

Assembly instructions

Axial fans

for livestock house ventilation




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Compliance with the following instructions is mandatory to ensure the functionality and safety of the product. If the following instructions given especially but not limited for general safety, transport, storage, mounting, operating conditions, start-up, maintenance, repair, cleaning and disposal / recycling are not observed, the product may not operate safely and may cause a hazard to the life and limb of users and third parties.

Deviations from the following requirements may therefore lead both to the loss of the statutory material defect liability rights and to the liability of the buyer for the product that has become unsafe due to the deviation from the specifications.

Operational area

- ZIEHL-ABEGG axial fans of series FB, FC, FE, FF, FG and FN (type designation see rating plate) with integrated asynchronous external rotor motor for stable ventilation are no ready-to-use products, but designed as components for stable ventilation plants.
-  The fans may not be operated until they are installed in line with their intended use. The supplied and certified guard grille of ZIEHL-ABEGG SE fans is designed in accordance with DIN EN ISO 13857 Table 4 (from the age of 14 up). In the event of deviations, further structural protective measures must be taken for safe operation.



Safety instructions

- The fans are intended for the transportation of air of mixtures that are similar to air. Usage in potentially explosive areas for the transportation of gas, mist, vapours or their mixtures is not permissible. The transportation of solid materials or similar materials in a transport media is also not permissible.
- Mounting, electrical connection and commissioning must only be carried out by trained personnel (definition in DIN EN 50 110 or IEC 364).
- The fan is only to be operated within the ranges specified on the type plate! Use the fan only in the authorised fashion and only for the tasks and flow media specified in the order!
- The temperature monitors (TB) or PTC built into the winding serve as the motor protection and must be connected!
- In models using PTC's, comply with the permissible test voltage max. 2.5V!

安装说明

轴流风机

用于隔间通风




内容摘要

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遵守下列规范也有助于确保产品的安全。尤其是在一般安全、运输、储存、安装、运行条件、调试、维修、维护、清洁和处理/回收等方面，若未注意到所注明的提示，则可能导致产品无法安全运行，并可能会危及用户和第三方的生命安全。

因此，背离以下规范可能导致货物缺欠法定责任权利的丧失，以及由于背离规范而造成不安全产品的买方赔偿责任。

应用

- 用于隔间通风的带有内置外转子异步电动机的 ZIEHL-ABEGG 轴流风机 FB、FC、FE、FF、FG 和 FN 系列（型号名称详见铭牌）不是最终产品，而是作为隔间通风设备的组件设计的。
-  只有在风机按照其相应规定安装后方可对风机进行操作。附带的已获批准的 ZIEHL-ABEGG SE 风机接触防护装置依照 DIN EN ISO 13857 表 4（14 年以上）设计。当存在偏差时，必须采取进一步的结构防护以确保安全运行。



安全提示

- 风机只能用于输送空气或类似空气的混和气体，不能用于危险区域或易燃、易爆气体，雾气及其混合物的通风，也不能用于有固体成分的介质的流通。
- 安装、接线、调试必须由专业人员完成。（如 DIN EN 50110 或 IEC 364 所述）
- 马达只能在铭牌上指定的范围内运转，只能用于定单中指定的介质流通、功能及授权的方式运行。
- 在线圈中安装温度限制器（TB）和电机热敏电阻保护装置并且必须将两者连接在一起！
- 热电偶的最大测试电压为 2.5V！
- 不带过热保护器的马达必须使用马达防护开关！
- 带有本公司控制器的风机遵循 EMC 标准。风机与其他部件整合后也应遵循 EMC 标准 2014/30/EU。
- 注意与维护和服务相关的说明。
- 装配说明书是产品的组成部分，放到触手可及的地方妥善保存。
- 请遵守各种风机的安装和 safety 注意事项。不遵守或错误使用可能造成身体伤害，以及风机和设备的损坏。
- 禁止松开单个的风机叶片或叶轮。

