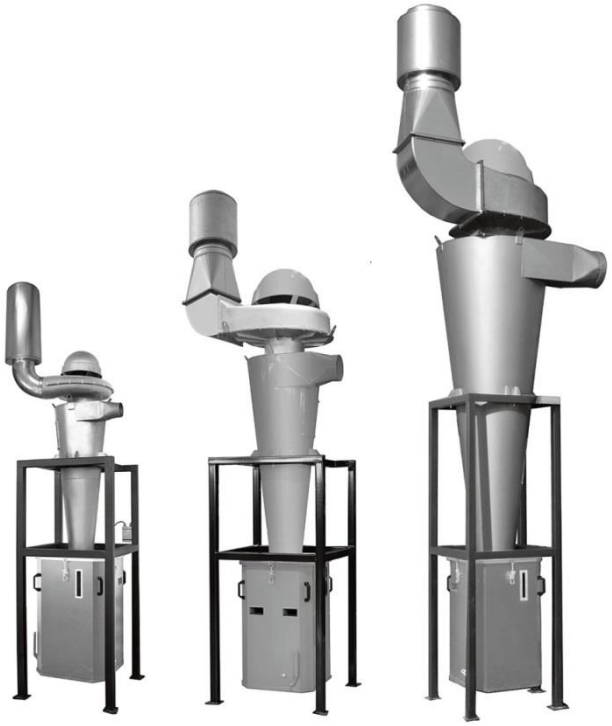
Use and Maintenance Manual



Cyclone separator STORM-1000-H
STORM-2000-H
STORM-5000-H

Manufacturer:
KLIMAWENT S.A.
81-571 Gdynia; **ul. Chwaszczyńska 194**
phone 58 629 64 80; **58 771 43 40**
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www.klimawent.com.pl

802O20	STORM-1000-H	05.11.2019/EN
802O21	STORM-2000-H	05.11.2019/EN
802O22	STORM-5000-H	05.11.2019/EN
802O14	STORM-1000 SOFT-H	05.11.2019/EN
802O15	STORM-2000 SOFT-H	05.11.2019/EN
802O16	STORM-5000 SOFT-H	05.11.2019/EN

Contents:

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 **STORM-H cyclone separator**.

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.

Construction of the **STORM-H** cyclone separator 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 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. /*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 ISO 13857:2010** – "Safety of machinery – Safe distances to prevent hazard zones being reached by upper and lower limbs"

2. Application

STORM-H cyclone separators are efficient in cleaning the **dry** air from contamination of dust of particle diameter above 5 μm. They belong to vacuum device group. Separation proceeds here on the basis of centrifugal force phenomenon, whereby the extracted dust accumulates in the waste container (located underneath the cyclone separator).

In case of coarse dust particles: the STORM-H cyclone separator can work as a final filter, whereas, for fine dust extraction, it can be used as a pre-filter, where it is connected in a line before the fine filter of similar volume flow.

The dust separating efficiency oscillates within limits 95 – 99%.

Separators are manufactured in versions:

– **with a fan** (STORM-5000-H, STORM-2000-H, STORM-1000-H) or

– **without fan** (STORM-5000 SOFT-H, STORM-2000 SOFT-H, STORM-1000 SOFT-H).

In a version without the fan, the feature resistance of the separator must be overcome by the final fan of the cooperating filtering unit.

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 that are not belonging to the normal device structure (or accessory set) is not acceptable.

C. Do not introduce any structural changes or constructional modifications on the device on one's own.

D. Protect the device housing from mechanical damage.

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

F. Do not apply the device for conveying the air containing viscous impurities that would deposit within the device, especially on the impeller.

G. The device cannot be used for conveying the air containing aggressive contaminants as they would have destructive effect on the device structure.

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

I. **In the course of operational use, pay attention that any ignition sources i.e. glowing cigarettebutts / embers should not get into cyclone**.

4. Technical Data

Table No.1

Type	Maximum volume flow	Maximum vacuum	Supply voltage	Motor rate	Acoustic pressure level [dB(A)] from distance 1m	5m	Weight
	[m³/h]	[Pa]	[V]	[kW]	[pcs]		[kg]
STORM-1000-H	1400	2000	230	1,5	77,0	67,0	227
STORM-2000-H	3500	4200	3x400	4,0	78,4	73,3	353
STORM-5000-H	7700	4200	3x400	7,5	77,2	72,0	531
STORM-1000 SOFT-H	–	–	–	–	–		193
STORM-2000 SOFT-H	–	–	–	–	–		244
STORM-5000 SOFT-H	–	–	–	–	–		335

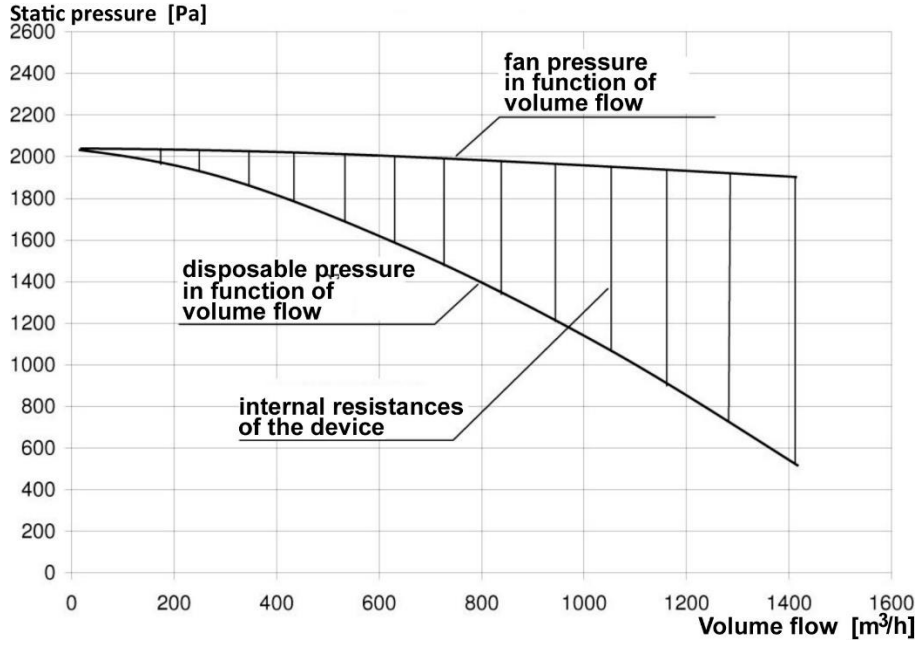
CAUTION:

1. Acoustic pressure level has been measured with the silencer at the outlet.
2. Weight of the STORM-H separator is given without the weight of the sound absorbing set.
3. Capacity of the waste container is 330 dm³.

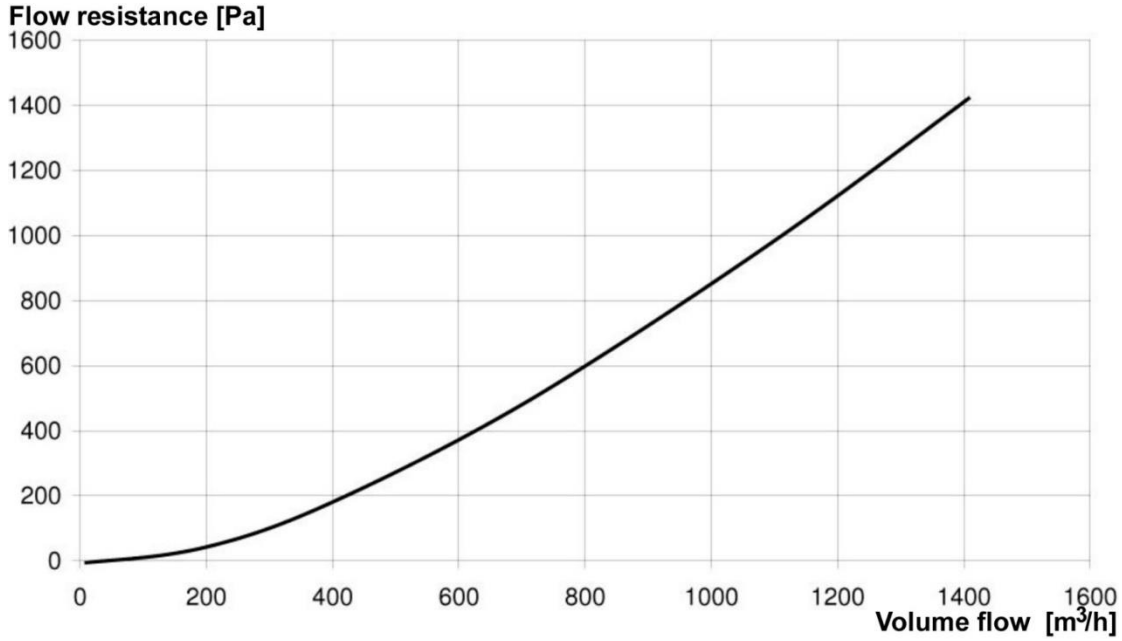
Table No.2

Dust separating efficiency			
sawdust	quartz sand	moulding sand	Portland cement
99,5%	99,0%	98,0%	95,0%

