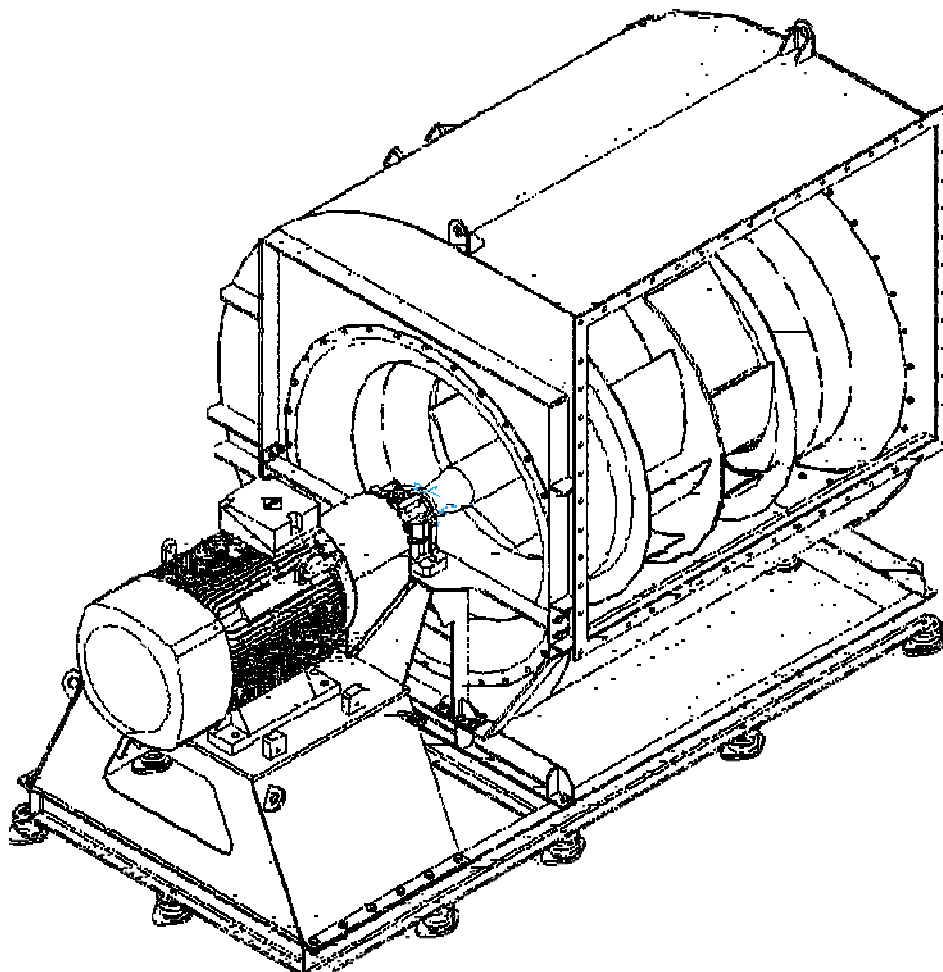


Operating and Maintenance Instructions

Centrifugal Fan



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2 General

2.1 Introduction

2.2 General Instructions

2.3 Additional Notes

2.1 Introduction

The following information is intended to be read, understood and observed in all points by the persons responsible for the EDEL VENT. The complete technical information should always be kept at hand near the fan.

Particularly important details for the use of the EDEL VENT fans are pointed out in these operating instructions.

2.2 General Instructions

Observe directions in these operating instructions

- Basic requirement for safe handling and trouble-free operation of this fan is the knowledge of the basic safety instructions and safety regulations.
- These operating instructions contain the most important instructions to operate the fan safely.
- These operating instructions, in particular the safety instructions, shall be observed by all persons working on the fan.
- In addition, the rules and regulations for the prevention of accidents valid at the place of use are to be adhered to.

2.3 Additional Notes

Guarantee and Liability

Basically, our "General Sales and Delivery Conditions" apply. These will be available to the operator/owner at the latest since conclusion of the contract. Guarantee and liability claims in the case of personal injury and damage to property are excluded, if these are due to one or several of the following causes:

- Operation of the fan not in accordance with its intended use
- Improper installation, start-up, operation and maintenance of the fan
- Operation of the fan with defective safety equipment or improperly mounted or inoperable safety and protection equipment
- Non-observance of the operating instructions pertaining to this fan.
- Unauthorized constructional changes to the fan
- Unauthorized change of the performance data
- (e.g. drive conditions, power and speed) of the fan
- Insufficient monitoring of fan parts subjected to wear
- Improperly performed repair
- Catastrophic failure due to the effects of foreign objects and force majeure

3 Safety

3.1 General Safety Instructions.

3.2 Instructions for Prevention and/or Correction of Problems.

3.3 Additional Rules and Regulations for Accident Prevention.

3.1 General Safety Instructions

Basic Safety Instructions

When operated to its intended purpose, and the fan wheel is regularly cleaned, the fan will run trouble-free and reliably. However, if the necessary external conditions are not adhered to, there will be danger:

- To the life and limb of persons working in the vicinity of the fan
- To the fan and other property of the operator/owner
- To the efficient operation of the fan

All persons involved in installation, start-up and maintenance shall carefully read, understand and observe the following information. It is your safety that is concerned!

Commitment of the Operator/Owner

The operator/owner commits himself to only employ persons for work on the fan who

- are familiar with the regulations of occupational safety and accident prevention and are instructed in handling the fan
- have read the safety section and warning notes and confirmed this by their signature.
- The safety-conscious working of the personnel will be checked at regular intervals.

Commitment of the Personnel

All persons employed to perform work on the fan commit themselves before start of work to :

- adhere to the basic regulations of occupational safety and accident prevention
- read the safety sections and warning notes in these operating instructions and confirm by their signature that they have understood them.
- All safety and warning labels on the machine shall be maintained in legible condition.

