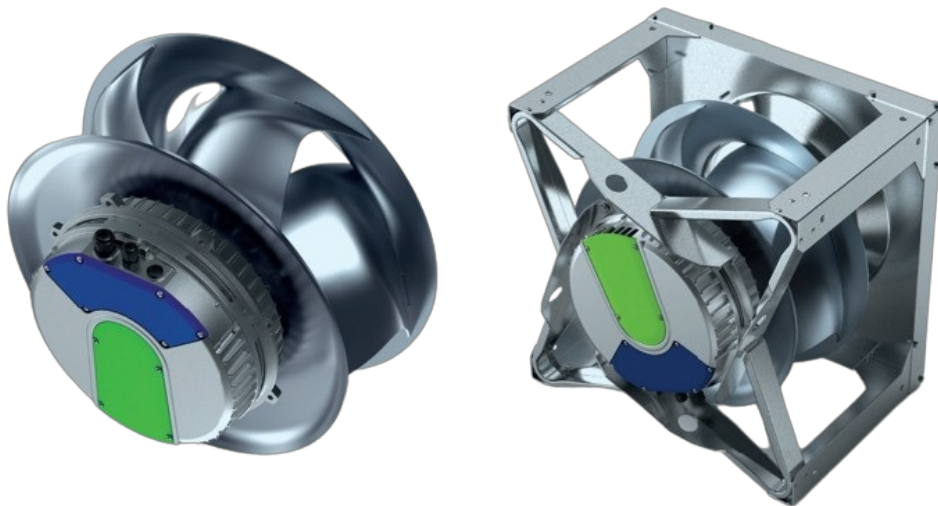


NICOTRA COPRA Direct Driven Radial Fans Without Scroll Instruction Manual

[Home](#) » [NICOTRA](#) » NICOTRA COPRA Direct Driven Radial Fans Without Scroll Instruction Manual 

NICOTRA | **Gebhardt®**
COPRA™
DIRECT DRIVEN RADIAL FANS
WITHOUT SCROLL
RELEASE VERSION 1.2



Contents

- 1 Important information
- 2 Safety instructions
- 3 Technical description
- 4 Transport
- 5 Installation
- 6 Commissioning
- 7 Maintenance / repairs
- 8 Breakdowns/malfunctions
- 9 Troubleshooting Guide
- 10 Recycling/disposal
- 11 Service
- 12 Manufacturer's notification
- 13 Appendix
- 14 Documents / Resources
 - 14.1 References

Important information

The fans are state-of-the-art and fulfil the basic safety and health requirements of the EC Machinery Directive. The fans offer a high level of operating safety and a high standard of quality, which is guaranteed by a certified quality management system (EN ISO 9001). Before leaving the factory, all fans are checked and have a CE quality mark applied. Any fan can potentially present hazards:

- if it is not installed, operated and maintained by trained personnel.
- if it is not used for the intended use.

This can present hazards to the life and limbs of personnel, as well as material damage to systems and the building, while the benefits associated with the product can also be impaired.

NOTE

All persons that are commissioned to work on the fan must both read and observe these Operating Instructions.

The Operating Instructions:

- describe the intended use of the fan and offer protection from improper use.
- include safety instructions that must always be observed.
- warn of hazards that can also potentially occur during the intended use.
- provide important notes on safe and efficient use of the fan, as well as helping to secure the full benefits associated with the product.
- are to be supplemented by specialist and country-specific standards/regulations and policies.

Nicotra Gebhardt GmbH accepts no liability for any damage or malfunctions that can be attributed to failure to observe the Operating Instructions.

The manufacturer warranty ceases to apply as soon as any unauthorised modifications or changes are made to the fan. No liability is accepted for consequential damage.

Safety instructions

⚠ DANGER

Indicates a hazard which, if not avoided, will result in serious injury or death.

⚠ WARNING

Indicates a hazard which, if not avoided, could result in serious injury or death.

⚠ CAUTION

Indicates a hazard which, if not avoided, could result in minor or moderate personal injury.

NOTICE

Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

Technical description

3.1. COPRA product description

⚠ CAUTION

The fans are designed for installation in devices or systems and do not offer any dedicated touch protection as standard. Corresponding protective measures as per DIN EN ISO 13857 should therefore be implemented.

The fans are driven by a permanent magnet synchronous motor (PM motor). The optimised radial impeller with backward curved, dust repellent hollow-profile aluminum blades is mounted directly to the motor shaft. This is statically and dynamically balanced as per DIN ISO 21940-11. Performance measurements in accuracy class 1 according to DIN 24166 on certified test benches according to ISO 5801. Noise measurements according to DIN 45635. The fans of the COPRA series have an integrated controller (EC/PM technology). Surface corrosion protection systems are available in both galvanized steel and powdercoated steel and aluminum.

COPRA Core

Motor impeller unit can be fitted in each installation orientation.

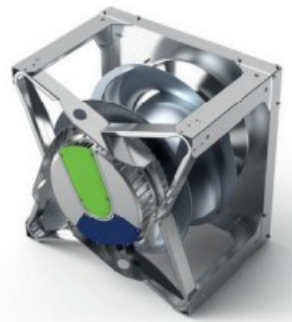
COPRA Plug

Fan module with support unit and inlet nozzle, installed and adjusted in the factory. COPRA can be fitted in each installation orientation.

1. COPRA Core



2. COPRA Plug



3.2. Specifications

Specifications and permitted limit values should be taken from the type plate, the technical datasheet, the tender information or the respective technical catalogue and always observed.

3.3. Intended use

The fans are suitable for conveying dust-free air and other non-aggressive gases/vapours. They are designed as components for installation in devices or systems.

Permitted conveying medium temperature at a density of 1.2 kg/m³.

Series	COPRA
Temperature	-20°C to +40°C

NOTICE

Max. ambient temperature at the drive motor: +40°C. Any other use is considered improper use. No liability is assumed for personal injuries and/or damage to property resulting from this.

The recommendations of the device manufacturer for preventing electromagnetic interference (EMI) are to be observed (earthing, cable lengths, cable screens, etc.).

NOTICE

3.4. Improper use

The following are examples of improper use (conveying media):

- Media at impermissibly high or low temperatures
- Very wet media
- Aggressive (e.g. strongly acidic or alkaline) media with pH values < 5 or > 8 media
- Very dusty media
- Abrasive media
- Chlorinated media
- Explosive media

Unauthorized operating conditions:

- No operation above the indicated rotational speed (type plate, specifications).
- No operation in rotational speed ranges with increased vibration (resonance) after commissioning in the system.
- No operation in rotational speed ranges outside the permitted characteristic range (flow instability).
- No operation if the fan becomes heavily soiled or imbalanced.
- No operation if the fan has not been mounted in a way that prevents forces and stress from acting on it.
- No operation in potentially explosive atmospheres.

This can lead to the following consequences: Motor damage, corrosion damage, imbalance, vibration, deformation, abrasion damage.



WARNING

Avoid dynamic stress of the impeller, as well as frequent load cycles. The following can potentially occur here: Personal injuries and damage to property due to impeller breakages, shaft breakages, fatigue fractures, fire and explosions caused by sparking.

