Venture Industries Group

# OPERATION AND MONTAGE MANUAL
# CENTRIFUGAL DUCT FANS
# TYPE AFB

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**INTRODUCTION**

This manual covers fans in standard version, listed on the title page and it is source of information necessary for safe and proper use. Read this manual carefully before any use of the device, comply with it requirements and keep it in place with easy access for users and service. If case of any doubts about use of the fan, please contact with manufacturer.

Additional requirements about use of the unit can be found in electric motor, and isolating switch documentation and markings - those requirements need to be met.

**After receiving the device - check**

- whether the device is in compliance with order,
- whether the data on the rating plate are the same as desired (voltage, frequency, etc.);
- whether fan was not damaged during transport (e.g. there are no dents/cracks, impeller rotates freely);
- whether a motor documentation (containing manual) is attached

**In case of any irregularities, contact with your dealer or Venture Industries Sp. z o.o. service.**

## 1. GENERAL INFORMATION

### 1.1 Information about device

•The fan is a not completed machine within the meaning of the Machinery Directive 2006/42/WE (please refer to the manufacturer's declaration – Appendix D).

•Fan is designed for use by trained, qualified adult persons. The fan is not designed for household and similar use.

•**The device is designed to transport clean air or air with low level of contamination.** Do not transport the explosive mixtures, liquids, viscous substances, substances with high humidity, substances that cause erosion, solid elements, and chemically reactive compounds - we recommend the use of suitable filters. The maximum temperature of transported medium is specified on the fan nameplate, the minimum is -15°C.

•The fan is designed for outdoor use. It must be protected from effects of the thunderstorms (lightning).

•The fan surroundings cannot contain explosives atmospheres, substances causing abrasion, chemically aggressive substances and viscous substances. The maximum ambient temperature is specified on the fan nameplate, minimum is -15°C (or lower – if confirmed by the manufacturer).

•The device must not be exposed to radiation (such as microwave, UV, laser, x-ray).

•The fan has a hinged service flap (located on one side of the housing). In order to gain access to the inside of the fan interior, pick up the flap after releasing fasteners.

•The impeller has been balanced in accordance with minimum G2.5/G6.3 class ISO 1940-1, and general construction of the fan in accordance with cat. BV-3 ISO 14694

•Description of construction of the fan has been included in Appendix E.

•Additional information of the fan usage has been indicated on the device.

### 1.2 General risk and guidelines

During entire fan life cycle pay particular attention to **the risk and guidelines** presented below:

1.2.1 moving parts

•The fan has moving elements (motor impeller set). Do not use the fan when not installed in the duct or without installed proper protection structures (e.g. guards on inlet and outlet) protecting from contact with moving elements. Prevent from opening the fan by unauthorized persons.

1.2.2 suction power

•The fan has high suction power. Clothing, hair, assembly elements, items, and even body elements can be easily sucked in. Make sure that before start and during operation of the fan, near the fan inlet there is no person and items which can be sucked. It is forbidden to approach the fan in “loose” clothing or reaching toward inlet of working fan. Use appropriate inlet covers and if necessary – use relevant protective clothing (e.g. headgears).

1.2.3 parts thrown with a high speed

•The air at the outlet of the fan has high energy. Elements sucked or placed inside the fan can be thrown with a high speed. In case of damage or improper operation, parts (with high kinetic energy) can be thrown out from fan. It is forbidden to look into the fan reaching toward inlet and outlet of the working fan. Make sure that before start and during operation of the fan there is no person on inlet side and in stream of transported medium. Use fan with proper safety constructions, install in duct with inlet and outlet covers.

1.2.4 sharp edges

•During manufacturing the fan sharp edges was grinded. However the fan may have edges touching which may cause injury. We recommend the use of relevant protective gloves.

1.2.5 inertia

•Conveying equipments and fan support structures must by selected proper to the fan weight and ensure that fan would not move. Do not approach the hanging load during transport.

