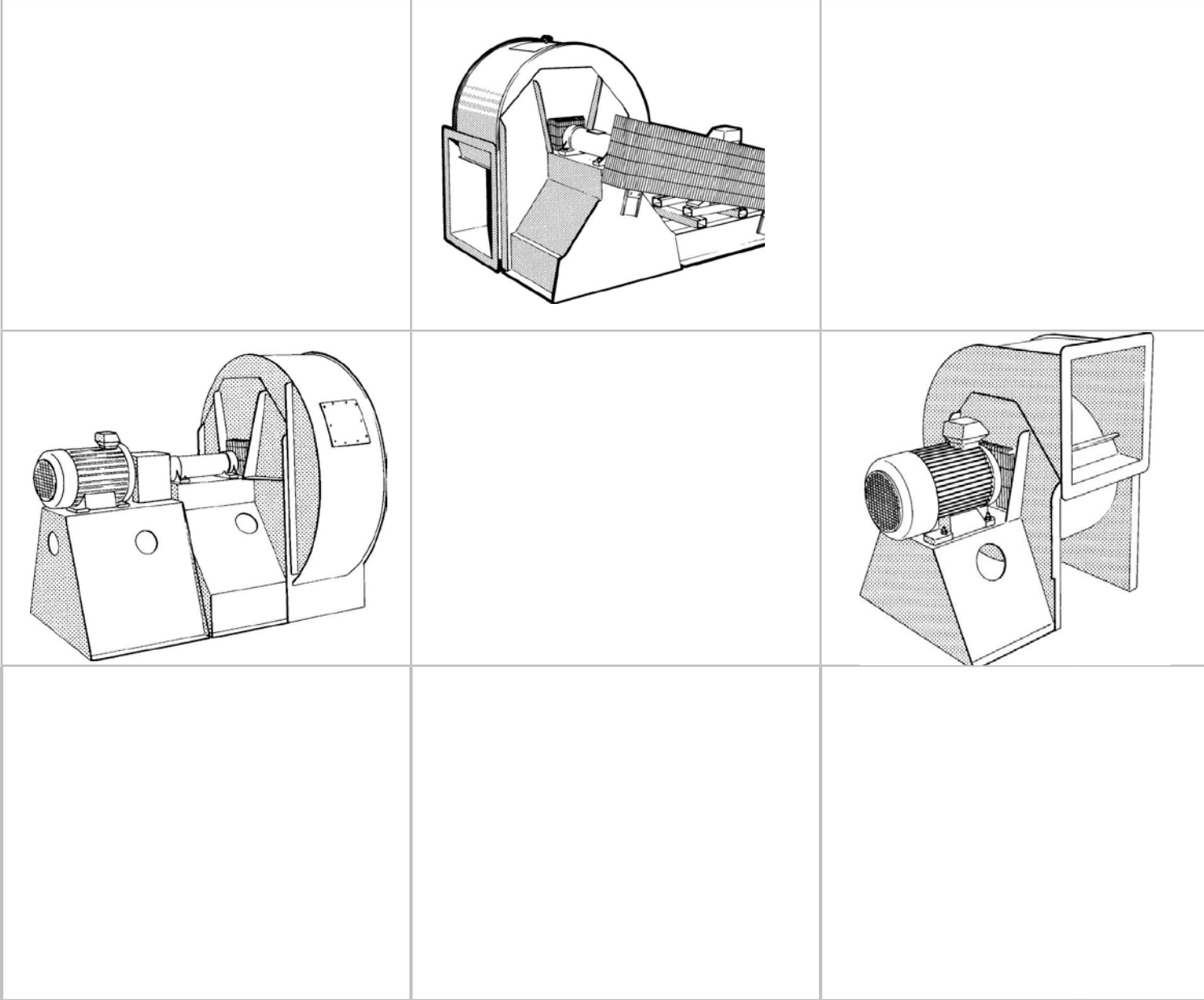


# Operating instructions

EN

Installation, Use and Maintenance Manual Centrifugal Fans  
(Translation of the Original)

## BA-IPF PAM/PAK/PBM/PBK 1.0 09/2014



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Thank you for having chosen a Nicotra Gebhardt fan.

Our fans have been planned by technicians with long experience in this branch, and are manufactured to the high quality standards that distinguishes our products.

Nicotra Gebhardt recommends that the first thing you do on getting the fan is to read the manual carefully (if possible, with the fan nearby).

After having read this manual you will be able to get the best possible use out of the fan, while protecting yourself and others by following the safety precautions included.

We would suggest carefully keeping this manual handy so that it can be consulted at any time.

# 1. Important Information

## 1.1. Safety rules

Our technicians, who have been in this sector for years, research and develop our products every day in order to create efficient fans in accordance with current safety regulations. All the rules and regulations shown in the following represent those currently in force regarding safety, and so are based on the compliance with these general laws. Therefore we would advise those exposed to risk to strictly abide by the safety prevention regulations applied to their country. Nicotra Gebhardt reminds all staff concerned to comply with and put into practice all the indications shown in the following. Nicotra Gebhardt declines all responsibility for any damage to persons or property caused by the failure to comply with safety regulations or by modifications to the fans. Fans which do not have the „CE“ marking are to be filled in by the customer who must certify the entire installation, in order to have a conformity certificate. In this case a Declaration of incorporation is provided by Nicotra Gebhardt, (type „B“).

<b>NICOTRA   Gebhardt</b>	
Ref. N.	
Type	
Date	
Item	
←	

## 1.2. General rules

It's responsibility of customer to be sure that installation and maintenance is done by qualified personnel with specific experience on these type of products.

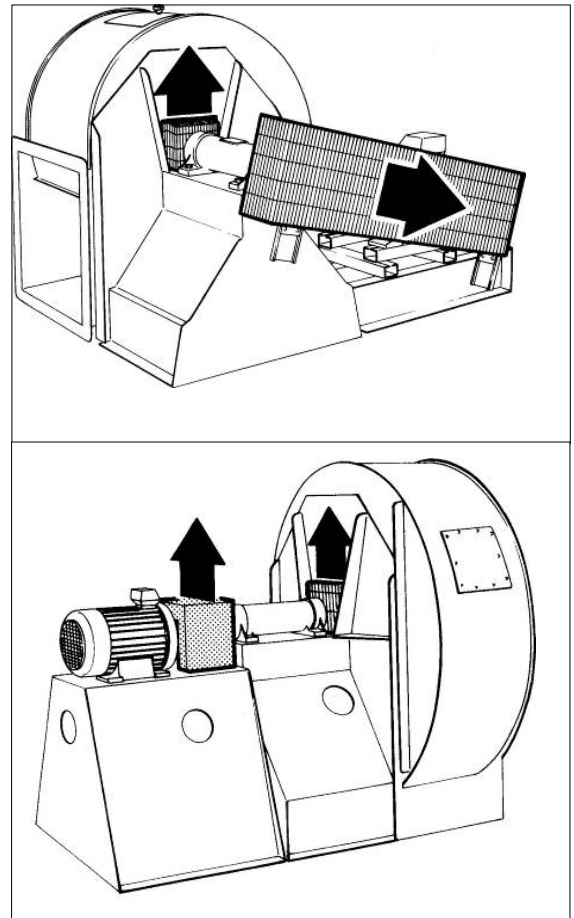
A proper installation and a regular maintenance are mandatory to obtain the maximum efficiency of working. Ventilator fan is a rotating machinery that could become a source of danger for people and/or damaging for things if not proper used.

Working conditions (in particular rotating speed and maximum temperature) for what fan has been designed, must never exceed.

People assigned to use fan and/or to make maintenance must have copy of this manual.

