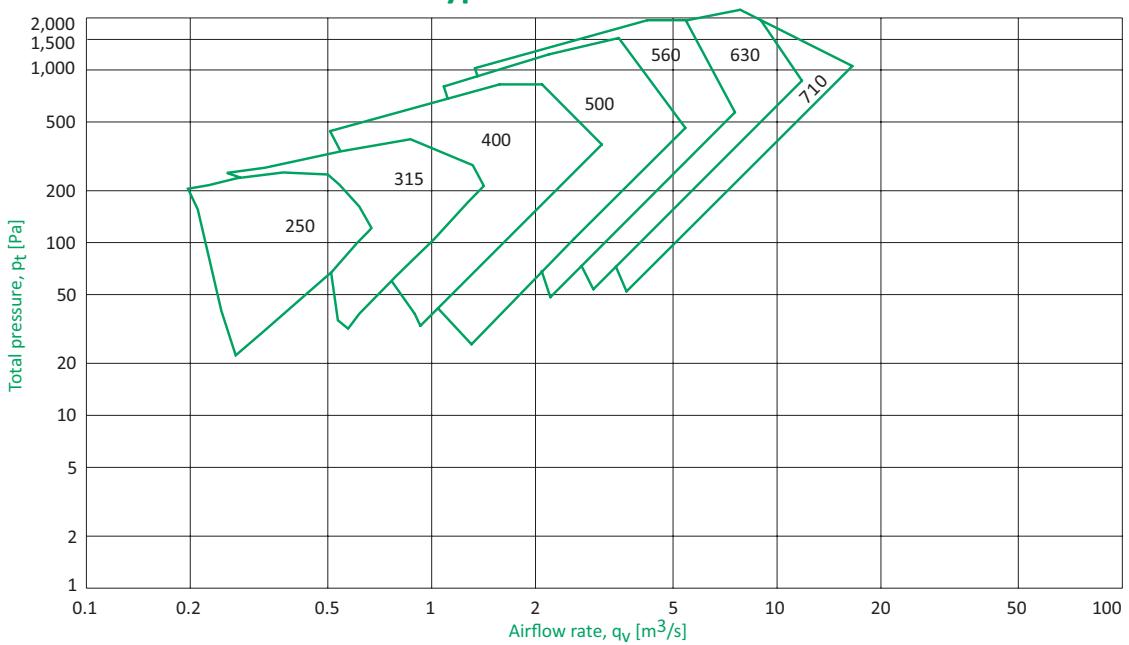
Final dimensioning, including calculation of blade angles, choice of motor, power consumption and sound calculation, is done with AirBox. See section "AirBox calculation program" on page 3.



**Type ACG — 1470 RPM**



**Type ACG — 2900 RPM**

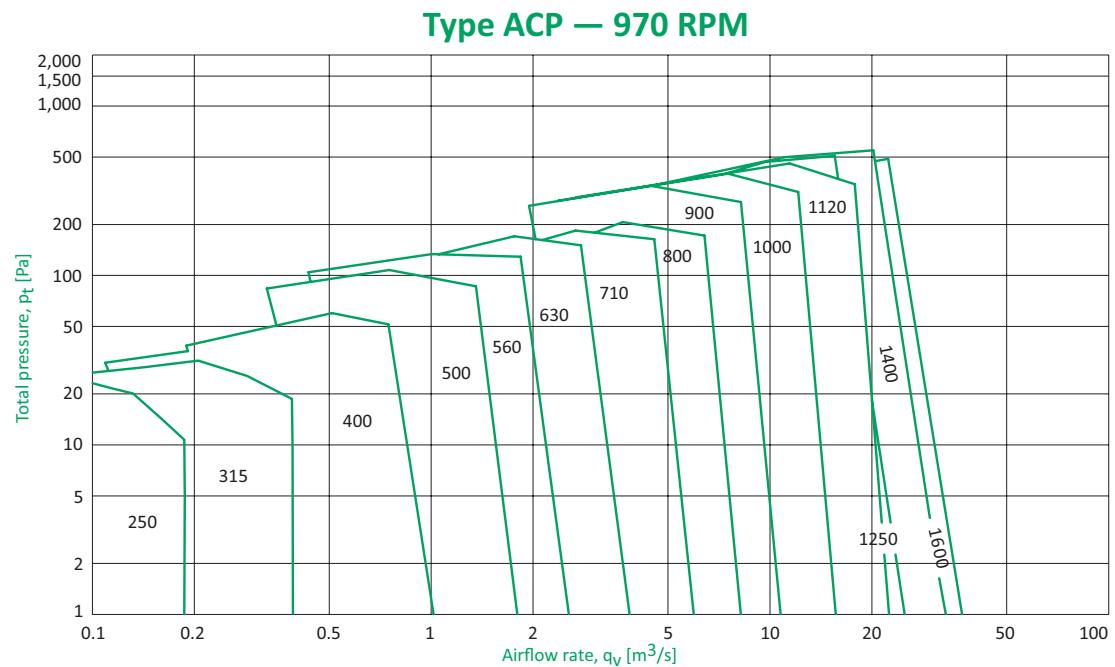
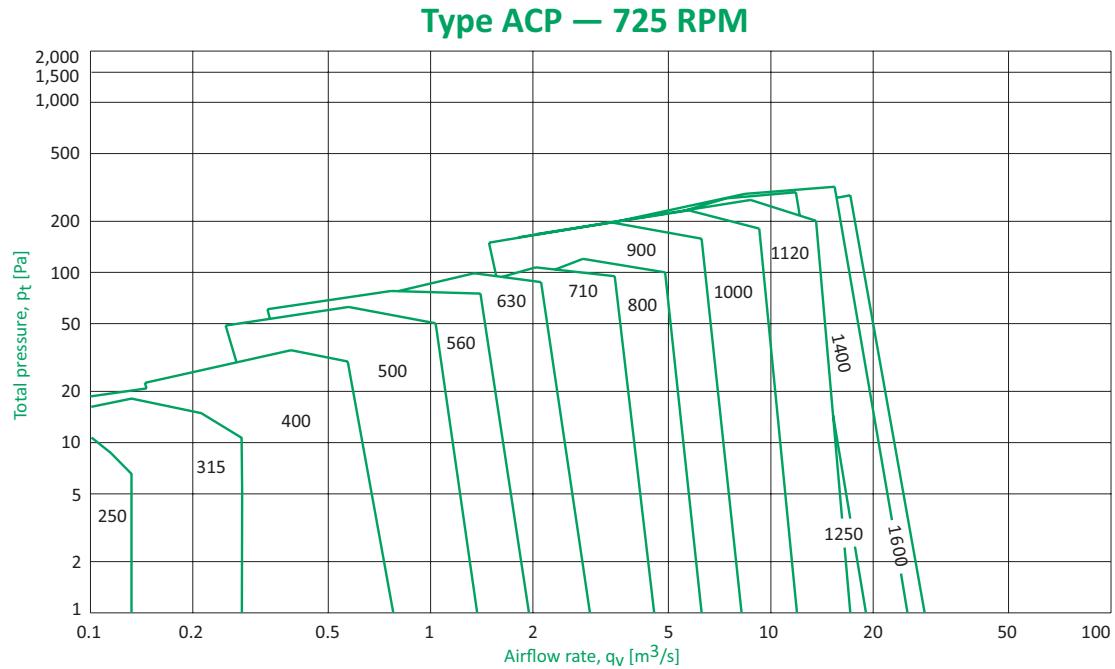


# Performance curves — ACP

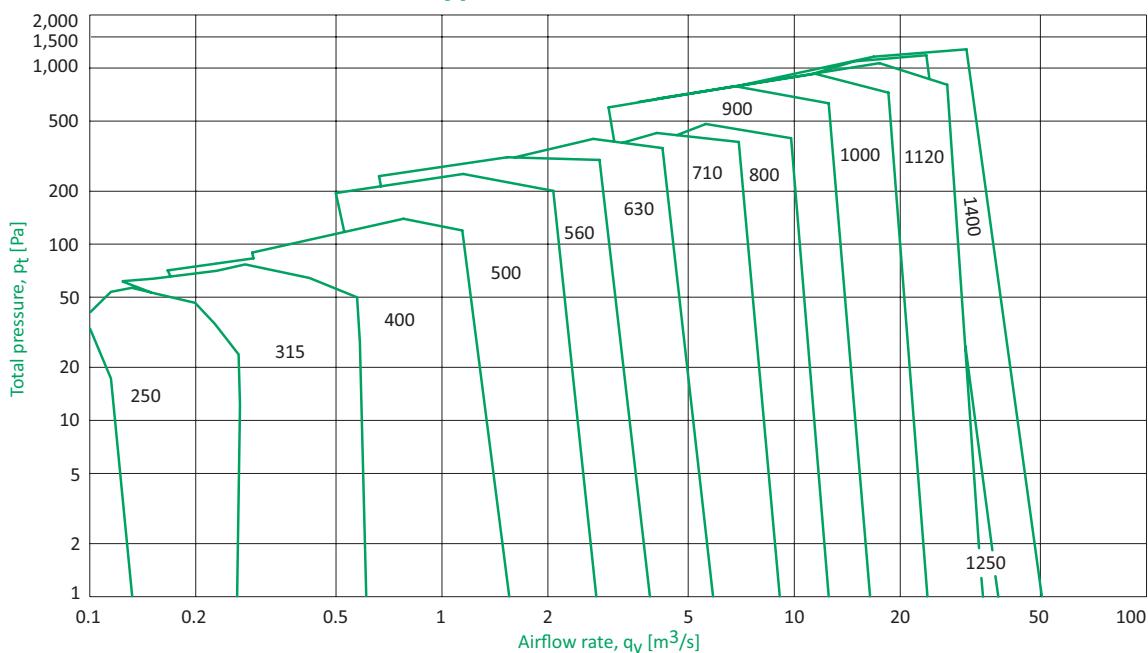
The diagrams show the coverage for each fan size without consideration of the hub diameter.

The capacities are based on fan installation in accordance with EN 5801, category B configuration, i.e. with free inlet and an outlet duct. Other installation types yield other data. The air density is  $\rho = 1.20 \text{ kg/m}^3$ .

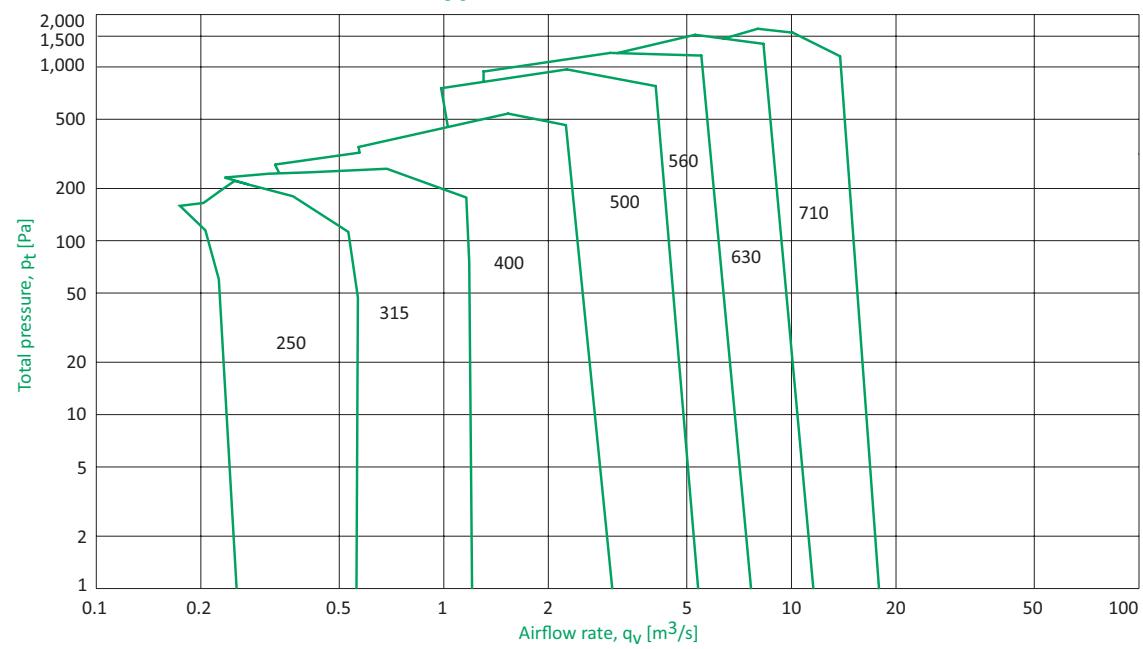
Final dimensioning, including calculation of blade angles, choice of motor, power consumption and sound calculation, is done with AirBox. See section "AirBox calculation program" on page 3.