1.2.6 noise

•The sound pressure level is not the same over the fan whole range. We recommend to check the sound pressure level and if necessary use the silencer and relevant sound protection.

1.2.7 used materials

•In case of fire or transport of improper medium – fan parts can generate fumes hazardous to health. See also 1.2.5.

1.2.8 environment

•The fan can make over and under pressure. In areas where a specified air pressure and the quantity of air are required (e.g. in places with combustion) make sure that there would be no deficit/excess of air. Ensure that the installation to which the fan is connected withstand the under/over pressure which can be made by fan (including work with forbidden parameters).

1.2.9 high temperature

•The housing and fan elements are not insulated and take the temperature of the transported medium. During transport the temperature of medium and fan components may increase. Electric motor may heat up to high temperatures (especially when overloaded/overheated – cased by e.g. blocking the impeller, too low supply voltage, too high medium temperature). The appropriate steps should be made to prevent from fire and burns caused of high temperatures.

**In case of fire – to extinguish a fire use fire extinguisher approved for electrical equipment and follow recommendation of fire department.**

1.2.10 unexpected start/ connecting power supply

•Before undertaking any kind of work on fan (e.g. installation, maintenance and inspection, disassembly), it has to be completely and reliably disconnected (isolated) from power supply (check there is no voltage). It has to be ensured, that power supply will not be connected during work on fan and moveable parts are not moving.

•The appropriate steps need to be made in order to provide protection against electric shock and to prevent from access to electrical components by unauthorized person.

•Fan is equipped with the on/off switch – the connecting of power supply doesn't causes immediate start-up. The device is not equipped with system, that would permanently shut it down in case of temporary power supply loss. It has to be ensured, that any dangerous or unpermitted event does not occur in case of temporary loss of power supply.

•Thermal sensors installed in motor (if fitted) after tripping caused by motor overheat turn back to initial state after cooling down. It has to be ensured, that any dangerous or unpermitted event does not occur in case of action of thermal sensors and after motor cooling down.

● In case of impeller jamming – its unblocking may cause sudden movement. Appropriate steps need to be made in order to avoid impeller jamming. In case of impeller jamming, fan need to be completely disconnected from power supply and repaired.

● After disconnecting from power supply fan still works for certain time (moveable parts are moving) as a result of energy accumulation.

1.2.11 use

● Improper installation and/or use may lead to damage of the device and occurrence of dangerous situation. The unit can by installed, maintained, dismantled and used only by qualified and authorized personnel, in accordance to safety rules and current regulations in the country of use (including proper electrical authorization). Personnel need to be familiar with reactions caused by the fan.

•**Using of fan in dismantled/uncompleted state is forbidden, e.g. without junction box cover.**

•During the works (e.g. maintenance, installation) the fans surrounding needt to be protected from bystanders approach.

•Any modifications of the unit are forbidden. Complicated maintenance work (such as dismantling the motor or impeller) need to be made by Venture Industries Sp. z o.o. service or with it permission - according to additional guidance. Improper assembly may lead to reduce the fan parameters, damage the unit and lead to the dangerous situation.

1.2.12 accumulation of dust

● Prevent the accumulation of dust, sediment on and inside the fan. Dirt accumulated on: grids – reduce the fan parameters; impeller – may lose it balance; housing and motor – can reduce the cooling; hot surfaces (see 1.2.9) – may ignite.

1.2.13 explosive atmospheres

•Contact of the fan with explosive atmospheres cause in ignition. It is forbidden to contact the fan with explosive atmospheres.

## 2. TRANSPORT AND STORAGE

•The fan need to be transported and stored in original packaging, without excessive shocks. The device must be protected from weather conditions, transported and stored in dry, well ventilated, and free from substances harmful to the device areas. The fan cannot by transported and stored in areas with fertilizers, chlorinated lime, acids and other aggressive chemicals. Fan need to be protected against foreign body entrance.

