

Use and Maintenance Manual



Explosion proof stand fans

WPA-E-N/Ex

ATEX marking:  II 2 G c Ex e II T3

Contents:

1.	Introductory Remarks	2
2.	Application.....	3
3.	Reservations of Producer.....	3
4.	Technical Data	4
5.	Structure and Function	6
6.	Assembly and Start-up.....	6
7.	Operational Use	9
8.	Troubleshooting Guide	10
9.	Maintenance	10
10.	Occupational Health and Safety.....	11
11.	Transport and Storage	11
12.	Terms of warranty	11
13.	Sample of the Declaration of Conformity.....	12

888W01	WPA-3-E-N/Ex	04.06.2019/EN
888W02	WPA-5-E-N/Ex	04.06.2019/EN
888W03	WPA-6-E-N/Ex	04.06.2019/EN
888W04	WPA-7-E-N/Ex	04.06.2019/EN
888W05	WPA-8-E-N/Ex	04.06.2019/EN
888W06	WPA-9-E-N/Ex	04.06.2019/EN
888W07	WPA-10-E-N/Ex	04.06.2019/EN

1. Introductory Remarks

The purpose of the present Use and Maintenance Manual is to supply User with directions within the range of application, installation, start-up and the use of the **WPA-E-N/Ex explosion-proof stand fans**.

Installing, start up and operational use are exclusively admissible after getting acquainted with the contents of the Use and Maintenance Manual.

With regard to continuity of work carried on improvement of our products, we reserve for ourselves the revision possibility of the draft and technological changes improving their functional features and safety.

The construction of the **WPA-E-N/Ex Explosion-proof stand fans** meets the requirements of the current state of technology as well as the safety and health assurances included in:

- **2006/42/EC Machinery Directive** of the European Parliament and of the Council of May 17th, 2006 on machinery – amending the 95/16/EC (recast) /*Journal of Laws EC L157 of 09.06.2006, page 24*/
- **2014/35/EC Directive** of the European Parliament and of the Council of February 26th, 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits. /*Journal of Laws EC L96 of 29.03.2014*/
- **2014/34/EC ATEX Directive** of the European Parliament and of the Council of February 26th, 2014 on the harmonisation of the laws of Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres. /*Journal of Laws EC L96 of 29.03.2014*/

Additionally, the appliance meets following harmonized standard:

- | | |
|------------------------------------|--|
| ● EN ISO-12100:2012 | – “Safety of machinery – Basic concepts, general principles for design. Risk assessment and risk reduction”. |
| ● EN 60204-1:2018-2 ?????? | – “Safety of machinery – Electrical equipment of machines. Part 1: General requirements”. |
| ● EN ISO 13857:2010 | – “Safety of machinery – Safe distances to prevent hazard zones being reached by upper and lower limbs”. |
| ● EN 80079-0:2013/A11:2014 | – “Electrical appliances in areas of gas explosion risk. Part 0: General requirements”. |
| ● EN 60079-7:2016-02 | – “Electrical appliances for areas of gas explosion hazard. Part 7: Increased safety construction “e”. |
| ● EN 1127-1:2011 | – “Explosive atmospheres. Explosion prevention and protection. Basic terminology and methodology”. |
| ● EN ISO 80079-36:2016-07 | – “Explosive atmospheres – Part 36: Non-electrical equipment for explosive atmospheres. Methodology and requirements. |
| ● EN ISO 80079-37:2016-07 | – “Explosive atmospheres – Part 37: Non-electrical equipment for explosive atmospheres. Non-electrical types of protection. Constructional safety “c”, supervised ignition “b”, immersion in a liquid “k”. |
| ● EN 14986:2017-02 | – “Designing of fans applied in areas of explosion hazard” |
| ● ISO 14694:2003+AMD1:2010 | – “Industrial fans – Guidelines on the quality of balancing and the vibration level. |
| ● ISO 14695:2008/AC:2017-10 | – “Industrial fans – Methods of measurements of vibration of fans. |

2. Application


WPA-E-N/Ex explosion proof stand fans are intended for use in areas of explosion risk, where where explosive atmosphere, (i.e. mixture of flammable substances in form of gas and vapour with the air, whereby after ignition – in atmospheric conditions – the burning mass would expand within the whole non-burning mixture) can occur.

Increased fan pressure of these devices allows their application in a system cooperating with local exhausts, filtering units, as well as in a ventilation system of significant flow resistances. The fans can work in temperature range -20°C up to +40°C. They are meant for forwarding the dry air of dustiness not exceeding 0,3 g/m³, without viscous impurities.


Pursuant to the ATEX 2014/34/EC Directive and PN-EN 13463-1 the appliance features level of protection: HIGH as appliance classified in **group II, category 2**; can work in areas where **explosive atmospheres are possible to occur**. The device can be applied in **zones 1, 2 (G)**.


The appliance is marked on the Ex classification board:  **II 2 G c Ex e II T3**

Marking of the operational conditions of the device: **group / category / hazard / class**.