3.2 Instructions for Prevention and/or Correction of Problems

Problem	Possible cause	Correction of Problem/Action
FAN CAUSES:		
unsteady run of fan	material sticking to impeller blades	clean impeller carefully
	impeller worn out	exchange impeller
	impeller deformed by thermal effect	exchange impeller
	distortion of fan by uneven foundation	loosen foundation fastenings and level foundation, subsequently re-fasten the fan
	improper adjustment of the anti- vibration mounts or of the anti- vibration mounts (spring-type)	correct adjustment
	stress due to incorrect installation of the ductwork	use flexible connections for the ducting

decreased of volume flow total pressure is low	too low impeller rotation	Check type of fan motor/engine with the type mentioned in fan datasheet
	wrong way of rotation	Make sure of that, the electric power is connected to motor/engine correctly
	can not full open the throttle valve	Check the valve adjusting, inform the installation/mounting provider company Remove stoppers and adjust it again
handled gas leaks from the shaft sealing	seal defective or worn out	exchange sealing
rubbing noises from the fan	impeller rubs against inlet.	loosen top part of housing and readjust, if required, check ducting and readjust it
	motor noise	check motor for bearing damages, if required, exchange bearings
the current consumption stated on the motor name plate is exceeded permanently	handled gas volume too high	reduce the flow volume by using a damper until the permitted current consumption is reached
	different speed due to 60 Hz net work	check frequency.
fan does not start up	incorrect electric connection of the motor	check electric connection
	trouble with star-delta starting, motor stops acceleration during star connection	reduce change-over time from star to delta
	start-up against too low system resistance	close dampers or install additional plate shutters
	design of motor protective system insufficient	cable cross section and motor protective system must be designed for the starting current during the complete start-up
	start-up time takes too long	close dampers, check starting torque of the motor MA/MN
	drive motor defective	check motor and exchange, if required
	motor too warm due to high connecting frequency	choose permanent operation of the fan and control the flow with dampers or variable speed control
	starting current too high	incorrect voltage provide for star-delta start-up, insufficient local power supply

BEARINGS CAUSES:

unsteady run	damages on bearing races and rollers/balls, bearing clearance too large	exchange bearings
	wear caused by dirt or insufficient lubrication	protect bearings against contamination, use clean grease only

extraordinary running noise:		
wailing or whistling noise	bearing clearance too small	use bearings with higher clearance
rumbling or irregular noise	bearing clearance too high, damages on bearing rolling surfaces, dirt	exchange bearings
	inappropriate lubricant	use appropriate grease only
gradual change of running noise	bearing clearance is changed by thermal influences damages on the bearing races (e.g. caused by contamination or material fatigue)	protect bearings against temperature

COUPLING CAUSES

unsteady run	the halves of the coupling do not stay in optimum alignment.	check alignment according to the instructions
	flexible components are worn out	exchange flexible components
	flexible components are too soft	use flexible components with higher shore-hardness
strong impacts during start-up	flexible components are worn out	exchange flexible components
	starting torque of the motor(s) is too high MA/MN	star-delta-wiring
Rupture of coupling during test run	high negative torque impacts when the motor is re-started	on principle, the fan may only be restarted after the total standstill of the impeller, this prevents torque impacts which can occur when the rotor is still running (even slightly) at the time of restart (phases do not match), check function mode of the star- delta switch (change-over time response)

3.3 Additional Safety Rules and Accident Prevention Regulations

The following markings are used in these instructions

Danger !



denotes an imminent danger. When not observed, death or severest injuries may be caused.

Warning!

denotes a possibly dangerous situation. Non-observance may lead to severest injuries.

Caution!

denotes a possibly dangerous situation. If you do not avoid this situation, slight or minor injuries may result.

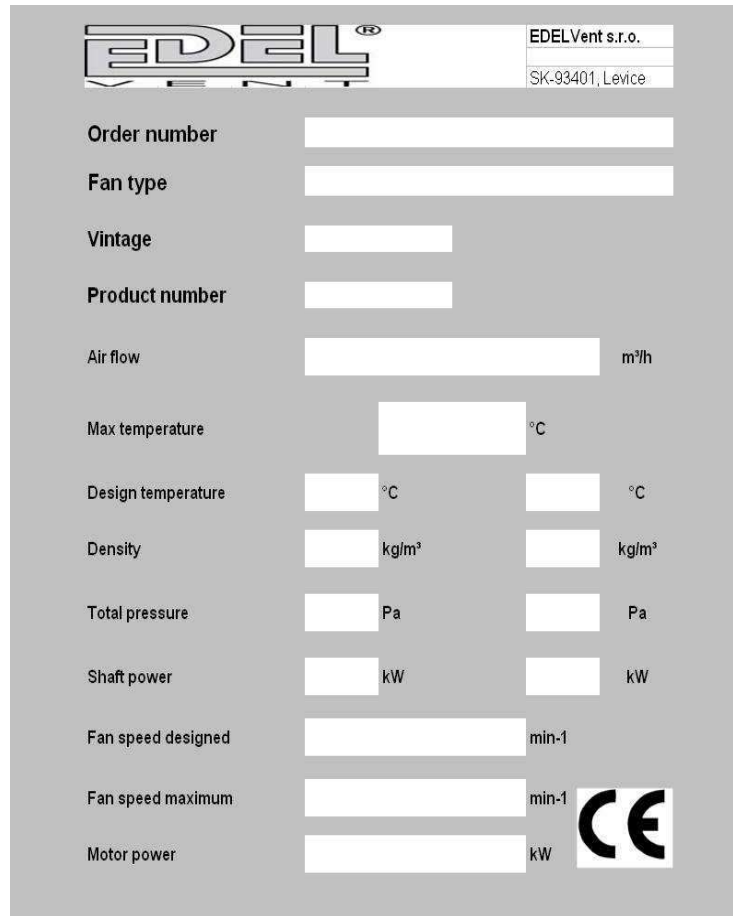
Note !

denotes application hints and other useful information.

4 Technical Data**4.1 Characteristic Data****4.2 Range of Application****4.1 Characteristic Data**

To each EDEL VENT fan a nameplate is affixed as shown below. The performance data n_{max} and t_{max} indicated on the nameplate should not be exceeded without consultation with the manufacturer's works !

Picture 1.



The form contains the following fields and labels:

- Order number**: [input field]
- Fan type**: [input field]
- Vintage**: [input field]
- Product number**: [input field]
- Air flow**: [input field] m³/h
- Max temperature**: [input field] °C
- Design temperature**: [input field] °C [input field] °C
- Density**: [input field] kg/m³ [input field] kg/m³
- Total pressure**: [input field] Pa [input field] Pa
- Shaft power**: [input field] kW [input field] kW
- Fan speed designed**: [input field] min⁻¹
- Fan speed maximum**: [input field] min⁻¹
- Motor power**: [input field] kW

Additional information on the form includes the EDEL VENT logo, the company name EDELVent s.r.o., and the address SK-93401, Levice. A CE mark is also present.

4.2 Range of Application

Operation in accordance with the Intended Use

The fan is intended exclusively for moving air or similar gaseous mixtures. Another application or application exceeding this range of application is not in accordance with its intended use. EDEL VENT is not liable for any damage resulting from this. Usage to the intended purpose also includes:

- Observance of all instructions contained in the operating instructions and
- Adherence to the inspection and maintenance work.