Transport

4.1. Transport damage

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

NOTICE

Transport fans carefully.

Improper transport (for example setting the fan down roughly or at an angle) can lead to the following:

- Fan impellers getting jammed.
- Shafts getting deformed.
- Bearings getting damaged.
- Frequency converters getting damaged.

The devices are packaged and secured in a box on a pallet in the factory.

4.2. Transport safety

- The transport medium should be selected according to the weight and packaging of the fan (type plate, datasheet).
- Always secure the load in accordance with applicable regulations.
- Use appropriate lifting points based on the installation situation and the centre of gravity position.



DANGER

Never spend time below suspended loads, as there is a risk of injury from components falling down.

4.3. The attachment points on the fan:

4.3.1. COPRA Plug Series



Supporting structure

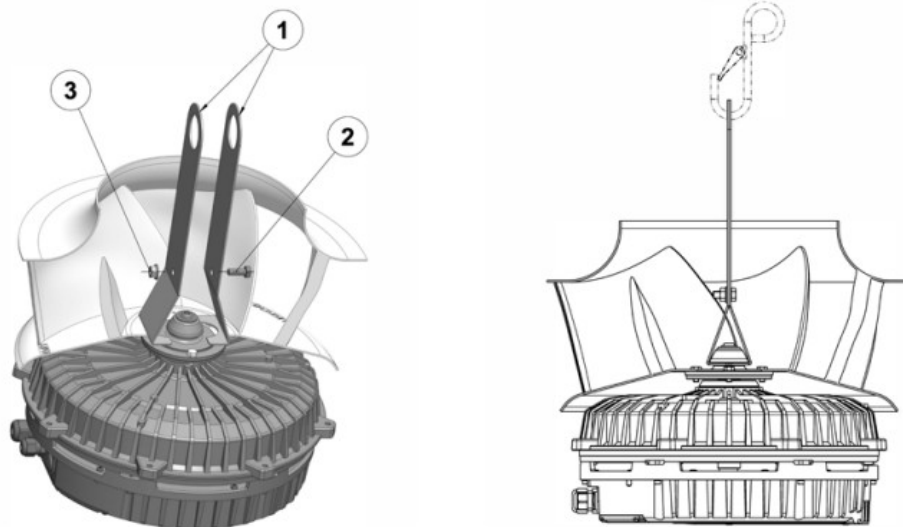


Supporting structure

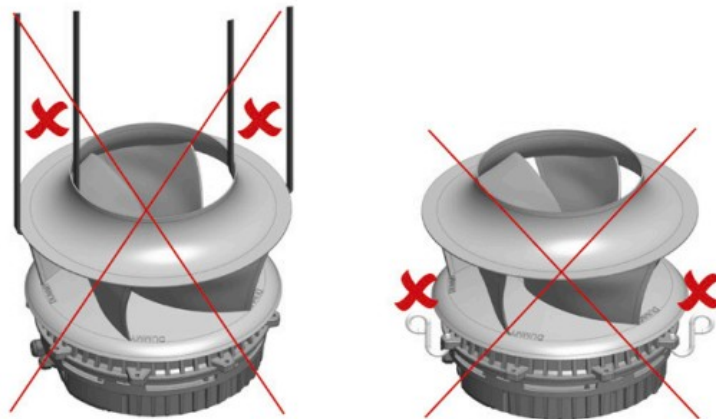


Fitting lifting lugs in the positions provided

4.3.2. COPRA Core Series



1. Lifting aid – 2. Locking screw – 3. Lock nut



NOTICE

Use the lifting aid available in the accessories to unpack the COPRA Core component.

NOTICE

No attachment points are: nozzle, impeller, motor, electronics.

4.4. Temporary storage

- When storing the fan temporarily, always observe the following points:
- Store the fan in its packaging, adding any other protection dictated by its storage environment.
- The storage location must be dry and free of dust. The relative humidity must be < 70%, non-condensing.
- Maximum permitted storage temperature: -40°C to +85 °C.
- The impellers must be periodically rotated several times (at least every 3 months) and this must also be documented.

4.4. Temporary storage

- When storing the fan temporarily, always observe the following points:
- Store the fan in its packaging, adding any other protection dictated by its storage environment.
- The storage location must be dry and free of dust. The relative humidity must be < 70%, non-condensing.
- Maximum permitted storage temperature: -40°C to +85 °C.
- The impellers must be periodically rotated several times (at least every 3 months) and this must also be

documented.

Installation

5.1. Safety instructions



WARNING

- The installation may only be carried out by specialist personnel, observing the information provided in the operating instructions and also applicable regulations.
- Any guards that were removed in order to perform installation work must be reattached immediately once this work has been completed (and before the electrical connection is re-established).
- The fans must be mounted in such a way that they are held securely in place at all times during operation.
- Attach the fans to the supporting structure (Plug) or the on-site motor installation plate (Core).



CAUTION

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

5.2. Installation location

- The installation location must be appropriate and suitable for the respective fan in terms of its nature, condition, ambient temperature and ambient medium (also observe sections 3.3 and 3.4).
- The substructure must be flat and have the requisite load capacity.
- Include monitoring units if operational cannot be performed visibly.
- If condensation is likely to form, the fan may only be installed in the “shaft horizontal” or “rotor at bottom” configurations. Ensure led draining of the condensation.

5.3. Installation / mounting

Attach the fan or base frame to the substructure without any tension or stress.



CAUTION

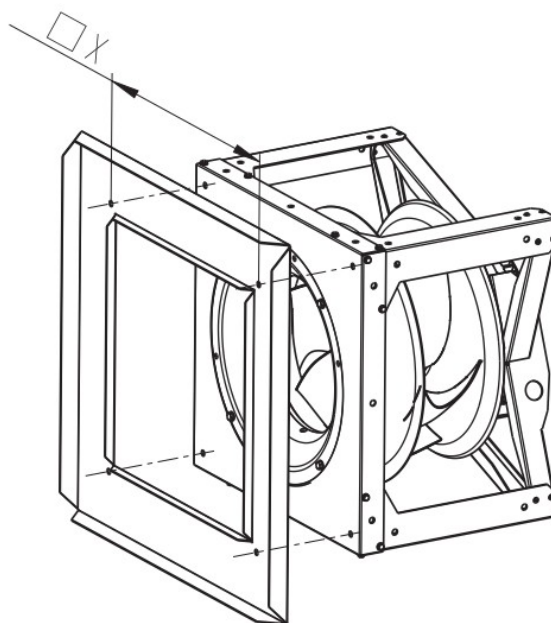
Tension leads to fatigue fractures. These in turn adversely affect the function of the fan and can lead to personal injury and property damage.

- No forces from system components may be transferred to the fan.

5.4. Mounting instruction

The COPRA™ series fans have been designed for installation with horizontal or vertical shaft on a baffle. The baffle must be adequately dimensioned to handle the mass of the device without causing any vibrations. Please note that no assembly materials are included as standard. Nicotra Gebhardt recommends mounting the fan permanently to the baffle and sealing it. This can be performed on site using a sealing strip.

