

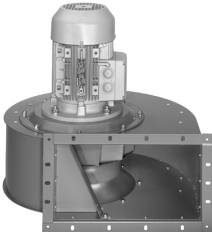
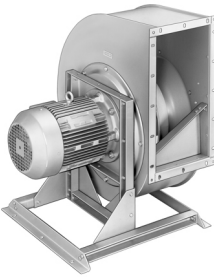
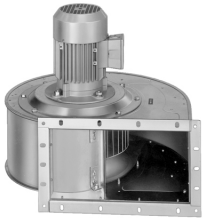
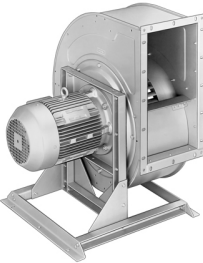
Operating Instructions

Direct driven centrifugal fans

(Translation of the original)

EN

BA-CFD_REM-TEM-RZM 8.8 – 05/2014

		REM
		TEM
		RZM

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BA RVM 8.5 – 08/2011	
BA RVM 8.6 – 10/2011	
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BA RVM 8.7 – 01/2013	
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1. Important information

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

The 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



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



The fans are intended for incorporation into equipment and do not have their own contact protection fitted as standard. The appropriate protective measures are to be taken in accordance with DIN EN ISO 13857.

3.1.1 REM / TEM

REM / TEM direct driven centrifugal fans with single inlet, with built-on motor. Designed in accordance with the standards series R 20. The scroll casing is not gas-tight and is made of galvanised or coated sheet steel, with or without foot construction according to the configuration. The types of fans without foot construction can be used with a vertical or horizontal shaft. The impeller has a floating attachment to the motor shaft. The motor is outside the air flow attached by a flange to fan casing.

REM: Centrifugal impeller with backward-curved blades.

TEM: Impeller with forward-curved blades

TEM 01-0160/-0355,

REM 11/13-0200/-0355

REM 41-0200/-0450

REM 11/13-0400/-0630

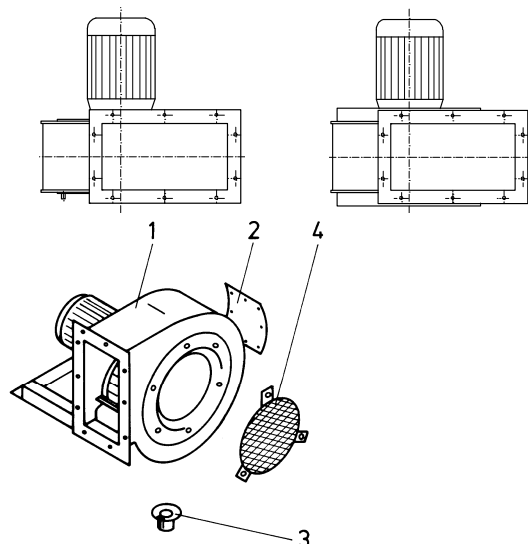
REM 41-0200/-0450

TEM 08-0160/-0355,

REM 18/19-0200/-0355

REM 48-0200/-0450

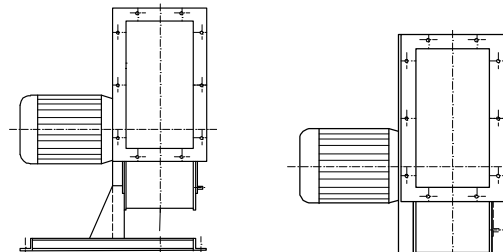
REM 18/19-0400/-0630



TEM 08-0160/-0355,

REM 18/19-0200/-0355

REM 48-0200/-0450



1. Fan

Important accessories

2. Access door

3. Drain plug

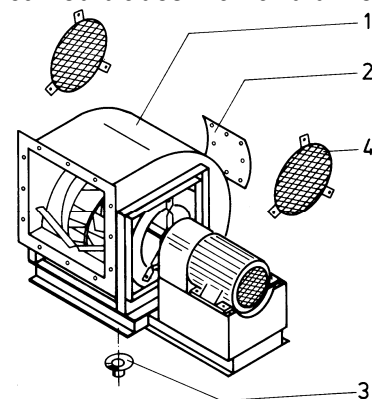
4. Inlet guard

3.1.2 RZM

Centrifugal fans RZM, double inlet, direct drive through coupled built-on motor.

Designed in accordance with the standards series R 20.

Casing made of galvanised or coated sheet steel. Centrifugal impeller with backward-curved blades. Fan and drive unit attached to a common stable base frame.



1. Fan

Important accessories

2. Access door

3. Drain plug

4. Inlet guard

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.

Permissible media temperatures:

Model	REM / TEM	RZM
Temperature	-20°C to +60°C	-20°C to +40°C

CAUTION Maximum ambient temperature at the drive motor: +40°C.