- For motors without temperature monitors a motor protection switch obligatory must be used!
- The EMC guideline is to be observed in connection with our control units. If the fans are completed with components of other manufacturers, the manufacturer or operator of the entire plant is responsible for keeping to the EMC guideline 2014/30/EU .
- Pay attention to the notes which concerning maintenance and service.
- These assembly instructions are part of the product and, as such, are to be kept accessible at all times.
- Observe the installation and safety information for the various fan types. Non-observation or misuse can lead to physical injury or damage to the fan or installation.
- Releasing the individual fan blades or the impeller is forbidden.
- Do not remove the balancing weight!
- Prior to installing the fan, it is to be checked whether the safety zone as per DIN EN ISO 13857 is met. If the installation height (danger zone) above the reference level is greater than or equal to 2700 mm and is not reduced by auxiliary means such as chairs, ladders, work platforms or bases on vehicles, a protection grating against accidental contact is not necessary at the fan.
- If people are located in the fan danger area, then the manufacturer or operator of the complete system shall ensure that hazards are prevented by appropriate protective constructions which meet the requirements to EN ISO 13857.
- **Danger due to electric current**
 - The rotor is not protected against indirect contact neither by supplementary or reinforced insulation nor by connection to safety-earth in accordance with EN 60204-1, therefore the motor/fan must be installed so that it is not touchable.

- 禁止移除平衡块。
- 在安装风机之前应检查安全距离是否符合 *DIN EN ISO 13857*。如果安装高度（危险区域）高于参照面 2700 mm 或以上，且不会有类似凳子、梯子、工作台或支承面的辅助装置而减少安全距离，则无需在风机上安装防护格栅。
- 如果风机危险区域内有人员，则整体设备或操作方的生产商必须确保通过符合 *EN ISO 13857* 的防护设计防止危险。
- **由于电流造成的危险**
 - 转子未按 *DIN EN 60204-1* 保护绝缘或保护接地，故须确保安装的电机/风机不被接触。

Abb./fig. 1

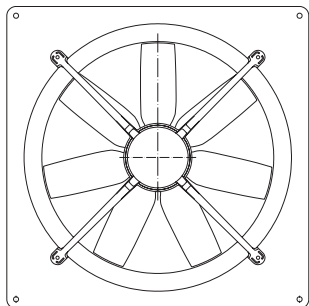


Abb./fig. 2

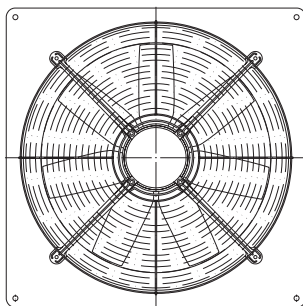


Abb./fig. 3

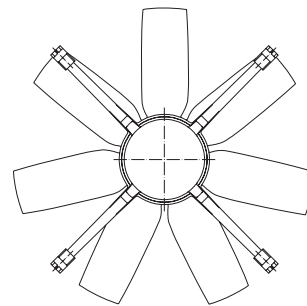


Fig. 1 Design Q without guard grille on the suction side
Fig. 2 Design Q with guard grille on the suction side
Fig. 3 Design T for installation in exhaust chimneys

图1 不带吸入侧防护格栅的结构形式 Q
图2 带吸入侧防护格栅的结构形式 Q
图3 用于排气烟囱内的安装的结构形式 T

Note on the ErP directive

ZIEHL-ABEGG SE wishes to point out that, based on the directive (EU) no. 327/2011 of the Commission of 30th of March 2011 for enforcing directive 2009/125/EC (hereinafter referred to as ErP directive), the operational area of certain fans within the EU is bound by certain prerequisites.

The fan may only be used within the EU when it meets the requirements of the ErP directive.

If the said fan does not have a CE mark (cf. especially the rating plate), use of this product within the EU is not admissible.

All ErP-relevant information comprises measurements which are determined using a standardised measurement set-up. More details can be obtained from the manufacturer.

Further information about the ErP directive (Energy related Products-Directive) can be found on www.ziehl-abegg.de search key: "ErP".

关于遵守ErP指令的说明

施乐百公司特此声明，依据2011年3月30日欧盟委员会关于实施2009/125/EC指令（以下称为ErP指令）第327/2011号条例，公司有义务保证使其在欧盟内销售的风扇符合相关的规范。

只有满足针对风扇的ErP条例所列要求，才能在欧盟内使用。如果风扇并未贴有CE标记（参见型号铭牌），则该产品不得在欧盟内使用。

所有与耗能相关产品指令（ErP）相关的数据，均指在标准化测量装置上进行测量所获得的数据。有关详细信息请向制造商咨询。

关于ErP指令（耗能产品指令）的详细信息，则请登录www.ziehl-abegg.de 检索词：“ErP”。



Transport, storage

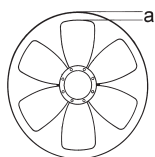
- **Wear safety shoes and gloves for handling!**
- Observe the weight data on the type code
- Do not transport the fan by the connecting cable!
- Do not lift the fan by any of its blades!
- Avoid impacts and collisions, especially on fans set-up on devices.
- Watch out for possible damage to the packaging or fan.
- Store the fan in the original packaging in a dry area protected from the weather or protect it from dirt and weather until final installation.
- Avoid exposure to extreme heat and cold.
- Avoid excessive storage periods (we recommend a one year max.) and inspect the motor bearings for proper operation prior to installation.



