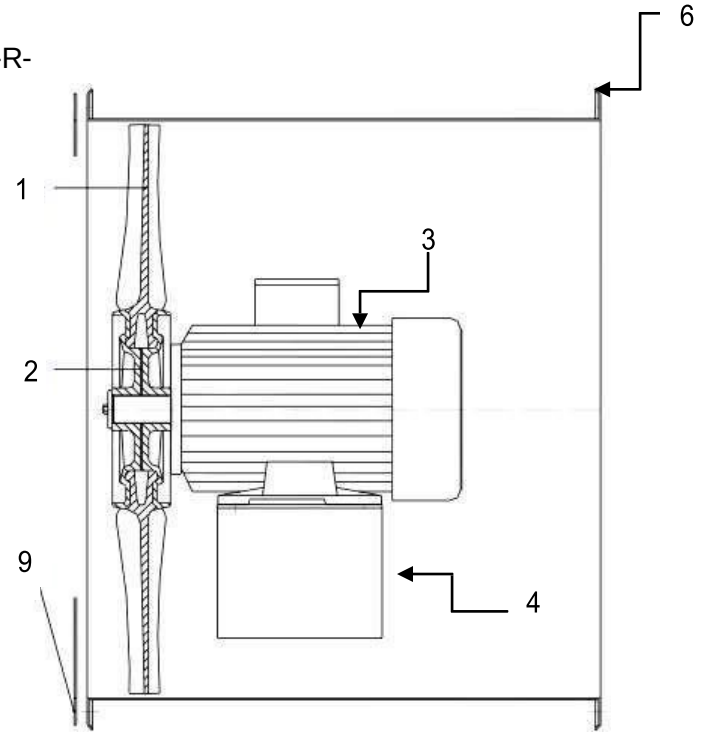
PRODEK
Industrial Fan Systems

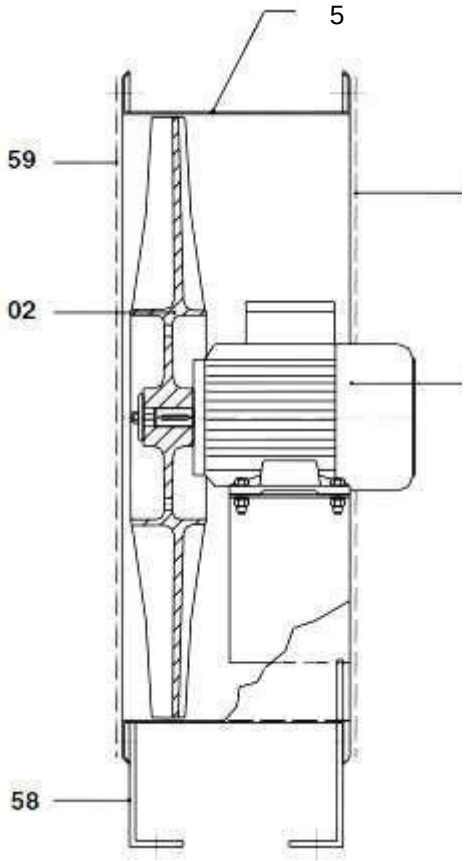
OPERATION OF AXIAL FAN AND SERVICE MANUAL CE

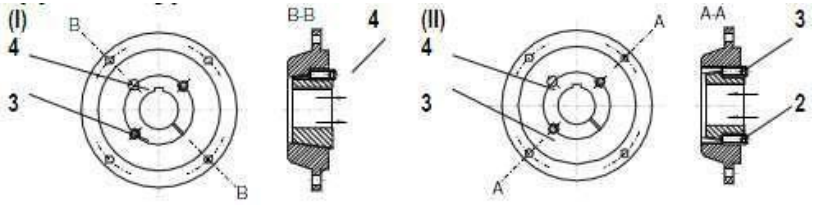
Axial Fan design and drawings.

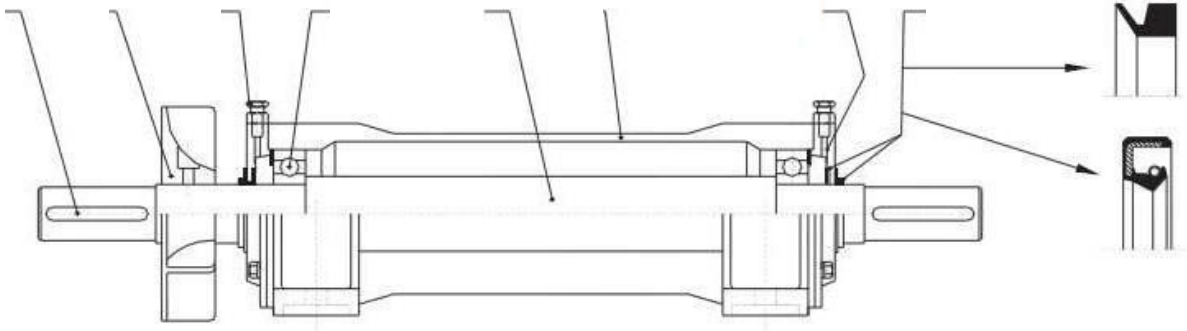
For devices AWD – AQD – AIR AKD-W – AIR HC- AKD-AKD-R-AHD