Note If the motor is to be set up outdoors or if very damp air is to be moved, then a condensation drain plug - available as an accessory - should be inserted in the lowest point in the casing.



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 (e.g. frequency inverter), the recommendations of the manufacturer are to be observed concerning the avoidance of electromagnetic radiation (EMC) (through suitable earthing, cable lengths, cable screening, etc.).

3.4 Improper use

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

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

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!

The results are: Bearings damage, corrosion damage, loss of balance, vibration, deformation, abrasion damage.

CAUTION



Avoid dynamic load of the impeller. No frequent alteration of load!

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 (e.g. unyielding, tilted positioning) can lead to:

- **Impeller jamming.**
- **Shaft deformation.**
- **Incorrect shaft alignment of the coupling (RZM).**
- **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).
- Note signs.

The attachment points on the fans are:

- Lifting eyes
- Base frame
- Base plate
- Machine rack

The following are not attachment points:

- Motor transport eyes
- Bearing supports
- Housing frame
- Intake and pressure side flanges
- 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.
- Fans must be fixed to plinths or base frames.

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 3.1 to 3.3 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 condensation drain plug - available as an accessory - should be inserted in the lowest point in the casing.

5.3 Installing / Fixing

The fan or base frame must be fixed without stresses to the supporting structure. TEM / REM fans without plinths can be mounted with the shaft vertical or horizontal.

CAUTION

Malfunction through fatigue break. Stress (tensions) of the fan is prohibited!

- 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 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 / EN 60204-1
 - site regulations of the Electricity Supply Companies
- Equipment in accordance with 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

- Motors are to be protected against overload in accordance with DIN EN 60204-1.
- Standard motor protection switches are to be provided and set to the nominal motor current. A higher setting is not permitted!
- Care must be taken to ensure for explosion protected motors that motor protection devices are utilised which correspond with the te time given on the motor type plate.
- Motors with built-in thermistors or similar must be protected through a thermistor or similar operated release device.

CAUTION

Fuses and automatic cutouts but also simple bimetal circuit breakers do not provide sufficient motor protection. Damage due to insufficient motor protection invalidates the manufacturer's guarantee.

5.4.4 Motor starting

- Motors with a nominal rating of 4kW can generally be direct started.
- Motors with a nominal rating >4kW are usually star-delta or soft started

In all cases the power limitations provided by the existing power supply company must be taken into account.

In the event that plant conditions necessitate a direct start the suitability of the fan design is to be confirmed with Nicotra Gebhardt. Fans with high inertia impellers can take over 6 seconds to reach top running speed. In these cases heavy duty motor protection relays or bimetal relays must be provided. The motors are designed for **S1** continual operation. With more than three starts per hour the suitability of the motor is to be confirmed by Nicotra Gebhardt.

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!
- The appropriate protection grids are available and must be expressly ordered.
- If the surface temperature of accessible fan parts exceed +70°C (DIN 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.
- Check vibration levels. The shaft alignment of the coupling may not exceed +0.2mm (use a suitable alignment laser).



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.

6.1.1 Inverter operation



When operating with a frequency inverter the system of fan-motor-inverter can generate increased vibrations within certain frequencies or fan rpm-areas. Operation in such an area must absolutely be avoided!
When putting the fan into operation this type of eventually occurring resonance rpm have to be determined and to be blinded out.
Matching frequency inverters have to be set and operated according to the instructions given by their manufacturer.
Non observance of these instructions may cause a destruction of the fan!

Note The Operator is responsible for compliance of applicable EMC standards and directives. The system should always be evaluated in its application.

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 Checking 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.

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 it's lubrication capacity (30.000 h for standard applications) an bearing exchange may be required.

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.

If due to the type of media conveyed one can expect wear or dirt accumulation on the housing (corrosion, abrasion, caked material) then regular inspection and cleaning must be carried out. The intervals will vary according to operating conditions and should be set by the operator.

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

7.3 Inlet and discharge connections

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 spare parts in accordance with the Spare Parts List are to be used.

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

We offer to all our partners the following services:

- **Mobile Customer Service** Telephone +49 (0)7942 101 384
- **Spare Parts Service** Fax +49 (0)7942 101 385
E-Mail service@nicotra-gebhardt.com
www.nicotra-gebhardt.com

7. Appendix to Upkeep / Maintenance

7.5 Bearings

7.5.1 Safety notes



The safety notes from section

2. Safety notes

7. Upkeep / Maintenance

7.1 Safety notes

The work may only be carried out with due regard for the safety instructions!

7.5.2 General

It is necessary to use precision bearings that have been subjected to a noise check which have been designed for a nominal lifetime (L_{10h} as per DIN ISO 281-1) of 40,000 hours of operation respectively.

