Operating Manual

CE

Cvsair Axial Fans




CVS Havalandırma Sistemleri San.ve Tic. A.Ş.

Orta Mah. Erk Sk. A blok No.5/A İç kapı No:2

Tuzla / İstanbul /Türkiye

Tel : +90 (216) 417 12 48

www.cvsair.com.tr

These operating instructions are part of the fan and must be available to the operating personnel at all times. The safety information given in these instructions must be followed. In the event of a fan resale, these operating instructions must be included with the equipment supplied.

1. Content

1.2 EC-/EU-Declaration of Conformity

INTEGRA96

UYGUNLUK ONAYI
ATTESTATION OF COMPLIANCE

Reference No: *Referans Nu:*	**TRCY-23-0501/01**
Applicant: *Başvuru Sahibi:*	**CVS HAVALANDIRMA SİSTEMLERİ SAN. VE TİC. A.Ş.** Orta Mahalle Erk Sokak A Blok, No:5/A İç Kapı No:2 Tuzla/İSTANBUL
Manufacturer: *Üretici:*	**CVS HAVALANDIRMA SİSTEMLERİ SAN. VE TİC. A.Ş.** Orta Mahalle Erk Sokak A Blok, No:5/A İç Kapı No:2 Tuzla/İSTANBUL
Product: *Ürün:*	**AXIAL FAN** AKSİYAL FAN
Trade Mark: Ticari Marka:	Cvsair
Type/Model: *Tip/Model:*	CVS-Ø, CVS- H, CVS- RV, CVS-RH, CVS-AJ
Reference Directives(s) Referans Yönetmelik(ler)	Machinery Safety Directive 2006/42/EC Makina Emniyet Yönetmeliği (2006/42/AT) Low Voltage Directive (LVD) 2014/35/EU Belirli Gerilim Sınırları İçin Tasarlanan Elektrikli Ekipman İle İlgili Yönetmelik (2014/35/AB)
Reference Standard(s): *Referans Standart(lar)*	EN ISO 12100:2010, EN 60204-1:2018, EN ISO 13857:2019, EN ISO 14120:2015
Base of attestation: *Onay Dayanağı:*	***File of technical documentation, test report Ref. No. GMG.220330(GMGTEST)*** *Teknik Dökümantasyon, GMG.220330(GMGTEST) numaralı test raporu*
Issue Date: *Yayın Tarihi*	23.05.2023
Expiry Date: *Geçerlilik Tarihi*	22.05.2026

Integra96, has been determined by examining the documentation provided by the above-mentioned company regarding the product in accordance with the above-mentioned reference regulations and / or standards. Compliance of the product and documentation according to the regulation and standards is under the responsibility of the company. In case the product is subject to other relevant regulations and standards, a certificate is issued when the company fulfills the requirements of other regulations and standards. This certificate is given at the request of the company. This certificate does not eliminate the obligation of the manufacturer to issue a declaration.

İntegra96, yukarıda bahsi geçen firmanın ürüne ilişkin sunduğu dökümantasyonu yukarıda belirtilen referans yönetmelik ve / veya standartlara göre incelenerek uygunluğu saptanmıştır. Yönetmeliğe ve standartlara göre ürünün ve dökümantasyonun uygunluğu firma sorumluluğundadır. Ürünün diğer ilgili yönetmelik ve standartlara tabi olması durumunda diğer yönetmelik ve standartların şartlarını da firma yerine getirdiğinde sertifika hazırlanır. Bu sertifika firmanın isteği üzerine verilmiştir. Bu sertifika üreticinin beyan düzenleme zorunluluğunu ortadan kaldırmaz.

Cihangir HURSİTOĞLU
İNTEGRA96 Belgelendirme
İZMİR, *(rev. 00) <23.05.2023>*

İNTEGRA96 ULUSLARARASI ÜRÜN VE SİSTEM BELGELENDİRME, BAĞIMSIZ DENETİM, GÖZETİM EĞİTİM HİZMETLERİ LTD. ŞTİ.
Mollaşşe Mah. 8090/1 Sk. No:5A Çiğli - İzmir / TÜRKİYE Tel: +90 232 462 20 51-52 Faks: +90 232 462 20 61
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INTEGRA96

Fig. 1 EC-/EU-Declaration of Conformity

DECLARATION OF CONFORMITY
UYGUNLUK BEYANI

CE

Owner of Declaration: *Deklarasyon Sahibi*	**CVS HAVALANDIRMA SİSTEMLERİ SAN VE TİC AŞ** Orta Mah. Erk Sok. A Blok. No:5/A İç Kapı No:2 Tuzla/İSTANBUL
Manufacturer *Üretici:*	**CVS HAVALANDIRMA SİSTEMLERİ SAN VE TİC AŞ** Orta Mah. Erk Sok. A Blok. No:5/A İç Kapı No:2 Tuzla/İSTANBUL
Product: *Ürün*	***AXIAL FAN*** Aksiyal Fan
Type/Model *Tip/Model*	***CVS-Ø, CVS- H, CVS- RV, CVS-RH, CVS-AJ***
Trade Mark *Ticari Marka*	Cvsair
Base of Attestation Onay Dayanağı	**File Of Technical Documentation, Operating Manual** *Teknik Dosya, Kullanma Kılavuzu*
Applied EC Directives: *Uygulanan AT Yönetmelikleri:*	**2006/42/EC 2014/35/EU** *2006/42/AT 2014/35/EU*
Applied EN Standards: ***Uygulanan EN Standartları:***	***EN ISO 12100:2010, EN 60204-1:2018,*** ***EN ISO 13857:2019, EN ISO 14120:2015***
Last Two Digit Year of CE Mark Affixed: *CE işaretinin iliştirildiği Yılın Son İki Rakamı*	23
Name and address of the person authorized to prepare the technical file: Teknik dosyayı hazırlamakla yetkili olan adı ve adresi :	Emre Cem BOZTEPE

