Assembly instructions

Cross flow fans

Contents

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 cross flow fans (type designation see rating plate) are not ready-to-use products, but designed as components for aerodynamic devices, machines and installations.
- The fans may only be operated when they are installed as intended, and when safety is ensured by safety equipment according to DIN EN ISO 13857 (DIN EN ISO 12100) or by other protection measures.
- ZIEHL-ABEGG cross flow fans are suited to a wide range of applications due to their slim construction design. They stand out against other fans particularly by virtue of their broad laminar air band with favourable noise response.
- Speed control through voltage reduction is possible, depending upon the application.
- All fans are dynamically balanced on two planes in accordance with ISO 21940-11.

Safety instructions

- The cross flow fans are only intended for the transfer of air or air-like mixtures. They cannot be used in hazardous areas for the transfer of gas, mist vapours or mixtures. Nor can they be used for the transfer of solid components in the transfer medium.
- Mounting, electrical connection and commissioning may only be carried out by trained specialized personnel who observe the relevant regulations !
- 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!
- Designer, manufacturers or operators are responsible for proper and safe installation as well as for safe operation!
- Safety features, e.g. guard grilles, are not to be dismantled, circumvented or made inoperative!

寧褡鬱明

横流风机

九赤 鮭

逖嬿黩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的不安全产品的买方赔偿责任。

廳用

- *ZIEHL-ABEGG* 横流风机（型号见铭牌）不是最终产品，而是专为空调等通风排风设备设计的部件。
- 只有在风机按照其相应规定安装、并且在使用符合*DIN EN 13857 (DIN EN ISO 12100*)标准规定的防护装置或其它搭建防护措施确保运行安全后方可对风机进行操作。
- *ZIEHL-ABEGG* 横流风机因其平面结构而应用广泛。相对其它风机而言，该产品因其宽大的百叶形风口而拥有优秀的低噪音性能。
- 根据具体应用可以通过降低电压调控转速。
- 所有风机均根据 *ISO 21940-11*部分的要求进行了双面质量平衡。

賽全提示

- 横流风机仅可用于输送空气或类似于空气的混合物。在爆炸危险区域使用时，不得用于输送废气、烟雾、蒸汽及其混合物。同样不得输送固体材料或含有固体成分的输送介质。
- 装配，电连接和调试只能由经过培训专业人员完成，此外，这些人员还必须遵守 相关规范 !
- 请严格按照风机铭牌注明的范围操作马达 !
- 请按照指定用途使用风机并且只能将其用于在订货时规定的任务范围和输送介质*!*
- 规划商、生产商或操作方须负责确保正确和安全的安装和安全的运转 !
- 禁止拆卸、避开或关闭安全零部件，如防护格栅 !
- 如果在线圈内安装若干温度监控器用作马达防护，则温度监控器必须相连接*!*
- 如果温度监控器未安装在马达电路中 *(→* 电路图*)*，则需要亿个触发器。

- If thermal protector is integrated into winding as motor protection, the thermal protectors must be connected.
- If the temperature monitor is not integrated into the motor circuit (→ wiring diagram), a tripping device is required.
- For motors without a temperature monitor, a motor cut-out switch is to be used for P1 > 750 W (P2 ≥ 500 W)!
- Blocking or braking the fan by, say, pushing objects into it is forbidden. This leads to heated surfaces and damage to the impeller.
- It is not possible to exclude a residual risk due to incorrect use, malfunction or force majeure. The designer or constructor of the installation must take suitable safety measures in accordance with DIN EN 12100, e.g. protection devices, in order to prevent hazardous situations arising.
- **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.

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".

Transport, storage

Wear safety shoes and gloves for handling!
- Transport the fan(s) either in the original packaging or using the transport fixtures provided (mounting brackets and bored holes). Use suitable lifting equipment, insofar as required by the dimensions or weight.
- Do not transport the fan by the connecting cable!
- Avoid excessive vibration and shocks.
- 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

Mounting, electrical connection and commissioning are only to be performed by trained service personnel. Adhere to all machinery-related requirements and specifications supplied by the system manufacturer or machine builder.
Wear safety shoes and gloves for handling!
- The following applies for all cross flow fans:
  – Do not install distorted.
  – Housing or mounting bracket must be fixed flat on a level surface.
  – Protective measures must be taken against falling parts when mounting with a hanging rotor.
  – Do not apply force (levering, bending).
  – Standard horizontal installation.
  – Depending on installation circumstances and application, the open motor (IP10) will require protection against water spray and objects falling into it.

