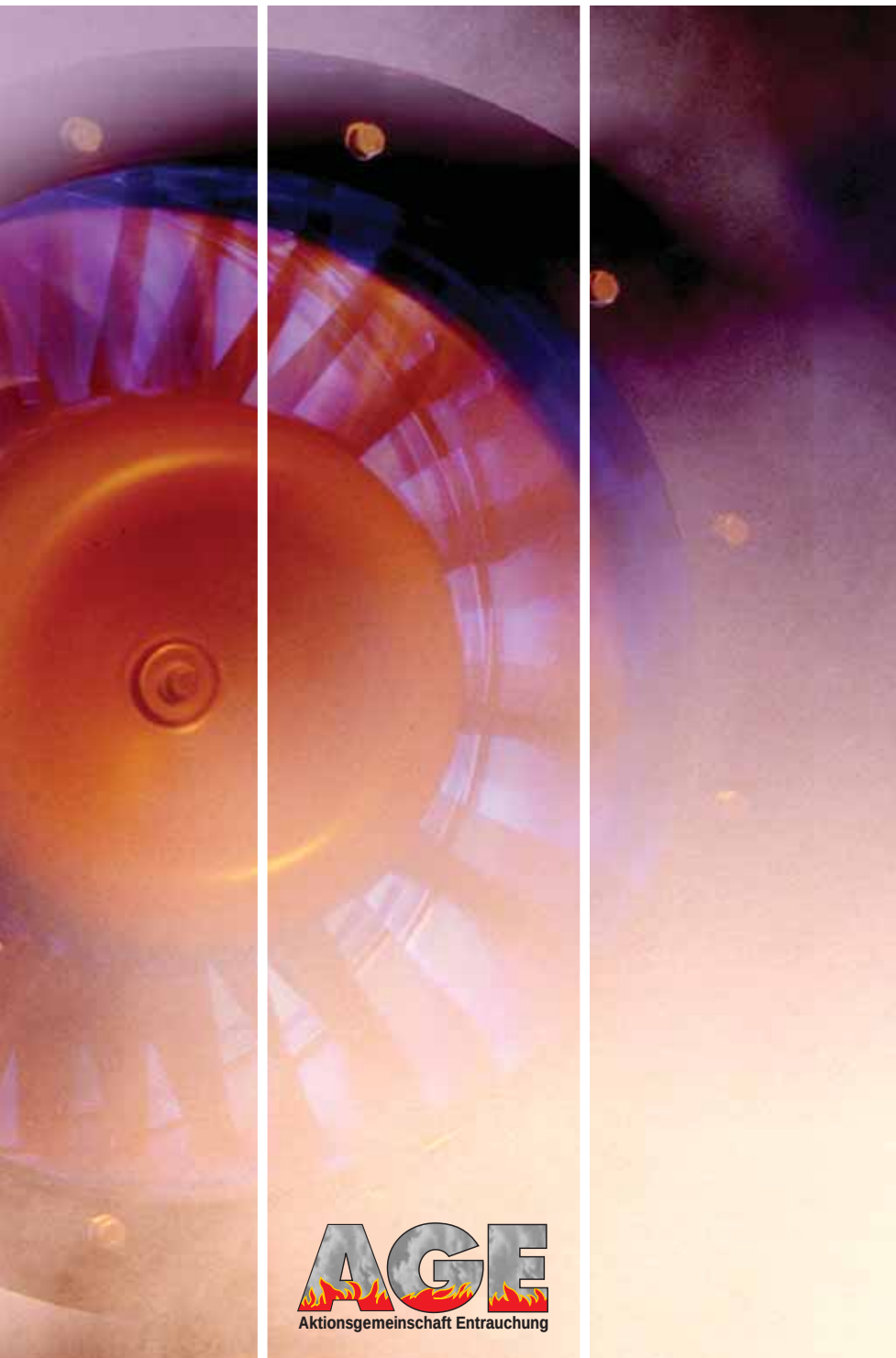




AGE
Aktionsgemeinschaft Entrauchung

Smoke extraction

Smoke Exhaust Fans

- ▲ roof-installation
- ▲ wall-installation
- ▲ central ventilation fans



TLT-Turbo GmbH



TLT-Turbo GmbH

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TLT-TURBO GMBH STANDARD FAN PRODUCTION PLANT AT BAD HERSFELD

002



TLT standard fan production plant at Bad Hersfeld

Our Bad Hersfeld facility has a history going back to 1874, when Benno Schilde and August Büttner founded their factories here.

The “exhausters” traditionally made of cast iron could be built much lighter and cheaper through the use of steel sheet.

At Büttner the focus was initially on blowers for tubular boilers and dryers, then shifted to heavy-duty industrial fans as required specifically in power plant de-dusting applications. Schilde, meanwhile, stepped up its research and development of light-duty ventilating fans and medium-duty industrial blowers. Numerous patents and registered designs testify to a steady flow of engineering breakthroughs. With the erection of its series production facility at Bad Hersfeld, dedicated mainly to the cost-effective production of roof fans, the Babcock-BSH Group gained a leading market position both in Germany and abroad. The Turbo-Lufttechnik GmbH (TLT) – Bad Hersfeld site - was newly esta-

blished in June 1995, now integrating Babcock-BSH's Air and Thermal Engineering division.

The “TLT-Turbo GmbH”, newly established in March 2003 as a company in their own rights, belongs to AG Kühnle, Kopp & Kausch, Frankenthal.

TLT now is one of the world's leading fan manufacturers and our competence is expressed in mature and very economical products. Our two R&D centres at Zweibrücken and Bad Hersfeld guarantee a continuing process of always adapting all TLT products to the latest demands of the market.

**TLT-Turbo GmbH**Am Weinberg 68 · D-36251 Bad Hersfeld/Germany
Phone: +49.6621.950-0 · Fax: +49.6621.950-100**SMOKE EXHAUST FANS
FOR ROOF- OR WALL-INSTALLATION OR AS
CENTRAL VENTILATION FANS
INDEX****003**

Product-Range – Overview

Basics, Test-report issued by Munich Technical University/Approval by DIBt, Berlin

Application examples

004 – 007**008 – 038****Roof-mounted****Centrifugal Smoke Exhaust Fans BVD****400/620°C – 120 min.**

Main Dimensions

Characteristic Curves /Technical Data

Specification texts

041**042 – 044****045 – 046****Axial Smoke Exhaust Fans BVAXO****200/300°C – 120 min.**

Dimensions and Weight

Acoustic Data

Technical Lists

Characteristic Curves /Technical Data

Specification texts

048 – 050**051****052 – 053****054 – 058****059 – 060****Axial Smoke Exhaust Fans BVAXN 12/56****200/300/400°C – 120 min.**

Dimensions and Weight

Acoustic and Thermal Isulation

Acoustic Data

Technical Lists

Characteristic Curves /Technical Data

Specification texts

061 – 063**065 – 067****068****069 – 077****078 – 087****088 – 093****Axial Smoke Exhaust Fans BVAXN 8/56****600°C – 120 min.**

Dimensions and Weight

Acoustic Data

Technical Lists

Characteristic Curves /Technical Data

Specification texts

095 – 097**098****099 – 100****101 – 107****108 – 110****Two-Stage Axial Smoke Exhaust Fans BVZAXN 12/56****200/300/400°C – 120 min.**

Dimensions and Weight

Technical Lists

Characteristic Curves /Technical Data

Specification texts

113 – 115**116 – 118****119 – 126****127 – 128****Wall-mounted Axial Smoke Exhaust Fans BWAXO****200/300°C – 120 min.**

Dimensions and Weight

Specification texts

130**131 – 132****Wall-mounted Axial Smoke Exhaust Fans BWAXN 12/56****200/300/400°C – 120 min.**

Dimensions and Weight

Specification texts

133**134 – 136****Centrifugal Smoke Exhaust Fans BVW****600°C – 120 min.**

Dimensions and Weight

Characteristic Curves /Technical Data

Specification texts

138 – 150**151 – 154****155 – 160****Centrifugal Smoke Exhaust Fans BV-REH****400°C – 120 min.**

Dimensions and Weight

Acoustic data

Characteristic Curves /Technical Data

Specification texts

162 – 166**169****170 – 172****173 – 174****Centrifugal Smoke Exhaust Fans BVRA****620°C – 90 min.**

Dimensions and Weight

Characteristic Curves

Specification texts

175 – 179**180 – 184****184 – 186****Centrifugal Plug-In Smoke Exhaust Fans BV-ERV****300°C – 120 min.**

Product Range - Overview and

Main Dimensions

187**Smoke detection switches** for mechanical smoke extraction**189 – 196**

Application examples / References

200 – 201

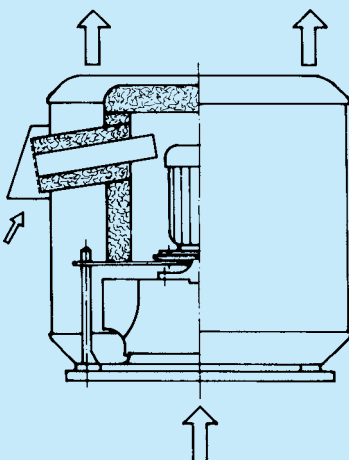


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RANGE – OVERVIEW SMOKE (FUME) EXHAUST FANS

004



Centrifugal Smoke Exhaust Fans, roof-mounting type / Series BVD

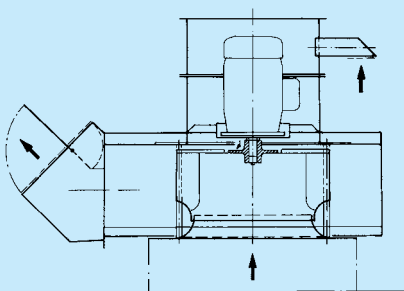
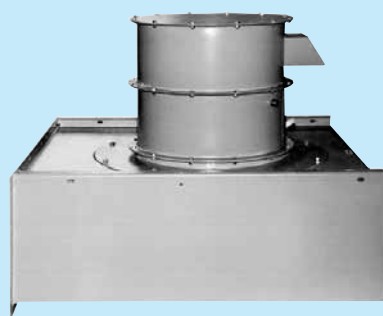
for use in fume and smoke extraction applications.

Temperature / Time category according to EN 12101 – Part 3

F 400 **400°C – 120 min**

F 600 **620°C – 120 min**

6 sizes: 315 - 710



Centrifugal Smoke Exhaust Fans, roof-mounting type Series BVW-D

for extracting fumes and smoke from unheated indoor areas (e.g., cold warehouse buildings), with snow safety rating, snow load class SL 1000.

Temperature / Time category according to EN 12101 – Part 3

F 600 **600°C – 120 Min**

6 sizes: 315-710

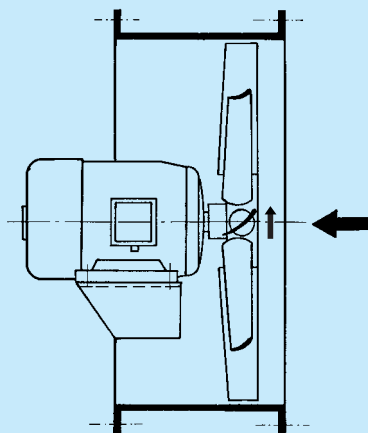


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RANGE – OVERVIEW SMOKE (FUME) EXHAUST FANS

005



**Axial Smoke Exhaust Fans
Series BVAXO** for use in fume
and smoke extraction applications.

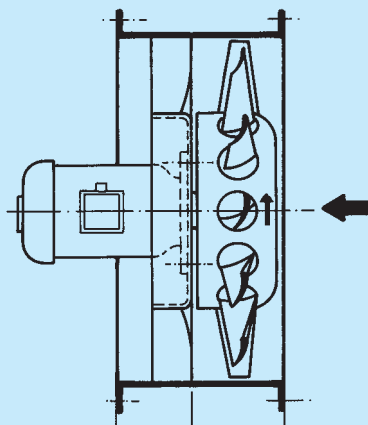
Temperature / Time category
according to EN 12101 – Part 3

F 200 **200°C – 120 min**

F 300 **300°C – 120 min**

6 sizes: 400 - 1120

Installation within the fire zone is
possible (without additional
cooling).



**Axial Smoke Exhaust Fans
Series BVAXN 12/56** for use in
fume and smoke extraction
applications.

Temperature / Time category
according to EN 12101 – Part 3

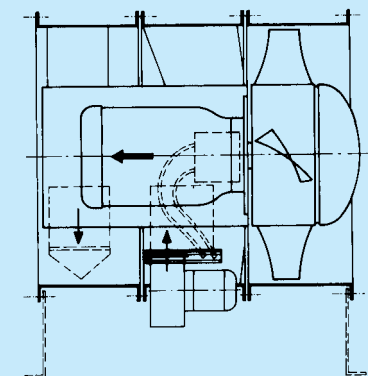
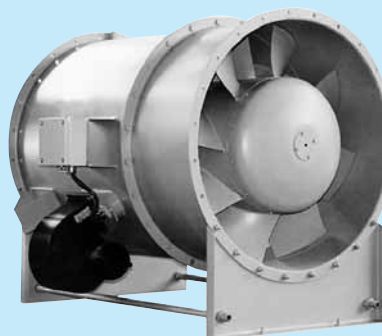
F 200 **200°C – 120 min**

F 300 **300°C – 120 min**

F 400 **400°C – 120 min**

14 sizes: 355-1600

Installation within the fire zone is
possible (without additional cooling).



**Axial Smoke Exhaust Fans
Series BVAXN 8/56** for use in
fume and smoke extraction
applications.

Temperature / Time category
according to EN 12101 – Part 3

F 600 **600°C – 120 min**

10 sizes: 500-1600

Motor cooling is provided by a
cooling fan. Installation within the
fire zone is possible (with custo-
mer-supplied cooling system).

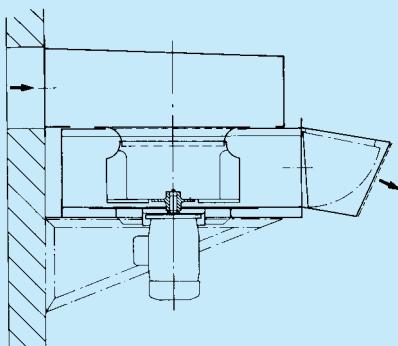


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RANGE – OVERVIEW SMOKE (FUME) EXHAUST FANS

006



Centrifugal Smoke Exhaust Fans, wall mounting type

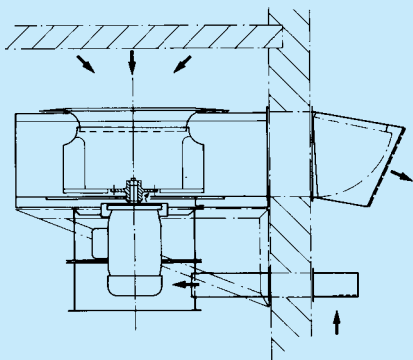
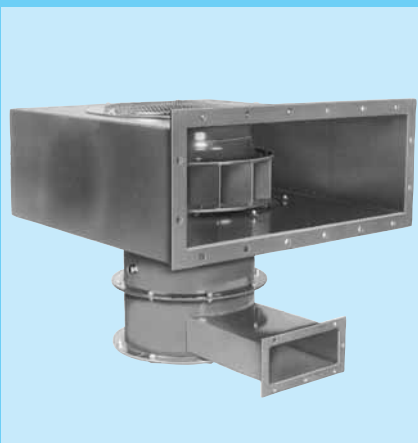
Series BVW-A (fitted externally on the building wall) for use in fume and smoke extraction applications.

Temperature / Time category according to EN 12101 – Part 3

F 600 **600°C – 120 min**

6 sizes: 315-710

Motor cooling with outdoor ambient air.



Centrifugal Smoke Exhaust Fans, wall mounting type

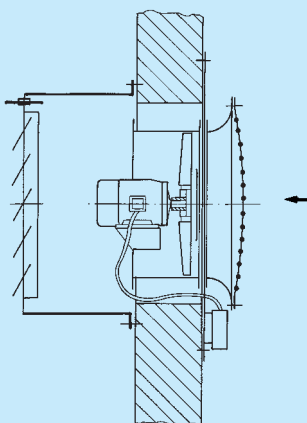
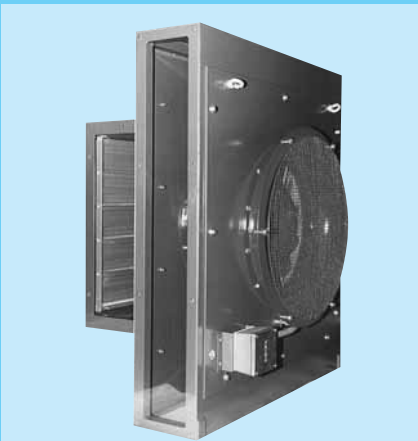
Series BVW-R (installed in the room containing the fire source) for use in fume and smoke extraction applications.

Temperature / Time category according to EN 12101 – Part 3

F 600 **600°C – 120 min**

6 sizes: 315-710

Motor cooling with outdoor ambient air via an auxiliary cooling duct.



Axial Smoke Exhaust Fans, wall-mounting type

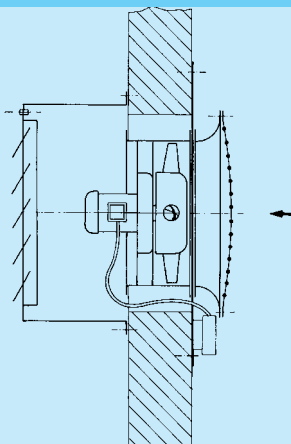
Series BWAXO To be mounted in an outer wall for fume and smoke extraction (no additional cooling required).

Temperature / Time category according to EN 12101 – Part 3

F 200 **200°C – 120 min**

F 300 **300°C – 120 min**

Sizes: 400/500/630/800



Axial Smoke Exhaust Fans, wall mounting type

Series BWAXN 12 / 56

To be mounted in an outer wall for fume and smoke extraction (no additional cooling required).

Temperature / Time category according to EN 12101 – Part 3

F 200 **200°C – 120 min**

F 300 **300°C – 120 min**

F 400 **400°C – 120 min**

Sizes: 400/500/630/800

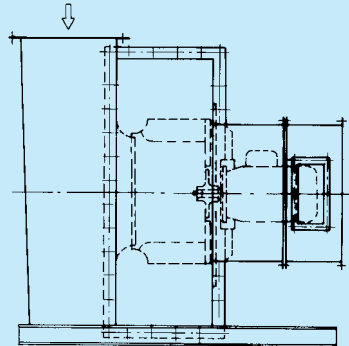
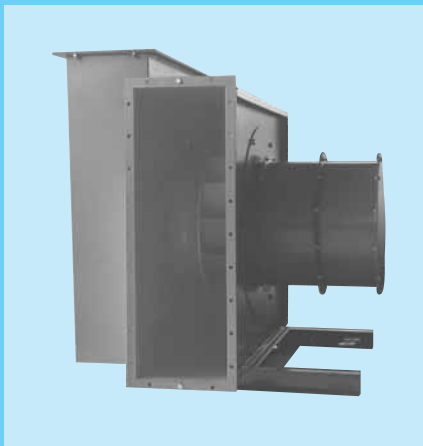


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RANGE – OVERVIEW SMOKE (FUME) EXHAUST FANS

007



Centrifugal Smoke Exhaust Fans for central service

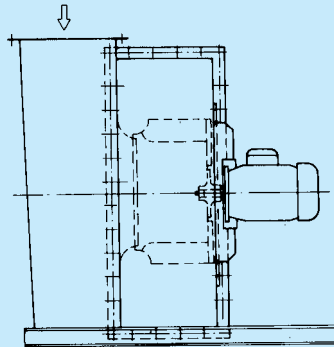
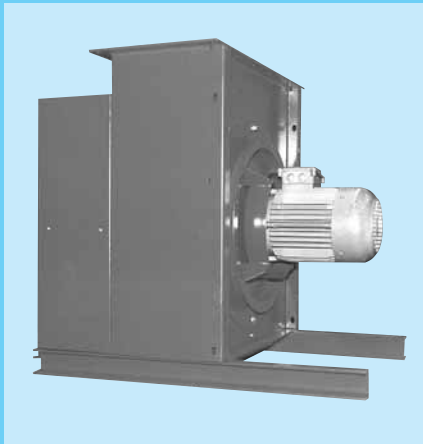
Series BVW-R/B with inlet duct,
for installation within the fire zone
(floor-mounted).

Temperature / Time category
according to EN 12101 – Part 3

F 600 **600°C – 120 min**

Motor cooling with outdoor ambient
air via an auxiliary air duct or addi-
tional cooling fan.

6 sizes: 315-710



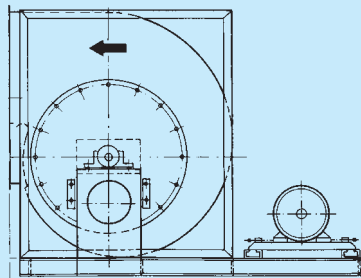
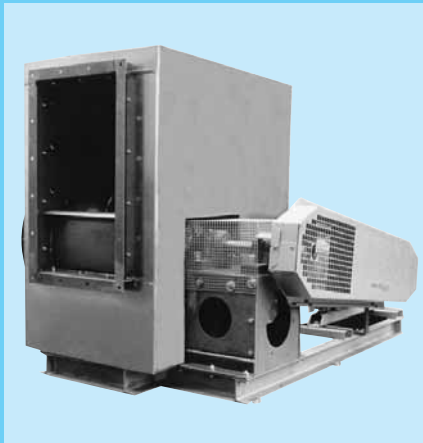
Centrifugal Smoke Exhaust Fans for central service

Series BVW-A/B with inlet duct,
for installation in a ventilated room,
possibly with customer-supplied
insulation (floor-mounted).

Temperature / Time category
according to EN 12101 – Part 3

F 600 **600°C – 120 min**

6 sizes 315-710



Centrifugal Smoke Exhaust Fans for central service

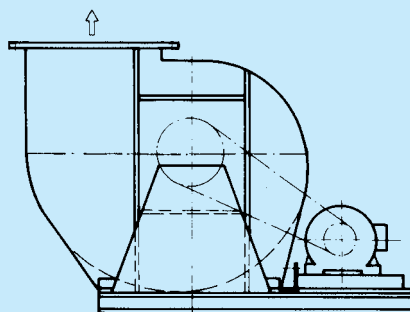
Series BV-REH for use in fume
and smoke extraction applications.

Temperature / Time category
according to EN 12101 – Part 3

F 400 **400°C – 120 min**

Fans also available with thermal
and acoustic insulation.

12 sizes: 400-1400



Centrifugal Smoke Exhaust Fans for central service

Series BVRA for use in fume and
smoke extraction applications.

Temperature / Time category
according to EN 18232 – Part 6

F 600 **620°C – 90 min**

Fans also available with thermo-
insulated casing for installation in a
ventilated room.

19 sizes: 180-1400



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SMOKE (FUME) EXHAUST FANS FUNDAMENTALS

008

3.0 Basic considerations

Some recent fires have reminded us of the vast potential for destruction, injury and loss of life that fire may have. Its perils lie in the blaze that forms the core of the disaster and in its products such as smoke and heat, both of which are at their most hazardous form in a "captive" state, i.e., within an enclosed building. Practical experience has shown that the smoke is much more dangerous to human beings than the heat (flames). According to fire statistics, two-thirds of all deaths due to fire result from suffocation and smoke poisoning, while one-third is caused by burns and collapsing buildings. These observations confirm the dominant role of smoke as a threat to human beings in the event of a fire. Moreover, hot smoke and combustion gases, in conjunction with thermal buoyancy effects, may literally "pre-heat" those building areas to which the flames themselves have not yet spread, thus paving the ground for their propagation.

These conditions and hazards impose a whole set of requirements for an effective preventive fire protection strategy. The main objectives can be summarized thus:

- **Smoke extraction**
- **Smoke dilution**
- **Keeping escape routes and rescue accessways clear of smoke so as to facilitate the fire-fighting effort.**

To prevent the fire from spreading, the heat of combustion must be removed from the building along with the smoke. In modern building services engineering, mechanical smoke and heat exhaust systems have therefore become a standard feature since they effectively protect lives and property. The heart of such a smoke and heat exhaust system are the smoke exhaust fans.

4.0 History of TLT smoke exhaust fans

In the early '70s, a fire in a PVC film manufacturing shop devastated the production facilities of Kalle AG in Wiesbaden, a leading manufacturer of packaging film. Presumably, an overheated bearing had ignited a small quantity of PVC and caused a local smouldering fire that nevertheless released clouds of billowing smoke. The damage was assessed at several millions DM.

The high loss was caused by the hydrochloric acid vapours which inevitably form in the combustion of PVC. These gases attacked all unprotected metal surfaces of the film making line, which had to be scrapped as a result. Kalle's works fire department contacted the Hersfeld-based BSH company, their traditional fan supplier, and requested the development of a fan that would be able to extract smoke, fumes and toxic matter via the roof. Starting out from their standard roof fan range, BSH (now TLT) set out to develop a roof-mounted smoke exhaust fan rated for "higher temperatures". Following extensive in-house testing, the unit was finally classified for 400°C service for a duration of 120 minutes.

Thus, the "smoke exhaust fan" was born, although a market warranting volume production or even promising significant sales revenue had yet to be identified. At the time, stationary smoke exhaust fans were virtually unknown as a preventive fire protection solution. Through word of mouth in the fire-fighting and consulting experts' community and an intense information and sales promotion effort directed by BSH at fire authorities, building supervision offices, architects and specifiers, the potential of smoke/fume exhaust fans was soon established. In addition to the roof-mounted fan versions, the market soon demanded diverse other designs since smoke and fumes cannot always be extracted via the building roof. Thus, BSH began to develop smoke exhaust fans for wall installation and floor-mounted units for use inside buildings. Today, Turbo-Luft-

technik GmbH of Bad Hersfeld supplies a complete range of smoke and fume exhaust fans for virtually any application. Needless to say, each model is fully tested and certified according to the latest European standards and regulations. And it all began with that "small fire" at Kalle AG in Wiesbaden.





5.0 Legal basis

Although in Germany the conference of the Ministers of Urban Planning, Housing and Construction (ARGEBAU) has imposed a model building code (MBO) for reference by the federal states, building law has in essence remained the responsibility of the latter.

As a result, applicable building law is enshrined in the State Building Code (LBO) of each federal state. It follows that fire protection requirements vary regionally.

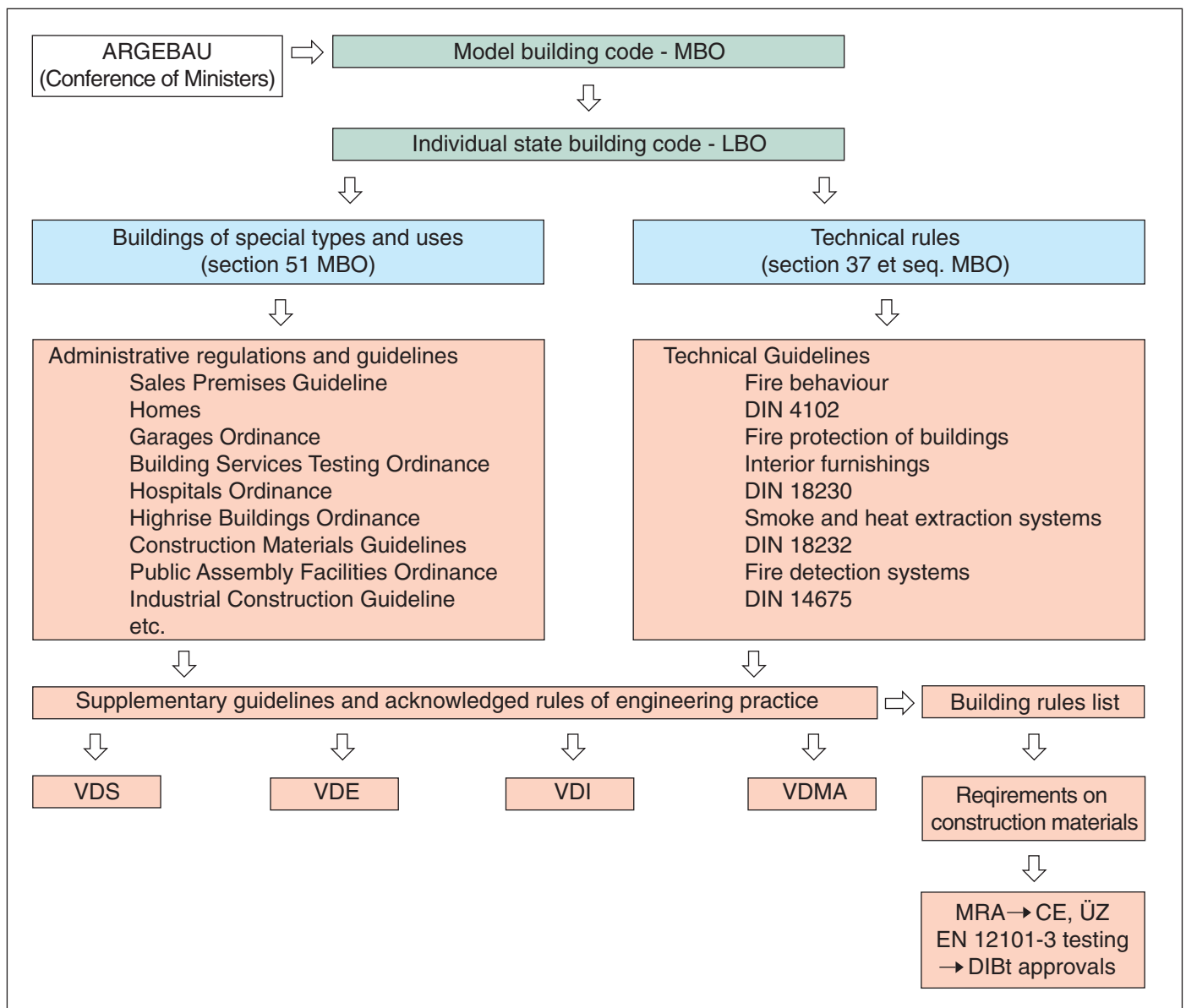
However, each LBO code applies to all construction activities and equipment. It is supplemented by building law standards for classified construction materials, components, and special components.

A review of the building codes for the various federal states with regard to fume and smoke extraction reveals a common principle that features in all German building regulations. Referring to smoke and heat control, section 17(1) contains the following provision:

"Structures shall be designed such that the outbreak of fire and the propagation of flames and smoke are effectively prevented, and that human beings and animals can be rescued and an effective fire-fighting effort can be launched should a fire nevertheless occur."

Considering this being a general formulation, the aim of the efforts can be seen clearly though.

Laws, regulations and codes





5.1 Objectives in preventive fire protection

The rather general provisions of section 17 at least serve to define the overriding objective.

This is to maximize the hazard prevention effort so as to achieve a maximum degree of fire safety. In global terms, this goal implies the following:

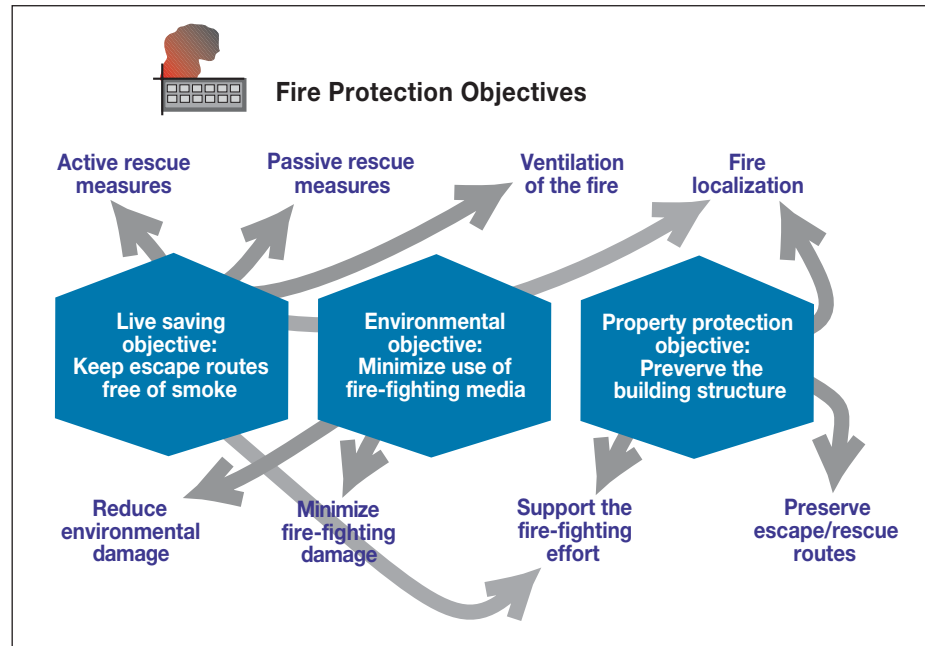
- Restriction of flame propagation
- Securing the rescue of human beings and animals
- Ensuring the feasibility of fire-fighting activities

Given the interrelationship between construction, building services and equipment technology, it emerges that the steps aimed at achieving these goals cannot be viewed in isolation but must always be judged and assessed in the common context. Smoke and heat control, which will always form an integral part of any overall building protection strategy, is no exception to this rule.

5.2 Personal liability

In the period since 1994, nearly all German states have amended their building codes in an effort to simplify and accelerate the construction process. The aim was to reduce the amount of regulatory intervention and to strengthen the responsibility of the building/project owner. In essence, preventive inspection and testing requirements are limited to a small number of building or structural criteria. Wherever the building authorities have thus shed their original responsibilities, liability now rests with the building owner. As a result, owners will usually have to enlist expert aid (architects, consultants) to have the building inspected on their behalf for compliance with all material aspects of the building code.

Not many building professionals such as architects, planners and experts are aware of the resulting responsibility and indeed, personal liability, they assume through the exercise of their profession. Thus, section 323 of the



German Criminal Code relating to environmental offences stipulates the following:

"Any person engaged in the planning, management or execution of a building construction activity who violates generally accepted rules of practice, thereby endangering the life or health of another, shall be punished with up to five years' imprisonment, or imposition of a fine."

It follows that planners, experts and other professionals, apart from being aware of the standards and guidelines described in section 3.3, should make a continuous effort to remain on top of the "accepted rules of practice".

This leads us to the question of how these rules are defined, and where they are published. By studying trade publications and corporate information material and by attending professional congresses and symposiums, the individual specialist should be able to maintain an up-to-date understanding of current practices.

At least, in the event of a loss involving human injury, such familiarity with the "state of the art" will be his best defence.





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SMOKE (FUME) EXHAUST FANS FUNDAMENTALS

011

5.3 Standards and guidelines

Design guidelines for mechanical smoke exhaust systems are defined in the European standard EN 12101-5 (draft) and the German DIN 18232, part 5 (pre-standard).

As a rule, the design and sizing process should be coordinated with the relevant authorities (fire safety experts, fire safety authority, local fire department, building supervision office, etc.) from the earliest planning stage.

Fire loads shall be determined in accordance with DIN 18230, parts 1 and 2.

Other sizing methods are possible where they are justified, e.g., in the case of

- different heat release modes
- use of suitable computing methods for determining smoke gas mass flows
- issuance of particular specifications by a fire protection expert
- special conditions, e.g., special types of building use

List of German and European standards for smoke and heat extraction systems

German standards

DIN 18232	Structural fire protection; smoke and heat control
DIN 18232 Teil 1, (draft)	Terms, safety objectives
DIN 18232 Teil 2, (draft)	Natural smoke and heat exhaust ventilators, requirements, design, installation
DIN 18232 Teil 3, (draft)	Natural smoke and heat exhaust ventilators, testing
DIN 18232 Teil 4, (draft)	Heat exhaust systems
DIN 18232 Teil 5, (preliminary standard)	Mechanical smoke exhaust systems, requirements, sizing
	Release of an EN standard is not to be expected in the near future.
DIN 18232 Teil 6, Vornorm (preliminary standard)	Mechanical smoke exhaust systems, testing
DIN 18232 Teil 7, (working paper)	Smoke exhaust systems for staircases (in preparation)

European standards

EN 12101	Smoke and heat control systems
EN 12101-1, (draft)	Specification for smoke curtains; requirements and test methods
EN 12101-2, (draft)	Specification for natural smoke and heat exhaust ventilators
EN 12101-3, (draft)	Specification for mechanical smoke and heat exhaust ventilators
EN 12101-4, (draft)	Natural and mechanical smoke and heat exhaust systems, installation and test methods
EN 12101-5, (draft)	Design and calculation methods for smoke and heat exhaust systems
EN 12101-6, (currently under revision)	Design, calculation methods and installation procedures for pressure differential systems for room flow control monitoring

6.0 Fundamentals

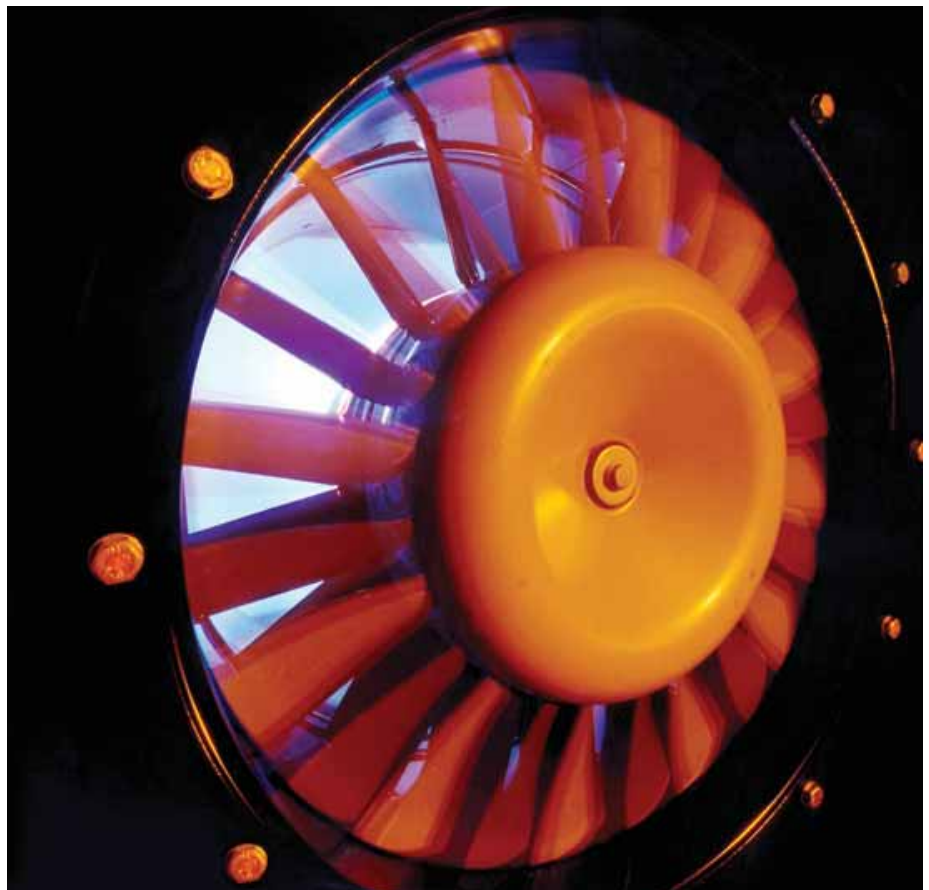
6.1 Initiation of fire

The outbreak of a fire and its subsequent propagation are contingent on the presence of

- an inflammable substance
- an ignition source of sufficient energy
- oxygen

6.2 Propagation

The evolution of a fire is essentially determined by the composition of the inflammable substance, the supply and concentration of oxygen, and the resulting combustion temperature.



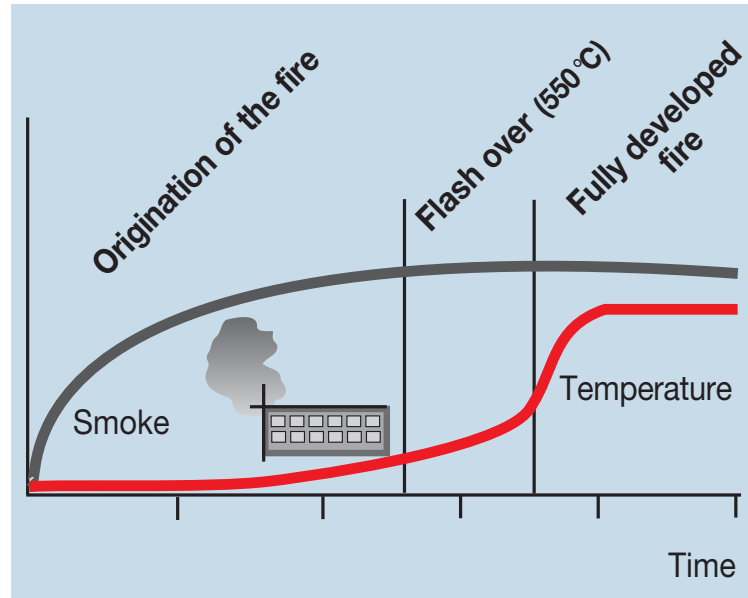


6.3 Smoke formation and behaviour

The combustion process releases large amounts of combustion gases (oxides), smoke and thermal energy which will accumulate under the ceiling of the building, spreading both horizontally and vertically from there.

The key function of a smoke and heat exhaust system is to remove smoke from the building. Depending on the nature of the fire source, the smoke may be more or less toxic. The room in which a fire has started may fill with enormous volumes of smoke in just a few minutes.

Smoke and temperature development without smoke and heat extraction

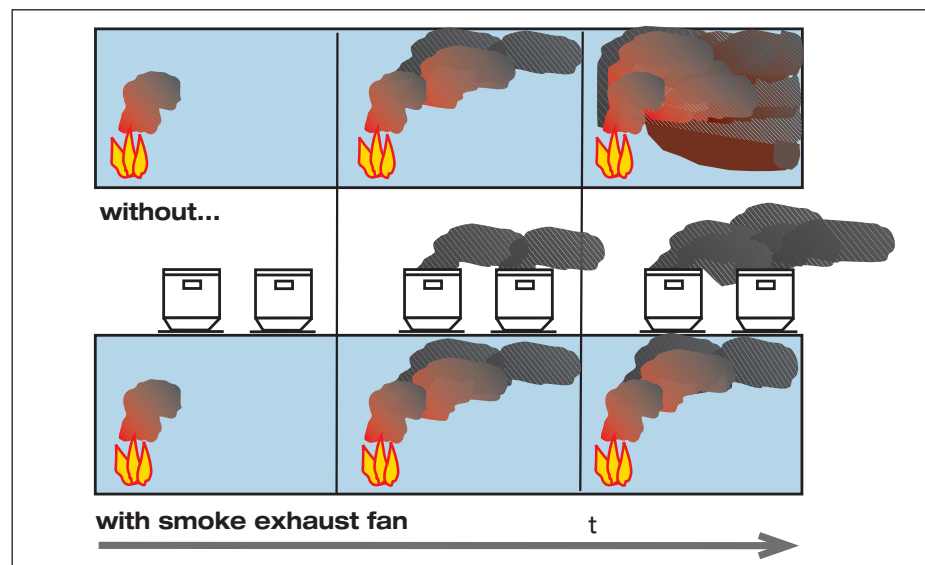


The following phases can be observed:

1. Ignition phase
2. Smouldering fire
3. Flash-over (eruption of a sudden blaze in the fire area)
4. Fully developed fire
5. Subsequent cooling phase

6.3.1 Smoke propagation example in case of fire

A staircase with a floor area of 16 m² and a height of 15 m can be filled with smoke and products of combustion more than 100 times over by the mere burning of 10 kg of foam rubber. The fire releases heat, combustion gases, and smoke. In a fully enclosed indoor space these will rise to the ceiling due to thermal buoyancy effects. The resulting layer of smoke and combustion gases originally gathered there will increase in density until it fills the entire room. At the same time, the environment heats up quickly due to the high energy release rate. When a temperature of 550 °C is exceeded, flash-over occurs, i.e., a sudden blaze erupts throughout the heat-affected area.



Propagation of smoke in the case of fire



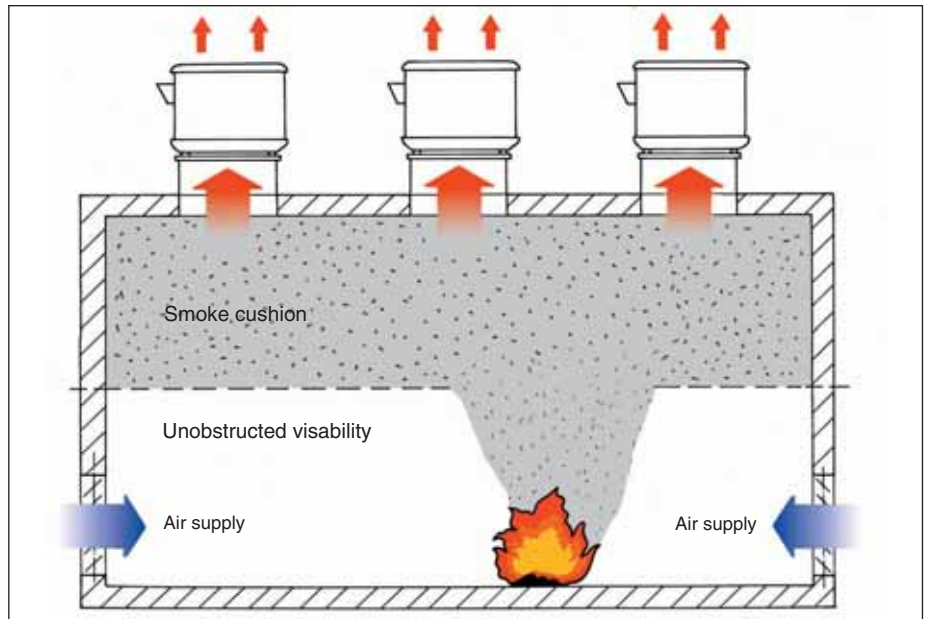
6.4 Operating principle of mechanical smoke and heat exhaust systems

Depending on the nature of the burning substance, varying degrees of smoke formation (density) may be anticipated. Originating in a small area, these gases eventually rise to the ceiling where they will form a smoke layer which initially does not mix with the cold air underneath. As the fire gains force, more and more combustion gas accumulates under the ceiling of the closed room. Eventually the gas cushion expands downwardly, towards the floor. Once it has fallen to below head level, the prospects for rescuing people and controlling the fire become critical.

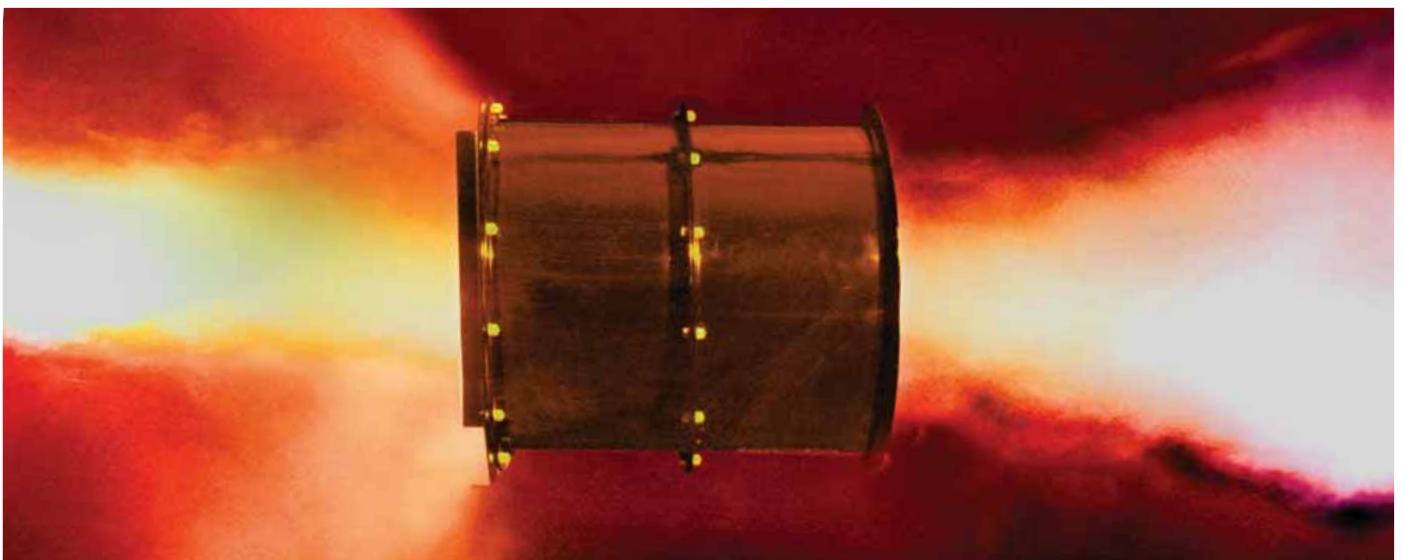
When the room containing the fire is opened at specific (planned) points, the thermal and smoke load is reduced by the resulting inrush of air and the simultaneous extraction of smoke. Initially, a pressure equalization with the surrounding ambient areas takes place. With time, an underpressure forms in the lower half of the room and more fresh air enters through the appropriate access openings.

If these openings are adequately sized for the dimensions and combustible content of the room, the evacuation of hot smoke and the ingress of fresh air will be ensured. Ideally, as the fire progresses, the gas cushion under the ceiling should remain at a constant height above floor level (**equilibrium condition between inflowing air and extracted smoke**), so that enough visibility and breathing air remains available underneath for human beings to leave the room and to conduct fire-fighting operations. This equilibrium can be achieved via simple openings toward the outside, as well as through me-

chanical smoke exhaust equipment. Fig. 2 illustrates this state. If one takes into account all relevant planning aspects, natural and mechanical smoke exhaust systems emerge not as competing solutions but as separate strategies complementing each other effectively. Apart from the building situation, the expected thermal conditions in the event of a fire are a key consideration.



Equilibrium state between air supply and extraction of smoke



The smoke exhaust fan is the heart of any mechanical smoke and heat exhaust system

**6.4.1 Difference between natural and mechanical smoke/heat extraction systems**

Natural smoke and heat extraction systems rely on the thermal behaviour of gases. They use the so-called "chimney effect", i.e., the draft created between the air supply and exhaust levels due to the density difference between the cooler fresh air and the hot combustion gases.

Advantage:

- Increasing volume flow as the fire progresses.

Disadvantage:

- Limited effect in the case of a low temperature and height difference between the supply/exhaust openings.
- Building characteristics and unforeseeable influences of wind limit the effectiveness of natural smoke/heat extraction systems.

Mechanical smoke/heat extraction systems utilize fans designed specifically for hot smoke and combustion gas duty.

These fans can be adapted to the individual building situation and extraction requirements by design.

Mechanical smoke/heat extraction systems would be preferred in the following cases where a natural system is either not feasible or would imply an unreasonable degree of complexity:

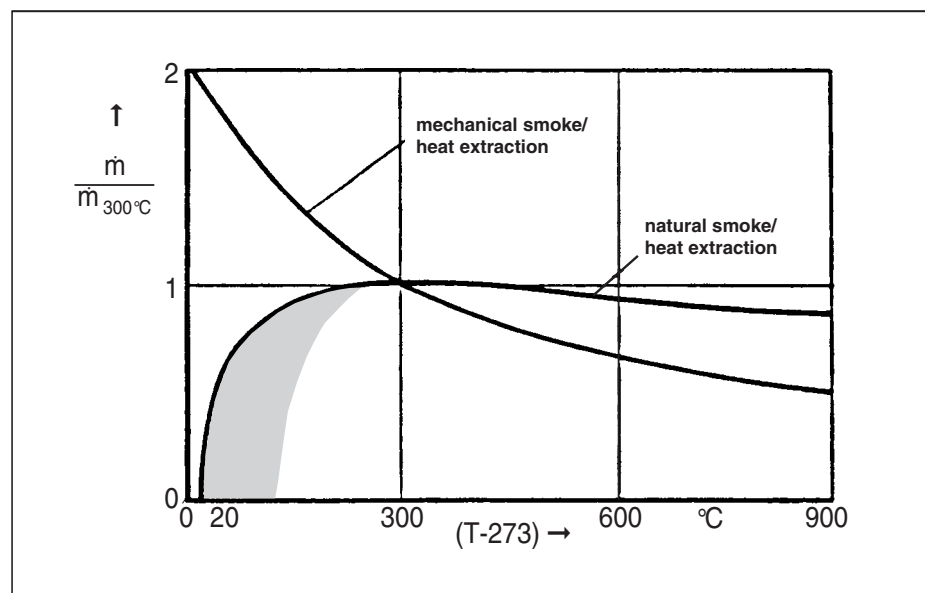
- Windowless rooms, or areas located deep inside the building structure
- Roof and building designs rendering natural exhaust systems ineffective due to wind attack conditions.
- Rooms in which high temperatures cannot form due to combustible content, combustion behaviour, size, or the presence of automatic fire-fighting installations (e.g. sprinklers)
- Cleanrooms in which the opening of a supply/extraction vent for testing or maintenance purposes would already create an operating disruption.

Disadvantage:

- Electrical installation requirements.

Advantage:

- The full air power is available as soon as the fan is activated or triggered. The goal of keeping escape routes smoke-free is effectively achieved, specifically in the important early stages of the fire.
- The volume flow remains nearly constant throughout the duration of the fire.



Mass flow comparison between natural and mechanical smoke/heat extraction systems

According to DIN 18232, a basic distinction is made between the following:

- | | |
|--|------------|
| ■ Natural smoke extraction systems (rooms subject to fire hazard) | NRA |
| ■ Mechanical smoke extraction systems (rooms subject to fire hazard) | MRA |
| ■ Pressure-based fire protection systems (stairwells, corridors) | RDA |



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SMOKE (FUME) EXHAUST FANS FUNDAMENTALS

015

6.5 Smoke exhaust fans

The relevant requirements are defined by the European product standard DIN EN 12101, Part 3 ("Smoke and heat control systems – Specification for mechanical smoke and heat exhaust ventilators"). All TLT smoke exhaust fans are tested to this standard and meet its severe requirements.

In addition, German building law requires each fan to be generally approved by the Building Supervisory Authority.

In accordance with this requirement, our smoke exhaust fans possess the supplementary General Building Supervisory Approval issued by the German Institute of Building Technology (DIBt), Berlin. Significant advances in standardization of preventive fire protection technology have allowed these standards to be integrated into building law. With the inclusion of smoke exhaust fans into the Building Rules List, their installation has become permissible only where the relevant units are tested and certified to legally valid standards.

6.5.1 Suitability testing and certification by the Building Supervisory Authority

Only one test institute in Germany is accredited to perform suitability testing of smoke exhaust fans according to the test and inspection provisions of EN 12101-3. This is the test institute of the Technical University of Munich (Domestic Services Research Laboratory).

The approval certificates of the Building Supervisory Authority, issued by the German Institute of Building Technology, a corporation under public law, acknowledge compliance with the technical requirements of the Building Rules List B2.

This document is published by the German Institute of Building Technology (Deutsches Institut für Bautechnik, DIBt).

The Building Rules List "B", Part 2, includes construction products which are sold and introduced into commerce under regulations governing the implementation of European Community directives, with the exception of regulations for the implementation of the Construction Products Directive, where such directives do not reflect key requirements of section 5(1) of the German Construction Products Act and additional proof of suitability for use is required under German building codes to meet these requirements. Such construction products must bear the DE label in addition to a conformity label according to the building codes of the German federal states. The specific requirements of section 5(1) of the Construction Products Act not met by the directives are stated in column 4 of the Construction Rules List "B", Part 2. Columns 5 and 6 indicate which suitability and conformity certificates a product must possess to fulfill such key requirements of the German state building codes.

Key requirements under section 45(1) of the Building Products Act relate to the following properties:

- mechanical strength
- stability
- fire protection
- hygiene
- health
- environmental protection
- safety for use
- acoustic insulation
- energy savings
- thermal insulation

The essential requirements are detailed in the basic documents under Article 12 of the Council Directive 89/106/EEC of December 12, 1988.

Building Rules List "B", Edition 97/1 (Excerpt)

The Building Rules List "B" is a compilation of construction products whose introduction into commerce and sale is subject to regulations of European Union member states – including Germany – and of signatory states of the Agreement on a European Economic Area, and which bear the CE label. For smoke exhaust fans, the Building Rules List "B", Part 2, shall be applicable.

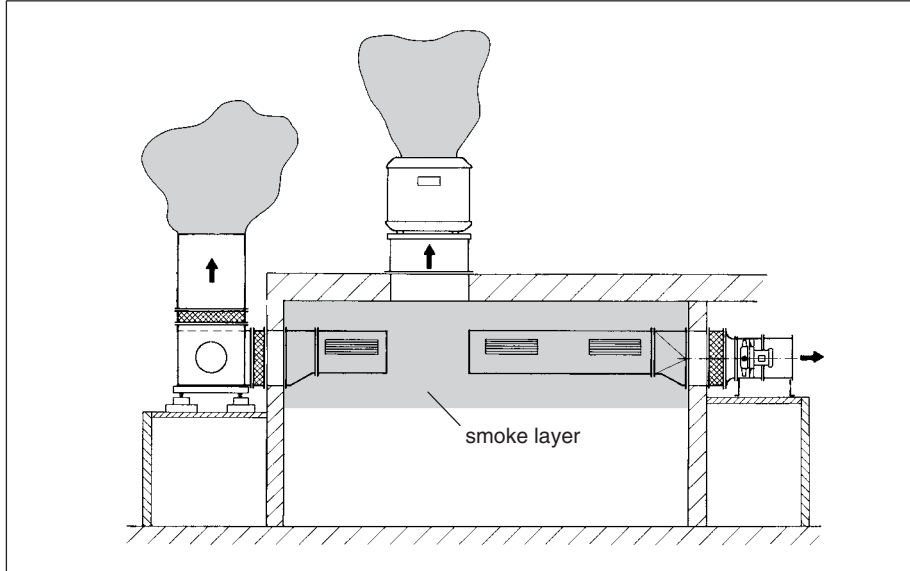


All TLT smoke exhaust fans possess Supervisory Approval issued by Deutsches Institut für Bautechnik in Berlin.



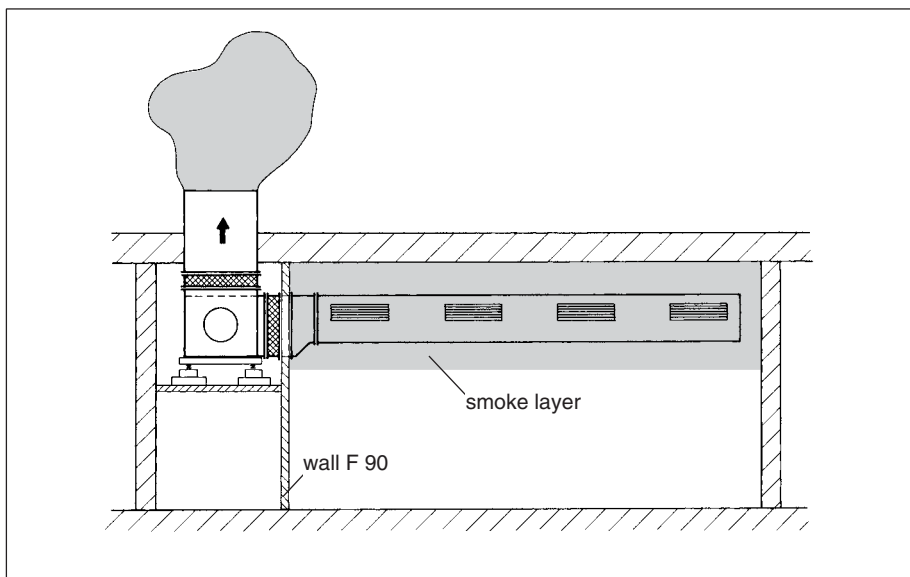
6.5.2 Various installation configurations

The diverse available models, designs and types cover the needs of virtually any application.



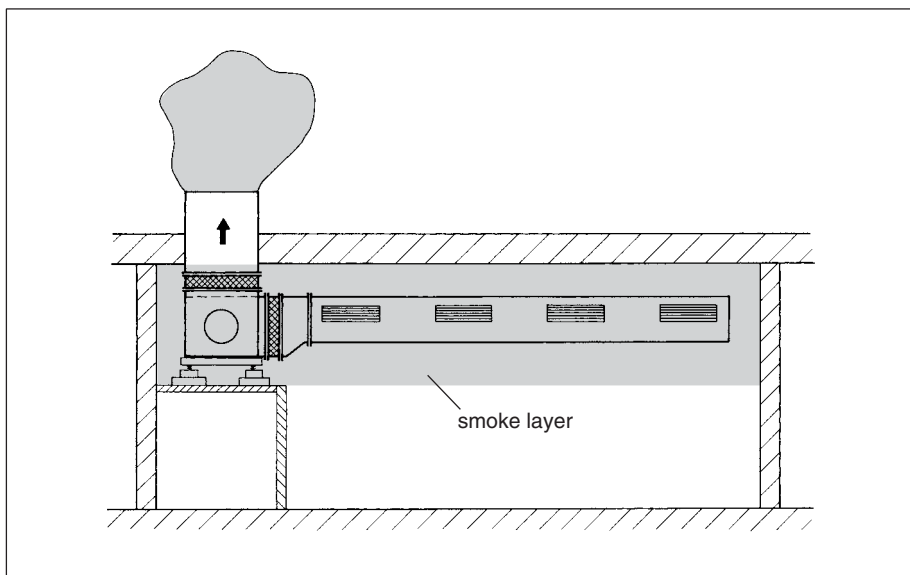
Fan installation outside the fire compartment and outside the building

These fans need no thermal insulation. The minimum distance to combustible materials must be met. (Belt-driven fans must, however, be fitted with heat insulation).



Fan installation outside the fire compartment but inside the building (in an adequately ventilated room)

The fan must be insulated in accordance with DIN 4102-4, or enclosed in mineral fibre lagging (density $\geq 90 \text{ kg/m}^3$) measuring at least 40 mm in thickness.



Fan installation inside the fire compartment

If the fan is suitable for installation within the fire compartment, no insulation is necessary.

(Fans depending on external air for cooling must be provided with an appropriate L90-grade cooling air supply duct. However, this requirement is not applicable to wall-mounted fans).



Complete test rig for roof-mounted smoke exhaust fans. Fumes are extracted from a furnace and returned to it via a duct connected to the fan outlet.



Heat-insulated repair switch, cooling air inlet nozzle

6.5.3 Test conditions and criteria

Our smoke exhaust fans are functionally tested under virtually realistic mounting conditions. Each fan series is run in smoke extraction mode according to its appropriate temperature/time category for at least the specified minimum operating duration; in most cases, the test is continued for much longer (Table 1).

6.5.4 Suitability testing criteria

- Volume flow decrease over the test interval ($\leq 10\%$)
- Reduction in static pressure head over the test interval ($\leq 20\%$)
- Surface temperature increase on insulated fans must not exceed 180 K at any one point

6.5.5 Tests

The prescribed tests relate to smoke exhaust fans operating as standalone units in an installed condition.

Many accessories, although not subject to testing themselves, are critical for the operation of the fan. It has there-

fore been our policy to test them on a voluntary basis in conjunction with the fan system. For each fan series, a minimum of two (up to a total of five) specimens had to be tested depending on type and model. The number of specimens reflects the criteria set forth in the test standard as well as the diversity of application conditions

for which TLT smoke exhaust fans are built.

Temperature / Time Category according to EN 12101, Part 3

Category	F300	F200	F400	F600	F842	not assigned
Temperature (i C) according to EN 12101-T3	300	200	400	600	842	as determined by supplier
Insulated fans minimum operating duration (min)	60	120	120	60	—	as determined by supplier
Tested operating duration of TLT fans (min)	120	120	120	120	—	—
In determining categories, existing classifications under national standards such as DIN, BS, etc., were taken into account.						

Table 1



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**SMOKE (FUME) EXHAUST FANS
TECHN. UNIV. OF MUNICH CONSULTANCY REPORTS
GENERAL APPROVALS UNDER BUILDING
SUPERVISORY LAW**

018

6.5.6 Supervisory Approvals and Test Reports

Fan type	Fan series	Temperature limit [°C]	Minimum operation duration [min.]	Report No.	General approval No.
Roof-mounting fans	BVD (SDI)	620	120	96/1162	Z-78.1-24
	BVD (SDI)	400	120	97/1188	Z-78.1-25
	BVW-D	600	120	96/1166	Z-78.1-29
Wall-mounting fans	BVW	600	120	96/1166	Z-78.1-29
	BWAXO	200/300	120	98/1196-1	Z-78.1-41
	BWAXN 12/56	200	120	96/1167-4	Z-78.1-18
	BWAXN 12/56	300	120	96/1167-2	Z-78.1-20
	BWAXN 12/56	400	120	96/1167-6	Z-78.1-21
Central service fans Centrifugal fans	BVRA *	620	90	91/196-1-a*	Z-78.1-16
	BVW for floor installation	600	120	98/1196-3	Z-78.1-29
	BV-REH	400	120	98/1196-4	Z-78.1-42
	BV-ERV	300	120	98/1196-2	Z-78.1-43
Axial-flow fans	BVAXO	300	120	98/1196-1	Z-78.1-41
	BVAXN 12/56	200	120	96/1167-4	Z-78.1-18
	BVAXN 12/56	300	120	96/1167-2	Z-78.1-20
	BVAXN 12/56	400	120	96/1167-6	Z-78.1-21
	BVAXN 8/56	600	120	96/1167-1	Z-78.1-17
Accessories	Inlet box for BVW types			96/1166	Z-78.1-29
	Outlet dampers for BVW types			96/1166	Z-78.1-29
	Automatic shutoff dampers			2140**	
	Flexible connectors (inlet or outlet side)			2140**	
	Bases for BVD + BVW-D				Z-78.1-24 Z-78.1-25
	Round silencer TSR			2140**	
	Noise-damping base SDS			2140**	

* to DIN 18232-6

** Expertise regarding use for preventive fire protection



6.5.7 Fan sizing

As a rule, any smoke and heat exhaust system must be sized in conformance with applicable laws and standards. This can only be accomplished through cooperation between the specifier and the building supervisory authority. As a result, the calculation steps and sizing criteria outlined below should only be viewed as a guide.

Sizing steps

1. Calculate the fire load of the room in question and the theoretical fire load with the aid of the formulas given above (from DIN 18230, Part 1, and the design specifications of EN 12101-5 or EN 18232-5).
2. Determine the requisite smoke exhaust volume flow.
3. Determine the smoke temperature. If the temperature thus obtained exceeds the proof temperature of the fan the number of air changes must be increased, or a bypass must be installed to mix the extracted smoke with cooler air.
4. Determine the leakage air flow and the requisite total air volume.

The leakage flow will vary as a function of pressure loss conditions and number and sizes of ducts in the system. In practice, long duct sections on the fan inlet side and the associated high pressure loss will often translate into leakage flows that exert a significant impact on the overall system throughput.

It should always be remembered that the exhaust volume flow of a mechanical smoke exhaust system is measured not at the fan, but in the assumed fire compartment under normal conditions.

The anticipated leakage loss must be taken into account in any fan sizing effort.

In this context the specifier should also check whether the air supply openings are sufficient for the total make-up air volume, and whether appropriate scavenging conditions exist in the room.

The air flow rate through the supply openings should be ≤ 3 m/s.

5. Determine the total pressure loss across the system.
6. Select the appropriate fan

Often it may appear expedient to use the fan for normal room ventilation purposes as well. In this case, a drive motor with two or three operating speeds may be selected. The lower rpm level is then used for normal venting, while the higher speed is activated in the event of a fire.

Fan use

Selecting the right fan in terms of temperature resistance, operating time and output does not suffice to ensure a proper smoke exhaust system. The following fan operating aspects must likewise be taken into account:

- The switchgear cabinet for the smoke exhaust fan must be installed outside the rooms exposed to a fire (or high temperature) hazard.

Switchgear cabinets or panels must not be fitted on an (interior or exterior) wall of the fire compartment.

Only the fulfilment of these aspects, which are all too often neglected in the use of smoke exhaust fans, can ensure an effective smoke and heat exhaust operation in conjunction with the correct fan sizing.

Please also see our Installation, Operating and Maintenance Instructions.

Smoke exhaust fans may be operated via a frequency converter when in normal venting mode, but not in smoke extraction service (except where the frequency converter is tested in conjunction with the fan).

To ensure a reliable smoke extraction performance the installation must conform to the fan manufacturer's specifications and to all requirements imposed by the Building Supervisory Authority, e.g., with regard to

- installation room cooling
- thermal installation
- use of tested and approved accessories (e.g., flexible connectors, spring-type antivibration mounts, silencers, shutoff dampers)
- uninterruptible power supply

**7.0 Fire load determination
according to DIN 18230,
Parts 1 & 2**

A method of determining the fire load and its relevant factors is defined in DIN 18230, Parts 1 & 2. According to this standard, the fire load q (in kWh/m²) is the aggregate amount of heat that can be released by all combustible materials in a given fire zone having a theoretical surface area A (in m²). This can be written as follows:

$$q = \frac{\sum (M_i \cdot H_{ui})}{A} \text{ in kWh/m}^2$$

The term "combustible materials", as used here, must be deemed to include all inflammable substances, whether building materials, operating fuels and consumables, stored products, packaging, or surface finishes (e.g., paneling, coatings or the like). More detailed instructions are presented in the standard m.a.

DIN 18230 and the resulting equation are intended for determining the requisite fire resistance time of the building components in a specific fire compartment. As a result, applications of the standard may deviate from those discussed in the present document.

While the parameters and assessment methods defined in the standard relate to a theoretical building section ("compartment") affected by fire, in the present case individual analyses for specific rooms or groups of rooms must often be conducted.

The theoretical fire compartment area A expressed in m² will therefore not always be the same as the surface area of a smoke compartment of a building to be assessed. In practice one room or flights of rooms having a smaller surface area than the fire compartment concerned will depend on the demands of the mechanical smoke extraction. For our purpose we must calculate the room surface area to be protected by the mechanical smoke extraction system.

In any event, each area in the affected fire compartment must be assessed in terms of the quality and quantity of combustibles it contains, i.e., we must determine the mass M_i (in kg) of each combustible substance and its net calorific value H_{ui} (in kWh/kg).

The result is the fire load for the fire compartment area A_R examined.

$$q' = \frac{\sum (M_i \cdot H_{ui})_R}{A_R} \text{ in kWh/m}^2$$

The calculated fire load q_r for unprotected combustibles is obtained after weighting with the combustion factor m_i .

$$q_r = \frac{\sum (M_i \cdot H_{ui} \cdot m_i)_R}{A_R} \text{ in kWh/m}^2$$

The calculated fire load used in design should be at least equal to 25 kWh/m².

The combustion factor m_i is thus directly reflected in the design of the smoke/heat exhaust system. It reflects the specific type, shape and

distribution as well as the combustion behaviour of the inflammable substances. Obviously, the mass of unprotected paper, cardboard, textile material, etc., that will be consumed by fire in unit time is much larger than the corresponding mass of wood or packaged products.

Depending on the material and its net calorific value and storage density, the combustion factor m_i will typically vary between 0,2 and 1,7.

For more detailed information, reference should be made to DIN 18230, Part 1, Addendum 1.



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SMOKE (FUME) EXHAUST FANS FUNDAMENTALS

021

Excerpt from the Addendum to DIN 18230, Part 1.

(More detailed data are given in DIN 18230, Parts 1 & 2)

Extract from annex to DIN 18230 - part 1

For details refer to DIN 18230, part 1 + part 2, preliminary standard

No.	Material	Compact-ness %	m _i -factor	H _{ui} kWh/kg
1 Wood and wooden materials				
1.1	spruce wood			
1.1.1	boards	50	1,0	
		70	0,8	4,8
1.1.2	squared timber 40 mm x 40 mm	50	1,0	4,8
1.1.3	squared timber 100 mm x 100 mm	50	0,7	4,8
		90	0,5	
1.1.4	squared timber 200 mm x 200 mm	50	0,3	
		95	0,2**)	4,8
1.1.6	spar, scalped diameter 150-300 mm	50	0,5	4,8
1.1.7	loose wood wool (pressed bale)	8	1,0	4,7
		60	0,2**)	
1.2	chipboard (DIN 4102 - B 2)	99	0,2**)	4,8
2 Paper, cardboard				
2.1	writing paper and printing paper	100	0,2**)	3,8
2.2	rolles or sizes of cardboard on paletts			
2.2.1	painted cardboard	90	0,2**)	3,8
		100	0,2**)	
2.2.2	unpainted cardboard	90	0,2**)	4,2
		100	0,2**)	
2.3	bales of wrapping paper	90	0,2**)	4,2
		100	0,2**)	
2.4	paper rolls, standing, lying or on pallets			
	cut to size			
2.4.1	painted paper	75	0,2**)	3,8
2.4.2	unpainted paper	75	0,2**)	4,2
2.5	sanitary crepe paper rolls, or packed in bags	80	1,7	3,7
3 Textile products				
3.1	cotton			
3.1.1	fibre bales	—	0,4	4,3
3.1.2	pressed fibre bales	—	0,2**)	4,3
3.2	pressed polyamide fibre bales	—	0,7	7,9
3.3	Pressed polyacrylonitrile bales			
3.3.1	fibres, not modified	—	0,8	8,2
3.3.2	fibres, modified with approx. 35% vinylidenchloride	—	0,2**)	6,6
3.4	waste			
3.4.1	pressed cotton, polyamide and polyacrilnetrile fibres bales	—	0,8	—
4 Plastics				
4.1	polyethylene			
4.1.1	granulate in individual sacks	—	0,8	12,2
4.1.2	moulded parts (empty beer boxes) piled up	—	0,5	12,2
4.2	polystyrole			
4.2.1	hard foam (DIN 4102 - B 3) PS 20	100	0,8	11,0
4.2.2	hard foam (DIN 4102 - B 1) PS 20 SE	100	0,4	11,0
4.3	polyurethane hard foam			
4.3.1	PUR hard foam (DIN 4102 - B 2)	100	0,3	6,7
4.3.2	PUR hard foam (DIN 4102 - B 1)	100	0,2**)	6,7
4.4	Polycarbodiimide hard foam	100	0,2**)	8,6
4.5	UP unsaturated polyester resins , glass-reinforced			
4.5.1	bars in loose piles	25	0,7	5,3
5 Solid fuel				
5.1	brown-coal briquettes, dropped charge	60	0,3	5,8
6 Combustible liquids in bath-tube combustion				
6.1	chlorbenzole	—	0,5	11,2
6.2	cyclohexane	—	0,6	8,9
6.3	dimethylformamide	—	1,3	6,1
6.4	glycole	—	1,3	4,6
6.5	oil fuel EL	—	0,4	11,7
6.6	oil fuel S	—	0,5	11,4
6.7	iopropylealcohol	—	1,2	7,5
6.8	methanole	—	1,0	5,4
6.9	oleoresin	—	0,6	11,5
6.10	xylene	—	0,4	11,1

*) bulk density = material volume / total volume or = bulk density / apparent density

**) incineration factors m_i < 0.2 can be evaluated according to DIN 18230 part 1, if the examination authority issued their comments according to advice and recommendations given in NABau-Arbeitsausschuss XII 45/2 "m-factor"

q = fire load in kWh/m²
q' = fire load in kWh/m², related to the fire department
q_r = calculated fire load in kWh/m²
A_R = Surface of the fire compartment in m²
M_i = mass of the individual combustible material in kg
H_{ui} = net calorific value of the individual combustible material in kWh/kg
m_i = combustion factor of the individual combustible material
w = heat exhaust factor
c = conversion factor in min. m²/kWh
t_a = equivalent fire duration in min.
l = cubic capacity of the room in m³
t_m = average fire room temperature in °C
n = air changes in h⁻¹ (number per minute)



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SMOKE (FUME) EXHAUST FANS FUNDAMENTALS

022

7.1 System design in accordance with DIN 18232, Part 5

The new standard DIN 18232, part 5, applies to large rooms with a minimum interior height of 3 m. However, it is not suitable for rooms with stationary gas extinguishing equipment, storage rooms with storage heights exceeding 1.5 m, hazardous material storage areas, and hazardous duty rooms.

The calculation of the volume flow to be extracted is based on the so-called dimensioning category. To obtain the appropriate dimensioning category it is necessary to determine the underlying fire development time and the fire propagation rate. The fire development time is the interval between the outbreak of the fire and the start of fire-fighting operations. In any case, it is assumed that the premises are protected by a fire alarm system in accordance with EDIN VDE 0832-2 (VDE 0833T2) with fire detectors as per DIN EN 54-7, or else that appropriately trained personnel is continuously present. The mechanical smoke exhaust system should be triggered by smoke detectors as soon as possible, as only this way the evacuation of occupants, who are mostly unfamiliar with the building, can be ensured.

As soon as the fire brigade has arrived at the scene, it will take charge of rescue operations and can also determine whether or not the mechanical smoke exhaust system should remain in operation. The time between the start of the initiation of the fire and the arrival of the fire brigade is therefore decisive. Where a company fire department is in place, an interval of 5 minutes is typically assumed. With volunteer fire brigades and under unusually adverse conditions, as much as 20 minutes may pass. In the normal case, calculations will be based on an average fire development time of 10 minutes.

Once this interval has been defined in consultation with the expert and/or local fire department, the fire propagation rate remains to be determined. It depends on the combustible materials present in the various fire compartments.

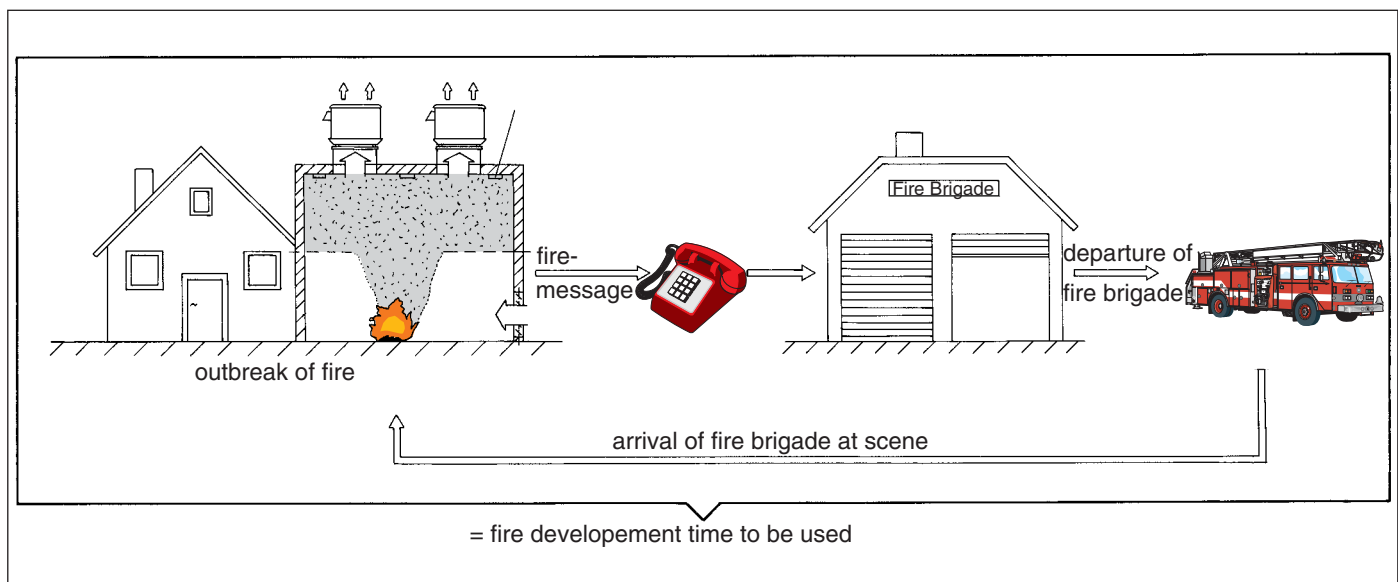
Combustible construction materials in non-combustible packaging, for instance, have a particularly low fire propagation rate. On the other hand, where substances such as benzene or rubberized products are stored, the flames will spread very quickly. Usually, an average propagation rate will be assumed.

A note in the standard tells us that the presence of a sprinkler system justifies the selection of the next lower dimensioning category. This statement must be viewed as exceedingly problematic. A discharge of water from the sprinkler system into the accumulated smoke layer will definitely increase the amount of smoke to be extracted. In addition, the water literally forces the smoke downwards into the escape routes, which should be kept clear by all means.

Our recommendation, therefore, is to leave the mechanical smoke exhaust system running for as long as occupant protection is still an issue, and to ensure that the sprinkler system will be triggered after the smoke exhaust fans.

Moreover, the standard assumes smoke compartment surface areas in the region of $\leq 1600 \text{ m}^2$.

The volume flow of smoke to be extracted and the fan temperature category can now be determined from the exhaust flow rate tables, depending on the desired depth of the low-smoke layer, the dimensioning group, and the energy release rate (a result of the fire load calculation).





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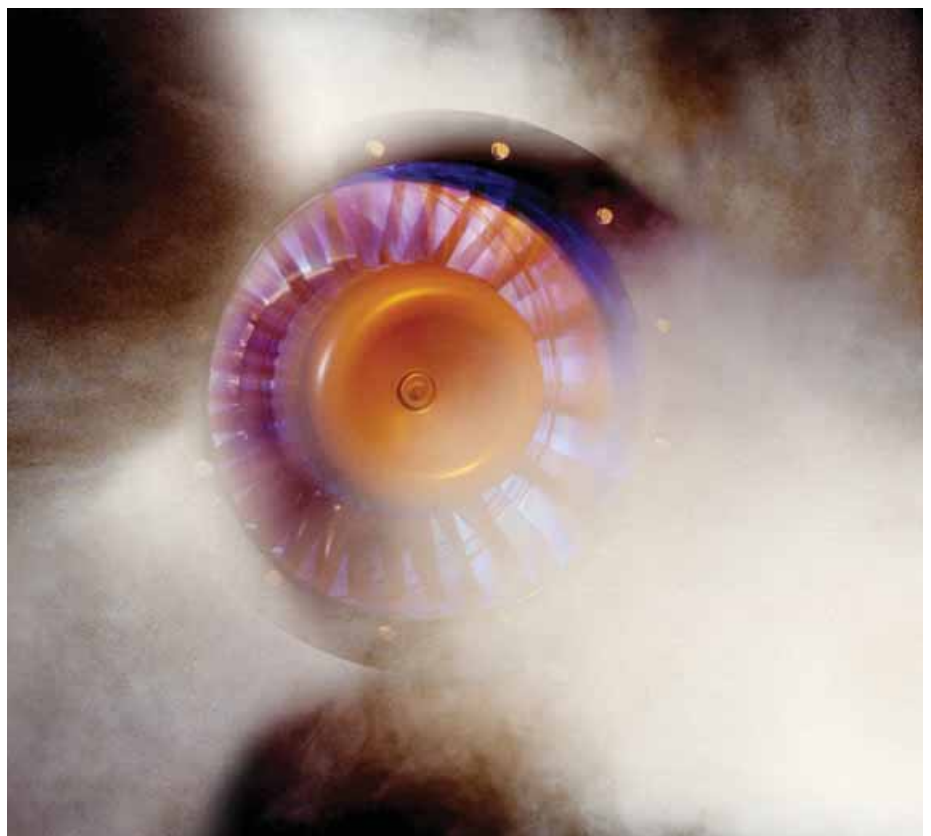
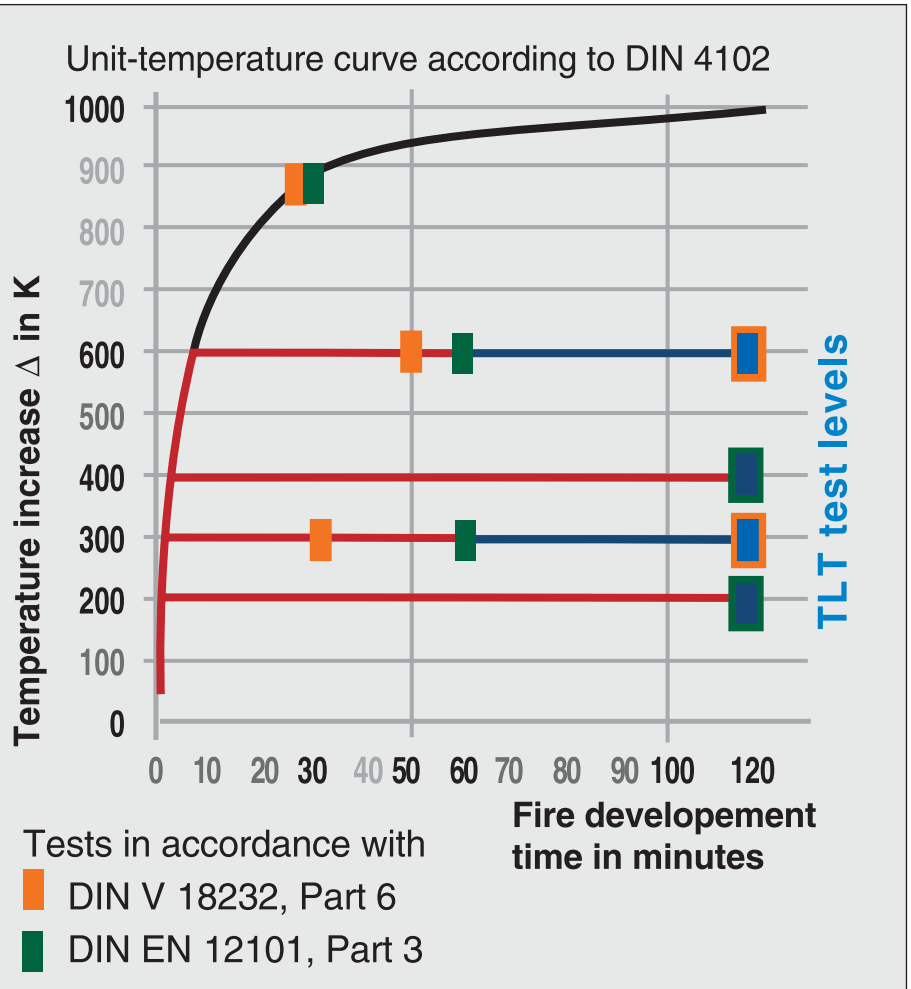
SMOKE (FUME) EXHAUST FANS FUNDAMENTALS

023

The pre-standard DIN 18232-5 gives tables for two different fire scenarios:

The energy release rate to be employed as a function of the calculated fire load is 600 kW/m² in one case and 300 kW/m² in the other.

The "installation rules" likewise provided in the standard shall be examined in detail in section 7.5.



**7.2 Design according to DIN 18230
and Quenzel**

For guidance, Fig. 7 plots the curve of the unit-temperature in the fire compartment over time. A few key critical temperatures have been marked in the diagram as average points of occurrence of the events identified.

For the smoke exhaust system designer the question arises in this context which temperatures (and specifically, which combustion gas temperature) must be expected in case of a fire.

A clear-cut law linking from the fire compartment temperature to the fire load cannot be established because of the diversity of effects governing each individual fire. However, we can identify a relationship between the fire load and the equivalent fire duration $t_{\bar{a}}$, a term introduced in DIN 18230. The equation incorporates the factors w and c :

$$t_{\bar{a}} = c \cdot q_r \cdot w \quad \text{in min}$$

The heat factor w is a coefficient expressing the specific ventilation conditions characterizing the fire scenario. Depending on the arrangement of the smoke extraction system and the make-up air supply (and possibly, the achievable number of air changes), a value of $w = 2.2$ to 3.2 may be assumed for a mechanical smoke exhaust installation.

The conversion factor c , according to DIN 18230, reflects the thermal insulation properties of the fire compartment enclosure walls. It is given as $c = 0.15$ to $0.25 \text{ min} \cdot \text{m}^2/\text{kWh}$, the higher value indicating the higher insulation level.

If the insulating capability of enclosure components is destroyed by the fire, e.g., because of windows shattering, a value of $c = 0.15$ may be adopted.

Where this computing method is taken into account in the system design process, it should be remembered that the various factors all have an uncertainty margin to the positive or negative side. Still, they should be used as a guide in calculating fire

events. Bearing this in mind, and in accordance with a calculated equivalent fire duration and the assumption that no fire-fighting action is taken, the unit-temperature curve permits an approximate calculation of the temperature increase (or fire temperature) to be expected. A real-case analysis of fire loads and building situations yields an equivalent fire duration of 20 – 55 minutes for most buildings, so that smoke temperatures of about 1020 to 1220 K (750 - 950°C) would have to be anticipated from the fire compartment.

The temperature in the fire compartment will not reach this level if a smoke and heat exhaust system generates sufficient air changes from the start.

In this case the average fire temperature should be described by the empirical formula:

$$t_m = 20 + 250 \log \left(4 \cdot t_{\bar{a}}^2 \cdot \frac{q_r}{n \cdot I} \right) \text{ in } ^\circ\text{C}$$

This formula including the number of air-changes.

This temperature is approximately equal to that of the extracted air, and may therefore be used to determine the temperature resistance of the mechanical smoke exhaust system.

$t_{\bar{a}}$	= equivalent fire duration (in min)
t_m	= average fire room temperature (in $^\circ\text{C}$)
q_r	= calculated fire load (in kWh/m^2)
n	= air changes (number per hour)
I	= cubic capacity of the room (in m^3)

**7.3 Necessary number of air
changes**

An attempt is made in Fig 8 (page 025) to give a guidance to the necessary number of air changes as a function of the fire room height and prevailing fire load. It is assumed that the smoke concentration (k_{j2}) in the room is kept below 25% for 15 minutes after the smoke exhaust system is activated.

This 15-minute interval was selected since it will normally give enough time to evacuate occupants and initiate fire-fighting measures.

Smoke development is an important factor here since it has a major impact on visibility in the room.

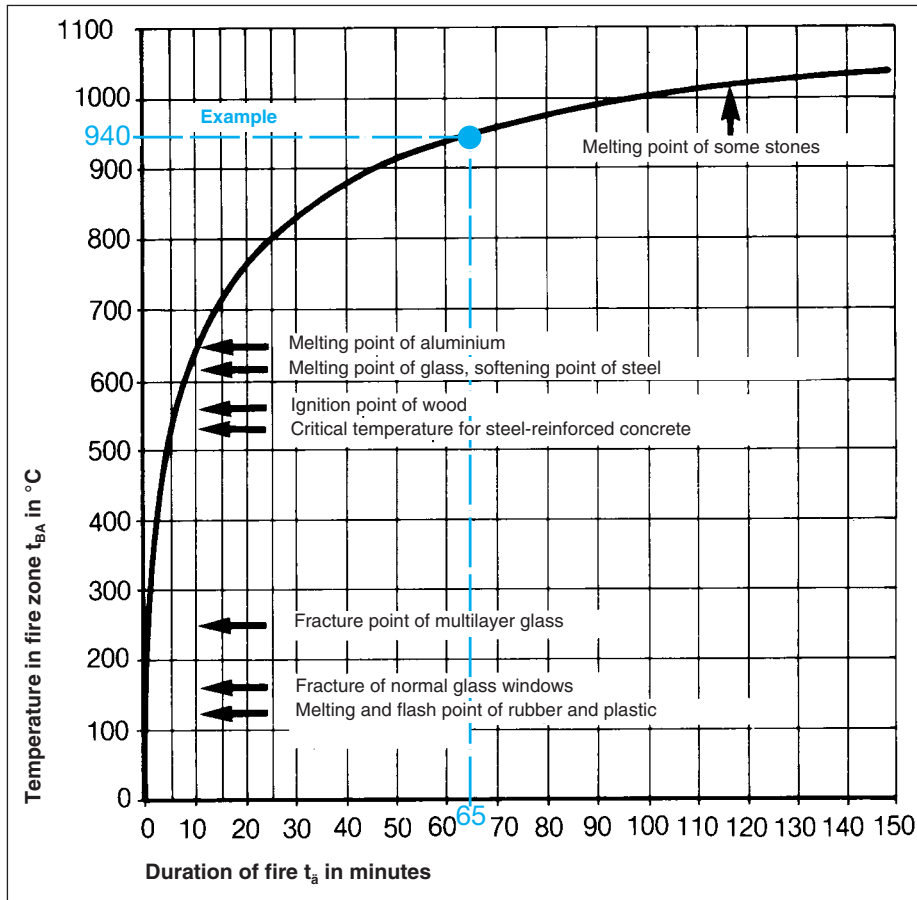


Fig. 7: Temperatur criteria during evolution of fire

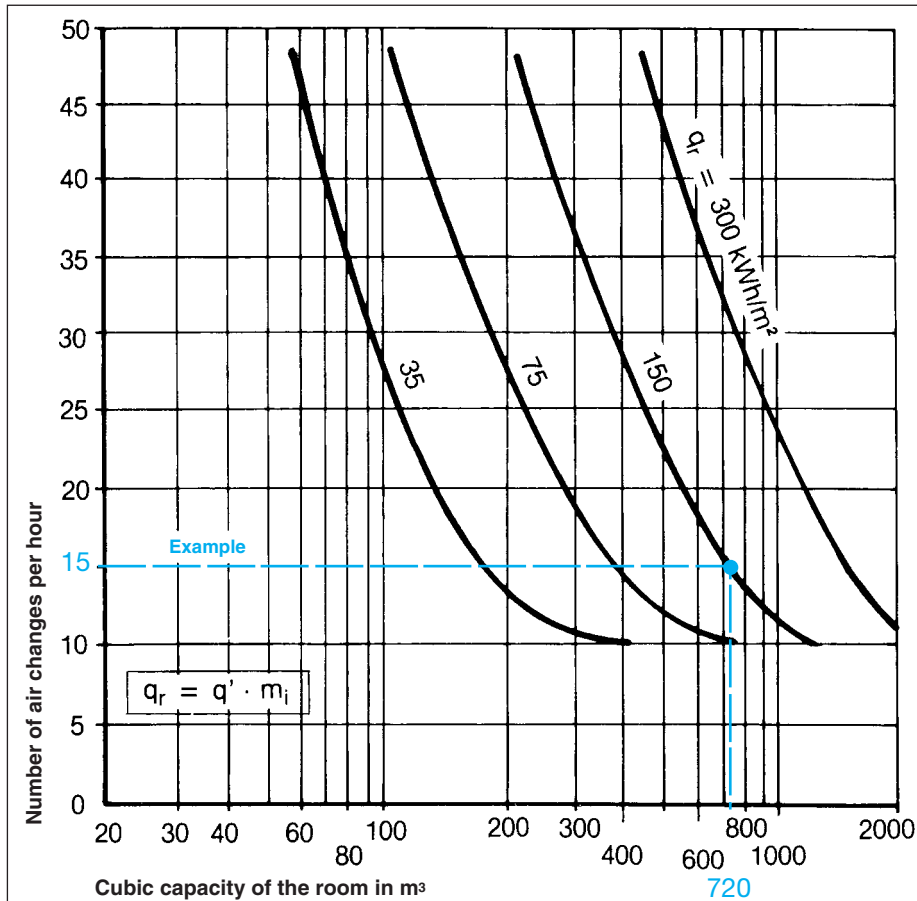


Fig. 8: Number of air changes required, as a function of the fire load and room size, to maintain $k_{12} = 25\%$ for 15 minutes after activation of the smoke and heat exhaust system.



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SMOKE (FUME) EXHAUST FANS SIZING - APPLICATION EXAMPLE 1 CENTRIFUGAL SMOKE EXHAUST FAN FOR 600°C SERVICE SERIES BVW-R WITH INLET DUCT

026

8.4.8 Example 1

Bibliography: Dipl.-Ing. Karl-Heinz Quenzel, „Smoke and Heat Extraction Systems“, 2nd edition

A furniture warehouse in a multi-storey building is to be protected. Fig. 10 shows the floor plan and elevation, as well as the fan arrangement.

The floor plan geometry and arrangement of the air supply opening (door) permit a good transverse ventilation of the room with just a short fan connecting duct. A concentrated supply of make-up air, combined with an underpressure in the warehouse, keep the corridor and the fire-fighting access zone clear of smoke.

Sizing steps:

Ad 1. The room is assumed to contain a mix of stored materials in the following composition: 5600 kg wood, 3000 kg textiles, 672 kg plastics.

The calculated fire load can thus be determined as follows:

From: DIN 18230, Table 1

Material	M_i (kg)	H_{ui} kWh/kg	m_i	$M_i \cdot H_{ui} \cdot m_i$ (kWh)
Wood	5600	4,8	1	26880
Textiles	3000	4,3	0,4	5160
Plastics	672	6,7	0,4	1800
TOTAL				33840

By dividing this sum through the floor area of 240 m², we obtain

$$q_r = \frac{33840}{240} = 141 \frac{\text{kWh}}{\text{m}^2}$$

Ad 2. Taking into account the room volume of 720 m³ the resulting requisite number of air changes per hour is 15 (N=15). Please refer to fig. 8.

Ad 3. Using q_r , the equivalent fire duration t_a can now be calculated. For this purpose we assume

$$c = 0,2 \frac{\text{min} \cdot \text{m}^2}{\text{kWh}}$$

for the conversion factor, and $w = 2.2$ (from DIN 18230) for the heat exhaust factor. It follows that

$$t_a = c \cdot w \cdot q_r = 0,2 \cdot 2,2 \cdot 141 = 62,04 \text{ min.}$$

From this figure, a fire zone temperature of 940°C is obtained (see Fig. 7, page 019). The average fire zone temperature with the smoke exhaust system in operation is determined via the following empirical equation:

$$t_m = 20 + 250 \log \left(4 \cdot t_a^2 \cdot \frac{q_r}{n \cdot l} \right) \text{ in } ^\circ\text{C}$$

In our example,

$$t_m = 20 + 250 \log \left(4 \cdot 62^2 \cdot \frac{141}{15 \cdot 720} \right) = 595,65 ^\circ\text{C}$$

At 596°C, it does not exceed the 600°C operating temperature of the smoke exhaust fan.

Ad 4. A leakage air flow presumably does not have to be taken into account, since the ducts are routed inside the storage room only. The volume flow to be extracted can thus be written as

$$V = n \cdot l = 15 \text{ h}^{-1} \cdot 720 \text{ m}^3 = 10800 \text{ m}^3/\text{h}$$

Ad 5. The resistance of the duct system, including protection grids, is about 400 Pa at a volume flow of 10800 m³/h (3 m³/s). The pressure loss due to the cap is about 70 Pa, that of the inlet box about 60 Pa. A fan delivering a total pressure increase of approx. 530 Pa must therefore be selected.

Ad 6. A look at the characteristic curve (page 153) suggests that a centrifugal-type BVW-R 630/25-6 smoke exhaust fan with inlet duct would be a suitable unit.

**Centrifugal-type smoke exhaust fan
BVW-R 630/25-6 with inlet duct (intake box)**

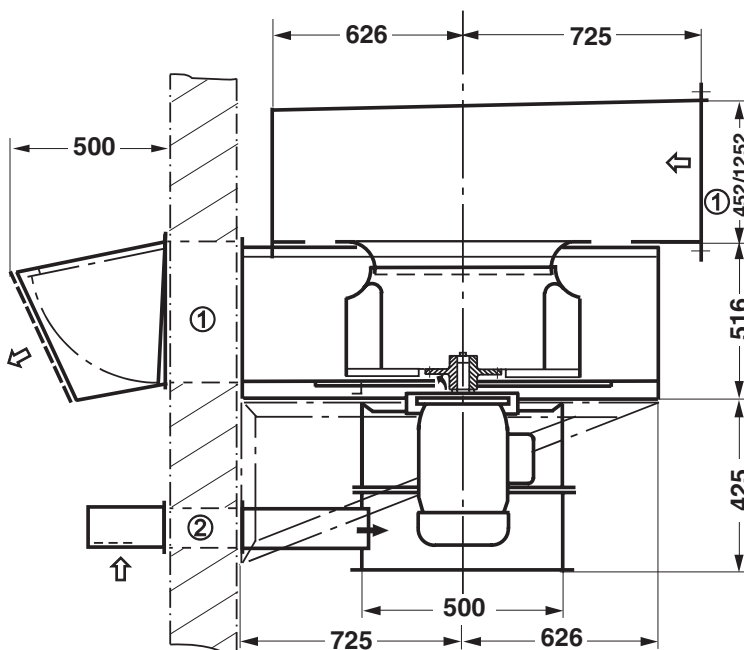
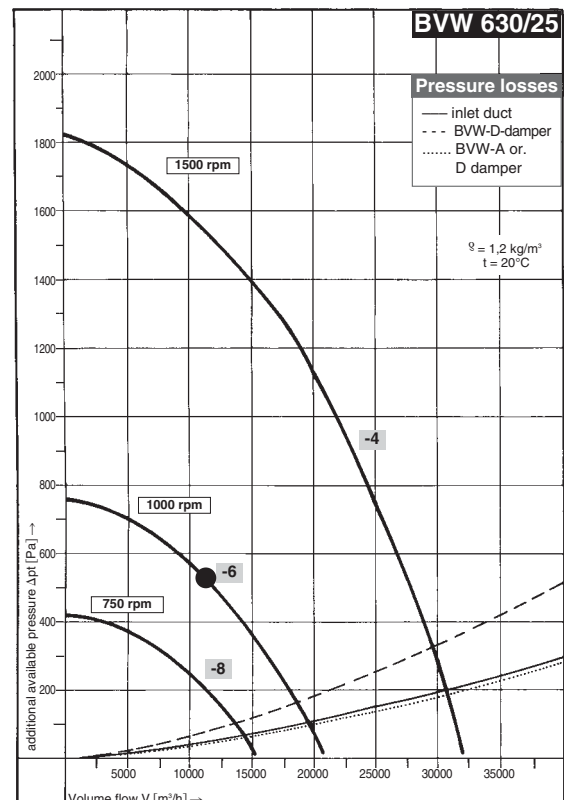


Fig. 9





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SMOKE EXHAUST FANS APPLICATION EXAMPLE 1 CENTRIFUGAL SMOKE EXHAUST FAN FOR 600°C BVW-R SERIES WITH INLET DUCT

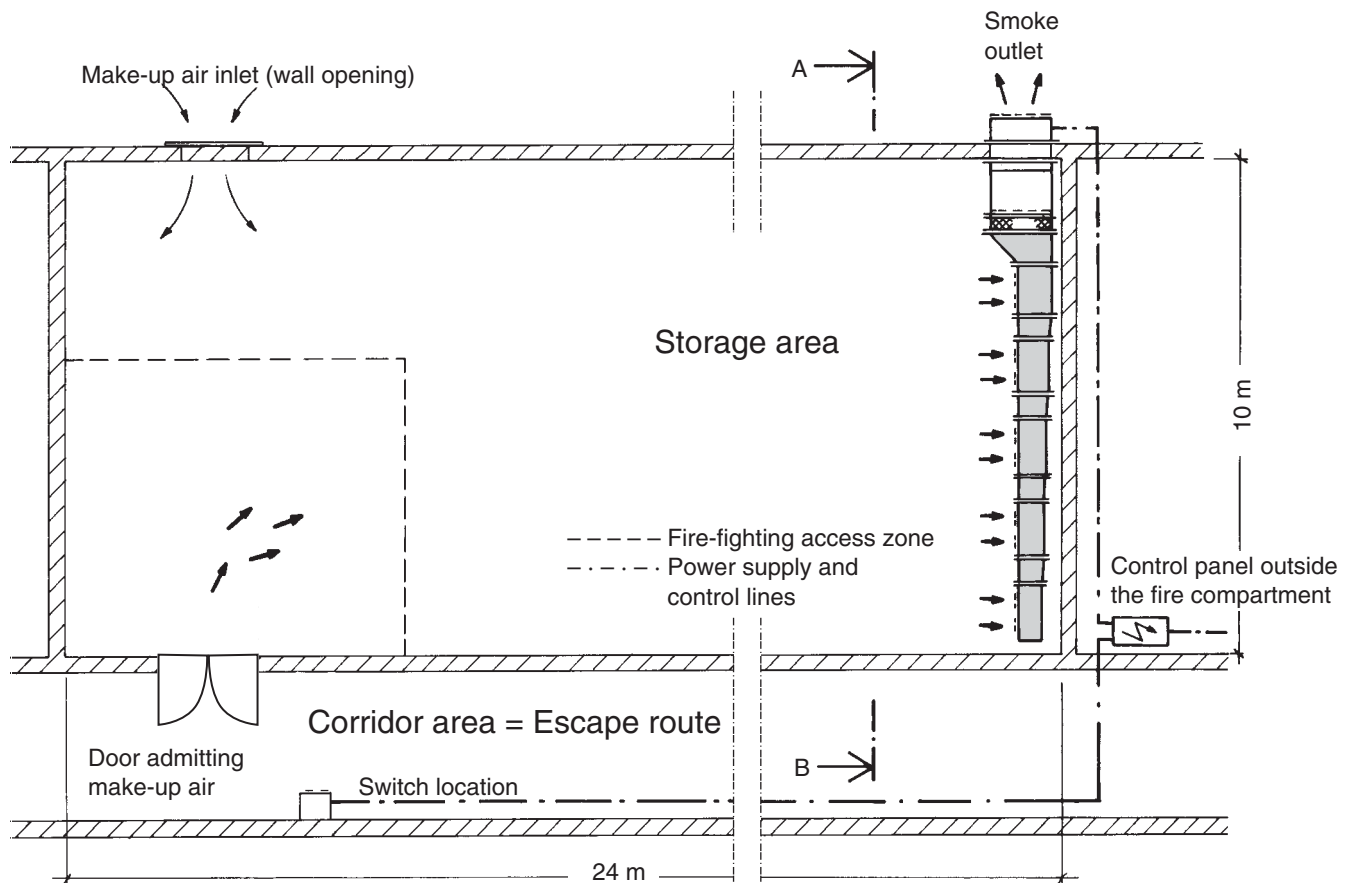
027

Example 1

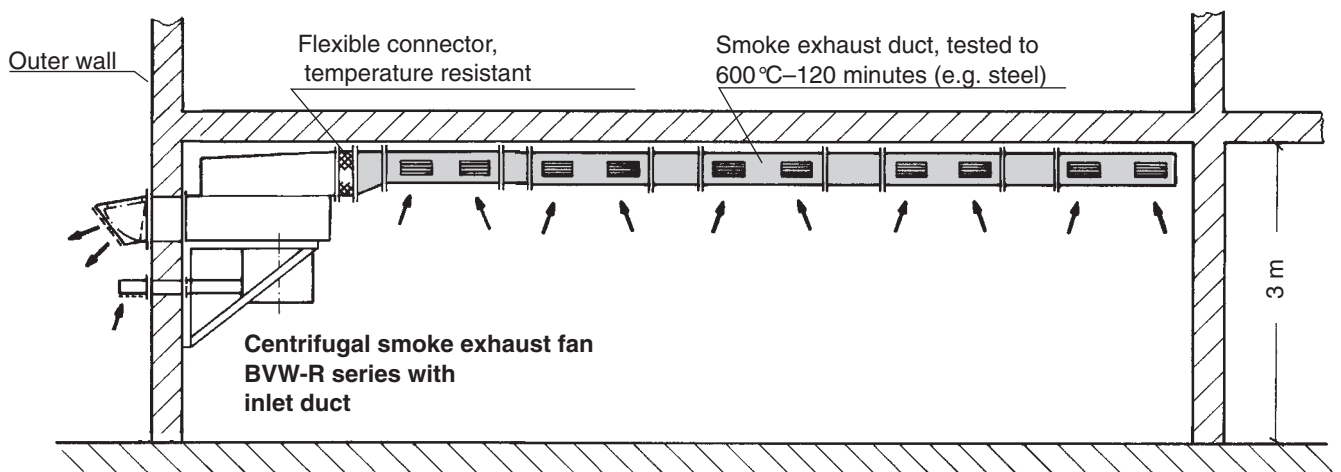
Furniture warehouse in a multi-storey building, equipped with a wall-mounted centrifugal smoke exhaust fan.

for 600°C – 120 minutes

For planning and installation please also refer to our Installation, Operation and Maintenance Instruction (MBW).



Scale 1:150



Section A-B

Scale 1:75

Fig. 10 Floor plan and sectional view of a storage room

■ = Customer supplied



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SMOKE EXHAUST FANS APPLICATION EXAMPLE 2 ROOF-MOUNTED SMOKE EXHAUST FAN FOR 400/620°C BVD SERIES

028

Example 2

Industrial shed ventilation and smoke exhaust system using 3 roof-mounted smoke exhaust fans.