Date: 2023.05.01
Tarih: 2023.05.01

We **"CVS HAVALANDIRMA SİSTEMLERİ SAN VE TİC AŞ"**hereby declare that specified above conforms covering European Parliament and Council Directives, (2006/42/EC) of 17 May 2006 Machinery Safety Directive and (2014/35/EU) of 26 February 2014 Low Voltage Directive.

Biz **"CVS HAVALANDIRMA SİSTEMLERİ SAN VE TİC AŞ"** *yukarıda belirtilen ürünümüzü Avrupa Topluluğu Yönetmelikleri 17 Mayıs 2006 Tarihli (2006/42/AT) Makina Emniyeti Yönetmeliği ve 26 Şubat 2014 Tarihli (2014/35/EU) Alçak Gerilim Yönetmeliği'ne göre uygun olduğunu beyan ederiz.*

General Manager

Cvsair
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Fig. 2 EC-/EU-Declaration of Conformity

2.1 Construction of the fans

Part No	Part Name
1	Fan Case
2	MOTOR STAND
3	MOTOR STAND SIDE
4	MOTOR
5	IMPELLER
6	MOUNTING FEET

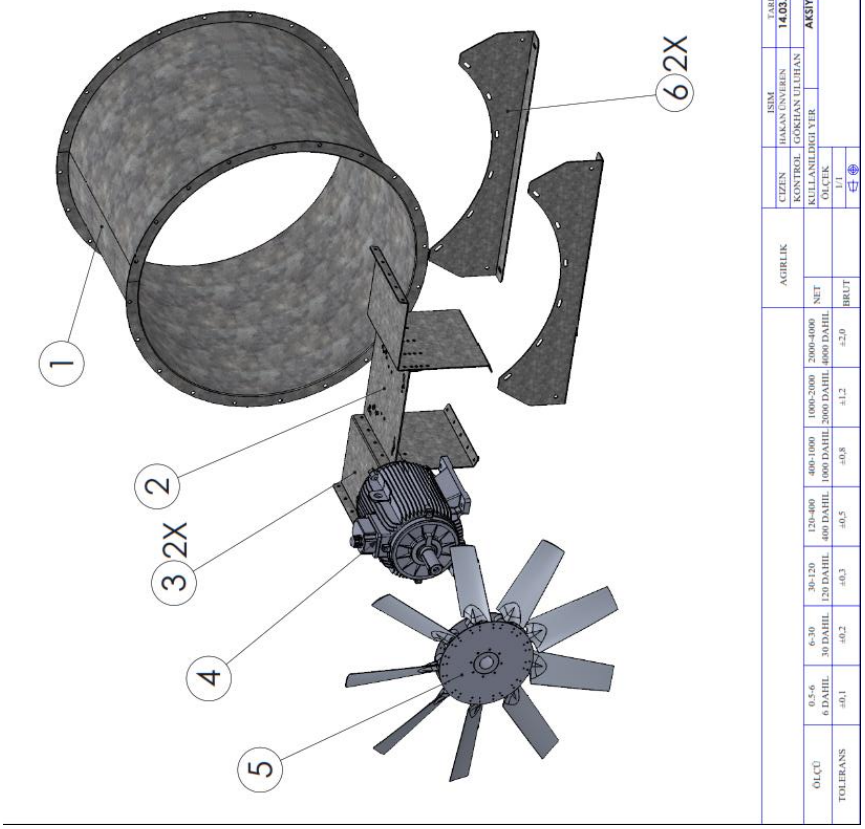


Fig. 3 Overview of the fan

Axial fans consist of the following main assemblies: Housing, impeller and drive motor. They are only built with direct drive (impeller on the motor shaft).

The impeller is statically and dynamically balanced (min. quality class G 6.3 acc. to ISO 1940-1). The vibration limits correspond to the ISO 14694 standard. impeller materials are aluminium alloy.

On the type label are registered the maximum impeller r.p.m.s. For increasing the impeller r.p.m., previous consultation of the manufacturer is indispensable.

2.2 Correct use for the intended application and field of application

The fans are suitable for exhausting or supplying aggressive, dust-free, and clean air.

Depending on gas composition and impeller speed, these temperature ranges must be check and restricted, if necessary. With particularly aggressive media, the reductions must be checked and determined individually in each case. The max. ambient temperature is -20-40 °C.

Sufficient cooling can be ensured regardless of the volume flow, in accordance with the above-mentioned conditions.

The fan was developed, designed and built exclusively for industrial and commercial use. Using the fan for domestic purposes is excluded.

