EN

Movement by Perfection

The Royal League in **ventilation**, control and drive technology

Process air fans

Individual, modular, flexible

ZIEHL-ABEGG

Content

Process air fans – individual, modular, flexible

Clean and safe in any application

In the industrial machines and production plants of various sectors, ZIEHL-ABEGG process air fans are performing important tasks: They secure functions which would hardly be possible without defined air flows. They guarantee good indoor air and a clean atmosphere. Thanks to the optimal fan concept for HVAC plant, they perform their tasks with absolute reliability. All standard series and individual solutions based on customer demands are achieved with a calculation programme developed by ZIEHL-ABEGG and energyoptimised drive technology. Energy and operating costs are reduced even further with an independently planned and adapted system – both for standard applications as well as in special areas.

Materials and workmanship of the highest order

The multiple certified ZIEHL-ABEGG process air fans are manufactured from coated sheet steel or stainless steel. Their performance is secured on test chambers which rank among the most modern in the world. This is the reason that the process air fans put their best foot forward daily use; in the air handling units industry just as well as in paint shops and many other ventilation and air extract installations..

Benefits at a glance

- Optimal machine and plant ventilation by design
- Individualised fans in accordance with customer requirements
- FEM – Finite Element Method
- Measurements on our own, highly-modern test chambers
- Independently developed calculation programme for process air fans
- Tight interaction between quality management and technical service
- Certification according to DIN ISO 9001
- ATEX, everything except Zone 0 – dust and gas

Making the good even better

ZIEHL-ABEGG develops individual and customised fan solutions for highly different sectors and application areas: Air-handling units, ceramic industry, chemical and pharmaceutical industry, generator/motor cooling and railway applications just to name a few of the areas that put their trust in the technical expertise and innovative developments from ZIEHL-ABEGG.

In-house development department

In the futuristic centre for research and development, the In-Vent Technology Centre – the world's largest and most modern air flow and noise level test chambers for fans – the fan units are tested and all imaginable FEM calculations and load tests are carried out.

Our customers include:

BOSCH Invented for life

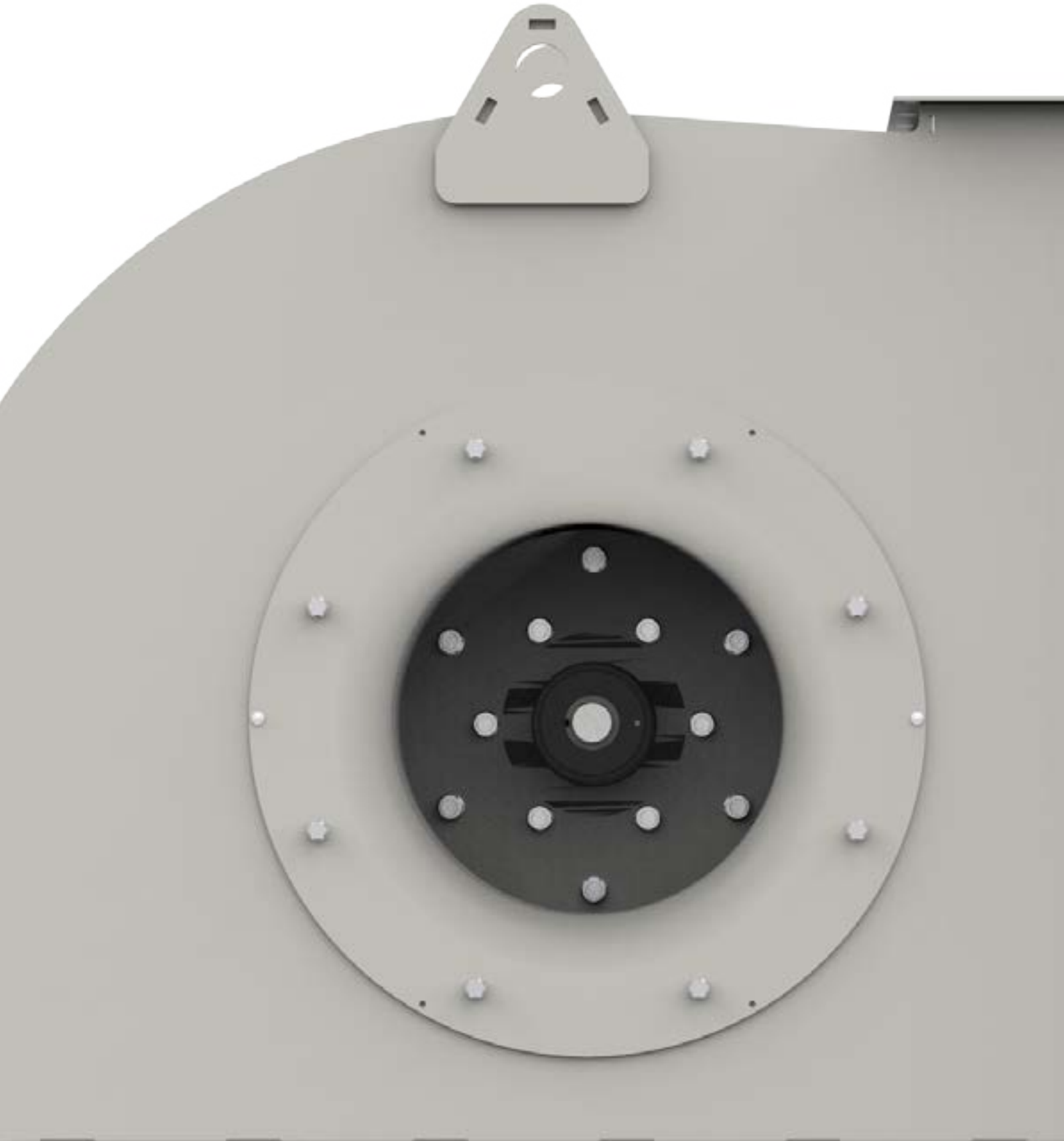
BRÜCKNER MASCHINENBAU

EISENMANN

KRONES

SWISS COMBI

Scroll fans – maximum quality for every application



Centrifugal fans with spiral housing, single-ended extracting, direct-drive and with a max. conveying medium temperature of +400°C.