400/620°C – 120 minutes

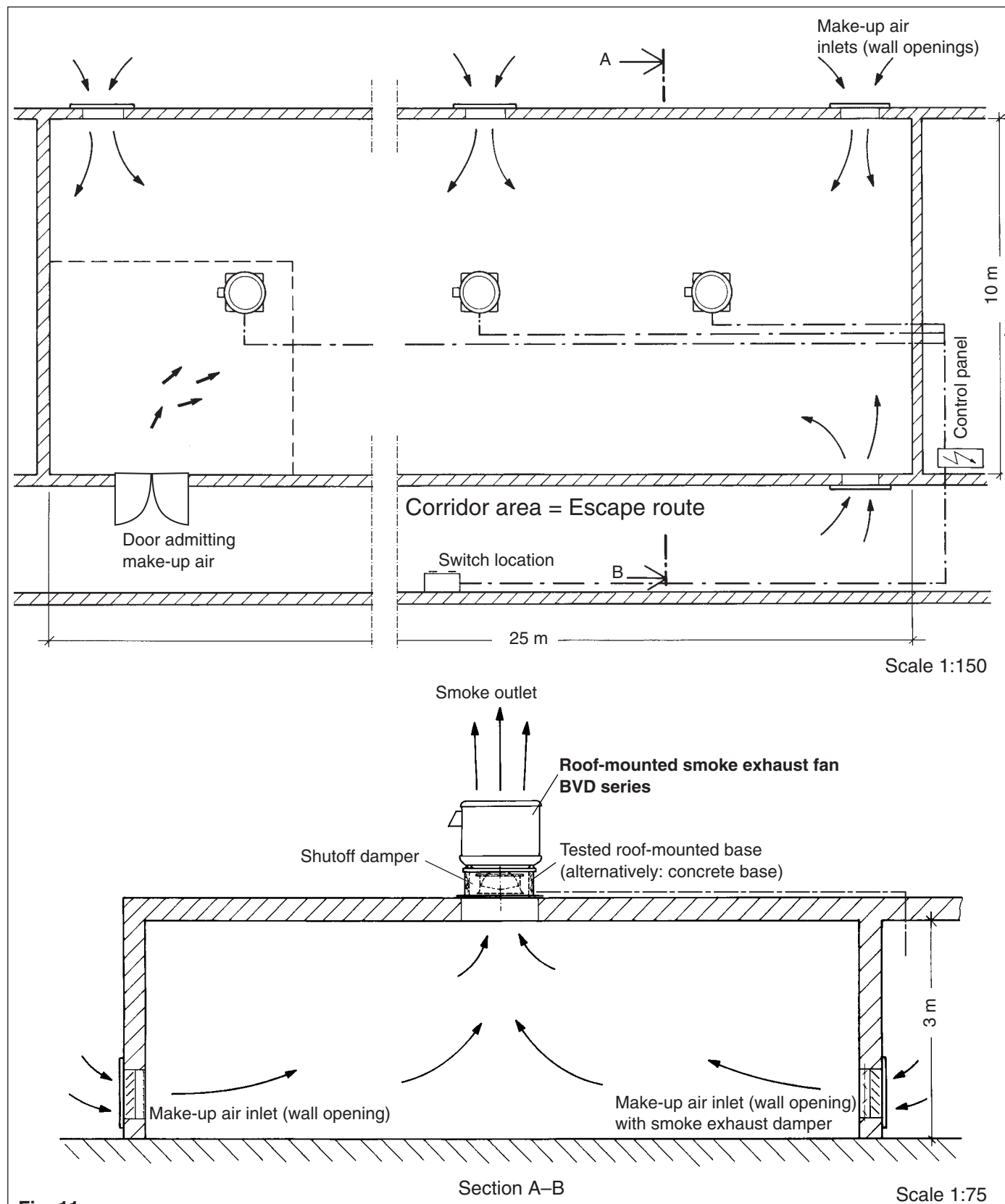


Fig. 11



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SMOKE EXHAUST FANS APPLICATION EXAMPLE 3

WALL-MOUNTED AXIAL FLOW SMOKE EXHAUST FAN FOR 200/300/400°C
BWAXN 12/56 SERIES

029

Example 3

Industrial shed ventilation and smoke exhaust system using wall-mounted axial flow exhaust fans

for 200/300 or 400°C – 120 minutes

For planning and installation please also refer to our Installation, Operation and Maintenance Instruction (MBW).

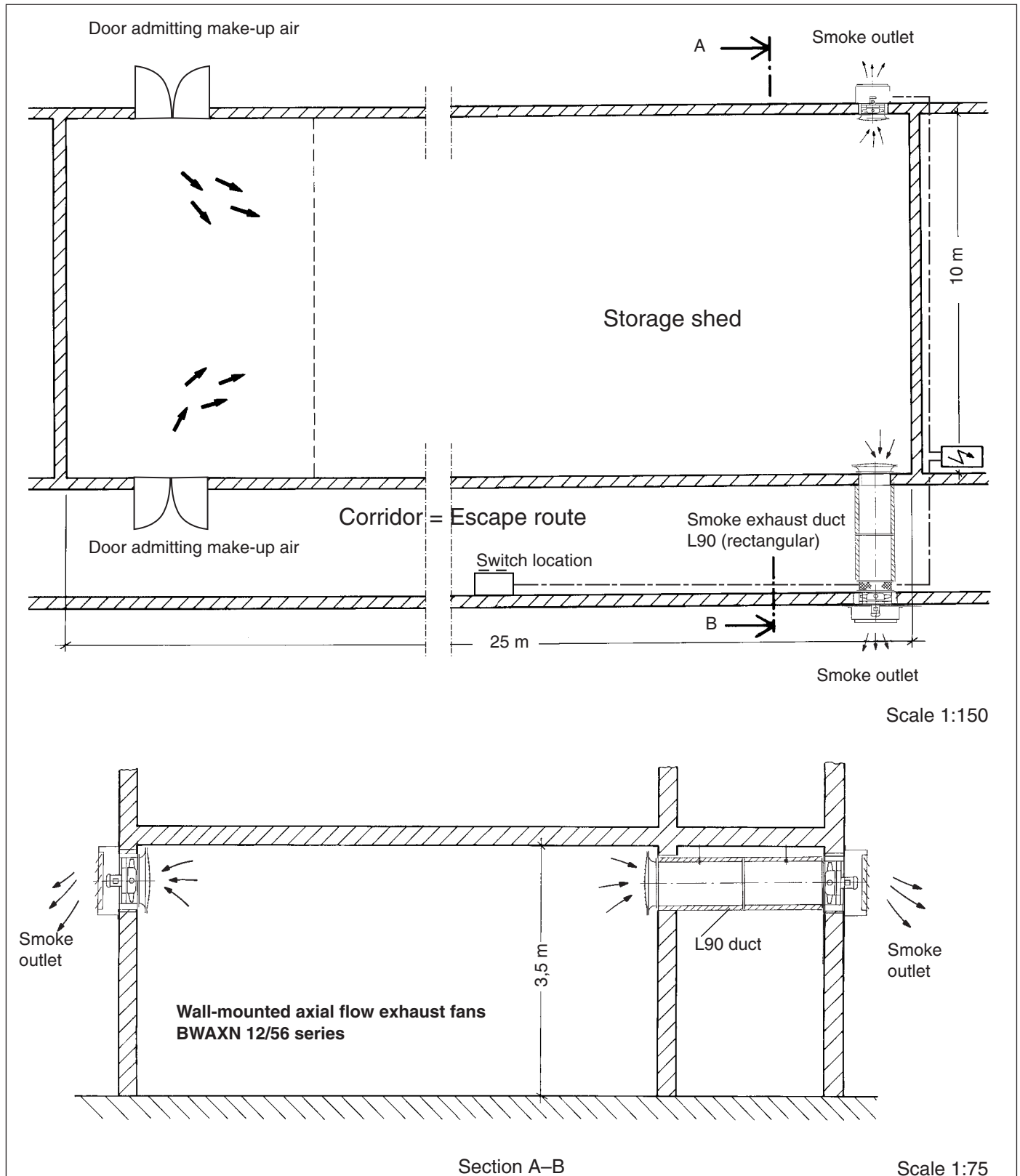


Fig. 12



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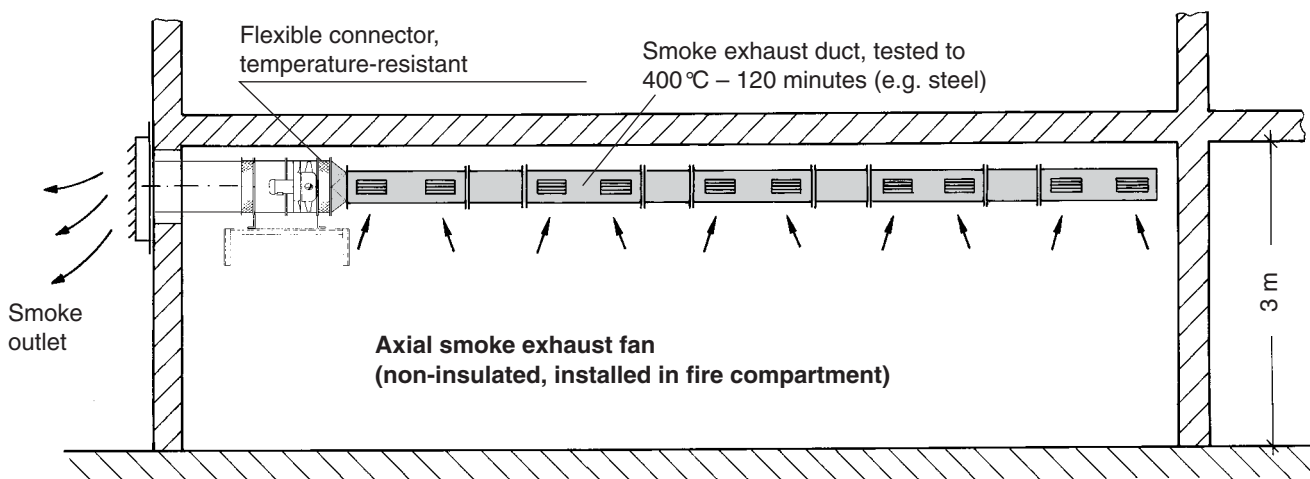
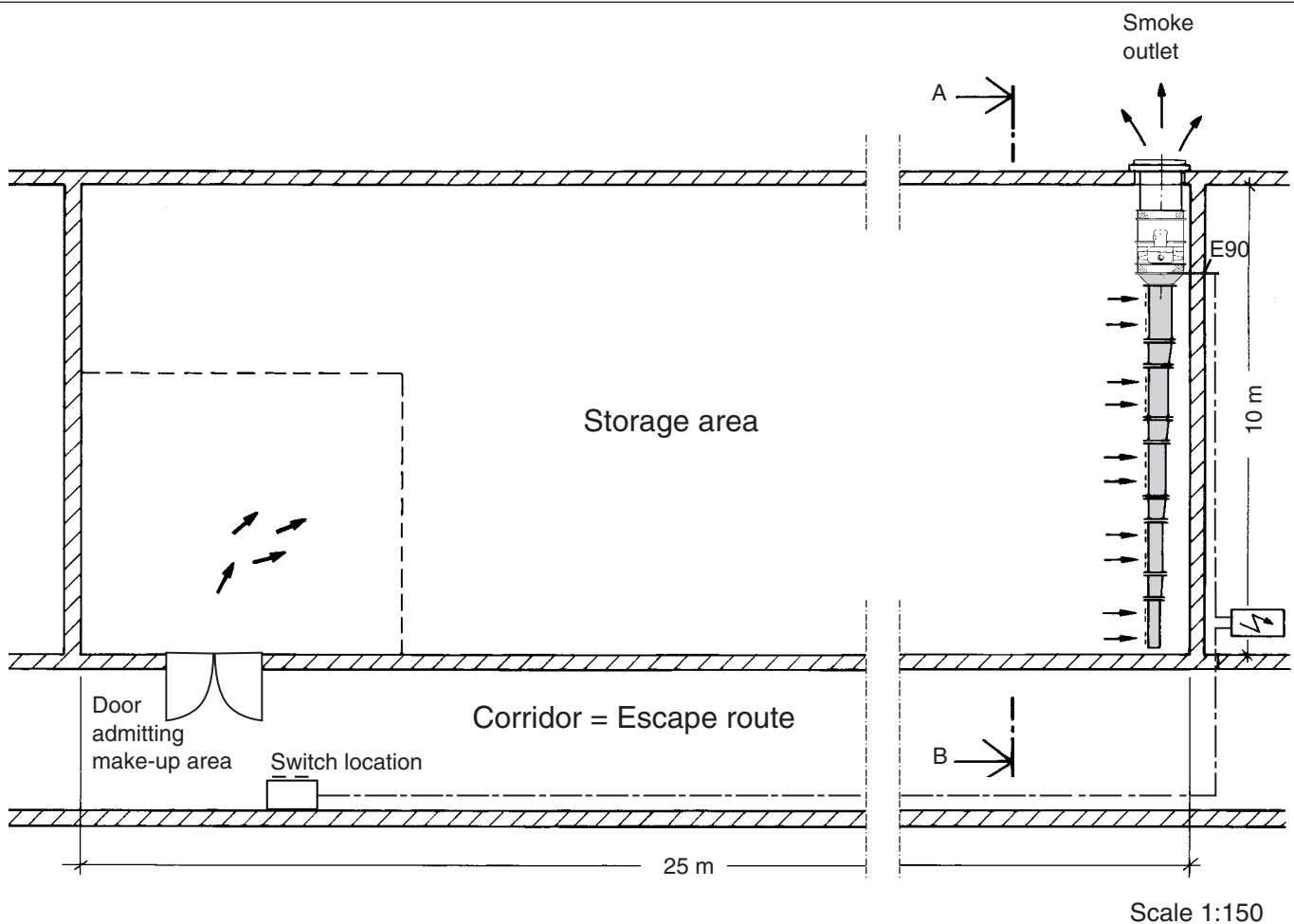
SMOKE EXHAUST FANS APPLICATION EXAMPLE 4 AXIAL FLOW SMOKE EXHAUST FAN FOR 200/300/400°C BVAXN 12/56 SERIES

030

Example 4

Ventilation and smoke exhaust system
using one axial smoke exhaust fan for
200/300 oder 400°C – 120 minutes

For planning and installation
please also refer to our
Installation, Operation and
Maintenance Instruction (MBW).



Section A-B

Fig. 13

Customer supplied



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SMOKE EXHAUST FANS APPLICATION EXAMPLE 5 AXIAL FLOW SMOKE EXHAUST FAN FOR 600°C SERIES BVAXN 8/56

031

Example 5

Multi-storey building with basement ventilation and smoke exhaust system using a BVAXN 8/56 series axial smoke exhaust fan

for 600°C – 120 minutes

No cooling air fan required.

For planning and installation please also refer to our Installation, Operation and Maintenance Instruction (MBW).

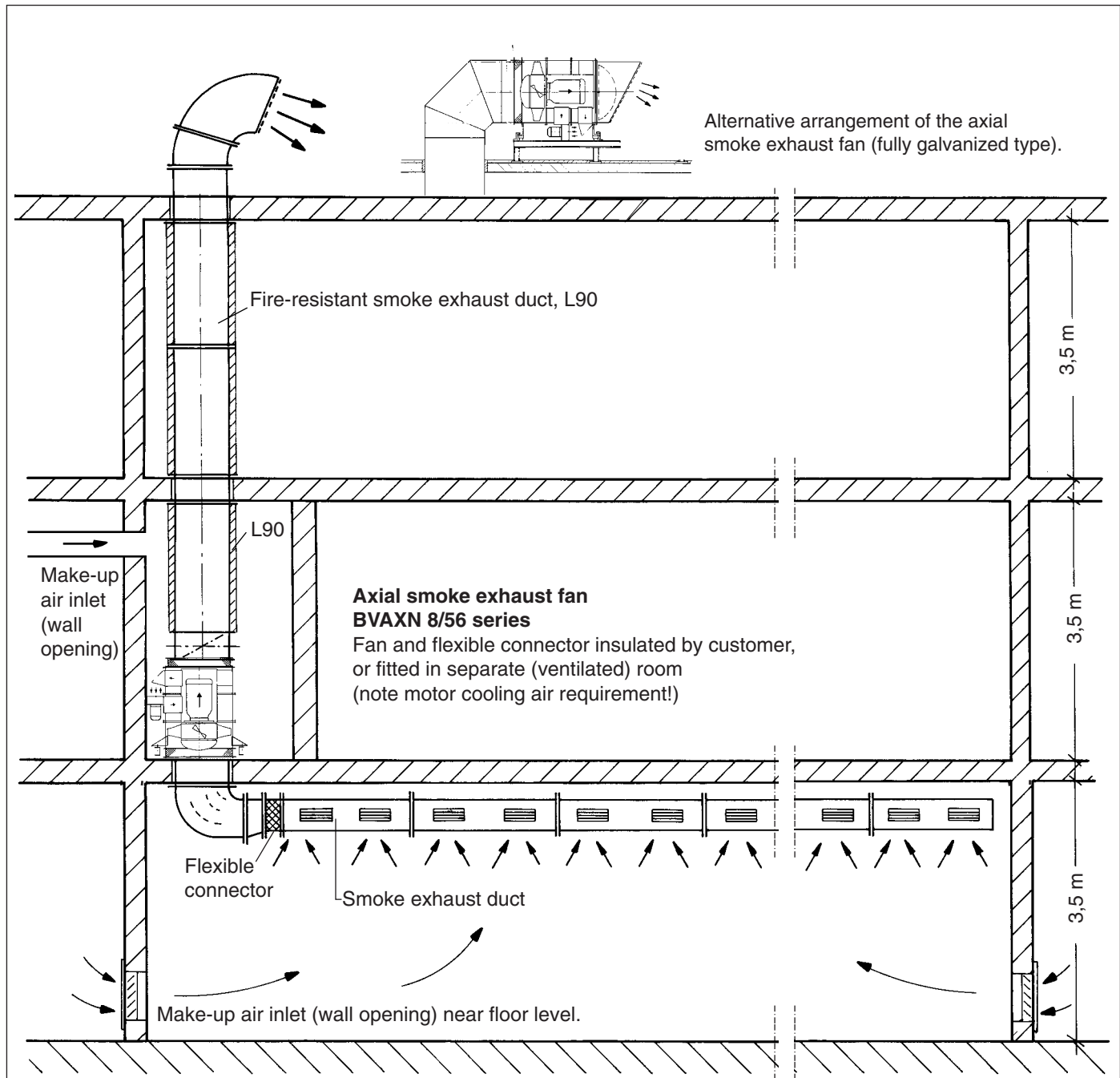


Fig. 14



7.5 Installation notes for smoke exhaust fans

By embracing intelligent solutions at the planning stage and adopting a practice-oriented installation strategy for the smoke exhaust system, users can save significant installation and maintenance costs.

We are all familiar with practical examples of fans virtually inaccessible for maintenance, or whose disassembly requires an unreasonable effort and can therefore be carried out only on legal holidays – with the associated penalty of immense cost.



Installation example: BVAXN 8/56/1400 MD

Compliance with legal requirements and the use of appropriate practical know-how constitute effective safeguards against such errors.

Indoor fan installation outside the fire compartment

Fans for this application type must be heat insulated when installed in a ventilated room. Data concerning the requisite nominal air flows which must be ensured to keep the air temperature in the installation room below 40°C under any fan operating condition are available from the manufacturer upon request.

Insulation in the form of wire-net mineral fiber matting may be applied retroactively in a single layer. The thickness of the lagging must exceed 40 mm, at an apparent density > 90 kg/m³. Note also that the insulation material for fire-resistant air ducting must meet DIN 4102, Part 4. As regards electrical wiring, routing and execution requirements vary with the installation site. In any case, cables shall conform to the circuit integrity

maintenance specifications of DIN 4102, Part 12.

In practice, this means that the connecting cables must not contact the fan casing and must be routed in appropriate mechanical protection systems.

The specifications further describe the installation of switchgear components and maintenance switches, which must be provided in duly protected form in areas not exposed to a fire or temperature hazard and in any case, outside the fire compartment.

As an example, consider the placement of maintenance switches outside the fire zone. According to VDE 0113-1, such switches must be fitted in the immediate vicinity of the fan for maintenance and repair purposes, but this requirement applies only if the fan is not in the line of sight of an operator at the switchgear cabinet.

It should also be noted that the fan's radiant heat output must not interfere with maintenance switch operability, and that the switch must be secured against unauthorized operation in its energized state. (In no case shall switches be mounted in the fire zone without protection).

Always remember when designing circuits and control systems that the fan's smoke extraction function must take priority over all other functions the smoke exhaust system may have.

Thus, where a fan is started or energized via a suitable switchgear device, all thermal or electrical monitoring components must be bypassed or de-energized, and all switching devices must be rated for the projected (usually, maximum) fan rpm. The fan speed must NOT be variable for the duration of the fire, and indeed, such speed control would be counterproductive. Another important requirement is that all devices have undergone an appropriate acceptance procedure.

This acceptance must be conducted and documented at the system operator's initiative. The acceptance tests shall determine the system's full operability and appropriate installation, and specifically the proper interaction of all components. In the functional test, the fan's power consumption at normal temperatures of about 20°C must not exceed permissible values

and its direction of impeller rotation must be verified.

The circuit integrity, safety and reliability of the power supply must likewise be ensured. The system must be maintained in good repair at all times. Its power supply must be ensured throughout the smoke extraction operation. The option is essentially between a primary or secondary power supply. Secondary power may be derived from an emergency power unit or a second mains connection; in any case, it must be fully isolated from the primary power source. The change-over between primary and secondary supply must be automatic (second mains connection). The power requirement of a smoke exhaust system shall be rated under normal ambient conditions.

Another issue, ultimately, is the maintenance of smoke exhaust fans. It must be consistent with the fan manufacturer's maintenance instructions. As a minimum, component operability checks must be carried out at three-month intervals.

If due regard has been paid to accessibility at the planning stage, the following functional checks can be performed quickly and economically:

- Fan start-up test
- Check of measuring and triggering devices, smoke detectors and manual start functions
- Visual inspection of fans and smoke exhaust dampers
- Review of smoke extraction scenarios with regard to triggering, damper positioning and fresh air supply
- Sample check of individual volume flows and comparison with the acceptance condition



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SMOKE (FUME) EXHAUST FANS INSTALLATION EXAMPLES

033

The **ideal mounting configuration** corresponds to that of the test airflow duct, with inlet and outlet tube diameters of $2.5 \times D$ (D = fan diameter).

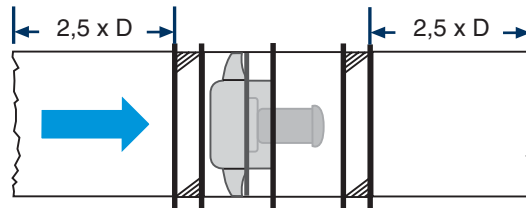
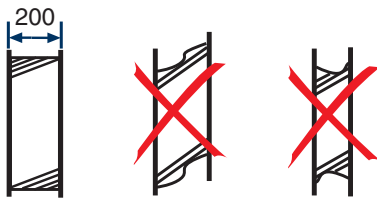
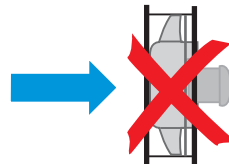


Fig. 1

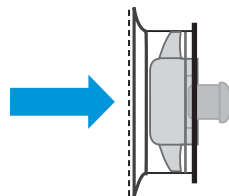


Flexible duct connectors upstream and downstream of the fan must be fitted carefully with zero offset, taking into account the installed length. Failure to observe this rule will result in performance loss and increased acoustic emissions. Flexible connectors are not intended as "elastic fit" adapters compensating for installation inaccuracies!

Fig. 2/2.1/2.2

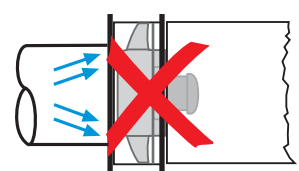


On free inlet fans, the use of an optimized bellmouth is mandatory. Failure to install this would result in severely degraded fan performance and increased noise levels.

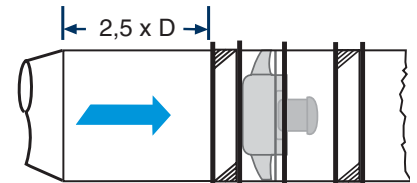


To satisfy accident prevention rules, a wire guard must be fitted to the front of the bellmouth.

Fig. 3/3.1

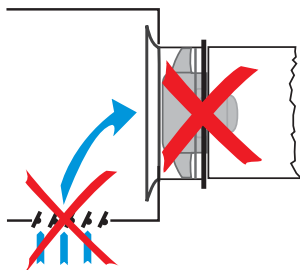


Connections of the above type are absolutely unacceptable in practice.

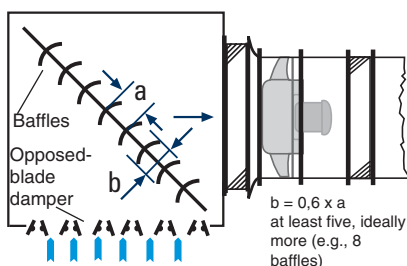


In special cases, i.e., where no alternative is feasible, an adapter cone and $2.5 D$ tube section (D = fan diameter) must be fitted as shown.

Fig. 4/4.1

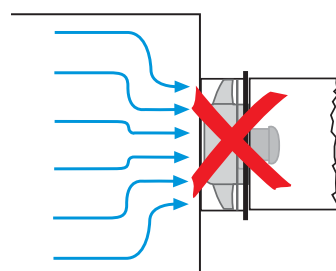


Where dampers must be fitted in airflows arriving vertically from below (e.g., through a ceiling or inlet duct), an opposed-blade damper type should be used to ensure an appropriate approach flow onto downstream deflector or baffle elements.

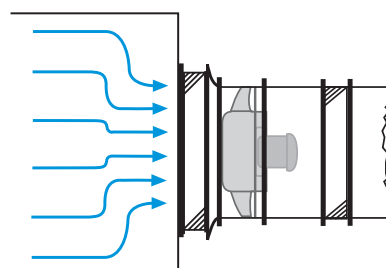


The flexible duct connector (two nominal sizes > nominal fan size) ensures an additional improvement in incoming flow conditions and superior acoustic performance.

Fig. 5/5.1

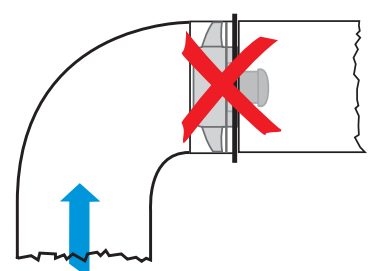


With horizontal approach flows from a larger duct or inlet chamber, an oversized flexible connector (two nominal sizes > nominal fan size) in conjunction with the bellmouth will greatly improve incoming flow conditions and noise output.

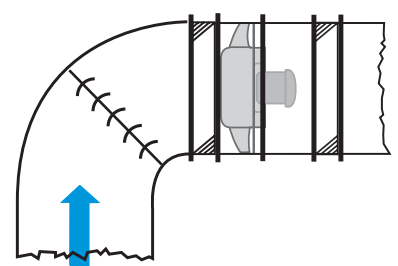


An approach flow situation as shown in Fig. 6 will result in a greatly impaired fan performance.

Fig. 6/6.1



Installation of an axial-flow fan directly downstream of a curved duct section will give rise to substantial performance losses and noise increase.



If a $2.5 \times D$ inlet flow section cannot be fitted, baffles should be used (for configuration and sizes refer to Fig. 5.1)

Fig. 7/7.1



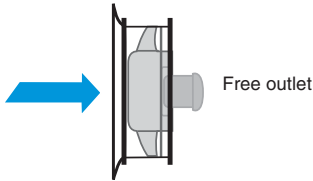
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SMOKE (FUME) EXHAUST FANS INSTALLATION EXAMPLES

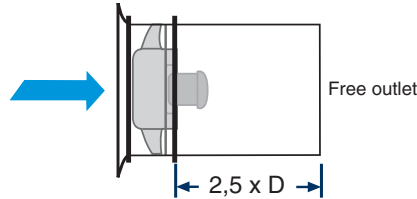
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Maximum impact loss



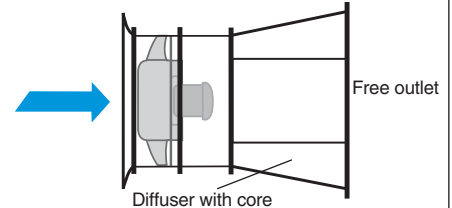
In a free-outlet configuration, the dynamic pressure acting on the fan's annular surface area (fan surface minus hub surface) must be taken into account as impact loss.

50% reduced impact loss



On a free outlet system with $2.5 \times D$ outlet duct, the entire surface area as determined from the nominal fan size may be used for the impact loss calculation (rectified flow).

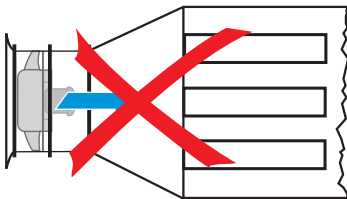
70% reduced impact loss



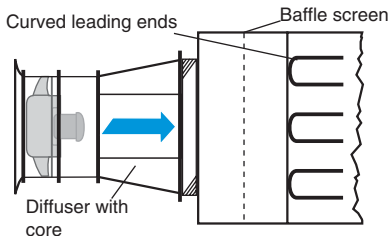
Diffusers can reduce impact loss by about 70% when compared to the configuration shown in Fig. 8.

Fig. 8/8.1/8.2

High impact loss

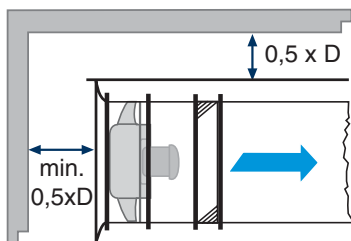


To avoid high impact loss, turbulence effects and excessive noise, downstream splitter attenuators should be connected via a diffuser with internal core and an interposed pressure chamber. In systems with large cross sections, the pressure chamber may be additionally provided



with a built-in baffle screen (perforated metal panel). This recommendation also applies to filters, heaters, etc. The splitters should have curved leading ends.

Fig. 9/9.1

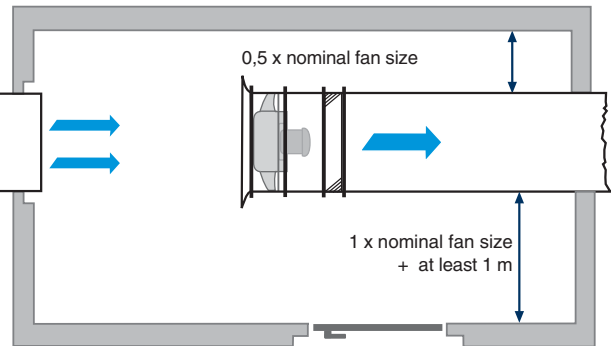


For in-chamber installation specified minimum distance must be observed. If multiple fans are mounted next to each other, the distance between their bellmouths must be at least $0.5 D$.

Fig. 10

In-chamber installation

The same applies by analogy for installation in tube or channel ducts.



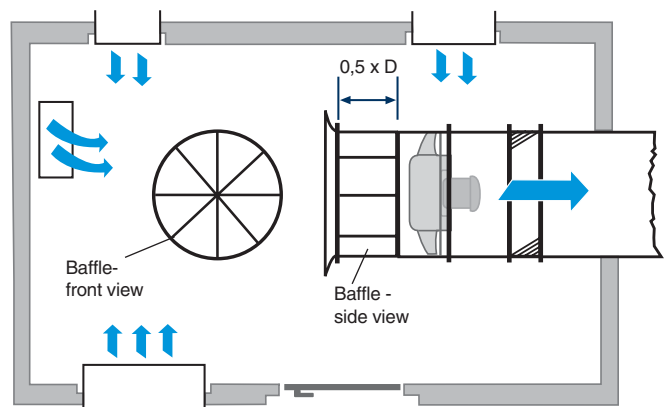
In practice, fans are often mounted in such cramped conditions that proper maintenance or repairs are impossible or extremely costly to carry out. Fans are machines which comprise wearing parts. It is therefore important to provide adequate free space around the unit for maintenance or repair access. On roofs (especially warm

roofs), the availability of sufficiently strong support areas is important. It should be possible to erect scaffolding above and around the fans for installation and maintenance.

Fig. 11

Plenum inlet chamber

Vortex flow effects are often encountered in configurations of this type. The use of an anti-vortex baffle is recommended.



In large inlet chambers with multiple air streams, vortex effects may impair the airflow at the fan inlet. Performance losses are an inevitable result. In this type of operating situation, the recommended anti-vortex baffle should either be fitted from the start or planned in such a way it can be installed later.

Please also observe other fan technology fundamentals as described in the relevant academic and trade literature (e.g., TLT Fan Primer, published by Promotor Verlag, Karlsruhe). Our staff will be glad to answer your questions on this subject.

Fig. 12



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SMOKE (FUME) EXHAUST FANS FUNDAMENTALS

035

8.0 Individual system components

8.1 Smoke exhaust dampers

Since work on the relevant European standard (prEN 1366-10) is still continuing, the relevant national approval mechanisms have remained applicable. In Germany, these are enshrined in the Building Rules List established by the new Building Code (the currently valid list is designated 99-1). According to this document, all smoke exhaust dampers require approval by the building supervisory authority.

Smoke exhaust dampers are known to have two safety positions:

- a) the closed position (standby, with or without fire resistance)

- b) the open position (during extraction of hot gases).

Moreover, their power supply must be reliably ensured since a smoke exhaust damper is required to retain its opening and closing capability even after 25 minutes of fire exposure, so that consistent with the Model Guideline for Ducting (draft 98), the exhaust duct equipment will remain operable for at least 90 minutes.

The drive units for smoke exhaust dampers are tested for a fire resistance of 90 minutes. In the case of a power failure, the de-energized drive units must secure the damper in its open position, e.g., via a mechanical locking feature.

Such equipment is designated ETK90, i.e., it has a fire resistance of 90 minutes at the ISO 834 unit-temperature curve (in the future, the relevant document will be EN 1363-1), and its smoke extraction functionality, based on the same curve, remains ensured for the same period.



8.2 Smoke exhaust ducts

The fire resistance behaviour of smoke exhaust ducts is currently governed by the national standard DIN 4102-6, while their smoke extraction capabilities are subject to DIN 18232-6.

DIN 4102-6 is scheduled to be replaced within the next 6 months by EN 1366-1, while DIN V 18232-6 will remain applicable until the European standard for smoke exhaust ducts (EN 1366-8) becomes available. This is expected to happen in about two years' time.

The differences between the two European standards and their German counterparts are minimal, except for the characteristics and length of the suspension elements. The calculations use the same baseline value of 6 N/mm².

With the publication of DIN EN 1366-1, this European specification has come to reflect the state of the art. It is to replace DIN 4102, Part 6.

According to the European testing criteria, the elongation of the suspension elements must be measured and recorded in the test record upon completion of the fire test. The measured elongation applies for a maximum hanger length of 1.5 m. Where longer suspension elements are needed, their elongation shall not exceed the

value measured in the test, e.g., 40 mm for a 1.5 m (uncovered) hanger. For longer elements to remain within this elongation range, they must be enclosed in a fire-resistant material.

The tightness of the ductwork is another criterion. Practical experience shows that ducts assembled on site exhibit the greatest installation flaws.

Leakage flows shall not exceed 10 m³/h per square meter of inside surface area. Thus, for instance, an Li 1.0 x 1.0 m duct has an interior circumference of 4.0 meters, and a 5-meter length of this duct has an inside surface area of 20.0 m.

Its maximum acceptable leakage would thus be 2.0 x 10 = 200 m³/h. In the case of multi-range systems, allowance must also be made for permissible cold leaks of 200 m³/h per square meter of cross-sectional area (smoke exhaust dampers) and for the acceptable exhaust fan power loss.

In sizing a smoke exhaust fan, all acceptable sources of leakage or power loss have to be duly taken into account.



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FUNDAMENTALS****036**

Engineering Standards	DIN... EN...	Contents
Smoke exhaust fans	DIN V 18232-6 EN 12101-3	Mechanical smoke exhaust systems Requirements for components and suitability testing Smoke and heat control systems Part 3: Specification for mechanical smoke and heat exhaust ventilators (test and product standard)
Fire protection dampers	DIN EN 1366-2	Fire protection dampers
Smoke exhaust dampers	DIN V 18232-6	Mechanical smoke exhaust systems Requirements for components and suitability testing
Ducting	DIN V 18232-6 DIN 1366-1 pr EN 1366-8 pr EN 1366-9	Mechanical smoke exhaust systems Requirements for components and suitability testing Fire resistance tests on service installations, Fire-resistant ventilation ducts Fire resistance tests on service installations in buildings, Smoke extraction ducts Fire resistance tests on service installations in buildings Smoke extraction ducts in a fire zone
Sizing of smoke exhaust systems	DIN V 18232-5 pr EN 12101-5	Smoke and heat extraction systems Mechanical smoke exhaust systems Requirements and design Smoke and heat protection systems Functional requirements and calculation methods for smoke and heat exhaust systems
Pressure-based smoke protection systems	DIN 18232-7 (draft) pr EN 12101-6	Smoke and heat extraction systems Pressure-based smoke protection systems for safety staircases Smoke and heat control systems Pressure differential systems, kits
Smoke exhaust systems	pr EN 12101-4	Smoke and heat control systems Design of smoke and heat exhaust systems



8.3 Control of smoke exhaust systems

8.3.1 Triggering devices and single-range systems

Smoke exhaust fans and fire protection dampers must be approved by the German Institute of Building Technology (DIBt) according to Building Rules List "B", Part 2, in conjunction with the relevant smoke detectors. Compliance with the codes is demonstrated via certification tests performed by independent testing institutes.

The smoke exhaust system is triggered by pushbuttons or automatically via smoke detection switches. The signals that activate the mechanical heat and smoke exhaust installation and move the fire protection and smoke exhaust dampers into their safety position are transmitted by a controller. The various devices cooperate to ensure a high-speed fire detection, alarm, and smoke exhaust.

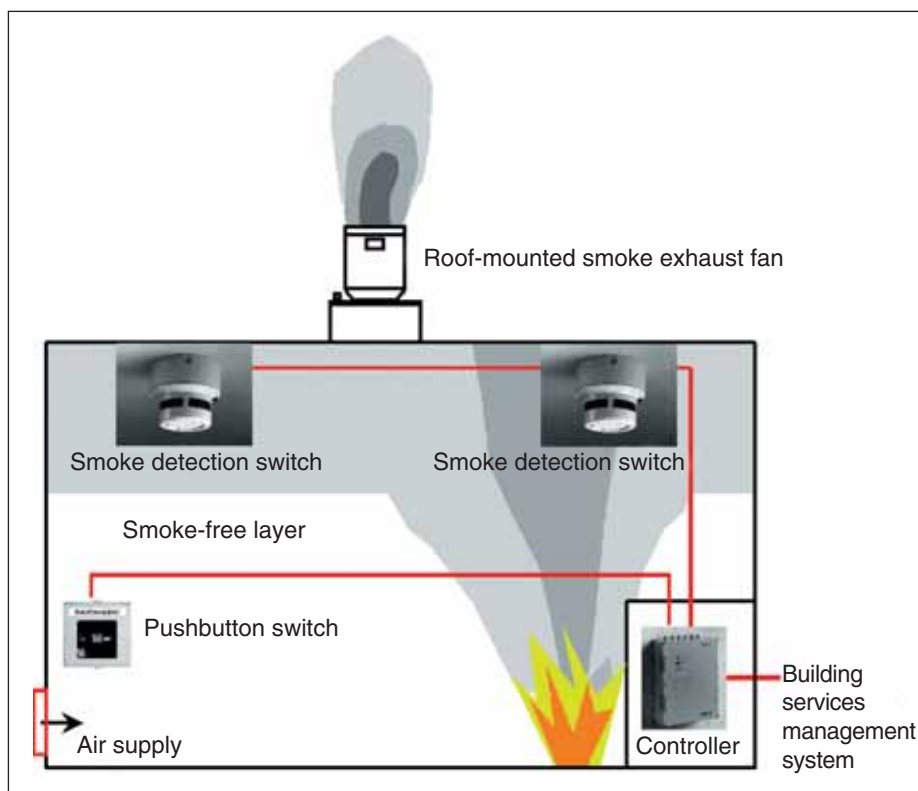
Past fire disasters have shown that an effective rescue of human beings can only be achieved through an early and effective extraction of smoke from escape and safety routes until

the arrival of fire-fighting services. To ensure the direct and immediate activation of the smoke exhaust system, smoke extraction fans must be equipped with automatic triggering devices that sense the presence of smoke (smoke detectors).

Smoke exhaust systems designed for human safety must not require manual activation, since the occupants at risk must be able to leave the building safely within the first few minutes after a fire has started. If, in the course of the planning process, the fire authorities should insist on manual activation by the fire brigade, the system no longer qualifies as a smoke exhaust installation for human safety, since experience shows that it will usually take 5 – 15 minutes for fire fighters to arrive.

The foregoing does not apply where smoke exhaust dampers form part of the smoke exhaust system. In this case the fans may be integrated with the wiring of the smoke exhaust damper and the associated triggering device, which meets the same protection objective. Still, it must be possible to start the fans manually via pushbuttons.

Obviously, all triggering devices must be approved by the building supervisory authorities. The layout and number of smoke detectors used must conform to DIN VDE 0833-1.





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SMOKE (FUME) EXHAUST FANS FUNDAMENTALS

038

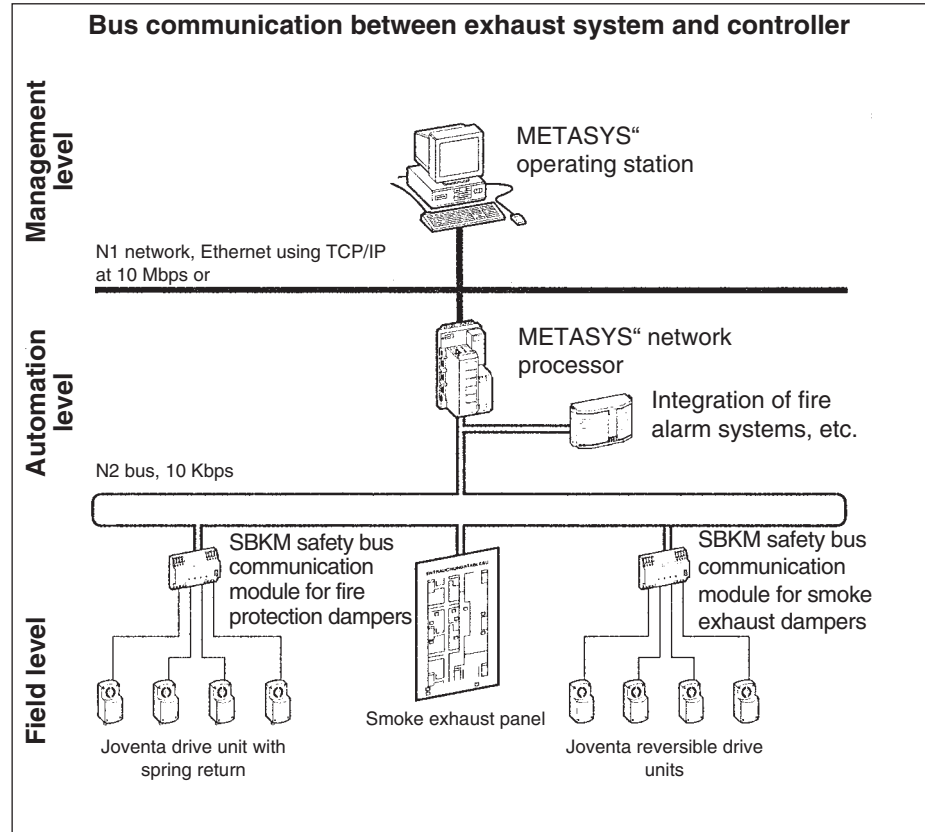
8.3.2 Control via LON bus (ICI)

The integration of all equipment such as central fire detection, emergency lighting and fire compartment doors into the building services automation structure provides an overall functionality and comprehensive control capability offering numerous benefits. On one hand, it ensures that escape and rescue routes will be kept clear of smoke for a defined interval to protect occupants and fire-fighting services. On the other, it enables a continuous documentation of all processes in conjunction with the building services automation system allowing full records of incidents for subsequent analysis. In addition, maintenance-free fire protection dampers (or dampers with extended service intervals) can be installed if the system allows these units to be periodically actuated with full performance logging. High maintenance costs can thus be effectively reduced, given that according to the "General Building Supervision Approval", conventional fire protection dampers must be serviced annually.

Considerable cost savings

Bus communication is a key advantage of digital building automation solutions. It implies considerable cost savings because of a significant reduction in installation costs. The need for traditional star-pattern wiring, with its high cabling investment (at least E30 for smoke exhaust applications), is eliminated. This is illustrated in the following example.

At the field level the bus is arranged as a ring circuit for the transmission of data and control signals, thus offering a high degree of safety. From the control module the individual actuating motors of the smoke exhaust and fire protection dampers are fed and operated via a 2-wire system (power supply plus data/control signals). The amount of cabling required and hence, the fire load, are greatly reduced. The 2-wire connections can even be interchanged during assembly. Only



Cost saving and more security are arguments in favour of N2 bus wiring in building services automation controlling a smoke extraction system.



a bus system can ensure a full closed-loop and open-loop control of the smoke extraction process without additional interfaces, with full integration into the building automation system for the entire building.



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ROOF-MOUNTING SMOKE EXHAUST FANS PRODUCT RANGE TECHNICAL DESCRIPTION

039



Characteristic curves as of page 041

BVD series

Temperature/Time category acc. to
EN 12101 - part 3:

F 400 400°C - 120 min.

F 600 620°C - 120 min.

Product range:

6 sizes

more than 100 types

Volume flow up to 51500 m³/h

additional pressure up
to appr. 1900 Pa



Characteristic curves as of page 151

BVW-D series

Temperature/Time category acc. to
EN 12101 - part 3:

F 600 600°C - 120 min.

Product range:

6 sizes

more than 35 types

Volume flow up to 48000 m³/h

additional pressure up
to appr. 2000 Pa

Technical description BVD series

Vertical outlet, casing made of corrosion-resistant aluminium. Centrifugal impeller, single intake type, made of sheet steel, dynamically balanced to DIN ISO 1940, Quality Grade G 6,3. Surface finished with powder coating.

Mounting plate made of sendzimirgalvanized sheet steel with deep-drawn bellmouth, stud-bolts for direct flange attachment of accessories.

Direct drive three-phase a. c. type IEC standard motor, type V1, ISO class H Protection class: IP54, enclosed against the flow, with separate forced-air motor cooling system. Electrically wired to exterior terminal box or maintenance switch.

Technical description BVW-D series

Direct-drive type, consisting of casing and impeller made of steel sheet, protected by an polyester powder coating, colour RAL 7030, with bellmouth, motor support plate, companion flange as per DIN 24154, Series R3, companion frame as per DIN 24193, Series R2.

Centrifugal impeller, single inlet type, aerodynamically optimized, dynamically balanced to DIN ISO 1940, quality grade G 6,3.

Three-phase a.c. motor as per IEC standard, style V1, Protection class IP 55, ISO class H

Motor enclosure:

Round sheet steel housing, cooling air supplied via cooling air inlet duct.



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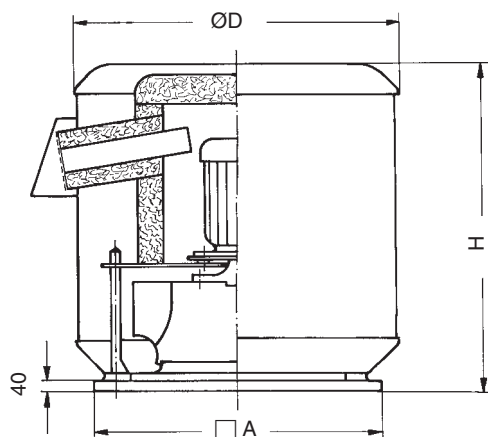
ROOF-MOUNTED SMOKE EXHAUST FANS

BVD SERIES

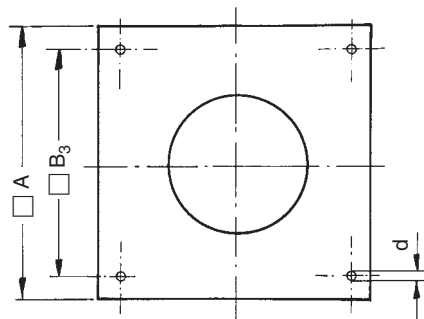
MAIN DIMENSIONS

400/620°C – 120 MIN

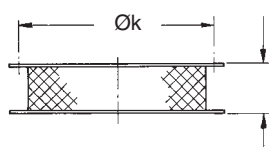
040



Base plate ¹⁾

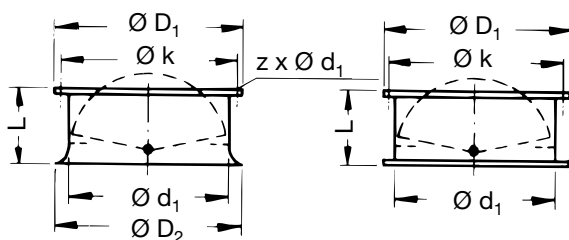


Flexible connector

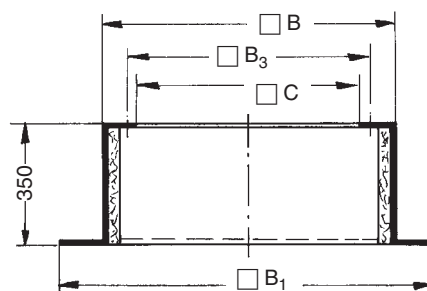


L (400°C) = 200 mm
L (620°C) = 90 mm

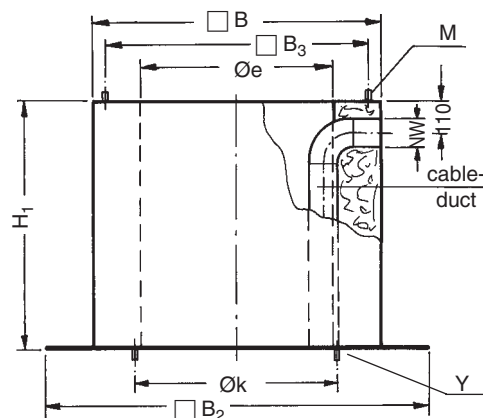
Self-activating shutoff damper
– for free inlet – for duct connection



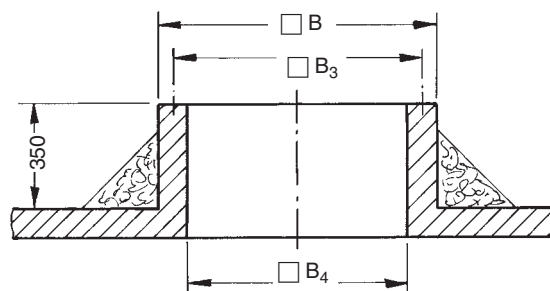
Steel flat roof base
– double shell type



SDS Noise damping base



Customer-supplied base



Size	Ø D	A	B ₃	H ²⁾	Ø D ₁	Ø D ₂	d	Stud bolt M	y	Ø d ₁	Ø k	z x Ø d ₁	L	B ₁	B	B ₄ min. - max.	C	H ₁	B ₂	Ø e	NW
315	638	560	460	695	386	369	14	12x25	8xM8	322	356	8 x 9,5	180	765	525	400 - 420	421	780	823	326	80
355	808	710	600	772	425	407	14	12x25	8xM8	360	395	8 x 9,5	180	975	675	450 - 540	565	810	981	365	80
400	808	710	600	848	468	451	14	12x25	12xM8	404	438	12 x 9,5	180	975	675	490 - 540	565	810	981	408	80
500	993	1000	880	923	571	586	18	16x25	12xM8	507	541	12 x 9,5	305	1265	965	600 - 830	850	850	1274	511	100
630	1272	1000	880	1337	712	730	18	16x25	16xM10	638	674	16 x 11,5	305	1265	965	750 - 820	850	900	1274	642	100
710	1272*	1160	1040	1337	785	798	18	16x25	16xM10	715	751	16 x 11,5	305	1425	1125	900 - 965	1000	930	1427	719	100

¹⁾ Flanges as per DIN 24 154, Series 3. An inlet wire guard can be fitted directly to the base plate or flanges.

²⁾ BVD 315/30-2 = 744 mm
* 1500 mm with 710 XL

Dimensions in mm



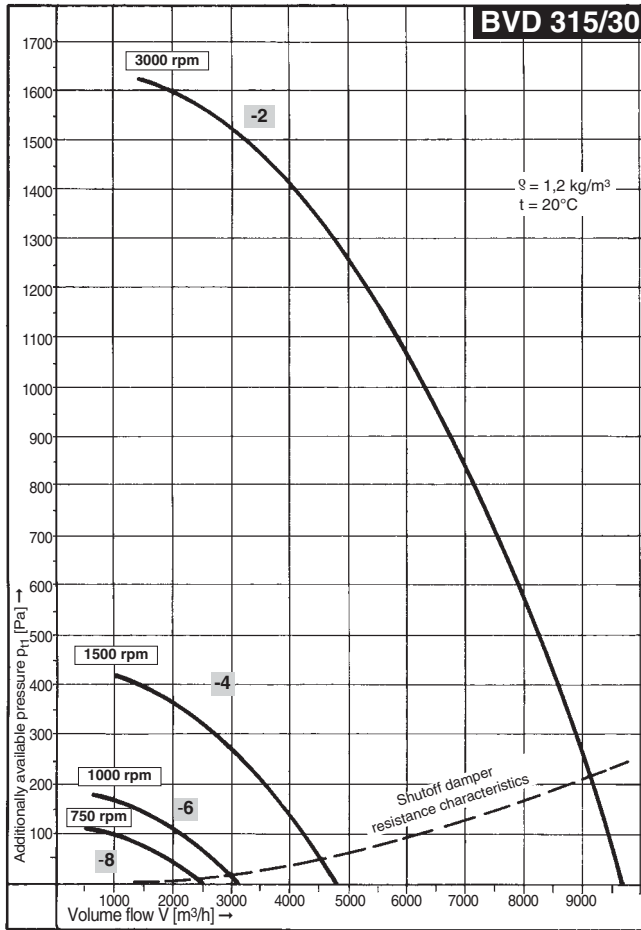
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ROOF-MOUNTED SMOKE EXHAUST FANS BVD SERIES

400/620°C – 120 MIN

041



Type	Weight approx [kg]	Speed [rpm]	Motor output [kW]	Nominal current at 400 V 50 Hz [A]	Volume flow (m³/h)	
					Free inlet without shutoff damper	Free inlet with shutoff damper
BVD 315/30-8	50	670	0,12	0,65	2500	2250
BVD 315/30-8/12	50	700/470	0,22/0,08	1,0/0,7	2500/1100	2250/1050
BVD 315/30-6	50	930	0,18	0,82	3200	2800
BVD 315/30-6/12	50	890/400	0,25/0,044	0,9/0,38	3200/1100	2800/1050
BVD 315/30-6/8	50	920/700	0,22/0,11	0,9/0,72	3200/2500	2780/2250
BVD 315/30-4	50	1380	0,55	1,4	4900	4500
BVD 315/30-4/8	50	1410/670	0,5/0,12	1,5/0,7	4900/2500	4500/2500
BVD 315/30-4/6	50	1410/920	0,55/0,18	1,45/0,8	4900/3200	4500/2800
BVD 315/30-2	70	2880	4,0	8,5	9700	9050
BVD 315/30-2/4	70	2890/1440	4,1/1,0	9,1/2,0	9700/4900	9050/4050

Acoustic levels in the room (inlet side)

Conditions: A = 173,2 m² Sabin, measuring surface S = 100 m², $L_s = 20$ dB, background noise influence $K_1 = 0$ dB, room influence $K_2 = 5,2$ dB

Speed rpm	Acoustic level ¹⁾ at V max.			Relative acoustic power level $L_{w,rel.} = L_w - \text{Table value}$ Octave center frequency [Hz]							
	L_w [dB]	L_{WA} [dB]	L_{PA} [dB]	63	125	250	500	1000	2000	4000	8000
670	75	62	47	4,6	4,3	7,6	19,2	22,3	23,6	24,2	34,6
930	81	70	55	4,5	4,6	6,3	12,4	20,1	23,5	22,4	28,6
1380	88	79	65	5,1	6,6	5,0	9,6	17,0	20,2	21,3	22,2
2880	102	97	85	6,0	8,0	9,0	4,0	12,0	15,0	18,0	19,0

Influence of the self-activating shutoff damper: +3 dB

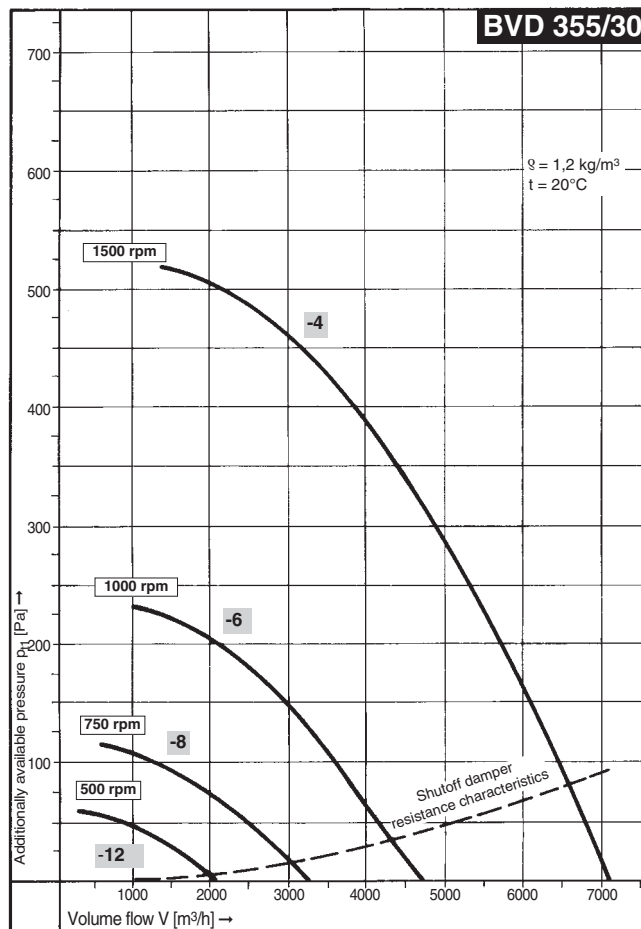
Acoustic levels above roof (outlet side)

Conditions: free field, measurement area S = 117 m², $L_s = 20,7$ dB, background noise influence $K_1 = 0$ dB, directional factor -3 dB

Speed rpm	Acoustic level ¹⁾ at V max.			Relative acoustic power level $L_{w,rel.} = L_w - \text{Table value}$ Octave center frequency [Hz]							
	L_w [dB]	L_{WA} [dB]	L_{PA} [dB]	63	125	250	500	1000	2000	4000	8000
670	74	69	43	6,4	6,6	3,7	15,9	12,7	12,3	12,4	23,5
930	80	75	50	7,6	7,4	4,1	11,0	11,7	13,0	11,7	18,7
1380	86	83	57	9,2	10,3	4,8	8,6	9,5	10,7	11,4	13,5
2880	100	98	73	13,0	8,0	10,0	7,0	10,0	9,0	11,0	13,0

Influence of the self-activating shutoff damper: +2 dB

¹⁾ L_w = Total acoustic power level L_{WA} = Total acoustic power level L_{PA} = Sound pressure level, $r = 4$ m, 0°
Acoustic levels apply to free intake at V max without shutoff damper.



Type	Weight approx [kg]	Speed [rpm]	Motor output [kW]	Nominal current at 400 V 50 Hz [A]	Volume flow (m³/h)	
					Free inlet without shutoff damper	Free inlet with shutoff damper
BVD 355/30-8	76	670	0,12	0,65	3300	3000
BVD 355/30-8/12	76	700/470	0,22/0,08	1,0/0,7	3300/2150	3000/2000
BVD 355/30-6	76	910	0,25	0,86	4750	4100
BVD 355/30-6/12	76	890/400	0,25/0,044	0,9/0,38	4750/2150	4100/2000
BVD 355/30-6/8	76	920/700	0,22/0,11	0,9/0,72	4750/3300	4100/3000
BVD 355/30-4	76	1390	1,1	2,8	7050	6550
BVD 355/30-4/8	76	1400/700	1,0/0,25	2,4/1,0	7050/3300	6550/3000
BVD 355/30-4/6	76	1430/950	1,1/0,37	2,8/1,35	7050/4750	6550/4100

Acoustic levels in the room (inlet side)

Conditions: A = 173,2 m² Sabin, measuring surface S = 100 m², $L_s = 20$ dB, background noise influence $K_1 = 0$ dB, room influence $K_2 = 5,2$ dB

Speed rpm	Acoustic level ¹⁾ at V max.			Relative acoustic power level $L_{w,rel.} = L_w - \text{Table value}$ Octave center frequency [Hz]							
	L_w [dB]	L_{WA} [dB]	L_{PA} [dB]	63	125	250	500	1000	2000	4000	8000
470	71	57	42	2,3	4,3	9,8	21,1	23,5	21,2	27,0	39,9
670	77	65	51	3,9	4,4	6,9	18,9	21,8	21,3	21,1	31,1
910	82	72	58	4,2	4,3	7,2	12,1	18,6	21,4	18,1	23,1
1390	90	82	68	5,2	6,7	5,0	9,7	16,8	19,3	19,0	17,0

Influence of the self-activating shutoff damper: +3 dB

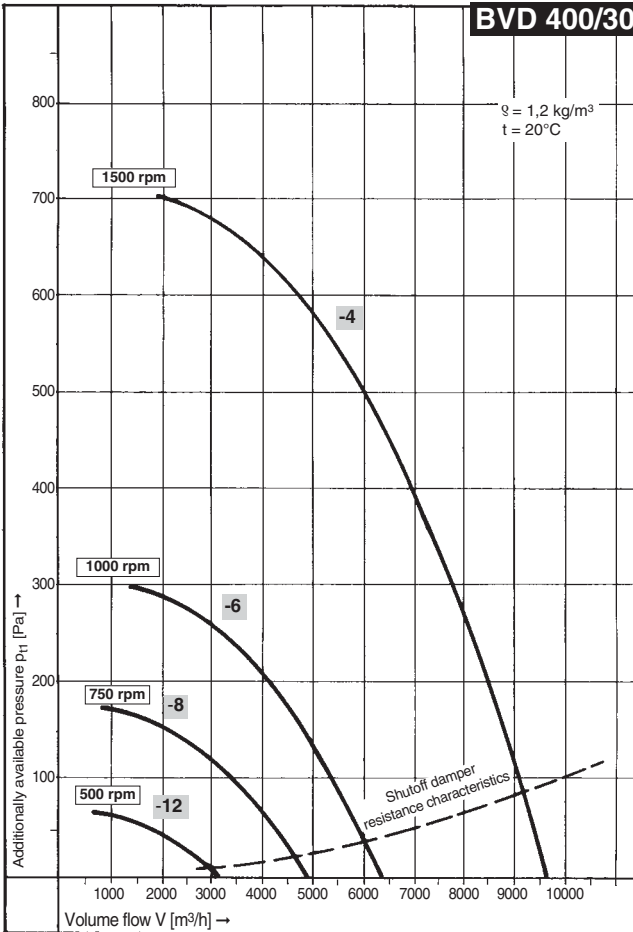
Acoustic levels above roof (outlet side)

Conditions: free field, measurement area S = 117 m², $L_s = 20,7$ dB, background noise influence $K_1 = 0$ dB, directional factor -3 dB

Speed rpm	Acoustic level ¹⁾ at V max.			Relative acoustic power level $L_{w,rel.} = L_w - \text{Table value}$ Octave center frequency [Hz]							
	L_w [dB]	L_{WA} [dB]	L_{PA} [dB]	63	125	250	500	1000	2000	4000	8000
470	69	63	38	4,5	4,9	8,6	17,4	12,1	10,4	15,0	29,1
670	76	71	46	7,5	6,8	4,3	16,4	12,1	11,9	10,4	21,5
910	82	79	53	8,8	7,0	5,6	11,0	9,9	12,9	8,0	14,5
1390	90	87	62	10,6	10,4	5,7	9,0	8,8	11,7	10,0	9,3

Influence of the self-activating shutoff damper: +2 dB

¹⁾ L_w = Total acoustic power level L_{WA} = Total acoustic power level L_{PA} = Sound pressure level, $r = 4$ m, 0°
Acoustic levels apply to free intake at V max without shutoff damper.

**TLT-Turbo GmbH**Am Weinberg 68 · D-36251 Bad Hersfeld/Germany
Phone: +49.6621.950-0 · Fax: +49.6621.950-100**ROOF-MOUNTED SMOKE EXHAUST FANS
BVD SERIES****400/620°C – 120 MIN****042****BVD 400/30**

Type	Weight approx [kg]	Speed [rpm]	Motor output [kW]	Nominal current at 400 V 50 Hz [A]	Volume flow (m³/h)	
					Free inlet without shutoff damper	Free inlet with shutoff damper
BVD 400/30-8	85	670	0,37	1,45	4900	4600
BVD 400/30-8/12	85	700/470	0,22/0,08	1,0/0,7	4900/3100	4600/2900
BVD 400/30-6	85	920	0,55	1,6	6250	6000
BVD 400/30-6/12	85	900/420	0,33/0,055	1,15/0,33	6250/3100	6000/2900
BVD 400/30-6/8	85	920/700	0,44/0,22	1,45/0,95	6250/4900	5950/4000
BVD 400/30-4	85	1410	1,5	3,5	9600	9150
BVD 400/30-4/8	85	1400/690	1,4/0,35	3,3/1,35	9600/4900	9150/4600
BVD 400/30-4/6	85	1430/960	1,6/0,6	3,9/1,8	9600/6250	9150/5950

Acoustic levels in the room (inlet side)Conditions: $A = 173,2 \text{ m}^2$ Sabin, measuring surface $S = 100 \text{ m}^2$, $L_s = 20 \text{ dB}$, background noise influence $K_1 = 0 \text{ dB}$, room influence $K_2 = 5,2 \text{ dB}$

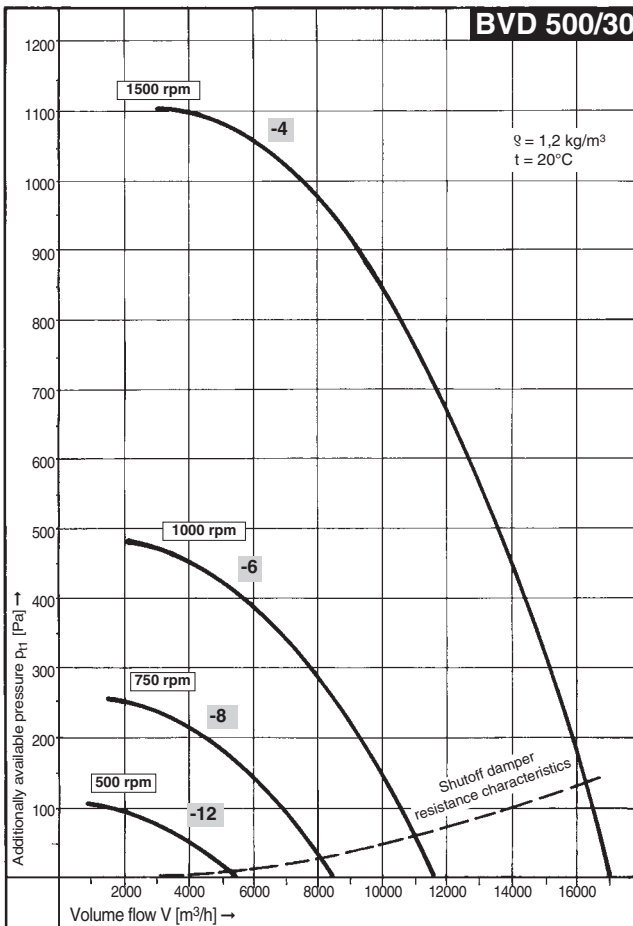
Speed rpm	Acoustic level ¹⁾ at V max.			Relative acoustic power level $L_{w \text{ rel.}} = L_w - \text{Table value}$ Octave center frequency [Hz]							
	L_w [dB]	L_{WA} [dB]	L_{PA} [dB]	63	125	250	500	1000	2000	4000	8000
470	77	64	49	3,1	5,6	8,5	20,8	23,9	20,7	24,3	38,6
670	86	75	61	4,4	4,3	7,4	18,0	20,2	22,2	18,7	27,0
920	92	83	69	5,0	4,5	6,7	10,7	18,6	21,7	18,4	21,9
1410	98	90	76	7,3	8,8	2,7	10,4	18,0	20,3	21,4	18,2

Influence of the self-activating shutoff damper: +3 dB

Acoustic levels above roof (outlet side)Conditions: free field, measurement area $S = 117 \text{ m}^2$, $L_s = 20,7 \text{ dB}$, background noise influence $K_1 = 0 \text{ dB}$, directional factor -3 dB

Speed rpm	Acoustic level ¹⁾ at V max.			Relative acoustic power level $L_{w \text{ rel.}} = L_w - \text{Table value}$ Octave center frequency [Hz]							
	L_w [dB]	L_{WA} [dB]	L_{PA} [dB]	63	125	250	500	1000	2000	4000	8000
470	73	68	43	6,9	6,4	4,4	16,5	13,1	11,2	12,9	29,0
670	82	78	52	9,1	6,6	4,9	14,4	10,6	13,7	8,5	18,1
920	89	85	60	10,9	7,1	4,5	9,6	10,1	14,6	9,5	14,3
1410	97	93	68	13,4	12,0	3,5	8,6	9,5	13,5	12,8	11,1

Influence of the self-activating shutoff damper: +2 dB

¹⁾ L_w = Total acoustic power level L_{WA} = Total acoustic power level L_{PA} = Sound pressure level, $r = 4 \text{ m}$, 0°
Acoustic levels apply to free intake at V max without shutoff damper.**BVD 500/30**

Type	Weight approx [kg]	Speed [rpm]	Motor output [kW]	Nominal current at 400 V 50 Hz [A]	Volume flow (m³/h)	
					Free inlet without shutoff damper	Free inlet with shutoff damper
BVD 500/30-8	148	690	0,75	2,2	8500	8200
BVD 500/30-8/12	148	710/470	0,55/0,18	2,5/1,18	8500/5500	8200/5300
BVD 500/30-6	148	910	1,1	3,15	11500	10900
BVD 500/30-6/12	148	910/450	1,5/0,3	3,8/1,35	11500/5500	10900/5300
BVD 500/30-6/8	148	940/710	1,3/0,66	3,3/2,3	11500/8500	10900/8200
BVD 500/30-4	160	1420	4,0	9,0	17000	16000
BVD 500/30-4/8	190	1400/700	5,5/1,4	11,4/4,3	17000/8500	16000/8200
BVD 500/30-4/6	190	1450/960	4,5/1,5	9,5/3,8	17000/11500	16000/10900

Acoustic levels in the room (inlet side)Conditions: $A = 173,2 \text{ m}^2$ Sabin, measuring surface $S = 100 \text{ m}^2$, $L_s = 20 \text{ dB}$, background noise influence $K_1 = 0 \text{ dB}$, room influence $K_2 = 5,2 \text{ dB}$

Speed rpm	Acoustic level ¹⁾ at V max.			Relative acoustic power level $L_{w \text{ rel.}} = L_w - \text{Table value}$ Octave center frequency [Hz]							
	L_w [dB]	L_{WA} [dB]	L_{PA} [dB]	63	125	250	500	1000	2000	4000	8000
470	81	66	51	2,3	5,3	8,2	21,1	24,9	29,7	34,8	40,0
690	88	76	62	4,8	4,2	6,3	12,9	21,8	26,2	31,1	36,3
950	93	83	69	5,0	3,9	8,0	10,8	19,2	22,7	27,5	32,6
1420	104	95	82	5,0	7,0	6,0	10,0	15,0	23,0	28,0	33,0

Influence of the self-activating shutoff damper: +3 dB

Acoustic levels above roof (outlet side)Conditions: free field, measurement area $S = 117 \text{ m}^2$, $L_s = 20,7 \text{ dB}$, background noise influence $K_1 = 0 \text{ dB}$, directional factor -3 dB

Speed rpm	Acoustic level ¹⁾ at V max.			Relative acoustic power level $L_{w \text{ rel.}} = L_w - \text{Table value}$ Octave center frequency [Hz]							
	L_w [dB]	L_{WA} [dB]	L_{PA} [dB]	63	125	250	500	1000	2000	4000	8000
470	78	69	45	6,8	4,9	3,7	14,8	13,8	19,6	23,8	31,2
690	86	78	54	10,5	5,6	3,2	11,3	12,4	17,8	21,9	29,2
950	92	87	62	10,7	5,6	5,5	7,3	9,9	14,4	18,3	25,2
1420	101	97	73	8,0	8,0	6,0	10,0	9,0	15,0	18,0	19,0

Influence of the self-activating shutoff damper: +2 dB

¹⁾ L_w = Total acoustic power level L_{WA} = Total acoustic power level L_{PA} = Sound pressure level, $r = 4 \text{ m}$, 0°
Acoustic levels apply to free intake at V max without shutoff damper.



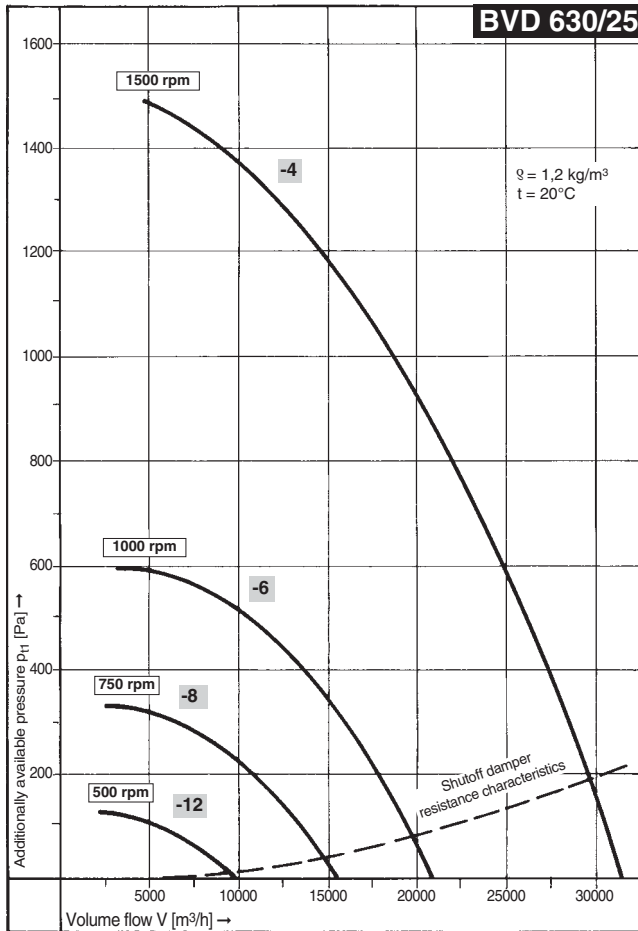
TLT-Turbo GmbH

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Phone: +49.6621.950-0 · Fax: +49.6621.950-100

ROOF-MOUNTED SMOKE EXHAUST FANS BVD SERIES

400/620°C – 120 MIN

043



Type	Weight approx [kg]	Speed [rpm]	Motor output [kW]	Nominal current at 400 V 50 Hz [A]	Volume flow (m³/h)	
					Free inlet without shutoff damper	Free inlet with shutoff damper
BVD 630/25-8	220	705	1,5	5,15	15700	14800
BVD 630/25-8/12	220	720/450	1,1/0,37	4,0/2,0	15700/10000	14800/9600
BVD 630/25-6	220	945	3,0	7,4	20800	19700
BVD 630/25-6/12	220	950/470	2,6/0,5	7,1/2,8	20800/10000	19700/9600
BVD 630/25-6/8	220	950/720	3,3/1,5	9,3/4,4	20800/15700	19700/14800
BVD 630/25-4	240	1460	9,2	20	31500	29600
BVD 630/25-4/6	295	1460/970	12/3,5	24/9,5	31500/20800	29600/19700
BVD 630/25-4/8	285	1440/720	11/3,0	24/9,5	31500/13700	29600/14800

Acoustic levels in the room (inlet side)

Conditions: $A = 173,2 \text{ m}^2$ Sabin, measuring surface $S = 100 \text{ m}^2$, $L_s = 20 \text{ dB}$, background noise influence $K_1 = 0 \text{ dB}$, room influence $K_2 = 5,2 \text{ dB}$

Speed rpm	Acoustic level ¹⁾ at V max.			Relative acoustic power level $L_{w \text{ rel.}} = L_w - \text{Table value}$ Octave center frequency [Hz]							
	L_w [dB]	L_{WA} [dB]	L_{PA} [dB]	63	125	250	500	1000	2000	4000	8000
450	84	71	57	2,5	6,4	7,9	18,7	22,0	26,7	31,8	37,0
705	91	81	68	2,5	6,2	8,1	10,7	17,7	21,8	26,7	31,8
945	96	86	73	6,5	2,7	9,4	11,0	17,1	20,2	24,9	30,0
1460	107	99	86	7,0	2,0	9,0	12,0	14,0	17,0	21,0	26,0

Influence of the self-activating shutoff damper: +3 dB

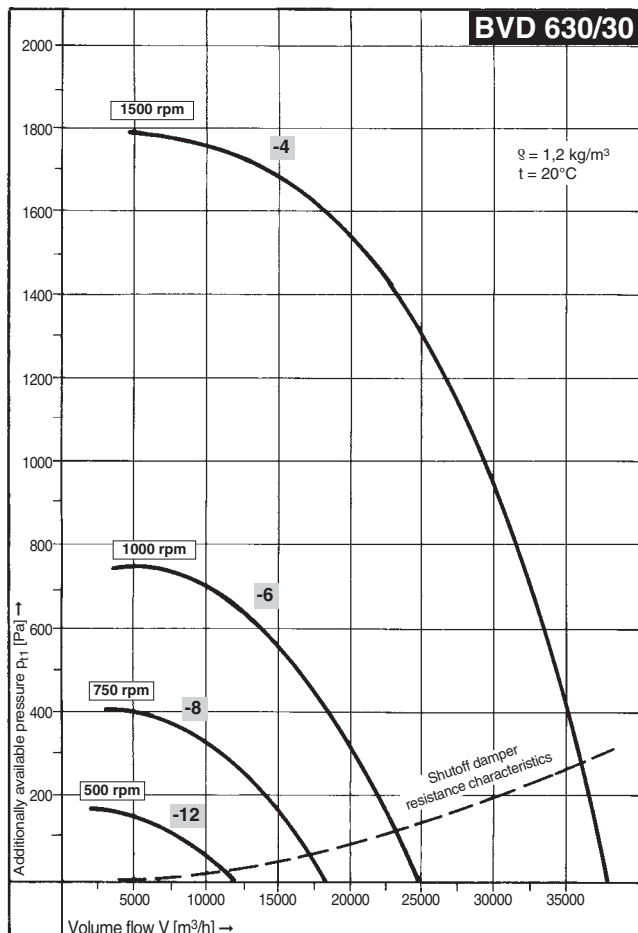
Acoustic levels above roof (outlet side)

Conditions: free field, measurement area $S = 117 \text{ m}^2$, $L_s = 20,7 \text{ dB}$, background noise influence $K_1 = 0 \text{ dB}$, directional factor -3 dB

Speed rpm	Acoustic level ¹⁾ at V max.			Relative acoustic power level $L_{w \text{ rel.}} = L_w - \text{Table value}$ Octave center frequency [Hz]							
	L_w [dB]	L_{WA} [dB]	L_{PA} [dB]	63	125	250	500	1000	2000	4000	8000
450	83	75	51	7,1	4,5	6,6	10,8	12,1	16,9	22,8	30,1
705	90	85	60	6,5	5,9	8,8	5,4	9,9	13,9	19,6	26,9
945	95	91	66	11,9	4,8	10,2	5,1	9,5	12,3	17,9	25,0
1460	107	102	77	16,0	7,0	6,0	7,0	8,0	12,0	15,0	16,0

Influence of the self-activating shutoff damper: +2 dB

¹⁾ L_w = Total acoustic power level L_{WA} = Total acoustic power level L_{PA} = Sound pressure level, $r = 4 \text{ m}$, 0°
Acoustic levels apply to free intake at V max without shutoff damper.



Type	Weight approx [kg]	Speed [rpm]	Motor output [kW]	Nominal current at 400 V 50 Hz [A]	Volume flow (m³/h)	
					Free inlet without shutoff damper	Free inlet with shutoff damper
BVD 630/30-8	240	710	2,2	5,4	18300	17400
BVD 630/30-8/12	240	720/470	2,4/0,8	6,8/3,6	18300/11800	17400/11000
BVD 630/30-6	240	945	5,5	12,7	24800	23200
BVD 630/30-6/12	240	920/460	6,3/1,5	16,6/6,1	24800/11800	23200/11100
BVD 630/30-6/8	240	970/720	4,8/2,4	11,4/6,7	24800/18300	23200/17400
BVD 630/30-4	320	1460	18,5	38	38000	36000
BVD 630/30-4/6	350	1460/980	18/6,0	36/14	38000/24800	36000/23200
BVD 630/30-4/8	350	1460/710	20/5,5	39/16,2	38000/18300	36000/17400

Acoustic levels in the room (inlet side)

Conditions: $A = 173,2 \text{ m}^2$ Sabin, measuring surface $S = 100 \text{ m}^2$, $L_s = 20 \text{ dB}$, background noise influence $K_1 = 0 \text{ dB}$, room influence $K_2 = 5,2 \text{ dB}$

Speed rpm	Acoustic level ¹⁾ at V max.			Relative acoustic power level $L_{w \text{ rel.}} = L_w - \text{Table value}$ Octave center frequency [Hz]							
	L_w [dB]	L_{WA} [dB]	L_{PA} [dB]	63	125	250	500	1000	2000	4000	8000
470	87	73	59	3,4	5,2	8,3	21,1	23,6	28,1	33,1	38,3
710	96	86	72	5,4	4,2	6,5	11,2	19,8	23,4	28,2	33,3
945	101	90	76	9,6	1,3	9,8	14,1	18,5	24,6	29,0	23,0
1460	111	104	91	6,0	7,0	3,0	10,0	13,0	17,0	21,0	26,0

Influence of the self-activating shutoff damper: +3 dB

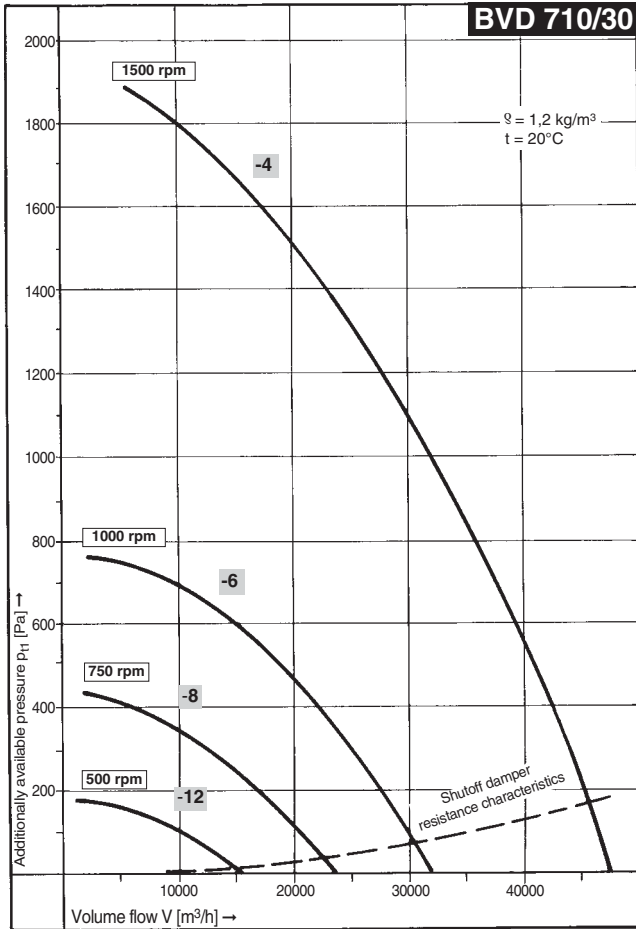
Acoustic levels above roof (outlet side)

Conditions: free field, measurement area $S = 117 \text{ m}^2$, $L_s = 20,7 \text{ dB}$, background noise influence $K_1 = 0 \text{ dB}$, directional factor -3 dB

Speed rpm	Acoustic level ¹⁾ at V max.			Relative acoustic power level $L_{w \text{ rel.}} = L_w - \text{Table value}$ Octave center frequency [Hz]							
	L_w [dB]	L_{WA} [dB]	L_{PA} [dB]	63	125	250	500	1000	2000	4000	8000
470	86	77	53	6,9	3,9	7,0	13,0	13,7	18,3	24,1	31,4
710	95	89	65	10,4	5,1	7,0	5,6	11,7	15,2	20,8	28,0
945	100	94	69	14,5	2,7	9,4	7,7	9,2	16,2	21,5	28,6
1460	110	105	82	15,0	2,0	8,0	10,0	14,0	16,0	18,0	26,0

Influence of the self-activating shutoff damper: +2 dB

¹⁾ L_w = Total acoustic power level L_{WA} = Total acoustic power level L_{PA} = Sound pressure level, $r = 4 \text{ m}$, 0°
Acoustic levels apply to free intake at V max without shutoff damper.

**TLT-Turbo GmbH**Am Weinberg 68 · D-36251 Bad Hersfeld/Germany
Phone: +49.6621.950-0 · Fax: +49.6621.950-100**ROOF-MOUNTED SMOKE EXHAUST FANS
BVD SERIES****400/620°C – 120 MIN****044**

Type	Weight approx [kg]	Speed [rpm]	Motor output [kW]	Nominal current at 400 V 50 Hz [A]	Volume flow (m³/h)	
					Free inlet without shutoff damper	Free inlet with shutoff damper
BVD 710/30-8	270	710	2,2	5,4	24000	23000
BVD 710/30-6	270	945	5,5	12,7	32000	30500
BVD 710/30-6/8	355	980/720	7,0/3,5	15,5/9,4	32000/24000	30500/23000
BVD 710/30-6/12	270	950/460	6,3/1,5	16,6/6,1	32000/16000	30500/15000
BVD 710/30-4	405	1460	18,5	38	47000	46000
BVD 710/30-4/6	460	1480/980	20/7,0	41/16,2	47000/32000	46000/30500
BVD 710/30-4/8	435	1460/710	20/5,5	39/16,2	47000/24000	46000/23000

Acoustic levels in the room (inlet side)Conditions: A = 173,2 m² Sabin, measuring surface S = 100 m², L_s = 20 dB, background noise influence K₁ = 0 dB, room influence K₂ = 5,2 dB

Speed rpm	Acoustic level ¹⁾ at V max.			Relative acoustic power level L _{w rel.} = L _w – Table value Octave center frequency [Hz]							
	L _w [dB]	L _{WA} [dB]	L _{PA} [dB]	63	125	250	500	1000	2000	4000	8000
475	89	77	64	1,6	8,2	8,7	13,9	18,4	22,8	27,8	33,0
710	97	87	74	8,0	3,0	6,0	13,0	15,5	19,0	23,8	28,9
945	102	95	82	9,3	3,8	4,2	13,8	15,0	17,3	21,8	26,8
1460	109	100	87	14,0	15,0	1,0	16,0	19,0	18,0	21,0	26,0

Influence of the self-activating shutoff damper: +3 dB

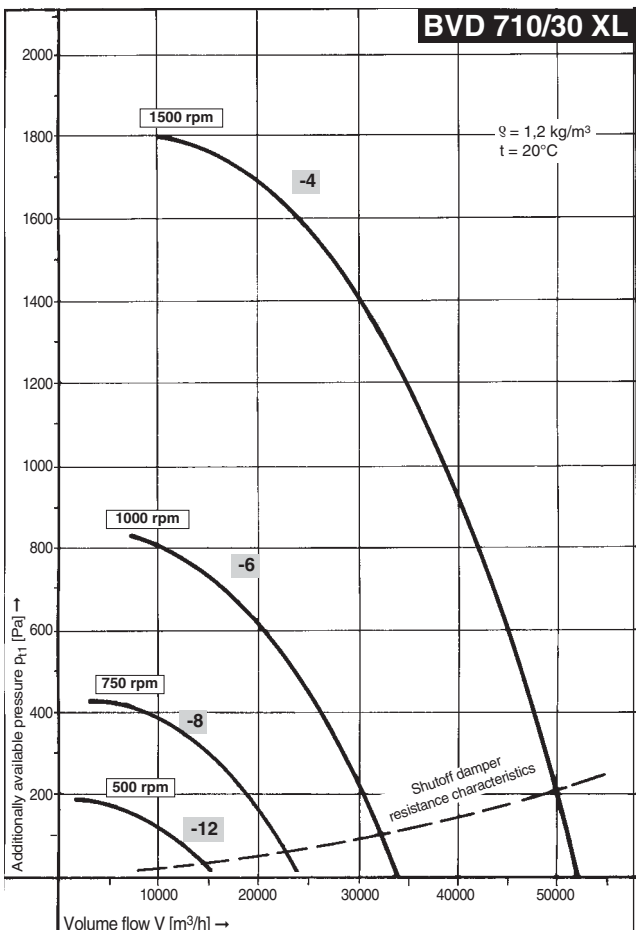
Acoustic levels above roof (outlet side)Conditions: free field, measurement area S = 117 m², L_s = 20,7 dB, background noise influence K₁ = 0 dB, directional factor -3 dB

Speed rpm	Acoustic level ¹⁾ at V max.			Relative acoustic power level L _{w rel.} = L _w – Table value Octave center frequency [Hz]							
	L _w [dB]	L _{WA} [dB]	L _{PA} [dB]	63	125	250	500	1000	2000	4000	8000
475	89	83	58	4,8	8,3	9,0	7,2	11,6	14,7	21,1	28,1
710	96	92	67	12,7	5,7	6,6	6,4	9,0	11,1	17,2	24,2
945	102	98	73	15,5	5,5	5,1	8,3	10,0	10,9	16,7	23,6
1460	108	104	79	15,0	6,0	1,0	9,0	12,0	11,0	15,0	21,0

Influence of the self-activating shutoff damper: +2 dB

¹⁾ L_w = Total acoustic power level L_{WA} = Total acoustic power level L_{PA} = Sound pressure level, r = 4 m, 0°

Acoustic levels apply to free intake at V max without shutoff damper.



Type	Weight approx [kg]	Speed [rpm]	Motor output [kW]	Nominal current at 400 V 50 Hz [A]	Volume flow (m³/h)	
					Free inlet without shutoff damper	Free inlet with shutoff damper
BVD 710/30 XL-4	420	1470	22	43	51500	50000
BVD 710/30 XL-4/6	475	1470/970	25/9,0	47/18,5	51500/33500	50000/32000
BVD 710/30 XL-4/8	420	1470/725	24/6,0	46/14,5	51500/24000	50000/23000
BVD 710/30 XL-6	315	965	7,5	15,7	33500	32000
BVD 710/30 XL-6/12	315	975/475	7,5/1,85	19/6,7	33500/16300	32000/15500

Acoustic levels in the room (inlet side)Conditions: A = 173,2 m² Sabin, measuring surface S = 100 m², L_s = 20 dB, background noise influence K₁ = 0 dB, room influence K₂ = 5,2 dB

Speed rpm	Acoustic level ¹⁾ at V max.			Relative acoustic power level L _{w rel.} = L _w – Table value Octave center frequency [Hz]							
	L _w [dB]	L _{WA} [dB]	L _{PA} [dB]	63	125	250	500	1000	2000	4000	8000
710	103	93	78	5,0	3,0	13	14	15	18	23	28
945	107	99	82	4,0	4,0	11	14	13	14	19	24
1460	116	110	91	5,0	9,0	6,0	13	13	12	15	20

Influence of the self-activating shutoff damper: +3 dB

Acoustic levels above roof (outlet side)Conditions: free field, measurement area S = 117 m², L_s = 20,7 dB, background noise influence K₁ = 0 dB, directional factor -3 dB

Speed rpm	Acoustic level ¹⁾ at V max.			Relative acoustic power level L _{w rel.} = L _w – Table value Octave center frequency [Hz]							
	L _w [dB]	L _{WA} [dB]	L _{PA} [dB]	63	125	250	500	1000	2000	4000	8000
710	100	92,4	71	6,9	2,5	10,1	11,4	11,9	15,2	20	25,1
945	105	99	76	7,2	3,1	9,6	12,1	10,9	12,7	17	22
1460	113	110	84	7,2	9,0	3,0	10	10	9,0	12	17

Influence of the self-activating shutoff damper: +2 dB

¹⁾ L_w = Total acoustic power level L_{WA} = Total acoustic power level L_{PA} = Sound pressure level, r = 4 m, 0°

Acoustic levels apply to free intake at V max without shutoff damper.

Lfd. Nr.	Qty.	Description	Unit price €	Total €																										
	or	Roof-mounted smoke exhaust fan, BVD Series for smoke extraction applications Tested to EN 12101 - Part 3 (Technical University of Munich) - max. 400°C – 120 min. with general building supervision approval Z-78.1-25. - max. 620°C – 120 min. with general building supervision approval Z-78.1-24																												
	or	Vertical outlet, direct drive three-phase a.c. type IEC standard motor, type V1, ISO class H Protection class: IP54 enclosed against the flow, with separate forced-air motor cooling system. Electrically wired to exterior terminal box maintenance switch. Mounting plate made of sendzimir-galvanized sheet steel with deep-drawn inlet nozzle, stud-bolts for direct flange attachment of accessories. Casing made of corrosion-resistant aluminium. Centrifugal impeller, single intake type, made of sheet steel, dynamically balanced to DIN ISO 1940, Quality Grade G 6,3 Impeller-surface finished with polyester powder coating, colour: RAL 7030.																												
	or	Standard three-phase motor, squirrel cage type single-speed unit with Dahlander pole-changing type pole-changing type with separate windings																												
		Specifications: <table><tr><td>Volume flow</td><td>m³/h</td></tr><tr><td>Temperature (design)</td><td>20°C</td></tr><tr><td>Temperature (max./withstand time)</td><td>°C/min</td></tr><tr><td>Additionally available pressure</td><td>Pa</td></tr><tr><td>Motor speed</td><td>rpm</td></tr><tr><td>Motor output</td><td>kW</td></tr><tr><td>Motor winding</td><td>V</td></tr><tr><td>Current consumption</td><td>A</td></tr><tr><td>Operating voltage</td><td>V</td></tr><tr><td>Frequency</td><td>Hz</td></tr><tr><td>Acoustic pressure level L_{PA}</td><td>dB</td></tr><tr><td>above roof level, r = 4 m</td><td></td></tr><tr><td>Weight</td><td>kg</td></tr></table>	Volume flow	m³/h	Temperature (design)	20°C	Temperature (max./withstand time)	°C/min	Additionally available pressure	Pa	Motor speed	rpm	Motor output	kW	Motor winding	V	Current consumption	A	Operating voltage	V	Frequency	Hz	Acoustic pressure level L _{PA}	dB	above roof level, r = 4 m		Weight	kg		
Volume flow	m³/h																													
Temperature (design)	20°C																													
Temperature (max./withstand time)	°C/min																													
Additionally available pressure	Pa																													
Motor speed	rpm																													
Motor output	kW																													
Motor winding	V																													
Current consumption	A																													
Operating voltage	V																													
Frequency	Hz																													
Acoustic pressure level L _{PA}	dB																													
above roof level, r = 4 m																														
Weight	kg																													
		Manufacturer: TLT-Turbo GmbH																												
		Type: BVD																												
		Carryover																												

Item No.	Qty.	Description	Unit price €	Total €
		Accessory equipment Surface protection • Polyester powder coating (standard colour: RAL 7030) • Wire guard on inlet side (with free inlet configurations) • Wire guard on outlet side • Self-activating shutoff damper for free inlet systems, with nozzle shaped inlet and mounting flange • Self-activating shutoff damper for duct connection, with connecting flanges on both ends • Flexible connector made of temperature-resistant compensator fabric, with connecting flanges on both ends. • Matching flange • Steel flat roof base made of sendzimir-galvanized sheet steel, with interior insulation - for flat roofs - for inclined roofs, ___° gradient • Steel flat roof base made of sendzimir-galvanized sheet steel, double-shell design, with building supervision approval - for flat roofs - for inclined roofs, ___° gradient • Outlet attenuator SDI, with vertical air outlet Consisting of the interior core made of galvanized perforated sheet, integrated into the fan housing and the non-inflammable insulation material covered with a layer of non-woven glass fiber Tested to EN 12101-part 3 Silencing: appr. 5 to 7 dB • Silencing base SDS for inlet-side silencing, consisting of the base construction with roof integration flange made of sendzimir-galvanized sheet steel and the duct-attenuator with galvanized perforated sheet cover. For easy wiring the base is equipped with an integrated cable duct. Tested to EN 12101-part 3 - for flat roofs - for inclined roofs, ___° gradient • Additional surface protection: - Acoustic silencing hood - Acoustic silencing base Note: Please observe our Installation, Operating and Maintenance Instructions (available upon request).		



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AXIAL SMOKE EXHAUST FANS PRODUCT RANGE TECHNICAL DESCRIPTION

047



Characteristic curves as of page 054

BVAXO series

Temperature/Time category acc.
EN 12101 - part 3:

F 200 200°C - 120 min.

F 300 300°C - 120 min.

Appropriate for installation in- and
outside of fire-zone.

Product range:

6 sizes
ranging from 400 to 1120 mm diam.
Volume flow up to 100 000 m³/h
total pressure increase
up to appr. 900 Pa

Technical description BVAXO series

Consisting of Casing of welded sheet steel construction with drilled flanges according to DIN 24 154, Series 3, hub and blades made of cast-aluminium, non-adjustable, directly mounted on shaft end of special motor placed within the smoke fume flow, type B3, protection classe IP 54, wired to exterior temperature-resistant terminal box.

Airflow direction: motor in outlet, direct-drive type

Surface protection:

- Polyester powder coating, colour: RAL 7030
- as of nominal size 1120: with full paint finish, colour: RAL 7030

Also available with acoustic and thermal insulation.



Characteristic curves as of page 078

BVAXN 12/56 series

Temperature/Time category acc.
EN 12101 - part 3:

F 200 200°C - 120 min.

F 300 300°C - 120 min.

F 400 400°C - 120 min.

Appropriate for installation in- and
outside of fire-zone.

Product range:

14 sizes
ranging from 355 to 1600 mm diam.
Volume flow up to 250 000 m³/h
total pressure increase
up to appr. 2 500 Pa

Technical description BVAXN 12/56 series

Casing of welded sheet steel construction with drilled flanges according to DIN 24 154, Series 3; Outlet guide vanes for boosting outlet pressure and achieving an essentially swirl-free outlet flow; aluminium impeller, blade pitch steplessly adjustable when fan is at rest¹, directly mounted on motor shaft end. Special motor placed within the smoke fume flow, wired to exterior temperature-resistant terminal box. Airflow direction: motor in outlet, direct-drive type.

Surface protection:

- Polyester powder coating, colour: RAL 7030
- as of nominal size 1400: with full paint finish, colour: RAL 7030

Also available with acoustic and thermal insulation.



Characteristic curves as of page 101

BVAXN 8/56 series

Temperature/Time category acc.
EN 12101 - part 3:

F 600 600°C - 120 min.

Appropriate for installation inside of
fire-zone (cooling-system to be
provided by customer)

Product range:

10 sizes
ranging from 500 to 1600 mm diam.
Volume flow up to 180 000 m³/h
total pressure increase
up to appr. 1 400 Pa

Technical description BVAXN 8/56-series

Casing of welded sheet steel construction with drilled flanges according to DIN 24 154, Series 3; Outlet guide vanes for boosting outlet pressure and achieving an essentially swirl-free outlet flow; impeller made of sheet steel, non-adjustable blades, directly mounted on motor shaft end. Motor enclosed and insulated, arranged in the inner casing. Airflow direction: motor in outlet, direct-drive type.

Standard surface protection:

- 2-component polyacrylate coating, colour: RAL 7030.

¹ Blades of 400°C/120 min. version are non-adjustable.



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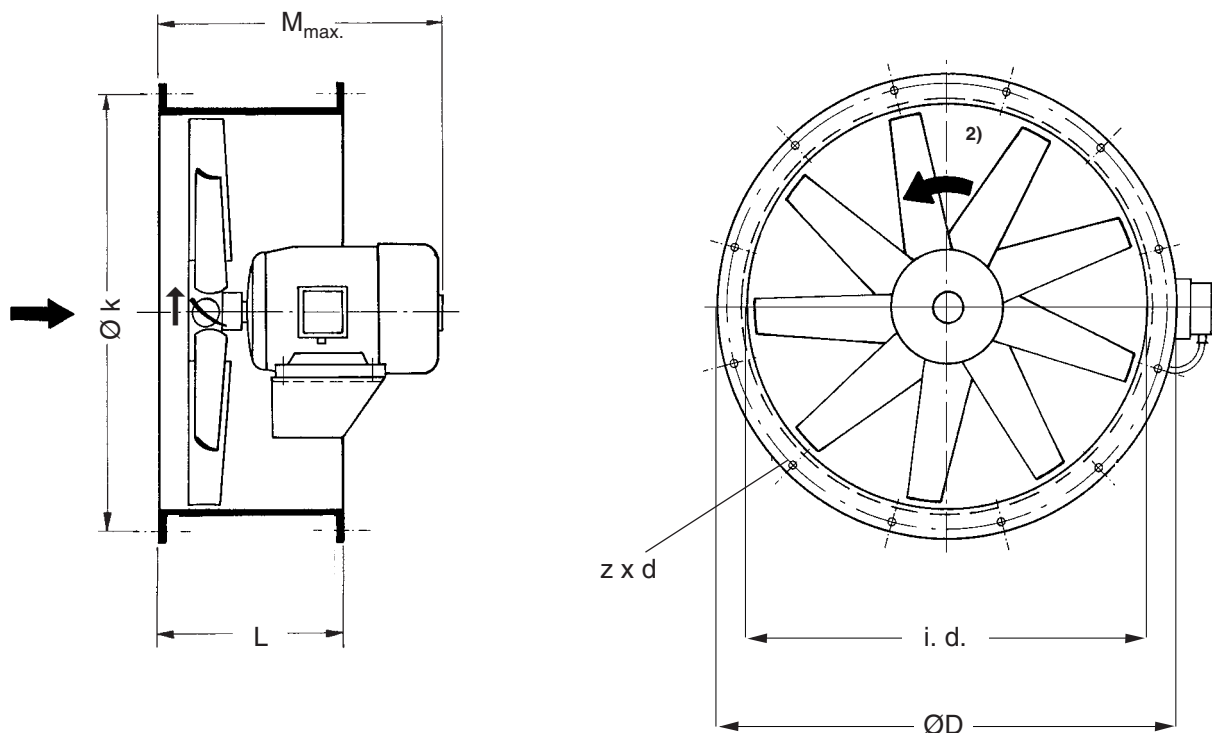
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AXIAL SMOKE EXHAUST FANS BVAXO SERIES MAIN DIMENSIONS

200/300°C - 120 MIN

048

Important! This fan series is available only with the motor outputs stated in our price lists.



No cooling fan required.

Size ¹⁾	i. d.	Ø k	Ø D	z x d	L	M _{max.}	Weight [kg] (without motor)	Motor sizes / Shaft Dia. Type B3					
400	401	438	468	12 x 9,5	188	455	11/16*	90/24	100/28*				
500	504	541	571	12 x 9,5	225	570	19/26*	90/24	100/28	112/28*	132/38*		
630	634	674	712	16 x 11,5	286	450	27	90/24	100/28	112/28	132/38		
800	797	837	875	24 x 11,5	350	575	38	90/24	100/28	112/28	132/38		
1000	1003	1043	1081	24 x 11,5	415	805	80	112/28	132/38	160/42	180/48		
1120	1124	1174	1214	24 x 11,5	450	825	110	132/38	160/42	180/48	200/55		

¹⁾ For vibration-damped installation an extension casing will be required with certain fan sizes.

* Possible with extension casing only

²⁾ available as "turning-anti-clockwise" (seen in airflow-direction) only

Dimensions in mm

Dimensional and design changes reserved.



TLT-Turbo GmbH

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AXIAL SMOKE EXHAUST FANS BVAXO SERIES ACCESSORIES*

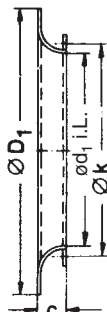
200/300°C - 120 MIN

049

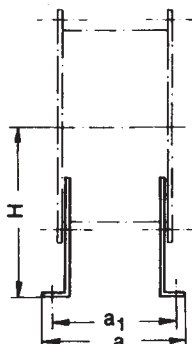
Wire guard,
inlet side



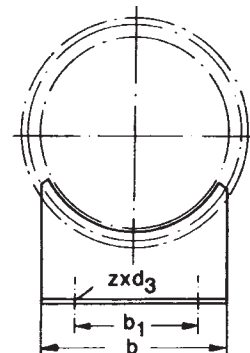
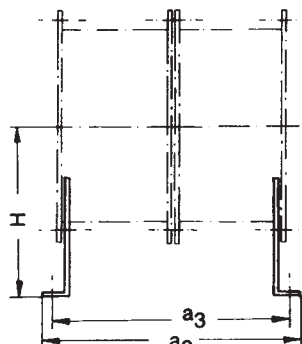
Bellmouth inlet,
with flange



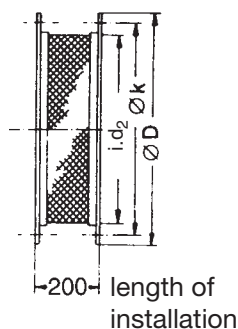
Mounting feet



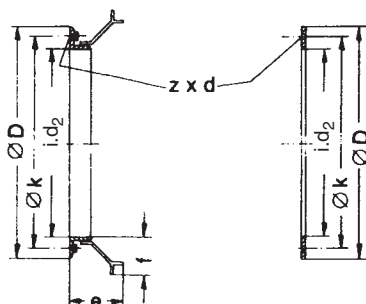
Mounting feet
for fans with extension casing or R1 types



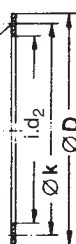
Flexible connector



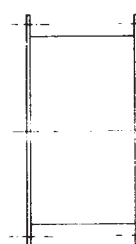
Angular
wall ring



Matching flange

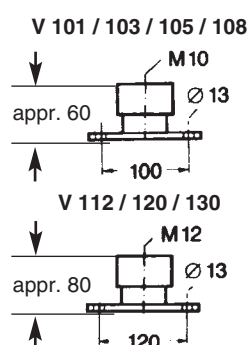


Extension casing



(same dimensions as
fan type M-D)

Spring-type
AV mounts ²⁾



Please mount Flexible Connector correctly and watch installation length.

Size	ØD ₁	i.d ₁	c	H	a	a ₁	a ₂	a ₃	b	b ₁	z x d ₃	i.d ₂	Øk	ØD	z x d ¹⁾	e	f
400	562	403	78	300	248	218	436	406	370	300	5 x 9,5	403	438	468	12 x 9,5	80	50
500	708	509	98	375	285	255	510	480	460	380	5 x 9,5	506	541	571	12 x 9,5	80	50
630	875	640	95	470	361	321	647	607	550	470	5 x 11,5	637	674	712	16 x 11,5	100	70
800	1081	801	115	585	425	385	775	735	730	640	5 x 11,5	800	837	875	24 x 11,5	100	70
1000	1351	1009	145	730	512	466	927	881	830	740	5 x 14	1006	1043	1081	24 x 11,5	100	70
1120	1470	1130	160	760	547	501	997	951	920	820	5 x 14	1133	1174	1214	24 x 11,5	110	90

¹⁾ Connecting dimensions in accordance with DIN 24 154 – Series 3

²⁾ Height under load will be communicated upon specification (value is calculated individually for each purchase order).

* all accessories, except duct feet and duct extension, are packed separately

Dimensions in mm

Dimensional and design changes reserved.



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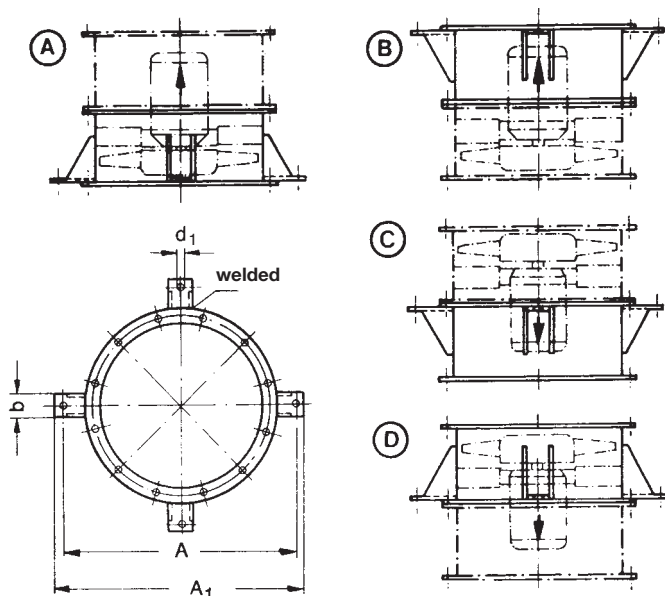
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AXIAL SMOKE EXHAUST FANS BVAXO SERIES ACCESSORIES

200/300°C – 120 MIN

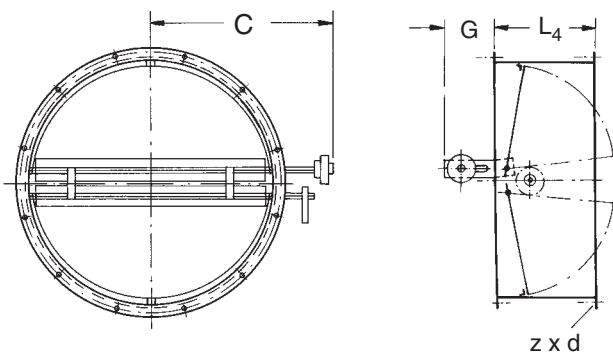
050

Brackets for vertical installation

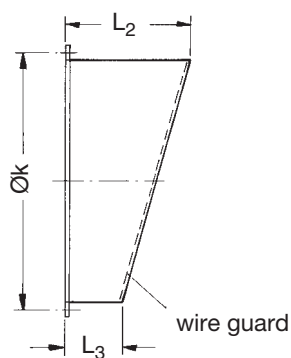


Please refer to pages 065 to 067 regarding acoustic and thermal insulation for BVAXO series.