Residual risks

Although the fans have been constructed according to the newest technology as well as to the security rules and they are monitored by quality assurance (QA) system, there remains a residual risk due to the possible rupture of the impeller. This happens especially, when the conditions of use have not been complied. Therefore, it is necessary to pay attention on technically perfect conditions and on the right case of application. The environment of the fans has to be secured in such a way, that in case of a damage, neither persons nor objects get harmed.

These assemblies are intended exclusively for the above purpose. Using the assemblies for different purposes than described above, or modifying them without written consent of the manufacturer are considered as non-compliant with the intended application. The manufacturer cannot be held responsible for damage resulting from such use. The risk is borne exclusively by the user. The fan may be started only after checking that all safety devices are operable and that the system in which this fan is installed complies with the EU directives.

The correct use for the intended application also implies compliance with the instructions given in the manufacturer operating manual and with the conditions for maintenance and repair.

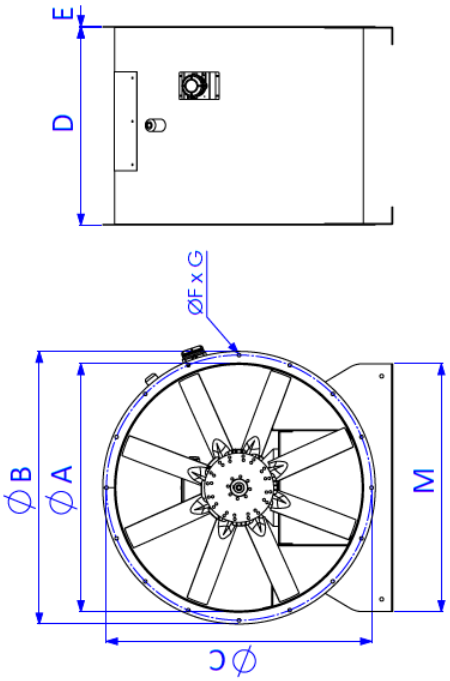
2. Product specific data

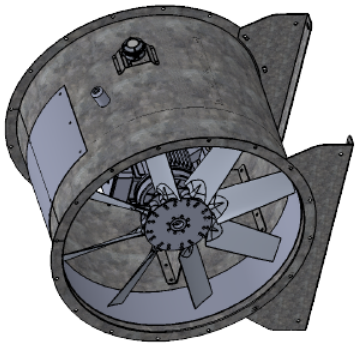
The materials/fluids for the correct use of the fan in compliance with the intended application are procured and applied by the manufacturer. The user is responsible exclusively for correct handling of these materials/fluids and the related hazards. Information on hazards and disposal must be provided by the user. Follow the rules given in the manufacturer ‘s safety data sheets for materials and fluids.

Technical data sheet

All dimensions shows on mm.

ÜRÜN MODEL	ØA	ØB	ØC	D	E	F	G	M
AF Ø315	315	395	355	400	2	8	12	315
AF Ø355	355	435	395	400	2	8	12	355
AF Ø400	400	480	450	420	2	8	12	400
AF Ø450	450	530	500	420	2	8	12	450
AF Ø500	500	600	560	520	2	12	12	500
AF Ø560	560	660	620	520	2	12	14	560
AF Ø630	630	730	790	710	2	12	14	630
AF Ø710	710	810	770	710	2	16	14	710
AF Ø800	800	900	860	710	2	16	14	800
AF Ø900	900	1000	970	820	2	16	15	900
AF Ø1000	1000	1100	1070	820	2	16	15	1000
AF Ø1120	1120	1220	1190	910	3	20	15	1120
AF Ø1250	1250	1370	1320	910	3	20	15	1250
AF Ø1400	1400	1520	1470	1000	4	20	15	1400





CVS-AF MONTAJ TABLOSU

CİZEN HAKAN ÜNVEREN 27.01.2024
KONTROL GÖKHAN ULUHAN
KULLANILDIĞI YER AKSİYEL FAN
ÖLÇEK 1/1
AĞIRLIK NET BRÜT
MALZEME
GENEL ÖLÇ. TOL.
TAKIM ADETİ
RESİM NO

ÖLÇÜ	0.5-6 6 DAHİL	6-30 30 DAHİL	30-120 120 DAHİL	120-400 400 DAHİL	400-1000 1000 DAHİL	1000-2000 2000 DAHİL	2000-4000 4000 DAHİL
TOLERANS	±0,1	±0,2	±0,3	±0,5	±0,8	±1,2	±2,0

3.1 General data

Ambient temperature range

The specifications on the type label are applicable. If they are missing, the temperature range is - 20 °C to + 40 °C. Max temperature flow must be 40°C.

Noise level

For the value applicable to each fan on different working point, see the technical data or contact us via phone. Maximum 110 dBA.

Others

More relevant data are given on the type label.

3.2 Power supply (see motor type label)

The cable must be selected and connected in accordance with EN 60079-14 clause 9 regarding energy connections and sensor systems.

Optionally, the electric motors can be controlled continuously by means of a frequency inverter. The maximal rotation speed at the impeller (see fan type label) must not be exceeded.

The ICA (instrumentation technology, control technology, automation technology) on site must ensure protection against overspeed in compliance with EN 60204-1 and compliance with the technical standard against electrical erosion. The instructions of the frequency-converter and motor manufacturers must be observed.

Motor bearing damage caused by inadequate measures during operation on frequency inverters does not constitute cause for complaint.

