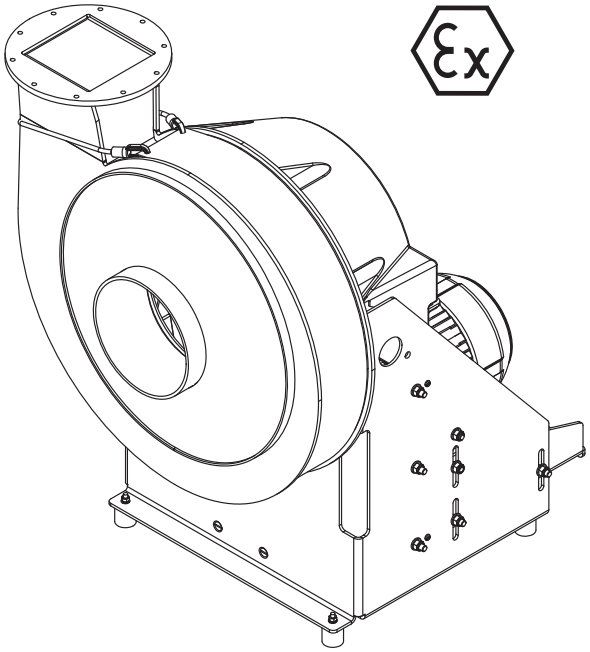
Operating instructions

CHVS 63-250 ATEX

Centrifugal fan with V-belt drive



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1 Operating instruction information

Scope

These operating instructions provide qualified personnel with all essential safety instructions, information, and guidance for working with CHVS 63-250 ATEX type fans.

All phases of a fan's service life are covered, from transport, mounting, and placement in service to repairs and disposal.

Careful reading of and compliance with these operating instructions will help to avoid injuries as well as environmental and material damage, ensure operational safety and reliability of the fan, and minimize downtime.

Storage location

The operating instructions and associated documents are to be stored near the fan such that they are easily accessible to qualified personnel at all times.

Upon request, the operating instructions and associated documents are also to be provided in electronic form upon delivery of the fan. This gives the operator the ability to print new operating instructions in the event that they go missing or to replace illegible or missing pages.

Design notes

For the sake of simplification, in these operating instructions,

- the company COLASIT AG is referred to as the "manufacturer,"
- all sizes (CHVS 63-250 ATEX) are generally referred to as the "fan,"
- "frequency converter" is abbreviated as "FC,"
- the drive type "V-belt drive" is abbreviated as "BD" for "belt drive,"
- chapter and page number references appear as follows: ⇨ Chap. 1 [▸ 7]

The images in these operating instructions are for illustrative purposes and could differ from the actual execution.

In the interest of our customers, we reserve the right to make changes as a result of technical developments.

Translation note

The German language version of this document is the original set of operating instructions.

Inquiries

If possible, clarify any ambiguities in a given language version with the aid of the original operating instructions. Ambiguities regarding the operating instructions are to immediately be clarified with the manufacturer. Placement in service of or other work on the fan is only permitted after successful clarification.

1.1 Further applicable documents

In addition to these operating instructions, the following documents and guidance shall be available as associated documents for working on the fan:

- Technical data sheet for the fan with complete technical data, including application limitations.
- Order confirmation or the specification sheet for the conveyed medium with information on the (limited) resistance of the fan to certain chemical substances. See also “Permissible conveyed media” ⇨ Chap. 2.2.1 [▶ 9].

The order confirmation also provides details regarding the full scope of delivery.

- Operating instructions for the electric motor.
- ATEX declaration of conformity for ATEX components: partly contained in separate operating instructions.
- Operating instructions for devices or equipment that were installed or included (e.g. FC or isolation switch).

Additional document

- Fan manufacturer’s EMC Guidebook, if the fan is intended for operation with a frequency converter (FC).

1.2 Copyright

These operating instructions are protected by copyright.

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The use and distribution of the operating instructions is permitted in the context of using the fan. Any other use is only permitted with the written consent of the manufacturer.

2 Additional safety instructions

This chapter contains information relevant to safety and additional as well as more in-depth safety instructions for operators and technical specialists.

Additional safety instructions

Depending on the execution of the fan, associated documents can contain additional operating instructions with important safety instructions.

2.1 Use and storage of the operating instructions

- Before beginning mounting procedures or working on the fan, read these operating instructions carefully and completely.
- After use, always return the operating instructions to the marked storage location near the fan.

2.2 Intended application of the fan

The fan is intended for conveying gaseous media in potentially explosive atmospheres and is designed and manufactured in accordance with the state of the art and the recognized technical safety regulations.

Nevertheless, the fan may pose a danger to life and limb of personnel or third parties as well as material damage. Special care is therefore to be taken to ensure that the fan is in technically sound condition and that it is used as intended.

2.2.1 Intended use

The fan is intended exclusively for the application specified on the nameplate and for installation in a complete system ⇨ Chap. 4.2 [▸ 25]. The fan may only be transported, mounted, and operated by trained qualified personnel with appropriate ATEX training/qualification ⇨ Chap. 2.3 [▸ 14].

Operating guidelines for potentially explosive atmospheres

The fan

- is suitable for conveyance of gases in zone 1 or 2 (equipment category 2 and 3), depending on the execution.

See the fan name nameplate ⇨ Chap. 5.2 [▸ 27] and the ATEX Declaration of Conformity ⇨ Chap. 15 [▸ 83].

Permissible conveyed media

In general, conveyance of dust-free air is permissible within the parameters specified in the technical data sheet.

Conveyance of corrosive, hazardous, explosive, gaseous media is restricted as follows:

1. The following apply to a conveyed medium that is specified in the fan's technical data sheet:
   - The fan is suitable exclusively for conveyance of the specified medium.
   - The service life of the fan could be limited if there is a corresponding note in the order confirmation or the specification sheet.

2. The following apply to a conveyed medium that is specified as “undefined” in the fan's technical data sheet:
   - The fan is suitable for conveyance of corrosive, hazardous, explosive, gaseous media that fall under the explosion protection marking of the fan (explosion group, temperature class) and to which the plastics of the fan and the sleeves are resistant.
   - For independent assessment, the operator is to consult the pertinent available resistance lists for plastics. The SIMCHEM guide is found on the manufacturer's website (www.colasit.com).
   - The order confirmation or the additional specification sheet contains further information and notes regarding a potential reduction in service life of the fan.
3. The following apply if, according to the operator’s information, the conveyed medium contains several chemical substances:
   - The named importer or the manufacturer confirms the resistance of the fan to these chemical substances in the order confirmation or the specification sheet, which is an associated document.
   - The service life of the fan can be limited if there is a corresponding note in the order confirmation or the specification sheet.

Permissible environmental conditions

1. The permissible operating and ambient temperature ranges are indicated on the fan nameplate.
   The minimum permissible operating temperature for the plastic parts of the fan is -20 °C.
2. The following applies if this information is missing from the nameplate:
   - Permissible ambient temperature range of the electric motor: See nameplate of the electric motor or the operating instructions/declaration of conformity of the motor manufacturer.
3. At operating temperatures below 4 °C, it is to be ensured by means of a constant minimum flow rate that
   - no condensate freezes in the fan or ductwork.
   - no pieces of ice from the ductwork get into the fan.

Procedure for process changes

- The operator is to ensure upon a process change that
  - the fan can withstand the zone or parameters changed or the new conveyed medium,
  - the operating conditions according to the technical data sheet and nameplate plate are adhered to.

Operating conditions

- The permissible operating conditions of the fan are defined by the parameters and limit values on the technical data sheet or on the nameplate of the fan and electric motor.

Note especially:

- Equipment category as well as ATEX certification of electric motor and accessories (FC, isolation switch, etc.) must be zone-compliant.
- The drive motor of the fan is designed for continuous operation (S1) or FC operation (S9).
- Maximum speed, which is dependent on
  - the temperature of the conveyed medium,
  - chemicals present and their concentration in the air stream.
- Prevention of excessive self-heating:
  - The operating point (see characteristic map on the technical data sheet) shall be above the minimum permissible conveyed volume.
- So that no or minimal conveyed medium escapes from the impeller hub,
  - operate the fan at a negative pressure,
  - or use a hub seal.

The leakage value of the supplied fan can be requested from the distributor.

- The fan must have vibration absorbers ⇨ Chap. 7.5 [▸ 40].
  - Observe the permissible vibration limits according to standard values.
- The fan may not be mechanically stressed at the inlet and outlet connections.
  - Decouple the ductwork from the fan via the sleeves ⇨ Chap. 7.6 [▸ 41].
- When using a frequency converter,
  - observe the limit values for the acceleration and braking time ⇨ Chap. 8.3 [▸ 47]
  - the electrical connection to the motor is to be EMC compliant, with cable shield and grounding ⇨ Chap. 8.3.3 [▸ 50].
- Series or parallel operation of fans is permitted only after clarification and approval by the manufacturer or importer named in the operating instructions.

Intended use also includes compliance with all safety regulations and guidelines in these operating instructions.

Maintenance and repair regulations

Adjustments and modifications to fans are strictly prohibited. Failure to comply will void ATEX conformity of the fan.

Only trained, qualified, and authorized personnel may perform work on explosion-proof fans.

2.2.2 Reasonably foreseeable misuse

Any use of the fan other than that for which it is intended or any other use is considered misuse and can lead to dangerous situations. The manufacturer assumes no responsibility for resulting injuries or material damage.

The following list of misuse is exemplary and not exhaustive.

- Conveyance of explosive dust.
- Operation in explosion protection zone 0 or in a zone that is not specified in the explosion protection marking on the nameplate of the fan or in the technical data sheet.
- Operation of the fan outside the parameters and limit values specified in the technical data sheet.
- Operation of the fan with prohibited conveyed media, such as solids and dust.
- Operation of the fan in spite of strong vibration or with disturbances that create an objectionable condition in terms of safety.
- Prohibited configurations of the frequency converter.
- Removal of components or tampering with components that ensure safe and proper function of the fan (e.g. vibration absorbers, splinter protection, sleeves, protective grid).
- Maintenance work conducted inappropriately, without ATEX training/qualification.
- Use of non-original spare parts.
- Explosion protection testing of the fan and system incomplete or not conducted.
- Unauthorized changes, modifications, or alterations to the fan.
- Any use of the fan that does not comply with the essential safety regulations of these operating instructions.
    - Operation without operating instructions and associated documents.
    - Operation with illegible or missing warning signs.

2.2.3 Equipment limits

Spatial dimensions

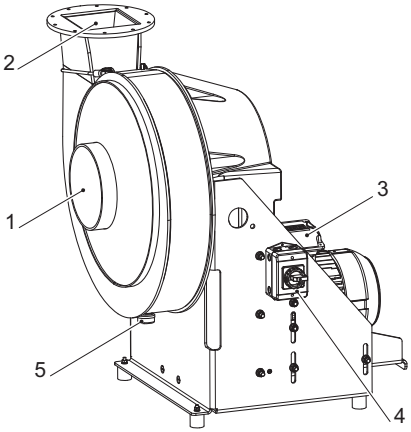
The dimensions of the fan are specified in the technical data sheet.

Application limits

The operating temperature range and further operating conditions are specified in the technical data sheet and on the nameplate.

Interfaces

The fan has the following interfaces:



1. Inlet connection (suction side): Connection to supply air ductwork with sleeve.
2. Outlet connection (pressure side): Connection to discharge air ductwork with sleeve.
3. Terminal box on electric motor.
4. Isolation switch:
   Terminal for electrical supply for accessories and options (e.g. FC for electric motor).
5. Casing drain (option) for manual draining or connection to siphon.

Fig. 1: Interfaces on fan

Service life

The fan is designed for an expected service life of 15 years.

The motor bearings of quality motors are designed for a service life of 40,000 hours when used as intended.

The environmental, application, and operating conditions determine the service life of the hub seal (wear parts) of a given application.

2.2.4 Residual risks

The fan is designed and manufactured in accordance with the state of the art and the recognized technical safety regulations. Residual risks nevertheless remain. They are indicated by safety instructions in these operating instructions and require the user to proceed with caution.

Explosive, hazardous, aggressive conveyed media

Residue and deposits of the conveyed medium can reside in the fan or flow in from the ductwork.

- Qualified personnel responsible for maintenance and repair work shall
  - have appropriate ATEX training/qualification,
  - be trained in handling hazardous conveyed media,
  - wear suitable personal protective equipment ⇨ Chap. 3.2.1 [▸ 19],
  - coordinate with the operator when taking suitable protective and lockout measures.

When operating the fan in an overpressure condition, the conveyed medium can escape at the impeller hub and lead to an explosion hazard and/or adverse health effects.

- When used with explosive and/or hazardous conveyed media, the fan is to be operated at a negative pressure or outfitted with an optional hub seal ⇨ Chap. 5.3.13 [▶ 33].

2.3 Target groups and personnel requirements

These operating instructions are intended for:

- The operator of the system in which the fan is installed.
- The qualified personnel who carry out work on the fan during its various life cycle phases, from installation to disposal.

The duties and personnel requirements for these target groups are described next.

Requirements for staying and working in potentially explosive atmospheres

- Appropriate ATEX training/qualification required.
- Wear special personal protective equipment ⇨ Chap. 3.2.1 [▶ 19].
- Only use certified non-sparking equipment and tools in the explosion protection area.

2.3.1 Operator

The operator is the person who operates the fan for commercial or economic purposes or who allows a third party to use it and who assumes legal liability during its operation.

The operator has the following duties:

For fan operation in potentially explosive atmospheres:

The classification and documentation of zones or definition of the equipment category in the system/installation.

Operate the fan only in zones for which the fan is approved.

- Comply with the minimum safety and health protection regulations for the use of work equipment and performance of activities on the fan.
- Keep current on national and local occupational safety and health regulations.
- Prepare Safety Data Sheets when the conveyed medium contains explosive and/or hazardous substances.
- Identify via risk assessment all additional dangers that arise due to special working conditions at the fan installation location.
  - Based on the risk assessment, derive, define, and implement for qualified personnel the appropriate protective measures and operating instructions for safe maintenance and other activities.
  - Adapt these operating instructions to current applicable standards and regulations at the time of operation.
- Ensure that the fan is always in a technically sound condition under observance of the maintenance intervals per these operating instructions.

- Initiate and verify that the function and integrity of all fan safeguards are checked regularly.
- Ensure that all manufacturer's regulations are observed upon retrofitting of safeguards.
- Determine the priority of shutting down the fan upon system malfunction or in an emergency.
- Clearly determine and regulate the responsibility for installation, servicing, maintenance, and repair of the fan.
- Ensure that the responsible qualified personnel
  - have read and understood these operating instructions,
  - have adequate occupational qualifications,
  - are regularly trained in the dangers related to and measures to take upon malfunction or in an emergency.
- Store these operating instructions and associated documents in their entirety in legible condition in an identified location near the fan.
- Save and protect the electronic version of these operating instructions.
- Prepare the required protective equipment and direct the wearing of this protective equipment by qualified personnel based on the operating and environmental conditions.

2.3.2 Transport personnel

The transport personnel are responsible for the transport of the fan to the installation location and for its removal for disposal at the end of its lifespan.

The transport personnel:

- Possess all necessary occupational knowledge, qualifications, and authorizations for operating the necessary lifting and transport devices.
- Are trained in the proper application of lifting and load handling attachments.
- Are knowledgeable of the safety and accident prevention guidelines and directives as well as recognized regulations of the technology applicable to transport.
- Are authorized by the operator to perform transport operations.

2.3.3 Mounting personnel

Mounting personnel are responsible for the installation of the fan in the system and for the subsequent placement in service. Removal of the fan for disposal also falls in this area of responsibility.

- Mounting personnel consist exclusively of qualified technical specialists who possess the necessary occupational experience, knowledge, and qualifications for mechanical and electrical work on the fan.
- The technical specialist is dependable when it comes to current safety and accident prevention guidelines, directives, and recognized regulations of the technology in their line of activity, and they are instructed by the operator.
- All work on the fan's electrical components may only be carried out by electricians.

- The fan may only be connected to the frequency converter by an electrician
  - after its operating instructions have been read and understood,
  - including detailed knowledge of the respective frequency converter,
  - and specialized knowledge of EMC-compliant wiring (consult the manufacturer's EMC Guidebook).
- The fan manufacturer's declaration of conformity is invalidated upon erroneous connection of the frequency converter and electric motor.

2.3.4 Operating personnel

The fan is generally used in automatic operations with a controller.

If operating personnel are necessary, the operator ⇨ Chap. 2.3.1 [▸ 14] of the system is to determine the required education and qualifications for

- operating and outside cleaning of the fan ⇨ Chap. 10 [▸ 58].
- checking the operating condition of the fan ⇨ Chap. 11.3 [▸ 60].

2.3.5 Maintenance personnel

Maintenance personnel are responsible for the inspection, cleaning, maintenance, and repair of the fan.

- The same requirements apply as for the mounting personnel ⇨ Chap. 2.3.3 [▸ 15].
- An electrician is responsible for carrying out maintenance and repair work and for switching off and safely disconnecting the power supply from the fan.

3 Essential safety instructions

The associated documents can contain additional operating instructions with important safety instructions Further applicable documents.

