



FAN MÜHENDİSLİĞİ

# OPERATION MANUAL

TUNNEL FANS

AI-JU SERIES



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## COMPANY INFO

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## WARRANTY and SERVICE

***We kindly ask you to follow the recommendations below;***

1. When you purchase your product, do not forget to have the Warranty Document validated by an Authorized Retailer.
2. Follow the instructions in the user manual while using your product.  
This warranty provided by AIRONN Ventilation does not cover the elimination of malfunctions caused by using the product other than the instructions specified in the user manual. In addition, the following situations are also excluded from the warranty:
  1. Damages and malfunctions that occur during transportation, loading and unloading after the product is delivered to the customer,
  2. Damages and malfunctions caused by natural disasters such as fire, earthquake, lightning strike, etc.
  3. Faulty electrical installation, under voltage or excess, damage and malfunctions that may occur if the product is used at a voltage different from the voltage on the label,
  4. Damages and malfunctions caused by user errors.
3. The repair of the damages and malfunctions mentioned above will be conducted at a fee determined based on the size of the damage and malfunction. The transportation of the product and the installation at the intended location are excluded from the product price..
4. The responsibility for validating and providing this warranty document to the customer lies with the seller, dealer, agent, or representatives from whom the consumer purchased the product.
5. In the event of any disputes during the warranty period, the invoice date will be considered the basis. Therefore, the user should keep their product's Warranty Document along with the original or a legible photocopy of the invoice.

6. Any alterations made to the Warranty Document, removal or modification of the original serial number on the product renders the Warranty Document invalid.

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## WARRANTY CONDITIONS

- The warranty period is 24 months following the delivery date of the product.
- All parts on the product are under warranty under the assurance of AIRONN Ventilation.
- In case of a possible malfunction of the product, the repair cannot exceed 20 working days and the repair period is added to the warranty period. The repair period starts with the user notifying the product malfunction to the service station, or if there is no service station, any of the product's seller, dealer, agency, representative, importer or manufacturer. Failure notification can be made by the consumer by telephone, e-mail, fax, registered letter with return receipt, etc. ways can be done. However, in case of a possible dispute, the burden of proof lies with the consumer. If the defect of the product is not rectified within 10 working days, the manufacturer or importer must offer another product with similar features to the use of the consumer until the repair of the product is completed.
- If the product suffers a malfunction due to material, workmanship and assembly errors within the warranty period, it will be repaired without demanding any labor cost, replacement part fee or any other price.
- Elimination of malfunctions caused by using the product other than the instructions specified in the user manual is not covered by the warranty.
- For any problem that may arise regarding the Warranty Certificate, the Ministry of Customs and Trade, General Directorate of Consumer Protection and Market Surveillance can be applied.
- Consumers can make their applications regarding their complaints and objections to consumer courts and consumer arbitration committees.
- Despite the consumer's right to repair, the product;



- In the event that it fails at least 4 (four) times within a year, or 6 (six) times within the warranty period determined by the manufacturer or importer, provided that it is within the specified warranty period from the moment it is delivered to the consumer, and in case of not being able to benefit from the goods caused by these failures,
- In case of exceeding the specified maximum time for repair,
- In case it is determined that the repair of the malfunction is not possible, with the report to be prepared by any of the seller, dealer, agency, representative, importer or manufacturer, respectively, of the company's service station, in the absence of a service station,

The consumer may request a free replacement of the product, a refund or a discount at the rate of the defect on the sales price.

- If it is understood that the product is defective, the consumer;
  - I. Returning from the contract by declaring that he will return the sold product,
  - II. Withholding the sold product and requesting a discount on the sales price at the rate of defects,
  - III. In cases where the defect of the product does not require an excessive cost, to request free repair of the sold product at the seller's expense,
  - IV. If possible, to demand the replacement of the sold product with a non-defective one,It can only use one of its optional rights. The seller is obliged to fulfill this demand preferred by the consumer.

## **SPECIAL WARRANTY CONDITIONS**

1. Our company is not responsible for the damage that may occur during the transportation and installation of the customer.
2. Failures that may occur during the warranty period are only repaired by our company's service personnel or service personnel who have received the necessary training and are authorized by us. The warranty is void if other persons interfere with the machine without our written agreement.
3. The warranty given by our company is valid if the machine is used as described in this user manual, otherwise the warranty is void.
4. If the warranty document is tampered with, the original serial number is removed from the machine, or it is tampered with, this warranty will be voided.
5. The warranty given in this document is valid if the obligations and responsibilities of the customer written in the user manual and catalog are completely fulfilled.

## USER RESPONSIBILITIES AND WARRANTY

**AIRONN** cannot be held responsible in any way for the following, except for those included in this user manual.

- From any use not permitted by laws and norms.
- Inappropriate and unsuitable area and structure where the machine will be used
- Non-observance or misuse of the items specified in the booklet
- Use of electricity that is not suitable for the specified electrical installation
- Any modification not made by authorized persons
- Using the machine beyond its performance
- Failure to do necessary maintenance
- Using the machine without trained personnel
- Use of non-original and manufacturer-approved spare parts



**ANY MODIFICATION ON THE MACHINE IS PROHIBITED !!!**

# PRODUCT INFORMATION

## PRODUCT DESCRIPTION

In tunnels, jet fans serve in 2 situations as daily ventilation and emergency (fire) moment ventilation. In the event of a fire, jet fans are to carry the smoke generated at the fire source out of the tunnel and help the people inside to evacuate during this time.