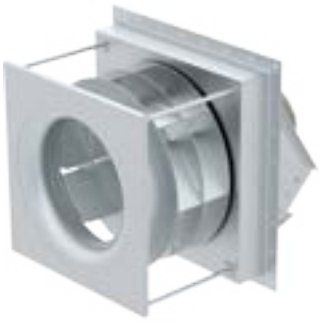
PR-T scroll fans

- Centrifugal fans with spiral housing, single-ended extracting, direct-drive
- High-performance impeller with backwards-curved blades
- Max. conveying medium temperature +400°C
- Stable welded spiral housing
- IEC standard motor type IM B5 / B5
- ISO class F
- Protection rating IP55
- Volume flow rate 22,000 to 100,000 m^3/h
- Pressure 2,600 to 20,000 Pa
- Impeller diameter up to 2,000 mm
- Drawings and 3D models available with quote
- Insulated design

Built-in fans – even closer to perfection

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

Built-in centrifugal fans with free running impeller insulated. Centrifugal fans for installation in devices, without housing.



PRdry uninsulated built-in fans

- Centrifugal fans for installation in devices, without housing
- High-performance impeller with backwards-curved blades
- Max. conveying medium temperature +100°C
- IEC standard motor type IM B5
- ISO class F
- Protection rating IP55
- 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
- Impeller diameter up to 1,600 mm
- Drawings and 3D models available with quote

PRdry insulated built-in fans

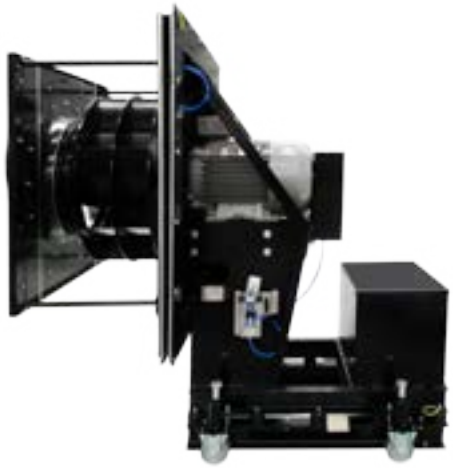
- Centrifugal fans for installation in devices, without housing
- High-performance impeller with backwards-curved blades
- Max. conveying medium temperature +600°C; insulated design including cooling vane
- IEC standard motor type IM B3
- ISO class F
- Protection rating IP55
- Design can be varied depending on the intended operating point
- Impeller, inlet nozzle and support plate can be freely configured
- Flexibly adapted to existing construction
- Impeller diameter up to 1,600 mm
- Drawings and 3D models available with quote

Free running fans – every version a fine-tuned solution

Free running fans without housing.
Free running fan installed in duct.

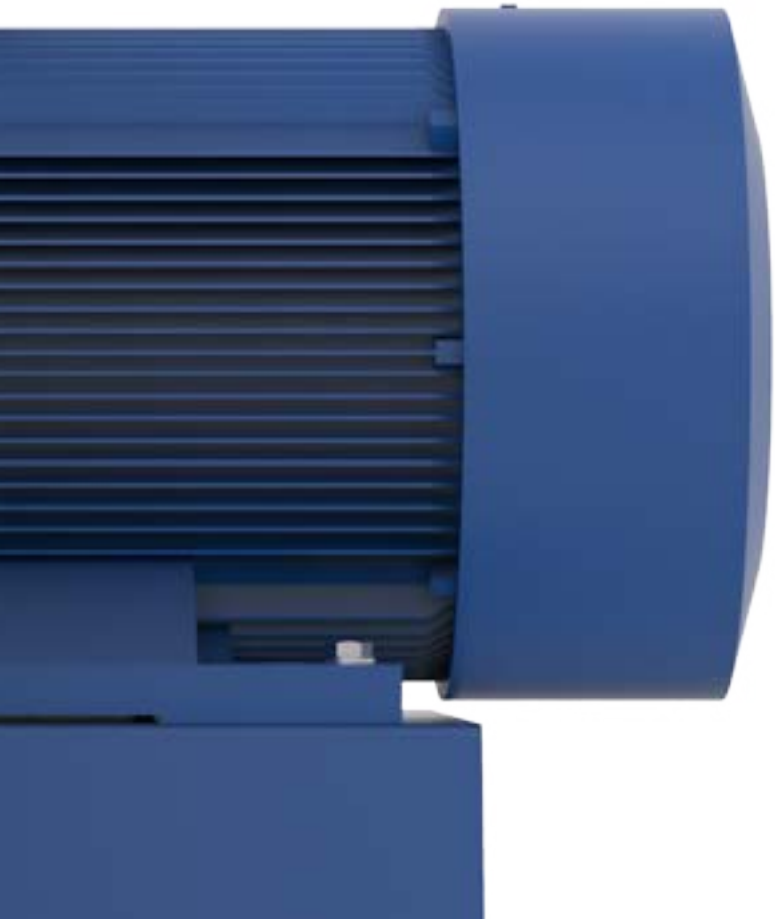
PK free running fans

- Centrifugal fans for installation in devices, without housing
- High-performance impeller with backwards-curved blades
- Max. conveying medium temperature +100°C
- IEC standard motor type IM B3
- ISO class F
- Protection rating IP55
- 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
- Volume flow rate 500 to 200,000 m^3/h
- Impeller diameter up to 2,000 mm
- Drawings and 3D models available with quote