The fan is designed for moving air or similar gaseous mixtures. For this purpose, it is expediently connected on the inlet and discharge side to a piping.

5 Transport and Storage

Transport



The fan is delivered completely assembled. Immediately on receipt, the fan shall be inspected for shipping damage and if damage is detected, claims should be put forth with the carrier. Rough lowering may damage the bearings of the fans.

Loading

Suspend the fan from its lifting lugs on the fan housing at the center (lifting lugs on the motor only for balancing). Remove suspension from the crane only after fixing the fan.

Danger !



Keep clear of the suspended fan! The suspension device may break! The dropping fan could kill or severely injure you!

Storage



Storage of the fan in the open air should be avoided. Severe corrosion can shorten the service life of the fan, reduce the maximum allowable speed. Unbalance of the fan wheel may result. Water can ingress the anti-friction bearings and lead to premature failure. Therefore, store the fan in a roofed place or sealed in plastic sheet.

6 Installation

- 6.1 Detailed Installation Harmonogram
- 6.2 Drawings for Installation
- 6.3 Information Required for Installation
- 6.4 Additional Information for Installation and Dismounting

6.1 Detailed Installation Harmonogram

Installation works must exclusively be carried out by specialist personnel ! It is recommended to request installation specialists of the manufacturer EDEL VENT.

- Stability of fan is at risk when the installation site is not even. This might increase the danger of crushing and shearing of parts of the body. Prior to the start of the installation the mounting place has to be checked for evenness and dimension accuracy. Substructure of the fan like base plates, additional base frames, sole plates, steel stages or foundations must:

- be designed in accordance with the weight and the foundation load (fan master drawing)
- ensure a vibration-free installation for operation or standstill.

Compare foundation dimensions with the fan master(dimension) drawing and the foundation plan and ensure that:

- there is sufficient space for installation, maintenance and repair works,
- there is sufficient space for the intake and discharge of the cooling air for the rotary current motor.

- Carry out required corrections on the foundation and clean treated surfaces.

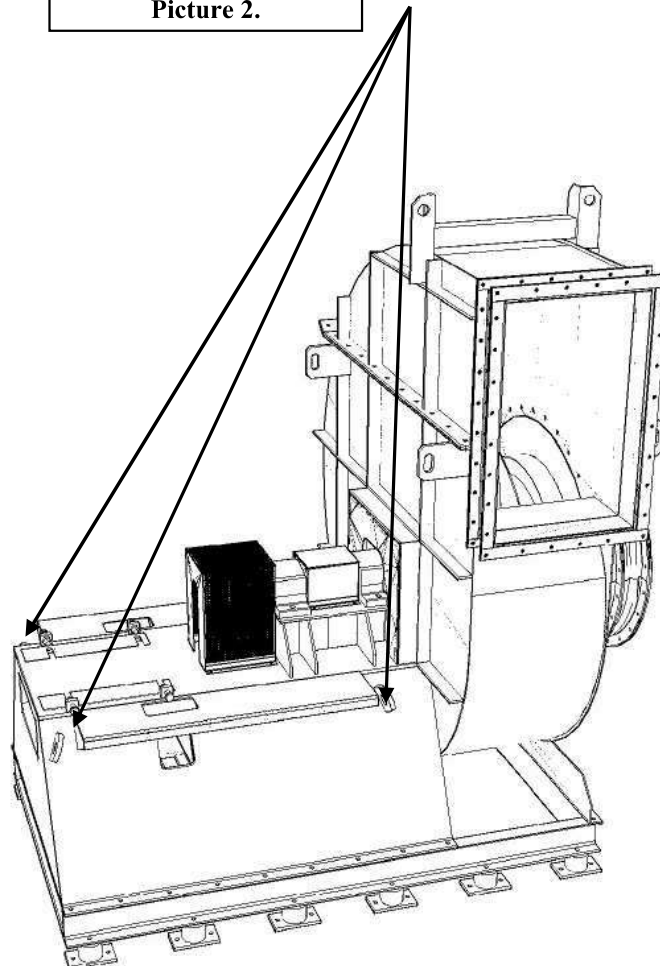
The sequence of mounting depends on the fan design. Take the appropriate fan design from the separate master/dimension drawing or any additional order-related drawings.

mounting on	without anti-vibration mounts	with anti-vibration mounts		
		anti-vibration mounts without mounting plate	anti-vibration mounts with mounting plate	anti-vibration mounts (spring type)
steel foundation	X	X	X	X
concrete foundation	X	-	X	X
X = possible - = not possible				

- Fan transport to the location of installation by suitable transport and lifting lugs on the fan. During transport motor and bearing can get displaced.

Transport and lifting lugs

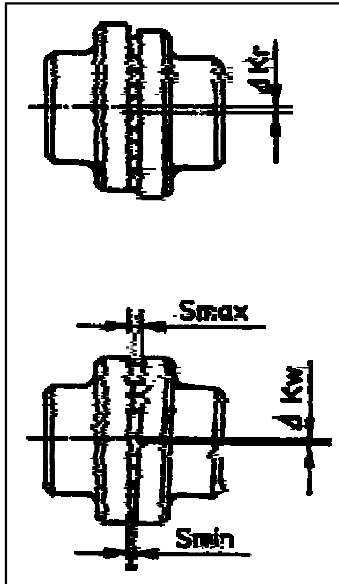
Picture 2.



In case of fan type drive - direct through coupling:

- The shafts of fan and motor must be aligned. Therefore, check the shafting for proper alignment prior to the first start-up and re-align it if necessary.

Picture 3.