Our jet fans are equipped with equipment suitable for working at high temperatures and are driven by motors that can operate at high temperatures as well. Both our fans and the motors used in our fans have F300 and F400 certificates according to EN-12101-3 standard.

We offer our fans from 400 mm to 1800 mm in diameter, from 0.55 kW to 160 kW motor power, up to 3 200 Newtons, with one-way and two-way options using different blade structures.

While the blades and fixing parts of our propeller are produced from Etial 171 aluminum material with injection technology according to EN1725 standard, our bushings, which are used as shaft connection parts, are made of CK-45 carbon steel. Parts such as screws and nuts used are zinc plated.

As a result of the structural analyzes and post-production tests performed in the computer environment, the wall thicknesses of the fan guard were determined for different diameters. The wall thickness of the inner cylinder, outer cylinder, inlet mouth and end ring products of our silencers is 2 mm. The diameter of the holes on the inner cylinder is determined as 8 mm. All sheet metal products on the fan are covered with hot-dip galvanized and then protected with epoxy paint. High temperature resistant non-combustible rock wool with 50 kg/m<sup>3</sup> density and 100 mm thickness is used in silencers .



Figure 1: Tunnel Fan Series

## AIRONN AIR-JU SERIES FAN LABEL



	AIRONN HAVALANDIRMA VE KLİMA SİSTEMLERİ SAN.DİŞ TİC.LTD.ŞTİ.		
	KARATEPE KÖYÜ MERA SOK.NO:13 KARTEPE/KOCAELİ/TURKEY		
SİPARİŞ NO ORDER NO		HAVA DEBİSİ (m3/s) Flow Rate (m3/s)	
CİHAZ KODU ITEM CODE	AIR-J-U	İTKİ GÜCÜ - (N) THRUST - (N)	
CİHAZ MODELİ MODEL NO	TÜNEL FANI	MOTOR/POWER (kW) DEVİR/SPEED (rpm) NOMİNAL AKIM (A) RATED CURRENT (A)	
*** TEST EDİLMİŞTİR Made In Turkey			 

Figure 2: Tunnel Fan Series Label Example

## AREA OF USE

AIR-JU Series Tunnel Fans serve in 2 situations as daily ventilation and emergency (fire) moment ventilation. In the event of a fire, jet fans are to carry the smoke generated at the fire source out of the tunnel and help the people inside to evacuate during this time.



**THE INTENDED USE OF THE MACHINE IS CLEARLY STATED IN THIS MANUAL. USING THE MACHINE OTHER THAN THESE PURPOSES IS ABSOLUTELY PROHIBITED !!!**

Any damage that may arise from the use of the machine other than its intended use is beyond the responsibility of AIRONN.

The machine's usage capacity is limited by the duct sizes on the label. AIRONN cannot be held responsible for any damages that may arise from using the machine above the specified capacity.

The machine is not suitable for working in open weather conditions (rain, snow, wind, etc.). Any responsibility that may arise from the use of the machine in an open area belongs to the user.

AIR-JU Series Tunnel Fans are designed for exhausting polluted air and fire smoke only . AIRONN does not accept responsibility for negative situations that may occur in case of operations different from its function with the machine.

## PACKAGING CONTENT

- 1 Tunnel Fan
- 1 user manual

## GENERAL NOTES ABOUT THE MACHINE

All modification works on the machine other than authorized personnel are prohibited. The manufacturer does not allow any misuse without its permission.

**If the instructions given in the user manual are not followed, no danger, damage or any situation will occur. It cannot constitute a good binding reason .** The employer has to give all kinds of training and information to the user personnel in accordance with CE norms. **Therefore, it is imperative that this user manual be read and understood by the user before using the machine .**



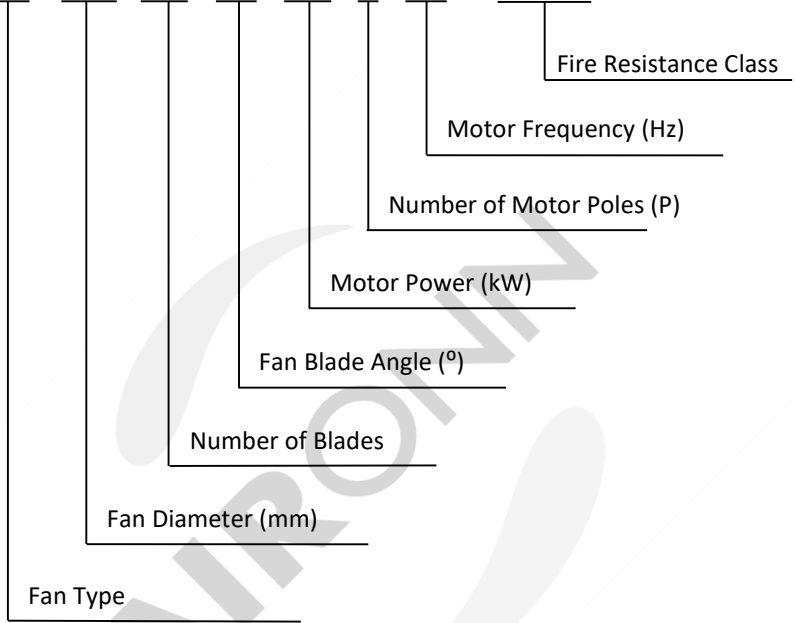
### THE MACHINE CAN ONLY BE USED BY AUTHORIZED OPERATOR!