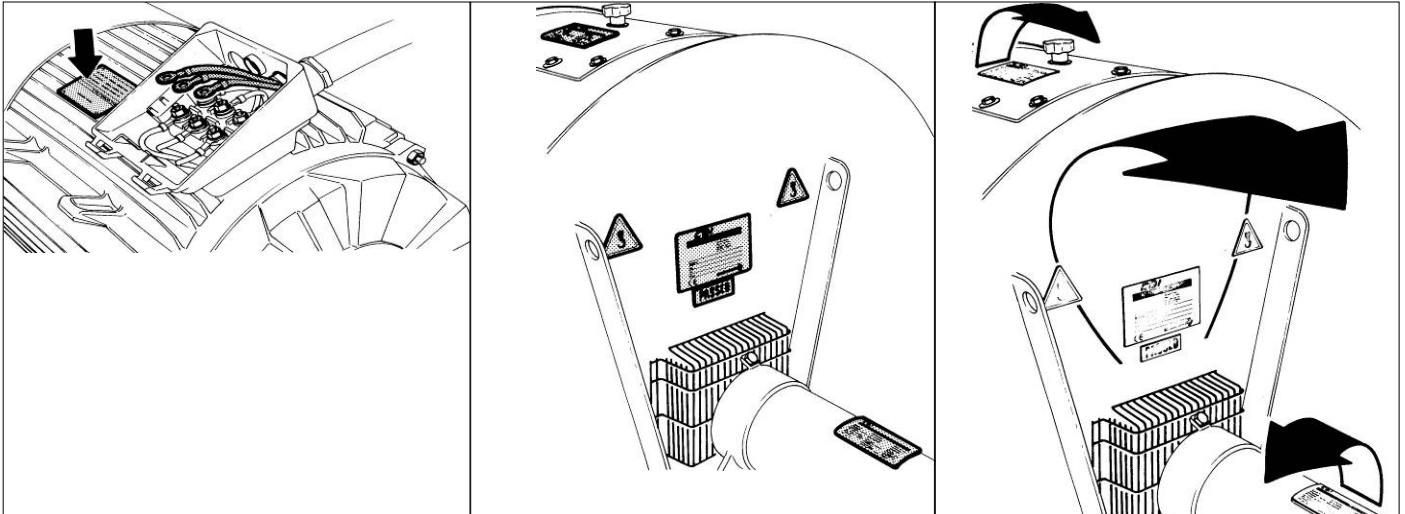
The protection guards are not to be removed, unless absolutely necessary for maintenance purposes, in which case appropriate steps must be taken to clearly indicate the possible danger.

The protection guards must be re-installed on the machine as soon as the maintenance work has finished.



All maintenance work (routine or extraordinary) must be done with the fan stopped and all electrical, pneumatic, and steam, etc supplies disconnected. In order to ensure that such supplies are not mistakenly reconnected it would be advisable to place notices on the electrical panels, the power units and the control pulpits with the following sentence :“Attention : controls suspended for maintenance“.

Before connecting the power supply cable to the fan’s connection box, check that the line voltage is the same as the one shown on the motor’s data plate. Take note of the tags placed on the fan. Replace the tags if they should become illegible over time.



### 1.3. Maintenance rules

Maintenance staff must not only comply with current safety prevention regulations but also the following rules:

- It is important that suitable safety prevention clothing is worn.
- These must not have loose parts that can get caught in the machine

Special earphones or protectors must be used when noise exceeds permitted levels.

It is important to check that there is an interlocking device preventing others from starting up the machine.

### 1.4. Residual risks

We have analysed the risks represented by the axial fan as required by the Machines Directive. The present manual reports the information required by staff exposed to risk in order to prevent any damage to persons or property due to residual risks. During operation and soon after a stop (for about 30 minutes) pay attention to the following possible risks:

- metallic parts at hot temperature
- rotating parts
- danger of suction (inlet not ducted)
- danger of fluid leakage (outlet not ducted)



## 1.5. Noise level

The various regulations regarding phonometric monitoring in the test room, establish very exact procedures and environmental conditions for measuring the sound pressure level LpA to be indicated in catalogues. (\*)

In practice not all the installations are made or can be made in compliance with these regulations. There are often operating conditions, accessories and environmental situations that differ from the test rooms.

This is generally the cause of the difference between sound pressures indicated in catalogues, and the ones obtained from the installation. There are various causes for this difference. With the intention of pointing out the importance of this phenomenon we list some particular cases quantifying the variation in dB(A) of sound pressure that they cause:

- actual use differing from that selected in catalogues: this can result in nearly +3 dB(A) variation;
- traditional flexible connections between fan and ducts : emission in the environment about +2 dB(A);
- inlet vane control : increase of about +9 dB(A);
- outlet damper : increase of about +3 dB(A);
- electrical motor : the increase of noise level due to the electric motor is obtained by adding the highest noise level to the B values in the following table:

<b>A</b>	0	1	2÷3	4	5÷8	9÷10	>10
<b>B</b>	+3	+2,5	+2	+1,5	+1	0,5	0

In which A = dBA Fan - dBA Motor

### position of fans with electric motor in the environment:

- Installed near a wall without any absorbent property : increase of 3 dB(A)
- Installed near where two walls meet : increase of 6 dB(A)
- Installed near where two walls meet in a room with a low ceiling : increase of 9 dB(A)

### environment noise:

- The increase of sound level due to environmental noises is obtained by adding the highest noise level to the B values in the following table :

<b>A</b>	0	1	2÷3	4	5÷8	9÷10	>10
<b>B</b>	+3	+2,5	+2	+1,5	+1	0,5	0

In which A = dBA Fan - dBA Umgebung

\* (see „Noise Level“ chapter in Nicotra Gebhardt Catalogue)

### 1.6. Tags installed on the machine

On the machine several indication tags are installed. These are not to be removed for any reason.

The indications are divided into:

- obligation signals
- danger signals
- identification signals

#### 1.6.1. Obligation signals

Use the lubricant indicated on the tag.

Use lifting hoists inserting the hooks into the special holes of the fan.

#### 1.6.2. Danger signals

Warning moving parts, Do not remove guards and do not approach unless authorised.

Indicates the presence of live parts within the container on which the label is applied.

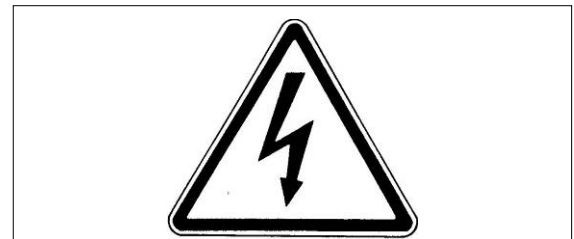
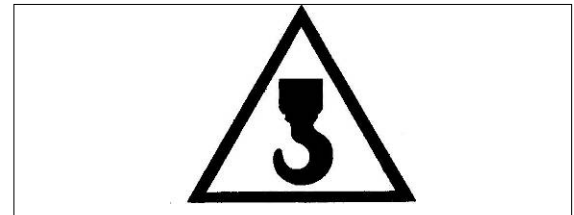
Prohibits opening the access door with the fan in operation.

#### 1.6.3. Identification signal

It is placed on fans supplied with the declaration of incorporation (class „B“).. Indicates the earth connection point. Shows that the fan has passed the operational trials.

<b>NICOTRA  Gebhardt</b> D-74638 Waldenburg Tel.: +49 (0) 7942 101 304 Fax.: 305 email: service@gbhardt.de <b>REM 18-0560-4X-19-2G RD/90</b>			
GERÄTE-NR.	125-365083-275018/1	HERSTELLJAHR	2010
<b>VENTILATOR</b> n max = 1500 1/min Dichte = 1.2 kg/m <sup>3</sup> Tmax = 60 °C		<b>MOTOR</b> U N = 230/400 V(D/S) f N = 50 Hz I N = 13/7,5 A n N = 1435 1/min P N = 3,6 kW T M max = 40 °C Schutzart IP 55 Warmeklasse F Stromart 3-	
MUSTER			

<b>NICOTRA  Gebhardt</b>		
<b>Grease recomanded</b>	ELF EPEXA 2	ROL OIL LITEX EP-2
AGIP GR/MU EP-2	ESSO BEACON EP-2	SHELL ALVANIA EP-2
BP LTX-EP-2	MOBIL MOBILUX EP-2	SKF LG EP-2



<b>NICOTRA  Gebhardt</b>		<b>NICOTRA  Gebhardt</b>
<b>Warning</b> Ensure that the electric power/motor are isolated, and rotating parts have stopped, before removing the access door.	<b>Achtung</b> Bevor die Revisions-türe geöffnet wird, müssen alle drehenden Teile stillstehen und die Stromleitung abgeschaltet sein.	Ref. N. Type Date Item 
<b>Attention</b> Avant l'ouverture de la porte de visite assurez-vous que les parties rotatives soient totalement arrêtées, et que	<b>Attenzione</b> Prima di aprire la portella di ispezione assicurarsi che le parti rotanti siano ferme e che la linea elettrica	

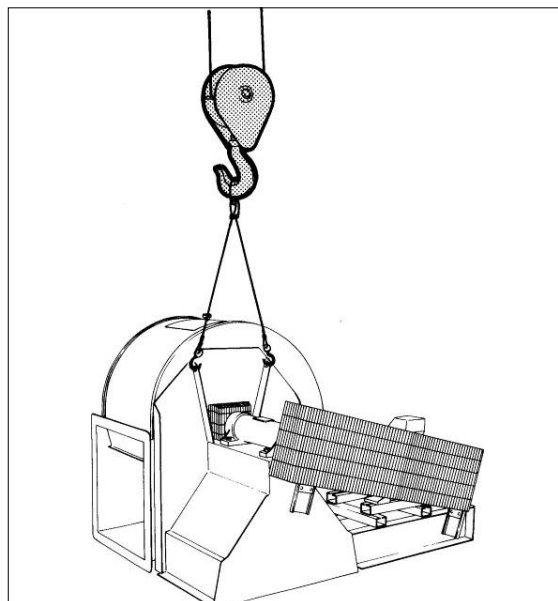
## 2. Reception

Each fan is carefully checked before being shipped. On receiving, the fan should be checked to ensure that it has not been damaged in transport and, if it has, a claim should be lodged with the forwarder. The delivery company is responsible for any damage caused during transport.