•Protect the fan against damage (including crush). After lifting unit it need to be put slowly.

● The unit need to be lifted by housing elements. When a sticker "lifting point" occurs (on the right), the unit must be lifted by the elements indicated by the sticker. Do not lift the unit by motor elements (e.g. eye bolt). **During lifting the device must remain stable.**

● It is recommended that storage time does not exceed one year. After long storage, before installation check the fan (section 5).

Do not approach lifted device. In case of breaking, falling device may cause serious injury or death.

### 3. ASSEMBLY AND INSTALLATION

#### 3.1 General information

•During installation follow the guidelines contained in section 1.2

•The fan is a machine not ready for use (within the meaning of the Machinery Directive 2006/42/WE - before use of the device ensure conformity with requirements of Machinery Directive 2006/42/WE. After installation the device must meet the requirements included in EN ISO 12100, EN ISO 13857, EN ISO 13850 and EN 60204-1 standards. Additional information is included in Manufacturer Declaration (Appendix D).

•Before installation remove temporary items that protect fan during transport and storage (e.g. box, foil, inlet and outlet caps – do not remove any guards) – Starting the fan with those items could lead to damage of the fan. Make sure that the fan is not damaged.

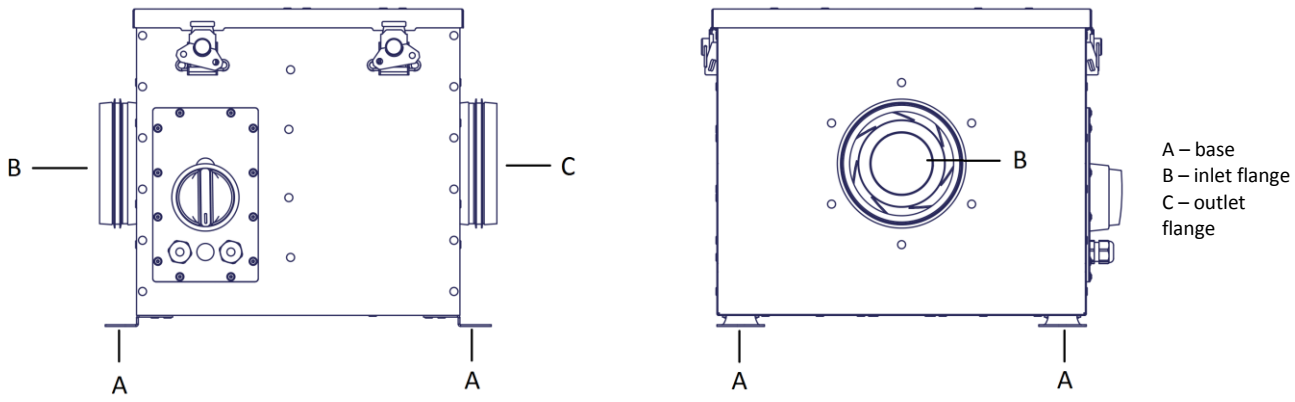
•Ensure that there are no foreign bodies (e.g. mounting elements, tools) inside fan and near of the unit, the fan is properly secured after installation (the cover of connection box is closed and secured, the connecting elements are properly tightened). Technical acceptance need to be carried out in accordance with Appendix B.

During mechanical connection special attention need to be paid to prevent from falling sold objects into fan, which would lead to it damage.

#### 3.2 Assembly information

•Fan need to by mounted in horizontal or vertical motor shaft possition – (Fig. 1). All holes placed in base (A) have to be used, fasteners secured against loosing need to be applied. Ventilation installation need to be connected to fan inlet and outlet flange.

**Fig. 1**




•Supporting construction has to be solid enough in order to carry the weight of the fan and generated vibration (including fan damage). The fan cannot be exposed to vibration.

•Covers from inlet and outlet side need to be applied. Covers need to protect from touching the impeller according to ISO 13857.