- 如果 *P1 > 750 W (P2 ≥ 500 W)*，则不带过热保护器的马达必须使用马达防护开关！
- 禁止向风扇插入异物，阻止其旋转。 这会导致叶轮表面发热或 损。
- 由于不正确使用，功能故障或不可预知力造成的风险是无法避免的。设备的规划人员或搭建人员必须根据*DIN EN 1 2100*采取合适的措施（例如安装防护装置）确保防止危险情况的发生。
- ***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。

关于遵守ErP指令的说明

敞齲瘟公司特此声明，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*327/201*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"*。

儇运

在搬运时请穿戴安全鞋和安全手套！
- 如果因尺寸或重量而必须，请将风机原包装保留或通过合适的举升工具使用规定的运输装置（固定弯角和钻孔）进行运输。
- 禁止利用连接的电缆搬运风机。
- 防止过度振动和碰撞。
- 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、防候。
- 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。

赛装

嬪衧風布线和调试只能由经过培训的专业人员进行。遵守和设备相关的条件以及系统生产商或设备装配师的规定。在搬运时请穿戴安全鞋和安全手 ！
- 以下要求适用于所有横流风机：
  – 安装时，不 张力。
  – 壳罩和固定弯角必须位于平整的平面上。
  – 在用悬挂的转子安装时，必须采取防护措施防止部件坠落。
  – 请勿使用暴力（撬、掰）。
  – 标准方式的水平安装。
  – 开放式的马达 *(IP10)* 要求根据安装位置和使用的不同采取措施防止喷溅水或物体落入。
  – 如果是隔音式的马达（通过橡胶元件消除固体声的结构）并且导电零部件固定在风机壳罩上，则须 另外将风机壳罩接地。

– If the motor installation is insulated (version with structure-borne noise decoupling using rubber elements), the fan housing must also be earthed where components under voltage are connected to it.
– The fan discharge must not be adversely affected with respect to flow engineering by installation of or attachments to the fan (e.g. shifting of housing edges, protruding seals).

Electrical connection

- Mounting, electrical connection and commissioning must only be carried out by trained personnel (definition in DIN EN 50 110 or IEC 364).
- Connect fan only to electrical circuits that can be disconnected with an all-pole isolating switch.
- 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)!
- Electrical connection corresponding to wiring diagram on housing.
- Connect the temperature monitor to the tripping device and/or motor cut-out switch.

Operating conditions

- Do not operate the fan 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 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 °C is dependent on not being subjected to unusual, sudden or mechanical loads or stresses on the material (see minimal permissible ambient temperature).
- A-rated sound power levels of over 80 dB(A) are possible, see product catalogue.
- Corrosion is possible at the cutting edges on sendzimir galvanised parts.
- The fans are suitable for operation with frequency inverters when the following points are observed:
  – 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 EN50178 must be provided.
- 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.

– 出风口不能因安装风机（例如移位的壳罩边缘、伸入的密封件）而变窄或进行流体动力学的更改。

疗气连接

- 安装、接线、调试必须由专业人员完成。*(*如*DINEN50110*或*IEC364*所述*)*
- 设备只能连接到通过全极分离开关可切断的电路。
- 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　；例如通过电缆填料来实现）！
- 根据壳罩上的电路图进行电连接。
- 将温度监控器连同触发器和/或马达保护开关一起连接。

攒作条件

- 不得在爆炸性环境运行风机
- 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* ℃ 至 *-25* ℃ 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* ℃ 以下长期运行。
- 运行所允许的最小和最大环境温度
  – 有关相应风扇的最小和最高环境温度，请参阅产品的技术文档
  、低于*-25*° *C*的操作以及制冷应用的部分负载操作，仅可应要求提供制冷应用的特殊轴承。如果风扇中安装了用于制冷应用的特殊轴承，请在产品技术文档中遵守允许的最高温度。
  – 应用环境温度低于 *-10* ℃ 时，须预防材料　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）。
- *A*计权声功率级可大至*80dB(A)*，详见产品目录。
- 对于经过森氏镀锌的零部件，其切边可能出现腐蚀。
- 当观察到以下点时，风扇适合使用变频器操作：
  – 在变频器和电机之间必须如一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！相位与相位之间、相位与地线之间）。此外，请向我们索取技术信息 *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。
- 若运行时的漏电电流大于*3.5 mA*，则必须依照 *EN 50178*，条标准的规定接地。
- 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*Fcontro*l变频器
- ***如果使用其它　造商生产的电压控　器或变频器进行的转速控　，我们将不负责对马达的正常功能与损坏进行质量担保。***

- **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**

Start-up

- Before first-time start-up, check the following:
  - Installation and electrical connection have been properly completed?
  - Safety equipment is in place (→ Contact protection).
  - All leftover installation materials and other foreign materials have been removed from the fan cavity.
  - Is the protective earth connected?
  - Temperature monitor/motor protection switch are professionally connected and operating properly.
  - Connection data complies with the specifications on the type plate.
- Start-up:
  - Switch fan on in accordance with switched state and local conditions.
  - Check: Smoothness of motor operation, **Direction of rotation/direction of conveyance when looking at the motor (see also Fig. 1, 2)**