3.1 Notation of safety instructions

The safety instructions and warnings in these operating instructions are identified by the following warning symbols, signal words, and colors (electronic version of the operating instructions only), which convey the severity of the dangers.

Death or serious injuries

DANGER Danger to life due to... !

Outcome of the danger upon noncompliance...

- Conditions for prevention of the danger...
- ▶ Measures for prevention of the danger...

This safety instruction, the highest danger level, denotes a direct and immediate dangerous situation. This indicates a hazardous situation which, if not avoided, will result in death or serious injury.

Serious injuries

WARNING Risk of injury due to... !

Outcome of the danger upon noncompliance...

- Conditions for prevention of the danger...
- ▶ Measures for prevention of the danger...

A safety instruction of this danger level denotes a possible dangerous situation. This indicates a hazardous situation which, if not avoided, could result in death or serious injury with lasting effects.

Minor injuries

CAUTION Bodily injuries due to... !

Outcome of the danger upon noncompliance...

- Conditions for prevention of the danger...
- ▶ Measures for prevention of the danger...

A safety instruction of this danger level denotes a possible dangerous situation. This indicates a hazardous situation which, if not avoided, may result in minor or moderate injury, possibly with lasting effects.

Material damage

NOTICE Material damage due to... !

Outcome of the danger upon noncompliance...

- Conditions for prevention of the danger...
- ▶ Measures for prevention of the danger...

This warning instruction informs of a dangerous situation that can damage the fan or or lead to other material damage.

3.2 Personal protective equipment

The personal protective equipment to be worn:

- is to be determined and made available by the operator based on the operating conditions and conveyed medium.
- is the personal responsibility of the qualified personnel to be worn as suitable for the work to be conducted and to be supplemented as necessary.

The manufacturer recommends personal protective equipment according to the following table:

Symbol	Meaning
	Class 2 fluorescent warning vest with reflective stripes for improved visibility during transport operations.
	Close-fitting industrial safety clothing with low tear resistance for protection against introduction into rotating machinery.
	Hardhat to protect the head from falling objects, swinging loads, and strikes from sharp, pointed machine parts.
	Safety glasses to protect the eyes from airborne particles, parts, and fluids. Protection from aggressive, hazardous conveyed media or residues.
	Hearing protection required at or above noise exposure levels of 85 dB(A) or 137 dB (CPeak).
	Suitable breathing protection when in contact with aggressive, toxic conveyed media or residues.
	Work gloves for protection from injuries, burns, or contact with aggressive, toxic residues of the conveyed medium.
	Safety shoes for protection from crushing and from falling parts as well as slips and falls on slick surfaces.

3.2.1 Personal protective equipment for potentially explosive environments

It must be ensured for maintenance work on the fan in a potentially explosive environment that maintenance personnel are never dangerously electrostatically charged.

The following apply when in a potentially explosive environment:

- Personal protective equipment may not be changed, put on, or taken off.
- Wear conductive protective equipment (protective clothing, hardhat, gloves, and safety shoes).
  - The conductive properties may not be diminished through washing.
  - If potentially explosive areas are only entered temporarily, conductive shoe or boot covers may also be used.

3.3 Mechanical hazards

DANGER Risk of injury due to
- rotating impeller,
- rotating belt (for execution with BD),
- parts ejected with high force following impeller breakage,
- sharp corners or edges.

Serious injuries due to debris being launched out.

Crush, cut, strike, eye, or other injuries.

- Operation in a manner other than that intended (e.g. regarding temperature, speed, conveyed medium).

▶ Only authorized qualified personnel may conduct work on the fan.
▶ Prior to beginning mounting, maintenance, and repair work: Use the isolation switch to remove voltage on all phases.
▶ Prevent unauthorized start-up of the fan: Hang personal padlock and tag on isolation switch.
▶ Wear personal protective equipment.
▶ Do not leave any tools or mounting accessories in the fan.
▶ Comply with all current accident prevention guidelines.

WARNING Risk of injury due to automatic start-up

Entry and crushing of appendages.

- The fan is to be operated in a system and controlled by automatic controls.

▶ Prior to beginning mounting, maintenance, and repair work: Use the isolation switch to remove voltage on all phases.
▶ Prevent automatic start-up of the fan: Hang personal padlock and tag on isolation switch.

3.4 Electrical hazards

DANGER Danger to life due to electric shock from contact with current-carrying conductors or components under hazardous voltage.

Immediate danger to life due to respiratory and cardiac arrest.

- Only a qualified and authorized electrician may work on the power mains and the electrical components of the fan.
- ▶ Prior to beginning mounting, maintenance, and repair work: Use the isolation switch to remove voltage on all phases.

- ▶ Prevent unauthorized start-up of the fan: Hang personal padlock and tag on isolation switch.
- ▶ Establish an electrically safe work condition before beginning work.
- ▶ Promptly rectify any defects discovered in the electrical components and wiring of the fan.
- ▶ Eliminate moisture from current-carrying components to avoid a short circuit.

WARNING Risk of injury due to fire caused by short circuit

Burns, respiratory tract damage due to toxic fire smoke.

- ▶ Protect cables from mechanical, chemical, and thermal stresses.
- ▶ Regularly inspect the fan's electrical components. Replace damaged components and cables immediately.
- ▶ Have and periodically inspect suitable fire extinguishers. Observe the safety instructions on the fire extinguisher.

3.4.1 Danger due to electromagnetic interferences

Observe the following safety and hazard instructions if the fan is used with a frequency converter.

Frequency converters generate electromagnetic interference during operation and can cause high-frequency leakage current in the electric motor, supply power network, and grounding system.

CAUTION Interference from electromagnetic fields

Disturbance of sensitive electronic equipment by electromagnetic fields.

- ▶ When the fan is running, persons with pacemakers and other implanted electronic devices must not remain in the immediate vicinity of the frequency converter and electric motor.

NOTICE Disturbances to other devices from electromagnetic fields as well as bearing damage to electric motor due to leakage current

Exceeding legally permissible emission limits.
Reduced lifespan of the motor bearing.
Possible system operating faults and production interruptions.

- ▶ Use of suitable interference suppression and shielding methods, such as a mains suppression filter and shielded motor connection cable.
- ▶ EMC-compliant equipment design, especially for cable routing and shielding connections. See EMC Guide of the manufacturer and/or third-party equipment manufacturer.
- ▶ Observe FC manufacturer's recommendations for avoiding electromagnetic interferences.

3.5 Explosion hazards

DANGER Danger to life due to ignition of explosive gas mixtures

Death or serious injuries if gas mixtures explode due to the following causes:

- Hot surfaces, such as frictional heat in hub seal or hot bearing surface of a defective motor bearing.
- Spark formation upon friction, impact, and grinding due to foreign bodies in the fan or a defective motor bearing.
- Spark formation due to electrostatic charge if the fan is not grounded or is grounded incorrectly.
- Spark formation due to leakage current induced in the motor bearings.

▶ Monitor ambient temperature or motor temperature and ensure sufficient cooling air supply.

▶ Protect fan against infiltration of foreign bodies (degree of protection at least IP 20 according to DIN EN 60529).

3.6 Thermal hazards

CAUTION Risk of burn due to contact with hot surfaces

Burns to unprotected body parts.

- The fan housing and support can reach temperatures over 60 °C due to a hot conveyed medium.
- The fan's electric motor can reach temperatures over 60 °C on its surface during operation.

▶ Allow a hot fan or electric motor to cool off.

▶ Wear protective gloves when working on the fan or electric motor.

▶ When mounting the fan, observe the minimum distance between the fan cowl of the electric motor and neighboring components or walls ⇨ Chap. 7.2 [▶ 37].

3.7 Noise hazard

CAUTION High noise level with start-up and operation of the fan

Response upon being startled as well as hearing damage and hearing loss as long-term consequences.

▶ Observe the information in the technical data sheet on noise emissions from ducts and the casing.

▶ Wear hearing protection in the vicinity of the fan when required.

▶ Comply with legally mandated noise control regulations. If the fan is installed outdoors, comply with environmental noise emission limit values.

3.8 Conveyed medium hazards

⚠WARNING Risk of injury due to escape or inflow of a conveyed medium with the ability to cause adverse health effects

Risk of eye irritation, cough, difficulty breathing, burn, and suffocation.

- ▶ Clarify what medium is being conveyed.
- ▶ Observe the Safety Data Sheet(s) of the conveyed medium.
- ▶ Wear suitable personal protective equipment.
- ▶ Close the shut-off damper in the ductwork.
- ▶ Ventilate closed rooms.
- ▶ Take special safety precautions when working in confined spaces:
  - Request permit.
  - Inform supervisory personnel.
  - Assign an attendant.
  - Measure gas content in the work area.

⚠WARNING Risk of injury due to aggressive, hazardous residue and deposits

Chemical burn and poisoning upon contact.

- Conveyed medium forms deposits in the fan and ductwork that can cause adverse health effects.
- ▶ Wear suitable personal protective equipment.
- ▶ Observe the Safety Data Sheet(s) of the conveyed medium.
- ▶ For leaking condensate: neutralize, immediately wipe up, and dispose of in accordance with current local regulations.

3.9 Dangers due to insufficient safety

⚠WARNING Risk of injury due to missing or non-functioning safeguards

- Safeguards on fan: Isolation switch, splinter protection, protective grid for free sucking/blowing installation.
- Belt guard for V-belt drive.
- ▶ Regularly inspect safeguards for function and damage.
- ▶ Replace missing or damaged safeguards immediately.

3.10 Actions to take in an emergency

Explosion or melting of the plastic components during fan operation constitutes an emergency situation.

Possible causes (due to use in a manner other than that intended):

- Mechanical damage to the impeller due to foreign objects or speeds above the permissible limit.
- Prohibited chemical or thermal factors (compare with technical data sheet).

Possible consequences:

- Parts ejected from the fan with high force.
- Casing explosion.
- Escape of conveyed medium.
- Development of hot, corrosive, hazardous, or flammable gases.

⚠WARNING Risk of injury due to damaged fan

- Fan can continue coasting for a long time after being switched off.
- Danger by contact with dangerous parts and conveyed medium if casing is damaged.

▶ Use caution when approaching the fan.
▶ Observe the Safety Data Sheet(s) of the conveyed medium.

If no emergency measures are directed by the operator, proceed as follows:

1. Use the isolation switch to remove voltage on all phases.
2. Get personnel who are injured or in danger to safety. Get personnel who are having difficulty breathing to fresh air immediately.
3. Perform first aid.
4. Alert rescue/emergency personnel and inform them of the hazards of the conveyed medium according to the Safety Data Sheet.
5. Safeguard the hazardous area.
6. Fight small incipient fires only with fire extinguishers approved for low-voltage electrical equipment and the conveyed medium.

⚠WARNING Risk of burn, risk of poisoning from smoke inhalation

Burns, damage to respiratory tract.

- The thermoplastic of the fan generates smoke when burnt.
- If the fan housing is made of PVC, there will be adverse health effects and caustic smoke when burnt.

▶ Maintain a safe distance when extinguishing.
▶ Pay attention to the direction in which the smoke is spreading.

⚠WARNING Danger of asphyxiation with carbon dioxide (CO_2) fire extinguisher use

- There could be a high concentration of carbon dioxide (CO_2) in the breathing air.

▶ Do not attempt to extinguish in confined, small, or enclosed spaces.
▶ Instead, fight fire from outside through open door.
▶ Do not access area where fire occurred until it has been thoroughly ventilated.

4 Explosion protection

The zone of the conveyed medium and the installation site are to be specified by the system operator when ordering the fan.

Explosion protection information

- Intended use and operating conditions ⇨ Chap. 2.2.1 [▶ 9].
- The fan is approved for conveyance of gases in zone 1 or 2 (equipment category 2 and 3).
- **The fan is not approved for explosion protection zone 0 (equipment category 1).**
- The fan is approved for temperature classes T3 or T4.
- Parameters and limit values according to technical data sheet.

In addition to these operating instructions, additional ATEX information on the design and operation of fans is available from the point of contact.

4.1 Explosion protection measures

An ignition hazard assessment has been carried out by the manufacturer in accordance with the requirements of Directive 2014/34/EU (ATEX).

The operating instructions contain important instructions regarding explosion protection measures:

- General hazards ⇨ Chap. 3.5 [▶ 21].
- Thermal motor protection ⇨ Chap. 8.2 [▶ 45] / ⇨ Chap. 8.2.3 [▶ 46].
- Grounding ⇨ Chap. 8.4 [▶ 52].
- Using a frequency converter ⇨ Chap. 8.3 [▶ 47].
- Operation ⇨ Chap. 10 [▶ 58].
- Maintenance and explosion protection testing ⇨ Chap. 11 [▶ 59].

4.2 Explosion protection marking

The explosion protection marking is located on the nameplate of the fan ⇨ Chap. 5.2 [▶ 27] and classifies the fan for use in a potentially explosive atmosphere ⇨ Chap. 15 [▶ 83].

Explosion protection marking example

CE UKCA Ex	II 2/3G	Ex h IIB+H2 T3 Gb/Gc	Droplets excluded
	Directive section	Standards section	Addendum

Symbol/ Code	Description
CE	CE mark
UKCA	UKCA mark
Ex	Explosion protection marking according to Directive 2014/34/EU (ATEX).
II	Equipment group
2/3G	Equipment category inside (2)/outside (3) the fan for gaseous conveyed media (G).
Ex h	Explosion protection (Ex) through protection type (h): Explosion protection through design safety.
IIB+H2	Explosion group: Equipment group (II) for electrical devices with gaseous media and hydrogen (B+H2).
T3	Temperature classes for maximum surface temperatures: T3 (≤ 200 °C), T4 (≤ 135 °C)
Gb/Gc	Equipment protection level (EPL) inside/outside of fan: Gas (G), protection level (b) for equipment category 2 (zone 1, 2), Gc for equipment category 3 (zone 2)
Droplets	Addendum only for the case that droplets in the conveyed medium are excluded.

The nameplate of the electric motor also contains information on explosion protection, such as temperature class and protection type.

5 Structure and function

5.1 Overview

5.1.1 Execution with V-belt drive

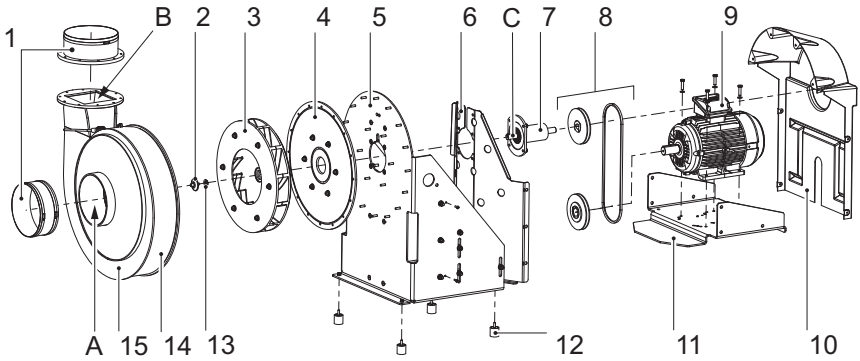


Fig. 2: Fan overview

1	Sleeves: Connect the inlet (A) and outlet (B) connections to the connection tubes in a stress-free manner.
2	Hub end cap: Seals the impeller (4) and flanged shaft (C) from contact with the conveyed medium.
3	Impeller: Backward-curved impeller blades, balanced.
4	Rear plate
5	Support
6	Support plates
7	Flange-mount bearing
8	V-belt drive, consisting of drive belt, belt pulleys, and taper lock bushings
9	Electric motor
10	Belt guard
11	Motor bracket
12	Vibration absorber: Absorbs damaging vibration and serves for fastening the fan.
13	Impeller fastening: Fixes the impeller (4) to the flanged shaft (C).
14	Splinter protection: Prevents fragments from being ejected in the event of impeller breakage.
15	Casing

Function description

In the centrifugal fan, a gaseous medium is drawn in through the inlet connection in the direction of the motor axis and deflected radially by the rotating impeller.

The mechanical energy supplied by the electric motor causes an increase in pressure and speed of the conveyed medium. The spiral-shaped casing directs the conveyed medium to the outlet connection.

