Use and Maintenance Manual

Filtering unit BIG-2000-N

Contents:

1. Introductory Remarks

The purpose of the present User's Manual is to supply User with directions within the range of application, installation, start-up and the operational use of the **BIG-2000-N filtering unit**.

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 **BIG-2000-N filtering unit** 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 17 May, 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 26 February, 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.
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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 L285 of 31.10.2009*/

– **327/2011** (**EU**) **Commission 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 L90 of 06.04.2011*/

The device has been constructed and produced on the basis of following harmonized standards:

• **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 ISO 13857:2010**	– "Safety of machinery – Safe distances to prevent hazard zones being reached by upper and lower limbs".
• **EN 60529:2003/A2:2014-07**	– "Degrees of protection provided by enclosures (IP Code)"
• **EN 61439:2011**	– "Low-voltage switchgear and controlgear assemblies – Part 1: General resolutions".

2. Application

BIG-2000-N filtering unit is appropriate for cleaning the air contaminated with dust- and gaseous impurities, arising during various manufacturing processes.
It is perfect in removal of dry dust and fumes emitted during welding, gaseous metal cutting and during other processes, in chemical industry, food processing, pharmaceutics, plastic processing.
The appliance is not appropriate for capturing humid dust and aggressive compounds and substances causing explosion risk. The maximum temperature of the conveyed air is +60ºC.
The filtering unit is equipped with automatic cleaning system for the cartridge filter, therefore the dust particles (accumulated on the filter's outer surface) are periodically struck off by the impulses of compressed air.

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. Any structural changes or modification of the filtering unit, carried out by User on one's own are not permitted.

D. Protect the housing from mechanical damage.

E. **The appliance is not appropriate for conveying the air that is contaminated with a mixture of flammable substances, in the form of gas, vapour, mist or dust, which would create explosive atmosphere with the air.**

F. Do not use the filtering unit for cleaning the air polluted with aggressive substances which could exert destructive effect on the device.

G. Manufacturer is not responsible for wounds / body laceration caused in the course of improper operational use.

H. **In the course of operational use, pay attention that any sources of ignition i.e. glowing cigarette butts would not get into the filtration chamber.**

4. Technical Data

Table No.1

Type of the device	Maximum volume flow	Maximum vacuum	Supply voltage	Current	Motor rate	Acoustic pressure level from distance		Consumption of compressed air	Weight
						1m	5m		
	[m³/h]	[Pa]	[V]	[A]	[kW]	[dB(A)]			[kg]
BIG-2000-N	2500	2000	3x400	2,8	1,5	74	60	0,7	260

CAUTION: **1**. Quantity of connections for extraction arms – 2
2. Volume flow has been measured at the clean filter
3. Complete assortment of extraction arms is represented on separate catalogue cards

Table No.2 – Cartridge filter

	Type	Weight [kg]	Filtration efficiency [%]	Quantity of filters [pcs]
	PN206638U	4,2	99,9	1

Table No.3 – Additional equipment (option)

Filter of activated carbon impregnated nonwoven (spunbond)			
	Type	Weight [kg]	Remarks
	FCR-BIG-2000	0,6	The complete filter consists of nonwoven (spunbond) along with the protective net, all these elements are placed inside the cartridge filter.
	WFCR-BIG-2000	0,3	Carbon spunbond constitutes replaceable element of the filter.

5. Structure and Function

BIG-2000-N filtering unit consists of:

- steel sheet housing,
- radial fan,
- spark catcher,
- cut-off dampers – to cut off the air flow while the fan is switched off,
- high-efficiency cartridge filter – polyester paper – filtration efficiency 99,9%,
- pneumatic filter regeneration system – set: compressed air tank, electromagnetic valve,
- waste container – to collect the dust (capacity 30 litres),
- control unit – to switch on the system and to control its function,
- differential pressure control (pressostat) to control the pollution degree of the filter,
- hour-meter – to measure the time of operation,
- a set of four castor wheels.