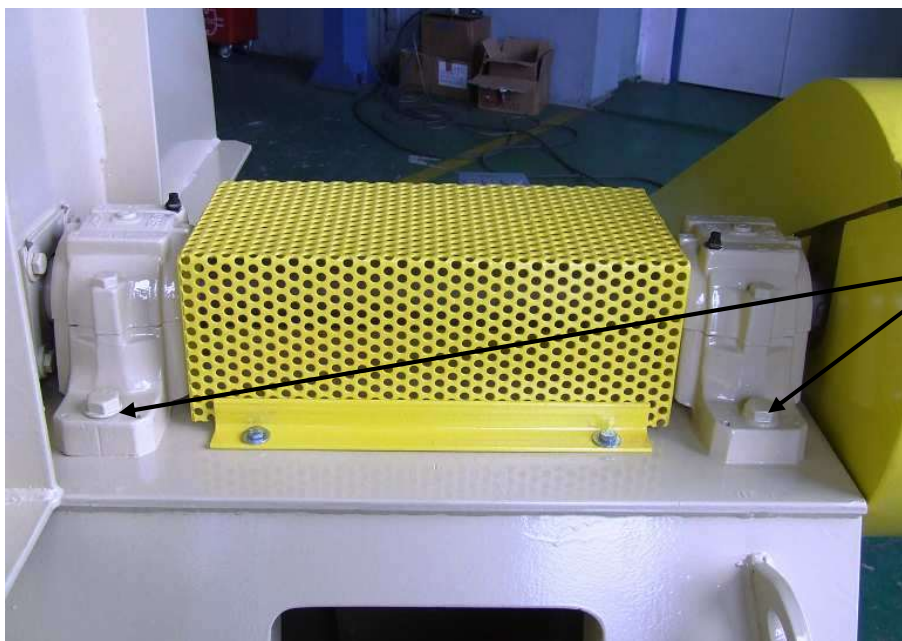


- Remove protection cover of coupling (fan bearings / motor).
- Check the alignment of the motor to the bearings with appropriate measuring tools.
- During alignment, the angular offset and the radial offset of the shaft ends must be kept as small as possible.
- Permissible offset (Picture 3) - Guidance values for permissible shaft offsets and gap widths.
- Align the coupling in two opposite, vertically arranged, axial planes.
- Check the radial offset (ΔK_r) with a ruler. Check the angular offset (ΔK_w) with a thickness gauge (feeler gauge).

- The accuracy of alignment can be improved by use of a dial gauge respectively by use of a laser optical sensor. The protocol about coupling adjustment is provided by our specialist according your request / purchase order.

6.2 Drawings for installation

- In principle, make sure for all screwed connections that there is sufficient excess length after the screw or nut has been tightened.



Example for bearing
housing screwing (in case
of V-belt driven fan)



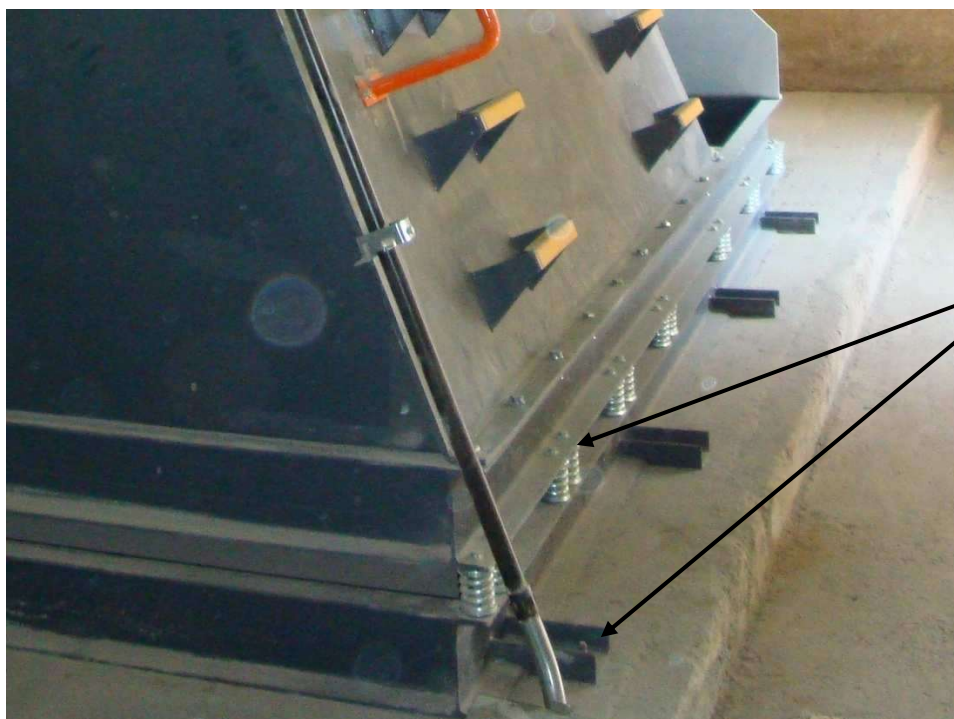
Example for bearing housing screwing (in case of direct through coupling driven fan)



Example for motor position fixing and screwing (in case of direct through coupling driven fan)



**Example for motor
position fixing and
screwing (in case of V-
belt driven fan)**



**Example for fan base and
counter frame position
fixing and screwing**

**Example for flexible joint/
compensator screwing**

When flexible connections are screwed, the screw ends must always be turned away from the flexible connection. Tighten all screw connections with the proper tightening moment. The inner sleeve must be installed in line with direction of medium flow !

6.3 Information Required for Installation

- The fan and the equipment are designed, tested and delivered in accordance with the design conditions specified in the order. The specifications made in the order are documented in the fan data sheet.

The important information is that, the electric components of the machine are designed for a maximum ambient temperature of 40°C.

- The flexible compensators/joints are intended to prevent the transmission of structure-borne sound and vibration forces. They are also used to reduce / prevent the transmission of forces from the duct work to the fan. Furthermore alignment errors of the ducts are reduced. The flexible connections should always be arranged directly at the fan connection flange. Except when a damper is mounted on the fan ! Do not install flexible connections before completion of the duct work !

- The fan can be equipped with vibration monitoring, bearing condition monitoring and bearing temperature monitoring. Furthermore, the temperature probes can be installed for monitoring the temperature of the handled gas. Additional monitoring devices are described in separate operating manuals. Connections of the monitoring devices must be connected in accordance with the detailed wiring diagram.

- Prior to the first commissioning of the fan, the radial clearance between inlet cone and impeller nozzle must be checked

6.4 Additional Information for Installation and Dismounting

Installation

The fan is supplied with a prime coat as standard - unless otherwise agreed upon. For outdoor installation, a corrosion-resistant surface protection should be provided and the fan shall be roofed.. Also for intermediate storage in the open air, measures shall be taken to prevent corrosion (roofing/wrapping in protective plastic sheet). The bearings may be damaged during prolonged downtime in a humid atmosphere, they should be covered.