### Type ACP — 1470 RPM

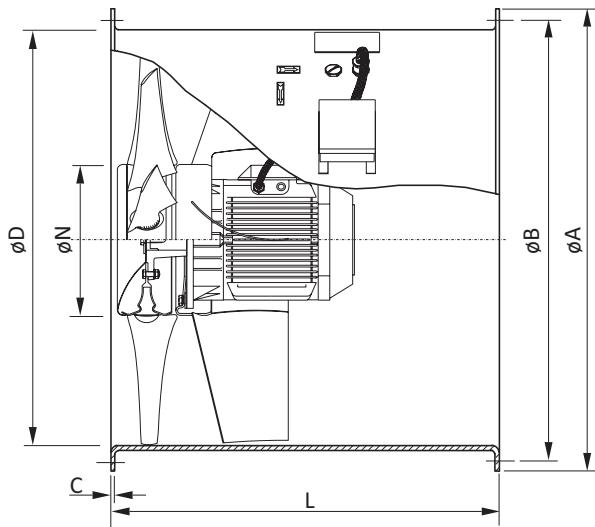
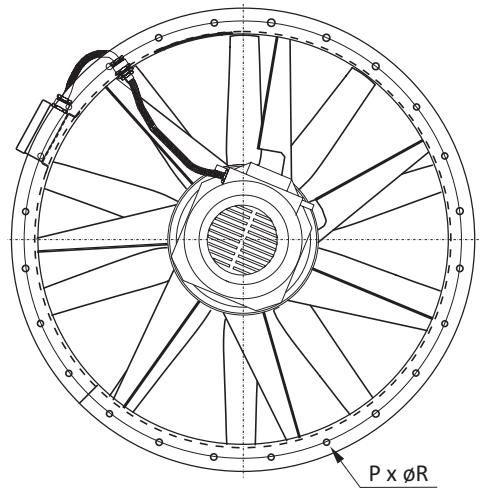


### Type ACP — 2900 RPM



# Dimensions

ACN, ACW and ARN



| Hub diameter $\phi N$ [mm]                   | Motor size | Fan sizes [mm] <sup>2</sup>                  |                      |                      |                      |                      |                      |                      |                      |                         |                         |                         |                         |                         |                         |                      |                      |
|--|------------|--|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|----------------------|----------------------|
|  |            | $\phi 250$                                   | $\phi 315$           | $\phi 400$           | $\phi 500$           | $\phi 560$           | $\phi 630$           | $\phi 710$           | $\phi 800$           | $\phi 900$              | $\phi 1000$             | $\phi 1120$             | $\phi 1250$             | $\phi 1400$             | $\phi 1600$             |                      |                      |
| $\phi A$ <sup>5</sup>                        |            | 310<br>334                                   | 385<br>409 or<br>407 | 480<br>494 or<br>492 | 590<br>594 or<br>592 | 650<br>674 or<br>672 | 720<br>744 or<br>742 | 800<br>824 or<br>822 | 890<br>914 or<br>912 | 1000<br>1015 or<br>1012 | 1100<br>1115 or<br>1113 | 1220<br>1255 or<br>1263 | 1360<br>1385 or<br>1393 | 1510<br>1535 or<br>1543 | 1720<br>1745 or<br>1753 |                      |                      |
|  |            | 280  | 355                  | 450                  | 560                  | 620                  | 690                  | 770                  | 860                  | 970                     | 1070                    | 1190                    | 1320                    | 1470                    | 1680                    |                      |                      |
| $\phi B$ <sup>4</sup>                        | All        | 292  | 366                  | 448                  | 551                  | 629                  | 698                  | 775                  | 861                  | 958                     | 1067                    | 1200                    | 1337                    | 1491                    | 1663                    |                      |                      |
|  |            | 250  | 315                  | 400                  | 500                  | 560                  | 630                  | 710                  | 800                  | 900                     | 1000                    | 1120                    | 1250                    | 1400                    | 1600                    |                      |                      |
| $\phi D$                                     | All        | 4  | 8                    | 12                   | 16                   | 16                   | 16                   | 16                   | 16                   | 16                      | 16                      | 20                      | 20                      | 20                      | 24                      |                      |                      |
|  |            | 8  | 12                   | 16                   | 16                   | 16                   | 16                   | 24                   | 24                   | 24                      | 24                      | 32                      | 32                      | 32                      | 40                      |                      |                      |
| $\phi R$ <sup>4</sup>                        |            | 10   | 10                   | 12                   | 12                   | 12                   | 12                   | 12                   | 12                   | 15                      | 15                      | 15                      | 15                      | 15                      | 19                      |                      |                      |
|  |            | 12   | 12                   | 12                   | 12                   | 14                   | 14                   | 14                   | 14                   | 14                      | 14                      | 18                      | 18                      | 18                      | 18                      |                      |                      |
| C <sup>3</sup>                               | All        | 2  | 2                    | 3                    | 3                    | 3                    | 3                    | 3                    | 3                    | 3                       | 3 or 4 <sup>1</sup>     | 3 or 4 <sup>1</sup>     | 3 or 4 <sup>1</sup>     | 4                       | 4                       |                      |                      |
|  |            | 6  | 6 or 10                 | 6 or 10                 | 6 or 10                 | 6 or 10                 | 6 or 10                 | 6 or 10                 |                      |                      |
| L  | 160-380    | 360  | 400                  | 520                  | 560                  | 620                  | 620                  | 730                  | 750                  | 850                     | 900                     |                         |                         |                         |                         |                      |                      |
|  |            | Max. weight, without motor [kg] <sup>5</sup> | 11<br>23             | 14<br>32 or 44       | 27<br>48 or 68       | 42<br>69 or 96       | 55<br>90 or<br>123   | 60<br>99 or<br>137   | 73<br>121 or<br>172  | 82<br>138 or<br>195     | 98<br>166 or<br>239     | 134<br>190 or<br>278    |                         |                         |                         |                      |                      |
| L  | 403        | 112  |                      |                      |                      |                      |                      |                      |                      |                         | 650                     | 750                     |                         |                         |                         |                      |                      |
|  |            | 132  |                      |                      |                      |                      |                      |                      |                      |                         | 850                     | 750                     | 650                     | 750                     | 850                     |                      |                      |
|  |            | 160  |                      |                      |                      |                      |                      |                      |                      |                         | 850                     | 750                     | 750                     | 750                     | 850                     |                      |                      |
|  |            | 180  |                      |                      |                      |                      |                      |                      |                      |                         | 900                     | 850                     | 850                     | 850                     | 850                     |                      |                      |
| Max. weight, without motor [kg] <sup>5</sup> |            |  |                      |                      |                      |                      |                      |                      |                      |                         | 117<br>182 or<br>256    | 154<br>207 or<br>294    | 167<br>260 or<br>365    | 184<br>306 or<br>437    | 202<br>351 or<br>506    |                      |                      |
|  |            | 132  |                      |                      |                      |                      |                      |                      |                      |                         | 750                     | 650                     | 750                     |                         |                         |                      |                      |
| L  | 578        | 160  |                      |                      |                      |                      |                      |                      |                      |                         | 850                     | 750                     | 750                     | 750                     | 850                     |                      |                      |
|  |            | 180  |                      |                      |                      |                      |                      |                      |                      |                         | 850                     | 900                     | 850                     | 850                     | 850                     |                      |                      |
|  |            | 200  |                      |                      |                      |                      |                      |                      |                      |                         | 900                     | 950                     | 950                     | 950                     | 900                     |                      |                      |
|  |            | 225  |                      |                      |                      |                      |                      |                      |                      |                         | 950                     | 950                     | 950                     | 950                     | 1120                    |                      |                      |
| Max. weight, without motor [kg] <sup>5</sup> |            | 250  |                      |                      |                      |                      |                      |                      |                      |                         | 1060                    | 1120                    | 1120                    | 1120                    | 1120                    |                      |                      |
|  |            | 280  |                      |                      |                      |                      |                      |                      |                      |                         |                         | 1120                    | 1120                    | 1120                    | 1120                    |                      |                      |
| Max. weight, without motor [kg] <sup>5</sup> |            |  |                      |                      |                      |                      |                      |                      |                      |                         |                         | 153<br>217 or<br>291    | 192<br>243 or<br>330    | 219<br>300 or<br>405    | 269<br>350 or<br>481    | 329<br>425 or<br>580 | 366<br>497 or<br>675 |

1. Depends on motor size

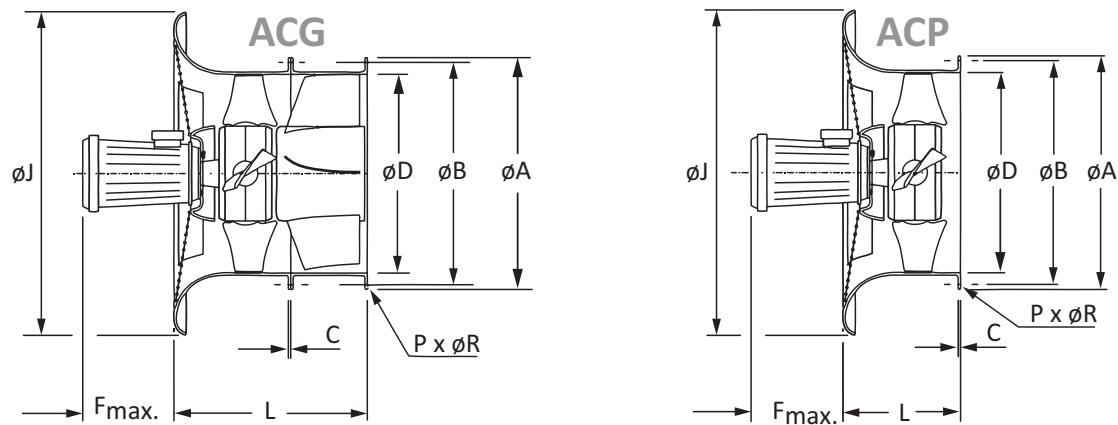
2. ARN fans are limited to fan sizes  $\phi 900$  to  $\phi 1600$ .

3. Top values indicate fan housing thickness for ACN and ARN. Bottom values are for ACW.

4. Top values apply to ACN and ARN. Bottom values are for ACW. Single values apply to all fan types.

5. Top values apply to ACN and ARN. Bottom values are for ACW with fan housing thicknesses of 6 (1st) or 10 mm.

## ACG AND ACP



|          | Hub diameter $\phi N$ [mm] | Motor size | Fan sizes [mm] <sup>4</sup> |            |            |            |            |            |            |            |            |             |             |             |             |             |
|----------|----------------------------|------------|-----------------------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|
|          |                            |            | $\phi 250$                  | $\phi 315$ | $\phi 400$ | $\phi 500$ | $\phi 560$ | $\phi 630$ | $\phi 710$ | $\phi 800$ | $\phi 900$ | $\phi 1000$ | $\phi 1120$ | $\phi 1250$ | $\phi 1400$ | $\phi 1600$ |
| $\phi A$ |                            |            | 310                         | 385        | 480        | 590        | 650        | 720        | 800        | 890        | 1000       | 1100        | 1220        | 1360        | 1510        | 1720        |
| $\phi B$ |                            |            | 280                         | 355        | 450        | 560        | 620        | 690        | 770        | 860        | 970        | 1070        | 1190        | 1320        | 1470        | 1680        |
| $\phi D$ | All                        | All        | 250                         | 315        | 400        | 500        | 560        | 630        | 710        | 800        | 900        | 1000        | 1120        | 1250        | 1400        | 1600        |
| P        |                            |            | 4                           | 8          | 8          | 12         | 12         | 12         | 16         | 16         | 16         | 16          | 20          | 20          | 20          | 24          |
| $\phi R$ |                            |            | 10                          | 10         | 12         | 12         | 12         | 12         | 12         | 12         | 15         | 15          | 15          | 15          | 15          | 19          |

ACG and ACP

|                            | Hub diameter $\phi N$ [mm] | Motor size | Fan sizes [mm] <sup>4</sup> |            |            |            |            |            |            |                      |                      |                  |                  |                  |                  |                  |
|----------------------------|----------------------------|------------|-----------------------------|------------|------------|------------|------------|------------|------------|----------------------|----------------------|------------------|------------------|------------------|------------------|------------------|
|                            |                            |            | $\phi 250$                  | $\phi 315$ | $\phi 400$ | $\phi 500$ | $\phi 560$ | $\phi 630$ | $\phi 710$ | $\phi 800$           | $\phi 900$           | $\phi 1000$      | $\phi 1120$      | $\phi 1250$      | $\phi 1400$      | $\phi 1600$      |
| C                          | All                        |            | 2.5                         | 2.5        | 3          | 3          | 3          | 3          | 3          | 3                    | 3                    | 3                | 3                | 4                | 4                | 4                |
| $\phi J$                   | All                        |            | 333                         | 420        | 545        | 675        | 760        | 840        | 950        | 1055                 | 1200                 | 1333             | 1500             | 1650             | 1800             | 2000             |
| L                          | 160                        | All        | 350                         | 350        | 355        | 355        |            |            |            |                      |                      |                  |                  |                  |                  |                  |
| $F_{Max}$                  |                            |            | 197                         | 235        | 259        | 259        |            |            |            |                      |                      |                  |                  |                  |                  |                  |
| Max. weight, no motor [kg] |                            |            | 13                          | 16         | 24         | 30         |            |            |            |                      |                      |                  |                  |                  |                  |                  |
| L                          | 230-578                    | All        |                             | 355        | 355        | 410        | 415        | 415        | 410        | 430/665 <sup>2</sup> | 450/687 <sup>2</sup> | 715              | 739              | 739              | 739              |                  |
| $F_{Max}$                  |                            |            | 197                         | 235        | 250        | 370        | 479        | 544        | 505        | 510                  | 490                  | 470              | 610              | 579              | 644              | 644              |
| Max. weight, no motor [kg] |                            |            |                             |            | 26         | 40         | 52         | 57         | 65         | 72                   | 139 <sup>3</sup>     | 171 <sup>3</sup> | 188 <sup>3</sup> | 234 <sup>3</sup> | 258 <sup>3</sup> | 297 <sup>3</sup> |