We explicitly state that, if the bearing damage is demonstrably caused by bearing currents, Cvsair or the motor manufacturer is not at fault. A bearing that has failed due to bearing currents is not a fault that is due to a manufacturer’s error (production error).

In case of operation of several motors with a frequency inverter all-pole sinusoidal filter should

be used between frequency inverter and motor.

Before connecting the fan, check the specifications on the type label and dimension the electrical control system accordingly. With a motor power ≥ 4 kW for starting up the fan is a star-delta-connection, a soft starter or a FI regulation to use to protect the impeller and the motor bearing against premature damages.

In the case of direct involvement or frequent restart, damage or increased wear may arise bt the torque forces on the impeller.

4.1 Signs and explanations

The information given in the operating manual is binding is marked with a „book “.

Warnings

are marked with a „STOP “sign.

Danger warnings

are marked with a warning triangle.

Notes

are marked with a hand symbol.

Hazards due to electric current

are marked with the symbol shown opposite

Protective earth connection

is marked by these symbols at the connecting points.

4.2 Fan marking

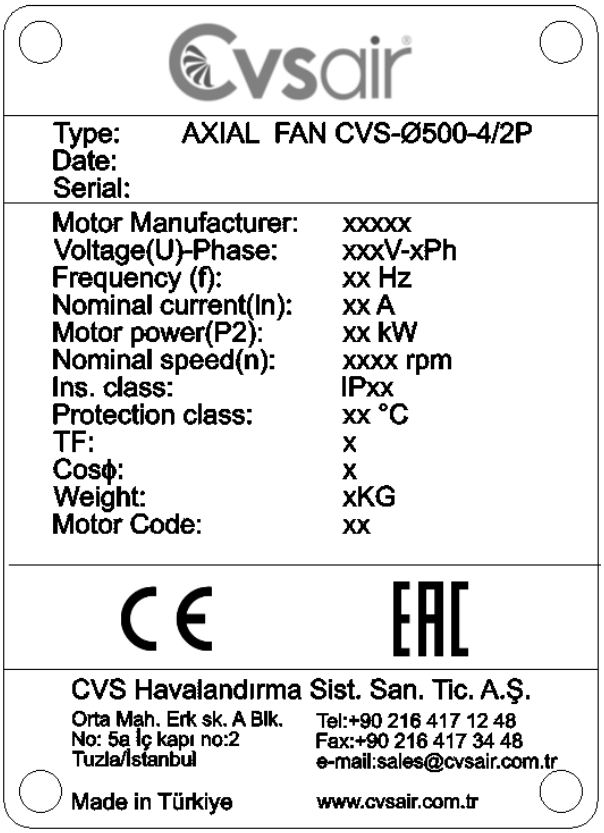


Fig. 6 Name plates

4.3 Built-in safety systems (to be implemented by the user)

The built-in safety devices must be checked at regular intervals:

d = daily, **w** = weekly, **m** = monthly, **y** = yearly.

The following methods must be used for checking:

V = visual check, **F** = functional check, **M** = measurement.

Protective claddings

All mobile fan components driven by the electric motor as well as all other hazardous parts of the fan are covered by fixed, safely fastened protective claddings that can be removed only using tools.

Check	
Interval	Method
m	**V**

Electrical connection

The electrical connections are made using a 4-wire supply cable system, 3 phases and 1 earth conductor with three-phase motors and using a 3-

wire supply cable system, 1 phase, 1 neutral wire and 1 earth conductor with alternating current motors.

Check	
Interval	Method
y	**V, F, M**

Deactivating the safety devices, or changing their operating principle, is strictly prohibited.

4.4 Interfaces of the fan

The fan has the following interfaces:

- Outlet side
- Terminal box
- Inlet side

4.5 Safety measures (to be implemented by the user)

We point out that the user is under the duty to:

- instruct the operating and maintenance personnel on the protective devices of the fan,
- and to ensure supervision concerning compliance with the safety measures.

This operating manual must be kept for future use. The specified frequency of inspection and control measures must be met.

- The chapters related to transport, installation and mounting, maintenance, troubles/causes/ troubleshooting must be understood by a qualified person. Work described in this chapter may be performed only by qualified personnel.

4.6 User ‘s responsibilities

The user must obtain the local operating licence and follow the relevant rules. Additionally, the user must ensure compliance with the national legal regulations concerning

- the personnel safety (regulations relating to accident prevention)
- the safety of work equipment (protective equipment and maintenance)
- product recycling (Waste Management Law)
- material disposal (Waste Management Law)
- cleaning (cleaning agents and disposal)
- and comply with the requirements for environment protection.

2. General warning symbols

5.1 Hazards

Pay attention to the safety devices described in this manual and follow the safety notes.

During setup, maintenance and repair work, mind the **squeezing hazards.**

During setup, maintenance and repair work, mind the **hazard due to electric current!**

During setup, maintenance and repair work, be aware of the **risk of getting burned** due to hot components.

In the event of a failure of the forced ventilation, the drive motor presents a hazard of **getting burned**.

5.2 Operating and hazardous areas on the fan

Hazardous area

During setup, maintenance and repair work, the overall area around the fan is a hazardous area.

During maintenance and repair work, the hazardous area extends 1 m around the fan. The flap pivoting area must be taken into account as well. Keep the area around the fan free from any objects.

5.3 Installation of spare and wear parts

We point out explicitly that spare parts and accessories not supplied by us are not checked and released for use by us either. Installation and/or use of these products can change the design properties of your fan negatively.