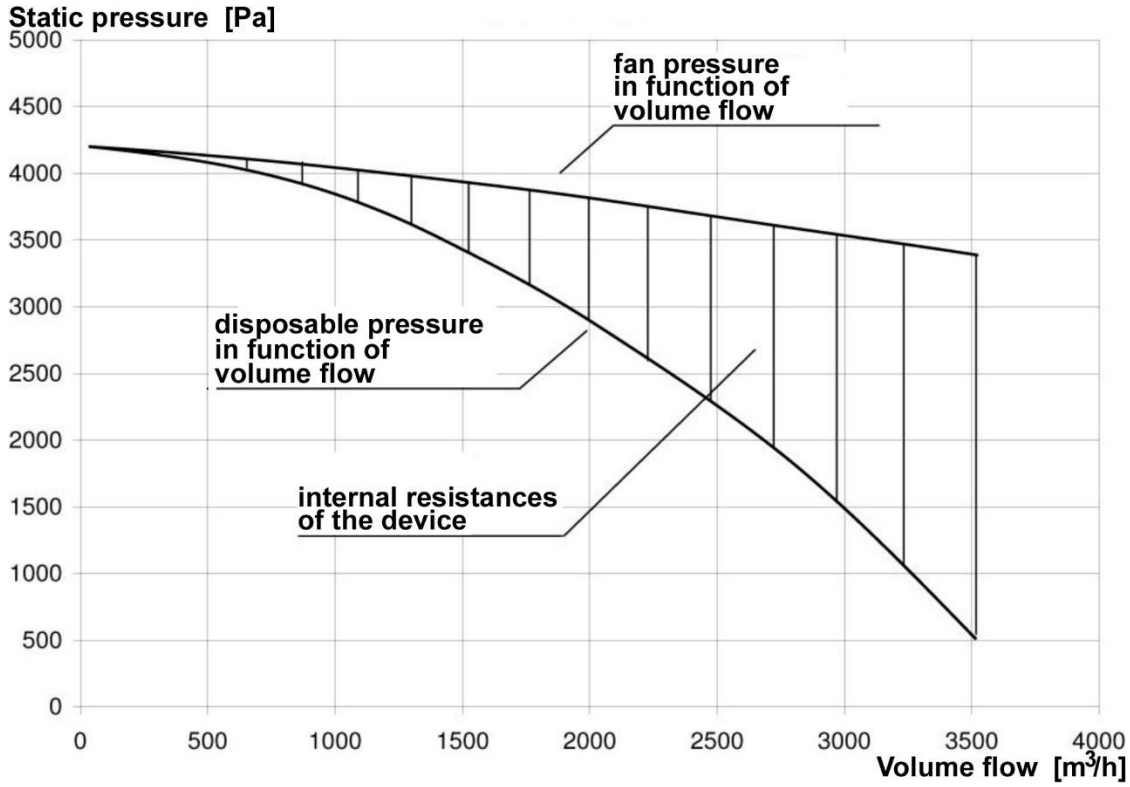
STORM-1000-H



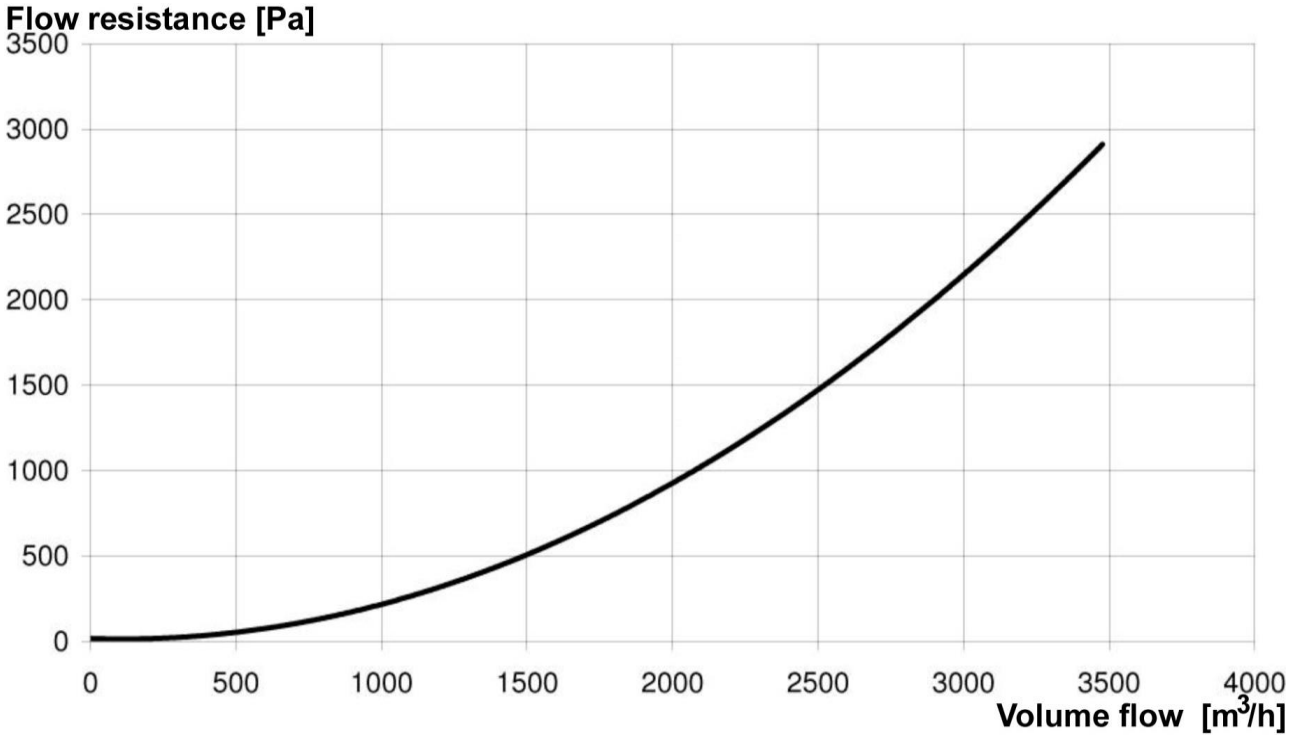
STORM-1000 SOFT-H



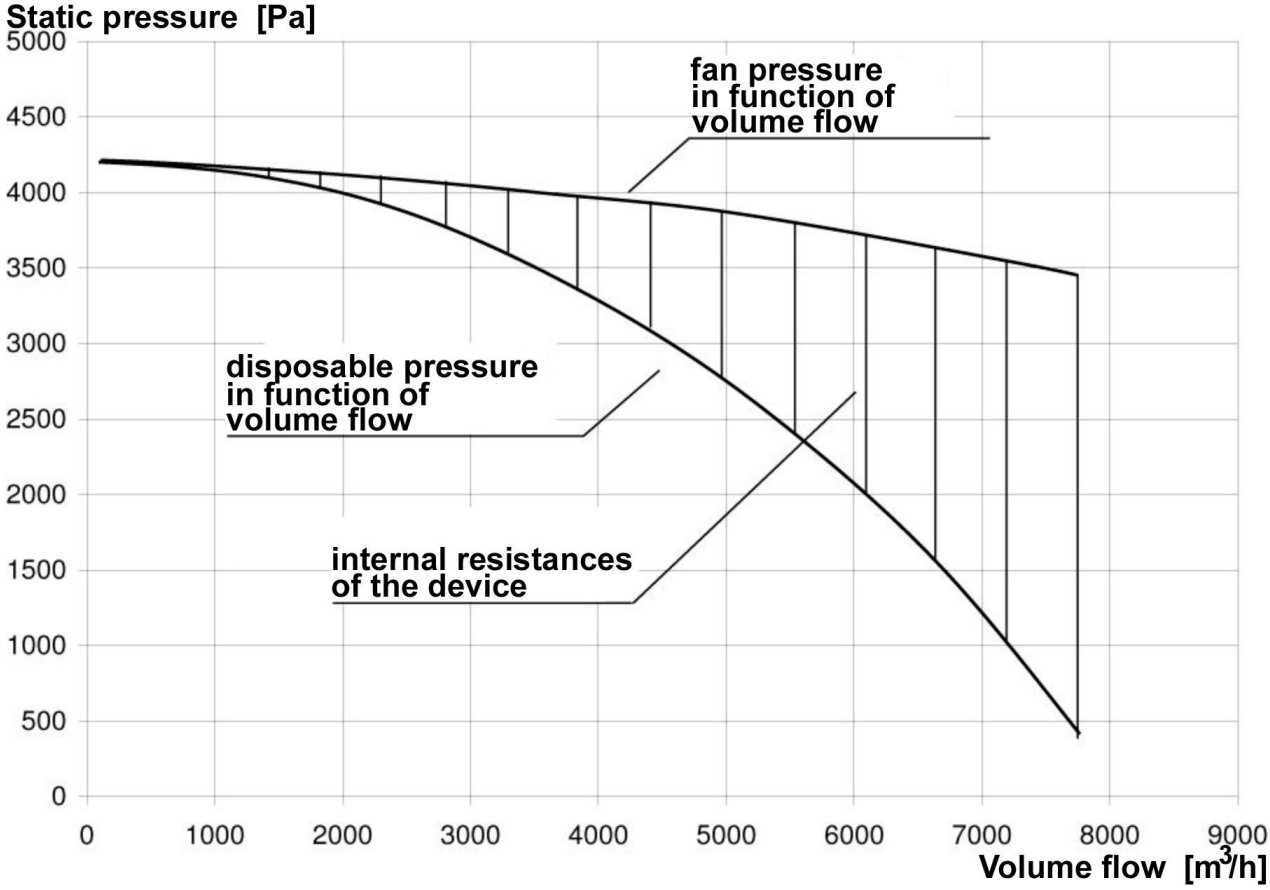
STORM-2000-H

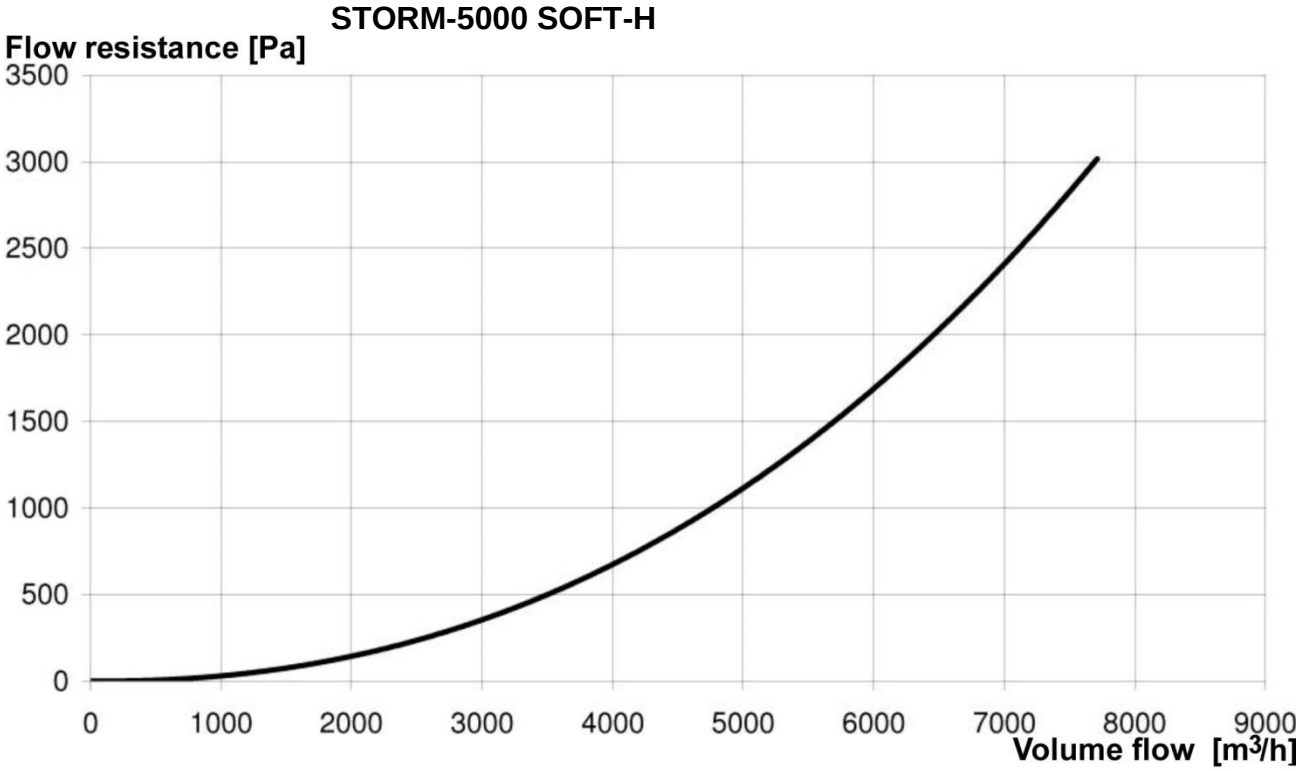


STORM-2000 SOFT-H



STORM-5000-H





5. Structure and Function

STORM-H cyclone separator consists of:

1. supporting structure,
2. cyclone (cone-shape in whole height),
3. self-unloading waste container – with view-holes to control the filling-up ratio,
4. radial fan – for version STORM-H,
5. connection fitting piece – for version STORM SOFT-H,
6. sound absorbing set – for version STORM-H (**on separate order**),
7. motor protective switch – for versions **STORM-1000-H**, **STORM-2000-H**, or motor starter – for version **STORM-5000-H**.

The dust separation process consists in centrifugal forces. Larger dust particles (coarse dust) is accumulating in the waste container. The cleaned air is discharged (free outlet) or (in application with a filtering unit) conveyed into the filtering unit, to submit the air to a precise cleaning.