-  marking for explosion proof properties of the appliance,
- **group II** – the device is designed for work on-ground, in factories in areas where explosive atmospheres occur, **but this cannot be methane risk (firedamp)** neither carbon dust occurrence,
- **category 2** – the device is designed for application in areas where **explosive atmospheres are sporadically likely to occur**,
- **gas hazard G**,
- “**c**” – signifies the constructional protection,
- **Ex** – mark of the electrical device – constructed and tested according to the European Standards for work in areas of explosion hazard,
- **execution “e”** – type of construction of the motor (a motor of increased safety)
- gas explosion **group II** – occurring in factories of on-ground location – the fans are constructed according to EN 14986:2009, whereby they can be applied for gas in explosion groups **II and hydrogen**,
- **temperature class T3** – the surface temperature of any part of the appliance should not exceed **200°C**; the device can be used safely in explosive atmospheres belonging to classes **T1, T2, T3**.

3. Reservations of Producer

- A. Manufacturer accepts no liability for any consequences following from the operational use that is in contradiction to the purpose of application.
- B. Installing any additional elements not belonging to the normal device structure (or accessory set) is not acceptable.
- C. Do not undertake any structural changes or constructional modifications on the device on one's own.
- D. Protect the appliance's housing from mechanical damage.
- E. Before the installing check the load carrying capacity of the wall/building structure in points where the stand fan shall be installed. Unsure mounting could cause hazard to personnel / people in the vicinity.
- F.  **Do not use the fan for conveying the air containing viscous impurities that could deposit (build up) on the device surface, especially on the impeller.**

G.  Neither use it for forwarding the air with aggressive pollutants which will destructively effect the device structure.

H. During operation, the maximum impeller rotations should not exceed the nominal rotations.

I. **Manufacturer is not responsible for wounds, injuries, body laceration experienced by User or personnel during the incorrect operational use.**

4. Technical Data

Table No.1

Type	Synchronous rotations**	Supply voltage	Motor rate	Ingress protection	Acoustic pressure level [dB(A)] from distance		Maximum volume low	Maximum vacuum	Weight
					1m	5m			
	[1/min]	[V]	[kW]	IP			[m³/h]	[Pa]	[kg]
WPA-3-E-N/Ex	3000	3 x 400	0,25	56	69/61*	55/47*	1020	990	12
WPA-5-E-N/Ex	3000	3 x 400	0,55	56	76/67*	62/53*	1900	1250	17
WPA-6-E-N/Ex	3000	3 x 400	0,75	56	83/75*	69/61*	2500	1700	20
WPA-7-E-N/Ex	3000	3 x 400	1,1	56	86/74*	72/60*	3100	1800	23
WPA-8-E-N/Ex	3000	3 x 400	1,5	56	88/78*	74/64*	3900	2050	31
WPA-9-E-N/Ex	3000	3 x 400	2,2	56	91/82*	77/68*	4500	2400	38
WPA-10-E-N/Ex	3000	3 x 400	4,0	56	91/81*	77/67*	7400	2600	66

* Acoustic pressure levels have been measured with the TK L=500 silencer attached at the at the fan inlet and outlet (in case of WPA-3-E-N/Ex apply the silencer TK L=370 mm).

1. Maximum temperature of the conveyed air is +60°C, whereas maximum temperature within the work zone +40°C.
2. Maximum dustiness of the conveyed air should not exceed 0,3 g/m³.

Static pressur [Pa]

