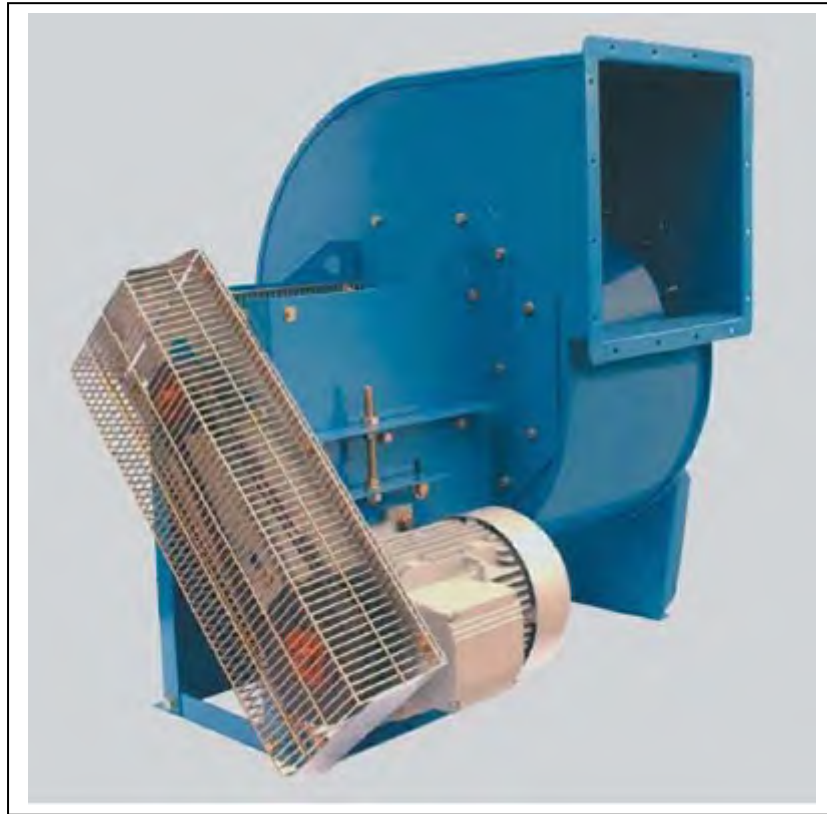


OPERATION AND MAINTENANCE CENTRIFUGAL FAN



للحصول علي الاستخدام الأفضل ومن أجل سلامتك وسلامة الآخرين يرجى أتباع الإرشادات التالية ،
خطوة بخطوة مع وضع علامة أمام كل بند عند الانتهاء منه .
قبل بدء التشغيل :

1	الإطلاع علي البيانات الموجودة علي الوحدة
2	التأكد من خلو الوحدة والدكت الموصل عليها من أي مخلفات
3	التأكد باليد من حرية حركة الأمبلر والأجزاء المتحركة بالوحدة
4	التأكد علي الربط المحكم لمسامير تثبيت المروحة ، الموتور ، الأمبلر
5	التأكد من التشحيم لكل من الموتور والمروحة
6	التأكد من درجة شد السيور وأحكام ربط مسامير تثبيت الطنابير
7	التأكد من وجود الفلاتر وتأمينها في موضعها بأحكام
8	التأكد من تثبيت الوحدة علي قاعدتها وكذلك التوصيلات الميكانيكية
9	التأكد من الوصلات الكهربائية وفولت التيار طبقاً لمواصفات الموتور
10	التأكد من التوصيل السليم للوحدة مع نظام التسريب الأرضي
11	التأكد من وجود جميع حواجز الحماية والأمان في أماكنها
12	التأكد من وجود شبكة حماية لمدخل أو مخرج المروحة الغير موصل
13	التأكد من إغلاق أبواب الكشف والصيانة بإحكام

فور بدء التشغيل :

14	إيقاف الوحدة عند صدور صوت غير عادي لمعرفة السبب وإزالته
15	التأكد من أن اتجاه دوران المروحة مطابق للموضح علي المروحة
16	متابعة قراءة الأمبير وإيقاف الموتور إذا اعلي من المكتوب عليه
17	التأكد من عدم وجود اهتزاز بأي جزء من الوحدة

بعد ساعة من التشغيل:

18	تأكيد مرة أخرى من درجة شد السيور
19	راجع وأكد مرة أخرى علي إحكام ربط مسامير التثبيت لأجزاء الوحدة

يراعي إعادة الخطوات أعلا بعد كل عملية فك وتركيب للوحدة أو أجزائها

Thank you for having chosen a CBI fan.