5.2 Signs and warning symbols on the fan with V-belt drive

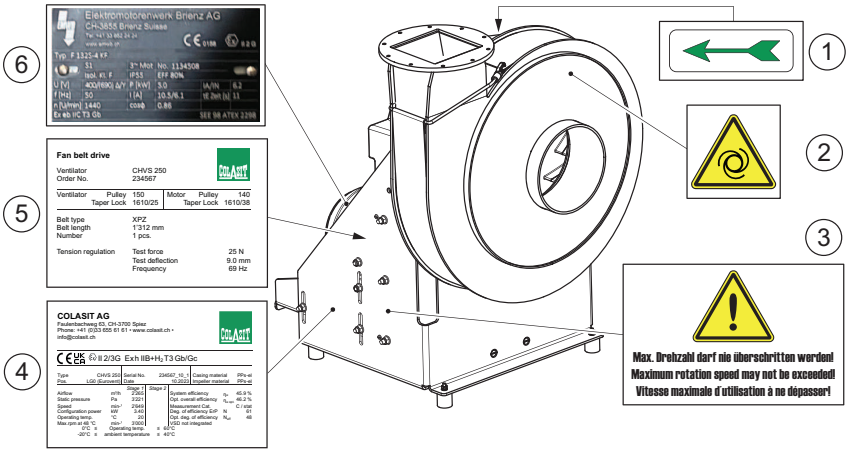


Fig. 3: Signs and warning symbols on the fan

1	Direction of rotation arrow	4	Fan nameplate
2	“Automatic start-up” warning sign	5	V-belt drive plate
3	“Maximum speed” warning sign	6	Electric motor nameplate

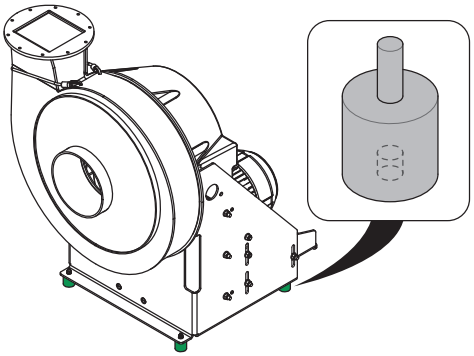
For FC operation, the nameplate or a supplementary nameplate of the electric motor contains additional information on limit values according to EN 60079-7 (max. frequency [f_{max}] and other information).

The operator's responsibilities regarding these signs on the fan are to

- keep them clean and uncovered,
- replace them if damaged or missing.

5.3 Options and accessories

5.3.1 Vibration absorbers (round isolators) for floor mounting

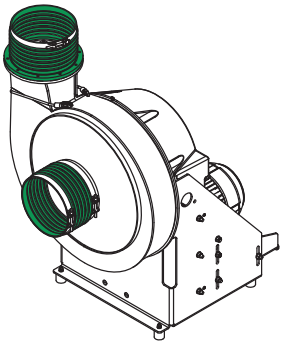


- **Required accessory.**
- For attaching the fan to the floor ⇨ Chap. 7.5.1 [▶ 40].
- Dampens vibration and prevents operating faults.
- Designed for permissible fan vibration according to ISO 14694.

Fig. 4: Vibration absorbers for floor mounting

Instructions for vibration absorber selection and item characteristics
⇨ Chap. 7.5 [▸ 40].

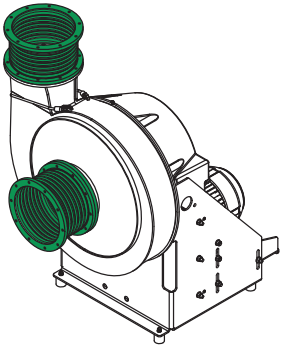
5.3.2 Sleeves



- **Required accessory.**
- Wellflex sleeve made of electrically conductive material for zone 1 (equipment category 2 and 3). In zone 2, standard execution.
- For flexible connection of the inlet and outlet connections to straight ductwork.
- Sleeves inhibit the transfer of mechanical loads to the fan housing.
- Inlet side, round with worm-gear hose clamps.
- Outlet side with flange and worm-gear hose clamp.
- Executions: See accessories for the CHVS 63-250 on the manufacturer's website (www.colasit.com).
- Permissible distance between fan connections and ductwork ⇨ Chap. 7.6 [▸ 41].

Fig. 5: Sleeve installation locations

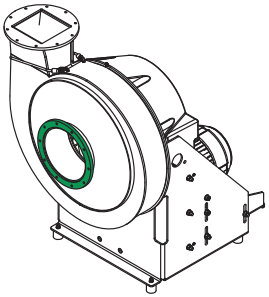
5.3.3 Sleeves with flange



- **Required accessory for fans with flange connections.**
- Wellflex sleeve made of electrically conductive material for zone 1 (equipment category 2 and 3). In zone 2, standard execution.
- Spherical sleeves made of electrically conductive material are used for a connection diameter of 63 or 90 mm.
- For flexible connection of the inlet and outlet connections to ductwork with flange connections.
- Executions: See accessories for the CHVS 63-250 on the manufacturer's website (www.colasit.com).

Fig. 6: Sleeves with flange

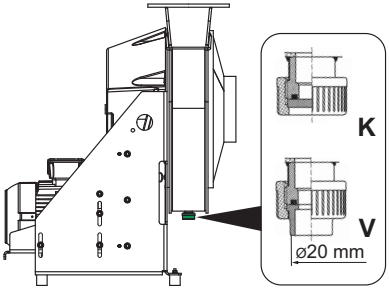
5.3.4 Flange connections



- Optional.
- Inlet connection with flange connection.
- Executions: See accessories for the CHVS 63-250 on the manufacturer's website (www.colasit.com).
- Sleeves with flange required
  ⇨ Chap. 5.3.3 [▸ 28].

Fig. 7: Flange connections

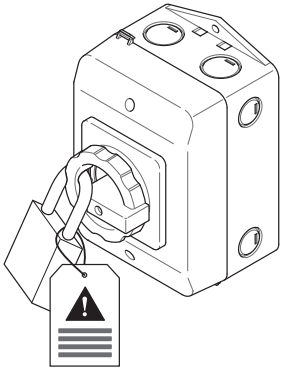
5.3.5 Condensate drain



- Optional.
- For draining of condensate.
- Executions:
  - "K" for manual draining with cover cap.
  - "V" for connection to siphon. Suitable for socket welds.
- For instructions on retroactive mounting as well as siphon dimensioning
  ⇨ Chap. 7.7 [▸ 42].

Fig. 8: Casing drain on condensate drain

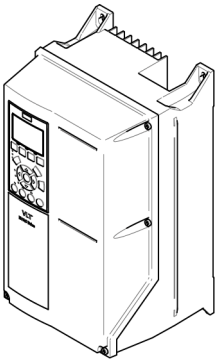
5.3.6 Isolation switch



- **Required accessory.**
- In zone-compliant ATEX execution.
- For removal of voltage on all phases before maintenance and repair work.
- Can be locked in the OFF position with a customer-supplied padlock.
- Note: The isolation switch is also referred to as a maintenance switch.

Fig. 9: Isolation switch

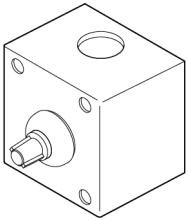
5.3.7 Frequency converter (FC)



- Optional accessory.
- Mounting outside of ATEX zone.
- For fan speed control.
- FC installation options ⇨ Chap. 8.3.1 [▶ 48].
- EMC-compliant wiring ⇨ Chap. 8.3.3 [▶ 50].
- FC parameterization ⇨ Chap. 8.3 [▶ 47].
- With connection for PTC thermistor tripping device or integrated PTC thermistor monitoring ⇨ Chap. 8.2.3 [▶ 46].

Fig. 10: Frequency converter (example)

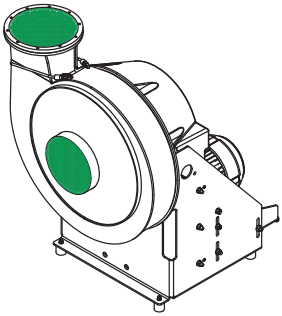
5.3.8 Speed adjustment potentiometer



- Optional accessory.
- Only applicable if inside is ATEX zone 2 and no ATEX zone outside.
- For setting the nominal speed on the frequency converter (FC) according to the technical data sheet.
- FC parameterization ⇨ Chap. 8.3 [▶ 47].

Fig. 11: Speed adjustment potentiometer (example image)

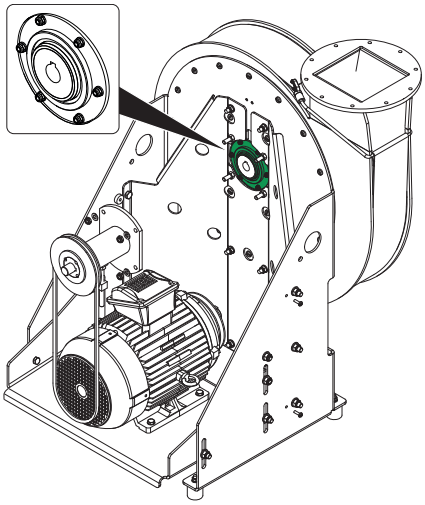
5.3.9 Protective grid



- **Required accessory for free sucking and/or blowing installation,** as access and safety protection.
- Made of material that conforms to zone.
- Gets permanently installed (welded) to the free-sucking inlet connection and/or to the blowing outlet connection.
- Entry protection as well as protection against infiltration of contamination and foreign objects (IP20 degree of protection).
- **NOTICE** Installing the protective grid can cause high pressure loss.

Fig. 12: Protective grid

5.3.10 Lip seals



- Optional.
- Seal in the casing.
- Executions:
  - Single-layer seal
  - Double-layer seal with lubrication nipple in casing.
- Use with hazardous, aggressive conveyed media when the fan is operated in an overpressure condition.
- Wear part
- For mounting instructions ⇨ Chap. 12.9 [▶ 74].

Fig. 13: Lip seal (single layer)

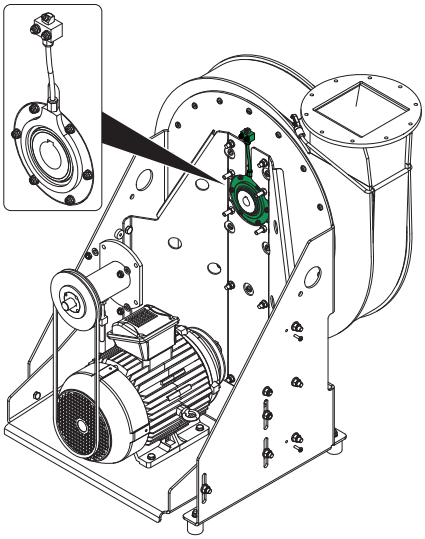
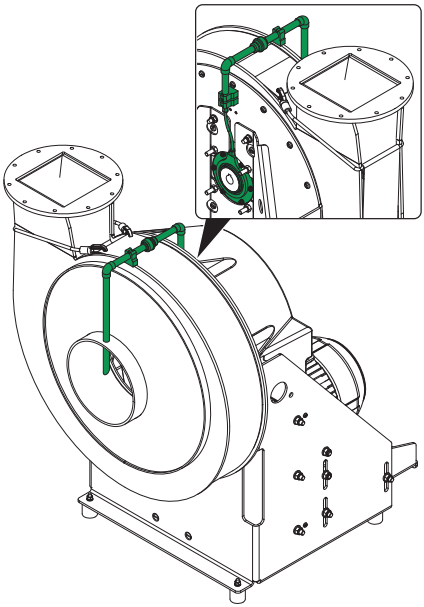


Fig. 14: Double-layer seal with lubrication nipple

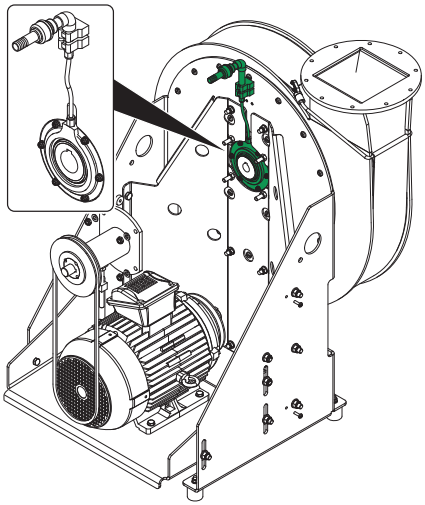
5.3.11 Back suction for lip seal



- Optional.
- Supplement to double-layer lip seal.
- Leakage near the hub passage is directed to the suction connection via a tube and guided back into the main flow.
- For mounting instructions ⇨ Chap. 12.9 [▶ 74].

Fig. 15: Back suction

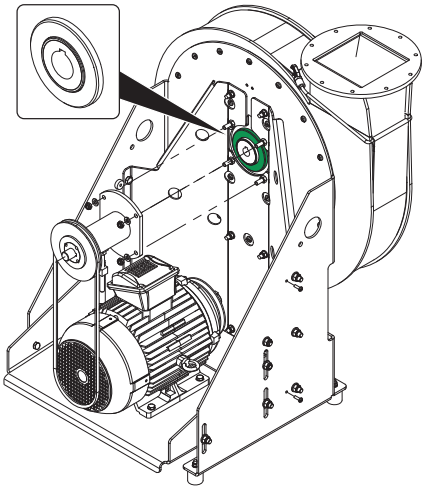
5.3.12 Sealing gas for lip seal



- Optional.
- Supplement to double-layer lip seal.
- Sealing gas is forced into the cavity between the impeller hub and the casing wall. This prevents leakage near the hub passage.
- For mounting instructions ⇨ Chap. 12.9 [▶ 74].

Fig. 16: Sealing gas

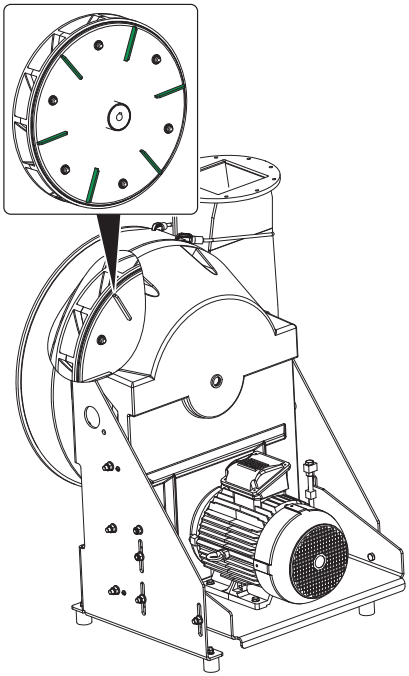
5.3.13 Hub seal felt ring



- Optional.
- Use with hazardous, aggressive conveyed media when the fan is operated in an overpressure condition.
- Wear part
- For mounting instructions
  ⇨ Chap. 12.10 [▶ 75].

Fig. 17: Hub seal felt ring

5.3.14 Impeller back-plates



- Optional.
- Used in combination with a hub seal and/or in high humidity.
- Impeller back-plates are welded onto the impeller before balancing.

Fig. 18: Impeller back-plates

6 Transport

6.1 Safety instructions

These safety instructions warn against dangers that can arise when transporting the fan.

⚠WARNING Danger to life when remaining under suspended loads

Injuries due to falling or swinging loads.

- ▶ Avoid hazardous area under the suspended load.
- ▶ Never stand under or in swinging range of suspended loads.
- ▶ Maintain a safe distance from suspended loads.
- ▶ Do not leave suspended loads unattended.

⚠WARNING Risk of injury due to packing pieces falling or tipping over

Bruising and contusion injuries.

SAFETY INSTRUCTIONS

- ▶ Wear personal protective equipment.
- ▶ Only use hoisting gear, load handling attachments, and slings that are undamaged, approved, and have suitable load-bearing capacity.
- ▶ Use all attachment points provided, and observe the center of gravity ⇨ Chap. 6.5.1 [▶ 35]. Exception: **The lifting eye bolt on the electric motor is not an attachment point for transport.**
- ▶ Do not place slings on sharp edges or corners, and do not knot or twist them.
- ▶ The transport route must be free of obstacles and safeguarded in accordance with local regulations.

NOTICE Risk of damage due to improper transport

Damage to the fan and other material damage.

- A package with a center of gravity that is off center can tip, swing out, or fall down when lifted.
- ▶ Use provided attachment points.
- ▶ Use additional transport aids as transport protection.
- ▶ Lift package cautiously.
- ▶ Avoid rocking and swinging movements during transport.

6.2 Incoming goods inspection

For the delivered fan:

- Check for completeness based on the shipping documents.
- Inspect for possible transport damage.

If transport damage is detected:

1. Do not receive delivery, or doing so only conditionally.
2. Record transport damage (photos).
3. Note the extent of the damage on the transport paperwork or on the transport company's bill of lading.
4. File a complaint immediately.

Claims for damages can only be made within the complaint period and in accordance with the general terms and conditions (T&C). Save packing for a possible return shipment.

5. Mount the fan and place it in service only after repairs and resolution of complaints.

6.3 Packing

The packing and provided transport protection protect the fan from transport damage and environmental influences.

Do not damage the packing, and remove it only shortly before mounting.

Disposal instructions

The transport packing is intended as disposable packing and is to be disposed of after use in accordance with current local disposal instructions.

6.4 Intermediate storage

Pack the fan in the original packaging as follows:

- Covered, dry, and dust-free location.
- Protect from sun, weather, and condensation.
- Storage temperature +10 °C to +50 °C with max. 50 % humidity.

Measures for longer intermediate storage

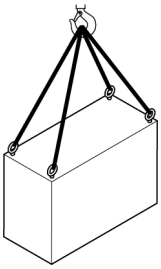
After every 3 months of storage time, turn the impeller several rotations to prevent bearing damage.

6.5 Transport to installation location

Provide suitable hoisting gear and load handling attachments for transport.

6.5.1 Transport by crane

Transporting package with lifting eye bolts

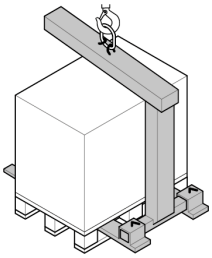


- Position crane hook over the middle of the package.
- Attach sling to all lifting eye bolts of the packing.
  ⚠WARNING Do not lift the fan by the lifting eye bolt of the electric motor.
- Check: Slings are not twisted. Sling legs and bends are in permissible positions.
- Lift package slightly and check that it hangs level.

