

Movement by Perfection



The Royal League in ventilation, control and drive technology

## Process air fans

Individual, modular and flexible





# Table of contents

**Process air fans –  
individual, modular and flexible**

Page 4

---

**Plug fans –  
even closer to perfection**

Page 6

---

**Free running fans –  
every version a fine-tuned solution**

Page 8

---

**Free running fan as duct installation  
supported in every situation**

Page 10

---

**Housing fans –  
maximum quality for every application**

Page 12

---

**Clutch-driven fans –  
efficient and compact**

Page 14

---

**Special designs –  
meet every challenge**

Page 16

---

**Extension concepts  
Sophisticated, maintenance-friendly and intelligent**

Page 18

---

**ATEX –  
an in-depth review**

Page 20

---

**Frequency inverter –  
smart control**

Page 24

---

**Accessories  
Sound absorbers, soundproof booths,  
monitoring, maintenance concepts**

Page 26

---



# Process air fans – individual, modular, flexible

## Clean and safe in all applications

ZIEHL-ABEGG process air fans perform tasks with a high level of responsibility in industrial machines and production systems across a range of different sectors: They ensure functions that would be impossible without defined air transport, guaranteeing ideal room air and a clean atmosphere. Thanks to the optimum fan concept, they perform their tasks with full reliability and functional reliability. All standard model ranges and the individual solutions in line with customer needs are equipped with the design programme developed by ZIEHL-ABEGG together with energy-optimised drive technology. Energy and operating costs are reduced even further - both in standard use and in special areas.

## Maximum quality material and processing

ZIEHL-ABEGG process air fans are made from coated sheet steel or stainless steel and have received a number of certifications. Their function is ensured on test rigs that are among the most cutting-edge in the world. This ensures that the process air fans are always top performers even within the scope of everyday use. Not only in the air handling industry, but also in coating systems and many other supply and exhaust air systems.

## Benefits at a glance

- Highest efficiency with precision
- Compact and flexible design
- Individual solutions for all requirements
- Measurements on cutting-edge in-house test rigs
- Broad product portfolio
- Quality management and technical service closely interlinked
- Certification according to DIN EN ISO 9001
- ATEX certified fans



### Even closer to perfection

ZIEHL-ABEGG develops individual customised fan solutions for a wide range of sectors and application areas: air handling units, the ceramics industry, the chemicals and pharmaceuticals industry, generator/motor cooling and railway applications are just some of the areas that place their trust in the technical expertise and innovative developments of Trust ZIEHL-ABEGG.

### In-house development team

In the futuristic Centre for Research and Development, the In-Vent Technology Centre – the world's biggest and most modern air and acoustic test rig for fans – the fan units are tested and all conceivable FEM calculations and endurance tests are carried out.





# Plug fans – even closer to perfection

## Standard PR plug fans

Built-in centrifugal fans with free running impeller  
uninsulated, without housing.



Built-in centrifugal fans with free running impeller  
insulated, without housing.

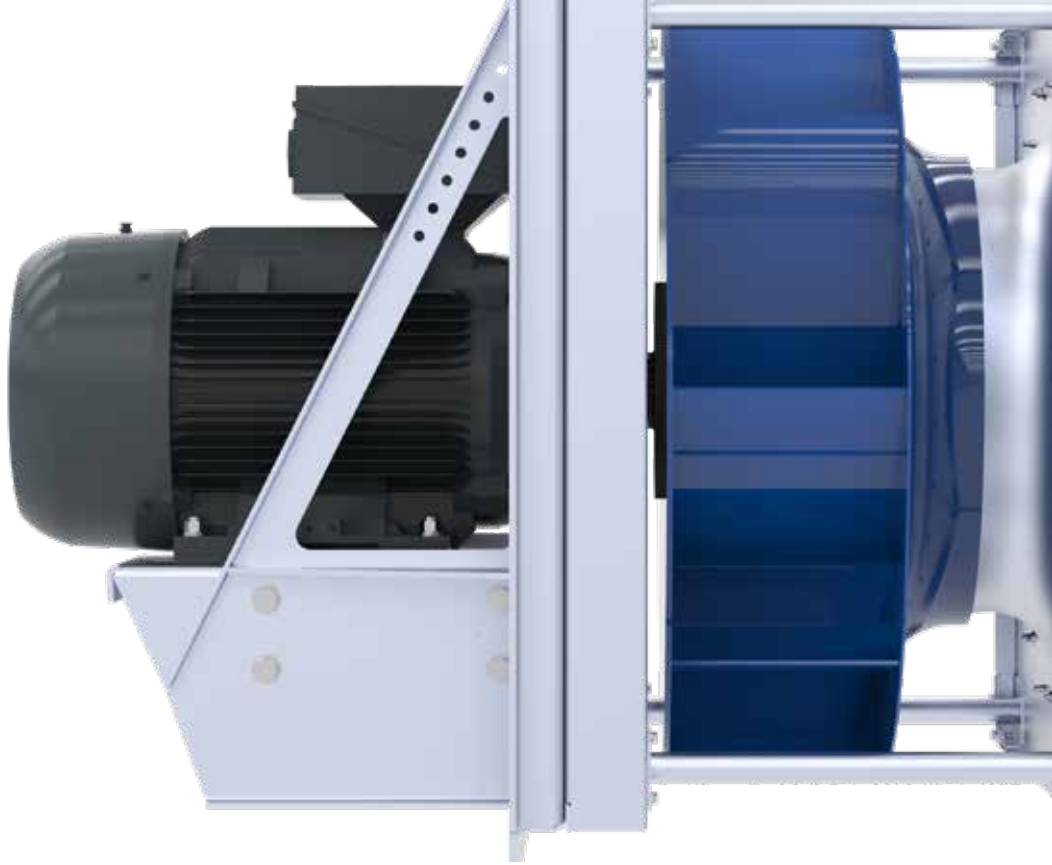


### PRdry uninsulated plug fans

- Centrifugal fans for device installation, without housing
- High performance impeller with backward curved blades
- Max. conveying medium temperature +100 °C
- 50-200mm support tray
- Design can be varied depending on the intended operating point
- Impeller, inlet nozzle and support plate can be freely configured
- Flexibly adapted to existing construction

### PRdry insulated plug fans

- Centrifugal fans for device installation, without housing
- High performance impeller with backward curved blades
- Max. conveying medium temperature +600°C, insulated design including cooling system
- 50-100 mm insulated plate
- 50-200 mm support tray
- Design can be varied depending on the intended operating point
- Impeller, inlet nozzle and support plate can be freely configured
- Flexibly adapted to existing construction



