

Use and Maintenance Manual



Chem-proof duct fans **BOX-CHEM**

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802W12	BOX-CHEM-160/1500	31.05.2019/EN
802W13	BOX-CHEM-200/1500	31.05.2019/EN
802W14	BOX-CHEM-250/1500	31.05.2019/EN
802W15	BOX-CHEM-315/1500	31.05.2019/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 **BOX-CHEM chem-proof duct 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 **BOX-CHEM chem-proof duct 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/*

The appliance meets the requirements included in:

- **2009/125/EC (ErP) Directive** of the European Parliament and of the Council of October 21th, 2009 establishing a framework for the setting of ecodesign requirements for energy-related products / *Journal of Laws L 285 of 31.10.2009 /*
- **327/2011 (EU) Regulation** of March 30th, 2011 on implementing the **2009/125/EC Directive** of the European Parliament and of the Council with regard to ecodesign requirements for fans driven by motors with an electric input power between 125W and 500 kW / *Journal of Laws L No. 90 of 06.04.2011 /*

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 60204-1:2018-12 | – “Safety of machinery – Electrical equipment of machines. Part 1: General requirements”. |
| • EN 60034-1:2011 | – “Rotating electrical machines – Part 1: Rating data and parameters” |
| • EN ISO 5802:2008/A1:2015-07 | – “Industrial Fans – Performance testing in situ of installing” |
| • EN ISO 13857:2010 | – “Safety of machinery – Safe distances to prevent hazard zones being reached by upper and lower limbs” |

2. Application

Duct fans BOX-CHEM are developed for conveying the clean air or the air contaminated with chemically aggressive media (see Table, pages 9-12) of maximum dustiness 0,3 g/m³ and maximum temperature up to 40°C.

These fans cannot convey explosive mixtures. They are designed for the air-supply- and extraction ventilation in various industrial branches, public facilities, for ventilation application of buildings, storehouses and various types of process halls.

Due to their construction, they can be installed directly between square ventilation ducts where the flow direction of the conveyed medium is not changed.

The chemically resistant fans are equipped with one-phase motors, of ingress protection IP55 and insulation class F.

The fans carry hygienic certificates issued by National Institute of Public Health of the Department of Communal Hygiene.

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 of 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. Prior to installing check the load carrying capacity of the building structure where the device will be mounted. Unsure mounting could cause hazard to personnel/people in vicinity and effect in damage of the device.
- F. **The fan cannot be used for conveying the air contaminated with a mixture of flammable substances in form of: gas, vapour, mist and dust, that in connection with the air could create the explosive atmosphere.**
- G. **Do not use the fan for conveying the air containing viscous impurities that could accumulate on the device surface, especially on the impeller.**
- H. During operation, the maximum impeller rotations should not exceed the nominal rotations.
- I. Producer is not responsible for wounds, injuries, body laceration experienced by User / personnel during the improper operational use.

4. Technical Data

Table No.1

Type of the fan	Synchro- nous rotations	Supply voltage	Motor rate	Maximum Volume flow	Maximum vacuum	Acoustic pressure level from distance		Weight
						1m	5m	
	[r.p.m.]	[V]	[kW]	[m³/h]	[Pa]	[dB (A)]		[kg]
BOX-CHEM-160/1500	1500	1x230	0,12	460	170	56	48	13,2
BOX-CHEM-200/1500	1500	1x230	0,18	1150	230	62	35	22,0
BOX-CHEM-250/1500	1500	1x230	0,25	2100	300	65	57	26,0
BOX-CHEM-315/1500	1500	1x230	0,75	3820	460	70	62	40,0

1. Ingress protection IP 55
2. Maximum temperature of the conveyed air is +40°C.
3. Maximum dustiness of the conveyed air is 0,3 g/m³.
4. On demand are available fans of special execution for supply voltage 3 x 400V.