•Fan need to be secured from sucking foreign elements (see paragraph 1.2.3). Covers from inlet and outlet side must comply with requirements of IP20 (EN 60529). If there is still risk of sucking foreign objects - additional protection need to be used.

•It is recommended to apply measures minimizing transmission of vibration from/to the fan. For fans placed on vibro-isolators connecting on inlet and outlet side need to be made in flexible form.

•Keep safe distance between installed device and inflammable elements (special attention to hot surfaces of device need to be paid).

#### 3.3 Electrical connection guidelines

•The fan and power supply network must be protected in accordance with local law requirements.

•Detailed guidelines related to electrical connection are located in Appendix F - those guidelines need to be applied.

•Protection against short-circuits, protection against overload and voltage asymmetry need to be applied. It is necessary to use switch that cmpletely disconnect fan from voltage.

**•Use appropriate protection against electric shock. Fan need to be connected to grounding system with designed for such purpose ground terminal (terminals) – according to documentation and markings placed on motor and markings placed on fan.**

**•Grounding protective terminal (PE) located in motor connection box need be used.**

- Voltage and frequency of supply network cannot exceed those indicated on the fan nameplate.
- Use electrical wires with proper insulation and cross-section. Wires need to be placed in way excluding contact with moving elements and in a way that liquid (e.g. from condensation) does not run over them in the motor connection box. Connection box and housing cable glands need to be properly tightened.

**3.4 Rotor rotation direction**

The fan has built-in speed regulator which do not allow to change the direction of rotor rotation, although if the impeller would rotate in incorrect direction contact with manufacturer. Direct of rotor rotation is shown by arrow on the fan casing.

**4. USE**

- Make sure that turning on of the fan does not make any risk for personnel and property.
- The fan is designed for continuous operations (S1) – too high frequency of turning may lead to the motor regulator overheat and damage (see also chapter 4.2 Guidelines for regulation).
- **Fan cannot work with voltage, frequency, current higher than shown on the fan nameplate.**
- In case of activation of any electrical protection, detection of damage, working with current greater than specified on the fan nameplate – unit must by immediately turn out off use.
- The parameters of the device (ambient and operation temperature, flow rate min and max etc.) refer to the rated speed.

**5. MAINTENANCE, REVIEW**

**5.1 Maintenance guidelines**

- During maintenance and review follow the guidelines contained in point 1.2
- Fan need to be subject of regular review and maintenance (point 5.2). The set between routine checks and maintenance need to be determined by user, based on the observation of unit and specific conditions of use, in order to include specific work conditions. In the case of irregularities the device must be turn off and subjected to review, maintenance and possible repairs.
- To clean fan construction use slightly damp delicate material. It is prohibited to use detergents, liquids under pressure and tools that may scratch the unit surface.
- In case of long fan downtimes it should be run at least once per month for 2 hours (with full speed).
- Prevent the accumulation of dust/dirt on and inside the fan. Dirt accumulated on: grids – may reduce the fan parameters; impeller – may lose it balance; housing and motor – can reduce the cooling; hot surfaces – in extreme situations may ignite. If the device is secured by filter - filter should by regularly inspected and replaced if it pollution is too high. The dirt accumulated on the filter reduces the fan parameters.
- Ensure that there are no foreign bodies near and inside the fan, the impeller is not blocked, the unit is clean, dry and secured after maintenance and review.
- Fan motor is equipped with bearing with life expectancy 40 000 hours (ambient temperature 40˚C). Bearings do not need refill lubricate.
- Excessive vibration may cause mechanical damage of the fan or it mounting construction. The vibration increase can indicate bearings damage or loss of impeller balance. Vibration value needs to be controlled, and if its growth is noticed, the reason need to be determined and device must be repaired.
- Maximum vibration value on motor cover (see Pic. 2) after fan installation cannot exceed value presented in table below:

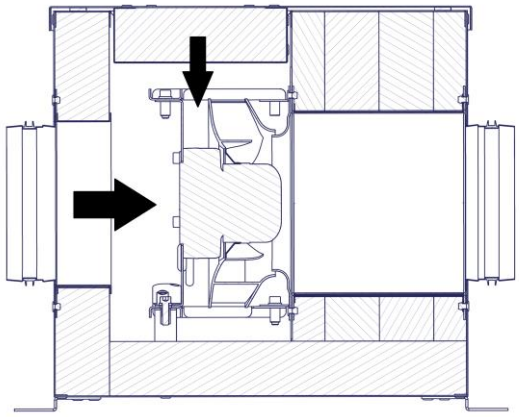
| Rigidly mounted* | | Flexibly mounted* | |
|---|---|---|---|
| peak | r.m.s | peak | r.m.s. |
| 6.4 mm/s | 4.5 mm/s | 8.8 mm/s | 6.3 mm/s |

Tab.1. Maximum vibration value according to ISO 14694

- During review special attention to the following need to be paid:

| | |
|---|---|
| dust and dirt | Prevent the accumulation of dust/dirt on and inside the fan. Dirt accumulated on: grids – may reduce the fan parameters; housing and motor – can reduce the cooling; hot surfaces –may ignite. Special attention must be paid to motor cooling impeller and its cover. Reduction of cooling ability may lead to overheat of motor without working of safety devices. |
| corrosion | Corrosion of the fan may lead to mechanical damage of it. It is forbidden to use the fan if corrosion appears |
| overload | Exceeding of nominal current may be caused by improper choice of fan, mechanical damage (e.g. impeller, bearing), improper electrical connection. Current value must be controlled, and if its growth is noticed, the reason need to be determined and device need to be repaired. Current value cannot exceed nominal value. |
| vibration | Excessive vibration may cause mechanical damage of the fan or it mounting construction. The vibration increase can indicate bearings damge or loss of impeller balance. Vibration value need to be controlled, and if its growth is noticed, the reason need to be determined and device must be repaired. |

**Fig. 2**



**5.2 Review and maintenance**

•The set between routine checks and maintenance need to be determined by user, based on the observation of unit and specific conditions of use, in order to include specific work conditions. The set cannot be longer than introduced below

• In the case of irregularities the device must be turn off and subjected to review, maintenance and possible repairs / cleaning (when dirt occurs). Examples of reasons for device to work in emergency mode are given in Appendix C.

•Staff operating the device must be familiar with it normal working conditions. If the fan work differ from it normal working conditions it need to be turn off from work and inspected.

•Detailed information about komponents and it tightening torque is available on request.

*Recommended daily review, not less frequently than once a week.:*

•Device is undamaged, stable and works properly
•There are not any leaks, smoke from motor
•Device does not emit any untypical noise, and does not heat up excessively
•Device is clean (general control), corrosion does not occur (general control)
•Wires are not damaged
•there are no untypical leaks from fan
•Covers are in proper state and clean

*Monthly review*

•Fan current value is not higher than beginning value
•The values of generated vibration did not increase (according to beginning value)
•Device and covers are clean
•Device is clean, filter is not clogged.

*Review once per 3 months, not less than 6 month and 3000 hours of work*

•Corrosion does not occur
•Fasteners state is proper (they are properly tightened)
•Security devices are working and set properly, protection against electrical shock is effective.
•Motor insulation resistance value is correct
•Structure is complete, components are not damaged (**e.g. by abrasion**)