### 3. Move

Before moving the fan, make sure that the vehicle used has sufficient load capacity.

For the lifting use a hoist crane or a fork-lift, inserting the hooks in the holes shown on the tags. Particular care must be taken during handling, avoiding knocking the machine which could damage the paint or even cause the fan to malfunction. When moving using the fork-lift truck, do not exceed the speed or maximums slope limits. Never leave the load hanging.

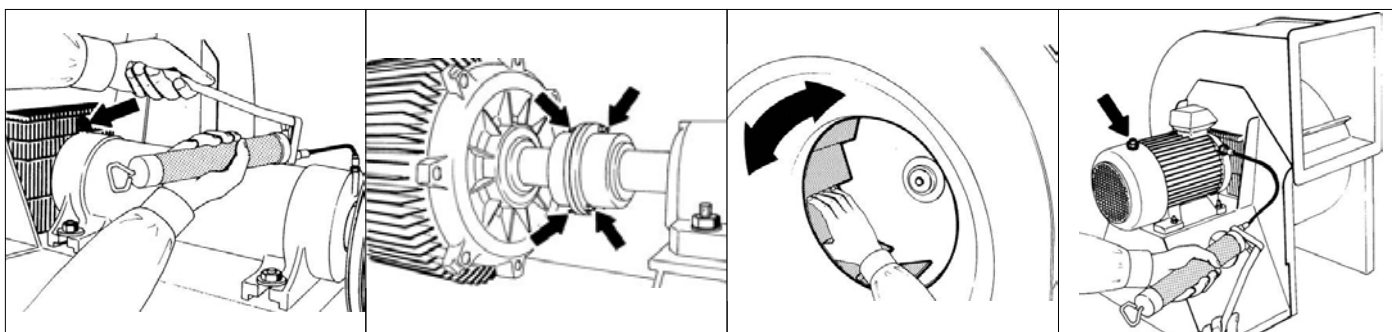


### 4. Transport und storage

The fans must be stored in a dust free and closed area where the relative humidity is lower than 80 %. When this is not feasible, adequate protections should however be provided to protect machinery from weather conditions, as well as for those designed for open-air installation, especially on rotating parts (motor, shaft, impeller, bearings, transmission joint, etc.) in order to prevent condensation, corrosion and dust or sand build-ups. Machinery, if stored outside, must be inspected on a regular basis (max every 14 days) to stop and correct any of the above mentioned defects. Monthly, new grease must be added through the greasing point, turning the impeller by hand (about 100 turns) to avoid rusting from contact on the bearings. In case of severe weather conditions (for example, humidity rate exceeding 80%), the impeller must be rotated every week. If the fan is not operated for extended periods of time (over 1 month), make sure that bearings and supports are fully filled with grease.

**Achtung:** In this last case is necessary before to run the fan, to remove the excess of grease reestablishing the right initial operation conditions.

**Achtung:** A long storage, even if adequate, may reduce oil or grease lubrication capacity which must be necessarily replaced every two years. Moreover we recommend to check joints and belts before start-up because they may have deteriorated due to long standing. During transport make sure no water enters the motor, bearings or other delicate components (instrumentation).



Sind bei einem Gebläse ohne Verpackung die Saug- und Druckstutzen unbedeckt, sind sie mit einer Schutzfolie zu verschließen, damit weder Schmutz noch Fremdkörper, Tiere usw. eintreten bzw. eindringen können.

## 5. Installation

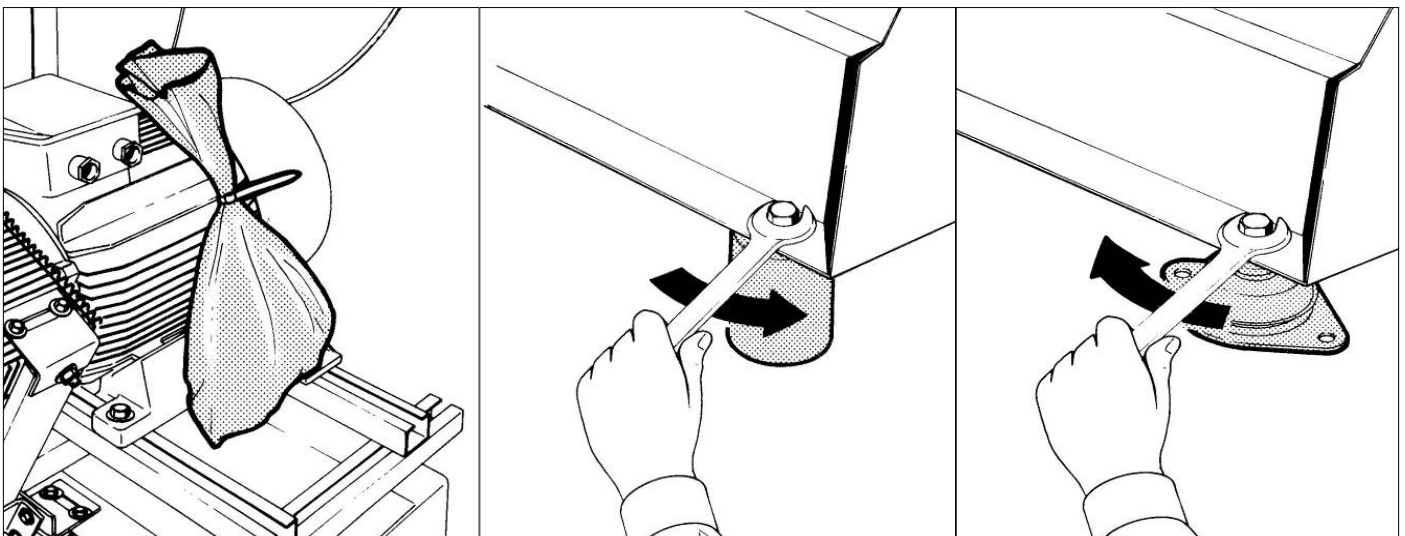
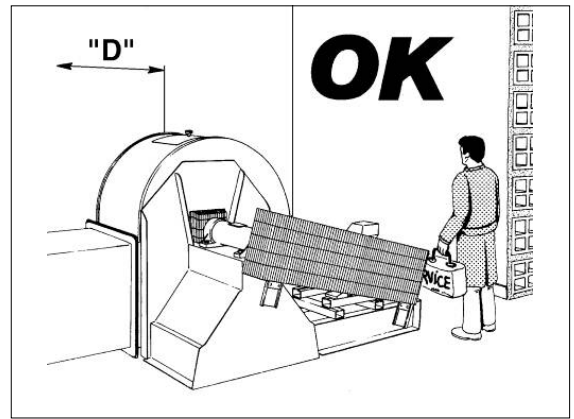
Position the fan in such a way to assure a minimum space for the maintenance and repair work. For fans with inlet not ducted the distance "D" from the wall must be higher or at least equal to the inlet diameter. We recommend to put a safety barrier to prevent possible accidental approach to fan unducted inlet or outlet.

### Foundation

The foundation should, by preference, be made in reinforced concrete and its minimum weight must be four times the weight of the rotating mass (around double the total static weight). If the fan is installed on a metallic structure, make sure that it is solid. The minimum resonance frequency in every point of metallic structure must be greater than 50% of the ones corresponding at the rotating speed velocity of fan and motor. The foundations or support structure must be level to prevent any damaging vibrations.