## Industrial PI plug fans

**Built-in centrifugal fans with free running impeller uninsulated, with engine block and without housing.**

**Built-in centrifugal fans with free running impeller insulated, with engine block and without housing.**



### PRdry uninsulated plug fans

- Centrifugal fans for device installation, without housing
- High performance impeller with backward curved blades
- Max. conveying medium temperature +100 °C
- 50-200mm support tray
- Version with engine block
- Design can be varied depending on the intended operating point
- Impeller, inlet nozzle and support plate can be freely configured
- Flexibly adapted to existing construction

#### Accessories

- Motor brake
- Vibration sensors
- Speed sensor
- Ring measuring line
- Pressure fitting
- Increased spark protection
- Preparation for expansion carriage

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- Motor brake
- Vibration sensors
- Speed sensor
- Ring measuring line
- Pressure fitting
- Increased spark protection
- Preparation for expansion carriage

# Free running fans – every version a fine-tuned solution





### Free running fans for device installation

- Centrifugal fans for device installation, without housing
- High performance impeller with backward curved blades
- Max. conveying medium temperature +100 °C
- IEC standard motor type IM B3
- Design can be varied depending on the intended operating point
- Air flow of 250,000 m<sup>3</sup>/h
- Pressure up to 4,000 Pa

### Accessories

- Mechanical motor brake
- Mechanical back stop
- Temperature monitoring
- Vibration monitoring
- Speed monitoring
- Compensators
- Guard grille, suction side
- Guard grille, pressure side
- Inlet nozzle with spark protection
- Atex versions for Zones 2G/2D and 3G/3D

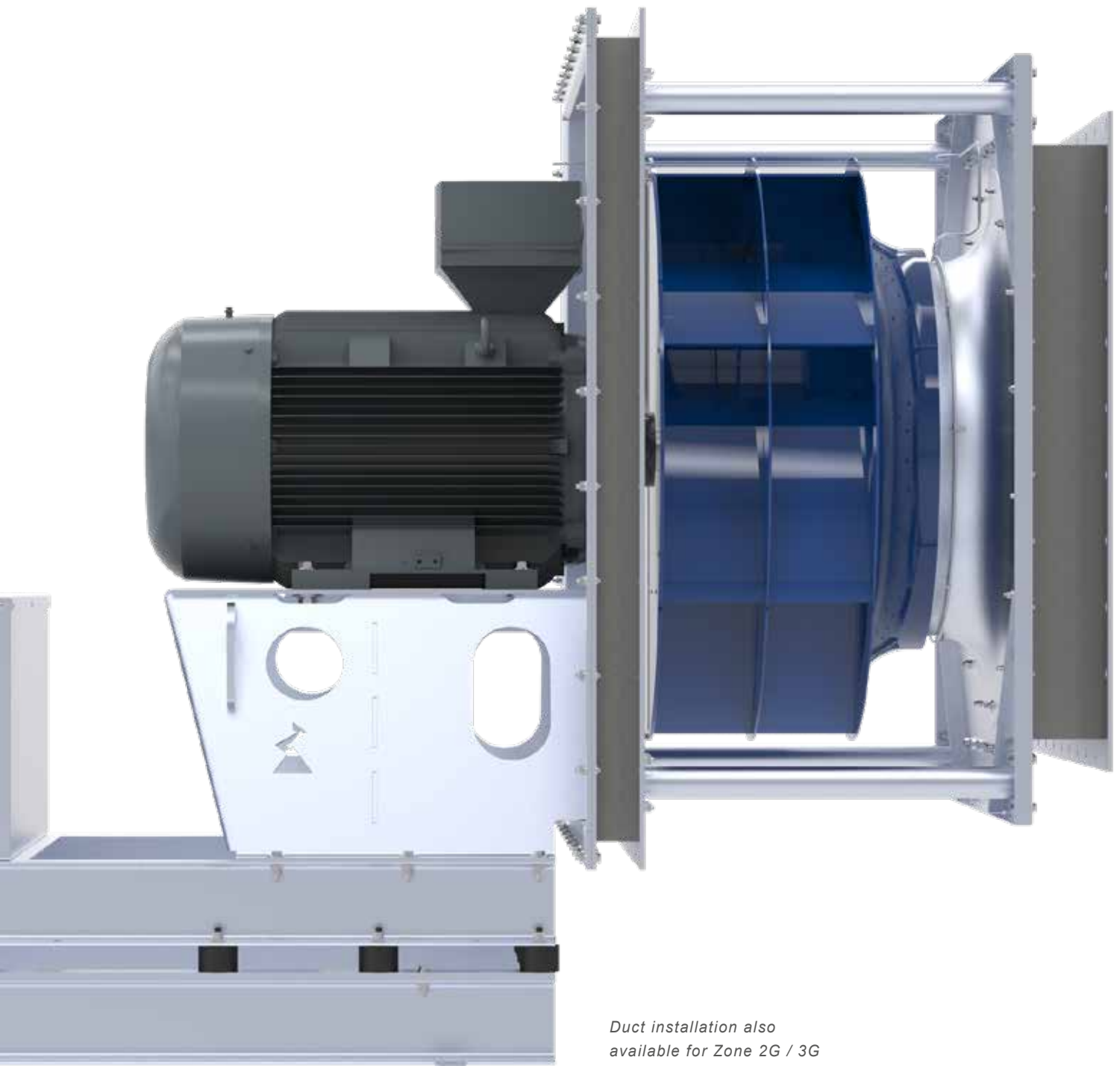


Standard PR



Industry PI

# Free running fan as duct installation – supported in every situation



*Duct installation also  
available for Zone 2G / 3G*

## Free running fans for duct installation

### Duct installation

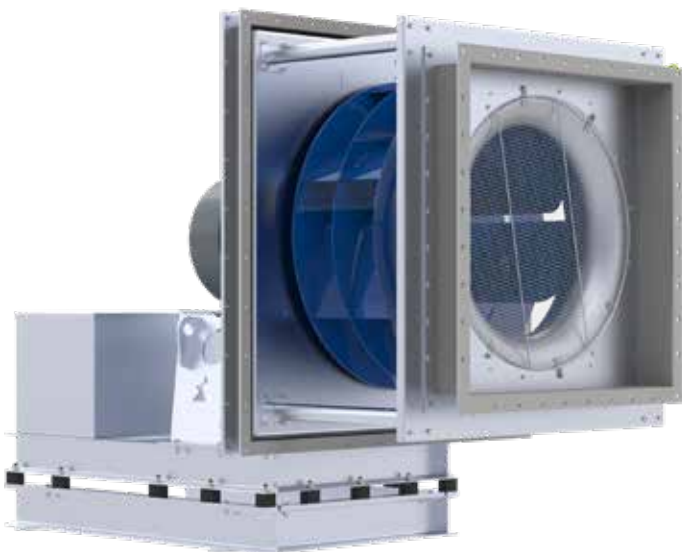
- Centrifugal fans for duct installation, without housing with counterweight
- High performance impeller with backward curved blades
- Max. conveying medium temperature +250 °C
- IEC standard motor type IM B3
- Design can be varied depending on the intended operating point
- Air flow of 250,000 m<sup>3</sup>/h
- Pressure up to 4,000 Pa

