

Operating Instruction

Centrifugal fans without scroll

(Translation of the Original)

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BA-RLE-AC 1.5 – 08/2014



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Further languages on request!

Revisionsindex

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Revision Index

Revision	Date
BA-RLE 1.3	03/2012
BA-RLE-AC 1.4	01/2013
BA-RLE-AC 1.5	08/2014

1. Important information

Nicotra Gebhardt Fans are of state of the art design and comply with the requirements for health and safety of the EU Machinery Directive.

Nicotra Gebhardt Fans offer a high level of operational safety and a high standard of quality which is guaranteed through a certified Quality Assurance System (EN ISO 9001).

All fans leave the factory after being subjected to testing and are provided with a test seal.

All fans however can be dangerous,

- if they are not installed, operated and maintained by trained personnel
- if they are not used for approved applications.

This can endanger the life and limbs of personnel, provoke material damage to buildings and equipment and influence the use of the product.



Attention!

These Operating Instructions must be read and observed by all personnel engaged on works involving fans!

The Operating Instructions

- describe the approved applications for the fans and protect against misuse.
- contain safety notes which must be closely observed.
- warn of dangers which can exist even with correct applications.
- give important information on safety and the economic use of the fan while ensuring the full benefits of the product are available.
- are to be complemented with the trade and national Standards, Regulations and Directives.

Nicotra Gebhardt accepts no responsibility for damage or breakdowns which can be traced back to non-observance of the Operating Instructions.

The manufacturer's guarantee does not apply following unauthorised and unacceptable conversions and alterations to the fan.

There is no responsibility accepted for resultant damages!

2. Safety Notes



CAUTION

This danger symbol identifies all safety and danger information concerning danger to life and limbs of personnel.

This draws attention to all information at all points in the Operating Instructions which must be particularly well observed in order to ensure the correct procedures for the work as well as helping to prevent damage and the destruction of the fan.

3. Technical Description

3.1 Product description

RLE centrifugal fans, optimised for use without scroll, with direct drive.

The fans are suitable for the transport of dust-free air and other non-aggressive gases or vapours.

The centrifugal impeller with backward-curved blades is mounted directly onto the rotor of the motor.

RLE 20/30/50/90

RLA 20/30/50/90

Motor Impeller

RLE 21/31/51/91

RLA 21/31/51/91

Motor Impeller with
lose inlet cone

RLE 22/32/52/92

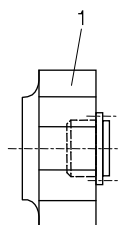
RLA 22/32/52/92

Motor Impeller with
mounting plate and
lose inlet cone

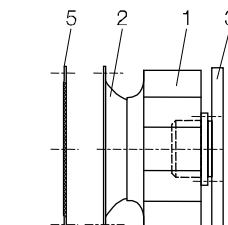
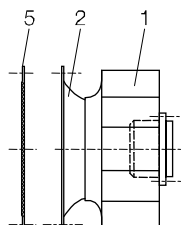
RLE 23/33/53/93

RLA 23/33/53/93

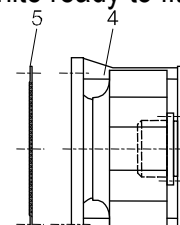
Motor Impeller with
mounting plate and
inlet cone, fitted and
adjusted at the
factory
(unite ready to fit)



1. Motor Impeller
2. Inlet cone
3. mounting plate



4. unite ready to fit
 5. Inlet guard
- Important accessories**



CAUTION

The fans are designed as parts of equipment or plant constructions. They are not ready for use as a stand alone product and in the standard version they do not have protection against body contact. The appropriate protective measures are to be taken according to DIN EN ISO 12100-1, -2 / DIN EN ISO 13857.

3.2 Technical Data

Technical data and the permissible limits are to be taken from the type plate, the technical datasheets or the appropriate technical catalogue and must be adhered to.

3.3 Authorised use

The fans are intended for the transport of dust-free air and other non-aggressive gases or vapours. The RLE fans are not approved for the use in explosive areas.

CAUTION

Avoid dynamic stress of the impeller, no frequent load changes!

Permissible transport media temperatures:

Model	Temperature
RLE / RLA	-20°C ... +40°C

**Any installation deviating from the above shall be considered unauthorised.
Nicotra Gebhardt will not be responsible for any injury to personnel and/or material damage resulting from any deviations from the above!**



Should any control equipment utilising electronic components be employed, the recommendations of the manufacturer are to be observed concerning the avoidance of electromagnetic radiation (EMC) (through suitable earthing, cable lengths, cable screening, etc.). In this case the manufacturer or user of the whole system is responsible to meet the requirements of the EMV standard 89/336/EWG.

3.4 Improper use

An improper installation would be e.g. the transporting of:

- media with unacceptable high or low temperatures
- aggressive media.
- dusty media.