Mounting

Do not loosen the impeller, fan or balancing weight. Do not allow the installation and the electrical connection to be made by qualified personnel.

- The system manufacturer or the machine builder is responsible that the inherent installation and security information are harmonized with the valid standard and guidelines (DIN EN ISO 12100 / 13857).
- **Wall mounting fans (Fig. 1 and Fig. 2),**
 - Wall plate design **Q** must be fixed flat on a level surface, fig.1
 - Ensure that the clearance (gap) "a" see fig. between the fan impeller and the stationary housing section is constant. Distortion due to uneven surface may lead to fan failure.



- Protective measures must be taken against falling parts when mounting with a hanging rotor.
- Provide screwed connections with suitable screw locking.
- Fans with plastic wall plate: Use U-plates DIN 125 to secure. Permissible starting torque: **M8=10 Nm, M10=21 Nm**
- In the case of a vertical motor axis, the respective lower condensation drain hole (if available) must be open (does not apply to protection class IP55 fans).
- Electrical connection as per connection diagram in the terminal box. Connect temperature controller e.g. to the motor full protection device type STE_/STD_ of ZIEHL-ABEGG.
- Connect fan only to electrical circuits that can be disconnected with an all-pole isolating switch.
- Lead-out temperature monitors must be integrated in the control circuit in such a way that, if a fault occurs, **the motor cannot switch on again automatically** after it has cooled down. The protection of several motors using one protection device is possible by connecting the temperature monitors of the individual motors in series. It must be remembered that if a temperature fault occurs at one motor, **all** motors will then be switched off. In practice, motors are therefore assembled in groups so that **emergency operation** with reduced performance is still possible if a motor fails.
- Without thermal protection: Use a motor protection switch!
- When in fan motors for 1~ 230V +/-10% the mains voltage is permanently over 240 V, in extreme cases the temperature monitor can trigger. In such cases a capacitor-type with the next smaller capacity should be used instead of the stated capacity."



储运

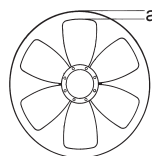
- **在搬运时请穿戴安全鞋和安全手套！**
- 请注意铭牌上的重量说明。
- 禁止利用连接的电缆搬运风机。
- 不能在叶片上提升风机。
- 避免击打和碰撞，特别风机安装到设备后。
- 注意避免任何破坏包装或风机的行为。
- 将原包装的风机存储在干燥、耐候的环境中，或在最终安装前注意防尘、防晒。
- 避免过热或过冷环境。
- 避免过期存放（建议最多一年），安装前检验风机的轴承运转状况。



安装

不要松开叶轮、风扇或平衡重量。不允许由合格人员进行安装和电气连接。

- 系统或设备制造商负责设备相关的安装和安全注意事项与现有标准相一致(DIN EN ISO 12100 / DIN EN 13857)。
- **壁挂式安装风机 (图 1 和 图 2),**
 - 壁孔结构形式 **Q** 必须平放在水平表面上, 图 1
 - 为确保扇叶与壁架板之间的间隙如图示 "a" 均匀而稳定。支撑表面不平引起的变形会导致叶轮磨损, 进而造成风机失灵。



- 在用悬挂的转子安装时, 必须采取防护措施防止部件坠落。
- 江螺栓连接位置配上合适的螺栓固定件。
- 带有塑料壁孔板的风机: 使用符合 DIN125 标准的垫片进行固定。允许的拧紧扭矩: **M8 = 10 Nm, M10 = 21 Nm**
- 如果是垂直轴电机, 必须打开相应下面的冷凝水孔 (如果有) (不适用于防护等级 IP 55 的风机)。
- 根据接线箱中的电路图进行电气连接。连接温度监控器, 例如: 连接至 ZIEHL-ABEGG 的型号为 STE_/STD_ 的电机完全保护设备。
- 设备只能连接到通过全极分离开关可切断的电路。
- 外接过热保护器必须合并在控制器回路中, 以便马达 **出现故障时在冷却后不会自动启动**。通过把多个马达串联起来, 可以使用一个防护装置同时保护多个马达。但务必注意: 如果一个马达出现温度故障, **所有的** 马达都会同时断电。在实际运行中, 可将多台马达分成多组, 当一台马达发生故障时, 其他组马达可在 **紧急模式** 下以低负荷运转。
- 无热保护装置: 使用马达保护开关!
- 如果单相 230V +/-10% 的风机马达长期运转在超过 240 V 的市电电压下, 过热保护器在极端情况下会响应。请使用小一号的电容以替代标准电容。