Structure of the cyclone separator is illustrated in Fig. No.1.

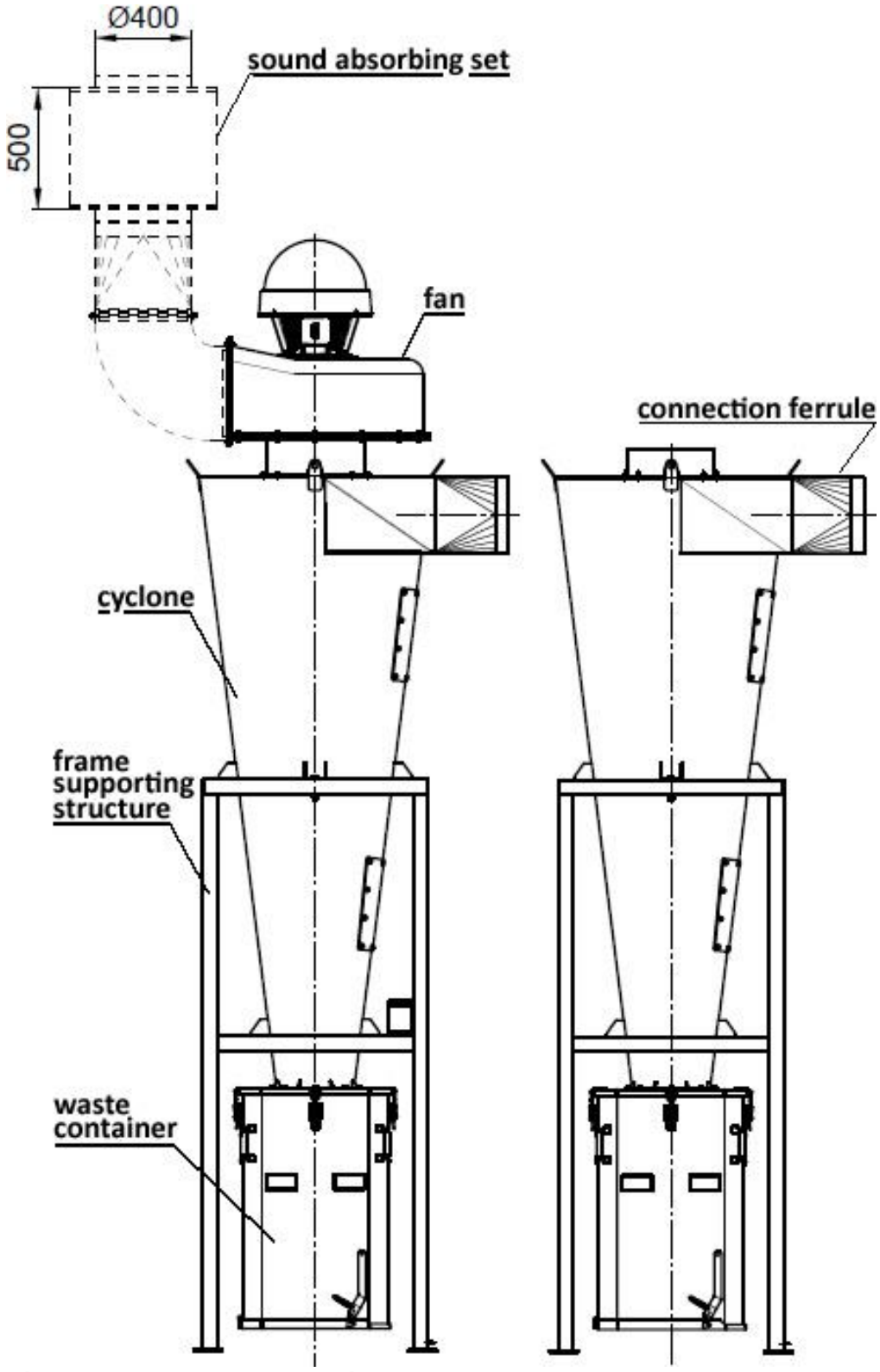
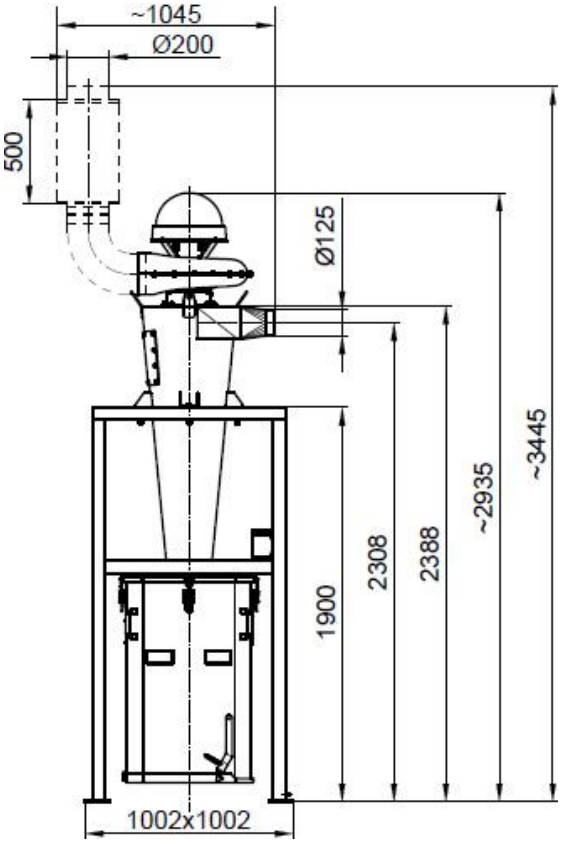
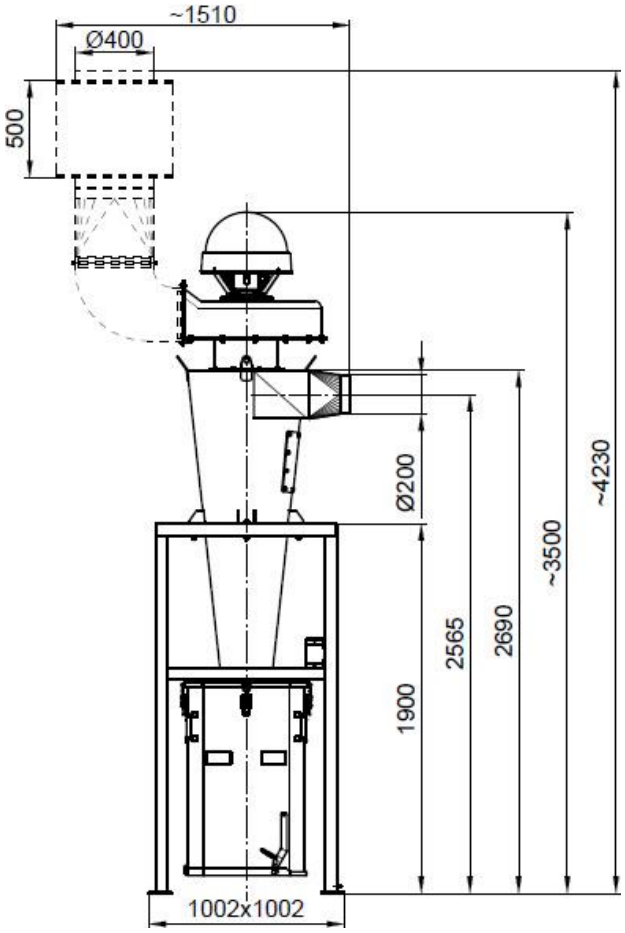