### Extension concepts

- Pull-out
- Roll-out

### Accessories

- Mechanical motor brake
- Mechanical back stop
- Temperature monitoring
- Vibration monitoring
- Speed monitoring
- Compensators
- Guard grille, suction side
- Guard grille, pressure side
- Inlet nozzle with spark protection
- Atex versions for Zones 2G/2D and 3G/3D





# Housing fans – maximum quality for every application



## Standard PR housing fans

- Centrifugal fans with spiral housing, single-side suction with direct drive
- High performance impeller with backward curved blades
- Max. conveying medium temperature +250 °C
- Stable welded spiral housing
- IEC standard motor type IM B5
- Air flow up to 50,000 m<sup>3</sup>/h
- Pressure up to 5,000 Pa

### Industrial PI housing fans

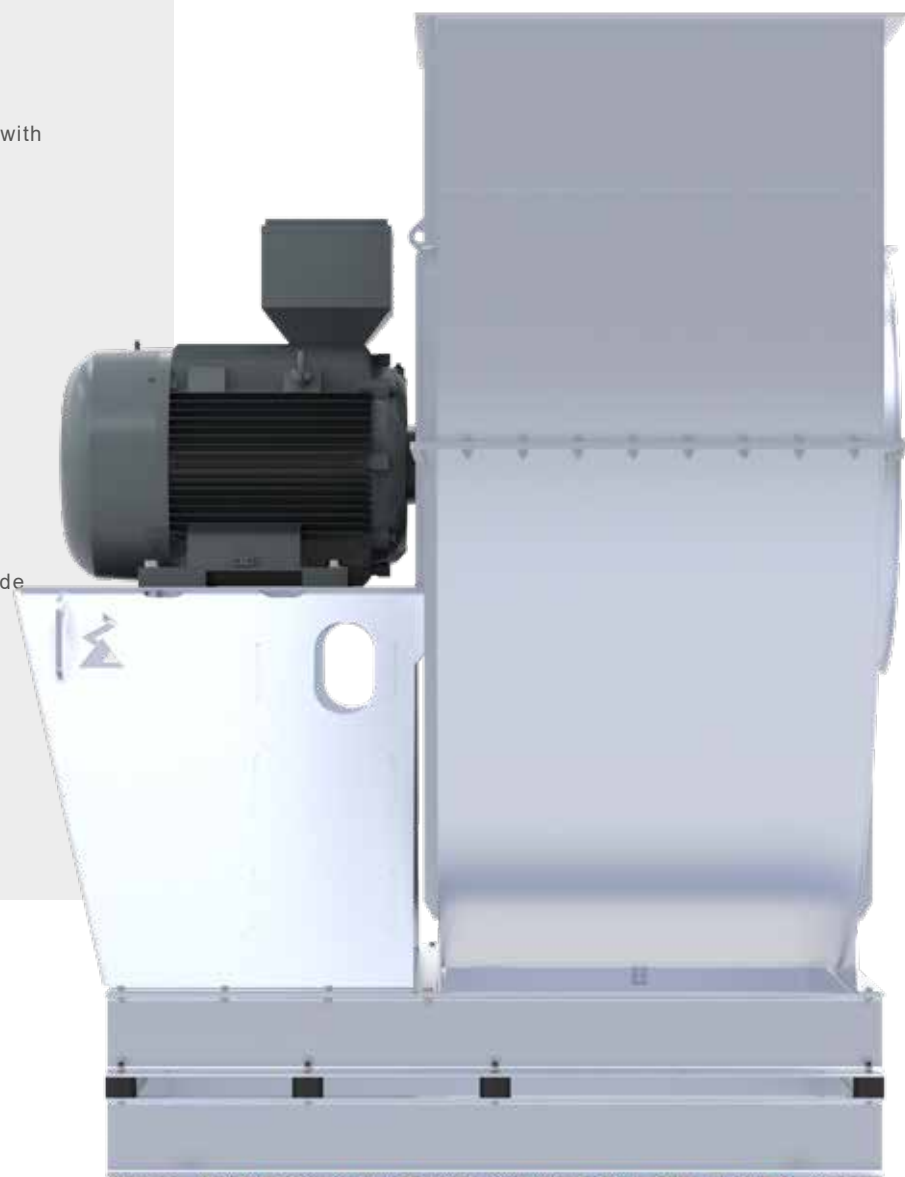
- Centrifugal fans with spiral housing, single-side suction with direct drive
- Housing reinforced and sealed
- High performance impeller with backward curved blades
- Max. conveying medium temperature +400 °C
- Stable welded spiral housing
- Air flow up to 250,000 m<sup>3</sup>/h
- Pressure up to 50,000 Pa
- Impellers up to 2500 mm diameter

### Accessories

- Housing insulation 100 - 200 mm covered with galvanised sheet steel, aluminium or stainless steel
- Soundproof bonnet above drive
- Different versions of compensators
- Various sealing systems
- Housing division
- Temperature monitoring
- Pressure monitoring
- Speed monitoring
- Vibration monitoring
- Mechanical motor brake
- Mechanical back stop
- Ring measuring line
- Adaptor pieces on suction and pressure side
- increased spark protection
- Automatic relubrication unit