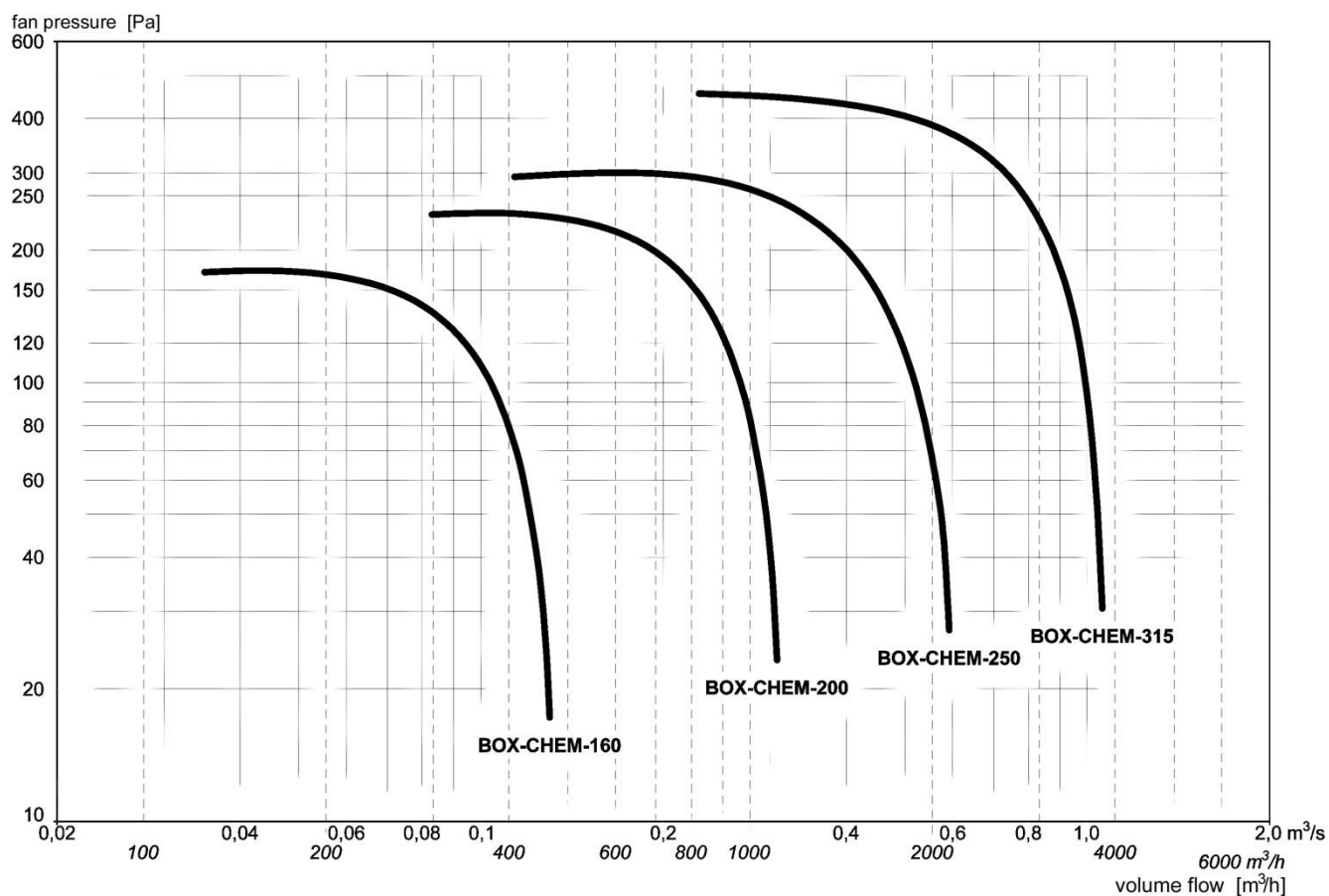


Fig. No.1 – BOX-CHEM – Flow chart

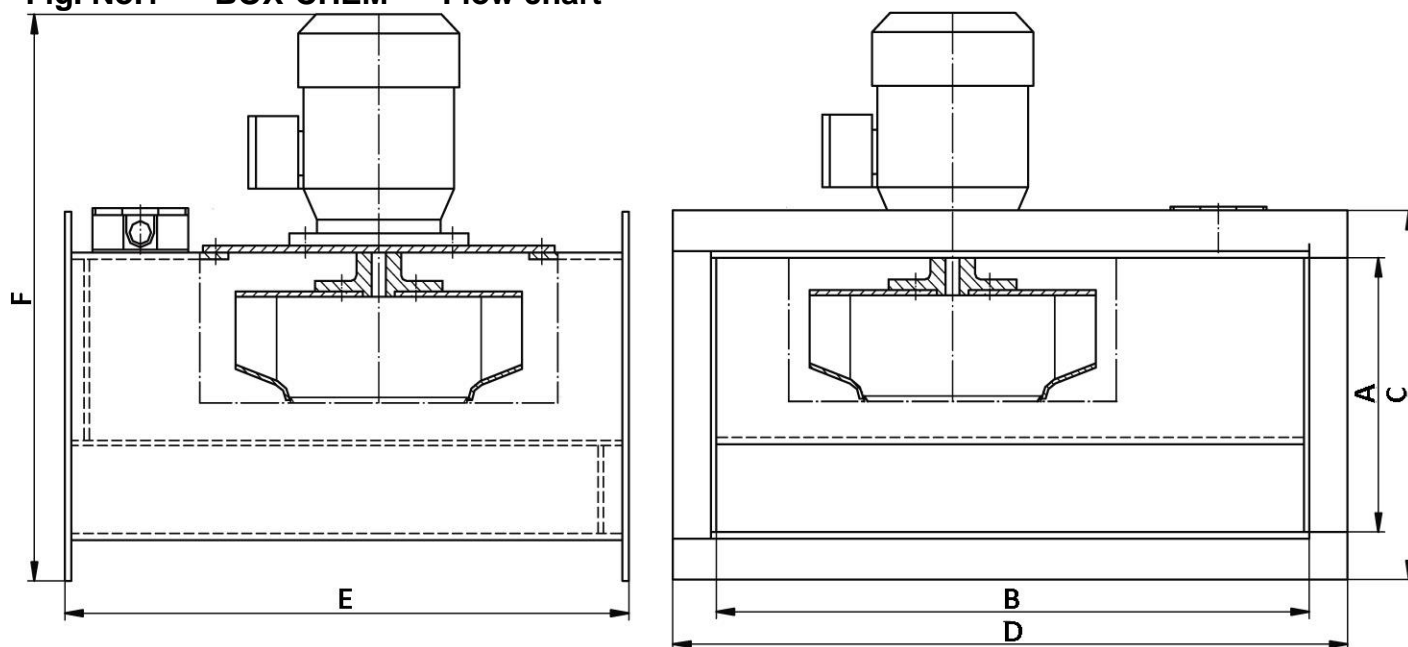


Fig. No.2 – BOX-CHEM – Dimensions

Table. No.2 – Dimensions of the BOX-CHEM chem-proof fans – dimensions in [mm]

Type of the fan	A	B	C	D	E	F
BOX-CHEM-160/1500	228	460	298	530	441	458
BOX-CHEM-200/1500	265	577	335	647	545	495
BOX-CHEM-250/1500	350	721	420	791	665	583
BOX-CHEM-315/1500	448	819	530	900	800	733