### 5.1. Positioning

Take the anti-vibrations supports (if included with the supply) from the plastic bag attached to the fan. Lift up the fan, remove the wood feet and install the antivibrations supports.





## 6. Starting

### 6.1. Bevor Starting

Before starting up it is important to carry out various checks : check that the bearings of the fan and motor are correctly lubricated. (1)

Make sure the drive flexible connection is adequately lubricated. (2)

Make sure that all the bolts are fully tightened, with a torque force indicated in the table below . (3)

Torque Force					
Bolt - Ø	Material Class				
	4.8	5.8	8.8	10.9	12.9
	Torque force (Nm)				
M 8	12	15	24	34	41
M 10	26	31	50	70	84
M 12	45	56	90	127	153
M 16	107	134	214	302	362
M 18	155	193	308	434	520
M 20	216	270	431	607	728
M 24	365	457	731	1030	1230
M 27	534	667	1070	1500	1800
M 30	738	923	1480	2080	2490

In particular be careful with the bolts of support, of the foundations, of the pulley bushes, of the coupling joint, of the motor, and close the head screw of the impeller. (4) (5) (6) (7) (8)

Check that there is no foreign matter inside the fan. (9)

Rotate the impeller by hand to be sure that it does not touch the walls. (10)

Check the alignment of the pulleys and the alignment of the coupling joint . (see cap. 7.1) (11) (12)

Check the tension of the belts. (see cap. Kap. 7.1) (13)

Manually check that all the parts rotate freely.

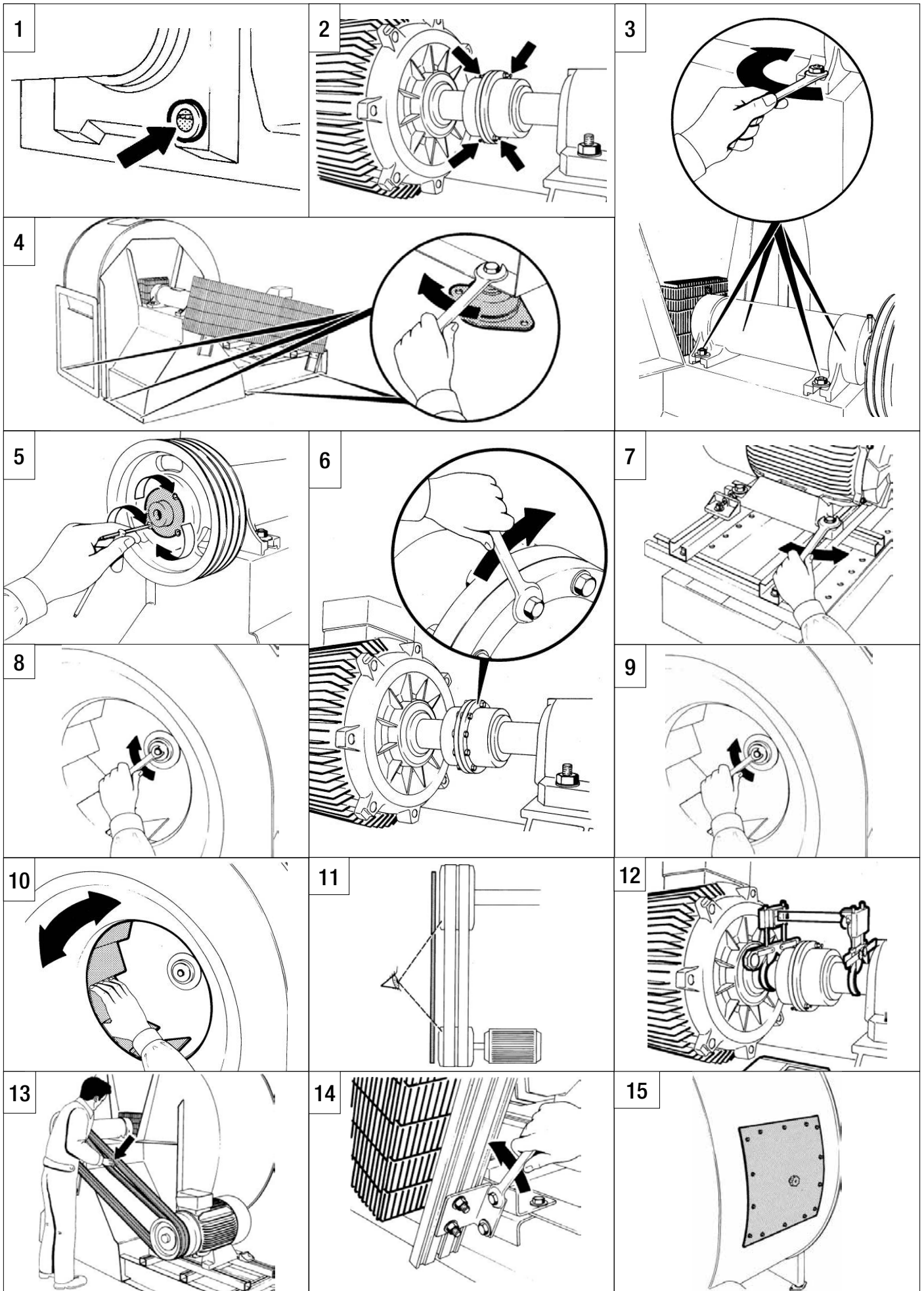
Check if all the protection guards are fitted and make sure that the screws are fully tightened. (14)

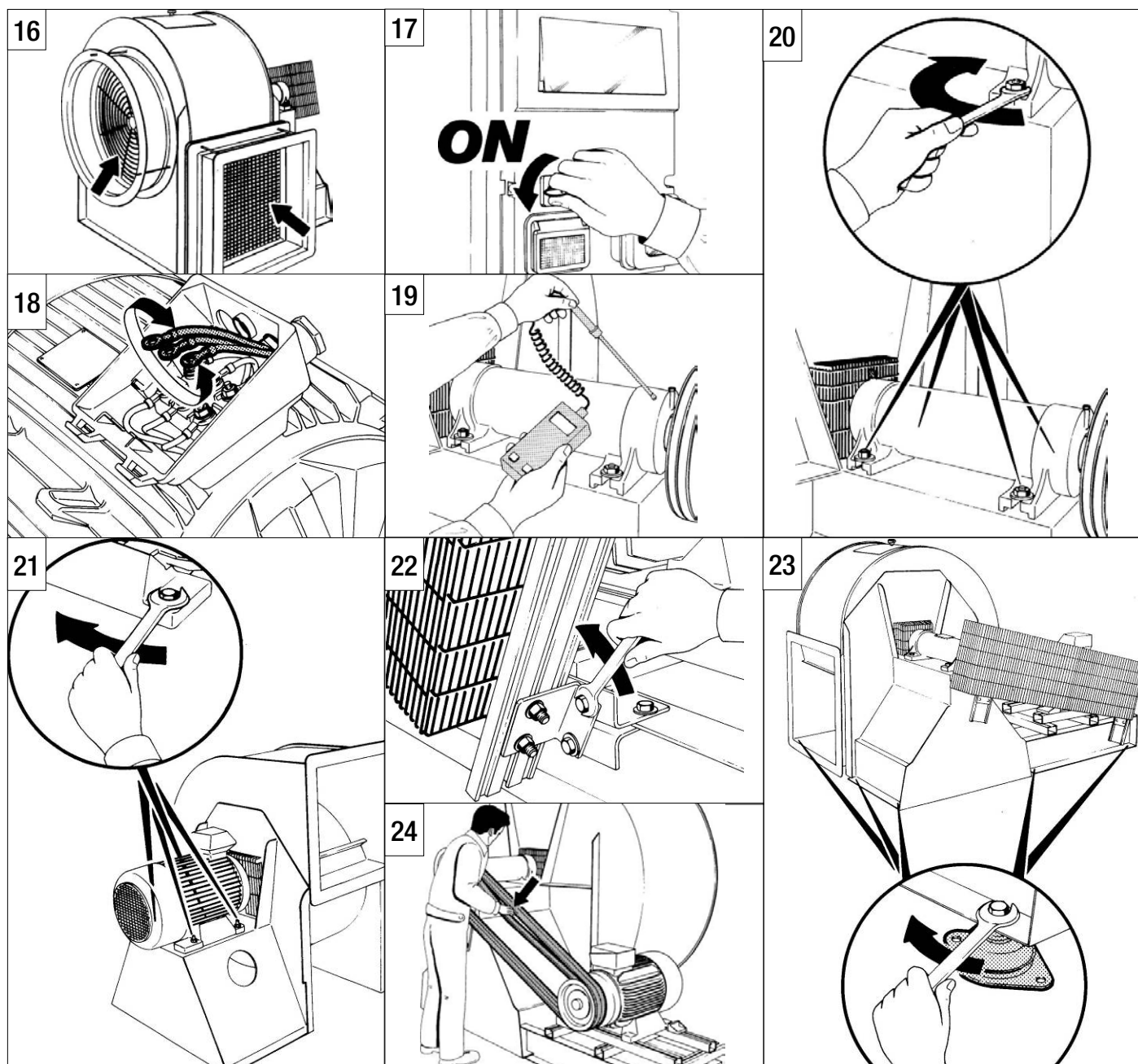
Check that the access door is closed. Verify the absence of any water product of condensation Eventually remove the water from the dedicated plug put on the below part of the housing. (15)