Duct with self-activating damper



Outlet cone with wire guard



Size	A □	A ₁ □	b	d ₁	i.d.	Ø k	Ø D	z x d ¹⁾	i.d ₂	Ø d ₃	Ø k ₂	Ø D ₂	z x d ₂	L ₁	L ₂	L ₃	L ₄	C	G
400	554	602	68	12	—	438	—	12 x 9,5	—	—	—	—	—	—	280	60	188	280	40
500	657	705	68	12	504	541	571	12 x 9,5	634	282	674	712	16 x 11,5	600	280	60	225	390	200
630	852	900	90	14	634	674	712	16 x 11,5	797	355	837	875	24 x 11,5	750	330	70	286	465	200
800	1015	1063	90	14	797	837	875	24 x 11,5	1003	446	1043	1081	24 x 11,5	950	520	200	350	550	200
1000	1221	1269	90	14	1003	1043	1081	24 x 11,5	1261	562	1311	1391	24 x 11,5	1200	640	240	415	690	200
1120	1374	1434	100	18	1124	1174	1254	24 x 11,5	1415	630	1465	1545	24 x 11,5	1340	730	250	450	820	300

¹⁾ Connecting dimensions in accordance with DIN 24 154 – Series 3

Dimensions in mm

Dimensional and design changes reserved.



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AXIAL SMOKE EXHAUST FANS BVAXO SERIES ACOUSTIC DATA

051

Acoustic level

The total acoustic power level $L_{W,vent.}$ (in dB) of an axial smoke exhaust fan can be obtained directly from the characteristic data sheets for each operating point.

Starting from this value, the A-weighted acoustic power level L_{WA} and the relative acoustic power level $L_{Wrel.}$ can be determined using the tables below. These values are available as the acoustic power emitted into the duct and as the acoustic power emitted from the fan inlet or outlet opening.

ning, respectively. The values given were taken from measurements as per EN 25136 (formerly DIN 45 635, Part 9) duct testing method.

1. Acousting power level emitted into the duct

The level of acoustic power an axial smoke exhaust fan emits into the ducting is used for calculating the sound power characteristics of downstream systems, e.g., silencers.

The levels are calculated as follows:

$L_{W,vent.}$ [dB] = total acoustic power emitted by the fan,
(please see respective characteristic curve sheets)

$L_{WA,vent.}$ [dB] = A-weighted acoustic power level, according to the equation

$L_{WA,vent.}$ = $L_{W,vent.} - \text{portion 1.1 [dB]}$

$L_{Wrel,vent.}$ [dB] = relative acoustic power level as expressed by the equation

$L_{Wrel,vent.}$ = $L_{W,vent.} - \text{portion 1.2 [dB]}$

2. Acoustic power emitted from the fan inlet or outlet opening

To determine the sound levels at a given installation site, it is usually necessary to know the level of acoustic power emitted from the fan's inlet or outlet opening. The adjacent tables are based on the outlet reflection pattern assumed in VDI 2081, Case 2.

$L_{WA,op.}$ [dB] = A-weighted level of acoustic power emitted from the fan's opening, expressed by the equation

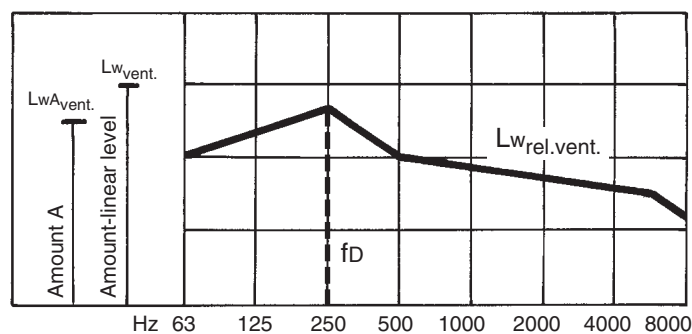
$L_{WA,op.}$ = $L_{W,vent.} - \text{portion 2.1 [dB]}$

$L_{Wrel,op.}$ = relative level of acoustic power emitted from the fan's opening, expressed by the equation

$L_{Wrel,op.}$ = $L_{W,vent.} - \text{portion 2.2 [dB]}$

Blade frequency of the fan is calculated from the number of blades z and the fan speed n [rpm].

$$f_D = \frac{z \cdot n}{60} \text{ [s}^{-1}\text{]}$$



Axial Smoke Exhaust Fan BVAXO (without guide vanes)

$f_D = \frac{z \cdot n}{60}$	Portion 1.1	Portion 1.2 at mid-octave frequency [Hz]							
		63	125	250	500	1000	2000	4000	8000
500	4	12	9	7	5	11	12	14	15
250	6	9	7	4	10	12	13	15	17
125	7	6	4	10	11	13	14	16	21
63	8	2	8	10	11	13	15	19	24
31,5	8	6	8	9	11	13	17	21	26

Size*	$f_D = \frac{z \cdot n}{60}$	Portion 2.1	Portion 2.2 at mid-octave frequency [Hz]							
			63	125	250	500	1000	2000	4000	8000
315	500	4	24	17	11	6	11	12	14	15
	250	6	21	15	8	12	12	13	15	17
	125	8	18	12	14	13	13	14	16	21
400	500	4	22	16	10	5	11	12	14	15
	250	6	20	13	7	11	12	13	15	17
	125	7	17	10	13	12	13	14	16	21
	63	8	13	15	13	12	13	15	19	24
500	500	4	21	14	9	5	11	12	14	15
	250	6	18	12	6	11	12	13	15	17
	125	7	15	9	11	11	13	14	16	21
	63	8	12	13	12	12	13	15	19	24
630	500	4	20	13	8	5	11	12	14	15
	250	6	17	11	6	10	12	13	15	17
	125	7	14	8	11	11	13	14	16	21
	63	8	10	12	11	11	13	15	19	24
800	500	4	18	12	8	5	11	12	14	15
	250	6	15	10	5	10	12	13	15	17
	125	7	12	7	10	11	13	14	16	21
	63	8	9	11	11	11	13	15	19	24
1000	250	6	14	9	5	10	12	13	15	17
	125	7	11	6	10	11	13	14	16	21
	63	8	8	10	10	11	13	15	19	24

*Intermediate values to be obtained by interpolation.

Note:
Portions 1.1 / 1.2 / 2.1 / 2.2 to be taken from the above spreadsheets.

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TECHNICAL LISTS (AVAILABLE MODELS)
BVAXO 200°C - 120 MIN SERIES****052**

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ①	Size	Type	

400	1500		1,1	2,8	90	B3	5
	3000		1,5	3,25	90	B3	5
			2,2	4,6	90	B3	5
			3,0	6,7	100	B3	5
	3000/1500		1,5/0,37	3,7/1,0	90	B3	5
			2,2/0,48	4,6/1,15	90	B3	5
			3,0/0,75	6,7/1,7	100	B3	5

500	1500		1,1	2,8	90	B3	5
	3000		3,0	6,7	100	B3	5
			4,0	8,3	112	B3	5
			5,5	11	132	B3	9
			7,5	14,6	132	B3	9
			11	20,5	132	B3	9
	1500/750		1,0/0,25	2,4/1,0	90	B3	5
	1500/1000		1,1/0,37	2,8/1,35	90	B3	5
	3000/1500		4,1/1,0	8,8/2,1	112	B3	5
			7,8/2,0	16,2/4,1	132	B3	9

630	1000		0,75	2,2	90	B3	9
			1,1	3,15	90	B3	9
	1500		1,1	2,8	90	B3	9
			1,5	3,5	90	B3	9
			2,2	5,5	100	B3	9
			3,0	7,1	100	B3	9
	1500/750		1,0/0,25	2,4/1,0	90	B3	9
			1,4/0,35	3,3/1,35	90	B3	9
			2,5/0,6	5,6/2,2	100	B3	9
	1500/1000		1,1/0,37	2,8/1,35	90	B3	9
			2,2/0,75	5,3/2,3	100	B3	9
			3,0/1,0	6,3/3,0	112	B3	9

800	1000		1,5	3,9	100	B3	9
			2,2	5,4	112	B3	9
	1500		4,0	8,6	112	B3	9
			5,5	11,4	132	B3	9
			7,5	15,4	132	B3	9
	1500/750		3,8/1,0	8,1/3,4	112	B3	9
			5,5/1,4	11,4/4,3	132	B3	9
			7,0/1,7	15,2/5,1	132	B3	9

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ①	Size	Type	

1000	1000		3,0	7,4	132	B3	9
			4,0	9,2	132	B3	9
			5,5	12,7	132	B3	9
			7,5	15,7	160	B3	9
	1500		7,5	15,4	132	B3	9
			11	22	160	B3	12
			15	29,5	160	B3	12
			18,5	36	180	B3	12
			22	43	180	B3	12
			30	52	200	B3	12
	1500/750		5,5/1,4	11,4/4,3	132	B3	9
			7,0/1,7	15,2/5,1	132	B3	9
			11/3,0	24/9,5	160	B3	12
			14/3,5	30,5/11,4	160	B3	12
			20/5,5	39/16,2	180	B3	12
			28/7,0	52/16,2	180	B3	12

1120	1000		5,5	12,7	132	B3	12
			7,5	15,7	160	B3	12
			11	22	160	B3	12
			15	29,5	180	B3	12
	1500		11	22	160	B3	12
			15	29,5	160	B3	12
			18,5	36	180	B3	12
			22	43	180	B3	12
			30	52	200	B3	12
			37	68	200	B3	12
	1500/750		11/3,0	24/9,5	160	B3	12
			16/4,0	32,5/11,9	180	B3	12
			20/5,5	39/16,2	180	B3	12
			24/6,0	46/14,5	200	B3	12
			28/7,0	52/16,2	200	B3	12
			36/9,0	78/24	200	B3	12

① Nominal current = appr. values for 400 V motors, brand EMOD.
It is important to check nominal current in case of other motor brands.

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TECHNICAL LISTS (AVAILABLE MODELS)
BVAXO 300°C - 120 MIN SERIES****053**

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	

400	1500		1,1	2,8	90	B3	5
	3000		1,5	3,25	90	B3	5
			2,2	4,6	90	B3	5
			3,0	6,7	100	B3	5
	3000/1500		1,5/0,37	3,7/1,0	90	B3	5
			2,2/0,48	4,6/1,15	90	B3	5
			3,0/0,75	6,7/1,7	100	B3	5

500	1500		1,1	2,8	90	B3	5
	3000		3,0	6,7	100	B3	5
			4,0	8,3	112	B3	5
			5,5	11	132	B3	9
			7,5	14,6	132	B3	9
			11	20,5	132	B3	9
	1500/750		1,0/2,5	2,4/1,0	90	B3	5
	1500/1000		1,1/0,37	2,8/1,35	90	B3	5
	3000/1500		4,1/1,0	8,8/2,1	112	B3	5
			7,8/2,0	16,2/4,1	132	B3	9

630	1000		0,75	2,2	90	B3	9
			1,1	3,15	90	B3	9
	1500		1,1	2,8	90	B3	9
			1,5	3,5	90	B3	9
			2,2	5,5	100	B3	9
			3,0	7,1	100	B3	9
	1500/750		1,0/0,25	2,4/1,0	90	B3	9
			1,4/0,35	3,3/1,35	90	B3	9
			2,5/0,6	5,6/2,2	100	B3	9
	1500/1000		1,1/0,37	2,8/1,35	90	B3	9
			2,2/0,75	5,3/2,3	100	B3	9
			3,0/1,0	6,3/3,0	112	B3	9

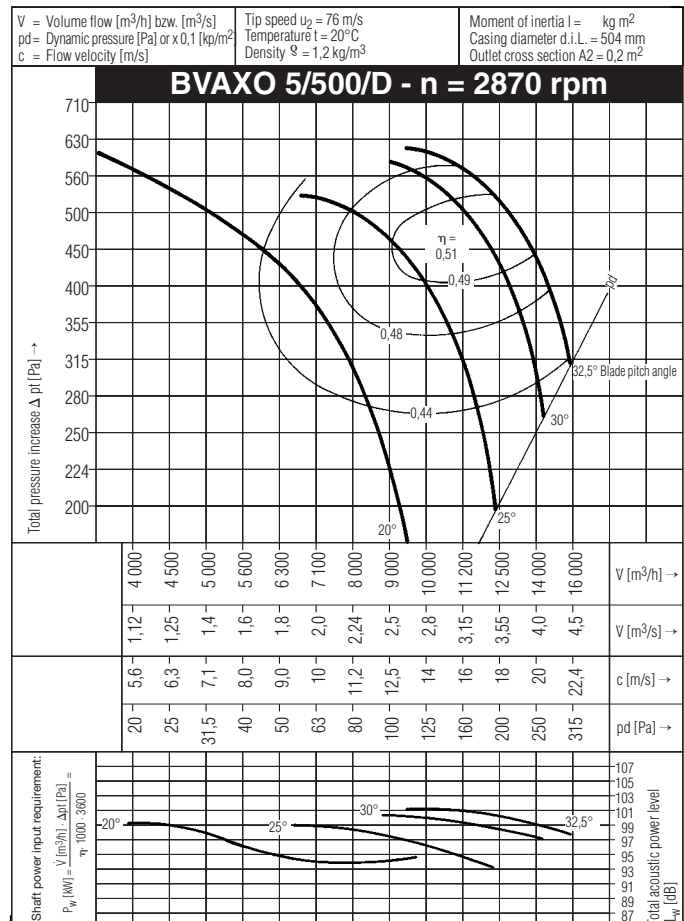
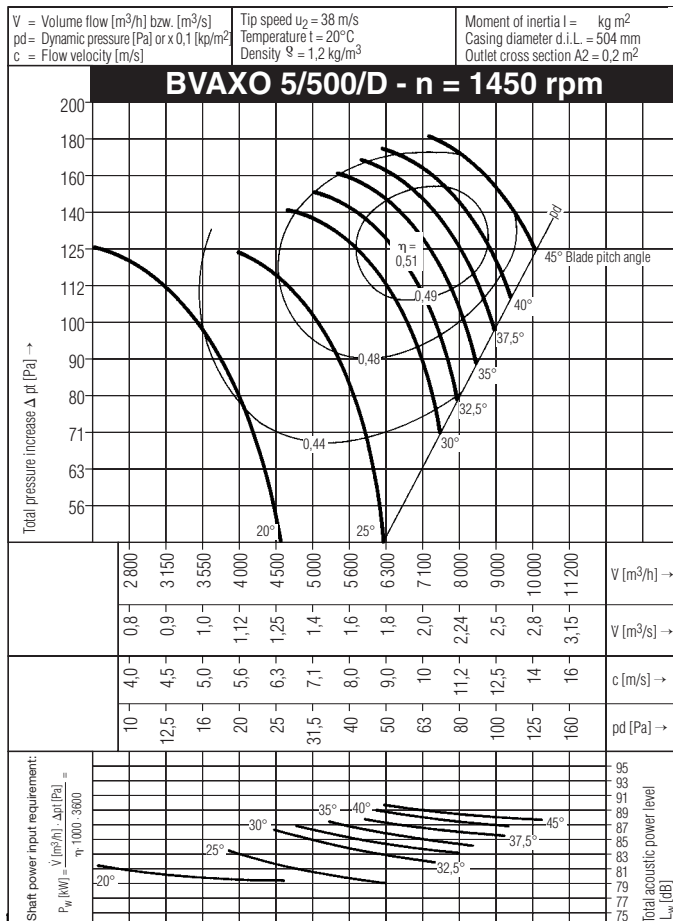
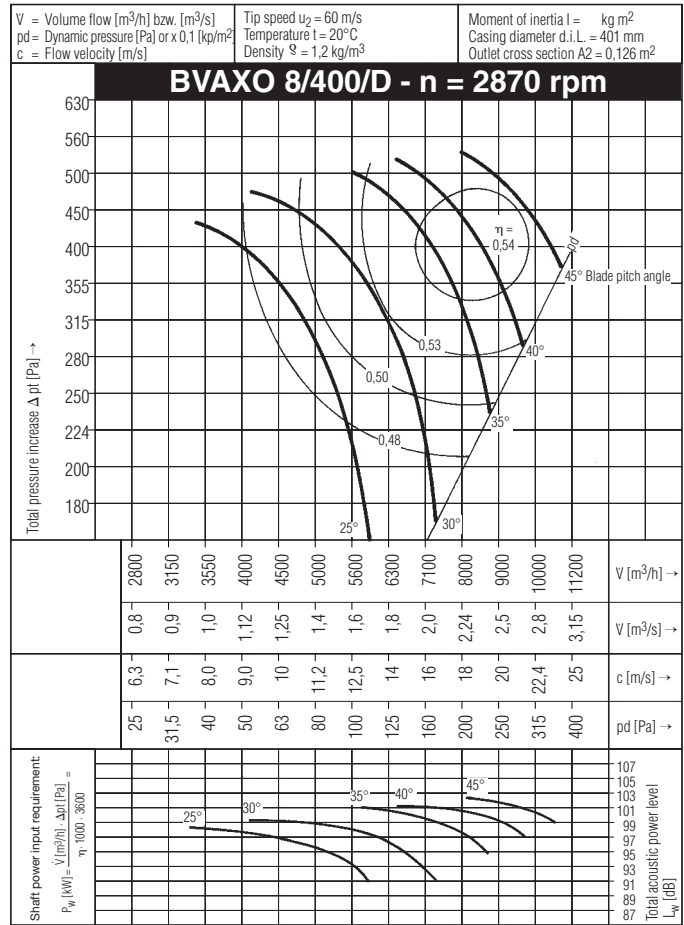
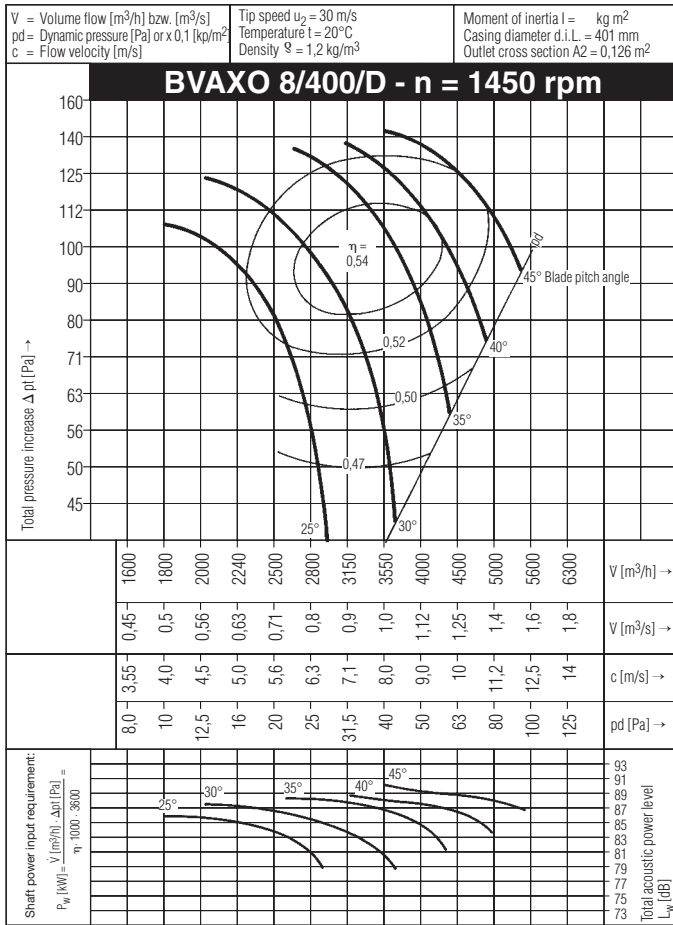
800	1000		1,5	3,9	100	B3	9
			2,2	5,4	112	B3	9
	1500		4,0	8,6	112	B3	9
			5,5	11,4	132	B3	9
			7,5	15,4	132	B3	9
	1500/750		3,8/1,0	8,1/3,4	112	B3	9
			5,5/1,4	11,4/4,3	132	B3	9
			7,0/1,7	15,2/5,1	132	B3	9

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed		Output [kW]	Nominal current [A] ❶	Size	Type	

1000	1000		3,0	7,4	132	B3	9
			4,0	9,2	132	B3	9
			5,5	12,7	132	B3	9
			7,5	15,7	160	B3	9
			11	22	160	B3	12
	1500		7,5	15,4	132	B3	9
			15	29,5	160	B3	12
			18,5	36	180	B3	12
			22	43	180	B3	12
			30	52	200	B3	12
			5,5/1,4	11,4/4,3	132	B3	9
			7,0/1,7	15,2/5,1	132	B3	9
			11/3,0	24/9,5	160	B3	12
			14/3,5	30,5/11,4	160	B3	12
			20/5,5	39/16,2	180	B3	12
			28/7,0	52/16,2	180	B3	12

1120	1000		5,5	12,7	132	B3	12
			7,5	15,7	160	B3	12
			11	22	160	B3	12
			15	29,5	180	B3	12
	1500		11	22	160	B3	12
			15	29,5	160	B3	12
			18,5	36	180	B3	12
			22	43	180	B3	12
			30	52	200	B3	12
			37	68	200	B3	12
			11/3,0	24/9,5	160	B3	12
			16/4,0	32,5/11,9	180	B3	12
			20/5,5	39/16,2	180	B3	12
			24/6,0	46/14,5	200	B3	12
			28/7,0	52/16,2	200	B3	12
	1500/750		36/9,0	78/24	200	B3	12

❶ Nominal current = appr. values for 400 V motors, brand EMOD.
It is important to check nominal current in case of other motor brands.

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DIRECT DRIVE WITHOUT GUIDE VANES
SERIES BVAXO****200/300°C - 120 MIN**These fans are available with the indicated blade pitch only.
Subsequent pitch variations are not possible.**054**

* rounded to standard values

For maximum motor sizes please see dimension pages



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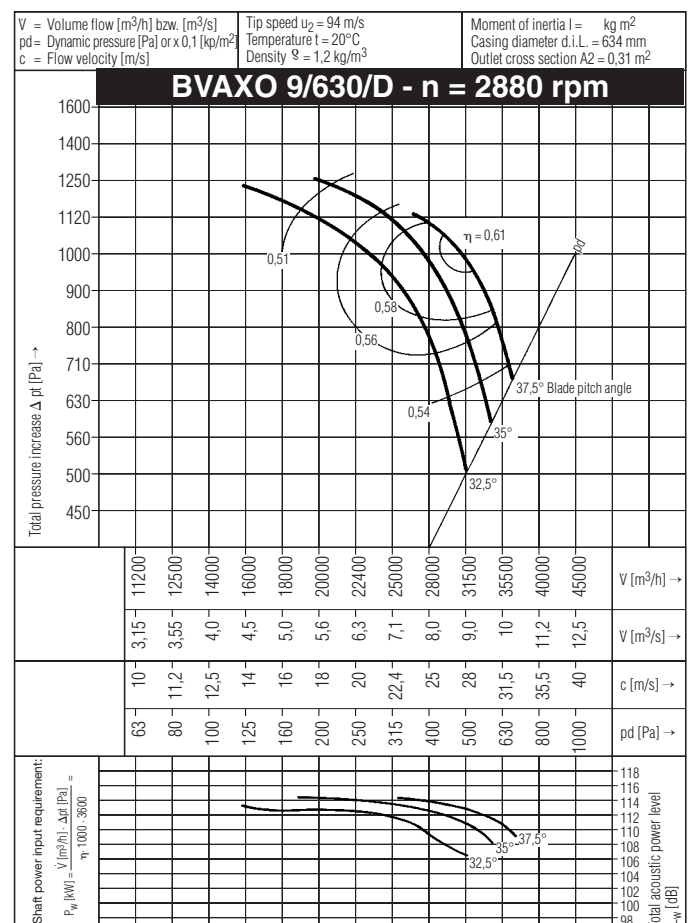
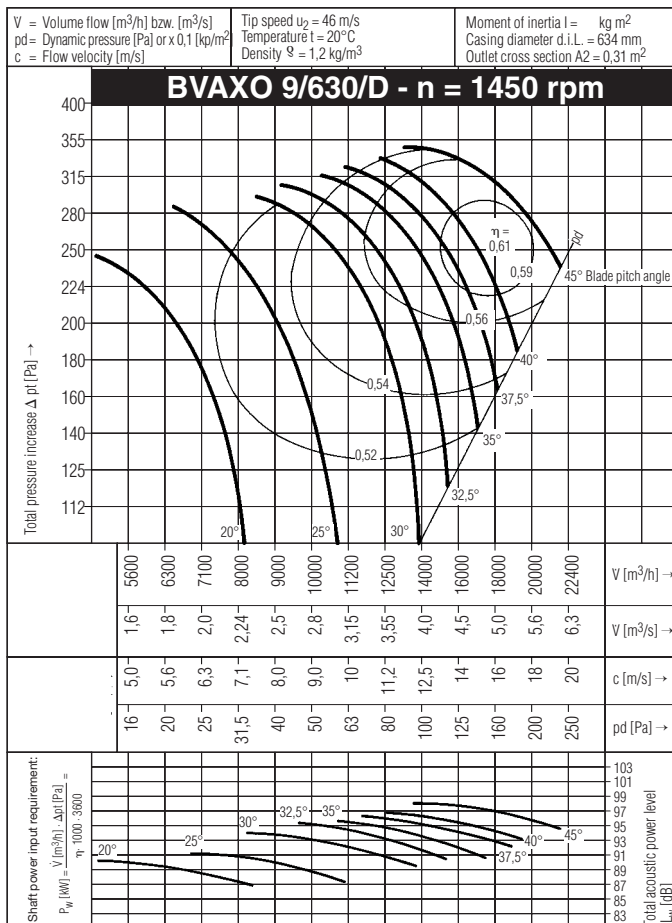
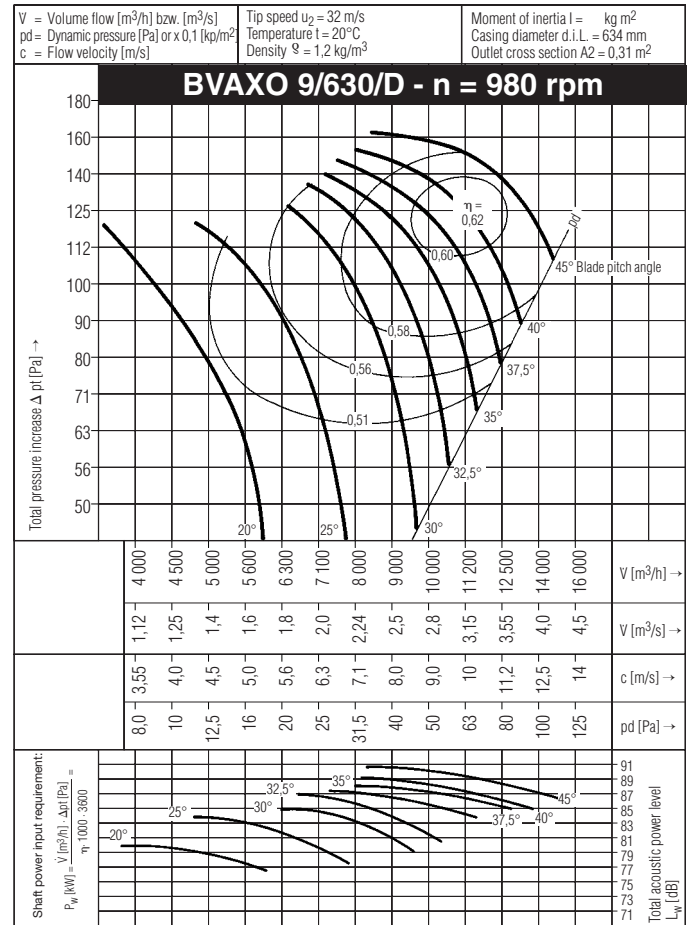
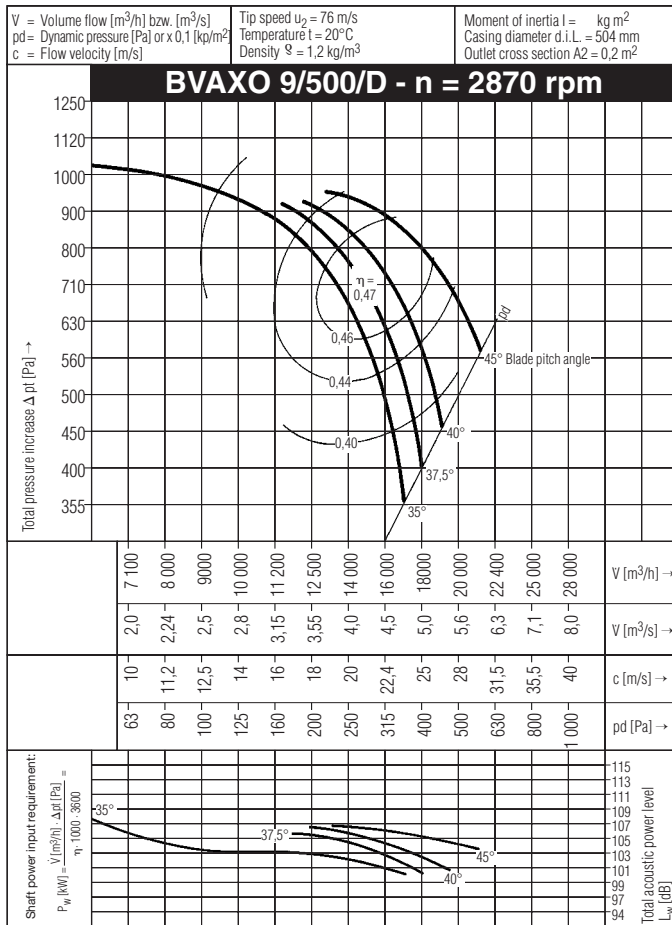
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AXIAL SMOKE EXHAUST FANS DIRECT DRIVE WITHOUT GUIDE VANES SERIES BVAXO

200/300°C – 120 MIN

These fans are available with the indicated blade pitch only.
Subsequent pitch variations are not possible.

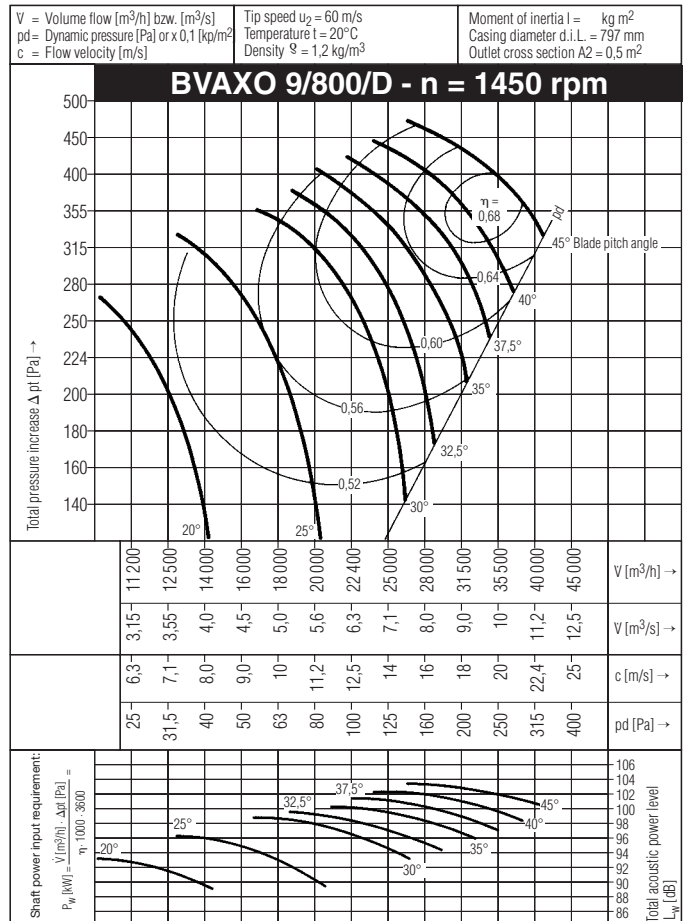
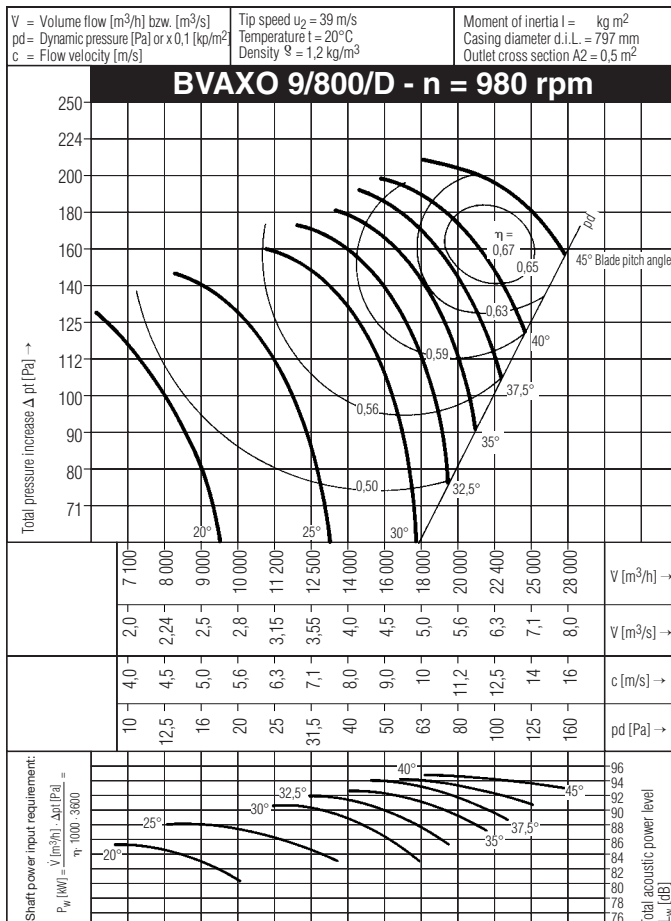
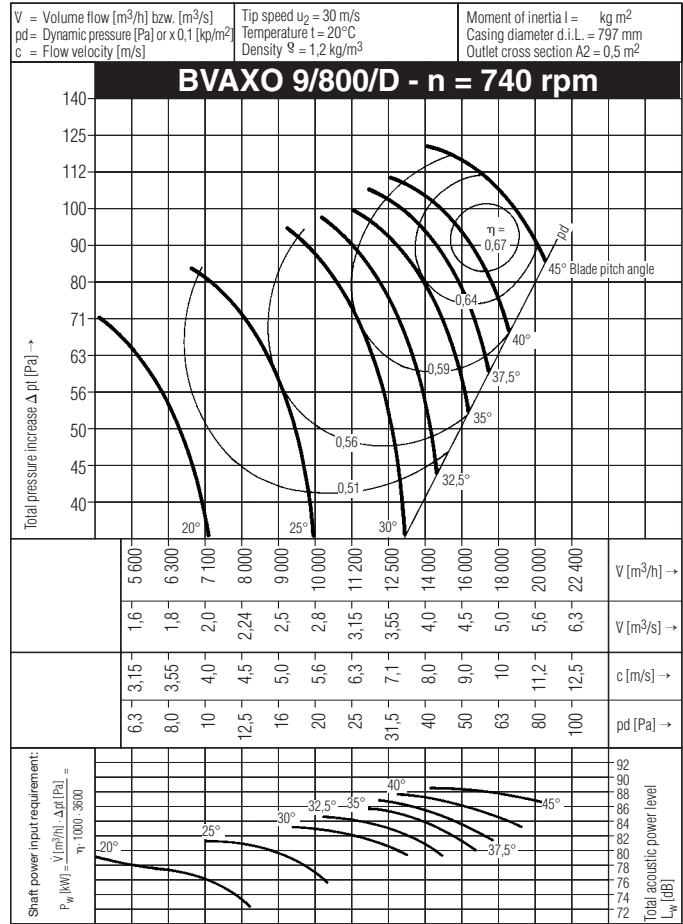
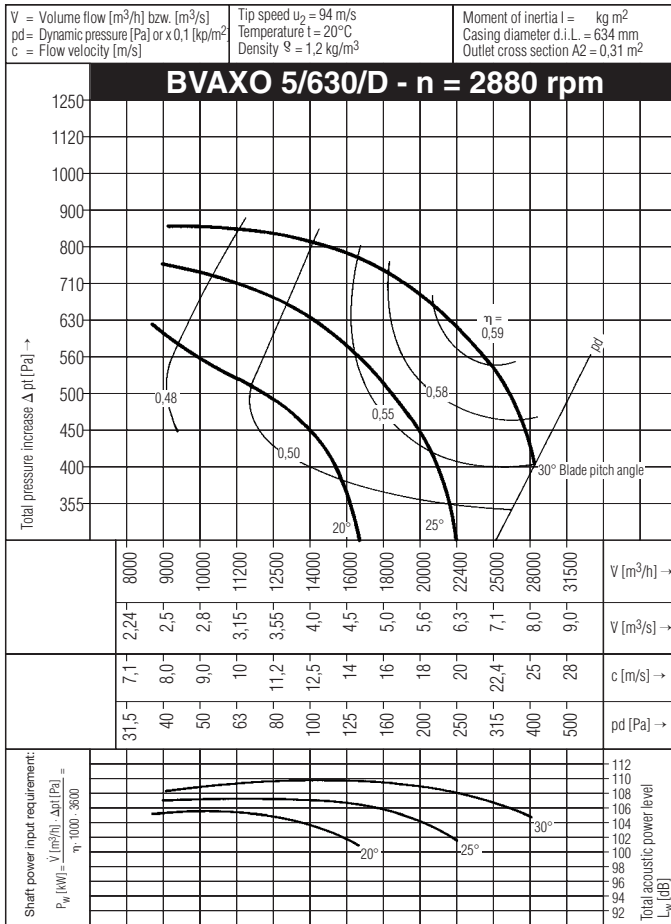
055



* rounded to standard values

For maximum motor sizes please see dimension pages

BVAXO

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DIRECT DRIVE WITHOUT GUIDE VANES
SERIES BVAXO
200/300°C - 120 MIN**These fans are available with the indicated blade pitch only.
Subsequent pitch variations are not possible.**056**

* rounded to standard values

For maximum motor sizes please see dimension pages



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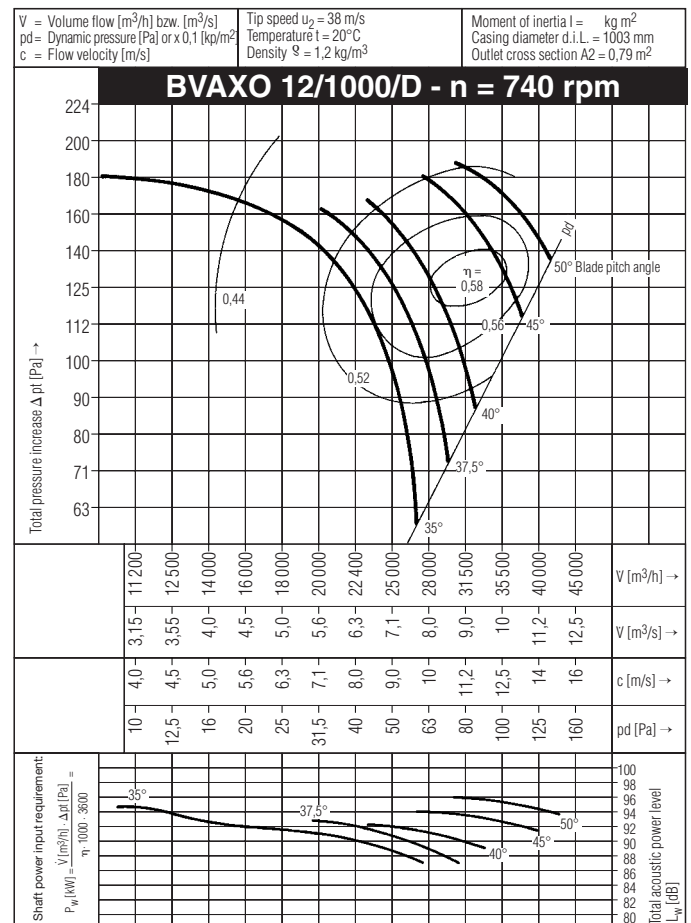
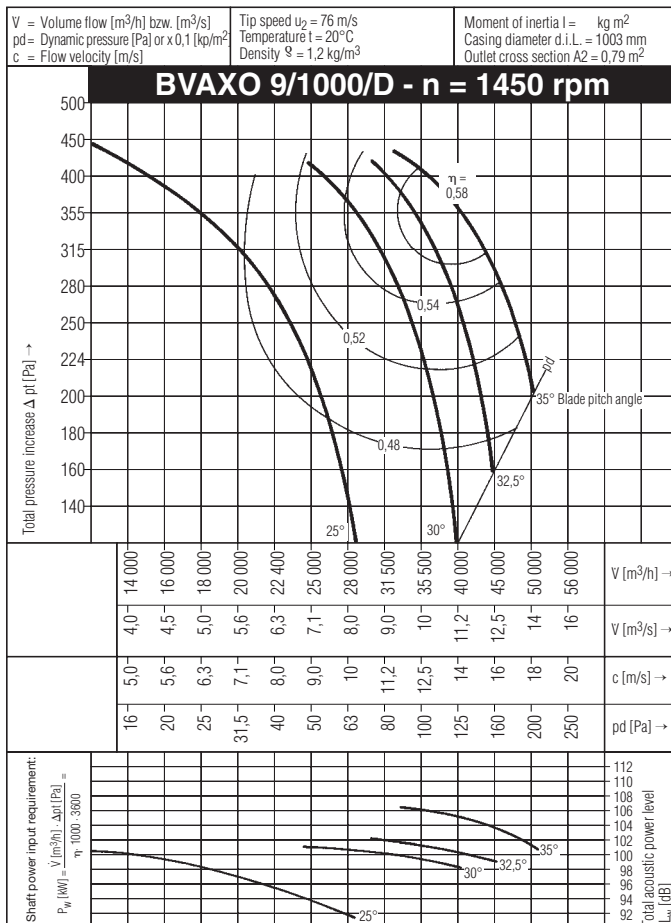
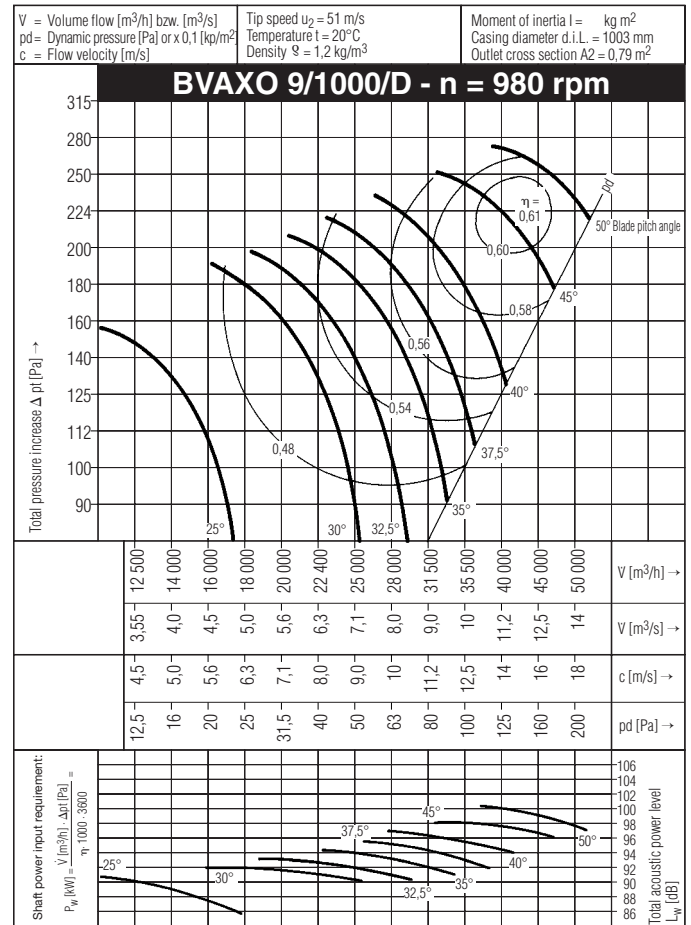
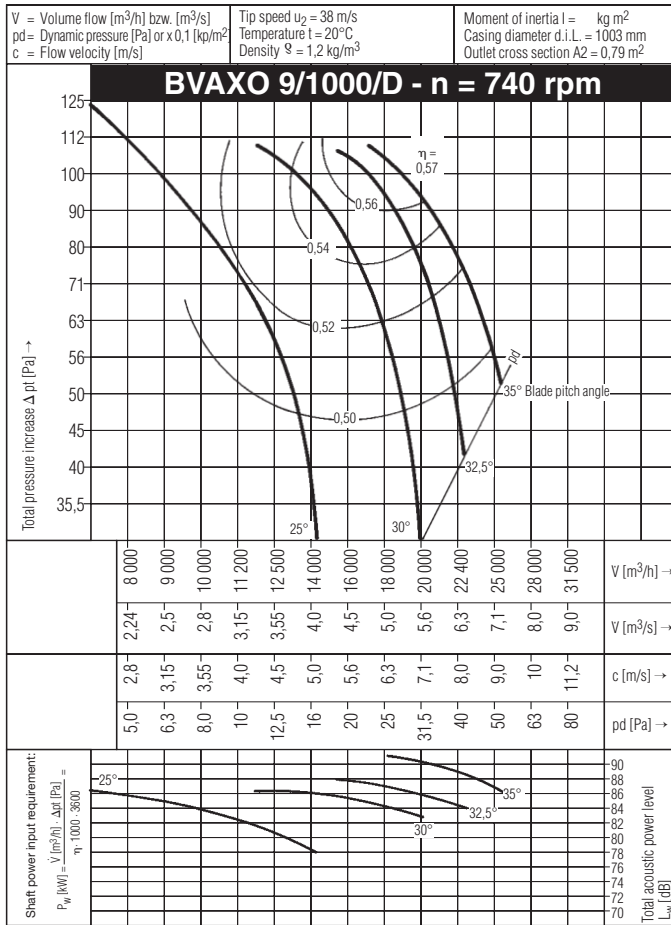
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AXIAL SMOKE EXHAUST FANS DIRECT DRIVE WITHOUT GUIDE VANES SERIES BVAXO

200/300°C - 120 MIN

These fans are available with the indicated blade pitch only.
Subsequent pitch variations are not possible.

057



* rounded to standard values

For maximum motor sizes please see dimension pages

BVAXO



TLT-Turbo GmbH

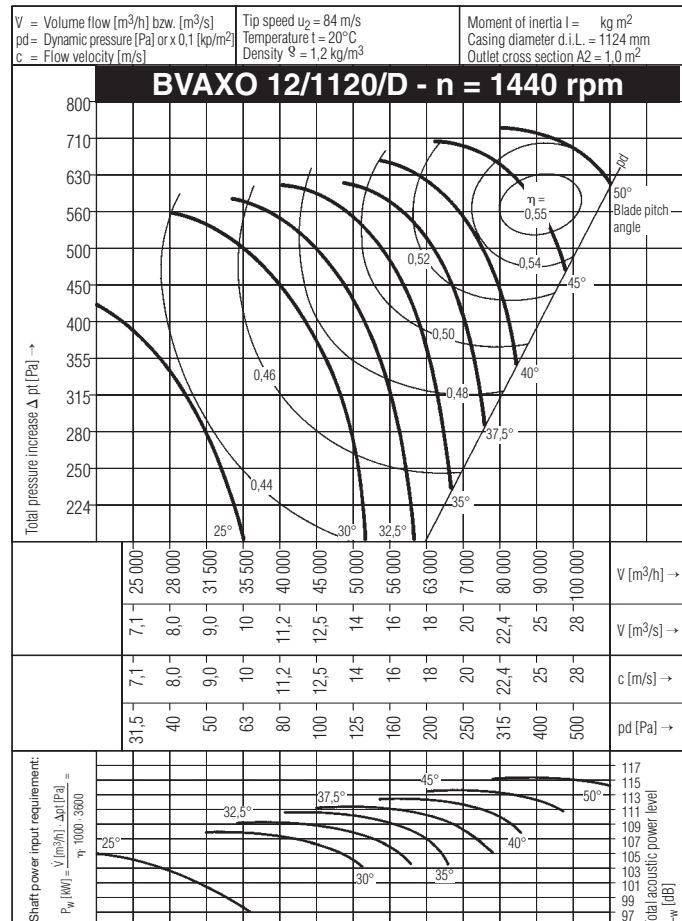
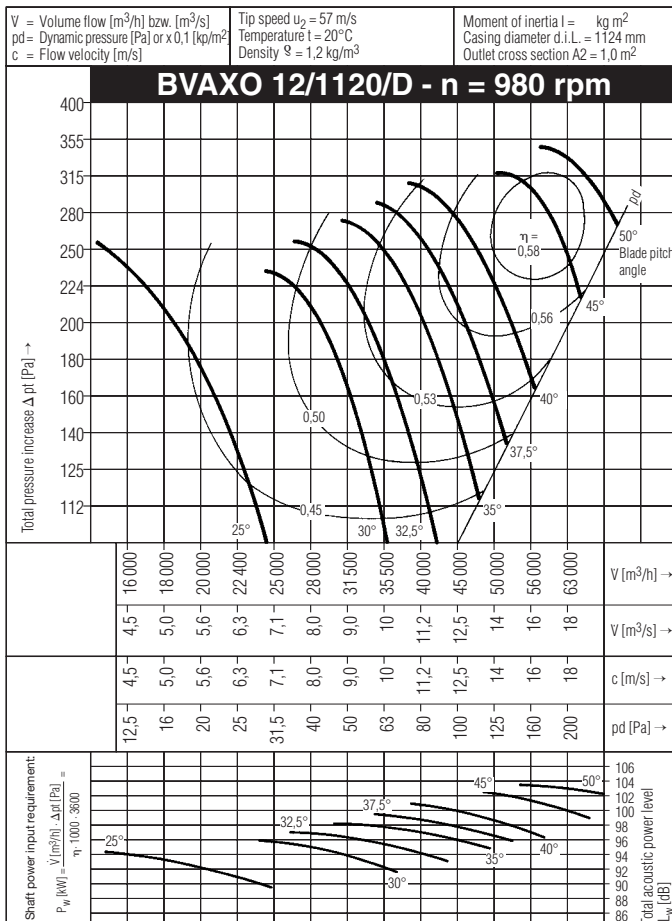
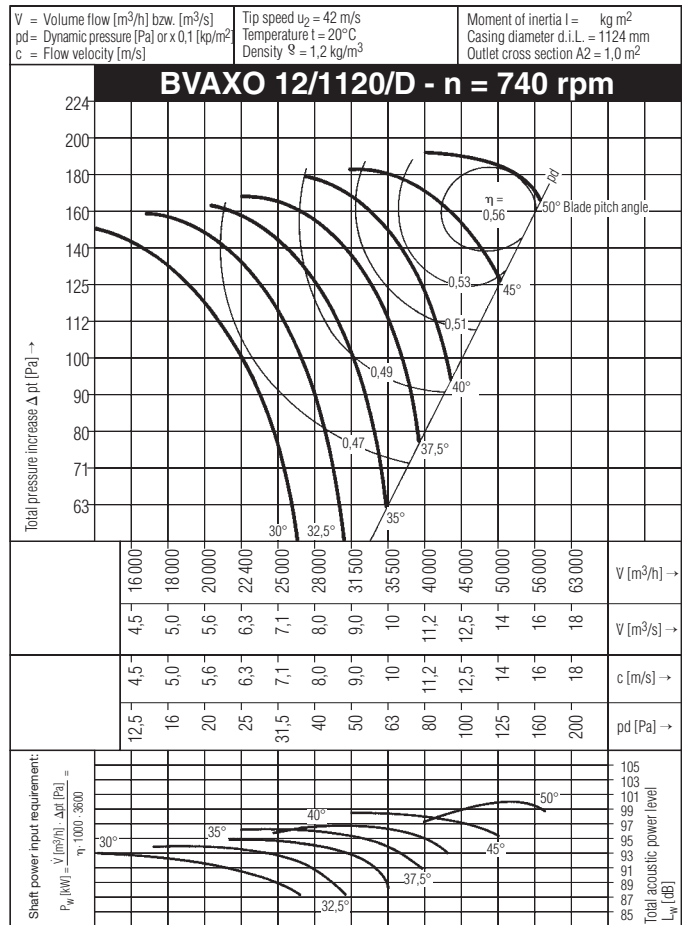
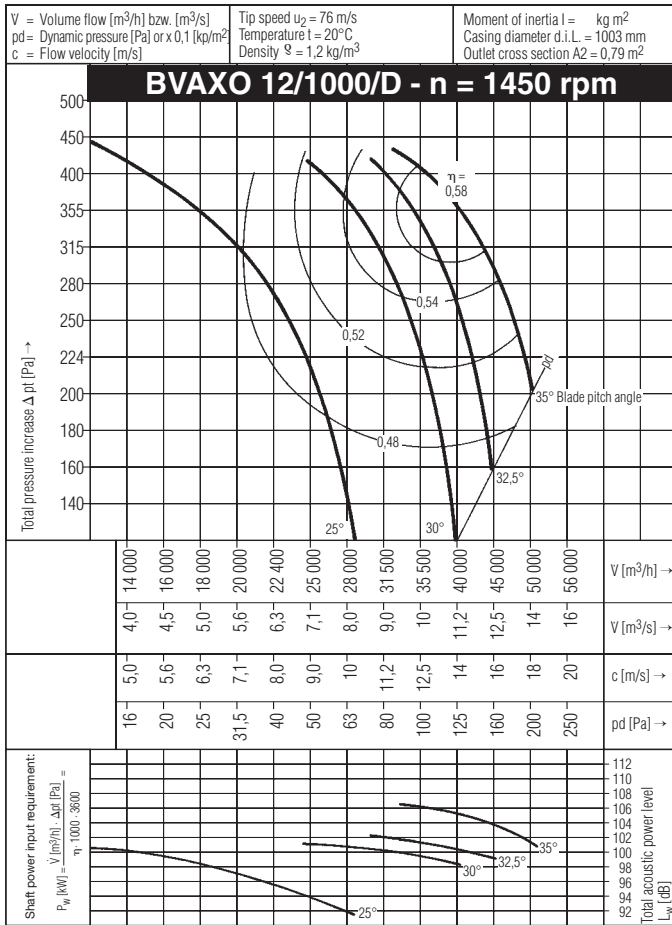
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200/300°C - 120 MIN

These fans are available with the indicated blade pitch only.
Subsequent pitch variations are not possible.

058

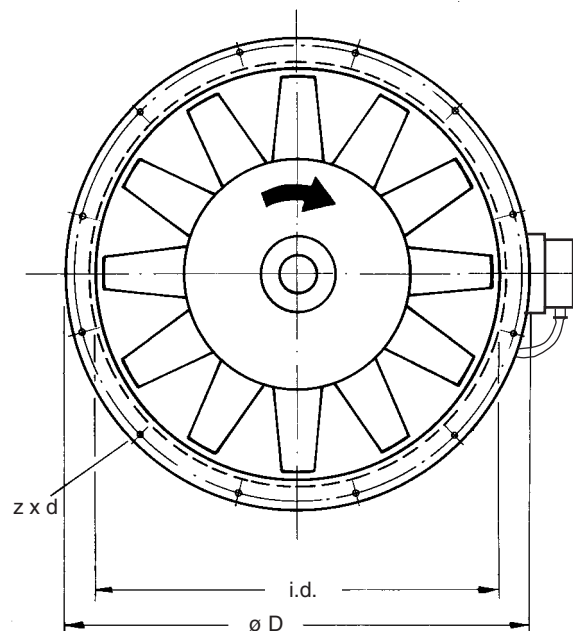
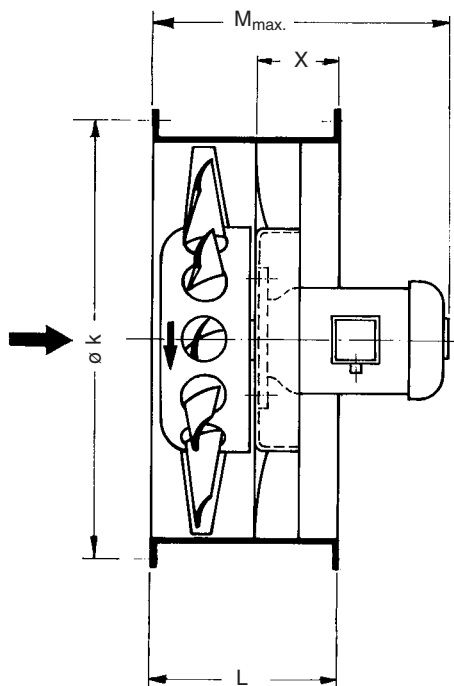


* rounded to standard values

For maximum motor sizes please see dimension pages

Lfd. Nr.	Qty.	Description	Unit price €	Total €																																		
		Axial Smoke Exhaust Fan – BVAXO Series, Type M-D for the extraction of smoke fumes of 200°C/120 min. or 300°C/120 min. respectively tested as per EN 12101-T3 (Munich Technical University) approval no. Z-78.1-41 Airflow direction: motor in outlet Direct-drive type Appropriate for installation in- and outside of fire-zone. Consisting of: Casing of welded sheet steel construction with drilled flanges according to DIN 24 154, Series 3 hub and blades made of cast-aluminium, non-adjustable directly mounted on shaft end of special motor placed within the smoke fume flow, type B3, protection classe IP 54, wired to exterior temperature-resistant terminal box Surface protection: Polyester powder coating, colour: RAL 7030 as of nominal size 1120: with full paint finish, colour: RAL7030 Hot-dip galvanized Outlet-side installation: Duct connection Direct outlet without diffuser Outlet into diffuser (optional) Specifications: <table><tr><td>Volume flow</td><td>m³/h</td></tr><tr><td>Temperature / humidity</td><td>°C/ %R.H.</td></tr><tr><td>Dynamic pressure</td><td>Pa</td></tr><tr><td>Total pressure increase</td><td>Pa</td></tr><tr><td>Fan speed</td><td>rpm</td></tr><tr><td>Blade pitch angle</td><td>deg.</td></tr><tr><td>Total sound power level L_w</td><td>dB</td></tr><tr><td>Efficiency</td><td>%</td></tr><tr><td>Power input requirement</td><td>kW</td></tr></table> Three-phase motor: single-speed Dahlander pole-changing type pole-changing type with separate windings <table><tr><td>Motor speed</td><td>rpm</td></tr><tr><td>Motor output</td><td>kW</td></tr><tr><td>Current consumption</td><td>A</td></tr><tr><td>Voltage</td><td>V</td></tr><tr><td>Frequency</td><td>Hz</td></tr><tr><td>Protection Class (IP)</td><td></td></tr><tr><td>Type</td><td>B/V</td></tr><tr><td>Size</td><td></td></tr></table> Weight: Fan incl. accessories kg Manufacturer: TLT-Turbo GmbH	Volume flow	m³/h	Temperature / humidity	°C/ %R.H.	Dynamic pressure	Pa	Total pressure increase	Pa	Fan speed	rpm	Blade pitch angle	deg.	Total sound power level L _w	dB	Efficiency	%	Power input requirement	kW	Motor speed	rpm	Motor output	kW	Current consumption	A	Voltage	V	Frequency	Hz	Protection Class (IP)		Type	B/V	Size			
Volume flow	m³/h																																					
Temperature / humidity	°C/ %R.H.																																					
Dynamic pressure	Pa																																					
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Frequency	Hz																																					
Protection Class (IP)																																						
Type	B/V																																					
Size																																						
		Type: BVAXO.....M-D Carryover																																				

Item No.	Qty.	Description	Unit price €	Total €
		Options: • Galvanised fan • Fan with special coating • Extension casing without inspection hatch • Inspection hatch • Bellmouth inlet with flange • Wire guard on bellmouth side • Wire guard on extension casing (motor side) • Flexible connector, inlet side* • Flexible connector, outlet side* • Matching flange inlet side* • Matching flange outlet side* • Angular wall ring with brackets* • Set of mounting feet (2 pcs.)* • Set of spring-type antivibration mounts* • Brackets for vertical fan installation • Diffuser without interior core* • exhaust pipe with protection grid* • duct with self-activating damper* Note: Please see our Installation, Operating and Maintenance Instructions that are available on request. * Loosely supplied		

**TLT-Turbo GmbH**Am Weinberg 68 · D-36251 Bad Hersfeld/Germany
Phone: +49.6621.950-0 · Fax: +49.6621.950-100**AXIAL SMOKE EXHAUST FANS****SERIES BVAXN 12/56****MAIN DIMENSIONS****200/300/400°C - 120 MIN****061****Important! This fan series is available with the motor outputs stated in our price lists only.**

No cooling-fan required

Size ¹⁾	i.d.	Ø k	Ø D	z x d	L	x	M _{max.}	Weight (kg) without motor	Motor size - Type Flange dia. Ø ²⁾ - Shaft dia. Ø					
355	359	395	425	8 x 9,5	165	77	370	8,0	90 - B 14 160 - 24					
400	401	438	468	12 x 9,5	188	88	430	12	90 - B 5 200 - 24	100 - B 14 200 - 28	112 - B 14 200 - 28			
450	450	487	517	12 x 9,5	200	88	440	14	90 - B 5 200 - 24	100 - B 14 200 - 28	112 - B 14 200 - 28			
500	504	541	571	12 x 9,5	225	100	540	18	90 - B 5 200 - 24	100 - B 5 250 - 28	112 - B 5 250 - 28	132 - B 5 250 - 38		
560	565	605	643	16 x 11,5	242	100	560	26	90 - B 5 200 - 24	100 - B 5 250 - 28	112 - B 5 250 - 28	132 - B 5 250 - 38		
630	634	674	712	16 x 11,5	286	128	570	33	90 - B 5 200 - 24	100 - B 5 250 - 28	112 - B 5 250 - 28	132 - B 5 250 - 38		
710	711	751	789	16 x 11,5	305	128	700	45	90 - B 5 200 - 24	100 - B 5 250 - 28	112 - B 5 250 - 28	132 - B 5 250 - 38	160 - B 5 350 - 42	
800	797	837	875	24 x 11,5	350	150	780	56	90 - B 5 200 - 24	100 - B 5 250 - 28	112 - B 5 250 - 28	132 - B 5 250 - 38	160 - B 5 350 - 42	180 - B 5 350 - 48
900	894	934	972	24 x 11,5	373	149	930	74	100 - B 5 250 - 28	112 - B 5 250 - 28	132 - B 5 250 - 38	160 - B 5 350 - 42	180 - B 5 350 - 48	
									200 - B 5 350 - 55	225 - B 5 350 - 60				
1000	1003	1043	1081	24 x 11,5	415	165	960	93	100 - B 5 250 - 28	112 - B 5 250 - 28	132 - B 5 250 - 38	160 - B 5 350 - 42	180 - B 5 350 - 48	
									200 - B 5 350 - 55	225 - B 5 450 - 60				
1120	1124	1174	1214	24 x 11,5	450	170	1200	120	160 - B 5 350 - 42	180 - B 5 350 - 48	200 - B 5 400 - 55	225 - B 5 450 - 60	250 - B 5 550 - 65	280 - B 5 550 - 75
1250	1261	1311	1351	24 x 11,5	500	185	1230	145	160 - B 5 350 - 42	180 - B 5 350 - 48	200 - B 5 400 - 55	225 - B 5 450 - 60	250 - B 5 550 - 65	280 - B 5 550 - 75
1400 ³⁾	1415	1465	1545	24 x 11,5	900	547	1020	460	160 - B 5 350 - 42	180 - B 5 350 - 48				
					1120	767	1350	495	200 - B 5 400 - 55	225 - B 5 450 - 60	250 - B 5 550 - 65	280 75 B3/V1/V3	315 80 B3/V1/V3	
1600 ³⁾	1587	1637	1717	32 x 11,5	900	500	1070	570	200 - B 5 400 - 55	225 - B 5 450 - 60				
					1120	725	1390	610	200 - B 5 550 - 65	280 75 B3/V1/V3	315 80 B3/V1/V3			

¹⁾ For vibration-damped installation an Extension Extension casing may be required with fans up to size 1250²⁾ Special flanges may be needed with certain sizes.³⁾ with steel impeller 8/56

= For vibration-damped installation two extension casings should be provided.

Dimensions mm

Dimensional and design changes reserved.

For planning and installation please also refer to our Installation, Operating and Maintenance Instructions (MBW).

BVAXN 12/56



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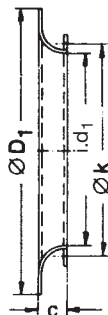
AXIAL SMOKE EXHAUST FANS SERIES BVAXN 12/56 MAIN DIMENSIONS ACCESSORIES* 200/300/400°C – 120 MIN

062

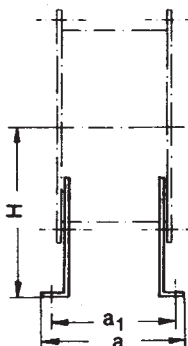
**Wire Guard
Inlet side**



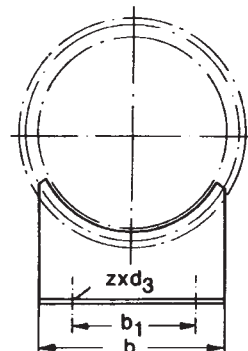
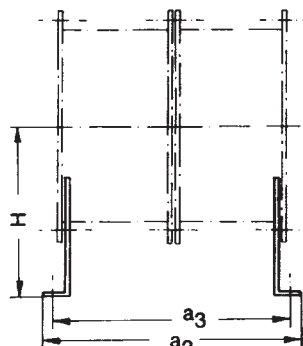
**Bell mouth
inlet**



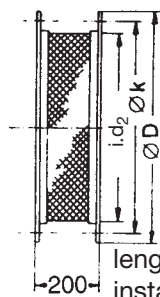
Mounting feet



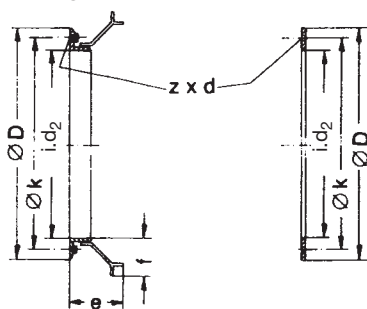
**Mounting feet for fans with extension casing or
R1 types**



Flexible connector

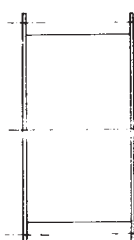


**Angular
wall ring**



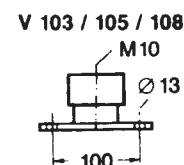
Matching flange

Extension casing

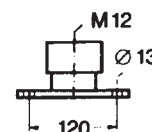


(same dimensions as
fan type M-D)

**Spring-type
AV-mounts 2)**



V 112 / 120 / 130 / 150



Size	ØD ₁	i.d ₁	c	H	a	a ₁	a ₂	a ₃	b	b ₁	z x d ₃	i.d ₂	Øk	ØD	z x d ¹⁾	e	f
355	501	362	69	270	221	191	386	356	330	270	5 x 9,5	360	395	425	8 x 9,5	80	50
400	562	403	78	300	248	218	436	406	370	300	5 x 9,5	403	438	468	12 x 9,5	80	50
450	631	424	87	335	260	230	460	430	410	330	5 x 9,5	452	487	517	12 x 9,5	80	50
500	708	509	98	375	285	255	510	480	460	380	5 x 9,5	506	541	571	12 x 9,5	80	50
560	794	571	109	420	317	277	559	519	510	430	5 x 11,5	568	605	643	16 x 11,5	100	70
630	875	640	95	470	361	321	647	607	550	470	5 x 11,5	637	674	712	16 x 11,5	100	70
710	972	717	103	525	380	340	685	645	620	530	5 x 11,5	714	751	785	16 x 11,5	100	70
800	1081	801	115	585	425	385	775	735	730	640	5 x 11,5	800	837	875	24 x 11,5	100	70
900	1214	898	130	655	452	412	825	781	730	640	5 x 11,5	897	934	972	24 x 11,5	100	70
1000	1351	1009	145	730	512	466	927	881	830	740	5 x 14	1006	1043	1081	24 x 11,5	100	70
1120	1470	1130	160	760	547	501	997	951	920	820	5 x 14	1133	1174	1214	24 x 11,5	110	90
1250	1677	1263	185	855	597	551	1097	1051	1030	930	5 x 14	1270	1311	1351	24 x 11,5	110	90
1400	1870	1417	210	930	a = Casing length + 87 a ₁ = " " + 41				1140	1040	5 x 14	1424	1465	1505	24 x 11,5	130	100
1600	2087	1587	210	1020	a = Casing length + 92				1350	1230	5 x 18	1596	1637	1677	32 x 11,5	130	100

1) Connecting dimensions in accordance with DIN 24 154 – Series 3

2) Height under load will be communicated upon specification (value is calculated individually for each purchase order).

* all accessories, except duct feet and duct extension, are packed separately

Dimensions in mm

Dimensional and design changes reserved.



TLT-Turbo GmbH

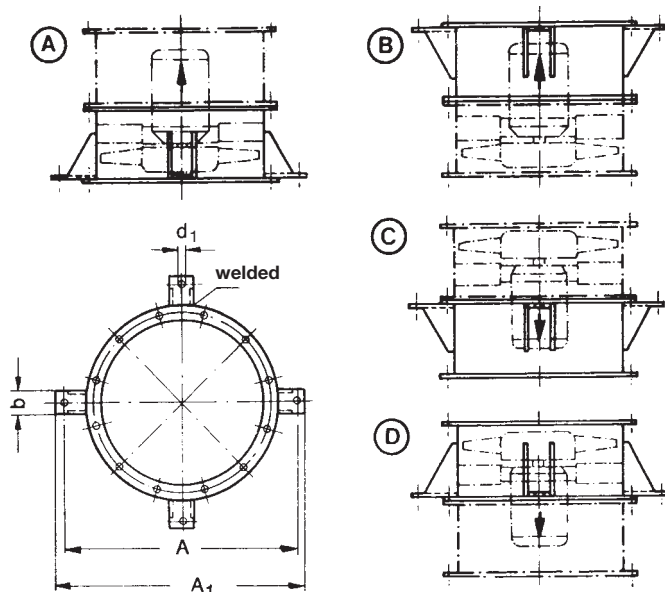
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AXIAL SMOKE EXHAUST FANS SERIES BVAXN 12/56 MAIN DIMENSIONS ACCESSORIES

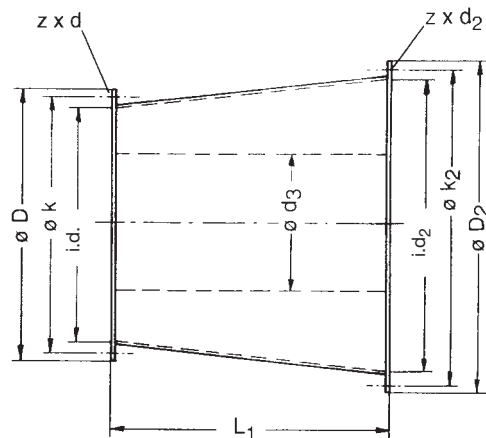
200/300/400°C – 120 MIN

063

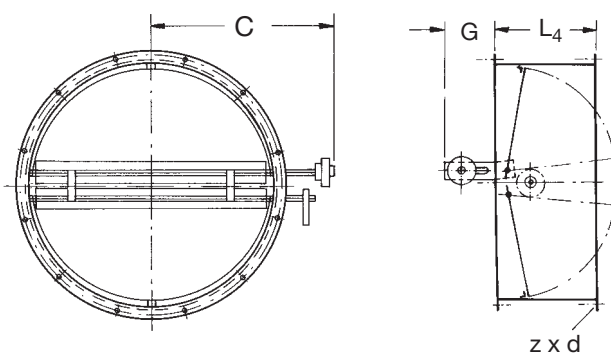
Brackets for vertical installation



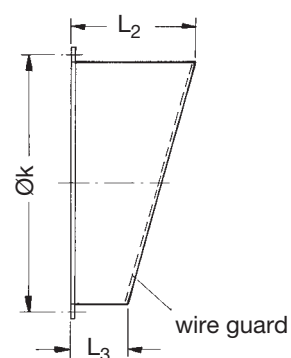
Diffuser with interior core



Duct with self-activating damper



Outlet cone with wire guard



Size	A □	A ₁ □	b	d ₁	i.d.	Ø k	Ø D	z x d ¹⁾	i.d ₂	Ø d ₃	Ø k ₂	Ø D ₂	z x d ₂	L ₁	L ₂	L ₃	L ₄	C	G
355	511	559	68	12	–	395	–	8 x 9,5	–	–	–	–	–	–	280	80	165	250	40
400	554	602	68	12	–	438	–	12 x 9,5	–	–	–	–	–	–	280	60	188	280	40
450	603	651	68	12	–	487	–	12 x 9,5	–	–	–	–	–	–	290	70	200	350	200
500	657	705	68	12	504	541	571	12 x 9,5	634	282	674	712	16 x 11,5	600	280	60	225	390	200
560	783	831	90	14	565	605	643	16 x 11,5	711	315	751	789	16 x 11,5	670	330	70	242	430	200
630	852	900	90	14	634	674	712	16 x 11,5	797	355	837	875	24 x 11,5	750	330	70	286	465	200
710	929	977	90	14	711	751	789	16 x 11,5	894	397	934	972	24 x 11,5	850	350	70	305	505	200
800	1015	1063	90	14	797	837	875	24 x 11,5	1003	446	1043	1081	24 x 11,5	950	520	200	350	550	200
900	1112	1160	90	14	894	934	972	24 x 11,5	1124	502	1174	1254	24 x 11,5	1060	585	225	373	620	200
1000	1221	1269	90	14	1003	1043	1081	24 x 11,5	1261	562	1311	1391	24 x 11,5	1200	640	240	415	690	200
1120	1374	1434	100	18	1124	1174	1254	24 x 11,5	1415	630	1465	1545	24 x 11,5	1340	730	250	450	820	300
1250	1511	1571	100	18	1261	1311	1391	24 x 11,5	1587	710	1637	1717	32 x 11,5	1510	810	250	500	950	300
1400	1665	1725	100	18	1415	1465	1545	24 x 11,5	1780	789	1830	1910	32 x 11,5	1690		on request			
1600	1837	1897	100	18	1587	1637	1717	32 x 11,5	1997	888	2047	2167	32 x 11,5	1900					

¹⁾ Fitting dimensions to
DIN 24 154 – series 3

Dimensions in mm

Dimensional and design changes
reserved.

**TLT-Turbo GmbH**Am Weinberg 68 · D-36251 Bad Hersfeld/Germany
Phone: +49.6621.950-0 · Fax: +49.6621.950-100**AXIAL SMOKE EXHAUST FANS
ACCESSORIES
ROUND SILENCERS – TSR
200/300/400°C – 120 MIN****064**

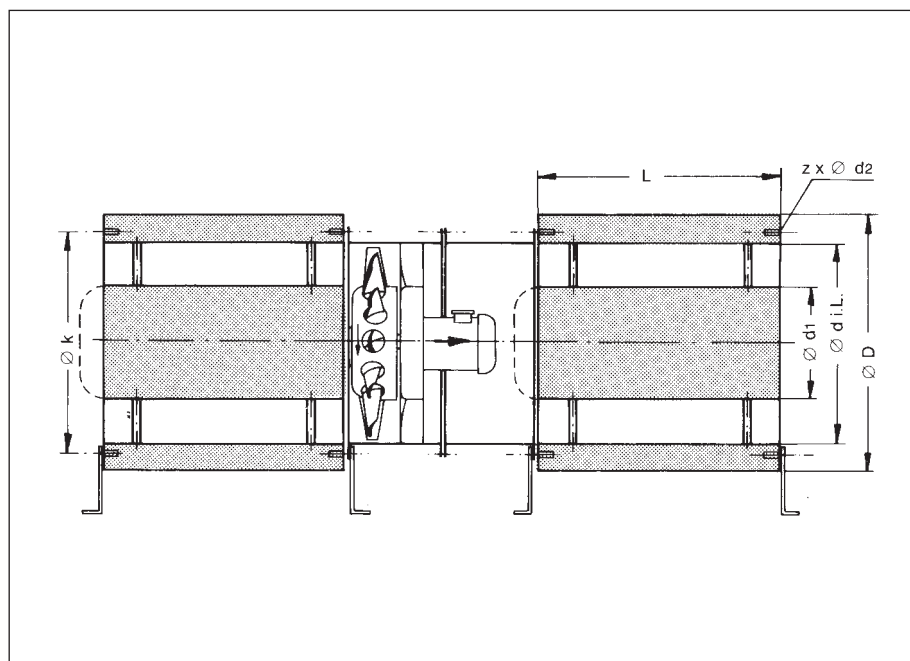
As a supplement to our BVAXN 12/56 series of axial smoke exhaust fans we can supply specially developed round silencers available in 12 sizes. These units substantially reduce the sound level.

They are easily fitted on the fan inlet or outlet side, without any additional intermediate elements.

The silencer housing consists of Sendzimir galvanized sheet steel.

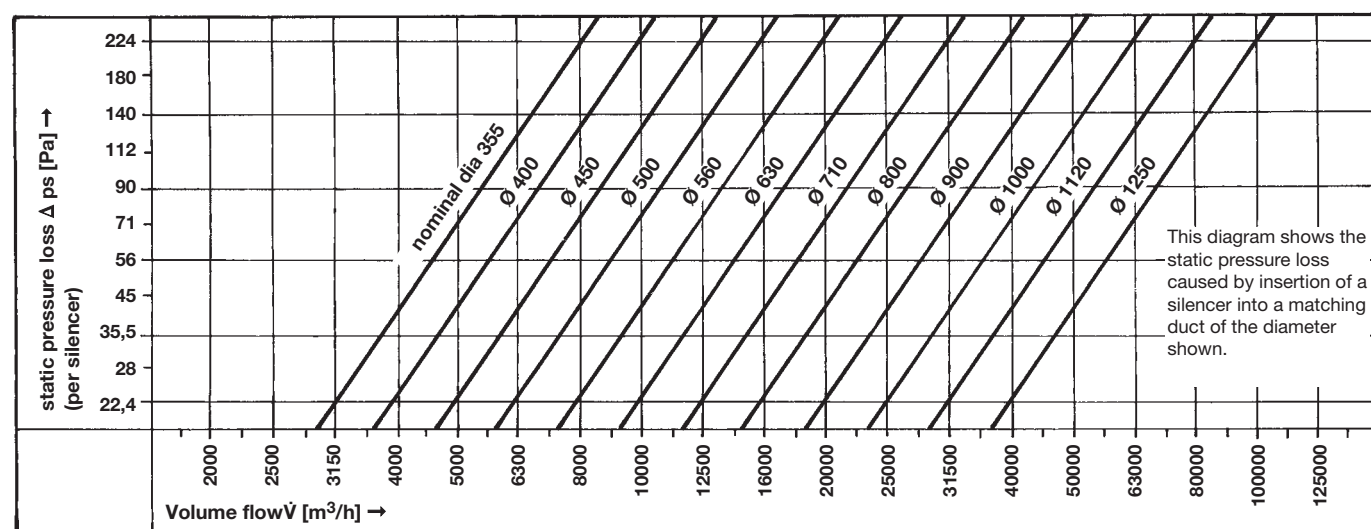
Mounting nuts are provided internally on the connecting face sides (hole pattern as per DIN 24154-Series 3).

The interspace between the exterior barrel and the interior sleeve (made of galvanized perforated sheet metal) as well as the interior core are filled with non-combustible acoustic damping material.

**Insertion attenuation per silencer**

Nominal dia.	Insertion attenuation in dB For higher attenuations several silencers of identical diameter may be arranged in series.							
	Octave center frequency fo [Hz]							
	63	125	250	500	1000	2000	4000	8000
355	7	13	17	22	24	30	23	19
400	6	12	16	21	23	29	22	18
450	6	11	15	19	21	26	20	16
500	5	10	14	17	19	23	18	14
560	4	9	13	16	18	22	17	13
630	3	8	12	15	17	20	16	12
710	6	11	16	19	21	20	17	13
800	5	10	14	17	19	18	16	12
900	4	9	13	16	18	16	13	9
1000	3	8	12	15	17	14	12	8
1120	4	8	13	16	18	15	13	9
1250	4	9	13	17	18	16	13	9

Nominal diameter	Ø d i.L.	Ø D	Ø k	Ø d ₁	L	z x Ø d ₂	Weight [kg]
355	359	525	395	200	930	8 x M 8	39
400	401	570	438	224	930	12 x M 8	50
450	450	620	487	250	930	12 x M 8	56
500	504	675	541	280	930	12 x M 8	60
560	565	735	605	315	930	16 x M 8	68
630	634	885	674	355	930	16 x M 8	76
710	711	960	751	400	1430	16 x M 8	120
800	797	1050	837	450	1430	24 x M 8	137
900	894	1145	934	500	1430	24 x M 8	153
1000	1003	1255	1043	560	1430	24 x M 8	167
1120	1124	1375	1174	630	1430	24 x M 8	207
1250	1261	1515	1311	710	1430	24 x M 8	254



Dimensional and design changes reserved.



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ACOUSTIC - AND THERMAL INSULATION FOR BVAXO + BVAXN

065

Description:

shell-design, easy dismanteling, re-usable. For acoustic insulation and/or reduction of thermal emission from the fan casing.

The design of this insulation - compared to some other types - allows a more space saving installation with improved accessibility as well as considerably easier testing and maintenance of the fan.

The Insulation consists of:

A certain number of shells acc. to fan length, split into upper and lower shell, made of galvanized steel sheet with adjustable also galvanized tensioners. Galvanized steel sheets for connecting the shells in the vicinity of the fan's mounting feet as well as insulated connections to flexible connectors or ducts.

Insulating material made of mineral wool with wire gauze on one side, thickness 80 mm and 120 mm respectively, not inflammable class A1 as per DIN 4102 T4, specific density 60-80 kg/m³. These mats are fixed to the shells.



Axial Fan BVZAXN 12/56/1000 with acoustic insulation

Total insulation value Axial Fan with insulated casing [A-weighted]

approximative calculation of the
A-weighted acoustic power, emitted
from the insulated fan casing

$$L_{WA\text{casing}} = L_{W\text{vent.}} - D_{e\text{chart}}$$

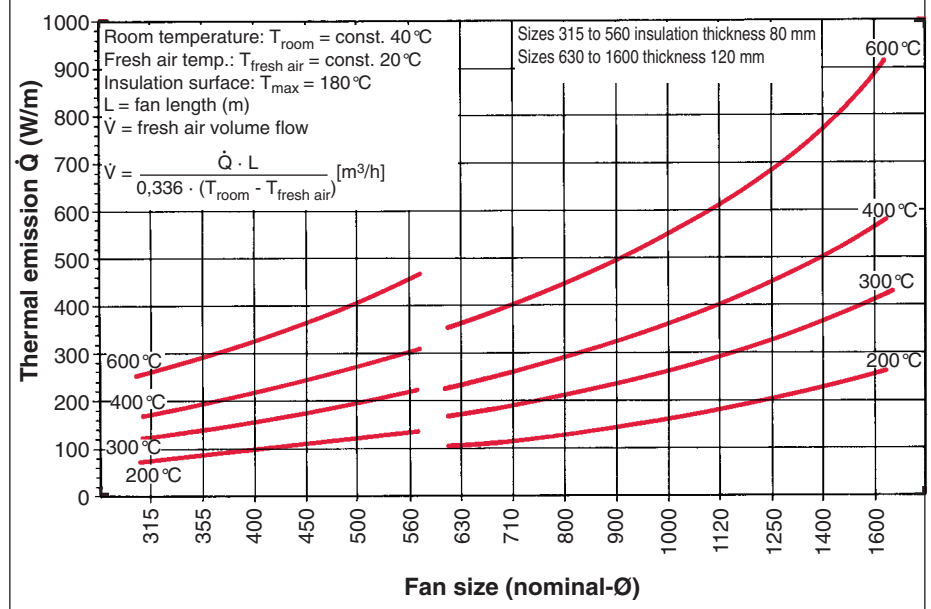
Insulation value [De]

	Insulation value [De] dB (A) weighted		
f_D [Hz]	500	250	125
size 315-560	35	35	36
size 630-1600	37	38	37

(please ask for exact value of insulation within the octave band)

Calculation of fresh air needed for installation room

Thermal emission of insulated axial fans at flue gas temperatures of 200, 300, 400 and 600 °C





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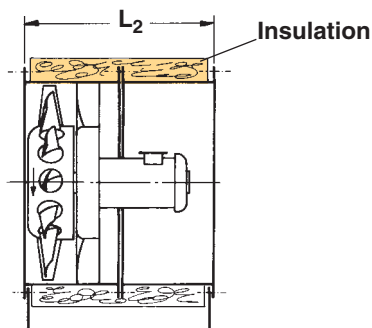
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ACOUSTIC AND THERMAL INSULATION TYPES MAIN DIMENSIONS

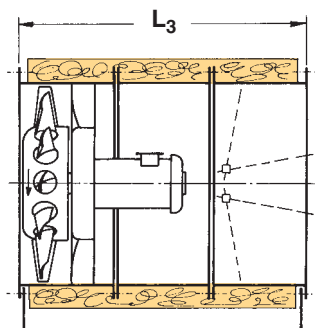
066

Examples for horizontal installation

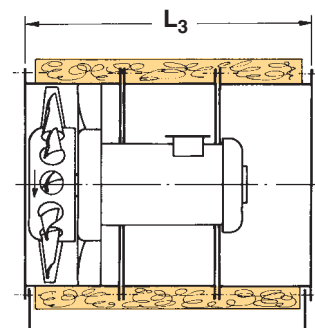
Type A



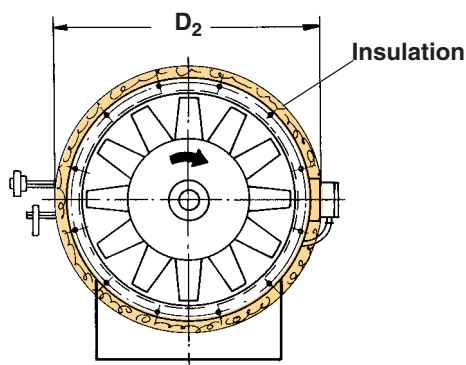
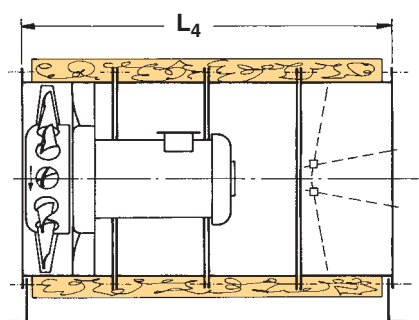
Type B



Type C



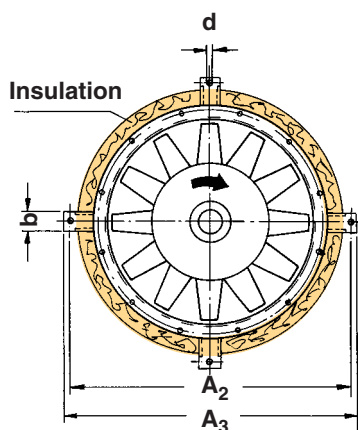
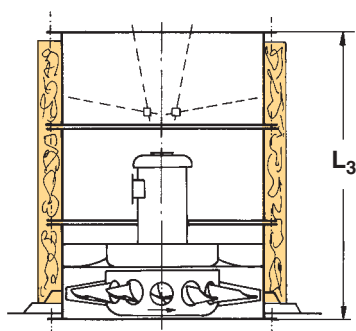
Type D



for dimensions please
see page 067

In case of horizontal outdoor installation a canopy is to be erected covering complete insulation (available upon request).

Examples for vertical installation



Size	L ₃	A ₂	A ₃	b	d
355	495	631	679	68	12
400	564	674	722	68	12
450	600	723	771	68	12
500	675	777	825	68	12
560	726	903	951	90	14
630	858	1014	1066	90	14
710	915	1091	1143	90	14
800	1050	1177	1229	90	14
900	1119	1274	1326	90	14
1000	1245	1383	1435	90	14
1120	1350	1504	1564	100	18
1250	1500	1641	1701	100	18

dimensions in mm

This insulation should not be used
for vertical outdoor installation.



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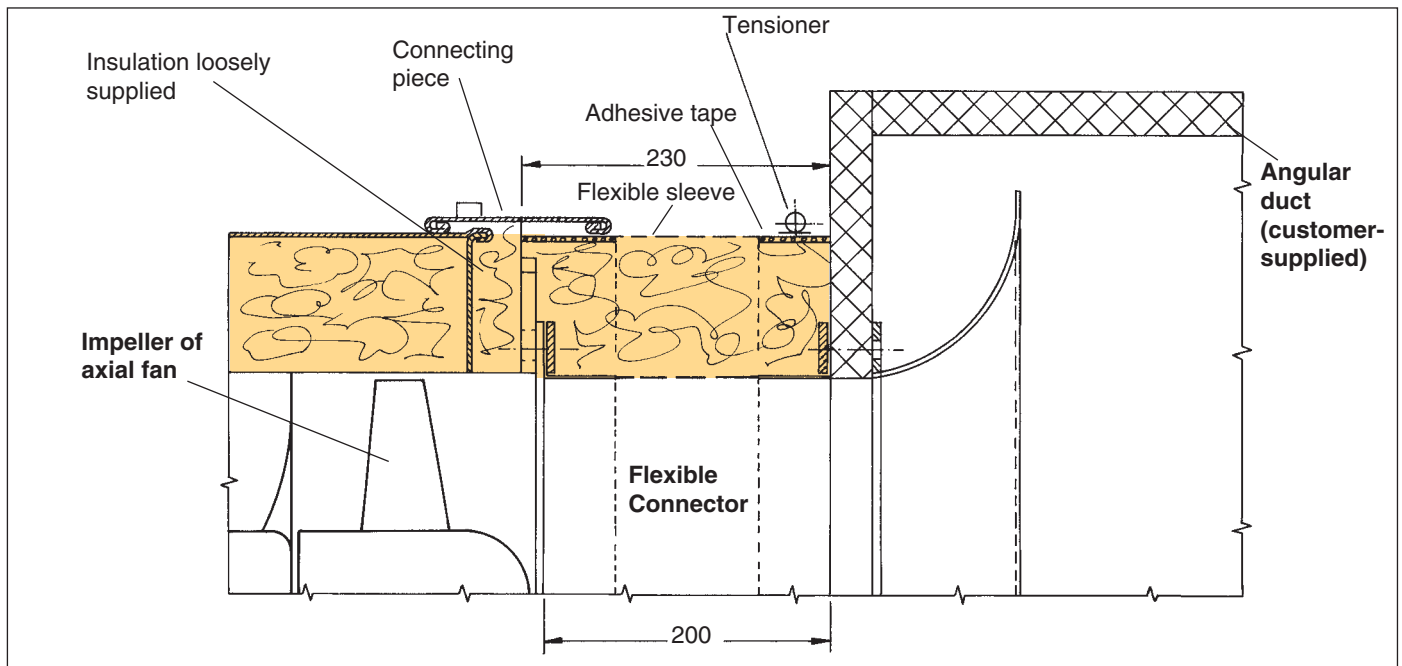
ACOUSTIC AND THERMAL INSULATION MAIN DIMENSIONS CONNECTION DETAILS

067

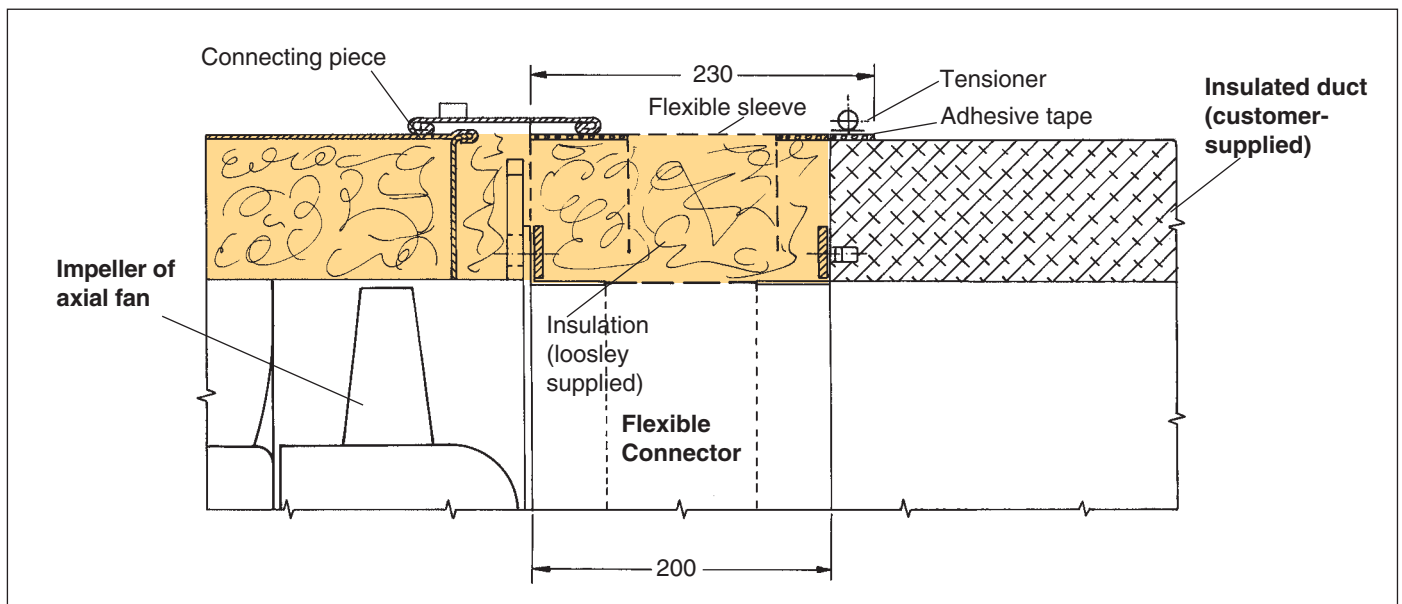
Size	D ₂	L ₂	L ₃	L ₄			
355	525	330	495	660			
400	570	376	564	752			
450	620	400	600	800			
500	675	450	675	900			
560	735	484	726	968			
630	885	572	858	1144			

Size	D ₂	L ₂	L ₃	L ₄			
710	960	610	915	1220			
800	1050	700	1050	1400			
900	1145	746	1119	1492			
1000	1255	830	1245	1660			
1120	1375	900	1350	1800			
1250	1515	1000	1500	2000			

Fan - Flexible connector - angular duct



Fan - Flexible Connector - Duct





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AXIAL SMOKE EXHAUST FANS BVAXN 12/56 SERIES ACOUSTIC DATA

068

Acoustic level

The total acoustic power level $L_{W,vent.}$ (in dB) of an axial smoke exhaust fan can be obtained directly from the characteristic data sheets for each operating point.

Starting from this value, the A-weighted acoustic power level L_{WA} and the relative acoustic power level $L_{Wrel.}$ can be determined using the tables below. These values are available as the acoustic power emitted into the duct and as the acoustic power emitted from the fan inlet or outlet opening.

ning, respectively. The values given were taken from measurements as per EN 25136 (formerly DIN 45 635, Part 9) duct testing method.

1. Acousting power level emitted into the duct

The level of acoustic power an axial smoke exhaust fan emits into the ducting is used for calculating the sound power characteristics of downstream systems, e.g., silencers.

The levels are calculated as follows:

$L_{W,vent.}$ [dB] = total acoustic power emitted by the fan,
(please see respective characteristic curve sheets)

$L_{WA,vent.}$ [dB] = A-weighted acoustic power level, according to the equation

$L_{WA,vent.}$ = $L_{W,vent.} - \text{portion 1.1 [dB]}$

$L_{Wrel,vent.}$ [dB] = relative acoustic power level as expressed by the equation

$L_{Wrel,vent.}$ = $L_{W,vent.} - \text{portion 1.2 [dB]}$

2. Acoustic power emitted from the fan inlet or outlet opening

To determine the sound levels at a given installation site, it is usually necessary to know the level of acoustic power emitted from the fan's inlet or outlet opening. The adjacent tables are based on the outlet reflection pattern assumed in VDI 2081, Case 2.

$L_{WA,op.}$ [dB] = A-weighted level of acoustic power emitted from the fan's opening, expressed by the equation

$L_{WA,op.}$ = $L_{W,vent.} - \text{portion 2.1 [dB]}$

$L_{Wrel,op.}$ = relative level of acoustic power emitted from the fan's opening, expressed by the equation

$L_{Wrel,op.}$ = $L_{W,vent.} - \text{portion 2.2 [dB]}$

Axial Smoke Exhaust Fan BVAXN

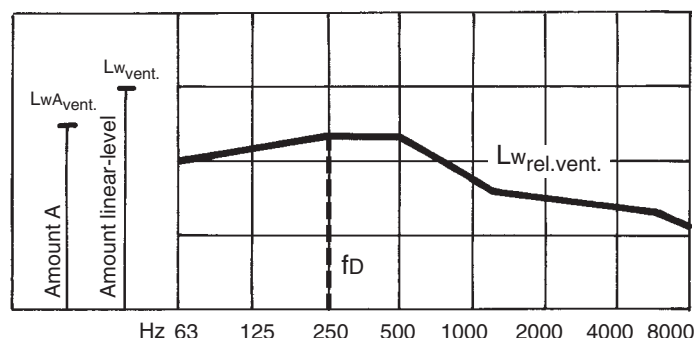
$f_D = \frac{z \cdot n}{60}$	Portion 1.1	Portion 1.2 at mid-octave frequency [Hz]							
		63	125	250	500	1000	2000	4000	8000
500	2	13	10	8	6	6	12	15	16
250	5	10	8	5	5	11	14	16	18
125	7	7	5	5	11	14	16	18	22
63	10	4	4	10	13	15	17	21	25
31,5	11	3	9	12	13	15	20	24	28

Size*	$f_D = \frac{z \cdot n}{60}$	Portion 2.1	Portion 2.2 at mid-octave frequency [Hz]							
			63	125	250	500	1000	2000	4000	8000
315	500	3	25	18	12	7	6	12	15	16
	250	6	23	16	9	7	12	14	16	18
	125	8	20	13	9	12	14	16	18	22
	63	10	15	11	13	14	15	17	21	25
400	500	3	23	17	11	6	6	12	15	16
	250	5	21	14	9	6	11	14	16	18
	125	8	18	11	8	12	14	16	18	22
	63	10	15	11	13	14	15	17	21	25
500	500	2	22	15	10	6	6	12	15	16
	250	5	20	13	8	6	11	14	16	18
	125	8	17	10	7	11	14	16	18	22
	63	10	14	9	12	13	15	17	21	25
630	500	2	21	14	9	6	6	12	15	16
	250	5	18	12	7	6	11	14	16	18
	125	8	15	9	6	11	14	16	18	22
	63	10	12	8	11	13	15	17	21	25
800	500	2	19	13	9	6	6	12	15	16
	250	5	17	11	6	5	11	14	16	18
	125	7	14	8	6	11	14	16	18	22
	63	9	11	7	11	13	15	17	21	25
1000	250	5	15	10	6	5	11	14	16	18
	125	7	12	7	5	11	14	16	18	22
	63	9	9	6	10	13	15	17	21	25
	250	5	14	9	6	5	11	14	16	18
1250	125	7	11	6	5	11	14	16	18	22
	63	9	9	5	10	13	15	17	21	25

*Intermediate values to be obtained by interpolation.

Blade frequency of the fan is calculated from the number of blades z and the fan speed n [rpm].

$$f_D = \frac{z \cdot n}{60} \text{ [s}^{-1}\text{]}$$



Note:

Portions 1.1 / 1.2 / 2.1 / 2.2 to be taken from the above spreadsheets.

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TECHNICAL LISTS (AVAILABLE MODELS)****BVAXN 12/56 200°C - 120 MIN****069**

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

355	1500		1,1	2,8	90	B14	160
	3000		1,5	3,25	90	B14	160
			2,2	4,6	90	B14	160
	1500/750		1,0/0,25	2,4/1,0	90	B14	160
	3000/1500		1,5/0,37	3,7/1,0	90	B14	160

400	1500		1,1	2,8	90	B5	200
	3000		1,5	3,25	90	B5	200
			2,2	4,6	90	B5	200
			3,0	6,7	100	B14	200
			4,0	8,3	112	B14	200
	1500/750		1,0/0,25	2,4/1,0	90	B5	200
	3000/1500		1,5/0,37	3,7/1,0	90	B5	200
			2,2/0,48	4,6/1,15	90	B5	200
			3,0/0,75	6,7/1,7	100	B14	200
			4,1/1,0	8,8/2,1	112	B14	200

450	1500		1,1	2,8	90	B5	200
	3000		3,0	6,7	100	B14	200
			4,0	8,3	112	B14	200
			5,5	11	112	B14	200
			7,5	14,6	112	B14	200
	1500/750		1,0/0,25	2,4/1,0	90	B5	200
	1500/1000		1,1/0,37	2,8/1,35	90	B5	200
	3000/1500		3,0/0,75	6,7/1,7	100	B14	200
			4,1/1,0	8,8/2,1	112	B14	200

500	1500		1,1	2,8	90	B5	200
	3000		1,5	3,5	90	B5	200
			4,0	8,3	112	B5	250
			5,5	11	132	B5	250
			7,5	14,6	132	B5	250
			11	20,5	132	B5	250

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

500	1000/500		0,48/0,08	1,6/0,58	90	B5	200
	1500/750		1,0/0,25	2,4/1,0	90	B5	200
			1,4/0,35	3,3/1,35	90	B5	200
	1500/1000		1,1/0,37	2,8/1,35	90	B5	200
			1,6/0,6	3,9/1,8	100	B5	250
	3000/1500		6,0/1,5	13,3/3,2	132	B5	250
			7,8/2,0	16,2/4,1	132	B5	250

560	1000		0,75	2,2	90	B5	200
	1500		1,1	2,8	90	B5	200
			1,5	3,5	90	B5	200
			2,2	5,5	100	B5	250
			3,0	7,1	100	B5	250
	1000/500		0,8/0,15	2,3/0,9	90	B5	200
	1500/750		1,4/0,35	3,3/1,35	90	B5	200
			2,5/0,6	5,6/2,2	100	B5	250
			3,8/1,0	8,1/3,4	112	B5	250
	1500/1000		1,1/0,37	2,8/1,35	90	B5	200
			1,6/0,6	3,9/1,8	100	B5	250
			3,0/1,0	6,3/3,0	112	B5	250

630	750		0,55	1,8	90	B5	200
	1000		0,75	2,2	90	B5	200
			1,1	3,15	90	B5	200
			1,5	3,9	100	B5	250
	1500		1,5	3,5	90	B5	200
			2,2	5,5	100	B5	250
			3,0	7,1	100	B5	250
			4,0	8,6	112	B5	250
			5,5	11,4	132	B5	250
	1000/500		0,8/0,15	2,3/0,9	90	B5	200
			1,2/0,22	3,1/1,15	100	B5	250
	1500/750		2,5/0,6	5,6/2,2	100	B5	250
			3,8/1,0	8,1/3,4	112	B5	250
			5,5/1,4	11,4/4,3	132	B5	250
	1500/1000		2,2/0,75	5,3/2,3	100	B5	250
			3,0/1,0	6,3/3,0	112	B5	250
			6,0/2,0	12,5/5,4	132	B5	250

BVAXN 12/56

❶ Nominal current = appr. values for 400 V motors, brand EMOD.
It is important to check nominal current in case of other motor brands.

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TECHNICAL LISTS (AVAILABLE MODELS)****BVAXN 12/56 200°C - 120 MIN****070**

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

710	750		0,75	2,2	100	B5	250
			1,1	3,15	100	B5	250
	1000		1,1	3,15	90	B5	200
			1,5	3,9	100	B5	250
			2,2	5,4	112	B5	250
			3,0	7,4	132	B5	250
			3,0	7,4	132	B5	250
	1500		3,0	7,1	100	B5	250
			4,0	8,6	112	B5	250
			5,5	11,4	132	B5	250
			7,5	15,4	132	B5	250
			11	22	160	B5	350
	1000/500		1,2/0,22	3,1/1,15	100	B5	250
			1,85/0,33	4,6/1,6	112	B5	250
			3,3/0,75	9,3/3,6	132	B5	250
	1500/750		3,8/1,0	8,1/3,4	112	B5	250
			5,5/1,4	11,4/4,3	132	B5	250
			7,0/1,7	15,2/5,1	132	B5	250
			11/3,0	24/9,5	160	B5	350
	1500/1000		4,5/1,5	9,5/3,8	132	B5	250
			6,0/2,0	12,5/5,4	132	B5	250
			8,5/3,0	17,9/7,6	160	B5	350
			12/3,5	24/9,5	160	B5	350

800	750		1,1	3,15	100	B5	250
			1,5	5,15	112	B5	250
			2,2	5,4	132	B5	250
	1000		2,2	5,4	112	B5	250
			3,0	7,4	132	B5	250
			4,0	9,2	132	B5	250
			5,5	12,7	132	B5	250
			5,5	12,7	132	B5	250
	1500		5,5	11,4	132	B5	250
			7,5	15,4	132	B5	250
			11	22	160	B5	350
			15	29,5	160	B5	350
			18,5	36	180	B5	350
	1000/500		2,6/0,5	7,1/2,8	132	B5	250
			3,3/0,75	9,3/3,6	132	B5	250
			4,4/1,0	11/4,40	132	B5	250
	1500/750		5,5/1,4	11,4/4,3	132	B5	250
			7,0/1,7	15,2/5,1	132	B5	250
			11/3,0	24/9,5	160	B5	350
			14/3,5	30,5/11,4	160	B5	350
			16/4,0	32,5/11,9	180	B5	350

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

800	1500/1000		6,0/2,0	12,5/5,4	132	B5	250
			8,5/3,0	17,9/17,6	160	B5	350
			12/3,50	24/9,5	160	B5	350
			14/4,8	30/12	180	B5	350
			18/16,0	36/14	180	B5	350

900	750		1,1	3,15	100	B5	250
			1,5	5,15	112	B5	250
			2,2	5,4	132	B5	250
			3,0	7,6	132	B5	250
			4,0	9,3	160	B5	350
	1000		3,0	7,4	132	B5	250
			4,0	9,2	132	B5	250
			5,5	12,7	132	B5	250
			7,5	15,7	160	B5	350
			11	22	160	B5	350
	1500		11	22	160	B5	350
			15	29,5	160	B5	350
			18,5	36	180	B5	350
			22	43	180	B5	350
			30	52	200	B5	350
	1000/500		3,3/0,75	9,3/3,6	132	B5	250
			4,4/1,1	11/4,4	132	B5	250
			6,3/1,5	15,7/5,4	160	B5	350
			8,8/2,2	20,5/7,0	160	B5	350
			11/3,0	24/9,5	160	B5	350
	1500/750		14/3,5	30,5/11,4	160	B5	350
			16/4,0	32,5/11,9	180	B5	350
			20/5,5	39/16,2	180	B5	350
			28/7,0	52/16,2	200	B5	350
			28/7,0	52/16,2	200	B5	350
	1500/1000		12/3,5	24/9,5	160	B5	350
			14/4,8	30/12	180	B5	350
			18/6,0	36/14	180	B5	350
			20/7,0	41/16,2	200	B5	350
			25/9,0	47/18,5	200	B5	350
			31/10	60/21,5	225	B5	350
			31/10	60/21,5	225	B5	350
			31/10	60/21,5	225	B5	350

❶ Nominal current = appr. values for 400 V motors, brand EMOD.
It is important to check nominal current in case of other motor brands.

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TECHNICAL LISTS (AVAILABLE MODELS)****BVAXN 12/56 200°C - 120 MIN****071**

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

1000	750		2,2	5,4	132	B5	250
			3,0	7,6	132	B5	250
			4,0	9,3	160	B5	350
			5,5	11,4	160	B5	350
			7,5	16,1	160	B5	350
	1000		5,5	12,7	132	B5	350
			7,5	15,7	160	B5	350
			11	22	160	B5	350
			15	29,5	180	B5	350
	1500		15	29,5	160	B5	350
			18,5	36	180	B5	350
			22	43	180	B5	350
			30	52	200	B5	350
			37	66	225	B5	450
			45	82	225	B5	450
	1000/500		4,4/1,0	11/4,4	132	B5	250
			6,3/1,5	15,7/5,4	160	B5	350
			8,8/2,2	20,5/7,0	160	B5	350
			12,5/3,0	32,5/11	180	B5	350
			22/5,5	44,5/16	225	B5	450
	1500/750		16/4,0	32,5/11,9	180	B5	350
			20/5,5	39/16,2	180	B5	350
			28/7,0	52/16,2	200	B5	350
			32/8,0	60/19	225	B5	450
			37/10	69/24,5	225	B5	450
	1500/1000		18/6,0	36/14	180	B5	350
			20/7,0	41/16,2	200	B5	350
			25/9,0	47/18,5	200	B5	350
			31/10	60/21,5	225	B5	450

1120	750		4,0	9,3	160	B5	350
			5,5	11,4	160	B5	350
			7,5	16,1	160	B5	350
			11	23,5	180	B5	350
			15	31	200	B5	400
	1000		7,5	15,7	160	B5	350
			11	22	160	B5	350
			15	29,5	180	B5	350
			20	40	200	B5	400
			22	43	200	B5	400
			30	57	225	B5	450

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

1120	1000/500		8,8/2,2	20,5/7,0	160	B5	350
			12,5/3,0	32,5/11	180	B5	350
			15,5/3,3	34/11	200	B5	400
			18,5/4,4	40/13,3	200	B5	400
			22/5,5	44,5/16	225	B5	450
			27/6,6	52/20	225	B5	450

1250	750		5,5	11,4	160	B5	350
			7,5	16,1	160	B5	350
			11	23,5	180	B5	350
			15	31	200	B5	400
			18,5	37	225	B5	450
			22	44,5	225	B5	450
	1000		15	29,5	180	B5	350
			20	40	200	B5	400
			22	43	200	B5	400
			30	57	225	B5	450
	1000/500		37	67	225	B5	450
			15,5/3,0	34/11,0	200	B5	400
			18,5/4,4	40/13,3	200	B5	400
			22/5,5	44,5/16	225	B5	450
			27/6,6	52/20	225	B5	450

1400	750		11	23,5	180	B5	350
			15	31	200	B5	450
			18,5	37	225	B5	450
			22	44,5	225	B5	450
	1000		30	57	225	B5	450
			37	67	225	B5	450
	1000/500		27/6,6	52/20	225	B5	450

1600	750		22	44,5	225	B5	450
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❶ Nominal current = appr. values for 400 V motors, brand EMOD.
It is important to check nominal current in case of other motor brands.