ACG

|                            | Hub diameter $\phi N$ [mm] | Motor size | Fan sizes [mm] <sup>4</sup> |            |            |            |            |            |            |            |                      |                      |                  |                  |                  |                  |
|----------------------------|----------------------------|------------|-----------------------------|------------|------------|------------|------------|------------|------------|------------|----------------------|----------------------|------------------|------------------|------------------|------------------|
|                            |                            |            | $\phi 250$                  | $\phi 315$ | $\phi 400$ | $\phi 500$ | $\phi 560$ | $\phi 630$ | $\phi 710$ | $\phi 800$ | $\phi 900$           | $\phi 1000$          | $\phi 1120$      | $\phi 1250$      | $\phi 1400$      | $\phi 1600$      |
| C                          | All                        |            | 2.5                         | 2.5        | 3          | 3          | 3          | 3          | 3          | 3          | 3                    | 3                    | 3                | 4                | 4                | 4                |
| $\phi J$                   | All                        |            | 333                         | 420        | 545        | 675        | 768        | 840        | 950        | 1055       | 1200                 | 1332                 | 1500             | 1650             | 1800             | 2000             |
| L                          | 160                        | All        | 200                         | 200        | 205        | 205        |            |            |            |            |                      |                      |                  |                  |                  |                  |
| $F_{Max}$                  |                            |            | 197                         | 235        | 259        | 259        |            |            |            |            |                      |                      |                  |                  |                  |                  |
| Max. weight, no motor [kg] |                            |            | 9                           | 11         | 15         | 19         |            |            |            |            |                      |                      |                  |                  |                  |                  |
| L                          | 230-578                    | All        | 200                         | 200        | 205        | 205        | 260        | 265        | 265        | 260        | 280/415 <sup>2</sup> | 300/437 <sup>2</sup> | 465              | 489              | 489              | 489              |
| $F_{Max}$                  |                            |            | 197                         | 235        | 250        | 370        | 479        | 544        | 505        | 510        | 490                  | 470                  | 610              | 579              | 644              | 644              |
| Max. weight, no motor [kg] |                            |            |                             |            | 18         | 28         | 38         | 42         | 48         | 53         | 106 <sup>3</sup>     | 134 <sup>3</sup>     | 147 <sup>3</sup> | 188 <sup>3</sup> | 207 <sup>3</sup> | 238 <sup>3</sup> |

ACG

1.  $F_{Max}$  is the maximum dimension based on motor make type ABB.  
 2. Values on the left are for fan size  $\phi 900$  with  $\phi 280$  hub and for fan size  $\phi 1000$  with  $\phi 380$  hub. Values on the right are for all other hub diameters.  
 3. For hub diameter  $\phi 578$  mm. The weight is lower for other hub diameters.  
 4. ACP-ACG fans size  $\phi 1250$  with  $\phi 578$  hubs and motor size 132 are unavailable.

# Accessories

## Anti-vibration mounts

The prevention of vibrations spreading between fan units and the installation environment, and vice versa, is effectively achievable with anti-vibration mounts. The kind of mounts depends on the fan size. Smaller and medium fans are typically fitted with cylindrical rubber discs on the support frame or on the mounting plates. Larger fans are fitted with steel springs as rubber discs cannot provide sufficient damping due to heavy weight and low speeds.

The anti-vibration mounts are available in different size combinations. Types and sizes are dimensioned by Novenco based on fan type and size, air pressure and accessories.

## Counter flanges

Counter flanges duplicate the hole patterns of the fan flanges. They are produced in different kinds of materials depending on the intended use. Counter flanges in sheet steel are for welding on to existing ducts to enable fan attachment, while counter flanges

in galvanised material are for installation as backing on wall-like surfaces.



Anti-vibration mounts

## Dampers

Dampers shut off, regulate and mix airflows in ventilation systems and air-handling installations.

## Diffusers and acoustic diffusers

The diffusers are for use in installations for comfort and industrial ventilation. The basic versions have limited noise reduction capabilities, smooth airflow, reduce pressure loss and are available in short or long lengths. The acoustic diffusers attenuate noise well and are available with cores for removal of high frequency sounds.



Acoustic diffuser type YAD

| Fan features                                    | ACN-ARN | ACW | ACG | ACP |
|---|---------|-----|-----|-----|
| Acoustic diffusers with or without cores        | YAD     | YAD | YAD | YAD |
| Certificates (works, weight, balancing, test)   | •       | •   | •   | •   |
| Diffusers for outlet (short or long)            | •       | •   | •   | •   |
| Duct pieces with wire guards                    | •       | •   | •   | •   |
| Inlet cone with wire guard <sup>5</sup>         | •       | •   |     |     |
| Inspection hatch                                | •       | •   |     |     |
| Measuring pipes                                 |         |     | •   | •   |
| Outlet guide vane arrangement <sup>4</sup>      |         |     |     | •   |
| Silencers with or without cores <sup>1</sup>    | YAH     | YAH | YAH | YAH |
| Spark-proof linings <sup>3</sup>                | ○       | ○   |     |     |
| Wire flange (pressure side)                     | •       | •   |     |     |
| Wire guards for inlet and outlet <sup>2,5</sup> | •       | •   | •   | •   |
| Connection                                      |         |     |     |     |
| Counter flanges                                 | •       | •   | •   | •   |
| Duct spigots                                    | •       | •   | •   | •   |
| Flexible connections (PERL / Maritex)           | •       | •   | •   | •   |
| Welding spigots                                 | •       | •   | •   | •   |
| External  |         |     |     |     |
| Dampers   | SBC     | SBA | SBC | SBC |
| Roof hoods                                      | HAN     | HAT |     |     |
| Motor   |         |     |     |     |
| Frequency converters                            | •       | •   | •   | •   |
| Kit for lubrication <sup>6</sup>                | •       | •   |     |     |
| Low temperature                                 | •       | •   |     | •   |
| Marine classification                           | •       | •   | •   | •   |
| Space heater                                    | •       | •   | •   | •   |
| Thermal protection                              | •       | •   | •   | •   |
| Mounting  |         |     |     |     |
| Anti-vibration mounts                           | •       |     | •   | •   |
| Support frames for horizontal mounting          | •       | •   | •   | •   |
| Vertical mounting plates                        | •       |     | •   | •   |

• = All versions ; ○ = Limited programme availability

**1.** A standard clamping ring is used for joining two silencers type YAH. It is inadvisable to join more than two silencers with standard clamping rings.

**2.** Wire guards for fan housings come with an installation duct for sizes up to and including Ø1000.

**3.** The number of versions with spark-proof lining is limited by the blade angle. Information on versions offered with spark-proof linings is available on request and in the AirBox calculation program.

**4.** The ACG is as standard fitted with outlet guide vanes. The ACP can be retrofitted with outlet guide vanes and is then identical to the ACG.

**5.** Installation of a wire guard in the inlet cone reduces the total pressure by 2%.

A wire guard in the duct reduces the dynamic pressure by 5%.

**6.** The kits are for WEG motor sizes 160 and 180. Smaller sizes are greased for life and bigger sizes are fitted with grease nipples as standard. Refer to the motor manufacturer's documentation.

## Duct and welding spigots

Duct spigots mount on to the fan flanges and allow for connection to ducts by clamping rings.

Welding spigots mount on the fan flanges and allow for connection to ducts by welding ducts directly on to the spigots.

## Flexible connections

The flexible material in these connections absorb vibrations from the fans and ducts. The pressure loss is minimal due to the strength and short length of the material. Versions with one or two connection spigots are available.



Flexible connection

## Inlet cones

Inlet cones screw directly on to the fan flanges. They even out the inlet airflow, improve performance and reduce the noise level.

## Inspection hatches

The hatches are square holes in the fan housing, which are closed off with metal hatches. The hatches are for verification purposes.

## Roof hoods

The roof hoods prevent ingress of wind, rain and objects in the ventilation systems with subsequent noise-generation and clogging. The design and materials of the hoods are very durable.

## Silencers

Silencers have round connection profiles, attenuate noise in installations and are available with or without cores.

Versions with cores remove high frequency sounds.

Two silencers can be joined with a standard clamping ring. More than two silencers in series require other measures for joining.

## Spark-proof linings

The linings prevent flying of sparks from blade tips in case these come in contact with the fan housing. The material is either aluminium for ATEX or brass for EX fans. Brass executions are primarily for marine environments.

## Support frames and vertical mounting plates

Support frames are for fan installations where the configurations become too heavy or where there, for example, is a need for an elevated fan position. The frames are of sheet steel and can be fitted with anti-vibration mounts.



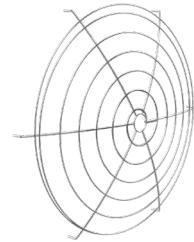
Support frame

Mounting plates for installation on to walls or other plane surfaces are also part of the mounting accessory programme.

## Wire guards for inlet cones and ducts

Wire guards for mounting on fans with free inlets prevent contact with the impellers and stop objects from entering the fans. These guard nets attach with screws to inlet cones or in ducts.

Duct pieces and inlet cones with integrated wire guards for flange mounting are also available.



Wire guard for inlet cone

Use of wire guards causes a loss of 2% of the total pressure when fitted on inlet cones and a loss of 5% of the dynamic pressure when fitted in ducts.

## Frequency converters

Frequency converters facilitate full and optimal fan control, enable efficient operation and reduce energy consumption through effective management of energy and fan motors. This is possible as the converters remove the limitations of fixed power grid frequencies. The converters can be used with all NovAx fan types and environments.

The use of permanent magnet (PM) motors with NovAx fans requires connection and control through frequency converters. Direct connection of PM motors to power sources damages the motors and voids the warranty. Additionally, alternating current (AC) motors can also be used with frequency converters.

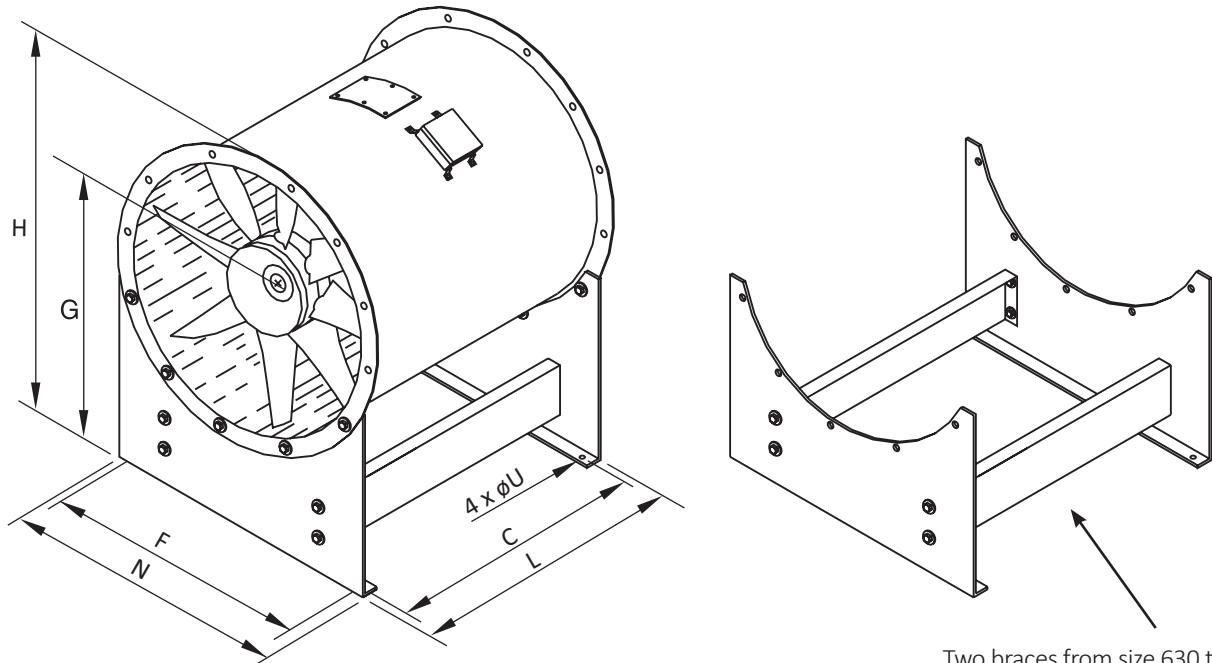
## Benefits

- Reduction of fan and motor wear through smooth control
- Better motor reversal control
- Reduction of harmonics
- Higher power factor
- Lower noise levels
- Reduction of operation and maintenance costs, i.e. low total cost of ownership (TCO)
- Flexible integration with new and existing automation systems
- Manual and remote operation possible

Calculation of the total system efficiency is done by multiplication of all the system component efficiencies.

$$\text{Total efficiency} = \text{Fan} \times \text{Motor} \times \text{Frequency converter}$$