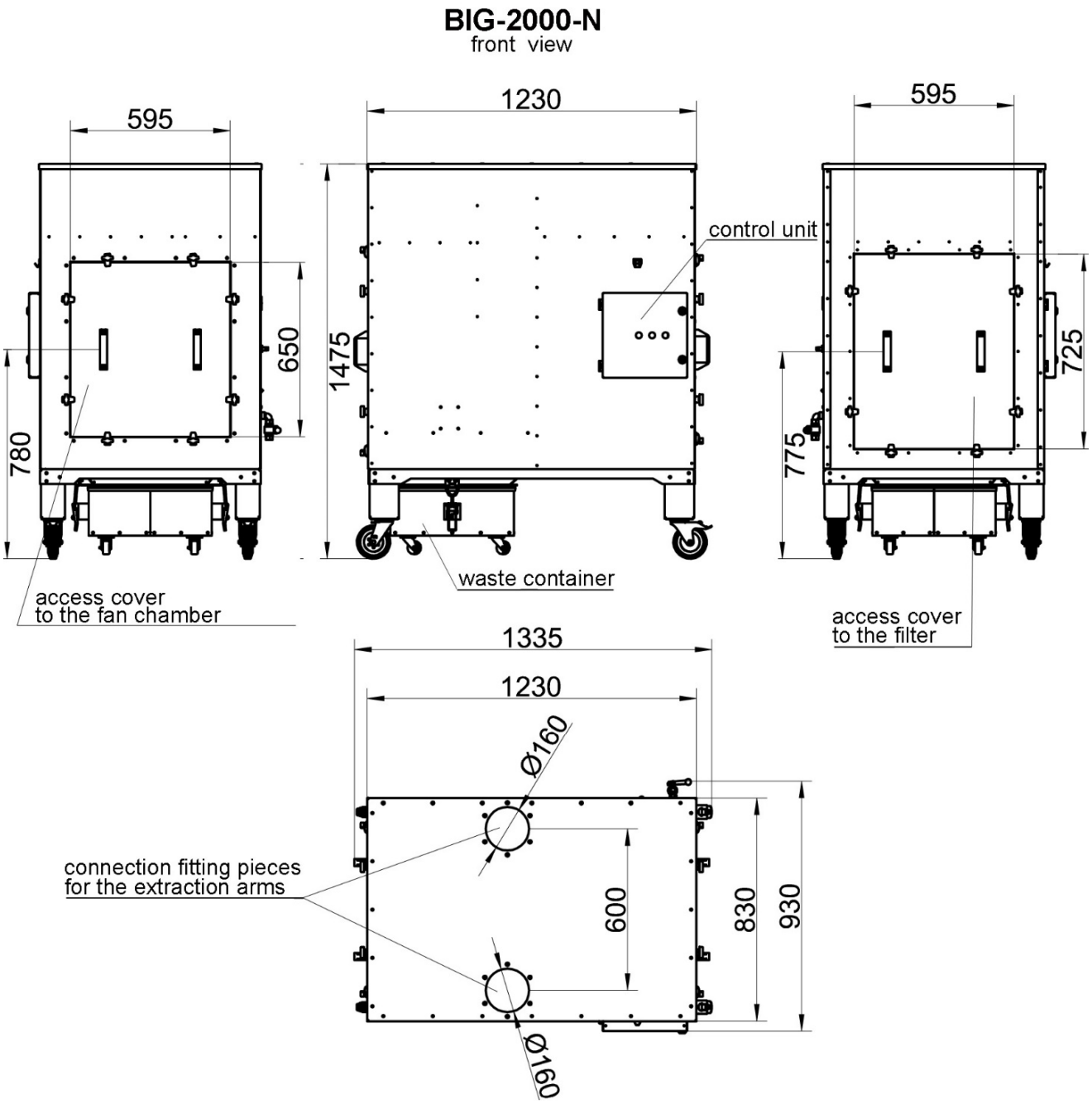

Fig. No.1 – Structure and dimensions of the filtering unit BIG-2000-N

The BIG-2000-N filtering unit is manufactured in a mobile version and is adapted for installing of two extraction arms of workranges 2, 3, 4 m and diameter 160 mm.
The appliance is equipped with an hour-meter “P1” (see control unit), to monitor the work time during the operational use.

Additionally, the device is equipped with a spark catcher, to avoid entering the welding sparks being drawn into the extraction arm during the welding process.

BIG-2000-N filtering unit is fitted with cut-off dampers closing the air inlets for the time when the fan is switched off. This enables additional final filter shaking (cleaning).

The appliance is controlled by automation unit, which provides continuous work of the fan and automatic filter cleaning, by periodical impulses of compressed air, without work interruption.

The filter pollution grade is monitored by the differential pressure control (pressostat). In case of excessive filter pollution, (i.e. increased flow resistance, reduction of efficiency), the yellow control lamp will go on.
Optionally, the device can be equipped with an active carbon impregnated spunbond filter, for filtration of gases arising during the welding processes.