1- Impeller
2-pulley
3- motor housing
4- engine support
5- fan housing
6- Fan housing flange
8- Mounting base(Kas.Kay. mod. İçin) (resimde yok
11- Pulley and motor core
12-strap
13-
14- Cooling fan
15- Cooling impeller
16- Lubrication valve
17-roller
18- Bearing cap
19- Protective housing
20- Rear bearing
21- Pulley and belt
22- Mounting support
23- Suction protection wire –EN294
24- Shooting protection – EN294
25- Shaft
26- Lower base of ceiling fan
27- Bumper
28- Brackets for mounting the bump stop









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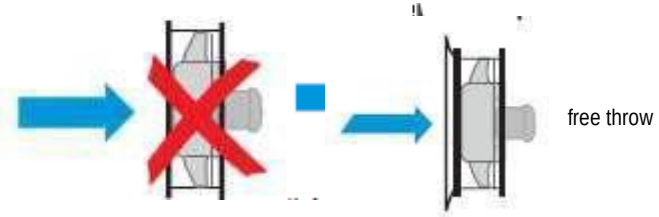
Mounting types and efficient operation of fans... D= impeller diameter



Connector (flexible inserts).

For free suction fans, the suction diffuser must be connected from the front. Otherwise, inefficient and noisy operation occurs.

Free-flow fans exhibit high dynamic pressure loss when discharged directly into the atmosphere.

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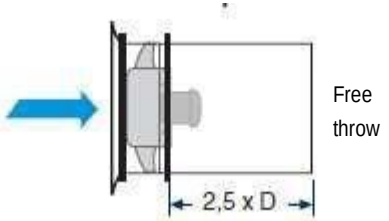
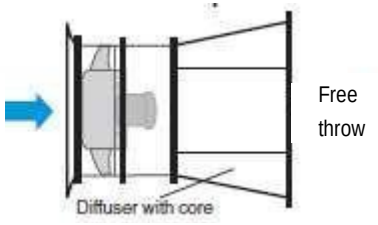
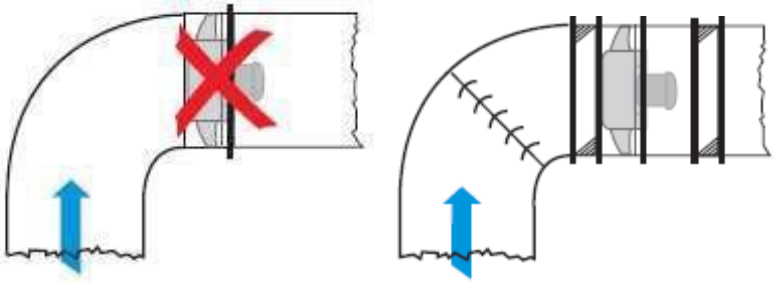
All systems connected to the installation must be made with connecting



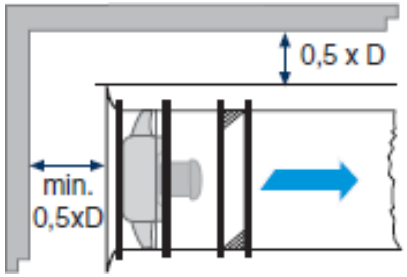


If the specified number of air ducts is connected to th blower part of the fan, the dynamic pressure is reduc by 50%. The fan works more efficiently.

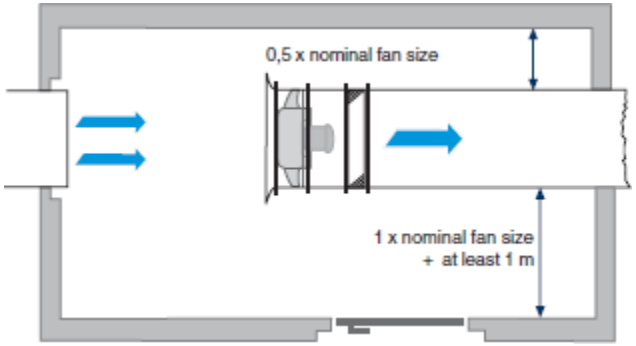
fan, then the dynamic pressure loss If the outlet diffuser is connected to the discharge section is reduced by 70%. The fan operates at maximum efficiency.

