

# Operating Instructions

Direct driven centrifugal fans  
with brushless DC external rotor motor  
(Translation of the original)

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## BA-RZP-DDMB-TZP 1.3 – 01/2013

|  |  |             |
|--|--|-------------|
|  |  | <b>RZP</b>  |
|  |  | <b>DDMB</b> |
|  |  | <b>TZP</b>  |

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Further languages on request!

## Amendments index

| Amendment                     | Change  |
|-------------------------------|---|
| BA-RZP-DDMB-TZP 1.0 – 09/2011 | This is the first edition of these Operating Instructions                                   |
| BA-RZP-DDMB-TZP 1.1 – 04/2012 | loose supplied parts<br>RZP casing position 90 as standard deleted                          |
| BA-RZP-DDMB-TZP 1.2 – 10/2012 | Temperature – EKE "-10...+40°C" added.  |
| BA-RZP-DDMB-TZP 1.3 – 01/2013 | EN 61800-3 and EN 61000-3-2 added<br>Declaration of Conformity to ecodesign Directive added |

# 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 limb 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 work 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.

No responsibility is accepted for resultant damages!

# 2. Safety Notes



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

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

### 3. Technical Description



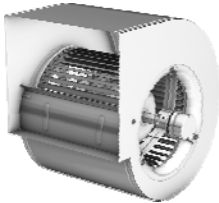
#### 3.1 Product description

These centrifugal fans, with double inlet and with direct drive through brushless DC external rotor motors, are suitable for the transport of dust-free and other non-aggressive gases or vapours.

The scroll casing, which is not gas-tight, is made of galvanised sheet steel and is provided with flange connections at the scroll outlet.

The impeller with backward-curved hollow section true aerofoil blades (RZP) or forward-curved blades (TZP/DDMB) is mounted directly onto the rotor of the built-in motor.

The built-in motors are designed to protection classes IP 54 and thermal insulation class F. If the fan is to be set up outdoors or if very damp air is to be moved, a drain plug must be inserted in the lowest point in the casing (Accessory).

| RZP  | TZP  | DDMB  |
|--|--|---|
|    |  |   |
| <ol style="list-style-type: none"> <li>1. Fan</li> <li>Important accessories</li> <li>2. Inspection door</li> <li>3. Drain plug</li> <li>4. Inlet guard</li> </ol> |  | <ol style="list-style-type: none"> <li>1. Fan</li> <li>Fittings / Accessories</li> <li>2. Inlet guards / Outlet guard</li> <li>3. Flange</li> <li>4. Mounting feet</li> </ol> |

- Note** The following parts of the fan are supplied loose for technical reasons:
- Flexible connections
  - Spring diffusors / Rubber buffers
  - Electronical commutation unit / driver



The fans are intended for incorporation into equipment and do not have their own contact protection or earthing of the metal casing fitted as standard. The appropriate protective measures against contact are to be taken in accordance with EN ISO 12100 and earthing measures in accordance with IEC 60364 / VDE 0100.

#### 3.2 Technical Data

Technical data and the permissible limits are to be taken from the product nameplate, 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.

Permissible transport media temperatures:

| Series           | Temperature     | Special        |
|------------------|-----------------|----------------|
| RZP / TZP / DDMB | -20°C ... +40°C | See type plate |
| EKE              | -10°C ... +40°C |                |

**CAUTION**

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!

The wiring recommendations in the controller operating instructions must also be observed to prevent electromagnetic faults (EMC).

### 3.4 Improper use

Improper use would be e.g. the transporting of:

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

The consequences are 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 outside permitted fan curve area (stability of flow pattern)
- No operation if fan becomes clogged by dirt



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 shall be immediately checked in the presence of the carrier to assess that they are intact and complete.

Please read the attached leaflet in the event of transport damage.

**CAUTION**

Fans must be carefully transported!

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

- the impeller becoming jammed
- the shaft becoming bent
- the bearings being damaged

### 4.2 Transport safety

- The transport means shall 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).