The manufacturer cannot be held responsible for damage resulting from the use of other than original components. In connection with the order confirmation, you will receive a data card and a spare parts list for the fan.

If you need spare parts, please, inform us

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Tuzla / İstanbul
Türkiye

When ordering spare parts, please specify the following data:

- Order no. (see type label)
- Fan type
- Spare part denomination

2. Installation

6.1 Scope of supplies

The equipment delivered to the user comprises:

- Axial Fan
- Operating manual
- Technical documents

For the detailed scope of equipment supplied, refer to the order confirmation.

6.2 Transport and packing

Although the fans are checked and packed carefully before shipment, damage during transport cannot be excluded.

6.3 Delivery (also with spare and substitute parts)

Inspection of incoming components:

- Check, if the consignment is complete according to the bill of delivery.

In the event of damage

- Check the consignment for damage (visual inspection).

In the event of complaints

If the consignment was damaged during transport:

- Contact the last forwarder immediately.
- Keep the packaging (for checking by the forwarder or for returning the product).

Packaging for returning the product

- If possible, use the original packaging and the original packaging material. If the original packaging and packaging material haven ‘t been kept, use commercial packaging material. Fasten the fan to a transport pallet (it must be dimensioned appropriately for the weight).
- With any questions relating to packaging and safe transport, please, consult the manufacturer.

6.4 Intermediate storage

The fans should be stored in a room or under a shelter. With outdoor storage, protect the fan from dirt and atmospheric conditions using a canvas cover. Keep the storage temperature between 0 °C and + 40 °C.

To avoid permanent deformation by preventing static load at the contact points between the rolling elements and bearing raceways, the impeller has to be turned for a ¼ turn at regular intervals (at least every 4 weeks).

6.5 Transport to the place of installation (at the customer ‘s site)

Transport must be performed only by qualified personnel in compliance with the local conditions and any warning notes on the packaging material.

The fan or fan unit is transported on transport pallets to the site.
The fan or transport unit **may tip** over during transport.
Pay attention to the **focus** (the focus is centred) and **weight** (see technical data).
Secure the fan or the transport unit with appropriated resources before the transport

Transport with forklift

- The forklift has to be adjusted according to the weight of the fan or the transport unit.
- Drive with the forks of the forklift between or under the arbours of the transport pallet of the fan or the transport unit.
- Make sure that the forks of the forklift are completely under the arbours (the forks have to look out at the opposite).
- Lift the fan or transport unit and transport it

6.6 Installation, mounting and initial commissioning of the fan are performed by qualified personnel of manufacturer or by qualified customer personnel that must have been trained adequately for this work.

- The constructional arrangement of the fan must ensure that operational under pressure conditions are present at the shaft passage.
- Check on the basis of the static of the building, if it is adjustable for the burden of the fan and if the bottom is flat.
- The installation of the fans and their components are based on the on-site installation plan.
- The fan must be mounted on vibration spring screwed to the pre-drilled points in the base frame and anchored in the on-site foundation. This is necessary to absorb any vibrations that occur and to prevent damage to the drive and fan.
- The fan must not be operated in non-installed condition. The impeller must be free to move without any impediment at all times.
- Mount the (on-site) duct. Use flexible connectors inlet and outlet
- The fan is equipped with a terminal box for connecting to the mains supply. The energy supply can be cut off using an onsite maintenance switch (if it is not already installed at the fan).
- Check before the first operation that the turning direction is correct (direction arrow on the fan housing) and that the max. speed is not exceeded (see nameplate).
- If there is danger of foreign parts falling into the fan or being aspirated, the connected duct upstream and downstream of the fan must be provided with a protective grid (min. IP20 to EN 60529).
- The motors are designed for a maximum ambient temperature of 40 °C.
- Max Air temperature flow must be 40 °C.
- If the fan shall be installed outdoor, we recommend a protection of the drive motor against water.
- The inside of the fan and of upstream and downstream channels and units must be kept free from foreign bodies.
- See point 3.2.
- Ensure that connected lines do not carry loads which lead to a distortion of the fan housing.
- To prevent vibrations spreading from the fan to the surroundings, anti-vibration mountings may be inserted between fan and support and flexible connections fitted in the ducts before and after the fan (available as optional extras).
- Secure anti-vibration mountings in the mounting feet by means of bolts
- The natural frequency of the support must differ at least 20% from the fan speed. The anti-vibration mountings serve to ensure that the natural frequency of the system does not exceed 10 Hz and that the damping is at least 80% at 1500 r.p.m.

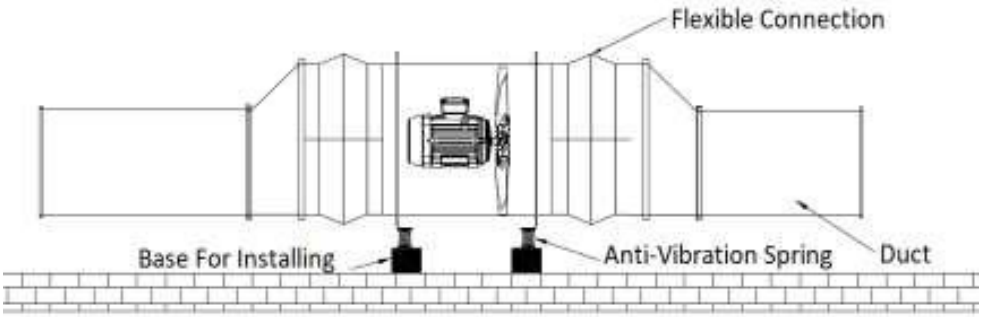


Fig 7. Flexible Connection

The fan may be connected to the supply voltage and switched on only, when the duct (on the inlet and outlet side) has been connected completely.