## Support frames for ACN, ACW and ARN



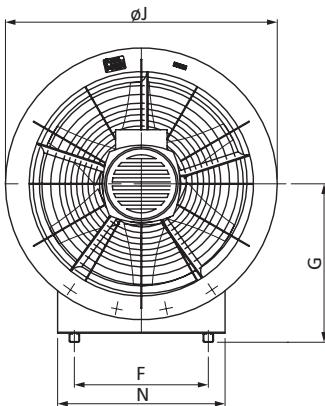
Two braces from size 630 to 1600

|                | Fan sizes [mm] |      |      |      |      |      |      |      |                   |                    |       |       |       |       |
|----------------|----------------|------|------|------|------|------|------|------|-------------------|--------------------|-------|-------|-------|-------|
|                | Ø250           | Ø315 | Ø400 | Ø500 | Ø560 | Ø630 | Ø710 | Ø800 | Ø900 <sup>1</sup> | Ø1000 <sup>1</sup> | Ø1120 | Ø1250 | Ø1400 | Ø1600 |
| G              | 240            | 280  | 330  | 390  | 440  | 480  | 530  | 580  | 680               | 740                | 800   | 850   | 925   | 1025  |
| H              | 395            | 473  | 570  | 685  | 765  | 840  | 930  | 1025 | 1180              | 1290               | 1410  | 1530  | 1680  | 1885  |
| C <sup>2</sup> | 296            | 336  | 454  | 494  | 554  | 554  | 664  | 684  | 794/784           | 834/832            | 882   | 992   | 1052  | 1052  |
| L <sup>2</sup> | 360            | 400  | 520  | 560  | 620  | 620  | 730  | 735  | 835               | 885                | 950   | 1060  | 1120  | 1120  |
| F <sup>2</sup> | 170            | 200  | 250  | 325  | 370  | 400  | 450  | 520  | 590               | 680/670            | 750   | 810   | 920   | 1060  |
| N              | 260            | 290  | 360  | 435  | 480  | 530  | 580  | 650  | 720               | 800                | 880   | 980   | 1090  | 1230  |
| ØU             | 8              | 8    | 8    | 10   | 12   | 12   | 12   | 12   | 12                | 12                 | 14    | 14    | 14    | 14    |
| Weight [kg]    | 1.5            | 2.8  | 3.8  | 4.4  | 7.2  | 11.4 | 13.2 | 14.9 | 21.0              | 23.5               | 26.0  | 32.6  | 34.6  | 46.5  |

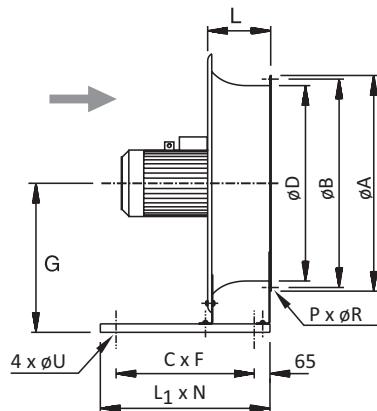
1. In cells with dual values, the values on the left are for hub diameters Ø230- Ø380 while values on the right are for hub diameters Ø403- Ø578.

2. The specified data is based on maximum fan housing length. Other lengths have other data.

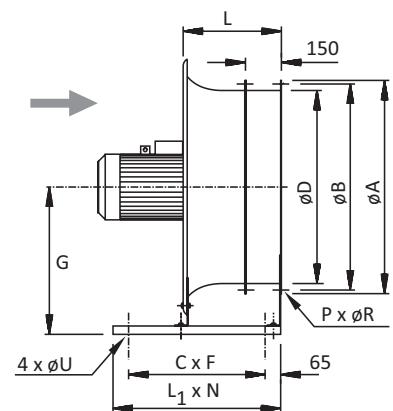
## Support frames for ACG AND ACP - vertical mounting plates for all fans



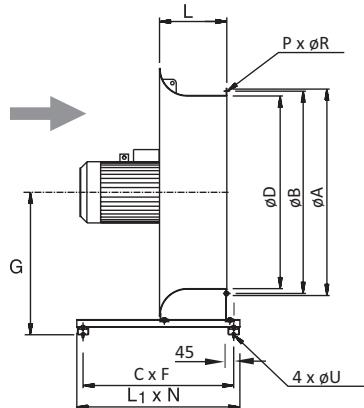
Support frame for ACG and ACP  
all hub sizes



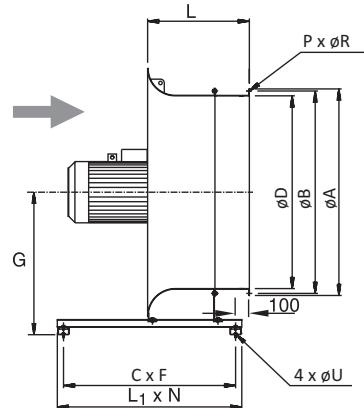
Support frame for ACP  
hub sizes  $\varnothing 160$  -  $\varnothing 380$



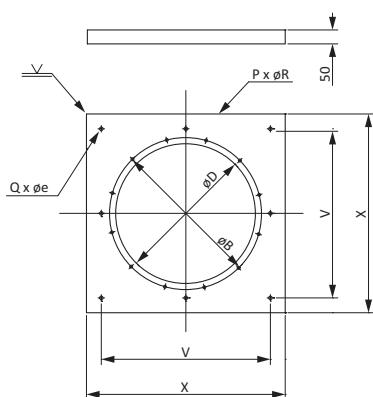
Support frame for ACG  
hub sizes  $\varnothing 160$  -  $\varnothing 380$



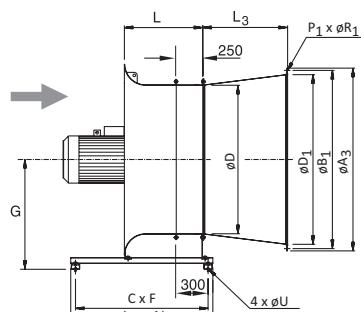
Support frame for ACP  
hub sizes  $\varnothing 403$  and  $\varnothing 578$



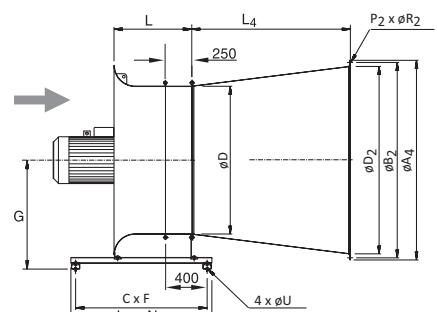
Support frame for ACG  
hub sizes  $\varnothing 403$  and  $\varnothing 578$



Vertical mounting plate



Support frame for ACG with  
short diffuser - hub sizes  $\varnothing 403$  and  $\varnothing 578$



Support frame for ACG with  
long diffuser - hub sizes  $\varnothing 403$  and  $\varnothing 578$

The  $\varnothing A$ ,  $\varnothing B$ ,  $\varnothing D$ ,  $L$ ,  $P$  and  $\varnothing R$  dimensions are found on pages 15 to 16. Other dimensions are on the next page.

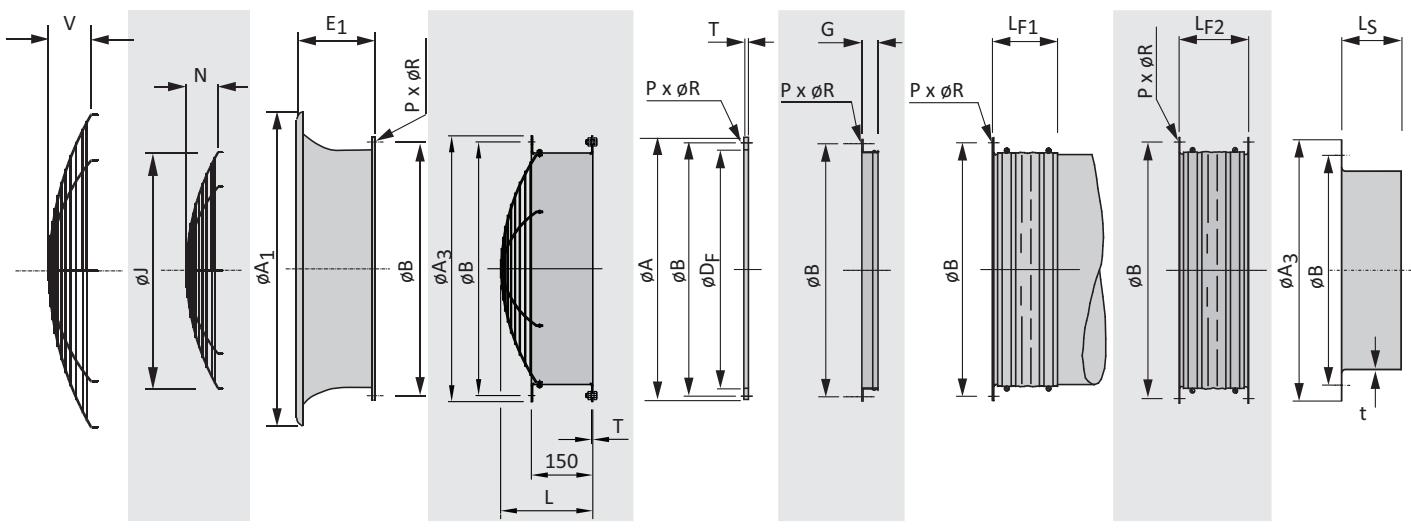
|                              |                             | Fan sizes [mm] |      |      |      |      |      |      |      |                             |                             |       |                         |       |       |
|------------------------------|-----------------------------|----------------|------|------|------|------|------|------|------|-----------------------------|-----------------------------|-------|-------------------------|-------|-------|
|                              |                             | Ø250           | Ø315 | Ø400 | Ø500 | Ø560 | Ø630 | Ø710 | Ø800 | Ø900                        | Ø1000                       | Ø1120 | Ø1250                   | Ø1400 | Ø1600 |
| Vertical mounting plates     | ØB                          | 280            | 355  | 450  | 560  | 620  | 690  | 770  | 860  | 970                         | 1070                        | 1190  | 1320                    | 1470  | 1680  |
|                              | ØD                          | 250            | 315  | 400  | 510  | 570  | 640  | 720  | 810  | 910                         | 1010                        | 1130  | 1260                    | 1410  | 1610  |
|                              | Øe                          | 8              | 8    | 12   | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5                        | 12.5                        | 12.5  | 12.5                    | 12.5  | 12.5  |
|                              | Q <sup>4</sup>              | 8              | 8    | 8    | 4    | 4    | 4    | 4    | 4    | 4                           | 4                           | 4     | 4                       | 4     | 4     |
|                              | P                           | 4              | 8    | 8    | 12   | 12   | 12   | 16   | 16   | 16                          | 16                          | 20    | 20                      | 20    | 24    |
|                              | ØR                          | 10             | 10   | 12   | 12   | 12   | 12   | 12   | 12   | 15                          | 15                          | 15    | 15                      | 15    | 19    |
|                              | V                           | 544            | 544  | 544  | 745  | 805  | 875  | 954  | 1044 | 1142                        | 1242                        | 1362  | 1492                    | 1640  | 1850  |
|                              | X                           | 600            | 600  | 600  | 830  | 890  | 960  | 1040 | 1130 | 1230                        | 1330                        | 1450  | 1580                    | 1730  | 1930  |
| Support frames for ACG / ACP | Weight [kg]                 | 9.8            | 9.1  | 8.0  | 12.4 | 13.7 | 15.2 | 20.2 | 22.6 | 33.6                        | 37.5                        | 42.2  | 47.6                    | 66.2  | 77.3  |
|                              | ØJ                          | 333            | 420  | 545  | 675  | 768  | 840  | 947  | 1055 | 1200                        | 1333                        | 1500  | 1650                    | 1800  | 2000  |
|                              | G <sup>1</sup>              | 275            | 315  | 365  | 425  | 475  | 515  | 565  | 615  | 715/790                     | 775/850                     | 910   | 960                     | 1035  | 1135  |
|                              | C                           | 420            | 420  | 420  | 420  | 420  | 570  | 570  | 570  | 570/1120 /1000 <sup>2</sup> | 770/1120 /1000 <sup>2</sup> | 1120  | 1250 /1120 <sup>3</sup> | 1250  | 1250  |
|                              | F                           | 170            | 200  | 250  | 325  | 370  | 400  | 450  | 520  | 590                         | 670                         | 750   | 810                     | 920   | 1060  |
|                              | L <sub>1</sub> <sup>1</sup> | 550            | 550  | 550  | 550  | 550  | 700  | 700  | 700  | 700/1210                    | 900/1210                    | 1210  | 1340                    | 1340  | 1340  |
|                              | N <sup>1</sup>              | 260            | 290  | 360  | 435  | 480  | 530  | 580  | 650  | 720/900                     | 800/1000                    | 1120  | 1250                    | 1400  | 1600  |
|                              | ØU                          | 12             | 12   | 12   | 12   | 12   | 12   | 12   | 12   | 12                          | 12                          | 12    | 12                      | 12    | 12    |
|                              | Weight [kg]                 | 5.7            | 5.7  | 5.7  | 6.3  | 8.5  | 10.2 | 11.2 | 12.2 | 15.3                        | 18.1                        | 61.8  | 62.1                    | 68.6  | 76.7  |