### Extension concepts

- Pull-out
- Roll-out
- Swing-out



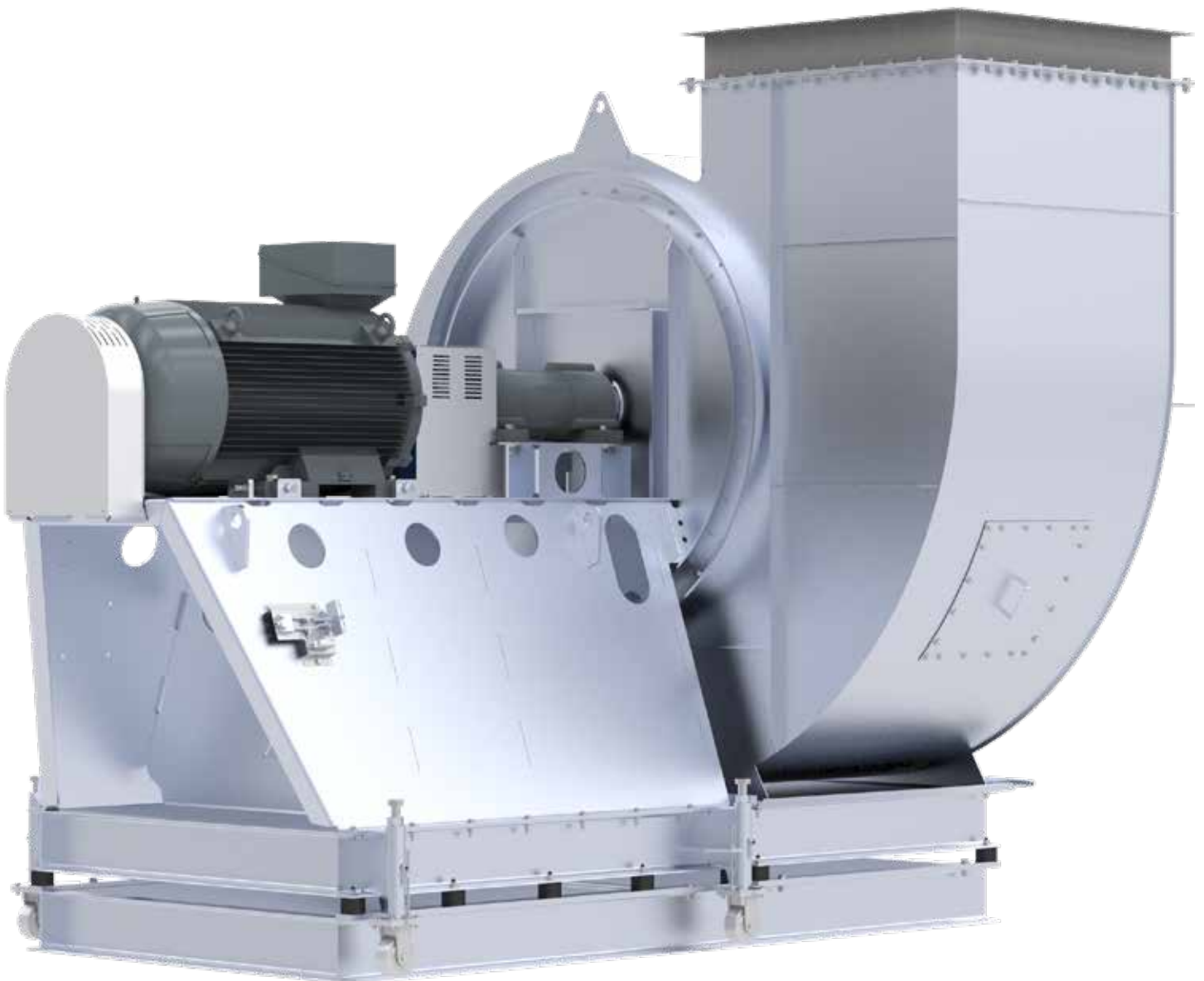
# Clutch-driven fans – efficient and compact

They can be used up to a maximum conveying medium temperature of +500°C and up to a maximum ambient temperature of +100°C.

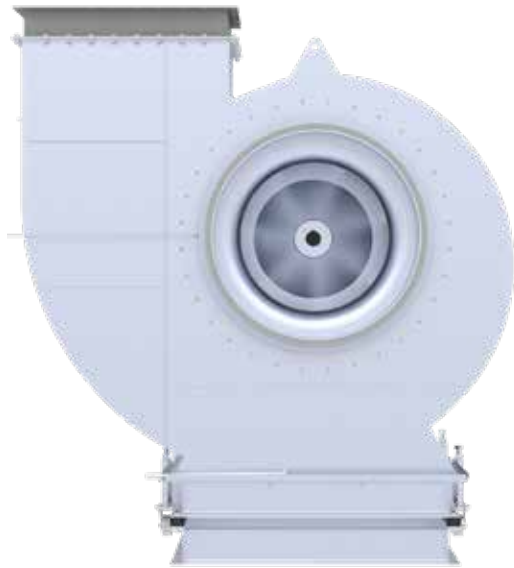
The interior of the fan contains a high performance impeller with backward curved blades.

The clutch-driven fans are available in a range of different steel qualities – from normal steel to high-alloy stainless steel.

The thermal insulation may be between 100 and 200 mm.







### Clutch machine

- Wheel types: low pressure, medium pressure and high pressure
- Temperature: -40 up to +500°C
- Materials from steel to high alloy stainless steels
- Impeller diameter up to 2500 mm
- Air flow up to 500,000 m³/h
- Pressure up to 50,000 Pa
- Monoblock storage or upright storage
- Coupling: elastic or magnet
- Base frame as U-profile

### Accessories

- Ex-protection zone (2G /2D and 3G/ 3D)
- Various sealing systems
- Vibration damper: rubber, spring damper, Viscous damper
- Counter base frame: U-profile
- Vibration monitoring
- Speed monitoring
- Mechanical motor brake
- Autom. relubrication unit
- Housing insulation 100 - 200 mm covered with galvanised sheet steel, aluminium or stainless steel
- Soundproof bonnet above drive
- Different versions of compensators
- Housing division
- Adaptor pieces on suction and pressure side