Installation must be performed according to the connecting diagram in the motor operating instructions only by adequately trained and qualified personnel.

If a duct will be connected to the blowing side of the fan, make sure that the duct distance is at least 3 times the fan diameter and that there is a straight duct of 1 fan diameter on the suction side.

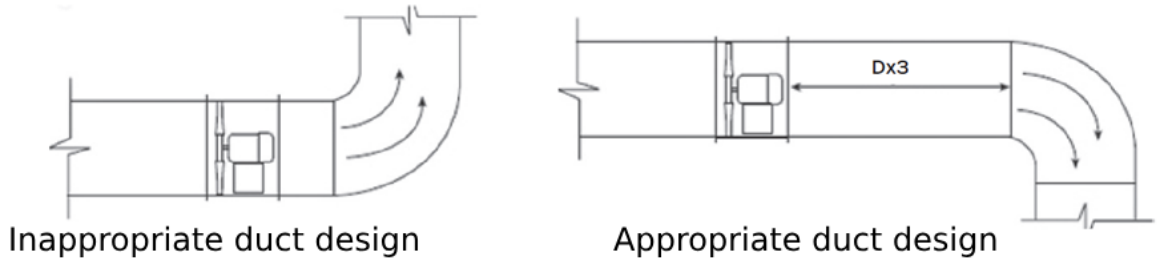


Fig. 8 Duct connection

If the fan will be used on the platform, it should be as it is shipped from the factory, if it will be mounted on the ceiling. "The mounting feet must be removed and attached to the upper part."

Fan Çapı	Kanat Uç Boşluğu Minimum (mm)	Kanat Uç Boşluğu Maximum (mm)
315	5mm	13mm
355	5mm	13mm
400	5mm	13mm
450	5mm	13mm
500	5mm	13mm
560	5mm	13mm
630	5mm	13mm
710	5mm	13mm
800	5mm	13mm
900	5mm	13mm
1000	5mm	13mm
1120	8mm	13mm
1250	8mm	13mm
1400	8mm	13mm

In free suction and blowing, the distance from the obstacle should be at least 1.5 times the diameter of the fan.

Table 2. Impeller Tip Clearance

The following conditions must be met:

- Compliance with the national regulations relating to the public utilities.
- The supply voltage at the place of installation and the mains frequency must correspond to the values specified on the motor type label.
- The power supply cable must be protected against damage and dimensioned adequately for the power rating.
- Set the thermal overcurrent relay to the nominal current specified on the motor type label and follow the instructions given in the motor operating instructions. We reserve ourselves the right to cancel the motor warranty in the event of failure to comply with this protective measure.

Make sure that the **rotating direction** is correct. To check the rotating direction, switch on the motor shortly and compare the impeller rotating direction with the arrow marked on the housing. If the rotating direction is wrong, change the motor polarity in compliance with the safety regulations. After reaching the operating speed, measure the power consumption immediately and compare it to the motor current specified on the type label.

24 h after initial commissioning: Check the tightness of the housing and the quiet run of the fan and re-tighten the screws.

Caution

The fan duct connections may be performed only using flexible couplings (compensators).

6.7 Operating modes

The fan is switched on and off via an on-site operating unit provided by the user, or operated via an on-site supervisory system. It is designed for continuous operation.

7. Operation

The fan may be operated only by specialized personnel qualified and trained for operation.

8. Maintenance / Cleaning

The chapter on **„Maintenance / Cleaning "is** intended only for qualified personnel. Maintenance, cleaning and repair work may be performed only by qualified personnel.

Qualified person

A person who is able to assess the work he/she is in charge of and aware of potential hazards due to his/her professional training, skills and experience as well as his/her knowledge of the relevant standards.

Definition according to EN 60204-1.

To ensure smooth operation of the fan, cleaning and maintenance of the fan at regular intervals is required.

During operation, the fan is subject to vibration susceptible of releasing screwed and clamping connections. To prevent damage, check the fan for loosened connections at regular intervals (recommended interval with single-shift operation: 3 months).

For information on maintenance/cleaning of individual components purchased from other manufacturers (e.g. electric motor), refer to the corresponding manufacturer operating instructions.

When switching off the supply voltage because of cleaning, maintenance and repair work, measures to prevent the supply voltage from being switched on accidentally must be taken by the user (locking the main or maintenance switch using a padlock).

During maintenance and repair work, mind all rotating and mobile parts. Risk of entanglement! Tight clothing must be worn in the danger area.

During maintenance and repair work, mind the squeezing hazards.

When doing maintenance and repair work, mind the hazards due to electric current.

The work intervals specified below are intended for single-shift opera- tion (8 hours a day; 22 days a month; 12 months a year).

d	= daily	y	= yearly
w	= weekly	R	= cleaning required when opening
m	= monthly	LT	= lifetime
½y	= half-yearly	MO	= manufacturer operating manual

8.1 Cleaning

Don ‘t use any sharp objects or tools for cleaning. Only objects that are explicitly provided for this purpose are suitable.