The machine always complies with the necessary safety precautions if the instructions given in the MAINTENANCE INFORMATION section are followed. These instructions are given as a precaution against any safety risks that may occur to the personnel using the machine. **Full capacity and efficient operation of the machine is ensured only if the instructions given in this booklet are followed .** This booklet should be kept in an easily accessible place as long as the machine is in use, and any changes and warnings made by the manufacturer should be indicated on the booklet. If the machine is sold to another user, the relevant booklet must be delivered. The manufacturer does not allow the reproduction and copying of this booklet for any reason and all rights are reserved. All kinds of pictures and drawings in the booklet serve as a guide. The manufacturer reserves the right to remove, delete and change them.

**The machine is delivered to the customer with a label attached to the machine with the identification information on it .**

## ABBREVIATIONS

**AIR - XX / XXX - XX - XX / XX - X - XX / - XXX-X**





## GENERAL SAFETY INSTRUCTIONS

**\*\*In this section, the safety instructions that must be followed during the transportation, installation, use, maintenance and scrapping of the machine are given.**

### WARNING LABELS ON THE MACHINE



**Electricity  
Available**



**Attention**



**Rotating  
Machine Alert**



**Handtrapping  
Hazard**



**Grounding**



**Do not Stand  
Under Load**

Figure 3: Warning labels on the machine

**\*\* These pictures and tags are for illustrative purposes only. It may not exactly match the labels on the delivered machine.**

## **DURING HANDLING AND SHIPPING**

***In order for your product not to suffer any damage during transportation;***

- While packaging the product, care was taken to ensure that it was suitable for normal transportation conditions. It should always be transported in its original package to avoid possible damage or injury.
- Lifting and loading should only be done by authorized and qualified personnel.
- It should not be kept in the rain or in wet environments.
- The products should be placed in such a way that they remain completely motionless in the vehicle they will be transported in order to avoid a possible tipping or falling situation.
- The product should be kept in its own package so that it is not exposed to any vibration, dust, abrasive or chemical substances until it reaches the place where it will be installed. Do not accept products that are not in their original packaging or that you find to be opened when they reach you.
- During the transportation of heavy products, suitable levers should be used to prevent damage to the product and the people carrying it.
- All necessary precautions should be taken to prevent damage caused by careless, rapid lifting and lowering.

***After the product is unpacked;***

- Check the accuracy of the product you receive.
- The product should be checked for damage during transportation. If there are missing or damaged part(s), immediately verbally and in writing **to the shipping company** and **Aironn Logistics Department officer** should be informed.
- When receiving the devices in the field, check on the delivery note that the parts (vibration mount, counter flange, etc.) that are shipped separately and unassembled from the device are sent in a separate box. Store these materials in a safe place.
- If there is any damage during transportation, take photos of the damaged products and record them, and immediately contact **the Aironn Logistics Department**. notify **the authorized person** and **the shipping company** .
- The product should not be lifted by holding the electrical cables or the junction box. Situations that will damage the wings during transportation should be avoided.
- During the transportation process, personnel should wear hard hat, gloves and steel-toed shoes.

***Follow the instructions below during handling and shipping;***

- 1- Before putting the products on the transport vehicle, it should be ensured that the packaging is done correctly and securely.
- 2- Before lifting or transporting the fan or its accessories, determine the following:
  - Total weight and center of gravity
  - The largest external dimensions
  - Location of lifting points
- 3- The load-bearing capacity of the vehicle used must be suitable for the weight of the fan and its accessories.

- 4- After all safety conditions are met, the removal process should be started.
- 5- Never stand under or near the lifted load.
- 6- Any protruding part on the device should not be used as a fulcrum to carry the device to the platform. To transport the device to the platform, only the eyebolts fixed to the device for the purpose of carrying it or the large holes in the base base should be used.
- 7- The device must not be tilted or tipped over during transport or lifting.
- 8- When removing the units from the truck by forklift, it must be ensured that the load is evenly distributed on the forklift's forks and that the forks do not hit the body of the device and the base frame.
- 9- In case the units are taken from the truck by crane/crane, it should be ensured that the load is evenly distributed and steel rope should not be used as lifting equipment. The parts of the device in contact with the rope must be protected.
- 10- If another lifting method is used, suitable lifting chocks must be placed under the device to perform the lifting operation.
- 11- During the lifting and placement of the devices, care should be taken against severe impacts and necessary precautions should be taken.
- 12- The products must be transported by fixing them to the transport vehicle.
- 13- The process of unloading the products from the vehicle must be done with the precision specified for the loading process.