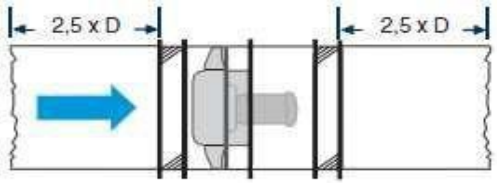


If the fan is to be connected to an elbow, the guide vanes must be connected to the elbow. Otherwise, very high turbulence occurs and the fan does not operate efficiently. Fan power is reduced by approximately 35%.

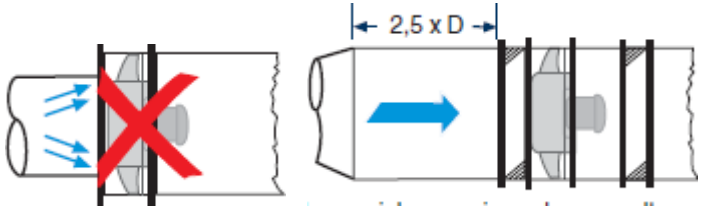


If the fan is used in the cabin, its dimensions must be no less than those indicated above and on the side.

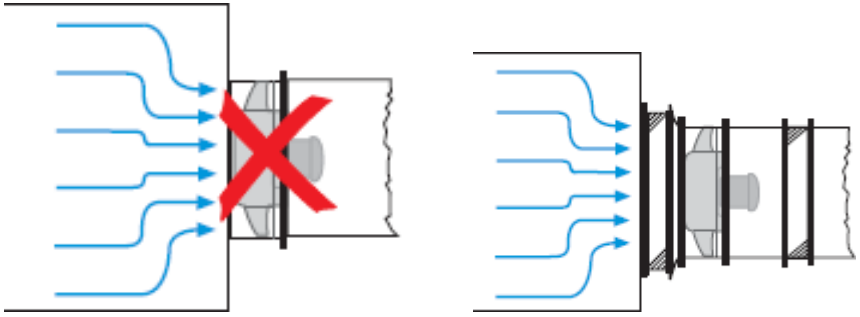




Fans connected to an air duct must have an air duct at least 2.5 times longer than the diameter of the fan in the suction and discharge sections



If the fan will be connected to a duct whose diameter is smaller than its own suction diameter in an existing duct system, the fan should be connected to the duct of its own diameter at dimensions above the suction section. Otherwise, the fan efficiency drops by 75%.



If the fan sucks air from the cabin, it is necessary to use the connection connector before and after the fan is sucked. This is important for efficiency and to ensure that the frequency resulting from the rotation effect does not spread into the cabin.

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Safety Information

PRODEK axial fans are not a ready-to-use product in themselves; they must be installed and adapted to the duct system or operated if sufficient protection is provided for safety reasons. (EN-294) . The products may only be installed, electrically connected and put into operation by qualified personnel. Fans should only be used under the conditions specified during product manufacture. When using fans, follow the manufacturer's instructions and do not use them for purposes other than those specified at the time of purchase. Project designers, contractors and manufacturers are responsible for safe operation as well as safe installation. Fans must be installed in such a way as to ensure safe use and maintenance. Safety parts (such as engine guards, guards, etc.) must not be removed or disabled. Temperature control devices must be connected to the distribution panel like motor switches and wired electrically. The maximum permissible test voltage for thermistors is 2.5 V. For motors without a temperature control unit, it is advisable to use a motor switch.

general description

Gurvent's fully enclosed direct motor driven axial fans are statically and dynamically balanced to ISO 2.6 (Q8.3), with high quality cast aluminum or fiberglass polyamide impellers, galvanized casing and aerodynamically shaped blades.

Internalization

• Before first use, check the following;

*** The electrical connection must be made correctly and the protective conductor (ground) must be connected.**

***It is necessary to connect the motor protection and install protective elements, such as protective grilles; Foreign materials and installation equipment must be removed from the process area; Temperature control units and motor switches must be correctly connected. Cable entries must be insulated (from water).**

*** Installation position and water drainage must be done accordingly. *The power value indicated on the label must not be exceeded; Connections should be made according to eket values; * Keep the fan suction pipe clean.**

Maintenance, service and repair

• Fan bearings do not require maintenance (using special lubricant), but must be replaced if damaged.

• Bearings must be replaced when the grease in the bearing has reached the end of its service life (30–40,000 hours).

• In single-phase motors, the capacitor capacity may decrease over time. Approximate service life: 30,000 hours VDE 0560-8).

• Maintenance of the electric motor is carried out in accordance with the instructions for installation and operation of electric motors.