The attachment points on the fans are:

- packaging
- fan casing (slings)

The following are not attachment points:

- mounting supports
- inlet and outlet flanges

### 4.3 Temporary storage

The following points must be observed when temporarily storing fans:

- The fan is to be stored in its original packaging, or additional packaging may have to be added, according to the environmental conditions.
- The place of storage must be dry and dust-free and must have limited 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.
- Mounting may only be carried out by trained personnel in accordance with these Operating Instructions and with regard to the regulations in force.
- The fans must be mounted such that secure fixing is guaranteed at all times during operation.
- Fans must be fixed to the locations provided

#### **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 3.2, 3.3, 3.4 are to be observed).
- The supporting construction must be level and have sufficient bearing strength.
- When installing outdoors or if very damp air is to be moved, then a drain plug - available as an accessory - should be inserted in the lowest point in the casing.

### 5.3 Installing / Fixing

- The fan must be fixed without stresses to the supporting structure.

#### **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.
- Ensure even spring of the vibration dampers.

## 5.4 Electrical connection

### 5.4.1 Safety notes



The rotor is stored electrically isolated. Before coming into contact with the impeller, the fan or the control unit must be switched off.  
 The scroll casing is not earthed by the plant!  
 The customer must take measures in accordance with DIN VDE 0100!

- 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 as well as the operating instructions of the controller.
- The following Standards and guidelines are to be observed:
  - IEC 60364 / DIN VDE 0100; EN 60204-1; EN 61800-3; EN 61000-3-2.
  - Site regulations of the Electricity Supply Companies.
- Equipment in accordance with EN 60204 is to be installed as protection during unexpected events (e.g. an isolation switch for inspections)

### 5.4.2 Motors

Highly efficient brushless DC motors with external control electronics are used to ensure that there is no obstruction at the fan inlet. The rams can be variably changed.

### 5.4.3 Motor protection



The controllers internally regulate the rams, output and motor current and thus a safe operating area (SOA) depending on the respective fan.

The EKE-07 controller should be mounted in the airflow of the fan in order to reach maximum load in high ambient temperatures of up to 40°C. Alternatively, cooling can also be forced by operating an additional fan. Should the temperature of the equipment exceed the permitted temperature due to insufficient cooling, the equipment will reduce its output automatically in order to maintain the maximum temperature. This condition will be indicated with the warning "Temperature reduction".

### 5.4.4 Motor connection



The motor must be connected in accordance with the attached operating instruction for the control electronics.

## 6. Commissioning

### 6.1 Safety checking



- Check whether all mechanical and electrical safety devices have been fitted and connected.
- If the type of installation of the fan cannot prevent human access to the moving parts of the fan, the inlets and/or the outlet of the fan, as well as any drive shafts must be fitted with protection devices in accordance with EN ISO 13857! Appropriate protection guards are available and must be expressly ordered.
- If the surface temperature of accessible fan parts exceed +70°C (EN ISO 13732-1), 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.
- Inspection openings (if they exist) must be closed.



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 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.

## 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 (see operating instructions of the control electronics).

## 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.

# 7. Upkeep / Maintenance

## 7.1 Safety notes



Before working on the fan it is imperative to ensure:

- The controller is separated from the mains on all poles. In the event of a fault the rotor could be under current!
- 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 a lockable isolating switch)!
- Any debris or dangerous materials which have arrived in the fan with the transported medium must be removed before maintenance work 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.

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

## 7.2 Maintenance intervals

Once the service life of the grease has ended (for standard applications approx. 30,000 hrs) it may become necessary to change the bearings.

For longer periods of standstill the fan must be started up regularly for a short period of time to prevent bearing damage from mechanical stresses or moisture penetration. After a longer period of storage the fan and motor bearings must be checked before installation.

The fan must be regularly checked for mechanical vibrations. The maximum vibration velocity in a radial direction at the bearings and/or the bearing plate of the motor must be 4.5 mm/s. For impellers with nominal diameters of up to 315 mm, up to 7.1 mm/s is permitted after the fan is installed. Dust or dirt on the impeller can lead to imbalance and damage. To prevent this hazard, appropriate inspection and cleaning intervals depending on the use must be determined and observed.