**PLACING ANY MATERIAL, TOOLS OR LOAD ON THE PRODUCTS IS PROHIBITED!**

***\*\* AIRONN cannot be held responsible for any negative situation that may arise during the transportation of the product.***

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## DURING INSTALLATION AND PLACEMENT

***Follow the safety instructions below during installation and placement;***

- The products should be transported safely to the place where they will be used in the enterprise with suitable vehicles.
- Products should be lowered to the floor slowly and in the correct position.
- During the installation process of the products, there should be no electricity in the system.
- Before making product connections, it should be ensured that the product is securely mounted on the wall, floor or in the places specified in the project. If the product is to be mounted on the wall, mounting brackets or clamps must be used.
- Fans are not ready-to-use products when unpacked. The product should be operated after being connected to its places as specified in the project and after the protection grilles are installed.
- Gloves should be used during handling and assembly.
- Fans should not be used in environments where dust at risk of explosion may be present in the duct.
- Necessary measures should be taken to prevent backflow caused by a possible gas leak (open gas pipes, other fuel burning devices, etc.) in the room.
- Before connecting the fan to the mains, the body should be checked for any damage. In addition, it should be checked whether there are foreign objects in the fan impeller and suction section, and if there are, they should be removed.
- There should be no obstructions in the airflow path.
- The fans are fed with three-phase 380 V / 50 Hz alternating current. Before applying electrical energy, it must be checked from the label.

- When the machine is decommissioned and shipped to another location, it must be handled in accordance with the handling and shipping instructions.

## DURING THE OPERATION

The machine described in the user manual has been manufactured according to the appropriate principles, taking into account the applicable law. The machine is equipped with necessary technical solutions and devices to prevent any risk of accident.

### ***Observe the following safety instructions during operation:***

- No personnel should be on the machine for any reason while the machine is in operation.
- The machine should only be used by a trained and authorized operator.
- Before operating, it should be ensured that the protection grilles are connected.
- While the fan is running, hands should never be put into it.



***IT IS ABSOLUTELY PROHIBITED BY STANDING ON THE MACHINE WHEN IT IS WORKING!***

***\*\* These prohibitions may be partially violated by trained maintenance engineers who investigate to detect faults on the machine and verify the causes of anomalies.***

## DURING MAINTENANCE

During the periodical maintenance of the machine, signs with the warning statement 'machine is in maintenance' should be placed on the machine and in the area where the maintenance is performed. Maintenance operations should only be carried out by trained and competent personnel.

### ***Observe the following safety instructions during maintenance:***

- The machine should never be cleaned with water / pressurized water.
- It is dangerous and prohibited to perform maintenance while the machine is in the air. Maintenance work should be done after the machine has been lowered to the ground.
- Before any maintenance operation is applied to the machine, the electrical connection must be disconnected from the main line.
- Maintenance should be done after the machine is completely stopped in order to prevent the maintenance personnel from encountering a pinched or crushed limb.
- Hand tools to be used during maintenance should be strong and safe, defective or damaged equipment should not be used.
- Personal protective equipment should be used when working with power tools (grinders, drills, etc.).
- During electrical maintenance, energized electrical cables must be replaced or repaired in a way that does not pose a danger to life safety.
- The work area to be maintained should be illuminated so as not to cause any work accidents and to facilitate the work of the maintenance personnel.
- If there are flammable explosive materials around the area to be maintained, they should be removed.





**THE ELECTRICAL CONNECTION OF THE MACHINE MUST BE DISCONNECTED COMPLETELY BEFORE STARTING THE MAINTENANCE PROCESS!**



**MAINTENANCE OR REPAIR SHOULD NEVER BE DONE WHILE THE MACHINE IS WORKING!**

***\*\* While some parts of the machine are routinely checked and maintained, the machine may need to be in working condition. In this case, if the engineer, maintenance person or technician leaves the machine, the machine must be shut down.***

## DURING SCRAPING

All parts of the machine are made from recyclable materials. Thus, all parts can be reused as raw materials. No materials that could harm human health were used in the production of the machine. When the machine has completed its service life, it can be separated down to the smallest component and safely sent to the relevant recycling facilities.

### ***Follow the instructions below when scrapping:***

- The cutting and piercing tools to be used while the machine is being separated into its components must be used in accordance with the occupational safety rules.
- During disassembly, personnel should take precautions against limb entrapment.
- Disassembled and cut sharp-edged parts should be stored in such a way that they do not cause work accidents.
- The oil that will come out of the machine components that contain mineral oil, such as the gearbox, should be collected in a closed container so as not to harm human and environmental health and sent to the recycling facility.
- Scrapped parts should be classified according to their types (iron, copper, aluminum, plastic, etc.) and sent to recycling facilities.
- None of the parts that make up the machine are radioactive. Therefore, scrapped machine parts do not need to be stored in a dedicated area.



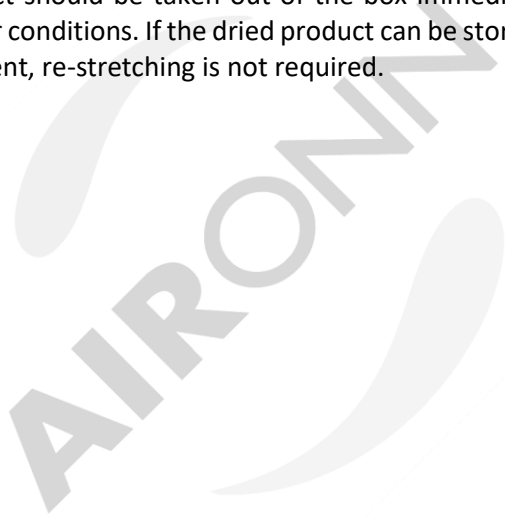
## STORAGE OF THE PRODUCT

***Follow the instructions below when storing the product after receipt.***

- It should be ensured that the product is protected against all weather conditions by covering it with a tarpaulin.
- The product should be stored in a closed area without being unpacked until it is time for assembly.
- General rules must be followed when transporting the product from the storage area to the assembly site.
- Care should be taken that the products transported to the construction site or assembly area are not exposed to weather conditions during storage, and that there is no excessive dust and dirt in the environment.
- Products should not be stacked on top of each other. Products should not be stepped on or weighted.
- Panel, profile, etc. that may damage the product. materials should not rest on the product.
- The product should not be placed in places with heavy pedestrian/vehicle traffic.
- In the construction site storage area, the product should be placed on the wedge.
- Until the moment of assembly, the product should be stored on the pallets shipped.