When carrying out maintenance and repairs, you should take into account

• The fan impeller must be stopped. •Electrical connections must be disconnected frequently. • Take necessary safety measures. • Leave the fan air duct open and clean it with a brush if necessary. • Periodic cleaning ensures long-term maintenance of motor balance. • High pressure steam etc. for cleaning. Do not use. Make sure the fan blades are not unbalanced and check if there is any abnormality in the operating sound.

• Do not bend the fan blades. • If the bearing needs to be replaced, use original parts. • Allow the fan to run freely

Make sure it rotates and the motor protection is working. If after checking the fan still does not work, contact the manufacturer.

Installation

Installation, electrical connection and commissioning must be carried out by qualified personnel and the installation requirements must be observed. All necessary system requirements and specifications must be met by the installer and system designer. Any failure in this regard will void the warranty conditions for the fan and accessories.

Things to consider during installation.

o Be sure to follow safety precautions before installing the fan.

o First check if the fan is suitable for the location where it will be used.

o Check that the impeller rotates easily.

o Check the stability of the place where you will mount the fan.

o Install the fan in such a way that foreign objects cannot enter the fan during rotation.

o Installation should not be carried out without proper support. No load should be placed on the fan. Make sure there is a constant distance between the fan impeller and the fan housing.

o Ensure that all installation connections are made using appropriate fasteners. Secure the threaded connections. - The electrical connection must be made in accordance with the connection diagram on the terminal box and the markings on the terminal input or cable. Do not use metal ties with plastic terminal boxes.

o Depending on the cable entry, use a drain sleeve with a gasket. Gaskets should be used in the threaded connections of plastic terminal boxes.

o operating conditions

o Do not use the fan in an explosive environment (except explosion-proof fans).

o The number that appears during continuous operation corresponds to class S1. The number of engine starts and stops should not be excessive.

o When speed control is carried out using a frequency converter, the maximum voltage at the motor terminals should not exceed 1000 V, and the pull speed should not exceed 500 V/µs (IEC 34-17).

o If the operating leakage current exceeds 3.5 maki, grounding must be carried out in accordance with DIN VDE 0160/5.88, art. 6.5.2.1.

o When using a long motor control cable, do not install an output filter between the frequency converter and the motor.

o The sound level can be reduced by using a muffler (sold separately).

o Fans are designed to supply clean air. Air density is Max. 1.3 kg/m3 and humidity Max. It could be 95%.

Common faults and troubleshooting methods

FAILURE	CAUSE	SOLUTION
If the fan experiences excessive vibration,	Clogged air ducts. Overgrowing of the impeller.	Air duct or impeller
	Bearings may contain foreign matter.	the fan needs to be cleaned.
	Poor impeller balancing.	The bearing needs to be cleaned. If necessary, it should be replaced with a new one.
	The impeller or pulley may be out of balance.	Balance the impeller or replace it.
	There may be runout in the impeller shaft.	Balances need to be checked.
	The propeller may rub against the fuselage.	It is necessary to check the shaft runout.
If the impeller wears out quickly,	The fan operating temperature may be too high.	It must be checked and placed correctly.
	The dust container may be clogged.	Temperature must be controlled.
If the fan does not operate at its designed capacity,		It needs to be replaced with a new one.
	There may be ruptures in the ducts.	Connections in ducts must be checked and sealed.
	The dust container may be clogged.	It needs to be replaced with a new one.
		This should be checked.
If the motor is running and gets hot quickly,	The fan can rotate in the opposite direction.	A higher power fan should be used.
	The fan power may be insufficient.	Friction must be prevented.
If the motor does not work,	Fan parts may rub.	A larger motor should be used. This should be checked.
	Engine power may be low.	
	The poles or switch may be connected incorrectly.	
	The phase may be missing.	
	The switch may have been turned incorrectly.	
	The engine does not cool down or the cooling fan may be damaged.	
If the fan bearings become hot or if there is sound,	The line voltage may be low.	
	The thermal switch may not be set correctly.	
	The bearing tension sleeve may be deformed.	

	Bearings may be over-lubricated.	It needs to be replaced with a new one.
	Excessive axial forces may occur in the bearings.	The oil phase must be cleaned.
	Bearings may contain foreign matter.	The impeller blades must be cleaned.
	Perhaps the bearings are left without oil.	Bearings must be cleaned.
If fan belts become deformed quickly,	The outer shell of the bearing can move around the bearing.	Bearings must be lubricated.
	The bearing can move on the shaft.	The bearings must be replaced with new ones.
	The straps may be overtightened.	The bearings must be replaced with new ones.
	The belt pressure gauge may be out of adjustment.	The straps must be loosened.