If wear and tear or fouling (corrosion, abrasion, material build-up) is expected at the casing due to the type of medium being transported, regular inspections and cleaning work must be carried out.

The intervals should be in line with the respective operating conditions and to be determined by the user.

**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 motor failures or danger from escaping transported medium, and must be replaced.

## 7.4 Spare parts

The centrifugal fans are mature, maintenance-free premium products with a long life.. In the event of a malfunction please contact our customer service or return the entire fan to us. For reasons of economy only complete fans will be exchanged.

**CAUTION** Nicotra Gebhardt accepts no responsibility for damages resulting from the use of non-original parts!

## 8. Faults

Deviations from normal operating conditions always lead to functional breakdowns and should be investigated 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 contact our customer service for assistance.

## 9. Service

We offer the following services to all our partners:

- Mobile customer service
  - Spare parts service
- Telephone: +49 (0) 7942 101 384  
Facsimile: +49 (0) 7942 101 385  
E-Mail: [info@nicotra-gebhardt.com](mailto:info@nicotra-gebhardt.com)  
[www.nicotra-gebhardt.com](http://www.nicotra-gebhardt.com)

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## EC Declaration of incorporation

The manufacturer: Nicotra Gebhardt GmbH  
Gebhardtstrasse 19-25, 4638 Waldenburg, Germany

herewith declares, that the following product:

Product designation: Centrifugal fan, direct driven  
Type nomination: RZP / TZP / DDMB  
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 with 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 <sup>1)</sup> have been applied:

EN ISO 12100: Safety of machines - general design principles  
EN ISO 13857: Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs  
EN 60204-1: Safety of machines - Electrical equipment of machines, Part 1: General requirements

Applied, national standards and technical specifications <sup>2)</sup> particularly:

VDMA 24167: Fans – Safety requirements

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

Waldenburg, 2nd January, 2013

Authorised representative for the technical documentation: Klaus Gundel

*i.V. W. Weckler*

i.V. W. Weckler  
Head of Production

*i.V. J. Anschütz*

i.V. Dr. J. Anschütz  
Research & Development Director

1) The complete listing of applied standards and technical specifications see manufacturer's documentation

2) As far as harmonised standards are not yet in existence

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## EC Declaration of conformity

for

EC guideline on electromagnetic compatibility (2004/108/EC)

We herewith declare that the machine described below, due its concept and construction as well as the design, brought onto the market by us complies with the relevant fundamental safety and health requirements of the EC guidelines mentioned below.

Should any changes be made to the machine without our consent this declaration shall be null and void.

Designation: Centrifugal fan, direct driven

Machine type: RZP / TZP / DDMB

Serial no.: see type plate

Year of production: see type plate

Relevant EC guidelines:

EC guideline on electromagnetic compatibility (2004/108/EC)

Applied, harmonised standards, particularly:

DDMB / TZP / RZP-51, -52: DIN EN 60204-1, DIN EN 61800-3;

RZP-11, -12, -31: DIN EN 60204-1, DIN EN 61800-3, DIN EN 61000-3-2

Waldenburg, 2nd January, 2013



i.V. W. Weckler  
Head of Production



i.V. Dr. J. Anschütz  
Research & Development Director

The complete listing of applied standards and technical specifications see manufacturer's documentation.

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## EC Declaration of conformity

We hereby declare that the product named below, based on the efficiency grade of the respective fan type and the measurement and efficiency category specified in the technical documentation, complies with the ecodesign requirements set by Commission Regulation (EU) No 327/2011, according to Annex I, Section 2.

Designation: Centrifugal fan with backward curved blades (with scroll)  
Machine type: RZP  
Serial no.: see type plate  
Year of production: see type plate

Designation: Centrifugal fan with forward curved blades (with scroll)  
Machine type: DDMB / TZP  
Serial no.: see type plate  
Year of production: see type plate

Relevant EC guidelines:

EC-Directive for the setting of ecodesign requirements for energy-related products (2009/125/EC)

Waldenburg, 2nd January, 2013



i.V. W. Weckler  
Head of Production



i.V. Dr. J. Anschütz  
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