Duct installation also available for zone 2G / 3G

Duct installation



Clutch-driven fans – efficient and compact

Our centrifugal fans for installation in devices are supplied without housing. They can be used up to a maximum conveying medium temperature of +500°C and up to a maximum ambient temperature of +40°C.

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

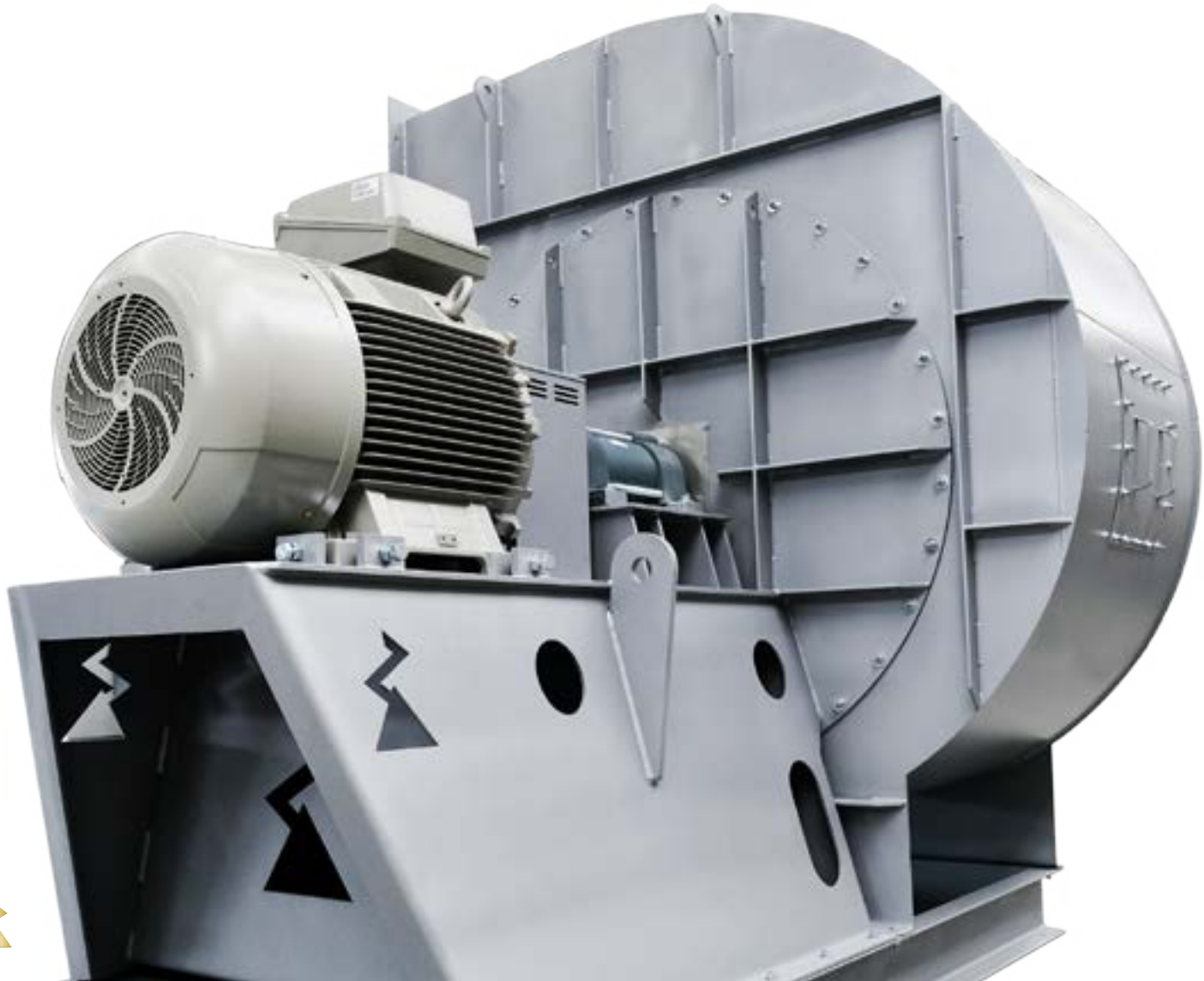
The clutch-driven fans are available in a range of different steel qualities – from normal steel to high-alloy stainless steel.

The support plate or the support tray is available in square or rectangular formats according to the system specification. In the modular design, this features a mounted and adjusted inlet nozzle; as a motor impeller, this features a loose inlet nozzle. The installation depth of the support tray can be defined by the user. The thermal insulation may be between 100 and 300 mm.

The drive motor is the IEC standard motor type IM B3 / B5, THCL155, featuring protection rating IP55.

94/9 EC ATEX – We use this new EU directive for all devices, components and protective systems intended for use in potentially explosive atmospheres.

Our explosion-proof fans are designed, produced and tested in compliance with ATEX 94/9 EG-, 1999 / 9 and are therefore suitable for operation in zones 1 and 2 as well as 21 / 22.