### Extension concepts:

- Pull-out
- Roll-out

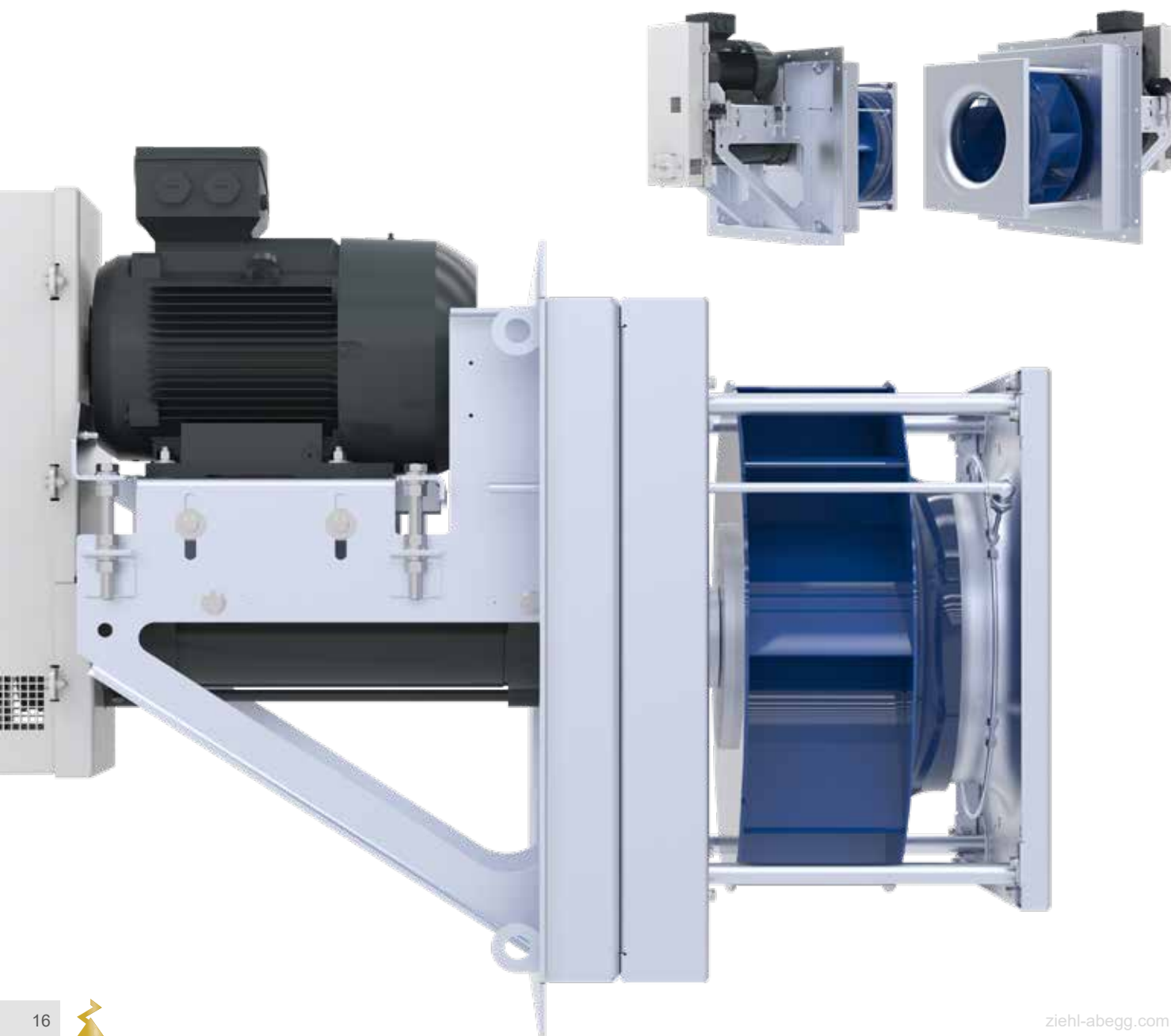


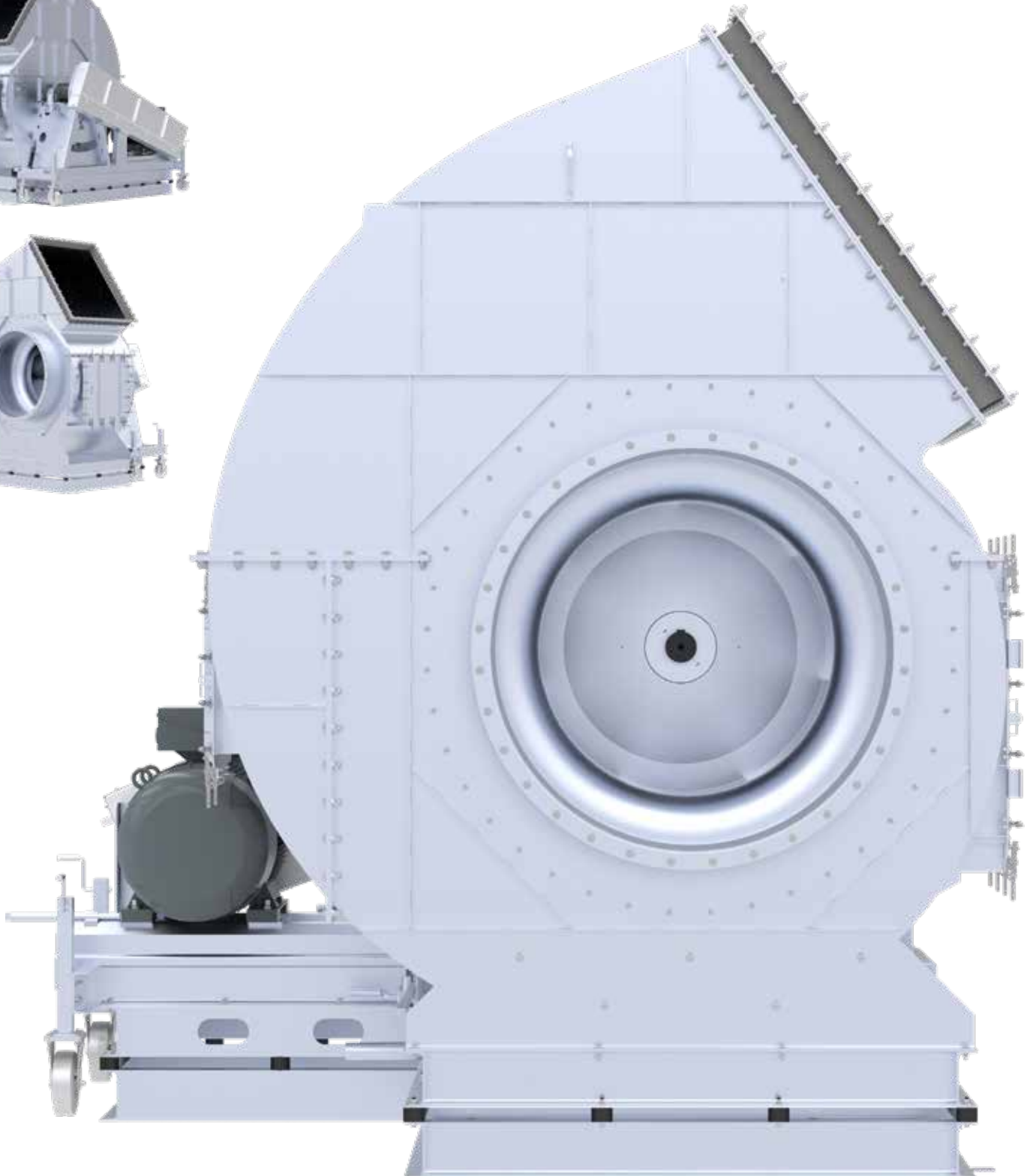
# Special designs – meet every challenge

## Belt-driven housing and plug fans for special requirements

### Special designs

- Centrifugal fans
- High performance impeller with backward curved blades
- Design can be varied depending on the intended operating point
- Flexibly adapted to existing construction
- Designs with special maintenance concepts
- Air flow up to 500,000 m<sup>3</sup>/h,
- Pressure up to 50,000 Pa
- Special and user-friendly maintenance concepts
- Sophisticated transport solutions for oversize







# Extension concepts

Sophisticated, maintenance-friendly,  
intelligent



## Swing-out

Carrying out maintenance work quickly and easily

- For direct-drive fans
- Available up to BG315 motor



### Pull-out

Our fans guarantee high maintenance-friendliness. Drive side removability is standard.