6. Assembly and Start-up

The structure of BIG-2000-N filtering unit is adapted for attachment of ERGO LUX extraction arms of workrange 2, 3 or 4 metres and diameter 160 mm. Prior to the operational use, connect the device to the external compressed air installation of pressure 6 – 8 bars.
ERGO LUX extraction arms should be mounted as shown in the Fig. No.1. Whereby, ERGO LUX extraction arms are additional equipment, delivered on separate order.
Installing, maintenance and use of the extraction arms are described in the Use and Maintenance Manual of the extraction arms.

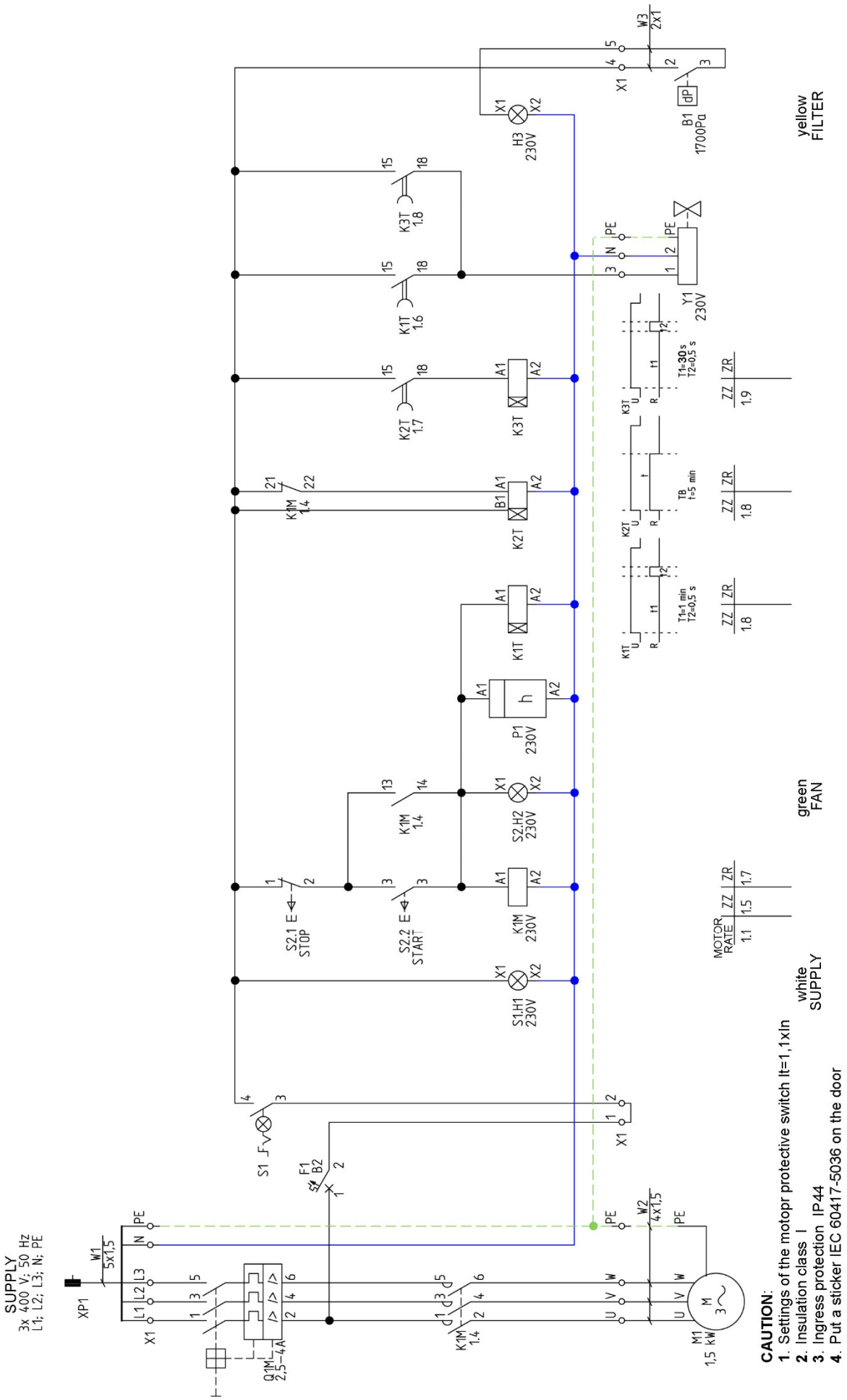

Fig. No.2 – Connection diagram – filtering unit BIG-2000-N

CAUTION:

1. Insulation class **I**
2. Ingress protection **IP44**
3. Setting of the motor protective switch – **Q1M**: **It – 1,1 x In** (where **In** means rated current of the motor)
4. The device is equipped with a five-metres-long power supply cable with a plug. To connect the device to the power supply, simply insert the plug into the socket.