Clutch-driven machine

- Impeller types: Low pressure, medium pressure and high pressure
- Temperature: - 40 to + 500 °C
- Materials: St. 37 to 1.4835 / 78
- Motor sizes: 180 M to 315 L (22 to 315) 2, 4, 6, 8-pole
- Nominal sizes: NW 400 to 2000
- Coating types: wet varnish, powdered
- Clutch: N-Eupex or Rupex

Accessories

- Ex-protection zone (2G/3G) as well as 21/22
- Sealing concepts: Stuffi ng box/shaft seal 1/2-fold with inert gas connection
- Vibration damper: Rubber, spring damper, viscous damper
- Block bearing: Monoblock or single pedestal bearing unit
- Base frame: U-section
- Vibration monitoring
- Automatic relubricating unit
- Soundproof hood / insulation / soundproof booth

Operating points (examples)

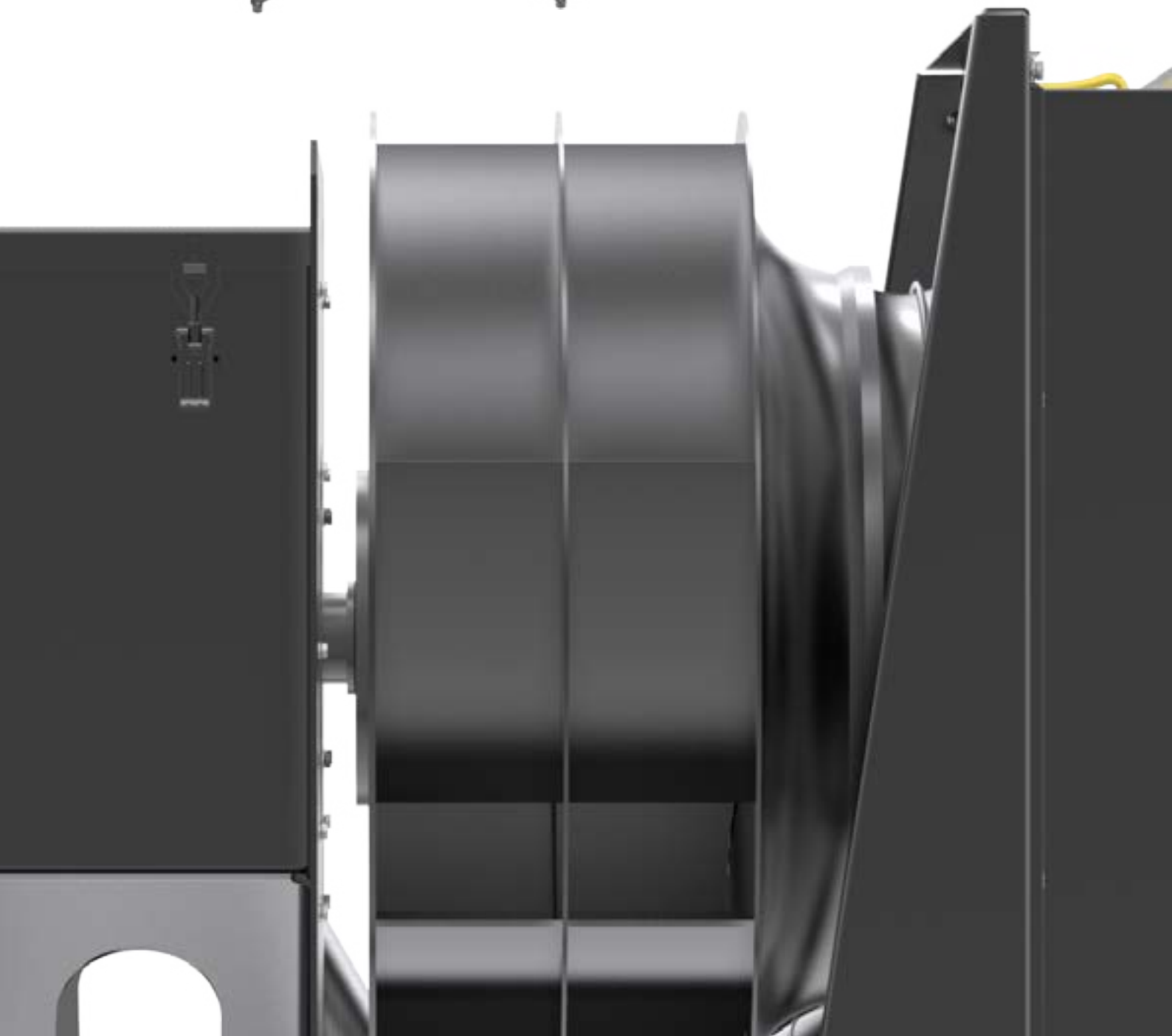
- 6,000 m³/h stat. 25,000 pa
- 5,000 m³/h stat. 40,000 pa
- 250,000 m³/h stat. 6,000 pa
- Efficiency: > 80%

Special applications – meet every challenge

Scroll fans, built-in fans and free running fans customised to the application.

Special designs

- Centrifugal fans for installation in devices, without housing
- High-performance impeller with backwards-curved blades
- ATEX 2G / 3G and 21 / 22
- IEC standard motor type IM B3
- ISO class F
- Protection rating IP55
- 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
- Designs with special shaft sealings
- Motor enclosures and ventilation concepts for motors
- Volume flow rate 500 to 500,000 m^3/h
- Impellers featuring special designs can be individually adapted
- Drawings and 3D models available with quote



ATEX – an in-depth review

94/9 EC ATEX – We use this new EU directive for all devices, components and protective systems intended for use in potentially explosive atmospheres. Our explosion-proof fans are designed, produced and tested in compliance with ATEX 94/9 EC and 1999/9 EC and are therefore suitable for operation in zones 1 and 2 as well as 21/22.