- Do not use metal compression-gland fittings with plastic terminal boxes. **Danger of an electric shock if connection is not made correctly!**
- Use a dummy plug seal for the compression-gland fitting as well.
- For operation under extreme conditions (damp operating environment, open-air installation) use pre-installed sealing elements.
- Only use lines which can guarantee a permanent seal around the cable glands (pressure-resistant, dimensionally-stable, round-centred jacket; e.g. by means of gusset filling)!

- 如果是塑料接线箱，不要使用金属电缆密封接头 - **如果连接错误，可能发生触电！**
- 使用绝缘封塞密封接线盒。
- 在特别条件下运行时（潮湿环境），使用预装的密封元件。
- 必须确保所使用的电缆在电缆接头中具有长久的密封性（压力下形状稳定、中心为圆形的护套；例如通过电缆填料来实现）！



Installation in exhaust chimneys

- Fan design **T** (Fig. 3)
 - Mark and bore position of the holding angles (2) as per figure 5 in the chimney (3) by means of a stencil 4x90°.
 - **From size F_040 up to F_063 (motor 106)** (inclusive) the holding angles (2) are made of plastic. By foamed chimneys underlay the holding angles inside and the bolts from the outside if need be with corrosion-resistant material and secure the bolt against loosening.
 - Insert fan (1) into the chimney (3) and engage upwards down into the holding angle (2) after overcoming the initial stress of the spring.
 - Lead mains supply line (4) through the chimney wall to the terminal box of the motor and connect as per the connection diagram inside. Attach mains supply line to the bracket of the fan by means of the cable clips.
 - **From size F_063 (motor 137) up to F_125 on**, fig. 6 the support angles (4) and the support clamp (5) are made of stainless steel. Fasten the screw (6) only as far as the support angles and the support clamps are not into the chimney wall (3). Self-locking nuts (7) are used to secure the screws. The nuts are part of the scope of delivery.
 - The enclosed rubber sheathed cables (8) have to be fitted on the ends of the brackets of the fan (1). The installation of the fan (1) into the chimney (3) is the same as for size FC063 as per fig. 5
 - Secure additional the support device as per fig. 6 by means of the bolt (9).
 - The four support clamps (5) are used as support eyelets for additional fixings (e.g. by standing ropes) in order to relieve the chimney of the weight of greater fans.



排气烟囱内的安装

- 风机结构形式 **T** (图 3)
 - 将固定弯角 (2) 根据图 5 通过模板在烟囱 (3) 中划线并钻孔 4x90° mm。
 - **从结构尺寸 F_040 直至包括 F_063 (电机 106)** 的固定弯角 (2) 是由塑料制成的。如果是发泡烟囱，必要时应该用由抗腐蚀材料制成的足够大的衬垫从固定弯角内部或螺栓外部垫在下面，并把螺栓接头固定以防止松动。
 - 将风机 (1) 根据图 5 导入烟囱 (3) 中并在克服弹簧预张力后从上面卡入到固定弯角 (2) 中。
 - 将电源引入线穿过烟囱围壁导入电机接线箱并根据内部的电路图进行连接。用电缆扎带将电源引入线固定在风机支撑臂上。
 - **从结构尺寸 F_063 (电机 137) 起直至包括 F_125**, 图 6 的固定弯角 (4) 和固定卡箍 (5) 是由不锈钢制成的。将螺栓 (6) 拧紧，直至固定弯角和固定卡箍不会埋入烟囱壁 (3) 中。为了固定螺栓，必须使用自紧型螺母 (7)，其包括在供货范围内。
 - 将随附的橡胶套管 (8) 推至风机支撑臂 (1) 的末端。根据图 5 将风机 (1) 安装在烟囱 (3) 中，与组件 FC063 相同
 - 此外，还须根据图 6 通过螺栓接头 (9) 固定支座。
 - 四个支撑卡箍 (5) 用作支撑环并且在必要时可以用作辅助固定装置 (例如通过支撑绳索)，以便减轻较大风机重量对烟囱的负担。