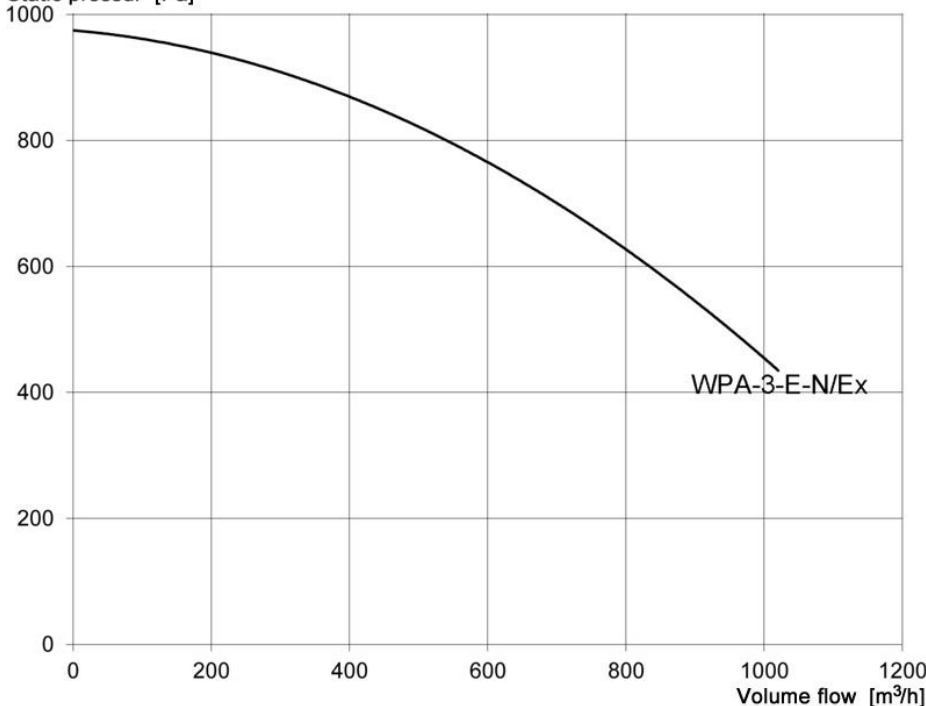


Fig. No.1 – Flow chart WPA-3-E-N/Ex

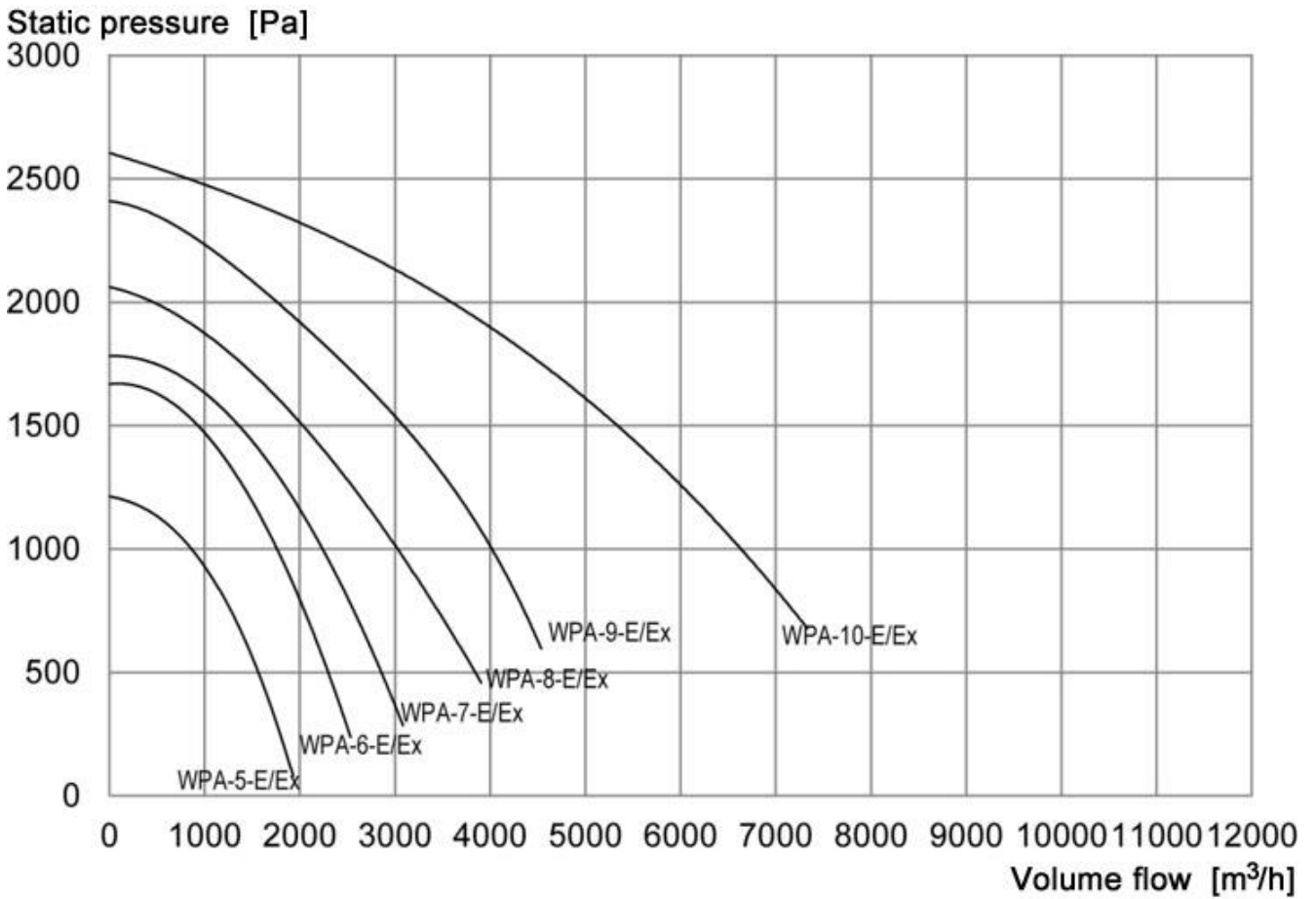


Fig. No.2 – Flow chart WPA-E-N/Ex

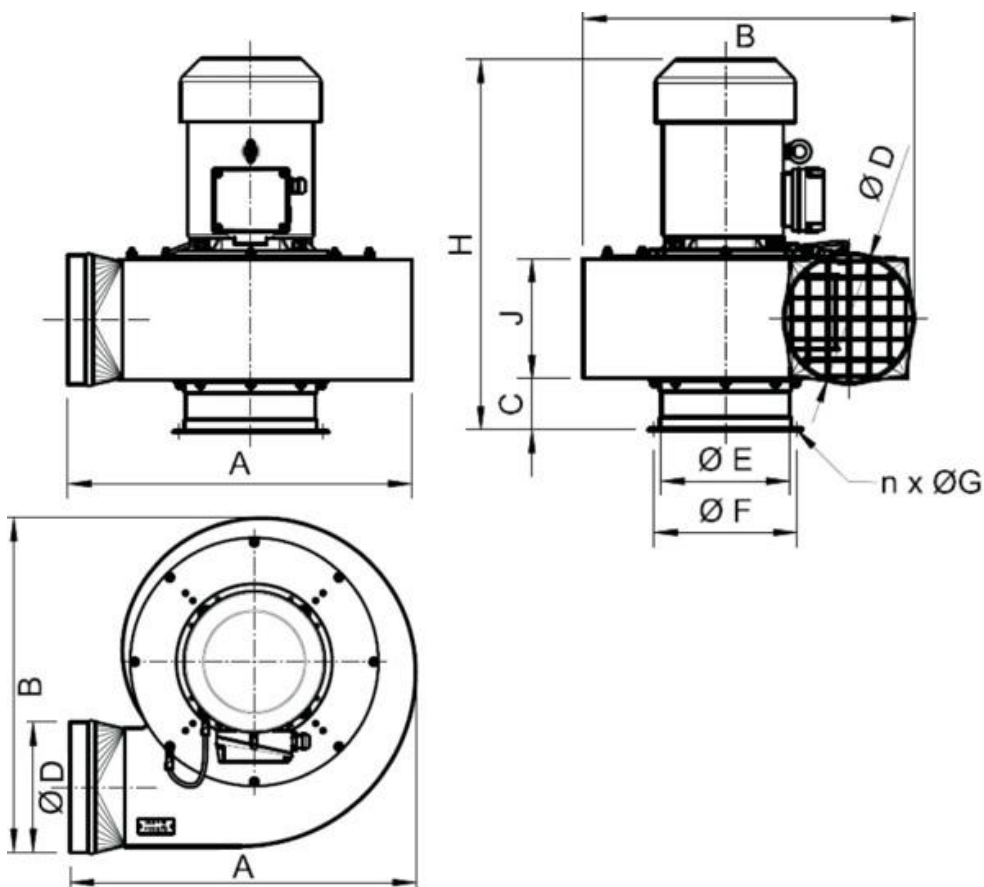


Fig. No.3 – Dimensions – WPA-E-N/Ex

Table No.2 – Dimensions – WPA-E-N/Ex

Type	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	n [pcs]	G [mm]	H [mm]	J [mm]
WPA-3-E-N/Ex	410	385	50	125	125	155	6	6,5	380	130
WPA-5-E-N/Ex	480	480	60	160	160	194	6	6,5	420	140
WPA-6-E-N/Ex	490	505	60	160	160	194	6	6,5	445	140
WPA-7-E-N/Ex	550	520	60	200	160	194	6	6,5	460	155
WPA-8-E-N/Ex	570	550	60	200	200	224	8	9,0	475	155
						234	6	6,5		
						246	8	9,0		
WPA-9-E-N/Ex	615	620	60	200	200	224	8	9,0	500	155
						234	6	6,5		
						246	8	9,0		
WPA-10-EN/Ex	645	625	100	250	250	274	8	9,0	670	232

5. Structure and Function

The fan consists of a steel spiral housing, motor with installed on its shaft aluminium radial impeller. The impeller blades remind the airplane wing cross-section and provide low acoustic pressure level of the fan.

The fan inlet is equipped with a flange to install the fan on the wall bracket or on a filtering unit, whereas, the fan outlet is ended with a round fitting piece, for a safe connection of the spiral seam duct (rigid conduit) or flexible connectors.

For safety reasons, the inlet and outlet are equipped with protective grills. It is recommended to install silencers type TK at the inlet and outlet of the fan (see acoustic data in Table No.1).

ADDITIONAL EQUIPMENT – delivery on separate order:

- motor protective switches WS – with short-circuit- and overload protection
- wall brackets
- silencers

It is important to fasten a protective cable (at the fan housing) to conduct the electrostatic charges away. Additionally, on the motor housing is located a clamp to attach the protective cable, which should be connected to the grounding. On the motor housing is placed a terminal box of electrical supply.

6. Assembly and Start-up

The fans are meant for application within the industrial rooms. It is recommended to mount them them on wall brackets (as additional equipment according to separate documentation). The fan outlet must be connected with the discharge duct through a flexible section (made of antistatic material). The connections should be fastened according to the configuration of the ventilation system and its technology, and they ought to be suitable, with reference to the condition clarifications at the installing place. It is recommended to use silencers at the inlet and outlet.

User, who is performing the assembly is responsible for the compatibility with the resolutions of EN ISO 13857.