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

CBI 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.

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.

CBI reminds all staff concerned to comply with and put into practice all the indications shown in the following.

CBI 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.

GENERAL RULES

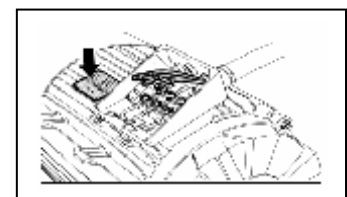
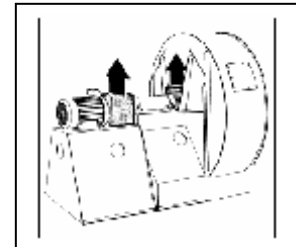
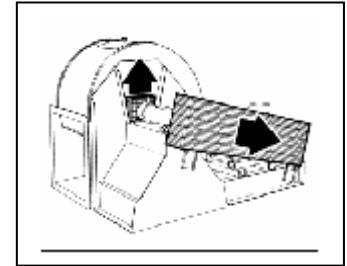
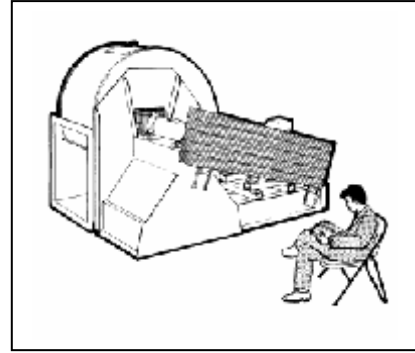
The protection guards are not to be removed, unless absolutely necessary for maintenance purposes, in which case appropriate steps must be taken to clearly indicate the possible danger.

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.

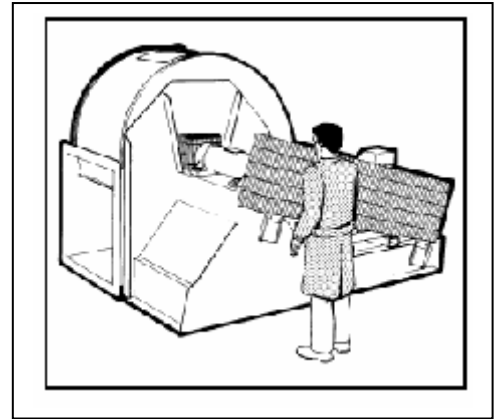


RECEPTION

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.



TRANSPORT AND STORAGE

The fans must be stored in a dustfree and closed area where the relative humidity is lower than 80 %.

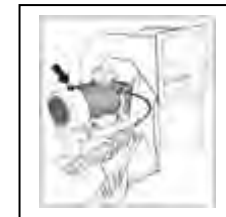
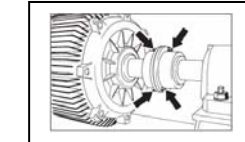
Monthly, new grease must be added through the greasing point, turning the impeller by hand (about 100 turns) to avoid rusting from contact on the bearings.

Introduce new grease in the motor bearings if this one is Equipped with greaser.

Attention

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).



If the fan is delivered without any packing, and if the inlet or outlet are free, it is important to close them with protective plastic film to prevent the entry of dust, foreign bodies, animals, etc ...

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.

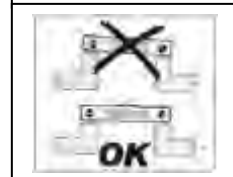
We recommend to put a safety barrier to prevent possible accidental approach to fan unducted inlet or outlet.

Foundations

The foundation should, by preference, be made in reinforced concrete and its minimum weight must to 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.

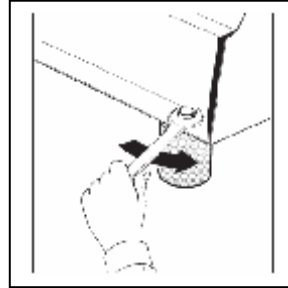
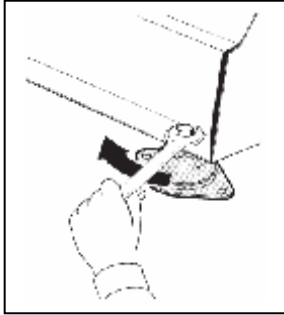
The foundations or support structure must be level to prevent any damaging vibrations.