**TLT-Turbo GmbH**Am Weinberg 68 · D-36251 Bad Hersfeld/Germany
Tel.: +49.6621.950-0 · Fax: +49.6621.950-100**AXIAL SMOKE EXHAUST FANS
TECHNICAL LISTS (AVAILABLE MODELS)****BVAXN 12/56 300°C - 120 MIN****072**

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

355	1500		1,1	2,8	90	B14	160
	3000		1,5	3,25	90	B14	160
			2,2	4,6	90	B14	160
	1500/750		1,0/0,25	2,4/1,0	90	B14	160
	3000/1500		1,5/0,37	3,7/1,0	90	B14	160

400	1500		1,1	2,8	90	B5	200
	3000		1,5	3,25	90	B5	200
			2,2	4,6	90	B5	200
			3,0	6,7	100	B14	200
			4,0	8,3	112	B14	200
	1500/750		1,0/0,25	2,4/1,0	90	B5	200
	3000/1500		1,5/0,37	3,7/1,0	90	B5	200
			2,2/0,48	4,6/1,15	90	B5	200
			3,0/0,75	6,7/1,7	100	B14	200
			4,1/1,0	8,8/2,1	112	B14	200

450	1500		1,1	2,8	90	B5	200
	3000		3,0	6,7	100	B14	200
			4,0	8,3	112	B14	200
			5,5	11	112	B14	200
			7,5	14,6	112	B14	200
	1500/750		1,0/0,25	2,4/1,0	90	B5	200
	1500/1000		1,1/0,37	2,8/1,35	90	B5	200
	3000/1500		3,0/0,75	6,7/1,7	100	B14	200
			4,1/1,0	8,8/2,1	112	B14	200

500	1500		1,1	2,8	90	B5	200
			1,5	3,5	90	B5	200
	3000		4,0	8,3	112	B5	250
			5,5	11	132	B5	250
			7,5	14,6	132	B5	250
			11	20,5	132	B5	250
	1000/500		0,48/0,08	1,6/0,58	90	B5	200
	1500/750		1,0/0,25	2,4/1,0	90	B5	200
			1,4/0,35	3,3/1,35	90	B5	200
	1500/1000		1,1/0,37	2,8/1,35	90	B5	200
			1,6/0,6	3,9/1,8	100	B5	250
	3000/1500		6,0/1,5	13,3/3,2	132	B5	250
			7,8/2,0	16,2/4,1	132	B5	250

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

560	1000		0,75	2,2	90	B5	200
	1500		1,1	2,8	90	B5	200
			1,5	3,5	90	B5	200
			2,2	5,5	100	B5	250
			3,0	7,1	100	B5	250
	1000/500		0,8/0,15	2,3/0,9	90	B5	200
	1500/750		1,4/0,35	3,3/1,35	90	B5	200
			2,5/0,65	5,6/2,2	100	B5	250
			3,8/1,0	8,1/3,4	112	B5	250
	1500/1000		1,1/0,37	2,8/1,35	90	B5	200
			1,6/0,6	3,9/1,8	100	B5	250
			3,0/1,0	6,3/3,0	112	B5	250

630	750		0,55	1,8	90	B5	200
	1000		0,75	2,2	90	B5	200
			1,1	3,15	90	B5	200
			1,5	3,9	100	B5	250
	1500		1,5	3,5	90	B5	200
			2,2	5,5	100	B5	250
			3,0	7,1	100	B5	250
			4,0	8,6	112	B5	250
			5,5	11,4	132	B5	250
			7,5	14,6	132	B5	250
	1000/500		0,8/0,15	2,3/0,9	90	B5	200
			1,2/0,22	3,1/1,15	100	B5	250
	1500/750		2,5/0,6	5,6/2,2	100	B5	250
			3,8/1,0	8,1/3,4	112	B5	250
			5,5/1,4	11,4/4,3	132	B5	250
	1500/1000		2,2/0,75	5,3/2,3	100	B5	250
			3,0/1,0	6,3/3,0	112	B5	250
			6,0	12,5/5,4	132	B5	250

❶ Nominal current = appr. values for 400 V motors, brand EMOD. Brands ATB and Loher marked (A) and (L) respectively.
It is important to check nominal current in case of other motor brands.

**TLT-Turbo GmbH**Am Weinberg 68 · D-36251 Bad Hersfeld/Germany
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TECHNICAL LISTS (AVAILABLE MODELS)****BVAXN 12/56 300°C - 120 MIN****073**

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

710	750		0,75	2,2	100	B5	250
			1,1	3,15	100	B5	250
	1000		1,1	3,15	90	B5	200
			1,5	3,9	100	B5	250
			2,2	5,4	112	B5	250
			3,0	7,4	132	B5	250
	1500		3,0	7,1	100	B5	250
			4,0	8,6	112	B5	250
			5,5	11,4	132	B5	250
			7,5	15,4	132	B5	250
			11	22	160	B5	350
	1000/500		1,2/0,22	3,1/1,15	100	B5	250
			1,85/0,33	4,6/1,6	112	B5	250
			3,3/0,75	9,3/3,6	132	B5	250
	1500/750		3,8/1,0	8,1/3,4	112	B5	250
			5,5/1,4	11,4/4,3	132	B5	250
			7,0/1,7	15,2/5,1	132	B5	250
			11/3,0	24/9,5	160	B5	350
	1500/1000		4,5/1,5	9,5/3,8	132	B5	250
			6,0/2,0	12,5/5,4	132	B5	250
			8,5/3,0	17,9/7,6	160	B5	350
			12/3,5	24/9,5	160	B5	350

800	750		1,1	3,15	100	B15	250
			1,5	5,15	112	B5	250
			2,2	5,4	132	B5	250
	1000		2,2	5,4	112	B5	250
			3,0	7,4	132	B5	250
			4,0	9,2	132	B5	250
			5,5	12,7	132	B5	250
	1500		5,5	11,4	132	B5	250
			7,5	15,4	132	B5	250
			11	22	160	B5	350
			15	29,5	160	B5	350
			18,5	36	180	B5	350
	1000/500		2,6/0,5	7,1/2,8	132	B5	250
			3,3/0,75	9,3/3,6	132	B5	250
			4,4/1,0	11/4,4	132	B5	250
	1500/750		5,5/1,4	11,4/4,3	132	B5	250
			7,0/1,7	15,2/5,1	132	B5	250
			11/3,0	24/9,5	160	B5	350
			14/3,5	30,5/11,4	160	B5	350
			16/4,0	32,5/11,9	180	B5	350

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

800	1500/1000		6,0/2,0	12,5/5,4	132	B5	250
			8,5/3,0	17,9/7,6	160	B5	350
			12/3,5	24/9,5	160	B5	350
			14/4,8	30/12	180	B5	350
			18/6,0	36/14	180	B5	350

900	750		1,1	3,15	100	B5	250
			1,5	5,15	112	B5	250
			2,2	5,4	132	B5	250
			3,0	7,6	132	B5	250
			4,0	9,3	160	B5	350
	1000		3,0	7,4	132	B5	250
			4,0	9,2	132	B5	250
			5,5	12,7	132	B5	250
			7,5	15,7	160	B5	350
			11	22	160	B5	350
	1500		11	22	160	B5	350
			15	29,5	160	B5	350
			18,5	36	180	B5	350
			22	43	180	B5	350
			30	52	200	B5	350
	1000/500		3,3/0,75	9,3/3,6	132	B5	250
			4,4/1,1	11/4,4	132	B5	250
			6,3/1,5	15,7/5,4	160	B5	350
			8,4/2,2	20,5/7,0	160	B5	350
			11/3,0	24/9,5	160	B5	350
	1500/750		14/3,5	30,5/11,4	160	B5	350
			16/4	32,5/11,9	180	B5	350
			20/5,5	39/16,2	180	B5	350
			28/7,0	52/16,2	200	B5	350
			32,5/11,9				
	1500/1000		12/3,5	24/9,5	160	B5	350
			14/4,8	30/12	180	B5	350
			18/6,0	36/14	180	B5	350
			20/7,0	41/16,2	200	B5	350
			25/9,0	47/18,5	200	B5	350
			33/11	61/24	225	B5	350

BVAXN 12/56

❶ Nominal current = appr. values for 400 V motors, brand EMOD. Brands ATB and Loher marked (A) and (L) respectively.
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TECHNICAL LISTS (AVAILABLE MODELS)
BVAXN 12/56 300°C - 120 MIN****074**

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

1000	750		2,2	5,4	132	B5	250
			3,0	7,6	132	B5	250
			4,0	9,3	160	B5	350
			5,5	11,4	160	B5	350
			7,5	16,1	160	B5	350
	1000		5,5	12,7	132	B5	250
			7,5	15,7	160	B5	350
			11	22	160	B5	350
			15	29,5	180	B5	350
	1500		15	29,5	160	B5	350
			18,5	36	180	B5	350
			22	43	180	B5	350
			30	52	200	B5	350
			37	66	225	B5	450
			45	82	225	B5	450
	1000/500		4,4/1,0	11/4,4	132	B5	250
			6,3/1,5	15,7/5,4	160	B5	350
			8,8/2,2	20,5/7,0	160	B5	350
			12,5/3,0	32,5/11	180	B5	350
			15,5/3,3	34/11	200	B5	350
	1500/750		16/4,0	32,5/11,9	180	B5	350
			20/5,5	39/16,2	180	B5	350
			28/7,0	52/16,2	200	B5	350
			32/8,0	60/19	225	B5	450
			37/10	69/24,5	225	B5	450
	1500/1000		18/6,0	36/14	180	B5	350
			20/7,0	41/16,2	200	B5	450
			25/9,0	47/18,5	200	B5	350
			33/11	61/24	225	B5	450

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

1120	750		4,0	9,3	160	B5	350
			5,5	11,4	160	B5	350
			7,5	16,1	160	B5	350
			11	23,5	180	B5	350
			15	31	200	B5	400
	1000		7,5	15,7	160	B5	350
			11	22	160	B5	350
			15	29,5	180	B5	350
			20	40	200	B5	400
			22	43	200	B5	400
			30	57	225	B5	450
	1500		30	52	200	B5	400
			37	66	225	B5	450
			45	82	225	B5	450
			55 (L)	97	250	B5	550
			75 (L)	132	280	B5	550
	1000/500		90 (L)	157	280	B5	550
			7,5/1,85	19/6,7	160	B5	350
			8,8/2,2	20,5/7,0	160	B5	350
			12,5/3,0	32,5/11	180	B5	350
			15,5/3,3	34/11	200	B5	400
			18,5/4,4	40/13,3	200	B5	400
	1500/750		22/5,5	44,5/16	225	B5	450
			27/6,6	52/20	225	B5	450
			32/8,0	60/19	225	B5	450
			37/10	69/24,5	225	B5	450
			39/9,5 (L)	72/21	225	B5	450
			44/11 (L)	78/24	225	B5	450
			49/11 (L)	84/23	250	B5	550
			68/17 (L)	125/43,5	280	B5	550
			80/20 (L)	140/48	280	B5	550

❶ Nominal current = appr. values for 400 V motors, brand EMOD. Brands ATB and Loher marked (A) and (L) respectively.
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TECHNICAL LISTS (AVAILABLE MODELS)****BVAXN 12/56 300°C - 120 MIN****075**

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

1250	750		5,5	11,4	160	B5	350
			7,5	16,1	160	B5	350
			11	23,5	180	B5	350
			15	31	200	B5	400
			18,5	37	225	B5	450
			22	44,5	225	B5	450
	1000		15	29,5	180	B5	350
			20	40	200	B5	400
			22	43	200	B5	400
			30	57	225	B5	450
			37	67	225	B5	450
	1500		45	82	225	B5	450
			55 (L)	97	250	B5	550
			75 (L)	132	280	B5	550
			90 (L)	157	280	B5	550
			110 (L)	200	315		
			132 (L)	240	315		
	1000/500		15,5/3,3	34/11	200	B5	400
			18,5/4,4	40/13,3	200	B5	400
			22/5,5	44,5/16	225	B5	450
			27/6,6	52/20	225	B5	450
			30/7 (L)	58/19	250	B5	550
	1500/750		44/11 (L)	78/24	225	B5	450
			49/11 (L)	84/23	250	B5	550
			68/17 (L)	125/43,5	280	B5	550
			80/20 (L)	140/48	280	B5	550

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

1400	1000/500		27/6,6	52/20	225	B5	450
			30/7,0	58/19	250	B5	550
			40/8,0 (L)	74/24	280	B5	550
			48/9,5 (L)	88/28	280	B5	550
			60/12 (L)	106/22	315	B5	660
			70/14 (L)	125/33	315	B5	660
			85/16 (L)	150/37	315	B5	660
			105/20 (L)	185/47	315	B5	660

1400	750		11	23,5	180	B5	350
			15	31	200	B5	400
			18,5	37	225	B5	450
			22	44,5	225	B5	450
			30 (L)	60	250	B5	550
			45 (L)	88	280	B5	550
	1000		30	57	225	B5	450
			37	74	225	B5	450
			45 (L)	81	280	B5	550
			55 (L)	99	280	B5	550
			75 (L)	136	315	B5	660
			90 (L)	160	315	B5	660

❶ Nominal current = appr. values for 400 V motors, brand EMOD. Brands ATB and Loher marked (A) and (L) respectively.
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TECHNICAL LISTS (AVAILABLE MODELS)
BVAXN 12/56 400°C - 120 MIN****076**

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

355	1500		1,1	2,85	90	B14	160
	3000		1,5	3,4	90	B14	160

400	1500		1,1	2,85	90	B5	200
	3000		1,5	3,4	90	B5	200
			2,2	4,8	100	B14	200
			3,0	6,2	112	B14	160
	3000/1500		3,0/0,8	7,0/2,0	112	B14	160

450	1500		1,1	2,85	90	B5	200
	3000		3,0	6,2	112	B14	200

500	1500		1,5	4,0	100	B5	250
	3000		4,0	8,5	132	B5	250
			5,5	11	132	B5	250
			7,5 ❷	14,5	160	B14	250
	1500/750		2,5/0,55	6,5/2,5	112	B5	250
	1500/1000		2,4/0,75	6,8/2,8	112	B5	250
	3000/1500		3,0/0,8	7,0/2,0	112	B5	250
			6,0/1,6	13/3,5	132	B5	250

560	1500		1,5	4,0	100	B5	250
			2,2	6,0	100	B5	250
			3,0	7,0	112	B5	250
	1500/750		2,5/0,55	6,5/2,5	112	B5	250
			3,7/0,9	9,2/3,8	132	B5	250
	1500/1000		3,0/0,9	7,0/2,5	132	B5	250

630	750		0,55	2,0	100	B5	250
	1000		1,5	4,2	112	B5	250
	1500		2,2	6,0	100	B5	250
			3,0	7,0	112	B5	250
			4,0	9,0	132	B5	250
			5,5	12	132	B5	250
	1000/500		2,0/0,33	5,0/2,5	132	B5	250
	1500/750		2,5/0,55	6,5/2,5	112	B5	250
			3,7/0,9	9,2/3,8	132	B5	250
			5,0/1,3	11,5/4,5	132	B5	250

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

710	750		1,1	3,5	112	B5	250
	1000		1,1	3,6	100	B5	250
			1,5	4,2	112	B5	250
			2,2	5,2	132	B5	250
			3,0	7,5	132	B5	250
	1500		3,0	7,0	112	B5	250
			4,0	9,0	132	B5	250
			5,5	12	132	B5	250
			7,5	14,5	160	B5	350
			11	23	160	B5	350
	1000/500		2,0/0,33	5,0/2,5	132	B5	250
			3,2/0,7	7,0/4,0	132	B5	250
	1500/750		3,7/0,9	9,2/3,8	132	B5	250
			5,0/1,3	11,5/4,5	132	B5	250
			10/3,0	25/10,5	160	B5	350
	1500/1000		4,2/1,25	10/3,2	132	B5	250
			7,5/2,2	17/6,0	160	B5	350
			12/3,5	28/11	160	B5	350

800	750		1,1	3,5	112	B5	250
			1,5	4,2	132	B5	250
			2,2	6,0	132	B5	250
	1000		2,2	5,2	132	B5	250
			3,0	7,5	132	B5	250
			4,0	9,4	132	B5	250
			7,5	16,5	160	B5	350
	1500		5,5	12	132	B5	250
			7,5	14,5	160	B5	350
			11	23	160	B5	350
			15	31	160	B5	350
			18,5	37	180	B5	350
	1000/500		2,0/0,33	5,0/2,5	132	B5	250
			3,2/0,7	7,0/4,0	132	B5	250
			6,2/1,3	15/4,2	160	B5	350
	1500/750		5,0/1,3	11,5/4,5	132	B5	250
			10/3,0	25/10,5	160	B5	350
			13/3,5	32/12,5	160	B5	350
			16/4	33/15	180	B5	350
	1500/1000		7,5/2,2	17/6,0	160	B5	350
			12/3,5	28/11	160	B5	350

❶ Nominal current = appr. values for 400 V motors, brand EMOD. Brands ATB and Loher marked (A) and (L) respectively.
It is important to check nominal current in case of other motor brands.

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TECHNICAL LISTS (AVAILABLE MODELS)****BVAXN 12/56 400°C - 120 MIN****077**

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

900	750		1,1	3,5	112	B5	250
			1,5	4,2	132	B5	250
			2,2	6,0	132	B5	250
			4,0	10	160	B5	350
	1000		3,0	7,5	132	B5	250
			4,0	9,4	132	B5	250
			7,5	16,5	160	B5	350
			11	32,5	160	B5	350
	1500		11	23	160	B5	350
			15	31	160	B5	350
			18,5	37	180	B5	350
			22	43	180	B5	350
			30	57	200	B5	350
	1000/500		3,2/0,7	7,0/4,0	132	B5	250
			6,2/1,3	15/4,2	160	B5	350
			8,4/1,8	18,5/5,1	160	B5	350
	1500/750		10/3,0	25/10,5	160	B5	350
			13/3,5	32/12,5	160	B5	350
			16/4,0	33/15	180	B5	350
			20/5,0	42/16	180	B5	350
			28/7,0	56/16,5	200	B5	350
	1500/1000		12/3,5	28/11	160	B5	350
			16,5/5,5	32/11,8	180	B5	350
			31/10	60/21	225	B5	350

1000	750		2,2	6,0	132	B5	250
			4,0	10	160	B5	350
			5,5	14,5	160	B5	350
			7,5	19	160	B5	350
			11	23,5	160	B5	350
	1000		7,5	16,5	160	B5	350
			11	23,5	160	B5	350
			15	33	180	B5	350
	1500		15	31	160	B5	350
			18,5	37	180	B5	350
			22	43	180	B5	350
			30	57	200	B5	350
			37	69	225	B5	450
			45	86	225	B5	450
			6,2/1,3	15/4,2	160	B5	350
	1000/500		8,4/1,8	18,5/5,1	160	B5	350
			12,5/3,0	26/8,0	180	B5	350
			20/4,5	40/14	200	B5	350

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

1000	1500/750		16/4,0	33/15	180	B5	350
			20/5,0	42/16	180	B5	350
			28/7,0	56/16,5	200	B5	350
			33/8,0	59/17,4	225	B5	450
			39/9,5	76/25	225	B5	450
	1500/1000		16,5/5,5	32/11,8	180	B5	350
			31/10	60/21	225	B5	450

1120	750		4,0	10	160	B5	350
			5,5	14,5	160	B5	350
			7,5	19	160	B5	350
			11	26	180	B5	350
			15	35	200	B5	400
			22	48	200	B5	400
	1000		7,5	16,5	160	B5	350
			11	23,5	160	B5	350
			15	33	180	B5	350
			22	48	200	B5	400
	1000/500		6,2/1,3	15/4,2	160	B5	350
			8,4/1,8	18,5/5,1	160	B5	350
			12,5/3,0	26/8,0	180	B5	350
			20/4,5	40/14	200	B5	400
			22/5,0	45/14,5	225	B5	450
			27/6,0	54/19	225	B5	450

1250	750		5,5	14,5	160	B5	350
			7,5	19	160	B5	350
			11	26	180	B5	350
			15	35	200	B5	400
			18,5	42	225	B5	450
	1000		15	33	180	B5	350
			22	48	200	B5	400
			30	61	225	B5	450
	1000/500		20/4,5	40/14	200	B5	400
			22/5,0	45/14,5	225	B5	450
			27/6,0	54/19	225	B5	450

1400	750		11	26	180	B5	350
			15	35	200	B5	400
			18,5	42	225	B5	450
			22	47,5	225	B5	450
	1000		30	61	225	B5	450
	1000/500		27/6,6	54/19	225	B5	450

1600	750		22	47,50	225	B5	450
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❶ Nominal current = appr. values for 400 V motors, brand EMOD. Brands ATB and Loher marked (A) and (L) respectively.
It is important to check nominal current in case of other motor brands.

• ATB motors

BVAXN 12/56



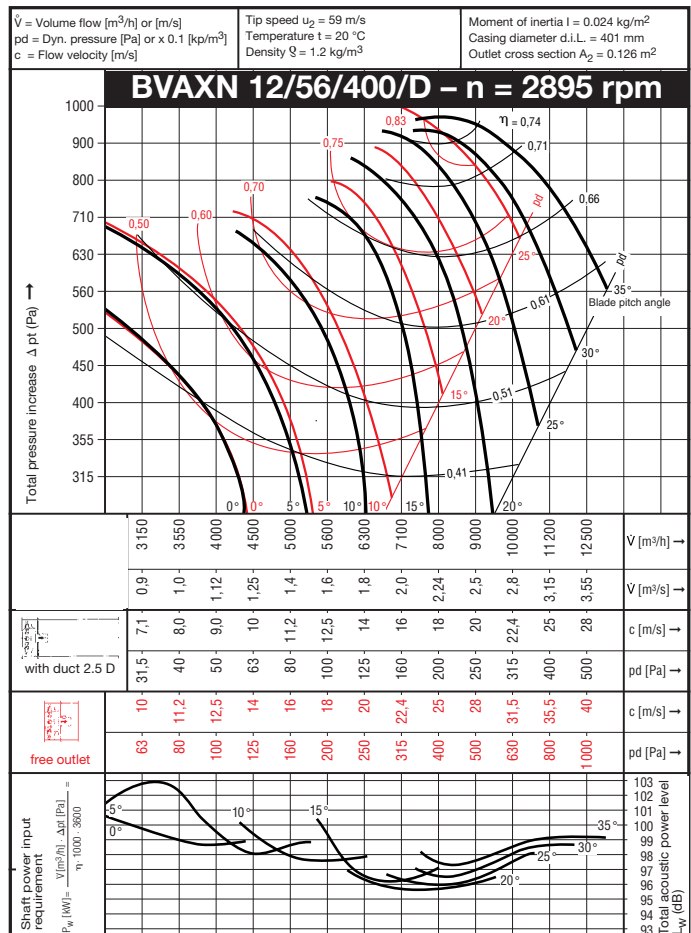
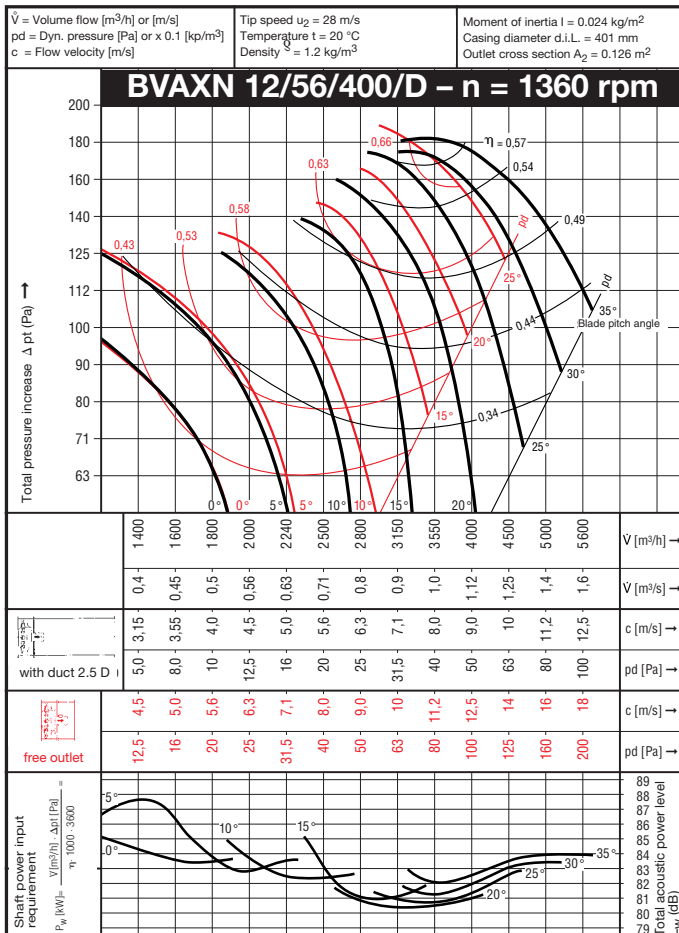
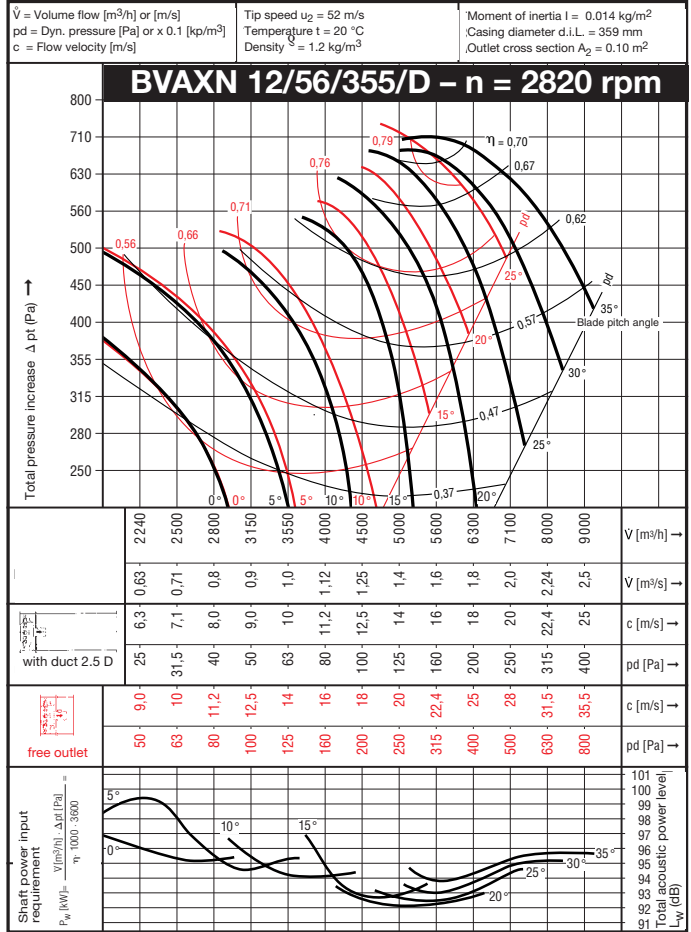
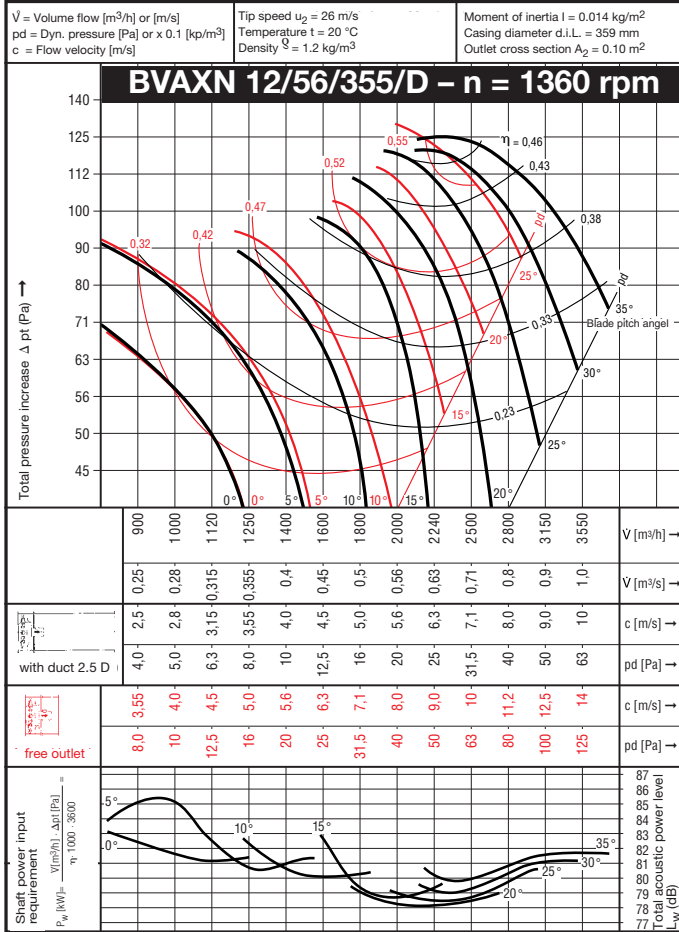
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AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES SERIES BVAXN 12/56

200/300/400°C – 120 MIN

078





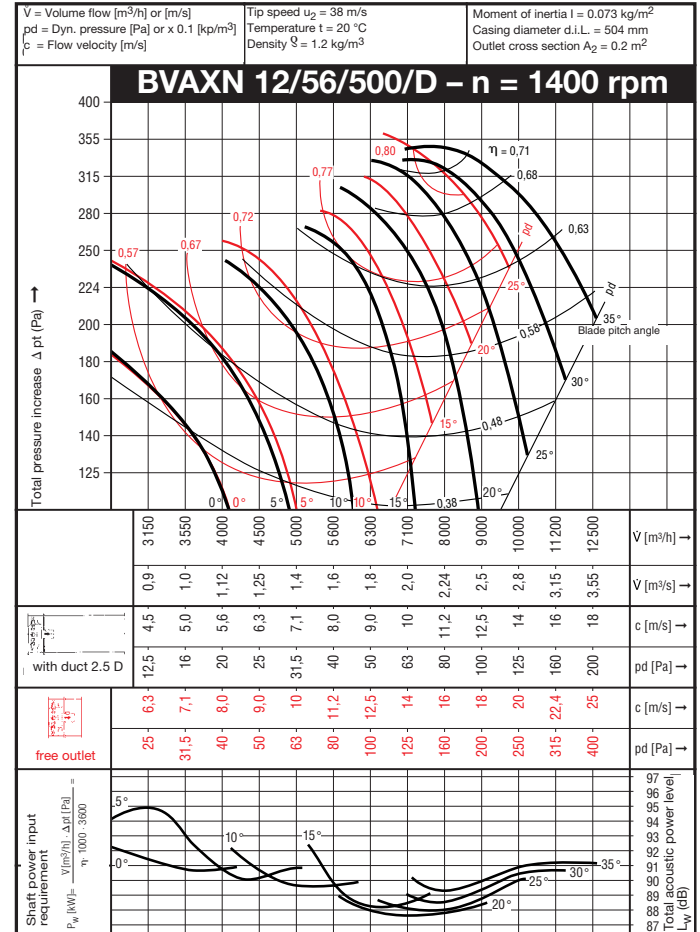
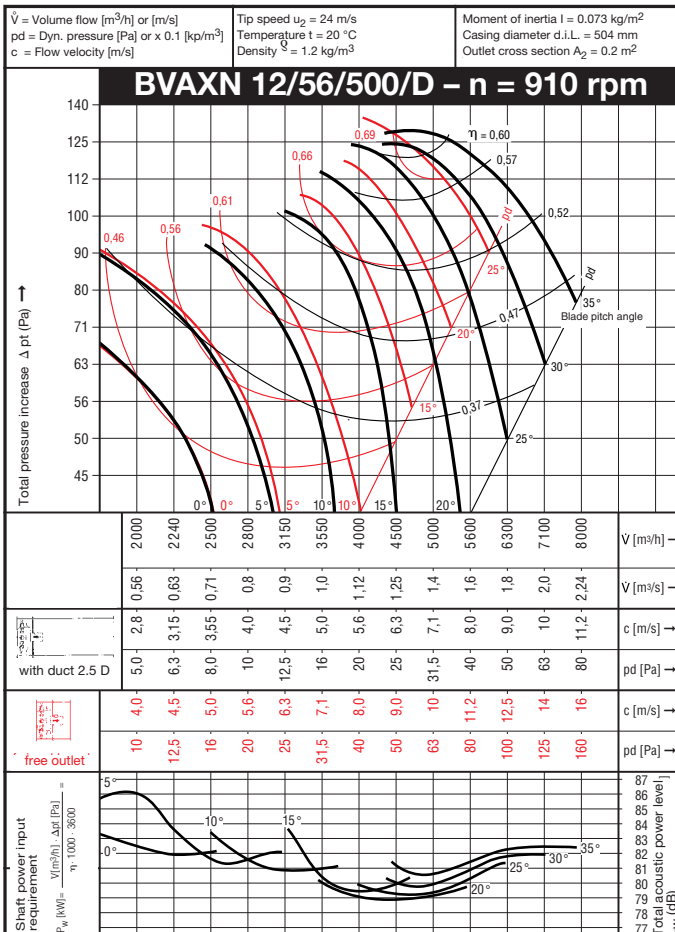
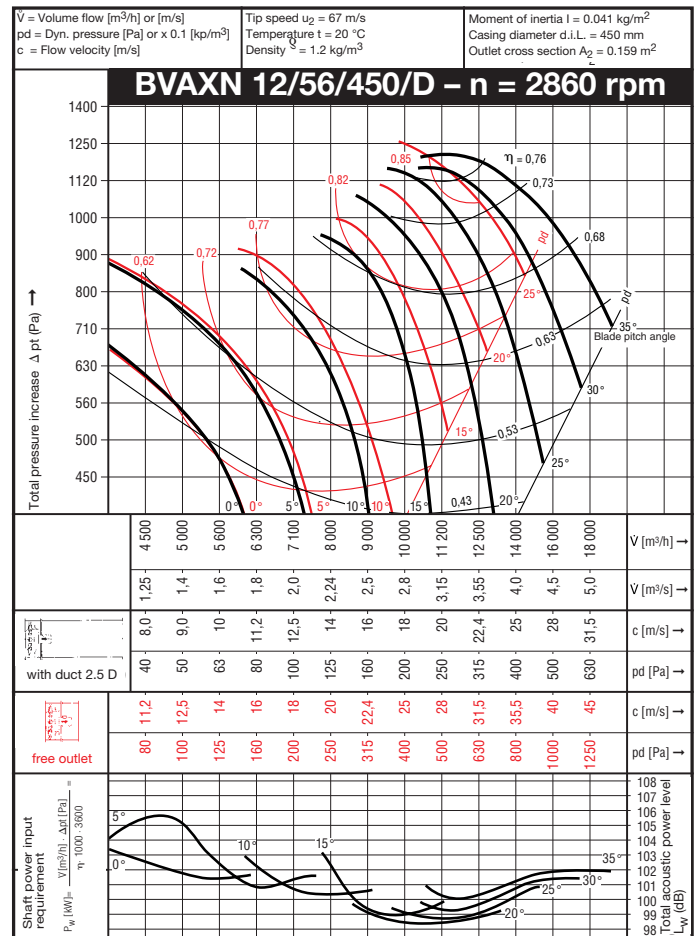
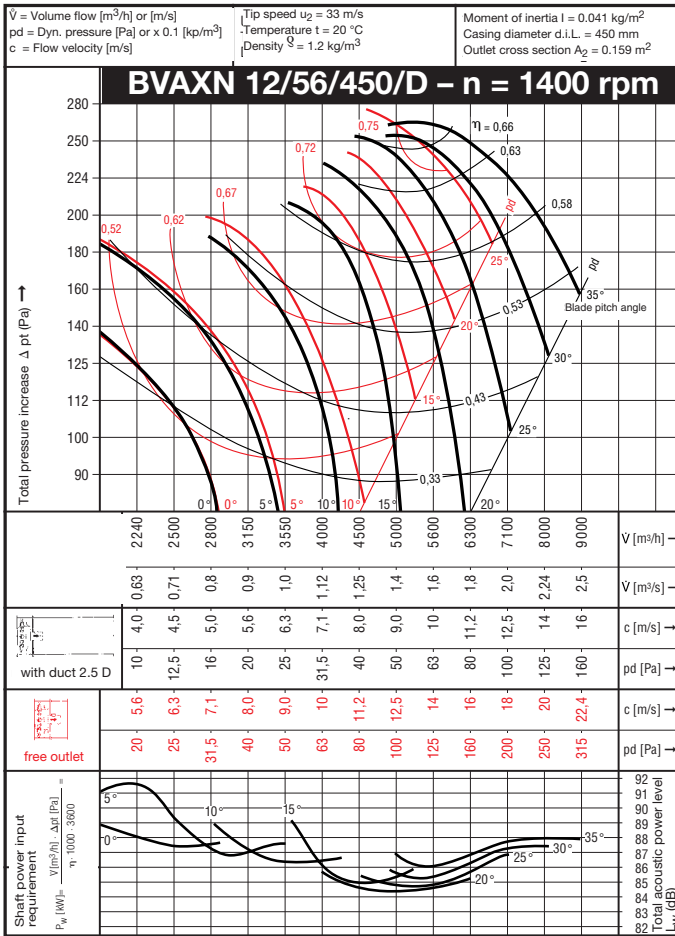
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AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES SERIES BVAXN 12/56

200/300/400°C – 120 MIN

079



* rounded to standard values

For maximum motor sizes please see dimension pages

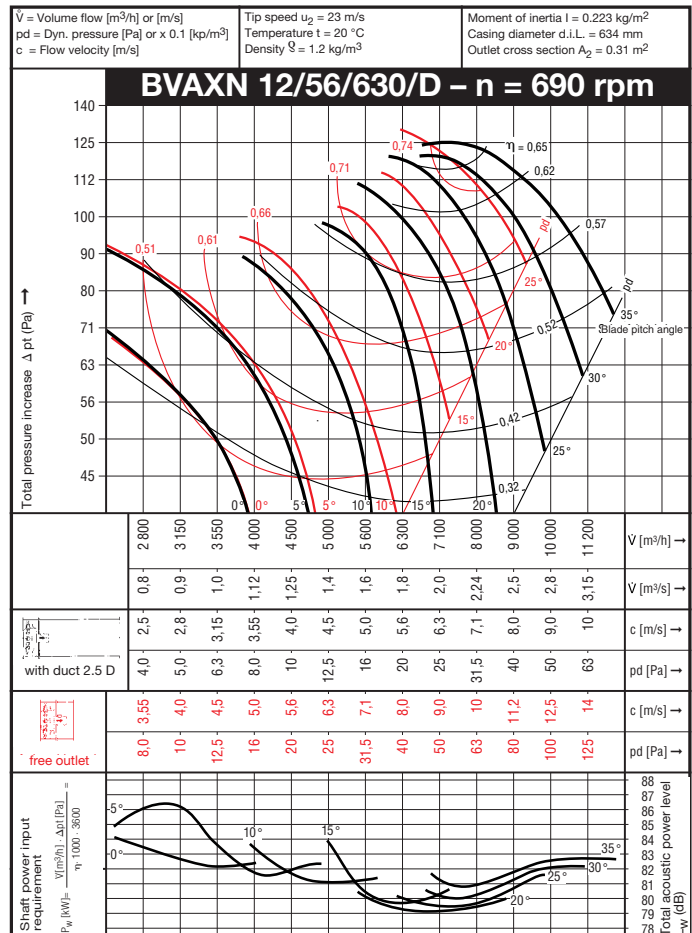
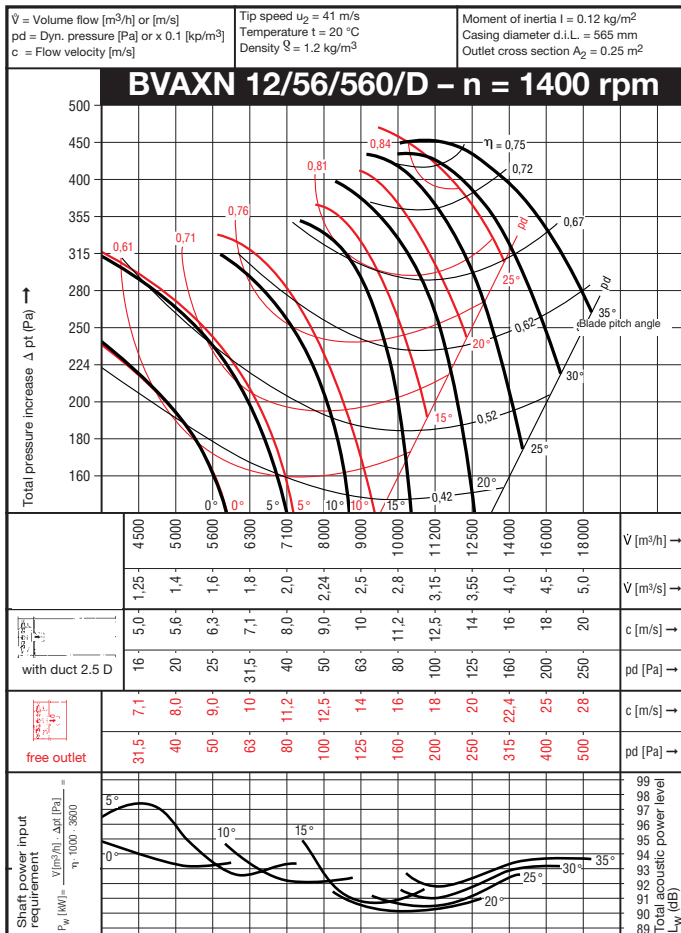
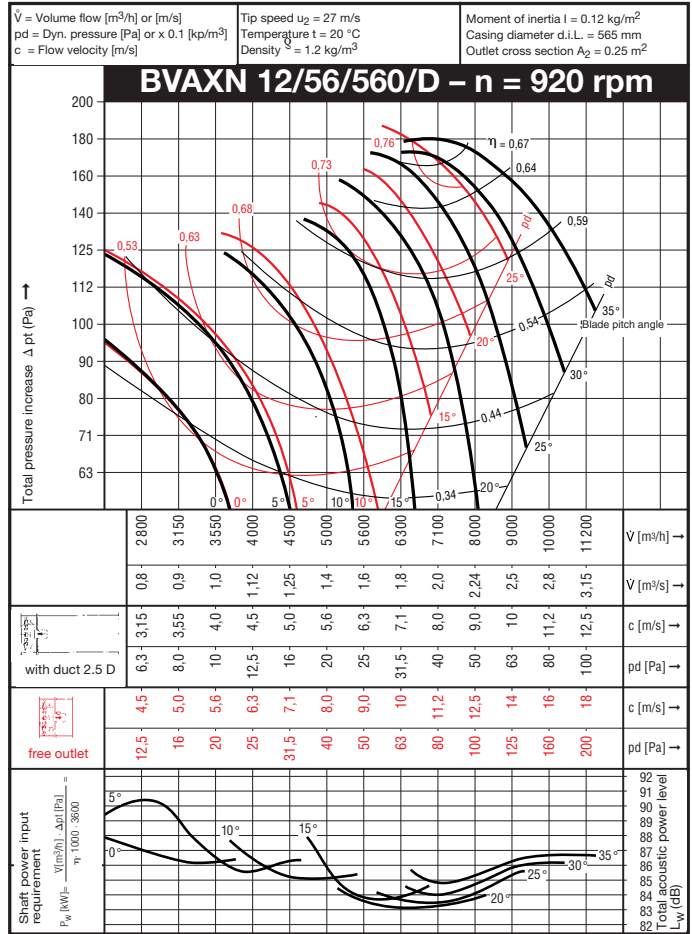
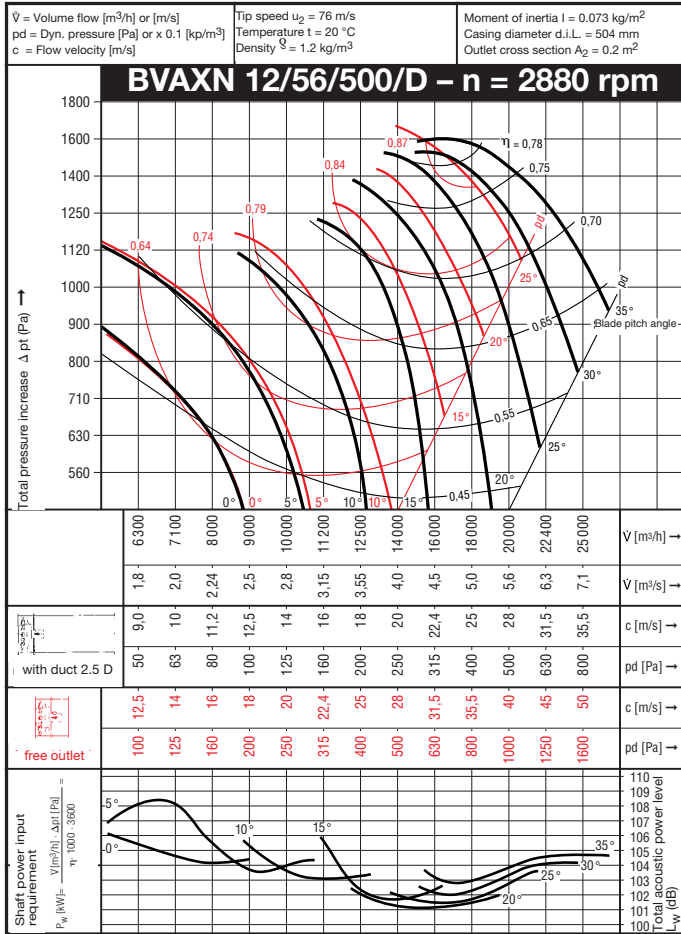


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AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES SERIES BVAXN 12/56 200/300/400°C – 120 MIN

080



* rounded to standard values

For maximum motor sizes please see dimension pages

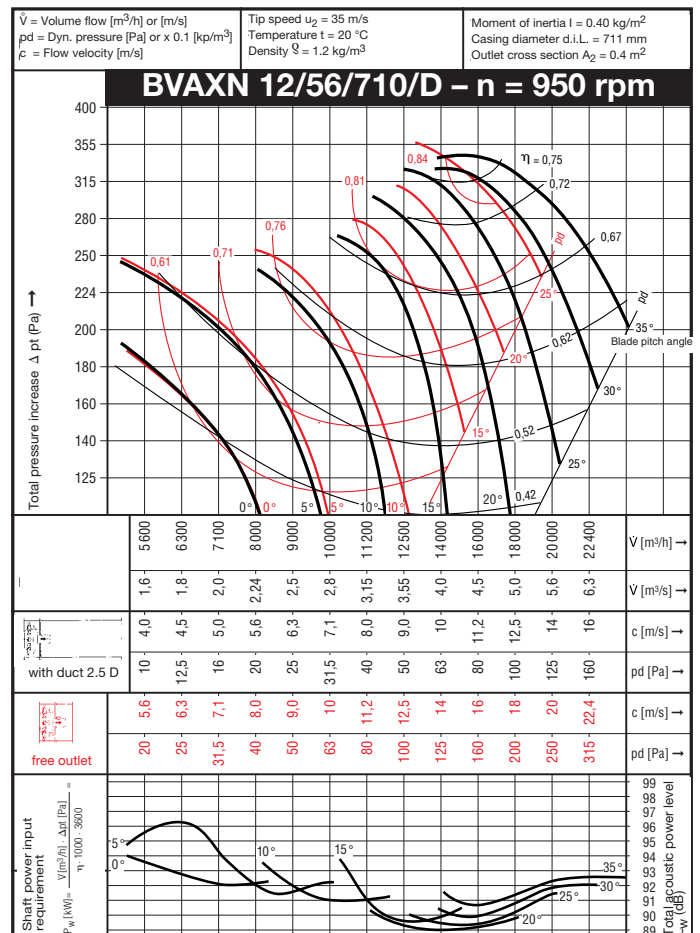
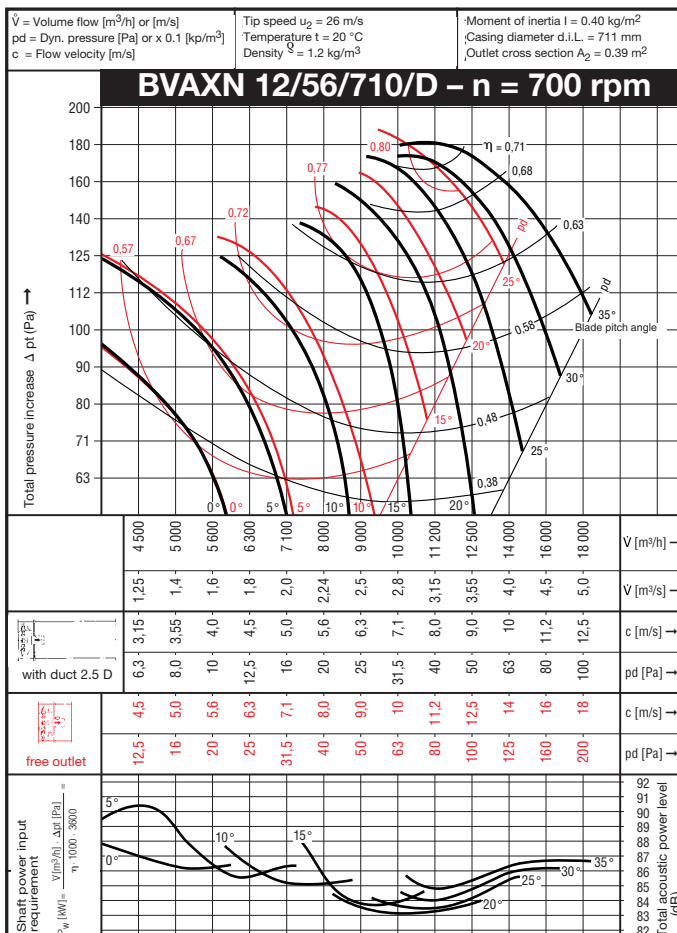
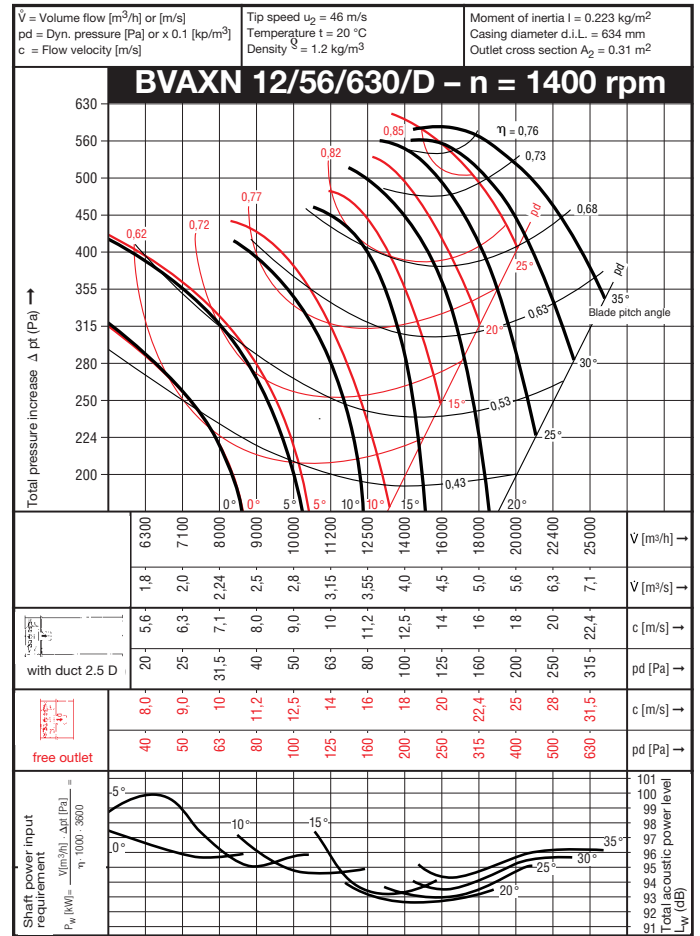
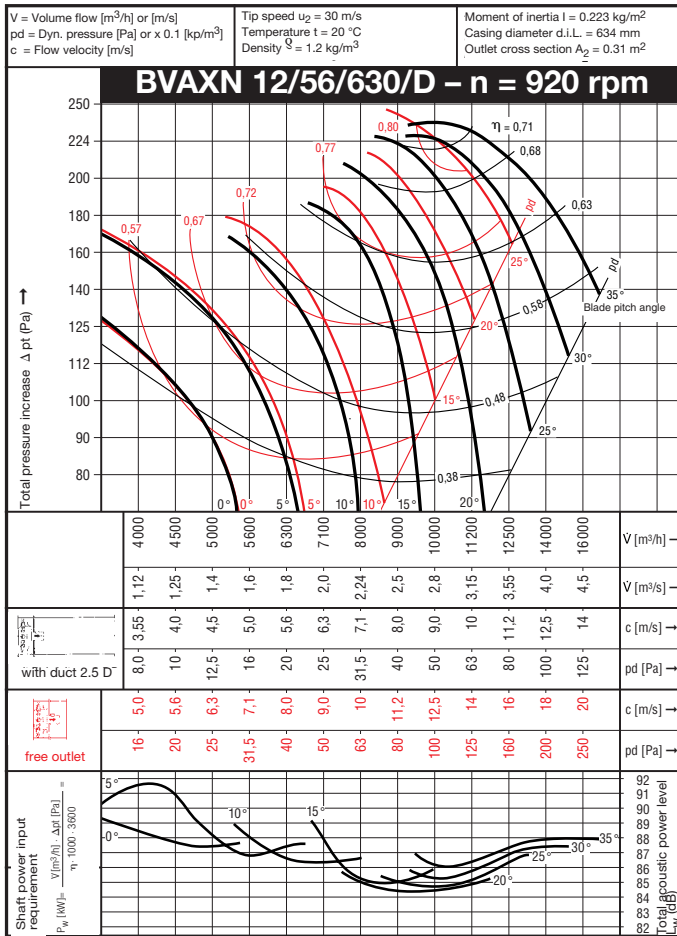


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AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES SERIES BVAXN 12/56 200/300/400°C – 120 MIN

081



* rounded to standard values

For maximum motor sizes please see dimension pages

BVAXN 12/56

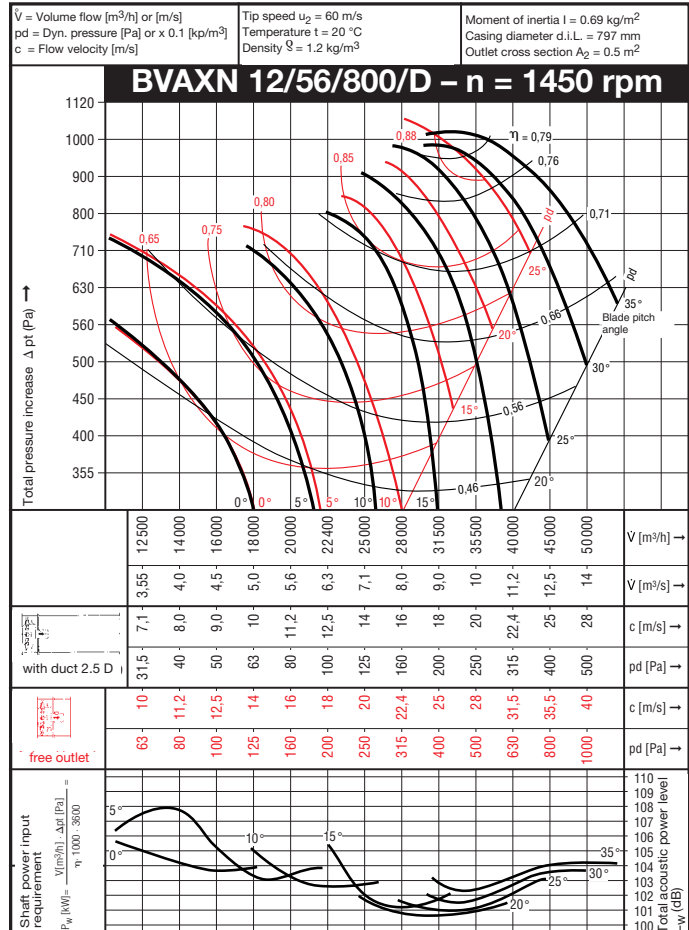
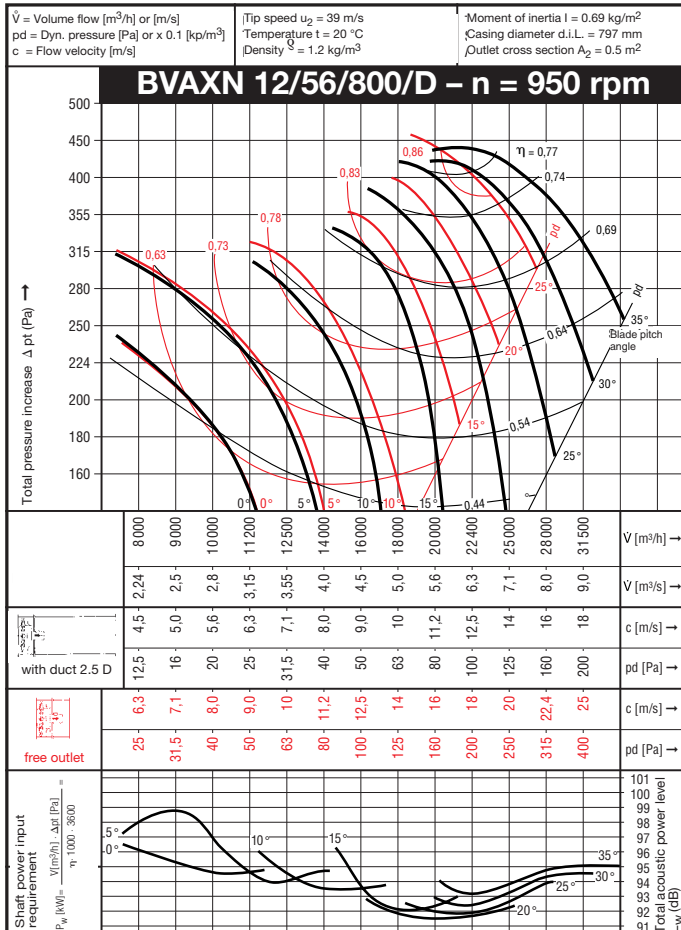
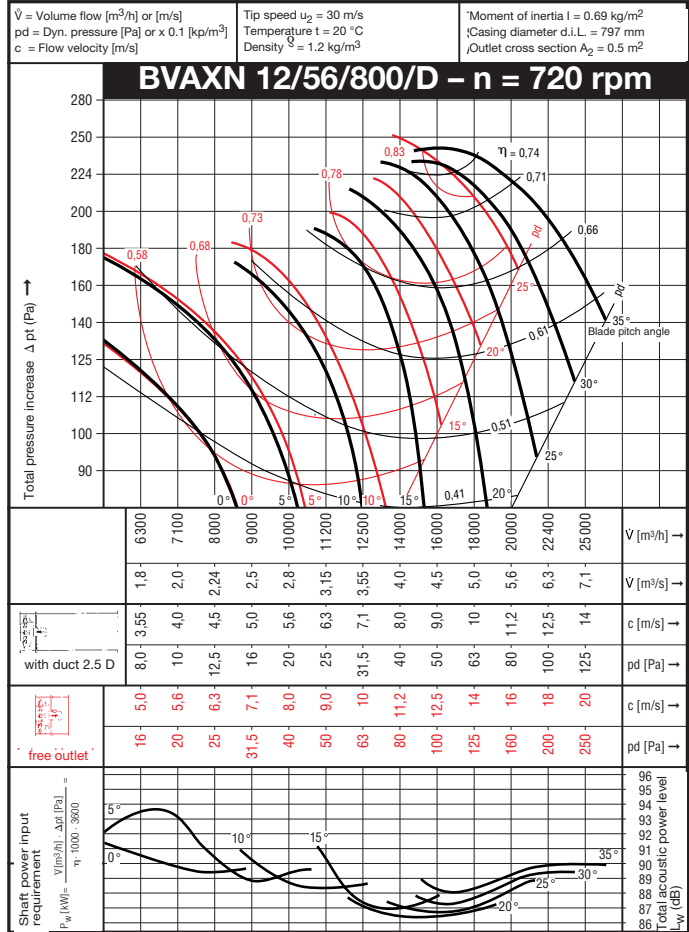
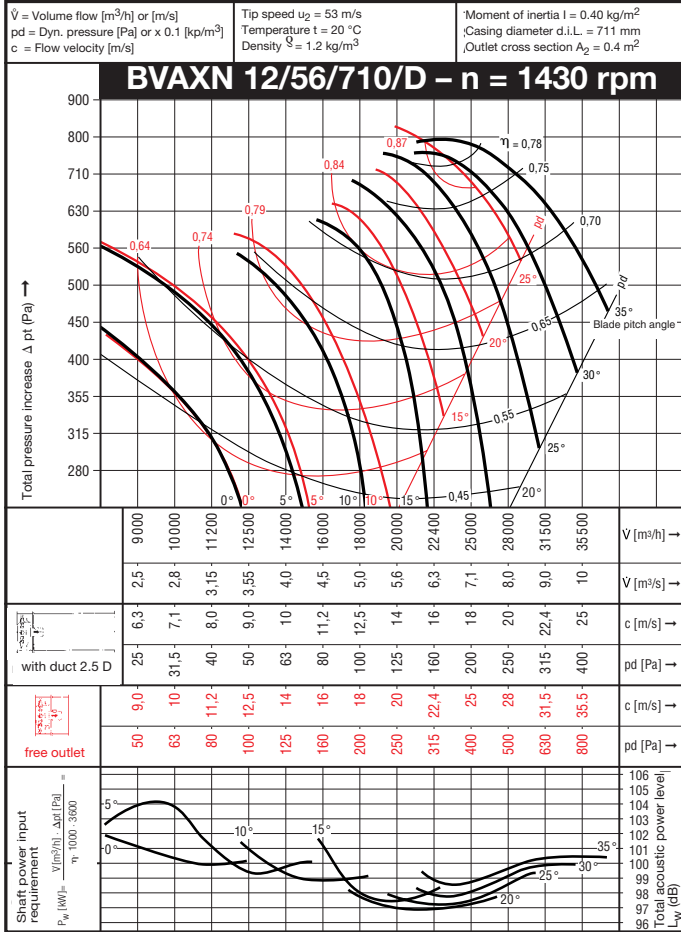


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AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES SERIES BVAXN 12/56 200/300/400°C – 120 MIN

082



* rounded to standard values

For maximum motor sizes please see dimension pages



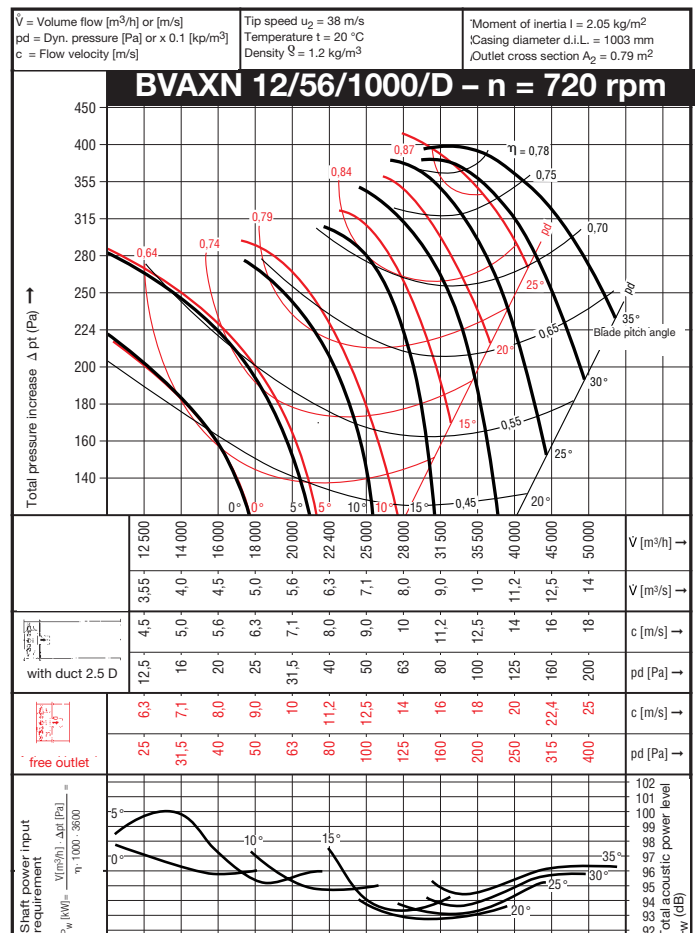
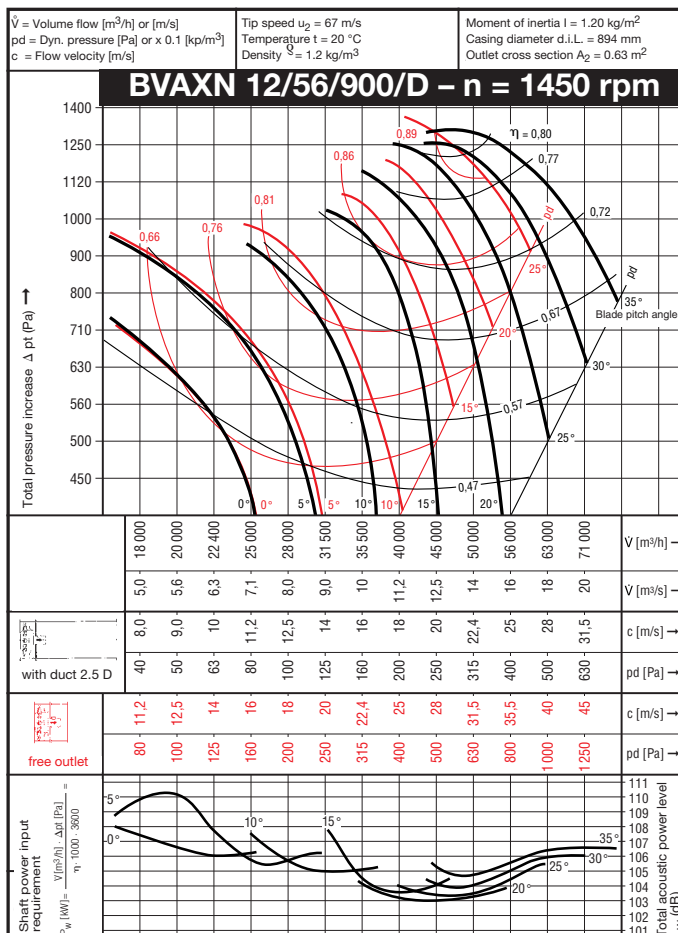
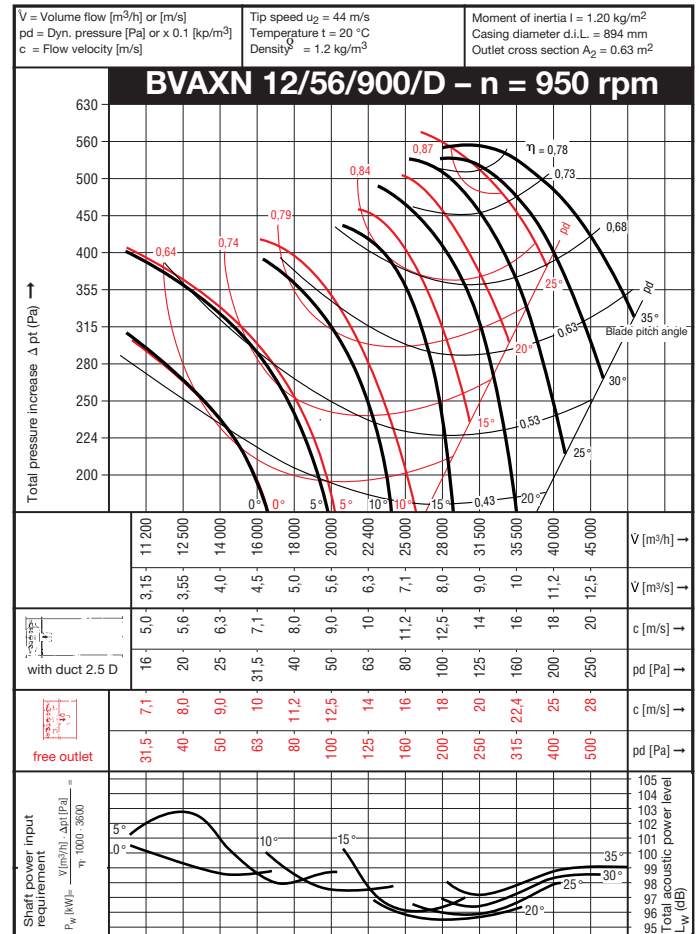
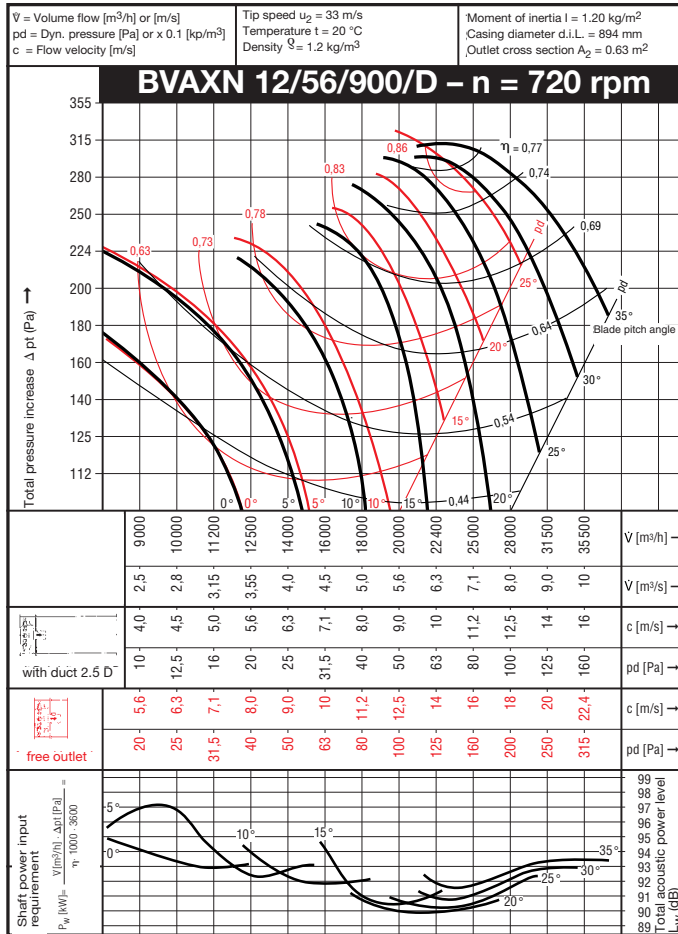
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AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES SERIES BVAXN 12/56

200/300/400°C – 120 MIN

083



* rounded to standard values

For maximum motor sizes please see dimension pages

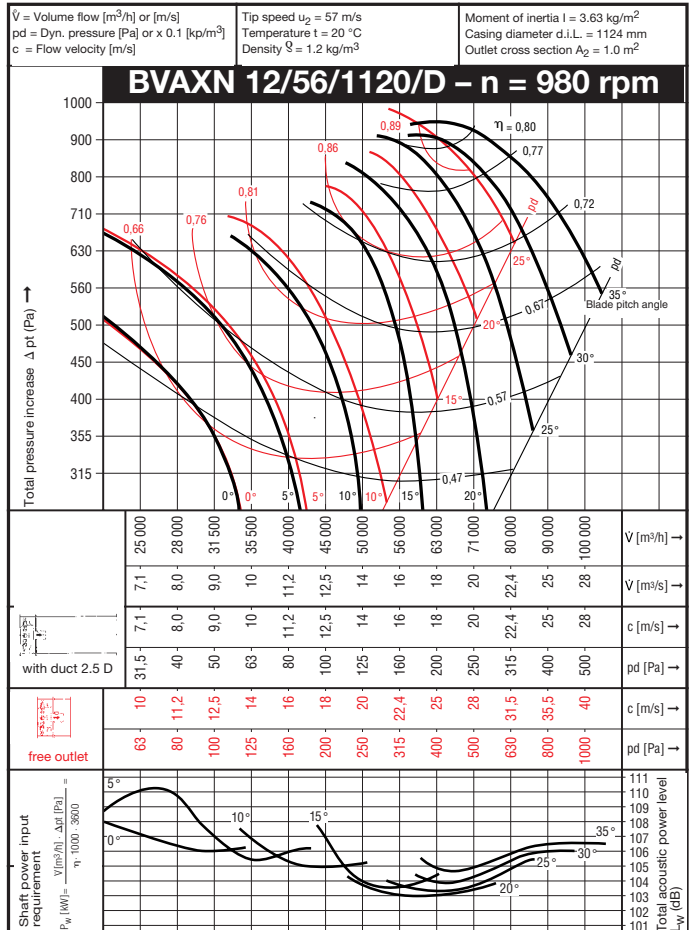
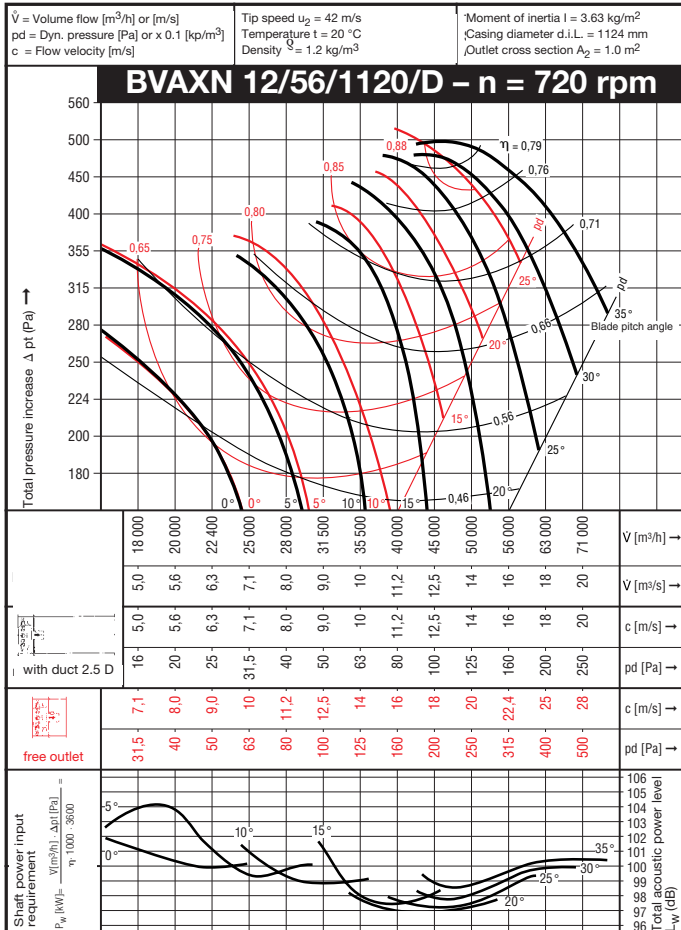
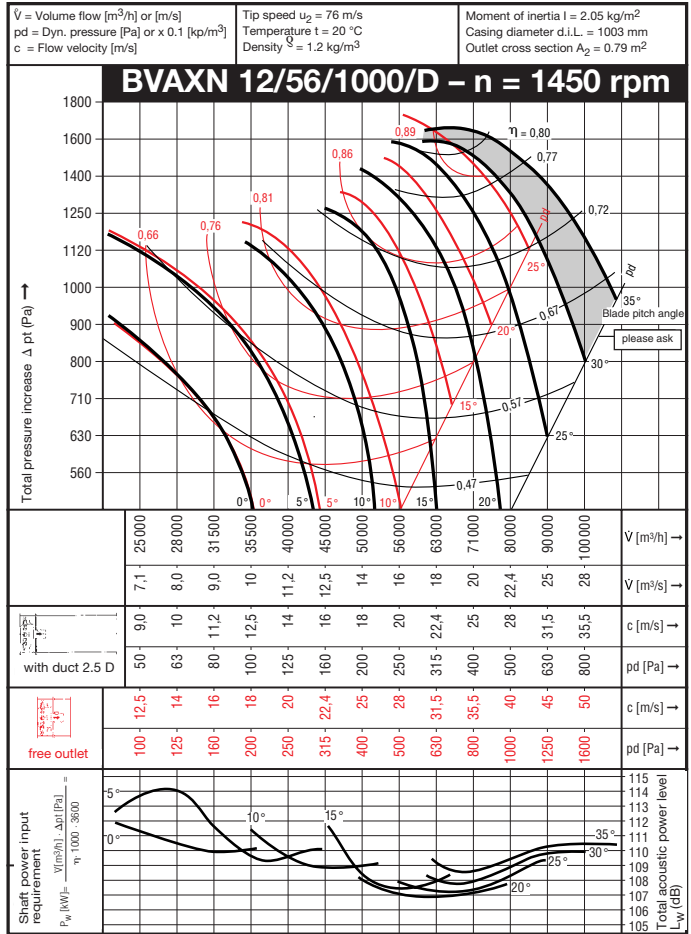
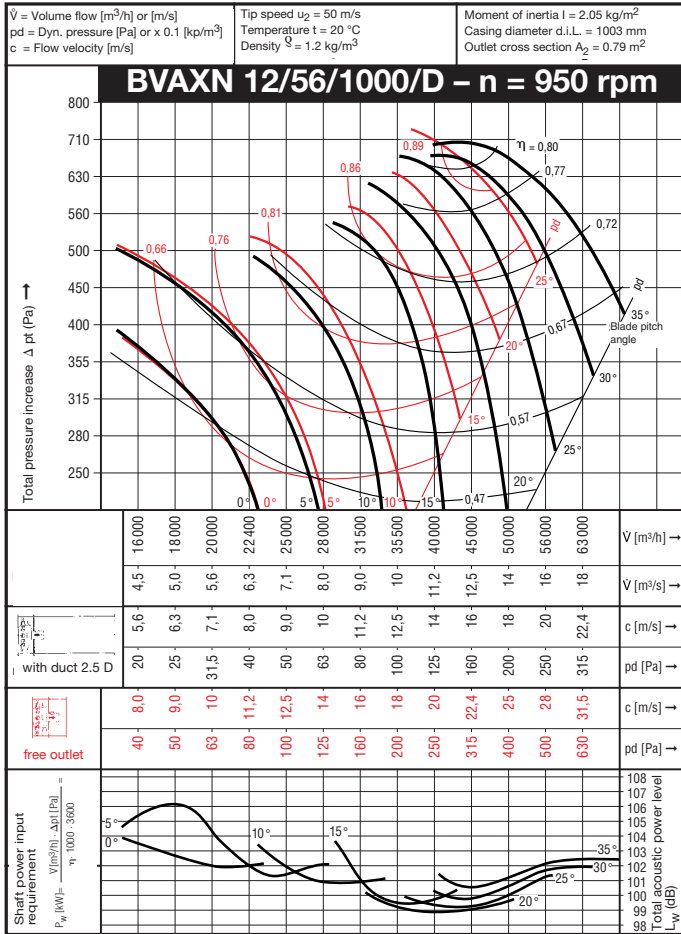


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AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES SERIES BVAXN 12/56 200/300/400°C – 120 MIN

084





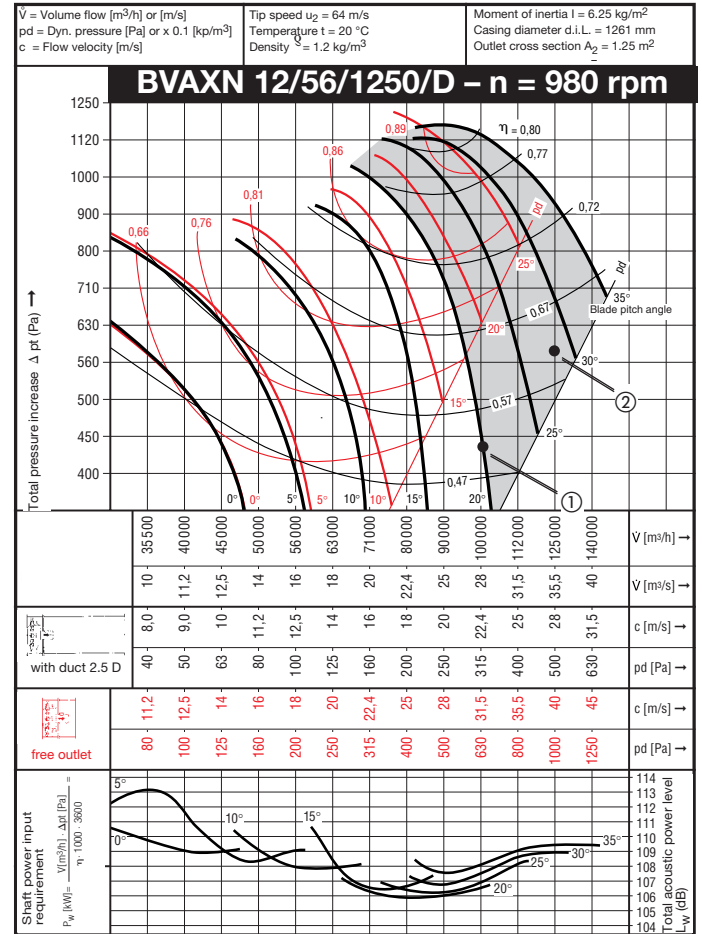
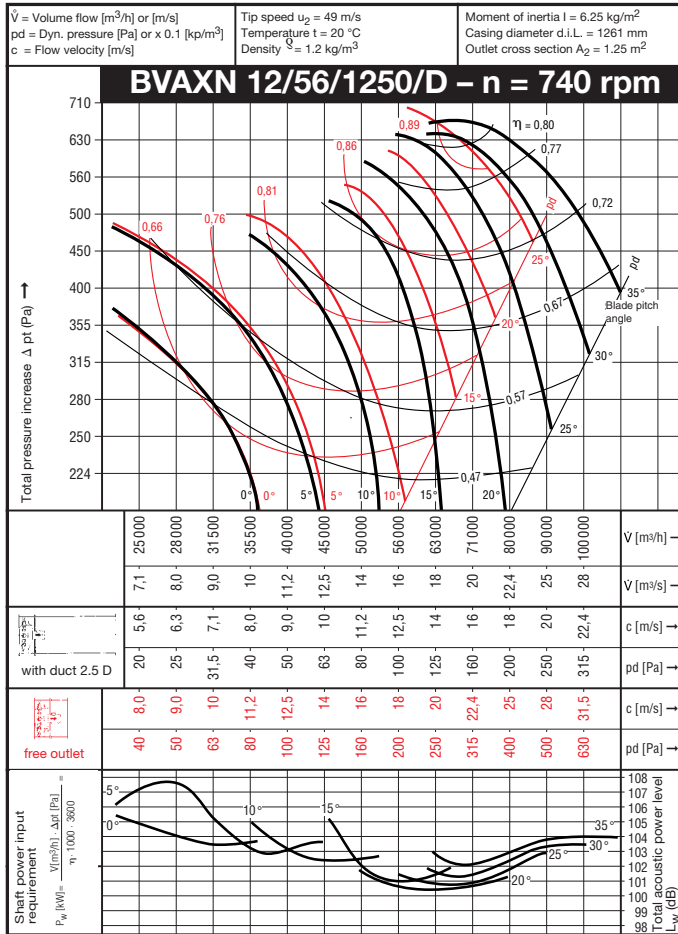
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AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES SERIES BVAXN 12/56

200/300/400°C – 120 MIN

085



① Capacity limit for fans for 400°C

② Fans in the screened field may only be used up to 200°C and 300°C resp.

Smoke exhaust fan types documented on the following pages 070+071 may be used for

200/300/°C – 120 MIN

BVAXN 12/56/1120/D - 1450 rpm

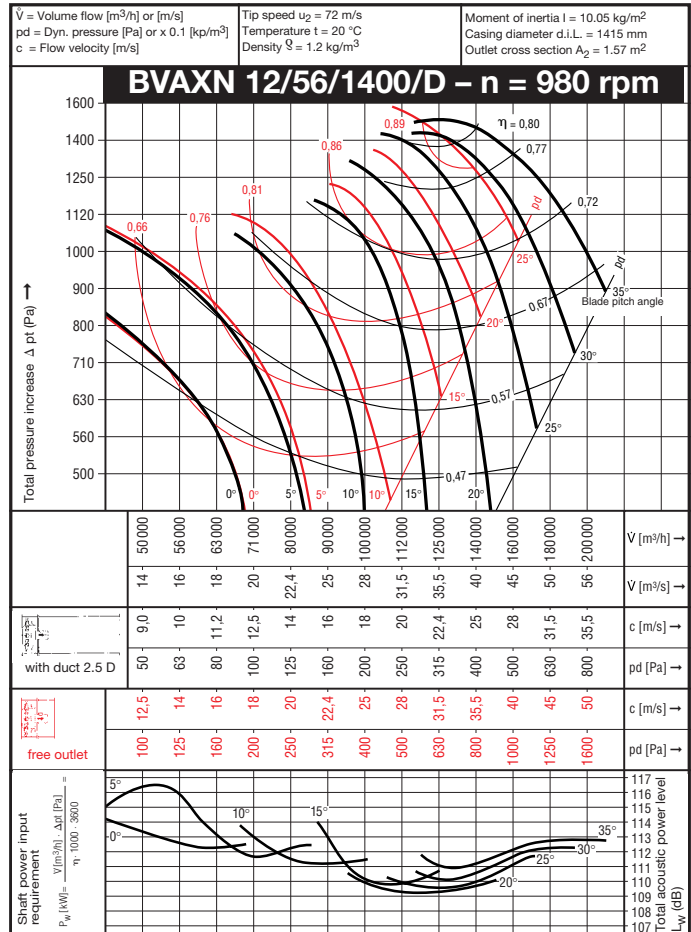
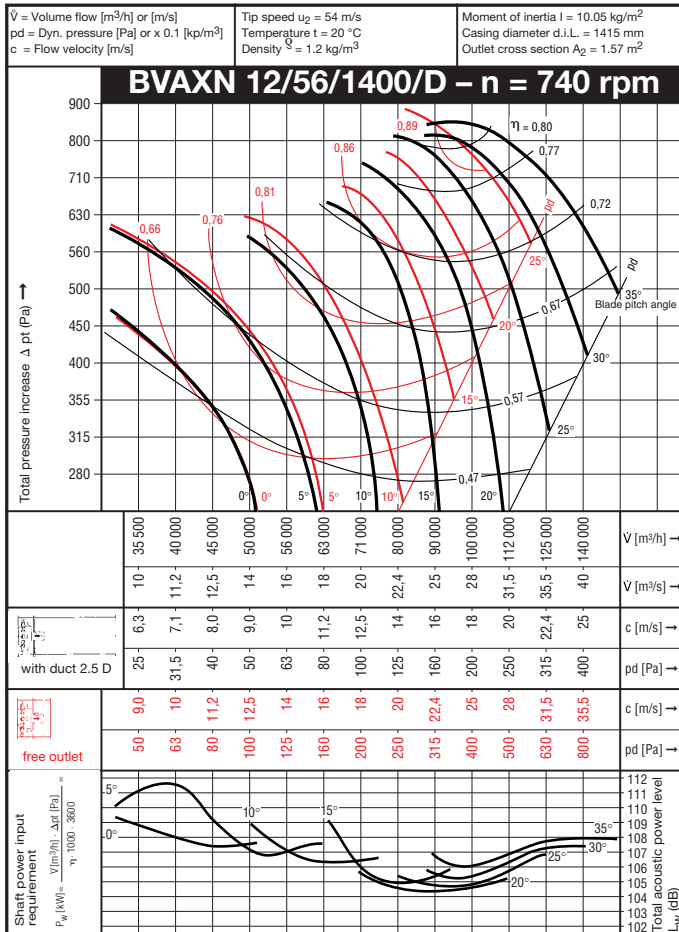
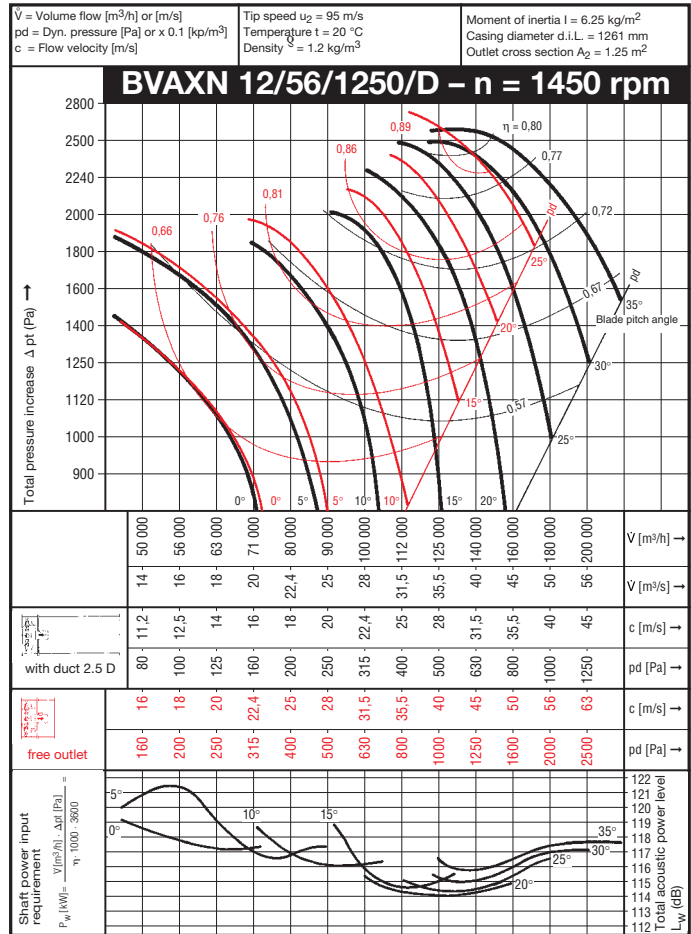
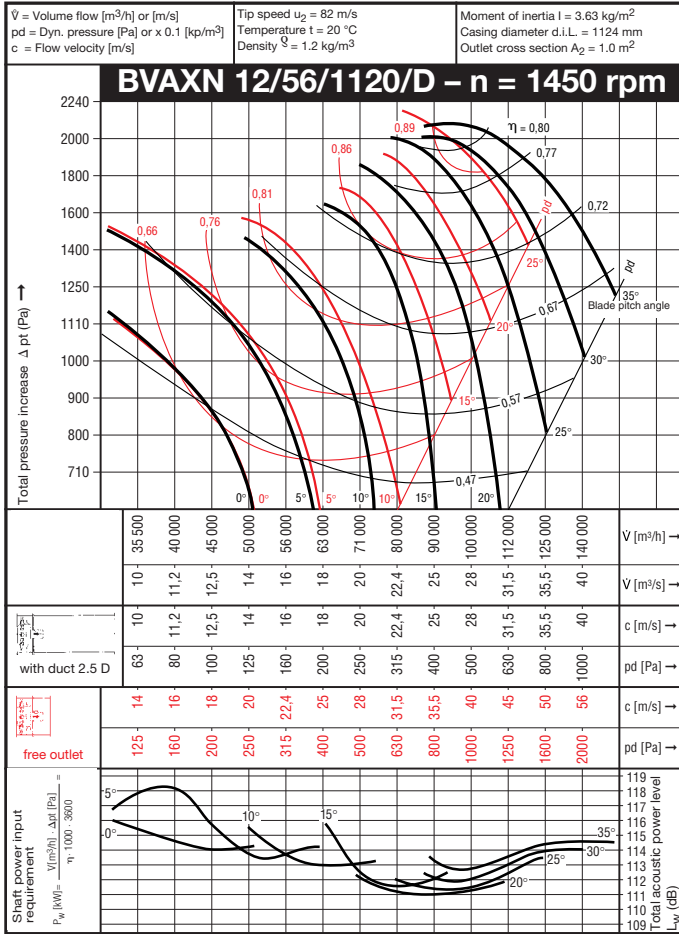
BVAXN 12/56/1250/D - 1450 rpm

BVAXN 12/56/1400/D - 740 rpm

BVAXN 12/56/1400/D - 980 rpm

BVAXN 12/56/1600/D - 740 rpm

BVAXN 12/56/1600/D - 980 rpm

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WITH DIRECT DRIVE AND OUTLET GUIDE VANES
SERIES BVAXN 12/56**
200/300°C – 120 MIN**086**

* rounded to standard values

For maximum motor sizes please see dimension pages



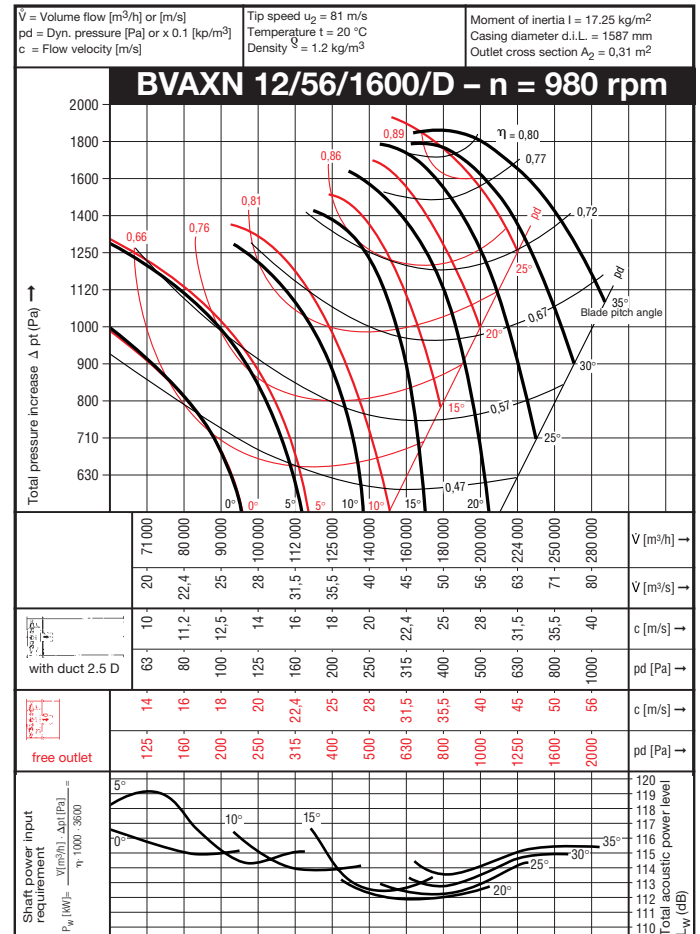
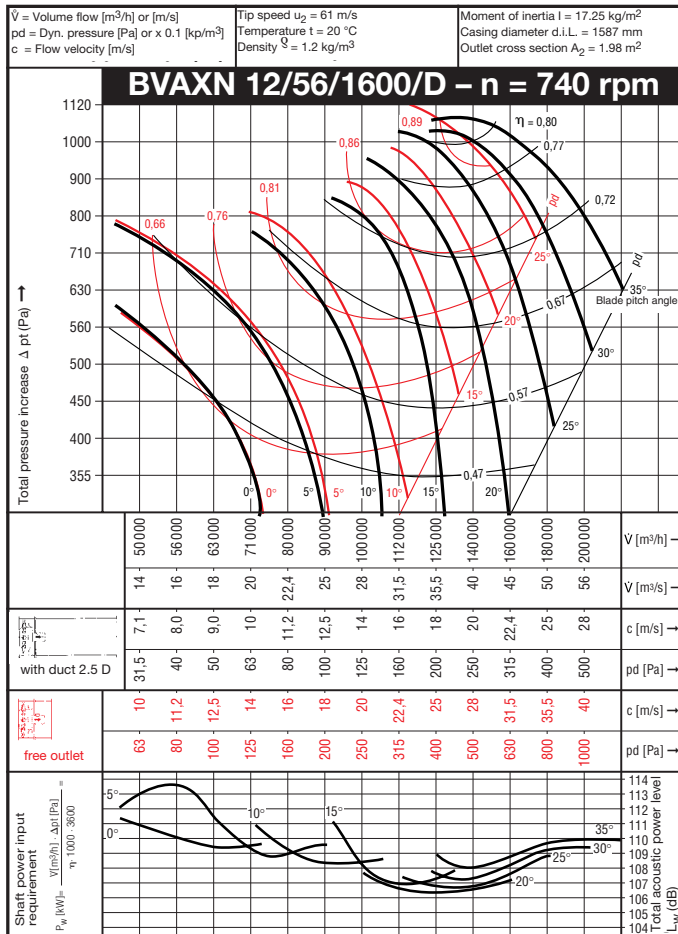
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AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES SERIES BVAXN 12/56

200/300°C – 120 MIN

087



Please look for further types of Smoke Exhaust Fans
for **400°C – 120 min**
without cooling fan
on pages 082 and 083

BVAXN 8/56/1400/D - 740 rpm / max. motor output 22 kW

BVAXN 8/56/1400/D - 980 rpm / max. motor output 37 kW

BVAXN 8/56/1600/D - 740 rpm / max. motor output 22 kW

Item No.	Qty.	Description	Unit price €	Total €
	or <			

Lfd. Nr.	Qty.	Description	Unit price €	Total €
		Accessory equipment • Galvanised fan • Fan with special coating • Extension casing without inspection hatch • Inspection hatch • Bellmouth inlet with flange • Wire guard on bellmouth side • Wire guard on extension casing (motor side) • Flexible connector, inlet side* • Flexible connector, outlet side* • Matching flange inlet side* • Matching flange outlet side* • Angular wall ring with brackets* • Set of mounting feet (2 pcs.)* • Set of spring-type antivibration mounts* • Brackets for vertical fan installation • Diffuser with interior core* • Round silencer, TSR type* Note: Please see our Installation, Operating and Maintenance Instructions that are available on request. * Loosely supplied		

Item No.	Qty.	Description	Unit price €	Total €
		Axial Smoke Exhaust Fan – BVAXN Series, Type M-D for the extraction of smoke fumes of max. 300°C/120 min. tested as per EN 12101-T3 (Munich Technical University) approval no. Z-78.1-20 Airflow direction: motor in outlet Direct-drive type Appropriate for installation in- and outside of fire-zone. Consisting of: Casing of welded sheet steel construction with drilled flanges according to DIN 24 154, Series 3; Outlet guide vanes for boosting outlet pressure and achieving an essentially swirl-free outlet flow; special motor placed within the smoke fume flow, wired to exterior temperature-resistant terminal box Surface protection: • Polyester powder coating, colour: RAL 7030 • as of nominal size 1120: with full paint finish, colour: RAL 7030 • Hot-dip galvanized Aluminium impeller, blade pitch steplessly adjustable when fan is at rest, directly mounted on motor shaft end. Outlet-side installation: Duct connection or Direct outlet without diffuser or Outlet into diffuser (optional) Specifications Volume flow m³/h Temperature / humidity °C /% RH Dynamic pressure Pa Total pressure increase Pa Fan speed rpm Blade pitch angle deg. Total acoustic power level L_W dB Efficiency % Power input requirement kW Three-phase motor single-speed or Dahlander pole-changing type or pole-changing type with separate windings Motor speed rpm Motor output kW Current consumption A Voltage V Frequency Hz Protection class (IP) Type B/V Size Weight: fan with accessories approx. kg Manufacturer: TLT-Turbo GmbH Type: BVAXN 12/56/.....M-D		
		Carryover		

Lfd. Nr.	Qty.	Description	Unit price €	Total €
		Accessory equipment: • Galvanised fan • Fan with special coating • Extension casing without inspection hatch • Inspection hatch • Bellmouth inlet with flange • Wire guard on bellmouth side • Wire guard on extension casing (motor side) • Flexible connector, inlet side* • Flexible connector, outlet side* • Matching flange inlet side* • Matching flange outlet side* • Angular wall ring with brackets* • Set of mounting feet (2 pcs.)* • Set of spring-type antivibration mounts* • Brackets for vertical fan installation • Diffuser with interior core* • Round silencer, TSR type* Note: Please see our Installation, Operating and Maintenance Instructions that are available on request . * Loosely supplied		

Item No.	Qty.	Description	Unit price €	Total €																																		
		Axial Smoke Exhaust Fan – BVAXN Series, Type M-D for the extraction of smoke fumes of max. 400°C/120 min. tested as per EN 12101-T3 (Munich Technical University) approval no. Z-78.1-21 Airflow direction: motor in outlet Direct-drive type Appropriate for installation in- and outside of fire-zone. Consisting of: Casing of welded sheet steel construction with drilled flanges according to DIN 24 154, Series 3; Outlet guide vanes for boosting outlet pressure and achieving an essentially swirl-free outlet flow; special motor placed within the smoke fume flow, wired to exterior temperature-resistant terminal box Surface protection: Polyester powder coating, colour: RAL 7030 as of nominal size 1120: with full paint finish, colour: RAL7030 Hot-dip galvanized Aluminium impeller, blade pitch not adjustable, directly mounted on motor shaft end. Outlet-side installation: Duct connection Direct outlet without diffuser Outlet into diffuser (optional) Technical data: <table><tr><td>Volume flow</td><td>m³/h</td></tr><tr><td>Temperature/air humidity</td><td>C/% RH</td></tr><tr><td>Dynamic pressure</td><td>Pa</td></tr><tr><td>Total pressure increase</td><td>Pa</td></tr><tr><td>Fan speed</td><td>rpm</td></tr><tr><td>Blade pitch angle</td><td>deg.</td></tr><tr><td>Total acoustic power level L_w</td><td>dB</td></tr><tr><td>Wfficiency</td><td>%</td></tr><tr><td>Power input requirement</td><td>kW</td></tr></table> Three-phase motor: single speed Dahlander pole-changing type pole-changing type with separate windings <table><tr><td>Motor speed</td><td>rpm</td></tr><tr><td>Motor output</td><td>kW</td></tr><tr><td>Current consumption</td><td>A</td></tr><tr><td>Voltage</td><td>V</td></tr><tr><td>Frequency</td><td>Hz</td></tr><tr><td>Protection class (IP)</td><td></td></tr><tr><td>Type</td><td>B/V</td></tr><tr><td>Size</td><td></td></tr></table> Weight: fan with accessories approx. kg Manufacturer: TLT-Turbo GmbH Type: BVAXN 12/56/.....M-D	Volume flow	m ³ /h	Temperature/air humidity	C/% RH	Dynamic pressure	Pa	Total pressure increase	Pa	Fan speed	rpm	Blade pitch angle	deg.	Total acoustic power level L _w	dB	Wfficiency	%	Power input requirement	kW	Motor speed	rpm	Motor output	kW	Current consumption	A	Voltage	V	Frequency	Hz	Protection class (IP)		Type	B/V	Size			
Volume flow	m ³ /h																																					
Temperature/air humidity	C/% RH																																					
Dynamic pressure	Pa																																					
Total pressure increase	Pa																																					
Fan speed	rpm																																					
Blade pitch angle	deg.																																					
Total acoustic power level L _w	dB																																					
Wfficiency	%																																					
Power input requirement	kW																																					
Motor speed	rpm																																					
Motor output	kW																																					
Current consumption	A																																					
Voltage	V																																					
Frequency	Hz																																					
Protection class (IP)																																						
Type	B/V																																					
Size																																						
		Carryover																																				

Lfd. Nr.	Qty.	Description	Unit price €	Total €
		Accessory equipment: • Galvanised fan • Fan with special coating • Extension casing without inspection hatch • Inspection hatch • Bellmouth inlet with flange • Wire guard on bellmouth side • Wire guard on extension casing (motor side) • Flexible connector, inlet side* • Flexible connector, outlet side* • Matching flange inlet side* • Matching flange outlet side* • Angular wall ring with brackets* • Set of mounting feet (2 pcs.)* • Set of spring-type antivibration mounts* • Brackets for vertical fan installation • Diffuser with interior core* • Round silencer, TSR type* Note: Please see our Installation, Operating and Maintenance Instructions that are available on request . * Loosely supplied		



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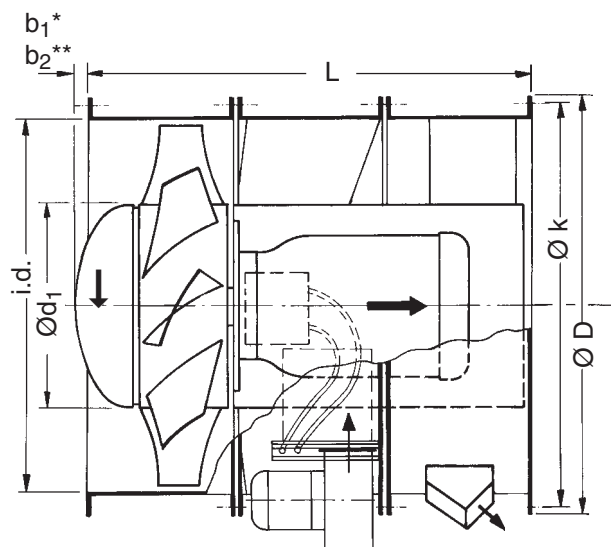
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AXIAL SMOKE EXHAUST FANS BVAXN 8/56 SERIES MAIN DIMENSIONS

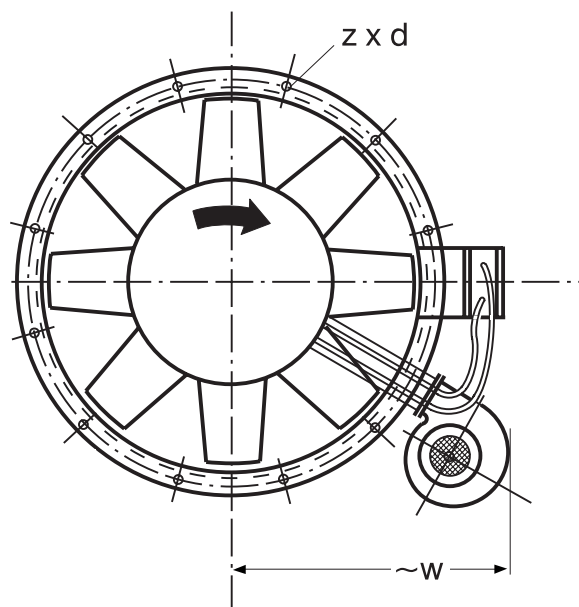
600°C - 120 MIN

095

Important! This fan series is available only with the motor outputs stated in our price lists.



For dimensions for external air connection please see page 097



In instances where the fan is installed inside the fire zone, there will be no cooling air fan. In this case the installer has to provide an insulated duct with cooling air fan. This is to be mounted outside the fire zone. Please ask for quantities of cooling air needed.

Cooling air fan required!

For quantities of cooling air needed please see page 107.

Size	i.d.	Ø k	Ø D	z x d	L	Ø d ₁	b ₁ [*]	b ₂ ^{**}	~W	max. motor size		Weight approx. kg (without motor)
500	504	541	571	12 x 9,5	675	280	30	45	620	112		80
630	634	674	712	16 x 11,5	858	355	10	30	665	132		120
710	711	751	789	16 x 11,5	915	397	—	40	610	160		150
800	797	837	875	24 x 11,5	1050	445	—	30	655	180		188
900	894	934	972	24 x 11,5	1119	498	75	105	690	200		223
1000	1003	1043	1081	24 x 11,5	1245	560	—	40	765	200		320
1120	1124	1174	1254	24 x 11,5	1400	630	—	—	835	225		500
1250	1261	1311	1391	24 x 11,5	1750	710	—	—	880	250		700
1400	1415	1465	1545	24 x 11,5	2000	790	—	—	1025	280		920
1600	1587	1637	1717	32 x 11,5	2250	890	—	—	1050	280		1210

Dimensional and design changes reserved.

* blade pitch angle 0 to 15°
** blade pitch angle 16 to 35°

Dimensions in mm

For planning and installation please also refer to our Installation, Operating and Maintenance Instructions (MBW).