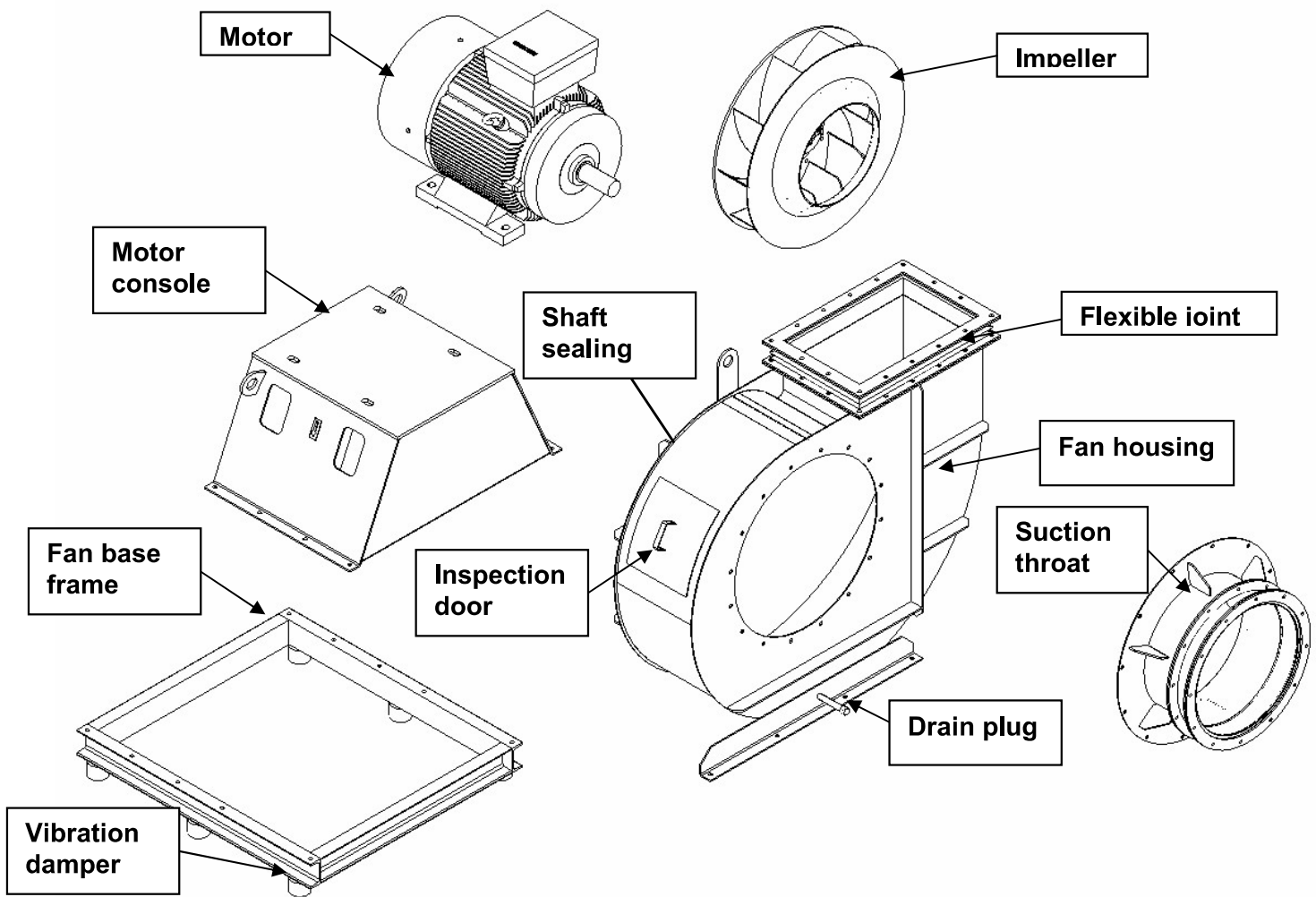
Caution when placing the fan in position!



Note girders at head level ! You may bump against a girder and injure yourself.

The fan shall be installed so that there is ample space for maintenance work. The transport of heavy parts of the fan by means of suitable lifting gears (fork-lift truck, crane) should be possible at all times.

Radial fan with direct drive - assembly overview:



7 Start-up

Danger due to Incorrect Connection

The fan shall be guarded on the intake and discharge side against the possibility of the operator placing his hands into the fan and against foreign objects being drawn in. This guard should expediently be a long piping which prevents reaching of the fan wheel or a sufficiently close-meshed screen at one opening. When the fan is operated with free intake and discharge a sufficiently close-meshed screen is to be firmly bolted to the inlet/outlet for protection against the possibility of the operator placing his hands into the fan. The fan is to be installed on its vibration isolators included in the supply. Make sure that the unit is located on firm footing. All supporting points shall be tightly bolted or firmly welded to the base. The bolting should be made in such a way that there is no danger of overturning.

Warning!



Unsteady installation may result in overturning of the fan. The overturning fan may cause serious injury. Make sure that the fan is on firm footing.

Danger !



A bent shaft will result in severe unbalance. The fan wheel may burst! Flung-out parts may cause death, serious injury! During start-up, check fan for unbalance.

Start-up Centrifugal Fan

The fan is designed for the installed condition at operating temperature. When operating at changed operating conditions the following should be considered. The centrifugal fan starts with the lowest starting current with the intake or outlet closed. During successive restarting, a damper (if provided) is therefore to be closed to keep heating-up of the motor as low as possible. In particular for fans designed for continuous operation at higher temperatures than the starting temperature, the starting current should be as low as possible. Information on the starting behaviour of the fan is given in the fan data sheet. For motors with thermistor motor protection, the surface temperature should be checked at least by touching it with the hand. Please read the motor documentation.

Warning !



Turn on the fan only when reaching the fan wheel is no longer possible. The rotating fan wheel may cause serious injury or draw you in! Switch on fan only after complete connection.

Warning !

Turn on fan only when the fan has been completely connected on the inlet and discharge side and is guarded by protective screens, if necessary. Flung-out parts may cause serious injury.

Start-up Axial Fan

The fan is designed for the installed condition at operating temperature. When operating at changed operating conditions the following should be considered. The axial fan starts with the lowest starting current when free - without delivery head (piping connection). During successive restarting, a throttle damper (if provided) is therefore to be closed to keep heating-up of the motor as low as possible. Maintain starting current at the lowest possible level! Information on the starting behaviour of the fan is given in the fan data sheet. For motors with thermistor motor protection, the surface temperature should be checked at least by touching the surface with the hand. Please read the motor documentation..

Warning !

Turn on the fan only when reaching the fan wheel is no longer possible. The rotating fan wheel may cause serious injury or draw you in! Switch on fan only after complete connection.

Warning !

Turn on fan only when the fan has been completely connected on the inlet and discharge side and is guarded by protective screens, if necessary. Flung-out parts may cause serious injury.