**Attention: If the inlet or the outlet of the fan are not ducted, it is important to attach a suitable protection screen (ISO 13857).** (16)

Check the earth connection. At this point start the motor. (17) Check if the rotating direction is the same as the one shown on the target. (18) Restart the motor and check that electric absorption doesn't overcome, at full speed, target value. After that verify that ventilator works properly, make sure the bearings do not heat over 90°C and that vibrations are within the contractual limits. Should vibrations be too high as a consequence of transport, handling on site or quality of the foundations, check the belt drive alignment (belts – flexible - connection), control the quality of the foundations and in case proceed with fan rebalancing. (19)

After one hour running, check the lock of all the screws. In case of necessity repeat the locking of the screws. With a particular attention to the pillow block bearing housing bolts, (20) of the motor, of the guards, and of the antivibrations supports. Check the tension of the belts after 2, 4, 8 and 100 hours of running (see cap 7.1). Check the alignment of the coupling joint after 4 hours of running . (21) (22) (23) (24)





## 6.2. Important notice

### 6.2.1. Temperature and rotation

Fan working at lower revolutions per minute and higher temperatures than the contractual values is forbidden. Fan working at lower revolutions must be authorized by the manufacturer in order to avoid resonance frequencies.

### 6.2.2. Adjustment of the r.p.m.

Adjustment shall not cause excessive accelerations or decelerations of the impeller. The maximum allowed value to avoid breaking due to overwork in a short time is  $0.5 \text{ rad/sec}^2$  ( $30^\circ/\text{s}^2$ ). In any case a fan with r.p.m. adjustment is more likely subject to accelerations and is also crossed by the frequencies of the other components which are the cause of shorter fan life. We recommend a complete revision of the fan every two years and replacement of the impeller every  $0,5 \cdot 10^6$  million variations of the r.p.m.

### 6.2.3. Working at high temperatures (>100°C)

Before turning the fan off, make it work with fluid at lower temperature until impeller and shaft reach a temperature of 90°C to avoid damage to bearings and deterioration of the lubricant.

Pay attention to:

- fan working at reduced r.p.m. (r.p.m regulator) reduces the cooling wheel efficacy..
- A sudden stop (power failure) causes bearings temperature increase; it is therefore necessary an intervention with additional air flow from outside through a safe air generator (compressed air or small service fan) so that the bearing support temperature never exceeds 90°C.

### 6.2.4. Aerodynamic Pulsations (Stall/Pumping)

In particular conditions of utilization, typically with a too high system resistance or with a moderate opening of the inlet damper control (say 20 to 60 percent), it could happen the phenomenon known as “stall or pumping”. In that conditions the aerodynamic pulsations generate a rumbling sound easily detectable, macroscopical vibrations on fan are easily observable and touchable. This could be very dangerous and can generate the damage of fan (in particular the impeller) and ducts. In case the phenomenon is caused by the too high system resistance, it is necessary to change opportunely the system. In case the phenomenon is caused by the moderate opening of the inlet, it is necessary to increase the opening of the inlet damper and , if necessary, to reduce the flow reducing the opening on a second damper in the outlet of fan.

## 7. Maintenance

The maintenance of the fan basically means ensuring that all the bearings are properly lubricated, periodically checking the transmission, and in cleaning the impeller.

**Attention: All maintenance must only be carried out when the fan is stopped and supplies of electricity, compressed air and steam, etc. are disconnected.**

In case of need, the level of the grease in the bearings can be restored when the machine is rotating, but this operation can only be carried out by expert staff and fitted with adequate equipment not requiring the opening of the bearing housings on which is necessary to intervene. For the bearings with is necessary the use of grease, it is mandatory to use a greasing pump connected to the specific fitting. For oil-lubricated bearings, it is necessary to take due precautions to avoid oil leakages from the drain plug when it is removed.

### 7.1. Lubrication of the motor

The electric motors supply without external greasers, are equipped with sealed life pre-lubricated bearings, and don't need any periodical lubrication. The electric motors supply with external greasers requires a periodical lubrication. (see manual of instructions of the motor)

### 7.2. Lubrication of the drives

The drives must be lubricated every 8 months.

### 7.3. Lubrication of the flexible connections

Monobloc bearings and SNL supports, must be greased according to the time schedules shown in the tables:

- Monobloc: RELUBRICATION INTERVAL FOR GREASE LUBRICATED MONOBLOC PERIODICAL MAINTENANCE DEPENDING FROM THE ROTATION SPEED (hours)
- - SNL: “RELUBRICATION INTERVAL FOR GREASE LUBRICATED SEPARATED PILLOW BLOCKS PERIODICAL MAINTENANCE DEPENDING FROM THE ROTATION SPEED (hours)”

#### 7.4. Maintenance in case of extended downtimes

In case of extended machine downtime (over one month), following the installation of fans, it is necessary to carry out some operations in order to ensure their conditions. When the machine is down, adequate weather protections must be provided, also for machines that were designed to be installed outside, especially on rotating parts (motor, shaft, impeller, beatings, transmission joint, etc.) in order to prevent condensation, corrosion and dust/sand built-ups. Machines, if installed outside, must be checked on a regular basis (10 days) in order to stop or correct any of the problems mentioned above. In case of severe weather conditions (for example, humidity rate exceeding 80%), the impeller must be rotated every week. If the fan is not operated for extended periods of time (over 1 month), make sure that bearings and supports are fully filled with grease.

**Attention: In this last case is necessary before to run the fan, to remove the excess of grease reestablishing the right initial operation conditions. Every month, new grease must be injected through grease nozzles and impellers must be rotated manually (about 100 turns) in order to avoid contact oxidation on bearings. Inject new grease into motor bearings, when they are fitted with external grease nozzles.**

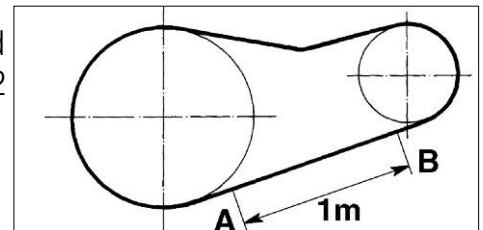
**In case fans are not used frequently, over time, grease and oil lubricating characteristics become reduced, so grease and oil must be replaced every two years Furthermore, at machine start, gaskets and belts status must be checked, as they could have deteriorated as a result of inactivity. Generally speaking, before re-starting the machine, all components must be carefully inspected to assess their perfect efficiency.**

#### 7.5. Alternate operation (stand by)

If the fans are installed in pairs and used alternatively (main fan/stand-by fan), it is recommended, as a general rule, to limit stand-by times within 10 days. Furthermore, in order to avoid early wear out of parts during stand-by period it is recommended to split operating time according to the same scheme: 60% main fan – 40% stand-by fan. In case weather conditions are particularly severe (for example, humidity exceeding 80%), the impeller must be rotated every week.

#### 7.6. Belts stretching

Before belts tensioning mark on the tensioned belt a line A-B of 1 meter and then make the first tensioning until you extend the line A-B of 5 mm. After 2 days make the second tensioning until to extend the line A-B of 3 mm more. After 2 days make the third tensioning until to extend the line A-B of 2 mm more, for a total extension of 10 mm.