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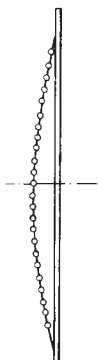
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AXIAL SMOKE EXHAUST FANS BVAXN 8/56 SERIES ACCESSORIES*

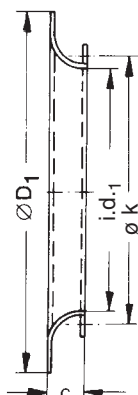
600°C – 120 MIN

096

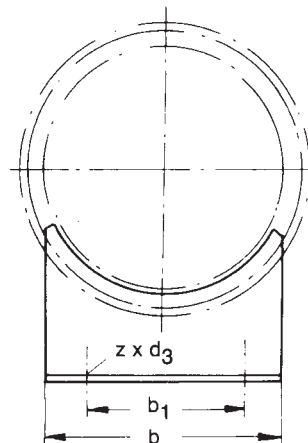
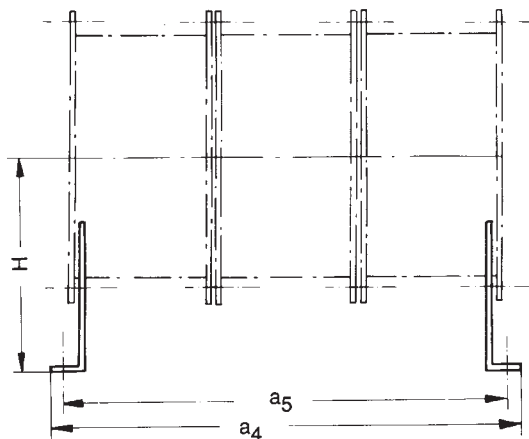
**Wire guard
inlet side**



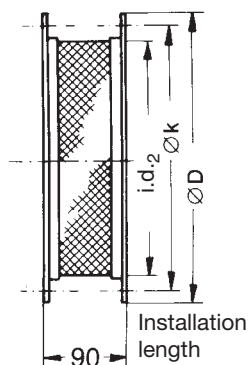
**Bellmouth inlet
with flange**



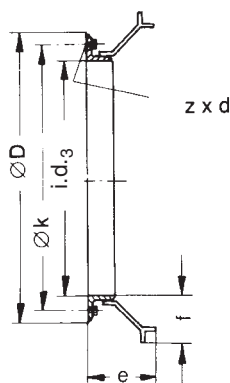
Mounting feet



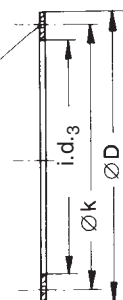
Flexible connector



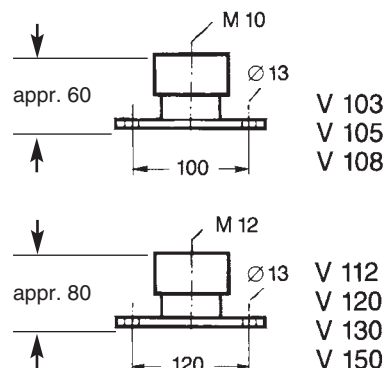
Angular wall ring



Matching flange



Spring-type AV mounts



Please mount Flexible Connector correctly and watch installation length.

Size	ØD ₁	i.d. ₁	c	H	a ₄	a ₅	b	b ₁	z x d ₃	i.d. ₂	i.d. ₃	Øk	ØD	z x d	e	f		
500	708	509	98	375	735	705	460	380	5x12	506	507	541	571	12x9,5	80	50		
630	875	640	95	470	933	893	550	470	5x12	637	638	674	712	16x11,5	100	70		
710	972	717	103	525	990	950	620	530	5x12	714	715	751	785	16x11,5	100	70		
800	1081	801	115	585	1125	1085	730	640	5x14	800	801	837	875	24x11,5	100	70		
900	1214	898	130	655	1198	1154	730	640	5x14	897	898	934	972	24x11,5	100	70		
1000	1351	1009	145	730	1342	1296	830	740	5x14	1006	1007	1043	1081	24x11,5	100	70		
1120	1470	1130	160	760	1487	1441	920	820	5x14	1133	1134	1174	1214	24x11,5	110	90		
1250	1677	1263	185	855	1837	1791	1030	930	5x14	1270	1271	1311	1351	24x11,5	110	90		
1400	1870	1417	210	930	2087	2041	1140	1040	5x14	1424	1425	1465	1505	24x11,5	130	100		
1600	2087	1587	210	1020	2342	2296	1350	1230	5x18	1596	1597	1637	1677	32x11,5	130	100		

Dimensional and design changes reserved.

*All accessories except for mounting feet and extension casings will be **supplied loosely**.

Dimensions in mm



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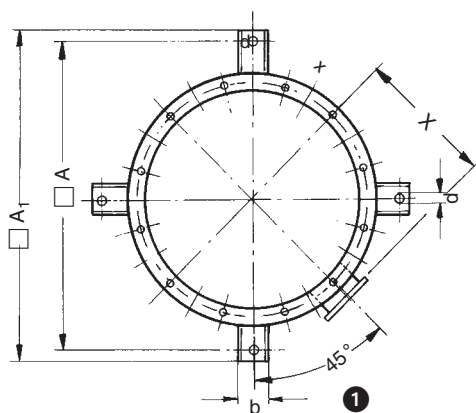
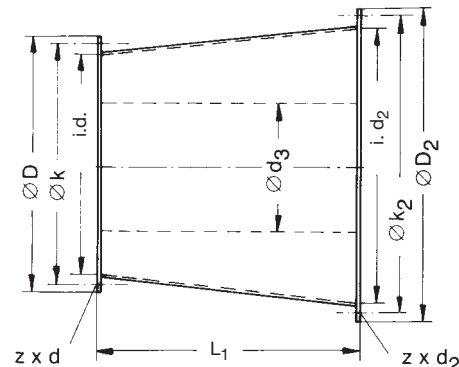
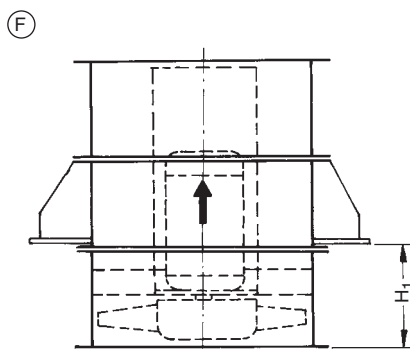
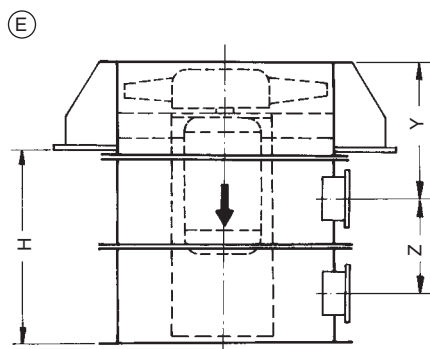
AXIAL SMOKE EXHAUST FANS BVAXN 8/56 SERIES ACCESSORIES*

600°C – 120 MIN

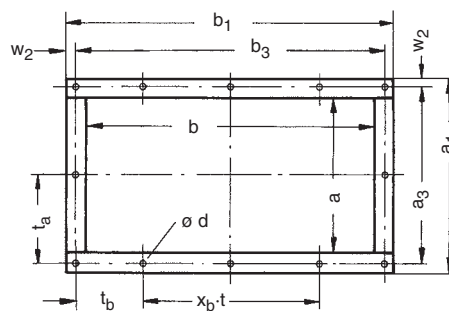
097

Mounting brackets for vertical installation (direct-driven fans only)

Diffuser with interior core

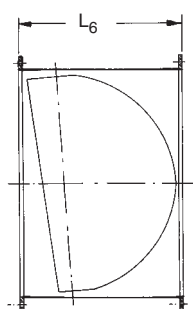


External air connection (fresh air or exhaust air resp.)

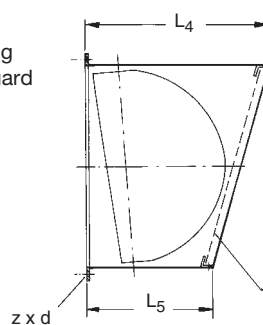


	Size	500-710	800-900	1000-1120	1250-1600
Frame – external air connection	a	102	102	102	142
	b	102	202	252	317
	a3	136	136	136	176
	b3	136	236	286	351
	a1	162	162	162	377
	b1	162	262	312	202
	ta	–	–	–	88
	xb · t	–	–	–	1 x 125
	tb	–	118	143	113
	w2	13	13	13	13
	d	10	10	10	10

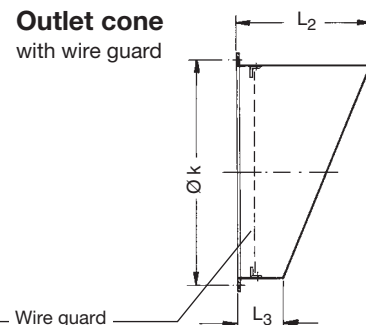
Duct with self-activating damper



Outlet cone with self-activating damper + wire guard



Outlet cone with wire guard



Size	□ A	□ A ₁	b	Ø d	i.d.	Ø k	Ø D	z x d	H	H ₁	X	Y	Z	i.d. ₂	Ø d ₃	Ø k ₂	Ø D ₂	z x d ₂	L ₁	L ₂	L ₃	L ₄	L ₅	L ₆
500	657	705	80	11,5	504	541	571	12x9,5	450	225	391	379	177	634	282	674	712	16x11,5	600	280	60	450	305	355
630	852	900	90	11,5	634	674	712	16x11,5	572	286	462	458	271	797	355	837	875	24x11,5	750	330	70	500	375	400
710	929	977	100	11,5	711	751	789	16x11,5	610	305	404	535	285	894	397	934	972	24x11,5	850	350	70	630	420	450
800	1015	1063	100	11,5	797	837	875	24x11,5	700	350	457	618	337	1003	446	1043	1081	24x11,5	950	520	200	710	474	500
900	1112	1160	100	11,5	894	934	972	24x11,5	746	373	499	646	353	1124	502	1174	1254	24x11,5	1060	585	225	800	541	560
1000	1221	1269	100	13,5	1003	1043	1081	24x11,5	830	415	551	714	411	1261	562	1311	1391	24x11,5	1200	640	240	900	612	630
1120	1374	1434	120	13,5	1124	1174	1254	24x11,5		570	635	935	345	1415	630	1465	1545	24x11,5	1340	730	250	1000	678	710
1250	1511	1571	120	13,5	1261	1311	1391	24x11,5		400	700	1168	445	1587	710	1637	1717	32x11,5	1510	810	250	1120	761	800
1400	1665	1725	120	13,5	1415	1465	1545	24x11,5		700	785	1108	845	1780	789	1830	1910	32x11,5	1690	800	160	1250	848	900
1600	1837	1897	120	13,5	1587	1637	1717	32x11,5		600	850	1235	905	1997	888	2047	2167	32x11,5	1900	900	180	1400	940	1000

Dimensional and design changes reserved.

① Sizes 500+630 = 30°

*please see page 096

Dimensions in mm



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AXIAL SMOKE EXHAUST FANS BVAXN 8/56 SERIES ACOUSTIC DATA

098

Acoustic level

The total acoustic power level $L_{W,vent.}$ (in dB) of an axial smoke exhaust fan can be obtained directly from the characteristic data sheets for each operating point.

Starting from this value, the A-weighted acoustic power level L_{WA} and the relative acoustic power level $L_{Wrel.}$ can be determined using the tables below. These values are available as the acoustic power emitted into the duct and as the acoustic power emitted from the fan inlet or outlet opening, respectively.

The values given were taken from measurements as per EN 25136 (formerly DIN 45 635, Part 9) duct testing method.

1. Acousting power level emitted into the duct

The level of acoustic power an axial smoke exhaust fan emits into the ducting is used for calculating the sound power characteristics of downstream systems, e.g., silencers.

The levels are calculated as follows:

$L_{W,vent.}$ [dB] = total acoustic power emitted by the fan,
(please see respective characteristic curve sheets)

$L_{WA,vent.}$ [dB] = A-weighted acoustic power level, according to the equation

$L_{WA,vent.}$ = $L_{W,vent.} - \text{portion 1.1 [dB]}$

$L_{Wrel,vent.}$ [dB] = relative acoustic power level as expressed by the equation

$L_{Wrel,vent.}$ = $L_{W,vent.} - \text{portion 1.2 [dB]}$

2. Acoustic power emitted from the fan inlet or outlet opening

To determine the sound levels at a given installation site, it is usually necessary to know the level of acoustic power emitted from the fan's inlet or outlet opening. The adjacent tables are based on the outlet reflection pattern assumed in VDI 2081, Case 2.

$L_{WA,op.}$ [dB] = A-weighted level of acoustic power emitted from the fan's opening, expressed by the equation

$L_{WA,op.}$ = $L_{W,vent.} - \text{portion 2.1 [dB]}$

$L_{Wrel,op.}$ = relative level of acoustic power emitted from the fan's opening, expressed by the equation

$L_{Wrel,op.}$ = $L_{W,vent.} - \text{portion 2.2 [dB]}$

Size	rpm	Portion 1.1	Portion 1.2 at mid-octave frequency [Hz]							
			63	125	250	500	1000	2000	4000	8000
500	675	9	5	3	9	12	16	18	21	31
	900	8	6	4	9	10	13	17	18	27
	1400	5	7	8	5	9	10	14	16	19
	2800	2	8	10	11	7	8	8	12	14
630	710	8	6	4	9	10	13	17	18	27
	920	6	6	4	9	9	11	15	16	22
	1410	4	7	9	6	9	9	12	15	16
710	710	6	6	4	9	10	12	16	17	24
	950	6	7	4	10	9	10	14	16	19
	1450	4	7	9	6	10	8	10	14	15
800	720	6	6	4	10	10	11	15	16	22
	960	5	7	5	10	9	2	13	15	18
	1460	3	8	9	6	10	8	10	14	15
900	720	6	6	4	10	9	10	14	16	20
	960	5	7	5	10	10	9	12	15	18
	1460	3	8	9	6	11	8	9	13	14
1000	720	5	6	5	10	10	9	13	15	18
	970	4	7	5	10	10	8	11	15	15
	1460	3	8	10	7	12	8	8	12	14
1120	730	5	7	5	11	10	9	12	15	17
	980	4	7	5	11	11	8	10	14	15
1250	740	4	7	5	11	10	8	11	15	15
	980	3	8	6	11	12	8	9	13	14
1400	740	4	7	5	12	10	8	10	14	15
	980	3	8	6	11	12	8	8	12	14
1600	740	3	7	6	12	11	8	9	13	14
	980	3	8	6	12	13	8	8	11	14

Size	rpm	Portion 2.1	Portion 2.2 at mid-octave frequency [Hz]							
			63	125	250	500	1000	2000	4000	8000
500	675	10	16	9	11	12	16	18	21	31
	900	8	17	9	10	10	13	17	18	27
	1400	5	18	13	7	9	10	14	16	19
	2800	3	19	15	13	7	8	8	12	14
630	710	8	15	8	10	10	13	17	18	27
	920	7	15	8	10	10	13	17	18	27
	1410	4	16	12	7	9	9	12	15	16
710	710	7	14	8	10	10	12	16	17	24
	950	6	14	8	10	9	10	14	16	19
	1450	4	15	12	7	10	8	10	14	15
800	720	7	13	7	10	10	11	15	16	22
	960	5	14	7	10	9	9	13	15	18
	1460	3	15	12	7	10	8	10	14	15
900	720	6	12	7	10	9	10	14	16	20
	960	5	13	7	10	10	9	12	15	16
	1460	3	14	11	7	11	8	9	13	14
1000	720	5	12	7	10	10	9	13	15	18
	970	4	12	7	11	10	8	11	15	15
	1460	3	13	11	7	12	8	8	12	14
1120	730	5	11	6	11	10	9	12	15	17
	980	4	12	7	11	11	8	10	14	15
1250	740	4	11	6	11	10	8	11	15	15
	980	3	11	6	11	12	8	9	13	14
1400	740	4	10	6	12	10	8	10	14	15
	980	3	11	6	11	12	8	8	12	14
1600	740	3	10	6	12	11	8	9	13	14
	980	3	11	6	12	13	8	8	11	14

Note:

Portions 1.1 / 1.2 / 2.1 / 2.2 to be taken from the above spreadsheets.

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TECHNICAL LISTS (AVAILABLE MODELS)****BVAXN 8/56 600°C - 120 MIN****099**

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A]	Size	Type	Flange dia.

500	1000		0,75	2,2	90	B14	160
	1500		1,1	2,6	90	B14	160
			1,5	3,5	90	B14	160
	3000		4,5	8,5	112	B14	160
	1000/500		0,75/0,13	2,8/0,97	90	B14	160
	1500/750		1,0/0,25	2,4/1,0	90	B14	160
			1,3/0,35	3,6/1,55	90	B14	160
	1500/1000		1,3/0,4	3,4/1,38	90	B14	160
	3000/1500		4,1/1,1	8,1/2,2	112	B14	160

630	750		0,55	1,82	90	B14	160
			0,75	2,3	100	B14	160
	1000		0,75	2,2	90	B14	160
			1,1	3,2	90	B14	160
			1,5	4,3	100	B14	160
			1,5	3,5	90	B14	160
	1500		2,2	5,0	100	B14	160
			3,0	7,0	100	B14	160
			4,0	8,3	112	B14	160
			4,0	8,3	112	B14	160
	1000/500		0,75/0,13	2,8/0,97	90	B14	160
			1,2/0,24	3,15/2,1	100	B14	160
			2,0/0,33	4,6/2,4	112	B14	160
			2,0/0,33	4,6/2,4	112	B14	160
	1500/750		2,0/0,45	4,5/1,8	100	B14	160
			2,5/0,55	5,8/2,1	100	B14	160
			3,7/0,9	9,2/3,6	112	B14	160
			3,7/0,9	9,2/3,6	112	B14	160
	1500/1000		2,4/0,75	5,7/2,95	100	B14	160
			3,0/0,9	7,0/2,3	112	B14	160
			4,2/1,25	9,0/3,1	132	B14	250
			4,2/1,25	9,0/3,1	132	B14	250

710	750		0,55	1,82	90	B14	160
			0,75	2,3	100	B14	160
			1,1	3,28	100	B14	160
			1,1	3,28	100	B14	160
	1000		0,75	2,2	90	B14	160
			1,1	3,2	90	B14	160
			1,5	4,3	100	B14	160
			2,2	5,3	112	B14	160
			3,0	6,3	132	B14	300
			3,0	6,3	132	B14	300
			3,0	6,3	132	B14	300
	1500		2,2	5,0	100	B14	160
			3,0	7,0	100	B14	160
			4,0	8,3	112	B14	160
			5,5	11	132	B14	300
			7,5	15	132	B14	300
	1000/500		1,2/0,24	3,15/2,1	100	B14	160
			2,0/0,33	4,6/2,4	112	B14	160
			2,5/0,6	5,8/2,1	100	B14	160
			3,7/0,9	9,2/3,6	112	B14	160
	1500/750		5,0/1,3	10,7/4,2	132	B14	300
			6,8/1,7	14,3/5,2	132	B14	300
			2,4/0,75	5,7/2,95	100	B14	160
			3,0/0,9	7,0/2,3	112	B14	160
	1500/1000		4,2/1,25	9,0/3,1	132	B14	300
			5,5/1,65	11,2/3,7	132	B14	300
			4,2/1,25	9,0/3,1	132	B14	300
			5,5/1,65	11,2/3,7	132	B14	300

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A]	Size	Type	Flange dia.

800	750		0,75	2,3	100	B14	160
			1,1	3,28	100	B14	160
			1,5	4,2	112	B14	160
			2,2	5,6	132	B14	300
			2,2	5,6	132	B14	300
	1000		1,5	4,3	100	B14	160
			2,2	5,3	112	B14	160
			3,0	6,3	132	B14	300
			4,0	8,6	132	B14	300
			4,0	8,6	132	B14	300
	1500		4,0	8,3	112	B14	160
			5,5	11	132	B14	300
			7,5	15	132	B14	300
			11	21	160	B14	300
			15	28,5	160	B14	300
	1000/500		1,2/0,24	3,15/2,1	100	B14	160
			2,0/0,33	4,6/2,4	112	B14	160
			3,2/0,7	6,8/3,8	132	B14	300
			4,4/1,0	9,0/4,5	132	B14	300
			4,4/1,0	9,0/4,5	132	B14	300
	1500/750		5,0/1,30	10,7/4,2	132	B14	300
			6,8/1,70	14,3/5,2	132	B14	300
			10/3,0	22,3/9,7	160	B14	300
			14/3,5	29,5/11,8	160	B14	300
			14/3,5	29,5/11,8	160	B14	300
	1500/1000		4,2/1,25	9,0/3,1	132	B14	300
			5,5/1,65	11,2/3,7	132	B14	300
			9,0/3,0	18/7,1	160	B14	300
			12/3,5	24/9,5	160	B14	300
			14/4,5	26,5/11,1	180	B14	350
			14/4,5	26,5/11,1	180	B14	350
			14/4,5	26,5/11,1	180	B14	350

900	750		1,1	3,28	100	B14	160
			1,5	4,2	112	B14	160
			2,2	5,6	132	B14	300
			3,0	7,5	132	B14	300
			3,0	7,5	132	B14	300
	1000		2,2	5,3	112	B14	160
			3,0	6,3	132	B14	300
			4,0	8,6	132	B14	300
			5,5	11,5	132	B14	300
			7,5	15,8	160	B14	300
	1500		7,5	15	132	B14	300
			11	21	160	B14	300
			15	28,5	160	B14	300
			15	28,5	160	B14	300
	1500		18,5	34,5	180	B14	350
			22	41	180	B14	350
			30	55	200	B14	350
			30	55	200	B14	350
	1000/500		2,0/0,33	4,6/1,6	112	B14	160
			3,2/0,7	6,8/3,8	132	B14	300
			4,4/1,0	9,9/4,5	132	B14	300
			6,2/1,3	13,3/3,6	160	B14	300
			8,4/1,8	17,1/4,8	160	B14	300
	1500/750		6,8/1,7	14,3/5,2	132	B14	300
			10/3,0	22,3/9,7	160	B14	300
			10/3,0	22,3/9,7	160	B14	300

① Nominal current = appr. values for 400 V motors, brand EMOD. Brands ATB and Loher marked (A) and (L) respectively.
It is important to check nominal current in case of other motor brands. • ATB motors

BVAXN 8/56

**TLT-Turbo GmbH**Am Weinberg 68 · D-36251 Bad Hersfeld/Germany
Tel.: +49.6621.950-0 · Fax: +49.6621.950-100**AXIAL SMOKE EXHAUST FANS
TECHNICAL LISTS (AVAILABLE MODELS)****BVAXN 8/56 600°C - 120 MIN****100**

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current ① [A]	Size	Type	Flange dia.

900	1500/750		14/3,5	29,5/11,8	160	B14	300
			16/4,0	30/13,1	180	B14	350
			20/5,0	39/13,8	180	B14	350
			28/7,0	52/15,2	200	B14	350
	1500/1000		9,0/3,0	18/7,1	160	B14	300
			12/3,5	24/9,5	160	B14	300
			14/4,5	26,5/11,1	180	B14	350
			16,5/5,5	32/11,8	180	B14	350
			20/7,0	35/13,7	200	B14	350
			28/9,0	47,5/18,6	200	B14	350

1000	1500		11	21	160	B14	300
			15	28,5	160	B14	300
			18,5	34,5	180	B14	350
			22	41	180	B14	350
			30	55	200	B14	350
	1000/500		4,4/1,0	9,0/4,5	132	B14	300
			6,2/1,3	13,3/3,6	160	B14	300
			8,4/1,8	17,1/4,8	160	B14	300
			12,5/3,0	24/7,5	180	B14	350
	1500/750		10/3,0	22,3/9,7	160	B14	300
			14/3,5	29,5/11,8	160	B14	300
			16/4,0	30/13,1	180	B14	350
			20/5,0	39/13,8	180	B14	350
			28/7,0	52/15,2	200	B14	350
	1500/1000		12/3,5	24/9,5	160	B14	300
			14/4,5	26,5/11,1	180	B14	350
			16,5/5,5	32/11,8	180	B14	350
			20/7,0	35/13,7	200	B14	350
			26/9,0	47,5/18,6	200	B14	350
	750		2,2	5,6	132	B14	300
			3,0	7,5	132	B14	300
			4,0	9,25	180	B14	300
			5,5	13	160	B14	300
	1000		4,0	8,6	132	B14	300
			5,5	11,5	132	B14	300
			7,5	15,8	160	B14	300
			11	22,5	160	B14	300
			15	30,5	180	B14	350

1120	750		3,0	7,5	132	B14	300
			4,0	9,25	160	B14	300
			5,5	13	160	B14	300
			7,5	17,2	160	B14	300
			11	23	180	B14	350
	1000		7,5	15,8	160	B14	300
			11	22,5	160	B14	300
			15	30,5	180	B14	350
			22	44	200	B14	350
			8,4/1,8	17,1/4,8	160	B14	300
			12,5/3,0	24/7,5	180	B14	350
			20/4,5	38,5/13	200	B14	350

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current ① [A]	Size	Type	Flange dia.

1250	750		5,5	13	160	B14	300
			7,5	17,2	160	B14	300
			11	23	180	B14	350
			15	32,5	200	B14	350
			18,5	39	225	B14	450
	1000		11	22,5	160	B14	300
			15	30,5	180	B14	350
			22	44	200	B14	350
			30	58	225	B14	450
			37	74	250	B14	550
	1000/500		12,5/3,0	24/7,5	180	B14	350
			20/4,5	38,5/13	200	B14	350
			22/5,0	41/13,3	225	B14	450
			27/6,0	51/18	225	B14	450
			30/7,0	58/19	250	B14	550

1400	750		7,5	17,2	160	B14	350
			11	23	180	B14	350
			15	32,5	200	B14	350
			18,5	39	225	B14	450
			22	47,5	225	B14	450
			30	60	250	B14	550
	1000		22	44	200	B14	350
			30	58	225	B14	450
			37	74	250	B14	550
			45	81	280	B14	550
			55	99	280	B14	550
	1000/500		20/4,5	38,5/13	200	B14	350
			22/5,0	41,1/13,3	225	B14	450
			27/6,0	51/18	225	B14	450
			30/7,0	58/19	250	B14	550
	1000/500		40/8,0	74/24	280	B14	550
			48/9,5	88/28	280	B14	550

1600	750		15	32,5	200	B14	350
			18,5	39	225	B14	450
			22	47,5	225	B14	450
			30	60	250	B14	550
			37	73	280	B14	550
			45	88	280	B14	550

① Nominal current = appr. values for 400 V motors, brand EMOD. Brands ATB and Lohr marked (A) and (L) respectively.
It is important to check nominal current in case of other motor brands. • ATB motors



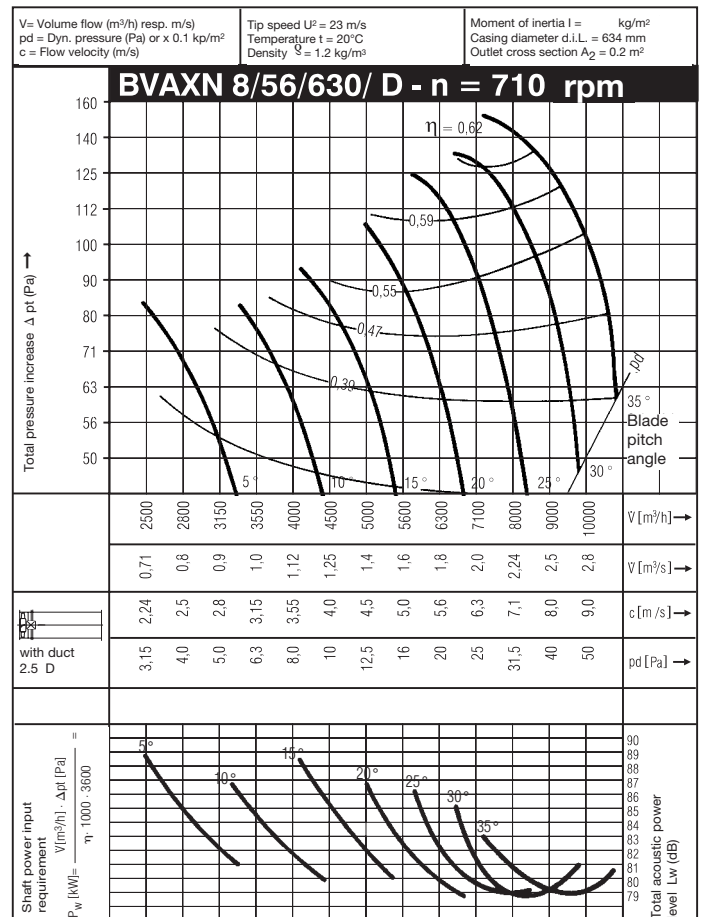
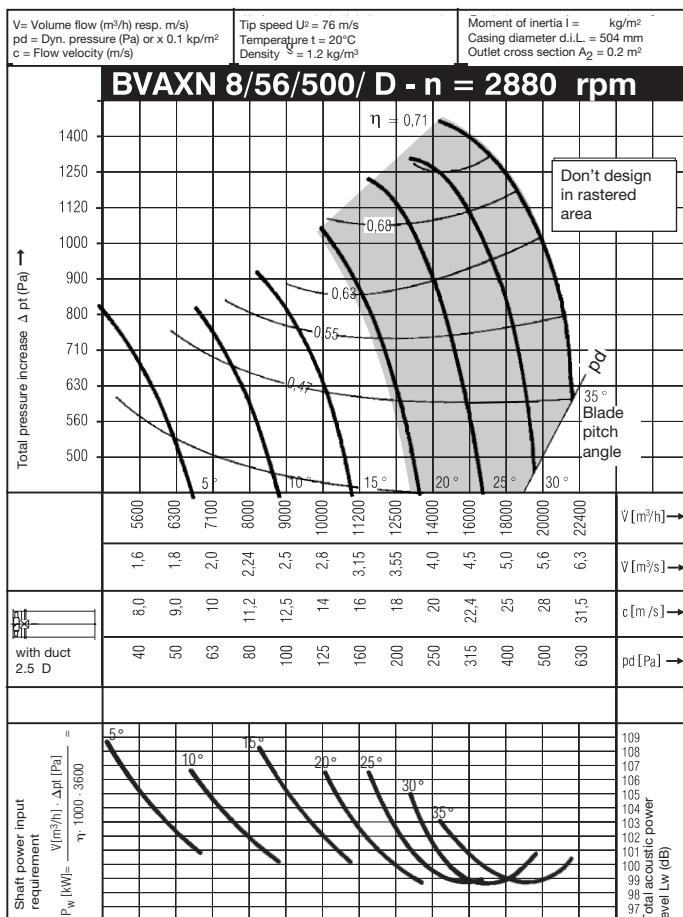
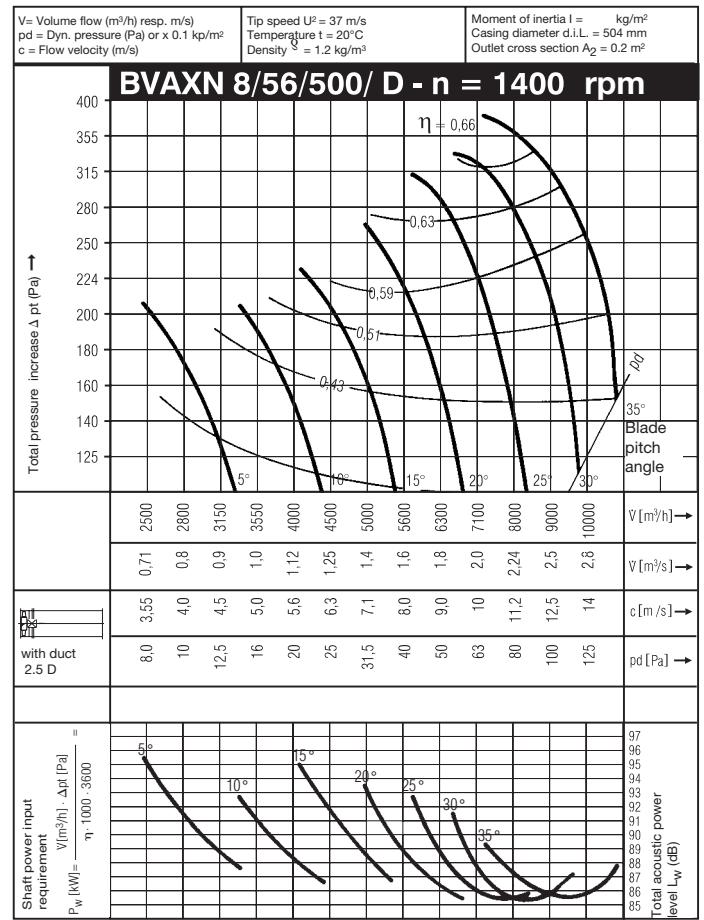
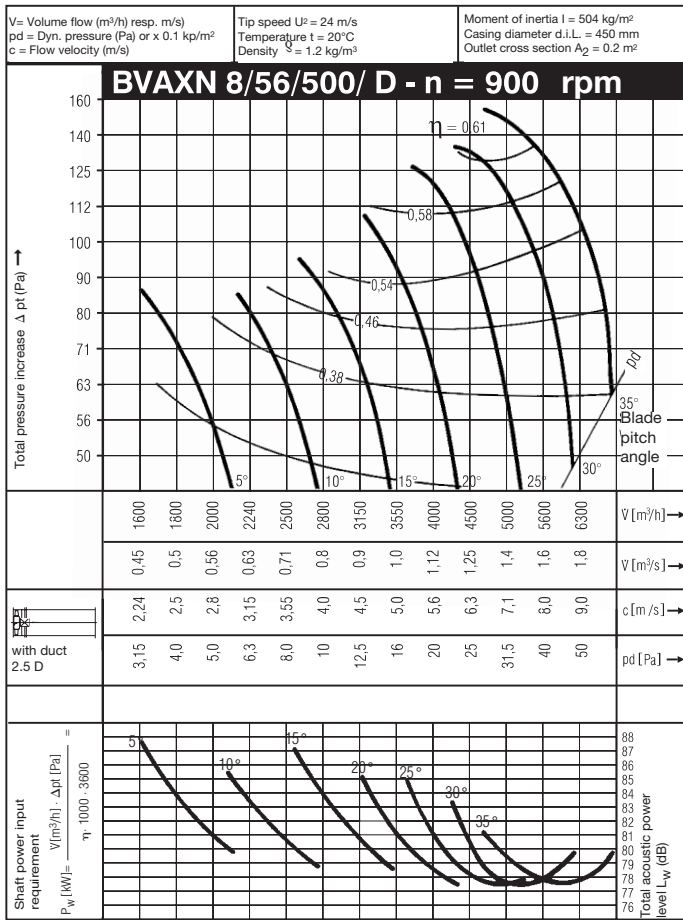
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AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES BVAXN 8/56 SERIES

600°C – 120 MIN

101



* rounded to standard values

For maximum motor sizes please see dimension pages

BVAXN 8/56



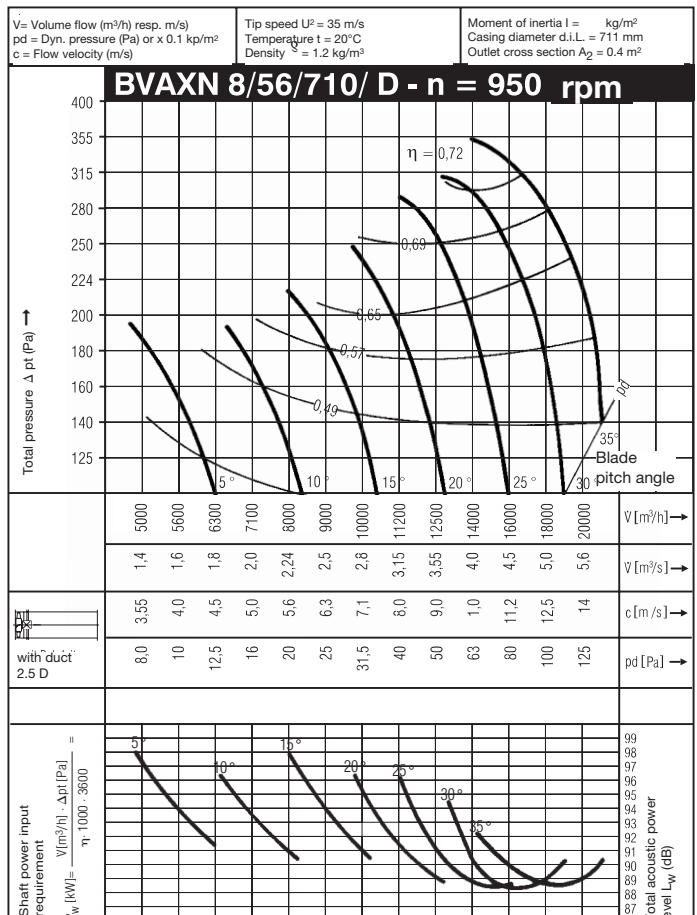
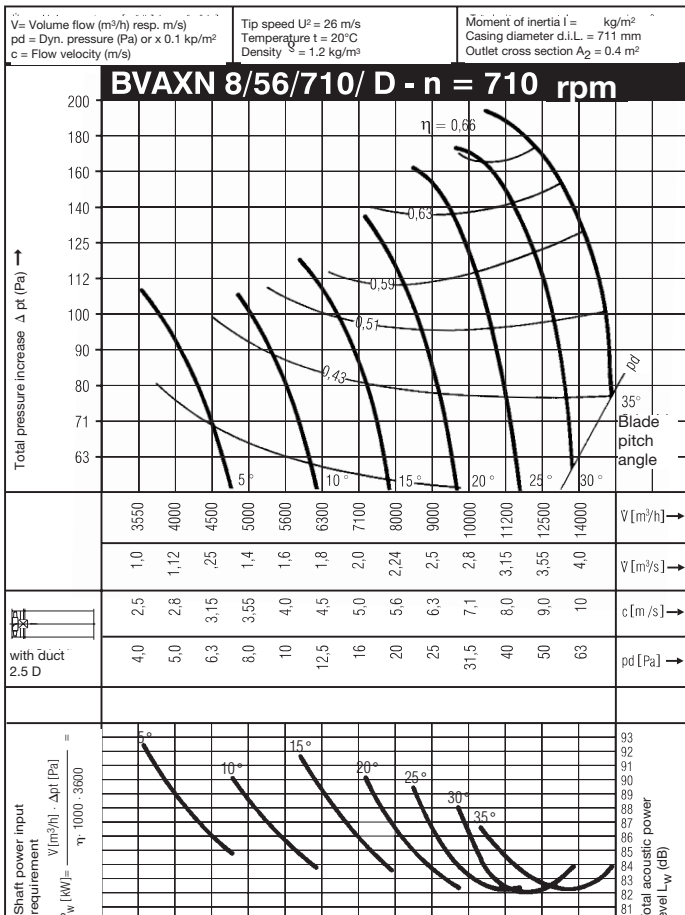
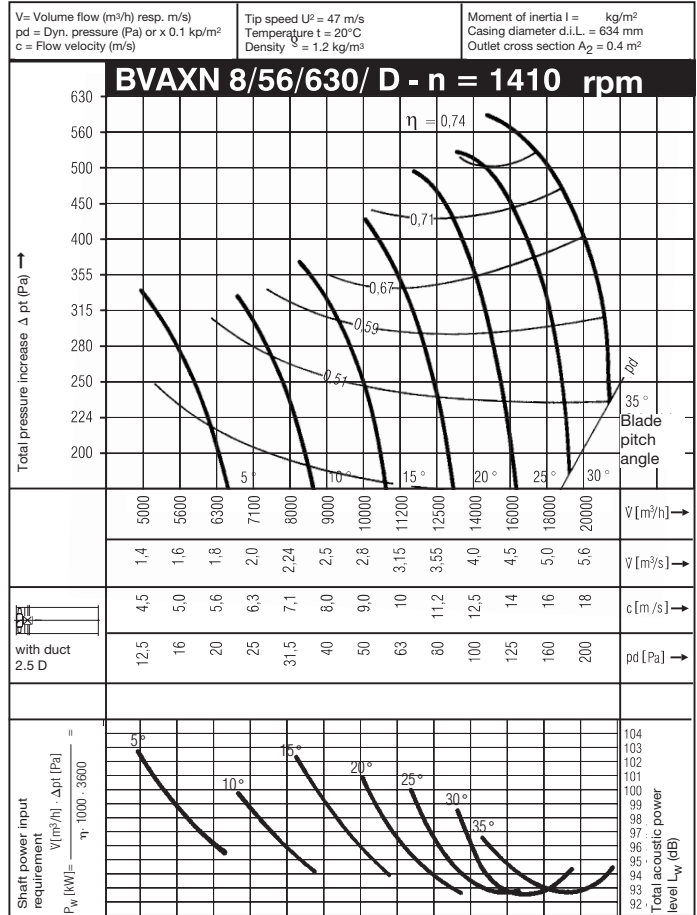
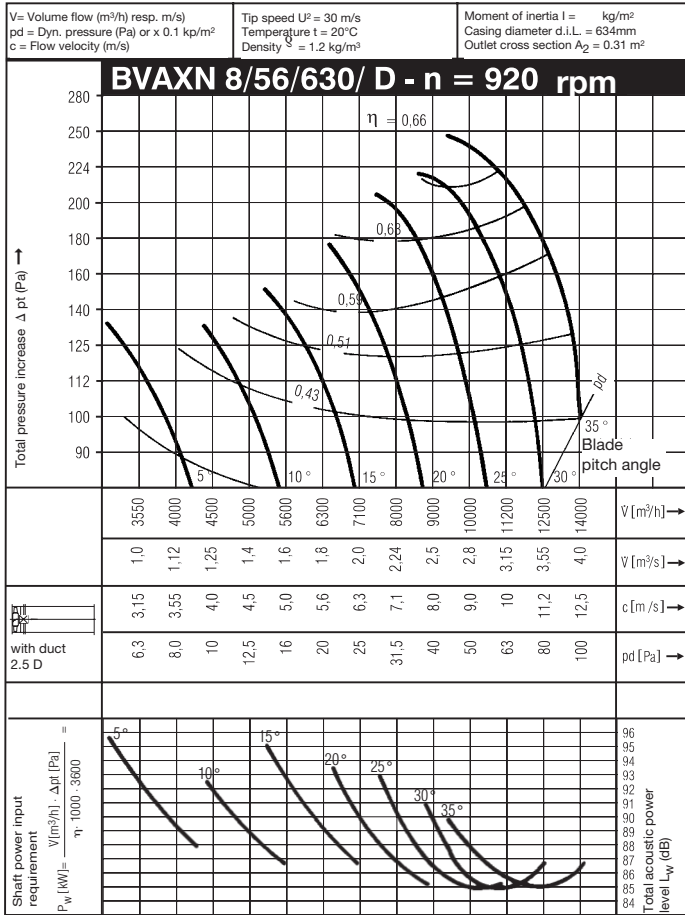
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AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES BVAXN 8/56 SERIES

600°C – 120 MIN

102



* rounded to standard values

For maximum motor sizes please see dimension pages



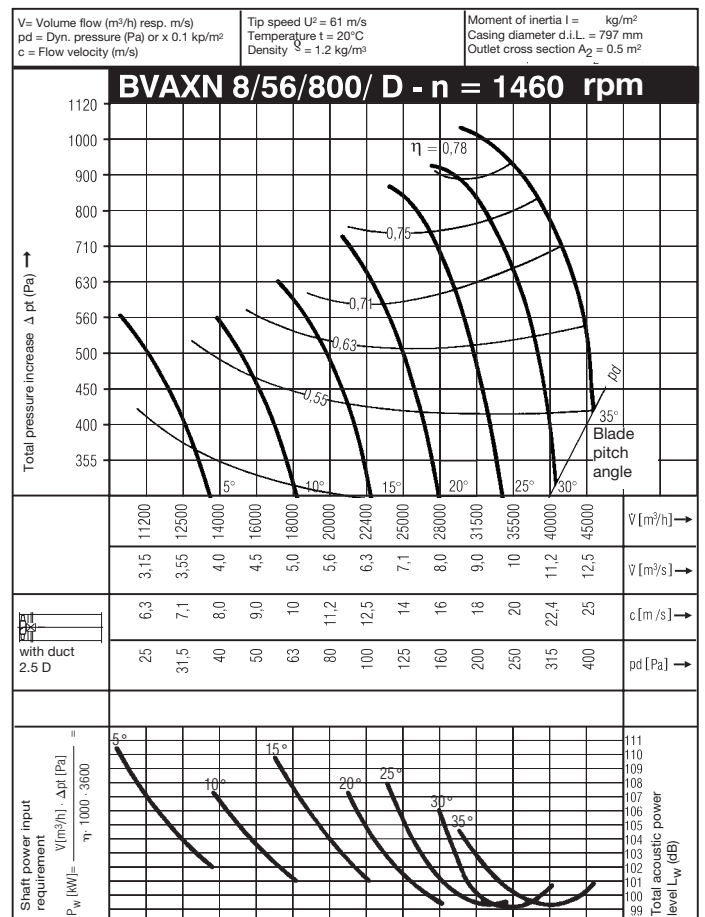
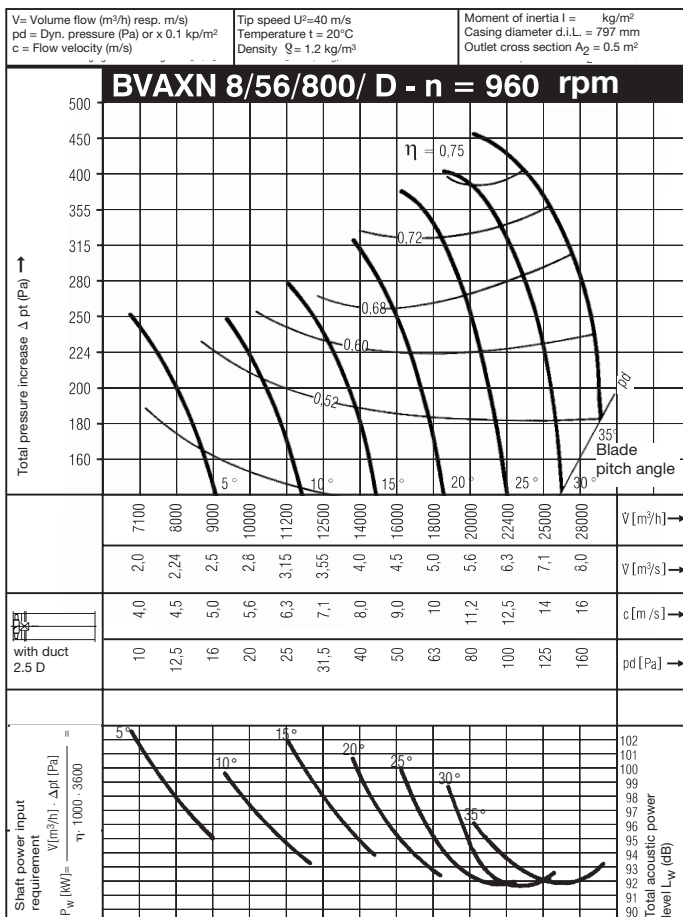
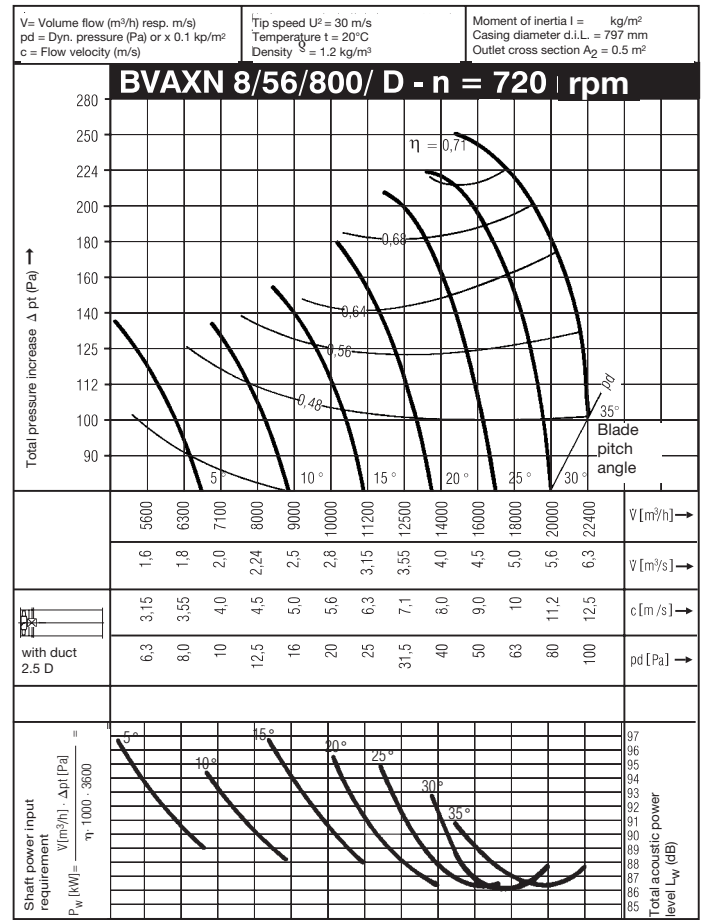
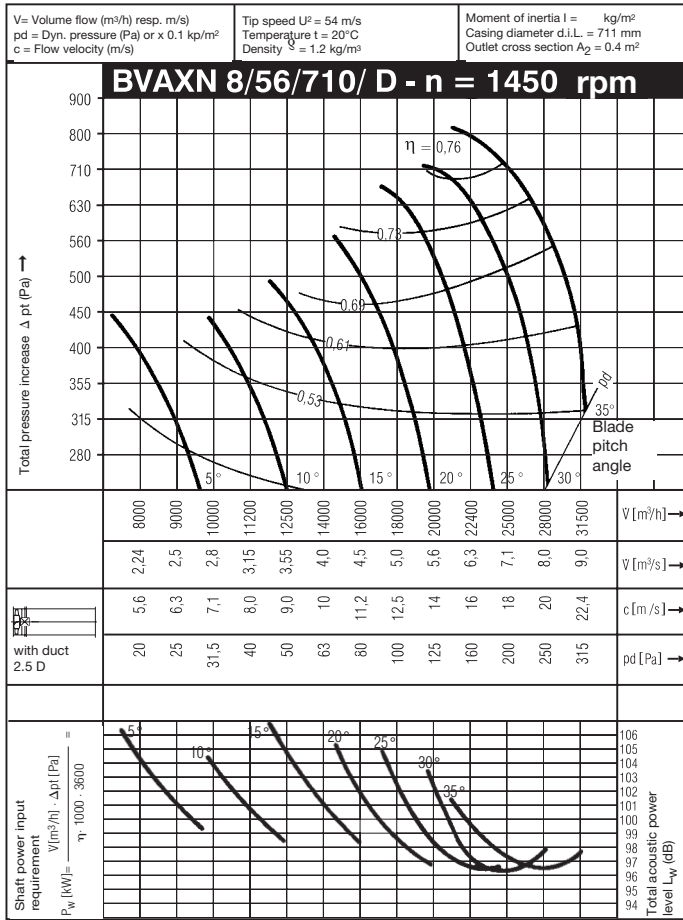
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AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES BVAXN 8/56 SERIES

600°C – 120 MIN

103



* rounded to standard values.

For maximum motor sizes please see dimension pages

BVAXN 8/56



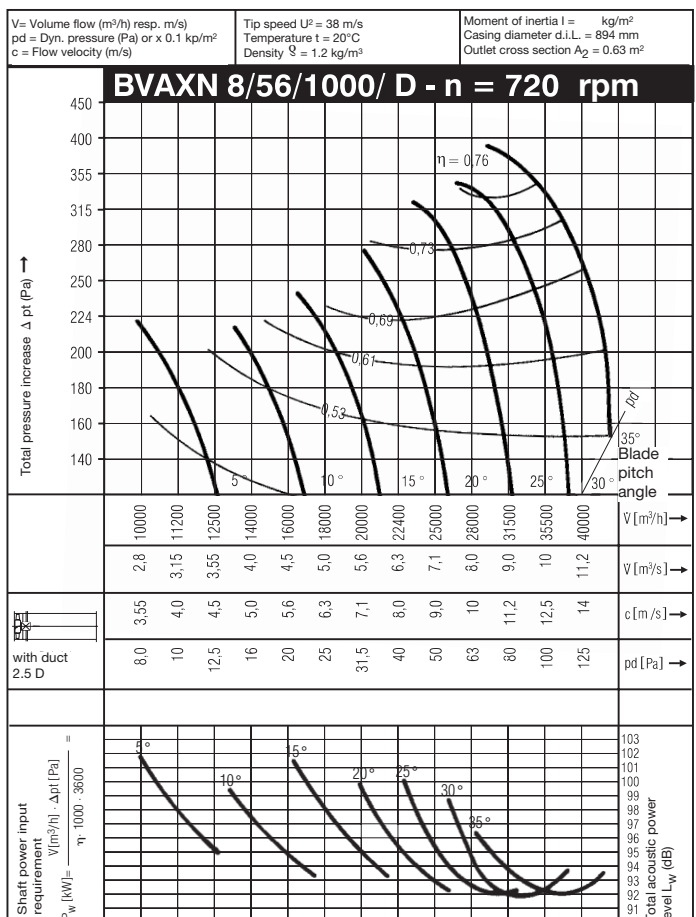
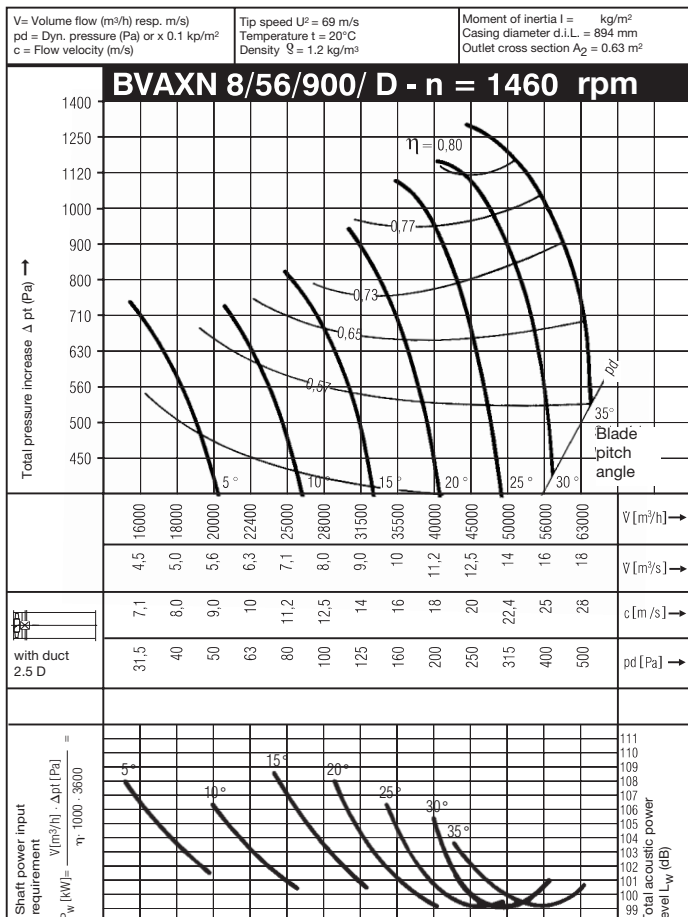
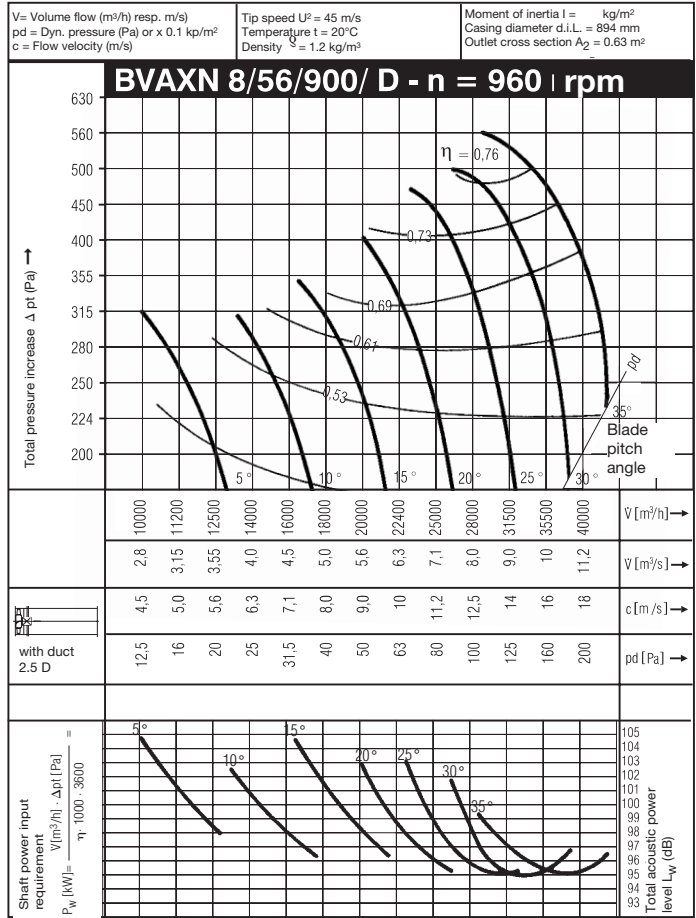
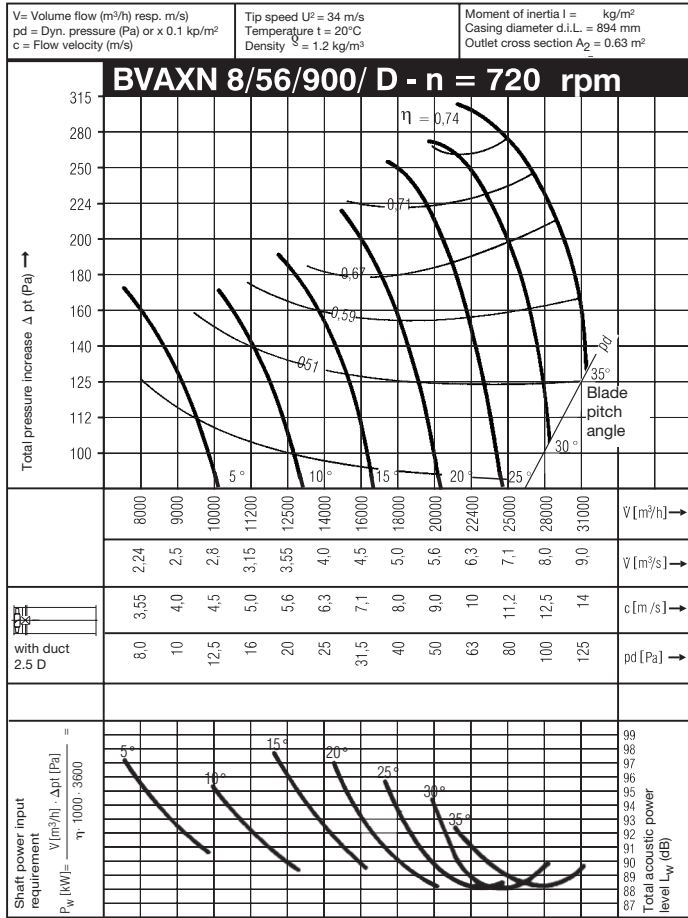
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AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES BVAXN 8/56 SERIES

600°C – 120 MIN

104



* rounded to standard values

For maximum motor sizes please see dimension pages



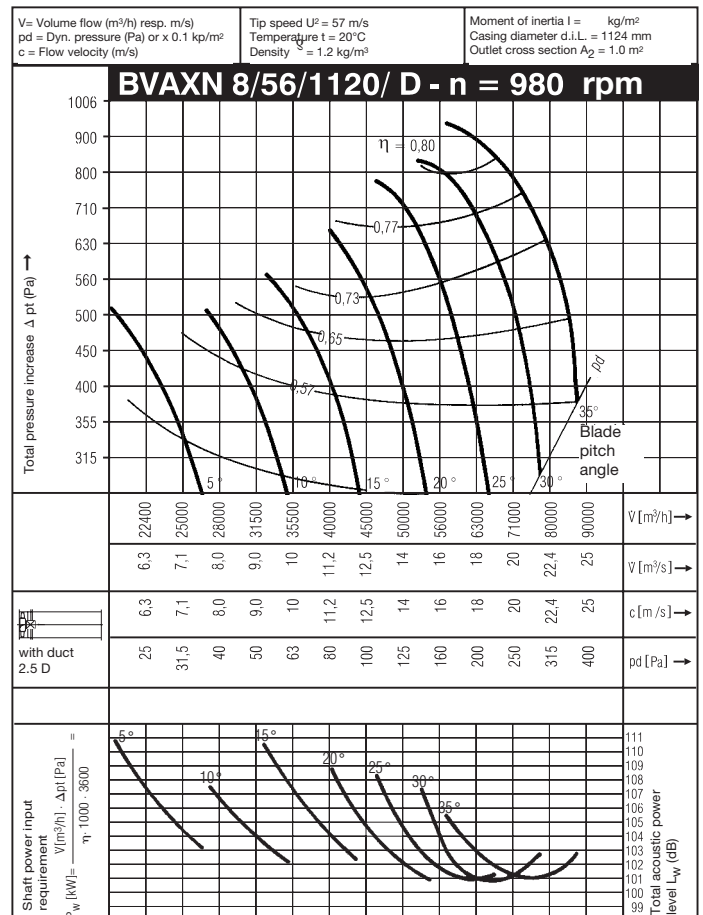
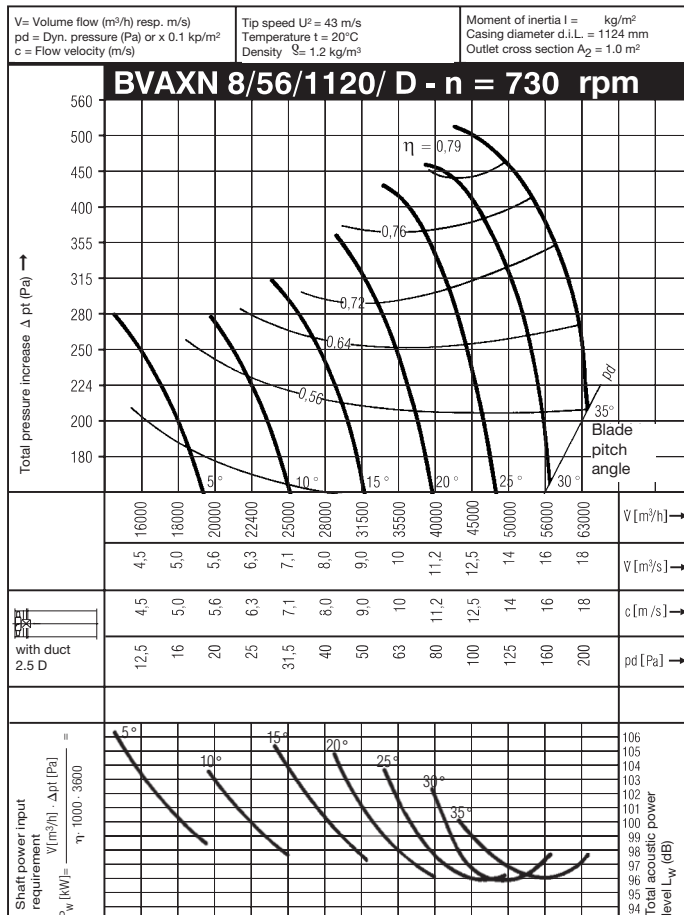
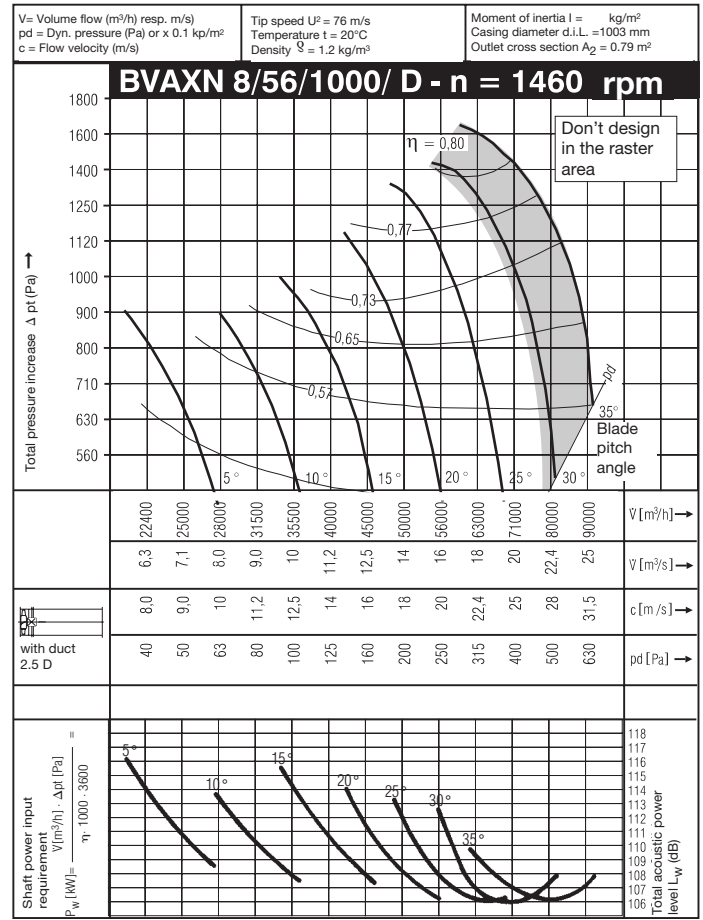
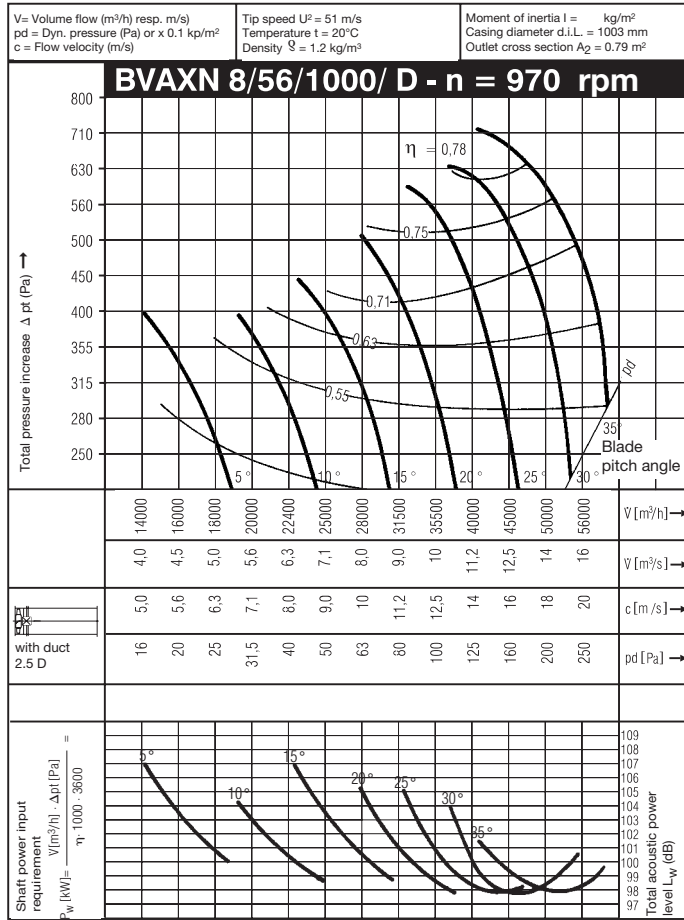
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600°C – 120 MIN

105



* rounded to standard values

For maximum motor sizes please see dimension pages



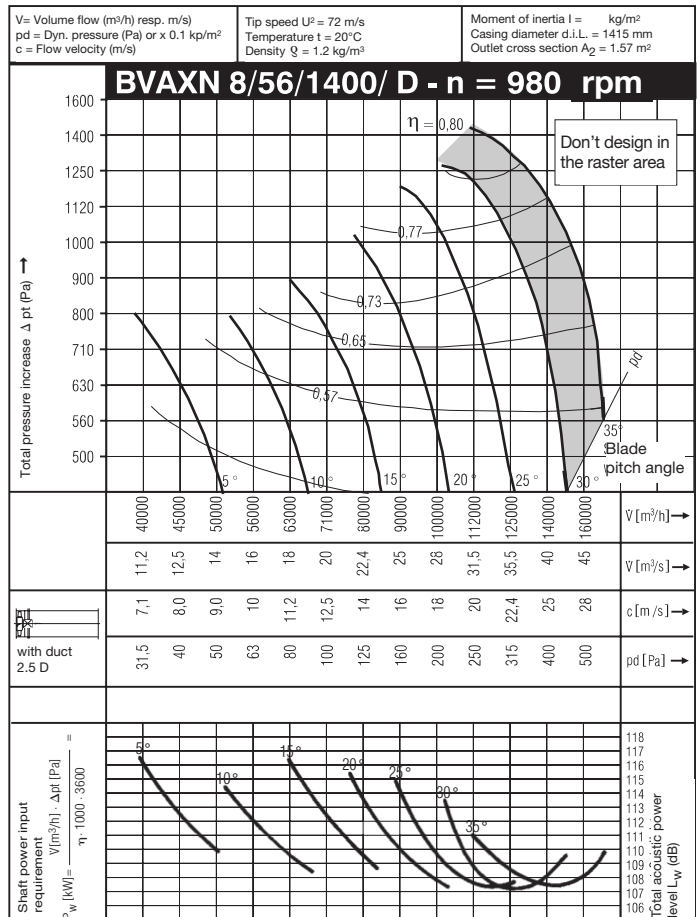
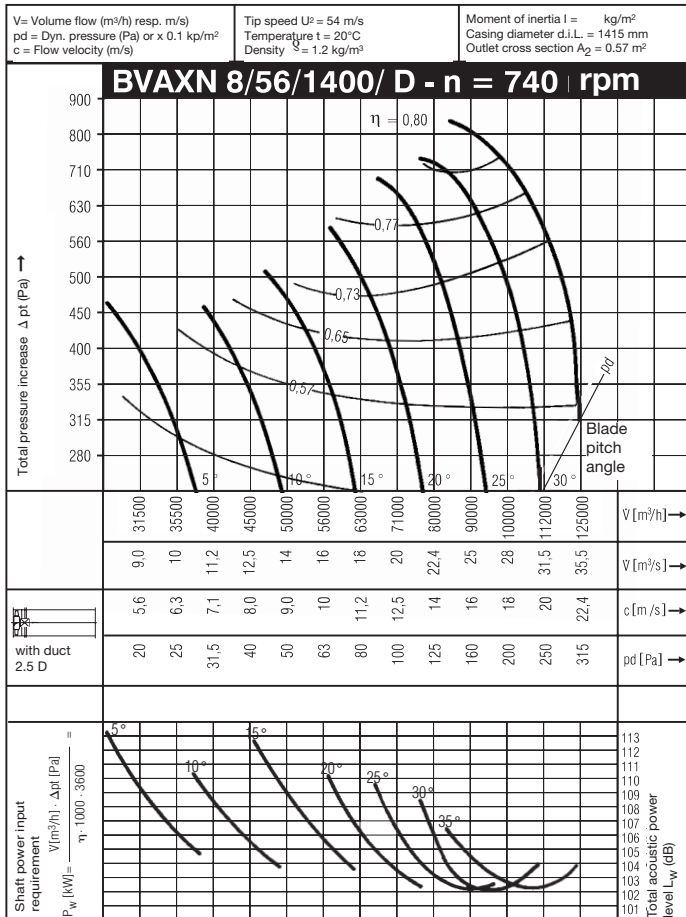
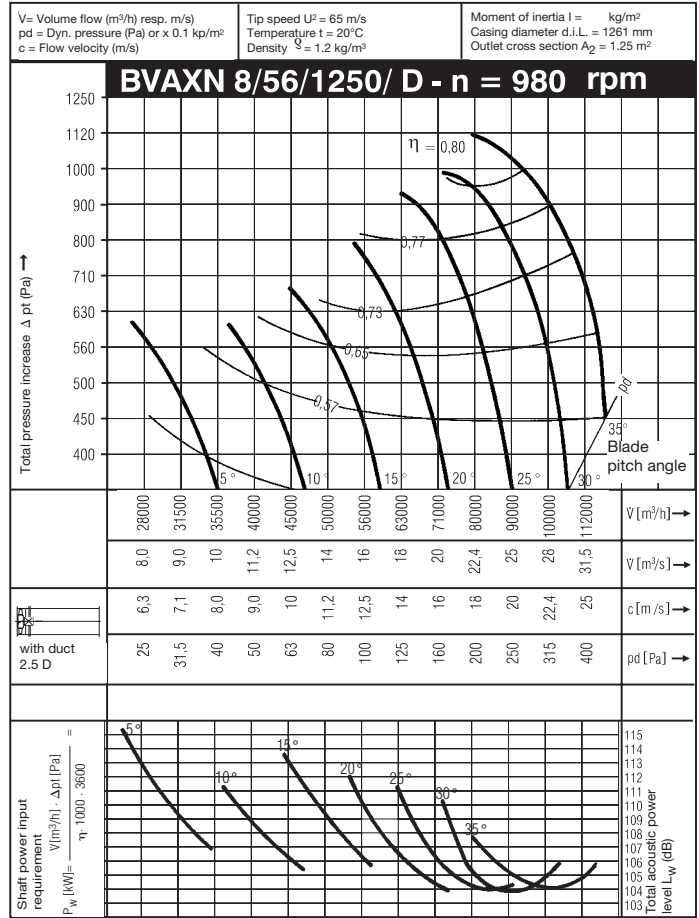
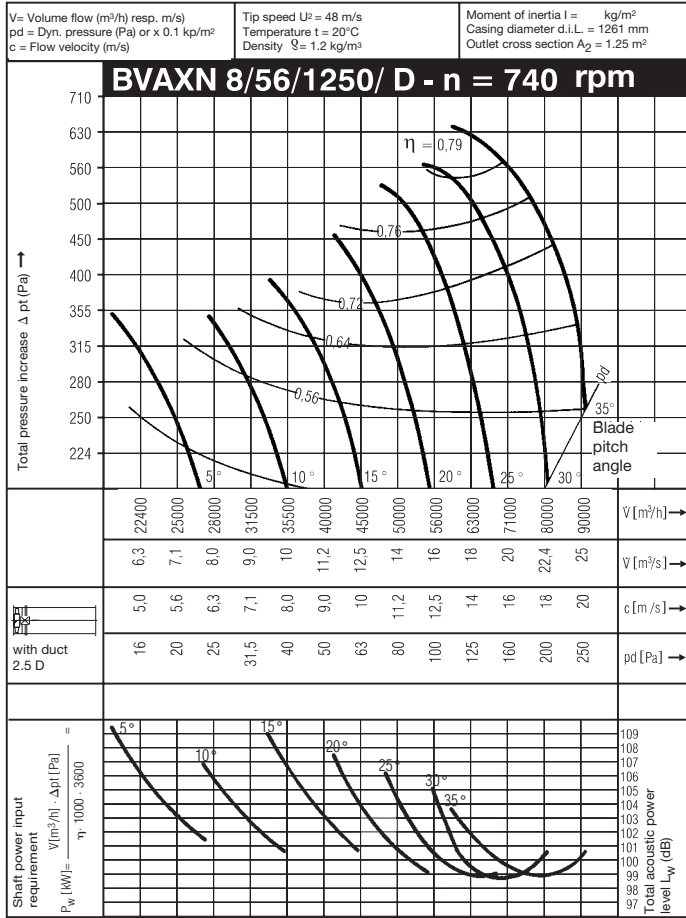
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AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES BVAXN 8/56 SERIES

600°C – 120 MIN

106



* rounded to standard values

For maximum motor sizes please see dimension pages



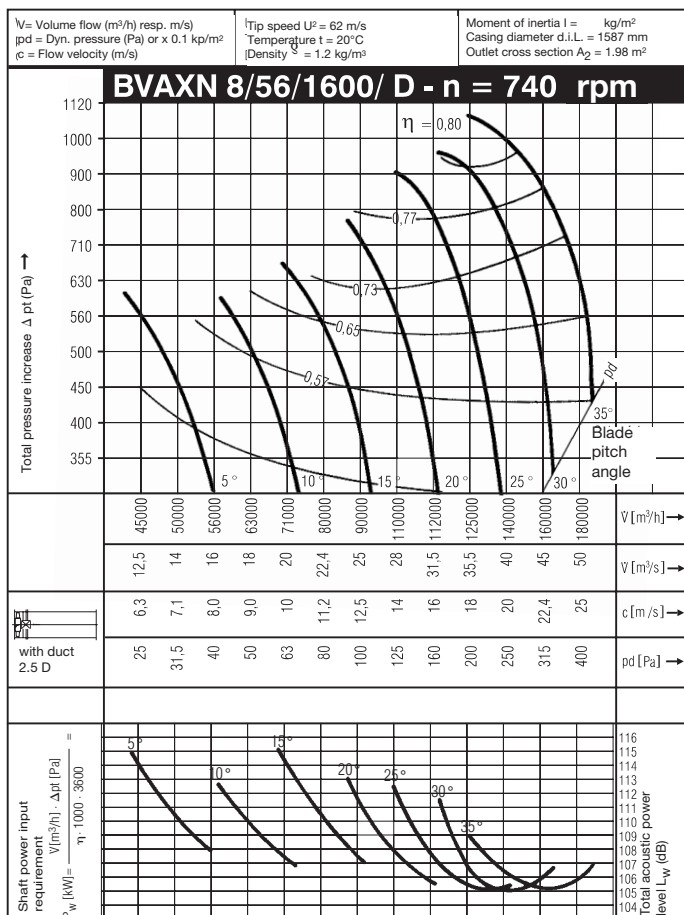
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AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES BVAXN 8/56 SERIES

600°C – 120 MIN

107



Necessary cooling air V [m³/h] for BVAXN 8/56 series (600°C – 120 min.)

Size	Nominal fan speed (rpm)									Type of cooling air fan	Motor output 400 V/50 Hz at 2,800 rpm [kW]	Current consumption [A]	Flange for duct-connection [mm]			
	750			1000			1500							3000		
	V	Δpk	Δpex	V	Δpk	Δpex	V	Δpk	Δpex	V	Δpk	Δpex				
500	120	100	430	160	180	300	240	400	50	240	400	50	4-14	0,18	0,52	100x100
630	120	100	430	160	180	300	240	400	50				4-14	0,18	0,52	100x100
710	120	100	430	160	180	300	240	400	50				4-14	0,18	0,52	100x100
800	265	110	390	355	195	305	530	440	80				5-19	0,25	0,86	200x100
900	265	110	390	355	195	305	530	440	80				5-19	0,25	0,86	200x100
1000	375	140	510	500	250	400	750	565	135				6-35	0,75	1,75	250x100
1120	375	140	510	500	250	400							6-35	0,75	1,75	250-100
1250	375	140	510	500	250	400							6-35	0,75	1,75	250x100
1400	1200	280	820	1800	630	370							8-70	2,2	4,6	315x140
1600	1800	630	820										8-70	2,2	4,6	315x140

Δpk = internal pressure loss of fan-owned cooling air system [Pa]

Δpex = additionally available pressure from cooling air duct losses [Pa]

V = Qty. of cooling air [m³/h] at 40° cooling air temperature

* rounded to standard values

For maximum motor sizes please see dimension pages

BVAXN 8/56

Item No.	Qty.	Description	Unit price €	Total €
		Axial Smoke Exhaust Fan, BVAXN 8/56, type M-D for the extraction of smoke fumes of max. 600°C / 120 min. tested to EN 12101, Part 3 (Technical University of Munich) with general building supervision approval Z-78.1-17 Airflow direction: outlet over motor, direct drive. For installation of axial smoke exhaust fans <u>outside</u> the fire compartment: • Wiring to the casing-mounted special terminal box and cooling fan terminal box to be provided by customer • Motor cooling via directly flange-mounted cooling fan For installation of axial smoke exhaust fans <u>inside</u> the fire compartment: Wiring to be provided by customer, as above, using heat-resistant cables. Terminal box heat insulation to be customer-supplied. or Motor cable (2 m) extending out of the motor cooling air port for routing through customer-supplied cooling air duct. (Longer cable available against surcharge). Terminal box loosely supplied. or Motor cooling by a separate cooling air fan to be fitted outside the fire compartment (via customer-supplied insulated cooling air duct). consisting of: Duct casing of welded sheet steel construction, with drilled flanges according to DIN 24154, Series 3 Guide vanes for pressure boosting and to ensure an essentially swirl-free outlet flow. Motor enclosed and insulated, arranged in the inner casing. Standard surface finish: • 2-component polyacrylate coating, colour: RAL 7030 Sheet steel impeller with fixed (non-adjustable) blades, dynamically balanced, ISO 1940, Quality Grade G 6,3 mounted on motor output shaft. Outlet side configurations: Duct connection or Free outlet without diffuser or Free outlet with diffuser		
		Carryover		

Lfd. Nr.	Qty.	Description	Unit price €	Total €
	or or	Specifications – BVAXN 8/56 Volume flow m³/h Temperature (design) 20°C Temperature (max./withstand time) 600°C/120 min Dynamic pressure Pa Total pressure increase Pa Fan speed rpm Efficiency % Power requirement kW Three-phase motor single-speed with Dahlander pole-changing winding pole-changing type with separate windings Motor speed rpm Motor output kW Nominal motor current A Voltage V Frequency Hz Protection class (IP) Style B 14 / V18 Size Total acoustic power level L_W dB Air cooling fan type: Air cooling fan specifications: Cooling air volume flow m³/h Additionally available pressure for customer supplied cooling duct (if mounted in fire compartment) Pa Motor output kW Motor speed rpm Nominal motor current A Voltage V Frequency Hz Weight (fan with accessories) approx. kg Manufacturer: TLT-Turbo GmbH Type: BVAXN 8/56/..... MD		
		Carryover		

Item No.	Qty.	Description	Unit price €	Total €
		Accessory equipment • Cooling air fan (standard version) • Set of mounting feet • Flexible connector, heat resistant * - inlet side - outlet side • Set of matching flanges * • Bellmouth incl. flange • Wire guard • Set of spring-type AV mounts * • Brackets for vertical installation • Diffuser with interior core * • Wire guard (diffuser-outlet) • Galvanized fan • Outlet duct with wire guard * • Outlet duct with self-activating damper and wire guard * • Duct with self-activating damper * In case of installation of BVAXN inside the fire zone • Flexible connector für connection to cooling air duct • Longer motor-cable, length m • Cooling air fan (special version) • Weather guard for cooling air fan Note: Please observe our Installation, Operating and Maintenance Instructions (available upon request).		
		* Loosely supplied		



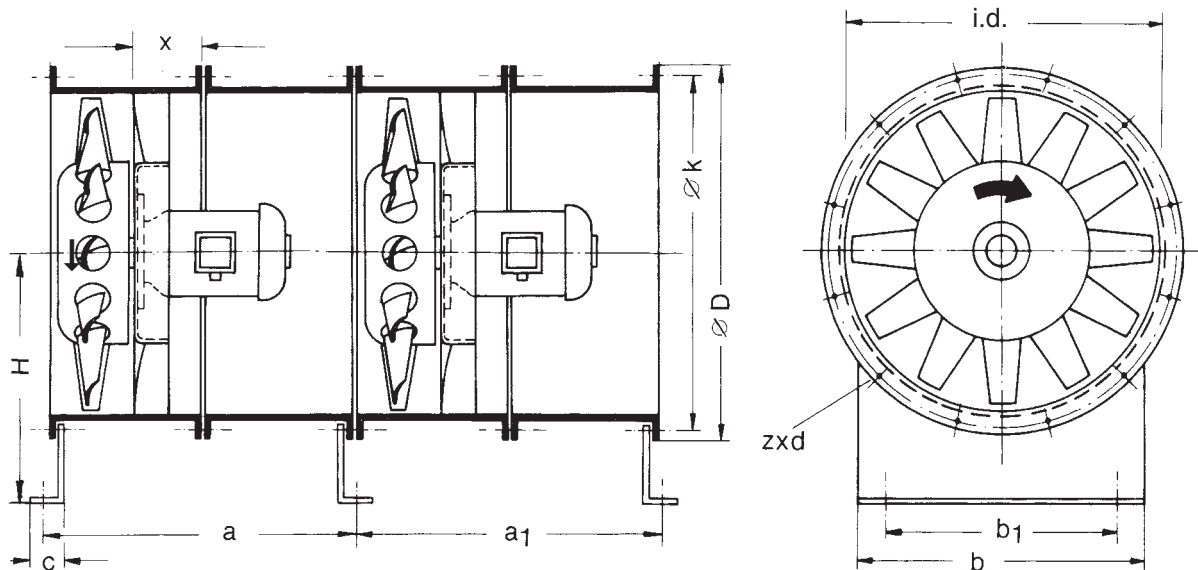
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TWO-STAGE AXIAL SMOKE EXHAUST FANS BVZAXN 12/56 SERIES MAIN DIMENSIONS

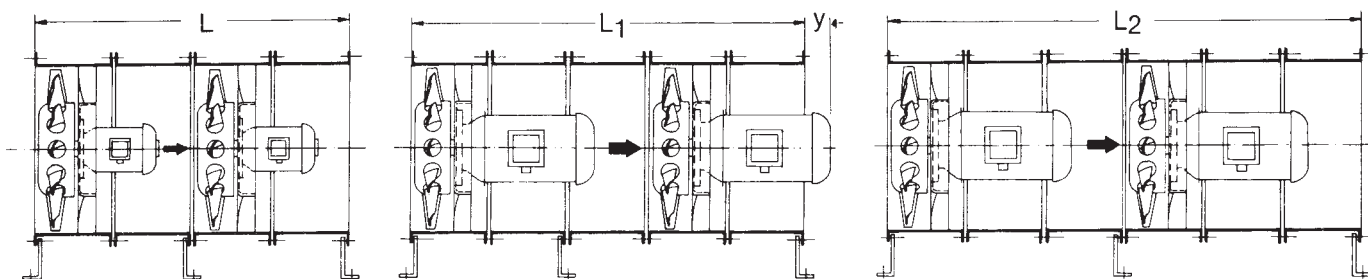
200/300/400°C – 120 MIN

113



Further technical details may be taken from our special catalogue « Multi-Storey Fans for Ventilation and Smoke Extraction ». Please ask for your copy.

Important! This fan series is available only with the motor outputs stated in our price lists.



Size	i.d.	Ø k	Ø D	z x d ¹⁾	up to motor size	L	Weight ²⁾ [kg]	up to motor size	L ₁ *	y	Weight ²⁾ [kg]	up to motor size	L ₂ *	Weight ²⁾ [kg]	H	a	a ₁	c	b	b ₁	x
355	359	395	425	8 x 9,5	80	660	25	90	825	8	30	90	990	35	270	356	330	35	330	270	77
400	401	438	468	12 x 9,5	90	752	36	112	940	54	43	112	1128	51	300	406	379	37	370	300	88
450	450	487	517	12 x 9,5	90	800	43	112	1000	34	52	112	1200	62	335	430	400	37	410	330	88
500	504	541	571	12 x 9,5	112	900	56	132	1125	81	68	132	1350	80	375	480	453	37	460	380	100
560	565	605	643	16 x 11,5	112	968	82	132	1210	64	99	132	1452	117	420	519	483	45	510	430	100
630	634	674	712	16 x 11,5	132	1144	105	—	—	—	—	—	—	—	470	607	575	45	550	470	128
710	711	751	789	16 x 11,5	132	1220	130	160	1525	112	152	160	1830	174	525	645	613	45	620	530	128
800	797	837	875	24 x 11,5	132	1400	164	180	1750	104	198	180	2100	232	585	735	703	45	730	640	150
900	894	934	972	24 x 11,5	132	1492	220	225	1865	78	264	225	2238	309	655	781	753	45	730	640	149
1000	1003	1043	1081	24 x 11,5	160	1660	274	225	2075	113	329	225	2490	383	730	881	833	57	830	740	165
1120	1126	1174	1214	24 x 11,5	180	1800	380	250	2250	180	450	280	2700	495	760	951	903	57	920	820	170
1250	1263	1311	1351	24 x 11,5	200	2000	450	250	2500	115	570	280	3000	625	855	1051	1003	57	1030	930	185
1400	1415	1465	1545	24 x 11,5	180	2000	please ask	—	—	—	please ask	315	2900	please ask	930	—	—	—	—	—	—
1600	1587	1637	1717	32 x 11,5	225	2200	please ask	—	—	—	please ask	315	2900	please ask	1020	—	—	—	—	—	—

Dimensions in mm

¹⁾ connecting dim. in acc. with DIN 24154 series 3 ²⁾ without motors.

* Here further ducts are required, dim. a + a₁ are therefore different

For planning and installation please also refer to our Installation, Operating and Maintenance Instructions (MBW).

BVZAXN 12/56



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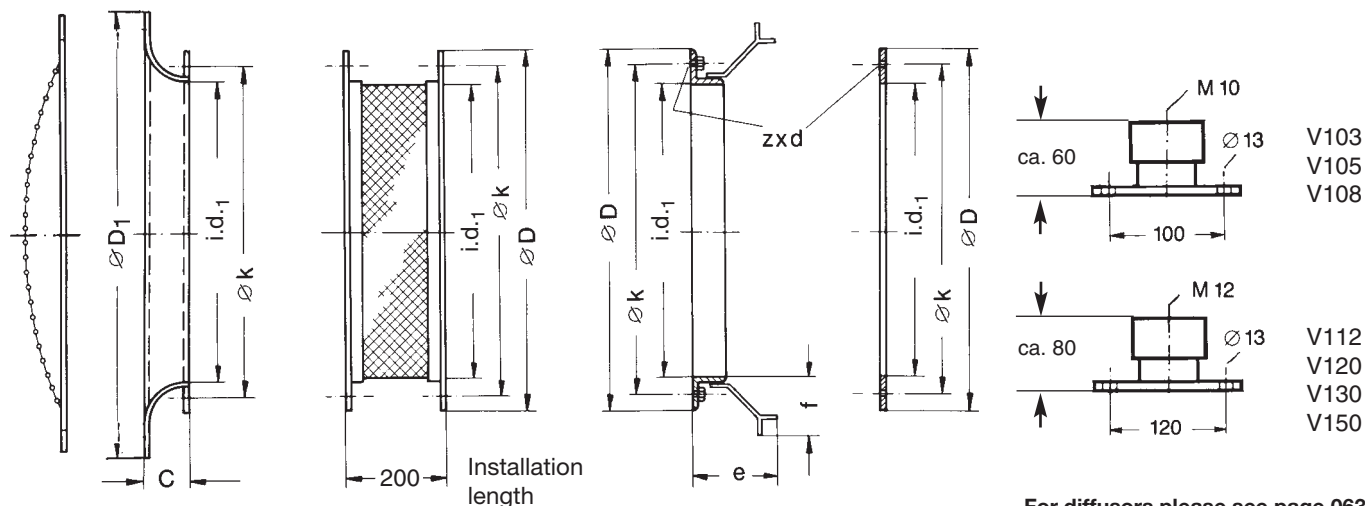
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TWO-STAGE AXIAL SMOKE EXHAUST FANS BVZAXN 12/56 SERIES ACCESSORIES

200/300/400°C – 120 MIN

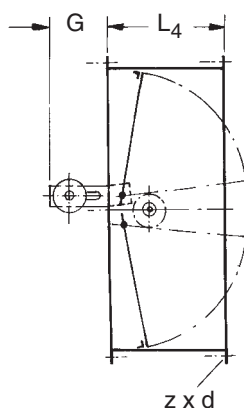
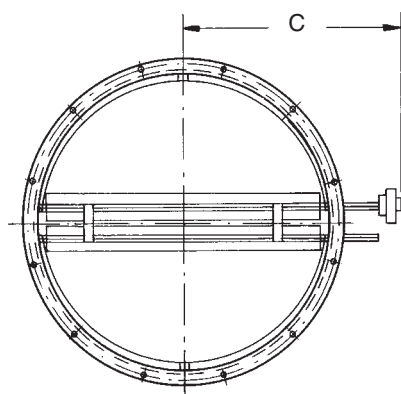
114

Wire guard **Bellmouth inlet with flange** **Flexible connector** **Angular wall ring** **Matching flange** **Spring-type AV mounts**



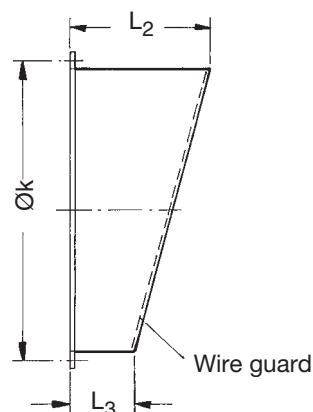
Duct

with self-activating damper



Outlet cone

with wire guard



Size	i.d.-1	$\varnothing k$	$\varnothing D$	$z \times d^1$	$\varnothing D_1$	C	e	f	L ₂	L ₃	L ₄	C	G
355	361	395	425	8 x 9,5	501	69	80	50	280	80	165	250	40
400	403	438	468	12 x 9,5	562	78	80	50	280	60	188	280	40
450	452	487	517	12 x 9,5	631	87	80	50	290	70	200	350	200
500	506	541	571	12 x 9,5	708	98	80	50	280	60	225	390	200
560	568	605	643	16 x 11,5	794	109	100	70	330	70	242	430	200
630	637	674	712	16 x 11,5	875	95	100	70	330	70	286	465	200
710	714	751	789	16 x 11,5	972	103	100	70	350	70	305	505	200
800	800	837	875	24 x 11,5	1081	115	100	70	520	200	350	550	200
900	897	934	972	24 x 11,5	1214	130	100	70	585	225	373	620	200
1000	1006	1043	1081	24 x 11,5	1351	145	100	70	640	240	415	690	200
1120	1133	1174	1214	24 x 11,5	1470	160	110	90	730	250	450	790	270
1250	1270	1311	1351	24 x 11,5	1677	185	110	90	810	250	500	900	270
1400	1424	1465	1505	24 x 11,5	1870	210	130	100	please ask				
1600	1587	1637	1677	32 x 11,5	2087	210	130	100					

¹⁾ connecting dim. in acc. with DIN 24154 series 3



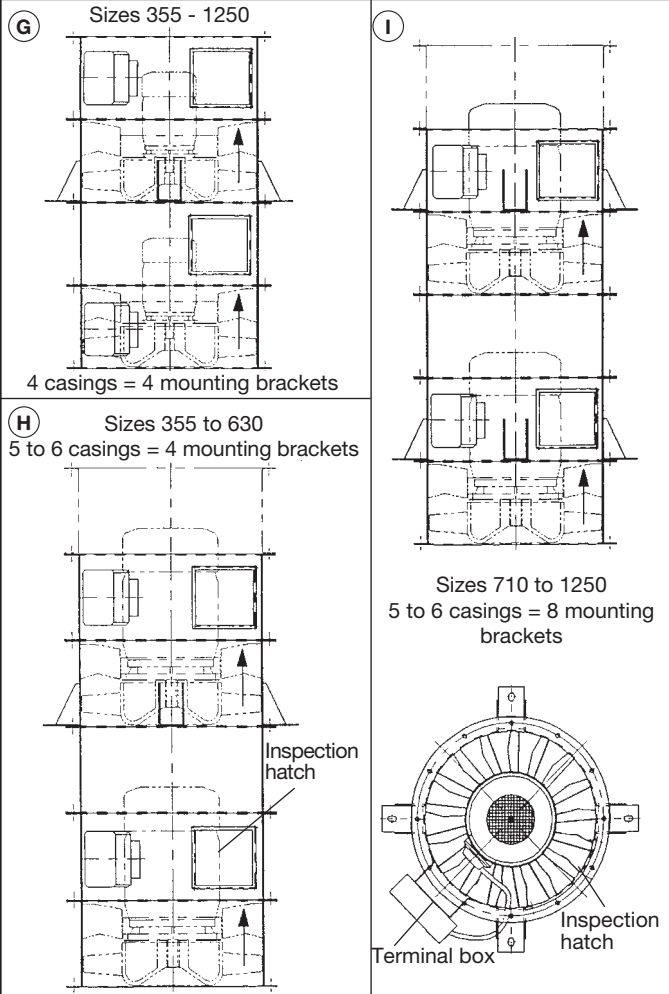
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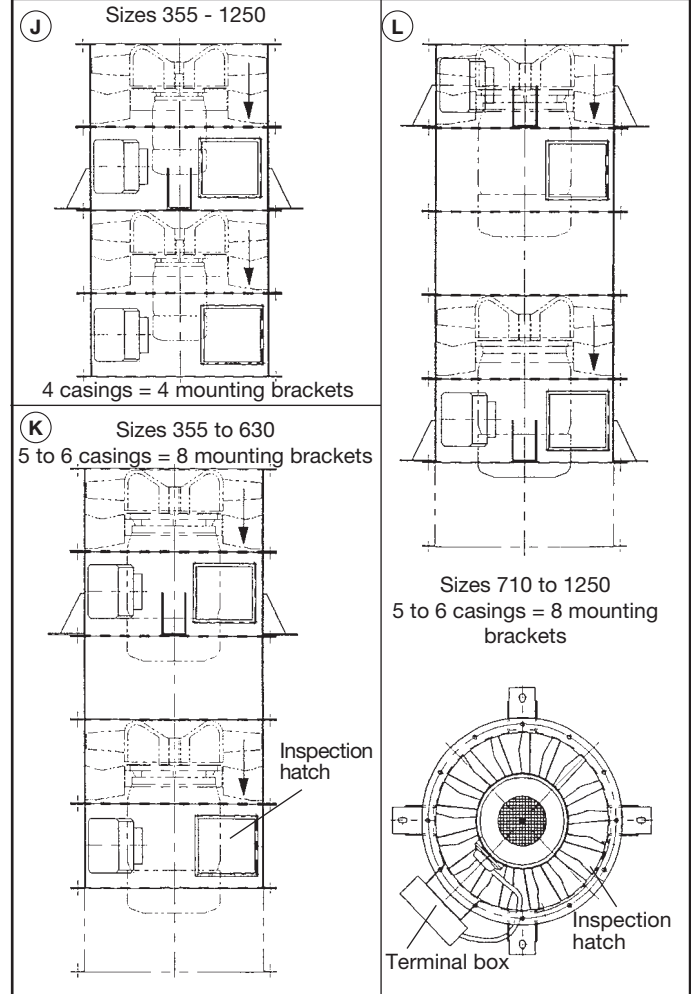
TWO-STAGE AXIAL SMOKE EXHAUST FANS BVZAXN 12/56 SERIES VERTICAL INSTALLATION SIZE 355 TO 1250 MOUNTING BRACKETS, TERMINAL BOX, INSPECTION HATCH

115

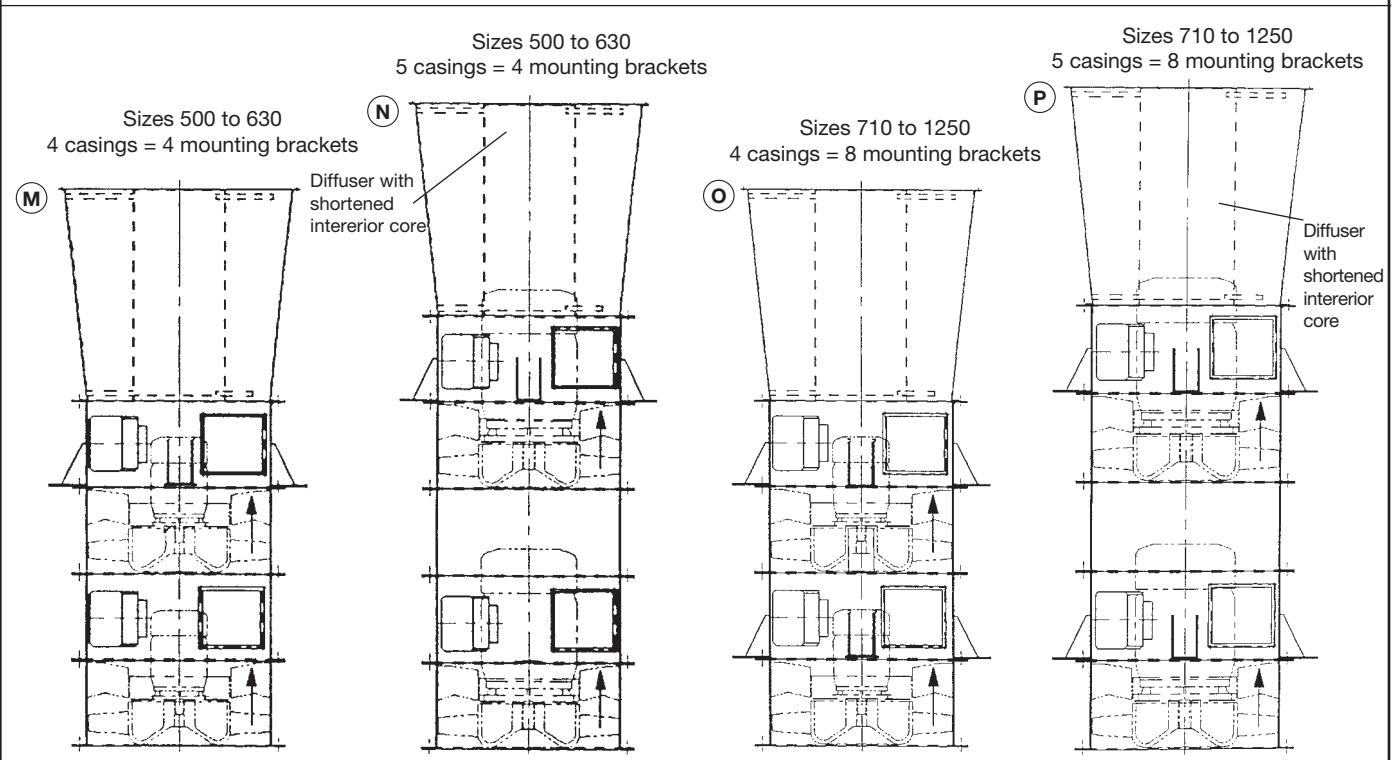
airflow upward



airflow downward



Airflow upward* (with outlet diffuser)



*Please ask for airflow downward

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WITH DIRECT DRIVE AND OUTLET GUIDE VANES
TYP BZAXN 12/56 300°C - 120 Min
TECHNICAL LISTS (AVAILABLE MODELS)****116**

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

355	3000		1,5	3,25	90	B14	160
			2,2	4,6	90	B14	160
	1500/750		1,0/0,25	2,4/1,0	90	B14	160
	3000/1500		1,5/0,37	3,7/1,0	90	B14	160

400	1500		1,1	2,80	90	B5	200
			1,5	3,25	90	B5	200
	3000		2,2	4,6	90	B5	200
			3,0	6,7	100	B14	200
			4,0	8,3	112	B14	200
			1,5/0,37	3,7/1,0	90	B5	200
	3000/1500		3,0/0,75	6,7/1,7	100	B14	200
			4,1/1,0	8,8/2,1	112	B14	200

450	1500		1,1	2,8	90	B5	200
	3000		3,0	6,7	100	B14	200
			4,0	8,3	112	B14	200
			5,5	11	112	B14	200
	1500/750		1,0/0,25	2,4/1,0	90	B5	200
	3000/1500		3,0/0,75	6,7/1,7	100	B14	200
			4,1/1,0	8,8/2,1	112	B14	200

500	1500		1,1	2,8	90	B5	200
			1,5	3,5	90	B5	200
	3000		4,0	8,3	112	B5	250
			5,5	11	132	B5	250
			7,5	14,6	132	B5	250
			11	20,5	132	B5	250
	1000/500		0,48/0,08	1,6/0,58	90	B5	200
	1500/750		1,4/0,35	3,3/1,35	90	B5	200
	3000/1500		3,0/0,75	6,7/1,7	100	B5	250
			6,0/1,5	13,3/3,2	132	B5	250
			7,8/2,0	16,2/4,1	132	B5	250

560	100		0,75	2,2	90	B5	200
	1500		1,1	2,8	90	B5	200
			1,5	3,5	90	B5	200
	1500		2,2	5,5	100	B5	250
	1000/500		0,8/0,15	2,3/0,9	90	B5	200
	1500/750		1,4/0,35	3,3/1,35	90	B5	200
			2,5/0,6	5,6/2,2	100	B5	250

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

630	1000		0,75	2,2	90	B5	200
			1,1	3,15	90	B5	200
	1500		1,5	3,5	90	B5	200
			2,2	5,5	100	B5	250
			3,0	7,1	100	B5	250
			4,0	8,6	112	B5	250
	1000/500		0,8/0,15	2,3/0,9	90	B5	200
			1,2/0,22	3,1/1,15	100	B5	250
	1500/750		2,5/0,6	5,6/2,2	100	B5	250
			3,8/1,0	8,1/3,4	112	B5	250
			5,5/1,4	11,4/4,3	132	B5	250

710	1000		1,1	3,15	90	B5	200
			1,5	3,9	100	B5	250
			2,2	5,4	112	B5	250
	1500		3,0	7,1	100	B5	250
			4,0	8,6	112	B5	250
			5,5	11,4	132	B5	250
			7,5	15,4	132	B5	250
			1,2/0,22	3,1/1,15	100	B5	250
	1000/500		1,85/0,33	4,6/1,6	112	B5	250
			3,3/0,75	9,3/3,6	132	B5	250
			5,5/1,4	11,4/4,3	132	B5	250
			7,0/1,7	15,2/5,1	132	B5	250
			11/3,0	24/9,5	160	B5	350
			11/3,0	24/9,5	160	B5	350

800	1000		2,2	5,4	112	B5	250
			3,0	7,4	132	B5	250
			4,0	9,2	132	B5	250
	1500		5,5	11,4	132	B5	250
			7,5	15,4	132	B5	250
			11	22	160	B5	350
			15	29,5	160	B5	350
			15	29,5	160	B5	350
	1000/500		2,6/0,5	7,1/2,8	132	B5	250
			3,3/0,75	9,3/3,6	132	B5	250
			4,4/1,0	11/4,4	132	B5	250
	1500/750		5,5/1,4	11,4/4,3	132	B5	250
			7,0/1,7	15,2/5,1	132	B5	250
			11/3,0	24/9,5	160	B5	350
			14/3,5	30,5/11,4	160	B5	350

❶ Nominal current = appr. values for 400 V motors, brand EMOD. Brands ATB and Loher marked (A) and (L) respectively.
It is important to check nominal current in case of other motor brands. • ATB motors

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WITH DIRECT DRIVE AND OUTLET GUIDE VANES
TYP BZAXN 12/56 300°C - 120 Min
TECHNICAL LISTS (AVAILABLE MODELS)****117**

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A]	Size	Type	Flange dia.

900	1000		3,0	7,4	132	B5	250
			4,0	9,2	132	B5	250
			5,5	12,7	132	B5	250
			7,5	15,7	160	B5	350
	1500		11	22	160	B5	350
			15	29,5	160	B5	350
			18,5	36	180	B5	350
			22	43	180	B5	350
			30	52	200	B5	350
	1000/500		3,3/0,75	9,3/3,6	132	B5	250
			4,4/1,0	11/4,4	132	B5	250
			6,3/1,5	15,7/5,4	160	B5	350
			8,8/2,2	20,5/7,0	160	B5	350
	1500/750		11/3,0	24/9,5	160	B5	350
			14/3,5	30,5/11,4	160	B5	350
			16/4,0	32,5/11,9	180	B5	350
			20/5,5	39/16,2	180	B5	350
			28/7,0	52/16,2	200	B5	350
	1500/1000		12/3,5	24/9,5	160	B5	350

1000	1000		5,5	12,7	132	B5	250
			7,5	15,7	160	B5	350
			11	22	160	B5	350
			15	29,5	180	B5	350
	1500		15	29,5	160	B5	350
			18,5	36	180	B5	350
			22	43	180	B5	350
			30	52	200	B5	350
			37	66	225	B5	450
			45	82	225	B5	450
	1000/500		4,4/1,0	11/4,4	132	B5	250
			6,3/1,5	15,7/5,4	160	B5	350
			8,8/2,2	20,5/7,0	160	B5	350
			12,5/3,0	32,5/11	180	B5	350
	1500/750		16/4,0	32,5/11,9	180	B5	350
			20/5,5	39/16,2	180	B5	350
			28/7,0	52/16,2	200	B5	350
			32/8,0	60/19	225	B5	450
			37/10	69/24,5	225	B5	450

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A]	Size	Type	Flange dia.