**General warning;**

The product is shipped from our factory either wrapped in stretch film on a pallet or in a box. If water enters between the stretch film on the product delivered to the customer or stored in the assembly area, the product faces the risk of corrosion. Since the water between the product and the stretch film will have a corrosive effect on the product with the effect of the sun, the stretch film should be removed quickly, the product should be dried under natural weather conditions and stretched again. In case the box gets wet; The product should be taken out of the box immediately and dried under natural air conditions. If the dried product can be stored in a safe and clean environment, re-stretching is not required.



## ASSEMBLY INSTRUCTIONS

***Pay attention to the following instructions during the assembly of the products;***

- Before starting the assembly, it must be ensured that there is no visible damage to the motor supply cables and that the fan wheel rotates freely.
- Installing the fan in its place and bringing it to its balance must be done by qualified personnel only. Incorrect mounting or fan base may cause malfunctions. In these cases, the products are not commissioned by Aironn authorized personnel and the products are excluded from the warranty.
- The automatic control elements mounted on the device should be mounted using suitable materials so that no air leaks from the body. Control elements should be mounted in a position that will not damage the mechanical operation of the device.
- Assembly; should be made using bolts, nuts and washers. Vibration pads must be properly connected between the connecting feet of the device and the surface to be mounted.
- The fan must be installed in accordance with the air flow direction label.