Abb./fig. 5

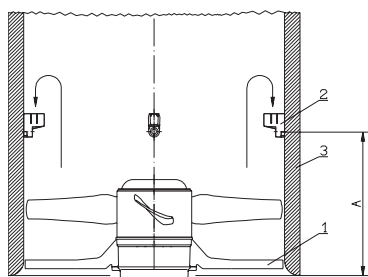
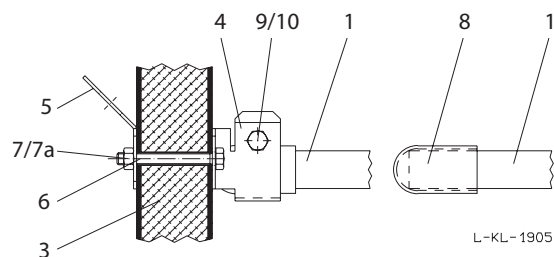


Abb./fig. 6



Operating conditions

- Do not operate Fans in an explosive atmosphere.
- Duty type of motor/fan
 - Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.
- Permissible minimal and maximal ambient temperature for operation
 - Please refer to the technical documentation of the product for the minimum and maximum ambient temperature valid for the respective fan. Operation below -25 °C as well as partial load operation for refrigeration applications is only possible with



操作条件

- 风机不能运行于易爆环境。
- 电机/风机的工作制类型
 - 按照 DIN EN 60034-1:2011-02 连续运行及偶尔启动 (S1)。允许在 -40 °C 至 -25 °C 下偶尔启动。仅在根据要求配备有适用低温环境的特殊轴承时，才可在 -25 °C 以下长期运行。
- 运行所允许的最小和最大环境温度
 - 有关各种风机适用的最低和最高环境温度，请参阅产品的技术文档。仅在根据要求配备有适用低温环境的特殊轴承时，才可在 -25 °C 以下运行及部分负荷运行。如果在风机中安装有特殊的耐低温轴承，请遵守产品技术文档中允许的最高温度。

special bearings for refrigeration applications on request. If special bearings for refrigeration applications are installed in the fan, please observe the permissible maximum temperatures in the technical documentation of the product.

- Any use below $-10\text{ }^{\circ}\text{C}$ is dependent on not being subjected to unusual, sudden or mechanical loads or stresses on the material (see minimal permissible ambient temperature).
- ZIEHL-ABEGG Axial fans are suitable for operation with frequency inverters when the following points are complied with:
 - Between the inverter and the motor, sinusoidal filters should be incorporated which are **effective for all phases** (sinusoidal output voltage, phase against phase, phase against protective conductor) as offered by manufacturers. Please ask for our technical information L-TI-0510.
 - **du/dt filters (also called motor or suppression filters) cannot be used in place of sinusoidal filters.**
 - When using sinusoidal filters, screened motor leads, metal terminal boxes and a second earth connection to the motor can, if necessary, be omitted. Check-back by the supplier of the sinusoidal filter.
- If the operational leakage current exceeds 3.5 mA, earthing in compliance with DIN EN 50 178, art. 5.2.11.1 must be provided. For this purpose there is a connection for a second protective earth on the stator flange. Tightening torque 2.7 Nm.
- When speed controlling through electronic voltage reduction (phase control), depending on the installation situation, increased noise formation caused by resonances can occur. In such cases we recommend the use of the Fcontrol frequency changer with integrated sine filter.
- **We cannot guarantee that competitive makers of voltage control devices and frequency converters will function properly and not damage the motor when used for rotational-speed control of our Fans**
- A-rated sound power levels of over 80 dB(A) are possible, see product catalogue.
- IP55 Fans with a seal which is rubbing may cause additional noise.
- The nominal current I_{nominal} on the type plate relates to the stalling point of the characteristic curve of the fan. I_{max} is the max. current consumption with transformatic control. If electronic control devices are used, a current consumption which is up to 15 % higher is to be expected.

ATTENTION! When using in waste air purification systems, ensure that the fan does not come into contact with any chemicals used, as these usually have a highly corrosive effect. In such cases, the product service life can be significantly reduced. ZIEHL-ABEGG rejects any warranty claims or other claims based on this.