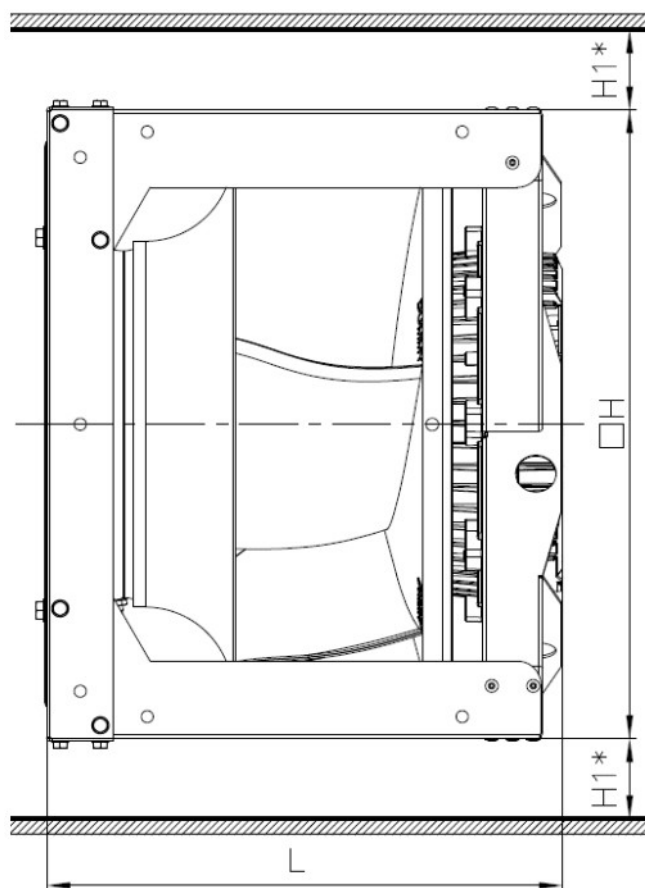
Type	Impeller ø	□ X
COPRA P/C-25	250	288
COPRA P/C-28	280	318
COPRA P/C-31	315	353
COPRA P/C-35	355	393
COPRA P/C-40	400	438
COPRA P/C-45	450	514
COPRA P/C-50	500	564
COPRA P/C-56	560	624
COPRA P/C-63	630	694
COPRA P/C-71	710	774



5.5. Recommended distances

As a distance to the chamber wall or to the nearest arranged fans in a fan grid, we recommend a ratio of 1.6 or higher to the nominal impeller diameter:

Size	COPRA Plug Height/ Width (mm)	H1* (mm)
250	325	39,5
280	355	48,5
315	390	59
355	430	71
400	475	84,5
450	580	72
500	630	87
560	690	105
630	760	126,5
710	840	150,5



5.6. Electrical connection



5.6.1. Safety instructions

- The electrical installation of the fan and the components may only be performed by specialist personnel that have received corresponding training, observing the information provided in these Operating Instructions and applicable regulations.

- The following standards and directives must be observed here: IEC 60364-1 / DIN VDE 0100; DIN EN 60204-1.
- Local regulations of the energy supply companies.
- As protection against unexpected start-up, fit devices in accordance with EN 60204–1 (for example lockable isolators).
- Always earth the fan properly.
- No potentially hazardous operating conditions may occur due to malfunctions of protective systems or their equipment.
- Protective systems should be provided on site. However, these are not included as standard by Nicotra Gebhardt.



There is electrical voltage in the intermediate circuit of the electronics and at the main connection when the permanent magnet motor is rotating.

- Do not perform any work on the fan when the impeller/motor is rotating freely.
- Lock the impeller using suitable means.

5.6.2. EMC compliant installation

NOTE

Electromagnetic Compatibility directive according to 2014/30/EU is only applicable if the listed types and series are installed and commissioned in accordance with the operating instructions. If the listed types and series are integrated as system components into a system or operated with other components such as control or control devices, the operator or manufacturer of the entire system is responsible for compliance with the directive according to 2014/30/EU.

NOTE

According to EN 61000-3-2, these types/series are professional devices. Connection to the public low-voltage network is permitted as long as this has been coordinated with the respective energy supply company.

5.6.3. Mains connection/connection plan

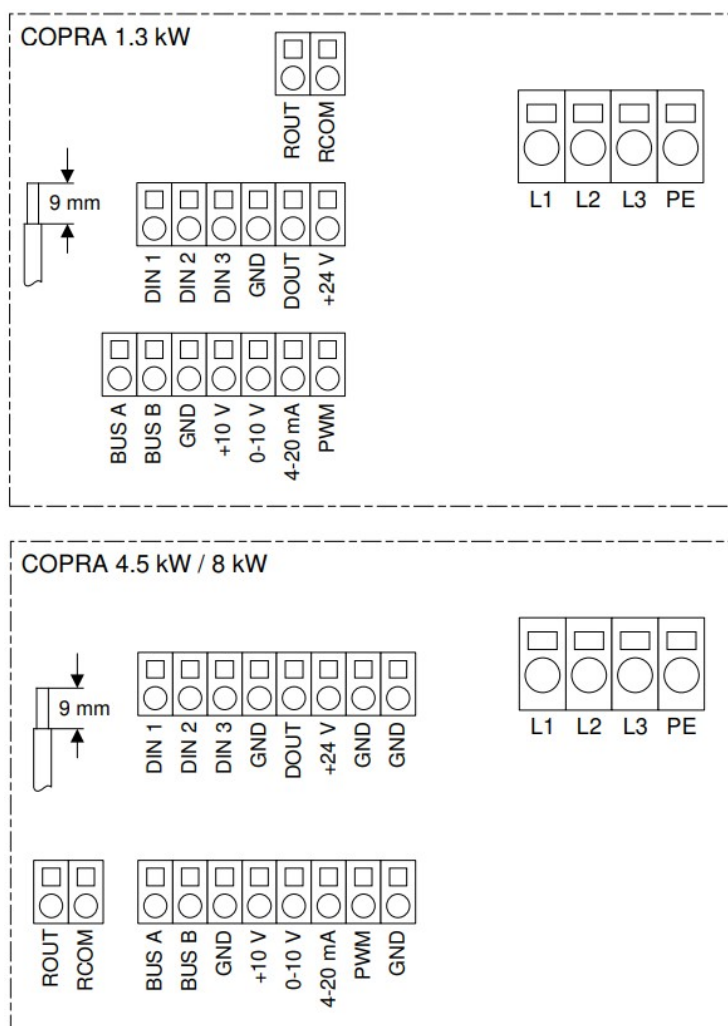
NOTE

Establish the mains connection as per the information provided in these operating instructions. The COPRA™ fans controller must be wired according to the locally adopted version of the NEC. A licensed, qualified electrician should complete the wiring for this product.