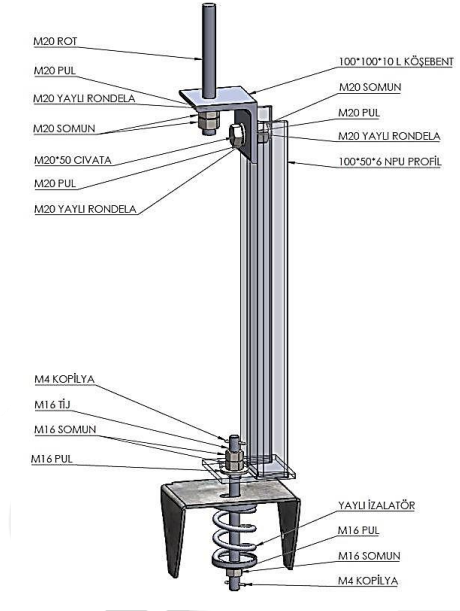


Figure 4: Detail of Tunnel Fan Suspension Apparatus

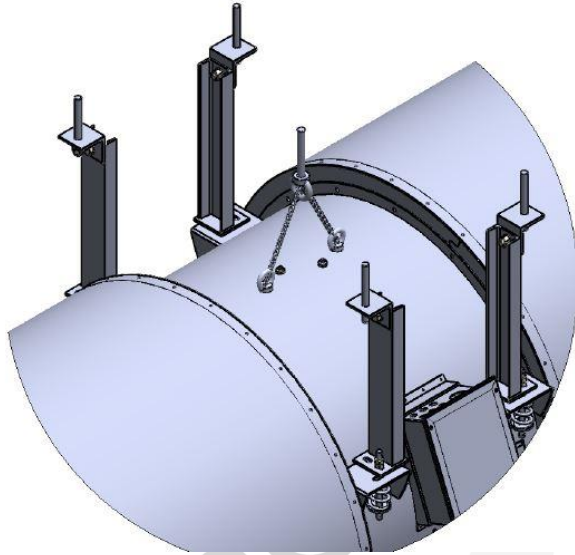


Figure 5: Installation Detail of Tunnel Fan Connection Apparatus

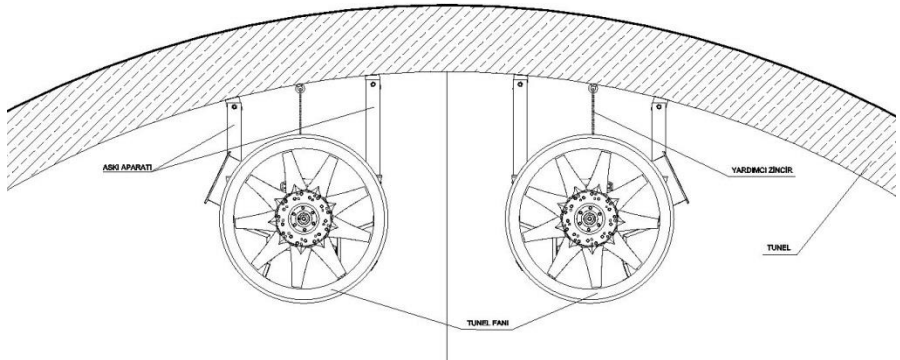


Figure 6: Tunnel Fan Connection Type

## **ELECTRICAL CONNECTION INSTRUCTIONS**

- Before electrical wiring is connected, the existing electricity must be disconnected directly from the source.
- When mounting the apparatus, it must be ensured that the assembly elements have the capacity to carry the weight of the product and that all connections are made correctly.
- Hot-dip galvanized cable trays should be used for electrical cables and the cables should be laid in this channel regularly.
- Data cables should not be laid in the same channel as energy-carrying cables. Because energy cables adversely affect the data transmitted through data cables.
- All cables must be systematically addressed and labeled with a durable material.
- Cables must be selected in accordance with the requirements specified in the fire code.
- Cables should be in one piece from the feeding point to the receiver and no splices should be made.
- The mechanical assembly of the panel modules and their assembly to the ground should be done on a carrier base to be prepared.
- All kinds of supply, power, control and measurement cables that have come to the panel and the bridge cables between the panel modules must be securely and tightly connected to the panel.
- Entry and end connections of fan motor cables to motor terminal boxes must be made using flexible cable end connections, cable ferrule and cable lug.
- Motor terminal box covers should be closed, screws and union nuts should be tightened sufficiently.



- Before connecting the apparatus, it should be checked that the main power supply is turned off, even if the product is not working.
- The electrical connection information (frequency, voltage, power, etc.) specified on the product must match the electrical connection information at the place of installation.
- For safety, it must be ensured that the grounding terminal on the terminal is connected to the building ground line.
- It should be checked that the overload relay and the motor thermal are properly connected.
- In case of a possible problem, if the thermal circuit opens (when the product does not work), the system must be reset from the mains and reactivated.
- The product wiring must be as in the electrical wiring diagram.
- It must be connected to the fixed installation in accordance with the installation rules, together with a switch with contact separation in all poles.

***\*\*Users are obliged to carefully read the user and maintenance manual before using the fans.***

***When you run your product for the first time;***

- After disconnecting the electricity from the source, make sure that the electrical connections of the product are made safely and correctly.
- Carefully check if the safety equipment is properly connected.
- Make sure that the grounding connections are made correctly.
- Ensure correct, safe and watertight sealing of electrical junction box and cable.
- Check that there are no obstructions in the air flow path and that the air outlet direction is in the direction indicated by the label on the body.
- Make sure the blades rotate in the correct direction.
- While the product is operating, make sure that there is no knocking and rubbing sound caused by the rotation of the fan or aspirator, and that there is no vibration.
- Electric source current and frequency values must comply with the product label.
- In the event of a possible electrical safety device being burned, immediately disconnect the power supply from the mains. Before operating the product, carefully check the entire installation again.
- If you encounter any problems, contact the authorized persons.

***\*\*When the product is started to be used continuously, the type of malfunction should be determined in case of a possible malfunction. In order to repair the fault, the technical service unit must be contacted.***

***\*\*It should definitely not be interfered with by people other than the technical service.***

Way of Giving	Motor power	
	PN ≤ 3 kW	PN > 3 kW
	3 ~ 400V	3 ~ 400V
<b>Direct Connection</b>	Y - Connection (15b)	Δ - Connection (15a)
<b>Y / Δ - Connection</b>	Impossible	Remove bridges (15c)

Table 1: Electrical connection table according to engine power

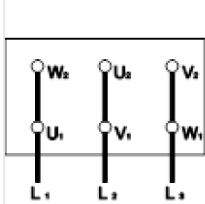


Figure 7: Δ Connection

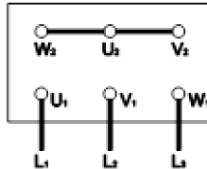


Figure 8: Y Connection

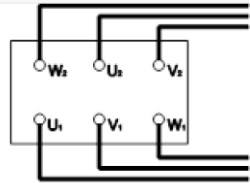


Figure 9: Y/Δ Connection

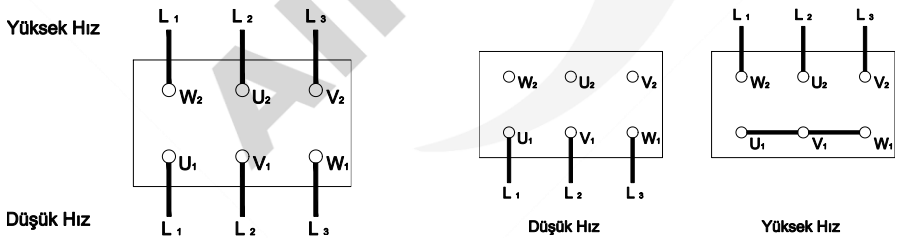
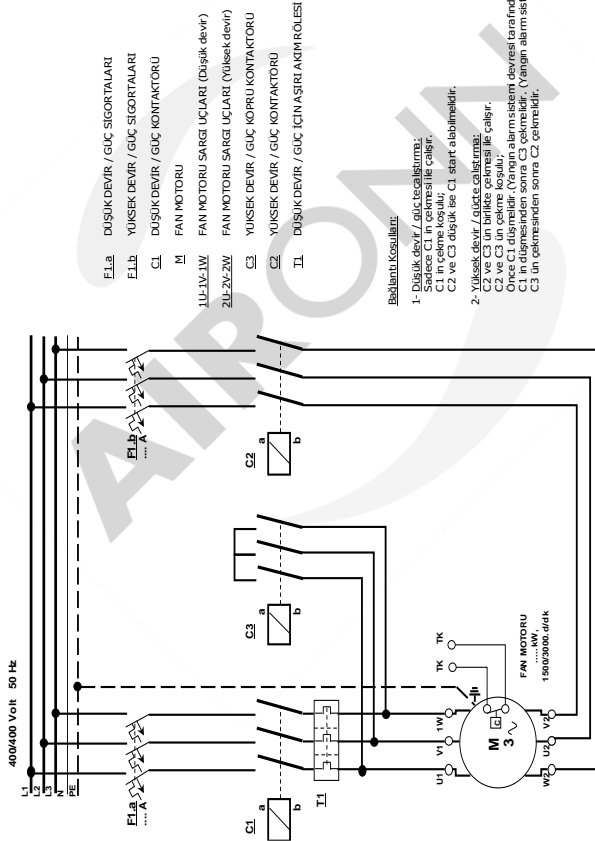