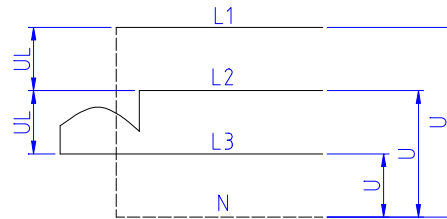
Electric Connection

The electric connection should be made by a trained electrician. The operating connection is shown on the nameplate. The motor should not be operated without motor protection. Any thermistor / thermal contact motor protection provided shall be in service before first start-up!

A lockable disconnect switch must be installed in the direct supply line to the motor which isolates the fan from the power source when inspection is to be performed. The electric supply lead is to be installed so that it is protected from damage.

Operating Connection

In Germany the power frequency is 50 Hz. The voltage conductors (L1L2L3) is the conductor voltage U_L (phase-supply voltage). The voltage between a main conductor conductor is the star voltage U_{ph} (phase voltage). There is relationship $U_L = 1.73 \times U_{ph}$

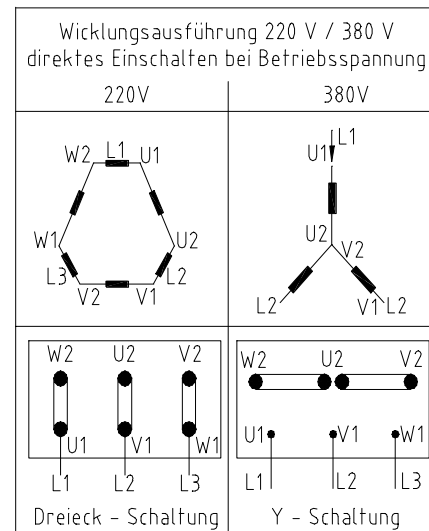


between two main to-phase voltage, and the neutral the following

The three starts (U1, V1, W1) and the three ends (U2, V2, W2) winding are run to the six terminals in the terminal box. main conductors (L1, L2, L3) are always connected with the winding phases.

If the phase ends (U2, V2, W2) are connected together the -connected. In the star point, the sum of the voltages and equal to zero, the phase resistance is connected to the phase motor current corresponds to the current in the winding

If the end of one phase is connected in each case to the start phase the motor is delta-connected. The phase resistance is the supply voltage. The motor current is obtained from the of two phase currents (Fig. 2)



W2) of the There, the three starts of the

motor is star (Y) currents is voltage. The phase.

of the following connected to geometric sum

Winding design 230 V/ 400 V direct starting at operating delta connection: Y-connection :

These relationships clearly show that a motor can be connected both in Y-connection to the 400-V mains and in delta connection to the 230-V mains. In the winding phase, the same current flows in both cases. The same also applies to the new standard voltage 690 v (Y) and 400 V (delta). If the alphabetic sequence of the terminal designations (U1, V1, W1, U2, V2, W2) coincides with the time sequence of the phases, the unit shall turn clockwise. For anti-clockwise rotation, two external connection lines are to be changed. According to VDE 0530 an connecting terminal should also be provided for the protective conductor. Units with a rated power above 100 kW shall have an additional ground terminal on the housing.

voltage ;

Vibrations on the Fan

A fan generates various frequency vibrations due to its residual unbalance and geometry. All vibrations occurring are summed up as vibration velocity v_{eff} - vibration severity for short. The unit of the vibration velocity is mm/s.

Preparations and instructions for the measurement.

The following items shall be observed before start of measurement:

Speed

The vibration velocity of a fan is to be determined at operating speed. For fans with variable speed, a measurement in the entire operating speed range is recommended to find any resonance points. Such resonance points should be passed through rapidly.

Installation

During measurement, the fan can be installed for operation or - if the fan is a smaller unit - may be placed on, or suspended from, special spring elements.

Measuring Points

For this, the bearings or the bearing levels are to be preferably chosen, one measurement on the bearing housing being sufficient.

Measuring Direction

The measurement is to be carried out in horizontal, vertical and axial direction, but at least in the direction in which the largest vibration amplitudes are to be expected. This is normally the horizontal measuring direction.

Vibration Pickup

A vibration pickup should be used which can either be placed by hand on the measuring point or fixed by a magnetic clamp or bolted on. The vibrating mass of the machine should be greater than about 3 kg so that the measuring result is not falsified to an unallowable extent by the mass of the vibration pickup (which is about 0.3 kg).

Evaluation



The measurement should be carried out after the same operating periods. Only then a prognosis about the course of damage is possible. For more detailed information, do not hesitate to contact us.

8. Operation of the Unit

The fan should only be operated by trained persons.

The fan shall only be in service when:

- all safety devices and safety-related monitoring systems are installed and operable.
- no persons are within the danger zone of the unit
- all inspection openings are guarded and closed.

The fan should be inspected at least once per shift for visible external damage and defects. Any detected changes are to be immediately reported to the competent department.

In case of operating faults, the fan is to be immediately shut down and this condition is to be locked out. Have faults promptly remedied!

Danger!



The fan shall only be operated at maximum speed when t_{max} is not exceeded. Flung-out parts may cause death or serious injury ! The fan wheel strength is only designed for the maximum operating conditions according to the nameplate.

Warning !

Turn on the fan only when reaching the fan wheel is no longer possible! The rotating fan wheel may cause serious injury or draw you in! Switch on fan only after complete connection.

Warning !

Turn on fan only when the fan has been completely connected on the inlet and discharge side and is guarded by protective screens, if necessary. Flung-out parts may cause serious injury.

9. Maintenance**9.1 General****9.2 Maintenance and Inspection****9.3 Lubrication****9.4 Cleaning****9.1 General****Caution !**

Before maintenance and/or inspection work is performed on this fan, you must have read and understood the operating instructions.

Conversions

Unauthorized conversion work and modifications to the fan are prohibited for reasons of safety. A consultation with, and written confirmation by, EDEL VENT is necessary beforehand.

Danger !

Before performance of maintenance work, the fan has to be isolated from the power source and locked out so that the fan cannot be restarted. Sudden starting of the fan may cause severe injury.

Caution !

Oils, greases and other contaminations may cause slipping and thus injury. The area around the fan should be clean before start of maintenance work.

Warning !

When hot fluids are handled the parts outside the insulation are as hot as the fluid itself ! You may burn yourself. Wait with the work on the fan till the fan has cooled down.

Note !

Make sure that safety for the fan to be maintained is ensured. Pay attention to sound body posture. Lift heavy parts by means of a crane.

Note !