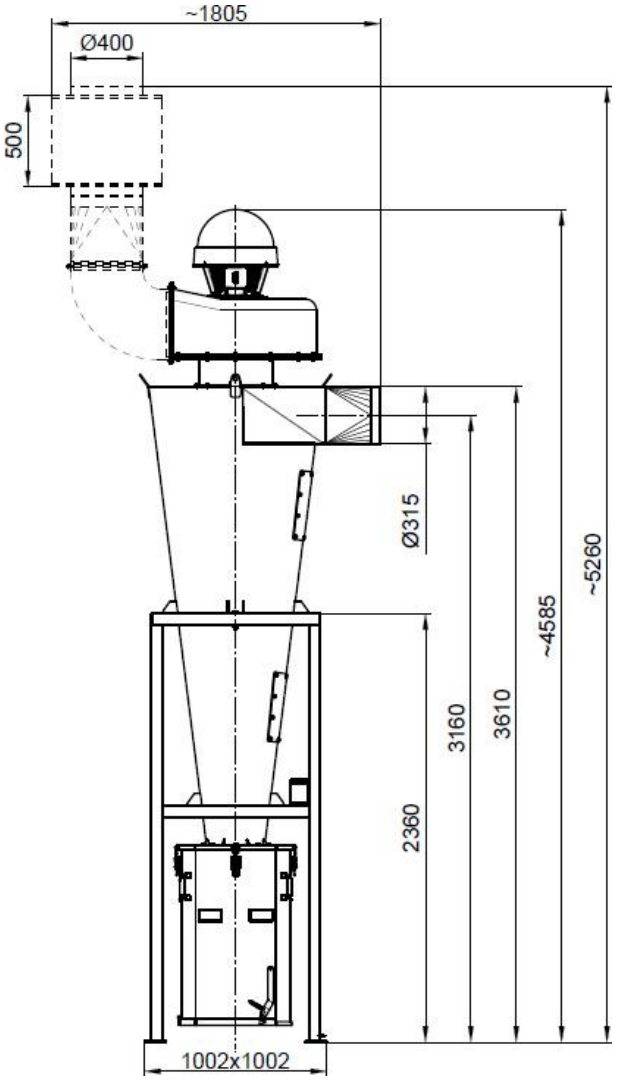
Fig. No.1 – STORM-H and STORM SOFT-H – Structure