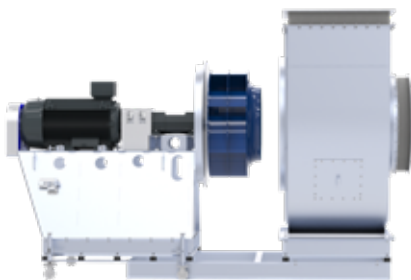
- For direct, clutch and belt-driven fans
- Available for all variants
- Available with forklift lugs on request



### Roll-out

Maintenance-friendly and sophisticated

- For direct, clutch and belt-driven fans
- Available for all variants



# ATEX – an in-depth review



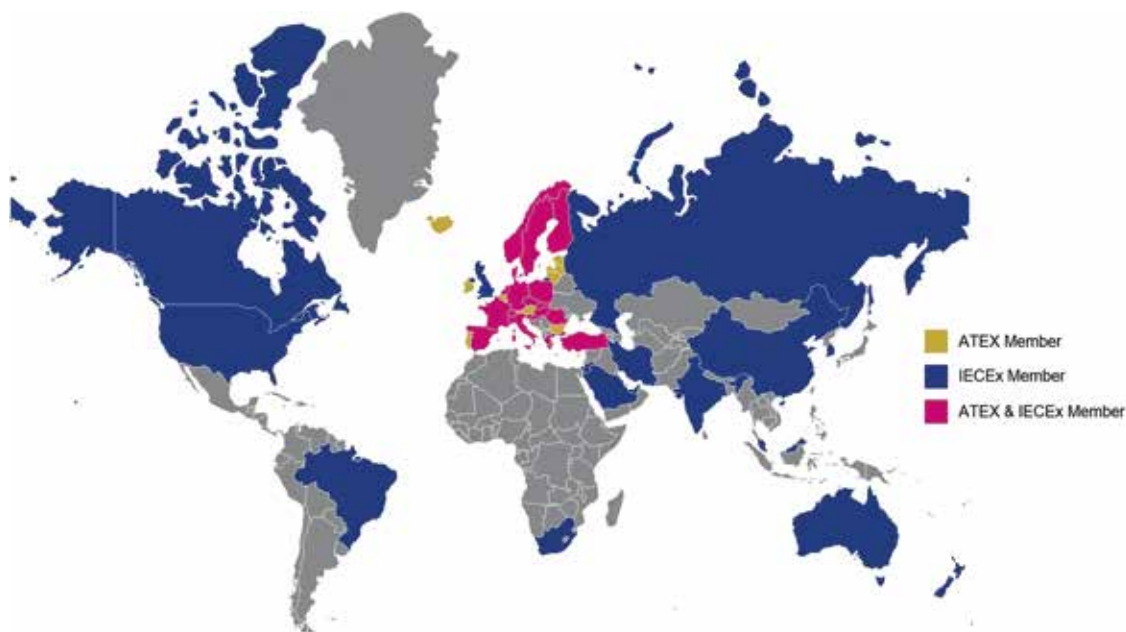
## ATEX

The ATEX Product Directive (ATmosphères EXplosives) 2014/34/EU specifies the conditions under which products used in potentially explosive atmospheres may be

marketed. Its main purpose is to protect persons working in potentially explosive atmospheres or who could be affected by explosions.

## IECEx

Like the ATEX Directive within the EU, IECEx standards define the marking of Ex products internationally with the aim of harmonising international regulations and establishing mutual recognition.



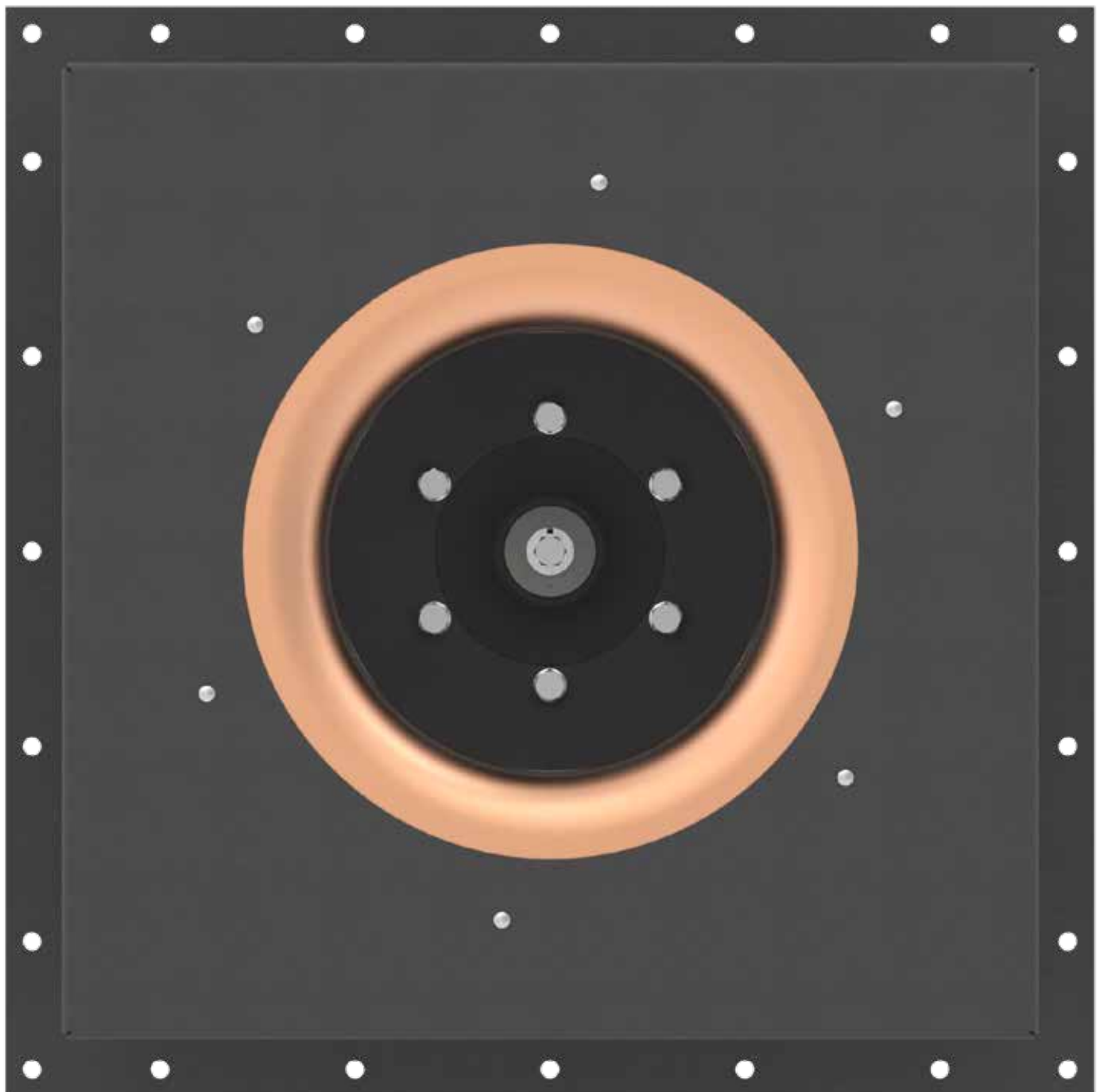
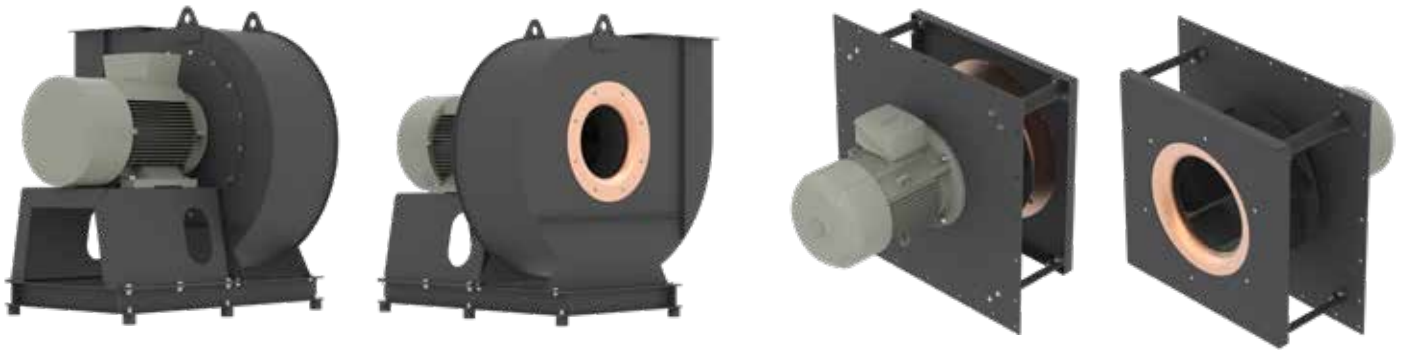
## Example marking for ZIEHL-ABEGG fans