A very hot and very cold working environment reduces the power of concentration. Pay attention to acoustic and optical warning signals of adjacent plant items!

9.2 Maintenance and Inspection

Cleaning, Maintenance

The fan should be periodically inspected to detect any damage in due time before complete failure. Only use insulated electrical equipment!

Maintenance work is necessary when:

- the fan wheel has become unbalanced due to non-uniform use, foreign solid objects have been drawn in which caused damage to the fan wheel or housing
- fouling of intake and discharge-side protective screens results in increased resistance of the system
- fouling of the ventilation screens of the belt guard does not allow cooling of the V-belts
- the V-belts develop cracks
- the V-belts have to be retightened due to normal stretching
- the abrasion of the flexible element of the coupling suggests wear
- the vibration isolators are corroded or the rubber is damaged or fatigued
- the relubrication interval for the bearing has expired
- increased BCU values suggest failure of the bearings.

Bearings

At maximum load, the bearings should only be heated up to 100 °C during continuous operation! The bearings shall be sufficiently lubricated. Insufficient lubrication will result in premature failure of the bearings. Permanently lubricated bearings (without provision for relubrication) have to be removed after 10 000 operating hours, cleaned and regreased (see bearing manufacturers' instructions). All bearings in EDEL VENT fans are designed for a minimum service life of 40 000 operating hours. Follow lubricating instructions on the nameplate / in the motor documentation!

Caution!



The bearings reach an operating temperature up to about 80 °C. You may burn yourself. Be careful when touching the bearing housing.

Danger !



Severe vibration of the fan wheel may result in fatigue fracture! The fan wheel may burst! Flung-out parts may cause death or serious injury!. Check fan periodically for vibration and, if necessary, clean fan wheel. When abrasive or caustic fluids are handled, replacement is necessary, if material loss is detected. Periodical inspection is imperative.

Danger !



Metal loss will result in loss of strength. The fan wheel can burst. Flung-out parts may cause death or serious injury. In case of metal loss, replace fan wheel! Inspect the fan wheel visually at regular intervals to be able to detect changes.

- Open cleanout door
- Clean fan wheel by steam jet

V-belts

The belts should always be tensioned according to specification. The technical data for this are shown in the fan data sheet. The V-belts should be replaced before imminent breaking, i.e. always the complete set so that the correct tension of all belts is ensured.

Caution !



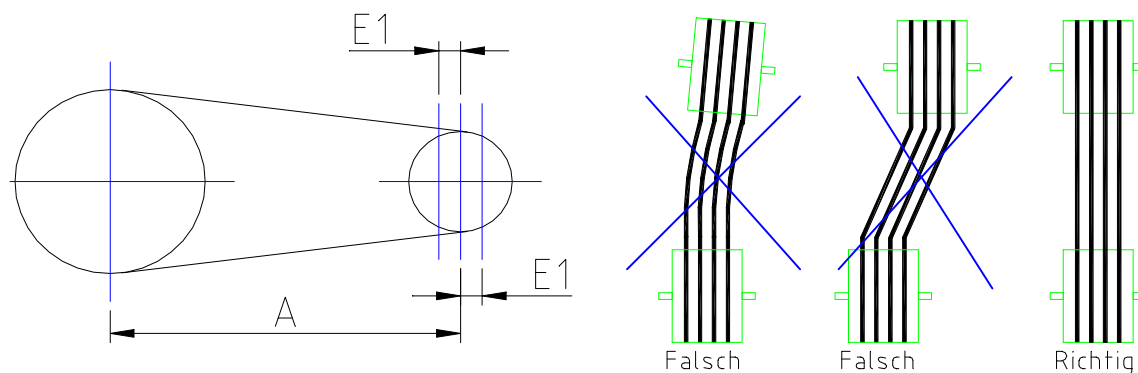
Caution is advised when replacing the belts! You may get your finger jammed. Follow the directions of the instructions Belt Replacement.

Belt Replacement

Untension the belt drive by moving the sheaves closer together. Do not remove belt with a screw driver. Place new set of belts into the sheave groove. Align V-belt drive and tension it in accordance with our recommendations.

After 30 minutes of operation under load, check belt tension and, if necessary, retension belt.

During the entire service life of the belt drive no maintenance is necessary.



Alignment

Proper alignment is very important since otherwise the belt sides will quickly wear out. Do not use a screw driver or the like to move the belt over the grooves by force. Make sure of good lateral alignment of the sheaves. Periodical checking of the belt tension ensures a long service life of the belts.

Storage of V-belts

V-belts should be stored in a dry place. They should be protected from heat and direct sunlight. If possible, they should be stored freely suspended and by no means be tied up tightly.

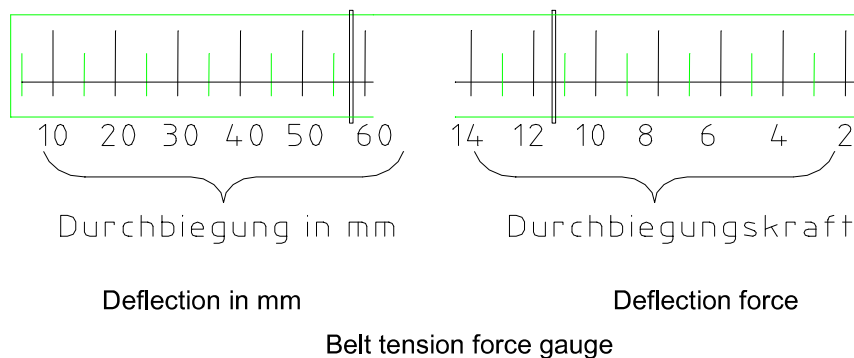
Belt Guard

If a belt guard is required, a protective screen should be used instead of a closed guard because of better ventilation.

Tensioning of the Narrow V-belt Drives

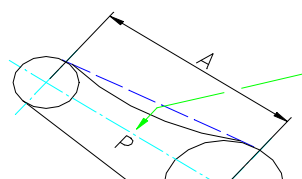
Only correct belt tension ensures optimum service life of the belts and highest possible efficiency of the drive.

We recommend the use of a belt tension force gauge .