7.5.3 Bearings without lubrication device

The bearings are normally supplied greased for life with a high-performance grease that is resistant to ageing and does not require maintenance under normal operating conditions. If it is necessary to replace the bearings as a result of normal wear and tear, please ask for the relevant installation instructions.

7.5.4 Bearings With IWN Lubrication Device

CAUTION

The bearings must be greased at regular intervals in order to attain the maximum permissible life of the bearings under more severe operating conditions.

IWN 01 standard grease (we recommend: Shell Gadus S2 V100 3)

IWN 11 moisture grease (we recommend: Klüber Staburags NBU 12/300KP)

The intervals depend on the relevant operating conditions and should be set by the operator. The values given in the lubrication interval tables should be taken as guidelines. If it is necessary to replace a bearing due to normal wear and tear, please request the relevant installation instructions.

7.5.5 Lubrication Intervals

If no greasing intervals are specified, they lie nominally above 8000 operating hours. Hence, regreasing must take place at least once yearly!

Depending upon operating conditions, it can become necessary to regrease several times, as determined by the operator.

The lubrication intervals given in the tables apply for bearings on a horizontal shaft where the temperature of the bearing outer ring does not exceed +70°C.

- **In the case of temperatures over +70°C, the lubrication interval must be reduced by half for each 15°C by which this temperature is exceeded.**

7.5.6 Lubrication

In the case of lubrication during operation, the prescribed amount of the corresponding type of grease is pressed into the bearing by the hydraulic-type lubricating nipple arranged on the outside (with due regard to the Safety In-structions 7.1).

The old grease that is pressed out can be removed during a brief stop.

In the case of self-aligning bearings in the cast casing, these bearings should be cleaned and regreased completely after they have been lubricated twice.

RZM 15-;19-0400/-1000

Split type cast iron housing strut mounted with self-aligning double row bearings with lubrication device IWN



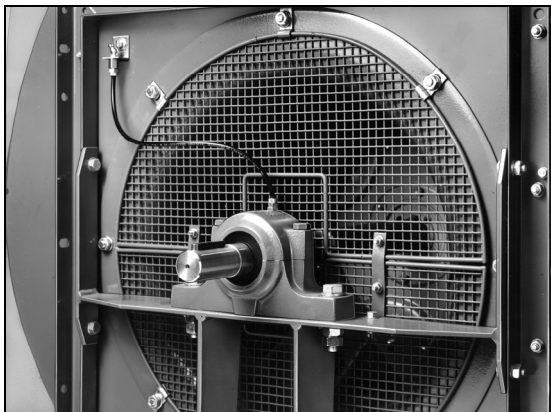
Self aligning double row bearing in a cast iron housing

Relubrication at least once a year. Interval to be reduced for heavy duty operation

Fan size	0400...0500	0560...0630	0710...0800	0900...1000
Grease qty.	15 g	20 g	30 g	35 g

RZM 13-0400/-1000

Split type plummer block housing with self-aligning double row bearings with lubrication device IWN



Self aligning double row bearing in a plummer block housing

Relubrication at least once a year. Interval to be reduced for heavy duty operation

Fan size	0400...0500	0560...0630	0710...0800	0900...1000
Grease qty.	15 g	20 g	30 g	35 g

Translation of the original

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.

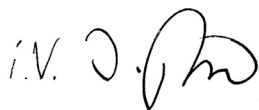
Designation: Centrifugal fan with backward curved blades (with scroll)
Fan type: REM 11-, 13-, 18-, 19-; 0225-2D-07 up to 0630-6W-19
REM 11-, 13-, 18-, 19-; 0200-2D-07-60 up to 0630-6W-21-60
REM 41-, 48-; 0200 up to 0450
RZM 13-, 15-, 18-; 0400 up to 1400
Serial no: See type plate
Year of manufacturing: See type plate

Designation: Centrifugal fan with forward curved blades (with scroll)
Fan type: TEM 01-, 08-; 0200-.W-.. up to 0355-.W-..
TEM 01-, 08-; 0200-.W-..-60 up to 0355-.W-..-60
Serial no: See type plate
Year of manufacturing: See type plate

Relevant EC Directives:

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

Waldenburg, 22nd May, 2014



i.V. I. Stöbe
Head of Production



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

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Translation of the original

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: **REM / TEM / RZM**

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**

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 machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs

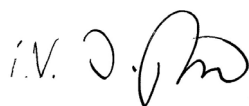
Applied, national standards and technical specifications ²⁾ particularly:

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, 22nd May, 2014

Responsible for the documentation: Michael Hampel



i.V. I. Stöbe
Head of Production



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

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

2) As far as harmonised standards are not existing

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