The controller is designed to operate with 230/460 Vrms, three phase power. For the AC mains connector, the wire gauge should be no larger than 14 AWG for 1.3kW motors, and no larger than 12 AWG for 4.5kW and 8kW motors. The wire can be single or stranded. The wire insulation should be stripped to approximately 0.59-0.62". The connectors for analog and digital I/O can accept bare wire between 16-24 AWG, with the insulation stripped to approximately 0.35"(min) Per datasheet 9mm = 0.35".

Overview Supply Connections

- 1,3 kW
- 4,5 kW / 8 kW



5.6.4. Supply Connections

- L1: Connection terminal for phase 1
- L2: Connection terminal for phase 2
- L3: Connection terminal for phase 3
- PE: Connection terminal for protective conductor

5.6.5. Control connections

- DIN1: Digital input 1; Factory setting: Motor enable when at +10 to 24 Vdc
- DIN2: Digital input 2; Factory setting: Specification fixed speed
- DIN3: Digital input 3; Factory setting: Specification fixed speed

DIN3	DIN2	Speed
0	0	0
0	1	Speed1 (40%)
1	0	Speed2 (60%)
1	1	Speed3 (80%)

- Further common specifications of digital inputs DIN1, DIN2, DIN3: Input impedance of 67 kΩ, max. voltage: 24

Vdc, LOW/HIGH: <2.6 Vde/>3.3 Vde.

- GND: Reference potential (0 V) for digital and analog control signals; all GND terminals are internally connected
- DOUT: Digital output; Factory setting: Display of actual speed by PWM signal (3.3 Vdc / 100 Hz)
- +424V: 24 Vdc supply for external display/control/regulation devices; max. current: 100 mA
- BUSA, BUS B: RS485 interface for Modbus RTU connectiong
- +10V: 10 Vdc supply for external potentiometer; max. current: 100mA
- 0-10 V: Analog input for 0-10 V control signal; input impedance: 11 kΩ, max. voltage: 24 Vdc (0 -11.5 V readable)
- 4-20mA: Analog input for 4-20 mA control signal; input impedance: 150 Ω, max. voltage: 24 Vdc, max. current 30 mA (0 -22 mA readable)
- PWM: Analog input for pulse-width modulated voltage signal; voltage range: 10 – 24 V, frequency range: 50 – 1000 Hz, control range-duty cycle: 5 – 95 % (0 – 100 % readable)
- ROUT, RCOM: Potential-free relay contacts for indicating faults or operation; factory setting: indication of faults (wire-break-proof design; contact closes shortly after switching on the power supply and opens in case of fault or interruption of the power supply), max. switching voltage/current: 2A max/30Vdc or 2A max/30Vac, rated contact resistance: 100 mΩ

Maximum and minimum input values				
Input	Unit	Minimum value	Nominal value	Maximum value
Mains voltage (230 V)	V	200 V	230 V	240 V
Mains voltage (460 V)	V	380 V	460 V	480 V

Commissioning

6.1. Check and ensure the following before performing commissioning:

- All mechanical and electrical protective devices must be attached and connected.
- Secure touch protection as per DIN EN ISO 13857 based on the installation conditions.
- Design guards in such a way that no falling objects are drawn in by the fan (DIN EN 60529).
- Check the duct system and fan for foreign objects (tools, small parts, construction waste, etc.) and remove where appropriate.
- Check that impeller is free by turning it manually.
- Check the current type, voltage and frequency of the mains connection to ensure that it matches the type plate of the fan or motor.
- Check that connected elements are working properly.
- Close off any inspection openings (insofar as present).



WARNING

Only when all guards have been attached and the impeller has been secured as per DIN EN ISO 13857 may the fan be started up. The suitability of the protective devices and their fixtures to the fan must be assessed within the overall safety concept of the installation.

NOTE

The entire system must be assessed in the concrete application to ensure compliance with applicable standards and directives with regard to EMC. This is the responsibility of the customer.

6.2. Test run

Switch on the fan for a short time and check the direction of rotation of the impeller by comparing the rotary direction arrow on the fan..



CAUTION

Risk of injury from rotating impeller. Wait for the impeller to come to a standstill.

6.3. Check the power consumption

NOTICE

Once the operating speed of the fan has been reached, immediately measure the current consumption and compare it with the nominal current stated on the motor or fan type plate. If overcurrent persists, shut down the device immediately.

6.4. Check for smooth running

NOTICE

Check that fan runs smoothly. If unusual oscillations, vibrations, temperatures and bearing noises are determined, the device must be shut down immediately. The impeller must not drag against the inlet nozzle (audible test) under operating conditions. If it continues to drag, shut down the fan immediately.

6.5. Volume flow measurement device

The fans are equipped with a volume flow measurement device as standard. This facilitates easy volume flow determination and monitoring of the fan when installed.

$$q_v = K \times \sqrt{\frac{2}{\rho} \times \Delta p_{Dü}}$$

q_v Volume flow m^3/h

K Calibration factor m^2s/h

ρ Gas density kg/m^3

$\Delta p_{Dü}$ Differential pressure nozzle Pa

For fans that are fitted in a chamber, the pressure difference between static pressure in the suction side chamber and the pressure at the inlet nozzle should be measured. It is important to ensure that the static pressure (measured upstream of the inlet nozzle) is not distorted by dynamic pressure effects. If the differential pressure is routed via a pressure sensor, the signal can also be used for purposes. In order to calculate the volume flow, a calibration factor K is required for the respective fan. This is determined by a comparison measurement on a standard test rig with unimpaired inflow.

COPRA P/C Size	Calibration factor K10	COPRA P/C Size	Calibration factor K10
250	73	450	156
280	79	500	190
315	89	560	242
355	106	630	310
400	128	710	385

Calib. factor deviation: Standard calibration factor $K_{10} < 10\%$

If the simplified formula $qV = K \times (\Delta p)^{0,5}$ excl. gas density (ρ) shall be used in stead, the K-factor needs to be multiplied with $(2/\rho)^{0,5}$, e.g. 1,291 for gas density $\rho = 1,2 \text{ kg/m}^3$.

When installing the measuring hose, it is important to ensure that the hose is well secured and cannot rub against the impeller. Furthermore it is important to ensure that the hose is not excessively crushed or kinked.

NOTICE

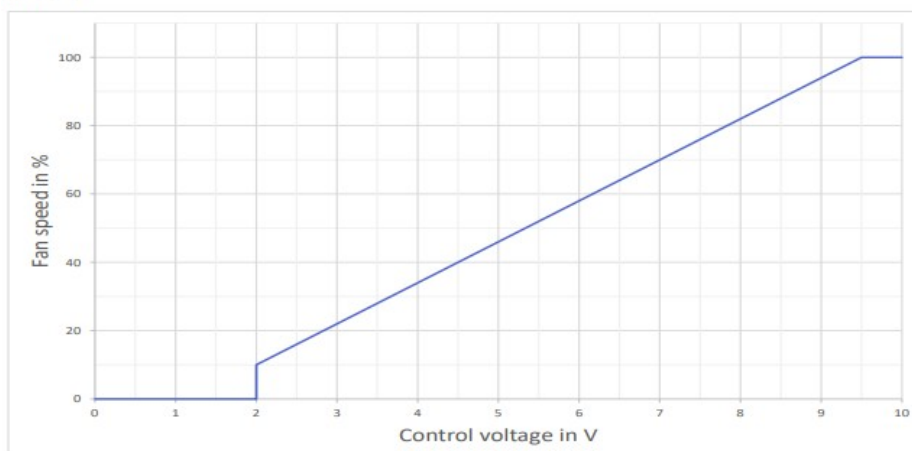
Certain parameters are required for commissioning. These are factory presets. Incorrect parameters can lead to problems, particularly during start-up.