Determination of the Belt Pretensioning Force:

1. Measure shaft-center distance.
2. Multiply the shaft-center distance by 16. The product gives the belt deflection in mm.
3. The belt deflection is adjusted on the tension force gauge by the lower marking ring on the deflection scale in mm.
4. The upper marking ring is positioned on the scale for the deflection force towards the end of the tube.
5. The gauge is placed at the midpoint of the shaft-center distance at right angles to the belt. Then the belt is deflected by pressure on the upper sleeve. Such an amount of force is applied that the marked deflection is reached.
6. The deflection force can now be read off at the position of the marking ring.
7. The deflection force is compared with the values given in the table. For new drives, the higher values should be



Riemendurchbiegung 16mm je
1000mm Achsabstand ,
rechtwinkling zur Achsmittle
gemessen

chosen for the starting phase. After an operating time of 30 minutes under load, the deflection force is to be checked again and , if necessary, readjusted.

Belt deflection 16 mm per 1000 mm of shaft-center distance,
measured at right angles to the shaft center
Force shaft-center distance for a deflection of 16 mm

Profil	Kraft Achsabstand für 16 mm Durchbiegung xxx	
	Wirkdurchmesser der kleinen Scheibe [mm]	Newton [N]
SPZ	67 bis 95	13 bis 20
	100 bis 140	20 bis 25
SPA	100 bis 132	25 bis 35
	140 bis 200	35 bis 45
SPB	160 bis 224	45 bis 65
	236 bis 315	65 bis 85
SPC	224 bis 355	85 bis 110
	375 bis 560	115 bis 150
Z	56 bis 100	5 bis 7.5
A	80 bis 140	10 bis 15
B	125 bis 200	20 bis 30
C	200 bis 400	40 bis 60

xxxI Riemenvorspannkraft – Meßgerät wird in der Mitte
des Achsabstandes rechtwinklig zum Riemen angebracht

Wirkdurchmesser der kleinen Scheibe= Effective diameter of the small sheave
bis: to; Riemenvorspannkraftmeßgerät wird in der Mitte des Achsabstandes rechtwinklig zum
Riemen angebracht = The belt tension force gauge is placed at the midpoint of the shaft-center
distance at right angles to the belt

Coupling

The flexible element of the coupling should be replaced before it is completely worn out. To do this, the motor has normally to be moved to the side. When bringing the two coupling halves - motor and bearings - make sure of optimum alignment.

Caution !



Be careful when moving the motor and bearing coupling halves closer together. You may jam our fingers! Pay attention to all movements of the parts.

Caution!

Do not remove abraded coupling particles by compressed air! The particles might get into your eyes. Remove abraded particles by means of a broom.

9.3 Lubrication**Caution !**

The bearings should be sufficiently lubricated. The bearings may run hot, you may burn yourself! Relubricate according to specification, check temperature!

Grease-lubricated bearings can also be relubricated during operation. For oil-lubricated bearings, the oil level is to be checked when the unit is not running. The oil level should be at the middle of the oil sight glass. For lubricating intervals see lubrication label on the bearing pillow block of the fan or in the fan data sheet.

When replacing a bearing, we recommend replacement of the complete bearing unit. The overhauled unit will be returned to you for your spare part store.

Bearings (Pillow Block Bearings)

At maximum load, the bearings should only be heated up to 125 °C during continuous operation! The bearings shall be sufficiently lubricated. Insufficient lubrication will result in premature failure of the bearings. Permanently lubricated bearings (without provision for relubrication) have to be removed after 10 000 operating hours, cleaned and regreased (see bearing manufacturers' instructions). All bearings in EDEL VENT fans are designed for a minimum service life of 40 000 operating hours. Follow lubricating instructions on the nameplate / in the motor documentation!

Caution !

The bearings reach an operating temperature up to 80°C . You may burn yourself. Be careful when touching the bearing housing!

Caution !

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The bearings should be sufficiently lubricated! The bearing may run hot, you may burn yourself. Relubricate according to specification, check temperature!

Grease-lubricated bearings can also be relubricated during operation. For oil-lubricated bearings, the oil level is to be checked when the unit is not running. The oil level should be at the middle of the oil sight glass. For lubricating intervals see lubrication label on the bearing pillow block of the fan or in the fan data sheet. When replacing a bearing, we recommend replacement of the complete bearing unit. The overhauled unit will be returned to you for your spare part store.

9.4 Cleaning

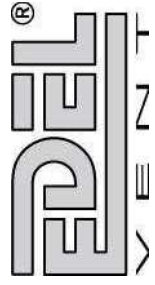
Fan Wheel Maintenance

Dirty fluids handled may cause non-uniform dust and particulate build-up on the fan which may lead to unbalance. The vibrations measured at the bearings should permanently not exceed 8 mm/s. Then, the fan wheel should be cleaned, for example, by steam jet.

10 Annex

In the annex, you will find the necessary Technical Documentation of all components which are integral part of the EDEL VENT fan, but were not manufactured by EDEL VENT(e.g. drive motor). Since these components are however absolutely necessary for satisfactory operation of the fan the operating instructions for these components are to be observed in the same way as the EDEL VENT operating instructions themselves. Any damage resulting from nonobservance of the operating instructions is caused by one's own fault!

- **Declaration of Conformity**
- **Fan Data Sheet**



Operating and maintenance instruction

Addition

Schedule of greases

Provider	Markings	Branch stores	Thickening	Dew-point	Permeability	Operating temperature °C	Viscosity -oil ground mm ² /s	Oil ground	Speed parameter mm/min
Aral	Aral Fett HL2	Europe	Litium soap	190 °C	265-295	-35/+130	52	Mineral oil	500.000
Esso	Beacon 2	World	Litium soap	185 °C	265-295	-30/+120	100	Mineral oil	500.000
Shell	Alvania R3	World	Litium soap	185 °C	265-295	-30/+130	74	Mineral oil	500.000
Shell	Albida RL2	Europe	Litium soap	260 °C	265-295	-25/+150	100	Mineral oil	500.000
Castrol	Longtime PD2	World	Litium soap	255 °C	265-295	-35/+140	95	Mineral oil	400.000
BP	Energrease LS 2	World	Litium soap	190 °C		-25/+130	98	Mineral oil	500.000
Fina	Marson L 2	World	Litium soap	195 °C		-25/+130	96	Mineral oil	500.000
Mobil	Mobilux	World	Litium soap	183 °C		-20/+130	107	Mineral oil	500.000
Texaco	Multifak	World	Litium soap	200 °C	265-295	-30/+130	100	Mineral oil	500.000
Chevron	Duralith EP 2	World	Litium soap	185 °C		-25/+125	81	Mineral oil	500.000
Reiner	Lagermeister OG-2	World	Litium soap	185 °C	-	-30/+120	80	Mineral oil	450.000
Aseol	LITEA 806-12	World	Litium soap	180 °C	275	-20/+125	110	Mineral oil	500.000

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