1120	750		4,0	9,3	160	B5	350
			5,5	11,4	160	B5	350
			7,5	16,1	160	B5	350
			11	23,5	180	B5	350
	1000		7,5	15,7	160	B5	350
			11	22	160	B5	350
			15	29,5	180	B5	350
			20	40	200	B5	400
			22	43	200	B5	400
			30	57	225	B5	450
	1500		30	52	200	B5	400
			37	66	225	B5	450
			45	82	225	B5	450
			55 (L)	97	250	B5	550
			75 (L)	132	280	B5	550
	1000/500		6,3/1,5	15,7/5,4	160	B5	350
			7,5/1,85	19/6,7	160	B5	350
			8,8/2,2	20,5/7,0	160	B5	350
			12,5/3,0	32,5/11	180	B5	350
	1500/750		15,5/3,3	34/11	200	B5	400
			18,5/4,4	40/13,3	200	B5	400
			22/5,5	41/13,3	225	B5	450
			27/6,6	51/18	225	B5	450
	1500/750		28/7,0	52/16,2	200	B5	400
			33/8,0	60/19	225	B5	450
			37/9,2	69/24,5	225	B5	450
			39/9,5 (L)	72/21	225	B5	450
	1500/750		44/11 (L)	78/24	225	B5	450
			49/12 (L)	84/23	250	B5	550
			68/17 (L)	125/43,5	280	B5	550
			80/20 (L)	140/48	280	B5	550

1250	750		5,5	11,4	160	B5	350
			7,5	16,1	160	B5	350
			11	23,5	180	B5	350
			15	31	200	B5	400
	1000		18,5	37	225	B5	450
			11	22	160	B5	350
			15	29,5	180	B5	350
			20	40	200	B5	400
	1250		22	43	200	B5	400
			30	57	225	B5	450
			37	67	225	B5	450
			45 (L)	81	280	B5	550

① Nominal current = appr. values for 400 V motors, brand EMOD. Brands ATB and Loher marked (A) and (L) respectively.
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BVZAXN 12/56

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WITH DIRECT DRIVE AND OUTLET GUIDE VANES
TYP BZAXN 12/56 300°C - 120 Min
TECHNICAL LISTS (AVAILABLE MODELS)****118**

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

1250	1500		45	82	225	B5	450
			55 (L)	97	250	B5	550
			75 (L)	132	280	B5	550
			90 (L)	157	280	B5	550
			110 (L)	200	315		
			132 (L)	240	315		
	1000/500		12,5/3,0	32,5/11	180	B5	350
			15,5/3,0	34/11	200	B5	400
			18,5/4,4	40/13,3	200	B5	400
			22/5,5	41/13,3	225	B5	450
			27/6,6	51/18	225	B5	450
			30/7,0 (L)	58/19	250	B5	550
	1500/750		44/11 (L)	78/24	225	B5	450
			49/12 (L)	84/23	250	B5	550
			68/17 (L)	125/43,5	280	B5	550
			80/20 (L)	140/48	280	B5	550

1400	750		11	23,5	180	B5	350
			15	31	200	B5	400
			18,5	37	225	B5	450
			22	44,5	225	B5	450
			30	60	250	B5	550
			45	88	280	B5	550
	1000		22	43	200	B5	400
			30	57	225	B5	450
			37	74	225	B5	450
			45 (L)	81	280	B5	550
			55 (L)	99	280	B5	550
			75 (L)	136	315	B5	660
	1000/500		18,5/4,4	32,5/11	200	B5	400
			22/5,0	41/13,3	225	B5	450
			27/6,0	51/18	225	B5	450
			30/7,0 (L)	58/19	250	B5	550
			40/8,0 (L)	74/24	280	B5	550
			48/9,5 (L)	88/28	280	B5	550
			58/12 (L)	106/22	315	B5	660
			70/14 (L)	125/33	315	B5	660
			82/16 (L)	150/37	315	B5	660

Fan Size	Motor 400 V, 50 Hz						
	Nominal speed [rpm]		Output [kW]	Nominal current [A] ❶	Size	Type	Flange dia.

1600	750		22	44,5	225	B5	450
			30 (L)	60	250	B5	550
			37 (L)	73	280	B5	550
			45 (L)	88	280	B5	550
			55 (L)	110	315	B5	660
			75 (L)	145	315	B5	660
	1000		45 (L)	81	280	B5	550
			55 (L)	99	280	B5	550
			75 (L)	136	315	B5	660
			90 (L)	160	315	B5	660
			110 (L)	195	315	B5	660
			132 (L)	228	315	B5	660
	1000/500		40/8,0 (L)	74/24	280	B5	550
			48/9,5 (L)	88/28	280	B5	550
			58/12 (L)	106/22	315	B5	660
			70/14 (L)	125/33	315	B5	660
			82/16 (L)	150/37	315	B5	660
			103/20 (L)	185/47	315	B5	660
	750		22	44,5	225	B5	450
			30 (L)	60	250	B5	550
			37 (L)	73	280	B5	550
			45 (L)	88	280	B5	550
			55 (L)	110	315	B5	660
			75 (L)	145	315	B5	660
	1000		45 (L)	81	280	B5	550
			55 (L)	99	280	B5	550
			75 (L)	136	315	B5	660
			90 (L)	160	315	B5	660
			110 (L)	195	315	B5	660
			132 (L)	228	315	B5	660
	1000/500		48/9,5 (L)	88/28	280	B5	550
			58/12 (L)	106/22	315	B5	660
			70/14 (L)	125/33	315	B5	660
			82/16 (L)	150/37	315	B5	660
			103/20 (L)	185/47	315	B5	660

❶ Nominal current = appr. values for 400 V motors, brand EMOD. Brands ATB and Loher marked (A) and (L) respectively.
It is important to check nominal current in case of other motor brands. • ATB motors



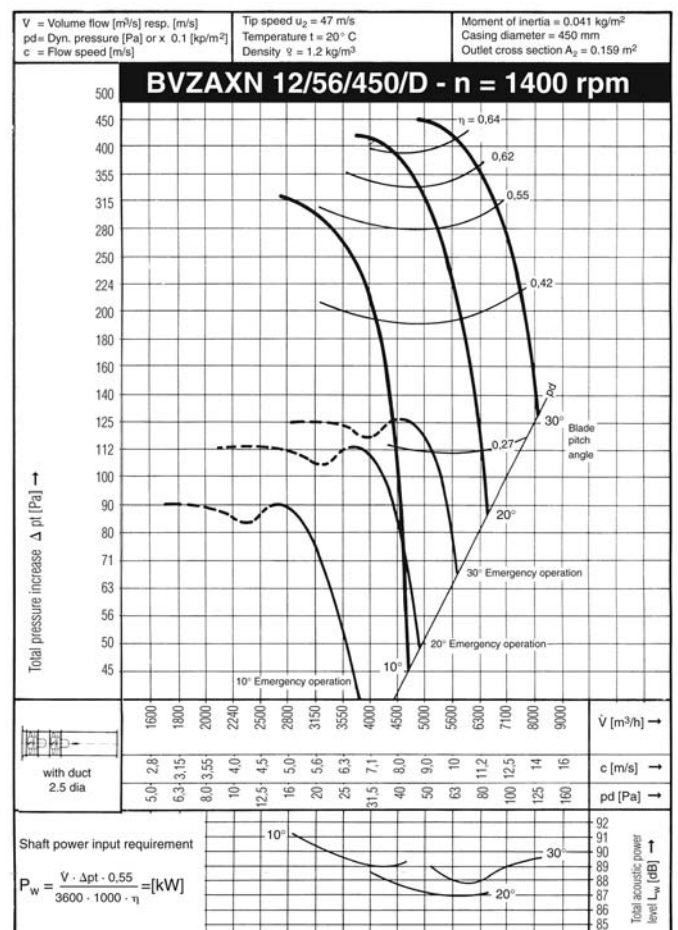
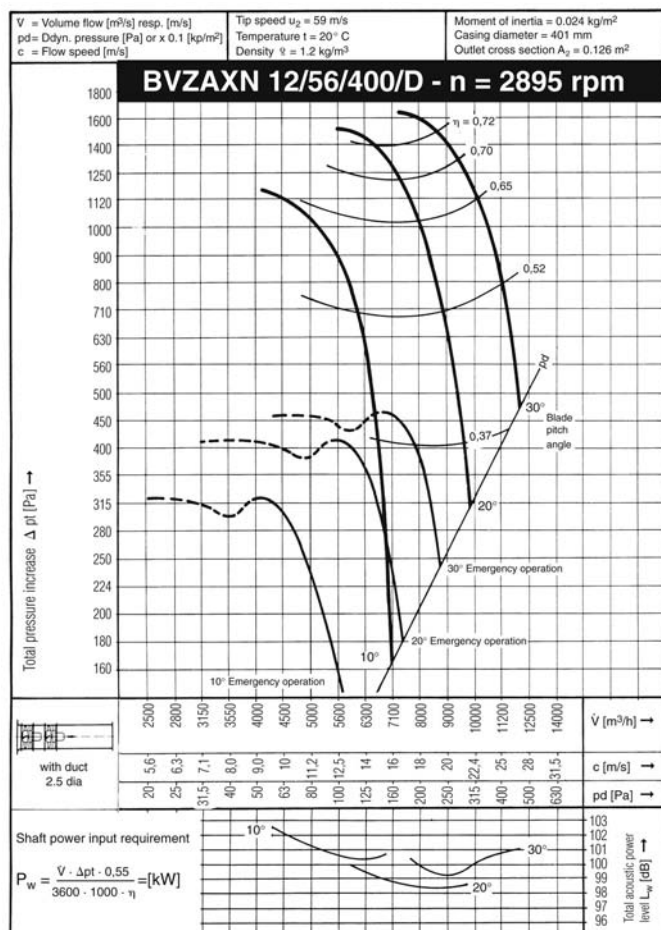
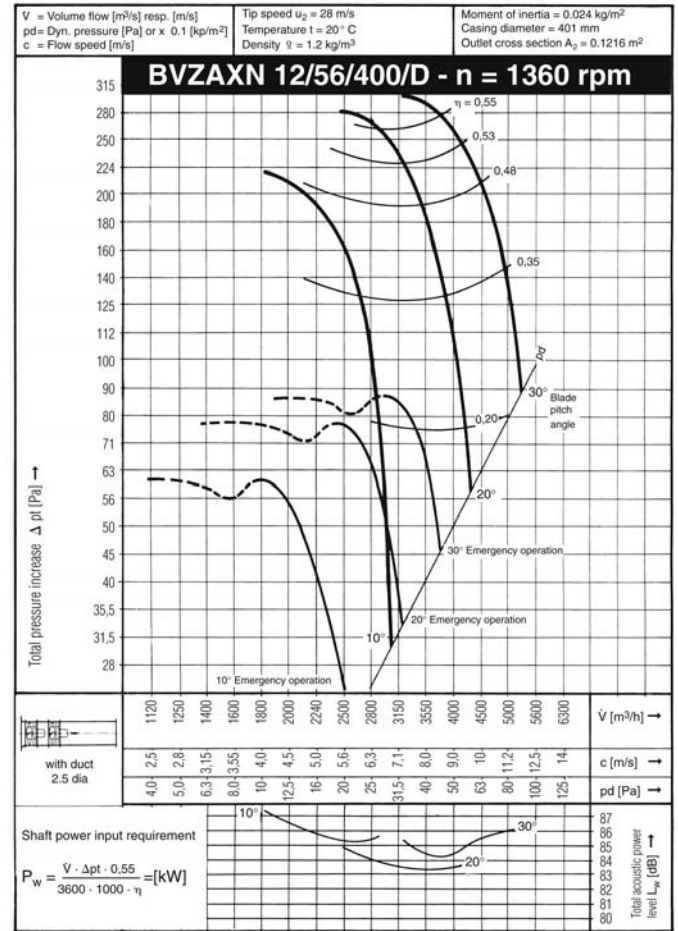
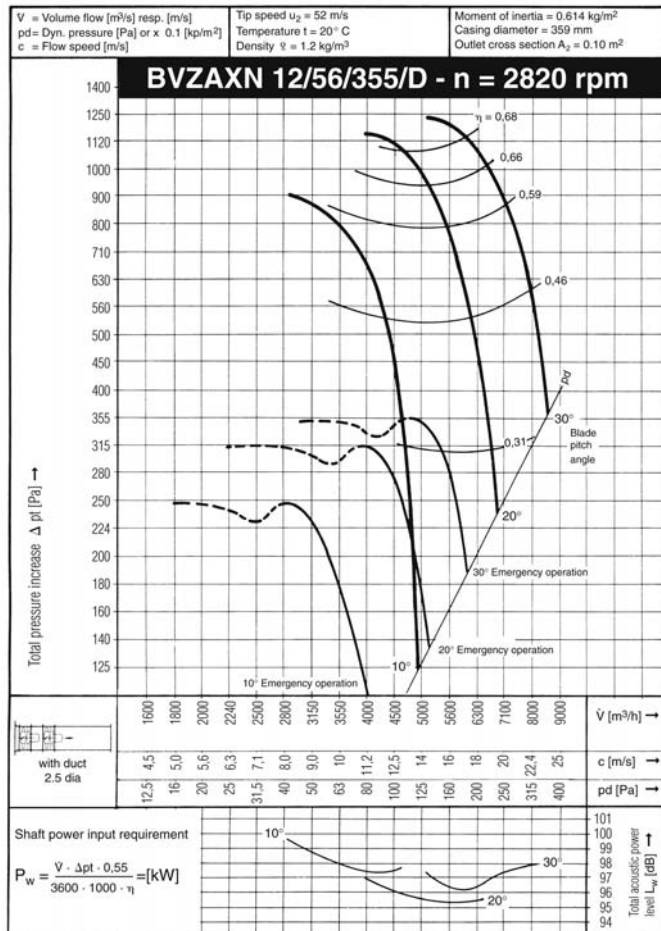
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TWO-STAGE AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES BVZAXN 12/56 SERIES

300°C - 120 MIN

119



• Also available for 200 or 400°C - 120 min.



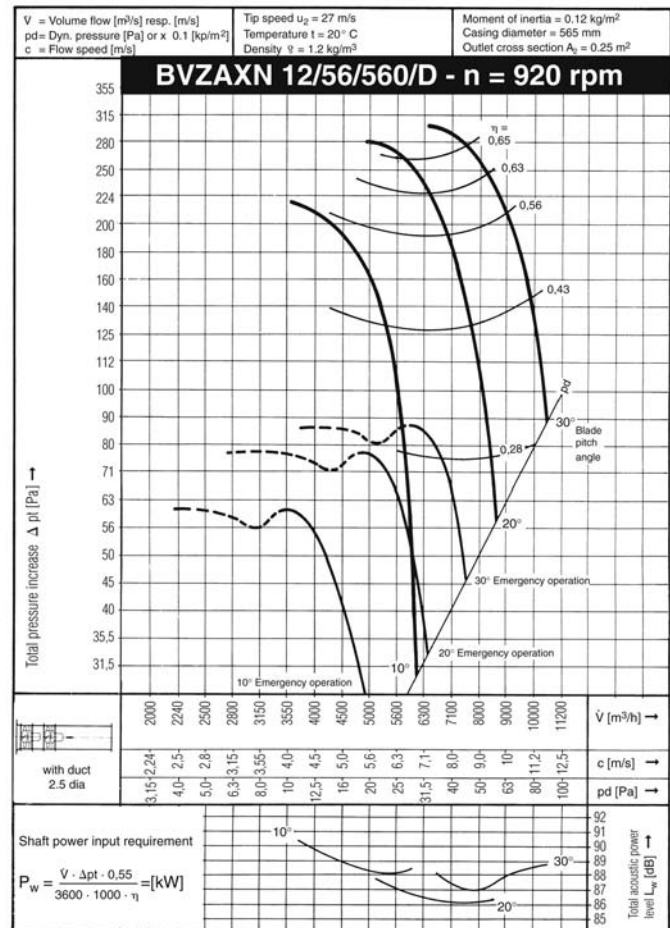
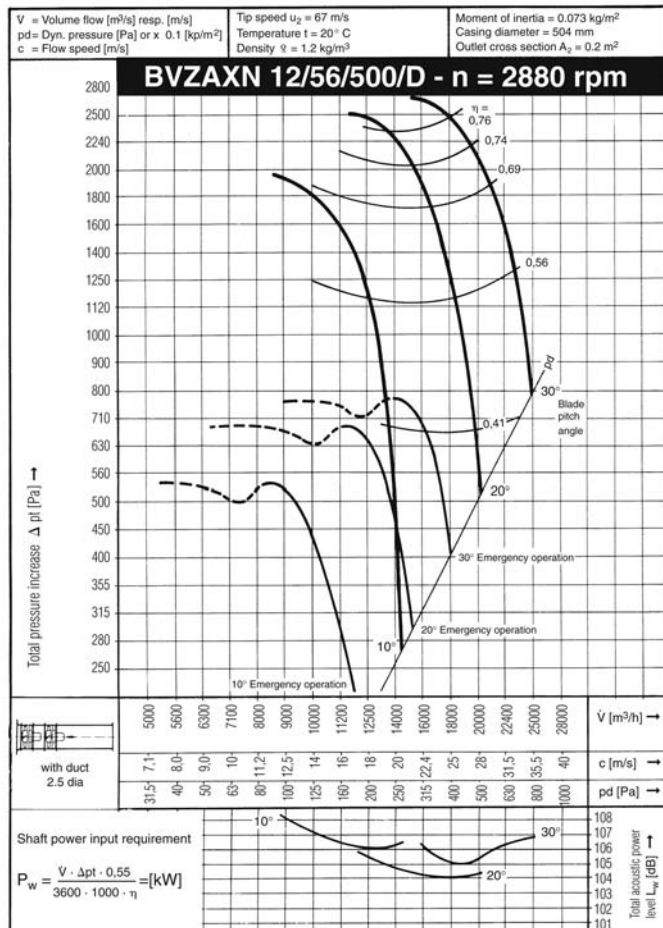
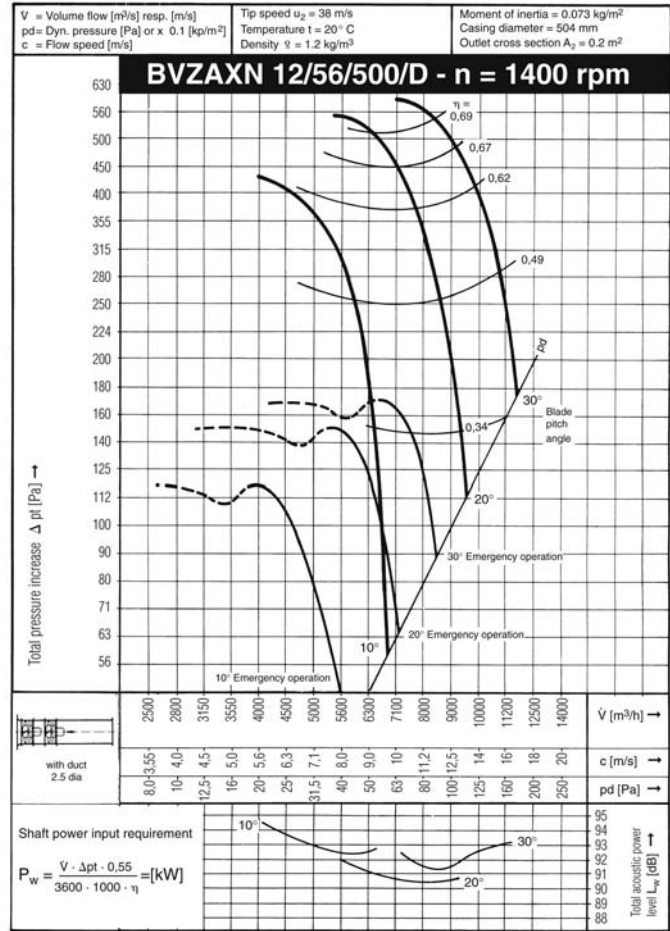
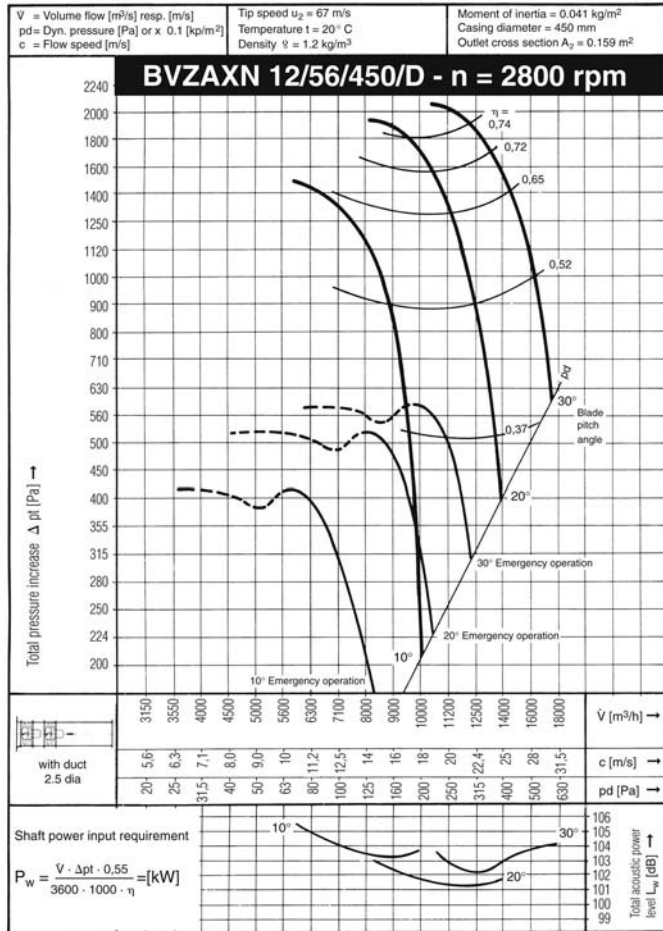
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TWO-STAGE AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES BVZAXN 12/56 SERIES

300°C – 120 MIN

120



• Also available for 200 or 400°C - 120 min.



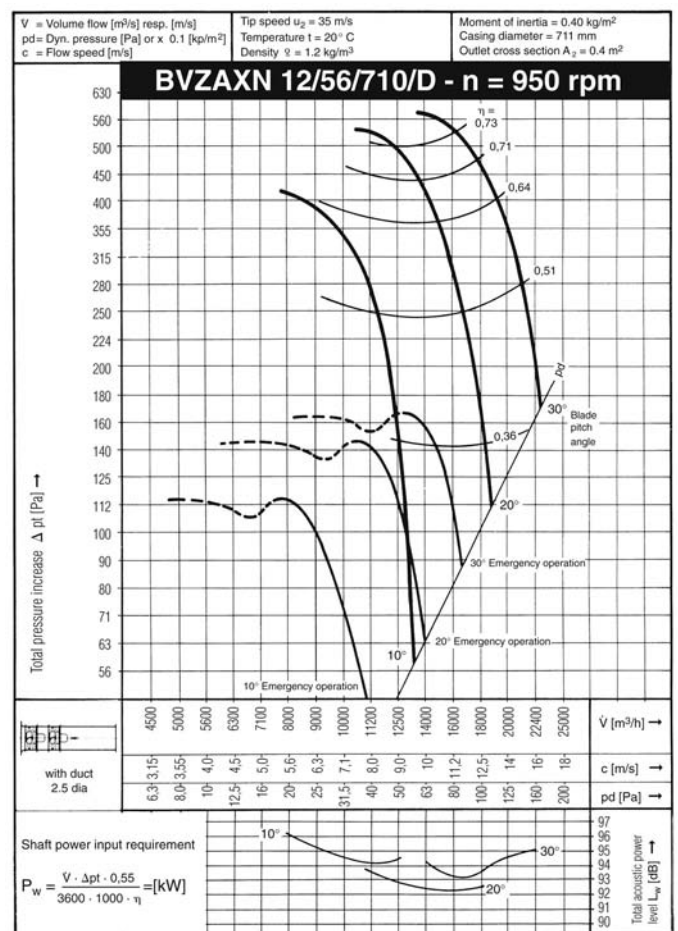
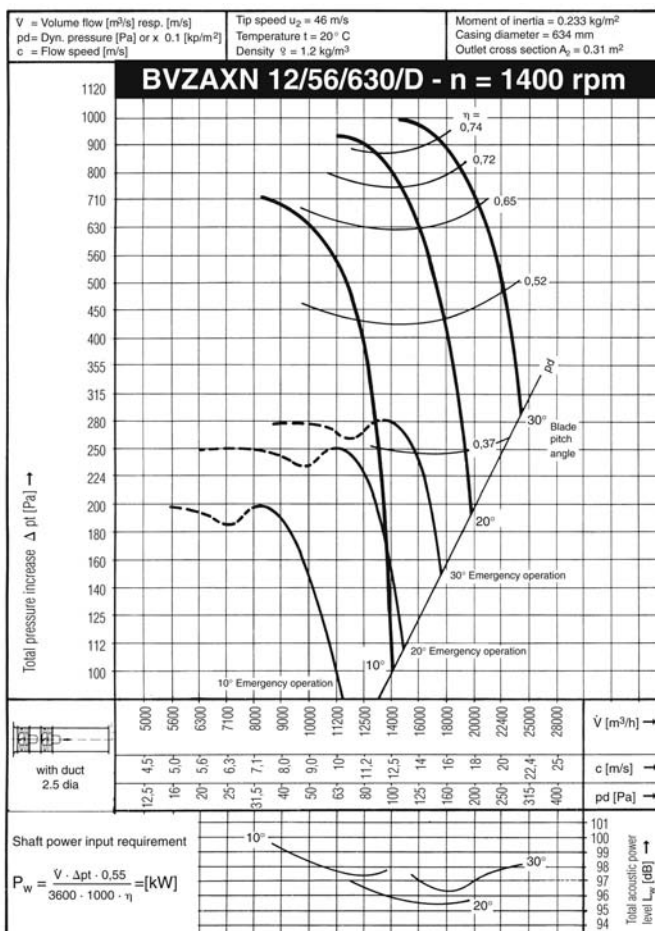
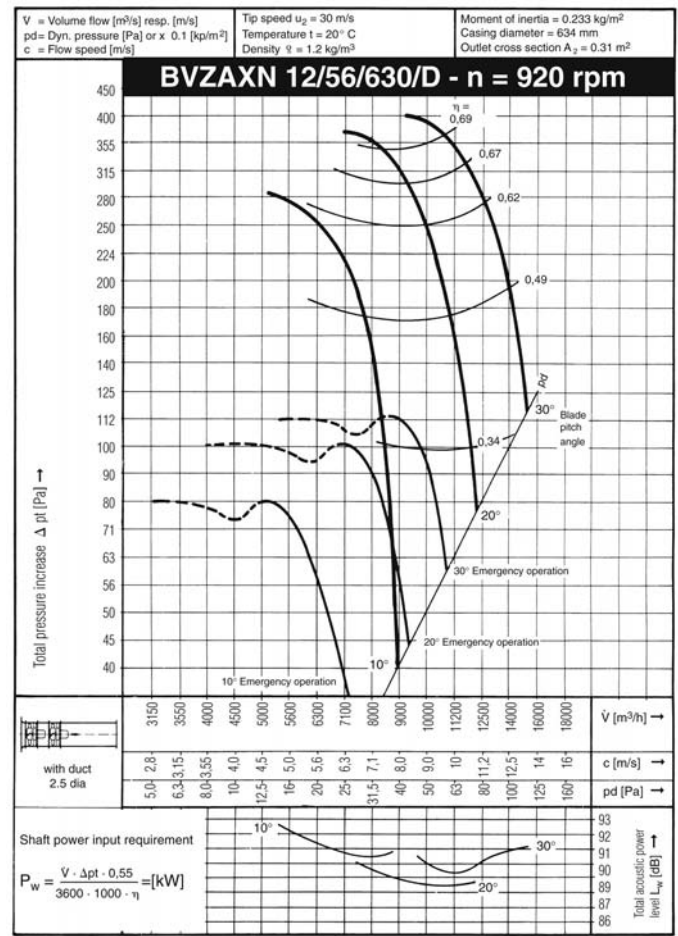
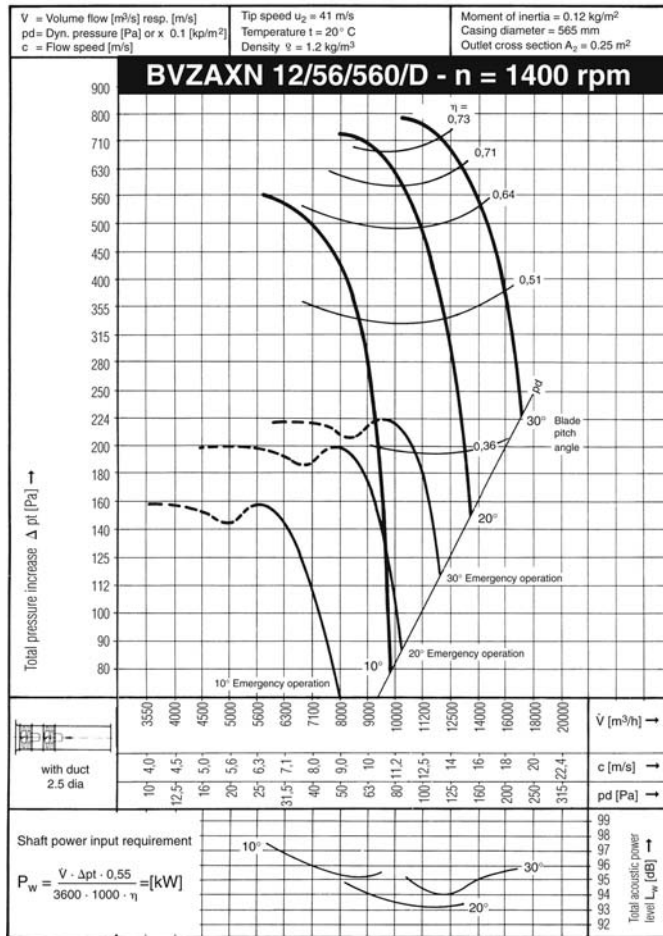
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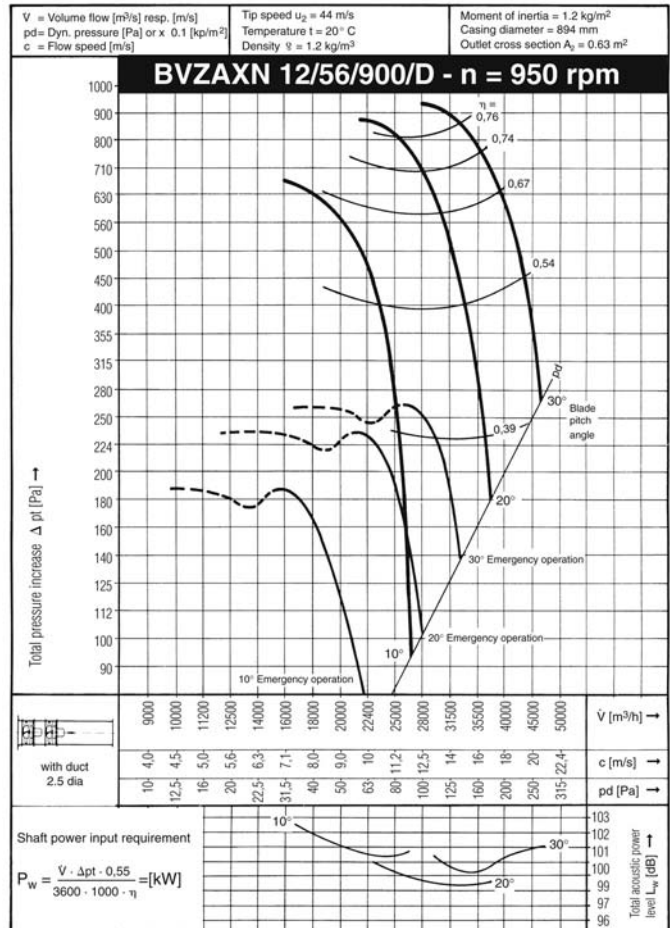
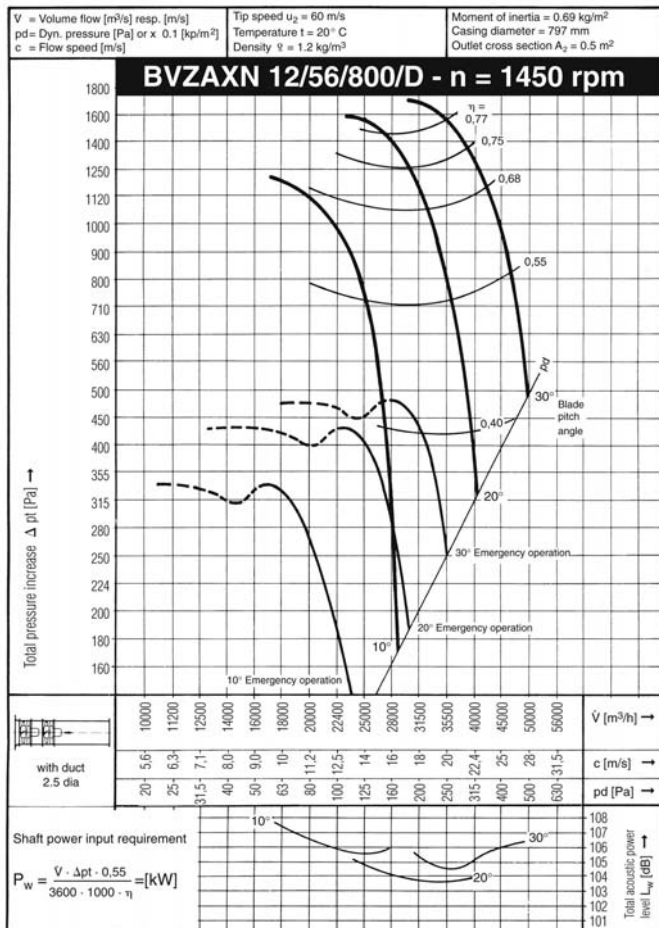
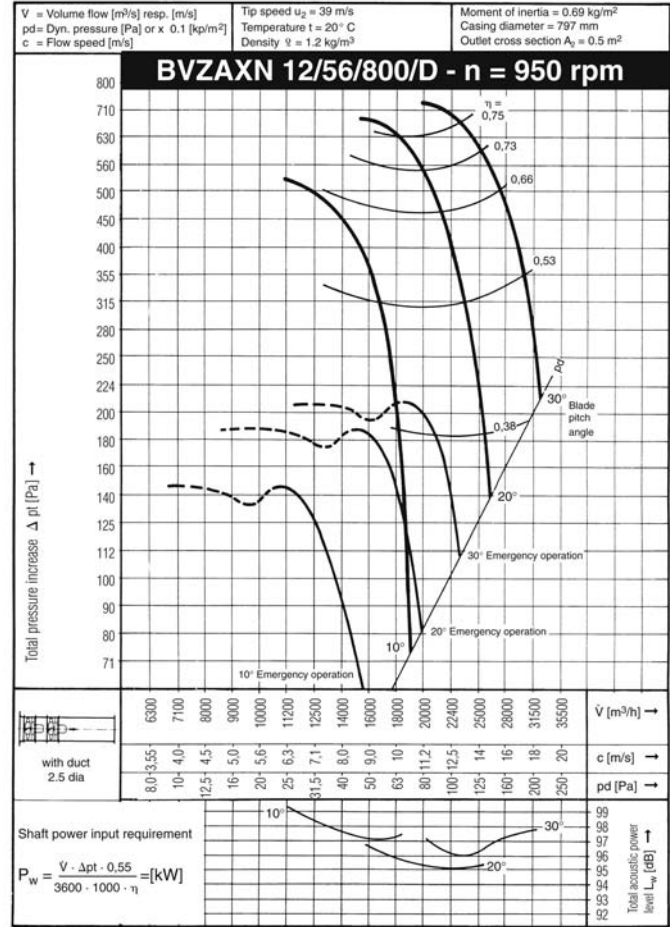
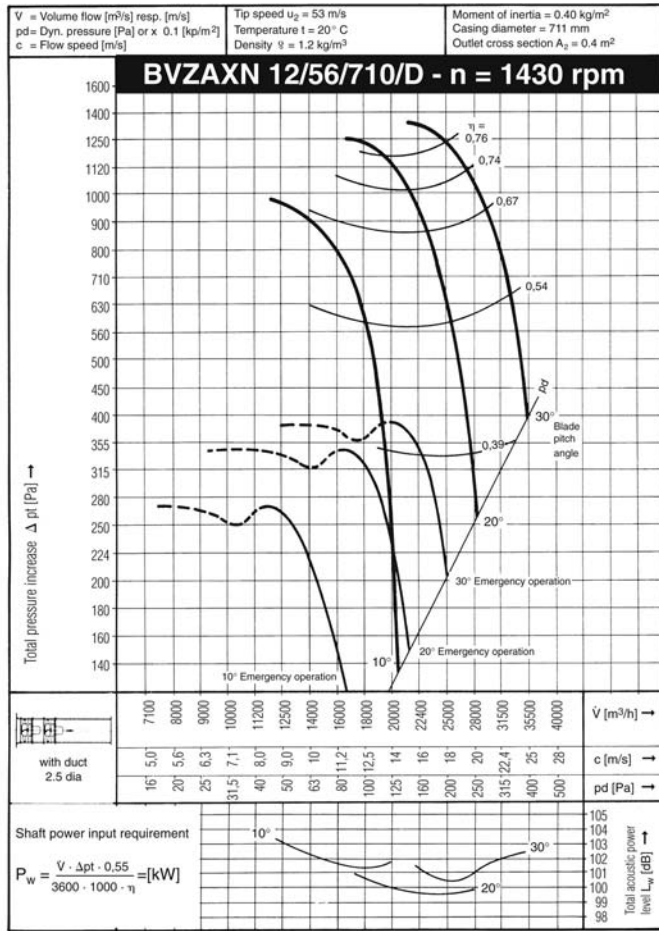
300°C – 120 MIN

121



BVZAXN 12/56

• Also available for 200 or 400°C - 120 min.

**TLT-Turbo GmbH**Am Weinberg 68 · D-36251 Bad Hersfeld/Germany
Phone: +49.6621.950-0 · Fax: +49.6621.950-100**TWO-STAGE AXIAL SMOKE EXHAUST FANS
WITH DIRECT DRIVE AND OUTLET GUIDE VANES
BVZAXN 12/56 SERIES****300°C – 120 MIN****122**

Also available for 200 or 400°C - 120 min.



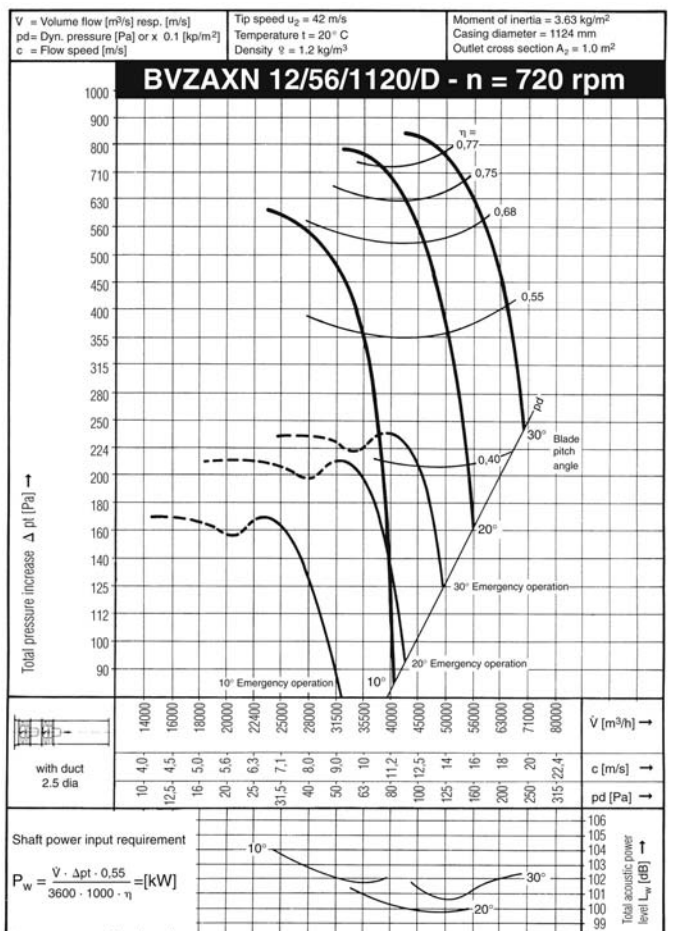
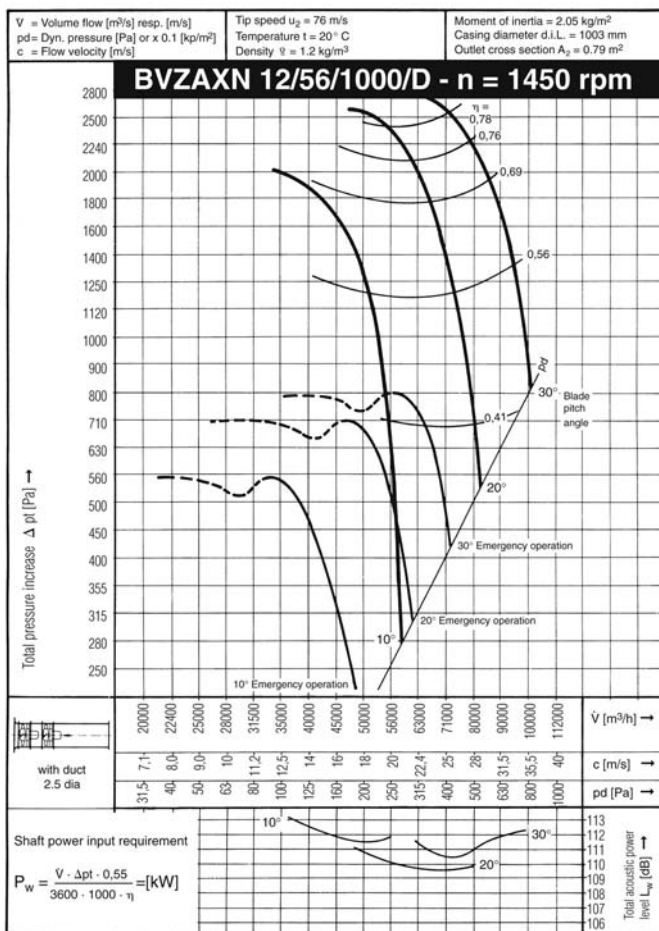
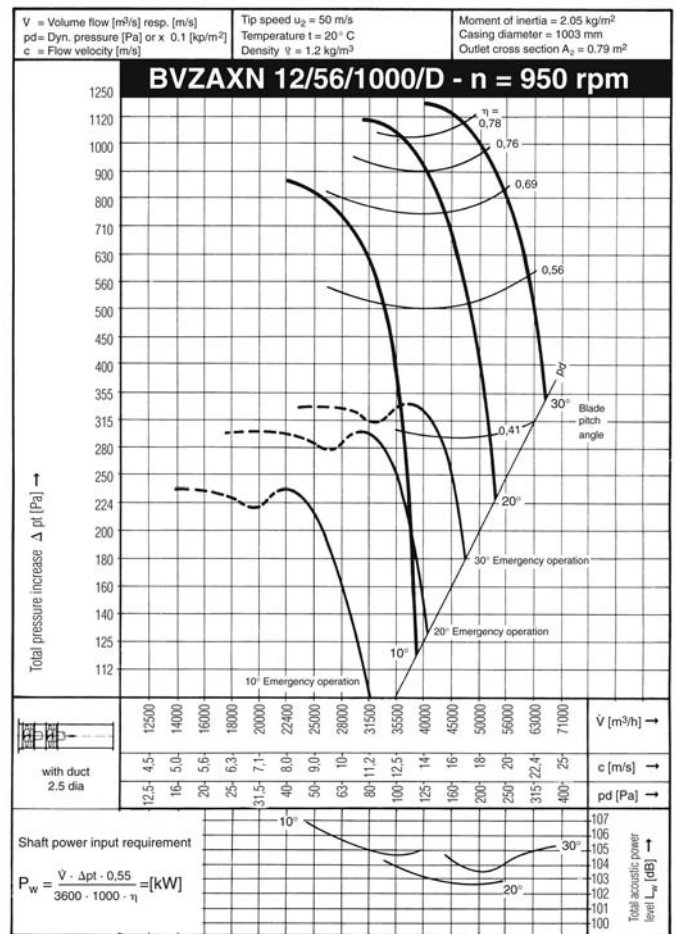
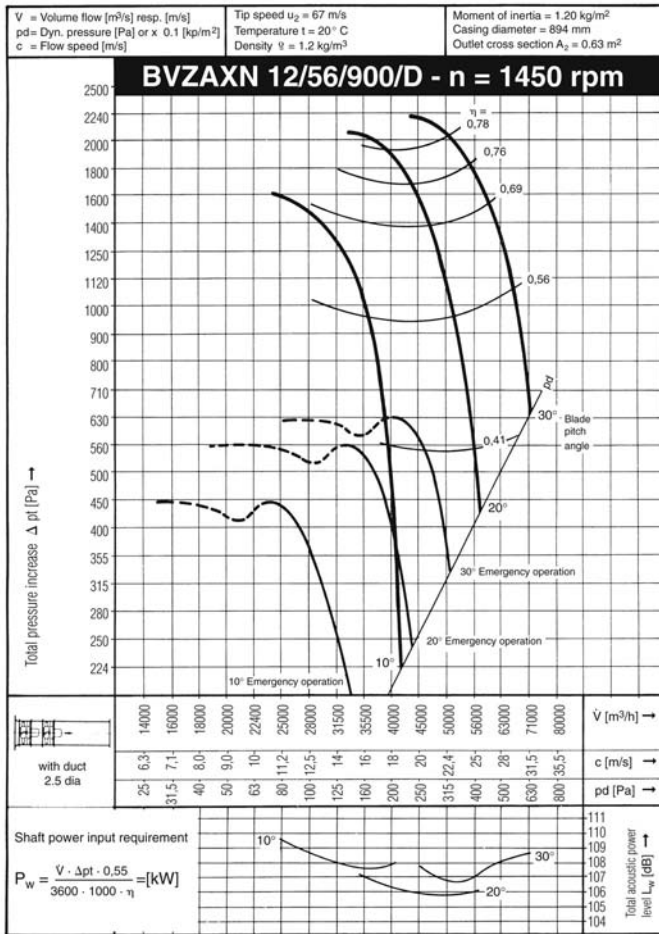
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TWO-STAGE AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES BVZAXN 12/56 SERIES

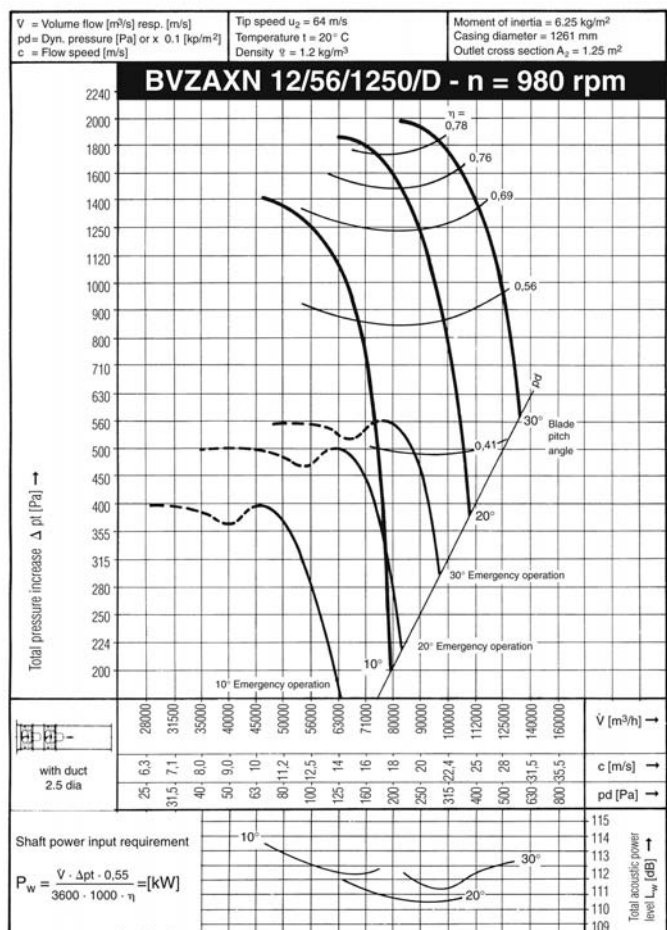
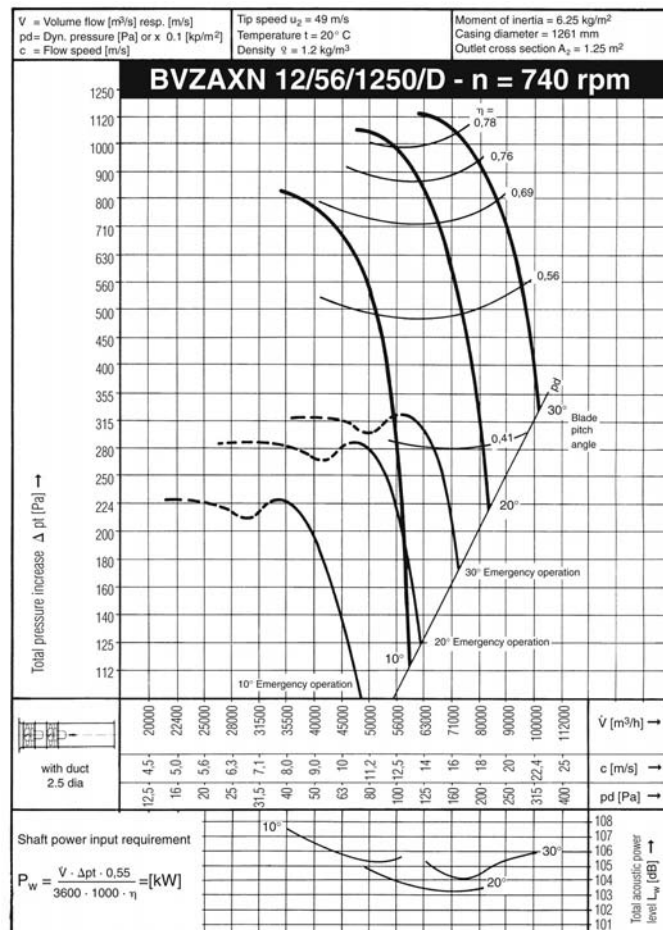
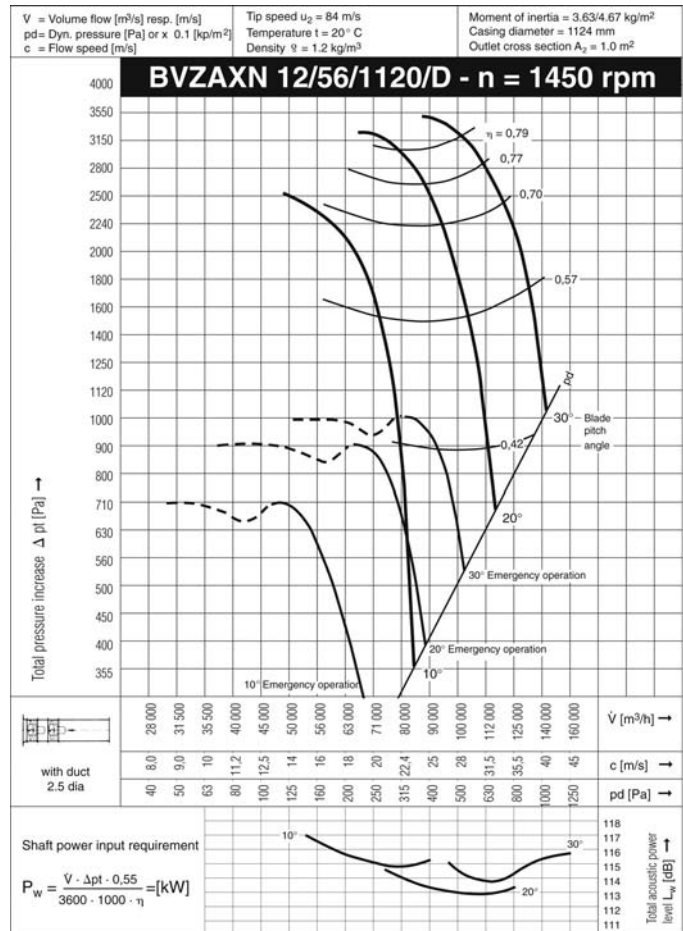
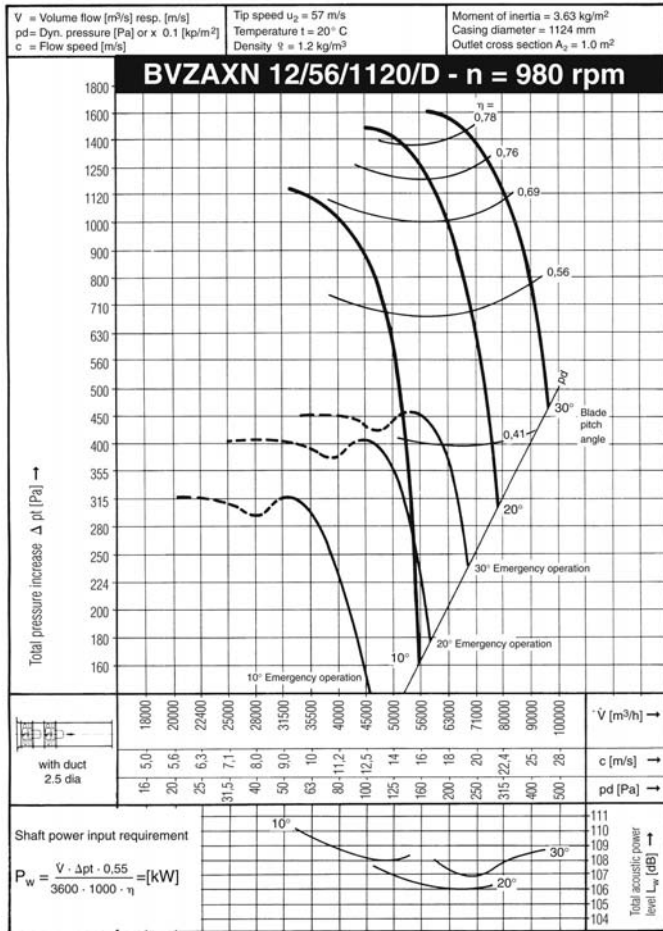
300°C – 120 MIN

123



BVZAXN 12/56

• Also available for 200 or 400°C - 120 min.

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WITH DIRECT DRIVE AND OUTLET GUIDE VANES
BVZAXN 12/56 SERIES****300°C – 120 MIN****124**

• Also available for 200 or 400°C - 120 min.



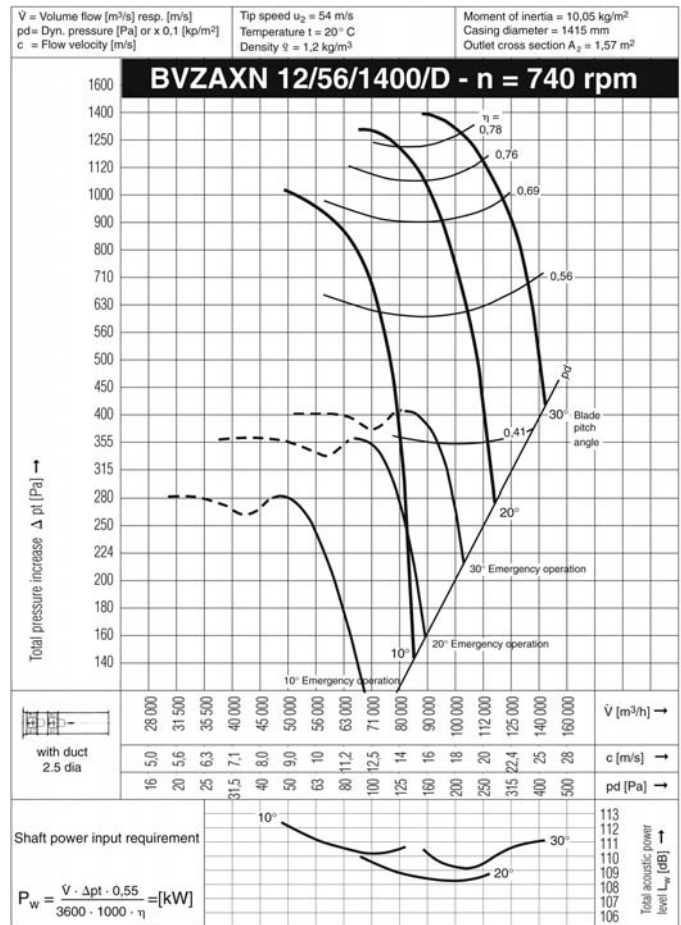
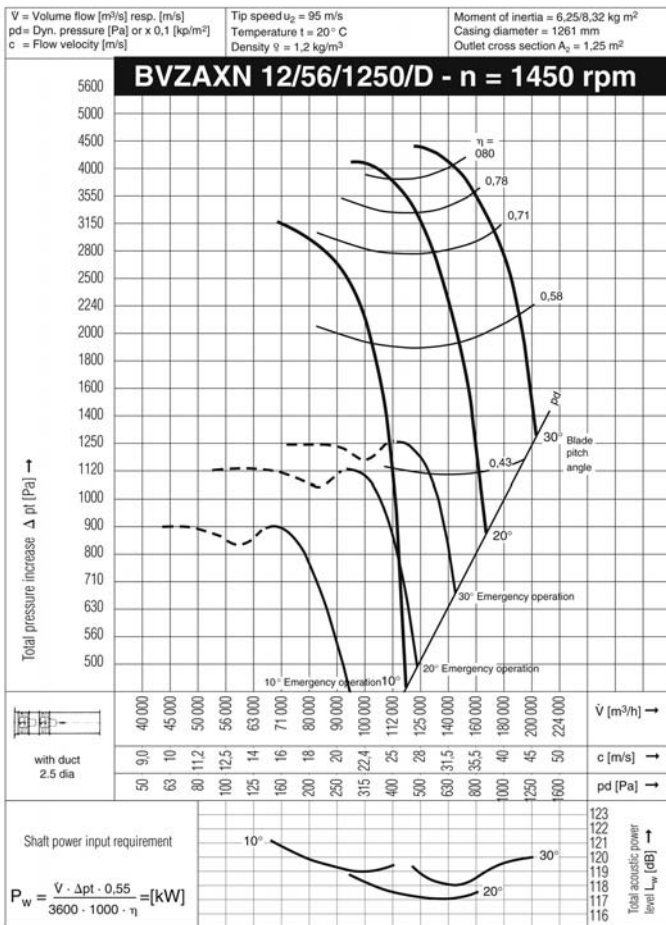
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TWO-STAGE AXIAL SMOKE EXHAUST FANS WITH DIRECT DRIVE AND OUTLET GUIDE VANES BVZAXN 12/56 SERIES

300°C – 120 MIN

125



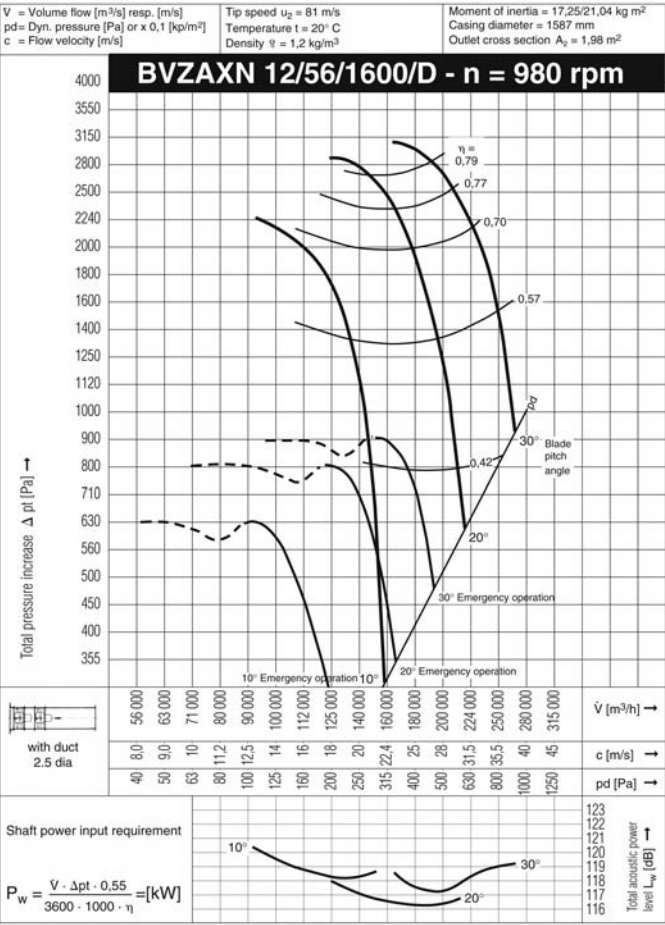


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**TWO-STAGE AXIAL SMOKE EXHAUST FANS
WITH DIRECT DRIVE AND OUTLET GUIDE VANES
BVZAXN 12/56 SERIES
300°C – 120 MIN**

126



Item No.	Qty.	Description	Unit price €	Total €
		Accessory equipment: ● Galvanised fan ● Fan with special coating ● Extension casing without inspection hatch ● Inspection hatch ● Bellmouth inlet with flange ● Wire guard on bellmouth side ● Wire guard on extension casing (motor side) ● Flexible connector, inlet side* ● Flexible connector, outlet side* ● Matching flange inlet side* ● Matching flange outlet side* ● Angular wall ring with brackets* ● Set of mounting feet (2 pcs.)* ● Set of spring-type antivibration mounts* ● Brackets for vertical fan installation ● Diffuser with interior core* ● Flexible connector (diffuser outlet)* ● Wire guard (diffuser outlet)* ● Round silencer, TSR type* ● Outlet cone with wire guard ● Duct with self-activating damper Note: Please see our Installation, Operating and Maintenance Instructions that are available on request * Loosely supplied		
		Carryover		



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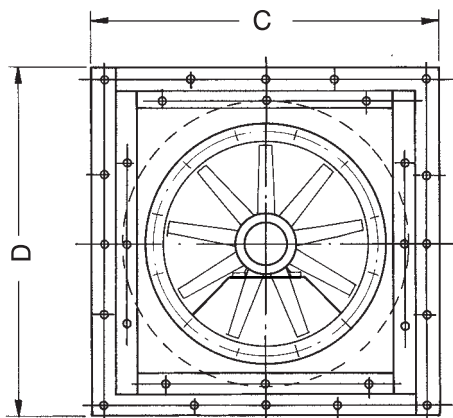
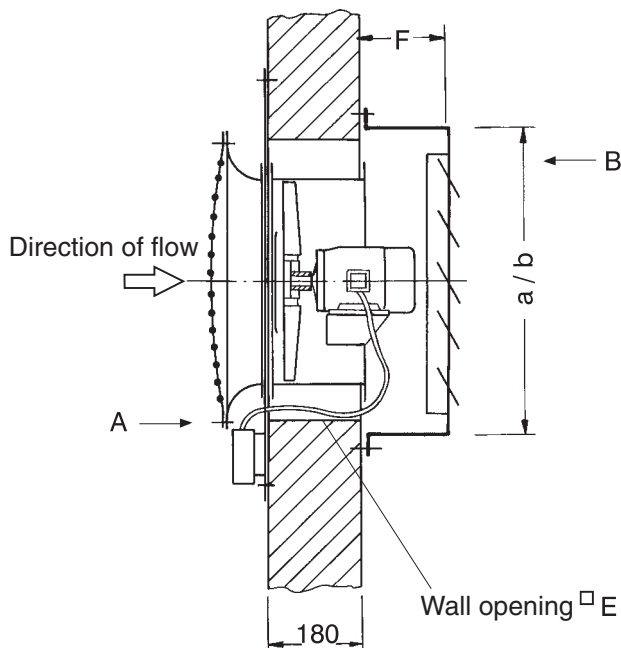
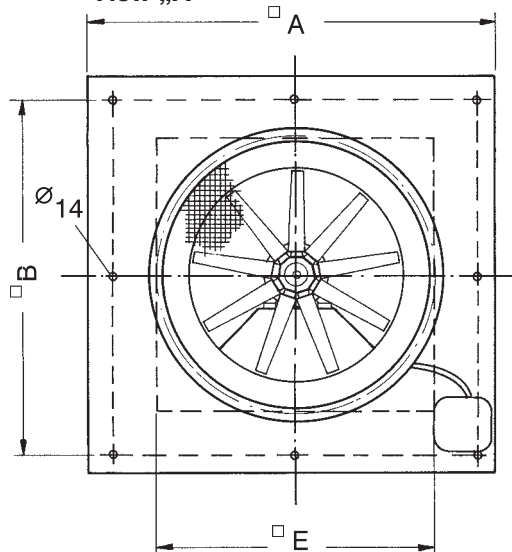
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WALL-MOUNTING AXIAL SMOKE EXHAUST FANS BWAXO SERIES

200/300°C - 120 MIN.

130

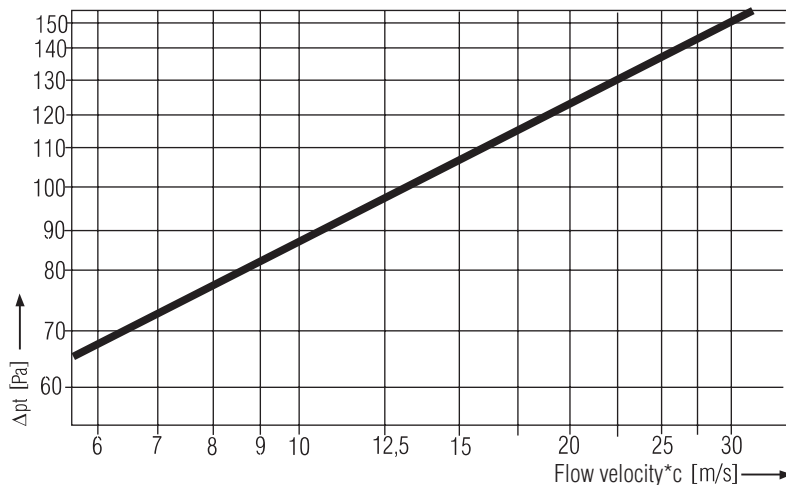
View „A“



View "B"
(shown without louvre-type damper)

Please refer to the characteristic curves on pages 053-055.

Pressure loss across shutoff damper (overpressure louvre)



Pressure losses of fan and shutoff damper sum up to the total pressure increase needed for the sizing of complete fan units (assuming free inlet / free outlet conditions).

*For flow velocities please refer to the characteristic curves.

Size	□ A	□ B	C	D	□ E	F	a	b				Weight approx. [kg] (without motor)
400	800	720	677	695	550	330	602	583				25
500	900	820	777	795	650	430	702	683				40
630	1050	3 x 325 975	977	995	900	450	902	883				65
800	1400	4 x 330 1320	1177	1195	1000	450	1102	1083				90

Dimensions in mm

For planning and installation please also refer to our Installation, Operating and Maintenance Instructions (MBW).



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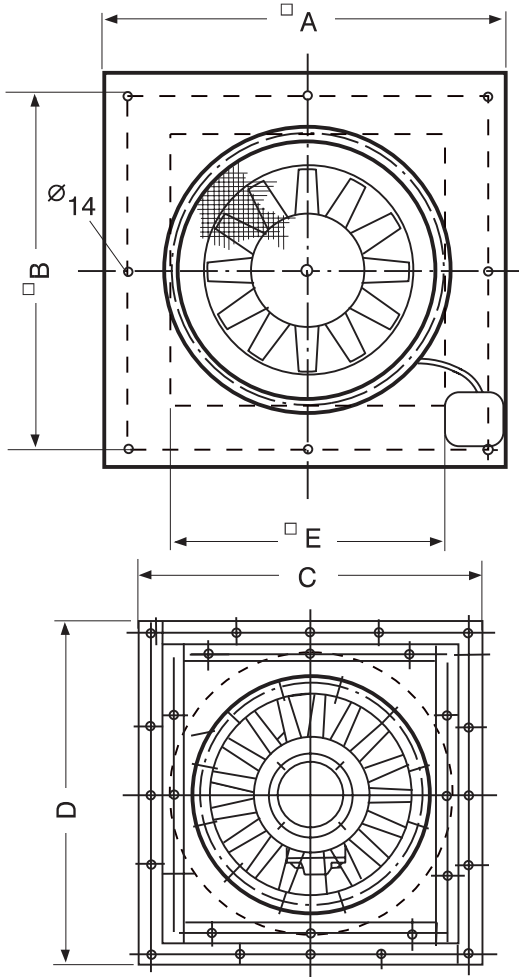
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WALL-MOUNTING AXIAL SMOKE EXHAUST FANS BWAXN 12/56 SERIES

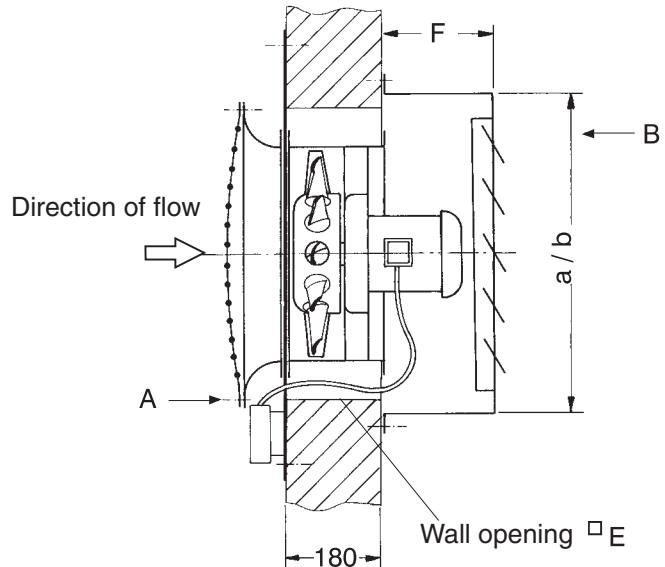
200/300/400°C - 120 MIN.

133

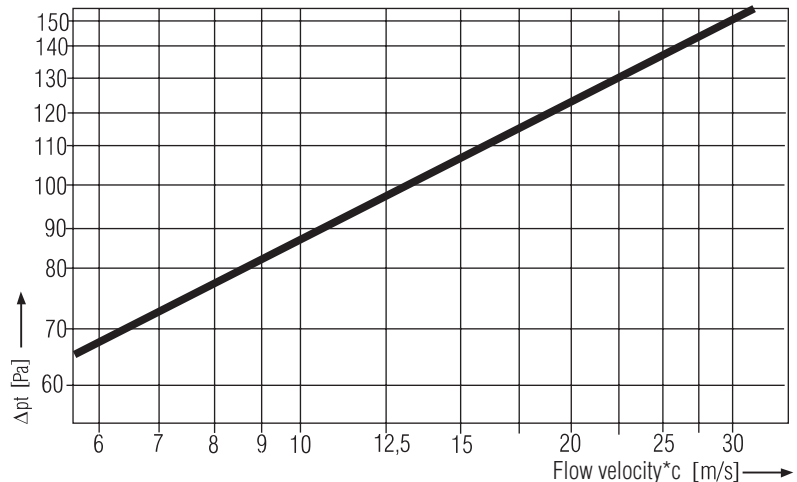
View „A“



View "B"
(shown without louvre-type damper)



Pressure loss across shutoff damper (overpressure louvre)



Pressure losses of fan and shutoff damper sum up to the total pressure increase needed for the sizing of complete fan units (assuming free inlet / free outlet conditions).

*For flow velocities please refer to the characteristic curves „free outlet“ installation (red curves and numbers)

Please refer to the characteristic curves on pages 078-082.

Size	A	B	C	D	E	F	a	b				Weight approx. [kg] (without motor)
400	800	720	677	695	550	330	602	583				35
500	900	820	777	795	650	430	702	683				50
630	1050	3 x 325 975	977	995	900	450	902	883				75
800	1400	4 x 330 1320	1177	1195	1000	650	1102	1083				115

Dimensions in mm

For planning and installation please also refer to our Installation, Operating and Maintenance Instructions (MBW).

BWAXO

Lfd. Nr.	Qty.	Description	Unit price €	Total €																																
	or or	Wall-mounting Axial Smoke Exhaust Fan BWAXN 12/56 Type M-D for the extraction of smoke fumes of max. 300°C / 120 min. tested to EN 12101, Part 3 (Technical University of Munich) with general building supervision approval Z-78.1-20 Airflow direction: outlet over motor, direct drive. For wall installation inside or outside the fire zone. Consisting of: Duct casing of welded sheet steel construction, with drilled flanges according to DIN 24154 - Series 3; guide vanes for pressure boosting and to ensure an essentially swirl-free outlet flow; special motor arranged in the exhaust gas flow, with temperature-resistant terminal box fitted on the casing. Surface protection: • Polyester powder coating, colour: RAL 7030 Louvre damper slats: made of aluminium Louvre damper frame and wire guard: galvanized. • Impeller made of cast aluminium, blades steplessly adjustable on the stationary fan, directly mounted on motor shaft • Bellmouth with wire guard • Wall-mounting plate (inside) • Outlet box (outside) • Louvre damper (outside) Specifications: <table><tr><td>Volume flow</td><td>m³/h</td></tr><tr><td>Temperature (design)</td><td>°C</td></tr><tr><td>Dynamic pressure</td><td>Pa</td></tr><tr><td>Total pressure increase</td><td>Pa</td></tr><tr><td>Fan speed</td><td>rpm</td></tr><tr><td>Blade pitch angle</td><td>°</td></tr><tr><td>Total sound power level L_w</td><td>dB</td></tr><tr><td>Efficiency</td><td>%</td></tr><tr><td>Power requirement</td><td>kW</td></tr></table> Three-phase motor single-speed with Dahlander pole-changing type pole-changing type with separate windings <table><tr><td>Motor speed</td><td>rpm</td></tr><tr><td>Motor output</td><td>kW</td></tr><tr><td>Nominal motor current</td><td>A</td></tr><tr><td>Voltage</td><td>V</td></tr><tr><td>Frequency</td><td>Hz</td></tr><tr><td>Protection class IP</td><td></td></tr><tr><td>Style</td><td>B</td></tr><tr><td>Size</td><td></td></tr></table> Weight of fan with accessories	Volume flow	m³/h	Temperature (design)	°C	Dynamic pressure	Pa	Total pressure increase	Pa	Fan speed	rpm	Blade pitch angle	°	Total sound power level L _w	dB	Efficiency	%	Power requirement	kW	Motor speed	rpm	Motor output	kW	Nominal motor current	A	Voltage	V	Frequency	Hz	Protection class IP		Style	B	Size	
Volume flow	m³/h																																			
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Fan speed	rpm																																			
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Voltage	V																																			
Frequency	Hz																																			
Protection class IP																																				
Style	B																																			
Size																																				

Item No.	Qty.	Description	Unit price €	Total €																																
	or or	Wall-mounting Axial Smoke Exhaust Fan BWAXN 12/56 Type M-D for the extraction of smoke fumes of max. 400°C / 120 min. tested to EN 12101, Part 3 (Technical University of Munich) with general building supervision approval Z-78.1-21 Airflow direction: outlet over motor, direct drive. For wall installation inside or outside the fire zone. Consisting of: Duct casing of welded sheet steel construction, with drilled flanges according to DIN 24154 - Series 3; guide vanes for pressure boosting and to ensure an essentially swirl-free outlet flow; special motor arranged in the exhaust gas flow, with temperature-resistant terminal box fitted on the casing. Surface protection: • Polyester powder coating, colour: RAL 7030 Louvre damper slats: made of aluminium Louvre damper frame and wire guard: galvanized. • Impeller made of cast aluminium, non-adjustable blades, directly mounted on motor shaft • Bellmouth with wire guard • Wall-mounting plate (inside) • Outlet box (outside) • Louvre damper (outside) Specifications: <table><tr><td>Volume flow</td><td>m³/h</td></tr><tr><td>Temperature (design)</td><td>°C</td></tr><tr><td>Dynamic pressure</td><td>Pa</td></tr><tr><td>Total pressure increase</td><td>Pa</td></tr><tr><td>Fan speed</td><td>rpm</td></tr><tr><td>Blade pitch angle</td><td>°</td></tr><tr><td>Total sound power level L_w</td><td>dB</td></tr><tr><td>Efficiency</td><td>%</td></tr><tr><td>Power requirement</td><td>kW</td></tr></table> Three-phase motor single-speed with Dahlander pole-changing type pole-changing type with separate windings <table><tr><td>Motor speed</td><td>rpm</td></tr><tr><td>Motor output</td><td>kW</td></tr><tr><td>Nominal motor current</td><td>A</td></tr><tr><td>Voltage</td><td>V</td></tr><tr><td>Frequency</td><td>Hz</td></tr><tr><td>Protection class IP</td><td></td></tr><tr><td>Style</td><td>B</td></tr><tr><td>Size</td><td></td></tr></table> Weight of fan with accessories	Volume flow	m ³ /h	Temperature (design)	°C	Dynamic pressure	Pa	Total pressure increase	Pa	Fan speed	rpm	Blade pitch angle	°	Total sound power level L _w	dB	Efficiency	%	Power requirement	kW	Motor speed	rpm	Motor output	kW	Nominal motor current	A	Voltage	V	Frequency	Hz	Protection class IP		Style	B	Size	
Volume flow	m ³ /h																																			
Temperature (design)	°C																																			
Dynamic pressure	Pa																																			
Total pressure increase	Pa																																			
Fan speed	rpm																																			
Blade pitch angle	°																																			
Total sound power level L _w	dB																																			
Efficiency	%																																			
Power requirement	kW																																			
Motor speed	rpm																																			
Motor output	kW																																			
Nominal motor current	A																																			
Voltage	V																																			
Frequency	Hz																																			
Protection class IP																																				
Style	B																																			
Size																																				

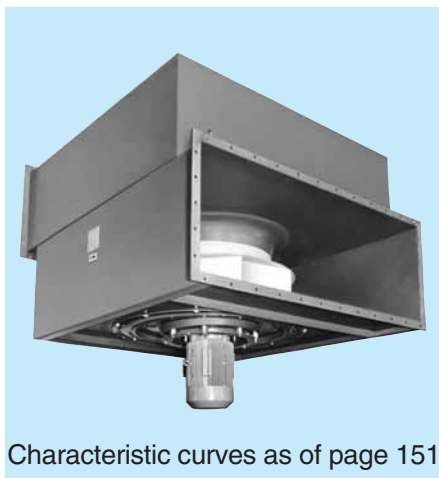


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CENTRIFUGAL SMOKE EXHAUST FANS PRODUCT RANGE ① TECHNICAL DESCRIPTION

137



Characteristic curves as of page 151

BVW-A series

Temperature/Time category acc. to
EN 12101 part 3:

F 600 600°C - 120 min.

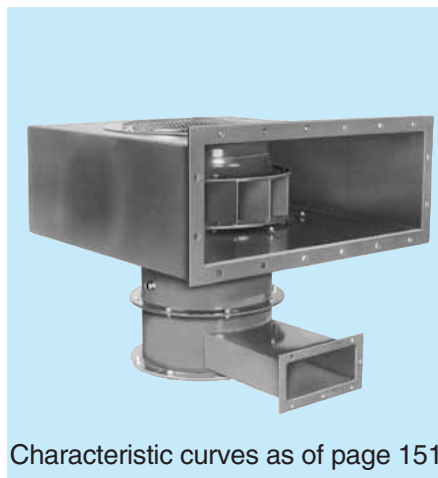
Appropriate for installation outside
of fire-zone. Motor cooled with
ambient air.

Product range:

6 sizes
more than 35 types
Volume flow up to 48 000 m³/h
total pressure increase
up to appr. 2 000 Pa

Technical description BVW-series

Direct-drive type, consisting of steel
sheet housing, protected by an poly-
ester powder coating, colour RAL
7030, with bellmouth, motor support
plate, companion flange as per DIN
24154, Series R3 companion frame
as per DIN 24193, Series R2, smoke
inlet box (without motor enclosure).
Centrifugal impeller, single inlet type
aerodynamically optimized, dynami-
cally balanced to DIN ISO 1940, qua-
lity grade G 6,3 welded sheet steel
with polyester powder coating,
colour: RAL 7030
Three-phase a.c. motor as per IEC
standard, style V 3 / B 5; Protection
class IP 55, ISO class H



Characteristic curves as of page 151

BVW-R series

Temperature/Time category acc. to
EN 12101 part 3:

F 600 600°C - 120 min.

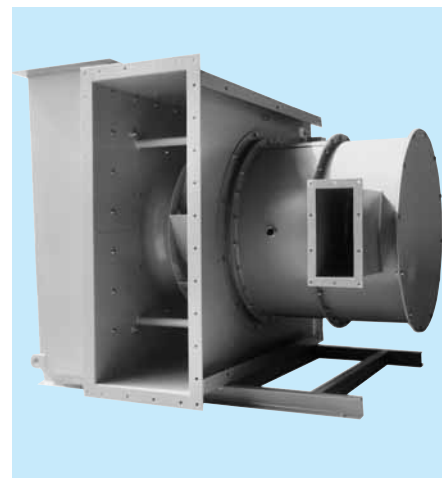
Appropriate for installation inside of
fire-zone. Motor requires outside
air cooling.

Product range:

6 sizes
more than 35 types
Volume flow up to 48 000 m³/h
total pressure increase
up to appr. 2 000 Pa

Technical description BVW-A series

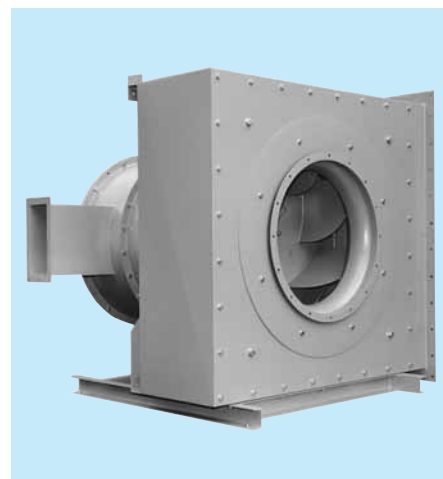
Direct-drive type, consisting of steel
sheet housing, protected by an poly-
ester powder coating, colour RAL
7030, with bellmouth, motor support
plate, companion flange as per DIN
24154, Series R3 companion frame
as per DIN 24193, Series R2.
Centrifugal impeller, single inlet type,
aerodynamically optimized, dynami-
cally balanced to DIN ISO 1940, qua-
lity grade G 6,3 welded sheet steel
with polyester powder coating,
colour: RAL 7030.
Three-phase a.c. motor as per IEC
standard, style V 3/B 5; Protection
class IP 55, ISO class H
Motor enclosure:
Round sheet steel housing, cooling
air supplied via cooling air inlet duct;
max. length of outside air supply li-
ne: 1,0 m.



BVW-R/B series with inlet duct



BVW-A/B series with duct
connector



BVW-R/B series with free inlet



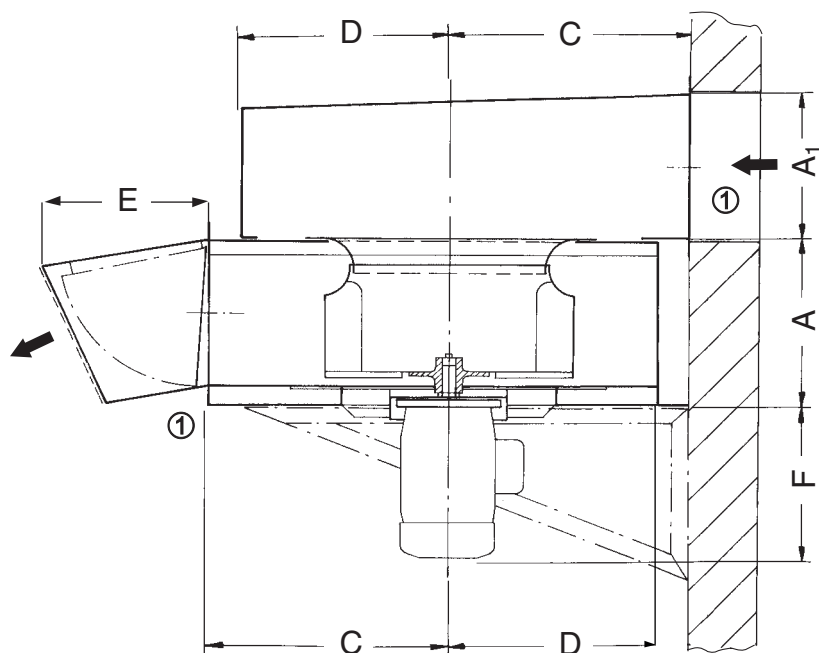
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WALL MOUNTING CENTRIFUGAL SMOKE EXHAUST FAN BVW-A SERIES

600°C – 120 MIN

138



① For dimensions please refer to page 148.

Size	A	A ₁	B	C	D	E	F	N				Max. weight ~kg
315	295	252	632	415	316	300	315	588				112
355	295	252	712	455	356	300	260	668				136
400	325	282	802	500	401	330	315	742				170
500	401	357	1002	600	501	400	410	932				270
630	516	452	1252	725	626	500	395 ■ 600 ●	1182				460
710	566	502	1402	800	701	560	395 ■ 600 ●	1332				570

■ up to motor size 132
● motor sizes 160 and up

Dimensions in mm

For planning and installation please also refer to our Installation, Operating and Maintenance Instructions (MBW).



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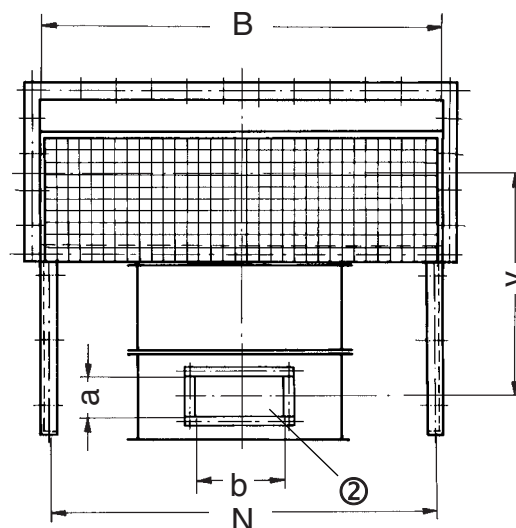
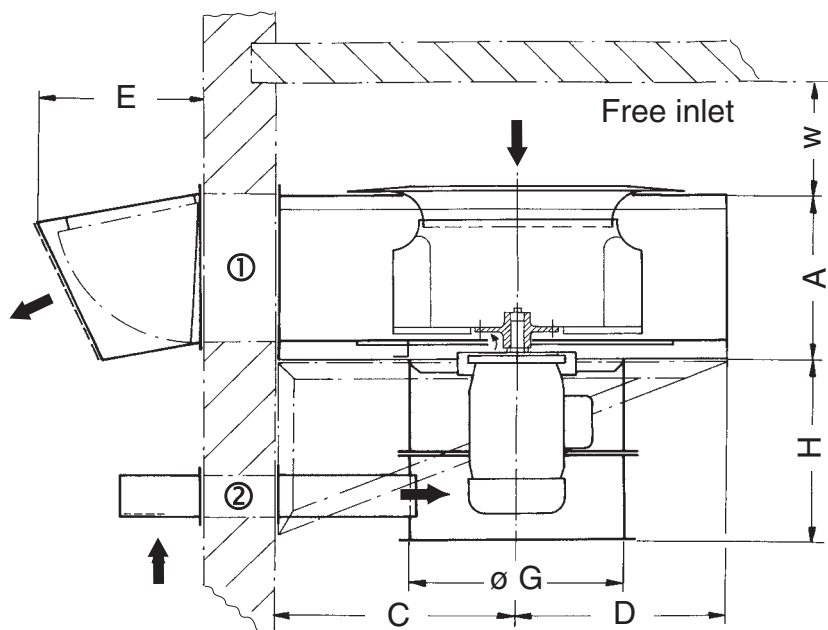
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WALL MOUNTING CENTRIFUGAL SMOKE EXHAUST FAN BVW-R SERIES

600°C – 120 MIN

also available for
200°C – 120 min.
300°C – 60 min.
400°C – 120 min.
without motor enclosure
and cooling air duct.

139



① + ② For dimensions please refer to page 148.

Size	A	B	C	D	E	øG	H	v	w	N	Max. weight ~kg
315	295	632	415	316	300	400	375	440	225	588	92
355	295	712	455	356	300	400	375	440	250	668	125
400	325	802	500	401	330	400	375	440	300	742	165
500	401	1002	600	501	400	500	450	540	375	932	230
630	516	1252	725	626	500	500 ■ 800 ●	425 ■ 680 ●	610 ■ 760 ●	475	1182	385
710	566	1402	800	701	560	500 ■ 800 ●	425 ■ 680 ●	610 ■ 760 ●	525	1332	475

■ up to motor size 132
● motor sizes 160 and up

Dimensions in mm

For planning and installation please also refer to our Installation, Operating and Maintenance Instructions (MBW).

BVW



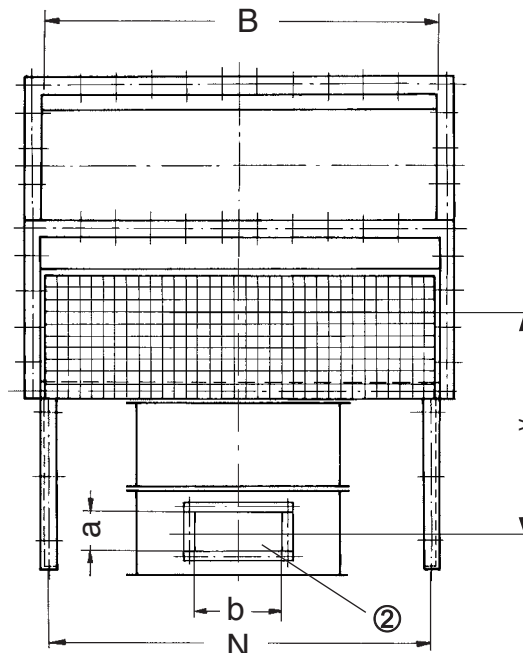
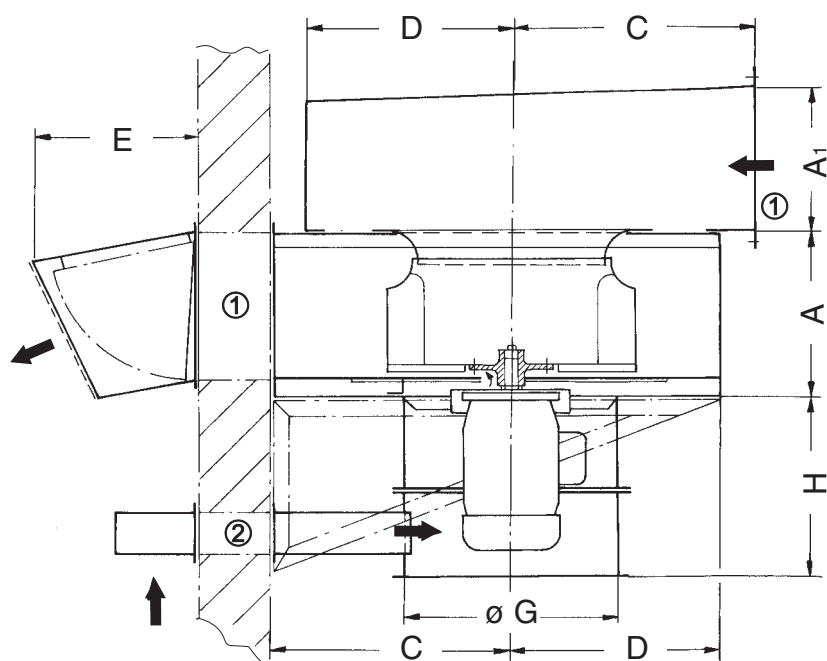
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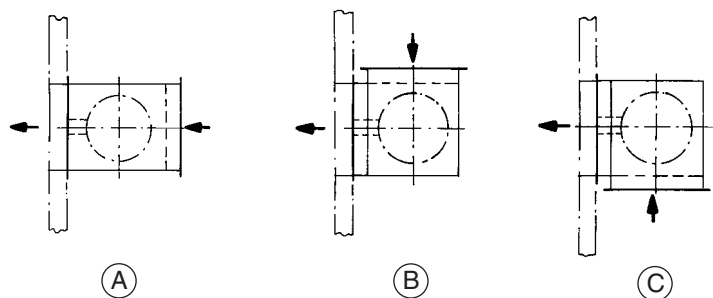
WALL MOUNTING CENTRIFUGAL SMOKE EXHAUST FAN BVW-R SERIES 600°C – 120 MIN

also available for
200°C – 120 min.
300°C – 60 min.
400°C – 120 min.
without motor enclosure
and cooling air duct.

140



Casing orientations*



*Viewed from above

① + ② For dimensions please refer to page 148.

Size	A	A ₁	B	C	D	E	Ø G	H	v	N	Max. weight ~kg
315	295	252	632	415	316	300	400	375	440	588	114
355	295	252	712	455	356	300	400	375	440	668	156
400	325	282	802	500	401	330	400	375	440	742	202
500	401	357	1002	600	501	400	500	450	540	932	282
630	516	452	1252	725	626	500	500 ■ 800 ●	425 ■ 680 ●	610 ■ 760 ●	1182	474
710	566	502	1402	800	701	560	500 ■ 800 ●	425 ■ 680 ●	610 ■ 760 ●	1332	605

■ up to motor size 132
● motor sizes 160 and up

Dimensions in mm

For planning and installation please also refer to our Installation, Operating and Maintenance Instructions (MBW).



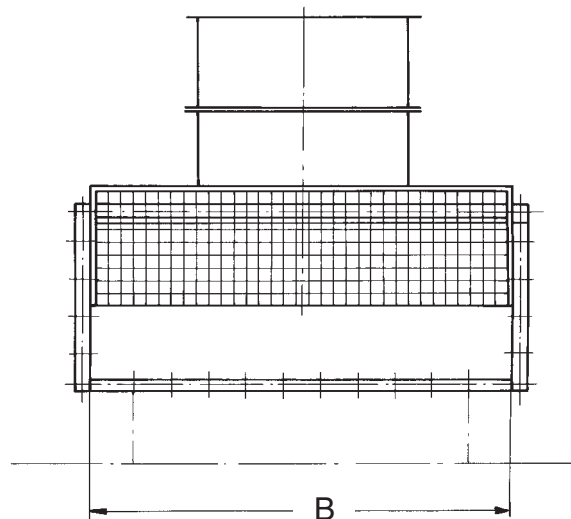
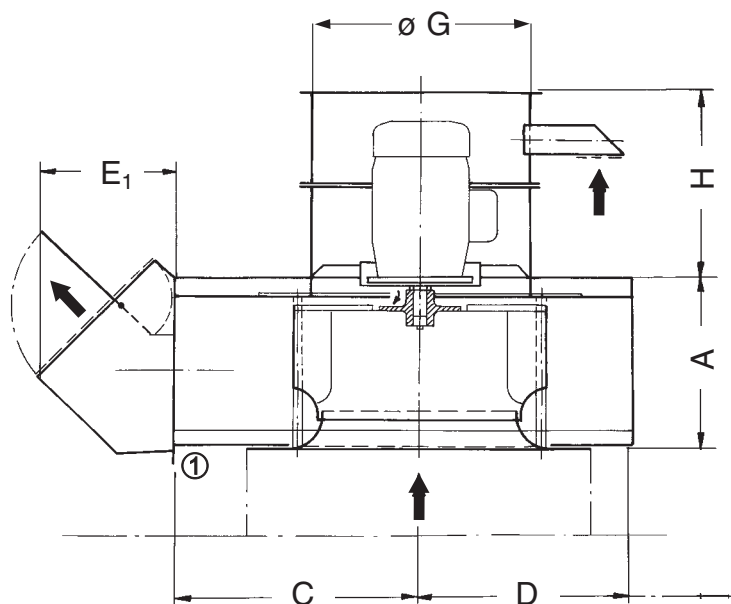
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ROOF MOUNTING CENTRIFUGAL SMOKE EXHAUST FAN BVW-D SERIES

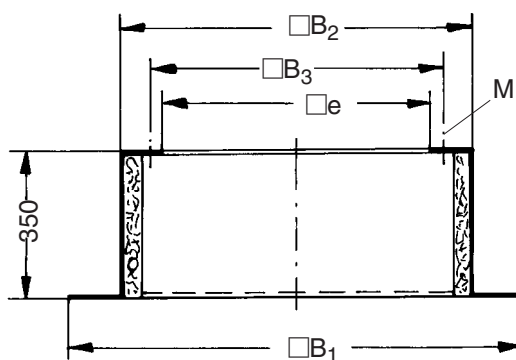
600°C – 120 MIN

141



① For dimensions please refer to page 148.

**Steel flat roof base with interior insulation
and double-shell design**



Size	A	B	C	D	E ₁	ØG	H	Max. weight ~kg	Steel flat roof base				Stud bolts M	Weight ~kg
									B ₁	B ₂	e	B ₃		
315	295	632	415	316	200	400	375	92	765	525	421	460	12x25	92
355	295	712	455	356	225	400	375	125	975	675	565	600	12x25	125
400	325	802	500	401	255	400	375	165	975	675	565	600	12x25	165
500	401	1002	600	501	320	500	450	230	1265	965	850	880	16x25	230
630	516	1252	725	626	400	500 ■	425 ■	385	1265	965	850	880	16x25	385
						800 ●	680 ●							
710	566	1402	800	701	450	500 ■	425 ■	475	1425	1125	1000	1040	16x25	475
						800 ●	680 ●							

■ up to motor size 132

● motor sizes 160 and up

Dimensions in mm

For planning and installation please also refer to our Installation, Operating and Maintenance Instructions (MBW).



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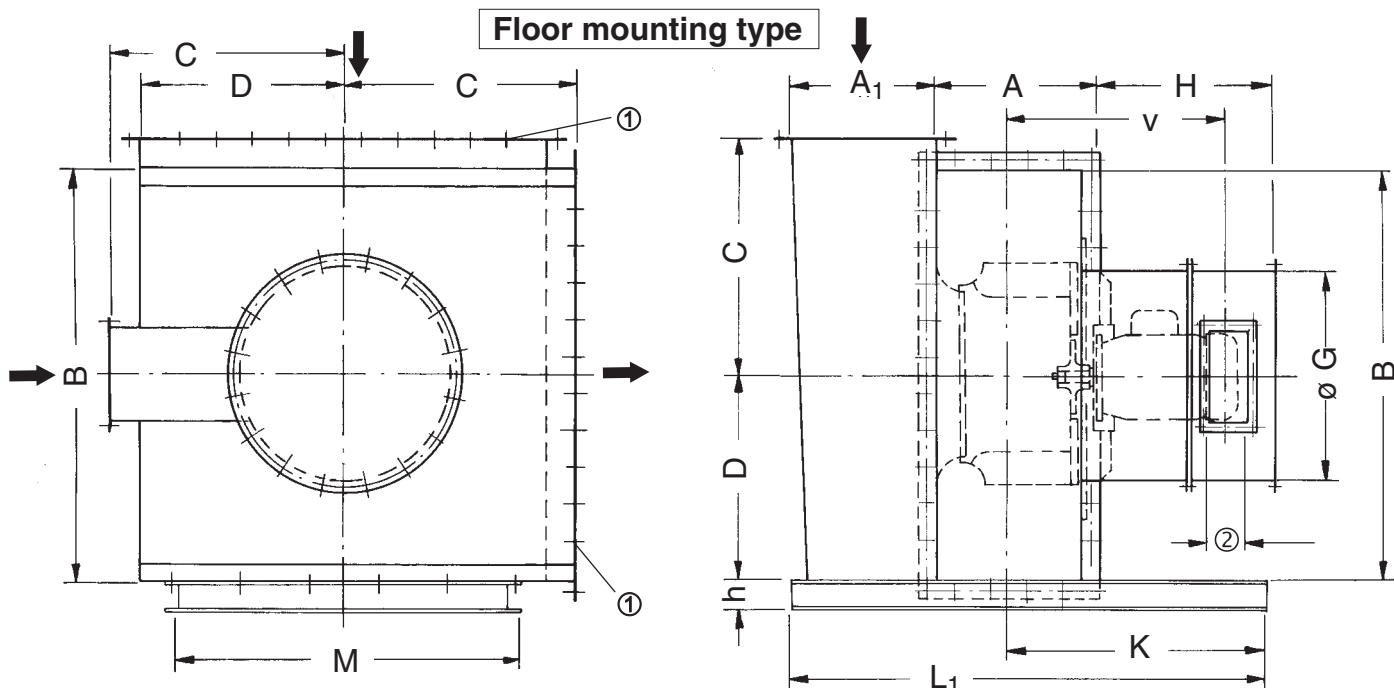
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CENTRIFUGAL SMOKE EXHAUST FAN BVW-R/B SERIES WITH INLET DUCT MAIN DIMENSIONS

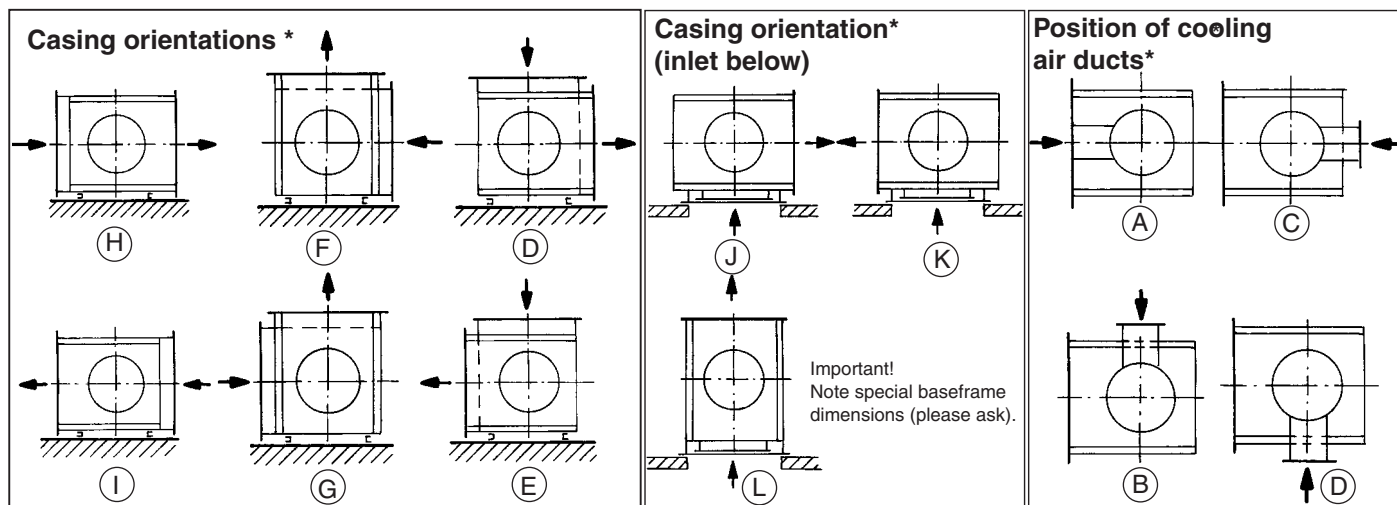
600°C – 120 MIN

also available for
200°C – 120 min.
300°C – 60 min.
400°C – 120 min.
without motor enclosure
and cooling air duct.

142



① + ② For dimensions please refer to page 148.



* View on motor enclosure.

Size	A	A ₁	B	C	D	øG	H	v	h	K	L ₁	M	Max. weight ~kg
315	295	252	632	415	316	400	375	440	65	500	850	580	130
355	295	252	712	455	356	400	375	440	65	500	850	580	135
400	325	282	802	500	401	400	375	440	65	550	950	650	170
500	401	357	1002	600	501	500	450	540	80	650	1150	850	265
630	516	452	1252	725	626	500 ■ 800 ●	425 ■ 680 ●	610 ■ 760 ●	80	850	1550	1050	525
710	566	502	1402	800	701	500 ■ 800 ●	425 ■ 680 ●	610 ■ 760 ●	100	900	1650	1250	660

■ up to motor size 132
● motor sizes 160 and up

Dimensions in mm

For planning and installation please also refer to our Installation, Operating and Maintenance Instructions (MBW).



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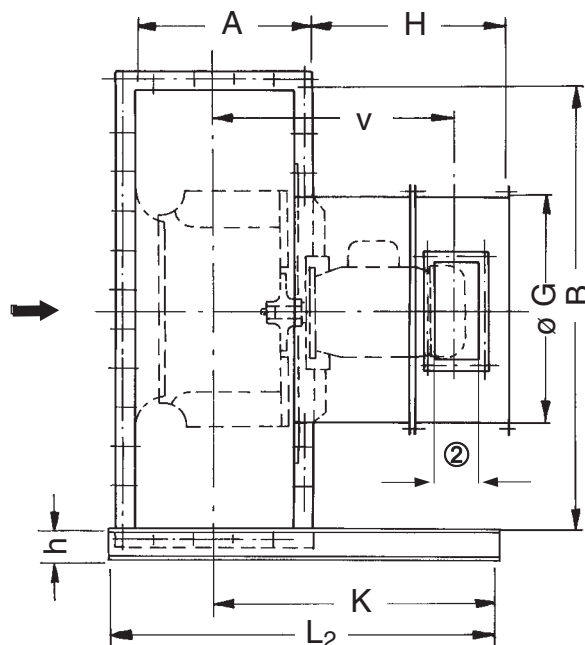
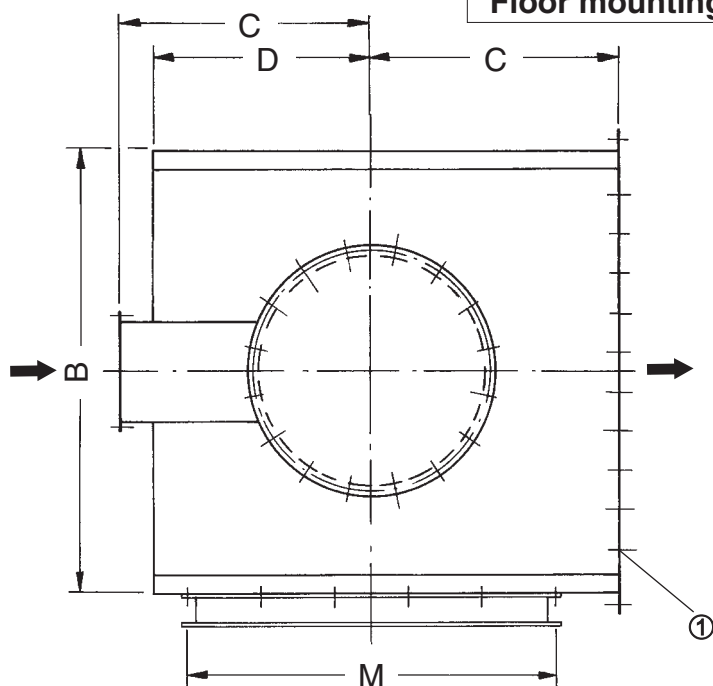
CENTRIFUGAL SMOKE EXHAUST FAN BVW-R/B SERIES, FREE INLET MAIN DIMENSIONS

600°C – 120 MIN

also available for
200°C – 120 min.
300°C – 60 min.
400°C – 120 min.
without motor enclosure
and cooling air duct.

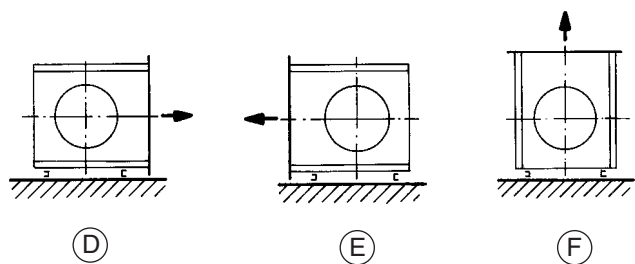
143

Floor mounting type

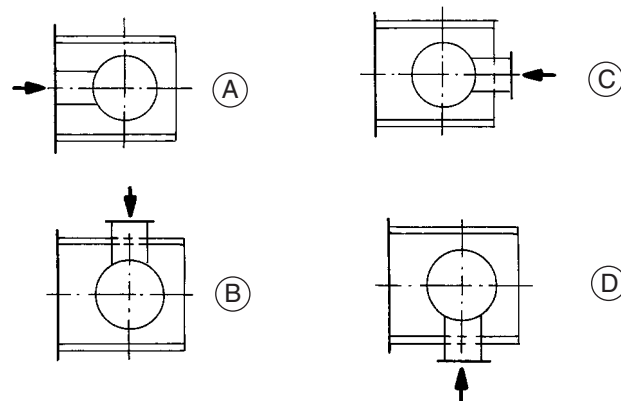


① + ② For dimensions please refer to page 148.

Casing orientations *



Position of cooling air ducts *



* View on motor enclosure.

Size	A	B	C	D	øG	H	v	h	K	L ₂	M				Max. weight ~kg
315	295	632	415	316	400	375	440	65	500	850	580				105
355	295	712	455	356	400	375	440	65	500	850	580				105
400	325	802	500	401	400	375	440	65	550	850	650				125
500	401	1002	600	501	500	450	540	80	650	850	850				205
630	516	1252	725	626	500 ■ 800 ●	425 ■ 680 ●	610 ■ 760 ●	80	850	1200	1050				430
710	566	1402	800	701	500 ■ 800 ●	425 ■ 680 ●	610 ■ 760 ●	100	900		1250				530

■ up to motor size 132
● motor sizes 160 and up

Dimensions in mm

For planning and installation please also refer to our Installation, Operating and Maintenance Instructions (MBW).