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2- TRANSPORTATION, INSTALLATION AND STORAGE

3-

4- 1 - Transportation: The fan is transported assembled in cardboard packaging or without packaging. When transporting the fan, it must be secured.

5- Fans should be transported and stored in conditions that prevent mechanical damage, under a canopy or in a room where temperature and air humidity fluctuations are no greater than in the open air. The bearings of a fan that will not operate for a long time should be lubricated.

6- Installation.

7- •Carry out an external inspection of the fan. If damage or defects resulting from improper transportation and storage are detected, putting the fan into operation without agreement with the manufacturer is not allowed.

8- •In order to prevent imbalance, dismantling the rotating parts of the fan is prohibited without agreement with the manufacturer.

9- •When installing fans, connect the electric motor with a 4-wire cable to be connected to a three-phase network 380V/50 Hz.

10-•Connect the grounding wire to the grounding screw of the electric motor.

11-•When connecting the wire to the motor terminal box, remove the protective cover. Check

12-correspondence of the mains voltage to the electric motor switching diagram shown on the inside of the electric motor terminal box.

13-•Make sure that the impeller rotates easily and smoothly (without touching or jamming).

14-•Check the tightness of bolted connections; Particular attention should be paid to securing the impeller to the motor shaft using a lock washer.

15-•Check the motor insulation resistance. If necessary, dry the engine.

16-•Ground the motor and fan.

17-•Inspect the fan, make sure there are no foreign objects inside it. Seal off the suction and discharge openings. By briefly turning on the engine, check that the direction of rotation of the impeller corresponds to the direction of the arrow on the housing. If there is no correspondence, change the direction of rotation of the impeller by switching phases.

18-

19-2- Electrical Hazards and Controls: Electric motor connections must be made by a licensed electrician. Electrical connections and switchboard system must be made in accordance with the standards. Make sure that the operating voltage indicated on the motor label matches the voltage where it will be connected. Engine protection, i.e. Use a magnetic thermal relay adjusted to the motor current. Be sure to remove the grounding installation housing. Check if the motor rotates smoothly. If an INVERTER (frequency speed controller) is connected to the circuit, check its settings. (You can use the attached brochure.) The operating conditions for the electric motor must be specified by the manufacturer. If necessary, use high-temperature or explosion-proof EX-POOF motors

20-PROHIBITED!!! OPERATION OF THE FAN WITHOUT GROUNDING.

21-

22-3- Starting the fan:

23-DO NOT TURN THE FAN IN REVERSE DIRECTION UNTIL THE IMPELLER COMPLETELY STOPS!

24-•When starting the fan and during its operation, all work on the air duct, fan (inspection, cleaning

25-etc.) must be stopped. To check the functionality of the mounted fan, a test run is performed. Before starting the fan you must:

26-• Check that the current-carrying cable is securely connected to the terminal box terminals and secured

27-ground clamp;

28-• Turn on the engine, measure the current in the phases of the electric motor, the current should not exceed the rated one

29-the value indicated on the electric motor plate or in the passport.

30-• Check the operation of the fan for an hour; if there are no extraneous knocks, noises, increased vibration or other defects, the fan starts normal operation

31-31- Inappropriate imports For example, • Harsh chemicals without proper fan routing and material selection. • Wet chemicals without condensation support and control cap, with risk of mold. • Abrasive chemicals without proper wear precautions. • Without the use of an unsuitable fan in food production, air in food production 5 ensuring recirculation. • Pre-applied chemicals that are not taken into account when defining the fan (see technical operating data), In cases where the fan and running motor are not operated in the above location, in installations in areas where there is a risk of explosion, the speed is greater than the maximum n.

32- All operating conditions (see Technical Description) which are not certified by Gurvent are not considered suitable for their intended use. If you have any questions, please contact us..

2. FAN MAINTENANCE AND PROBLEMS THAT MAY OCCUR

1- Periodic maintenance. The smoother and more correct the initial fan installation, the lower the failure rate. Personnel responsible for the ventilator must read the operating instructions and comply with the necessary conditions. Maintenance can be daily, weekly, monthly, quarterly and annual.

Maintenance. Regardless of maintenance, the fan must be de-energized and the impeller must be stationary. If bearings are lubricated with oil, check the oil level. Moving parts must be checked. Engine vibration and temperature must be checked. The chassis, bearing and engine mounting bolts must be checked. In addition, depending on the operating conditions, you should open the fan maintenance cover and remove foreign matter such as dust accumulated on the fan blades. If the impeller is damaged or worn, it should be replaced with a new one. For example, the bearings of a fan operating at 100°C must be lubricated every 3 months. Greases used inside a bearing retain their lubricating properties for a certain period of time and if this period passes, they lose their lubricating properties.