6.6. Operating modes

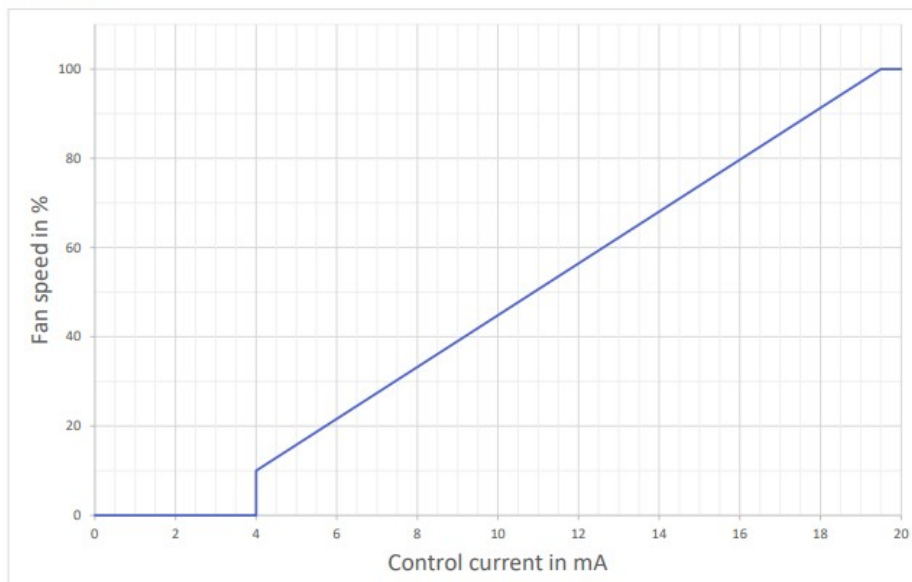
The speed can be set by analog control signal (0-10 V, 4-20 mA), PWM or by Modbus RTU. The control behavior of the individual interfaces is explained in the following sections.

6.6.1. Analog control (analog input signal)

0-10 V



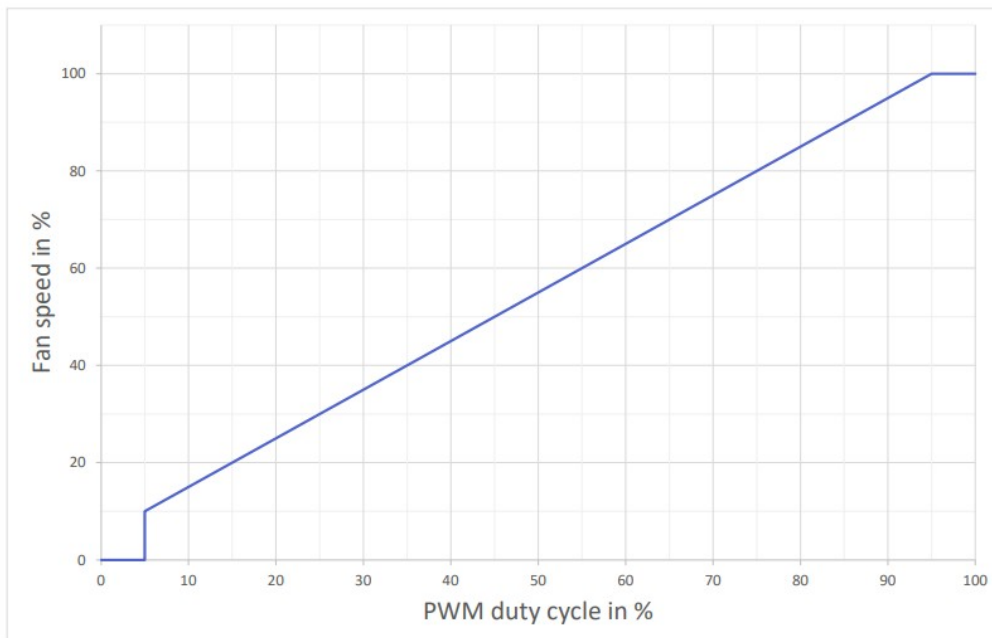
4-20 mA



6.6.2. PWM (PWM input)

Another method of setting the fan speed is with PWM input. Pin [PWM] accepts a PWM signal at a frequency anywhere between 50Hz and 1kHz. The duty cycle of the PWM frequency determines the fan speed, with the minimum duty cycle of 5% corresponding with minimum demand and increasing linearly to 100% demand at >95% duty cycle.

Duty Cycle (%) = $\frac{\text{Turn on Time}}{\text{Turn on Time} + \text{Turn off time}} \times 100$



6.6.3. Modbus operation

The Modbus interface has the following default communication settings:

- Protocol: Modbus RTU (8 bit data)
- Address/ID: 247
- Baud rate: 115200
- Stop bits: 1
- Parity: none
- Minimum response time: 50 ms
- Response timeout: >500 ms

The Modbus interface can be used for the following purposes:

1. Adjustment of:

- Modbus communication settings and monitoring (timeout)
- Settings/functions of digital/analog inputs/outputs, -min./max. speed, ramp times, frequency blanking etc.

2. Control:

- Enable/disable, presetting of speed

3. Monitoring:

- Query of operating data, such as actual speed, power, fault messages, actual state of digital/analog inputs/outputs

A complete list of read only and read/write parameters are identified in the COPRA Products Modbus Spec.

6.7. Self protective function of the electronics (faults and motor protections)

COPRA™ Fans have two layers of motor protections: UL safety features, and non-UL safety features. The UL safety features are backup protections if the non UL safety faults fails to shuts down or activate limits/derating. If UL safety faults exceeds four counts, the safety-core firmware will automatically perform a microler reset

Non UL Safety/application level protections:

- Over Voltage
- Under Voltage
- Over Temperature
- Loss of Input Phase

UL Safety-core level protections:

- Locked Rotor
- Loss of Output Phase
- Over Load
- Hardware Faults

6.7.1. Non UL – Over Voltage

1. Drive shuts down on over voltage when DC bus voltage exceeds the threshold voltage (see table below)

Model	Over Voltage Threshold (DC)	Approximate AC Input Voltage
230 V	450 V DC	318 V AC
460 V	830 V DC (1.3 kW)	586 V AC
460 V	850 V DC (4.5 – 8 kW)	600 V AC

2. Drive will try to restart after a delay of 2 seconds. If the over voltage condition persists, drive will shut down and indicate an over voltage fault and keeps retrying after the fault wait delay expires. Note that the number of retries is not limited.