Fig. 19: Package with lifting eye bolts

- Let down and adjust a package that doesn't hang level: Shorten or lengthen legs on one side appropriately until all legs are loaded equally.

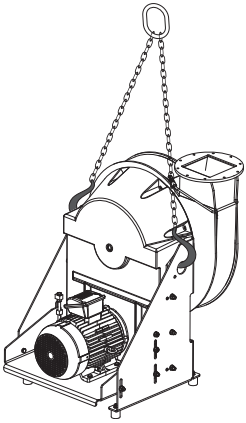
Transporting package on a pallet



- Inspect pallet: A damaged or rotted pallet may not be transported by crane.
- Preferably, transport pallet by crane fork or pallet jack.
- Otherwise, attach sling to pallet such that it will not slip.
- Further procedure same as for as transport with lifting eye bolts.

Fig. 20: Package on transport pallet

Transporting fan with chain sling



To transport an unpacked fan, use a two-leg chain sling.

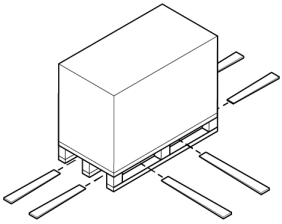
- Hang chain sling as illustrated in the two large holes in the support.

  ⚠WARNING Do not lift the fan by the lifting eye bolt of the electric motor.

- Further procedure same as for as transport with lifting eye bolts.

Fig. 21: Fan with chain sling

6.5.2 Transport by pallet stacker or forklift



A package on a pallet can be transported by pallet stacker or forklift under the following conditions:

- Forks inserted under the pallet as depicted such that they stick out from the opposite side.

Fig. 22: Package on transport pallet

7 Mechanical installation

7.1 Safety instructions

These safety instructions warn against dangers that can arise when mounting the fan.

⚠WARNING Risk of injury due to unsecured work area

Injuries due to objects falling or being bumped.

- The installation location of the fan could be inaccessible or at a dangerous height.

- ▶ Set up safe means for accessing the installation location (e.g. walkway with banisters, platform).
- ▶ Safeguard work area with enclosures, safety nets, etc.
- ▶ Secure work area against unauthorized access.

⚠WARNING Risk of injury due to improper mounting.

Injuries by pinching and crushing of body parts.

- ▶ Confirm the design and load capacity of the foundation and fastening elements with a structural or civil engineer.

- ▶ Safeguard the fan against tipping by suitable means.
- ▶ Immediately following completion of mounting work, remove all braces, supports, etc.
- ▶ Use a protective grid for guarding with a free-sucking or free-blowing execution. Use safety protection devices to prevent the ingress of dirt or foreign objects (IP20 degree of protection).

⚠WARNING Risk of injury due to escape or inflow of a conveyed medium with the ability to cause adverse health effects

Risk of eye irritation, cough, difficulty breathing, burn, and suffocation.

- ▶ Wear protective equipment.
- ▶ Close shut-off damper to inlet and outlet connections until all installation work is complete.
- ▶ Watch for escaping conveyed medium as well as deposits and condensate when using the service opening and inspecting the ductwork.

7.2 Installation location requirements

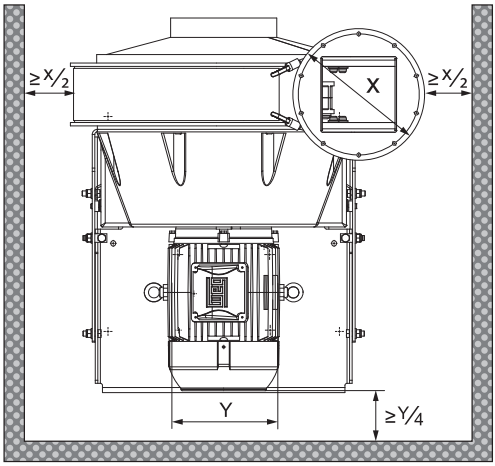
NOTICE Risk of damage due to improper outside mounting

Material damage and production downtime.

- ▶ Use platform for installation sites with poor drainage.

Foundation (baseplate) or mounting surface shall meet the following requirements:

- Vibration resistant
- Flat surface
- Suitable for absorption of static and dynamic loads.
  - For calculations for the mounting parts, assume four times the fan weight.



- Provide suitable clearance around the fan for
  - maintenance and repair work,
  - motor cooling.

Fig. 23: Space requirement for work area and motor cooling

Dimensioning notes

The minimum distance at the installation site for the fan cowl of the electric motor must be larger than one fourth the diameter (Y) of the fan cowl. Deviations are permitted if they are allowed per the motor manufacturer's operating manual.

7.3 V-belt drive – check proper mounting

NOTICE **Risk of damage due to improper mounting**

Proper belt tension is a prerequisite for error-free power transmission and for achieving the belt's rated service life.

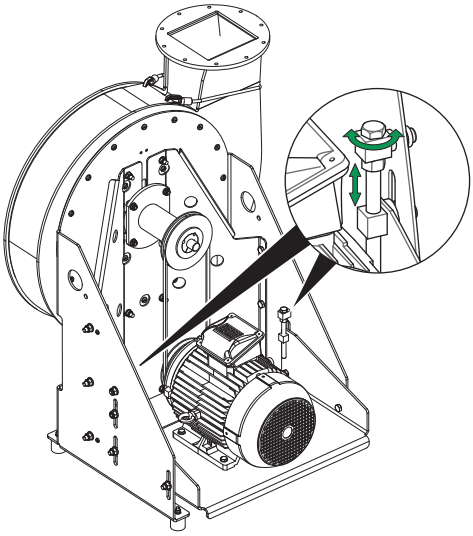
- Improper belt tension leads to a reduction in the fan's functionality and to early failure of the belt.
- An overtensioned drive belt often will also damage the bearing on the electric motor.

▶ The drive belt shall correspond to the information on the belt plate.

▶ The V-belt drive shall always be guarded against access with the supplied hood.

The settings for the V-belt drive are

- specified on the belt plate and
- depend on the belt type and are specific to the fan supplied.

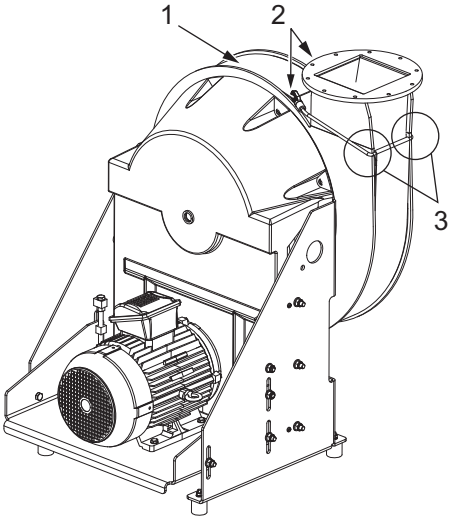


Procedure:

1. Remove the belt guard.
2. Check the belt tension of the drive belt. See the belt plate for the settings ⇨ Chap. 5.2 [▶ 27].
3. Tension the drive belt if necessary Measuring and setting belt tension.
4. Install the belt guard.

Fig. 24: Checking the V-belt drive

7.4 Splinter protection - check proper mounting



Check proper mounting of the splinter protection:

- The splinter protection (1) wraps around the casing between thewelding edges of the casing.
- Both snap hooks (2) are engaged in the eyes.
- The rubber band lies in notch (3) of the welding edge.

Fig. 25: Proper mounting of the splinter protection

7.5 Vibration absorbers mounting

⚠WARNING Risk of injury due to fan falling

Injuries by pinching and crushing of body parts.

- Undersized vibration absorbers can come off.
- ▶ Use the supplied vibration absorbers.
- ▶ Externally sourced vibration absorbers shall be equivalent.
- ▶ Only replace vibration absorbers with identical components during maintenance work.

NOTICE Risk of damage due to vibration

Material damage and production downtime, reduced service life.

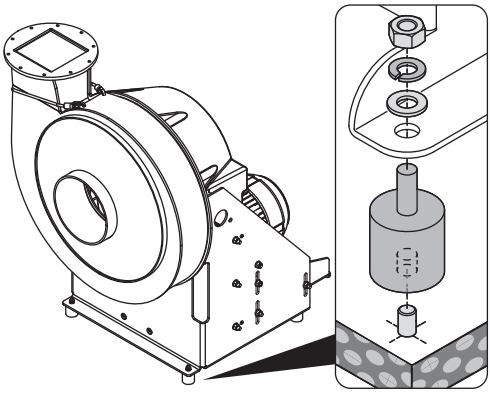
- Missing or improperly sized vibration absorbers lead to damage of the motor, impeller, and installation site.
- ▶ Always mount fan with suitable vibration absorbers.

- Mount suitable vibration absorbers on the mounting holes of the support ⇨ Chap. 7.5.1 [▶ 40].

Suitable vibration absorbers (round isolators) for floor mounting

Fan/ize	Round isolator type	Connection thread	Load capacity [N/pc]	Shore hardness [A]	Quantity [pc]
CHVS 63-250	Type B Ø40 x 40	M8 x 23	863	68	4

7.5.1 Floor mounting



Conditions:

- Installation location requirements ⇨ Chap. 7.2 [▶ 37].
- Round isolators and fastening elements present.

Fig. 26: Fastening recommendation for floor mounting

1. Transfer fan support hole pattern to the foundation (baseplate).

Hole pattern dimensioning according to technical data sheet.

2. Install anchoring elements (anchors) according to supplier's instructions.

3. Fix round isolators to anchoring elements.
4. Set fan on round isolators and fasten tightly.

7.6 Connecting fan to ductwork

NOTICE **Risk of damage due to deformation of fan housing**

Impeller touches casing.

- Connection tubes attached directly to fan connections transmit prohibited stresses to the fan housing, e.g. due to thermal expansion.

▶ Only connect fan connections to ductwork with sleeves.
▶ Mount sleeves properly.

NOTICE **Risk of damage due to lateral forces**

Cracking of the sleeve.

- Sleeves can only minimally compensate for a lateral/radial duct misalignment.

▶ Align connection tubes precisely.
▶ Use supports for supplemental securing of connection tubes.

A detachable duct section (1, see image) is provided at the inlet connection for maintenance and repair work on the impeller. The length of the duct section shall correspond to at least the diameter of the inlet connection or the fan size.

Check beforehand:

- Turn the impeller by hand and check that it is smooth running.
- Check the fan and ductwork for tools left behind, mounting residues, or foreign objects.

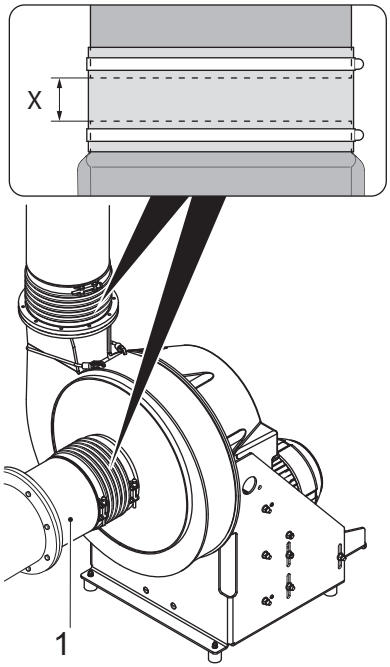


Fig. 27: Distance to ductwork connection

Procedure:

1. Sleeve Push the ⇨ Chap. 5.3.2 [▶ 28] over the ductwork end together with the hose clamps.
2. Mount the ductwork and adjust it to the fan connection.
3. Observe the permissible distance X (see detail view).
   Standard: X = 30 – 40 mm
   Conductive sleeve (CHVS 63-90) and
   Wellflex (CHVS 125-250, conductive material):
   X = 100 – 110 mm (overlap ductwork ends 30 mm each side)
4. Push the sleeve onto the ductwork end and fan connection equally, and secure it with hose clamps.
5. Check that the sleeve has been mounted in a flexible, stress-free manner.

As alternatives, Wellflex sleeves or sleeves with a flange on both sides ⇨ Chap. 5.3.3 [▶ 28] are available (use in Zone 2 environment if the piping is still in the explosion protection zone).

7.7 Connecting condensate drain to siphon

NOTICE **Environmental damage due to toxic condensate**

- ▶ If possible, direct condensate downstream of the siphon back into the process.
- ▶ Collect condensate in the collecting container and dispose of according to regulations.

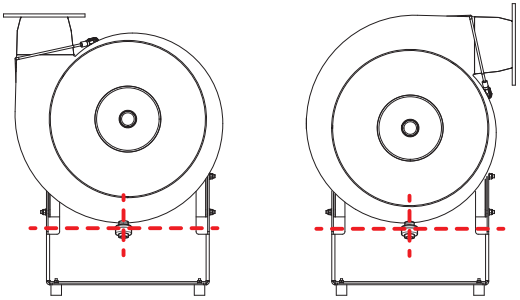


Fig. 28: Proper position of the casing drain

The casing drain shall always be located at the lowest point of the fan housing's current mounting position.
When mounting as a retrofit, an opening for the casing drain shall be cut in the splinter protection.

- Weld drain pipe (outer diameter 20 mm) to casing drain (type V) ⇨ Chap. 5.3.5 [▸ 29].
- Connect drain pipe to siphon.

7.7.1 Siphon calculations and execution

Required siphon height and installation height

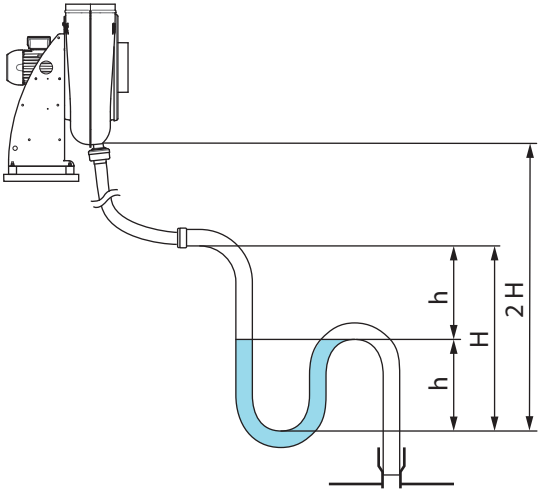


Fig. 29: Siphon height and installation height

Calculation formula with SI units:

$$h = \frac{p_{stat}}{10} + 15$$

$$H = 2 \cdot h = 2 \cdot \frac{p_{stat}}{10} + 30$$

Legend:

h = min. siphon height [mm]

p_{stat} = static fan pressure [Pa]

H = installation height [mm]

Siphon height [mm]:
At least 1/10 of the maximum static fan pressure p_{stat} [Pa].

Height difference between casing drain and siphon overflow:
If the siphon height "h" is not observed, the condensate will not drain and will be directed to the fan.

When planning for and mounting the siphon, observe a minimum installation height of 2 x H.

Instructions for execution of the siphon

- For negative pressure operation of the fan: If the siphon is insufficiently dimensioned or not filled with water, there is a risk that false air will be sucked in.
- Ensure functionality of the siphon: It is imperative to fill it with water before placing in service or after an extensive downtime period.
- For outside mounting, ensure frost-resistant execution of condensate drain and siphon.
- If there are space limitations (siphon height), mount siphon in a floor opening.

7.8 Guarding and safety protection for free-sucking or free-blowing execution

⚠WARNING Risk of injury due to unguarded inlet or outlet connection on fan.

Risk of injury due to rotating impeller.

▶ A protective grid must be installed as guarding on the inlet or outlet connection for free-sucking or free-blowing execution.

NOTICE Risk of damage to the fan.

The fan must generally be protected against the ingress of dirt and foreign objects that could enter through the air passage.

Contact your Colasit distributor for appropriate guarding and safety protection device solutions.

7.9 Final inspection

- Check that all screw connections on the fan and all fastening elements of the foundation (baseplate) or mounting surface are tight.
- Check splinter protection ⇨ Chap. 7.4 [▶ 39].
- If present in ductwork:
  - Shut-off dampers for inlet and outlet connections are closed.
  - Service openings are shut.
- Complete ATEX test report ⇨ Chap. 15.1 [▶ 85].

8 Electrical installation

8.1 Safety instructions

These safety instructions warn against dangers that can arise during electrical installation of the fan.

DANGER Risk of injury due to electrical energy

Immediate danger to life due to respiratory and cardiac arrest.

- Erroneous or insufficient execution of the electrical connections, the wiring, and the cable routing as well as the electrical safeguards of the fan.

- ▶ Only authorized, qualified electricians may carry out the electrical installation and connect the fan to the power supply.
- ▶ The electrical installation is to be executed in accordance with the standard EN 60204-1, the technical connection requirements, and the relevant regulations.

WARNING Trip and fall hazard due to cables run along the floor

Bruises and other injuries.

- ▶ Motor connection cables run along the floor are to be run properly and protected by a cover.
- ▶ Indicate the trip hazard with floor markings.

WARNING Risk of electrical shock due to electrostatic charge

Subsequent injuries due to response upon being startled.

- As a precaution, take protective measures against electrostatic charge when operating the fan.

- ▶ Ground the fan support.
- ▶ For outside mounting, connect the fan support to the lightning protection system.