2- Oil change. When changing the oil, drain all the oil. Then rinse with clean gasoline. Never use diesel fuel or kerosene. Use lint-free wipes when cleaning. If there is a lack of lubrication, the bolt at the top of the bearing is opened and the oil is pressed in. If overheating occurs in the bearings after lubrication, this means that excess oil has been poured and the excess must be drained. When replacing grease, be sure to use the same brand and type of grease.

Technical information: Technical information and permissible limits are specified on the model plate, technical information page or technical catalog and must be strictly observed.

Intended use

See Appendix Project Page, Warning Labels on the Ventilator and. 3.4. Unless otherwise specified in the technical description of the fan, the maximum operating temperature of the motor is: +40°C. Any operation that is not suitable for this purpose is not suitable for its purpose. assumes no liability for personal and/or material damage that may arise in connection with this! When used properly, ventilators and supplies may also produce noise that may cause hearing impairment or affect communications. Please be aware that the sound data provided by Gurvent (see Gurvent Catalog or Technical Performance Data) is subject to change due to environmental influences and site resonances. Gurvent - If soundproofing data is not provided, assistance must be sought during installation if required. If the Applicable Tools contain electronic components (such as frequency modulators), the Product manufacturer's recommendations for avoiding electromagnetic interference (EMV) must be followed. (Grounding, cable length, cable sheath, etc.).

Subsequent failures such as: Bearing failures, Corrosion damage, Imbalance, Vibration, Warp, Opening failures, Chemical contamination. Hazards presenting a threat such as: turbine wheel failure, crack failure, turbine wheel failure, permanent failure, sparks or environmental damage

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Explosion-proof fans

Gurvent - Process air fans used in areas where there is a risk of explosion and/or for the transport of explosive chemicals, comply with regulations 94/9/EG (ATEX 100 a) and DIN. EN 13463-1 and -5, VDMA 24169.-1 complies with the standards and regulations EN 1127-1, EN 12100-1. The fans comply with the specified standards for device group II, type of spark protection “c” (structural safety), as well as temperature classes T3 and T4 (G), i.e. T=125 °C.

(D) fulfills its requirements. The category suffix “D” (Dust Explosion Requirements), i.e. “GD” (Gas and Dust Explosion Requirements), is possible because Gurvent process fans meet all the requirements of the gas and dust zones. To use the tool in dust-explosive conditions, the protective housing must have an inspection cover that makes it possible to clean turbine engines and the internal surfaces of the tool. Fans with explosion protection, both in alloy steel quality 1.4541, coated with steel or zinc (other types of alloy steel on request). The leakage coefficients of the ATEX model fans (leakage unit ≤ 0.162 l/(s*m2) comply with the requirements of ISO 13349 in the leakage coefficient catalog D according to measurements carried out at a different pressure of 2500 Pa, in terms of the protective outer surface

The models (category and thermal class data) supplied with Prodek are available on the order confirmation document and on the ventilator model plate. The data indicated on the model plate and in the instructions for use must be strictly observed

3.5.2 Marking and rating: Marking of Fans with Anti-varnish model is ensured by indicating the Device Group, Category, Type of Ignition Protection and Degree Class on the Model plate (for the Internal and External surfaces of the Fan), as in the case of CE-EX marking, where the compliance of the Device is confirmed European regulation 94/9/EG. Accordingly, there is a European conformity report for the technical documentation of the ventilator. Installation fans (even the "A" model protective cover according to RSD and installation sequence) comply with the above Rules from a design point of view, but they are Gurwent However, since it first turns into a working fan when installed in a plant/machine, it cannot be marked CE-In varnish mark and Category 6 data. The documentation supplied with the Product (e.g. “Qualification Regulation for Installation of Fans in accordance with EU Explosion Protection Regulation 94/9/EC”) allows the Customer to fulfill the Category and CE coating specification, i.e. conformity assessment such as installation, completion, waterproofing and testing of the fan in accordance with the operating instructions 3.5.3 Warnings for safe operation in areas where varnish is likely to be applied: In particular, the following sources of sparks must be taken into account in our fans: • For example : Heat caused by friction or hot top surfaces caused by bearing winding or turbine wheel locking • For example, friction, creep sparks caused by turbine wheel contact with the tractor, and pressure compensation with tin parts and stationary parts due to conductive air (see section 7.5) • Electrostatic charge as a result of discharge, Sparks generated from non-conductive components such as shipped ethical hard coated surfaces Top Surfaces.In To meet the requirements of the above Codes and Regulations Ensuring safe operation in areas where there is the possibility of varnishing and/or transportation of chemicals with the possibility of varnishing, the customer, i.e. the operator of the ventilator, must fulfill the following conditions: • For the operator of the machine/installation, as well as for the manufacturer, In these areas, it is imperative to adhere to the relevant standards and regulations 94/9/EC (ATX 100a), 1999/92/EG3 (ATEX137, Regulations operator). • The instructions for transportation and storage must be observed (section)