Cleaning (Depending to the degree of contamination the cleaning intervals must be adapted)	**Interval**
Keep the fan and the area around the fan free from deposits on the outside regularly (e.g. dust, exhaust fluids).	**w**
Check the impeller regularly for contaminations and cakings and clean it, if necessary. **Caution** Contaminations on the impeller can cause imbalance of the fan. Depending on the intensity, this can even cause the destruction of the fan.	**½ y**

Table 3. Cleaning

Caution

When doing cleaning work, wear protective equipment in compliance with the operational regulations for occupational health and safety (e.g. protective gloves).

8.2 Lubrication

The bearings of the built-in electric motors are provided with a grease filling calculated for a service life of 10 000 – 20 000 operating hours.
The motor bearing maintenance and other problems please check manufacturer control manual.

8.3 Inspection interval / Function checking

	Interval with single-shift operation					
	d	w	m	½ y	1 y	MO
Superordinate facility for connecting the supply voltage				x		
Settings of the on-site protective devices						x
Fan motor function checking						x

Table 4. Inspection interval / Function checking

8.4 Vibrations

International standards for the balancing quality and vibration values for industrial fans are defi- ned in the standard ISO 14694:2003. The vibrations are measured radially on the shaft bearing of the drive motor. If a measurement is not possible directly on the motor, it is measured radially at the next point that has a mechanical connection to the motor. The following table shows the fan application categories for maximum permissible vibration

.

Stan-dard group ISO 14694	Motor power [kW]	Min. balan-cing quality	In operation Average values; maximum values in brackets	
			Fixed mounted [mm/s]	Flexibly mounted [mm/s]
BV-2	>0.15<3.7	G16	Start-up 5.6 (7.6) Alarm 9.0 (12.2) Slow-down 10 (14)	Start-up 9.0 (12.7) Alarm 14.0 (19.1) Slow-down 16 (21)
BV-3	>=3.7<37	G6.3	Start-up 4.5 (6.4) Alarm 7.1 (10.2) Slow-down 9.0 (12.7)	Start-up 6.3 (8.8) Alarm 11.8 (16.5) Slow-down 12.5 (17.8)
BV-4	>=37<300	G2.5	Start-up 2.8 (4.1) Alarm 4.5 (6.4) Slow-down 7.1 (10.2)	Start-up 4.5 (6.4) Alarm 7.1 (10.2) Slow-down 11.2 (15.2)

Table 5. Vibrations

8.5 Tightening torques for bolt connections

On the basis of VDI 2230 the following tightening torques are recommended for bolts of strength class 8.8:

Nominal diameter [mm]	Tightening torques [Nm]
M4	3,3
M5	6,5
M6	11,3
M8	27,3
M10	54
M12	93
M16	230
M20	464
M24	798

Table 6. Tightening torques

Please check technical document for recommended strength class for ex junction box cable gland

8.6 General hints for maintenance

Correct maintenance is decisive for the fan safety of operation and lifetime.
Operational disorders due to insufficient or improper maintenance can cause high repair costs and long downtimes.
For this reason, regular maintenance is indispensable

Before starting maintenance and repair work (especially when the fan must be opened), compliance with the switch-off procedures is essential.

Checks The inspection intervals must be shortened at strong degree of pollution, high ambient temperatures and frequent start / many load changes.	Interval
Check, if the fan is installed correctly and safely and pay attention to possible vibrations during operation. If necessary, re-tighten the screw connections.	m
Check the connections of the duct on the inlet and outlet side for tightness.	m
Check the housing for stress cracks and quiet run. Check the impeller for deformations, wear and cakings.	y

Table 7. Checks

8.7 Checks

After completing work, please, check:

- The completeness of performed work,
- Unless there is reason to complain, the fan can be taken into operation
- After checking and replacing the wear parts, please check, if all safety devices are fully operable.

9. Troubles, causes and measures

The problems and causes described in this manual are intended for the authorized person.

Appropriate tools and test equipment must be made available to this personal. Before any maintenance and repair work, the fan must be de-energized and protected against re-activation. Unless the specified measures are successful, please, contact the manufacturer

Trouble	Possible cause	Remedial action
Unquiet run of fan (heavy vibration)	Impeller unbalance	Balancing required, consult manufacturer
	Deposits on the impeller	Clean the impeller
	Damage on impeller	Consult manufacturer
Motor bearing noise	Motor bearing damaged	Replace bearing or motor, Consult manufacturer or motor supplier
Fan power output too low	Wrong impeller rotating direction	Reverse the rotating direction
	Output reduction facilities are not opened, or opened only partly	Check the output power reduction facilities
	Duct resistances on inlet or outlet side too high	Reduce resistances, increase the fan power, consult manufacturer
Motor power consumption to high	Defective motor winding	Change motor, consult manufacturer or motor supplier
	Wrong impeller rotating direction	Reverse the rotating direction
	Motor protective switch is not adjusted correctly	Adjust motor protective switch correctly
Motor is switched off by the motor protection switch	Motor protective switch is not adjusted correctly	Adjust motor protective switch correctly
	Motor winding defective	Change motor, consult manufacturer or motor supplier
	Impeller blocked	Check impeller
Sliding noises	Motor winding defective	Consult manufacturer
	Impeller unbalance	Balancing required, consult manufacturer
	Foreign body between impeller and housing	Remove the foreign body
Sudden power decrease	Inlet or outlet duct untight	Check the ducts
	Connecting collar defective	Replace the collar

Table 8. Troubles, causes and measures

10. Emergency

In case of emergency, switch off the main switch or withdraw the power supply connector.