CAUTION Electrical hazards due to improper layout/undersizing of the electric motor and protective devices.
Operation outside of the specified characteristic curves.

- ▶ The application limits of the electric motor must be greater than or equal to the application limits of the fan.
- ▶ Size electrical protective devices according to the electric motor and connection cables.
- ▶ Operate only within the specified characteristic curves (flow rate and differential pressure) according to the technical data sheet.

8.2 Electrical protective devices

8.2.1 Isolation switch installation

Improper use of isolation switch

The isolation switch is only a protective device for disconnecting the fan from electrical power during mounting, maintenance, or repair work and not to turn the fan on and off in the context of operation.

The isolation switch

- is a required protective device,
- shall be installed in an easily-accessible location near the fan,
- provides qualified personnel a means of directly controlling and disconnecting the electrical power supply from the fan,
- shall therefore be executed as a lockable all-pole disconnect switch.

DANGER Use only an explosion-proof isolation switch if the isolation switch is installed in a potentially explosive area.

8.2.2 Motor protection switch installation

An electric motor with a nominal power rating over 0.5 kW is to be protected against overload and connected to the electrical power supply with a motor protection device (overload and short circuit protection) suitable for this.

NOTICE **Risk of overheating of the electric motor**

Damage to motor

The motor protection switch does not reliably protect the electric motor from overheating, particularly with insufficient motor cooling due to low speed, defective fan impeller, or clogged ventilation grid.

- ▶ The installation of a motor protection switch is the responsibility of the operator.
- ▶ Specify the motor protection switch based on the motor rated current on the nameplate.

If a frequency converter (FC) is used, clarify whether integrated motor protection functions allow for fan operation without an additional motor protection switch.

The FC is to be parameterized with the motor data by qualified personnel.

8.2.3 PTC thermistor tripping device installation

Based on ATEX zone and FC operation, the electric motor of the fan is equipped with thermal motor protection. There are 3 PTC sensors (PTC thermistors) in the motor windings for temperature monitoring, with an additional terminal in the terminal box.

The PTC sensors are to be connected to an ATEX-certified PTC thermistor tripping device. Observe the following points when doing so:

- For the connection of the PTC thermistor tripping device, read the equipment manual and the operating instructions of the electric motor.
- Feed the connection cable into the terminal box of the electric motor through an Ex cable gland.

PTC thermistor tripping devices are usually not approved for use in potentially explosive atmospheres and must be installed in a safe location (e.g., in a protective casing or in the FC control cabinet).

Connecting PTC thermistor tripping unit to FC

When connected to a FC, shutdown should be performed by the "safe stop" safety function. This ensures that no residual voltage is applied to the motor windings and that the electric motor can cool down as quickly as possible.

8.2.4 Starting current limiter

NOTICE Strong mechanical load by the fan.
Thermal and electrodynamic load on the motor windings.

Reduced service life of the fan.
Disturbance of nearby electrical equipment, such as controllers.

- When larger fans are switched on and ramped up under full mains voltage, a high inrush current is generated.
- When the fan is started directly, excessive torque occurs that can severely stress and damage the impeller and motor bearings.

▶ The manufacturer recommends the use of a starting current limiter starting with motor ratings of 3 kW (e.g. star-delta starter, soft starter, or soft start with frequency converter (FC)).

At the latest, for fans with a motor rating above 4 kW, the starting current is to be limited by one of the listed methods or equipment:

- Star-delta start-up
- Soft start/soft starter
- FC with current-limiting and start-up characteristics.

Observe the national regulations and limit values of the power system operator for direct start-up of three-phase motors.

8.3 Instructions for frequency converter (FC) use

DANGER Risk of injury due to impeller explosion

Serious injuries due to debris being launched out.

- Exceeding the maximum speed after a malfunction or faulty operating condition of the frequency converter.

▶ The splinter protection must be properly mounted on the fan ⇨ Chap. 7.4 [▶ 39].
▶ The manufacturer recommends using a frequency converter with an integrated SLS safety function.
▶ Alternatively, implement higher-level drive control with an SLS safety subfunction.

The SLS (Safely Limited Speed) safety function prevents the electric motor from exceeding a specified speed limit.

DANGER Danger to life due to ignition of explosive gas mixtures by electric sparks

Death or serious injuries.

- Spark formation in electric motor.

▶ Check whether the explosion protection marking of the electric motor is also valid for operation with a frequency converter.

▶ If a frequency converter (FC) is used, the fan must be equipped with an explosion-proof electric motor (Ex db) if the FC and electric motor are not ATEX certified as a unit.

▶ Only install frequency converter in a safe location (control cabinet).

WARNING Risk of injury due to high contact voltage

Injury by electric shock.

- If long cable shields are not connected/grounded, high contact voltages can occur during operation.

▶ Connect cable shields of motor connection cables and signal lines to a common reference potential.

▶ Do not use protective earth connections for shielding purposes.

WARNING Risk of injury due to dangerous residual voltage

Injury by electric shock.

- After the fan has been switched off, dangerous residual voltage is still present in the frequency converter.

▶ The operating instructions of the frequency converter provide information about the time to be observed until this residual voltage has dropped to a safe value.

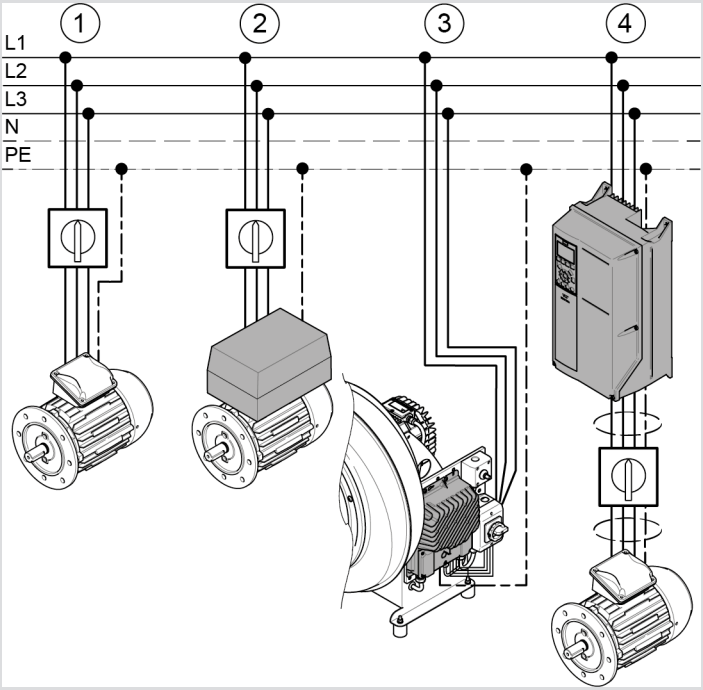
▶ Before beginning work on the electrical components, always establish an electrically safe work condition of the frequency converter.

8.3.1 Frequency converter (FC) installation options

For centrifugal fans, different executions of electric motors (IM, PM, EC) can be selected as a drive:

- IM ... Standard asynchronous motor/three-phase motor
- PM ... Permanent magnet motor
- EC ... Brushless DC motor

Connection options



Depending on the execution, an electric motor can either be connected directly (1) to the electrical mains or can/shall be operated with a FC.

L2 and L3 do not exist for a single-phase feed (230 V).

The FC is either

- directly attached to the electric motor (2, order option),
- mounted on the fan support (3, special option),
- or installed separately (4, customer solution).

NOTICE **Risk of damaging the frequency converter**

Do not manipulate the isolation switch when the electric motor is running if connection option 4 is used.

8.3.2 Frequency converter (FC) parameterization

NOTICE **Risk of damage due to erroneous parameterization**

Unpredictable fan behavior resulting in damage.

- ▶ Carry out parameterization carefully according to the FC operating instructions. The specialist shall be familiar with the FC. If necessary, consult the supplier.
- ▶ For basic setup, enter the motor data according to the nameplate on the electric motor.
- ▶ Enter the maximum frequency/speed limit according to the fan nameplate or technical data sheet. For FC operation, additional min./max. frequency limits are indicated on the motor nameplate (or additional nameplate) Signs and warning symbols on the fan.
- ▶ Enter frequency and current limit according to manufacturer specifications.
- ▶ Enter the acceleration and braking times with regard to the following table.
- ▶ Record the parameters that were entered.

To prevent mechanically overloading the fan, observe these minimum permissible acceleration and braking times:

Electric motor nominal power [kW]	Acceleration/braking time [s]
< 1.5	min. 15
> 1.5	min. 30

To avoid an FC error message, a longer acceleration/braking time could be necessary.

Parameterization for PM motors

Parameterization for PM motors differs significantly from three-phase motors. The FC and motor manufacturers offer support for this.

8.3.3 Connecting the electric motor to a frequency converter (FC)

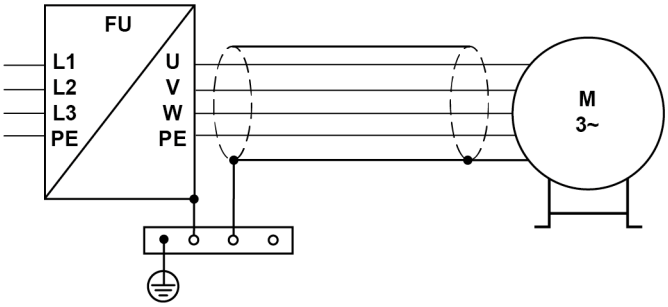


Fig. 30: Connection principle for short motor cable (FC close to fan)

EMC-compliant connection for FC operation

Observe the EMC instructions of the fan manufacturer as well as the operating instructions of the FC manufacturer.
In particular, the maximum permissible length of the motor connection cable between the FC and the electric motor as well as the corresponding grounding concept.

1. If possible, connect the cable shield of the motor connection cable directly to the FC output with a grounding bar.
2. Install the isolation switch in the EMC execution and/or ATEX execution given in the guidelines of these operating instructions.

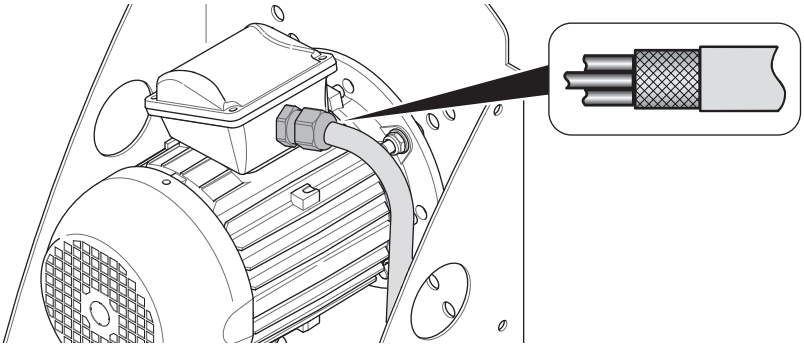


Fig. 31: EMC cable gland

3. Secure the motor connection cable to the motor terminal box with an EMC cable gland.
   - Strip the cable end appropriately so that contact can be made with the cable shield.
4. Connect the motor connection cable to the electric motor Connecting the electric motor.

8.4 Making an ATEX-compliant ground connection

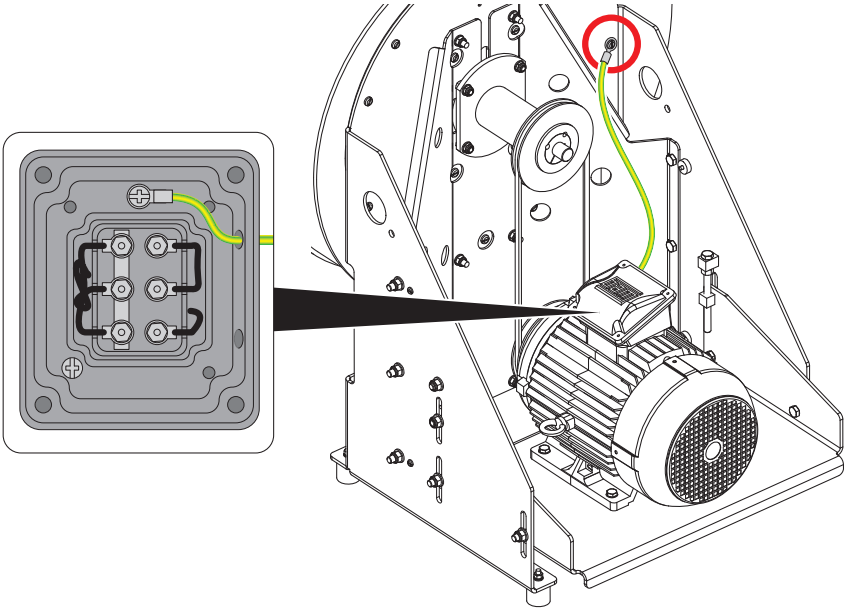


Fig. 32: Grounding cable on fan

To dissipate static charge, the casing and support of the fan are connected to the protective earthing connection in the terminal box via a grounding cable (see detailed view).

The cross section of the grounding cable must be at least 10 mm^2.

This grounding connection on the fan is installed by the manufacturer or distributor before delivery.

8.5 Connecting the electric motor

This chapter describes the direct connection of a three-phase motor (IM) to the electrical power supply (connection option No. 1 in overview
⇨ Chap. 8.3.1 [▶ 48]).
For instructions on connection to a frequency converter ⇨ Chap. 8.3.3 [▶ 50].

Sizing and installing the motor connection cable

Adequately size the cross section of the motor connection cable, taking into account:

- Applicable standards and regulations
- Cable lengths
- Rated current
- Environmental conditions
- Type of installation

To size the connection cable, consult the cable manufacturer's tables for current-carrying capacity or request sizing information directly from the cable manufacturer.

When running the cable, observe the following essential principles:

- Avoid damaging the cable by pinching, cutting, pulling, etc. during installation.
- Run connection cables in the building securely with clamps or mounting brackets, and protect them from damage with cable conduit.
- For protection against vibration, run the connection cable between the fan and cable fasteners to the installation location such that it is flexible and movable.

Making the cable connection

- DANGER Establish an electrically safe work condition before beginning work.
- Connect the connection cable to the motor protection switch/fuses and the isolation switch.
  - Ensure correct connection of the phase conductors.
  - Seal all cable entries such that they are splash-proof.
- Compare the mains voltage and mains frequency with the information on the motor nameplate and determine the connection type of the electric motor (star or delta connection).

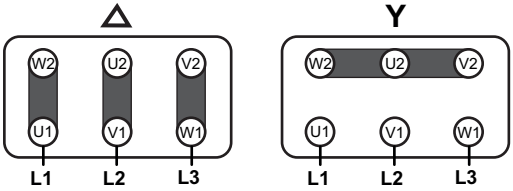


Fig. 33: Terminal assignment for delta and star connection

- Open the terminal box on the electric motor.
- If necessary, move the jumpers on the terminal board according to the terminal assignment.

The terminal assignment is also located on the inside of the terminal box cover.

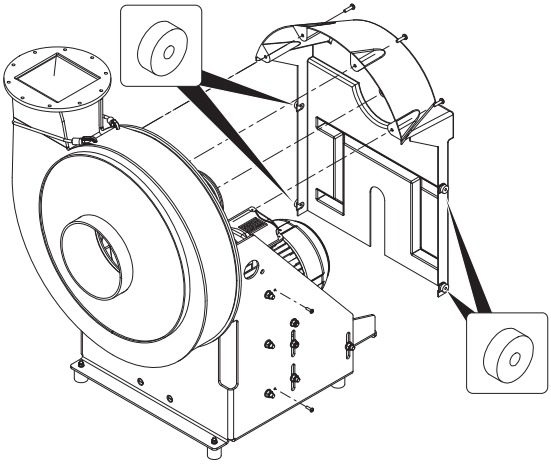
- Connect the phase conductors (L1, L2, L3) of the motor connection cable to the terminal board in the correct order.
  - Use insulated ring terminals for phase conductors.
- Attach the protective earthing (PE) to the protective earthing connection in the terminal box using a ring terminal and serrated lock washer.
- Check:
  - Only ATEX cable gland(s) and ATEX blind plugs are allowed.
  - Cable gland on the terminal box is suitable for the diameter of the connection cable.

- All unused cable inlets on the terminal box are sealed watertight with blind plugs.
- Sealing ring and sealing surface on the terminal box are clean.

- Close terminal box.

8.6 Installing the belt guard

After completion of the electrical installation work, the belt guard shall be installed on the fan with V-belt drive.



Procedure:

1. Attach the belt guard to the support as shown.
2. Install four spacers between the support and belt guard (see details).

Fig. 34: Installing the belt guard

8.7 Final inspection

- Verify mains and motor connections with motor nameplate data.
- Check the sizing and setting of the electrical protective devices (fuses, motor protection switch).
- Check installation of motor connection cable and isolation switch.
  - Three-phase mains voltage is applied to the line side of the isolation switch.
- Check connections of protective earthing (PE) and grounding for fixed position and for execution compliant with standards.
- If frequency converter (FC) is used:
  - Check FC terminal assignment, shield connection, and cable strain relief.
  - Check and record important FC parameters and settings: Maximum output frequency, V/f characteristic curves, acceleration and braking times Instructions for frequency converter (FC) use.

If required for control and placement in service, connect an external control unit to the FC.