POSITIONING

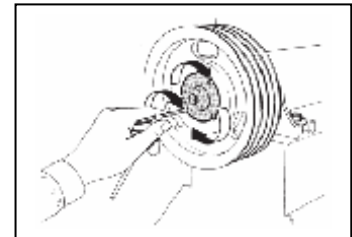
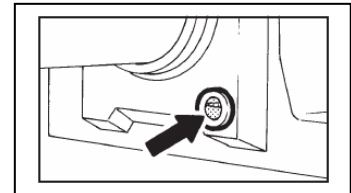
Take the anti-vibrations supports (if included with the supply) from the plastic bag attached to the fan.

Lift up the fan, remove the wood feet and install the antivibrations supports.



6.1 STARTING

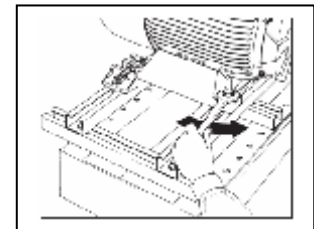
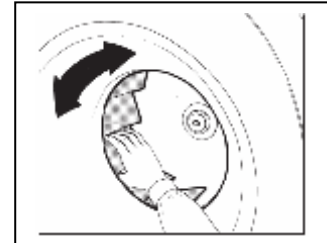
Before starting up it is important to carry out various checks :
check that the bearings of the fan and motor are correctly lubricated.
Make sure the drive flexible connection is adequately lubricated.
Make sure that all the bolts are fully tightened, particularly the bolts of the supports, of the foundations, of the pulley bushes, of the coupling joint the motor and close the head screw of the impeller



Check that there is no foreign matter inside the fan. Rotate the impeller by hand to be sure that it does not touch the walls.
Rotate the impeller by hand to be sure that it does not touch the walls.

Check the alignment of the pulleys.

Check the alignment of the pulleys. Check the alignment of the coupling joint



Check the tension of the belts

Manually check that all the parts rotate freely.

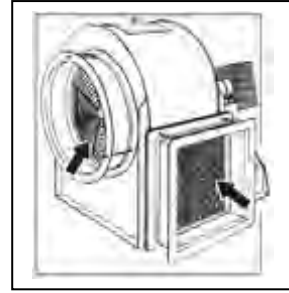
Check if all the protection guards are fitted and make sure that the screws are fully tightened.

Check that the access door is closed.



Attention

If the inlet or the outlet of the fan are not ducted, it is important to attach a suitable protection screen. Check the earth connection. At this point start the motor. Check if the rotating direction is the same as the one shown on the target.



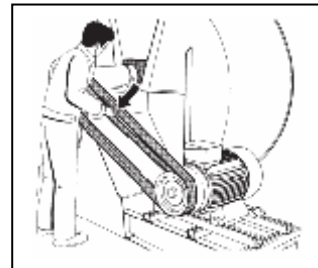
If it goes in a different direction, shut off the power supply and reverse the phases in the connection box. Restart the motor and make sure the bearings do not heat over 90°C and that vibrations are within the contractual limits. Should vibrations be too high as a consequence of transport, handling on site or quality of the foundations, check belt drive alignment (belts – flexible connection), control quality of the foundations and in case proceed with fan rebalancing.



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 monoblock support bolts, of the motor, of the guards and of the antivibrations supports.



Check the tension of the belts after 2-4-8-100 hours of running Check the alignment of the coupling joint after 4 hours of running.



6.2 IMPORTANT NOTICE

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.

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 rad/sec².

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 million variations of the r.p.m.

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.

7.1 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. disconnected.

Lubrication of the bearings

The fan bearings are supplied with the necessary quantity of grease for normal running.

After the initial running-in period during which the bearings must be lubricated weekly, the lubrication interval will depend on the speed of the fan and on the type and size of the bearings

Motor lubrication

The electric motors supply without external greasers, are equipped with sealed life prelubricated 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).

Lubrication of flexible connections

Flexible connections must be greased every 8 months.

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.