- 应用环境温度低于 $-10\text{ }^{\circ}\text{C}$ 时, 须预防材料受到异常的冲击或机械应力及材料应变 (见所允许的最低环境温度)。
 - 在满足以下条件的情况下, 施乐百 轴流风机适于变频运转:
 - 在变频器和马达之间必须如某些变频器制造商的说明安装 **多线正弦滤波器** (正弦输出电压! 相间, 相与零线间)。请索取我们的技术信息 L-TI-0510。
 - **du/dt滤波器(也称马达/阻尼滤波器)不能用来替代正弦滤波器。**
 - 使用正弦滤波器时, 马达可以不使用屏蔽电缆、金属接线盒, 也无须通过另外一根地线连接马达, 需与正弦滤波器供应商协调。
 - 如果超过了 3.5 mA 的运行漏电电流, 则须满足 DIN EN 50 178, 第 5.2.11.1 款规定的接地条件。为此, 在定子法兰上有用于第二保护导体的连接。压紧扭矩 2.7 Nm。
 - 对于以电子方式降低电压 (相位角控制) 的转速控制装置, 可能会因安装位置不同产生共振并且进而导致噪音增大。因此, 我们推荐使用集成有正弦滤波器的 Fcontrol 变频器。
 - **如果使用其它制造商生产的电压控制器或变频器进行风机的转速控制, 我们将不负责对马达的正常功能与损坏进行质量担保。**
 - A计权声功率级可大至 80dB(A), 详见产品目录。
 - 带有摩擦密封装置的 IP55- 风机 可能会产生附加噪音。
 - 铭牌上的额定电流 $I_{\text{额定}}$ 是指风机特性曲线的分离点。 I_{max} 是在变压控制时的最大电流消耗。在使用电子控制装置时, 须考虑到最多高出 15% 的电流消耗。
- 注意! 在废气净化设备中使用时, 尤其要注意风机不要与可能使用的化学制品接触, 因为这些化学制品通常具有强烈的腐蚀作用。在这些情况下, 产品使用寿命可能会显著缩短。ZIEHL-ABEGG 拒绝任何担保要求以及其他基于担保的要求



Start-up

- Before first-time start-up, check the following:
 - Installation and electrical connection have been properly completed?
 - Electrical connection carried out in accordance with wiring diagram (wiring diagram in terminal box, for cable version on cable or wall ring)
 - Turning direction corresponds to turning direction arrow on fan blade or fan housing. The airflow direction or turning direction determines the functionality of the fan, not the motor rotation field.
 - Is the protective earth connected?
 - Connection data complies with the specifications on the type plate.
 - Motor operating capacitor data (1~ motors) complies with the specifications on the type plate.
 - Safety equipment is in place (→ Contact protection).
 - Temperature monitor/motor protection switch are professionally connected and operating properly.
 - All leftover installation materials and other foreign materials have been removed from the fan cavity.
 - Cable gland is sealed (see "Installation").
 - Do the installation position and the arrangement of the condensation drain holes in the motor (if available) correspond to each other (does not apply to protection class IP55 fans)?
- Start-up may only begin when all safety instructions have been verified and any hazards have been ruled out.
- Check sense of rotation / air feed direction. **Sense of rotation series FB, FC, FE, FF, FG and FN „left“ with view to the rotor.**
- Check for low vibration operation. Strong vibrations due to erratic operation (unbalanced), e.g. caused by transportation damage or improper use, can lead to failure.



Maintenance, repair

- Ball-bearings service life
 - The according to standard calculation methods determined bearing service life expectation of the motor-integrated ball bearings is mainly determined by the grease service life F10h and amounts for standard application to approx. 30.000 - 40.000 operating hours. The fan or motor is maintenance-free due to the use of ball bearings with "lifetime lubrication". Once the grease operating life F10h has been reached, it may be necessary to replace the bearing. The bearing service life expectation may change compared to the specified value, if operating conditions such as increased vibrations or shocks, increased or too low temperatures, humidity, dirt in the ball bearing or unfavourable control modes are present. A service life calculation for special applications can be provided on request.
- Take note of abnormal operating noise!
- Please consult our service department with regard to changing the bearing as for all other damage (e.g. to the coil).
- On 1~ motors, condenser rating can decrease with time. Life expectancy approx. 30,000 hrs. per DIN EN 60252.
- **Outdoor fans: If a fan is stationary for long periods in a humid atmosphere, it should be switched ON for minimum of two hours every month to remove any moisture that may have condensed within the motor.**
- Fans with IP55 degree of protection or higher: open the existing sealed condensation bores every six months.
- Regular inspection and possibly cleaning is necessary to prevent imbalance and blockage of the condensation bores due to ingress of dirt.
- Watch out for vibration free motion!
- Maintenance interval in accordance with the degree of contamination of the impeller!
- Allow maintenance work to be carried out by trained specialists only.
- **For all repair and maintenance work:**
 - Observe the safety and labour regulations (DIN EN 50 110, IEC 364).