6.1. Guidelines of installing



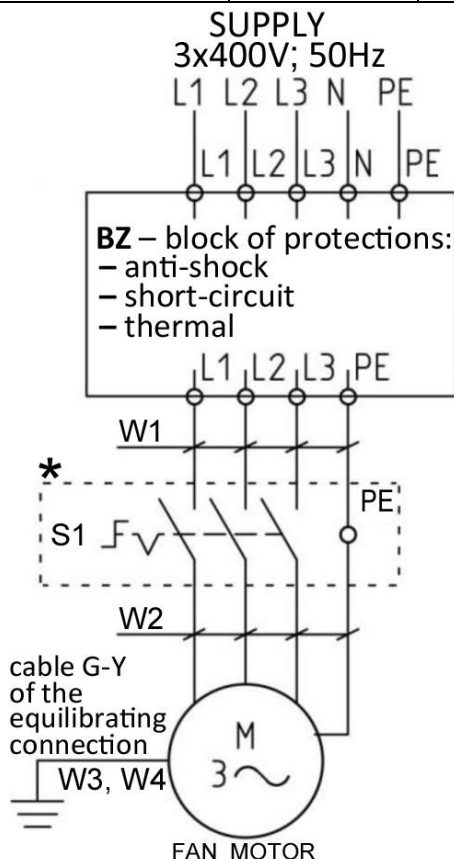
- a/ **VENTILATION INSTALLATION** – to which WPA-E-N/Ex fans are connected, shall be designed according to regulations and standards, with reference to the local explosion hazard.



- b/ **ELECTRICAL POWER SYSTEM** – to which WPA-E-N/Ex fans are connected, shall be designed according to regulations and standards, with reference to the local explosion hazard.

- Before connection, make sure if the parameters of the existing electrical installation comply with the parameters on the nominal data plate. Otherwise, connection cannot be carried out.
- Any steps of connection to the power supply system ought to be executed by a person with confirmed qualifications, according to the being in force, valid regulations and standards.
- The whole ventilation system should be fitted with properly prepared installation to conduct (dissipate) the electrostatic charges away. The couplings between the ventilation ducts must have electrostatic connections made of protective cable.
- Check if the metal ducts are grounded correctly. Moreover, carry out the grounding of the motor housing, joining the protective cable with the contact on the motor housing.

Fan	Motor rate [kW]	Current [A]	Motor type	Cable W1, W2	G-Y Protective cable W3, W4
WP-3-E-N/Ex	0,25	0,9	SKh 63-2B; 3x400V; 50 Hz; 2870 r.p.m.; BESEL	should be selected by User	H05V-K 1G6
WP-5-E-N/Ex	0,55	1,4	SKh 71-2B; 3x400V; 50 Hz 2720 r.p.m.; IMV1; BESEL		
WP-6-E-N/Ex	0,75	1,8	SKh 80-2A; 3x400V; 50 Hz; 2760 r.p.m.; IMV1; BESEL		
WP-7-E-N/Ex	1,1	2,4	SKh80-2B; 3x400V; 50 Hz; 2780 r.p.m.; IMV1; BESEL		
WP-8-E-N/Ex	1,5	3,5	SKh 90S-2; 3x400V; 50 Hz; 2850 r.p.m.; IMV1; INDUKTA		
WP-9-E-N/Ex	2,2	4,7	SKg 90L-2; 3x400V; 50 Hz; 2860 r.p.m.; IMV1; INDUKTA		
WP-10-E-N/Ex	4,0	7,5	SKg 112M-2; 3x400V; 50 Hz 2875 r.p.m.; IMV1; INDUKTA		



Caution: The steel plate for current-equilibrating connections – as in the Fig. No 1012-017078 of mechanical documentation – referring the fans **WPA-10-D-N/Ex**; **WPA-10-E-N/Ex**.

Caution:

1. Supply voltage: **3x400V; 50Hz**
2. Continuous work **S1**
3. Ingress protection **IP56**
4. Ambient temperature: **-20°C up to +40°C**
5. Insulation class **F**
6. To the fan housing connect the grounding cable of length 400mm, ended with a **KOI** terminal.
7. Installations and devices for use in areas of explosion risk – should be executed according to – arrangements of the 2014/34/EC ATEX Directive, – valid regulations and standards.

* **S1** isolating switch – in Ex execution. It is suggested to install it near the fan. The application of the isolating switch is not obligatory and depends on the decision of Investor.

Cables **W1**, **W2** have to be selected by Investor, with reference to the fan motor rate, cable length, outline of the cable, voltage drop.

W3, **W4** are cables for local equilibrating connections of cross-section 6mm², length 300 mm, ended with adequately selected eye terminals, designed for connection to the fan fitting pieces.

CAUTION: The motor windings must be connected according to the data on the nominal data plate of the motor and the connection diagram (placed on the terminal box of the motor).