7. Operational Use

Connection diagram of the appliance is illustrated in Fig. No.2.

Fig. No.3 – Control unit BIG-2000-N – front cover

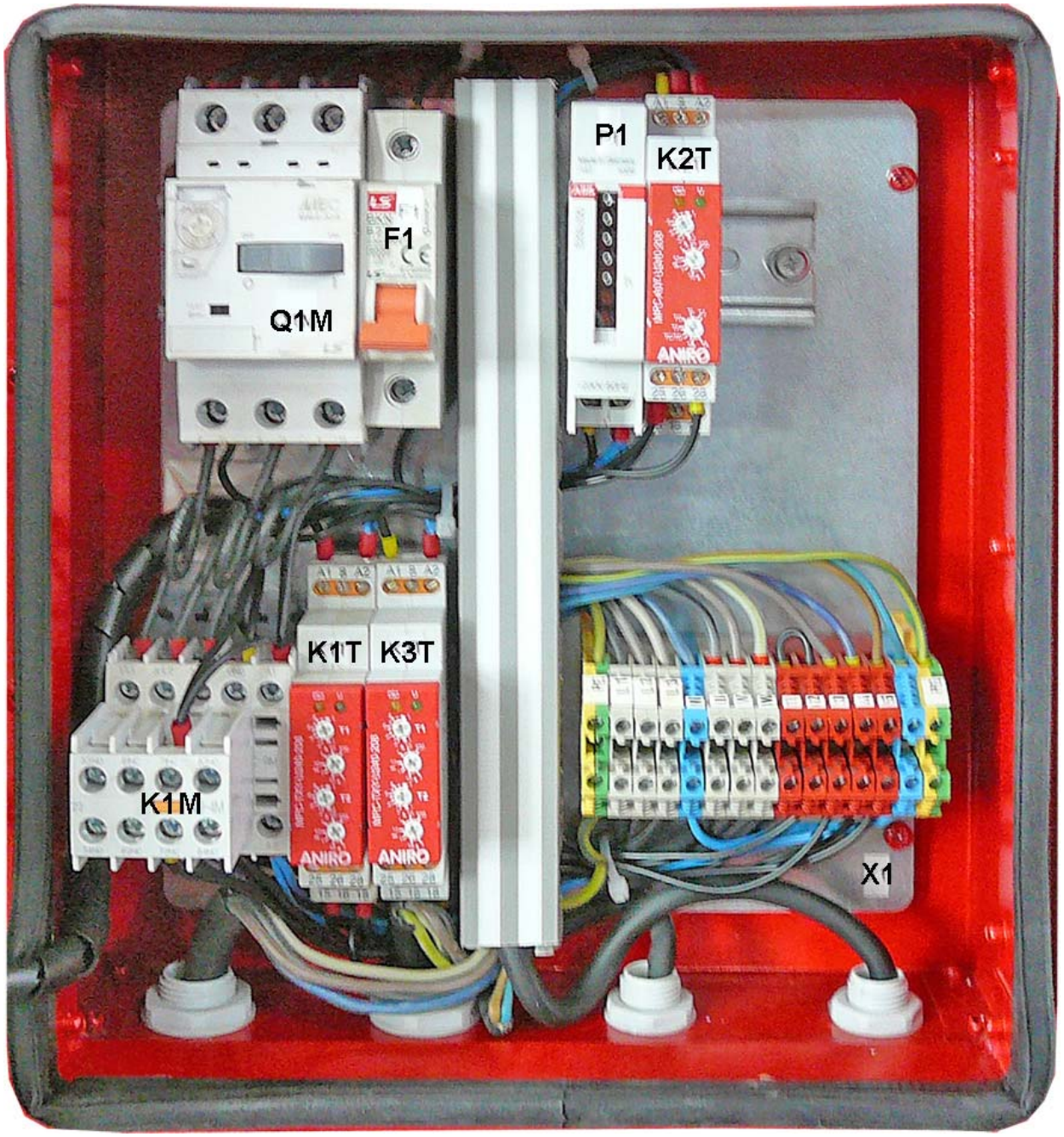

Fig. No.4 – Control unit BIG-2000-N – inside

START-UP OF THE APPLIANCE:

1. Open the compressed air valve.
2. Insert the plug into the power supply socket.
3. Switch on the motor switch **Q1M**.
4. Switch on the power supply by setting the **S1** into position "**ON**" ; this will be indicated by the white lamp **S1.H1**.
5. The system of the initial- and final regeneration is in operation – the relays **K2T**, **K3T** are controlling the impulses of the electromagnetic valve. Within the time of 3 minutes, every 30 seconds the valve opens and the impulse of compressed air cleans the filter. At any moment (during the filter regeneration) the device can be switched on.

FUNCTION:

1. Press the **S2.2** "**START**" button to switch on the fan – this will be indicated by the green **S2.H2** signalling lamp.
2. The appliance is in operation, the cleaning (regeneration) of the filters proceeds every 4 minutes.

DISCONNECTION OF THE DEVICE:

1. Press the **S2.1** "**STOP**" button; the green **S2.H2** signalling lamp will go off; the fan stops.
2. Proceeds the final stage of the filter regeneration. Within the time of 3 minutes, every 30 seconds the valve opens and the impulse of compressed air cleans the filter.
   At any moment (during the filter regeneration) the device can be switched on.
3. Disconnect the power supply, by setting the **S1** switch into position "**OFF**";
   The white **S1.H1** lamp will go off.

The control unit is equipped with a **H3** signaling lamp, indicating the excessive filter pollution.

The differential pressure control (pressostat) inside, controls the air flow, and at excessive flow resistance activates the yellow **H3** signaling lamp.
The hour-meter (on the cover of the control unit) indicates the summary time of the device work.

Settings of the time relays:
K1T
– idle time between the impulses – **T1** – 4 min
– impulse time – **T2** – 0,2 s

K2T
– duration of the initial- and final regeneration of the filter – **T1** – 3 min.

K3T
– idle time between the impulses – **T1** – 30 s
– impulse time – **T2** – 0,2s

Caution:
Setting of times on the time relay cannot be changed. In case when necessary, contact KLIMAWENT S.A.

The cartridge filter is of made of polyester fabric.

Maintenance of the appliance consists in servicing of the ERGO LUX extraction arm, which is described in the Use and Maintenance Manual of the extraction arms, and in maintenance of the filters.
Maintenance of the filter: periodically check the filter's surface state and eventually replace the cartridge filter (replacement – every 1 – 2 years, depending on the use intensity).

Once a week, it is recommended to remove the filter of the device, clean it with the compressed air stream, to strike off the deposited dust, examine the filter surface state, whether there are mechanical damages.

To replace the filter, necessarily disconnect the device from the power supply system and refer the Fig. No.5.