试运行

- 初次试运行前请检查：
 - 机械和电气安装是否按照专业方式正确完成？
 - 已根据电路图进行电气连接（接线箱中的电路图，在电缆布线时连接至电缆或壁环）
 - 转向对应于风机扇叶或风机壳罩上的转向箭头。对于风机的功能性起决定性作用的是气流方向或转向，而不是电机旋转磁场。
 - 接地线被连接。
 - 接线数据与铭牌上的说明是否相符
 - 马达运行电容参数（单相电机）与铭牌上的数据是否一致。
 - 安全装置是否已安装到位（→ 触摸防护装置）。
 - 过热保护器/马达防护开关安装正确，运行良好。
 - 清除风机段中的安装剩余材料和其他异物。
 - 电缆导入处是否密封良好（参阅“安装”）。
 - 是否已打开/关闭安装位置相应的冷凝水排放孔(如果有)(不针对防护等级 IP55 的风机)?
- 检查完所有的安全注意事项，并在排除所有危险后方可进行调试。
- 检查转动方向/空气输送方向：**看到转子时，FB, FC, FE, FF, FG 和 FN 系列的转动方向“向左”。**
- 检查风机平稳运转。强烈的振动是由不平衡运行造成的（不平衡），例如运输途中损坏或不当处理造成的。



维修, 维护

- 滚珠轴承使用寿命
 - 根据标准计算方法计算出的电机集成滚珠轴承的轴承使用寿命预测主要取决于润滑脂使用有效期 F10h，在标准应用条件下约为 30,000 - 40,000 个小时。风机或电机因使用带有“长效润滑”的滚珠轴承而免维护。润滑脂使用有效期 F10h 到期后可能需要更换轴承。当给出诸如振动增大、晃动增大、温度升高或过低、潮湿、滚珠轴承中有脏污或不利的调节形式等运行条件时，轴承使用寿命预测可能会相比于所述的数值发生变化。可以根据要求针对特殊应用进行使用寿命计算。
- 留意异常运行噪声！
- 请联系我们的服务部门，了解证券交易所以及所有其他损失（如绕组）。
- 对于单相马达而言，电容器的容量可能降低，根据 DIN EN 60252 标准的规定，使用寿命估计为 30,000 小时。
- **室外放置：如果风机在潮湿的环境中长期不工作，应保证每月至少运行 2 小时以便使马达内的水挥发掉。**
- 防护等级 IP55 或更高的风机：每半年打开现有的密封的冷凝水孔。
- 定期检查，如有必要，需要清洁沉积物，以避免由于脏污导致不平衡和冷凝水孔阻塞。
- 注意运转振动是否正常！
- 根据叶轮的污染程度不同选择维护周期！
- 维修作业只能由经过专业培训的专业人员进行。
- **对于所有维修和维护作业而言：**
 - 遵守安全及工作规范（DIN EN 50 110, IEC 364）。
 - 风机叶轮必须静止！
 - 在断开电路后的防重启保护。
 - 确定无电操作。
 - 切勿在风机转动的情况下进行维护作业！
- **请保持风机风路畅通 — 避免由于飞出物体造成的危险！**
- 在输送对于本产品不适合的强腐蚀性的介质时，存在着由于大规模的腐蚀造成叶轮断裂的危险这样受腐蚀的叶轮必须立即更换。

- The fan impeller stopped!
- Open the electrical circuit and secure against being switched back on.
- Verify the absence of voltage.
- No maintenance work at running fan!
- **Keep the airways of the fan free- danger because of objects dropping out!**
- If highly aggressive media for which the product is not suited are conveyed, the severe corrosion may result in the impeller breaking. Any impellers corroded in this way must be replaced immediately.

Cleaning



Danger due to electric current

Voltage supply for motor must be interrupted and secured against restoration!
Clean the fans` s flow area.

Attention!

- Do not use any aggressive, paint solvent cleaning agents when cleaning.
- Make sure that no water gets inside the motor and the electronics (e.g. by direct contact with seals or motor openings), observe protection class (IP).
- The condensation bores (if available) corresponding to the installation position must be checked for free passage.
- In case of improper cleaning work, no warranty is assumed regarding corrosion formation / paint adhesion for unpainted / painted fans.
- To avoid accumulation of moisture in the motor, the fan must be operated for at least 1 hour at 80% to 100 % of the maximum speed before the cleaning process!
- After the cleaning process, the fan must be operated for at least 2 hours at 80 to 100 % of the maximum speed for drying purposes!