6.7.2. Non UL – Under Voltage

1. Drive shuts down on under voltage when DC bus voltage falls below the threshold voltage (see table below)

Model	Under Voltage Threshold (DC)	Approximate AC Input Voltage
230 V	220 V DC	155 V AC
460 V	440 V DC	311 V AC

2. Drive will try to restart after a delay of 2 seconds. If the under voltage condition persists, drive will shut down and indicates an under voltage fault. Drive will keep retrying after the fault wait delay expires. Note that the number of retries is not limited.

6.7.3. Non UL – Over Temperature

1. Drive shuts down on Over Temperature when IPM temperature exceeds the internal threshold.
2. Drive will try to restart after a delay of 30 seconds. If the over temperature condition persists, drive will shut down and indicates an over temperature fault. Drive will keep retrying after the fault wait delay expires. Note

that the number of retries is not limited.

6.7.4. Non UL – Utility supply power input phase

1. Drive shuts down when loss of input phases is detected and significant power (>50% of rated power) is used.
2. Drive will try to restart after a delay of 30 seconds. If the loss of phase persists, drive will shut down and indicates a loss of phase fault and keeps retrying after the fault wait delay expires. Note that the number of retries is not limited.

6.7.5. UL – Locked Rotor

1. Drive shuts down on locked rotor on start-up if the locked rotor condition is detected.
2. Drive will try to restart after a delay of 30 seconds. If the locked rotor condition persists, drive will shut down and indicates an UL Locked Rotor Fault and keeps retrying after the fault wait delay expires. Note that the number of retries is not limited.

6.7.6. UL – Loss of Motor Phase

1. Drive shuts down if a sudden loss of one of the motor phases is detected while the motor is running.
2. This fault is not detected when the drive's output current is zero (when motor is in idle state).
3. Drive will try to restart after a delay of 30 seconds. If the loss of motor phase condition persists, drive will shut down and indicates an UL Loss of Motor Phase Fault and keeps retrying after the fault wait delay expires. Note that the number of retries is not limited.

6.7.7. Non UL – Derating

- There are three types of derating: 1. Current Derating, 2. Power Derating, 3. Temperature Derating
- Each of these has the following settings: 1. Threshold – Derate threshold, 2. Hysteresis – Threshold below which derate will stop, 3. Derate period – Wait period before next RPM reduction, 4. Derate RPM – Amount of RPM to reduce.
- If the measured value exceeds the threshold, the speed will be dropped periodically to keep the measured value until it is below the hysteresis threshold
- Typical temperature threshold is 110 deg C for 1.3kW and 107 deg C for 4.5 kW and 8 kW.

6.7.8. UL – Over Load

- If the measured phase current into the motor is above the UL over load threshold, motor will shut down on Over Load fault.
- Drive will try to restart after a delay of 30 seconds. If the condition persists, drive will shut down and indicates an UL Fault and keeps retrying after the fault wait delay expires. Note that the number of retries is not limited.

6.7.9. UL – Hardware Faults

1. Drive shuts down on hardware faults if a hardware fault is detected by safety core.

2. Drive will try to restart after a delay of 30 seconds. If the condition persists, drive will shut down and indicates an UL Fault and keeps retrying after the fault wait delay expires. Note that the number of retries is not limited.

NOTICE

After 4 total UL Faults within a power cycle, motor will not attempt restart until after 120 seconds..

Maintenance / repairs

7. 1 . Safety instructions

Before working on the fan, it is imperative to ensure the following:

- All drives have been disconnected from the mains.
- Wait until the impeller has come to a standstill.
- Check the surface temperature to avoid any risk of burns.
- Ensure that the fan cannot start up in an unled manner while performing the maintenance work (for example lockable isolators).
- Observe the regulations of the motor manufacturer and also the inverter manufacturer (where applicable).



DANGER

There is electrical voltage in the intermediate circuit of the electronics and at the main connection when the permanent magnet motor is rotating.

- Do not perform any work on the fan when the impeller/motor is rotating freely.
- Lock the impeller using suitable means.
- Before performing maintenance work, use suitable means to remove all harmful or hazardous residual materials that have found their way into the fan as a result of the conveying media.

Recommissioning is then performed once the safety inspections stated in Chapter 6 “Commissioning / safety inspections” have been completed. However, work that can only be performed during operation in compliance with the applicable safety and accident prevention regulations is excluded from this. This for example includes measurement of vibrations and shock pulses.



WARNING

Failure to observe these points can present hazards to the life or physical condition of the maintenance personnel.

NOTICE

If the condition of the fan does not allow repair by appropriate means, the fan must be shut down immediately and, if necessary, replaced.

7.2. Maintenance intervals

During extended periods of non-use, the fan should be started up regularly for a short period as a way of avoiding bearing damage due to mechanical stress or ingress of moisture. After being stored for an extended period of time, the motor bearings should both be checked before installation.

NOTICE

The maintenance regulations of the motor manufacturer, as well as information from the manufacturers of the switch and devices and the frequency converter must be observed.

To maintain correct operation and ensure safety, we recommend having the function and condition of fans checked

at regular intervals by qualified personnel or a specialist company and having the results documented. The type, scope and maintenance intervals, as well as any further actions that are necessary, should all be specified on the basis of how the fans are used, as well as the conditions in place on site. For the maintenance and inspection recommendations based on VDMA 24186–1, please refer to our website: www.nicotra-gebhardt.com.

NOTICE

Do not use any high-pressure cleaners (steam cleaners). Do not use cleaning agents that contain strong acids or alkalis!

7.2.1. Vibrations

The fan should be checked regularly for mechanical vibrations. The maximum vibration velocity in the radial direction on the level of the motor is 4.5 mm/s. In the case of impellers with nominal diameters of up to 315 mm, up to 7.1 mm/s is permitted when fitted. If the permitted vibration values are exceeded, it is mandatory to rebalance the entire rotating unit in accordance with DIN ISO 21940-11.

7.2.2. Impeller mounting

Following impeller mounting and remounting, the fan must be checked for mechanical vibrations. It may also need to be rebalanced.

7.3. Spare parts

Only use original spare parts as specified in the spare parts list.

NOTE

We do not accept any liability for damage caused by the use of nonoriginal parts.

Breakdowns/malfunctions

Deviations from the standard operating conditions of the fan indicate malfunctions and should be investigated promptly by the maintenance personnel.



CAUTION

Malfunctions that persist for an extended period of time can lead to destruction of the fan and also system components, as well as personal injuries.

If the maintenance personnel is unable to rectify the issue, please request a visit from our mobile customer service.

Troubleshooting Guide

9.1. Fault Indication – LED Blink Codes

When a fault is indicated, the LED will blink the number of times specified in the chart below followed by a 2 second pause before it blinks again.