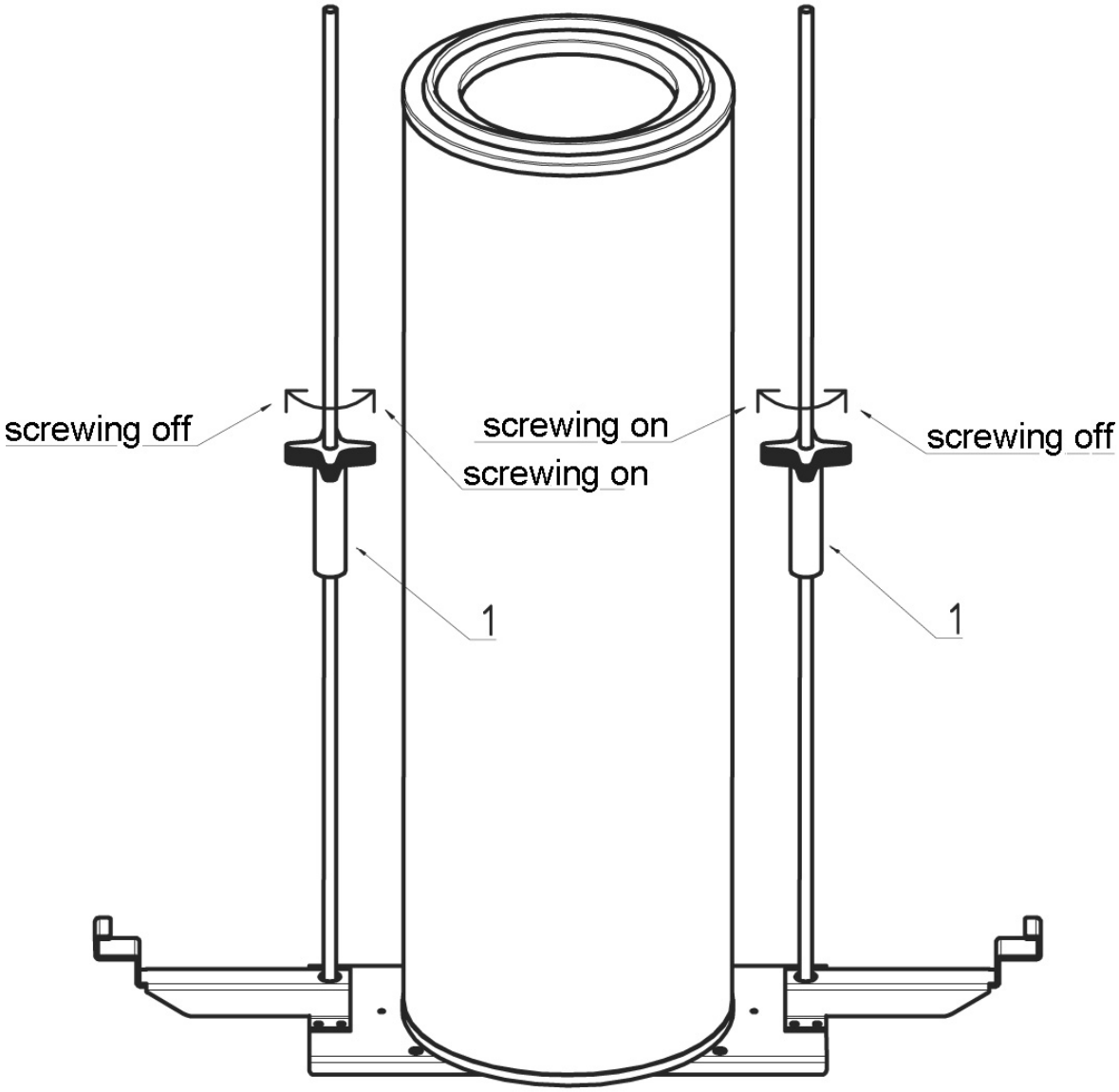

Fig. No.5 – How to feed the cartridge filter

Here are subsequent steps:

1. Set the shelf of the filter lift in the bottom position – so the filter can be inserted easily.
2. Put the filter in the central point on the lift shelf, additionally push the filter to the angle bar.
3. Screw up the two knobs No. 1 – until they are significantly tightened.

To take out the filter, release simultaneously the wheels (knobs) No.1 and lower the shelf. Now the filter is ready to be removed.
CAUTION: On both knobs are arrows indicating the direction of releasing and the direction of the movement of the filter shelf.

Remember to empty the waste container. To do this, clasp off the lockings, slide the container out, and remove the foil bag with dust. Subsequently, put in a new foil bag, insert the container and close the clasp locks.
CAUTION: **Manufacturer does not deliver the foil waste bags**.

8. Troubleshooting Guide

Table No.4

	Problem	Possible reason	Corrective action
1.	Drop in the intake volume flow.	The filter is clogged.	Clean the surface of the filter striking off the dusts by a “dry” mode” (see Section 7) or replace the filter for a new.
2.	Bad smells are not eliminated.	Active carbon nonwoven (spunbond) is worn out.	Replace the activated carbon nonwoven.
3.	Dust emerges in the chamber of the electromagnetic valve.	The cartridge filter is damaged.	Replace the faulty cartridge filter.
4.	Sudden vibrations of the fan are occurring.	The impeller is damaged.	Replace the impeller for a new.
5.	The ERGO LUX extraction arm is falling.	Incorrectly adjusted friction brake of the joint.	Increase the tension upon the frictional disks of the brake in the joint by tightening the adjustment nuts.
6.	The ERGO LUX extraction arm is automatically setting (falling) always into the same position.	The rotation axis of the swivel is not positioned vertically.	Carry out the positioning of the mounting flange of the ERGO LUX extraction arm to set the rotation axis vertically, or put the whole device stably on the levelled even floor.
7.	The device stops – **S1.H1** lamp “**SUPPLY**” is not flashing. The fan does not start.	**Q1M** motor disconnector activated, the **S1** switch is faulty, the **F1** protection is switched off.	Disconnect the plug of the socket. Check the motor disconnector, the **S1** switch and the protections. Switch all these protections on.