Disposal / recycling

Disposal must be carried out professionally and environmentally friendly in accordance with the legal stipulations.

Manufacturer

Our products are manufactured in compliance with valid international standards and regulations.

If you have any questions about how to use our products or if you are planning special applications, please contact:

ZIEHL-ABEGG SE
Heinz-Ziehl-Straße
D-74653 Künzelsau
Phone 07940/16-0
Fax 07940/16-300
info@ziehl-abegg.de

Service address

Please refer to the homepage at www.ziehl-abegg.com for a list of our subsidiaries worldwide.

清洁



由于电流造成的危险

断开电机电源并防止重新启动！
清洁风机的风流通过区域。

注意！

- 禁止使用侵蚀性、腐蚀油漆的清洁剂。
- 注意不要让水进入电机内部和电子系统（如经由与垫圈或电机开口直接接触），注意防护等级 (IP)。
- 对于安装位置合适的冷凝水孔（如果有）必须检查是否可以自由通过。
- 如进行不当的清洁工作，则涂装 / 未涂装的风机不再具备腐蚀/漆附着性方面的质保。
- 为了避免湿气聚集在发动机，清洁前必须采用 80% 至 100 % 的最高转速运行风机至少 1 小时！
- 为了进行干燥，清洁后必须采用 80% 至 100 % 的最高转速运行风机至少 2 小时！



废物处理/回收

废物处理必须专业、环保，并按照法规执行。

製造商是:

我们的产品生产符合相关的国际标准和规范。
如果您对任何与产品使用相关的问题或计划特殊的应用，请联系：

ZIEHL-ABEGG SE
Heinz-Ziehl-Strasse
D-74653 Kuenzelsau
Tel. 07940/16-0
Fax 07940/16-300
info@ziehl-abegg.de

售后服务地址

有关各国家和地区售后服务网点地址的信息请参见公司主页
www.ziehl-abegg.com

EC Declaration of Incorporation

- Translation -
(english)

ZA87-GB 1836 Index 008

as defined by the EC Machinery Directive 2006/42/EC, Annex II B

The design of the incomplete machine:

- Axial fan FA.., FB.., FC.., FE.., FF.., FG.., FS.., FT.., FH.., FL.., FN.., FV.., DN.., VR.., VN.., ZC.., ZF.., ZG.., ZN..
- Centrifugal fan RA.., RD.., RE.., RF.., RG.., RH.., RK.., RM.., RR.., RZ.., GR.., ER.., WR..
- Cross-flow fan QK.., QR.., QT.., QD.., QG..

Motor type:

- Induction internal or external rotor motor (also with integrated frequency inverter)
- Electronically commutated internal or external rotor motor (also with integrated EC controller)

complies with the requirements in Appendix I, Articles 1.1.2, 1.1.5, 1.4.1, 1.5.1 in EG Machinery Directive 2006/42/EG.

The manufacturer is the

ZIEHL-ABEGG SE
Heinz-Ziehl-Strasse
D-74653 Künzelsau

The following harmonised standards have been used:

EN 60204-1:2006+A1:2009+AC:2010	Safety of machinery; electrical equipment of machines; Part 1: General requirements
EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN ISO 13857:2008	Safety of machinery; safety distances to prevent danger zones being reached by the upper limbs
Note:	The maintenance of the EN ISO 13857:2008 relates only to the installed accidental contact protection, provided that it is part of the scope of delivery.

The specific technical documentation in accordance with Appendix VII B has been written and is available in its entirety.

The person authorised for compiling the specific technical documentation is: Dr. W. Angelis, address see above.

The specific documentation will be transmitted to the official authorities on justified request. The transmission can be electronic, on data carriers or on paper. All industrial property rights remain with the above-mentioned manufacturer.

It is prohibited to commission this incomplete machine until it has been secured that the machine into which it was incorporated complies with the stipulations of the EC Machinery Directive.

Künzelsau, 03.09.2018
(location, date of issue)

ZIEHL-ABEGG SE
Dr. W. Angelis
Technical Director Air Movement Division
(name, function)

ZIEHL-ABEGG SE
Dr. D. Kappel
Deputy Head of Electrical Systems
(name, function)

(Signature)

(Signature)