5. Structure and Function

The structure of the BOX-CHEM fan is illustrated in Fig. No.3. Impeller in BOX-CHEM is optimally constructed aerodynamically, providing high flow efficiency and low acoustic pressure level. Impeller structure: supporting disc, cover disc, blades, hub. The impeller is of plastic. Its aluminium hub is directly installed on the motor pivot. Both, impeller and motor are fastened on the supporting plate by means of screws. The supporting plate is of round shape and is made of non-plasticised polyvinylchloride. At its rim is a hole pattern, as a fastening system to the fan housing. Fan housing is of rectangular shape and is of non-plasticised polyvinylchloride and it provides a smooth flow of the medium, without changing the flow direction. The forwarded medium is drawn in, through the inlet duct of the housing and subsequently directed through the inlet confusor onto the fan impeller, and further into the spiral housing. Finally, the medium is conveyed and discharged through the outlet duct of the housing.

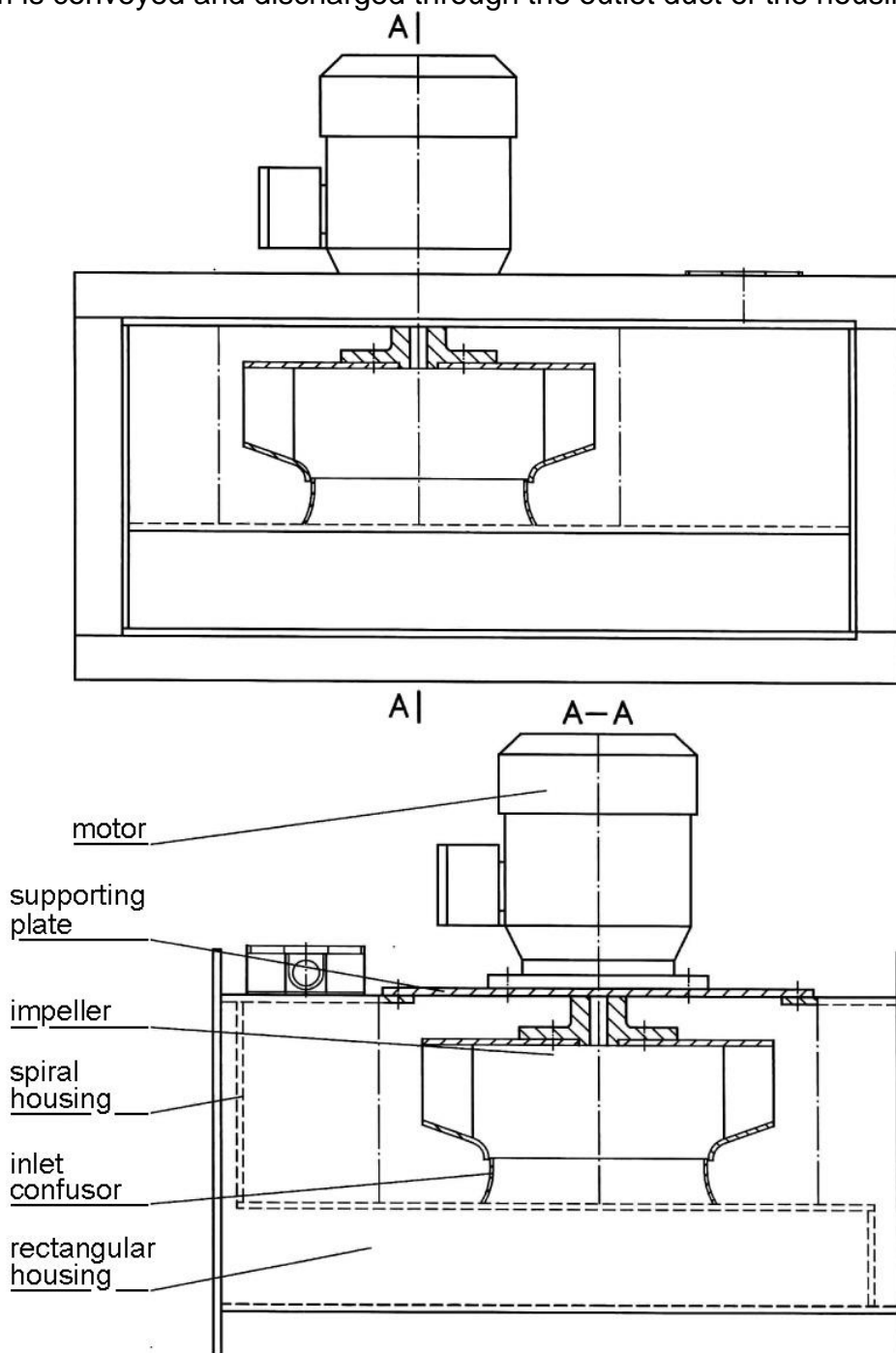


Fig. No.3 – BOX-CHEM – Structure

At the inlet- and outlet side (of the housing), there are square flanges, to install the fan between the square duct sections. The fan motor carries ingress protection IP55, insulation class F and is energised – both, from the one-phase- and three-phase supply system (on demand). The motor is designed for work in vertical position only. On the housing is installed a terminal box, for energising.

The inlet confusor is extruded from the non-plasticised polyvinylchloride plate and is fastened to the housing plate in the duct that is supplying the forwarded medium.

The spiral housing (spiral collector) contains the fan impeller. In this area, the dynamic pressure is converted into static pressure. Finally, the conveyed medium leaves the housing and is discharged into the outlet duct.

6. Assembly and Start-up

The fan is delivered in a completely assembled state. Prior to installing, examine if the delivered fan was not damaged or polluted during the transport and storage, (if polluted, clean it). At the inlet- and outlet side, the fan is equipped with square flanges, to install the fan between the sections of the square ventilation duct.

It is recommended to apply flexible connections to eliminate the vibration transmission. On the fan housing is located a terminal box, to connect the supply cables.

Before the connection to the power supply, make sure if the parameters of the existing electrical installation are in accordance with the data on the nominal plate. Otherwise, in case of inconsistency the connection cannot be executed.

Connection to the electrical power system has to be carried out by User on one's own by selecting the right type and the section of the supply cable, and choosing the appropriate short-circuit- and overload protection, according to the local conditions.