|                            | Support frame for ACG with short diffusers |                         |       |                         |       |       |
|----------------------------|--|-------------------------|-------|-------------------------|-------|-------|
|                            | Ø900                                       | Ø1000                   | Ø1120 | Ø1250                   | Ø1400 | Ø1600 |
| L3                         | 400  | 500                     | 560   | 600                     | 800   | 800   |
| ØD1                        | 1000                                       | 1120                    | 1250  | 1400                    | 1600  | 1800  |
| ØB1                        | 1070                                       | 1190                    | 1320  | 1470                    | 1680  | 1880  |
| ØA3                        | 1103                                       | 1223                    | 1363  | 1513                    | 1723  | 1923  |
| P1                         | 16   | 20                      | 20    | 20                      | 24    | 24    |
| ØR1                        | 15   | 15                      | 15    | 15                      | 19    | 19    |
| Weight, diffuser [kg]      | 33   | 40                      | 48    | 57                      | 77    | 86    |
| G                          | 790  | 850                     | 910   | 960                     | 1035  | 1135  |
| C                          | 1120 /1000 <sup>3</sup>                    | 1120 /1000 <sup>3</sup> | 1120  | 1250 /1120 <sup>3</sup> | 1250  | 1250  |
| F                          | 590  | 670                     | 750   | 810                     | 920   | 1060  |
| L1                         | 1210                                       | 1210                    | 1210  | 1340                    | 1340  | 1340  |
| N                          | 900  | 1000                    | 1120  | 1250                    | 1400  | 1600  |
| ØU                         | 12   | 12                      | 12    | 12                      | 12    | 12    |
| Weight, support frame [kg] | 52.4                                       | 57.2                    | 61.8  | 62.1                    | 68.6  | 76.7  |

|                            | Support frame for ACG with long diffusers |                         |       |                         |       |       |
|----------------------------|---|-------------------------|-------|-------------------------|-------|-------|
|                            | Ø900                                      | Ø1000                   | Ø1120 | Ø1250                   | Ø1400 | Ø1600 |
| L4                         | 900                                       | 1000                    | 1100  | 1400                    | 1600  | 1600  |
| ØD2                        | 1120                                      | 1250                    | 1400  | 1600                    | 1800  | 2000  |
| ØB2                        | 1190                                      | 1320                    | 1470  | 1680                    | 1880  | 2080  |
| ØA4                        | 1223                                      | 1363                    | 1513  | 1723                    | 1923  | 2123  |
| P2                         | 20  | 20                      | 20    | 24                      | 24    | 24    |
| ØR2                        | 15  | 15                      | 15    | 15                      | 19    | 19    |
| Weight, diffuser [kg]      | 52  | 62                      | 74    | 102                     | 123   | 139   |
| G                          | 790                                       | 850                     | 910   | 960                     | 1035  | 1135  |
| C                          | 1120 /1000 <sup>3</sup>                   | 1120 /1000 <sup>3</sup> | 1120  | 1250 /1120 <sup>3</sup> | 1250  | 1250  |
| F                          | 590                                       | 670                     | 750   | 810                     | 920   | 1060  |
| L1                         | 1210                                      | 1210                    | 1210  | 1340                    | 1340  | 1340  |
| N                          | 900                                       | 1000                    | 1120  | 1250                    | 1400  | 1600  |
| ØU                         | 12  | 12                      | 12    | 12                      | 12    | 12    |
| Weight, support frame [kg] | 52.4                                      | 57.2                    | 61.8  | 63.8                    | 68.6  | 76.7  |

1. In cells with two values, the right are for hub diameters Ø403 and Ø578.
2. The first value is for hub diameters Ø160 to Ø380. The second and third values are for hub diameters Ø403 and Ø578.
3. The first value is for ACG and the second is for ACP.
4. Vertical mounting plates for fan sizes Ø400 and up have a fixation bolt in each corner.

## Wire guards, flanges, spigots etc. for all NovAx types



Wire guards  
for inlet  
cones

Wire guard for  
ducts

Inlet cones

Duct pieces  
with wire guard

Counter  
flanges

Duct spigots

Flexible  
connection with  
one duct spigot

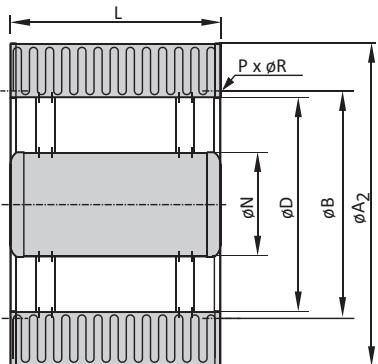
Flexible  
connection with  
two duct spigots

Welding  
spigots

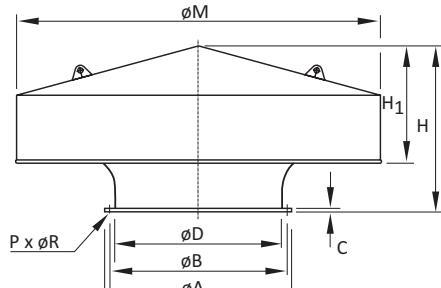
|                                |                            | Fan sizes [mm]      |      |      |      |      |      |      |      |                     |       |       |       |       |       |
|--------------------------------|----------------------------|---------------------|------|------|------|------|------|------|------|---------------------|-------|-------|-------|-------|-------|
|                                |                            | ø250                | ø315 | ø400 | ø500 | ø560 | ø630 | ø710 | ø800 | ø900                | ø1000 | ø1120 | ø1250 | ø1400 | ø1600 |
| Wire guards<br>for inlet cones | V                          | 29                  | 43   | 68   | 55   | 69   | 87   | 111  | 137  | 85                  | 106   | 133   | 133   | 171   | 218   |
|                                | Weight [kg]                | 0.1                 | 0.2  | 0.3  | 0.5  | 0.6  | 0.8  | 0.9  | 1.1  | 2.5                 | 3.0   | 3.6   | 3.6   | 4.2   | 5.7   |
| Wire guards<br>for ducts       | N                          | 19                  | 29   | 43   | 68   | 88   | 55   | 69   | 87   | 111                 | 137   | 85    | 106   | 133   | 171   |
|                                | φJ                         | 246                 | 310  | 396  | 496  | 556  | 626  | 706  | 796  | 896                 | 996   | 1114  | 1244  | 1394  | 1594  |
| Inlet cones                    | Weight [kg]                | 0.1                 | 0.1  | 0.2  | 0.3  | 0.3  | 0.5  | 0.6  | 0.8  | 0.9                 | 1.1   | 2.5   | 3.0   | 3.6   | 4.2   |
|                                | E1                         | 200                 | 200  | 205  | 205  | 260  | 265  | 265  | 260  | 280                 | 300   | 325   | 355   | 383   | 420   |
|                                | φA1                        | 333                 | 420  | 545  | 675  | 760  | 840  | 947  | 1055 | 1200                | 1333  | 1520  | 1650  | 1800  | 2000  |
| Duct pieces<br>with wire guard | Weight [kg]                | 4.5                 | 5.5  | 9.5  | 12.5 | 17   | 19   | 22   | 26   | 32                  | 38    | 45    | 51    | 57    | 66    |
|                                | L                          | 155                 | 164  | 178  | 203  | 223  | 190  | 204  | 222  | 246                 | 272   |       |       |       |       |
|                                | T                          | 2                   | 2    | 3    | 3    | 3    | 3    | 3    | 3    | 3                   | 3     |       |       |       |       |
| Counter flanges                | Weight [kg]                | 2.6                 | 3.5  | 6.8  | 8.9  | 10   | 11.3 | 12.8 | 14.5 | 17                  | 18.9  |       |       |       |       |
|                                | T                          | 4                   | 4    | 4    | 4    | 4    | 4    | 4    | 4    | 8                   | 8     | 8     | 8     | 8     | 8     |
|                                | φD <sub>F</sub>            | 260                 | 325  | 410  | 510  | 570  | 640  | 720  | 810  | 910                 | 1010  | 1130  | 1260  | 1410  | 1610  |
| Duct spigots                   | Weight [kg]                | 0.7                 | 1.1  | 1.5  | 2.2  | 2.4  | 2.7  | 3.0  | 3.4  | 8.5                 | 9.4   | 10.2  | 12.2  | 14.2  | 17.2  |
|                                | G                          | 55                  | 55   | 55   | 55   | 55   | 55   | 55   | 55   | 85                  | 85    | 85    | 85    | 85    | 85    |
|                                | Weight [kg]                | 1.0                 | 1.4  | 1.9  | 2.4  | 2.7  | 3.1  | 3.5  | 3.9  | 5.9                 | 6.6   | 7.4   | 8.5   | 9.5   | 11.3  |
| Flexible connections           | L <sub>F</sub>             | Min. 65 - Max. 100  |      |      |      |      |      |      |      | Min. 110 - Max. 175 |       |       |       |       |       |
|                                | Weight w.1<br>spigot [kg]  | 1.3                 | 1.7  | 2.3  | 3.0  | 3.5  | 3.8  | 4.3  | 5.0  | 7.8                 | 8.9   | 10.0  | 11.6  | 13.1  | 20.0  |
|                                | L <sub>F</sub>             | Min. 120 - Max. 145 |      |      |      |      |      |      |      | Min. 210 - Max. 250 |       |       |       |       |       |
| Welding spigots                | Weight w.2<br>spigots [kg] | 2.3                 | 3.0  | 4.2  | 5.5  | 6.2  | 6.9  | 7.8  | 8.8  | 13.7                | 15.5  | 17.4  | 20.2  | 22.7  | 26.6  |
|                                | L <sub>s</sub>             | 100                 | 100  | 100  | 100  | 100  | 120  | 120  | 120  | 120                 | 150   | 150   | 150   | 150   | 150   |
|                                | t                          | 4                   | 4    | 4    | 4    | 4    | 6    | 6    | 6    | 6                   | 6     | 6     | 6     | 6     | 6     |
| Welding spigots                | φB                         | 280                 | 355  | 450  | 560  | 620  | 690  | 770  | 860  | 970                 | 1070  | 1190  | 1320  | 1470  | 1680  |
|                                | φA <sub>3</sub>            | 310                 | 385  | 480  | 590  | 650  | 720  | 800  | 890  | 1000                | 1100  | 1220  | 1360  | 1510  | 1720  |
|                                | Weight [kg]                | 3.1                 | 3.9  | 5.4  | 6.7  | 7.5  | 15.0 | 16.9 | 19.0 | 21.4                | 29.0  | 32.4  | 36.2  | 40.5  | 46.3  |

The φA and P x φR dimensions are found on pages 15 and 16.

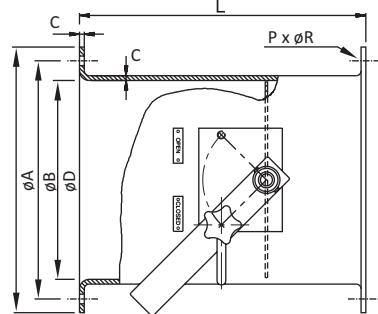
## Silencers, hoods and dampers



Silencer type YAH



Hood type HAN



Damper type SBC

|                    |                           | Fan sizes [mm] |      |      |      |      |      |      |      |      |       |       |       |       |       |  |
|--------------------|---------------------------|----------------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|--|
|                    |                           | Ø250           | Ø315 | Ø400 | Ø500 | Ø560 | Ø630 | Ø710 | Ø800 | Ø900 | Ø1000 | Ø1120 | Ø1250 | Ø1400 | Ø1600 |  |
| All                | ØD                        | 250            | 315  | 400  | 500  | 560  | 630  | 710  | 800  | 900  | 1000  | 1120  | 1250  | 1400  | 1600  |  |
|                    | ØB                        | 280            | 355  | 450  | 560  | 620  | 690  | 770  | 860  | 970  | 1070  | 1190  | 1320  | 1470  | 1680  |  |
|                    | ØA                        | 310            | 385  | 480  | 590  | 650  | 720  | 800  | 890  | 1000 | 1100  | 1220  | 1360  | 1510  | 1720  |  |
|                    | P [number]                | 4              | 8    | 8    | 12   | 12   | 12   | 16   | 16   | 16   | 16    | 20    | 20    | 20    | 24    |  |
| Silencers type YAH | ØR                        | 10             | 10   | 12   | 12   | 12   | 12   | 12   | 12   | 15   | 15    | 15    | 15    | 15    | 19    |  |
|                    | L                         | 250            | 315  | 400  | 500  | 560  | 630  | 710  | 800  | 900  | 1000  | 1120  | 1250  | 1400  | 1600  |  |
|                    | ØN                        | 125            | 160  | 200  | 250  | 280  | 315  | 355  | 400  | 450  | 500   | 560   | 578   | 578   | 578   |  |
|                    | ØA <sub>2</sub>           | 463            | 526  | 614  | 715  | 775  | 845  | 925  | 1015 | 1115 | 1215  | 1335  | 1463  | 1613  | 1813  |  |
|                    | ØR                        | M8             | M8   | M10  | M10  | M10  | M10  | M10  | M10  | M12  | M12   | M12   | M12   | M12   | M16   |  |
|                    | Weights without core [kg] | 6.2            | 8.9  | 12.5 | 19.1 | 22.8 | 27.6 | 33.8 | 41.3 | 50.6 | 61.1  | 74.5  | 140   | 168   | 192   |  |
|                    | Weights with core [kg]    | 7.9            | 11.5 | 16.8 | 26.5 | 32.8 | 40.8 | 52.1 | 69.2 | 86.8 | 109.6 | 134.4 | 170   | 205   | 247   |  |
| Hoods type HAN     | H                         | 361            | 412  | 476  | 540  | 641  | 694  | 744  | 811  | 868  | 890   | 1140  | 1252  | 1402  | 1602  |  |
|                    | H <sub>1</sub>            | 180            | 228  | 290  | 364  | 405  | 450  | 506  | 569  | 645  | 710   | 800   | 853   | 983   | 1153  |  |
|                    | ØM                        | 598            | 724  | 906  | 1106 | 1266 | 1406 | 1586 | 1766 | 2016 | 2236  | 2436  | 2810  | 3110  | 3510  |  |
|                    | C                         | 2.5            | 2.5  | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3     | 3     | 4     | 4     | 4     |  |
|                    | Weights [kg]              | 13             | 19   | 40   | 58   | 79   | 97   | 120  | 151  | 206  | 250   | 313   | 625   | 776   | 1020  |  |
| Dampers type SBC   | L                         | 360            | 400  | 520  | 560  | 620  | 670  | 730  | 810  | 910  | 1010  | 1130  | 1250  | 1400  |       |  |
|                    | C                         | 2              | 2    | 3    | 3    | 3    | 3    | 3    | 3    | 4    | 4     | 5     | 6     |       |       |  |
|                    | Weights [kg]              | 9.5            | 12.5 | 24   | 32   | 41.5 | 49   | 63   | 86   | 107  | 164   | 200   | 274   | 386   |       |  |