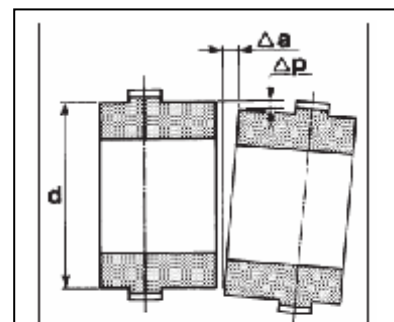
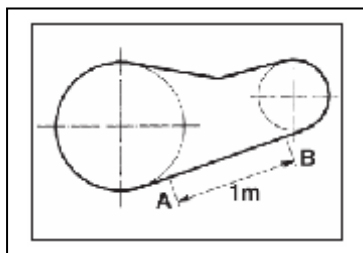
After 2 days make the third tensioning until to extend the line A-B of 2 mm more, for a total extension of 10 mm.

Correct alignment

The maximum tolerated misalignments

(-a= angular misalignment

-p = parallel misalignment) are as shown in the table.

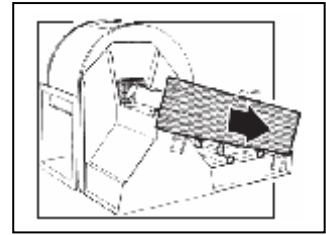


d (mm)	Δa (mm)	Δp (mm)
d ≤ 85	0,20	0,08
85 < d ≤ 130	0,35	0,13
130 < d ≤ 180	0,48	0,18
180 < d ≤ 230	0,62	0,25
230 < d ≤ 280	0,80	0,33
280 < d ≤ 350	1,0	0,43

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, then release the screws for the motor, and turn the adjustment screws to reduce the distance between the motor pulley and the fan pulley.



At this point it is possible to change the belts installing new belts of the same type.

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.

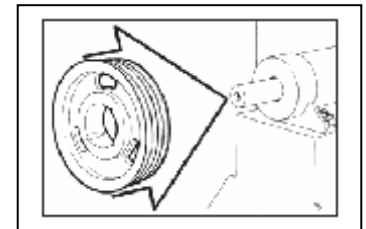
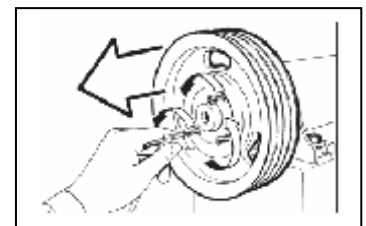


Replacing the pulleys

It is important to periodically check the state of the channels in the pulleys 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 nonthreaded 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.



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 them 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 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.



7.2 CLEANING

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

Attention

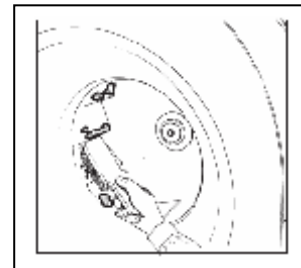
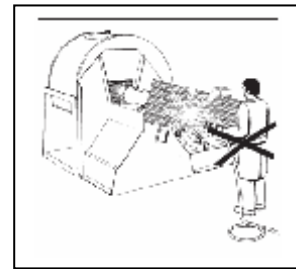
Before proceeding with the cleaning shut off electrical power to the fan.

For the cleaning it is sufficient to use a damp cloth with water or detergent. Do not use 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.

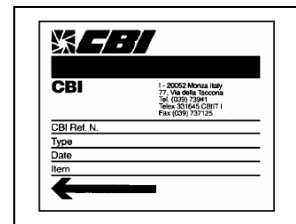


8.1 SPARE PARTS

To order spare parts 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.



Maintenance

Maintenance shall be performed every three months

Activity	Execution	
	Periodical	As required
<u>Fans:</u> Check for dirt , damage , Corrosion and correct mounting	×	
Check impeller balance.	×	
Check bearing for noise	×	
Lubricate bearing	×	
Check flexible connection for tightness.	×	
Check function of vibration dampers.	×	
Check function of fan guard.	×	
Check function of water drain .	×	
Clean .		×
<u>Electric motors</u> Check for dirt, damage, corrosion secures fixing and direction of rotation.	×	
Check the bearings for noise.	×	
Lubricate the bearings.	×	
Clean.		×
<u>Belt drives</u> Check for dirt, damage, wear , functiong , bealt tension and tight fit of screws	×	
Adjust.		×
Replace belts		×
Check quard for functioning, damage and secure fixing.	×	
Clean.		×