- Complete ATEX test report ⇨ Chap. 15.1 [▶ 85].

9 Placement in service

9.1 Safety instructions

These safety instructions warn against dangers that can arise when placing the fan in service.

⚠WARNING Risk of injury when placing the fan in service.

Injuries due to electrical, mechanical, and chemical hazards.

- ▶ Installation work on the fan as well as final inspection have been completed in their entirety ⇨ Chap. 7 [▶ 37], ⇨ Chap. 8 [▶ 45].
- ▶ Initial and subsequent placement in service is only to be completed by authorized mounting personnel.
- ▶ Secure the isolation switch with a personal padlock to prevent unauthorized energization until all checks and preparations have been carried out. Hang tag on isolation switch.
- ▶ For free sucking or blowing out installation of the fan:
  Before energization, ensure that no one remains in the hazardous area of the inlet and/or outlet connections.
- ▶ Do not place a fan in service that is iced over. Pieces of ice can then come off and cause serious injuries and material damage. Do not remove ice from the fan forcibly or with chemical deicers.
- ▶ An electrician is responsible for energization of the fan.

9.2 Carrying out placement in service

Open the shut-off or damper valves of the fan's supply air duct and discharge duct.

9.2.1 Check motor rotation direction

Procedure:

- Briefly turn the fan on and off with the isolation switch.
- Check motor rotation direction and compare with direction of rotation arrow on the fan housing. ⇨ Chap. 5.2 [▶ 27].

To check the direction of rotation, observe the fan impeller of the electric motor or use a motor tester for non-contact determination of the direction of rotation.

- If the direction of rotation is incorrect, have an electrician switch two phase connections of the isolation switch or in the terminal box of the electric motor, or, if available, change the direction of rotation on the frequency converter.
- For fan with V-belt drive: Check belt tension Measuring and setting belt tension.

9.2.2 Functional test of the frequency converter (FC, optional accessory)

Procedure:

- Test start/stop and acceleration behavior starting at a low frequency (25 Hz).
- Increase fan speed from minimum to maximum speed ⇨ Chap. 8.3.2 [▶ 50]
  - with an external signal from the higher-level controller,

- with FC control elements or an external control unit,
- with the local potentiometer ⇨ Chap. 5.3.8 [▶ 30].

Check during the functional test:

- Check acceleration and braking time ⇨ Chap. 8.3 [▶ 47].
- Commands shall cause corresponding speed changes.
- The electric motor may not generate any unusual vibration or noises when operating within the characteristic curve range according to the technical data sheet.
- Conduct speed measurement.
  - **NOTICE** Do not exceed the maximum speed of the impeller or the maximum frequency of the electric motor according to the technical data sheet/motor nameplate.
- During start/stop operations, the FC may not display an error message or trigger a protective function.

9.2.3 Conduct test run

DANGER Explosion hazard during test run

Death or serious injuries upon explosion.

- The fan shall never be located in an explosive atmosphere during the test run.
- ▶ Take all necessary safety precautions and measures to ensure that no explosive atmosphere exists during the test run.

Run the fan at the designated operating point, or at the operating impeller speed on the nameplate, for at least 1 hour.

At the beginning of the test run:

- Check for irregular running, unusual vibration, or noises.
- Once the operating speed has been reached, the current draw of the electric motor may not exceed the nominal value according to the motor nameplate.
- Check for leak tightness and flexible mounting of the sleeves on the fan.
- Perform vibration measurement on the fan's electric motor and compare with the table for vibration limits according to ISO 14694:

Status	Category	Permissible vibration when flexibly mounted (effective value/RMS) [mm/s]
Start-up	BV-2	9,0
	BV-3	6,3
Alarm	BV-2	14,0
	BV-3	11,8
Shutdown	BV-2	*
	BV-3	12,5

* Establish based on historical limit values.

The measured data provides comparison values during maintenance.

Heating, ventilation, air conditioning (HVAC), and agriculture: BV-2 < 3.7 kW
Industrial processes, etc.: BV-3 > 3.7 kW

At the end of the test run:

- Compare current values and parameters with initial values and parameters from the beginning of the test run:
  - Irregular running, vibration, or noises.
  - Current draw of the electric motor.
  - Vibration measurement.
- Check leak tightness of the sleeves.
- Measure temperature of the electric motor and compare with information in the technical data sheet or on the nameplate.
- For fan with V-belt drive: Check belt tension Measuring and setting belt tension.
- Create a test report during initial commissioning.
- The initial commissioning of the fan must also be documented with an ATEX test report ⇨ Chap. 15.1 [▶ 85]. Either deliver the completed ATEX test report to the operator or keep it with the project documents.
- Leakage value: The leakage value of the supplied fan can be requested from the distributor.

10 Operation

10.1 Safety instruction

This safety instruction warns against dangers that can arise during fan operation.

⚠WARNING Risk of injury due to fan operation

Injuries due to electrical, mechanical, and chemical hazards or explosions.

- ▶ Only qualified and authorized operating personnel may operate the fan and clean the outside of it.
- ▶ In the event of an operating fault, assign qualified personnel to rectify the fault.

10.2 Operating instructions

The fan is

- either operated with a higher-level, automatic control
- or manually switched on and off with operating elements on the plant side.

The operating personnel are also responsible for regularly checking the operating condition of the fan ⇨ Chap. 11.3.1 [▶ 60].

Actions to take in the event of a malfunction

1. Shut the fan down and inform supervisory personnel.
2. In case of emergency, immediately carry out emergency measures ⇨ Chap. 3.10 [▶ 22].
3. Shut down system components affected by fan failure.
4. Assign qualified personnel to rectify the fault ⇨ Chap. 12.2 [▶ 64].

10.3 Outside cleaning

⚠WARNING Risk of injury due to moisture penetration in current-carrying components

Injury by electric shock.

- ▶ Never clean electric motor or additional electrical components such as isolation switch, frequency converter, control cabinet, etc. with a water jet, pressure washer, or steam cleaner.

Procedure:

- Clean fan housing and plastic parts with a damp cloth.
  ⚠DANGER Spark formation due to static charge - do not use a dry cloth!
- Contamination and dust deposits on the cooling fins and fan cowl of the electric motor are only to be removed by dry means or with a damp cloth.
- Keep the installation site of the fan clean.

Observe cleaning interval and adjust if necessary ⇨ Chap. 11.2 [▶ 60].

11 Maintenance

11.1 Safety instructions

These safety instructions warn against dangers that can arise when performing maintenance on the fan.

DANGER Risk of injury due to maintenance work on the fan in a potentially explosive atmosphere

Death or serious injuries upon explosion.

Injuries due to electrical, mechanical, and chemical hazards.

- ▶ Control the operating condition via authorized operating personnel with appropriate ATEX training.
- ▶ All other maintenance work only to be performed by authorized maintenance personnel with appropriate ATEX training and certification.
- ▶ An electrician is responsible for energization of the fan.

SAFETY INSTRUCTIONS

- ▶ Wear special personal protective equipment for use in potentially explosive atmospheres ⇨ Chap. 3.2.1 [▶ 19].
- ▶ In the access and work areas of the maintenance work
  - eliminate trip and fall hazards,
  - ensure sufficient lighting,
  - keep clean and tidy.
- ▶ Secure the isolation switch with a personal padlock to prevent unauthorized energization until completion of the maintenance work. Hang tag on isolation switch.
- ▶ In a potentially explosive atmosphere, only use tools and equipment that are non-sparking and approved for the existing explosion protection zone.
- ▶ When working inside the fan, as protection from hazardous, aggressive, and explosive conveyed media:
  - Shut the provided shut-off damper to the supply air duct and discharge duct.
  - Ensure that no conveyed medium can flow in.
  - If provided, drain condensate to the casing drain.
  - Be mindful of harmful deposits and condensate residue.
- ▶ When working inside the fan, ensure that the impeller is stationary and prevented from automatically being rotated by supply or discharge air.
- ▶ After completion of work
  - check functionality of all safeguards,
  - remove all tools and materials from the work area,
  - wipe up spilled substances and dispose of them properly.

DANGER Risk of explosion due to electrostatic discharge

Death or serious injuries upon explosion.

- ▪ Cleaning the fan housing, impeller, or plastic parts with a dry cloth leads to electrostatic charge.
- ▶ Only clean the fan with a damp cloth in a potentially explosive atmosphere.

11.2 Maintenance table

The maintenance intervals (W/weekly, M/monthly, 6M/semi-annually and 12M/annually) are to be adapted to the current operating conditions of the fan as determined by the customer.

Maintenance activity	Cross reference	W	M	6M	12M*
Check operating condition	⇨ Chap. 11.3.1 [▸ 60]	X			
Outside cleaning	⇨ Chap. 10.3 [▸ 58]		X		
Manual casing drain type K (option): drain condensate	⇨ Chap. 5.3.5 [▸ 29]	X			
Check automatic casing drain type V (option) and siphon	⇨ Chap. 5.3.5 [▸ 29] ⇨ Chap. 7.7.1 [▸ 43]	X	X		
Test run during extensive downtime	⇨ Chap. 9.2.3 [▸ 56]			X	
Inside inspection (if necessary)	⇨ Chap. 11.3.2 [▸ 61]			X	
Inside cleaning (if necessary)	⇨ Chap. 11.3.3 [▸ 61]			X	
Annual inspection	⇨ Chap. 11.3.4 [▸ 62]				X
Checking of electrical components by electrician	—				X

* Or before placement in service after an extensive downtime period.

An hour meter is helpful.
Record all maintenance work performed in a machine logbook. A template is available from the point of contact.

11.3 Maintenance work

For questions regarding maintenance work and intervals, contact the distributor or manufacturer. Draw up a service contract if required.

11.3.1 Check operating condition

Visually check during fan operation:

- For proper mounting, damage, and contamination:
  - Safeguards (splinter protection, protective grid with free installation, optional motor cover), fan housing, electric motor, and support.
- For leak tightness:
  - Sleeves, optional hub seal.
- Optional double-layer lip seal, lip seal with back suction or sealing gas:
  - Lubricate via lubrication nipple for double-layer lip seal.

- Back suction functional (tube free of contamination)?
- Sealing gas available?

- For loose screw connections.
- Smooth operation of fan:
  - For irregular running, check for vibration or noise ⇨ Chap. 9.2.3 [▶ 56].
- Functionality of the V-belt drive: Check the belt tension upon irregular running, vibration, or noises Measuring and setting belt tension.
- Check electric motor, casing, and hub seal (option) for possible overheating (overload). **⚠CAUTION Risk of burn**

Promptly report any defects found and have them properly rectified.

11.3.2 Inside inspection

NOTICE Risk of damage due to vibration

Material damage and production downtime, reduced service life.

- Improper use or deposits on the impeller lead to imbalance and vibration.

▶ Switch fan off immediately in case of unusual vibration.
▶ Check parts in contact with the medium.

Procedure:

- Remove sleeve from the inlet connection ⇨ Chap. 7.6 [▶ 41]. If available, insert a borescope into the gap.
- Check impeller as well as internal housing for corrosion, stress cracks, deformations, and deposits.
- If necessary, clean the impeller and inside of the casing ⇨ Chap. 11.3.3 [▶ 61].
- Replace damaged impeller immediately. Use only genuine spare parts.

11.3.3 Inside cleaning

NOTICE Risk of damage due to aggressive cleaning agents and sharp cleaning tools

Damage to plastic surfaces.

▶ Select cleaning agent appropriate for conveyed medium and plastic fan material.
▶ If possible, use warm water and a household cleaning agent.
▶ Use a brush or a wooden scraper to loosen deposits.

Procedure:

- If present, first open casing drain (type K) and drain condensate into a container.
- Loosen sleeve at inlet connection and remove ductwork end ⇨ Chap. 7.6 [▶ 41].
- Carefully clean impeller and inside of the casing. **NOTICE** Do not damage the impeller blades in doing so.
- If there are heavy deposits, also clean the fan connection tubes.

11.3.4 Annual inspection

The mechanical and electrical functionality of the fan are assessed in the annual inspection, and its continued operation is ensured. This also applies in the event of extensive downtime.

1. Check during outside inspection
   - Cracking: Fan housing, vibration absorber
   - Noise: Motor bearings
   - Proper mounting and damage of: Protective devices (splinter protection, belt guard, protective grid), support.
   - Blockages in condensate drain (option) and missing water in siphon.
   - Damaged parts. Replace these parts immediately.
2. Test run
   - Vibration measurement and condition check of the motor bearings.

Compare measured values with
- limit value according to table ⇨ Chap. 9.2.3 [▶ 56],
- information in the test report from initial commissioning.

- Replace motor bearings at the end of their service life or if they exhibit significant noise development due to bearing wear. To do this, remove the electric motor ⇨ Chap. 12.8 [▶ 73].

The motor bearings are lifetime lubricated ⇨ Chap. 2.2.3 [▶ 12]. For information on the bearing service life, see the operating instructions of the electric motor.

- V-belt drive: Check the condition of the components of the V-belt drive: Replace the flange bearings at the end of their service life or if they exhibit significant noise development due to bearing wear.
  Check belt tension and adjust it if necessary Measuring and setting belt tension.

The flange bearings have lifetime lubrication.

- Check optional hub seal (lip seal, hub seal felt ring) for leakage.
- Optional double-layer lip seal, lip seal with back suction or sealing gas:
  - Lubricate via lubrication nipple for double-layer lip seal.
  - Back suction functional (tube free of contamination)?
  - Sealing gas available?
- Measure the current draw of the electric motor. The measured value may not exceed the rated current on the nameplate.
- Measure the temperature of the electric motor and compare the result with the information in the technical data sheet.
  ⚠CAUTION Risk of burns

3. Inside inspection and cleaning
   - Check the impeller for deformation and for damage such as cracking and corrosion ⇨ Chap. 12.5 [▶ 71].
   - Check the V-belt drive for damage.
     Check belt tension and adjust it if necessary Measuring and setting belt tension.
   - If necessary, conduct outside and inside cleaning.
4. Assembly and final inspection
   - Proper mounting of the splinter protection ⇨ Chap. 7.4 [▶ 39].
   - Fixed position of all screw connections.
   - Fixed position of all fastening elements (anchors) in the foundation (baseplate).
   - Short test run, checking for vibration and noise.

12 Repair

12.1 Safety instructions

These safety instructions warn against dangers that can arise when repairing the fan.

Modifications and adaptations to the fan are strictly prohibited and will result in the loss of ATEX certification.

DANGER Risk of injury due to repair work on the fan in a potentially explosive atmosphere

Death or serious injuries upon explosion.
Injuries due to electrical, mechanical, and chemical hazards.

- Only maintenance personnel authorized by the operator as well as service personnel authorized by the distributor or manufacturer, who have appropriate ATEX training/qualification, may carry out repair work.
- The same safety instructions as for maintenance work apply ⇨ Chap. 11.1 [▶ 59].
- Allow the fan to cool off with the electric motor before beginning work.
- An electrician is responsible for energization of the fan.
- Explosion protection testing is to be conducted before the fan is put back in service.

12.2 Fault table

Identify and rectify fan faults using this table, and enter them in the machine logbook. For further information, contact customer service (see title page).

Fault	Possible cause	Fault discovery	Remedy
No function	No electrical power.	Check phase voltage.	Check electrical installation.
Conveying capacity insufficient: operating point according to technical data sheet cannot be reached.	Incorrect direction of rotation of the impeller.	Visual inspection.	Swap phases ⇨ Chap. 8.5 [▶ 52].
	Damper valve improperly positioned.	Visual inspection.	Set damper valve to proper position.
	Pressure loss in ductwork.	Measure flow rate and pressure at the operating point.	Optimize ductwork layout.
	Inflow or outflow at the fan causes high pressure loss.		Adjust the speed for the new conditions within the limits of the intended use.
	Damper valve improperly positioned in ductwork.		Adjust the system.

Fault	Possible cause	Fault discovery	Remedy
			Observe minimum distance between fan connection and damper valve or duct bends (L ≥ 3 x duct Ø).
	Drive belt slips.	Check belt tension ⇨ Chap. 12.12 [▶ 78] .	Tension the drive belt ⇨ Chap. 12.11 [▶ 77] .
	Drive belt and belt pulleys are dirty.	Visual inspection.	Clean wedges of V-belt assembly. Clean grooves of belt pulleys.
Operating speed cannot be reached.	Faulty motor winding.	Winding measurement.	Replace electric motor ⇨ Chap. 12.8 [▶ 73].
	Improper phase voltage.	Measure phase voltage.	Check/replace fuses, motor connection cable, FC cable.
	Motor overload due to improperly positioned damper valve.	Measure flow rate and pressure at the operating point.	Set damper valve to proper position.
	Motor overload due to system changes.	Fan/electric motor no longer meeting the operating point.	Consult with point of contact (see title page).
FC error message.	Improper setting of motor characteristics, start/stop ramps, acceleration/braking time.	FC display: check relevant parameters.	Set parameters properly ⇨ Chap. 8.3.2 [▶ 50].
FC error message. No acceleration from low frequency.	FC current limits are exceeded due to insufficient power factor (cos φ).	FC current limits too low?	Adjust FC parameter "Motor characteristic" (torque quadratic to speed) ⇨ Chap. 8.3 [▶ 47].
	Improper motor and/or FC size.	Motor and/or FC too small?	Design FC according to motor ⇨ Chap. 8.3 [▶ 47].
	Start ramp too steep or acceleration time too short.	Check FC parameters.	Adjust start ramp. Increase acceleration time.