Fig. 1

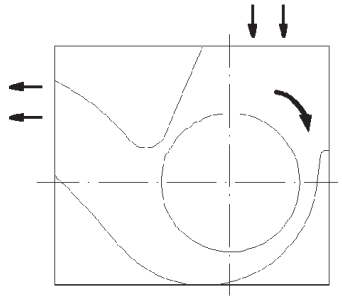


Figure	**Rotat. Direction**
1	right
2	left

Maintenance, repair

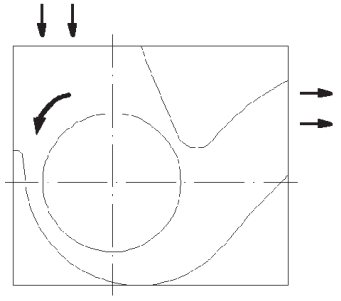
For all repair and maintenance work:

- Maintenance operation is only to be performed by trained service personnel.
- Observe the safety and labour regulations (DIN EN 50 110, IEC 364).
- No maintenance work at running fan!
- Open the electrical circuit and secure against being switched back on.
- Verify the absence of voltage.
- Fan cylinder has come to a standstill!
- **Wear safety shoes and gloves for handling!**
- Take note of abnormal operating noise!
- 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.**
- Allow maintenance work to be carried out by trained specialists only.
- After dismantling and reinstalling an impeller, the entire rotating unit must be rebalanced in accordance with DIN ISO 1940,-1.
- **Keep the airways of the fan free- danger because of objects dropping out!**
- **Do not bend fan cylinder or blades!**
- 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

谴运行

- 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？
  - 安全装置是否已安装到位（→ 触摸防护装置）。
  - 清除风机段中的安装剩余材料和其他异物。
  - 接地线被连接。
  - 过热保护器/马达防护开关安装正确，运行良好。
  - 接线数据与铭牌上的说明是否相符
- 试运行
  - 根据接电情况和当地的情况接通风机。
  - 检查：运转稳定性，***旋转方向/传送方向（见图1、2）***

Fig. 2



坝	***旋转方向***
1	向右
2	向左

冈修，维护

对于所有维修和维护作业而言：

- 只能由经过培训的专业人员才能进行相关作业。
- 遵守安全及工作规范（*DIN EN 50 110, IEC 364*）。
- 切勿在风机转动的情况下进行维护作业！
- 在断开电路后的防重启保护。
- 确定无电操作。
- 风机辊轮必须保持静止！
- ***在搬运时请穿戴安全鞋和安全手套！***
- 留意异常运行噪声！
- 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。***
- 维修作业只能由经过专业培训的专业人员进行。
- 在叶轮拆卸和重新安装后，必须根据*DIN ISO 1940, T1*标准的规定对旋转单元重新进行平衡校准。
- ***请保持风机风路畅通 — 避免由于飞出物体造成的危险！***
- ***不得弯折风机辊轮和风机叶片！***
- 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 *F10 h*，在标准应用条件下约为 *30,000 - 40,000* 个工时。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。

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.

- Please consult our service department with regard to changing the bearing as for all other damage (e.g. to the coil).

Cleaning

- Regular inspection, if necessary with cleaning, is necessary to prevent imbalance due to ingress of dirt.
  – Clean the fans`s flow area.
- Keep fan air way open; clean the fan cylinder with a brush when necessary.
- Watch out for vibration free motion.
- Maintenance interval in accordance with the degree of contamination of the impeller!
- Do not use any aggressive, paint solvent cleaning agents when cleaning.
- **Never use a high-pressure cleaner or water-spray for cleaning - particularly when the ventilator is running.**
- If water enters the motor:
  – Dry off the motor winding before using it again.
  – Replace motor ball bearings.
- **Wet cleaning under voltage may lead to an electric shock - danger to life!**

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.**

- 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）。

澉洁

- 定期检查，并在必要时进行清清洁，以免因污物造成不平衡。
  – 清洁风机的风流通过区域。
- 请保持风机的风路畅通并在必要时用刷子清洁风机辊轮。
- 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！
- 禁止使用侵蚀性、腐蚀油漆的清洁剂。
- ***切勿使用高压清洁器或喷射水进行清洁 — 切勿在风机转动的情况下清洁。***
- 如果水进入电机：
  – 在使用之前请对电机的线圈进行干燥处理。
  – 更换电机滚珠轴承。
- ***带电情况下进行湿式清洁时可能造成电击 — 生命危险！***

廾物处理/回

帧燻墐理必须专业、环保，并按照法规执行。

襜造商是:

憲亍瘥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

瞒儔厥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)

i.V. W. Angelis

(Signature)

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

i. V. Daniel Kappel

(Signature)

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