Fig. No. 4 – Connection diagram of the fan WPA-E-N/Ex

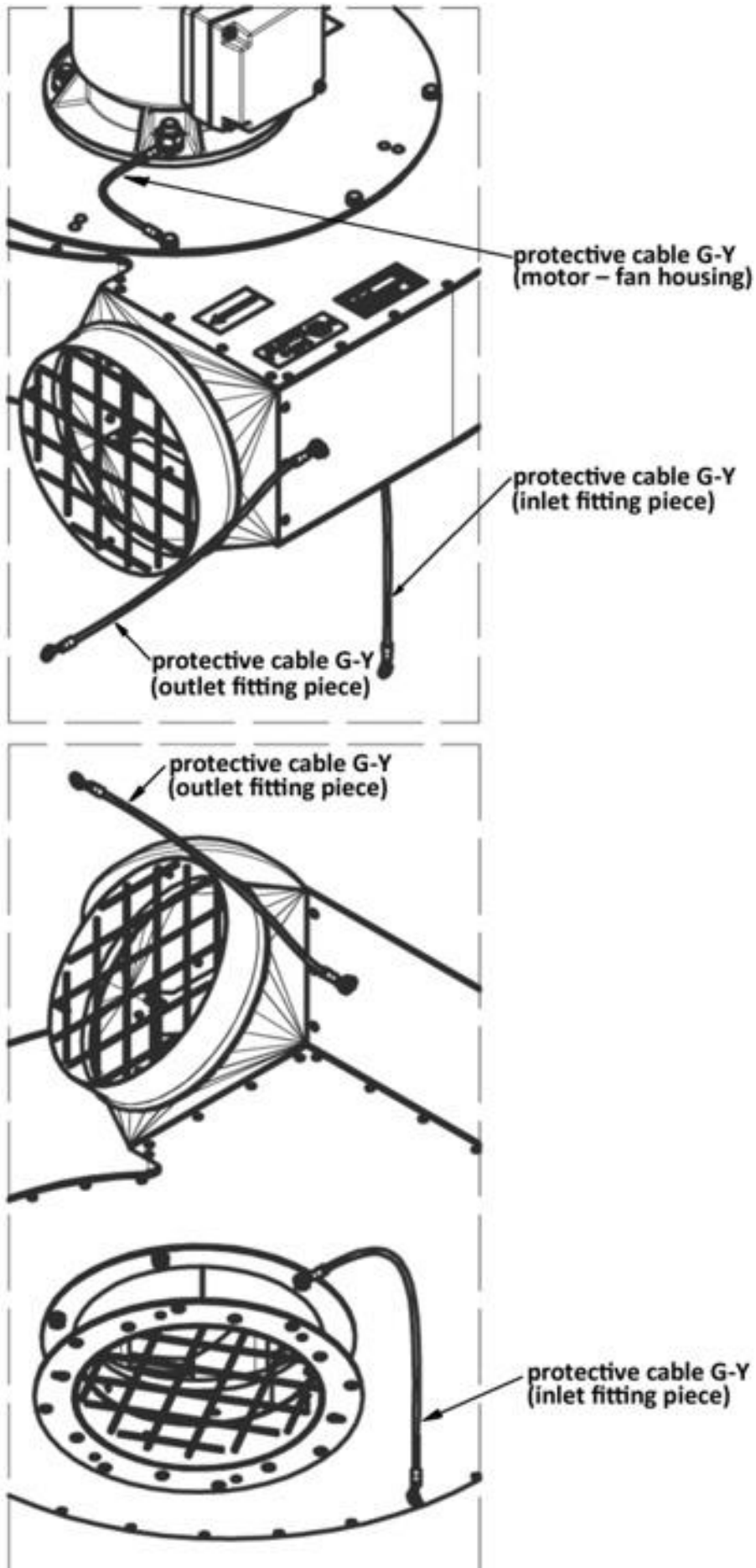


Fig. No.5 – Placement of the protective cables

6.2. Safety examine before the start-up:

- a/ Check if all the mechanical connections are carried out correctly.
- b/ Check the correctness of electrical connections and phase sequence.
- c/ Examine the correctness of the connection between the motor and PE protective cable.

After the device is started up – check if the impeller rotation sense is according to the arrow on the fan housing.