4), installation and installation (Section 5), operation (Section 6) and repair/maintenance (Section 7). Air ducts and ventilation pipes must be connected so frequently that gas cannot leak in or out. When coating fans and therefore protecting against corrosion, it is necessary to check the resistance to chemicals that will come into contact with the fan.rAccordingly, galvanic and therefore chemical reactions must be taken into account.• Before operating the fan (see section 6.1), the ignition temperature must be determined and therefore the likelihood of varnishing to ensure that the chemical being transported, i.e. the chemical being transported, at least matches the flash point rating data on the fan. This is a must. • The collision of foreign substances, which are sucked in and therefore enter the fan, with moving parts of the fan creates a high risk of sparks! For this reason, ventilators must be protected against ingestion of parts, that is, against the ingress of foreign substances (at least IP 20) or against mechanical influences/damage that may come from outside. • Electrostatic charge of fans and their parts can create a high risk of fire! To protect fans and running motors from electrostatic charges, they must be properly grounded. For example, non-conducting parts such as compensators must be conductive jumpers with a suitable ground (ground pole) and thus connected between them. General information about ATEX – During operation, flexible compressors and the gaskets installed on them must be cleaned with a damp cloth so as not to create an electric current! In category 2+3, conductive compensators and the gaskets placed on them will be used.• The formation of layers of dust on fans and their parts can create a high risk of fire! In particular, when transporting chemicals containing dust in operating ventilators (Powder-Inlac, category 3D), the maintenance/repair data (section 7) is taken into account. Зорунд Адир

. He gains access to the inner upper surfaces of the housing and cleaning of the turbine wheel through an inspection cover. When cleaning fan parts, it is necessary to remove layers of dust, especially between stationary and moving parts (for example, inlet nozzles/turbine wheel, turbine wheel hub/housing, shaft/shaft entry into the housing) and while the engine is running. • Excessive mechanical vibrations in the fan and its components can lead to a high risk of fire! When transporting chemicals containing dust that may be coated with varnish (Powder-Inlac, category 2D), as well as when installing fans that will be used in these works, vibration control must be provided to ensure timely shutdown of the fan in the event of unevenness in operation (for example, vibrations caused by imbalances in dust accumulation or material adhesion in the turbine wheel). After the ventilation required for this procedure, the ventilator must be properly acclimated to use. • Before commissioning and maintenance work, check whether the operational peace of mind is affected by transport, installation or operation. To do this, it is necessary to measure the rotation speed in the bearings.

Tablo 2: EN, IEC ve NEC gaz gruplarının karşılaştırılması		Table 2: Comparison of EN, IEC and NEC gas groups
EXPLOSIVE GAS EXAMPLE	NORTH AMERIA NEC ARTICLE 500. CEC SECTION 18	CENELEC/IEC EN 50014, IEC 79-0
ACETYLENE	A or IIC	IIC
Hydrogen	B or IIC	IIC
ETHYLENES	C or IIP	IIB
PROPANES	D or IIA	IIA
METHANS	D or I	I

Table 1: Gas and dust groups according to NEC			
CLASS I	Acetylene	GROUP A	Division 1 Division 2
	Hydrogen	GROUP B	Division 1 Division 2
	Alcohols and ethers etc.	GROUP C	Division 1 Division 2
	Metan, propan oktan Dekan v.s.	GROUP D	Division 1 Division 2
CLASS II	metal powders<100 Ωcm	GROUP E	Division 1 Division 2
	coal dust>100 Ωcm	GROUP G	Division 1 Division 2

*Class L: Explosive gases and vapors.

*Class ll: Explosive powders, powdered coal, flour, powdered sugar g ib i. * *Class lll: Volatile Powders. They are larger than regular alde powder. Pam uk powder, sawmill powder, textile powder etc. These materials are not explosive but quite flammable and contain a fire hazard.

* Group A: This group includes acid gases. The reason this gas is perceived at a higher level than the color of the gene is because copper acid is produced and is highly flammable.

*Group B: This group has a group of colored stars. * Group C: Alcohols and ethers.

* Group D: Metan, Proptan, dekan, oktan vb.

* Group E: Metal powders. Powders that are conductive and have a conductive light of i/100 Ohmcm.

*Group F: Coal powder containing carbon oil. Ozl

*Group G: High resistance plastic powders, etc.