## Technical data for silencer YAH

### YAH - pressure loss

**Without core:** Insignificant

**With core:**  $0.2 \times p_{df}$

**Two YAH in series:**  $0.35 \times p_{df}$  (dynamic pressure)

Inlets on ACN use silencers without cores

### Example

- YAH-800 with core
- Airflow rate,  $q_v = 5 \text{ m}^3/\text{s}$
- Air speed, inlet = 10 m/s
- $p_{df} = 60 \text{ Pa}$
- Pressure loss:  $0.2 \times 60 \text{ Pa} = 12 \text{ Pa}$

## Average values for sound attenuation

| Type              | Octave band [Hz] |     |     |     |    |    |    |    |
|-------------------|------------------|-----|-----|-----|----|----|----|----|
|                   | 63               | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| Without core [dB] | 0                | 1   | 10  | 13  | 11 | 9  | 7  | 7  |
| With core [dB]    | 2                | 4   | 10  | 17  | 17 | 15 | 12 | 11 |

## Acoustic diffuser type YAD

Acoustic diffusers type YAD are standard products for use in normal installations for comfort and industrial ventilation.

The YAD is available in 14 external diameters from  $\phi 250$  to  $\phi 1600$  mm with or without cores. Cores are made in seven sizes from  $\phi 160$  to  $\phi 578$  mm and are fitted according to the fan hub sizes.

### Environment

Acoustic diffusers type YAD are designed for the temperature range -40 to +120 °C.

The basic version is, in terms of materials, designed to operate in the environmental category C3. Refer to EN 12944.

Please note that sound data and attenuation values are based on measurements with the NovAx axial fan type ACG.



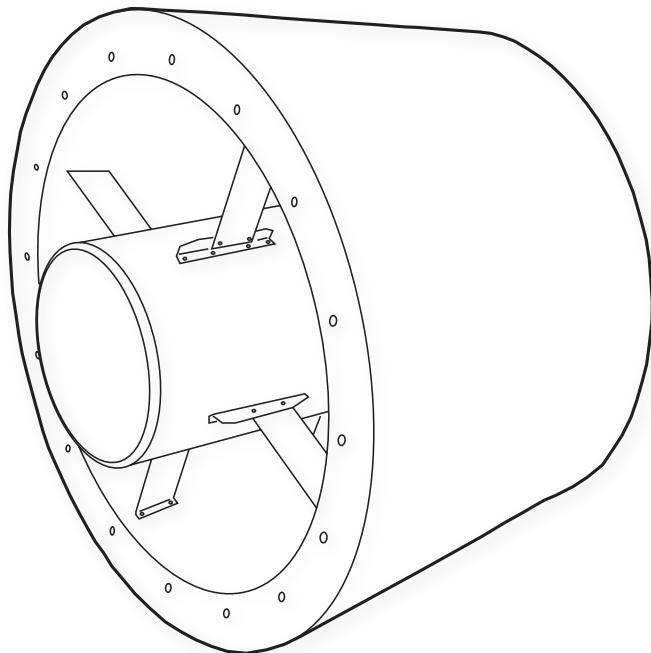
Acoustic diffuser type YAD

| Fans and connections<br>$\phi D$ [mm] | Hubs and cores<br>$\phi D$ [mm] | w/ cores         |     |    |    |    |    |    |     | w/o cores        |     |    |    |    |    |   |   |
|---------------------------------------|---------------------------------|------------------|-----|----|----|----|----|----|-----|------------------|-----|----|----|----|----|---|---|
|                                       |                                 | Octave band [Hz] |     |    |    |    |    |    |     | Octave band [Hz] |     |    |    |    |    |   |   |
| 63                                    | 125                             | 250              | 500 | 1k | 2k | 4k | 8k | 63 | 125 | 250              | 500 | 1k | 2k | 4k | 8k |   |   |
| 250                                   | 160                             | 1                | 1   | 2  | 9  | 11 | 11 | 8  | 5   | 1                | 0   | 2  | 8  | 5  | 1  | 1 | 2 |
| 315                                   | 160                             | 1                | 1   | 2  | 9  | 11 | 11 | 8  | 5   | 1                | 0   | 2  | 8  | 5  | 1  | 1 | 2 |
| 400                                   | 160                             | 0                | 2   | 3  | 12 | 11 | 11 | 7  | 4   | 0                | 0   | 3  | 11 | 6  | 1  | 1 | 1 |
| 500                                   | 160                             | 0                | 1   | 4  | 10 | 12 | 10 | 6  | 4   | 0                | 1   | 4  | 11 | 7  | 3  | 3 | 2 |
| 400                                   | 230                             | 0                | 2   | 2  | 11 | 14 | 13 | 10 | 6   | 0                | 0   | 2  | 10 | 8  | 3  | 3 | 3 |
| 500                                   | 230                             | 0                | 2   | 9  | 12 | 12 | 12 | 8  | 5   | 0                | 0   | 9  | 11 | 7  | 3  | 2 | 2 |
| 560                                   | 230                             | 0                | 1   | 4  | 12 | 13 | 11 | 7  | 5   | 0                | 1   | 4  | 12 | 8  | 4  | 4 | 3 |
| 630                                   | 230                             | 0                | 2   | 5  | 13 | 13 | 10 | 6  | 5   | 0                | 2   | 5  | 13 | 8  | 4  | 3 | 3 |
| 710                                   | 230                             | 1                | 3   | 6  | 13 | 12 | 9  | 6  | 5   | 0                | 3   | 6  | 13 | 9  | 4  | 3 | 3 |
| 800                                   | 230                             | 0                | 1   | 8  | 14 | 12 | 9  | 6  | 4   | 0                | 1   | 8  | 14 | 7  | 4  | 3 | 2 |
| 500                                   | 280                             | 0                | 2   | 2  | 12 | 15 | 15 | 11 | 7   | 0                | 0   | 2  | 11 | 9  | 5  | 4 | 4 |
| 560                                   | 280                             | 0                | 2   | 10 | 13 | 12 | 13 | 9  | 5   | 0                | 0   | 10 | 12 | 7  | 3  | 3 | 2 |
| 630                                   | 280                             | 0                | 1   | 4  | 12 | 14 | 11 | 7  | 5   | 0                | 1   | 4  | 12 | 8  | 5  | 4 | 3 |
| 710                                   | 280                             | 0                | 3   | 7  | 14 | 13 | 9  | 7  | 5   | 0                | 3   | 7  | 14 | 10 | 5  | 4 | 3 |
| 800                                   | 280                             | 0                | 1   | 8  | 15 | 13 | 10 | 6  | 4   | 0                | 1   | 9  | 15 | 8  | 5  | 3 | 3 |
| 900                                   | 280                             | 1                | 3   | 7  | 13 | 11 | 7  | 6  | 5   | 1                | 3   | 7  | 13 | 5  | 2  | 3 | 4 |
| 500                                   | 330                             | 0                | 2   | 3  | 15 | 18 | 18 | 13 | 8   | 0                | 0   | 3  | 14 | 12 | 8  | 6 | 5 |
| 560                                   | 330                             | 0                | 3   | 4  | 17 | 16 | 16 | 10 | 6   | 0                | 0   | 4  | 16 | 11 | 6  | 4 | 3 |
| 630                                   | 330                             | 0                | 2   | 10 | 13 | 13 | 13 | 9  | 5   | 0                | 0   | 10 | 12 | 8  | 4  | 3 | 3 |
| 710                                   | 330                             | 1                | 2   | 5  | 15 | 15 | 12 | 7  | 5   | 0                | 2   | 5  | 15 | 10 | 5  | 4 | 3 |
| 800                                   | 330                             | 1                | 3   | 7  | 15 | 14 | 10 | 7  | 5   | 0                | 3   | 7  | 15 | 10 | 5  | 4 | 4 |
| 900                                   | 330                             | 0                | 1   | 9  | 15 | 14 | 10 | 7  | 4   | 0                | 1   | 9  | 15 | 8  | 5  | 4 | 3 |

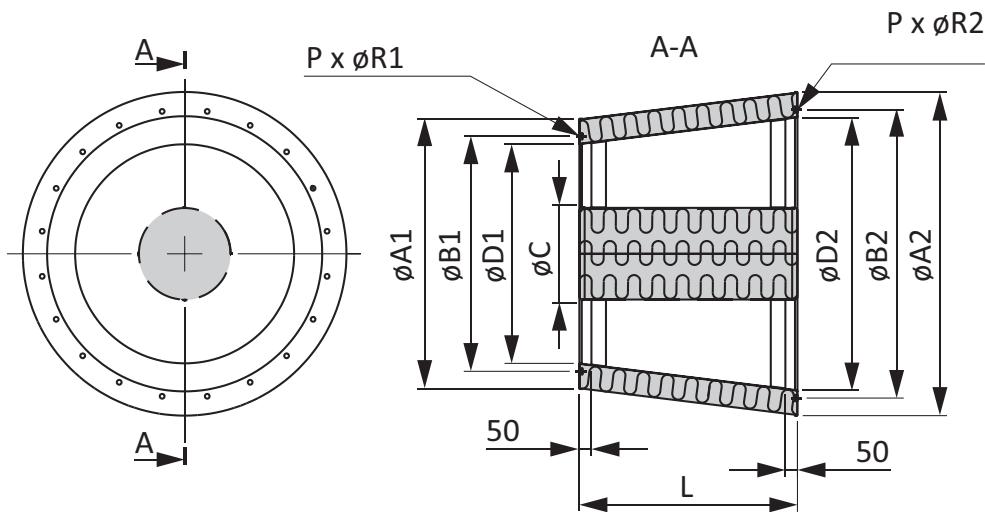
Attenuation values for YAD with or without core [dB]

| Fans and connections<br>ØD [mm] | Hubs and cores<br>ØD [mm] | w/ cores         |     |     |     |    |    |    |    | w/o cores        |     |     |     |    |    |    |    |
|---------------------------------|---------------------------|------------------|-----|-----|-----|----|----|----|----|------------------|-----|-----|-----|----|----|----|----|
|                                 |                           | Octave band [Hz] |     |     |     |    |    |    |    | Octave band [Hz] |     |     |     |    |    |    |    |
|                                 |                           | 63               | 125 | 250 | 500 | 1k | 2k | 4k | 8k | 63               | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 560                             | 380                       | 0                | 2   | 3   | 15  | 19 | 18 | 14 | 8  | 0                | 0   | 3   | 14  | 13 | 8  | 7  | 5  |
| 630                             | 380                       | 0                | 2   | 11  | 15  | 15 | 15 | 11 | 6  | 0                | 1   | 11  | 13  | 9  | 6  | 4  | 3  |
| 710                             | 380                       | 0                | 1   | 5   | 14  | 16 | 13 | 9  | 6  | 0                | 1   | 5   | 15  | 11 | 6  | 5  | 4  |
| 800                             | 380                       | 1                | 3   | 8   | 16  | 15 | 11 | 7  | 6  | 0                | 3   | 8   | 16  | 12 | 6  | 5  | 4  |
| 900                             | 380                       | 0                | 1   | 9   | 16  | 15 | 11 | 7  | 5  | 0                | 1   | 9   | 16  | 9  | 6  | 4  | 3  |
| 1000                            | 380                       | 1                | 3   | 7   | 14  | 11 | 8  | 6  | 6  | 1                | 3   | 7   | 14  | 6  | 3  | 4  | 4  |
| 900                             | 403                       | 0                | 1   | 10  | 17  | 15 | 11 | 7  | 5  | 0                | 1   | 10  | 17  | 10 | 6  | 4  | 3  |
| 1000                            | 403                       | 1                | 4   | 7   | 15  | 12 | 8  | 7  | 6  | 1                | 4   | 7   | 15  | 6  | 3  | 4  | 4  |
| 1120                            | 403                       | 1                | 3   | 7   | 14  | 11 | 8  | 6  | 5  | 1                | 3   | 7   | 11  | 6  | 4  | 4  | 4  |
| 1250                            | 403                       | 2                | 2   | 7   | 9   | 10 | 7  | 6  | 5  | 1                | 2   | 7   | 5   | 4  | 4  | 4  | 3  |
| 1400                            | 403                       | 2                | 2   | 7   | 8   | 9  | 7  | 5  | 4  | 1                | 2   | 7   | 5   | 4  | 3  | 3  | 3  |
| 900                             | 578                       | 0                | 1   | 6   | 18  | 20 | 16 | 11 | 7  | 0                | 1   | 6   | 18  | 15 | 10 | 7  | 5  |
| 1000                            | 578                       | 0                | 4   | 9   | 19  | 18 | 13 | 9  | 7  | 0                | 4   | 9   | 19  | 14 | 8  | 6  | 5  |
| 1120                            | 578                       | 0                | 1   | 11  | 19  | 17 | 13 | 8  | 5  | 0                | 1   | 11  | 19  | 12 | 8  | 5  | 4  |
| 1250                            | 578                       | 1                | 4   | 8   | 16  | 13 | 9  | 7  | 6  | 1                | 4   | 8   | 13  | 7  | 5  | 5  | 5  |
| 1400                            | 578                       | 2                | 3   | 8   | 10  | 11 | 8  | 6  | 5  | 1                | 3   | 8   | 6   | 5  | 5  | 5  | 4  |
| 1600                            | 578                       | 2                | 3   | 8   | 9   | 10 | 8  | 6  | 5  | 1                | 3   | 8   | 6   | 5  | 4  | 4  | 4  |