The results are:

damage of motor and controller, bearings damage, corrosion damage, loss of balance, vibration, deformation, abrasion damage.

Unauthorised operation

- No operation above the indicated rpm (see type plate, data sheet)!
- No operation at rpm ranges with increased vibration (resonance)!
- No operation at rpm ranges out of permitted fan curve area (unstability of flow pattern)!
- No operation if fan becomes polluted!



Danger points:

There can be injury to personnel and material damage through impeller breakage, shaft breakage, fatigue failure, fire from spark creation.

4. Transport

4.1 Transport damage

Deliveries are to be immediately checked in the presence of the carrier as being intact and complete.

CAUTION

Fans must be carefully transported!

Improper transport as e.g. unyielding, tilted positioning can lead to:

- **the impeller becoming jammed**
- **the shaft becoming deformed**
- **the occurrence of bearing damage**

4.2 Transport safety

- The transport material is to be selected according to the weight and packaging of the fan (type plate, data sheet)
- Ensure that loading is done in accordance with the instructions
- Four-point lifting is to be provided when transporting by crane (2 slings)

Attachment points on the fans:

- carrying unit

Not attachment points:

- bearing supports
- spacers

4.3 Intermediate storage

For intermediate storage of the fans the following points must be observed:

- The fan is to be stored in its transport packaging or this can be added to in accordance with external influences.
- The place of storage must be dry and dust free and must not have high humidity (<70%)
- max. permissible storage temperature: - 20°C to + 40°C.

5. Mounting / Installation

5.1 Safety notes



- Mounting may only be carried out by trained personnel in accordance with these Operating Instructions and with regard to the regulations in force.
- Safety devices that have been removed for mounting work must be replaced immediately afterwards, and before the electrical connection is made.
- The fans must be mounted such that secure fixing is guaranteed at all times during operation.

CAUTION Shoring up the weight at other points leads to fan damage and is dangerous

5.2 Installation site

- The installation site must be suitable for each fan with regard to type, composition, ambient temperature and ambient medium (points 3.3 and 3.4 are to be observed).
- The supporting construction must be level and have sufficient bearing strength.

5.3 Installing / Fixing

- The fan or base frame must be fixed without stresses to the supporting structure.
- The gap between impeller wheel and inlet cone has to be even.

CAUTION Stresses can lead to bearing damage and fatigue failures! They also affect the functioning of the fan.

- No forces should be transferred from other parts of the plant.
- Use flexible connecting supports for duct connection.

5.4 Electrical connections

5.4.1 Safety notes



- The electrical installation of the fans and components may only be carried out by trained personnel in observance of these Operating Instructions and the regulations in force.
- The following Standards and guidelines are to be observed:
 - IEC 60364-1 / DIN VDE 0100; DIN EN 60204- 1
 - site regulations of the Electricity Supply Companies
- Equipment in accordance with DIN EN 60204-1 is to be installed as protection during unexpected events (e.g. an isolation switch for inspections).

5.4.2 Motor / Motor connections

Motor connections are to be taken from the attached wiring diagram.

5.4.3 Motor protection

The motors are equipped with thermal contacts. (see technical catalogue for exceptions). The thermal contacts either switch directly (in sequence with the motor windings) or in connection with our motor full protection switching device if the maximum permissible temperature of the motor windings is exceeded and thus guarantees optimum motor protection (observe the circuit diagrams!).

CAUTION

Fuses or circuit breakers do not provide sufficient motor protection. The fans are equipped with thermo contacts as standard. Damage due to insufficient motor protection caused by the unuse of thermo contacts invalidates the manufacturer's warranty.

5.4.4 Motor starting

AC Motors with a nominal rating of 4kW can generally be direct started.

6. Commissioning

6.1 Safety checking



- It is to be checked whether all mechanical and electrical safety devices have been fitted and connected.
- According to the type of installation of the fan the inlet and discharge openings as well as the drive shafts must be fitted with protection devices in accordance with DIN EN ISO 13857!
- If the surface temperature of accessible fan parts exceed +70°C (DIN EN 563) isolating protection devices must be fitted.

Before commissioning the following checks must be carried out:

- The ducts and the fan must be checked for foreign bodies (tools, small components, building debris, etc.)
- The free running of the impeller must be checked by hand.
- The power setting, voltage and frequency for the mains connections must be checked against the fan or motor type plate.
- Connected control devices must be checked for functioning.



The fan may only be commissioned if all the safety devices have been fitted and if it is ensured that the impeller has been safeguarded according to DIN EN ISO 13857!



The suitability of protection devices and their fixtures to the fan have to be evaluated within the complete security concept of the installation.

CAUTION

The use of a frequency inverter is only possible if sinus filters effective on all poles between inverter and motor are installed. Simple dU/dt-filters are not suitable for the operation of this fan.