Fan review made by Venture Industries Group service is recommended

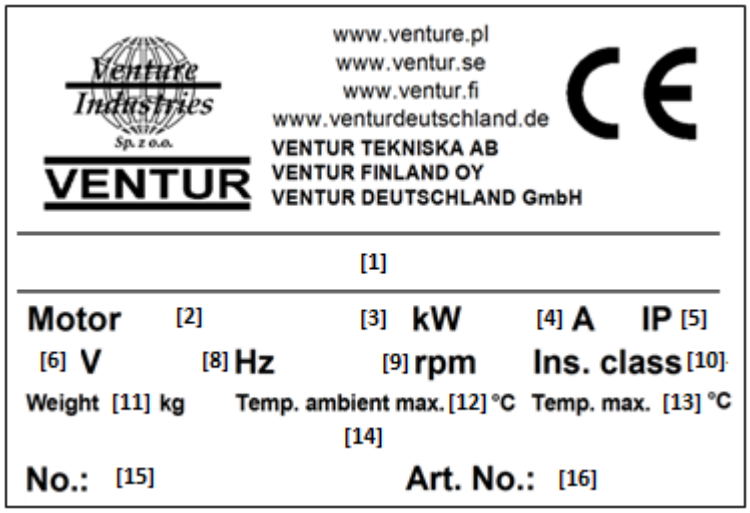
**6. REPAIR, WARRANTY**

Use only original spare parts and original accessories. Fan repairs need to be made by Venture Industries Sp. z o.o. service or outside, after manufacturer permission. Warrantee conditions are described in guarantee card.

**7. DISMANTLING AND RECYCLING**

Disconnect unit from its power supply, and dismount according to the guidelines from section 1 of this instruction. Therefore, please deposit all left-over material and packaging in their corresponding recycling containers and hand in the replaced machines to the nearest handler of this type of waste product.

**Appendix - A (Product indication)**




[1] – product full name
[2] – motor type
[3] – motor power
[4] – nominal current
[5] – motor IP class
[8] – nominal voltage
[8] – power supply frequency
[9] – nominal fan speed
[10] - motor insulation class
[11] - weight
[12] – max ambient temperature
[13] – max temperature of transproted medium
[14] – informetion of accordance with ErP Directive (if apply)
[15] – serial number
[16] – art. no.

**Appendix - B (The device receipt form)**

| **Before launch** | Check confirmation |
|---|---|
| Type and model of fan are in accordance with the order. | |
| The fan is undamaged. | |
| There is no foreign body inside fan, and the fan is clean. | |
| The fan is reliably and solidly fixed in workplace. | |
| The fan is properly leveled | |
| Wires are properly tightened. | |
| Ambient temperature and transported medium temperature are compatible with fan nameplate | |
| Proper electrical protection is applied | |
| Grounding of fan is applied. | |
| Network power supply is compatible with fan power supply. | |
| Power supply disconnecting switch is applied. | |
| Personnel using the fan read and understood the operation and montage manual. | |
| Proper inlet and outlet covers (grids) have been applied | |
| | |
| **After fan launch (continuous work period minimum 30 minutes)** | |
| Readings and set of vibration measurement device has been written (they are available in future) | |
| Readings and set of current measurement device has been written (they are available in future) | |
| Value of current for each of phase does not exceed nominal one | |
| The vibration value is not higher than permitted. | |

**Appendix - C (Examples of device faulty working)**

| SYMPTOMS | POSSIBLE REASON |
|---|---|
| Excessive vibration or noise | •Used or damaged impeller<br>•Fan levelled in wrong way<br>•Dirt accumulated on impeller caused loss of balance;<br>•Impeller loss of balance<br>•Parts rubbing;<br>•Damage or wear of bearings;<br>•Damage of measurement system, that is responsible for signalization of excessive vibration.<br>•Deformed motor shaft;<br>•Loose of impeller fix screw, impeller is loose on motor shaft;<br>•Loss of balance of motor impeller or damage of motor (wear/damage of bearing) |
| Motor overload | •Rubbing between fan impeller and housing;<br>•Damage or wear of bearings;<br>•Damage of motor windings (overheat, insulation degradation, insulation breakdown etc.);<br>•Damage of switch or security system;<br>•Failure of one of supply phases;<br>•Exceeding of maximum motor speed;<br>•Too low flow |
| Failed fan start-up | •Rubbing between fan impeller and housing or foreign body (e.g. tool left after installation);<br>•Failure of one of supply phases;<br>•Failure of start-up system, e.g. Y/D<br>•Reset of security devices has not been made, wrong security device<br>•Motor connected in wrong way or damaged<br>•Too low supply voltage |
| Protective devices activation during fan work and overheating | •Excessive start-up time<br>•Motor overload<br>•Motor launching done too often (thermal protection – if applied or overheating)<br>•Improper set of protection system e.g. in system with PTC or thermocontact sensors (if applied)<br>•Improper cross-section of power supply wires<br>•Lack of sufficient motor cooling eg. dirt placed on motor cooling impeller (thermal protection – if applied or overheating) |
| Too low flow | •Damage of device<br>•Too low power supply frequency<br>•Obstacles in ventilation installation<br>•Damaged bearings |