Attenuation values for YAD with or without core [dB], continued



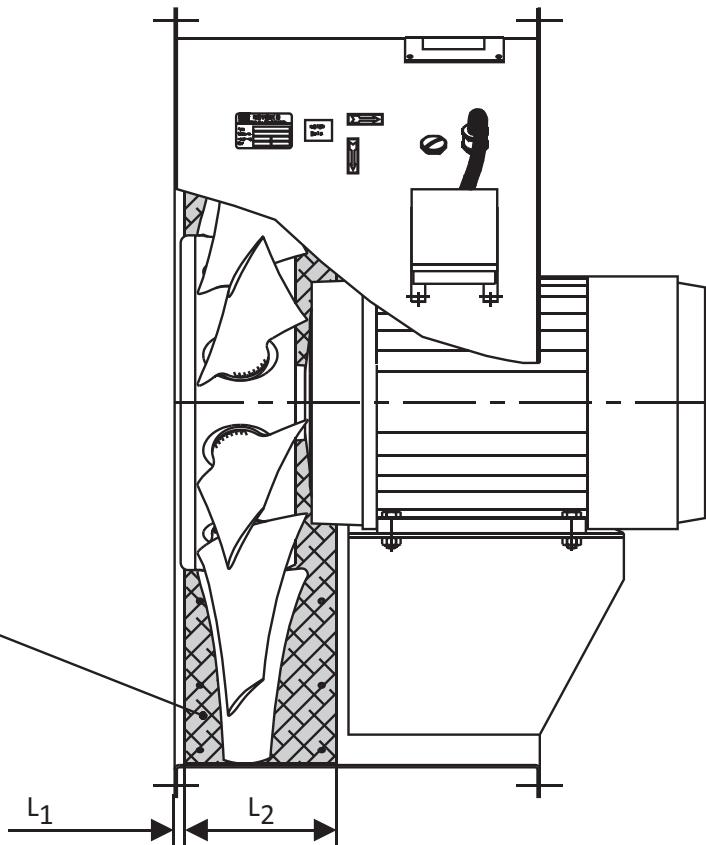
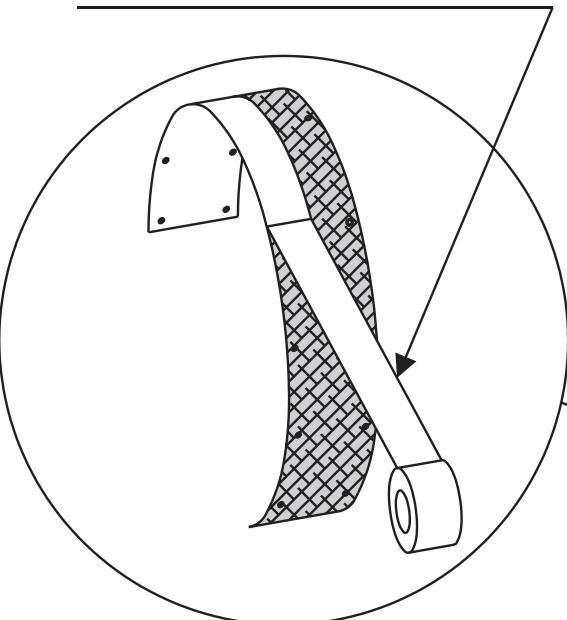
## Dimensions and weights for YAD



|            | Fan<br>$\phi D$ [mm] | Hub<br>$\phi C$ [mm] | Fan side dimensions [mm] |           |           | P x $\phi R1$<br>[Qty. x size] | Duct side dimensions [mm] |           |           | P x $\phi R2$<br>[Qty. x size] | L        | Weight<br>[kg] |      |
|------------|----------------------|----------------------|--------------------------|-----------|-----------|--------------------------------|---------------------------|-----------|-----------|--------------------------------|----------|----------------|------|
|            |                      |                      | $\phi A1$                | $\phi B1$ | $\phi D1$ |                                | $\phi A2$                 | $\phi B2$ | $\phi D2$ |                                |          |                |      |
| Micro hubs | 250                  | 160                  | 463                      | 280       | 253       | 4 x M8                         | 614                       | 450       | 404       | 8 x M10                        | 250      | 12.0           |      |
|            | 315                  |                      | 526                      | 355       | 318       | 8 x M8                         | 716                       | 560       | 504       | 12 x M10                       | 315      | 17.5           |      |
|            | 400                  |                      | 614                      | 450       | 404       | 8 x M8                         | 776                       | 620       | 564       | 12 x M10                       | 400      | 23.0           |      |
|            | 500                  |                      | 716                      | 560       | 504       | 12 x M10                       | 846                       | 690       | 634       | 12 x M10                       | 500      | 30.5           |      |
|            | 400                  |                      | 614                      | 450       | 404       | 8 x M10                        | 776                       | 620       | 564       | 12 x M10                       | 400      | 24.5           |      |
|            | 230                  |                      |                          |           |           |                                |                           |           |           |                                |          | 32.5           |      |
|            | 500                  |                      | 280                      | 716       | 560       | 504                            | 12 x M10                  | 846       | 690       | 634                            | 12 x M10 | 500            | 34.0 |
|            | 330                  |                      |                          |           |           |                                |                           |           |           |                                |          | 40.0           |      |
|            | 230                  |                      |                          |           |           |                                |                           |           |           |                                |          | 40.0           |      |
|            | 560                  |                      | 280                      | 776       | 620       | 564                            | 12 x M10                  | 926       | 770       | 714                            | 16 x M10 | 560            | 41.5 |
|            | 330                  |                      |                          |           |           |                                |                           |           |           |                                |          | 44.0           |      |
|            | 380                  |                      |                          |           |           |                                |                           |           |           |                                |          | 46.5           |      |
|            | 230                  | Medium hubs          |                          |           |           |                                |                           |           |           |                                |          | 46.0           |      |
|            | 630                  |                      | 280                      | 846       | 690       | 634                            | 12 x M10                  | 1011      | 860       | 804                            | 16 x M10 | 630            | 40.0 |
|            | 330                  |                      |                          |           |           |                                |                           |           |           |                                |          | 51.5           |      |
|            | 380                  |                      |                          |           |           |                                |                           |           |           |                                |          | 56.0           |      |
|            | 230                  |                      |                          |           |           |                                |                           |           |           |                                |          | 62.0           |      |
|            | 710                  |                      | 280                      | 926       | 770       | 714                            | 16 x M10                  | 1116      | 960       | 904                            | 16 x M12 | 710            | 64.0 |
|            | 330                  |                      |                          |           |           |                                |                           |           |           |                                |          | 70.5           |      |
|            | 380                  |                      |                          |           |           |                                |                           |           |           |                                |          | 73.0           |      |
|            | 230                  |                      |                          |           |           |                                |                           |           |           |                                |          | 77.0           |      |
|            | 800                  |                      | 280                      | 1016      | 860       | 804                            | 16 x M10                  | 1216      | 1070      | 1004                           | 16 x M12 | 800            | 79.5 |
|            | 330                  | Maxi hubs            |                          |           |           |                                |                           |           |           |                                |          | 83.0           |      |
|            | 380                  |                      |                          |           |           |                                |                           |           |           |                                |          | 86.5           |      |
|            | 280                  |                      |                          |           |           |                                |                           |           |           |                                |          | 94.5           |      |
|            | 900                  |                      | 330                      | 1116      | 970       | 904                            | 16 x M12                  | 1336      | 1190      | 1124                           | 20 x M12 | 900            | 98.5 |
|            | 380                  |                      |                          |           |           |                                |                           |           |           |                                |          | 109            |      |
|            | 1000                 |                      | 380                      | 1216      | 1070      | 1004                           | 16 x M12                  | 1466      | 1320      | 1254                           | 20 x M12 | 1000           | 122  |
|            | 403                  |                      | 578                      | 1116      | 970       | 904                            | 16 x M12                  | 1336      | 1190      | 1124                           | 20 x M12 | 900            | 116  |
|            | 1000                 |                      | 403                      | 1216      | 1070      | 1004                           | 16 x M12                  | 1466      | 1320      | 1254                           | 20 x M12 | 1000           | 138  |
|            | 578                  |                      |                          |           |           |                                |                           |           |           |                                |          | 157            |      |
|            | 1120                 |                      | 403                      | 1333      | 1190      | 1124                           | 20 x M12                  | 1613      | 1470      | 1404                           | 20 x M12 | 1120           | 154  |
|            | 578                  |                      |                          |           |           |                                |                           |           |           |                                |          | 175            |      |
|            | 1250                 |                      | 403                      | 1466      | 1320      | 1254                           | 20 x M12                  | 1816      | 1680      | 1604                           | 24 x M12 | 1250           | 193  |
|            | 578                  |                      |                          |           |           |                                |                           |           |           |                                |          | 216            |      |
|            | 1400                 |                      | 403                      | 1613      | 1460      | 1404                           | 20 x M12                  | 2013      | 1880      | 1804                           | 24 x M12 | 1400           | 248  |
|            | 578                  |                      |                          |           |           |                                |                           |           |           |                                |          | 274            |      |
|            | 1600                 | 578                  | 1816                     | 1680      | 1604      | 24 x M12                       | 2216                      | 2080      | 2004      | 24 x M12                       | 1600     | 320            |      |

## Spark-proof lining for ACN, ACW and ARN

To prevent galvanic corrosion special tape is applied to the back of the lining before installation.



|   |  | Fan sizes [mm]                |      |      |      |      |      |      |      |      |       |       |       |       |       |
|---|--|-------------------------------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|
|   |  | ø250                          | ø315 | ø400 | ø500 | ø560 | ø630 | ø710 | ø800 | ø900 | ø1000 | ø1120 | ø1250 | ø1400 | ø1600 |
| Spark-proof lining hub ø160 - ø380 <sup>1</sup> |  | L <sub>1</sub>                | 14   | 14   | 14   | 14   | 14   | 14   | 14   | 14   | 14    | 14    | 14    | 14    | 14    |
|   |  | L <sub>2</sub>                | 150  | 150  | 150  | 150  | 150  | 150  | 150  | 150  | 150   | 150   | 150   | 150   | 150   |
|   |  | S <sub>Min</sub> <sup>2</sup> | 1.7  | 2.0  | 3.0  | 4.0  | 4.5  | 5.5  | 5.5  | 5.5  | 5.5   | 6.5   |       |       |       |
|   |  | Aluminium [kg]                | 0.7  | 0.8  | 1.1  | 1.3  | 1.4  | 1.6  | 1.8  | 2.1  | 2.3   | 2.5   |       |       |       |
|   |  | Brass [kg]                    | 1.0  | 1.3  | 1.6  | 2.0  | 2.2  | 2.5  | 2.9  | 3.2  | 3.6   | 4.0   |       |       |       |
| Spark-proof lining hub ø403 and ø578            |  | L <sub>1</sub>                |      |      |      |      |      |      |      |      | 24    | 24    | 24    | 24    | 24    |
|   |  | L <sub>2</sub>                |      |      |      |      |      |      |      |      | 212   | 212   | 212   | 212   | 212   |
|   |  | S <sub>Min</sub> <sup>2</sup> |      |      |      |      |      |      |      |      | 5.5   | 6.5   | 7.5   | 8.5   | 9.0   |
|   |  | Aluminium [kg]                |      |      |      |      |      |      |      |      | 3.2   | 3.6   | 4.1   | 4.5   | 5.1   |
|   |  | Brass [kg]                    |      |      |      |      |      |      |      |      | 5.1   | 5.7   | 6.3   | 7.1   | 8.0   |

1. Tape with aluminium is used with ATEX fans, while tape with brass is used with EX fans.

2. S<sub>Min</sub> is the minimum blade clearance of the impeller along the circumference of the fan housing. The value depends on the motor shaft diameter.

# Calculation examples

## Basis

NovAx fans are measured corresponding to the normal installation of the fans. See the following configurations A, B, C and D.