9. Maintenance

The filter cleaning proceeds automatically, without interruption of the filtration and not reducing the filtration efficiency. The construction of the device provides its function without the every-day routine technical supervision. In case when faulty function is by noise or visually noticed necessarily undertake its technical revision (see Table No.4).

Within the scope of periodical controls, (every 9-12 months), examine the technical state of the according to the operational rules for the electrical driving devices.
During the maintenance check the mechanical, electrical and pneumatic connections.

WARNING **Any activity connected with repair/technical revision has to be executed exclusively after the device is switched off and disconnected from the power supply system.**

Periodically, remove the water and impurities from the compressed air tank. Once a year, control the state of the compressed air tank. In case of significant corrosion losses replace the tank for a new one.

Every time, during the filter cleaning, examine the state of the filter fabric surface, and search for mechanical damages. Replacement way of the cartridge filter is described in Section 7 of the present Use and Maintenance Manual.

Maintenance of the ERGO LUX extraction arms ought to be executed strictly according to the directions in the Use and Maintenance Manual of the ERGO LUX extraction arms.

10. Occupational Health and Safety

Start up and the operation use are only admissible after getting acquainted with the contents of the present manual. In the aspect of safety, BIG-2000-N will not cause hazard, when the instructions in the present Use and Maintenance Manual and the general rules of Occupational Health and Safety are observed**.**

Any activity associated with repair/technical revision has to be executed exclusively after the device is switched off and disconnected from the power supply system.
Additionally, cut off the device from the power supply before opening the ZE-BIG-2000-N control unit housing.

ERGO LUX extraction arms will not cause hazard to the personnel, under the condition that they are correctly and firmly installed to the filtering unit housing.

11. Transport and Storage

The device has to be stored in closed rooms and in dry and well ventilated area, free of aggressive substances. Do not put one device on top of another (no stacking).
During the transport, protect the device from uncontrolled slide / displacement and from overturn. Transport, loading, reloading should be carried out in a way that eliminates scratches, mechanical damages, indentations. Mind that the designations/inscription on the package would not get loose, or obliterated
Caution: ERGO LUX extraction arms are additional accessory and are packed separately. To the ERGO LUX extraction arms are enclosed separate operational manuals.

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

Infringement of the section 3 “Reservations of Producer” of the Use and Maintenance Manual and especially modifications undertaken by User on one’s own shall cause the loss of warranty validity.

