

Montageanleitung

RLO

(Original)

DE

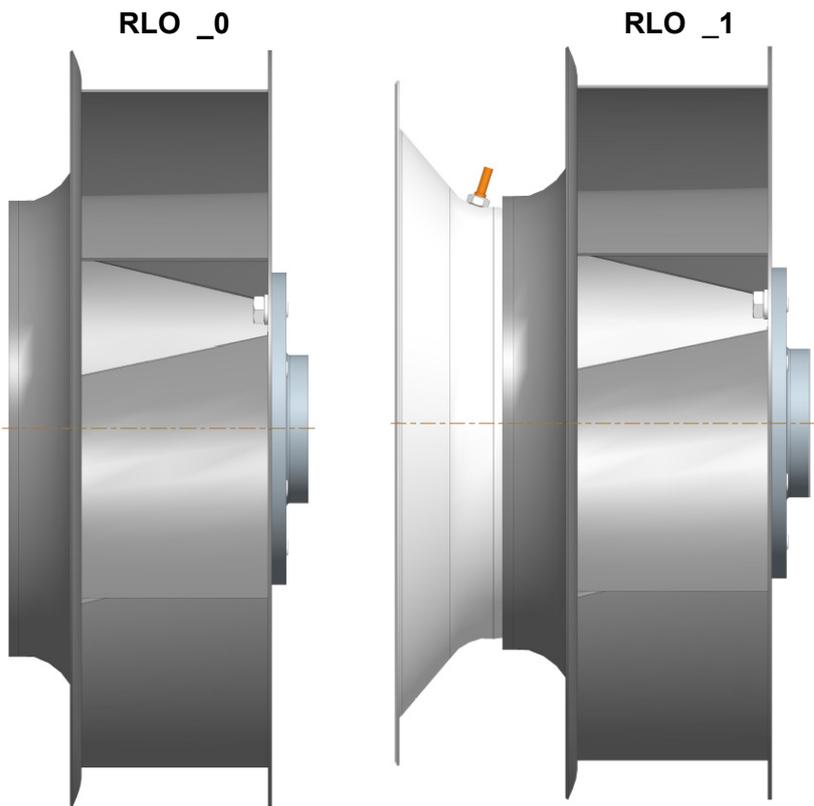
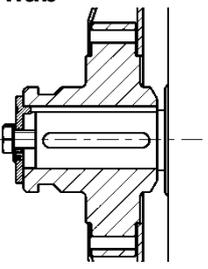
Mounting Instructions

RLO

(Translation of the original)

EN

MA_RLO 1.0 – 06/2014

	<p>Taperlock Clamping-bush system</p> 
<p>Fixed hub</p> 	
<p>Inlet nozzle with IMV</p> 	

1. Revision index

Revision	Date
MA_RLO 1.0	06/2014

2. Safety notes



RLO (Radial Laufrad Ohne Motor) (Radial Impeller Without a Motor) are not ready-to-use products but are designed as components for air conditioning, aeration and ventilation systems. The impellers with hub are prebalanced; the balancing status must be checked on the whole unit. They may only be operated when they have been installed according to their provisions and the safety level has been secured through use of safety equipment according to DIN EN ISO 13857 (DIN EN ISO 12 100) or other constructional safety measures.



- These mounting instructions are an integral part of the product and should be put, accessible, into safe keeping as such.
- The impellers are only designed to transport air or mixtures similar to air. Use in areas subject to explosions for transporting gas, mist, vapours or their mixtures is not permitted. Transport of solids or solid matter content in the conveying media is not permitted.
- The permitted temperature range lies between -20°C and $+60^{\circ}\text{C}$.



- Only operate the impeller for its intended use and only up to the maximum permitted operating rpm according to information provided on the impeller type plate. Exceeding the max. permitted operating rpm leads to risky situations due to the high centrifugal forces generated. The impeller can burst – danger to life! The max. permitted operating data shown on the type plate apply for an air density of $\rho = 1.2 \text{ kg/m}^3$.
- One should ensure through rpm controlling by means of a frequency converter that the max. permissible rpm is not exceeded through a malfunction of the frequency converter.
- Assembly must only be performed by skilled personnel while observing instructions in the operating manual as well as valid regulations.
- Before performing any work on the fan or on the motor, pull out the power plug for the power supply; to replace the motor unclamp the cable on the motor terminal box.
- Protective equipment, which was removed for assembly work, should be attached again immediately after assembly (and before connecting to the electrical power source).
- Mount impellers and accessories in such a way that their stability is achieved at all times during operation.

3. Transport / Storage

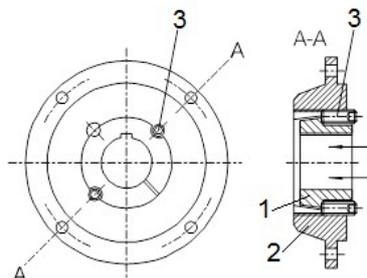
- Check the delivery for completeness and transport damage.
- Radial impellers are usually delivered on Euro pallets and can be transported using a fork low lift truck.
- When transporting with hoisting equipment: Lay a lifting belt with an adequate load carrying capacity around a impeller blade.
- Only use a lifting belt which is suitable for carrying sharp-edged loads.
- Avoids knocks and impacts.
- Inform the freight forwarder if damage is found.
- Store the impellers in a dry, dust and vibration free environment.