Figure 10: Terminal Connection for Double Speed Dahlander Wound Motor

# ELECTRICAL WIRING DIAGRAM



## USE OF THE PRODUCT

Tunnel Fans have easy-to-use features. These usage features vary according to the wishes of the users. These;

- 1- Manual operation
- 2- Use with automation

### 1-MANUAL USE

With manual use, it is possible to use the product by operating from a switch or fuse. Depending on the product model, it can be used easily and safely with 0-1 switch logic by connecting a paco switch or fuse between the electrical energy and the junction box connection on the product.

### 2-USE WITH AUTOMATION

It is possible to control the product with a PLC. This application varies according to the project where the user will use the product. By using sensors, using timer, using wireless module, using internet of things method, etc. methods can use the product efficiently. If this application is preferred, it is recommended to add the "Manual use" method externally as it will be needed during maintenance.

# MAINTENANCE INFORMATION

## PERIODIC MAINTENANCE

Simple anomalies may require simple maintenance interventions while the machine is starting to separate. Although these interventions are simple, they can be done by the operator. More complex interventions should be performed by trained caregivers. Other complex interventions must be carried out by the manufacturer's technical service.

According to the working year and the working environment of the machine, detailed visual and functional checks should be made by a specialist technician at least twice a year and the remaining life of the machine should be seen. The operator can take notes at regular intervals to determine the basic parameters of the machine properly. However, the maintenance technician should ask the operator about general service:

- When function abnormalities increase.
- Whenever there is a structural or mechanical failure during maintenance.
- When will the machine reach its theoretical usage limit (or has it been 10 years since the first installation?).

All maintenance, warning anomalies or breakdowns require a long period of use between the operator and the machine. This is an unsaleable feature of maintenance, which represents risks depending on the model and machine manufacture.

Traditionally, maintenance operators are more trained and skilled than other operators. Ultimately, the most important of all installations and procedures is the safety of the person.

***The following section contains the points to be considered during ordinary maintenance;***

- Before starting maintenance; Signs regarding maintenance, warning and electrical connection prohibition should be placed.
- Before maintenance or cleaning, even if the product is turned off, it should be checked that the electrical connection is disconnected from the main electricity supply.
- Maintenance should not be done while the mechanical organs are in motion.
- All electrical equipment should be checked regularly, connections should be inspected, and damaged or worn wiring and equipment should be replaced.
- In order to prevent pollution or deposits on the blades and the engine, its maintenance should be done by considering the operating conditions of the product. Otherwise, it may shorten the working life of the product or cause danger.
- While cleaning the product, care should be taken not to disturb the balance in the blade and turbine.
- Bolts that may loosen during maintenance should be checked for tightness.
- Parts that are not in good condition must be replaced immediately.
- While cleaning the product, flammable and combustible cleaners should not be used, it should be cleaned by wiping with a damp cloth.
- The product should never come into direct contact with water or pressurized water.

***\*\*AIRONN company does not take any responsibility for malfunctions and personnel safety caused by a reason contrary to this booklet .***

**\*\*Electrical maintenance of the machine must be carried out regularly by trained specialist personnel on a daily, weekly, monthly and semi-annual basis.**

## POSSIBLE FAULTS AND THEIR REMEDIES

### MEKANİK ARIZALAR

ARIZA	NEDEN	ÇÖZÜM
Civata ve somun gevşemeleri	Vibrasyona maruz kalmak	Civata ve somunların torkla sıkılması kendinden flanşlı civata, somun ve vibrasyon takozu kullanılması
Vibrasyon takoz kafalarının kopması, sabitlemediyse makinanın yerinden oynaması.	Vibrasyon takozları iki yıl garanti altındadır. Kötü koşullar altında çalışıyorsa, yaklaşık 3-4 yıl sonra kopabilir	Vibrasyon takozu kafalarının değiştirilmesi
Tel kafesin fana sürtmesi	Kalas vurmaya gibi dış etkenlere maruz kalması	Tel kafesin değiştirilmesi
Fanın fan gövdesine sürtmesi	Cihaza üst veya yan yüzeylerden kuvvet uygulanması sonucu gövdenin yamulması	Dış etkenlerin ortadan kaldırılması, Fan palalarının kısaltılması (tornalanması), Fana sıkışan malzemenin çıkarılması (çivi parçası, eldiven, kask gibi)
Servis kapağının çıkarıldıktan sonra tekrar yerine takılmaması	Cihazın rutubete, suya maruz kalması	Servis kapağının kapatılması
Motor bağlantı vidasının gevşemesi, kopması veya kırılması gibi parçaların arızalanması, fanın kopması	Darbe sonucu fanın balansının bozulması	Fanın balansının yapılması, Eğer motor bağlantı vidası gevşediye, sıkılmalıdır. Eğer motor bağlantı vidası kırıldıysa değiştirilmelidir. Eğer fan zarar gördüyse, fan palası veya fan değiştirilmelidir.
Sürtünme, sıkışma, deformasyon sonucu fanın balansının bozulması. Eğer fan yüksek hızda çalışıyorsa, fan yamulabilir, pervane kırılabilir veya motor yanabilir.	Fan koruma kapağının çıkması	Fanın ve bütün mekanik parçalarının düzenli olarak kontrol ve bakımının yapılması
Fanın sürtünmesi, kırılması ve balansının bozulması, motorunun yanması. Eğer termal röle kapanmazsa, motor sargıları zarar görebilir. Bağlantının kopması ve vidanın fana sıkışması sonucu motor kaidesi kayabilir.	Motor ayaklarının gevşemesi ve yer değiştirmesi, aşırı balans.	Vidaları sıkma veya değiştirme, Civataların sıkılması veya değiştirilmesi
Buat kutusunun yerinden çıkması ve sallanması	Zorlama gibi dış etkenler, titreşim nedeniyle yerinden çıkması	Fanların ve diğer mekanik bileşenlerinin düzenli kontrolü