Internal zoning

The inside of storage containers that are exposed to the atmosphere and used to store liquids and where the temperature often rises above flashing point, must be designated as explosion zone 0. The explosion zone can be reduced, for example through inertisation using pressure control. Zone 1 can be achieved if the probability of occurrence of an explosive mixture in accordance with the definition for Zone 1 can be reduced (occasional occurrence) through the use of additional monitoring equipment.

Equipment or pipelines that, even taking into account very rare faults, always contain a gas mixture that exceeds the upper explosive limit are not potentially explosive zones. These include, for example, natural gas pipelines and liquid gas lines, as these always contain pressure that is greater than the atmospheric pressure. However, particular conditions are imposed if these components are to be refilled with the combustible substance after being emptied. Any air that is contained must be removed or the equipment must be inertised before filling. Appropriate operating instructions are required for this (see also explosion protection document).

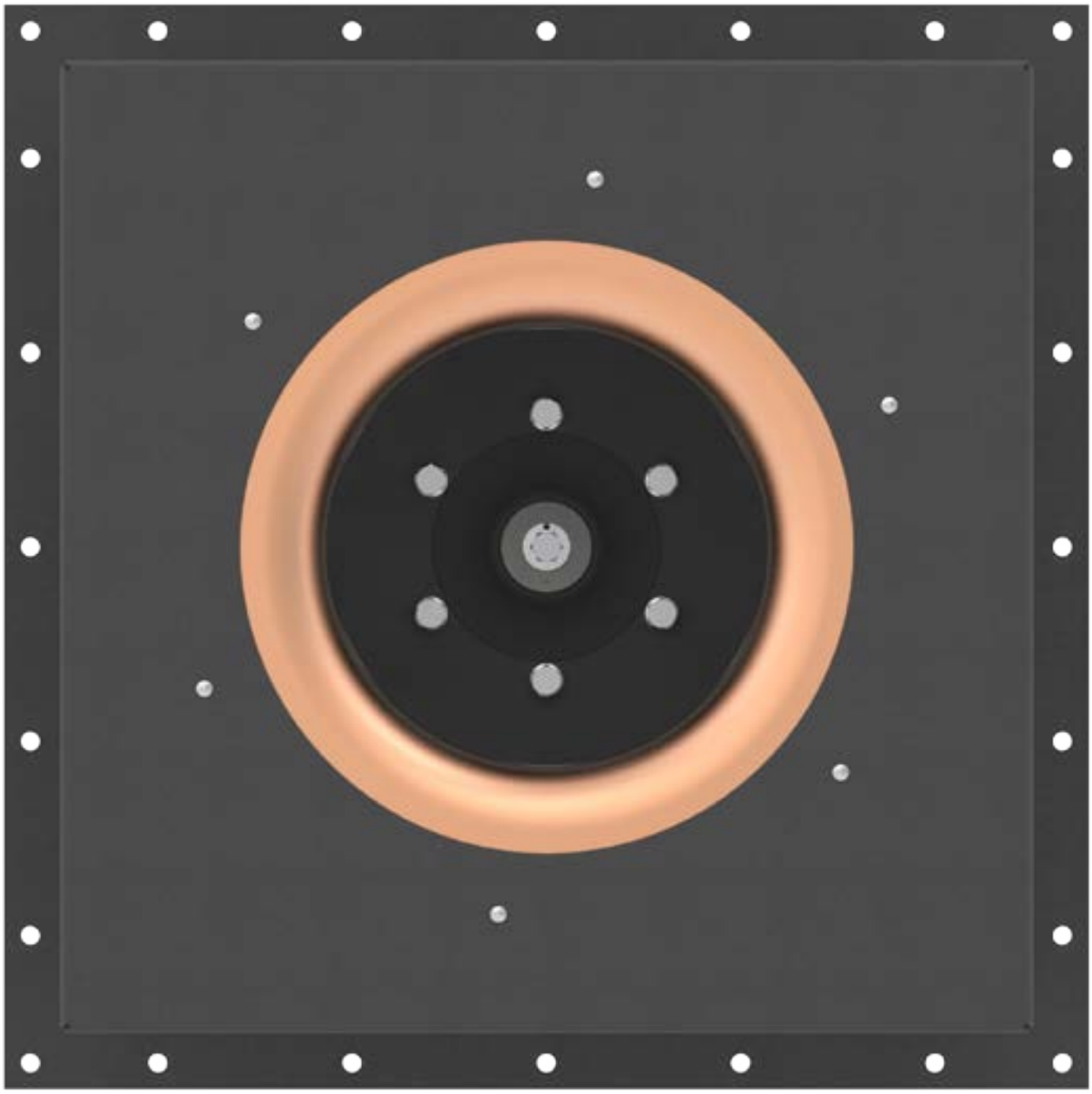
In the following cases, classification of explosive zones is necessary when handling potentially explosive substances: opening equipment, decanting, atomising or sampling. The information provided by the employers' liability insurance associations (BGI bulletins) can be helpful for defining zones. An area designated as Zone 1 usually follows an area specified as Zone 2. If the whole room is designated as Zone 1, then the doorway to an adjacent room may have to be classified as Zone 2.