Fault	Possible cause	Fault discovery	Remedy
Motor protection switch, PTC thermistor tripping device, or FC switches off.	Improper setting.	Measure current draw.	Set motor protection switch properly ⇨ Chap. 8.2.2 [▶ 46].
		Check FC parameters.	Parameterize FC properly.
	Faulty motor connection.	Measure current draw.	Check motor connection (star/delta) ⇨ Chap. 8.5 [▶ 52].
	Overheating due to excessive current consumption.	Operating point adjusted. Defect in motor or cable.	Set operating point according to specification.
	Impeller stiff or stopped.	Visual inspection.	Remove deposits or foreign objects ⇨ Chap. 11.3.3 [▶ 61].
	Winding damage on the electric motor.	Winding measurement.	Repair or replace electric motor ⇨ Chap. 12.8 [▶ 73]. Check EMC guidelines.
	Electric motor bearing damage.	Turn electric motor by hand.	
	Damaged cable, faulty cable connection.	Measurement, visual inspection.	Replace cable.
Drive belt damaged or torn.	Normal wear.	Visual inspection.	Replace severely damaged drive belt ⇨ Chap. 12.11 [▶ 77] .
	Drive belt pretension too high.	Check pretension, alignment, and condition of drive belt.	Replace severely damaged drive belt. Tension drive belt properly ⇨ Chap. 12.12 [▶ 78] .
Strong vibration.	Deposits on impeller, imbalance.	Visual inspection, vibration measurement.	Clean impeller ⇨ Chap. 11.3.3 [▶ 61]. Balance impeller ⇨ Chap. 12.7 [▶ 72].
			Adjust cleaning interval.
	Damaged or malformed impeller due to (prohibited) conveyed medium.	Visual inspection.	Replace impeller ⇨ Chap. 12.7 [▶ 72].

Fault	Possible cause	Fault discovery	Remedy
		Points to observe: ⇨ Chap. 2.2.1 [▶ 9] and ⇨ Chap. 2.2.2 [▶ 12].	Clarify composition of conveyed medium and plastic resistance.
		Measure temperature of the conveyed medium.	Adjust operating conditions to intended use ⇨ Chap. 2.2.1 [▶ 9].
		Check operating point.	
		Check environmental conditions.	
		Ductwork connected directly to fan casing.	Adjust connection (sleeve) and ductwork distance appropriately ⇨ Chap. 7.6 [▶ 41].
		Change in length of ductwork due to thermal expansion.	
	Loose impeller.	Impeller loosened on the motor shaft?	Tighten impeller ⇨ Chap. 12.7 [▶ 72].
	Impeller dips into condensate at bottom of casing.	Type K: Visual inspection.	Drain condensate ⇨ Chap. 5.3.5 [▶ 29].
		Type V: Visual inspection.	Clean and repair condensate drain/siphon ⇨ Chap. 5.3.5 [▶ 29].
		-	Retrofit with casing drain.
	Loose/defective vibration absorbers or fastening elements.	Visual inspection.	Tighten/replace vibration absorbers ⇨ Chap. 7.5 [▶ 40].
	Improper mounting.	Installation location requirements met ⇨ Chap. 7.2 [▶ 37].	Fortify foundation (baseplate). Resize fastening elements (anchors).
	V-belt drive misaligned.	Visual inspection.	Check alignment and belt tension ⇨ Chap. 12.12 [▶ 78] .
Overheating of electric motor.	Bearing or winding damage.	Auditory inspection, current draw measurement, winding measurement.	Repair or replace electric motor ⇨ Chap. 12.8 [▶ 73].

Fault	Possible cause	Fault discovery	Remedy
	Impeller stiff or stopped.	Visual inspection.	Remove deposits or foreign objects ⇨ Chap. 11.3.3 [▶ 61].
	Motor overload due to improperly positioned damper valve.	Measure flow rate and pressure at the operating point.	Set damper valve to proper position.
	Motor overload due to system changes.	Fan/electric motor no longer meeting the operating point.	Consult with point of contact (see title page).
	FC does not reach required voltage.	Check FC.	Use a suitable FC.
Prohibited operating conditions.	Ductwork not leak tight.	Check for leakage.	Seal up.
	Loose hose clamps or damaged sleeves.		Re-tighten hose clamps or replace sleeves ⇨ Chap. 7.6 [▶ 41].
	FC parameter "max. frequency" set improperly (speed too high, overheating of electric motor).	Check FC parameters ⇨ Chap. 8.3.2 [▶ 50].	Adjust parameters according to characteristic map in technical data sheet.
Grinding noise coming from the impeller.	Casing too tight.	Check distance and alignment of ductwork to fan connection.	Adjust ductwork distance and connection (sleeves) appropriately.
	Ductwork connected to fan without sleeves.		Connect ductwork to fan with sleeves ⇨ Chap. 7.6 [▶ 41].
	Loose impeller.	Impeller loosened on the motor shaft?	Tighten impeller. Replace impeller ⇨ Chap. 12.7 [▶ 72].
	Deposits or foreign objects between impeller and inlet cover.	Determine grinding point. Check with feeler gauge.	Remove deposits or foreign objects ⇨ Chap. 11.3.3 [▶ 61].
	Impeller defect.	Visual inspection.	Replace impeller ⇨ Chap. 12.7 [▶ 72].

Fault	Possible cause	Fault discovery	Remedy
Audible sound from bearings.	Bearing damage.	Auditory inspection.	Replace motor bearings or exchange motor ⇨ Chap. 12.8 [▶ 73].
	End of service life reached.		
	Bearing damage due to electrical discharge machining (bearing currents).	Measure voltage between the motor shaft and casing of the electric motor.	Interference suppression measures with FC operation; see FC manufacturer's guidance. Check EMC guidelines.
			Use current-insulated roller bearings or ceramic hybrid bearings.
Excessive leakage at impeller hub.	Overpressure operation of the fan (without optional hub seal).	Pressure measurement.	Operate fan at negative pressure.
			Install optional hub seal.
	Hub seal worn or defective.	Visual inspection.	Replace sealing ⇨ Chap. 12.10 [▶ 75] .

12.3 Spare parts and wear parts

DANGER Risk of injury due to impeller explosion

Serious injuries due to debris being launched out.

- Prohibited spare parts.
- ▶ Only use an original impeller from the manufacturer as a spare part.

DANGER Risk of explosion due to prohibited spare parts

Death or serious injuries upon explosion.

- ▶ Only use original spare parts for fan repair.
- ▶ If the fan is made of conductive plastic, the spare part must be made of the same material (PPs-el).

NOTICE Risk of damage due to prohibited spare parts

Component and material damage as well as production downtime.

- Loss of ATEX certification and void of warranty.
- ▶ Only use original spare parts from the manufacturer for maintenance activities and repairs.

Order spare parts and wear parts from customer service (see title page) in a timely manner with the following information:

- Type classification of fan according to nameplate or technical data sheet.
- Desired quantity.
- Specific designation

- of the spare part or wear part ⇨ Chap. 5.1 [▶ 26].
- or of the option or accessory ⇨ Chap. 5.3 [▶ 27].

Have spare parts and wear parts for the impeller or hub seal available:

Pc.	Designation	Spare part	Wear part
1	Impeller	X	
1	Hub end cap	X	
1	Hub seal (option) Operating material recommendations when using lip seals: • Grease: Interflon MP2/3 • Sealing gas: Nitrogen		X
1	Drive belt and belt pulleys for V-belt drive		X

12.4 Preparation for repairs

Installation tools

Special centering pieces are needed for proper installation and alignment of the flange bearing and the impeller to the casing and rear plate.

Contact your Colasit distributor for details and a comprehensive installation manual.

Prepare the fan for repairs (impeller, electric motor, hub seal, etc.) as follows:

1. Observe safety instructions ⇨ Chap. 11.1 [▶ 59].
2. Switch off the fan and FC (option) and use the isolation switch to remove voltage on all phases.
3. Secure the isolation switch with a personal padlock to prevent unauthorized energization until completion of the repair work. Hang tag on isolation switch.
4. Shut the shut-off damper to the supply air duct and discharge duct.
5. Drain condensate to casing drain type K (option).
6. Only for removal of the casing: Remove or disconnect the drain pipe to the siphon from the casing drain type V (option).
7. Loosen sleeves on inlet and outlet connections.
8. Remove removable duct section from inlet connection ⇨ Chap. 7.6 [▶ 41].

Risk of contamination of the ductwork

Cover open ductwork ends with plastic sheeting during repairs.

9. If the rear plate comes loose from the support or the electric motor must be replaced:
   - Prepare the centering pieces as installation tools for the electric motor.

12.5 Check impeller

DANGER Risk of explosion due to grinding impeller

Death or serious injuries upon explosion.

- Overheating of possible grinding points.

▶ Be mindful of grinding noises during fan operation.

▶ In the event of grinding noises, switch the fan off immediately and arrange for repair.

NOTICE Risk of damage due to grinding impeller

Damage to impeller.

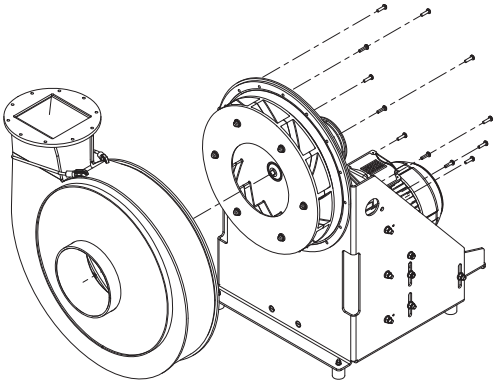
▶ If necessary, tighten the fastening screws on the casing and impeller.

▶ Determine grinding point. Inspect the casing and impeller for grinding marks and replace damaged parts after consulting the manufacturer. Remove deposits or foreign objects in the casing ⇨ Chap. 11.3.3 [▸ 61].

12.6 Casing exchange

Conditions:

- Fan has been prepared for repairs ⇨ Chap. 12.4 [▸ 70].



Procedure:

- Disconnect the grounding cable before removing the support/rear plate/casing ⇨ Chap. 8.4 [▸ 52].
- Remove the fastening screws on the rear of the support.
- Remove casing from support.

Fig. 35: Removing casing

Mounting instructions

- Align casing opening to the center of the motor shaft.
- **NOTICE** Torque the fastening screws of the casing in accordance with the following table.

Fan/size	Fastener threads	Max. tightening torque [Nm]
CHVS 63-250	M8	3

- Tighten the grounding cable to the ground connection of the casing ⇨ Chap. 8.4 [▸ 52].

12.7 Impeller exchange

Conditions:

- Fan has been prepared for repairs ⇨ Chap. 12.4 [▶ 70].
- The casing is removed ⇨ Chap. 12.6 [▶ 71].

NOTICE Do not remove the rear plate from the support.

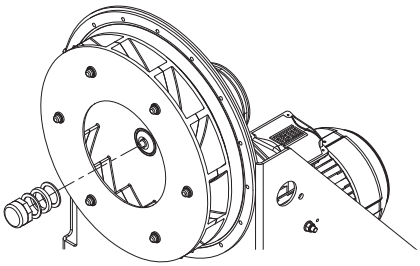


Fig. 36: Removing the hub connection

Procedure:

- Remove the hub connection.

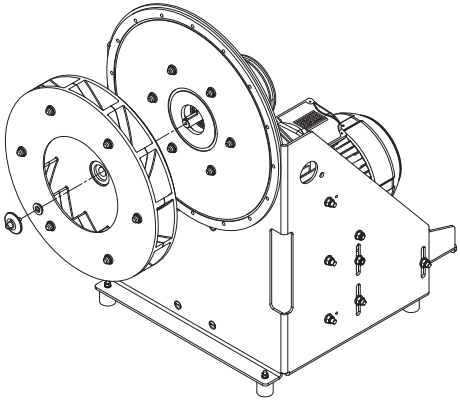


Fig. 37: Removing impeller

- Loosen and remove the fastening screw.
- Pull the impeller off the drive shaft.

With CHVS fans, the shaft seat on the impeller is adapted to the shaft diameter of the flange bearing.

Mounting instructions

- Clean and lightly grease the drive shaft and impeller hub before installation.
- Push the impeller onto the drive shaft as far as it will go. The impeller position cannot be adjusted.

  NOTICE Risk of bearing damage! Never strike the drive shaft when mounting the impeller.
- Tighten the impeller with the fastening screw, with RIPP LOCK® for fastener security, in accordance with the following table.

Flange bearing shaft diameter [mm]	Fastener threads	Max. tightening torque [Nm]
24	M8	20

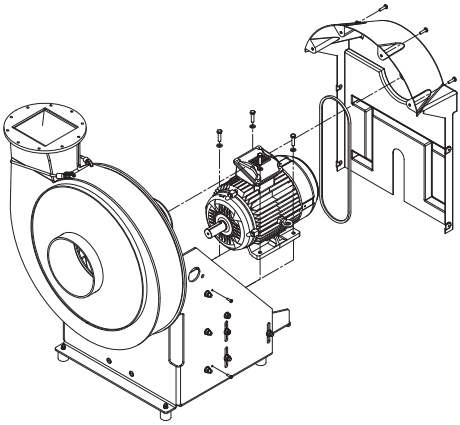
- Check impeller mobility.
  NOTICE The impeller may not grind.
- Install the hub end cap. Ensure leak tightness.
- Install the casing ⇨ Chap. 12.6 [▸ 71].
- Conduct a test run after repair ⇨ Chap. 9.2.3 [▸ 56].

12.8 Electric motor exchange

The electric motor may only be repaired at the motor manufacturer's facility or in special workshops with an ATEX certificate of competence.
Keep the repair certificate as associated documentation.

Conditions:

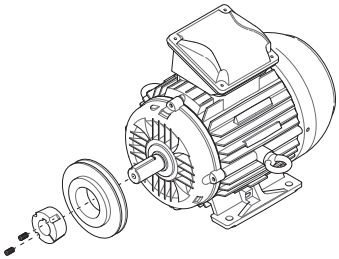
- Fan has been prepared for repairs ⇨ Chap. 12.4 [▸ 70].



Procedure:

1. Remove all cables from the terminal box of the electric motor and protect from damage.
2. Remove the grounding cable from the ground connection on the electric motor.
3. Support and secure the electric motor with suitable supports.
4. Remove the belt guard.
5. Tension the belt: Loosen the fastening screws of the motor bracket on the support and screw in the adjusting screws ⇨ Chap. 12.11 [▸ 77].
6. Remove the fastening screws and nuts on the motor bracket.

Fig. 38: Removing the electric motor



7. Remove the belt pulley with the taper lock bushing from the motor shaft and reuse them for the new electric motor.
8. Move a heavy electric motor with suitable hoisting gear.
   Use the lifting eye bolts on the electric motor for this purpose.
9. Install the new electric motor.
10. Align and tension the belt
    ⇨ Chap. 12.12 [▸ 78].

Fig. 39: Removing the V-belt pulley from the motor shaft

NOTICE **Risk of damage to the electric motor**

Damaged motor bearings.

- ▶ Protect the motor shaft/bearings from being hit during transport and mounting of the electric motor.
- ▶ Observe the instructions in the manual from the motor manufacturer.

Installation instructions and checks

- Fasten mounting nuts according to the following table.
  - The thread is based on the motor size:

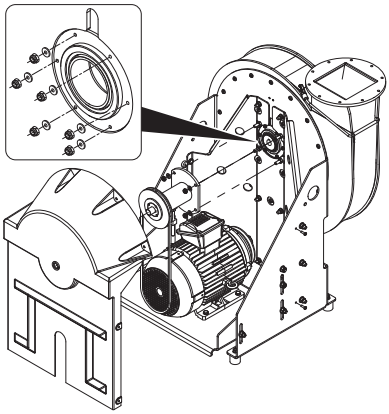
Thread	Max. tightening torque [Nm]
M8	22
M10	45
M12	80

- Install an ATEX-compliant ground connection ⇨ Chap. 8.4 [▸ 52].
- Connect electric motor ⇨ Chap. 8.5 [▸ 52], ⇨ Chap. 8.2.3 [▸ 46].
- Check the motor's direction of rotation ⇨ Chap. 9.2.1 [▸ 55].
- Conduct a test run ⇨ Chap. 9.2.3 [▸ 56].

12.9 Lip seal (option) replacement

Conditions:

- Fan has been prepared for repairs ⇨ Chap. 12.4 [▸ 70].
- The casing is removed ⇨ Chap. 12.6 [▸ 71].
- Impeller has been removed ⇨ Chap. 12.7 [▸ 72].
- Belt guard, V-belt drive, and flange bearing are removed.
- Electric motor is removed if necessary ⇨ Chap. 12.8 [▸ 73].
  - Disassembly depends on the type and size of the electric motor.



Procedure for single- and double-layer lip seals:

1. Remove the rear plate from the support.
2. Remove the casing of the lip seal (see detail).
3. Install the new lip seal.
4. Center the housing of the lip seal to the rear plate and impeller hub and screw it to the rear plate.
5. Pre-mount the rear plate to the support (only finger-tighten the screws).