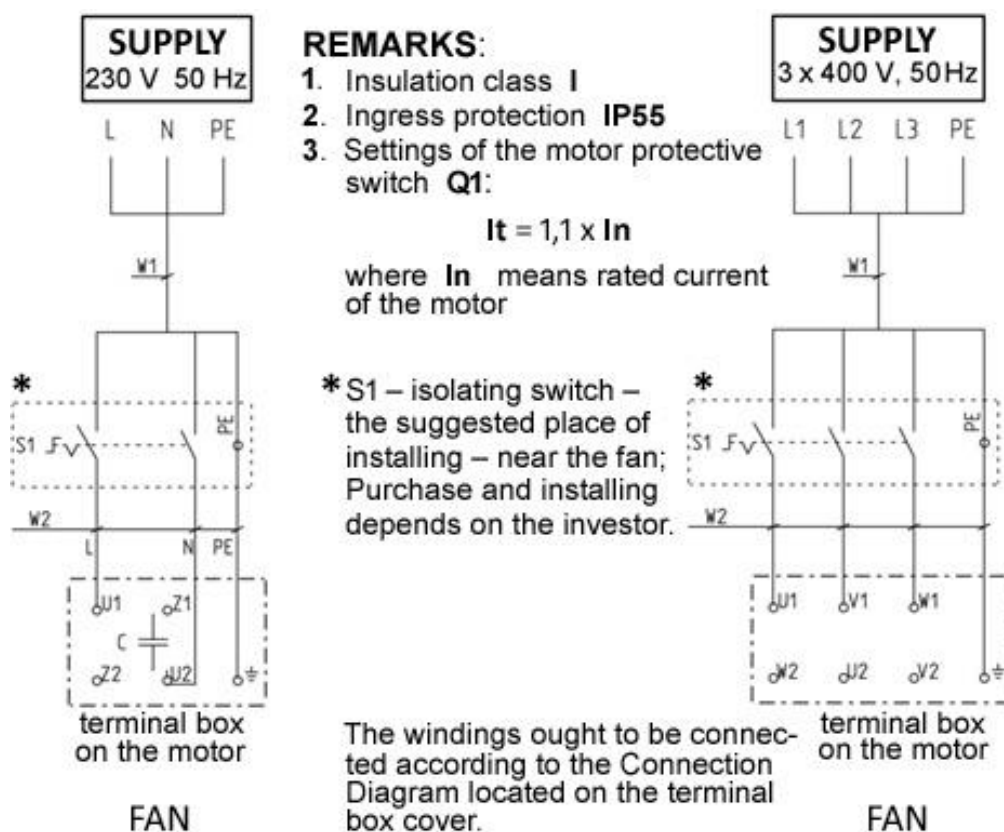


Fig. No.4 – BOX-CHEM – Connection Diagram

WARNING

Connection to the power supply system ought to be carried out by an authorised person with qualifications, according to the valid regulations and indications in Fig. No.4.

Prior to the start-up, check the connection between the motor and the PE protective cable, and the correctness of the electrical connections.

The impeller rotation sense ought to be according to the arrow on the housing, in case of incompatibility change the phase connection sequence (3-phase motors only).

Before the first start-up, check the correctness of the connections between the fan and the ventilation duct. Additionally, check if there are some pollutants / foreign objects (solids) in the fan or ventilation ducting.

7. Operational Use

The construction do not require any additional maintenance after the start-up.

If the place of operational use is changed – repeat the steps according to installing and adapting the ventilation system to the new application and conditions (see Section 6 of the present Use and Maintenance Manual).

In case when any symptoms of incorrect work of the device are noticed, (not typical noises or visually), follow steps as in Section 8.

8. Troubleshooting Guide

Table No.3

	Problem	Possible reason	Corrective action
1.	sudden vibrations of the fan are occurring.	obstacle objects reducing the air flow got stuck within the impeller	disconnect the fan from the power supply system and remove the hindrance
		the impeller is defective	replace the impeller with a motor for a new one
2.	noisy work of the fan along with decreased flow efficiency	incorrect impeller rotation sense	change the impeller rotation sense by changing the phase connection sequence (three-phase fans only).
3.	noisy work	the impeller is incorrectly balanced or the motor bearings are damaged	submit the impeller to balancing or replace the bearings

9. Maintenance

In the aspect of operational use, the fan construction guarantees its efficient function without continuous routine technical supervision. Nevertheless, during the operation carry out the routine maintenance steps.

Once a year submit the fan to technical revision – the electrical motor ought to be examined according to the instructions of the motor manufacturer.

Every several years, check the mechanical and electrical connections. The electrical installation ought to be checked according to the standard PN-HD 60364-6 “Low-voltage electrical installations – Part 6: Verification”.

Moreover, if any defective function of the unit or failure is noticed – undertake its additional control.

WARNING

Any maintenance activities ought to be performed exclusively by an authorised person with qualifications and after disconnection from the power supply system.

10. Occupational Health and Safety

Start up and the operational use is only admissible exclusively after getting acquainted with the contents of the present Use and Maintenance Manual.

The fan will not constitute any hazard, under the condition that it is correctly installed to the supporting structure or ventilation system.

Connect the fan to the electrical wiring system, strictly according to the enclosed Connection Diagram and the guidelines shown in Section 6 of the present Use and Maintenance Manual.

This ought to be carried out exclusively by a qualified person, and in accordance with the valid regulations.

The fan motor must be protected against the short-circuit- and overload effects. During the operational use, check the connection between the fan and the PE protective cable.



Any technical revisions and repair should be performed, necessarily after disconnection from the power supply system (isolating switch).