Groups

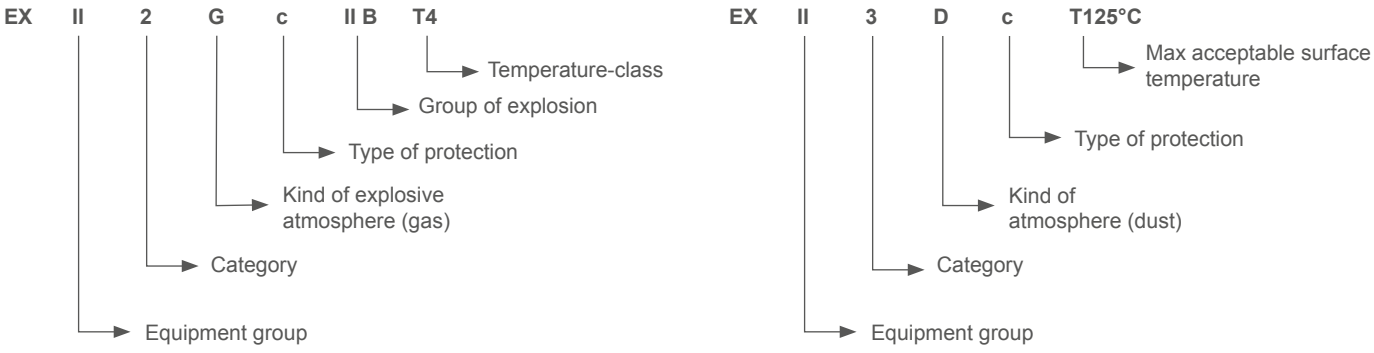
Devices that are suitable for use in potentially explosive atmospheres are split into three groups. Until the introduction of EN 60079-0:2009, all devices were divided into just two groups.

Group II represents potentially explosive gases and is divided into the subgroups IIA, IIB and IIC for some types of protection (Ex d, Ex n). For Ex d (flameproof enclosures): The letter indicates the maximum experimental safe gap (maximum width of the gap on a flashback arrester through which ignition cannot be transferred). For Ex n this is subdivided, as it is dependent on the relevant type: Ex nA.

Subgroup A includes, for example, diesel, petrol, ethane, methane and carbon monoxide. Subgroup B is for substances such as town gas, hydrogen sulphide and ethylene. Subgroup C covers hydrogen, acetylene and carbon disulphide.



Labeling for ZIEHL-ABEGG fans



Suitability of ZIEHL-ABEGG fans

Category	Atmosphere G (gas)	Atmosphere D (dust)	Occurrence of potentially explosive atmosphere
Category 2	Zone 1	Zone 21	During normal operation: occasional
Category 3	Zone 2	Zone 22	During normal operation: usually none or only brief

Ignition protection types (electrical operating equipment)

Protection class	Definition	Category	Use in Zone	Temperature class	Inverter operation
e Increased safety	Measures that avoid impermissibly high temperatures, sparks and electric arcs on internal and external parts	2G	1; 2	T1; T2; T3	No
d Pressure-resistant enclosure	The housing can resist the pressure of an explosion and prevents the force of the explosion being transferred outwards	2G	1; 2	T1; T2; T3; T4	Yes
nA Non-sparking operating equipment	Does not ignite ambient potentially explosive atmosphere in normal operation and under defined abnormal operating conditions	3G	2	T1; T2; T3	With tested inverter
tD Protection provided by housing	Limitation of maximum surface temperature and restriction of ingress of dust	2D; 3D	21; 22	T125°C	With tested inverter

Ignition protection types (non-electrical operating equipment)

c Design-related safety	Technical principles are applied to reduce to a very low level the risk of mechanical errors that can lead to the formation of temperatures and sparks capable of causing ignition.	All	1; 2; 21; 22		

Temperature classification

Maximum permissible surface temperature	Temperature class for gases
450°C	T1
300°C	T2
200°C	T3
135°C	T4
For dust: specification of max. surface temperature in °C	

Explosion groups for gases

Group	Typical gas
II A	Propane
II B	Ethylene
II C	Hydrogen

Application areas for installation and scroll fans in the PR-T and PRdry series from ZIEHL-ABEGG

Device group	II
Category	2 or 3
Type of potentially explosive atmosphere	G, D G/D (no hybrid mixtures)
Fan ignition protection type	c
Motor ignition protection type	de, e, na, tD, de/tD, nA/tD
Gas explosion groups	IIA, IIB and hydrogen from IIC
Temperature classes	T1, T2, T3, T4
Max. permissible surface temperature with presence of dust	T125°C
Intake temperature	Min. -20°C Max. +60°C
Ambient temperature	Min. -20°C Max. +40°C (up to +60°C on request)
Installation height	Max. 1000 m above MSL (higher on request)

Frequency inverters – smart control

ZIEHL-ABEGG is the only fan manufacturer who develops and builds its own products in the field of fan speed control.

Frequency inverter with system competence: perfectly coordinated for optimum performance. No frequency inverter is better adapted and parametrised for ZIEHL-ABEGG motors than the Icontrol or Fcontrol: everything you need from a single source for every application.

Special focus is put here on the simple handling of ZIEHL-ABEGG frequency inverters. This guarantees fast start-up and saves money.

The multifunctional Icontrol & Fcontrol from the "FXDM" type series feature preset 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 are equipped as standard with IP54 compliant housing. This allows for a direct installation without the need for a control cabinet, even outdoors, for example on air-conditioning units or directly on refrigerating system coolers outside on roofs.