Fig. 40: Replacing the lip seal

6. Install the flange bearing. Ensure proper alignment to the support when doing so.
7. Install the V-belt drive.
8. Install the impeller on the flange bearing shaft.
9. Tighten down the rear plate.
10. Install the casing.
11. Install the belt guard.

Installation tools

Special centering pieces are necessary for proper installation of the double-layer lip seal. Contact your Colasit distributor for details and a comprehensive installation manual.

Important

The impeller should turn freely by hand after mounting. Observe the direction of rotation ⇨ Chap. 9.2.1 [▸ 55].

12. Conduct a test run (at least 1 h) after repair ⇨ Chap. 9.2.3 [▸ 56].

12.10 Replacing the felt ring seal

Conditions:

- Fan has been prepared for repairs ⇨ Chap. 12.4 [▸ 70].
- The casing is removed ⇨ Chap. 12.6 [▸ 71].
- Impeller has been removed ⇨ Chap. 12.7 [▸ 72].
- **NOTICE** Do not remove the rear plate and flange bearing.

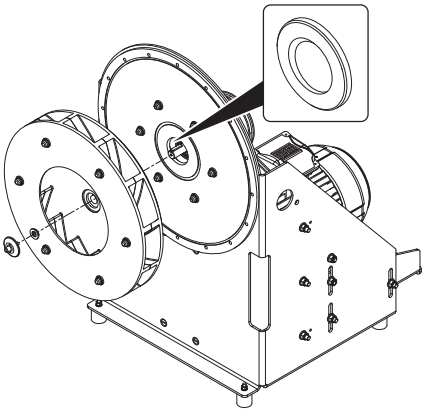


Fig. 41: Replacing the hub seal felt ring

Procedure:

1. Remove felt ring with tweezers (see detail).
2. Saturate the new felt ring with lubricant.
   Lubricant: Interflon Lube TF (aerosol)
3. Mount felt ring.
   NOTICE The felt ring may not protrude into the casing.
4. Install the impeller on the motor shaft.

Important

The impeller should turn freely by hand after mounting. Observe the direction of rotation ⇨ Chap. 9.2.1 [▸ 55].

5. Allow the felt ring to run for one minute at a maximum of 1500 rpm.

NOTICE Risk of damage to the fan.

Smoke and chips can develop for a short time while running.

▶ If this happens, remove the impeller and clean the hub.

6. Assemble the fan:
   - Impeller, see mounting instructions ⇨ Chap. 12.7 [▸ 72]
   .- Casing, see mounting instructions ⇨ Chap. 12.6 [▸ 71].
7. Conduct a test run (at least 1 h) after repair ⇨ Chap. 9.2.3 [▸ 56].
   DANGER Conduct test run outside the Ex-zone!

12.11 Replacing the drive belt

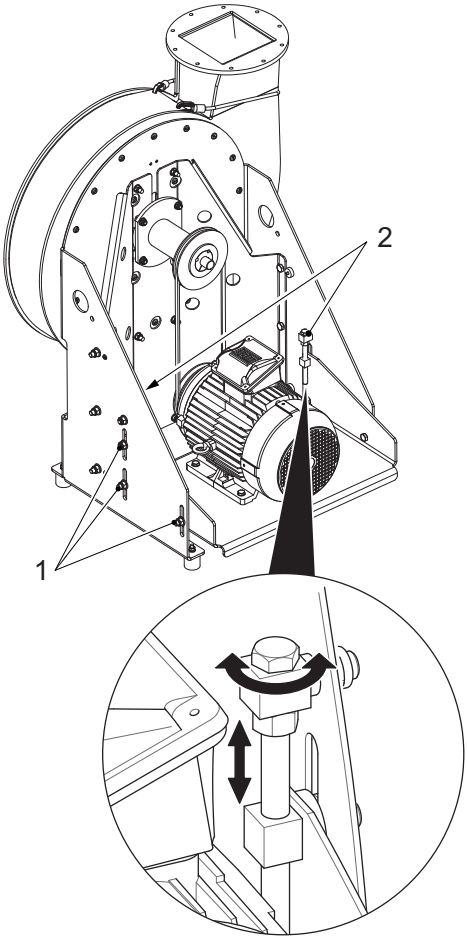


Fig. 42: Replacing the drive belt

Conditions:

- Belt guard is removed.

Procedure:

1. Relieve the tension on the drive belt: Loosen the fastening screws of the motor bracket on both sides of the support (1) and screw in the adjusting screws (2, see detail).
2. Replace the drive belt.
   NOTICE Use an identical drive belt – check the belt type and length.
   NOTICE Inspect the V-belt pulleys. Replace if worn.
3. Tension the drive belt using the two adjusting screws.
4. Install the belt guard.
5. Conduct test run Conduct test run.

Checking the belt tension after placement in service and test run

It is recommended to check the belt tension after a brief runtime (compensation for initial elongation). Inspection intervals of 3 to 6 months, based on load, are then recommended.

12.12 Measuring and setting belt tension

The belt tension (S) is to be set in accordance with the belt plate
⇨ Chap. 5.2 [▶ 27].

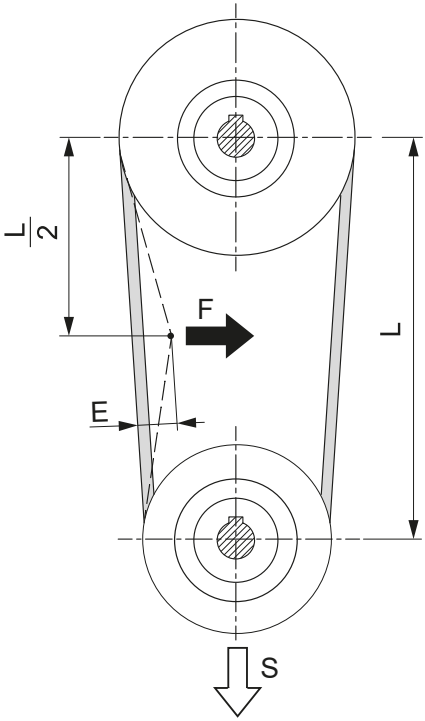


Fig. 43: Measuring belt tension

Procedure:

- Determine the frequency at the center of the belt span (approx. L/2) using a belt frequency meter and compare it with the value specified on the belt plate.
- Optional: Apply the specified test force (F) at the center of the belt span and measure the indentation depth (E). Compare the measured value with the value specified on the belt plate.
- Tension the drive belt if necessary until the specified value is reached.

The belt span is the free section of belt between two belt pulleys that is not resting on the pulleys.

13 Removal from service, disposal, and recycling

13.1 Safety instructions

These safety instructions warn against dangers that can arise during removal from service and disposal of the fan.

⚠WARNING Risk of injury during removal from service and disposal of the fan

Death or serious injuries upon explosion.
Injuries due to electrical, mechanical, and chemical hazards.

- ▶ An electrician is responsible for removal of the power supply from all phases.
- ▶ Ensure that the work area does not have a potentially explosive atmosphere.
- ▶ Removal of the fan to be completed only by authorized mounting personnel.
- ▶ Removal for disposal is to be completed only by authorized transport personnel.

13.2 Environmental protection

NOTICE Environmental hazards upon disposal of the fan

Water and soil pollution

- ▪ Check the fan for conveyed medium deposits that are harmful to health and the environment.
- ▶ Dispose of contaminated components such as the casing, impeller, and disc/rear plate as special waste.

The casing and impeller can be made of different plastics.

For proper recycling, the impeller and casing have a symbol indicating the type of plastic.

Special measures for PPs-el plastics

PPs-el plastics with high flame retardant capacity contain small amounts of 1,1'-(ethane-1,2-diyl)bis[pentabromobenzene] (DBDPE), which is classified as a substance of very high concern (SVHC).

Health and environmental hazards due to the hazardous substance DBDPE

Studies show:

- Indications of influence on hormonal regulation.
- Possible neurotoxicity.
- Effects on the cardiovascular system in animal studies.

The European Chemical Agency's (ECHA) SCIP database (Substances of Concern in Products) contains pertinent information for waste disposal companies. If the fan contains PPs-el plastic materials, provide the following information to the waste disposal company:

Raw material:	Extruded PPs-el sheets or pellets for injection-molded parts made of PPs-el
SCIP Reference Number:	d35123bd-0157-4c12-88d4-7c233bafa4fd
Hazardous Material:	1,1'-(ethane-1,2-diyl)bis[pentabromobenzene] (DBDPE)
CAS Registry Number:	84852-53-9

13.3 Removal from service

⚠WARNING Risk of injury due to improper removal

Injuries by pinching and crushing of body parts.

- ▶ Wear protective equipment.
- ▶ Safeguard work area and prevent unauthorized access using enclosures, safety nets, etc.
- ▶ Secure a fan that is mounted on the wall or ceiling against falling or tipping over by attaching suitable supports.
- ▶ Provide suitable transport aids for transportation of the fan.

⚠WARNING Risk of injury due to escape or inflow of a conveyed medium with the ability to cause adverse health effects

Risk of eye irritation, cough, difficulty breathing, burn, and suffocation.

- ▶ Wear protective equipment.
- ▶ Close shut-off damper to inlet and outlet connections.
- ▶ Watch for deposits and condensate of the conveyed medium in the fan and ductwork.

Procedure:

- Switch off fan and FC (option) and prepare them for removal:
  - Allow to cool down.
  - Close shut-off dampers in supply air and discharge air ductwork.
  - Drain and dispose of condensate in the condensate drain (option).
- To be completed by electrician:
  - Switch off higher-level control and FC.
  - Secure isolation switch with a personal padlock to prevent unauthorized energization and hang tag.
  - Remove power to the fan and additional electrical components on all phases, and disconnect the electrical connection.
- Remove piping and ductwork connections:
  - Disconnect the drain pipe to the siphon from casing drain type V (option).
  - Remove sleeves on inlet and outlet connections.
- Loosen threaded fasteners for the vibration absorbers on the support.
- Prepare fan for disposal in a location suitable for this purpose.

13.4 Disposal instructions

When disposing of the fan, observe all nationally applicable regulations and legal requirements for waste disposal, and comply with regional environmental protection regulations.

Preferably, commission a waste disposal company for proper recycling or disposal.

Disassembly instructions

- Separate the fan components into material groups and dispose of them separately:
  - Metals
  - Plastics
  - Electrical components

Dispose of plastic parts contaminated by conveyed media that are harmful to health and the environment as special waste.

14 EU - Declaration of conformity

We, the manufacturer	COLASIT AG Faulenbachweg 63 3700 Spiez Switzerland
declare under our sole responsibility that the product of the series CHVS 63-250 ATEX with V-belt drive	Plastic industrial fan CHVS 63 ATEX CHVS 90 ATEX CHVS 125 ATEX CHVS 160 ATEX CHVS 200 ATEX CHVS 250 ATEX

to which this declaration refers is in conformity with the provisions of the following EU directives and harmonized standards as of the date of issue stated:

EU Directives	Machinery Directive 2006/42/EC
	EMC Directive 2014/30/EU
	ATEX Directive 2014/34/EU
Harmonized standards	
EN 12100:2010	EN ISO 12499:2008
EN 60204-1:2019	EN IEC 61000-6-4:2019
EN 1127-1:2019	EN ISO 80079-36:2016
EN ISO 80079-37:2016	EN 14986:2024
EN 60079-0:2018	EN 60079-1:2014
EN 60079-7:2015	EN 60079-15:2019
Name and address of the document manager	Andreas Roth COLASIT AG , Faulenbachweg 63 3700 Spiez, Switzerland
Deposit of the assessment and technical documentation with	Eurofins Electric + Electronic Testing AG, Fehraltdorf (1258) Deposit no. 19CH-01129.X02

Spiez, 2/1/2026

R. Zwahlen (Division manager)

15 ATEX - Declaration of Conformity

(2) Equipment, components, and protective systems intended for use in potentially explosive atmospheres – **Directive 2014/34/EU (ATEX)**.

(3)	Declaration of Conformity number	TD-000865
(4)	Equipment group	Non-electrical equipment and components of equipment group II, categories 2 and 3
	Product description	Plastic industrial fan
	Product designations	CHVS 63 ATEX CHVS 90 ATEX CHVS 125 ATEX CHVS 160 ATEX CHVS 200 ATEX CHVS 250 ATEX
(5)	Manufacturer	COLASIT AG
(6)	Address	Faulenbachweg 63 3700 Spiez Switzerland

(7) The design of this equipment and the various executions are specified in the appendix to this Declaration of Conformity and in the technical report.

(8) Colasit AG certifies compliance with the essential health and safety requirements for the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres according to Annex II of Directive 2014/34/EU.

The results of the test are recorded in the confidential test report TD-000 807 and deposited with the notified body (Eurofins, Fehraltdorf, 1258) under the number 19CH-01129.X02.

(9) The essential health and safety requirements are met through conformance with:

EN ISO 80079-36:2016	EN ISO 80079-37:2016
EN 1127-1:2019	EN 14986:2024
EN 60079-0:2018	EN 60079-1:2014
EN 60079-7:2015	EN 60079-15:2019

(10) If there is an X after the certificate number, special conditions for safe use of the equipment are referred to in the appendix of this certificate.

(11) This Declaration of Conformity relates only to the design and construction of the specified equipment group according to Directive 2014/34/EU. Further requirements of this Directive apply to the manufacture of this equipment and its placement on the market.

(12) The identification of the equipment group shall contain the following information:

Conveyed medium Zone 2, Installation site no Zone		II 3/-G	Ex h IIB+H2 T3 or T4* Gc/-
Conveyed medium Zone 2, Installation site Zone 2		II 3G	Ex h IIB+H2 T3 or T4* Gc
Conveyed medium no Zone, Installation site Zone 2		II -/3G	Ex h IIB+H2 T3 or T4* -/Gc
Conveyed medium Zone 1, Installation site no Zone		II 2/-G	Ex h IIB+H2 T3 or T4* Gb/-
Conveyed medium Zone 2, Installation site Zone 1		II 3/2G	Ex h IIB+H2 T3 or T4* Gc/Gb
Conveyed medium Zone 1, Installation site Zone 1		II 2G	Ex h IIB+H2 T3 or T4* Gb
Conveyed medium Zone 1, Installation site Zone 2		II 2/3G	Ex h IIB+H2 T3 or T4* Gb/Gc
Conveyed medium no Zone, Installation site Zone 1		II -/2G	Ex h IIB+H2 T3 or T4* -/Gb

*) T3 or T4 according to the attached motor. The fan as a non-electrical component corresponds to T4.

COLASIT AG

Spiez, 2/1/2026

R. Zwahlen
(Division manager)

Andreas Roth
(Authorized Representative)

(13) **Appendix of the ATEX Declaration of Conformity**

(14)

Declaration of Conformity number	TD-000865

(15) **Description of the product**

- Centrifugal fans of the series CHVS 63-250 ATEX are used to extract room air or process exhaust air. They are driven directly by electric motors.
- Conveyed media are chemically aggressive gases or vapors, or air contaminated with them.
- Material selection depends on the requirements (zone inside/outside) and the presence of droplets.

(16)

Test report	TD-000 807

(17) **Special conditions**

- If the fans are used in potentially explosive atmospheres of Zone 1 or 2, they may only be operated with electric motors for which a corresponding approval (EU type examination certificate) is available.
- Ambient temperature: $T_{amb.}$ -20 °C to +40 °C
- Maximum temperature of the conveyed medium: according to data sheet, max. 60 °C.
- The minimum volume flow rate through the fan, which is listed on the data sheet, must be observed.
- The fan must be connected to the local potential equalization.
- The operator is responsible for ensuring that only substances are conveyed to which the materials used are resistant.
- Modifications to the named products are not permitted unless expressly authorized in writing by the manufacturer.
- For executions with V-belt drive, only V-belts shall be used that fulfill the requirements of EN 80079-37 Chap. 5.8.2 and have a corresponding manufacturer's certificate in accordance with EN 10204-2.1.
- All service and repair work shall be carried out by trained maintenance personnel.

Additional information

- Centrifugal fans of equipment category 3 may only be used for the extraction of gases for which the frequency of occurrence of flammable or explosive atmospheres corresponds ATEX Zone 2.
- If the named products are incorporated into a higher-level machine, the new risks arising from the incorporation must be assessed by the manufacturer of the new machine.

This certificate may only be reproduced in full and without modification.

15.1 ATEX test report

The ATEX test report:

- Serves to verify the proper mounting and initial commissioning as well as the permissible operating conditions of an ATEX-certified fan.
- For ongoing operation, it is recommended to keep a machine logbook in which the explosion protection testing is also entered.

Templates for the ATEX test report and machine logbook can be obtained from the point of contact.

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Notes

Innovative technology for the sake of the environment

- since 1945 -

When it comes to thermoplastics, COLASIT AG is one of the world's leading brands in fan and system engineering. Our qualified staff impress with technical expertise and great dedication, guaranteeing you the highest quality on all five continents.

We set our targets high to see all our projects through to success and complete every job to your complete satisfaction. We combine tradition and innovation – our many years of experience are a foundational component of our work, just as is the incorporation of the latest technology.

Place your trust in us – we accompany you throughout all phases of your project, starting from planning with the manufacturer all the way down to commissioning.