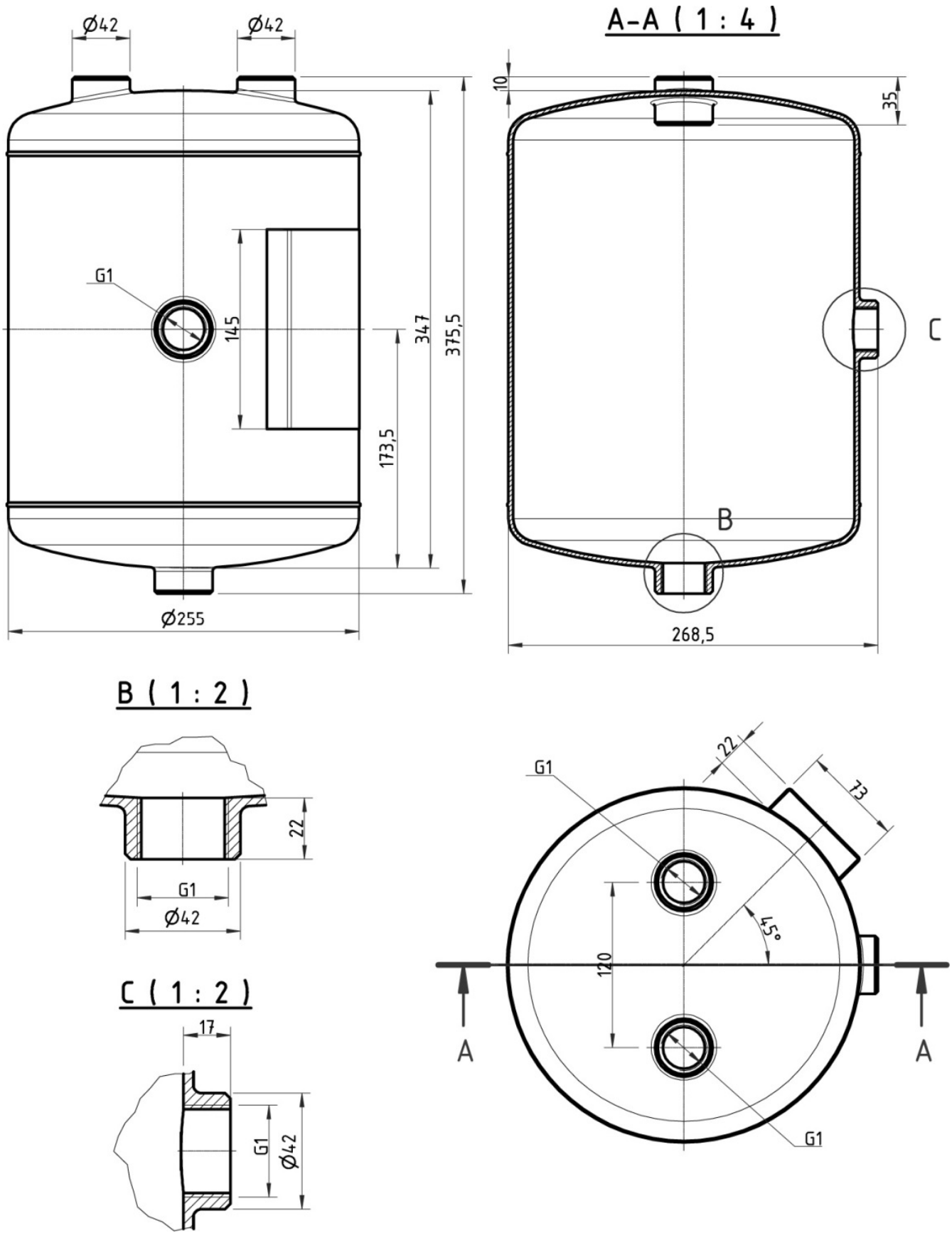

Fig. No.6 – Compressed air tank

Operational Instruction of the Compressed Air Tank

I. Technical data of the compressed air tank

- type of the tank: 35 – 35,
- maximum operational pressure: $\mathbf{P_s}$ = 10,0 bar
- maximum operational temperature: $\mathbf{T_{max}}$ = +100°C
- minimum operational temperature: $\mathbf{T_{min}}$ = -40°C
- capacity of the tank: **V** = 15 litres

II. Range of application

The tank is designed for use in pneumatic installations. The operating medium is the compressed air of operational pressure equal or less then pressure $\mathbf{P_s}$.

III. Conditions of installing and maintenance

1. The compressed air tank can be installed in the pneumatic installations where the operational medium is the compressed air and the highest pressure does not exceed the $\mathbf{P_s}$ operational pressure. **This condition ought to be fulfilled by the company who is installing the tank**.
2. The tank ought to be installed in a way providing its durability, tightness and in such a configuration that the outlet connection is located at the lowest bottom location.
3. The tank has to be fastened to the supporting structure and positioned in such a location where it would not be exposed to outer factors and to direct mechanical destructions and during the operational use it should not be exposed to vibrations that could contribute to a fatigue crack.
4. During any technical revision or repair of the pneumatic installation it is important to check the correctness and state of the tank mounting (screw connections, welds and their technical state).
5. If there is a damage in the wall (crack, indentation, infringement of the mounting stability, etc.) and the tank was relatively exposed to extreme temperatures that could change the structure of the wall material – **immediately the tank ought to be excluded from operational use**.
6. Do not dismantle the tank or its structural parts, while it is under pressure or the supply valve of compressed air is open.
   Any activities related to maintenance or cleaning the tank ought to be executed when the tank is emptied and the control unit is switched off.
7. Do not execute any welding operations close to the tank.
8. During the technical revisions, the tank ought to be emptied from condensate water through the condensate drainage device in the bottom part of the tank.
9. For the compressed air tank is foreseen 40 years of operational use. After this period the tank should be excluded from its operational use. The withdrawn from operation tank must be destroyed and its designations / markings must be wiped out, so the tank would never be returned to operation.

Do not introduce any constructional changes / modifications on the compressed air tank, its application in contradiction with its purpose is forbidden.

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**, **ul. Chwaszczyńska 194**

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

hereby declares that the appliance:
name: **filtering unit**

type/model: **BIG-2000-N**
serial number: …….. year of production: ……..

meets the requirements of the subsequent European Directives:

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……	……	……
place, date	signature of authorised person	name, surname, function of the signatory

KLIMAWENT S.A.
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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

NOTES:

NOTES:

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