11. Transport and Storage

For the transport time, the fan should be protected against damage (indentation, crack, etc.). The device ought to be stored in dry rooms and in areas of efficient ventilation. Absolutely, do not put one device on top of another (no stacking).

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 caused during use which was in contradiction with the purpose of application and with the present Use and Maintenance Manual,
- any damages being caused during improper transport, storage or incorrect maintenance.

Infringement of the Clause G 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. Table of resistance of PVC against various substances

Environment	Concentration %	40°C	60°C
Acetone	10	--	--
Pure amyl alcohol		++	o
Ethyl alcohol (ethanol)	10	++	+
Non-fermentative isopropyl alcohol	70 - 99	+	
Methyl alcohol (methanol)	96	++	–
Methyl alcohol (aqueous solution)	100	++	+
Ammonia, aqueous solution	50	++	+
Potassium nitrate, aqueous solution	saturated	++	++
Sodium nitrate, aqueous solution	saturated	++	++
Calcium nitrate, aqueous solution	saturated	++	++
Benzene	100	--	--
Painter's naphtha, mineral spirit		++	+
Liquid butane	100	++	
n-butanol (butyl alcohol)	100	++	o
Liquid chlorine	100	--	
Dry gaseous chlorine	100	--	
Potassium chlorate	7,3	++	o
Sodium chlorate, aqueous solution	25	++	++
Ammonium chloride, aqueous solution	all	++	++
Zinc chloride		++	++
Ethylene chloride	100	--	--
Methyl chloride	100	--	--
Potassium chloride, aqueous solution	saturated	++	++
Sodium chloride, (domestic salt) aqueous solution	saturated	++	++
Sodium chloride, aqueous solution	5	++	++
Chlorobenzene	100	--	--
Cadmium cyanide		+	+
Copper cyanide		+	+
Potassium cyanide		+	+
Mercuric cyanide		+	+
Sodium cyanide		+	+
Silver cyanide		+	+
Cyclohexane	100	++	o
Cyclohexanol	100	++	–
Cyclohexanon	100	--	--
Carbon tetrachloride	100	--	--
1,4-dioxane	100	--	--
Carbon disulphide	100	--	--
Sulphur dioxide	saturated	++	++
Ethyl ether	100	--	
Petroleum ether	100	++	+
2-etylohexanole	100	++	+
Phenol, aqueous solution	approx. 9	o	--
Formaldehyde	40	++	
Formalin	10	++	

Environment	Concentration %	40°C	60°C
Ammonia phosphate	all	++	++
Glycerine	100	++	++
Glycol	100	++	++
Heptane	100	++	
Izopropanol	100	++	
Chromium bath, technical		++	o
Methyl-ethyl ketone	100	--	--
Cresols	100	--	--
Accumulator acid (H ₂ SO ₄)		++	++
Nitric acid	10 / 50	++ / ++	++ / ++
Boric acid	100	++	++
Hydrocyanic acid		+	
Citric acid	saturated	++	++
Hydrofluoric acid	8 - 50	+	--
Phosphoric acid	50 / 85	++ / ++	++ / ++
Lactic acid, aqueous solution	90	++	++
Formic acid	10 / 50	++ / ++	+ / +
Formic acid	98	+	
Acetic acid, icy	100	o	--
Acetic acid, aqueous solution	50	++	-
Oleic acid	100	++	o
Sulphuric acid	3-50 / 96	+ / o	+ / --
Sulphuric acid	50 / 10	++ / ++	++ / ++
Hydrochloric acid	35	++	+
Stearic acid	100	++	+
Oxalic acid	saturated	++	++
Acidic sodium carbonate, aqueous solution	saturated	++	++
Acidic sodium sulphate, aqueous solution	saturated	++	++
Nail lacquer		o	
Lysol		-	--
White liquor (12,5% of the active chlorine)		++	o
Potassium lye	10 / 50	++ / ++	++ / ++
Potassium permanganate, aqueous solution	saturated	++	+
Hydrogen peroxide	30	++	
Naphthalene	100	o	--
Nitrobenzene	25 / 100	++ / --	++ / --
Table vinegar		++	++
Butyl acetate	100	--	--
Ethyl acetate	100	--	--
2-butoxyethyl acetate		+	
Edible vegetable oil		++	++
Edible animal oil		++	++
Coconut oil		++	++
Linseed oil		++	+
Olive oil		++	++
Paraffin oil	100	++	++