STORM-1000-H

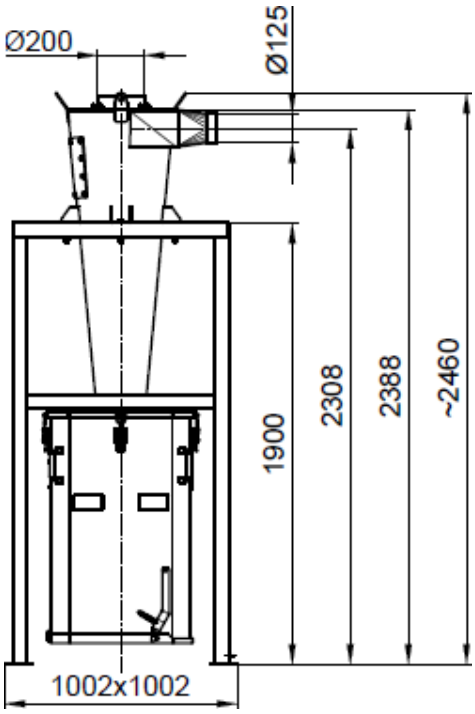


STORM-2000-H

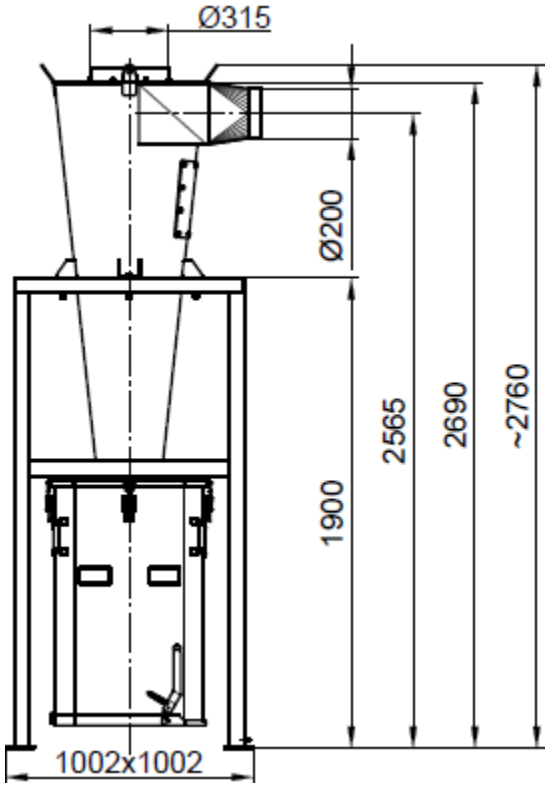


STORM-5000-H

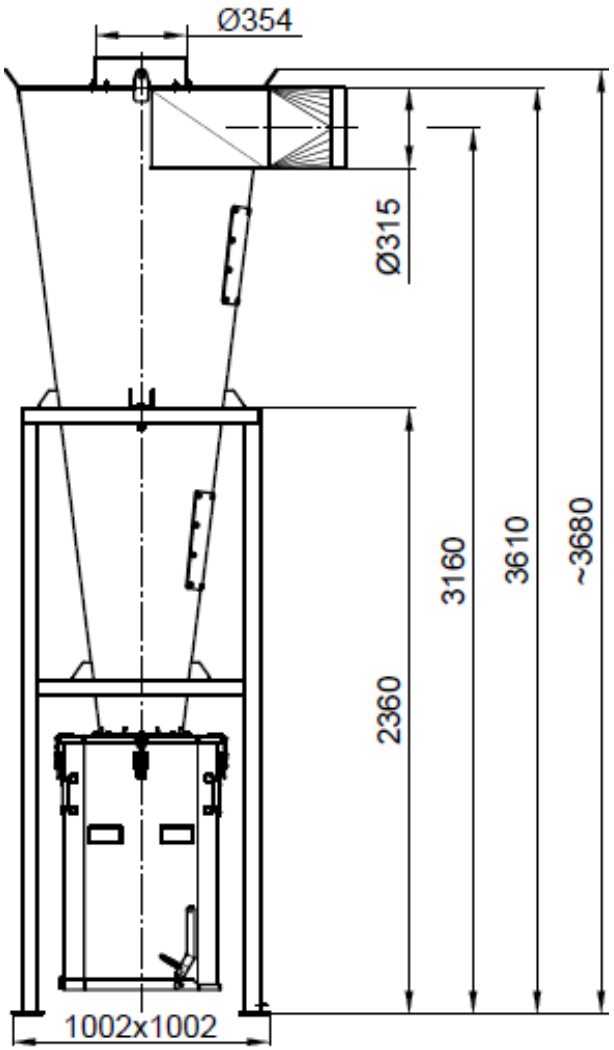
Fig. No.2 – STORM-H – Dimensions



STORM-1000SOFT-H



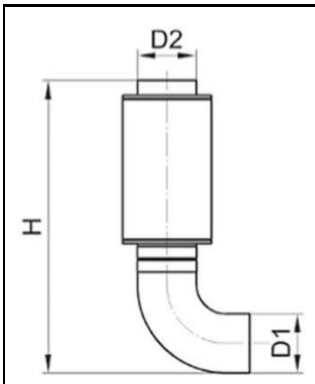
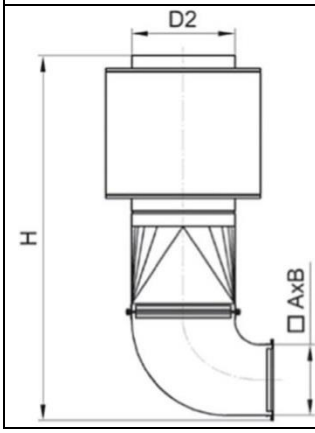
STORM-2000 SOFT-H



STORM-5000 SOFT-H

Fig. No.3 – STORM SOFT-H – Dimensions

Table No.3 – Additional equipment – Sound absorbing sets

	**Type**	**D1** [mm]	**D2** [mm]	**H** [mm]	**Weight** [kg]	**Application**
	ZT-STORM-1000-H	200	200	990	6	STORM-1000-H
	**Type**	**A x B** [mm]	**D2** [mm]	**H** [mm]	**Weight** [kg]	**Application**
	ZT-STORM-2000-H	250x295	400	1410	24	STORM-2000-H
	ZT-STORM-5000-H	370x380	400	1525	26	STORM-5000-H

6. Assembly and Start-up

The appliance is designed for use inside the industrial rooms. They can be also used outside the building, but with additional protection against atmospheric factors / weather conditions (i.e. roofing) The separator must be placed stably on the even floor surface, assuring that there is free access to the waste container. It must be fastened to the floor by four foundation bolts.

To connect the fan to the power supply system, use motor protective switch **WS** (in separators **STORM1000-H**, **STORM-2000-H**) or motor starter **RS** (in the separator **STORM-5000-H**).

For specification of the above mentioned switches and starters see the catalogue in Section “Electrical accessories”.