- A | CE symbol confirms conformity with the European Directives applicable to this product
- B | Number of the "Notified Body" (NB) responsible for certification of the manufacturer's quality system
- C | European symbol for marking explosion-proof equipment
- D | European label of equipment group (I = underground + associated systems aboveground // II = other systems)
- E | European label of equipment category
- F | Standard-specific Ex marking
- G | Type(s) of protection of the equipment
- H | Equipment group
- I | Temperature class
- J | Equipment protection level (EPL)
- K | Type-examination certificate number (NB - year - ATEX - consecutive number // ATEX could also be represented by ".")
- L | Marking for equipment with "special conditions" in use or "U" for incomplete equipment







## Types of protection

For classification according to type of protection, a general distinction is made between:

### Electrical equipment

Type of protection	Symbol	Standard	Zone	Description
Increased safety	Ex eb / Ex ec	EN 60079-7 / IEC 60079-7	1 / 2	Additional measures ensure a higher level of safety. No impermissibly high temperatures, no sparks or electric arcs. Examples: Terminal boxes, motors, lights.
Pressure-resistant enclosure	Ex da / Ex db / Ex dc	EN 60079-1 / IEC 60079-1	1 / 2	The housing is designed in such a way that an explosion inside cannot spread to the environment (pressure, gap dimensions). Examples: Motors, transformers, controls.
Protection provided by housing	Ex ta / Ex tb / Ex tc	EN 60079-31 / IEC 60079-31	20 / 21 / 22	A corresponding housing design prevents dust from penetrating and thus the formation of a dangerous atmosphere inside. Examples: Motors, lights, switchgear.

### Non-electrical equipment

Type of protection	Symbol	Standard	Zone	Description
Design safety "c"	Ex h	EN 80079-37 / ISO 80079-37	20 1 // 21 2 // 22	Safe during normal operation. The risk of ignition due to mechanical faults is minimised to a very low level. Examples: Fans, pumps, couplings, conveyor belts.

## Potentially explosive zones

ZIEHL-ABEGG products can be used for the following potentially explosive zones:

Type of protection	Symbol	Description
Gases, mists, fumes	Zone 1	Areas in which it must be assumed that an explosive atmosphere with a mixture of air and combustible materials in the form of gases, vapours or mists occasionally occurs during normal operation. Products with EPL Gb can be used in Zone 1
	Zone 2	Areas in which an explosive atmosphere with a mixture of air and combustible gases, vapours or mists does not normally occur during normal operation and if it does, then only rarely and for a short time. Products with EPL Gb, Gc can be used in Zone 1
Dusts	Zone 21	Areas in which an explosive atmosphere in the form of a cloud of combustible dust contained in the air can occasionally form during normal operation. Products with EPL Db can be used in Zone 21
	Zone 22	Areas in which an explosive atmosphere in the form of a cloud of combustible dust is generally not formed in normal operation, or only briefly. Products with EPL Db, Dc can be used in a Zone 22



## Temperature classes used at ZIEHL-ABEGG

For applications in explosion-protected areas, electrical equipment is divided into groups T1 to T6 according to their maximum surface temperature. The equipment must be aligned in such a way that its maximum surface temperature (according to EN 60079) is below the lowest ignition temperature of the explosive atmosphere.

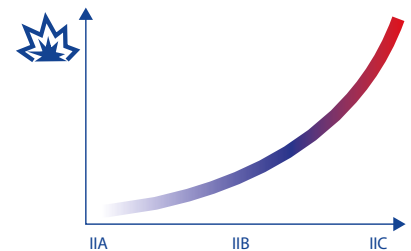
Temperature class	T1	T2	T3	T4
Max. surface temperature	≤ 450°C	≤ 300°C	≤ 200°C	≤ 135°C
IIA	Acetone, ethane, ethyl acetate, ammonia, benzene, benzenamine, formic acid, methane, methyl chloride	Methanol, propane, ethyl alcohol, n-butane, n-butyl alcohol	Benzines, turpentine, diesel fuel, aircraft fuel, heating oils, n-hexane	Acetaldehyde
IIB	Hydrogen cyanide	Ethylene	Dimethoxymethane	Ethyl ether
IIC	Hydrogen	Acetylene		

## Explosion group

Gases, vapours and combustible dusts are classified into various groups according to their ignition propensity:

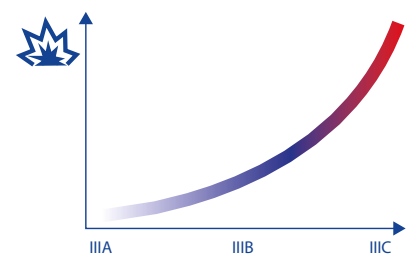
Gas: Classification according to minimum ignition energy or maximum experimental safe gap

Maximum experimental safe gap (MESG) [mm]	Minimum ignition current ratio (MIC)	Gas group
> 0.9	> 0.8	IIA
0.5 ≤ MESG < 0.9	0.45 < MIC < 0.8	IIB (+ H <sub>2</sub> )



Dust: Classification according to type of dust

Dust group	Description
IIIA	Flammable lint
IIIB	Non-conductive dust
IIIC	Conductive dust



# Frequency inverter – smart control

ZIEHL-ABEGG is the only fan manufacturer that develops and produces its own products for RPM control in fans.