## 7.7. Correct alignment

The maximum tolerated misalignments.

d (mm)	$\Delta a$ (mm)	$\Delta p$ (mm)
$d \leq 85$	0,20	0,08
$85 < d \leq 130$	0,35	0,13
$130 < d \leq 180$	0,48	0,18
$180 < d \leq 230$	0,62	0,25
$230 < d \leq 280$	0,80	0,33
$280 < d \leq 350$	1,0	0,43

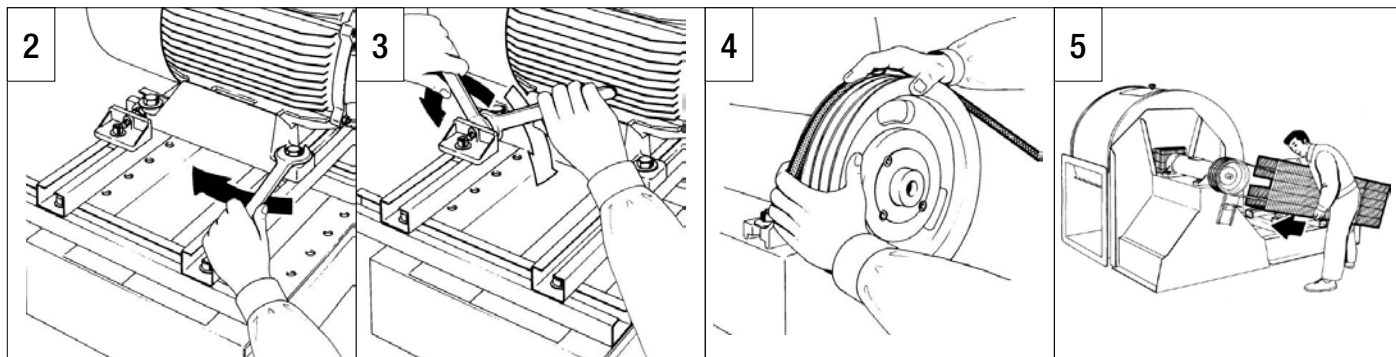
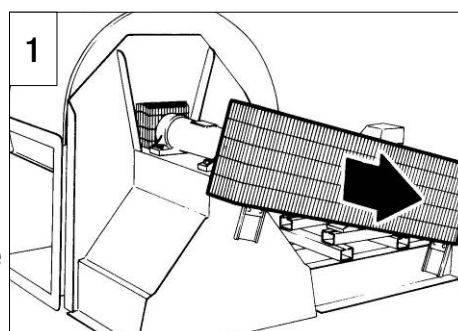
( $\Delta a$  = angular misalignment,  $\Delta p$  = parallel misalignment)

## 7.8. Replacing the belts

Owing to natural wear and tear the belts will need to be replaced with a frequency depending on the running conditions.

To dismantle the belts first of all remove the transmission guard, (1) then release the screws for the motor, (2) and turn the adjustment screws to reduce the distance between the motor pulley and the fan pulley. (3)

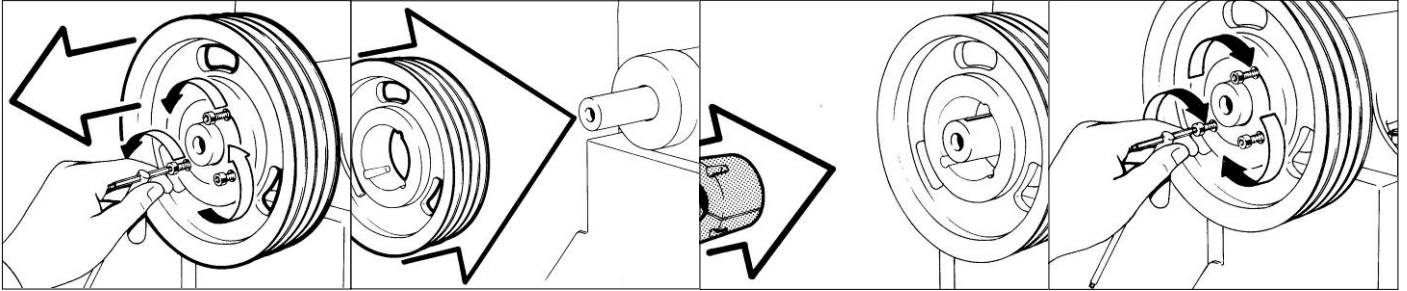
At this point it is possible to change the belts installing new belts of the same type. (4) Turning the adjustment screws bring back the motor and check the tension of the belts as previously explained, and then fasten the motor onto the stretchers. Refit the belts guard and fully tighten the bolts. (5)



## 7.9. Replacing the pulleys

It is important to periodically check the state of the channels in the pulleys (using the dedicated calibre for trapezoidal pulley) and, if necessary, to change them. It is important to note that the tension of the belts, and the alignment of the transmission are significant factors in prolonging the life of the pulleys.

The pulleys with conical bush are replaced as follows: release the three screws and insert one of them in the free hole; turn the screw in until the complete unlock clean the bush shaft support with a cloth but don't grease it mount the pulley on the fan shaft insert the bush in the pulley taking care that the threaded half holes of the pulley coincide with the non-threaded half holes of the bush put in and tighten the three screws evenly and alternating between them until the pulley is fully fastened check that the pulleys are statically and dynamically balanced.



## 7.10. Periodical checks

We recommend a complete overhaul of the bearings and the supports once a year, washing them with mineral oil (light petrol) and then lubricating with new grease:

It is also recommended to check the impeller periodically (every 3 months) through the inspection door, especially if you note vibrations.

It is also recommended to check the right tighten of the bolts of ventilator (every 6 months).

It is also recommended to check periodically (every 6 months) tensioning of the belts, alignment of the V-belt drive and of the coupling joint as well as status of anti-vibration supports and flexible connections.

## 7.11. Cleaning

In order to prolong the life and good working order of the fan it should periodically have a general clean.

**Attention: Before proceeding with the cleaning shut off electrical power to the fan. For the cleaning it is sufficient to use a damp cloth with water or detergent. Do not uses solvents that could damage the painting or the seals.**

**Attention: Jets of water must not be directed onto the fan.**

If the impeller is encrusted with matter, it should be thoroughly cleaned using a wire brush, removing all the bits with a vacuum cleaner .