Icontrol

Suitable for:

- IEC standard motors (internal rotor motors)
- Individual fan operation in air handling units
- Control of MAXvent axial fans
- Generally for frequency inverter compatible motors/fans
- Low investment costs

Fcontrol

Suitable for:

- External rotor motors
- Parallel operation of fans
- Long cable lengths + unshielded motor cables
- Motors that are not optimised for operation with frequency inverters
- Retrofitting
- Quiet outdoor fan operation (e.g. refrigeration)

Highly efficient, RPM-controlled AMblue and PMblue systems:

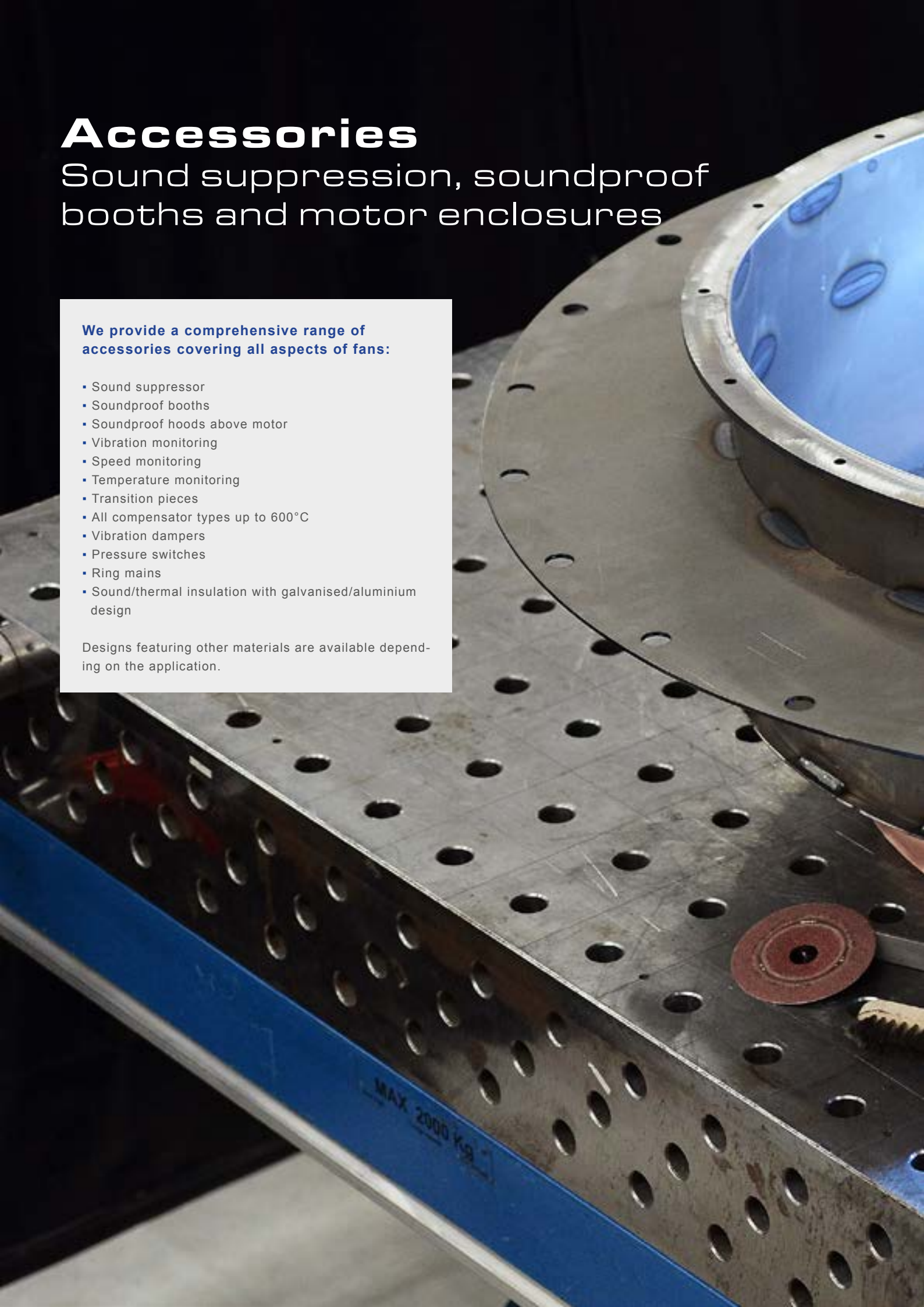
The AMblue fan system is made up of an asynchronous motor connected to a PMIcontrol Basic-M frequency inverter.

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 using the ZAstick data stick, which is simply plugged into the PMIcontrol Basic-M.