4. Impeller installation with the Taperlock clamping sleeve hub

The impeller is connected by means of clamping sleeves with the end of the shaft of the drive motor.

4.1 Installation

Picture 4-1:
Taperlock
clamping sleeve



1. **Clean** and degrease all blank surfaces (fitting surfaces for the clamping sleeves and motor shaft or drive shaft).
2. Insert the clamping sleeve (1) into the hub (2) and bring the bores to the cover.
3. Lightly oil the threaded pins (3) and screw them in – not fully tightened yet.
4. Push the impeller with the clamping sleeve unloaded onto the shaft (for a respective impeller weight with the aid of hoisting equipment), align in an axial position and tighten down the threaded pins cross-wise and evenly. **Observe the tightening torque conforming to Table 4-1.** Fill empty bores with grease to avoid ingress of foreign bodies.
5. Check the **tightening torque** on the screw connection after a **operating time of about 1 hour** using the required tightening torque.

When using open feather key grooves, first place the feather key in the middle in the shaft groove. The feather key must take weight over its whole length.

Picture 4-2:
Position of the
feather key

Position of the feather key:
Correct:

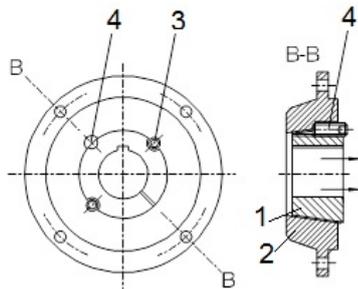


Wrong:



4.2 Disassembly

Picture 4-3:
Taperlock
clamping sleeve



1. Loosen all threaded pins (3) and completely remove one or two threaded pins dependent on the sleeve size, lubricate and screw into the disassembly bores (4).
2. Tighten one or both threaded pins evenly until the clamping sleeve (1) is released from the hub (2).
3. The impeller can be removed.

4.3 Technical data

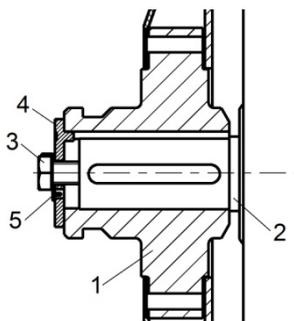
Table 4-1:
Torque table

Sleeve size	1008	1108	1210	1610	1615	2012	2517	3020	3030	3525	3535	4030	4040	4535	4545	5040	5050
Screw tightening torque (Nm)	5.6	5.6	20	20	20	30	50	90	90	115	115	170	170	190	190	270	270

5. Installation of an impeller for impellers with a fixed hub

5.1 Installation

Picture 5-1:
Fixed hub



1. The impeller is connected by means of the fixed hub with the end of the shaft of the drive motor.
2. Slightly grease all blank surfaces (end of the shaft, hub bore). Pull the impeller with hub (1) onto the shaft shoulder (2) (transition fit). For an appropriate weight secure the weight using hoisting equipment. Provide for axial shaft securing using a bolt 3), washer (4) and lock washer (5). Observe the tightening torque conforming to Table 5-1.

5.2 Disassembly

1. Loosen the axial bolt and pull off the impeller with a hub using a suitable extraction device.
2. For an appropriate weight secure the weight using hoisting equipment.

5.3 Technical data

Table 5-1:
Torque table

FK 8.8	M4	M5	M6	M8	M10	M12
Screw tightening torque (Nm)	2.8	5.5	9.5	23	45	79

6. Setting up equipment

Wear safety shoes and safety gloves when working!

- Observe the safety instructions
- Ensure there are adequate distances from the suction and the pressure side.
- Performing one's own changes / modifications on the product is not permitted. A safety risk!
- Disassembly or attachment of components to the impeller leads to annulment of the warranty!

7. Operating conditions



- Do not use the impeller in an explosive atmosphere – there is a hazard from spark formation. Explosion hazard!
- Exceeding the max. permitted operating rpm (see impeller type plate) is not permitted See safety instructions.
- For operation with a frequency converter ensure that there is no increase in the resonance vibration from the function “**Overmodulation**“ on the frequency converter. The overmodulation function must be switched off.
- Avoid any dynamic stress on the impeller; no frequent load changes!

8. Initial start-up



- Remove any assembly residues and foreign bodies from the area around the impeller and the suction removal area.
- Check the direction of rotation (the direction of the rotation arrow on the impeller base disk).
- During initial start-up the whole unit must be checked for mechanical vibrations. Rebalancing must be undertaken if necessary.
- Ensure quiet low vibration running.
- Determine the resonance area of the whole unit. If the resonance area lies within the operating area, adjust the frequency converter in such a way that the unit can run through the resonance area quickly. Strong vibrations through rough running (unbalance; overmodulation of the frequency converter) for example due to transport damage, inappropriate handling or operation in the resonance area, can lead to product failure.