Frequency inverter with system competence: perfectly adapted for optimal performance. No frequency inverter is better adapted and parametrised for use with a motor from ZIEHL-ABEGG than the Icontrol or Fcontrol: the ideal combination from a single source for every application.

Special emphasis is placed here on the ease of operation of the ZIEHL-ABEGG frequency inverters. This guarantees fast com-

missioning and saves money. The multifunctional Icontrol and Fcontrol from the "FXDM" model range come with stored pre-set operating modes. Depending on the application, the desired operating mode is simply selected during the start-up process.

All Fcontrol & Icontrol frequency inverters from ZIEHL-ABEGG have a housing compliant with the IP54 degree of protection. The benefit of this is the option of direct mounting without a control cabinet, even outdoors, for example on central air-conditioning units or directly on refrigerating system coolers located outside on roofs.







## Icontrol

### Suitable for:

- IEC standard motors (internal rotor motors)
- Independent operation of the fan in a central air handling unit
- Control of MAXvent axial fans
- Generally for motors/fans that are suitable for use with frequency inverters
- Low investment costs

## Fcontrol

### Suitable for:

- External rotor motors
- Parallel operation of fans
- Long cable lengths + unshielded motor cables
- Motors that are not designed for frequency inverter operation
- Retrofit
- Continuous operation of fans outdoors (e.g. refrigeration technology)

### Highly efficient, RPM-controlled AMblue and PMblue systems:

The AMblue fan system is made up of an asynchronous motor connected to a PMIcontrol Basic-M frequency inverter.

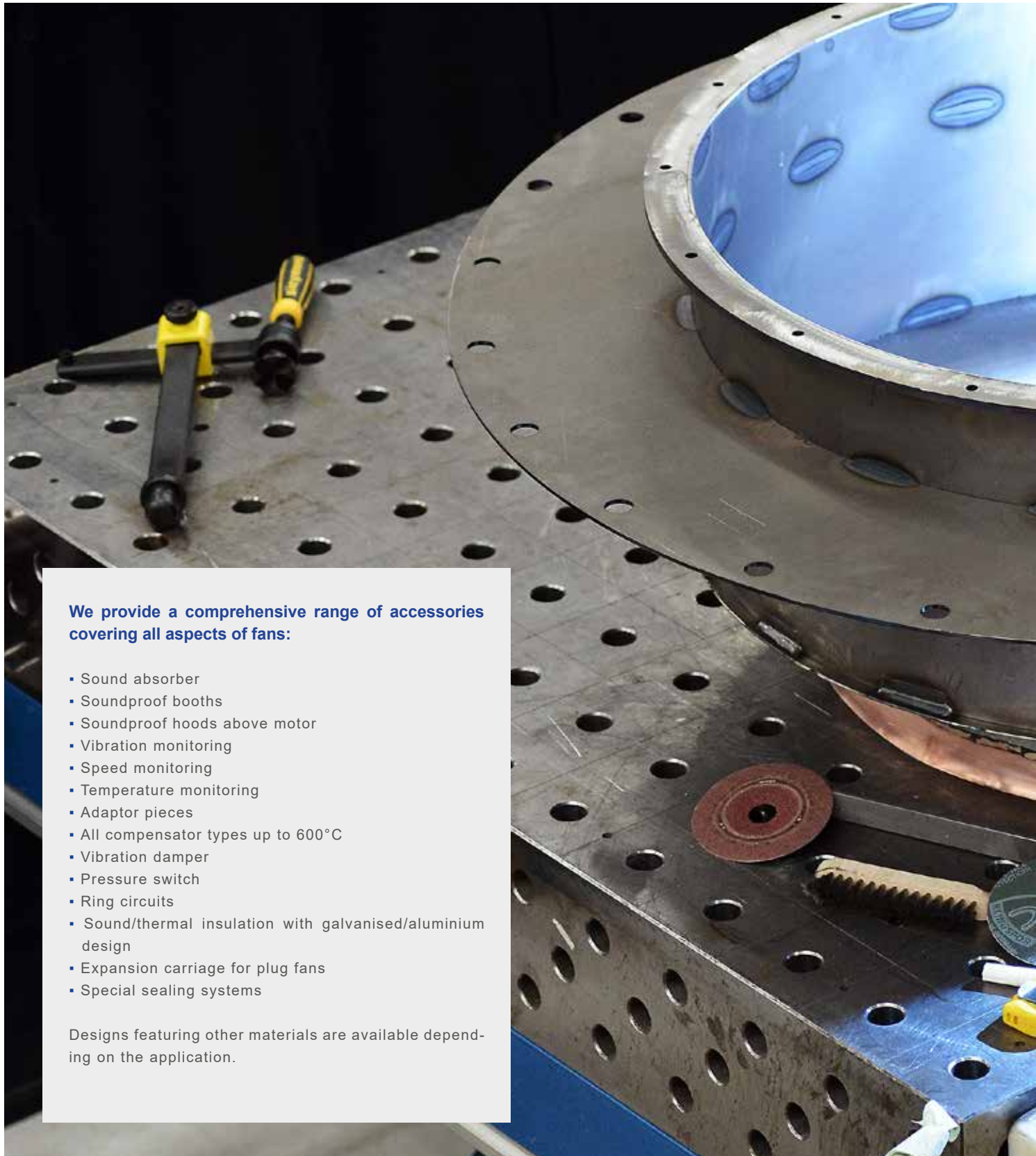
The PMblue system combines a PM motor (permanent synchronous motor) with a connected PMIcontrol Basic-M frequency inverter.

The frequency inverter is suitable for different motors. Configuration and commissioning are very easy to perform using the ZAstick data stick, which is simply plugged into the PMIcontrol Basic-M.



# Accessories

Sound absorbers, soundproof booths, monitoring, maintenance concepts



**We provide a comprehensive range of accessories covering all aspects of fans:**

- Sound absorber
- Soundproof booths
- Soundproof hoods above motor
- Vibration monitoring
- Speed monitoring
- Temperature monitoring
- Adaptor pieces
- All compensator types up to 600°C
- Vibration damper
- Pressure switch
- Ring circuits
- Sound/thermal insulation with galvanised/aluminium design
- Expansion carriage for plug fans
- Special sealing systems

Designs featuring other materials are available depending on the application.



# The Royal League

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