Accessories

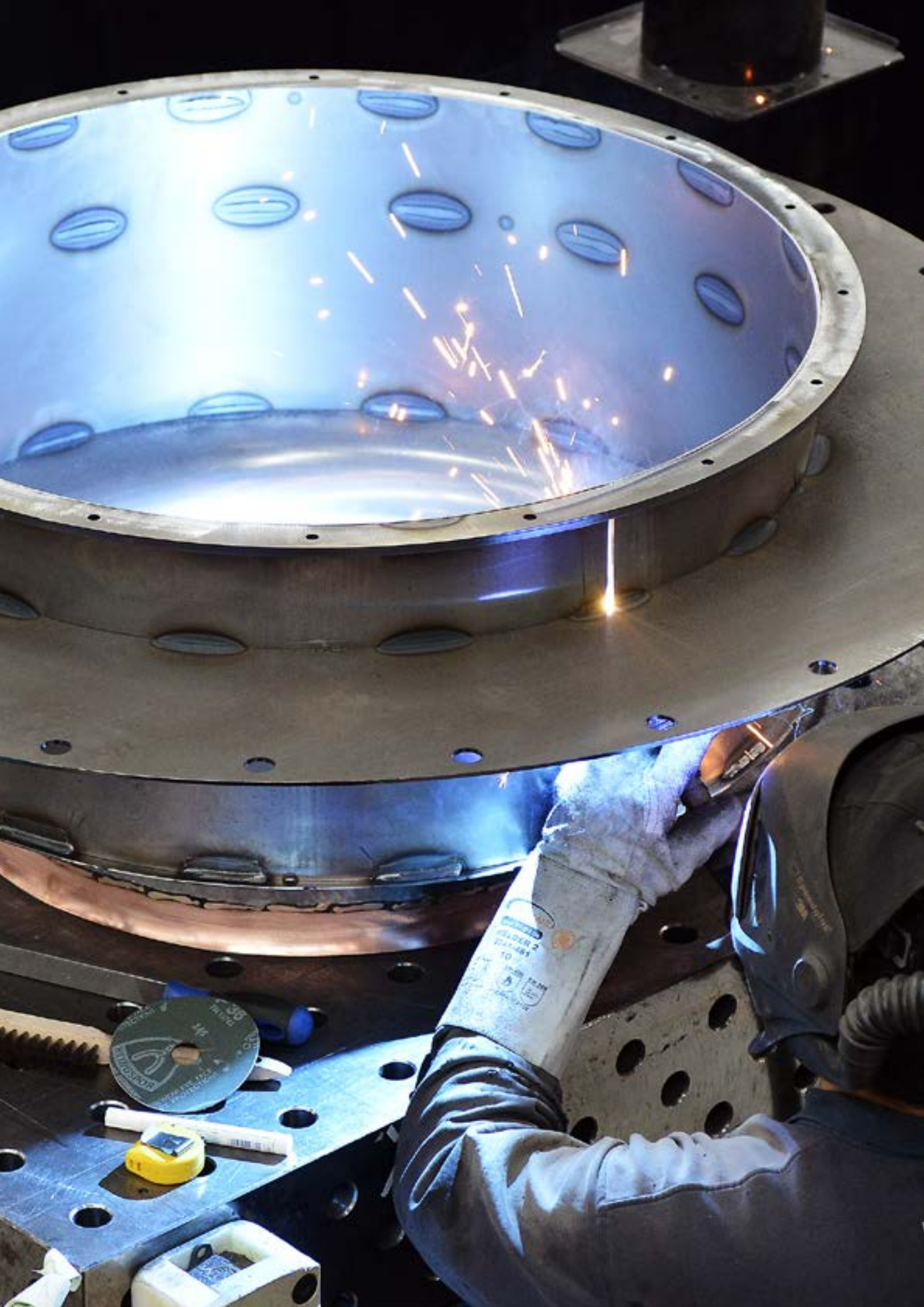
Sound suppression, soundproof booths and motor enclosures



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

- Sound suppressor
- Soundproof booths
- Soundproof hoods above motor
- Vibration monitoring
- Speed monitoring
- Temperature monitoring
- Transition pieces
- All compensator types up to 600°C
- Vibration dampers
- Pressure switches
- Ring mains
- Sound/thermal insulation with galvanised/aluminium design

Designs featuring other materials are available depending on the application.



Checklist process air fans

Project				
Customer				
Project				
Quantity				
Performance and design				
Application				
Fan design	☐ 	☐ 	☐ 	☐ 
Air flow	m^3/h operating cubicmetre			
Pressure	Pa	☐ static	☐ total	
Max. medium temperature	°C			
Max. ambient temperature	°C			
Density for duty point	☐ standard: 1,2 kg/m^3		☐ other:	kg/m^3
Voltage / frequency	V	Hz		
Operating mode	☐ mains operated		☐ frequency converter	
Rwquired speed range	1/min			
Motor shaft	☐ horizontal	☐ vertical upwards	☐ vertical downwards	
Rotating direction view on motor	☐ RD		☐ LG	
Material: Special requirements	☐ steel coated		☐ stainless steel	
Plug fan				
Plug fan	☐ 	☐ 	☐ 	☐ 
Insolation	☐ yes		☐ no	
Assembly dimensions Off-size from standard	wall thickness by customer mm mounting plate mm		mounting depth mm	
Inlet cone with copper border	☐ loose ☐ yes		☐ assembled ☐ no	
Accessories	☐ temperature measuring tube ☐ other		☐ pressure measuring tube	
Scroll fan				
Scroll fan	☐ 	☐ 	☐ 	☐ 
Connection	☐ A free inlet and outlet ☐ B free inlet; outlet connected ☐ C inlet connected; free outlet ☐ D inlet and outlet connected			
Rotating direction / scroll position	☐ RD degree		☐ LG degree	
Accessories	☐ scroll foot ☐ guard grill ☐ compensating unit with flange (suction) ☐ compensating unit with flange (discharge)		☐ inspection door ☐ condesed water drain ☐ base rails ☐ rubber block support	
	☐ coupling ☐ Block bearing ☐ Lubrication system ☐ temperature control		☐ vibration control ☐ Housing isolation ☐ performance Alu / galvanized ☐ cooling disk	
Shaft seal	☐ V-Ring seal ☐ other		☐ carbon ring seal	
Remarks				
Company	Contact person		Date	

ZIEHL-ABEGG

The Royal League

ZIEHL-ABEGG

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