6.2 Test run

The fan should be switched on briefly to check that the direction of rotation of the impeller agrees with that indicated by the arrow. In the event of the motor running in the wrong direction the poles are to be changed over while observing the electrical safety instructions.

6.3 Check the current consumption

CAUTION

On reaching the operating speed of the fan immediately measure the current consumption and compare it with the nominal current on the motor or fan type plate. In the event of a substantial overcurrent switch off immediately.

6.4 Check for quiet running

CAUTION

Check on the quiet running of the fan. There should be no unusual rocking or vibration. Check for untypical bearing noises. (max. vibration velocity 2.8 mm/sec)

7. Upkeep / Maintenance

7.1 Safety notes



Before working on the fan it is imperative to ensure:

- The drive motor is separated from the mains on all poles!
- The impeller has come to rest!
- The surface temperature has been checked to prevent burning!
- There is no possibility of an uncontrolled running of the fan during the maintenance work (e.g. through an isolating switch)!
- Any debris or dangerous materials which have arrived in the fan with the transported medium must be removed using a suitable method.
- Fan operation may resume after the safety checks of Section 6 “Commissioning / Safety checks” have been carried out.

Only limited work may be carried out while in the operating condition and in observance of the safety and accident prevention regulations :

e.g. measurement of vibration



Non-observance of these points endangers life and limb for the maintenance personnel.

CAUTION

If the state of the fan does not allow adapted action for repair it has to be put out of order immediately and to be replaced if required!

7.2 Maintenance intervals

After having passed the period during which the grease keeps its lubrication capacity (30.000 h for standard applications) a bearing exchange may be necessary.

During periods of longer lasting stand stills the fan may be operated shortly in regular intervals. This is to prevent the bearings from mechanical load and the avoid ingress of humidity. If fans have been hold on stock for a longer period the bearings of fan and motor have to be checked prior to installation.



The maintenance instructions of the motor supplier as well as the instructions for the switches and control units have to respected.

The fan has be checked regularly whether vibrations may occur. The maximum vibration speed in radial direction must not exceed 4.5 mm/s to monitored at the bearing or bearing housing of the fan or motor. For fans of a impeller diameter up to 315 mm a vibration speed of up to 7,1 mm/s is acceptable. A deposit of dust and solids can cause unbalancing and consecutive damages. In order to prevent this danger regular inspection and cleaning operations are to be scheduled.

CAUTION

No high pressure cleaners (steam rod cleaners) are to be used!

7.3 Intake and pressure side accessories

Flexible sleeving (compensators) between the fan and plant parts are to be checked at regular intervals.

CAUTION

Unsealed sleeving leads to breakdowns and danger from escaping transported medium and must be replaced.

7.4 Spare parts

Only original Nicotra Gebhardt spare parts in accordance with the Spare Parts List are to be used. worden gebruikt.

CAUTION

Nicotra Gebhardt accepts no responsibility for damages resulting from the use of other parts!

8. Faults

Deviations from normal operating conditions always lead to functional breakdowns and should be looked for immediately by maintenance personnel.



Longer lasting faults can result in the destruction of the fan and give rise to damage in plant parts and injuries to personnel!

In the event that the maintenance personnel cannot eliminate the fault, please make contact with our mobile customer service.

9. Service, Spareparts and Accessories

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EC Declaration of incorporation

The manufacturer: **Nicotra Gebhardt GmbH**
Gebhardtstraße 19-25, 74638 Waldenburg, Germany

herewith declares, that the following product:

Product designation: Centrifugal fan, direct driven
Type nomination: **RLE / RLA**
Serial n°: see type plate
Year of production: see type plate

qualifies as a partly-completed machine, according to Article 2, clause “g” and does comply to the following basic requirements of the Machine Directive **(2006/42/EC)**:
Annex I, Article **1.1.2; 1.3.7; 1.5.1.**

This partly-completed machine must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the Machine Directive (2006/42/EC).

The following harmonised standards ¹⁾ have been applied:

DIN EN ISO 12100: Safety of machines – General design principles

DIN EN ISO 13857: Safety of machines – Safety distances to hazardous areas

EN 60204-1: Safety of machines - Electrical equipment of machines, Part 1: General requirements

Applied, national standards and technical specifications ²⁾ particularly:

VDMA 24167: Fans – Safety requirements

The manufacturer is committing himself to make the special documents of partly-completed machine available to any state authority if required.

Waldenburg, 27.08.2014

Representative for the documentation: Klaus Gundel



Head of Production
i.V. I. Stöbe



Head of Research and Development
i.V. Dr. J. Anschütz

- 1) The complete listing of applied standards and technical specifications see manufacturer's documentation
- 2) As far as harmonised standards are not existing

NICOTRA || **Gebhardt**
fan|tastic solutions

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