Installing ACN or ACG fans with free outlet (cfg. C) causes loss of the entire velocity energy. However, fitting a diffuser on the outlet side lowers the outlet velocity, whereby some of the dynamic pressure loss is recovered as static pressure. Hence, the energy consumption of the fans is reduced. Novenco diffusers are designed to achieve optimal recovery of the dynamic energy.

## A-factor

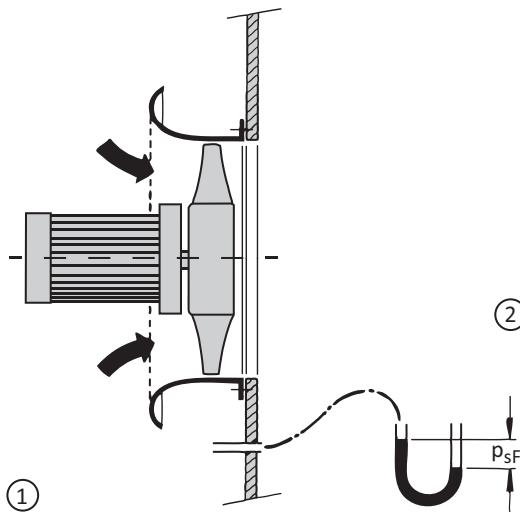
This is a loss factor, which is used if the fan is used with free outlet (cfg. A and C). The a-factor is related to the speed loss ( $\Delta p_d$ )

|                           | Symbols  | Units                  | Formula               |
|---------------------------|----------|------------------------|-----------------------|
| Air quantity, volume flow | $q_v$    | $\text{m}^3/\text{s}$  | $\frac{q_m}{\rho}$    |
| Correction factor         | $a$      |                        |                       |
| Density                   | $\rho$   | $\text{kg}/\text{m}^3$ |                       |
| Dynamic pressure of fan   | $p_{df}$ | Pa                     | $0.5 \rho \times c^2$ |
| Dynamic pressure of plane | $p_{dx}$ | Pa                     | $0.5 \rho \times c^2$ |
| Flow area                 | $A$      | $\text{m}^2$           |                       |
| Inlet diameter            | $D_1$    | mm                     |                       |
| Mass flow                 | $q_m$    | $\text{kg}/\text{s}$   |                       |
| Mean speed of plane       | $c_x$    | $\text{m}/\text{s}$    | $\frac{q_v}{A_x}$     |
| Outlet diameter           | $D_2$    | mm                     |                       |
| Power consumption         | $P$      | kW                     |                       |
| Static pressure of fan    | $p_{sf}$ | Pa                     | $p_{tf} - p_{df}$     |
| Static pressure of plane  | $p_{sx}$ | Pa                     |                       |
| System loss               | $p_t$    | Pa                     |                       |
| Total pressure of fan     | $p_{tf}$ | Pa                     |                       |
| Total pressure of plane   | $p_{tx}$ | Pa                     | $p_{sx} + p_{dx}$     |

## Cfg. A - free inlet and outlet

Type ACP

$$p_{sf} = p_{s2} - p_{t1}$$



resulting from the difference in air speed between the net inlet area and the total outlet area.

The effect of the a-factor is reduced if a diffuser is mounted on the outlet side.

The AirBox program compensates for the a-factor when the fan outlet is to a duct or as free outlet.

For fans with duct connections on the outlet and otherwise unchanged dimensions (cfg. B and D) the a-factor is included in the performance data and no correction is necessary.

## Examples

Fan type ACG

1470 RPM with free outlet

$$q_v = 20 \text{ m}^3/\text{s} ; p_s = 500 \text{ Pa}$$

The following is found with AirBox.

- ACG -1250 / 403-6-42°  
Required power with or without long diffuser is 14.7 or 17.5 kW, respectively. Hence, 2.8 kW is saved by mounting a long diffuser.
- ACG - 1400 / 403-6-38°  
Required power with or without long diffuser is 14.2 or 15.8 kW, respectively. Hence, 1.6 kW is saved by mounting a long diffuser.

## Formulas for pressure

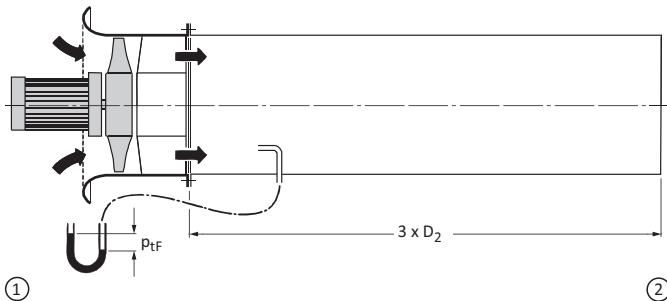
$$\begin{aligned} p_{tf} &= p_{t2} - p_{t1} \\ &= p_{s2} + p_{d2} - (p_{s1} + p_{d1}) \\ &= (p_{s2} - p_{s1}) + (p_{d2} - p_{d1}) \\ p_{sf} &= p_{tf} - p_{df} \text{ (Definition)} \end{aligned}$$

All inlet sizes of the fan are designated by sub-index 1 and all outlet sizes by sub-index 2.

## Cfg. B - free inlet and duct on outlet

Type ACG

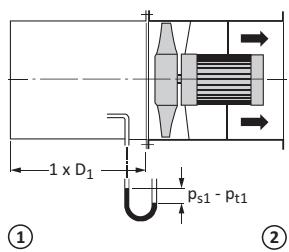
$$\begin{aligned} p_{tf} &= p_{t2} - p_{t1} \\ &= (p_{s2} + p_{d2}) - (p_{s1} + p_{d1}) \end{aligned}$$



## Cfg. C - duct on inlet and free outlet

Type ACN

$$\begin{aligned} p_{tf} &= p_{t2} - p_{t1} \\ &= p_{s2} + a \times p_{d2} - (p_{s1} + p_{d1}) \end{aligned}$$

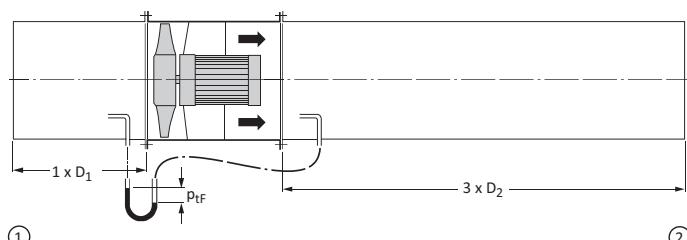


## Cfg. D - duct on inlet and outlet

Type ACN

$$\begin{aligned} p_{tf} &= p_{t2} - p_{t1} \\ &= (p_{s2} - p_{s1}) + (p_{d2} - p_{d1}) \end{aligned}$$

if  $p_{d2} = p_{d1}$ ; then  $p_{tf} = p_{s2} - p_{s1}$



## Run-up time

The run up time of the axial fan is calculated with the following formula.

$$t_s = \frac{0.24 \times n^2 \times (I_m + I_v)}{10^4 \times P \left( \frac{M_s}{M} + \frac{M_k}{M} - \frac{P_v}{P} \right)} \text{ where}$$

$t_s$  = Run up time [s]

$P$  = Rated output of motor [kW]

$P_v$  = Required power of fan [kW]

$n$  = Fan speed [RPM]

$\frac{M_s}{M}$  = The ratio between the starting torque of the motor and the nominal torque

$\frac{M_k}{M}$  = The ratio between the maximum torque of the motor and the nominal torque

$I_v$  = Polar moment of inertia for the fan [ $\text{kgm}^2$ ]

$I_m$  = Polar moment of inertia for the motor [ $\text{kgm}^2$ ]

According to international standards the torque of the motor can vary within the following limits.

$M_s$  : -15% + 25% of the catalogue value

$M_k$  : -10% + 0% of the catalogue value

The above factors may increase the run time more than calculated.

## Finding the total efficiency

The total efficiency tells how effective the complete configuration is. The efficiency is found with the following formula.

$$\eta_{\text{total}} = \eta_{\text{fan}} \times \eta_{\text{motor}} , \text{ where}$$

$\eta_{\text{total}}$  = Total efficiency

$\eta_{\text{fan}}$  = Fan efficiency

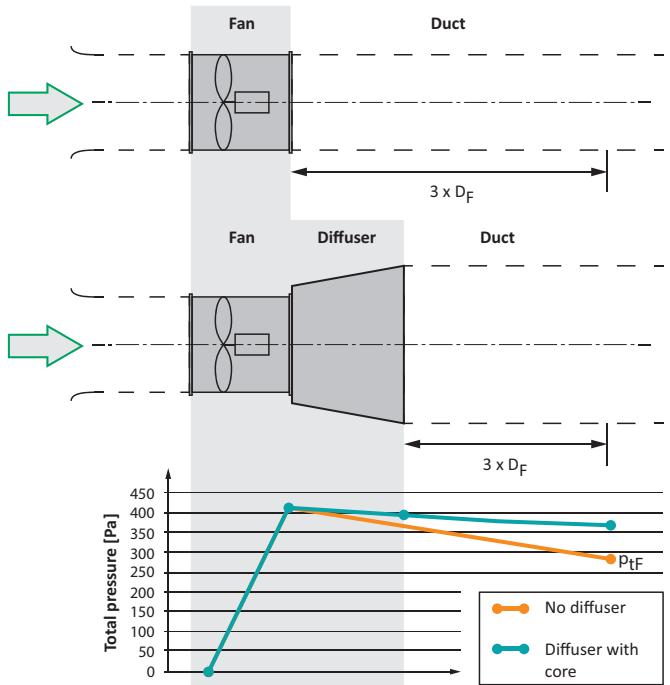
$\eta_{\text{motor}}$  = Motor efficiency

## Pressure loss example

The air pressure builds up across the fan wherather it decreases. In this example an acoustic diffuser controls the profile of the airflow and most importantly recovers a large part of the pressure loss. AirBox calculates the desired total pressure available at the system outlet. Here this is the diffuser outlet.

The example here calculates with AirBox for the following fan and conditions.

|                          |   |                     |
|--------------------------|---|---------------------|
| Blade angle              | : | 60°                 |
| Efficiency               | : | 88%                 |
| Fan diameter, $D_F$      | : | ø500 mm             |
| Fan type                 | : | ACN                 |
| Hub size                 | : | ø330 mm             |
| Total pressure, $p_{tF}$ | : | 369 Pa              |
| Volume flow              | : | 3 m <sup>3</sup> /s |



Pressure loss example

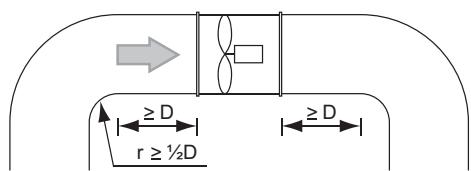
## Installation considerations

Whether NovAx fans are built into ducts or installed as part of other installations, minimum distances to nearby objects in the airflow path must be observed.

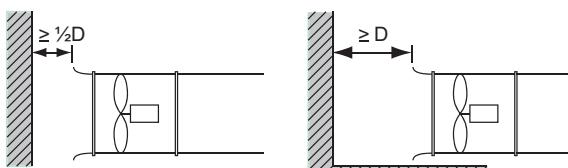
The space at the inlet side must be optimum to ensure a smooth and undisturbed airflow. At less than optimum conditions, the fan speed must be reduced.

Free inlet requires an inlet cone to get optimum performance with regard to efficiency and sound.

### Built into duct

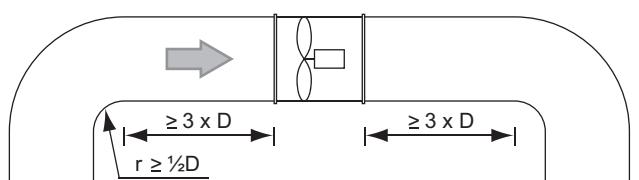


### Free inlet

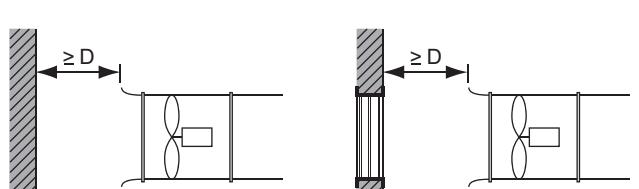


Minimum installation

### Built into duct



### Free inlet



Optimum installation

# Quality and service



## Rest assured

The production of Novenco NovAx axial fans meets our standards for high quality, inspection and test of all units.

Additionally, we offer technical guidance on installation, test of function and training.

## Warranty

The 12-month statutory warranty period applies from when the product leaves the factory unless otherwise agreed. In addition, Novenco Building & Industry A/S offers a supplementary warranty as described in the terms and conditions of sale and delivery found on our website. Wear parts are not covered by the warranty. Special warranty provisions may be agreed upon.

## Important

This document is provided 'as is'. Novenco Building & Industry A/S reserves the right to changes without further notice due to continuous product development.

Pictures in the catalogue may show products with accessories fitted.

The fans are designed for continuous operation. The following kinds of operation may cause fatigue break in the impeller and endanger people.

- Operation in stall area, i.e. with counter pressure that pulsates – called pump mode
- Operation with exceedingly starts and stops
- Uneven flow velocity through fan

If in doubt, Novenco should be contacted to assess the suitability of the fans.

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## Quality and environment

Novenco Building & Industry A/S is certified in accordance with ISO 9001 and 14001.



Products from Novenco Building & Industry A/S are designed, developed and manufactured in Denmark.





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