11. Dismantling / Disposal

Dismounting

Dismounting may be done only by qualified personnel.

Before starting dismounting work, make sure that the switch-off procedures are followed.

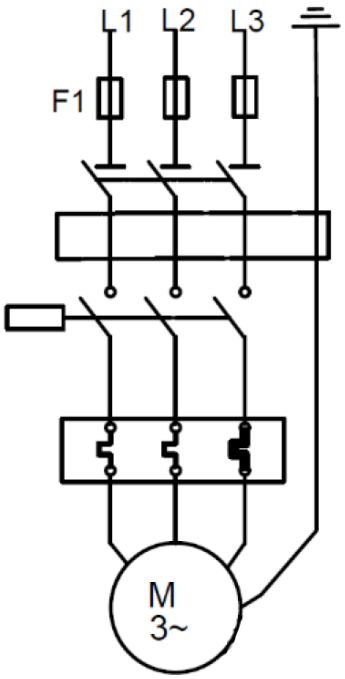
Disposal

The fan is made mainly of steel and plastics (except the electrical equipment) and must be discarded in compliance with the applicable local environmental regulations.

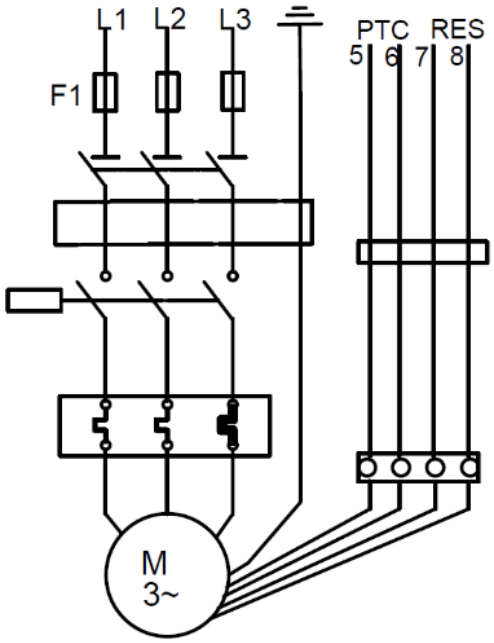
For discarding the cleaning agents, follow the local regulations and the information given in the manufacturer safety data sheets. Contaminated cleaning tools (brushes, clothes, etc.) must be discarded in compliance with the manufacturer specifications as well.

Depending on the fan application, the housing and the impeller must be considered as special waste and discarded accordingly.

13. Electrical Circuit Diagram



Electrical connection without PTC



Electrical connection with PTC

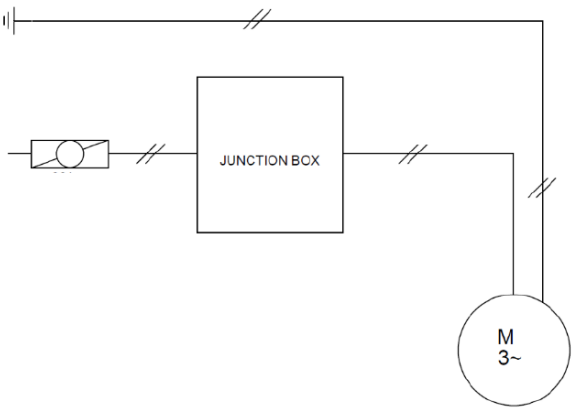


Fig. 13 Closed circuit electrical diagram

Exproof tip Aksiyal Fanlarda kullanılan ekipman listesi

Tablo 1: Elektrikli ekipman listesi

Equipment Name	Technical Spec.	Ex Code	Ta: Operating ambient temperature / IP protection	Certificate Number	Annex / Certificate Declaration
Motor	ABB Miksan Gamak Weg Elk Orange Pro-Ex OR Certified Any Motor	Bknz Ürün Sertifikaları	-20-40 °C / IP55-IP66(motor marka ve modele göre değişebilir ürün etiketine bakınız)	Bakınız Ürün sertifikaları Ek2 Dosyası	EK2
Ex junction box terminal <=5kW	MSM Mühendislik M-SC-16N	Iı 2G Ex db IIC T4-T6 Gb ıı 2D Ex tb IIC T85°C-T120°C Db	-60-110 °C	IEP 21 ATEX 0909X	EK3
Ex junction box cable gland <=5kW	Reksan	II 2 GD Ex db II C Gb		IEP 20 ATEX 0804X	Ek4
Ex body cable gland	ORTAC UGN1-40	II 2G Ex d IIC Gb/II 2G Ex e II Gb I M2 Ex d I Mb I M2 Ex e I Mb Ex tb IIIC Db	-30-100°C / IP68	IEP 14 ATEX 0217U	Ek4
Energy Cable	Öznur Kablo NKS Kablo				Ek5
Ground wire	ALKAN <=25 mm^2 H 07 V-K		0-70°C	TS 9758	EK5

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