9. Maintenance and upkeep



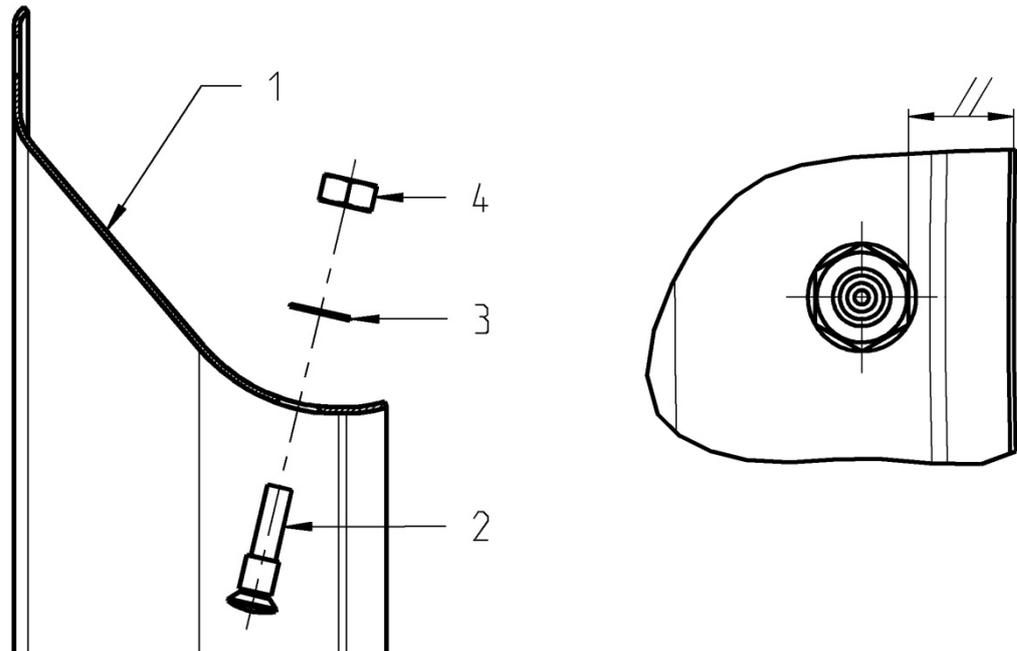
- Depending on the area of use and the conveying medium, the impeller is subject to natural wear. Sediments accumulating on the impeller can lead to unbalance and therefore to damage (risk of a fatigue fracture).
- Check the impeller, in particular welding seams, for possible crack formation.
- Check the total unit regularly for mechanical vibrations. We recommend a maximum oscillation speed in a radial direction on the bearings or on the bearing shield of the motor of not more than 4.5 mm/s. If the permissible vibration values are exceeded, it is essential to rebalance the whole rotating unit according to DIN ISO 1940-1.
- During impeller assembly and reassembly the whole unit must be checked for mechanical vibrations. Rebalancing must be undertaken if necessary.

10 Cleaning

- Regular inspection, if necessary with cleaning, is necessary to avoid unbalance through contamination.
- Cleaning intervals are according to the degree of contamination of the impeller.
- The complete product must be cleaned using a moist cloth.
- One should not use aggressive, paint removing cleaning agents while cleaning.

11 Mounting the measuring nipple

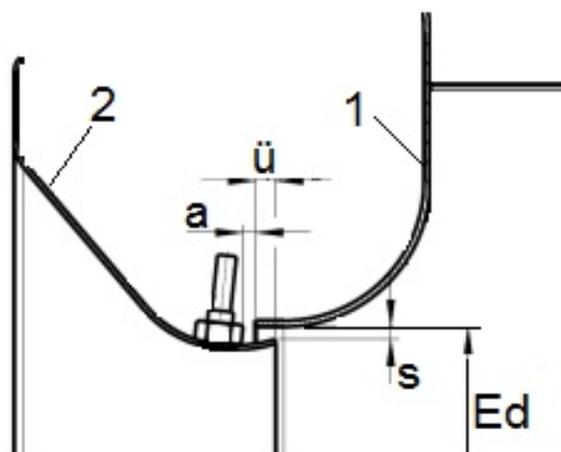
Picture 11-1:
Mounting the
measuring
nipple



- Put on the measuring nipple (2) from inside through the nozzle (1) and fasten in place using a toothed washer (3) and an hexagonal nut (for ATEX made out of copper) (4).
- Tighten by hand, about 7.5 Nm.
- Ensure that the key surface of the nut is parallel to the nozzle edge (picture on the right).

12 Nozzle overlapping, gap sizes and clearances

Picture 12-1:
Nozzle
overlapping



- The nozzle overlapping (\ddot{u}) should be 0.5% to 2,5% of the inlet diameter (Ed).
- Align the impeller (1) and nozzle (2) in such a way that the gap(s) is almost even all the way around.
- The clearance (a) should be at least 1.0% of the inlet diameter (Ed).

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