			<b>RELUBRICATION INTERVAL FOR GREASE LUBRICATED MONOBLOC PERIODICAL MAINTENANCE DEPENDING FROM THE ROTATION SPEED (hours)</b>									
SIDE	BEARING	QUANTITY (1)	750 RPM	1000 RPM	1250 RPM	1500 RPM	1750 RPM	2000 RPM	2250 RPM	2500 RPM	2750 RPM	3000 RPM
<b>MONOBLOC TYPE P0-30</b>												
DE/NDE	6306	7	12700	11800	11000	10200	9500	8900	8300	7700	7200	6700
<b>MONOBLOC TYPE P1-35</b>												
DE/NDE	6307	8	12400	11400	10500	9700	8900	8300	7600	7000	6500	6000
<b>MONOBLOC TYPE P2-45</b>												
DE/NDE	6309	13	11800	10500	9500	8500	7700	7000	6300	5700	5100	4600
<b>MONOBLOC TYPE P3-55</b>												
DE/NDE	6311	17	10900	9600	8500	7500	6700	5900	5200	4600	4100	3600
<b>MONOBLOC TYPE P4-65</b>												
DE/NDE	6313	23	10200	8900	7700	6600	5700	5000	4300	3700	3200	2800
<b>MONOBLOC TYPE P5-80</b>												
DE/NDE	6316	33	9300	7800	6500	5500	4600	3900	3200	2700	2300	1900
<b>MONOBLOC TYPE P6-90</b>												
DE/NDE	6318	41	8700	7200	5900	4800	4000	3300	2700	2200	1800	1500
<b>MONOBLOC TYPE R1-40</b>												
DE	NU 2208 EC	9	9500	8000	6800	5700	4800	4100	3500	2900	2500	2100
NDE	2 * 7208 BECB	14	12200	11200	10300	9500	8700	8000	7400	6800	6200	5700
<b>MONOBLOC TYPE R2-55</b>												
DE	NU 2211 EC	13	8200	6600	5300	4300	3400	2800	2200	1800	1400	1200
NDE	2 * 7211 BECB	22	11400	10200	9100	8200	7300	6600	5900	5300	4800	4300
<b>MONOBLOC TYPE R3-65</b>												
DE	NU 2213 EC	19	7200	5600	4300	3300	2600	2000	1500	1200	900	700
NDE	2 * 7213 BECB	28	10700	9400	8200	7200	6300	5600	4900	4300	3800	3300
<b>MONOBLOC TYPE R4-80</b>												
DE	NU 2218 EC	23	6200	4600	3400	2500	1800	1300	1000	700	500	400
NDE	2 * 7218 BECB	36	9900	8500	7300	6200	5300	4600	3900	3400	2900	2500
<b>MONOBLOC TYPE R4-80/8</b>												
DE	6313	23	10200	8900	7700	6600	5700	5000	4300	3700	3200	2800
NDE	2 * 7218 BECB	36	9900	8500	7300	6200	5300	4600	3900	3400	2900	2500
<b>MONOBLOC TYPE S1-35</b>												
DE	NU 307 ECJ	8	9700	8300	7000	6000	5100	4300	3700	3100	2700	2300
NDE	6307	8	12400	11400	10500	9700	8900	8300	7800	7000	6500	6000
<b>MONOBLOC TYPE S2-45</b>												
DE	NU 309 ECJ	13	8500	7000	5700	4600	3800	3100	2500	2100	1700	1400
NDE	6309	13	11800	10500	9500	8500	7700	7000	6300	5700	5100	4600
<b>MONOBLOC TYPE S3-55</b>												
DE	NU 311 ECJ	17	7500	5900	4600	3600	2800	2200	1700	1300	1100	800
NDE	6311	17	10900	9600	8500	7500	6700	5900	5200	4600	4100	3600
<b>MONOBLOC TYPE S4-65</b>												
DE	NU 313 ECJ	23	6600	5000	3700	2800	2100	1600	1200	900	700	500
NDE	6313	23	10200	8900	7700	6600	5700	5000	4300	3700	3200	2800
<b>MONOBLOC TYPE S5-80</b>												
DE	NU 316 EC	33	5500	3900	2700	1900	1300	900	700	500	300	200
NDE	6316	33	9300	7800	6500	5500	4600	3900	3200	2700	2300	1900
<b>MONOBLOC TYPE S6-90</b>												
DE	NU 318 EC	41	4800	3300	2200	1500	1000	700	500	300	200	-
NDE	6318	41	8700	7200	5900	4800	4000	3300	2700	2200	1800	-
<b>MONOBLOC TYPE S1-35/8</b>												
DE/NDE	6307	8	12400	11400	10500	9700	8900	8300	7800	7000	6500	6000
<b>MONOBLOC TYPE S2-45/8</b>												
DE/NDE	6309	13	11800	10500	9500	8500	7700	7000	6300	5700	5100	4600
<b>MONOBLOC TYPE S3-55/8</b>												
DE/NDE	6311	17	10900	9600	8500	7500	6700	5900	5200	4600	4100	3600
<b>MONOBLOC TYPE S4-65/8</b>												
DE/NDE	6313	23	10200	8900	7700	6600	5700	5000	4300	3700	3200	2800
<b>(1) GREASE QUANTITY (gr) TO ADD WITH THE SPECIFIED FREQUENCY</b>												
<b>USE ONLY SKF LGWA2 GREASE OR EQUIVALENT - PROVIDED BEARING TEMPERATURE FROM 63 TO 78°C. IF THE TEMPERATURE GROW UP OVER 78°C PLEASE CONTACT OUR MAINTENACE SERVICE OR TECHNICAL DEPARTMENT</b>												
<b>DRIVE END (DE) BEARING INTERVAL CAN BE LESS THAN INDICATED WITH V-BELTS TRANSMISSION WITH HIGH POWER MOTORS (OVER 75 kw). IN THIS CASES PLEASE REFER TO THE LUBRICATION CHART ON GA FAN DRAWING</b>												



			RELUBRICATION INTERVAL FOR GREASE LUBRICATED SEPARATED PILLOW BLOCKS PERIODICAL MAINTENANCE DEPENDING FROM THE ROTATION SPEED (hours)									
SIDE	BEARING	QUANTITY (1)	750 RPM	1000 RPM	1250 RPM	1500 RPM	1750 RPM	2000 RPM	2250 RPM	2500 RPM	2750 RPM	3000 RPM
<b>PILLOW BLOCK TYPE SN° 509</b>												
DE/ND	1209 EKTN9	8	12000	10900	10000	9100	8300	7800	6900	6300	5800	5300
DE/ND	2209 EKTN9	10	12000	10900	10000	9100	8300	7800	6900	6300	5800	5300
DE/ND	22209 EK	10	9100	7600	6300	5300	4400	3700	3000	2500	2100	1800
<b>PILLOW BLOCK TYPE SN° 510</b>												
DE/ND	1210 EKTN9	9	11700	10600	9600	8700	7900	7200	6500	5900	5300	4800
DE/ND	2210 EKTN9	10	11700	10600	9600	8700	7900	7200	6500	5900	5300	4800
DE/ND	22210 EK	10	8700	7200	5900	4800	4000	3300	2700	2200	1800	1500
<b>PILLOW BLOCK TYPE SN° 511</b>												
DE/ND	1211 EKTN9	10	11400	10200	9100	8200	7300	6600	5900	5300	4800	4300
DE/ND	2211 EKTN9	12	11400	10200	9100	8200	7300	6600	5900	5300	4800	4300
DE/ND	22211 EK	12	8200	6600	5300	4300	3400	2800	2200	1800	1400	1200
<b>PILLOW BLOCK TYPE SN° 512</b>												
DE/ND	1212 EKTN9	12	11000	9800	8700	7700	6800	6100	5400	4800	4200	3800
DE/ND	2212 EKTN9	15	11000	9800	8700	7700	6800	6100	5400	4800	4200	3800
DE/ND	22212 EK	15	7700	6100	4800	3800	3000	2300	1800	1400	1100	900
<b>PILLOW BLOCK TYPE SN° 513</b>												
DE/ND	1213 EKTN9	14	10700	9400	8200	7200	6300	5600	4900	4300	3800	3300
DE/ND	2213 EKTN9	19	10700	9400	8200	7200	6300	5600	4900	4300	3800	3300
DE/ND	22213 EK	19	7200	5600	4300	3300	2600	2000	1500	1200	900	700
<b>PILLOW BLOCK TYPE SN° 515</b>												
DE/ND	1215 K	16	10200	8900	7700	6600	5700	5000	4300	3700	3200	2800
DE/ND	2215 EKTN9	20	10200	8900	7700	6600	5700	5000	4300	3700	3200	2800
DE/ND	22215 EK	20	6600	5000	3700	2800	2100	1600	1200	900	700	500
<b>PILLOW BLOCK TYPE SN° 516</b>												
DE/ND	1218 K	18	9900	8500	7300	6200	5300	4600	3900	3400	2900	2500
DE/ND	2218 EKTN9	23	9900	8500	7300	6200	5300	4600	3900	3400	2900	2500
DE/ND	22218 EK	23	6200	4600	3400	2500	1800	1300	1000	700	500	400
<b>PILLOW BLOCK TYPE SN° 517</b>												
DE/ND	22217 EK	27	5800	4200	3000	2200	1600	1100	800	600	400	300
<b>PILLOW BLOCK TYPE SN° 518</b>												
DE/ND	22218 EK	32	5500	3900	2700	1900	1300	900	700	500	300	200
<b>PILLOW BLOCK TYPE SN° 519</b>												
DE/ND	22219 EK	37	5200	3600	2400	1700	1200	800	600	400	300	200
<b>PILLOW BLOCK TYPE SN° 520</b>												
DE/ND	22220 EK	41	4800	3300	2200	1500	1000	700	500	300	200	100
DE/ND	23220 CCK	54	4800	3300	2200	1500	1000	700	500	-	-	-
<b>PILLOW BLOCK TYPE SN° 522</b>												
DE/ND	22222 EK	53	4300	2800	1800	1200	700	500	300	200	100	100
DE/ND	23222 CCK	70	4300	2800	1800	1200	700	500	-	-	-	-
<b>PILLOW BLOCK TYPE SN° 524</b>												
DE/ND	22224 EK	62	3800	2400	1500	900	600	400	200	100	100	-
DE/ND	23224 CCK	82	3800	2400	1500	900	600	400	-	-	-	-
<b>PILLOW BLOCK TYPE SN° 526</b>												
DE/ND	22226 EK	74	3500	2100	1300	800	500	300	200	100	-	-
DE/ND	23226 CCK	92	3500	2100	1300	800	500	-	-	-	-	-
<b>PILLOW BLOCK TYPE SN° 528</b>												
DE/ND	22228 CCK	85	3000	1800	1000	600	300	200	100	-	-	-
DE/ND	23228 CCK	110	3000	1800	1000	600	-	-	-	-	-	-
<b>PILLOW BLOCK TYPE SN° 530</b>												
DE/ND	22230 CCK	99	2700	1500	800	500	300	100	-	-	-	-
DE/ND	23230 CCK	130	2700	1500	800	500	-	-	-	-	-	-
<b>PILLOW BLOCK TYPE SN° 532</b>												
DE/ND	22232 CCK	116	2400	1300	700	400	200	100	-	-	-	-
DE/ND	23232 CCK	151	2400	1300	700	400	-	-	-	-	-	-
<b>(1) GREASE QUANTITY (gr) TO ADD WITH THE SPECIFIED FREQUENCY</b>												
<b>USE ONLY SKF LGWA2 GREASE OR EQUIVALENT - PROVIDED BEARING TEMPERATURE FROM 63 TO 78°C, IF THE TEMPERATURE GROW UP OVER 78°C PLEASE CONTACT OUR MAINTENACE SERVICE OR TECHNICAL DEPARTMENT</b>												
<b>DRIVE END (DE) BEARING INTERVAL CAN BE LESS THAN INDICATED WITH V-BELTS TRANSMISSION WITH HIGH POWER MOTORS (OVER 110 kw), IN THIS CASES PLEASE REFER TO THE LUBRICATION CHART ON GA FAN DRAWING</b>												