Fault	Modbus fault code	LED Code	Description
No Fault	0	0	No Fault
Motor software fault	1	1	Sensorless loop in software lasted too long
Under Voltage	2	2	DC bus voltage falls below the threshold voltage
Over Voltage	4	3	DC bus voltage exceeds the threshold voltage
Over Temperature	8	4	IPM temperature is above threshold.
Speed Feedback	16	5	Measured speed does not match reference speed
Start Up	32	6	Open to close loop transition failed
Loss of input phase	64	7	Disconnection of motor phases
Reserved	128	8	tbd
Hardware Fault	256	9	Hardware over voltage or short circuit fault
UL Safety fault	512	10	One of the UL safety core faults
Internal Communication Loss	1024	11	Internal communication between micro controllers lost
Software Error	2048	12	Motor firmware error

9.2. Troubleshooting Faults

When the troubleshooting below calls for “power cycle” here is the procedure: turn off power to the motor, wait 30 seconds, turn power back on to the motor to restart. Note that the drive automatically retries after the 30 second wait time. Number of retries is not limited; drive will retry until the fault condition is cleared and a successful restart is achieved..

Fault	Description	Possible Remedy
Motor soft- ware fault	Sensorless loop in software lasted too long	Power cycle to reset drive
Under Voltage	DC bus voltage falls below the threshold voltage	Check line voltage to verify it is within 10% of nameplate voltage
Over Voltage	DC bus voltage exceeds the threshold voltage	Check line voltage to verify it is within 10% of nameplate voltage
Over Tempera- ture	IPM tempera- ture is above threshold	Turn off motor and remove power to allow drive to cool. Verify that the chimney of the drive is not blocked. Restart and retry.
Speed Feed- back	Measured speed does not match reference speed	Check if fan is loose and retighten. Check if shaft is physically locked and try to free. Restart and retry
Start Up	Open to close loop transition failed	Check if fan is loose and retighten. Check if shaft is physically locked and try to free. Restart and retry
Loss of output phase	Disconnection of motor phase/ winding	Please contact your service partner
Over current	Hardware over voltage or short circuit fault	Power cycle and try again. If problem persists, replace motor
UL Safety fault	One of the UL safety core faults	UL safety core faults occur for various reasons such as a locked rotor or an overloaded situation. Turn off motor and verify the shaft is not locked and retry. Power cycling can reset the fault
Internal Communication Loss	Internal communication between micro controllers is lost	Power cycle and try again. If problem persists, replace motor
Software Error	Motor firmware error	Power cycle and try again. If problem persists, replace motor

Recycling/disposal

The protection of the environment and the conservation of resources are important issues for Nicotra Gebhardt. We therefore pay attention to sustainable, environmentally friendly designs, as well as technical safety and health protection when developing our fans. When disposing of components or waste, please observe the applicable country-specific legal regulations.

10.1. Disassembly

The disassembly of the product must be performed or monitored by specialist personnel. The disassembly process should be prepared as follows:

- Disconnect the machine from the mains and remove all cables.
- Transport the machine to a suitable location for the disassembly process.



WARNING

The products include certain components that are quite heavy. These can fall down during disassembly. This may cause serious physical injury, death and material damage. Secure machine parts that are to be disassembled to prevent them from falling down.

10.2. Component disposal/recycling

The machine is made predominantly from metallic materials. These are fully recyclable. Please separate the components into the following categories:

- Steel and iron, aluminium, non-ferrous metal, insulating materials, cables and leads
- Electronic scrap (where present), plastics
- Electronic components must be disposed of as electronic scrap

Service

We offer all of our partners the following service:

Mobile customer service

Phone +49 (0)7942 101 0

info.ng.de@regalrexnord.com

www.nicotra-gebhardt.com

Manufacturer's notification

Our products are manufactured in compliance with applicable international standards and regulations. If you have questions regarding the use of our products, or if you are planning a special application, please contact us.

UL CERTIFIED

UL FILE NUMBER:

XDNW2.E306123 – ELECTRONICALLY PROTECTED MOTORS COMPONENT



Appendix

Original

EC declaration of incorporation

for the EC Machinery Directive (2006/42/EC)

The manufacturer: Nicotra Gebhardt GmbH

Gebhardtstraße 19-25, 74638 Waldenburg, Germany

hereby declares that the following product:

Product designation: Radial fan without housing with direct drive

Type designation: COPRA CB-C..., COPRA PA-C...

Serial number: See type plate

Year of manufacture: See type plate

as a partly completed machine in the sense of Article 2, clause "g" meets the following basic requirements of the Machinery Directive (2006/42/EC): Appendix I, Articles 1.1.2, 1.3.7

This partly completed machine may only be commissioned once it has been determined that the machine into which it is to be fitted complies with the provisions of the Machinery Directive (2006/42/EC).

The following harmonised standards 1) were applied:

DIN EN ISO 12100: Safety of machinery – General principles for design

DIN EN ISO 13857: Safety of machinery – Safety distances to prevent hazard zones being reached by upper and

lower limbs

Additional national standards and technical specifications 2), in particular: VDMA 24167: Fans – Safety requirements

The manufacturer is committed to providing the special documents required for the partly completed machine as per Appendix VII, Part B to any national authority on request by post/e-mail.

Waldenburg/Ciserano, June 01, 2023

Authorised representative for the technical documentation: Klaus Gundel

Production Director / Production Director / Head of Research and Development
pp. Ulrich Reichert / pp. Paolo Di Dionisio / pp. Dr. J. Anschütz

1. Please refer to the documentation provided by the manufacturer for a complete list of applicable standards and technical specifications
2. Insofar as no corresponding harmonised standards are yet available

Original

CE

EC declaration of conformity

for the European Ecodesign Directive (2009/125/EC)

We hereby declare that the product stated below complies with the ecodesign requirements, as stipulated by Regulation (EU) No. 327/2011 of the Commission in Appendix I, Section 2, based on the degree of efficiency of the corresponding fan type specified in the technical documentation and the measurement/efficiency category.

Designation: Radial fan without housing with direct drive

Fan type: COPRA CB-C..., COPRA PA-C...

Device number: See type plate

Year of manufacture: See type plate

Relevant EC Directives: EC Directive on the environmentally friendly “ecodesign” of energy-related products (2009/125/EC)

Waldenburg/Ciserano, June 01, 2023

Production Director / Production Director / Head of Research and Development pp. Ulrich Reichert / pp. Paolo Di Dionisio / pp. Dr. J. Anschütz

Original

CE

EC declaration of conformity

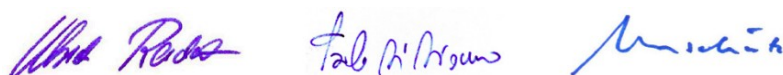
for the European Electromagnetic Compatibility Directive (2014/30/EU) for the European Low Voltage Directive (2014/35/EU)

Herewith we declare that the machinery designated below, on the basis of its design and construction in the form brought onto the market by us is in accordance with the relevant EU Council Directives as mentioned below. If alterations are made to the machinery without prior consultations with us, this declaration becomes invalid.