Environment	Concentration %	40°C	60°C
Soybean oil		++	++
Turpentine oil		++	0
Transformer oil		++	
Mineral oils (without aromatic hydrocarbons)		++	+
Furnace oils		++	0
Silicone oils		++	
Engine oils, car oils		++	+
Pine oil	100	++	
Vapours of ethoxyl amines		--	--
Vapours of chlorides		+	
Vapours of ferrous chloride FeCl ₂	20	+	
Vapours of acetic acid		++	
Vapours of hydrochloric acid	30	+	
Vapours of oxy-oxygen fatty alcohols		+	
Vapours of orange oils		--	--
Vapours of poly-glycols		+	
Vapours of ammonia soda (soda ash) and of caustic soda		++	
Vapours of tio-urea		+	
Vapours of aliphatic hydrocarbons		+	
Gaseous ozone		++	
Automotive fuel (normal petrol)		++	+
Automotive fuel (petrol super)		-	--
Automotive fuel (diesel oil)		++	+
Paraffin	100	++	--
Beer		++	++
Brake fluid		++	++
Anti-freeze fluid (di-ethylene glycol)		++	++
Sodium hypochlorite, aqueous solution	5	++	
Liquid propane	100	++	
Cresol solution		-	--
Soap solution	saturated	++	++
Mercury	100	++	++
Rum	40	++	++
Potassium sulphate, aqueous solution	saturated	++	++
Sodium sulphate, aqueous solution	saturated	++	++
Sodium sulphide, aqueous solution	saturated	++	++
Sodium sulphite, aqueous solution	saturated	++	++
Hydrogen sulphide	saturated	++	++
Pitch (tar)		++	++
Lemon juice		++	++
Brine (leach)	saturated	++	++
Dry salt		++	++
Agent for dishwashing, liquid		++	++
Tetra-chlor-ethane	100	--	--
Tetra-chlorethylene (per-chlorethylene)	100	--	--
Tetra-hydrofurane	100	--	--



Environment	Concentration %	40°C	60°C
Sodium tio-sulphate (fixative)	saturated	++	++
Toluene	100	--	--
Chlorinated lime		+	
Potassium carbonate, aqueous solution	saturated	++	
Sodium carbonate, aqueous solution	saturated	++	++
Water	100	++	++
Chlorinated water	saturated	+	
Aqua regia (nitro-hydrochloric acid)		+	
Seawater		++	++
Sodium hydroxide	50	+	+
Sodium hydroxide (caustic soda)	100	++	++

++	resistant
+	conditionally resistant with the occurrence hazard of tensioning stress cracks
0	conditionally resistant
–	low resistant
--	not resistant

14. 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: **chem-proof duct fans**

type/model: **BOX-CHEM**

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 17 May, 2006 on machinery – amending the 95/16/EC (recast) /*Journal of Laws EC L157 of 09.06.2006, page 24*/
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| • EN ISO 13857:2010 | – “Safety of machinery – Safe distances to prevent hazard zones being reached by upper and lower limbs”. |

.....
place, date

.....
signature of authorised person

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

KLIMAWENT S.A.

Supported Employment Enterprise

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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

NIP: 958 159 21 35

REGON: 220631262

Bank Account: **Santander Bank Polska S.A.**

56 1500 1025 1210 2007 8845 0000

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