## 8. Spare parts

To order spare parts contact Nicotra Gebhardt directly indicating, as well as the part required (shaft, impeller, bearings, etc...), all the data as shown on the fan's ID plate. Since there are only a limited number of parts that may need to be changed, a spare part list is not necessary. It is recommended to have a set of bearings always ready for fitting in case of unexpected need.

## 9. Putting out of service and dismantling

When dismantling the machine, set aside all still functioning parts in order to re-use them. Separate the materials according to type: iron, rubber, oil, etc. Rubbish must be collected in special containers bearing labels, and disposed of in compliance with local laws in force, going to companies specialized in the disposal of waste.

**Attention: Do not dispose of toxic wastes in municipal sewerage and drain systems. Uncertified scrap materials can be disposed of at municipal rubbish dumps.**

## 10. Troubleshooting

Problem	Cause	Solution
Vibrations	Impeller imbalanced	Check the absence of powders or other materials on the rotating parts. Check erosion or corrosion of the impeller. If the impeller is seriously damaged, it should be changed.
	Foundation inappropriate	Reinforce the structure or change the resonance frequency for example adding some weights.
	Loosening of bolt of foundation or of fixing support and relative covers.	Right bolts tightening as indicated in cap 6.1.
	Loosening of the head screw of the impeller.	Right screw tightening checking also if the impeller is in the right position.
	Opposite rotation sense of the impeller.	Check if the rotation sense is correct, looking what indicated in the target.
	Vibrations transmitted to the ventilator by the plant, other machines or other building structures.	Check the plant on where the ventilator is installed. Plan to add an expansion joint between ventilator and duct.
	Air pulsations.	See next point.
	Usage of ventilator to a greater speed higher than planned.	Ventilator must to be used within Nicotra Gebhardt limits of the utilization class. This limit must never overcome.
	Bearing break.	Change the damaged bearing.

Air pulsations (Stall/pumping)	<p>Working of the ventilator at reduced or nul flow rate, usually at the maximum pressure. Ventilator works in the stall zone of the working curve.</p> <p>This could be caused by many reasons, Among wich:</p> <ul style="list-style-type: none"> <li>• Accidental closure of the damper of the plant or of the ventilator.</li> <li>• moderate opening of the inlet damper control (say 20 to 60 percent)</li> </ul>	<p>Increase the opening of the inlet damper and, if necessary, to reduce the flow reducing the opening on a second damper in the outlet of fan.</p>
	<ul style="list-style-type: none"> <li>• Resistance of the circuit larger than expected.</li> <li>• Occlusion or bad connection to the Inlet with instable conditions of the air in entrance.</li> <li>• Alternative increase and decrease of the air flow on the wall in a divergent duct.</li> </ul>	<p>Eliminate eventually accidental occlusion and modify opportunely the system.</p>
Noise	Extraneous material in the case of ventilator	<p>Inspection impeller and case: clean and eliminate extraneous material.</p>
	Bearings	<p>Check the amount and quality status of lubricant. Check the backlashes, the integrity of the moving components and the presence of external particles.</p>
	Friction between statics and rotating parts.	<p>Check periodically (every 6 months) backlashes and tolerances between statics and rotating parts and the right tightening of bolts.</p>
	Sliding of belts	<p>Check and eventually correct the belt tension.</p>
Overheting of bearings	Wear bearings	<p>Change the bearings</p>
	Wrong lubrication	<p>Use lubricant lithium based as indicated in the motor manual.</p>
	Overgreasing	<p>Remove the excess of lubricant</p>
	Fluid temperature greater than expected	<p>Is mandatory that ventilator works with fluid within the maximum temperature expected as indicated in the ventilator target.</p>
	<p>Bearing put through an excess of heating coming from an oven or an dry kiln after the switching off.</p>	<p>It happens when ventilator is stopped and the cooling fan cannot cool the bearing. In order to cool the shaft of ventilator and protect the bearings is necessary to let work the ventilator for a sufficient time until the fluid temperature goes down 100°C after the switch off of the oven.</p>
	Excessive tension of belts	<p>Check and adjust tension of belts.</p>
Insufficient Noise flow rate	Wrong sense of rotation of fan	<p>Check the right sense of rotation as indicated in the target.</p>

	Sharp changing of direction in the duct near to the unload of ventilator or pre-rotation of fluid generated by an angle in the duct inlet.	Look to the tables of the right installations
	Air flow regulator of inhalation do not mounted in the right way.	Check if the air regulator is mounted with the air vent in agreement with the sense of rotation of impeller when it is partially closed
	Ventilator power unexpectedly low.	To correct one or more of the following conditions: <ul style="list-style-type: none"> <li>• pre-rotation of fluid in the inlet zone of fan.</li> <li>• resistance of fluid higher than planned (due to for example to a closed damper.)</li> </ul>
Performance with excess of flow rate	Ventilator power unexpectedly high.	Check if ventilator fan is not too high. To correct one or more of the following conditions: <ul style="list-style-type: none"> <li>• Ventilator is working with air at room temperature while it is planned to work with a higher or lesser density of air;</li> <li>• Excessive evaluation of loss of load (reduce the fan velocity or partially close the dampers).</li> </ul>

## 11. After sales service

We thank you once again for having chosen a Nicotra Gebhardt fan which, like all equipment, will increase its life and efficiency if it has good „service“. Please note that all maintenance not mentioned in this manual is to be considered „extraordinary“ and thus to be completed by qualified staff. All after-sales service is carried out directly by Nicotra Gebhardt.



## Translation of the original

# EC-Declaration of Conformity

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

Designation: Centrifugal fan with casing and backward curved blades

fan type: PAM/PAK/PBM/PBK

Serial no: see type plate

Year of construction: see type plate

Relevant EC Directives: EC-Directive 2009/125/EC;  
EC-Directive for the setting of ecodesign requirements for energy-related products

The following harmonized standards have been applied:

Waldenburg, 05th September 2014



i.V. I.Stöbe  
Head of Production



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

### **Nicotra Gebhardt GmbH**

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## EC-Declaration of incorporation

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

herewith declares, that the following direct/coupling driven products with casing

### **PAM/PAK/PBM/PBK**

Serial n°: see type plate

Year of construction: see type plate

qualifies as a partly-completed machine, according to Article 2, clause “g” and does comply to the following basic requirements of the **Machine Directive (2006/42/EC): Annex I, Article 1.1.2; 1.3.7**

The uncompleted machine may be put into operation only if it has been stated, that the machine, into which the uncompleted machine has to be incorporated, does comply with the requirement of the machine directive (2006/42/EC).

The following harmonised standards 1) have been applied:

ISO 12100 Safety of machines – General design principles

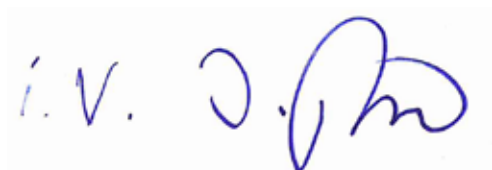
ISO 13857 Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs

Applied, national standards and technical specifications 2) particularly:

**VDMA 24167** Fans - Safety requirements

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

Waldenburg, 05th September 2014



i.V. I. Stöbe  
Head of Production



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

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

2) As far as harmonised standards are not existing

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