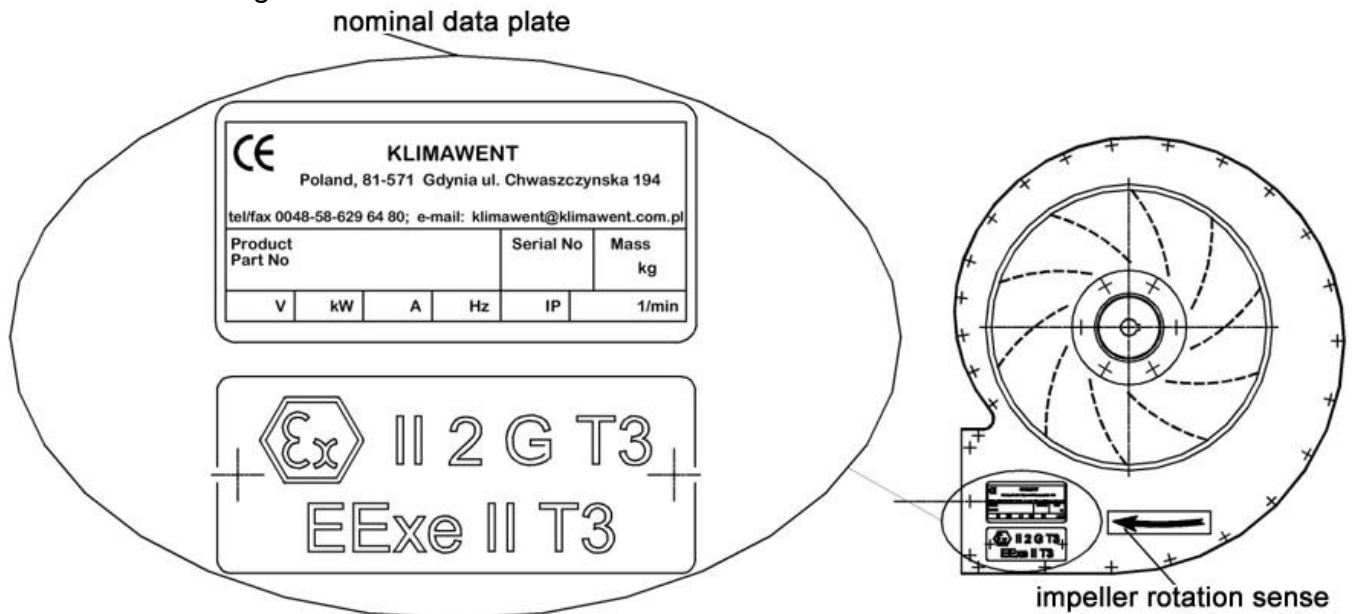


Fig. No.6 – Placement of the nominal plates and arrow of the correct fan rotation sense

The overload motor protection must have current-time performance, providing motor disconnection (from the power supply) in a time shorter than t_E at the current being equal to the start-up current of the motor.

7. Operational Use

Construction of the device assures a reliable function without continuous technical supervision. Periodically, check the mechanical and electrical connections, the state of grounding and also to provide the efficient cooling for the motor.

For incorrect operational use is considered:

- a) forwarding the media of temperature exceeding the admissible temperature (+60°C),
- b) conveying aggressive media,
- c) conveying the media of high dustiness or with high content of pollution particles,
- d) use of the fan in a place where the temperature exceeds +40°C within the ambient area of the motor.

Consequences of incorrect use:

- a) damage of the bearings,
- b) damages caused by corrosion,
- c) loss in balance of the rotating elements,
- d) vibrations,
- e) deformations,
- f) damages caused by friction.

Hazards which can occur due to improper use – damages or other defects caused by:

- burst of the impeller,
- break of the shaft,
- fatigue crack of the material,
- ignition / fire and explosion caused by sparks.

In cases when any symptoms of incorrect device function (noise increase, vibrations, lowered flow efficiency) are noticed, the device should be disconnected from the power supply system, and thoroughly revised (with reference to the reason of disturbance during the operation).

WARNING In case of every repair or spare part replacement (according to ATEX 2014/34 Directive) it is important to apply the adequate information on an additional plate or in the enclosed documentation (a register log of repair activities, etc.). This is the duty of the operator!

A list of frequent functional disturbances and ways of their elimination (corrective actions), is exposed below.

8. Troubleshooting Guide

Table No.3

	Problem	Possible reason	Corrective action
1.	Significant and sudden decrease of the intake flow efficiency.	Obstacle objects, pollutants reducing the air flow got stuck at the inlet grid.	Clean the inlet grid / ventilation conduits.
2.	Sudden vibrations of the fan occur.	Obstacle objects reducing the air flow got stuck in the impeller.	Disconnect the fan from the power system, and remove the obstacle.
		Impeller is defective.	Replace the impeller and the motor for new.
3.	It is not possible to start the fan.	Fade of one of the phases or the voltage is too low.	Adjust to gain the correct voltage.
		The block of protections got activated.	Adjust the correct settings of protections.

9. Maintenance

Chiefly, the construction and solid execution of the fan guarantees its operational use, without constant routine maintenance. To obtain correct functional performances of the fan and to meet the Occupational Health and Safety, **it is recommended to carry out technical revisions of the fan in regular periods.**



Technical revisions on the fan must be executed by a qualified person with adequate authorization. Additionally, the fan should be necessarily disconnected from the power supply system.

In the course of technical revisions, follow the recommendations included in the User's Manual of the motor, that constitute integral part of the main Use and Maintenance Manual of the fan.

Scope of the technical revision:

- Systematically, keep clean the inlet grill.
- Periodically, check the mechanical and electrical connections. Moreover, when defective function is by noise or visually spotted – undertake technical revision of the assembly.
- Execute the check of the fan (motor – according to instructions of motor producer). During the revision, clean the fan of the accumulated impurities.

WARNING

Before the start-up, follow subsequent steps on the fan:

- Disconnect the fan from the power supply. Exemption from this are activities that must be executed at the running fan, i.e. vibration measuring (especially here are important Occupational Health and Safety regulations).
- Wait until the fan impeller stops rotating.

The fan can be restarted after the control steps are carried out, strictly as described in Section 6 “Assembly and Start-up”.

10. Occupational Health and Safety

Start up and the operational use of the fan are admissible after getting acquainted with the contents of the present Use and Maintenance Manual. The fan shall not cause any mechanical hazard when it is correctly and firmly mounted to the floor or another constructional element of the building.

Any installation activities related to the power supply, have to be carried out strictly according to the enclosed Connection Diagram and in accordance with the instructions given in Section 6 of the present User’s Manual.