Designation: Radial fan without housing with direct drive

Fan type: COPRA CB-C..., COPRA PA-C...
Device number: See type plate
Year of manufacture: See type plate
Device Number: See type plate
Year of manufacture: See type plate
Relevant EC Directives: EU-Directive of Electromagnetic Compatibility (2014/30/EU)
Low Voltage Directive (2014/35/EU)
Applied harmonized standards, in particular
DIN EN 60335-1, DIN EN 60204-1
DIN EN 61000-3-2, DIN EN 61000-3-3
DIN EN 61000-6-2, DIN EN 61000-6-4
DIN EN 61000-4-3, DIN EN 61000-4-6
DIN EN 61000-4-13

The sole responsibility for issuing this declaration of conformity lies with the manufacturer.
Waldenburg, June 01, 2023



Production Director / Production Director / Head of Research and Development pp. Ulrich Reichert / pp. Paolo Di Dionisio / pp. Dr. J. Anschütz

*Electromagnetic Compatibility directive according to 2014/30/EU is only applicable if the listed types and series are installed and commissioned in accordance with the operating instructions. If the listed types and series are integrated as system components into a system or operated with other components such as control or control devices, the operator or manufacturer of the entire system is responsible for compliance with the directive according to 2014/30/EU.

OI COPRA™ FANS C/P 1.2

Original

UK declaration of incorporation

UK Machinery (Safety) Regulation 2008

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

hereby declares that the following product:

Product designation: Radial fan without housing with direct drive

Type designation: COPRA CB-C..., COPRA PA-C...

Serial number: See type plate

Year of manufacture: See type plate

as a partly completed machine in the sense of Article 2, clause “g” meets the following basic requirements of the Machinery (Safety) Regulation 2008: Appendix I, Articles 1.1.2, 1.3.7

This partly completed machine may only be commissioned once it has been determined that the machine into which it is to be fitted complies with the provisions of the Machinery (Safety) Regulation 2008.

The following harmonised standards 1) were applied:

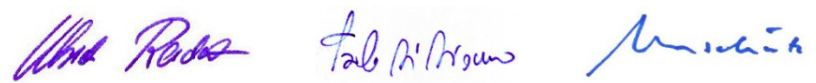
DIN EN ISO 12100: Safety of machinery – General principles for design

DIN EN ISO 13857: Safety of machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs

Additional national standards and technical specifications 2), in particular: VDMA 24167: Fans – Safety requirements

The manufacturer is committed to providing the special documents required for the partly completed machine as per Appendix VII, Part B to any national authority on request by post/e-mail.

WaldenburgCiserano, June 01, 2023
Authorised representative for the technical documentation: Klaus Gundel



Production Director / Production Director / Head of Research and Development pp. Ulrich Reichert / pp. Paolo Di Dionisio / pp. Dr. J. Anschütz

- 1. Please refer to the documentation provided by the manufacturer for a complete list of applicable standards and technical specifications
- 2. Insofar as no corresponding harmonised standards are yet available

Original



UK Declaration of Conformity
The Ecodesign for Energy-Related Products Regulations 2010

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

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 eco-design requirements of the UK Legislation as mentioned below.

Designation: Centrifugal fan without scroll direct driven
Fan type: COPRA CB-C..., COPRA PA-C...
Serial no: See type plate
Year of manufacturing: See type plate
Relevant UK Legislation: The Ecodesign for Energy-Related Products Regulations 2010

The sole responsibility for issuing this declaration of conformity lies with the manufacturer.
Waldenburg/Ciserano, June 01, 2023



Production Director / Production Director / Head of Research and Development pp. Ulrich Reichert / pp. Paolo Di Dionisio / pp. Dr. J. Anschütz

Original



UK Declaration of Conformity

UK-Directive of Electromagnetic Compatibility Regulations 2016 and for the Low Voltage Directive 2016

The manufacturer: Nicotra Gebhardt GmbH

Gebhardtstraße 19-25, 74638 Waldenburg, Germany

Herewith we declare that the machinery designated below, on the basis of its design and construction in the form brought onto the market by us is in accordance with the relevant Council Directives as mentioned below. If alterations are made to the machinery without prior consultations with us, this declaration becomes invalid.

Designation: Direct driven fan without scroll

Fan type: COPRA CB-C..., COPRA PA-C...

Serial no: See type plate

Year of manufacturing: See type plate

Relevant UK Legislation: UK-Directive of Electromagnetic Compatibility Regulations 2016* Low Voltage Directive 2016

Applied harmonized standards, in particular:

DIN EN 60335-1, DIN EN 60204-1, DIN EN 61000-3-2, DIN EN 61000-3-3,
DIN EN 61000-6-2, DIN EN 61000-6-4, DIN EN 61000-4-3, DIN EN 610004-6, DIN
EN 61000-4-13

The sole responsibility for issuing this declaration of conformity lies with the manufacturer.

Waldenburg/ciserano, June 01, 2023

Production Director / Production Director / Head of Research and Development pp. Ulrich Reichert / pp. Paolo Di
Dionisio / pp. Dr. J. Anschütz

*Electromagnetic Compatibility directive according to 2016 is only applicable if the listed types and series are installed and commissioned in accordance with the operating instructions. If the listed types and series are integrated as system components into a system or operated with other components such as control or control devices, the operator or manufacturer of the entire system is responsible for compliance with the directive according to 2016.

Direct driven Radial fans without scroll

Regal Rexnord

Contact us: [rexnord.com/contact](https://www.rexnord.com/contact) [regalrexnord.com](https://www.regalrexnord.com)

The proper selection and application of products and components, including assuring that the product is safe for its intended use, are the responsibility of the customer. To view our Application Considerations, please visit <https://www.regalrexnord.com/Application-Considerations>.

To view our Standard Terms and Conditions of Sale, please visit <https://www.regalrexnord.com/>

Terms-and-Conditions-of-Sale (which may redirect to other website locations based on product family).

"Regal Rexnord" is not indicative of legal entity. Refer to product purchase documentation for the applicable legal entity. Regal Rexnord and Nicotra Gebhardt are trademarks of Regal Rexnord Corporation or one of its affiliated companies.



Power Efficiency Solutions
Nicotra Gebhardt GmbH
Phone: +49 (0)7942 101 0
info.ng.de@regalrexnord.com
regalrexnord.com/brannds/nicotra-gebhardt

FORM

REV. 1.2

JUNE 2023

Further languages available on request


Revision index

Revision Date

BA-CFD-COPRA 1.1-04/2023

© 2023 Regal Rexnord Corporation. All Rights Reserved.

Documents / Resources

	<p>NICOTRA COPRA Direct Driven Radial Fans Without Scroll [pdf] Instruction Manual BA-CFD-COPRA 1.1, OI COPRATM FANS C-P 1.2, COPRA Direct Driven Radial Fans Without Scroll, COPRA, Direct Driven Radial Fans Without Scroll, Driven Radial Fans Without Scroll, Radial Fans Without Scroll, Fans Without Scroll, Scroll</p>
--	--

References

- [NG Home - Nicotra Gebhardt](#)
- [User Manual](#)

Manuals±, Privacy Policy

This website is an independent publication and is neither affiliated with nor endorsed by any of the trademark owners. The "Bluetooth®" word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. The "Wi-Fi®" word mark and logos are registered trademarks owned by the Wi-Fi Alliance. Any use of these marks on this website does not imply any affiliation with or endorsement.