BVW



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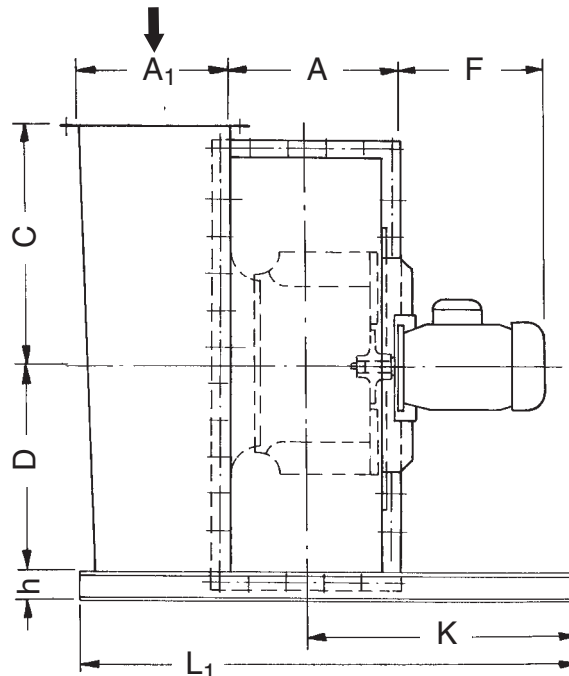
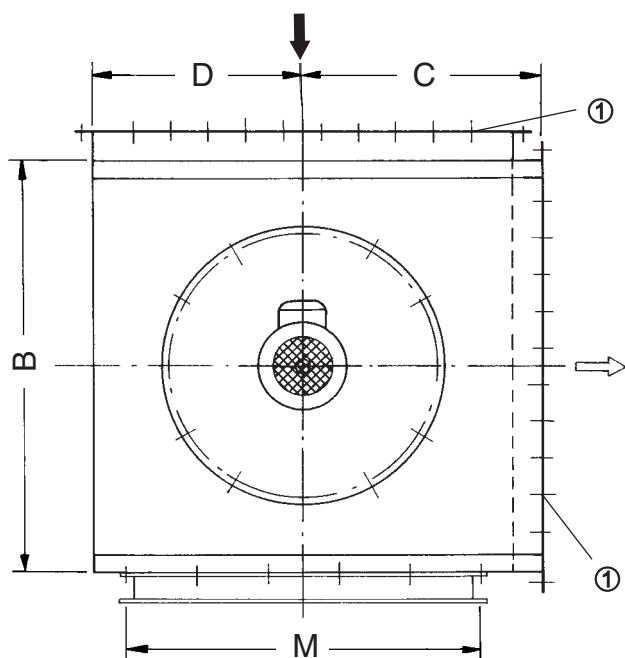
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CENTRIFUGAL SMOKE EXHAUST FAN BVW-A/B SERIES WITH INLET DUCT MAIN DIMENSIONS

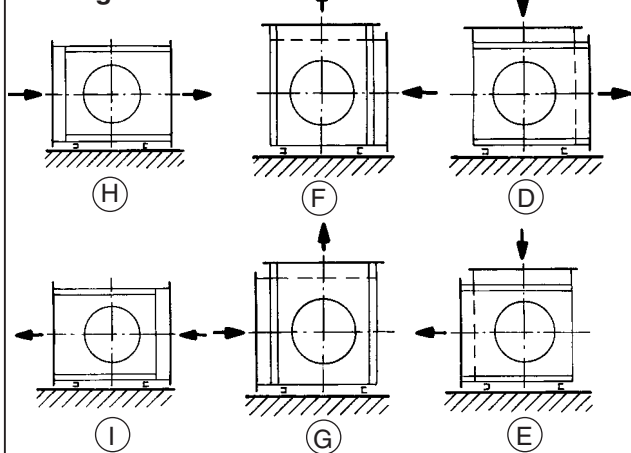
600°C – 120 MIN

144

Floor mounting type

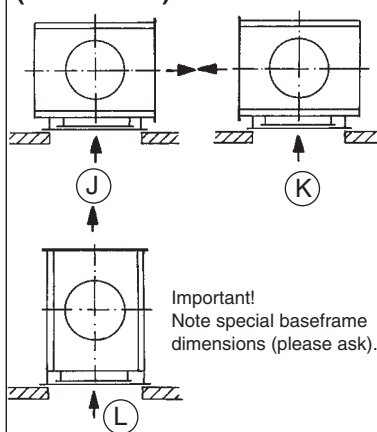


Casing orientations *



* View on motor enclosure.

Casing orientation* (inlet below)



① For dimensions please refer to page 148.

Size	A	A ₁	B	C	D	F	h	K	L ₁	M					Max. weight ~kg
315	295	252	632	415	316	315	65	500	850	580					120
355	295	252	712	455	356	260	65	500	850	580					125
400	325	282	802	500	401	315	65	550	950	650					160
500	401	357	1002	600	501	410	80	650	1150	850					255
630	516	452	1252	725	626	395 ■ 600 ●	80	850	1550	1050					510
710	566	502	1402	800	701	395 ■ 600 ●	100	900	1650	1250					640

■ up to motor size 132
● motor sizes 160 and up

Dimensions in mm

For planning and installation please also refer to our Installation, Operating and Maintenance Instructions (MBW).



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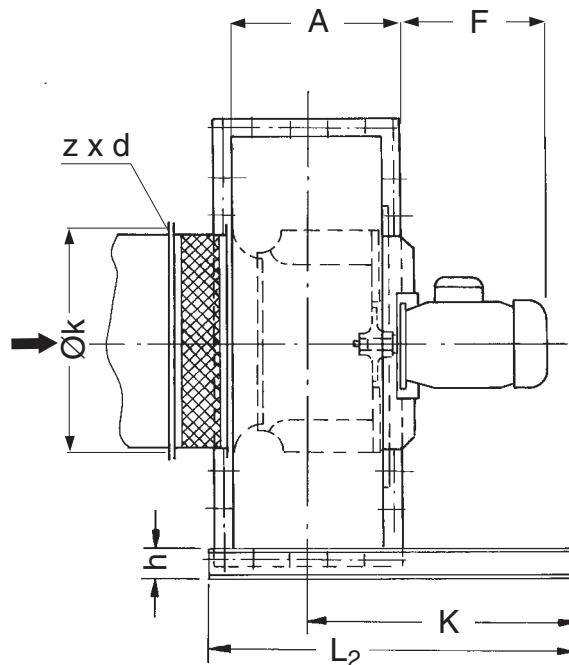
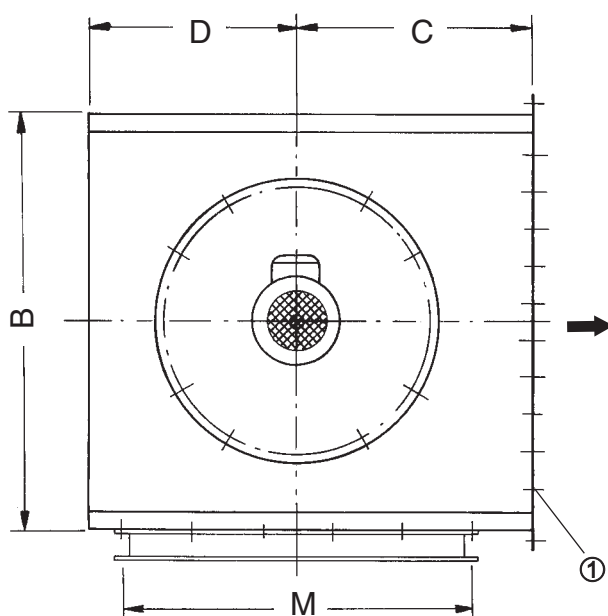
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CENTRIFUGAL SMOKE EXHAUST FAN BVW-A/B SERIES WITH ROUND DUCT CONNECTION MAIN DIMENSIONS

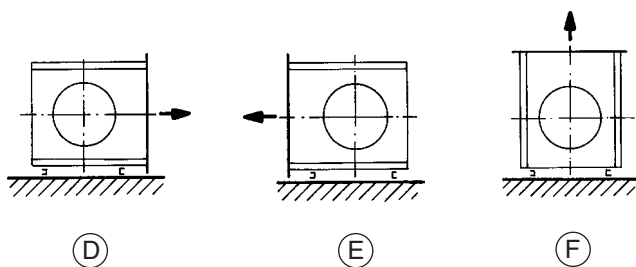
600°C – 120 MIN

145

Floor mounting type



Casing orientations *



① For dimensions please refer to page 148.

* View on motor enclosure.

Size	A	B	C	D	F	h	K	L ₂	M	Øk	z x d				Max. weight ~kg
315	295	632	415	316	315	65	500	850	580	356	8x10				100
355	295	712	455	356	260	65	500	850	580	395	8x10				100
400	325	802	500	401	315	65	550	850	650	438	12x10				120
500	401	1002	600	501	410	80	650	850	850	541	12x10				200
630	516	1252	725	626	395 ■ 600 ●	80	850	1200	1050	674	16x12				415
710	566	1402	800	701	395 ■ 600 ●	100	900	1400	1250	751	16x12				510

■ up to motor size 132
● motor sizes 160 and up

Dimensions in mm

For planning and installation please also refer to our Installation, Operating and Maintenance Instructions (MBW).

BVW



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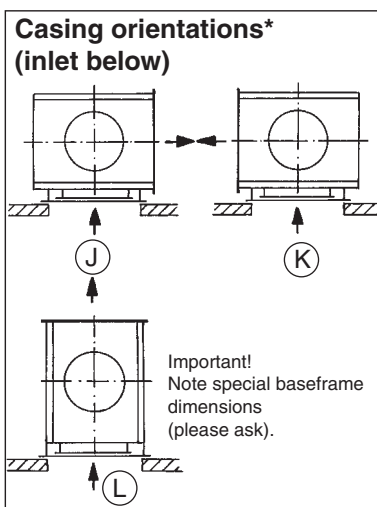
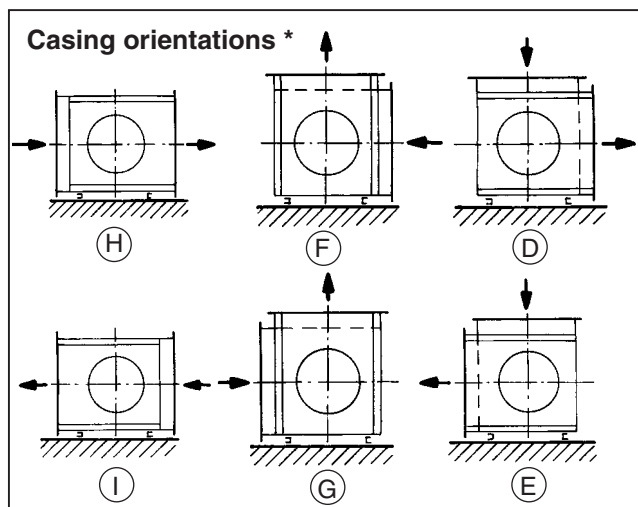
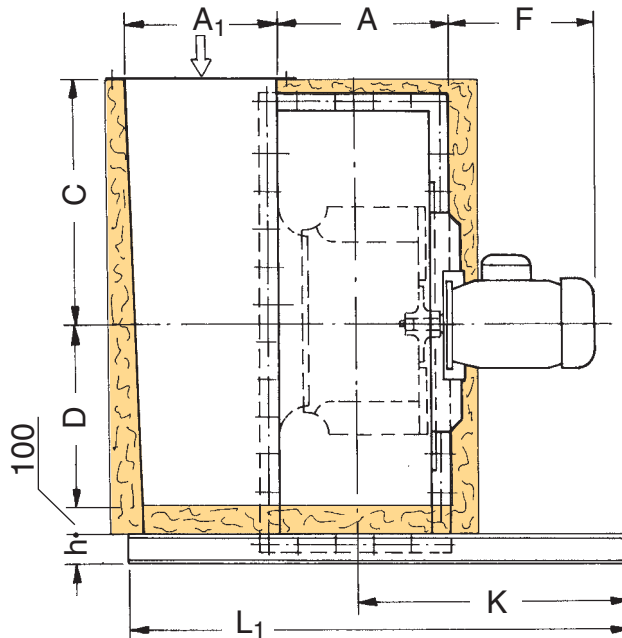
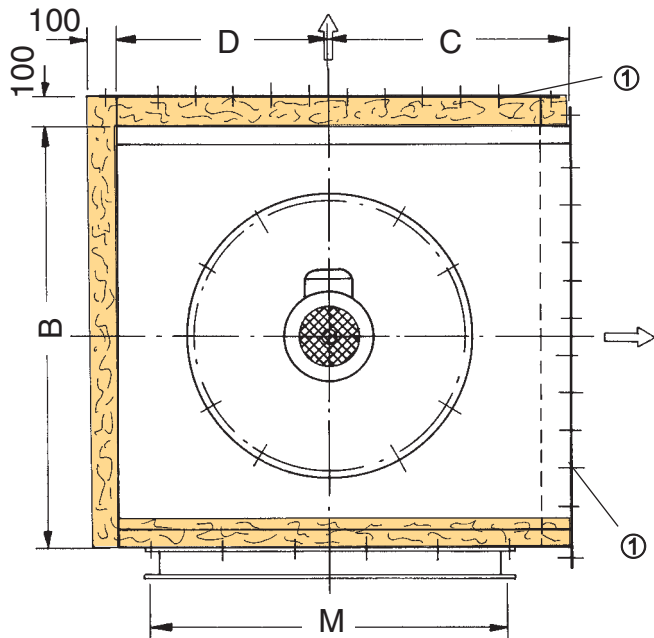
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**CENTRIFUGAL SMOKE EXHAUST FAN
BVW-A/B SERIES WITH INLET DUCT
AND ACOUSTIC AND THERMAL ISULATION
600°C – 120 MIN**

146

Floor mounting type

indoors, outside the fire zone



① For dimensions please refer to page 148

* View on motor enclosure.

Size	A	A ₁	B	C	D	F	h	K	L ₁	M					Max. weight ~kg
315	295	252	632	415	316	315	65	500	850	580					120
355	295	252	712	455	356	260	65	500	850	580					125
400	325	282	802	500	401	315	65	550	950	650					160
500	401	357	1002	600	501	410	80	650	1150	850					255
630	516	452	1252	725	626	395 ■ 600 ●	80	850	1550	1050					510
710	566	502	1402	800	701	395 ■ 600 ●	100	900	1650	1250					640

■ up to motor size 132
● motor sizes 160 and up

Dimensions in mm

For planning and installation please also refer to our Installation, Operating and Maintenance Instructions (MBW).



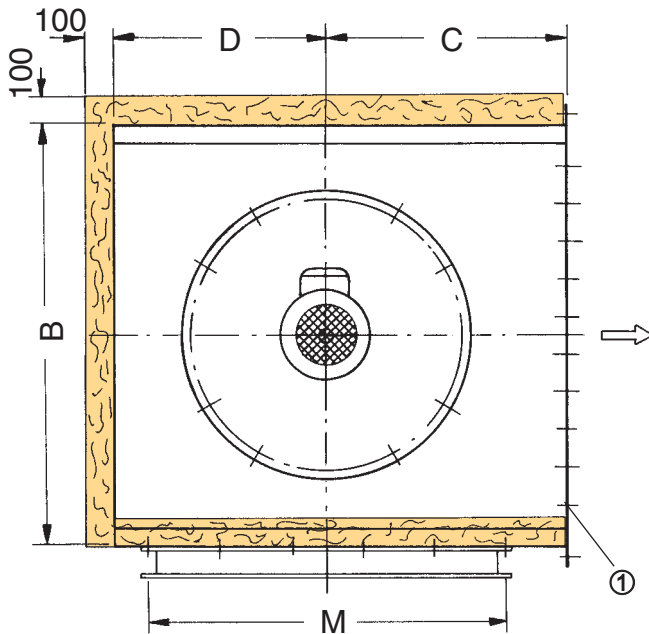
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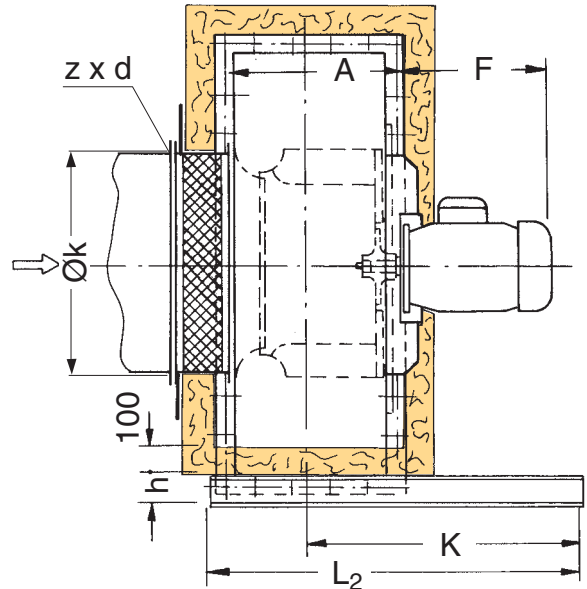
**CENTRIFUGAL SMOKE EXHAUST FAN
BVW-AI/B SERIES WITH ROUND DUCT CONNECTION
AND ACOUSTIC AND THERMAL ISULATION
600°C – 120 MIN**

147

Floor mounting type

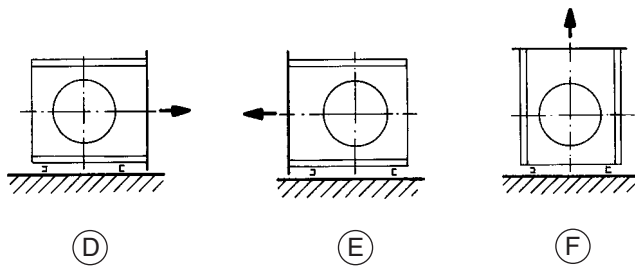


indoors, outside the fire zone



① Abmessungen siehe Seite 148

Casing orientations *



* View on motor enclosure.

Size	A	B	C	D	F	h	K	L ₂	M	Øk	z x d				Max. weight ~kg
315	295	632	415	316	315	65	500	850	580	356	8x10				100
355	295	712	455	356	260	65	500	850	580	395	8x10				100
400	325	802	500	401	315	65	550	850	650	438	12x10				120
500	401	1002	600	501	410	80	650	850	850	541	12x10				200
630	516	1252	725	626	395 ■ 600 ●	80	850	1200	1050	674	16x12				415
710	566	1402	800	701	395 ■ 600 ●	100	900	1400	1250	751	16x12				510

■ up to motor size 132
● motor sizes 160 and up

Dimensions in mm

For planning and installation please also refer to our Installation, Operating and Maintenance Instructions (MBW).

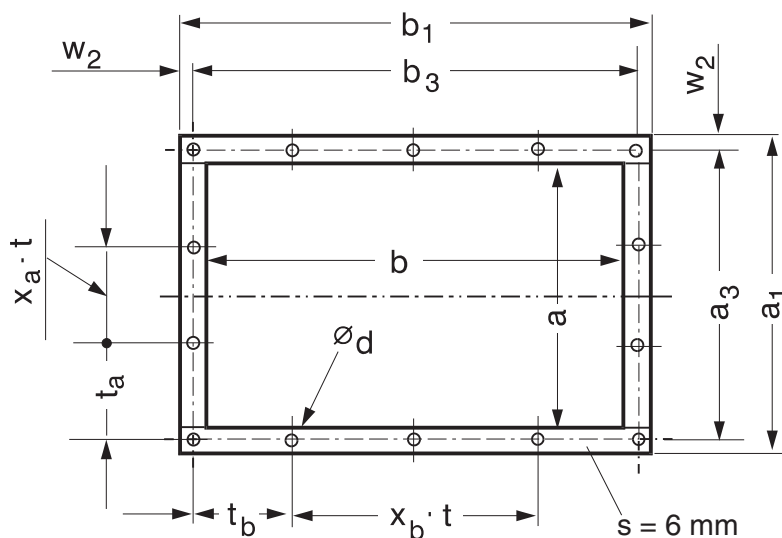


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CENTRIFUGAL SMOKE EXHAUST FANS **BVW SERIES** **Connecting Dimensions - All Types**

148



Dimensions - Inlet / Outlet Side Frame ①

Size	a	b	a ₃	b ₃	a ₁	b ₁	x _a · t	t _a	x _b · t	t _b	w ₂	Ø _d	s
315	252	632	296	676	332	712	-	148	3 x 125	150.5	18	12	6
355	252	712	296	756	332	792	-	148	5 x 125	65.5	18	12	6
400	282	802	326	846	362	882	-	163	5 x 125	110.5	18	12	6
500	357	1002	401	1046	437	1082	1 x 125	138	7 x 125	85.5	18	12	6
630	452	1252	522	1322	572	1372	3 x 125	73.5	9 x 125	98.5	25	12	6
710	502	1402	572	1472	622	1522	3 x 125	98.5	9 x 125	173.5	25	12	6

Dimensions - Frame for External Air Supply Connection ②

Size	a	b	a ₃	b ₃	a ₁	b ₁	x _a · t	t _a	x _b · t	t _b	w ₂	Ø _d	s
315	102	202	136	236	162	262	-	-	-	118	13	10	6
355	102	202	136	236	162	262	-	-	-	118	13	10	6
400	102	202	136	236	162	262	-	-	-	118	13	10	6
500	142	317	176	351	202	377	-	88	1 x 125	113	13	10	6
630	142	317	176	351	202	377	-	88	1 x 125	113	13	10	6
710	142	317	176	351	202	377	-	88	1 x 125	113	13	10	6

Dimensions in mm



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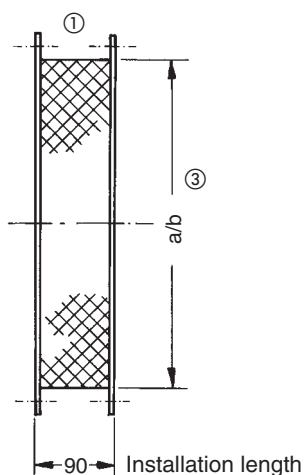
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CENTRIFUGAL SMOKE EXHAUST FAN BVW SERIES ACCESSORIES

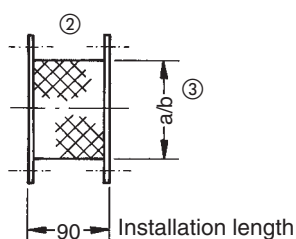
600°C – 120 MIN

149

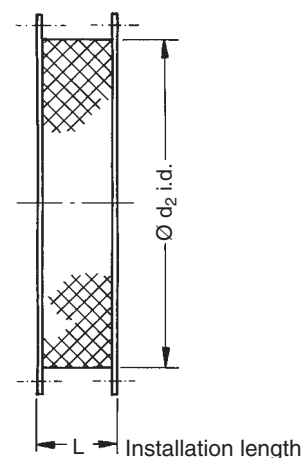
**Flexible connector
(rectangular) for fan casing /
intake box with damper**



**Flexible connector
for cooling air supply**



**Flexible connector (round)
for BVW-A/B fans (page 145)**



Please fit flexible connectors with precisions, observing the installation length.

Size	Dimensions				L (600°C)	L (200 - 400°C)	Ø d ₂ i.d.	
	for ① a	b	for ② a	b				
315	252	632	102	202	90	200	321	
355	252	712	102	202	90	200	360	
400	282	802	102	202	90	200	403	
500	357	1002	142	317	90	200	506	
630	452	1252	142	317	90	200	637	
710	502	1402	142	317	90	200	714	

③ For connecting dimensions Please refer to page 148.



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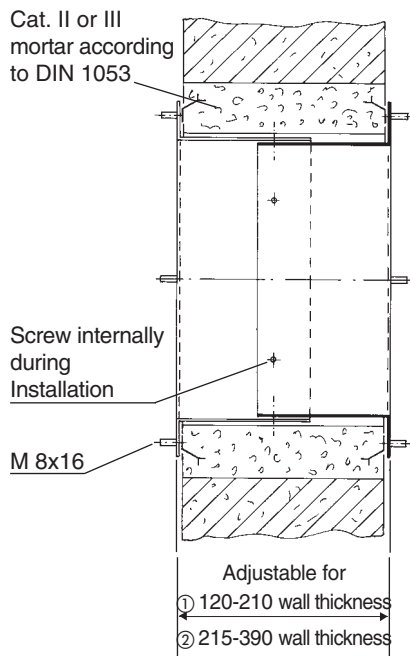
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CENTRIFUGAL TYPE SMOKE EXHAUST FANS BVW SERIES ACCESSORIES

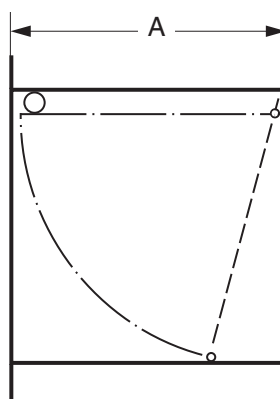
600°C – 120 MIN

150

Wall transition sleeve made of galvanized sheet steel



Duct with shutoff damper and 2 flanges*

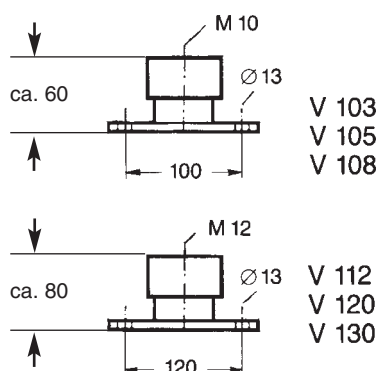


* Also available for type BVW-A/B
and BVW-R/B

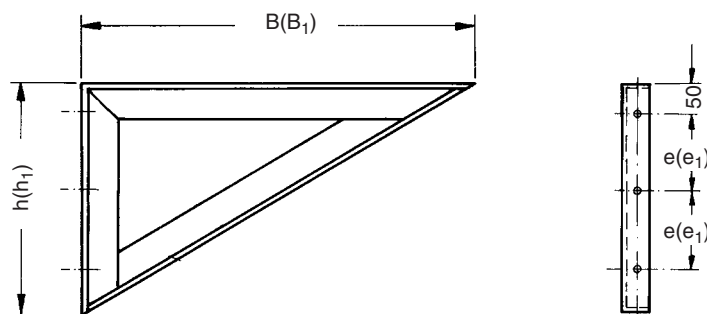
Inlet wire guard (rectangular)



Spring-type antivibration mounts



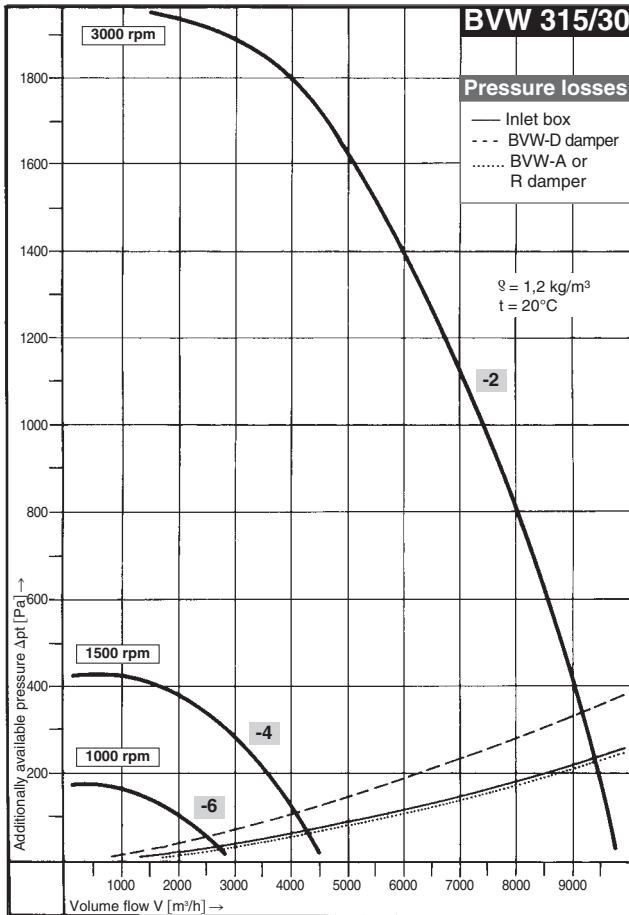
Installation jigs



Dimensions in brackets apply to installation on spring-type antivibration mounts. Detailed drawing showing installation jig hole patterns available on request.

Size	A	B	h	e	For installation with spring-type antivibration mounts.			Ø d	
					B ₁	h ₁	e ₁		
315	200	725	350	125	805	400	150	12	
355	260	805	400	150	815	450	175	12	
400	290	815	450	175	1095	500	200	12	
500	370	1095	500	200	1345	600	225	14	
630	470	1345	600	225	1490	600	225	14	
710	530	1490	600	225	1490	600	225	14	

Dimensions in mm

**TLT-Turbo GmbH**Am Weinberg 68 · D-36251 Bad Hersfeld/Germany
Phone: +49.6621.950-0 · Fax: +49.6621.950-100**CENTRIFUGAL TYPE SMOKE EXHAUST FANS
BVW-A · BVW-R · BVW-D SERIES****600 °C – 120 MIN****151**

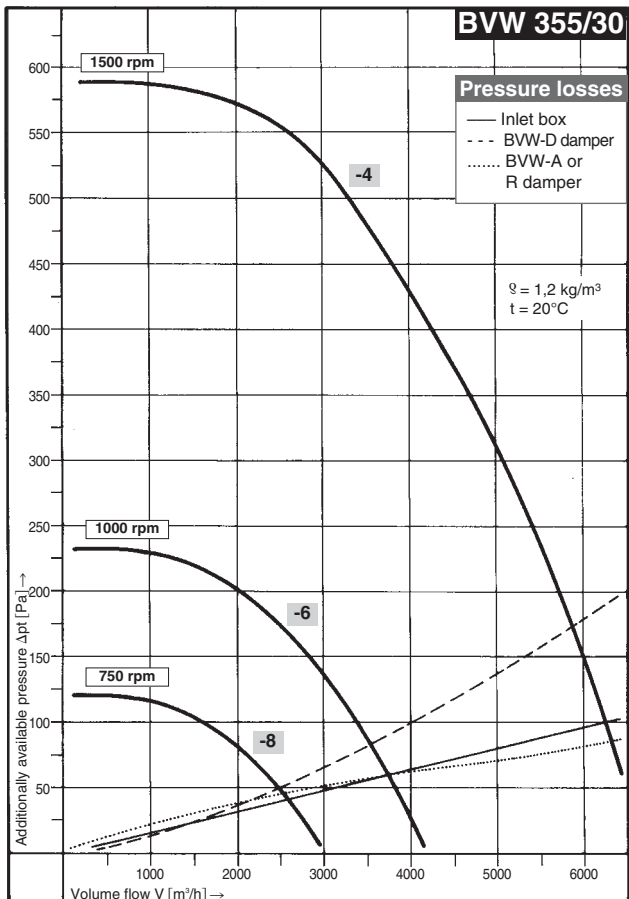
Model BVW-A BVW-R BVW-D	Speed [rpm]	Motor output [kW]	Nominal current at 400 V-50 Hz approx [A]	Motor size	Flange dia	Max. weight approx		
						BVW-A	BVW-R BVW-D	BVW-R **
315/30-6	910	0,55	1,6	80	200	112	92	114
315/30-4	1390	0,55	1,4	80	200			
315/30-2	2880	4,4	9,5	112	250			
315/30-2/4	2890/1440	4,1/1,0	8,8/2,1	112	250			
315/30-4/8	1400/670	0,7/0,18	2,0/0,8	80	200			
315/30-4/6/8	1430/950/700	1,0/0,33/0,26	2,4/1,05/0,95	100	250			

* for motor size 112

** BVW-R with inlet duct

Acoustic levels on outlet side (free-field conditions)

Speed [rpm]	Acoustic level V_{max}			Relative acoustic power level Octave center frequency [Hz]							
	L_w (dB)	L_{wA} (dB)	L_{pA} (dB)	63	125	250	500	1000	2000	4000	8000
670	74	65	45	68	71	64	63	60	56	51	46
920	80	72	52	73	77	70	68	67	65	61	56
1390	87	82	62	80	79	84	76	75	76	72	68
2880	101	98	78	93	92	90	96	89	90	92	88

 L_{pA} : Average sound pressure level at 4 m distance (free field)Measuring surface $S = 101 \text{ (m}^2\text{)}$ Measuring surface level: $L_s = 20 \text{ (dB)}$ 

Model BVW-A BVW-R BVW-D	Speed [rpm]	Motor output [kW]	Nominal current at 400 V-50 Hz approx [A]	Motor size	Flange dia	Max. weight approx		
						BVW-A	BVW-R BVW-D	BVW-R **
355/30-6	910	0,55	1,6	80	200	136	125	136
355/30-4	1410	1,5	3,6	90	200			
355/30-4/8	1400/680	1,4/0,35	3,3/1,35	90	200			
355/30-4/6	1410/950	1,1/0,37	2,8/1,35	90	200			
355/30-4/6/8	1430/950/700	1,0/0,33/0,26	2,4/1,05/0,95	100	250			

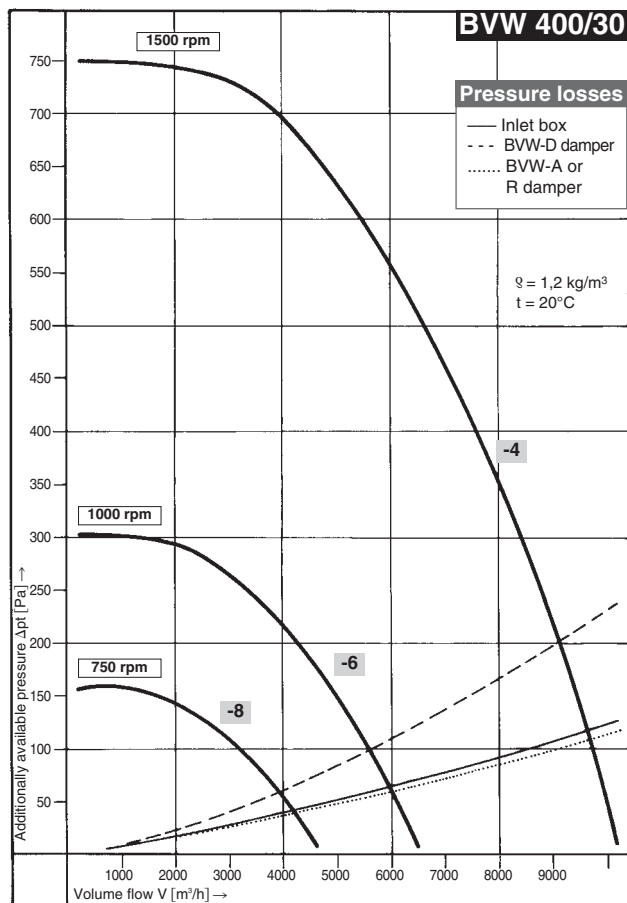
* for motor size 90

** BVW-R with inlet duct

Acoustic levels on outlet side (free-field conditions)

Speed [rpm]	Acoustic level V_{max}			Relative acoustic power level Octave center frequency [Hz]							
	L_w (dB)	L_{wA} (dB)	L_{pA} (dB)	63	125	250	500	1000	2000	4000	8000
420	66	58	38	63	60	60	56	52	47	42	37
670	77	69	49	71	74	67	66	64	61	56	51
910	83	76	56	76	80	73	71	71	69	65	60
1410	91	86	66	84	82	87	80	79	80	77	72

 L_{pA} : Average sound pressure level at 4 m distance (free field)Measuring surface $S = 101 \text{ (m}^2\text{)}$ Measuring surface level: $L_s = 20 \text{ (dB)}$

**TLT-Turbo GmbH**Am Weinberg 68 · D-36251 Bad Hersfeld/Germany
Phone: +49.6621.950-0 · Fax: +49.6621.950-100**CENTRIFUGAL TYPE SMOKE EXHAUST FANS
BVW-A · BVW-R · BVW-D SERIES****600 °C – 120 MIN****152**

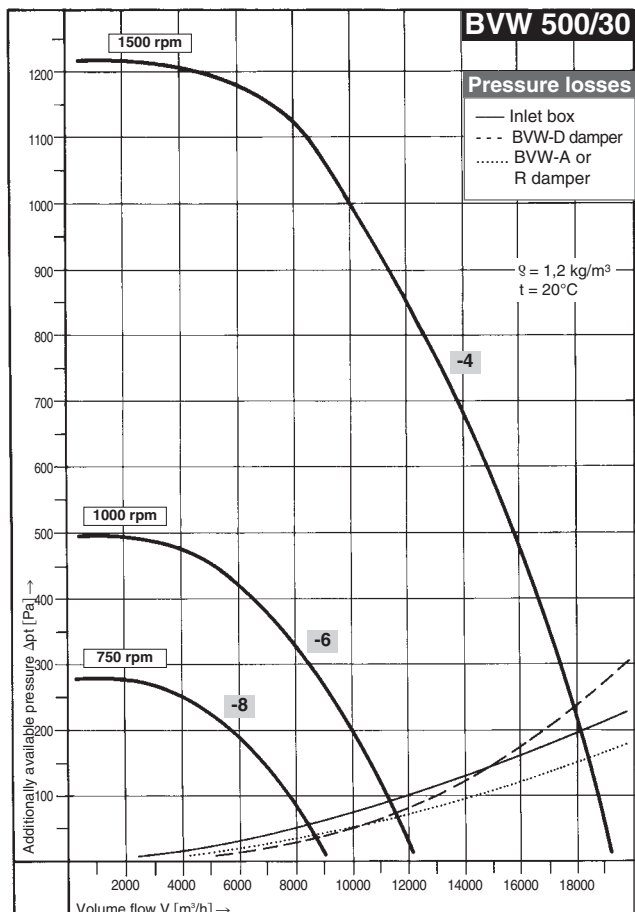
Model BVW-A BVW-R BVW-D	Speed [rpm]	Motor output [kW]	Nominal current at 400 V-50 Hz approx [A]	Motor size	Flange dia	Max. weight approx		
						BVW-A	BVW-R BVW-D	BVW-R **
400/30-6	910	0,55	1,6	80	200			
400/30-4	1410	1,5	3,6	90	200			
400/30-4/8	1400/680	1,4/0,35	3,3/1,35	90	200			
400/30-4/6	1405/930	1,6/0,6	3,9/1,8	100	250			
400/30-4/6/8	1440/965/700	1,5/0,6/0,37	3,5/1,8/1,45	100	250	170	165	202

* for motor size 100

** BVW-R with inlet duct

Acoustic levels on outlet side (free-field conditions)

Speed [rpm]	Acoustic level V_{max}			Relative acoustic power level Octave center frequency [Hz]							
	L_w (dB)	L_{wA} (dB)	L_{pA} (dB)	63	125	250	500	1000	2000	4000	8000
420	72	61	41	70	63	63	59	56	52	47	42
670	80	72	52	74	77	70	69	67	65	60	55
910	86	79	59	79	83	76	74	74	73	69	64
1400	94	89	69	87	85	90	82	81	83	81	77

 L_{pA} : Average sound pressure level at 4 m distance (free field)Measuring surface $S = 101 \text{ (m}^2\text{)}$ Measuring surface level: $L_s = 20 \text{ (dB)}$ 

Model BVW-A BVW-R BVW-D	Speed [rpm]	Motor output [kW]	Nominal current at 400 V-50 Hz approx [A]	Motor size	Flange dia	Max. weight approx		
						BVW-A	BVW-R BVW-D	BVW-R **
500/30-6	910	1,5	4,3	100	250			
500/30-4	1420	5,5	11,5	132	250			
500/30-4/8	1420/700	5,5/1,4	11,4/4,3	132	250			
500/30-4/6	1460/955	6,0/2,0	12,5/5,4	132	250	270	230	282
500/30-6/8/12	965/720/470	1,6/0,8/0,33	4,7/2,9/1,9	132	250			

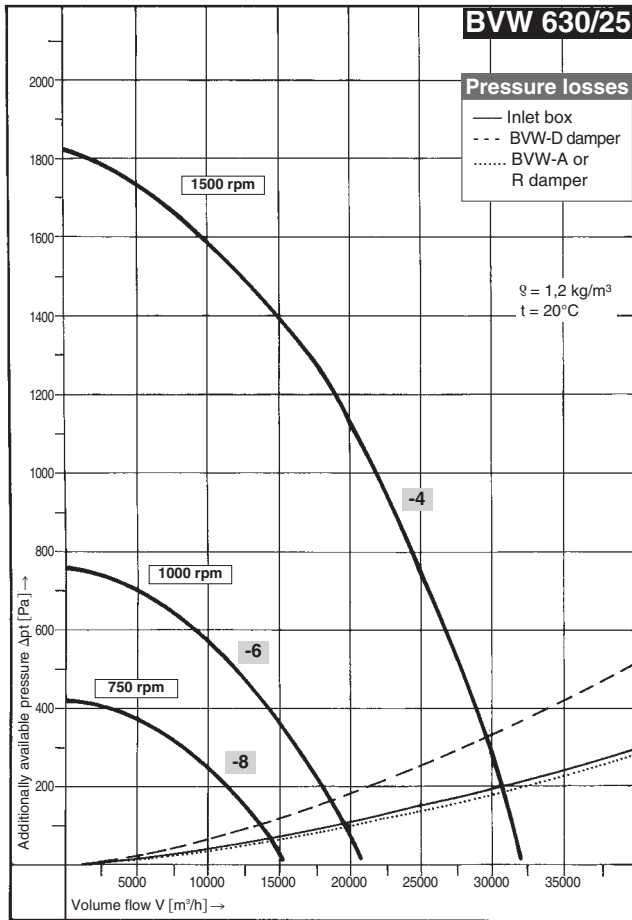
* for motor size 132

** BVW-R with inlet duct

Acoustic levels on outlet side (free-field conditions)

Speed [rpm]	Acoustic level V_{max}			Relative acoustic power level Octave center frequency [Hz]							
	L_w (dB)	L_{wA} (dB)	L_{pA} (dB)	63	125	250	500	1000	2000	4000	8000
420	75	69	49	71	68	69	67	64	60	55	50
690	87	80	60	80	84	76	76	75	74	69	65
910	92	86	66	85	89	82	80	80	81	77	73
1420	100	96	76	93	91	96	88	87	90	89	85

 L_{pA} : Average sound pressure level at 4 m distance (free field)Measuring surface $S = 101 \text{ (m}^2\text{)}$ Measuring surface level: $L_s = 20 \text{ (dB)}$

**TLT-Turbo GmbH**Am Weinberg 68 · D-36251 Bad Hersfeld/Germany
Phone: +49.6621.950-0 · Fax: +49.6621.950-100**CENTRIFUGAL TYPE SMOKE EXHAUST FANS
BVW-A · BVW-R · BVW-D SERIES****600 °C – 120 MIN****153**

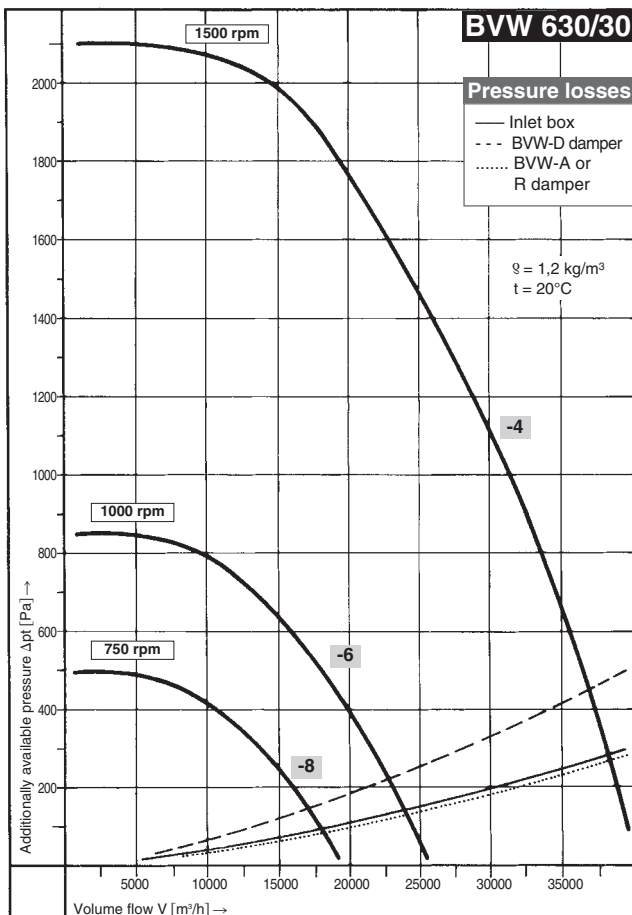
Model BVW-A BVW-R BVW-D	Speed [rpm]	Motor output [kW]	Nominal current at 400 V-50 Hz approx [A]	Motor size	Flange dia	Max. weight approx		
						BVW-A	BVW-R BVW-D	BVW-R **
630/25-6	940	3,0	7,0	132	300			
630/25-4	1470	11	22	160	300			
630/25-4/8	1460/710	10/3,0	22/10	160	300	460	385	474
630/25-6/12	975/480	3,3/0,75	9,3/3,6	132	300			
630/25-6/8/12	970/735/475	3,0/1,5/0,6	7,6/4,6/2,8	132	300			

* for motor size 160

** BVW-R with inlet duct

Acoustic levels on outlet side (free-field conditions)

Speed [rpm]	Acoustic level $V_{\max}$			Relative acoustic power level Octave center frequency [Hz]							
	L_w (dB)	L_{wA} (dB)	L_{pA} (dB)	63	125	250	500	1000	2000	4000	8000
480	86	72	52	85	77	75	70	67	62	57	51
710	96	86	66	91	88	85	84	82	78	73	68
940	101	93	73	94	99	91	89	89	86	81	77
1470	110	104	84	101	107	99	97	98	98	94	89

 L_{pA} : Average sound pressure level at 4 m distance (free field)Measuring surface $S = 101 \text{ (m}^2\text{)}$ Measuring surface level: $L_s = 20 \text{ (dB)}$ 

Model BVW-A BVW-R BVW-D	Speed [rpm]	Motor output [kW]	Nominal current at 400 V-50 Hz approx [A]	Motor size	Flange dia	Max. weight approx		
						BVW-A	BVW-R BVW-D	BVW-R **
630/30-6	940	5,5	12,7	132	300			
630/30-4	1470	18,5	35	180	300			
630/30-4/8	1460/710	20/5,5	39/16,2	180	300	460	385	474
630/30-6/12	975/480	6,3/1,5	15,7/5,4	160	300			
630/30-6/8/12	970/735/475	6,0/3,0/1,5	11,9/9,5/4,4	160	300			

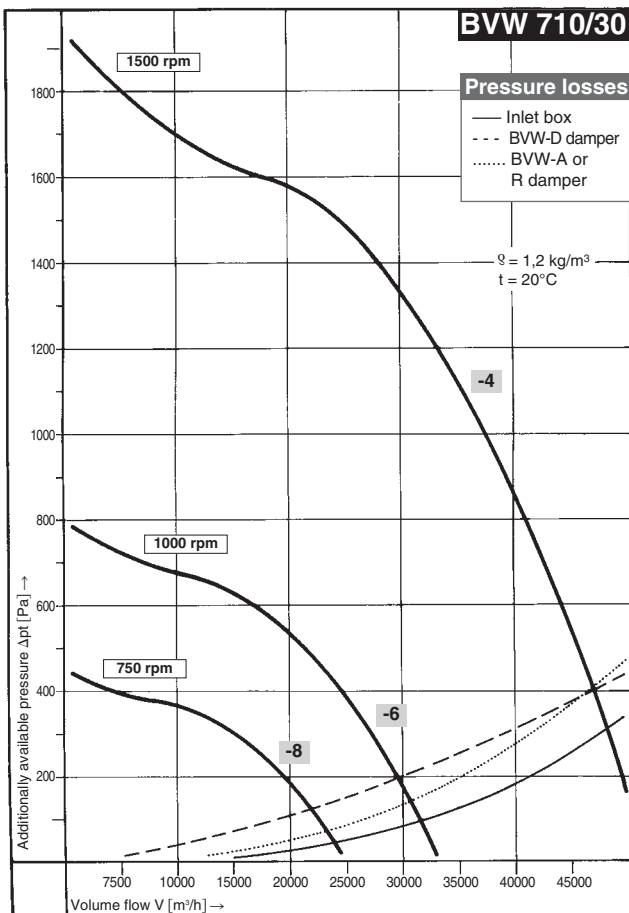
* for motor size 180

** BVW-R with inlet duct

Acoustic levels on outlet side (free-field conditions)

Speed [rpm]	Acoustic level $V_{\max}$			Relative acoustic power level Octave center frequency [Hz]							
	L_w (dB)	L_{wA} (dB)	L_{pA} (dB)	63	125	250	500	1000	2000	4000	8000
440	86	78	58	83	77	75	75	73	71	67	62
720	94	88	68	87	90	83	82	81	82	79	74
940	99	94	74	92	95	89	86	86	88	87	82
1470	107	103	83	99	98	103	95	93	97	98	95

 L_{pA} : Average sound pressure level at 4 m distance (free field)Measuring surface $S = 101 \text{ (m}^2\text{)}$ Measuring surface level: $L_s = 20 \text{ (dB)}$

**TLT-Turbo GmbH**Am Weinberg 68 · D-36251 Bad Hersfeld/Germany
Phone: +49.6621.950-0 · Fax: +49.6621.950-100**WALL MOUNTING SMOKE EXHAUST FANS
BVW-A · BVW-R · BVW-D SERIES****600 °C – 120 MIN****154**

Model BVW-A BVW-R BVW-D	Speed [rpm]	Motor output [kW]	Nominal current at 400 V-50 Hz approx [A]	Motor size	Flange dia	Max. weight approx		
						BVW-A	BVW-R BVW-D	BVW-R **
710/30-6	940	5,5	12,7	132	300			
710/30-4	1470	18,5	36	180	300			
710/30-4/8	1460/710	20/5,5	39/16,2	180	300	570	475	605
710/30-6/12	975/475	6,3/1,5	14/4,8	160	300			
710/30-6/8/12	970/725/475	7,5/4,0/1,85	16,2/10/7,1	180	300			

* for motor size 180

** BVW-R with inlet duct

Acoustic levels on outlet side (free-field conditions)

Speed [rpm]	Acoustic level $V_{\max}$			Relative acoustic power level Octave center frequency [Hz]							
	L_w (dB)	L_{wA} (dB)	L_{pA} (dB)	63	125	250	500	1000	2000	4000	8000
475	91	82	62	89	83	81	80	77	73	68	63
715	98	90	70	91	95	88	87	86	83	78	73
950	104	99	79	97	101	94	92	94	93	88	83
1470	113	109	89	104	103	109	101	102	104	100	96

 L_{pA} : Average sound pressure level at 4 m distance (free field)Measuring surface $S = 101 \text{ (m}^2\text{)}$ Measuring surface level: $L_s = 20 \text{ (dB)}$ **Minimum cooling air flow rate [m³/h]**

Fan size	Nominal motor speed [rpm]		
	3000	1500	1000
315	655	335	250
355	—	380	285
400	—	435	327
500	—	500	375
630	—	1500	1125
710	—	1500	1125

Lfd. Nr.	Qty.	Description	Unit price €	Total €																								
		Centrifugal Smoke Exhaust Fan, BVW-A series for the extraction of smoke fumes of max. 600°C / 120 min. tested to EN 12101, Part 3 (Technical University of Munich) with general building supervision approval Z-78.1-29 For installation outside the fire zone. Motor cooled with ambient air not exceeding 40°C Direct-drive type, consisting of steel sheet housing, protected by polyester powder coating, colour RAL 7030, with inlet nozzle, motor support plate, companion flange as per DIN 24154, Series R3 companion frame as per DIN 24193, Series R2 smoke inlet box (without motor enclosure). Centrifugal impeller, single inlet type, aerodynamically optimized, dynamically balanced to DIN ISO 1940 quality grade G 6,3 welded sheet steel construction with polyester powder coating, colour: RAL 7030 For wall-mounting installation For floor-standing installation. Three-phase motor as per IEC standard, style V 3 / B 5 Protection class IP 55 Insulation material grade H Specifications: <table><tr><td>Volume flow</td><td>m³/h</td></tr><tr><td>Temperature (design)</td><td>°C</td></tr><tr><td>Max. temperature / withstand time</td><td>600°C/120 min.</td></tr><tr><td>Additionally available pressure</td><td>Pa</td></tr></table> Three-phase motor single-speed with Dahlander pole-changing winding pole-changing type with separate windings <table><tr><td>Motor speed</td><td>rpm</td></tr><tr><td>Motor output</td><td>kW</td></tr><tr><td>Motor winding</td><td>V</td></tr><tr><td>Current consumption</td><td>A</td></tr><tr><td>Operating voltage</td><td>V</td></tr><tr><td>Frequency</td><td>Hz</td></tr><tr><td>Total sound pressure level L_W</td><td>dB</td></tr><tr><td>Weight of fan with accessories</td><td>kg</td></tr></table> Manufacturer: TLT-Turbo GmbH Type: BVW-A	Volume flow	m³/h	Temperature (design)	°C	Max. temperature / withstand time	600°C/120 min.	Additionally available pressure	Pa	Motor speed	rpm	Motor output	kW	Motor winding	V	Current consumption	A	Operating voltage	V	Frequency	Hz	Total sound pressure level L _W	dB	Weight of fan with accessories	kg		
Volume flow	m³/h																											
Temperature (design)	°C																											
Max. temperature / withstand time	600°C/120 min.																											
Additionally available pressure	Pa																											
Motor speed	rpm																											
Motor output	kW																											
Motor winding	V																											
Current consumption	A																											
Operating voltage	V																											
Frequency	Hz																											
Total sound pressure level L _W	dB																											
Weight of fan with accessories	kg																											
		Carryover																										

Item No.	Qty.	Description	Unit price €	Total €
	or	Accessory equipment • Set of installation jigs* • Flexible connector, inlet side* (temperature-resistant) - round - rectangular • Flexible connector, outlet side* temperature-resistant, rectangular • Matching frame * DIN 24193, Series R2 • Matching flange, * DIN 24154, Series R3 • Set of spring-type antivibration mounts* • Outlet duct including wire guard and self-activating shutoff damper • Inlet duct (not compatible with inlet box) • Duct section with self-activating shutoff damper* (with 2 frames) • Floor mounting baseframe • Wall transition sleeve (adjustable), max. 390 mm wall thickness • Inlet wire guard (rectangular) Note: Please observe our Installation, Operating and Maintenance Instructions (available upon request).		
		* Loosely supplied Carryover		

Lfd. Nr.	Qty.	Description	Unit price €	Total €																								
		Centrifugal Smoke Exhaust Fan, BVW-R series for the extraction of smoke fumes of max. 600°C / 120 min. tested to EN 12101, Part 3 (Technical University of Munich) with general building supervision approval Z-78.1-29 Motor requires outside air cooling. For installation within the fire zone. Direct-drive type, consisting of steel sheet housing, protected by polyester powder coating, colour RAL 7030, with inlet nozzle, motor support plate, companion flange as per DIN 24154, Series R3 companion frame as per DIN 24193, Series R2 Centrifugal impeller, single inlet type, aerodynamically optimized, dynamically balanced to DIN ISO 1940 quality grade G 6,3 welded sheet steel construction with polyester powder coating, colour: RAL 7030 For wall-mounting installation For floor-standing installation. Three-phase motor as per IEC standard, style V 3 / B 5 Protection class IP 55 Insulation material grade H Motor enclosure: Round sheet steel housing, cooling air supplied via cooling air inlet duct. Max. length of outside air supply line: 1,0 m. Specifications: <table><tr><td>Volume flow</td><td>m³/h</td></tr><tr><td>Temperature (design)</td><td>°C</td></tr><tr><td>Max. temperature / withstand time</td><td>600°C/120 min</td></tr><tr><td>Additionally available pressure</td><td>Pa</td></tr></table> Three-phase motor single-speed with Dahlander pole-changing winding pole-changing type with separate windings <table><tr><td>Motor speed</td><td>rpm</td></tr><tr><td>Motor output</td><td>kW</td></tr><tr><td>Motor winding</td><td>V</td></tr><tr><td>Current consumption</td><td>A</td></tr><tr><td>Operating voltage</td><td>V</td></tr><tr><td>Frequency</td><td>Hz</td></tr><tr><td>Total sound pressure level L_W</td><td>dB</td></tr><tr><td>Weight of fan with accessories</td><td>kg</td></tr></table> Manufacturer: TLT-Turbo GmbH Type: BVW-R	Volume flow	m³/h	Temperature (design)	°C	Max. temperature / withstand time	600°C/120 min	Additionally available pressure	Pa	Motor speed	rpm	Motor output	kW	Motor winding	V	Current consumption	A	Operating voltage	V	Frequency	Hz	Total sound pressure level L _W	dB	Weight of fan with accessories	kg		
Volume flow	m³/h																											
Temperature (design)	°C																											
Max. temperature / withstand time	600°C/120 min																											
Additionally available pressure	Pa																											
Motor speed	rpm																											
Motor output	kW																											
Motor winding	V																											
Current consumption	A																											
Operating voltage	V																											
Frequency	Hz																											
Total sound pressure level L _W	dB																											
Weight of fan with accessories	kg																											
		Carryover																										

Item No.	Qty.	Description	Unit price €	Total €
	or	Accessory equipment • Set of installation jigs* • Flexible connector, inlet side* (temperature-resistant) - round - rectangular • Flexible connector, outlet side* temperature-resistant, rectangular • Flexible connector for cooling air duct • Inlet box • Matching frame * DIN 24193, Series R2 • Matching flange, * DIN 24154, Series R3 • Set of spring-type antivibration mounts* • Inlet duct • Outlet duct connector including wire guard and self-activating shutoff damper* • Duct section with self-activating shutoff damper* (with 2 flanges) • Floor mounting baseframe • Wall transition sleeve (adjustable), max. 390 mm wall thickness • Wall transition sleeve for cooling air duct (adjustable) max. 390 mm wall thickness • Inlet wire guard (rectangular)		
		Note: Please observe our Installation, Operating and Maintenance Instructions (available upon request). Carryover * Loosely supplied		

Item No.	Qty.	Description	Unit price €	Total €
		Accessory equipment: • Shutoff damper, outlet side Snow load class SL 1000 • Roof mounting base, made of galvanised sheet steel, insulated* (height: 350 mm) • Round duct connector, inlet side • Matching flange, inlet side* • Flexible connector, inlet side* (temperature-resistant) Note: Please observe our Installation, Operating and Maintenance Instructions (available upon request).		
		* Loosely supplied		

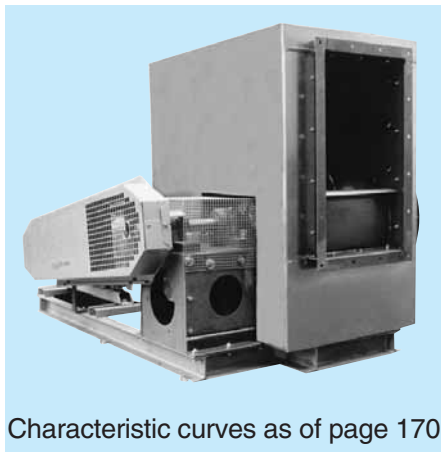


TLT-Turbo GmbH

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CENTRIFUGAL SMOKE EXHAUST FANS PRODUCT RANGE ① TECHNICAL DESCRIPTION

161



Characteristic curves as of page 170

BV-REH series (insulated casing)

Temperature/Time category acc. to
EN 12101 - part 3:

F 400 400°C - 120 min.

Appropriate for installation outside
of fire-zone.

Also available with acoustic and
thermal insulation.

Product range:

13 sizes

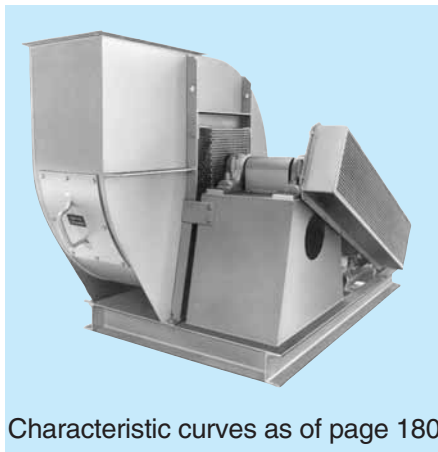
inlet ranging from 400-1600 mm
diam.

Volume flow up to 125 000 m³/h
total pressure increase
up to appr. 3 500 pa

Technical description

BV-REH series

Casing of rugged, welded construction with stiffened lateral panels, including outlet frame and inlet flange. Connecting dimensions in accordance with DIN 24193 - Series 2 (Euro standard) or DIN 24154, Series 3. High-performance impeller of welded steel construction, with backward curved blades, energy-optimized for maximum efficiency. Rounded-edge bellmouth made of flow formed sheet steel, aerodynamically matched to impeller. Shaft impeller in two self-aligning ball (or roller) bearings mounted in split cast-iron bearing pedestals. Impeller with Taperlock hub and shaft jointly balanced to DIN ISO 1940 - G 2.5 standard. Fitted on a rugged bearing. Surface finished with powder coating or high-grade 1-component synthetic coating. Colour: RAL 7030.



Characteristic curves as of page 180

BVRA series

Temperature/Time category acc. to
EN 12101 - part 3:

F 600 620°C - 90 min.

Appropriate for installation outside
of fire-zone.

Also available with acoustic and
thermal insulation.

Product range:

19 sizes

inlet ranging from 180 - 1400 mm
diam.

Volume flow up to 140 000 m³/h
total pressure increase
up to appr. 3 150 Pa

Technical description

BVRA series

Casing of rugged, welded construction with stiffened lateral panels. Outlet with DIN 24158, part 3 flanges. Inlet with DIN 24154, part 3, flanges. Centrifugal impeller, single inlet type, of welded sheet steel construction, dynamically balanced to DIN ISO 1940 quality grade G 6.3. Fan shaft with cooling disc and shaft seal, supported in pedestal bearings. V-belt drive complete with two pulleys, V-belt and guard. Casing coated with temperature-resistant aluminium paint (for indoor installation).

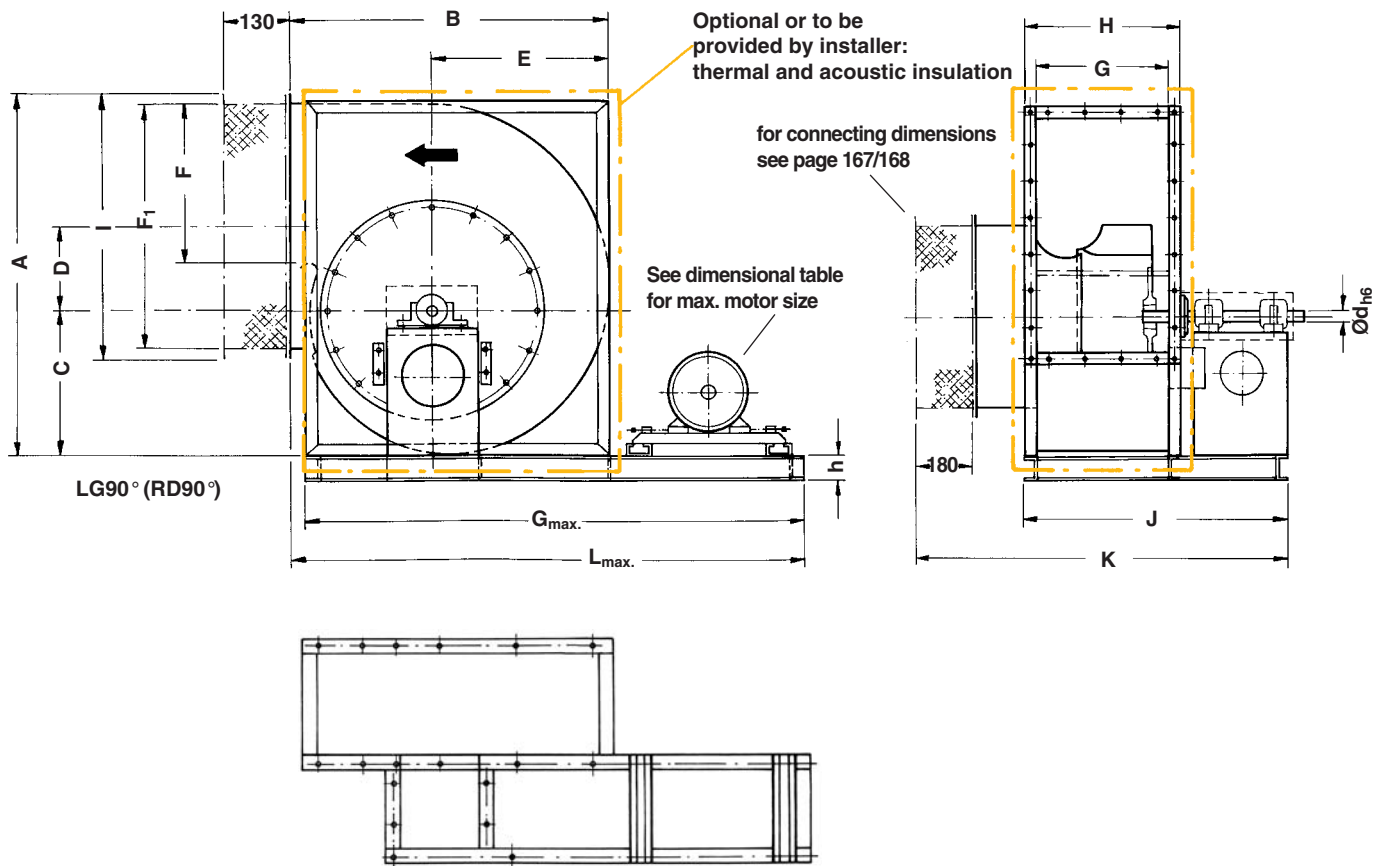


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CENTRIFUGAL SMOKE EXHAUST FANS REH SERIES - SINGLE INLET SINGLE WIDTH MAIN DIMENSIONS SIZES 400 TO 630 400°C - 120 MIN

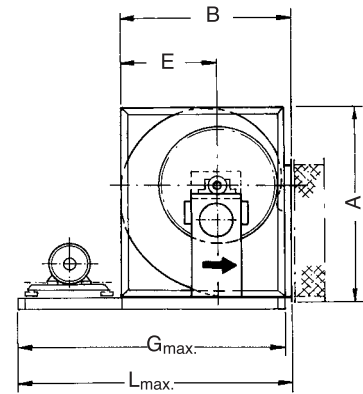
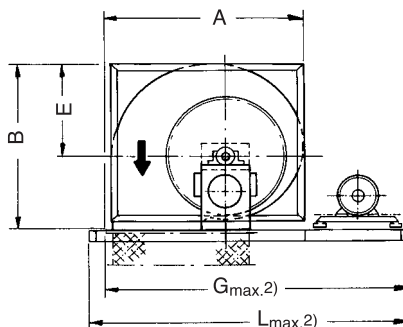
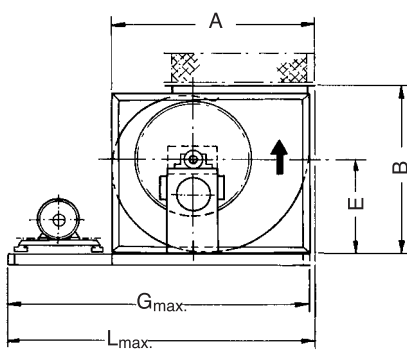
162



Casing position LG0° (RD0°)*

LG 180° (RD 180°)*

LG 270° (RD 270°)*



Size	A	B	C	D	E	F	F ₁	G	H	I	K	Ød _{h6}	appr. kg ¹⁾	Insulation appr. kg	Motor sizes	h	J	0°		90°/270°		appr. kg
																		L _{max.}	G _{max.}	L _{max.}	G _{max.}	
400	776	670	306	179	369	340	502	282	362	582	970	30	90	45	90-112	65	646	1350	1305	1250	1205	34
															132-180	80		1600	1555	1400	1355	46
450	874	755	351	202	410	380	562	317	397	642	1005	30	105	50	90-112	65	683	1500	1455	1350	1305	36
															132-180	80		1650	1605	1500	1455	48
500	957	827	380	221	457	425	632	357	437	712	1102	40	140	55	90-112	65	778	1600	1555	1450	1405	38
															132-180	80		1750	1705	1600	1555	50
															200	100		1850	1805	1700	1655	67
															90-112	65		1700	1655	1550	1505	40
560	1070	920	427	247	509	477	712	402	482	792	1147	40	170	64	132-180	80	821	1850	1805	1700	1655	53
															200	100		1950	1905	1800	1755	70
															90-112	80		1800	1755	1650	1605	52
630	1211	1026	479	291	574	550	802	452	532	882	1227	40	205	80	132-180	100	901	1950	1905	1800	1755	68
															200,225	120		2050	2005	1900	1855	82

1) Without motor/without baseframe without V-belt drive

*Mirror-inverted casing position

Dimensional and design changes reserved
2) please ask

Dimensions in mm



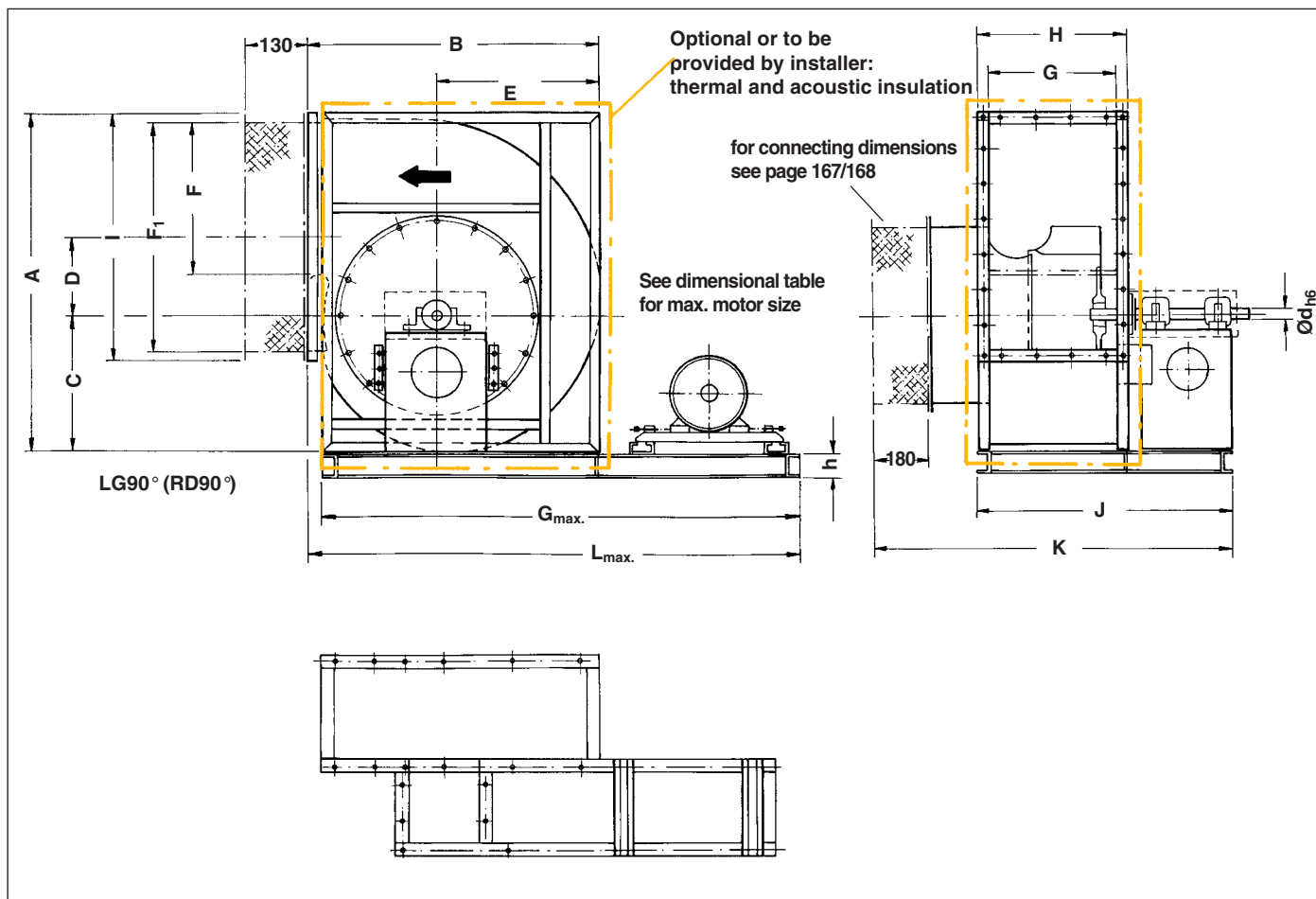
TLT-Turbo GmbH

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CENTRIFUGAL SMOKE EXHAUST FANS REH SERIES - SINGLE INLET SINGLE WIDTH MAIN DIMENSIONS SIZES 710 TO 1000

400°C - 120 MIN

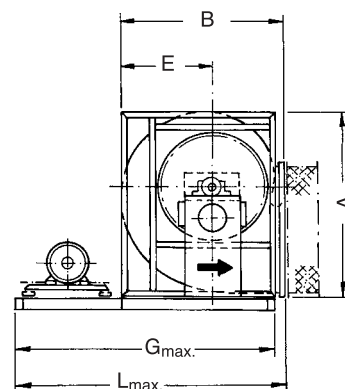
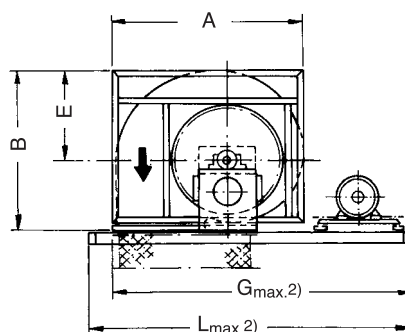
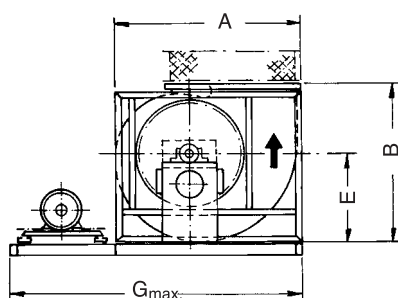
163



Casing position LG0° (RD0°)*

LG 180° (RD 180°)*

LG 270° (RD 270°)*



Size	A	B	C	D	E	F	F ₁	G	H	I	K	Ø _{d_{h6}}	appr. kg 1)	Insu- lation appr. kg	Motor sizes	h	J	0°		90°/270°		appr. kg
																		L _{max.}	G _{max.}	L _{max.}	G _{max.}	
710	1343	1153	539	313	647	600	899	502	586	983	1312	50	325	120	90-160	100	989	2100	2100	1900	1845	80
															180-225	140		2300	2300	2000	1945	120
800	1505	1290	604	359	726	673	999	559	643	1083	1369	50	390	180	90-160	100	1046	2200	2200	2100	2025	85
															180-225	140		2400	2400	2400	2325	130
900	1703	1445	674	407	811	755	1119	629	753	1243	1469	55	495	200	112-160	100	1156	2400	2400	2200	2135	95
															180-225	140		2600	2600	2400	2335	140
															250	160		3000	3000	2800	2735	160
															112-160	100		2600	2600	2400	2330	105
1000	1871	1576	746	438	894	848	1249	712	836	1373	1645	55	590	240	180-225	140	1337	2800	2800	2600	2530	160
															250	160		3200	3200	3000	2930	190

1) Without motor/without baseframe without V-belt drive

*Mirror-inverted casing position

Dimensional and design changes reserved
2) please ask

Dimensions in mm



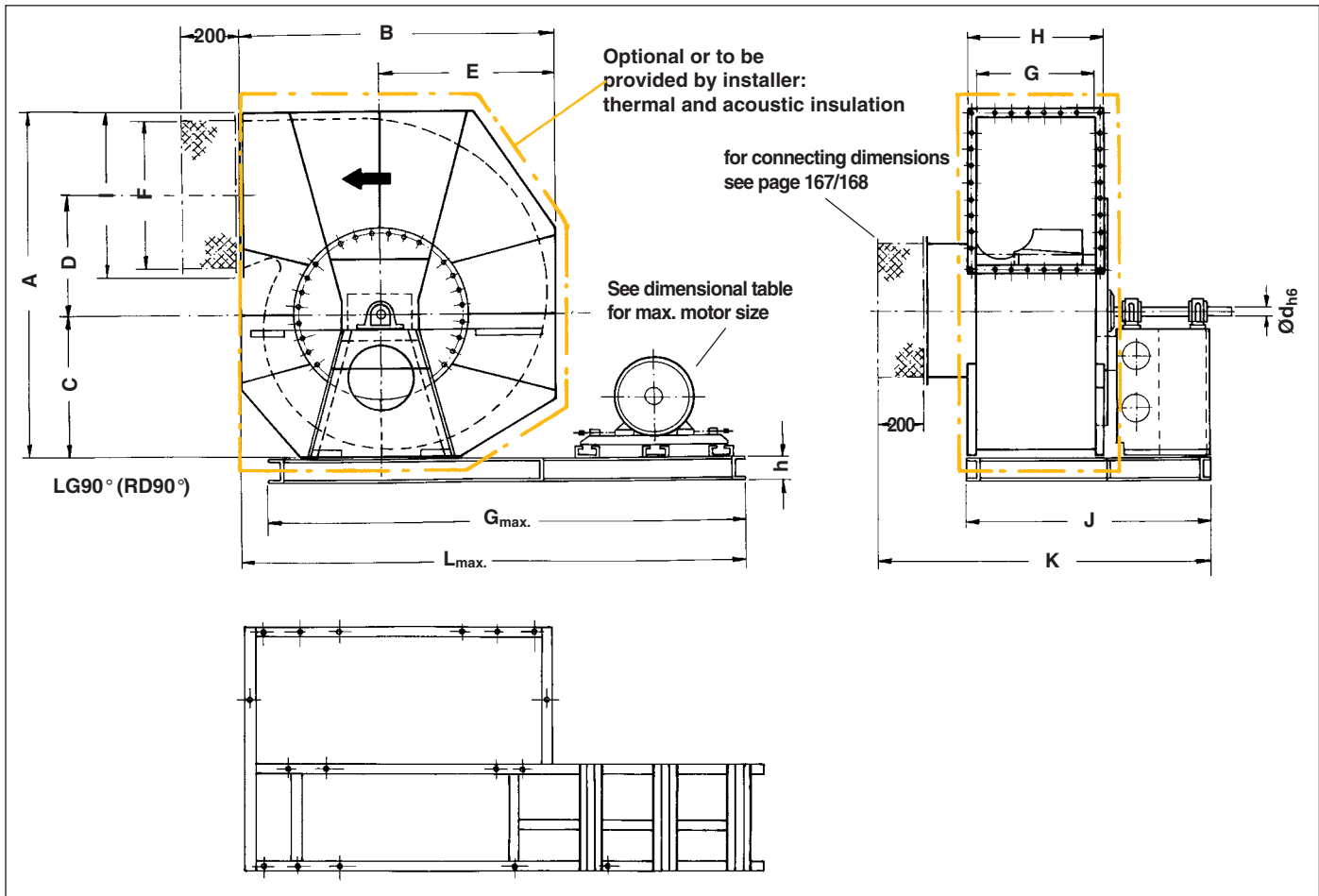
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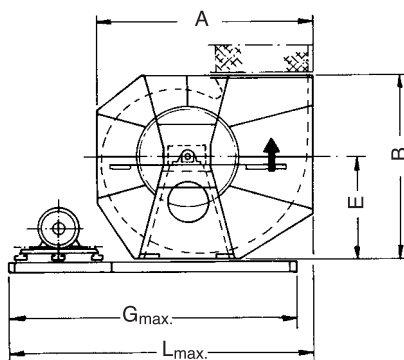
CENTRIFUGAL SMOKE EXHAUST FANS REH SERIES - SINGLE INLET SINGLE WIDTH MAIN DIMENSIONS SIZES 1120 TO 1600

400°C - 120 MIN

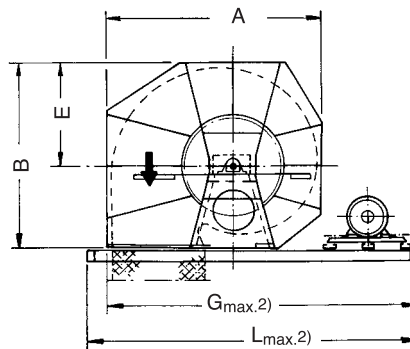
164



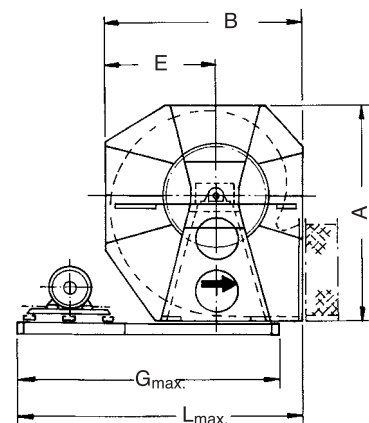
Casing position LG0° (RD0°)*



LG 180° (RD 180°)*



LG 270° (RD 270°)*



Size	A	B	C	D	E	F	G	H	I	K	Ød _{h6}	appr. kg ¹⁾	Isu- lation appr. kg	Motor sizes	h	J	L _{max.} 0°	G _{max.} 0°	L _{max.} 90°/270°	G _{max.} 90°/270°	appr. kg
1120	2350	2072	974	813	1162	1002	802	922	1124	1756	55	870	300	112-180	120	1436	3100	2970	2800	2670	155
														200-250	160		3300	3170	3100	2970	220
														280	180		3500	3370	3300	3170	260
1250	2625	2320	1088	911	1297	1122	902	1028	1248	2056	65	1170	330	160-180	120	1733	3400	3270	3100	2970	185
														200-250	160		3600	3470	3300	3170	260
														280	180		3800	3670	3500	3370	300
1400	2930	2600	1218	1023	1455	1252	1002	1128	1378	2137	70	1485	384	160-180	120	1834	3700	3570	3400	3270	200
														200-250	160		3900	3770	3600	3470	280
														280-315	180		4100	3970	3800	3670	325

1) Without motor/without baseframe without V-belt drive

*Mirror-inverted casing position

Dimensional and design changes reserved
2) please ask

Dimensions in mm



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CENTRIFUGAL SMOKE EXHAUST FANS

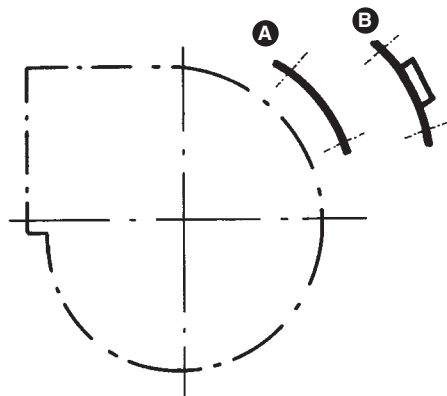
BV-REH SERIES

ACCESSORIES

165

Inspection hatch

Arranged in accordance with casing orientation. Available in two versions:



The inspection hatch meets accident prevention rules. It can only be opened by using tools.

The position of this hatch depends on casing orientation.

- A** Standard version, fitted with self-tapping screws.
- B** Industrial version with handle, attached via backwelded nuts and hexagonal head screws.

Drain connection

(Please specify casing orientation in purchase order).

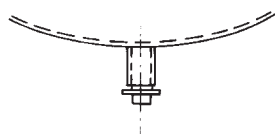
Fan sizes up to 1000:

R 1/2" female thread connection

Fan sizes of 1120 and higher:

R1" female thread connection

Fitted at lowest point of casing.

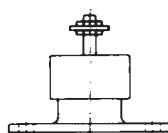


Shaft cover

for the exterior shaft end



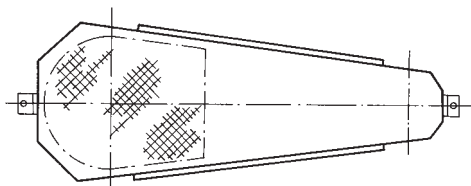
Antivibration mounts



Spring-type version

Please inquire reg. number and sizes.

Belt guard



Also available in horizontally split versions by special order.

Belt drive

Complete belt drive consists of the following components:

- 2 pulleys in accordance with DIN 2211
- 1 set of high-performance narrow V-belts according to DIN 7753
- ☐ Optionally: flat belt drive

Acoustic and thermal insulation for centrifugal smoke exhaust fans

- Mineral fibre mats, stitched with galvanized wire onto galvanized wire netting on one side
- Rigid support structure, 120 mm shell spacing
- Outer protective shell consisting of 1.0 mm gauge smooth sheet steel, galvanized on both sides. For outdoor installation, an additional protective lacquer coating is applied (for extra charge please see tariff).
- Connections are designed to facilitate dismantling and refitting. Horizontally and vertically split versions are available (for extra charge please see tariff).
- Technical details based on DIN 18421 and DIN 4102 standard specifications, respectively.
- Damping effect: approx. 12 dB (acoustic emission from fan casing)



BV-REH

For additional accessories refer to page 166 – 168

- Flexible connector
- Matching angular frame
- Matching flange
- Outlet box



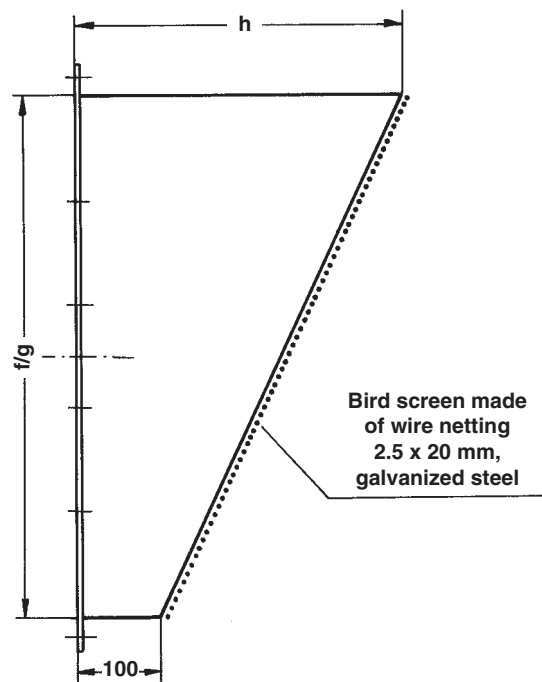
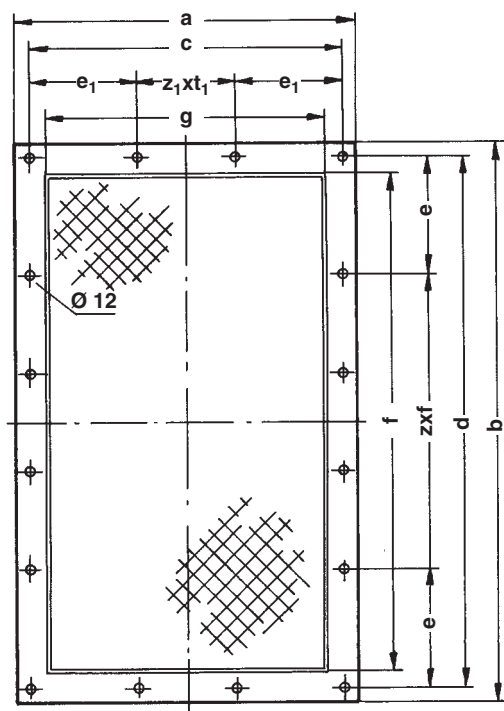
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CENTRIFUGAL SMOKE EXHAUST FANS BV-REH SERIES ACCESSORIES

166

Outlet box for outdoor installation (90° casing position)



Size	a	c	g	z ₁ xt ₁	e ₁	b	d	f	zxt	e	h				
400	362	326	282	-	163	582	546	502	3x125	85,5	334				
450	397	361	317	1x125	118	642	606	562	3x125	115,5	362				
500	437	401	357	1x125	138	712	676	632	3x125	150,5	395				
560	482	446	402	1x125	160,5	792	756	712	5x125	65,5	432				
630	532	496	452	3x125	60,5	882	846	802	5x125	110,5	474				
710	582	546	502	3x125	85,5	982	946	902	5x125	160,5	521				
800	642	606	562	3x125	115,5	1082	1046	1002	7x125	85,5	567				
900	752	702	632	3x125	163,5	1242	1192	1122	7x125	158,5	623				
1000	832	782	712	5x125	78,5	1372	1322	1252	9x125	98,5	684				
1120	922	872	802	5x125	123,5	1124	1072	1002	7x125	98,5	567				
1250	1022	972	902	5x125	173,5	1242	1192	1122	7x125	158,5	623				
1400	1122	1072	1002	7x125	98,5	1372	1322	1252	9x125	98,5	684				
1600	1242	1192	1122	7x125	158,5	1522	1472	1402	9x125	173,5	754				

Dimensions in mm



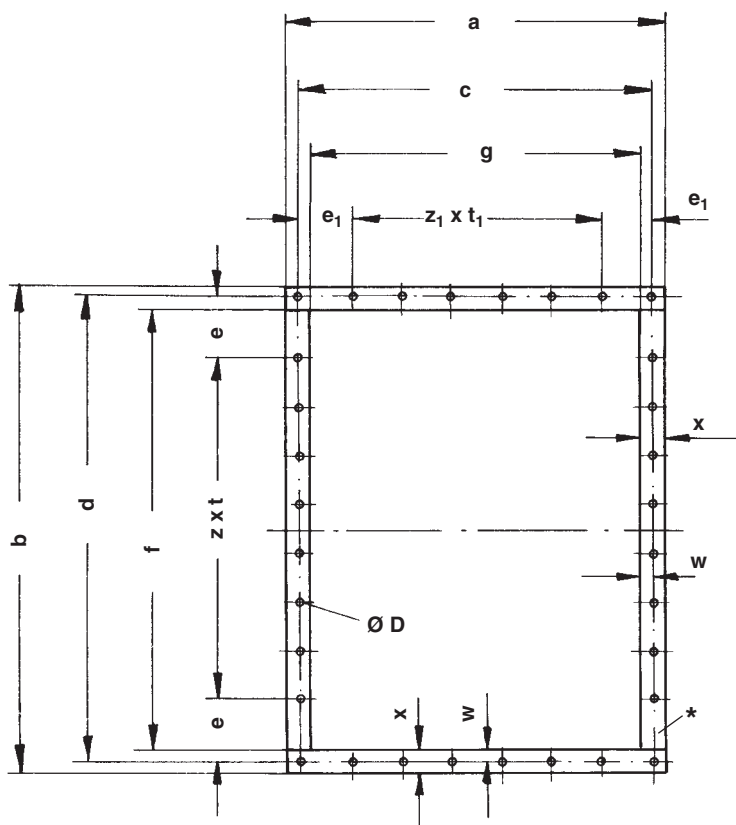
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CENTRIFUGAL SMOKE EXHAUST FANS REH SERIES - SINGLE INLET SINGLE WIDTH ACCESSORIES

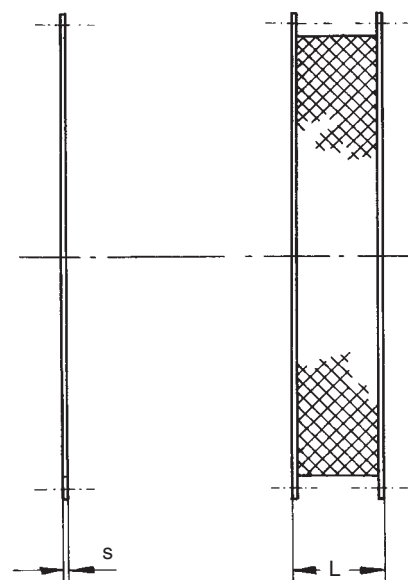
400°C-120 MIN

167



① Matching flange

② Flexible connector, rectangular



Size	a	c	g	$z_1 \times t_1$	e_1	b	d	f	$z \times t$	e	w	x	Ø D	s	L	① appr. (kg)	② appr. (kg)
400	362	326	282	—	163	582	546	502	3 x 125	85,5	22	40	12	4	130	8,0	4,0
450	397	361	317	1 x 125	118	642	606	562	3 x 125	115,5	22	40	12	4	130	8,5	5,0
500	437	401	357	1 x 125	138	712	676	632	3 x 125	150,5	22	40	12	4	130	9,0	5,0
560	482	446	402	1 x 125	160,5	792	756	712	5 x 125	65,5	22	40	12	4	130	10	6,0
630	532	496	452	3 x 125	60,5	882	846	802	5 x 125	110,5	22	40	12	4	130	12	6,0
710	582	546	502	3 x 125	85,5	982	946	902	5 x 125	160,5	22	40	12	4	130	12,5	7,0
800	642	606	562	3 x 125	115,5	1082	1046	1002	7 x 125	85,5	22	40	12	4	130	13	8,0
900	752	702	632	3 x 125	163,5	1242	1192	1122	7 x 125	158,5	35	60	12	6	130	15	20
1000	832	782	712	5 x 125	78,5	1372	1322	1252	9 x 125	98,5	35	60	12	6	130	17	23
1120	922	872	802	5 x 125	123,5	1124	1072	1002	7 x 125	98,5	35	60	12	4	200	18,5	7,0
1250	1022	972	902	5 x 125	173,5	1242	1192	1122	7 x 125	158,5	35	60	12	6	200	20	12
1400	1122	1072	1002	7 x 125	98,5	1372	1322	1252	9 x 125	98,5	35	60	12	6	200	23	13

* Burgert-Type

Dimensions in mm

BV-REH



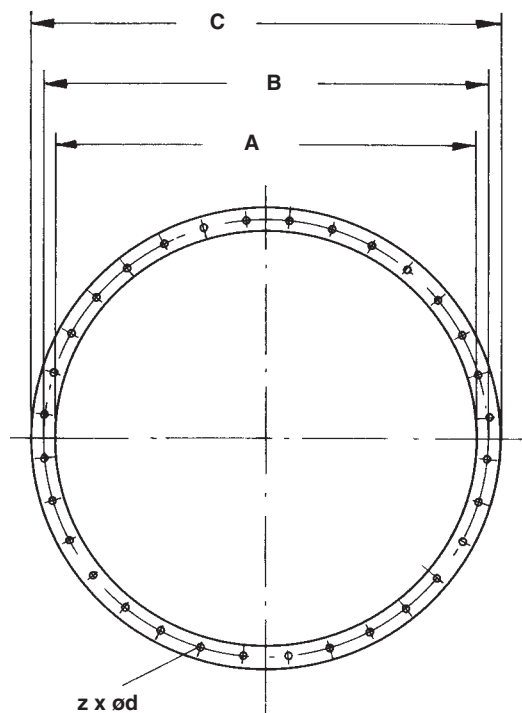
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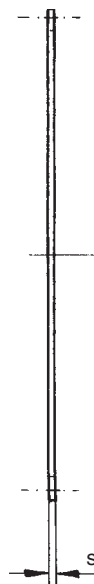
CENTRIFUGAL SMOKE EXHAUST FANS REH SERIES - SINGLE INLET SINGLE WIDTH ACCESSORIES

400°C-120 MIN

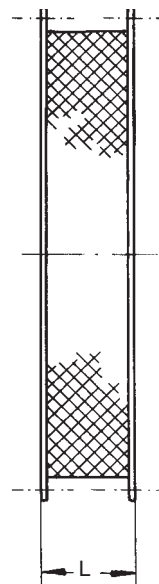
168



① Matching flange



② Flexible connector, round



Size	ØA	ØB	ØC	Z x ød	s	L								① appr. (kg)	② appr. (kg)
400	403	438	464	12 x 9,5	6	180								2,0	5,2
450	452	487	513	12 x 9,5	6	180								2,0	5,8
500	506	541	567	12 x 9,5	6	180								2,0	6,6
560	568	605	639	16 x 11,5	6	180								3,0	8,2
630	637	674	708	16 x 11,5	6	180								3,5	9,2
710	714	775	814	16 x 14	8	180								7,0	16,5
800	804	861	904	24 x 14	8	180								8,0	19,2
900	904	958	1004	24 x 14	8	180								9,0	21,3
1000	1005	1067	1105	24 x 14	8	180								10	23,8
1120	1005	1067	1105	24 x 14	8	200								10	25,8
1250	1125	1200	1245	32 x 18	10	200								17	26
1400	1255	1337	1375	32 x 18	10	200								19	40

Dimensions in mm



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CENTRIFUGAL SMOKE EXHAUST FANS BV-REH SERIES ACOUSTIC DATA

169

Acoustic level

The total acoustic power level L_{Wvent} of an axial-flow fan can be obtained directly from the characteristic data sheets for each operating point.

Starting from this value, the A-weighted acoustic power level L_{WA} and the relative acoustic power level L_{Wrel} can be determined using the tables below. These values are available as the acoustic power emitted into the duct and as the acoustic

power emitted from the fan inlet or outlet opening, respectively. The values given were taken from measurements as per EN 25136 (formerly DIN 45 635, Part 9) duct testing method.

Acoustic power level emitted into the duct

The level of acoustic power an axial-flow fan emits into the ducting is used for calculating the sound power characteristics of downstream systems, e.g., silencers. The levels are calculated as follows:

L_{Wvent} (dB) = total acoustic power emitted by the fan, (please see respective characteristic curve sheets)

L_{WAvent} (dB) = A-weighted acoustic power level, according to the equation

L_{WAvent} = L_{Wvent} - portion 1.1 (dB)

$L_{Wrelvent}$ (dB) = relative acoustic power level as expressed by the equation

$L_{WArelvent}$ = L_{Wvent} - portion 1.2 (dB)

Acoustic power emitted from the fan inlet or outlet opening

To determine the sound levels at a given installation site, it is usually necessary to know the level of acoustic power emitted from the fan's inlet or outlet opening. The tables below are based on the outlet reflection pattern assumed in VDI 2081, Case 2.