**Appendix - D (Declaration of Manufacturer)**

**EU Declaration of Conformity** in accordance with 2014/30/EU Directive
**EC Declaration of Incorporation** in accordance with 2006/42/EC Directive (Appendix II 1B)

Venture Industries Sp. z o.o.

*doc. no. BF1.1.* 14042020_EN

**Manufacturer:**
Venture Industries Sp. z o.o.
ul. Mokra 27
05-092 Łomianki-Kiełpin
Polska

**declares that the product described below:**

| | |
|---|---|
| Name: | Duct fan |
| Type: | IBF / IBF-I / ABF / AFB |
| Model and serial no.: | all manufactured |
| CE marking date: | 2010 (IBF) / 2013 (IBF-I) / 2016 (ABF) / 2020 (AFB) - in accordance with 2014/30/UE Directive |
| Use/Function: | transport of specified medium **after incorporation into machinery (as defined by 2006/42/WE Directive)** |

**complies with the requirements of:**

- Machinery Directive 2006/42/EC – Annex I, item: 1.3.4, 1.5.1, 1.7.1.
- Electromagnetic Compatibility Directive 2014/30/EU

*Compliance with 2014/30/EU Directive applies to the single product. When product is used with other components the installer is responsible for compliance of entire system with the provisions of 2014/30/EU Directive.*

**Following standards were applied (partially or full):**

EN ISO 12100 EN 60034-1 EN 60204-1 EN ISO 13857

*Compliance with EN ISO 13857 refers to safety devices supplied and installed in the product by the manufacturer.*