WARNING

Connection to the power supply system ought to be carried out by an authorized person with electrical qualifications, according to the valid regulations. The fan should be protected from short-circuit and overload effects. In the course of operational use, examine the connection to the PE protective cable.



Any revision activity and repair must be executed after the fan is disconnected from the power supply system. Approaching in “loose garment/clothing” or putting the hand into the open inlet of the running fan can cause risk of accident and severe disability.

11. Transport and Storage

Fans: **WPA-3-E-N/Ex**, **WPA-5-E-N/Ex**, **WPA-6-E-N/Ex**, **WPA-7-E-N/Ex**, **WPA-8-E-N/Ex** and **WPA-9-E-N/Ex** are wrapped in foil and in cardboard packages. On the package surface must be placed their weight. Whereas, large fans as **WPA-10-E-N/Ex** are solely wrapped in foil and placed on a pallet.

During loading, reloading and transport the device neither should be thrown nor knocked down / overturned. Do not put any load on top of the device. It is inadmissible to put one device on top of another (no stacking). During the transport protect them from atmospheric factors and from mechanical damage. The fan must be stored in dry rooms and of efficient ventilation.

12. Terms of warranty

The period of warranty for the purchased device is indicated in the “Card of Warranty”. The warranty does not comprise:

- mechanical damages and malfunctions caused by User,
- device failures / malfunctions caused during use which was in contradiction with the purpose of operational use and with the present Use and Maintenance Manual,
- any damages being caused during improper transport, storage or incorrect maintenance.

Infringement of the Clause 8 Section 3 “Reservations of Producer” of the present Use and Maintenance Manual and especially modifications undertaken by User on one’s own or use in contradiction with the purpose of application – shall result in the loss of warranty validity.

13. Sample of the Declaration of Conformity

Declaration of conformity EC No.

Manufacturer (eventually the authorized representative / importer):

name: **KLIMAWENT S.A.**

address: **81-571 Gdynia, Chwaszczyńska 194**

A person, authorized for issuing the technical documentation: Teodor Świrbutowicz, KLIMAWENT S.A.

hereby declares that the appliance:

name: **explosion-proof stand fans**

type/model: **WPA-E-N/Ex**

serial number: year of production:

meets the requirements of the subsequent European Directives:

- **2006/42/EC Machinery Directive** of the European Parliament and of the Council of May 17th, 2006 on machinery – amending the 95/16/EC (recast) /Journal of Laws EC L157 of 09.06.2006, page 24/
- **2014/35/EC Directive** of the European Parliament and of the Council of February 26th, 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits. /Journal of Laws EC L96 of 29.03.2014/
- **2014/34/EC ATEX Directive** of the European Parliament and of the Council of February 26th, 2014 on the harmonisation of the laws of Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres. / Journal of Laws EC L96 of 29.03.2014 /

The appliance meets following harmonized standard:

- | | |
|------------------------------------|--|
| ● EN ISO-12100:2012 | – “Safety of machinery – Basic concepts, general principles for design. Hazard assessment and risk reduction”. |
| ● EN 60204-1:2018-12 | – “Safety of machinery – Electrical equipment of machines. Part 1: General requirements”. |
| ● EN ISO 13857:2010 | – “Safety of machinery – Safe distances to prevent hazard zones from being reached by upper and lower limbs”. |
| ● EN 80079-0:2013/A11:2014 | – “Electrical appliances in areas of gas explosion risk. Part 0: General requirements”. |
| ● EN 60079-7:2016-02 | – “Electrical appliances for areas of gas explosion hazard. Part 7: Increased safety construction “e”. |
| ● EN 1127-1:2011 | – “Explosive atmospheres – Explosion prevention and protection. Basic terminology and methodology”. |
| ● EN ISO 80079-36:2016-07 | – “Explosive atmospheres – Part 36: Non-electrical equipment for explosive atmospheres. Methodology and requirements. |
| ● EN ISO 80079-37:2016-07 | – “Explosive atmospheres – Part 37: Non-electrical equipment for explosive atmospheres. Non-electrical types of protection. Constructional safety “c”, supervised ignition “b”, immersion in a liquid “k”. |
| ● EN 14986:2017-02 | – “Designing of fans applied in areas of explosion hazard” |
| ● ISO 14694:2003+AMD1:2010 | – “Industrial fans – Guidelines on the quality of balancing and the vibration level. |
| ● ISO 14695:2008/AC:2017-10 | – “Industrial fans – Methods of measurements of vibration of fans. |

.....
place, date

KLIMAWENT S.A.
Supported Employment Enterprise
81-571 Gdynia, ul. Chwaszczyńska 194
phone: +49 58 829 64 80
email: klimawent@klimawent.com.pl
www.klimawent.com.pl

.....
signature of authorised person

District Court Gdańsk-Północ
in Gdańsk, VII Wydział Gospodarczy
of the National Register of Court
KRS 0000308902 company stock
13.779.200 zł paid in total

.....
name, surname, function
of the signatory

NIP: 958 159 21 35
REGON: 220631262
Bank Account: **Santander Bank Polska S.A.**
56 1500 1025 1210 2007 8845 0000