L_{WAop} (dB) = A-weighted level of acoustic power emitted from the fan's opening, expressed by the equation

L_{WAop} = L_{Wvent} - portion 2.1 (dB)

L_{Wrelop} (dB) = relative level of acoustic power emitted from the fan's opening, expressed by the equation

L_{Wrelop} = L_{Wvent} - portion 2.2 (dB)

$LWOp$ (dB) = Unweighted (linear) level of acoustic power emitted from the fan's opening, expressed by the equation

$LWOp$ = L_{Wvent} - portion 2.3 (dB)

Size	Fan Speed [rpm]	Portion 1.1	Portion 1.2 at mid-octave frequency [Hz]							
			63	125	250	500	1000	2000	4000	8000
400	1250	11	5	8	4	11	20	25	30	35
	1600	9	5	8	4	12	16	23	28	33
	2000	7	6	8	4	11	14	20	25	30
	2500	6	6	8	11	4	11	18	23	28
	3150	5	6	8	11	4	11	14	20	25
450	1120	12	5	3	9	14	20	25	30	35
	1400	10	5	8	4	11	18	23	28	33
	1800	8	5	8	4	11	14	20	25	30
	2240	7	6	8	4	11	13	18	23	28
	2800	5	6	9	11	4	10	15	20	25
500	1000	12	5	3	9	14	20	25	30	35
	1250	10	5	8	4	11	18	23	28	33
	1600	8	5	8	4	11	14	20	25	30
	2000	7	6	8	4	11	13	18	23	28
	2500	5	6	8	11	4	10	15	20	25
560	900	12	5	3	10	14	20	25	30	35
	1120	11	5	3	9	13	18	22	27	33
	1400	9	5	8	4	11	16	20	25	30
	1800	7	6	8	4	11	13	18	23	28
	2240	6	6	8	4	11	12	15	20	25
630	800	12	5	3	10	14	20	25	30	35
	1000	11	5	3	9	13	18	22	27	33
	1250	9	5	8	4	11	16	20	25	30
	1600	7	6	8	4	11	13	18	23	28
	2000	6	6	8	4	11	12	15	20	25
710	710	13	5	3	10	16	20	25	30	34
	900	11	5	3	10	13	18	22	27	33
	1120	10	5	3	9	12	16	20	25	30
	1400	8	6	8	4	10	14	18	22	28
	1800	7	6	8	4	11	12	15	20	25
800	630	13	5	3	10	16	20	25	30	35
	800	11	5	3	10	13	18	22	27	33
	1000	10	5	3	9	12	16	20	25	30
	1250	8	6	8	4	10	14	18	22	28
	1600	7	6	8	4	11	12	15	20	25
900	560	13	2	7	11	16	20	24	30	35
	710	12	5	3	10	14	17	22	27	32
	900	10	5	3	10	13	15	20	25	30
	1120	9	5	3	10	12	14	18	22	28
	1400	7	6	8	4	11	12	15	20	25
1000	500	13	2	7	11	16	20	24	30	35
	630	12	5	3	10	14	17	22	27	32
	800	10	5	3	10	13	15	20	25	30
	1000	9	5	3	10	12	14	18	22	28
	1250	7	6	8	4	11	12	15	20	25
1120	450	12	1	9	12	14	16	21	26	31
	560	10	2	9	12	13	14	19	24	29
	710	8	10	2	10	13	13	16	21	26
	900	7	10	2	10	12	11	14	19	24
	1120	6	10	2	11	12	11	12	16	21
1250	400	12	1	9	12	14	16	21	26	31
	500	10	2	9	12	13	14	19	24	29
	630	9	2	9	12	13	13	16	21	26
	800	7	10	2	10	13	11	14	19	24
	1000	6	10	2	11	13	11	12	16	21
1400	355	12	1	9	12	14	16	21	26	31
	450	10	2	9	12	13	14	19	24	29
	560	9	2	9	12	13	13	16	21	26
	710	7	10	2	10	13	11	14	19	24
	900	6	10	2	11	13	11	12	16	21

Size	Fan Speed	Portion	Portion 2.2 at mid-octave frequency [Hz]								Portion
	[rpm]	2.1	63	125	250	500	1000	2000	4000	8000	2.3
400	1250	12	18	15	7	12	20	25	30	35	5
	1600	10	18	15	6	12	16	23	18	33	4
	2000	8	18	15	6	11	14	20	25	30	3
	2500	6	19	15	13	5	11	18	23	28	3
	3150	5	19	15	13	5	11	14	20	25	2
450	1120	13	17	8	11	15	20	25	30	35	5
	1400	11	17	14	7	11	18	23	28	33	4
	1800	9	17	14	6	11	14	20	25	30	3
	2240	7	18	14	5	11	13	18	23	28	3
	2800	6	18	14	13	5	10	15	20	25	2
500	1000	13	16	7	11	15	20	25	30	35	4
	1250	11	16	13	6	11	18	23	28	33	4
	1600	9	16	13	5	11	14	20	25	30	3
	2000	7	17	13	5	11	13	18	23	28	3
	2500	6	17	14	12	5	10	15	20	25	2
560	900	13	15	7	11	14	20	25	30	35	5
	1120	11	15	7	10	13	18	22	27	33	4
	1400	10	15	12	6	11	16	20	25	30	3
	1800	8	16	13	5	11	13	18	23	28	3
	2240	6	16	13	5	11	12	15	20	25	2
630	800	13	14	7	11	14	20	25	30	35	4
	1000	11	14	6	10	13	18	22	27	33	3
	1250	9	14	12	5	11	16	20	25	30	3
	1600	8	15	12	5	11	13	18	23	28	2
	2000	6	15	12	5	11	12	15	20	25	2
710	710	14	13	7	10	16	20	25	30	35	4
	900	12	13	6	10	13	18	22	27	33	3
	1120	10	13	6	10	12	16	20	25	30	3
	1400	8	13	11	5	10	14	18	22	28	2
	1800	7	14	11	5	11	12	15	20	25	2
800	630	13	12	6	10	16	20	25	30	35	4
	800	12	12	6	10	13	18	22	27	33	3
	1000	10	12	5	8	12	16	20	25	30	2
	1250	8	13	11	5	10	14	18	22	28	2
	1600	7	13	11	4	11	12	15	20	25	2
900	560	14	7	9	11	16	20	24	30	35	4
	710	12	11	6	10	14	17	22	27	32	3
	900	10	11	5	10	13	15	20	25	30	2
	1120	9	12	5	10	12	14	18	22	28	2
	1400	7	12	10	5	11	12	15	20	25	2
1000	500	14	6	9	11	16	20	24	30	35	3
	630	12	10	5	10	14	17	22	27	32	3
	800	10	10	5	10	13	15	20	25	30	2
	1000	9	11	4	10	12	14	18	22	28	2
	1250	7	11	10	4	11	12	15	20	25	1
1120	450	12	4	10	12	14	16	21	26	31	2
	560	10	4	10	12	13	14	19	24	29	2
	710	9	13	3	10	13	13	16	21	26	1
	900	7	13	3	10	12	11	14	19	24	1
	1120	6	13	3	11	12	11	12	16	21	—
1250	400	12	5	10	12	14	16	21	26	31	2
	500	10	4	10	12	13	14	19	24	29	2
	630	9	3	10	12	13	13	16	21	26	1
	800	7	12	3	11	13	11	12	16	21	1
	1000	6	13	3	11	13	11	12	16	21	—
1400	355	12	4	10	12	14	16	21	26	31	2
	450	10	4	10	12	13	14	19	24	29	2
	560	9	3	10	12	13	11	14	19	24	1
	710	7	12	3	10	13	11	14	19	24	1
	900	6	12	3	11	13	11	12	16	21	—



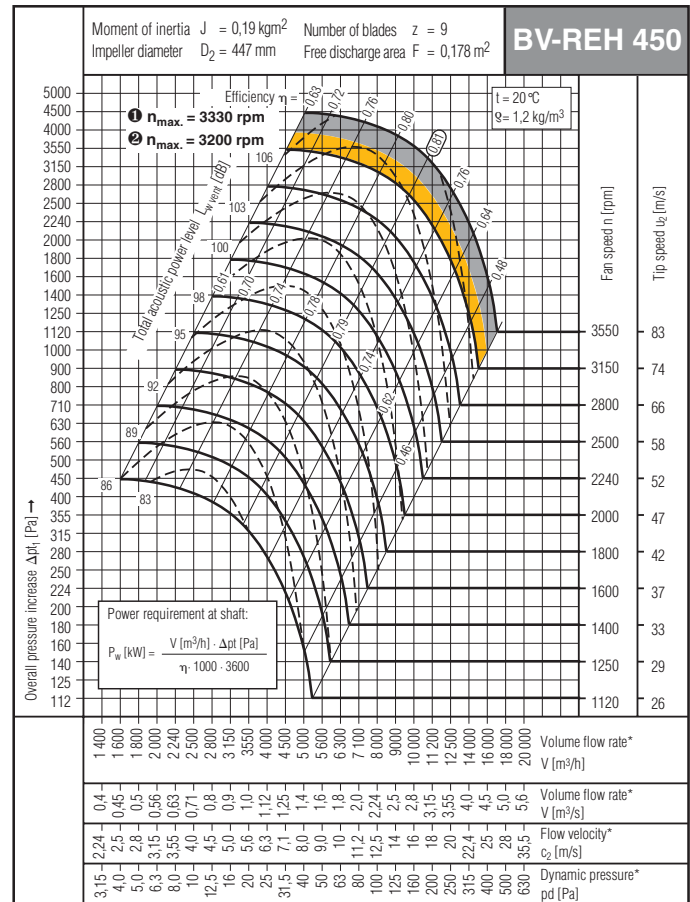
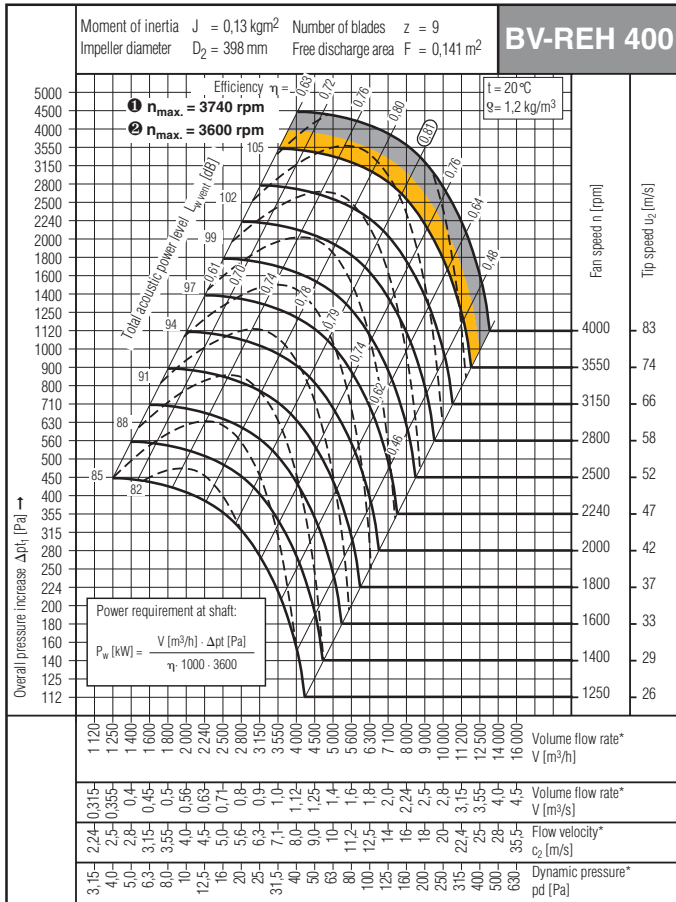
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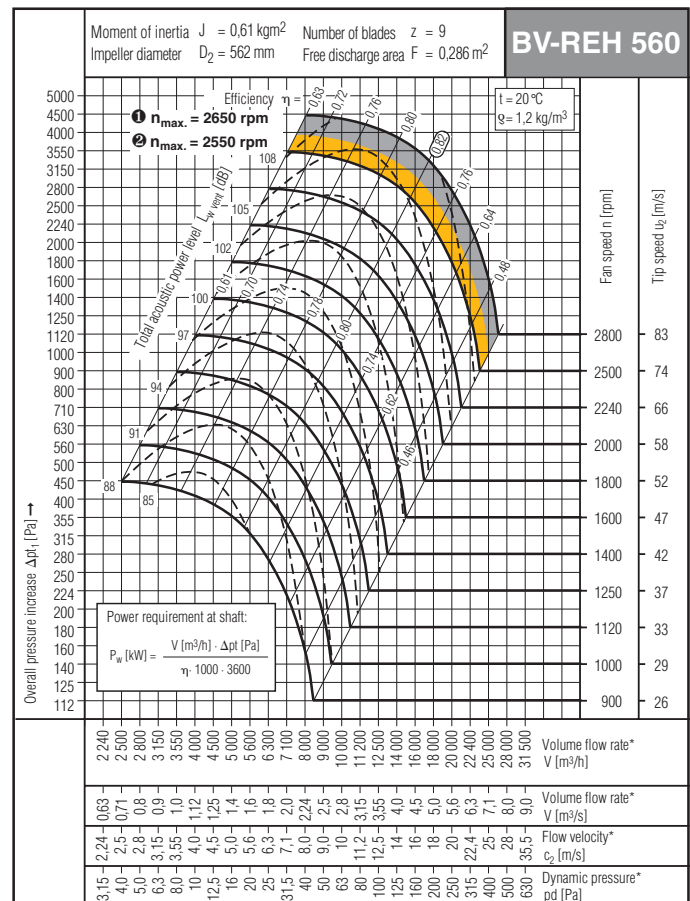
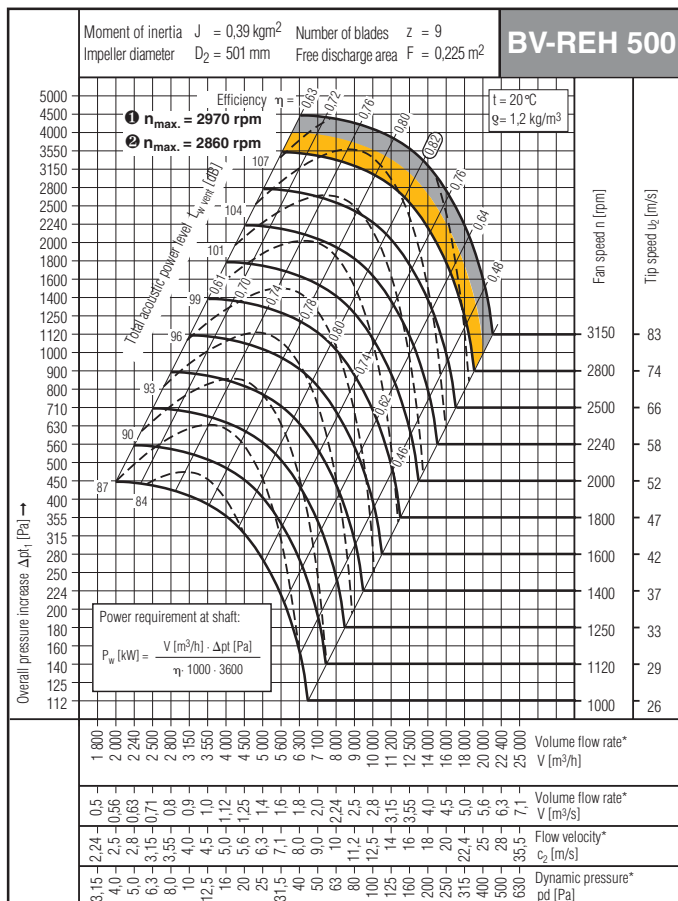
CENTRIFUGAL SMOKE EXHAUST FANS REH SERIES - SINGLE INLET SINGLE WIDTH

400°C - 120 MIN

170



① n_{max} if only used in case of fire / ② n_{max} if used for ventilation (continuous service). Do not select in grey screened fields



* values rounded to standard figures



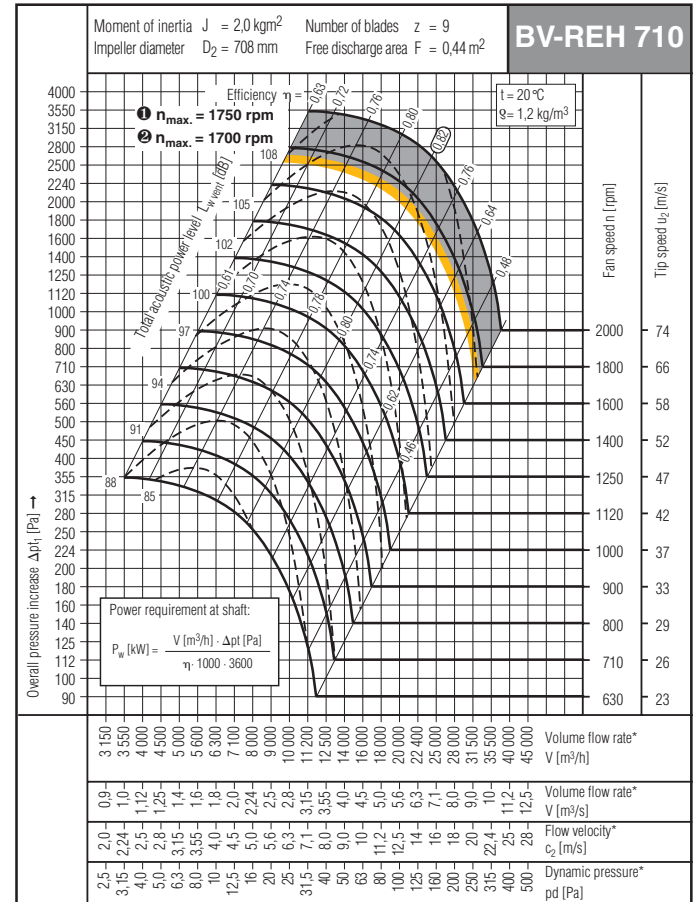
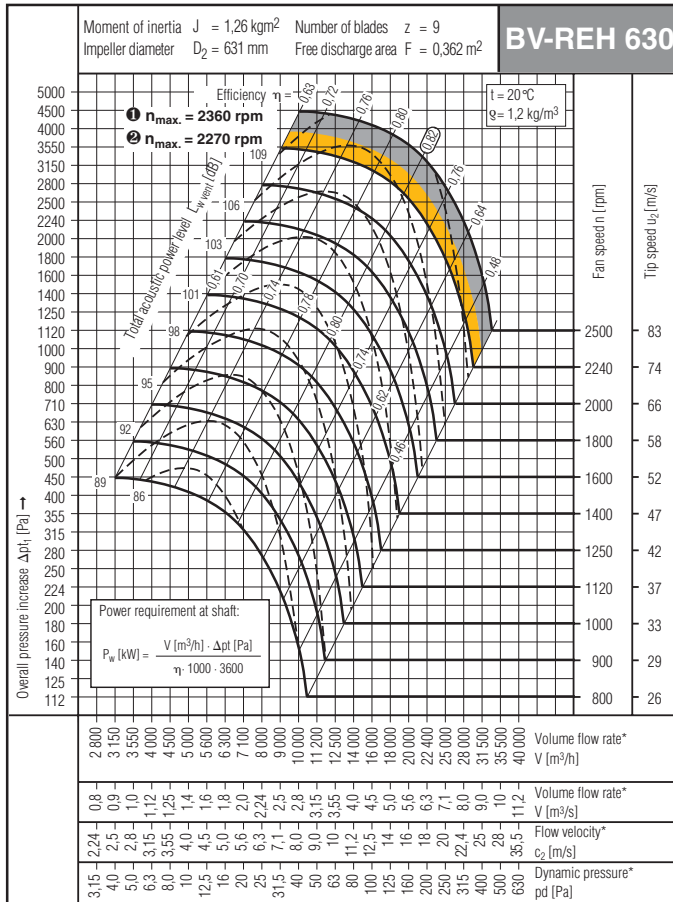
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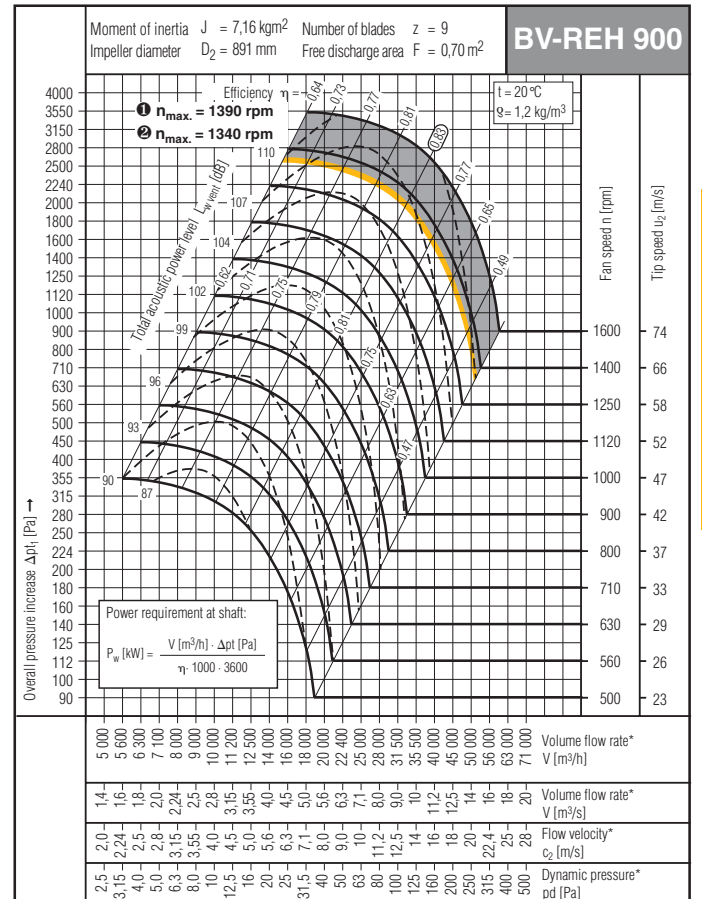
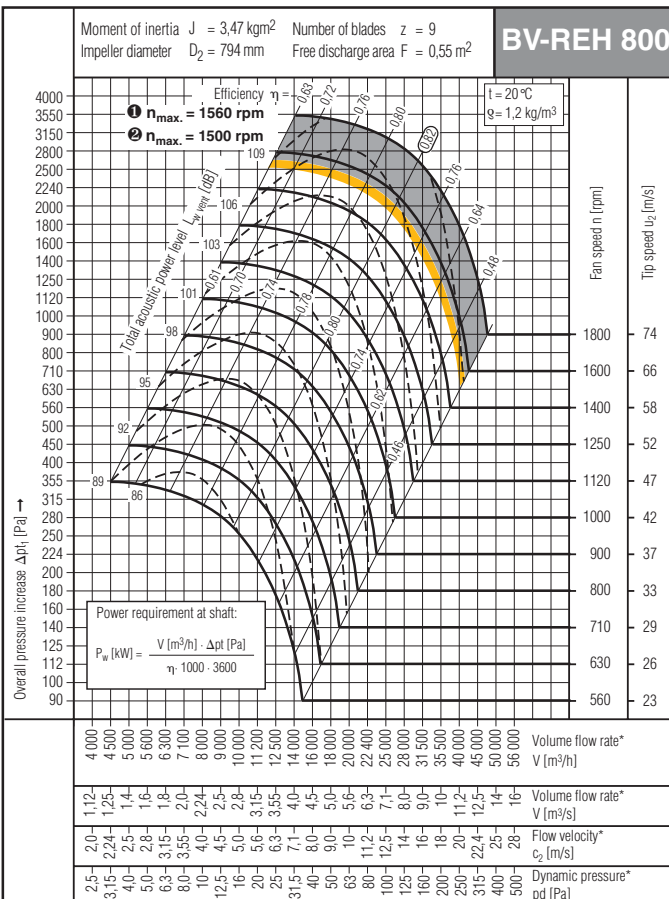
CENTRIFUGAL SMOKE EXHAUST FANS REH SERIES - SINGLE INLET SINGLE WIDTH

400°C - 120 MIN

171



① n_{max} if only used in case of fire / ② n_{max} if used for ventilation (continuous service). Do not select in grey screened fields



* values rounded to standard figures

BV-REH



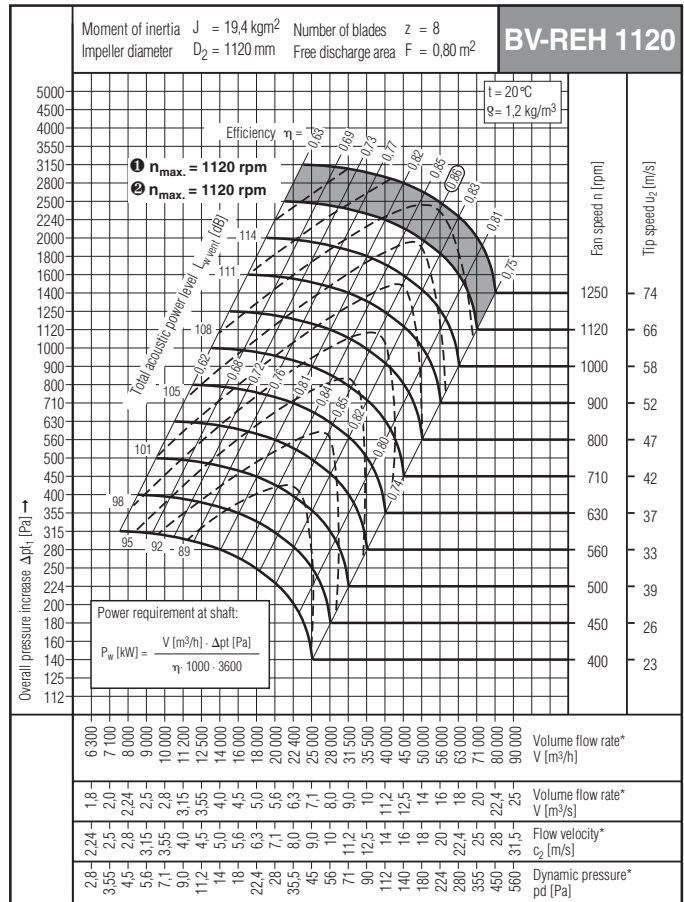
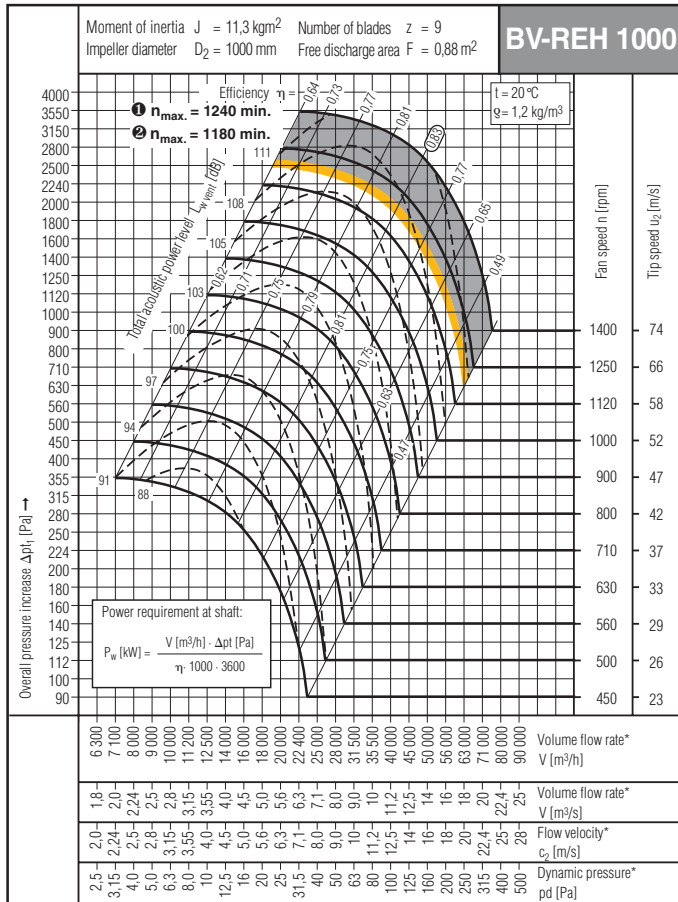
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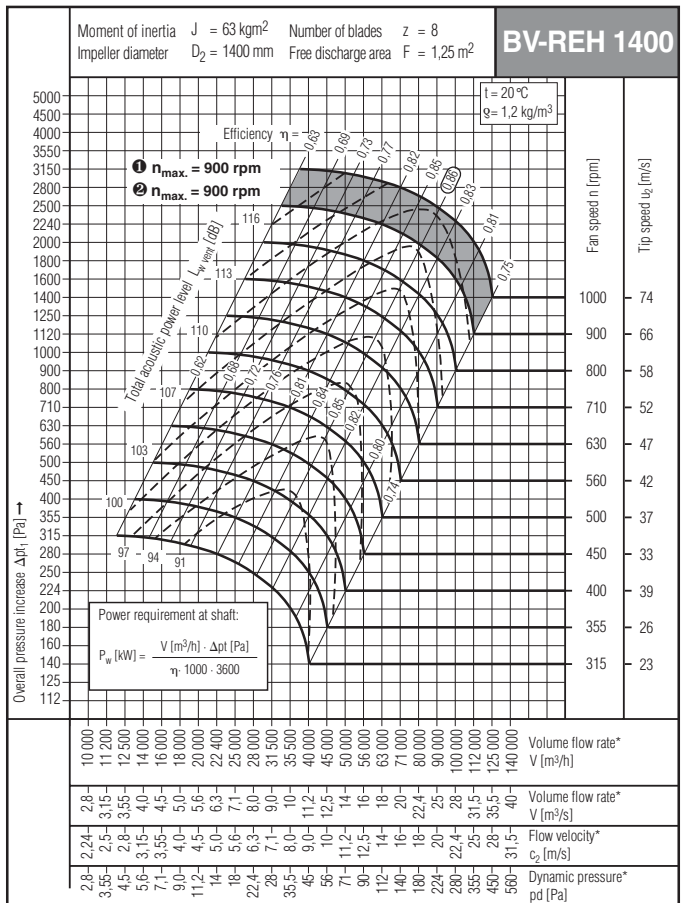
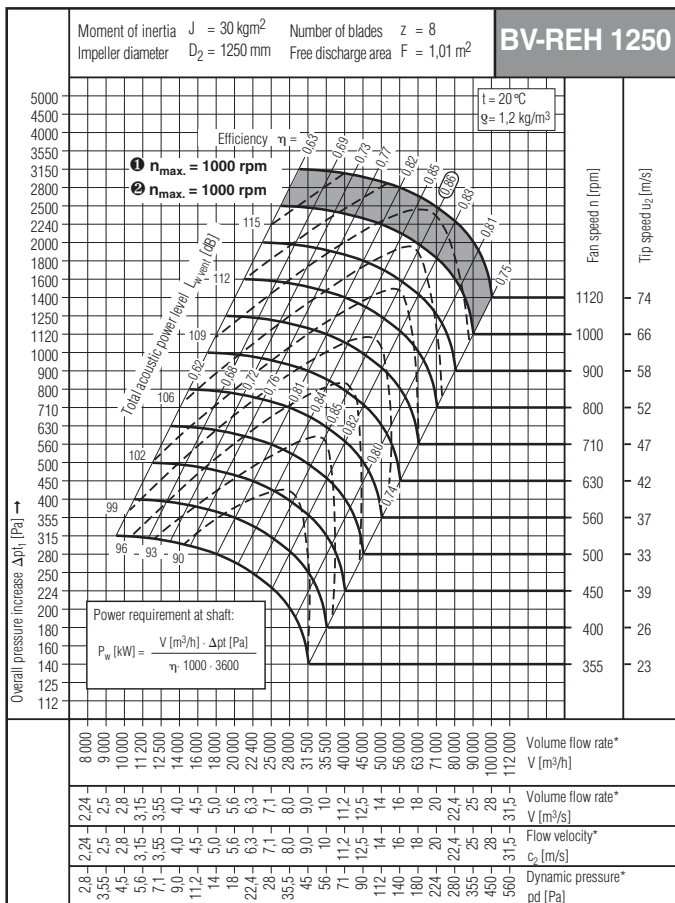
CENTRIFUGAL SMOKE EXHAUST FANS REH SERIES - SINGLE INLET SINGLE WIDTH

400°C - 120 MIN

172



① n_{max} if only used in case of fire / ② n_{max} if used for ventilation (continuous service). Do not select in grey screened fields



* values rounded to standard figures

Lfd. Nr.	Qty.	Description	Unit price €	Total €
		Centrifugal Smoke Exhaust Fan, BV-REH series		
		for the extraction of smoke fumes tested to EN 12101, Part 3 for 400 °C – 120 min. with Technical University of Munich consultancy report No. 98/1196-4 for installation outside the fire compartment. – Casing of rugged, welded construction. From size 1120 upwards a horizontally split casing is standard, from size 1250 upwards all casings are split in two planes. – High-performance impeller of welded steel construction, with backward curved blades, energy-optimized for maximum efficiency. – Rounded-edge inlet nozzle made of flow formed sheet steel, aerodynamically matched to impeller – Shaft with DIN 6885/1 keyway and key, Tectyl-coated. Shaft impeller in two self-aligning ball (or roller) bearings mounted in split cast-iron bearing pedestals, Regreasable optionally with fan stationary or running. – Impeller with Taperlock hub and shaft jointly balanced to DIN ISO 1940 – G2.5 standard. Fitted on a rugged bearing. – Baseframe made of torsion-resistant U-section steel, welded construction, to support the fan with bearing pedestal and motor, including motor tensioning rails as V-belt tensioning device. – Outlet frame and inlet flange integrated into the casing and inlet nozzle, respectively. Connecting dimensions in accordance with DIN 24193 – Series 2 (Euro standard) or DIN 24154, Series 3. – Surface finished with powder coating or high-grade 1-component synthetic coating.		
		Carryover		

Item No.	Qty.	Description	Unit price €	Total €
		Specifications Volume flow m³/h Temperature 20°C Total pressure increase Pa Dynamic pressure Pa Fan speed rpm Efficiency % Shaft power input requirement kW Total acoustic pressure level L_w dB Motor output kW Motor speed rpm Motor current rating A Voltage V Frequency Hz Weight kg Manufacturer: TLT-Turbo GmbH Type: BV-REH Accessory equipment: • Standard three-phase motor, style B3 with terminal box, protection class IP55 / ISO Cl. F, motor protection • Flexible connector for 400°C (inlet/outlet) • Flat flange (inlet) • Angular frame (outlet) • Spring-type antivibration mounts for 400°C • Inspection hatch • Condensate drain • Lubricant line (bearings re-greasable in operation) • V-belt drive (narrow type V-belt) • V-belt guard • RPM measuring orifice in V-belt guard • Fan suitable for outdoor installation • Thermal and acoustic insulation of fan casing Note: Please observe our Installation, Operating and Maintenance Instructions (available upon request).		
		Carryover		

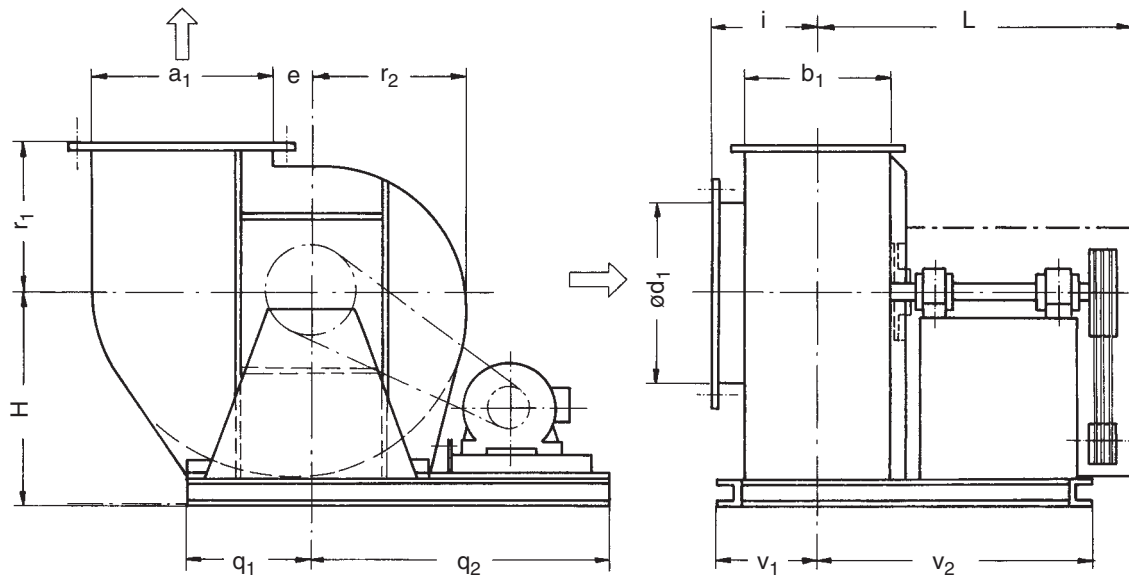


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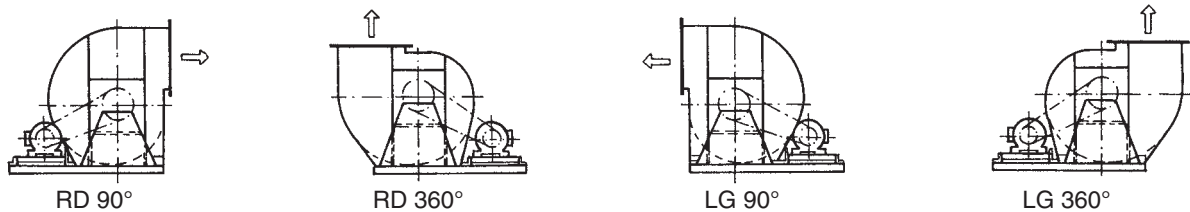
CENTRIFUGAL SMOKE EXHAUST FANS **BVRA SERIES** **MAIN DIMENSIONS - WITHOUT INSULATION** **620°C – 90 MIN**

175



(up to $\Delta p_t = 1800$ Pa / as from 1800 - 2400 Pa subject to extra charge)

Casing orientations / Directions of rotation (viewed from drive side)



Fan size	Max. motor size	a_1	b_1	ϕd_1	r_2	r_1	a_1+e	H 360°	H 90°	v_1+v_2	v_1	q_2	q_1	L	i	Weight w/o motor [kg]
180	90	183	146	183	172	175	216	242	220	576	113	550	150	510	173	36
200	90	205	164	205	190	190	240	260	235	594	122	580	150	520	182	40
	100													550		43
224	90	229	183	229	210	205	270	285	255	613	132	580	150	530	192	50
	112													560		53
250	100	256	205	256	230	220	300	310	275	645	143	650	175	550	203	55
	132													630		60
280	112	288	229	288	268	264	336	350	315	710	155	650	180	585	215	60
	132													660		70
315	112	322	256	322	284	266	380	380	330	736	168	650	190	620	228	80
	132													725		110
355	112	361	288	361	318	292	430	425	370	782	188	650	230	650	244	100
	160M													800		125
400	132S	404	322	404	360	330	480	480	430	892	211	810	290	730	261	130
	160M													900		170
450	132S	453	361	453	396	354	540	520	450	981	230	850	320	800	281	155
	160L													950		205
500	132M	507	404	507	450	405	600	590	520	1004	252	880	330	800	312	180
	180M													980		220
560	160M	569	453	569	500	450	670	650	570	1143	282	950	400	920	327	250
	180L													1110		320
630	160L	638	507	638	550	480	760	720	620	1237	309	1050	430	1000	354	300
	200													1250		360
710	180M	715	569	715	620	535	860	820	710	1260	330	1150	500	1000	385	390
	225S													1260		485
800	180L	801	638	801	690	590	960	930	795	1413	369	1200	550	1120	419	460
	225M													1300		513
900	200	898	715	898	780	665	1080	1040	885	1585	408	1300	570	1270	458	720
	250M													1480		805
1000	225S	1007	801	1007	870	740	1200	1140	980	1802	451	1300	610	1480	520	850
	280S													1800		1020
1120	250M	1130	898	1130	984	836	1360	1300	1109	2008	504	1400	650	1650	569	1040
	280M													1700		1400
1250	250	1267	1007	1267	1100	930	1520	1450	1240	2127	559	1450	700	1720	624	1300
	315S													2010		1865
1400	315M	1421	1130	1421	1250	1040	1721	1650	1410	2450	630	2025	800	2000	685	2400

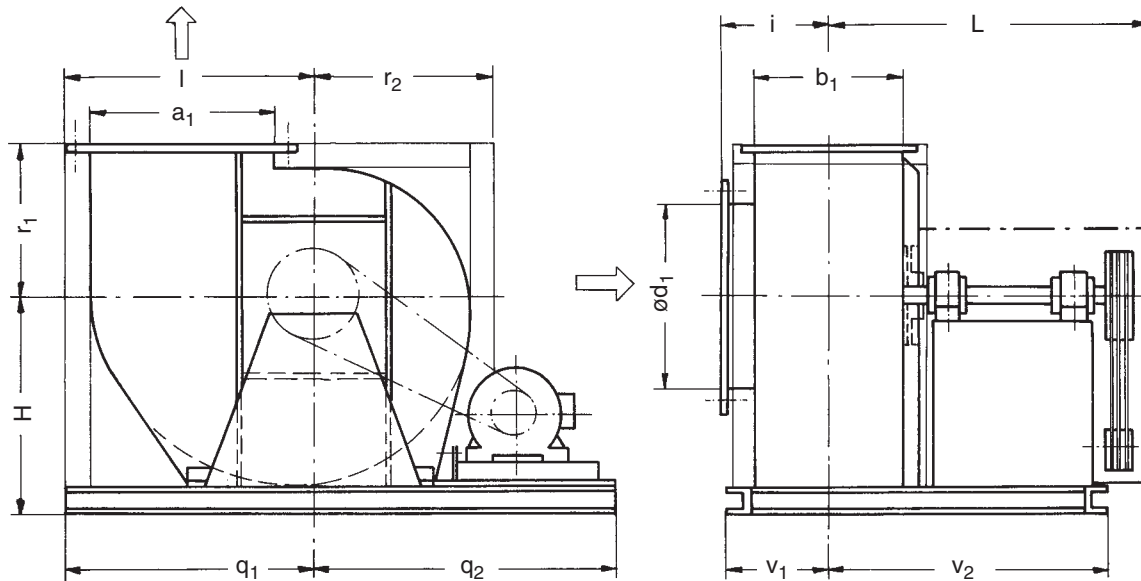


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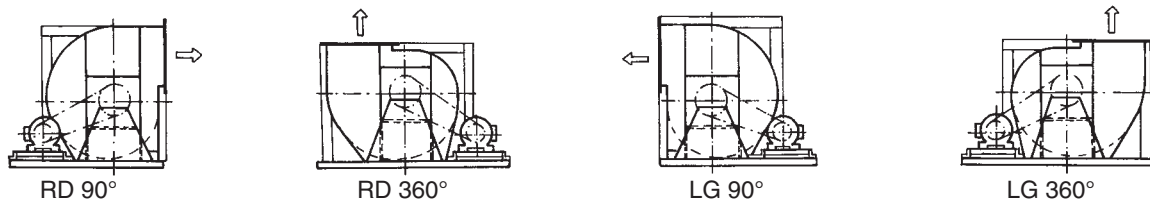
CENTRIFUGAL SMOKE EXHAUST FANS **BVRA SERIES** **MAIN DIMENSIONS - INCLUDING INSULATION** **620°C – 90 MIN**

176



(up to $\Delta p_t = 1800$ Pa / as from 1800 - 2400 Pa subject to extra charge)

Casing orientations / Directions of rotation (viewed from drive side)



Fan size	Max. motor size	a_1	b_1	ϕd_1	r_2	r_1	l	H_{360°	H_{90°	v_1+v_2	v_1	q_2	q_1	L	i	Weight w/o motor [kg]
180	90	183	146	183	212	175	256	242	220	631	128	605	296	510	173	60
200	90	205	164	205	230	190	280	260	235	644	137	605	320	520	182	65
	100									719				590		69
224	90	229	183	229	250	205	310	285	255	663	152	605	350	530	192	80
	112									723				590		85
250	112	256	205	256	270	220	340	310	275	725	163	670	380	595	203	90
	132									825				695		95
280	112	288	229	288	290	245	360	330	315	749	175	680	400	620	215	100
	132									880		720		750		113
315	112	322	256	322	324	266	420	380	330	806	188	720	463	660	228	130
	132M									890				755		135
355	112	361	288	361	358	292	470	425	370	838	204	720	510	670	244	160
	160M									943				775		170
400	132S	404	322	404	360	330	520	480	430	942	221	840	570	760	261	205
	160M									1080				890		218
450	132S	453	361	453	436	354	580	520	450	981	241	840	630	780	281	245
	160L									1141				940		270
500	132M	507	404	507	490	405	640	590	520	1069	262	880	695	860	312	295
	180M									1199				990		320
560	160M	569	453	569	540	450	710	650	570	1198	287	880	765	950	327	390
	180L							670	590	1300	277	945	755	1050		430
630	160L	638	507	638	590	480	800	720	620	1252	319	1010	855	1000	354	470
	200							740	640	1427		1020	845	1090		500
710	180M	715	569	715	660	535	900	820	710	1339	345	1035	945	1050	385	600
	225S							840	730	1500		1050	950	1330		640
800	180L	801	638	801	730	590	1000	930	795	1443	379	1100	1050	1120	419	720
	225M									1625				1430		750
900	180L	898	715	898	820	665	1120	1040	885	1520	418	1150	1170	1170	458	1045
	225S									1650				1300		1065
	250M							1060	905	1850	423			1500		1100
	225S									1681				1330		1240
1000	250M	1007	801	1007	910	740	1240	1160	1000	1861	461	1170	1295	1510	520	1260
	280S							1180	1020	2050	466	1430		1750		1280
1120	250M	1130	898	1130	1026	836	1402	1340	1135	1986	519	1340	1465	1530	569	1545
	280M									2115				1780		1700
1250	280S	1267	1007	1267	1142	930	1562	1480	1270	2235	574	1625	1627	1736	624	2060
	315S									2297				1895		2150
1400	315M	1421	1130	1421	1282	1040	1762	1670	1430	2525	640	1800	1832	2050	685	2550

Dimensional changes reserved.

Dimensions in mm



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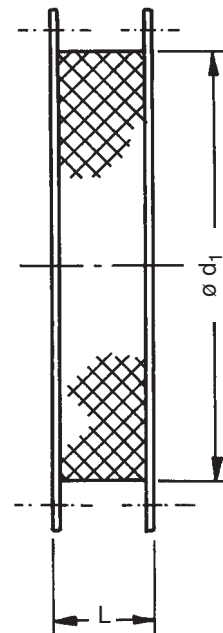
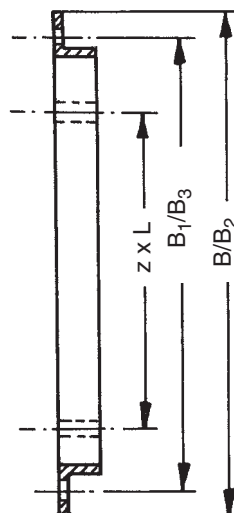
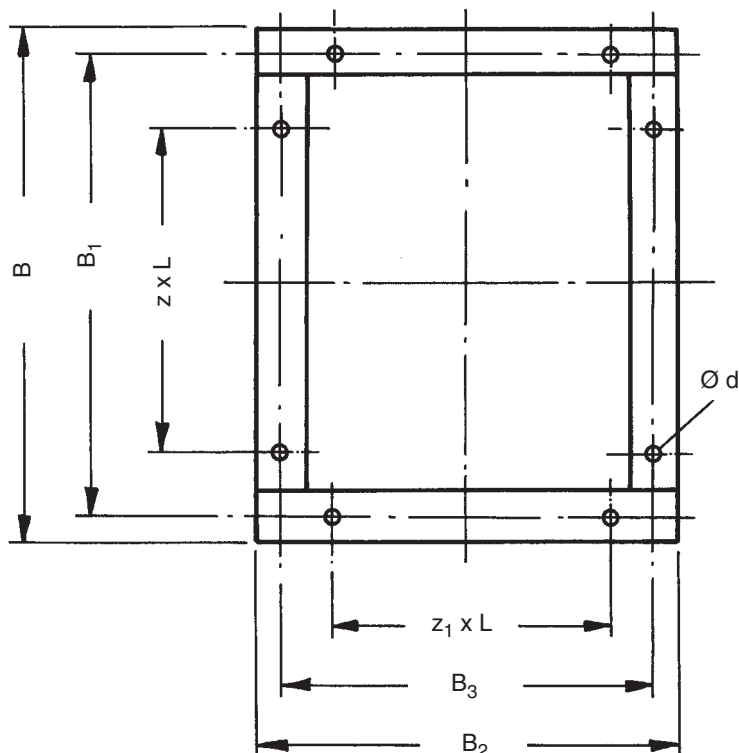
CENTRIFUGAL SMOKE EXHAUST FANS BVRA SERIES ACCESSORIES

620°C – 90 MIN

177

**Outlet side angular frame
(matching frame)**

**Flexible connector
(rectangular)**



Length of Flexible Connector: „L“
up to size 450 = 150 mm
as from size 500 = 200 mm

Size	B	B ₁	B ₂	B ₃	z x L	z ₁ x L	Ød	Ød ₁
180	233	213	196	176	1 x 100	1 x 100	9,5	183
200	255	235	241	194	1 x 112	1 x 112	9,5	205
224	279	259	233	213	1 x 112	1 x 112	9,5	229
250	306	286	255	235	2 x 112	1 x 112	9,5	256
280	348	322	289	263	2 x 112	1 x 112	9,5	288
315	382	356	316	290	2 x 125	1 x 125	9,5	322
355	421	395	348	322	2 x 125	2 x 125	9,5	361
400	464	438	382	356	3 x 125	2 x 125	9,5	404
450	513	487	421	395	3 x 125	2 x 125	9,5	453
500	567	541	464	438	3 x 125	3 x 125	9,5	507
560	639	605	523	489	3 x 160	2 x 160	11,5	569
630	708	674	577	543	3 x 160	2 x 160	11,5	638
710	785	751	639	605	4 x 160	3 x 160	11,5	715
800	871	837	708	674	3 x 200	3 x 200	11,5	801
900	968	934	785	751	4 x 200	3 x 200	11,5	898
1000	1077	1043	871	837	4 x 200	2 x 200	11,5	1007
1120	1210	1174	978	942	5 x 200	4 x 200	11,5	1130
1250	1347	1311	1087	1051	6 x 200	4 x 200	11,5	1267
1400	1501	1465	1210	1174	7 x 200	5 x 200	11,5	1421



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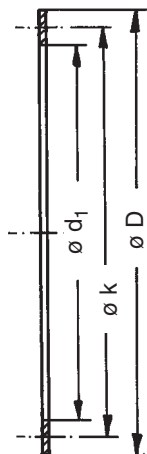
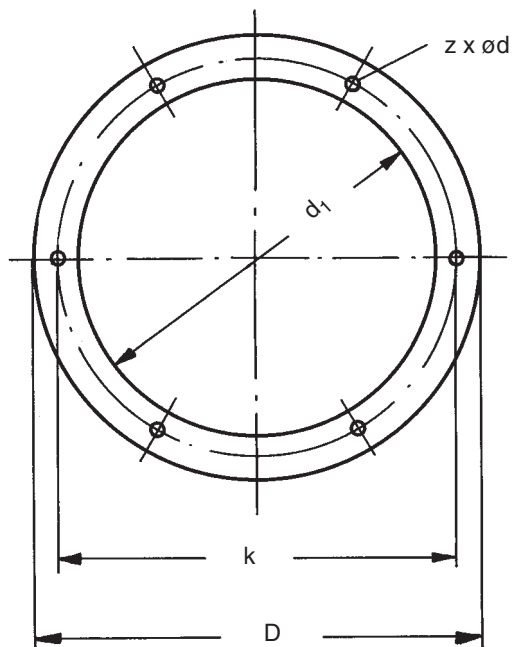
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CENTRIFUGAL SMOKE EXHAUST FANS BVRA SERIES ACCESSORIES

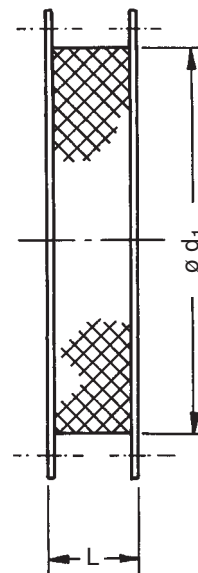
620°C – 90 MIN

178

**Inlet side flange
(matching flange)**



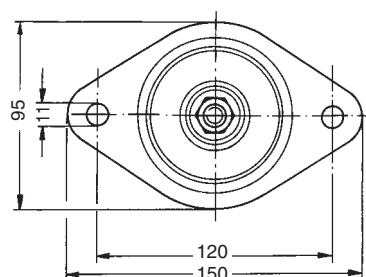
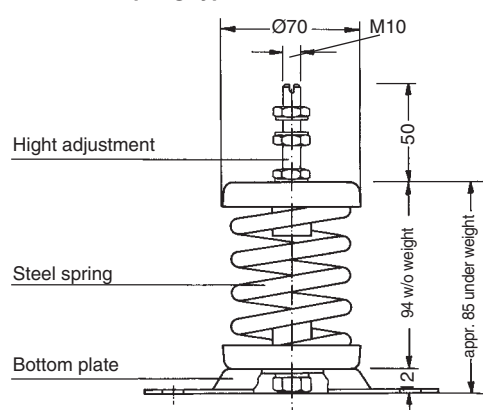
**Flexible connector
(round)**



Length of Flexible Connectors: „L“
up to size 450 = 150 mm
as from size 500 = 200 mm

Size	Ød ₁	Øk	ØD	z x Ød
180	183	213	233	6 x 9,5
200	205	235	255	6 x 9,5
224	229	259	279	6 x 9,5
250	256	286	306	6 x 9,5
280	288	322	348	8 x 9,5
315	322	356	382	8 x 9,5
355	361	395	421	8 x 9,5
400	404	438	464	12 x 9,5
450	453	487	513	12 x 9,5
500	507	541	567	12 x 9,5
560	569	605	639	16 x 11,5
630	638	674	708	16 x 11,5
710	715	751	785	16 x 11,5
800	801	837	871	24 x 11,5
900	898	934	968	24 x 11,5
1000	1007	1043	1077	24 x 11,5
1120	1130	1174	1210	24 x 11,5
1250	1267	1311	1347	24 x 11,5
1400	1421	1485	1501	24 x 11,5

Spring-type anti-vibration mounts





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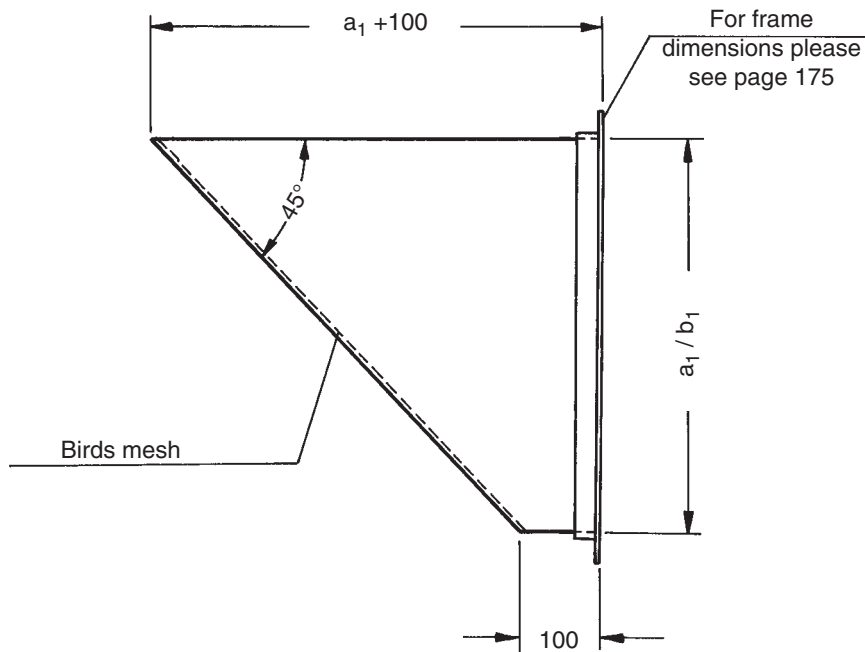
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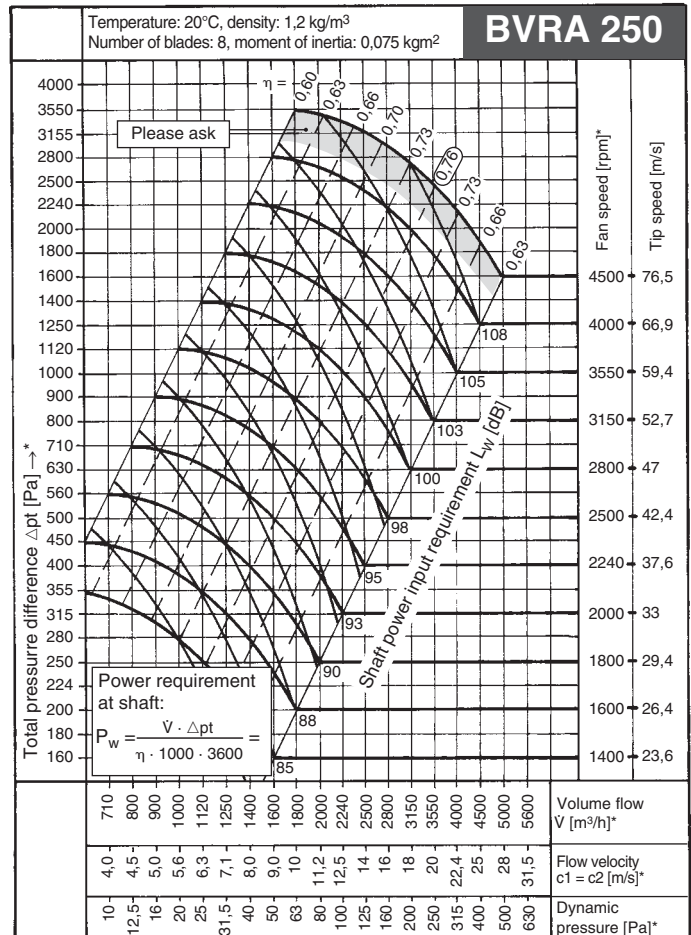
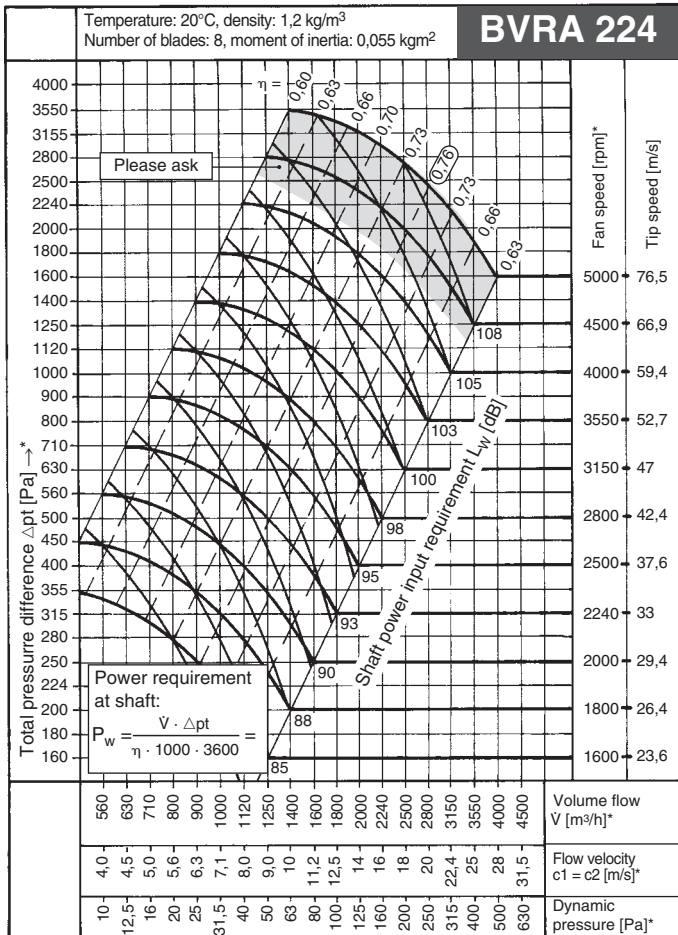
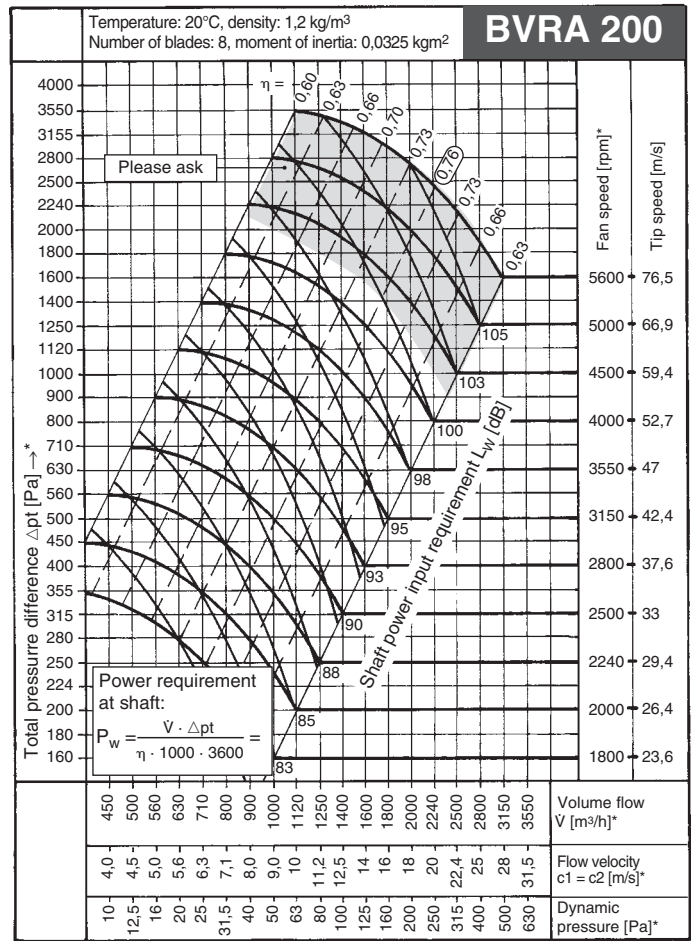
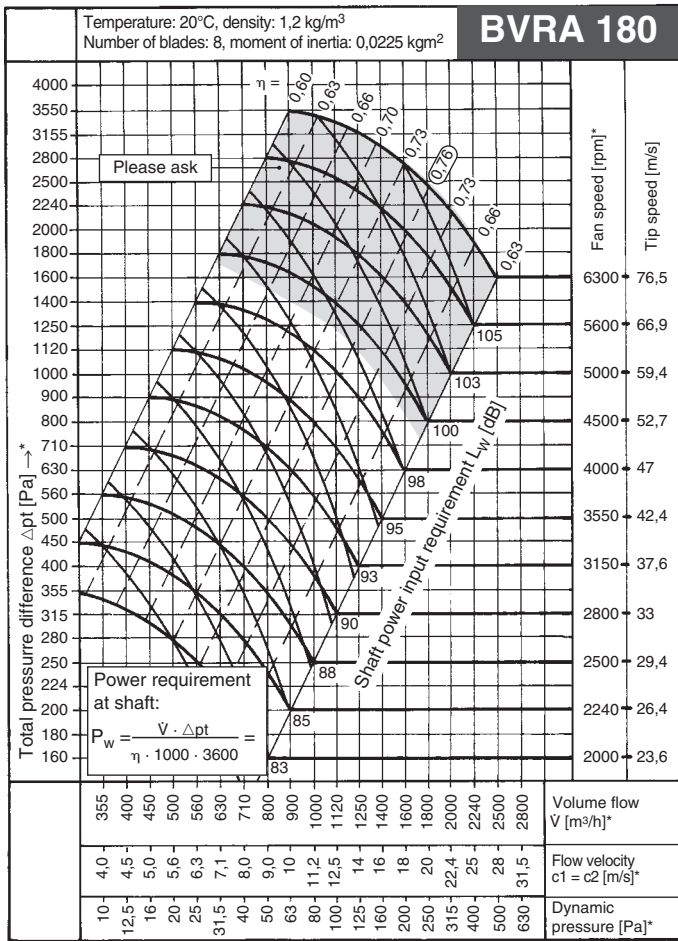
620°C – 90 MIN

179

Outlet (for outdoor installation)



Version of casing orientation RD/LG 90°

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BVRA SERIES****620°C – 90 MIN****180**

* Data rounded to standard figures



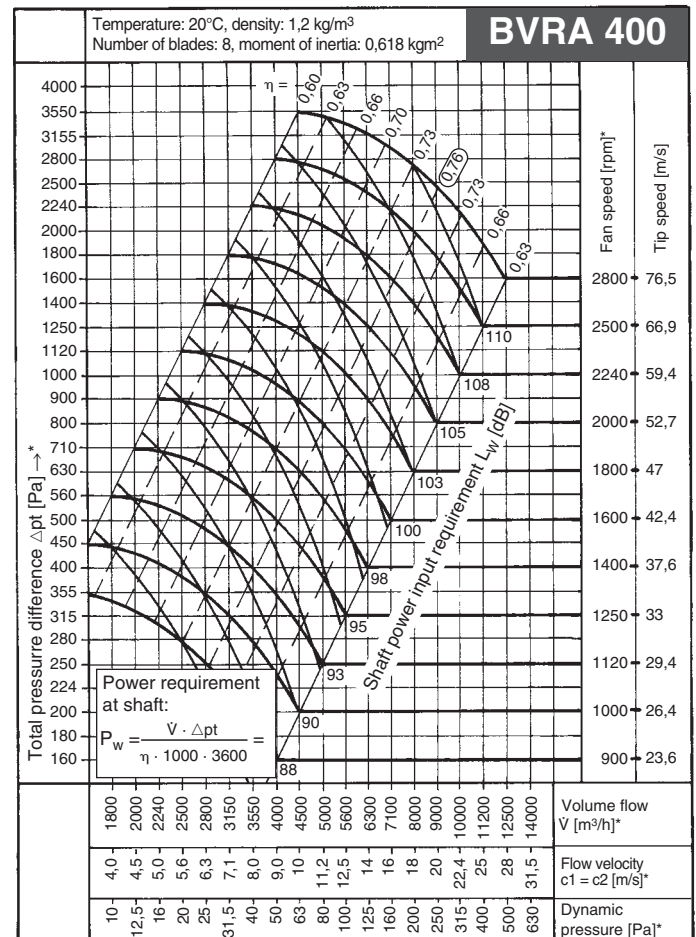
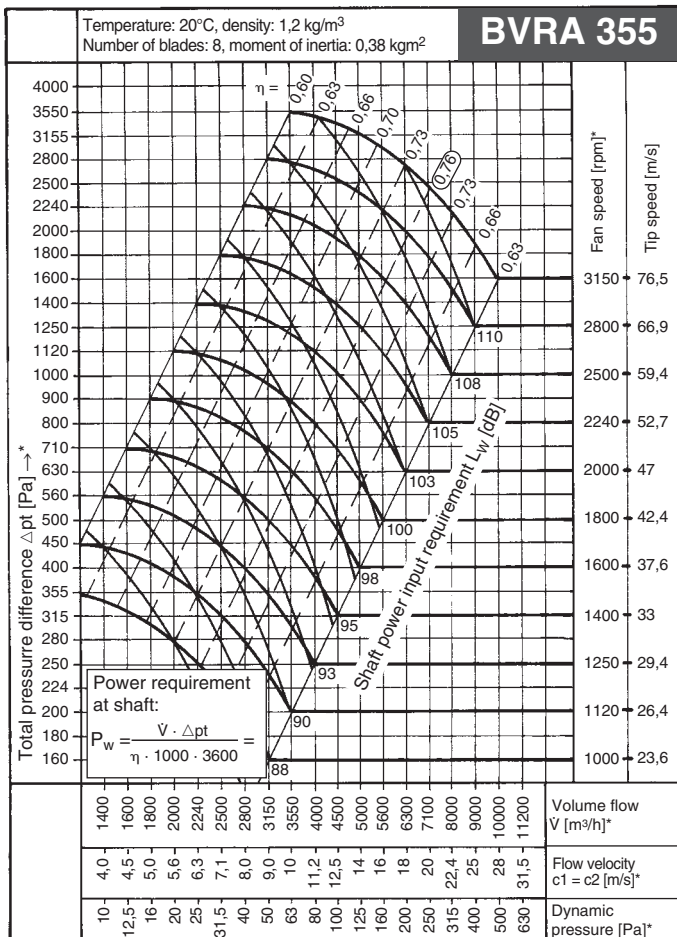
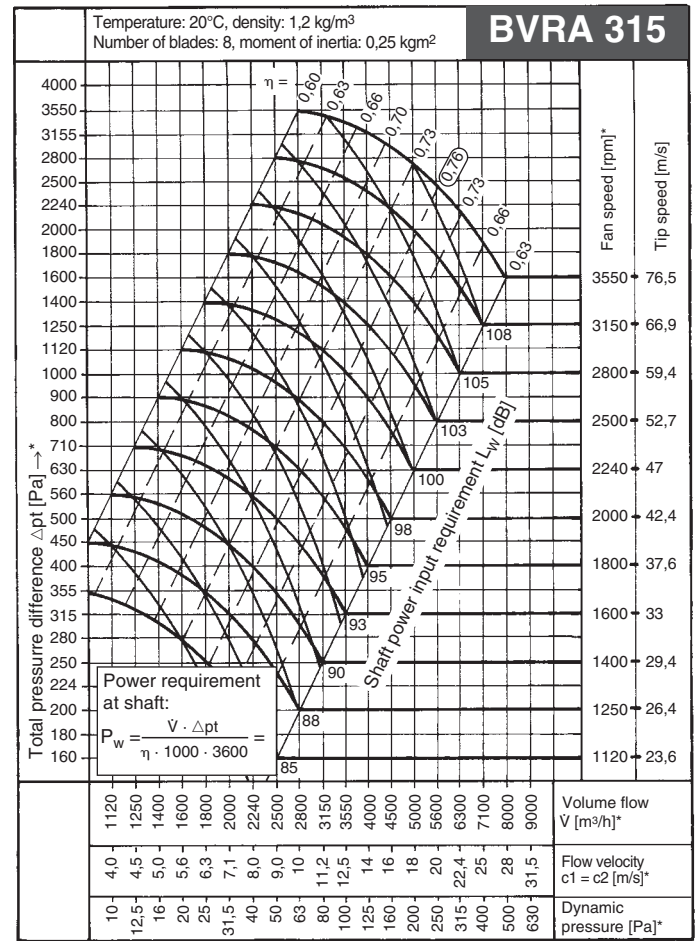
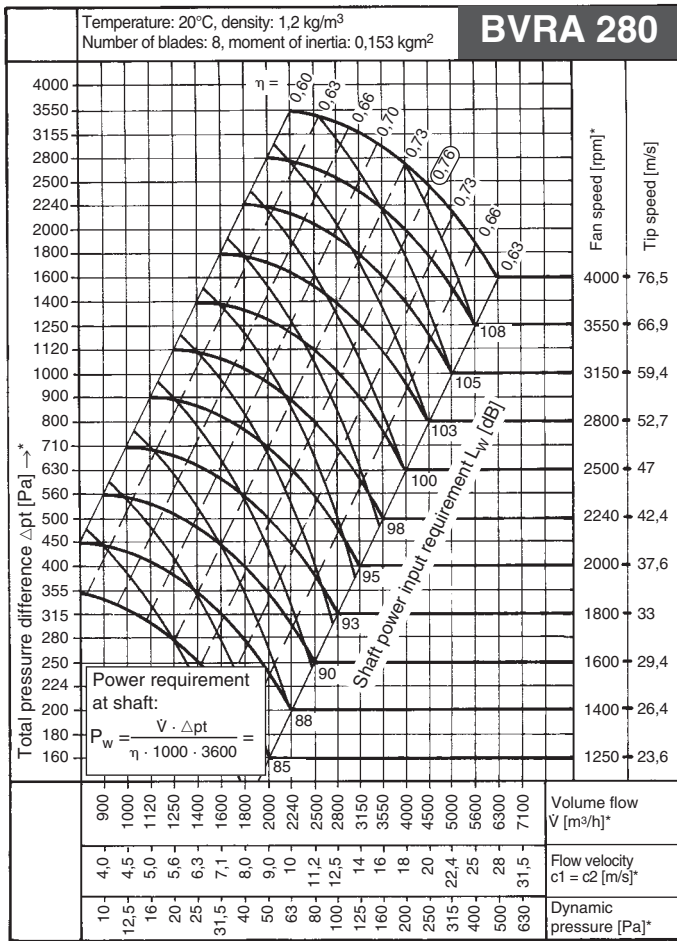
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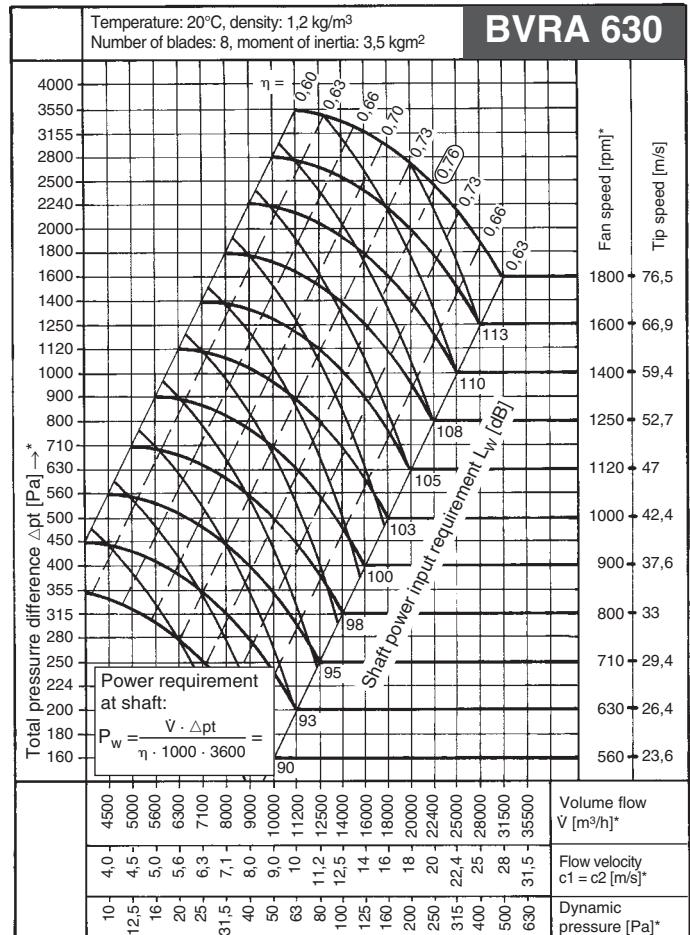
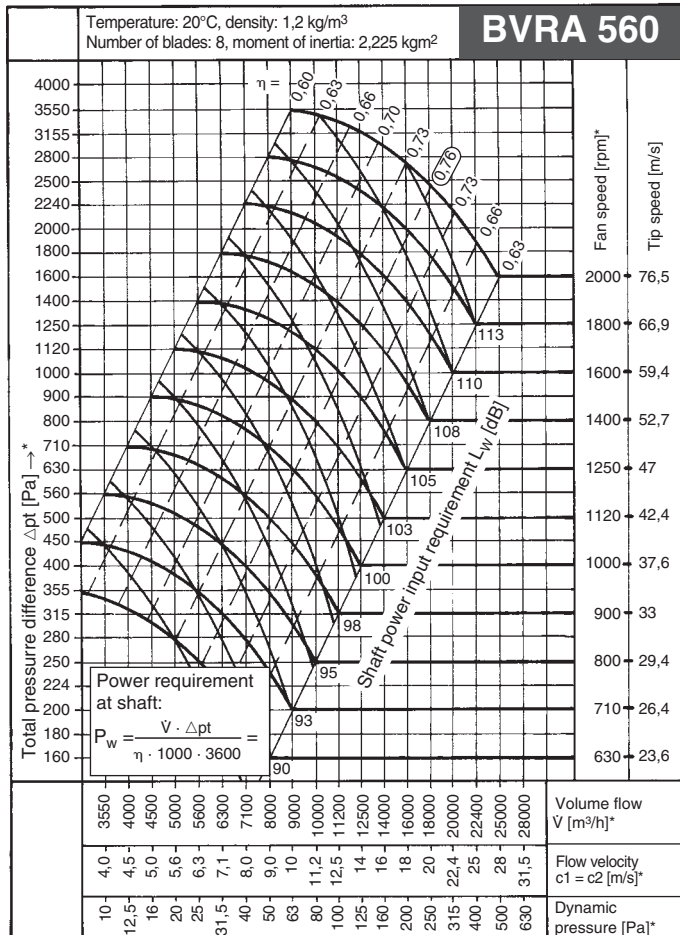
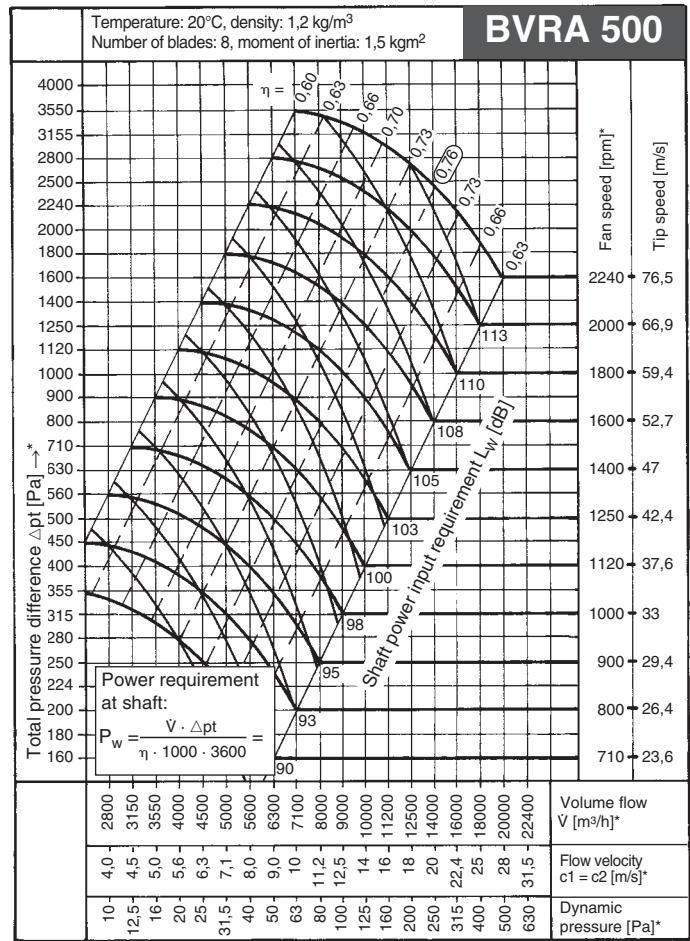
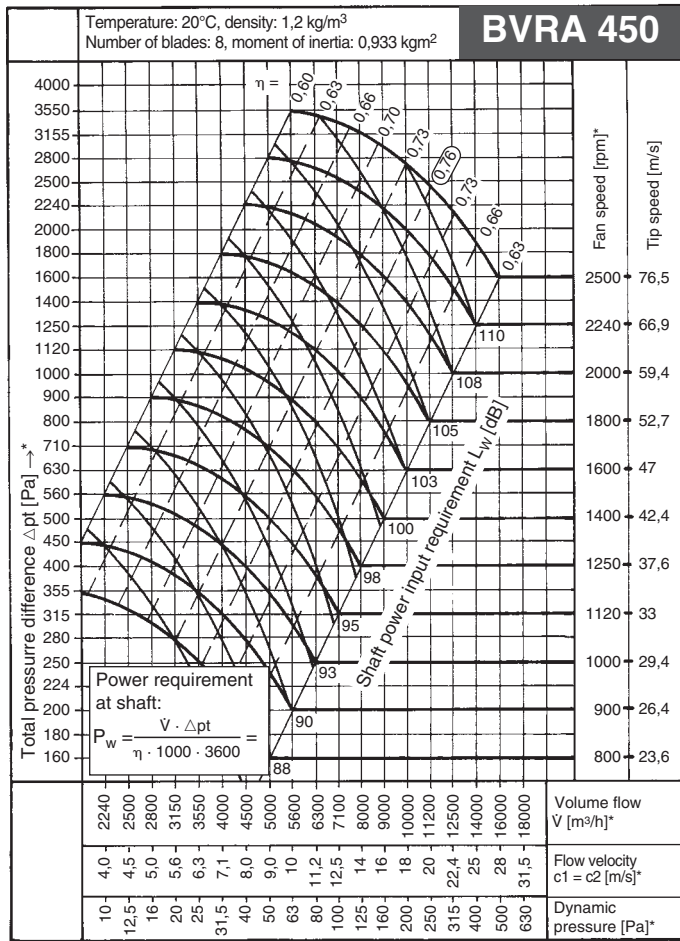
CENTRIFUGAL SMOKE EXHAUST FANS BVRA SERIES

620°C – 90 MIN

181



* Data rounded to standard figures

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BVRA SERIES****620°C – 90 MIN****182**

* Data rounded to standard figures



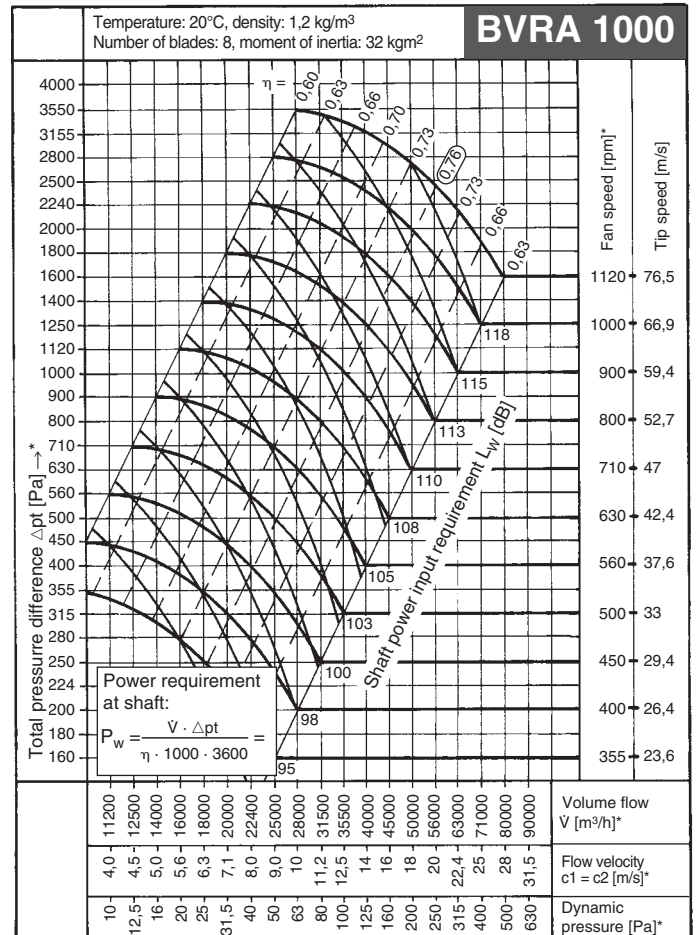
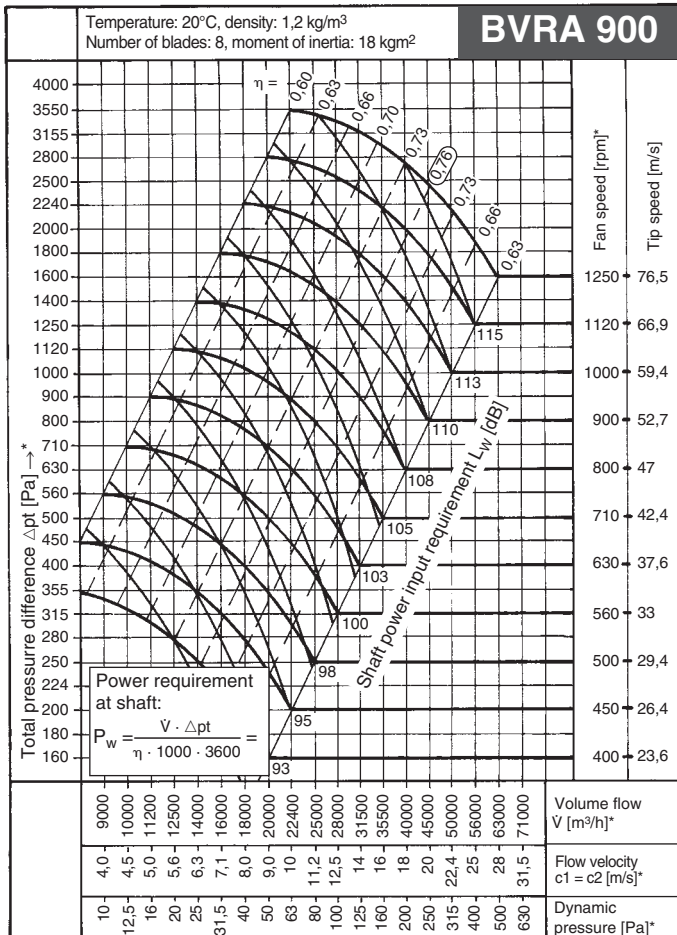
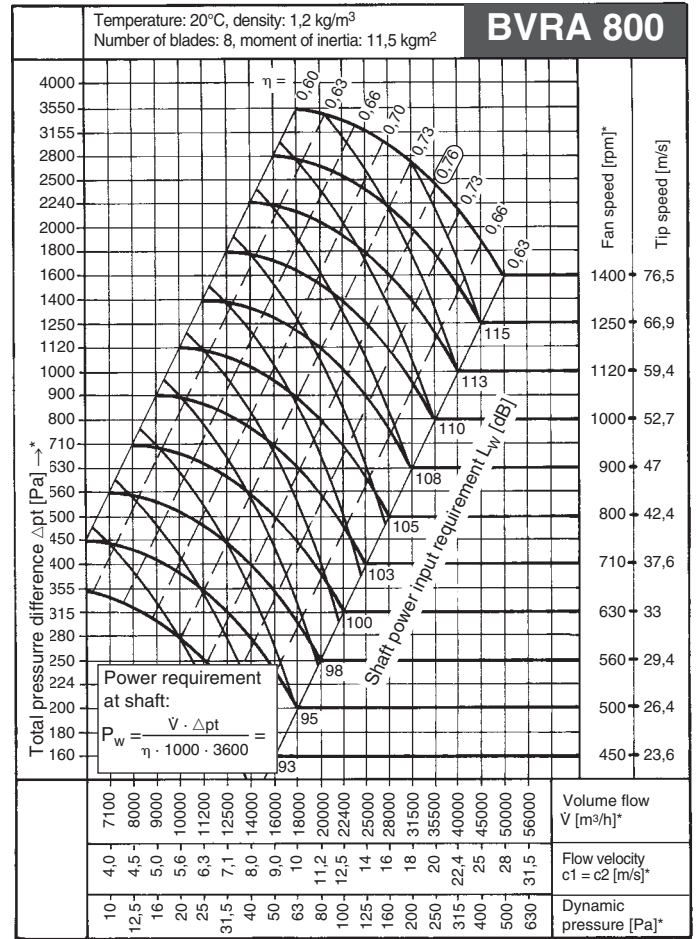
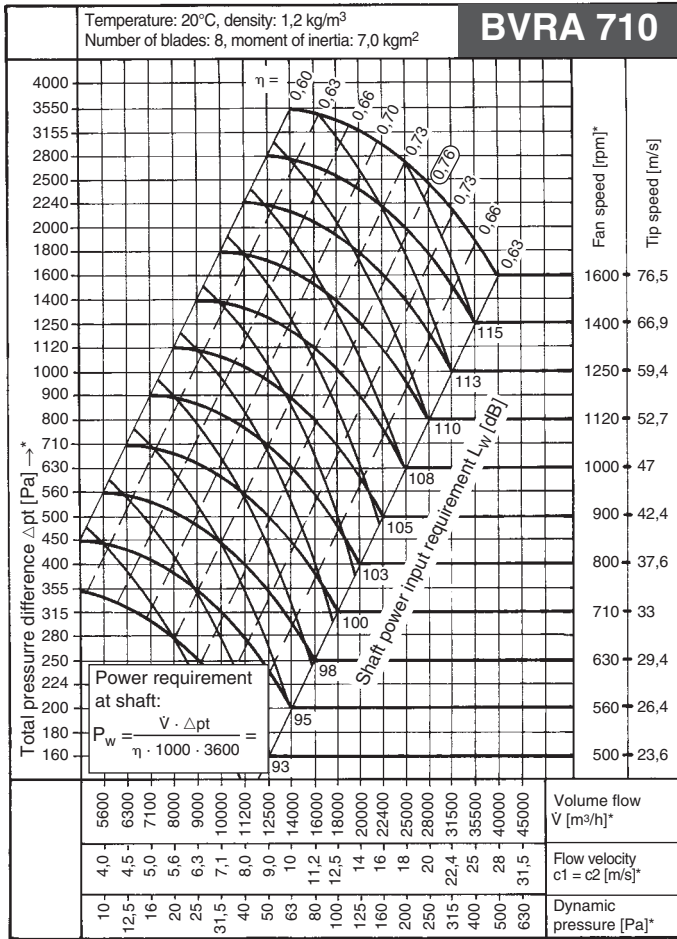
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CENTRIFUGAL SMOKE EXHAUST FANS BVRA SERIES

620°C – 90 MIN

183



* Data rounded to standard figures



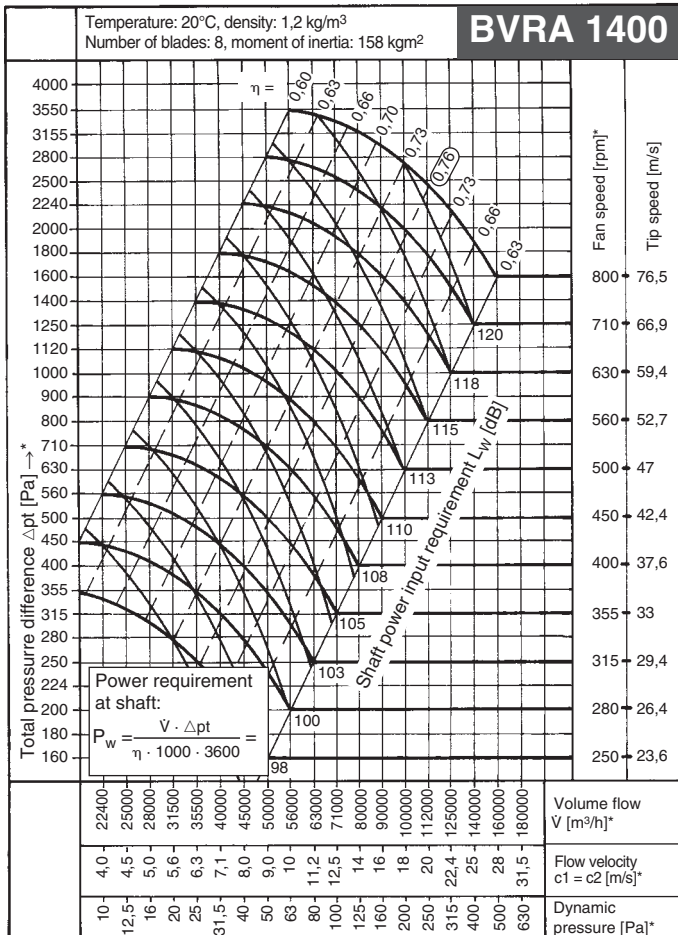
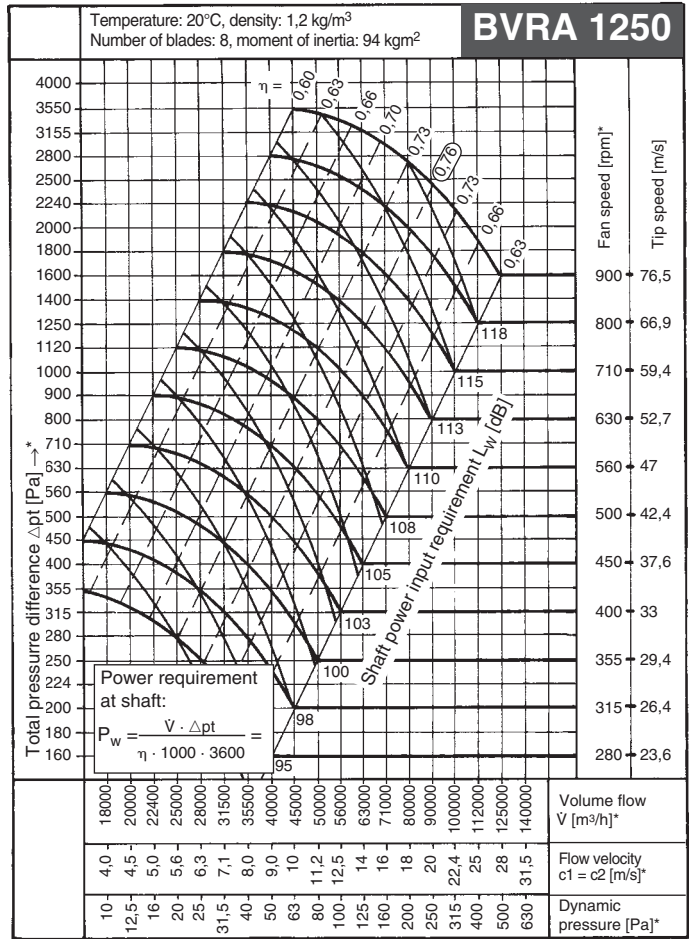
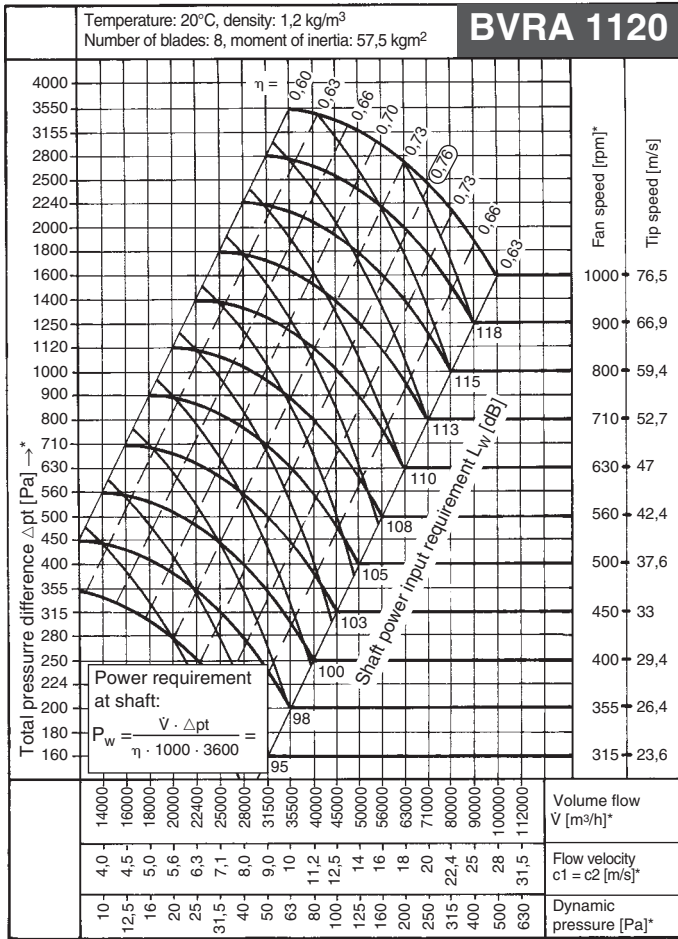
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CENTRIFUGAL SMOKE EXHAUST FANS BVRA SERIES

620°C – 90 MIN

184



* Data rounded to standard figures

Lfd. Nr.	Qty.	Description	Unit price €	Total €																				
		Centrifugal Smoke Exhaust Fan, BVRA series for the extraction of smoke fumes of max. 620°C – 90 minutes. tested to DIN 18232, Part 6 (Technical University of Mu- nich) with general building supervision approval Z-78.1-16 For installation outside the fire zone. Motor cooled with ambient air not exceeding 40°C. Consisting of Spiral casing made of welded sheet steel, with appropriate stiffening. Outlet with DIN 24158, Series 3 flanges. Inlet with DIN 24154, Series 3, flanges. Centrifugal impeller, single inlet type, of welded sheet steel construction, dynamically balanced as per DIN ISO 1940 quality grade G 6,3. Fan shaft with cooling disc and shaft seal, supported in pedestal bearings. V-belt drive complete with two pulleys, V-belt and guard. Casing coated with temperature-resistant aluminium paint (for indoor installation). Specifications: <table><tr><td>Volume flow</td><td>m³/h</td></tr><tr><td>Temperature (design)</td><td>20°C</td></tr><tr><td>Temperature (max./withstand time)</td><td>°C/min</td></tr><tr><td>Dynamic pressure</td><td>Pa</td></tr><tr><td>Total pressure increase</td><td>Pa</td></tr><tr><td>Fan speed</td><td>rpm</td></tr><tr><td>Efficiency</td><td>%</td></tr><tr><td>Shaft power input requirement</td><td>kW</td></tr><tr><td>Total acoustic power level L_w</td><td>dB</td></tr><tr><td>Weight of fan with accessories</td><td>kg</td></tr></table> Manufacturer: TLT-Turbo GmbH Type: BVRA	Volume flow	m³/h	Temperature (design)	20°C	Temperature (max./withstand time)	°C/min	Dynamic pressure	Pa	Total pressure increase	Pa	Fan speed	rpm	Efficiency	%	Shaft power input requirement	kW	Total acoustic power level L _w	dB	Weight of fan with accessories	kg		
Volume flow	m³/h																							
Temperature (design)	20°C																							
Temperature (max./withstand time)	°C/min																							
Dynamic pressure	Pa																							
Total pressure increase	Pa																							
Fan speed	rpm																							
Efficiency	%																							
Shaft power input requirement	kW																							
Total acoustic power level L _w	dB																							
Weight of fan with accessories	kg																							
		Carryover																						



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SMOKE EXHAUST PLUG FANS CENTRIFUGAL TYPE BV-ERV SERIES FOR 300°C – 120 MIN OVERVIEW

187

Technical Description

These units are rated for 300°C – 120 min. operation and tested to DIN 12101 / Part 3 standard specifications.

- 14 sizes from 250 to 1120
- Max. volume flow: 56,000 m³/h
- Available static pressure differential: 1600 Pa
- Impeller aerodynamically optimized for free outlet configuration, of welded steel sheet construction, dynamically balanced in compliance with DIN ISO 1940 / Grade G 2,5, complete with screw-in hub, for counter-clockwise rotation (viewed from drive side).
- Flow-formed inlet nozzle, made of sheet steel, aerodynamically matched to the impeller.

In addition, these fans are calibrated as volumetric flow measuring devices.

- The impeller components and inlet nozzle are made by a flow forming / metal spinning process for high manufacturing precision.
- The base structure consisting of the mounting plate, motor bracket and baseframe is of torsion-resistant welded and screwed construction.
- Following pre-treatment, the components receive a polyester powder coating which is then stoved at 215°C for maximum durability. Sizes exceeding 1120 mm in diameter are coated with a two-layer paint system.
- The heat-resistant special motor (protection class IP 54, style B3) operates in the exhaust gas flow.

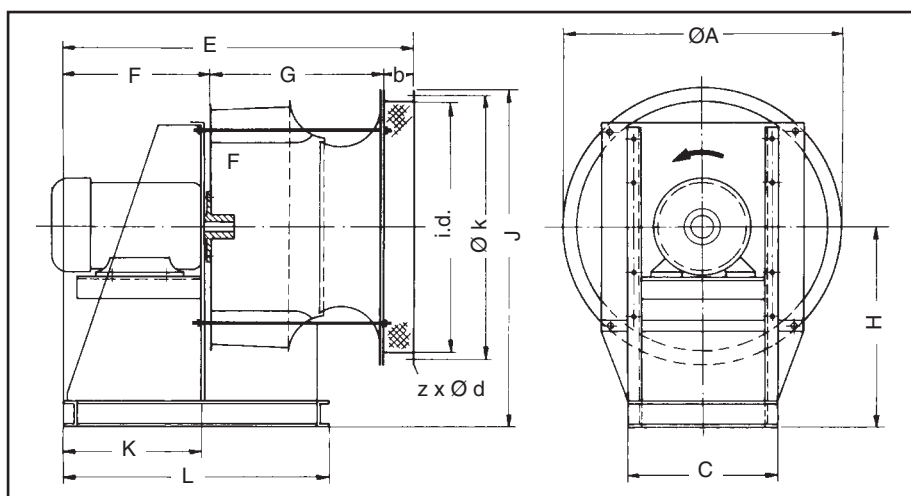


Units with frequency converter control are equipped with a PTC thermistor-based motor protection system (approved for ventilation mode only, i.e., in the case of a fire the fan must be switched to mains operation with the PTC thermistors shunted).

Accessory equipment:

- Flexible inlet connector
- Flat-type flange (inlet)
- Inlet wire guard
- Set of antivibration mounts
- Inlet nozzle with ring line for pressure measurements
- Three-phase motor, size ...

For characteristic curves, model tender call documents and additional technical data please refer to our complete „Centrifugal Plug-in Fans“ catalogue (ER 23/1.2).



Size	Ø A	H	C	i.d.		~E	F	G	b	~J	K	L	Øk	Number of holes z x Ød		Weight (approx.) without motor
250	306	250	290	256	Series 3 / DIN 24 154	617	258	179	180	403	240	420	286	6	7	25
280	348	250	290	288		639	260	202	180	426	240	420	322	8	10	30
315	386	285	350	322		710	310	220	180	478	285	500	356	8	10	38
355	425	320	350	361		733	310	249	180	533	285	500	395	8	10	45
400	468	360	435	404		860	410	270	180	594	385	675	438	12	10	65
450	517	400	435	453		895	410	308	180	650	385	675	487	12	10	80
500	571	450	435	507		940	415	345	180	736	385	705	541	12	10	95
560	643	530	480	569		998	430	389	180	852	405	730	605	16	12	115
630	712	570	480	638		1046	430	436	180	926	405	730	674	16	12	135
710	814	640	480	714	Series 2 / DIN 24 154	1186	510	496	180	1047	475	900	775	16	14	170
800	904	715	600	804		1240	510	550	180	1167	475	1000	861	24	14	250
900	1004	800	650	904		1478	680	618	180	1302	645	1150	958	24	14	340
1000	1105	900	650	1005		1545	680	685	180	1453	645	1115	1067	24	14	430
1120	1125	1000	780	1005		1679	740	734	205	1553	710	1350	1067	27	14	500



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SMOKE EXHAUST FANS SMOKE DETECTION SWITCHES FOR MECHANICAL SMOKE EXTRACTION SYSTEMS

189

Safety through certified products

The purpose of a smoke and heat exhaust system is to protect human beings from the risks and hazard situations typically encountered in a fire.

This target can only be achieved via a reliable mechanical smoke extraction system.

To provide optimum protection, the individual components of a mechanical smoke extraction installation must be optimally matched.

Smoke exhaust fans and fire protection dampers therefore have to be approved by the German Institute of Building Technology (DIBt) according

to Building Rules List "B", Part 2, in conjunction with the relevant smoke detectors. Compliance with the codes is demonstrated via certification tests performed by independent testing institutes.

Smoke exhaust fans are tested according to the European test standard EN 12101-3.

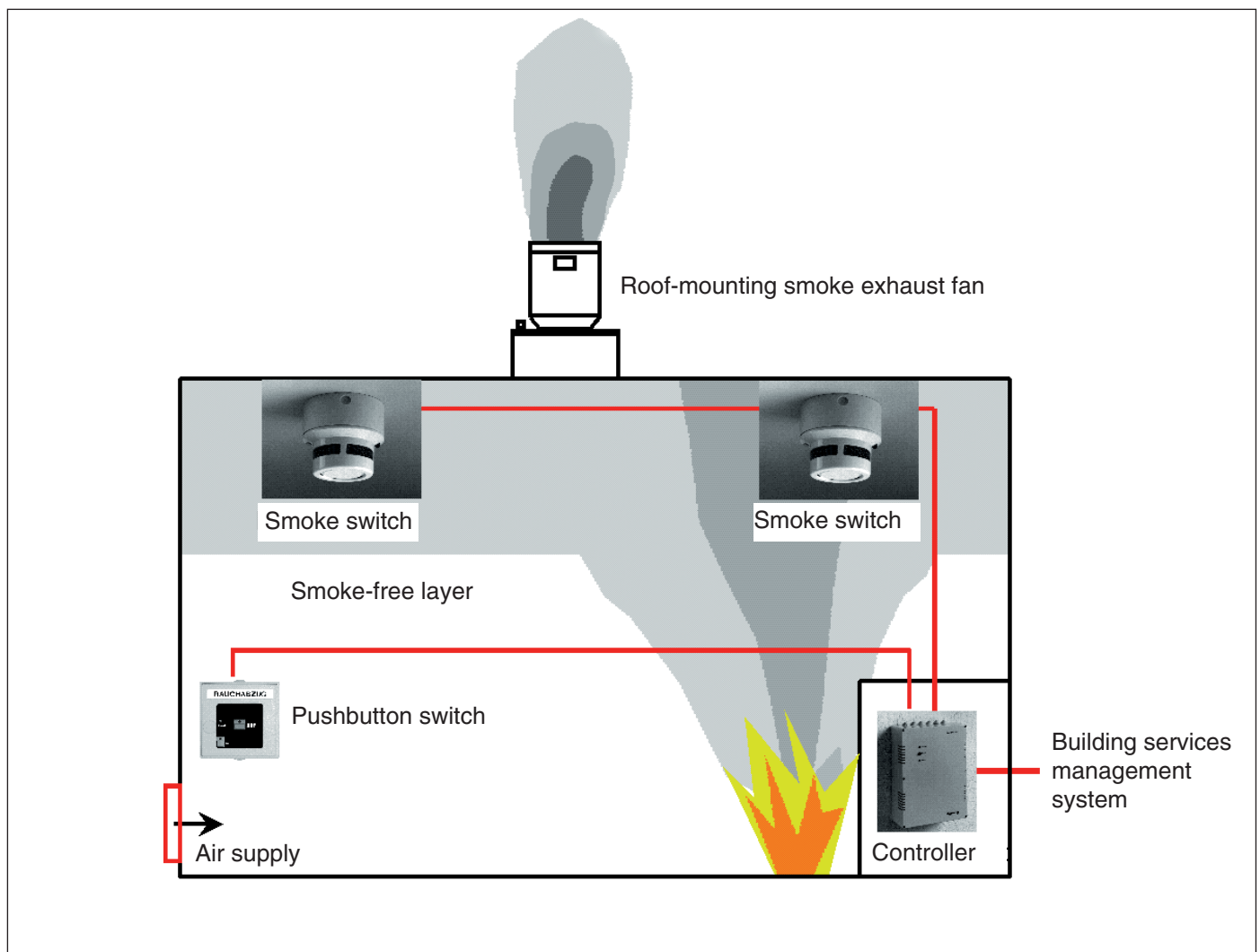
Optimum component interaction

A powered smoke and heat exhaust system comprises at least the following components:

- **Triggering device**
- **Controller**
- **Smoke extraction system**

The mechanical smoke extraction system is activated by pushbutton or automatically by means of smoke switches. A controller sends out control signals to energize the powered smoke exhaust installation and to move the fire protection and smoke exhaust dampers into their safety position. An effective interaction between the individual components ensures a rapid detection and alarm response so that smoke can be extracted quickly from the fire zone.

Example of a mechanical smoke extraction system



Item No.	Qty.	Description	Unit price €	Total €
1.0		Smoke switches for mechanical smoke extraction systems Specification Title 1 – Prerequisites 1. Function and application The analyzing and triggering device of a mechanical smoke extraction system responds to the first signs of a fire. It actuates downstream protection systems immediately and automatically. This device is specifically used as an analyzing and triggering unit for mechanical smoke extraction systems. It immediately energizes the smoke exhaust fan and the smoke exhaust dampers, if any, in accordance with the rules of the German Institute of Building Technology (DIBt) 2. Approval Smoke control switchgear must be approved by the Berlin-based DIBt Institute. All system components must have been jointly tested and approved and documented in a written DIBt certificate. Only devices confirmed in this approval must be used in combination. 3. Quality monitoring In addition to the manufacturer's own quality assurance, the approval certificate requires "quality monitoring" or "external monitoring" for mechanical smoke extraction systems to be conducted by the Association of German Property Insurers (VdS) in Cologne. Any monitoring agreement to that effect, concluded between the manufacturer and the VdS association, must be DIBt-approved. The results of the manufacturer's in-house quality assurance efforts must be submitted to DIBt upon request. In addition to these requirements, an approval sign must be fitted in the direct vicinity of the analyzing and triggering device. The individual units must carry the uniform certification label. Our smoke control switchgear systems are subject to VdS quality monitoring.		
		Carryover		

Lfd. Nr.	Qty.	Description	Unit price €	Total €
1.0	(cont'd)	Excerpts from the valid approval certificate: 4. Smoke switch installation The arrangement and number of smoke switches/detectors must conform to DIN VDE 0833-2 specifications. A reliable detection of smoke must be ensured. 5. Electrical wiring Electrical wiring must be designed separately and with appropriate mechanical protection so that its operability will be ensured for at least 30 minutes, as set forth in DIN 4102-12. It shall be routed using appropriate protection techniques. 6. Acceptance The analyzing and triggering device shall be examined for proper installation and functioning, and specifically for appropriate component interaction, immediately before the smoke exhaust system is first taken into operation. The acceptance tests shall be documented by the operator of the smoke exhaust system, who shall also file the related documentation. Upon successful completion of the acceptance test, the relevant authority shall install an acceptance sign in the immediate vicinity of the analyzing and triggering device, such sign to be supplied by the manufacturer. 7. Upkeep The analyzing and triggering device shall be kept operative and in a good state of repair by the operator of the smoke exhaust system at all times. 8. Maintenance The analyzing and triggering device shall be maintained monthly and inspected for its proper functional condition and operability in accordance with the manufacturer's instruction. In particular, all connected smoke detectors shall be tested by simulation (application of test gas). Maintenance activities and operability tests shall be documented by the operator of the smoke exhaust system, who shall duly file all related documentation.		
		Carryover		

Item No.	Qty.	Description	Unit price €	Total €														
1.1		Controllers Designed to control the mechanical smoke extraction system and provide a visual indication of operating status and alarms. Any transducing sensors connected to the system remain activated throughout the smoke exhaust cycle. Multiple controllers may be combined for the purpose of managing a single powered smoke exhaust system and actuating the associated smoke exhaust dampers. Approved by the German Institute of Building Technology (DIBt) as an analyzing and triggering device for smoke exhaust dampers and smoke exhaust fans. - Smoke switch connection - Connection of air supply dampers - Connection of the smoke exhaust damper - Connection for actuating the smoke exhaust fan - Connection of a momentary-contact pushbutton switch for manual triggering - Connection of a momentary-contact pushbutton switch for manual control of the smoke exhaust system - Connection for audible alarm devices - Connection for visual alarm devices - Floating-contact alarm relay (changeover contact type, 30 V / 1A) - Installation space for 2 additional alarm relays with two changeover contacts each (250 VAC / 5 A) Product covered by Building Supervision Authority approval. <table><tr><td>Mains voltage</td><td>230 VAC</td></tr><tr><td>Output voltage</td><td>24 VDC</td></tr><tr><td>Rated current</td><td>max. 0,8 A</td></tr><tr><td>Protection class</td><td>IP 20</td></tr><tr><td>DIBt-approval No.</td><td></td></tr><tr><td>Manufacturer</td><td></td></tr><tr><td>Type</td><td></td></tr></table>	Mains voltage	230 VAC	Output voltage	24 VDC	Rated current	max. 0,8 A	Protection class	IP 20	DIBt-approval No.		Manufacturer		Type			
Mains voltage	230 VAC																	
Output voltage	24 VDC																	
Rated current	max. 0,8 A																	
Protection class	IP 20																	
DIBt-approval No.																		
Manufacturer																		
Type																		
1.2		Optical smoke switches Designed as a triggering device for indoor (room) monitoring, equipped with a smoke and heat sensor for controlling mechanical smoke extraction systems. Units in compliance with the DIBt code of practice, fitted in a plastic housing with bayonet cap and featuring the following: Smoke detection by the stray light principle Status indication via integrated LEDs, as follows: <table><tr><td>LED green</td><td>in operation</td></tr><tr><td>LED green/yellow (flashing slowly)</td><td>slightly soiled</td></tr><tr><td>LED green/yellow (flashing rapidly)</td><td>highly soiled</td></tr><tr><td>LED yellow</td><td>measuring cell failure</td></tr><tr><td>LED red</td><td>alarm</td></tr></table>	LED green	in operation	LED green/yellow (flashing slowly)	slightly soiled	LED green/yellow (flashing rapidly)	highly soiled	LED yellow	measuring cell failure	LED red	alarm						
LED green	in operation																	
LED green/yellow (flashing slowly)	slightly soiled																	
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LED yellow	measuring cell failure																	
LED red	alarm																	
		Carryover																

Lfd. Nr.	Qty.	Description	Unit price €	Total €
1.3		Long-term alarm threshold correction Temperature sensing via semiconductor-based sensor, triggering when the temperature threshold (approx. 70°C) is exceeded. No use of radioactive substances Built-in relay (floating contact) Communication output port for smoke switch status indication or status polling via PC and/or modem Available in white, red, brown, yellow and black. Product covered by Building Supervision Authority approval. Operating voltage: 14 VDC protection class: IP 42 VdS test report No.: DIBt approval No. Manufacturer: Type: Base For smoke switches, designed for apparent installation in dry indoor locations, in the form of a plastic housing with built-in screw terminals. Product covered by Building Supervision Authority approval. Standard housing colour: white Special colours: red, brown, yellow, black Manufacturer: Type:		
1.4		Base For smoke switches, designed for apparent installation in damp indoor locations, in the form of a plastic housing with Built-in screw terminals Cable gland (PG 7) with rubber O-ring seal between detector and base. Product covered by Building Supervision Authority approval. Standard housing colour: white Special colours: red, brown, yellow, black Manufacturer: Type:		
1.5		Base For smoke switches, designed for concealed installation in suspended ceilings in dry indoor locations, in the form of a plastic housing with a white trim ring. Built-in screw terminals Product covered by Building Supervision Authority approval. Standard housing colour: white Special colours: red, brown, yellow, black Manufacturer: Type:		
		Carryover		

Item No.	Qty.	Description	Unit price €	Total €
1.6		Smoke switch status indicating unit Provides a collective status indication for all connected smoke switches. Control and communication signalling via RS bus Bus line continuity monitoring Monitoring of connected smoke switches for unauthorized replacement. Inevitable functional test during commissioning. (Smoke switches must be triggered by simulation of the smoke detection parameter). Status indication via integrated LEDs, as follows: LED 1 green in operation LED 2 yellow slightly soiled LED 3 yellow highly soiled LED 4 yellow measuring cell failure LED 4 flashing yellow RS bus error, unknown smoke switch LED 5 red alarm Built-in relay (floating-contact, 30 VDC/1 A) for each status message (LED), e.g., for connection to a building services management system. For apparent installation. Colour: white. Product covered by Building Supervision Authority approval. Operating voltage 18 ... 28 VDC Protection class: IP 20 Manufacturer: Type: Qty:		
1.7		Smoke switch status indicating unit Providing a collective status indication for all connected smoke switches. Control and communication signaling via RS bus Bus line continuity monitoring Monitoring of connected smoke switches for unauthorized replacement. Inevitable functional test during commissioning. (Smoke switches must be triggered by simulation of the smoke detection parameter). Status indication via integrated LEDs, as follows: LED 1 green in operation LED 2 yellow slightly soiled LED 3 yellow highly soiled LED 4 yellow measuring cell failure LED 4 flashing yellow RS bus error, unknown smoke switch LED 5 red alarm Built-in relay (floating-contact, 30 VDC /1 A) for each status message (LED), e.g., for connection to a building services management system. For concealed installation. Colour: white. Product covered by Building Supervision Authority approval.		
		Operating voltage 18 ... 28 VDC Protection class: IP 20 Manufacturer: Carryover Type: Qty:		

Lfd. Nr.	Qty.	Description	Unit price €	Total €
1.8		Smoke switch interface For polling status messages from the connected smoke switches by means of PC or modem and PC, via RS bus communication. Information polled: Type of smoke switch Smoke switch manufacturing No. (PID) Smoke switch ID No. within the system (allocated by the system during first commissioning) Operation Slightly soiled Highly soiled Error / measuring cell failure Unknown smoke switch within the system Alarm Temperature RS 232 interface for PC or modem connection PC log file documenting first commissioning data PC log file documenting status polling PC log file documenting prescribed maintenance procedures including info on whether all connected smoke switches were tested. For apparent installation, colour: white Product covered by Building Supervision Authority approval. Operating voltage 18 ... 28 VDC Protection class: IP 20 Manufacturer: Type: Qty:		
1.9		Modem For remote-polling the status of smoke switches in a smoke exhaust system. Wall-mounting / desktop type Colour: anthracite Including power supply unit and mains cable Similar or equivalent to Hekatron type MOD 142A. Supply and installation. Product covered by Building Supervision Authority approval. Manufacturer: Type: Qty:		
		Carryover		

Item No.	Qty.	Description	Unit price €	Total €
1.10		Momentary-contact pushbutton unit For indoor use, type G, painted yellow, for apparent installation in dry indoor locations, providing manual control of the smoke exhaust system. Features: Flat-type plastic housing Replaceable glass pane 2 momentary-contact switches with monitoring LED Standard colour: yellow (RAL 1003) Special colours: red, grey, blue Protection class IP 20 Weight: 0.167 kg Manufacturer: Type:		
1.11		Acoustic alarm device With plastic housing for apparent installation, VdS-approved. Features: Programmable with two alternating tones or one continuous tone, signal tone in accordance with DIN 33404, Part 3. Acoustic level: 105 dB(a) at 1 m distance Operating voltage: 24 V d.c Current consumption: max. 18 mA Protection class: IP 54 VdS approval No. Manufacturer: Type:		
1.12		Acceptance set Comprising: Acceptance record form Maintenance record form DIBt approval plate DIBt approval certificate Manufacturer: Type: Qty:		
1.13		Smoke detector tester For on-site testing of smoke detectors and smoke switches outside ventilation ducting, comprising Test head 918 Aerosol container 918/5 Holding rod, 1.7 m long Telescope-type holding rod, max. length 3.2 m, 918/1 Telescope-type holding rod, max. length 3.2 m, 918/2 Product covered by Building Supervision Authority approval. Manufacturer: Type:		
		Carryover		



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SMOKE EXHAUST FANS APPLICATION EXAMPLES/REFERENCES

200



Centrifugal smoke exhaust fan BV-REH 560
for 400°C - 120 Min. casing insulated
(Alsenblöcke, Berlin)



Axial smoke exhaust fan BVAXN 12/56/900 for 300°C - 120 Min. casing insulated
(Alsenblöcke, Berlin)



Centrifugal smoke exhaust fan BVRA 710
for 620°C - 90 Min. (Dorotheen-Blöcke, Berlin)



Axial smoke exhaust fan BVAX 12/56/800
for 300°C - 120 Min. with self-activating shutoff dampers (Dorotheen-Blöcke, Berlin)



Roof-mounting smoke exhaust fans BVD 630/30-6
for 620°C - 120 Min. with stubs for admixture of ambient air
(Berlin State Archives)



Axial smoke exhaust fan BVAXN 8/56/1120
for 600°C - 120 Min. with self-activating shutoff dampers and outlet duct with wire guard (Oyten refrigerating facility)



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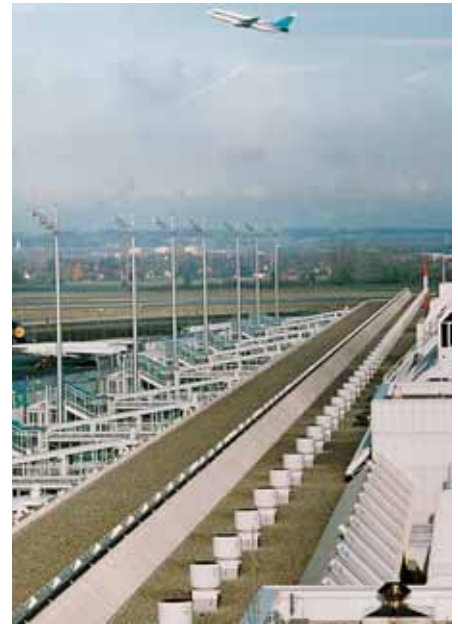
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SMOKE EXHAUST FANS APPLICATION EXAMPLES / REFERENCES

201



Roof-mounting smoke exhaust fans BVD and axial smoke-exhaust fans BVAXN
(Leipzig, Paunsdorf shopping mall)



Roof-mounting smoke exhaust fans BVD
Check-in terminal, Franz-Josef Strauss
Airport, Munich



Roof-mounting smoke exhaust fans BVD 710 for 620°C–120 min.
Cologne Arena



Wall-mounting smoke exhaust fans BVW-R
Freight handling complex, Franz-Josef
Strauss Airport, Munich



Axial smoke exhaust fans for 400°C–120 min. with outlet diffusers
(Düsseldorf Airport, Terminal C)



Wall-mounting smoke exhaust fans BVW-A
Furniture store Unger, Wolfratshausen



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