Table 2: Possible mechanical failures and their elimination



**ELEKTRİKSEL ARIZALAR**

ARIZA	NEDEN	ÇÖZÜM
Voltaj arızası	Düzensiz elektrik, istenilen düzeyde genlik sağlanamaması. Motor elektrik klemens bağlantılarında gevşeme, pano ve panodan sonraki hatlarda düzensizlik	İşletme görevlisinin enerji nakil hattını regüle etmesi veya faz dağılımını eşit dağıtması
Motorun devreye girmemesi	Yıldız veya üçgen bağlantılarının olmaması	Yıldız üçgen bağlantılarının yapılması
Motor klemens bağlantı papuçlarının gevşemesi, yer değiştirmesi ve kopması	Kablonun dışarıdan etkiyen mekanik strese maruz kalması, Civataların gevşemesi nedeniyle korozyona maruz kalması, Kaliteli olmayan malzeme kullanılması	Kontrol ve bağlantı yapılmalıdır.
Klemens bağlantı vidalarının kırılması sonucu kısa devre	Kablonun montaj sırasında dışarıdan etkiyen mekanik strese maruz kalması veya aşırı sıkılması	Klemens bağlantı vidalarının değiştirilmesi
Kısa devre	Motor ve buat kutusu arası kabloların ters veya gevşek bağlanmış olması, Motorun delta bağlantı ucunun dış buat kutusuna bağlantısının kopması	Fanların kontrol ve bakımı
Akım-gerilim ilişkisinde, devredeki termik rölede arıza	Dışarıdaki aşırı sıcaklık nedeniyle düzensiz nominal akım	Kabloları akım ölçerle kontrol etme
Motor sarğılarındaki aşırı ısınma sonucu motorun devreden çıkması	Kablo uçlarındaki korozyon nedeniyle oluşan düşük voltaj	Rulmanların değiştirilmesi, zararlı dış etkilerin ortadan kaldırılması
Motorun arka kapak soğutma fanının plastik kanatlarının çatlaması ve kırılması	Korozyon, darbeye maruz kalması	Fan kanatlarının değiştirilmesi
Kablo yanması	Rakorların gevşemesi ve içine sıvı alması	Rakorların sıkılması veya yenilenmesi
Bakım sırasında yeniden yapılan topraklamada gövdeye elektrik kaçması	Yetersiz topraklama	Topraklamanın bağlı ve işlevsel olup olmadığının kontrol edilmesi
Motor sargısının yanması	Aşırı akım	Motoru değiştirme
Motor yanması, motordan ses gelmesi	Düzensiz akım, düzensiz faz, faz sırasının değişmesi	Motorun kontrolü, işletmeye bildirilip, akım veya fazın düzeltilmesi
Servis kapağındaki kontrol anahtarının açılması nedeniyle motorun devreye girmemesi. (Kontrol anahtarı varsa) Servis kapağındaki kontrol anahtarında arıza.	Korozyon, ark oluşumu, uç bağlantılarının kopması veya darbeye maruz kalma.	Servis kapağındaki anahtarın ve motorun çalışıp çalışmadığının kontrolü.

Table 3 3

## WARRANTY CERTIFICATE

MANUFACTURER OR IMPORTER COMPANY	
TITLE	AIRONN HAVALANDIRMA VE KLİMA SİSTEMLERİ SAN. DIŞ TİC. LTD. ŞTİ
ADDRESS	ÇAMLIK MAH. SENOL GÜNEŞ BULVARI NO: 28/A ÜMRANİYE/İSTANBUL
TEL / FAX	(0216) 594 5696 / (0216) 594 5717
SIGNATURE AND STAMP OF THE COMPANY AUTHORITY	
SELLER	
TITLE	
ADDRESS	
TEL / FAX	
INVOICE DATE and NO	
SIGNATURE AND STAMP OF THE COMPANY AUTHORITY	
PRODUCT	
TYPE	FAN
BRAND	AIRONN
MODEL	
BANDROL and SERIAL NO	
DELIVERY DATE and PLACE	
MAXIMUM REPAIR TIME	20 WORKING DAYS
WARRANTY PERIOD	2 YEARS
CUSTOMER'S	
NAME AND SURNAME	
ADDRESS	
PHONE	