**Furthermore:**

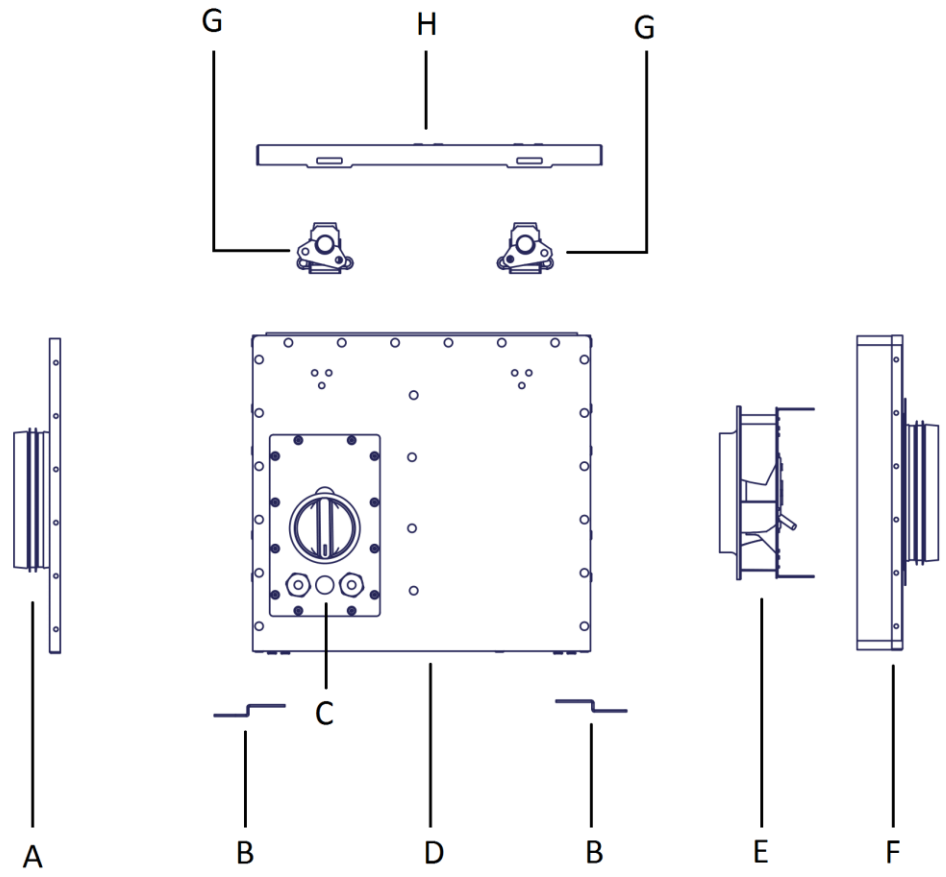
- **Product is partly completed machinery (as defined by Directive 2006/42/EC), and it must not be put into service**
- **until the machinery in which it is incorporated has been declared in conformity with the provisions of 2006/42/EC Directive (and its amendments).**
- The machinery (installation) into which the product is incorporated should particularly meet the requirements of current standards: EN ISO 12100, EN ISO 13857, EN 349+A1, EN ISO 13850, EN 60204-1.
- Product is in conformity with the Commission Regulation (EU) No 1253/2014 implementing ErP Directive 2009/125/EC with regard to eco-design requirements for ventilation units.
- In accordance with 2006/42/EC Directive requirements: The technical documentation for above mentioned
- product has been prepared in accordance with Directive 2006/42/EC, Annex VII, Part B, and is located in the manufacturer office: *Lotnicza 21A, 86-300, Grudziądz, Poland*. The person authorized to comply the relevant technical documentation: *Piotr Pakowski (Lotnicza 21A, 86-300, Grudziądz, Poland)*. Relevant information about the product will be provided in electronic or paper form in response to a reasonable request of national authorities.
- The product complies with Directive Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- According to the current level of knowledge, our suppliers of components, raw materials and preparations involved in our supply chain, working according to standards compatible with Regulation (EC) No 1907/2006 (REACH) and subsequent amendments.
- Integrated Management System is compliant with PN-EN ISO 9001:2015 and PN-EN ISO 14001:2015 standards.

**Wojciech Stawski**
Managing Director

Date: 14.04.2020
Kiełpin

**Appendix - E (Schematic diagram of the fan)**

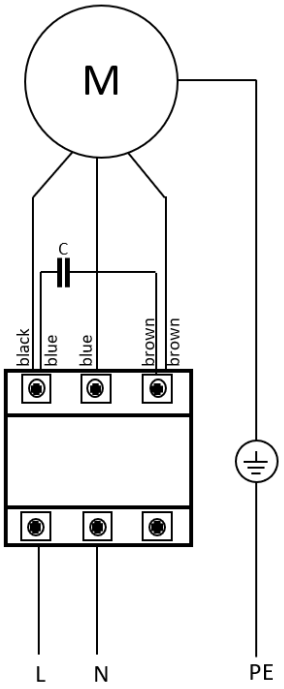
**General description (simplified)**




A - inlet
B - mounting base
C - control panel
D - casing
E - external motor rotor
F - outlet
G - butterfly lock
H - cover

**Appendix - F (Schematic diagram of the fan connection)**

**Models 125 i 315:**




**Models 150, 160, 200 i 250:**