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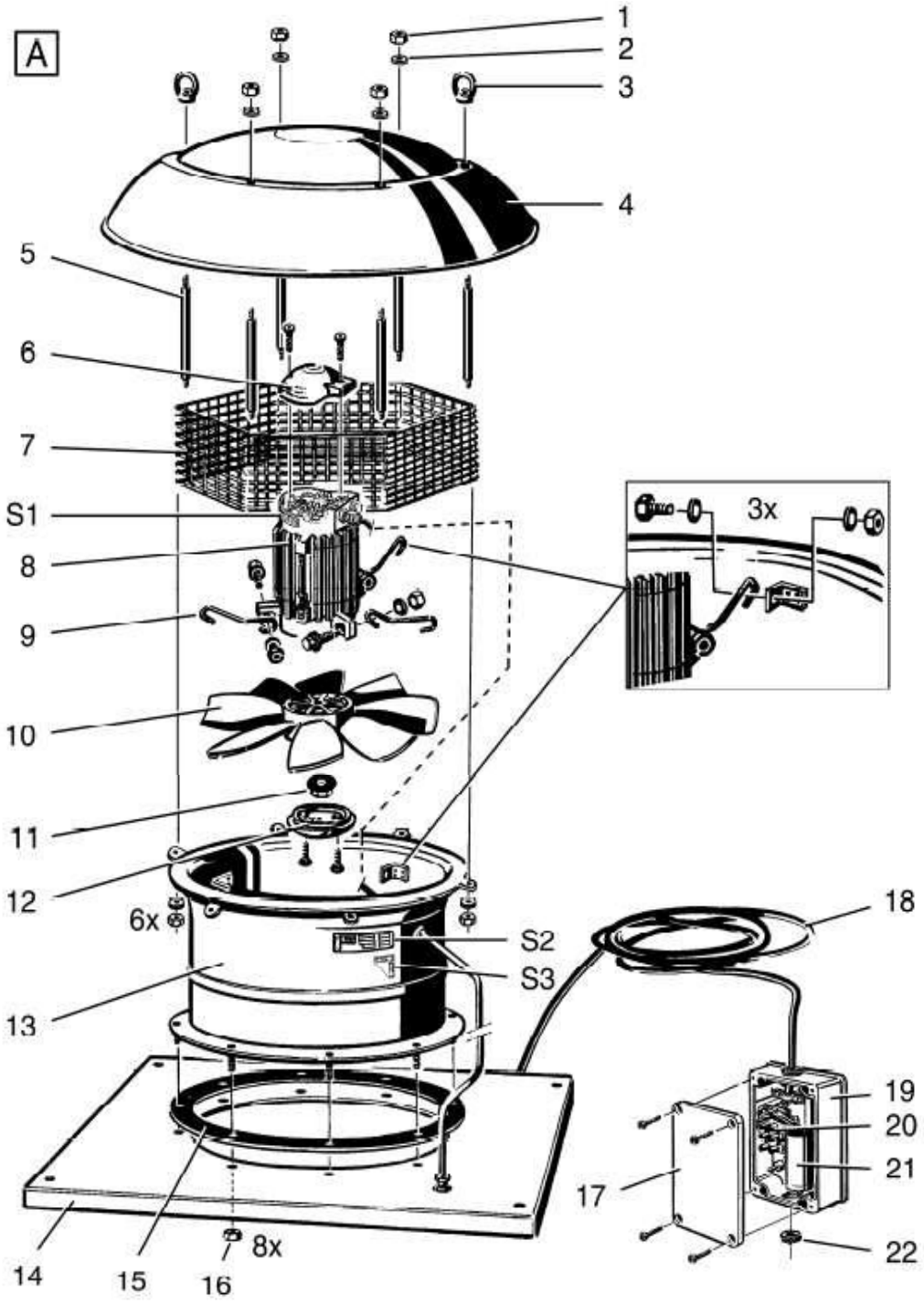
For fans of the ACD-Y – AIR AKD-R – AIR HCT-R series

1- Locknut
2- Washer
3- Eye bolt
4- Cover (Specify material)
5- Shipping pins
6- Engine cover
7- Blowing part, Protective mesh
8- Electric motor
9- Housing clamping studs
10- Impeller (Material must be specified)
11- Impeller retaining washer
12- Impeller cover
13- Fan housing
14- Roof fan mounting base
15- Support flange
16- Nut UX 8
17- Terminal box cover
18- Connecting cable
19- Terminal box
20- Junk (I don't know what this is)
21- Capacitor
22- Terminal record
23-

S2 – Product Label
S3 – Security labels



PRODEK
Industrial Fan Systems

1

For fans of the AKD – AIR AKD – AIR HCT series
(except for the router manual)

1- Engine cover
1- Engine
2- - Mounting bracket
3- - Impeller
4- Impeller cover
5- Fan housing
6- Terminal box
7- Capacitor