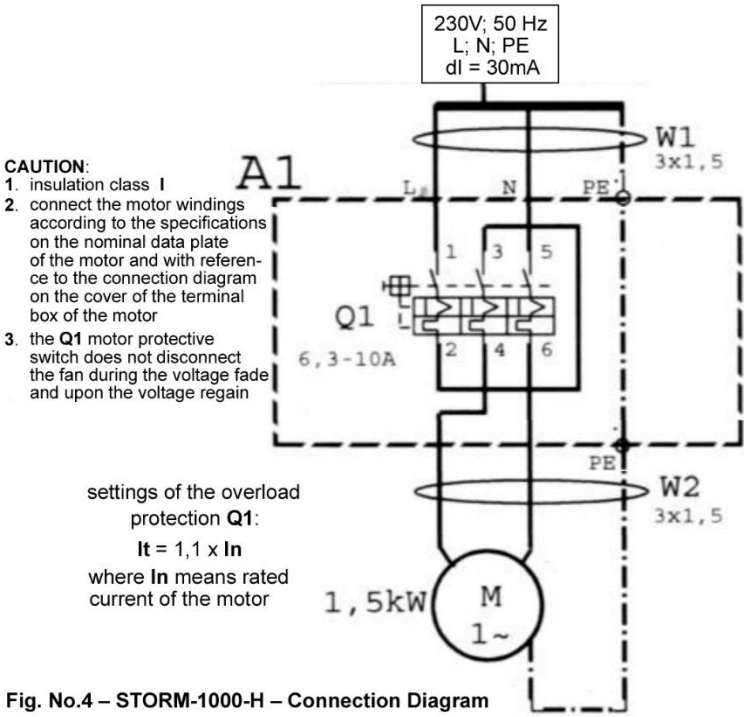


Fig. No.4 – STORM-1000-H – Connection Diagram

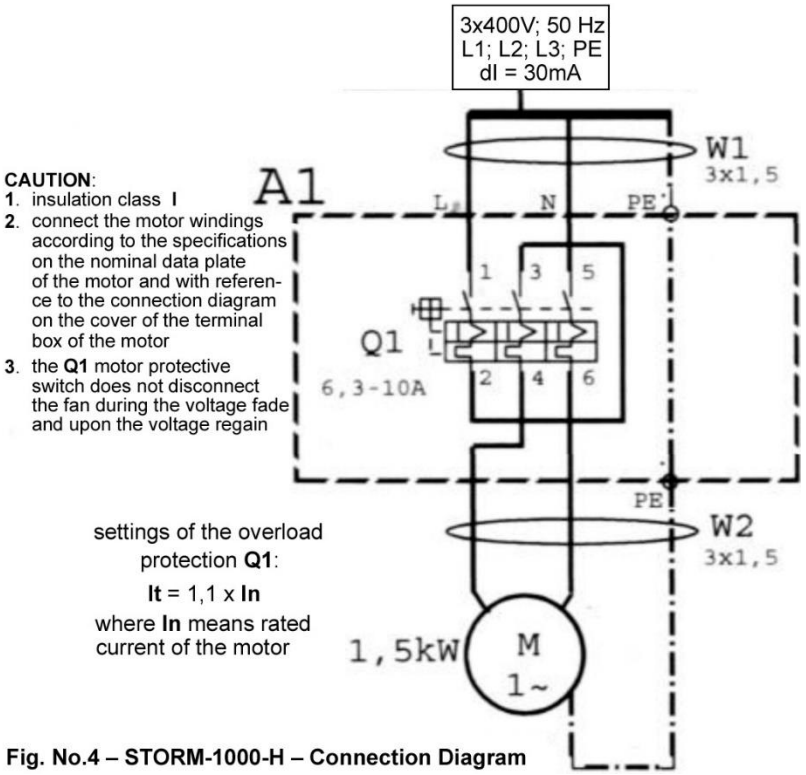
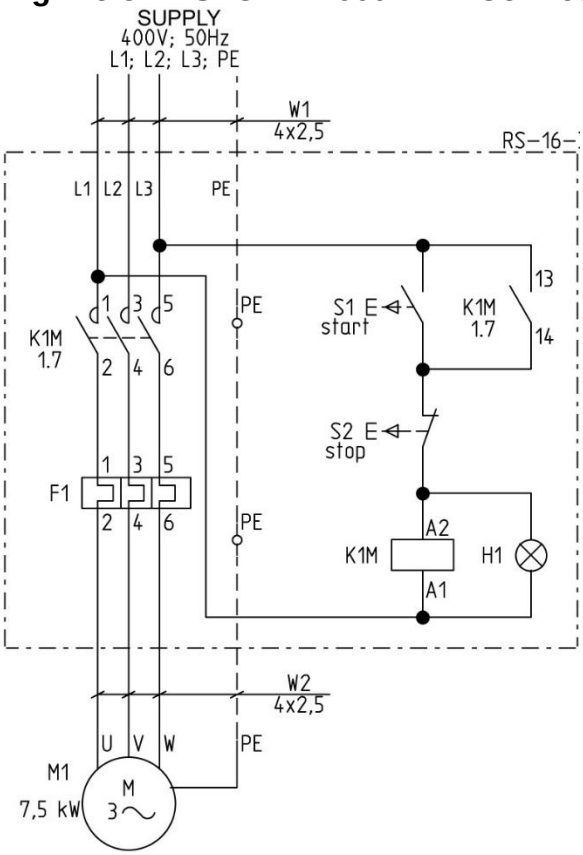


Fig. No.4 – STORM-1000-H – Connection Diagram

Fig. No.5 – STORM-2000-H – Connection Diagram



CAUTION:
1. setting of the overload protection **It** = 1,1 **In**
2. insulation class **I**

Fig. No.6 – STORM-5000-H – Connection Diagram

In application, where the cyclone separator serves as a **final filter**, the fan outlet ought to be equipped with a sound absorbing set (delivery on separate order).
Whereas, when the cyclone works as a **pre-filter**, it is important to connect the fan outlet with the filtering unit by means of ventilation conduit of a diameter suitable to fan outlet diameter. Similarly, the same connection must be carried out for the STORM SOFT-H outlet, itself.

Prior to start-up of the fan, check the connection between the motor and the PE protective cable and examine the electrical connections (**important is the correct impeller rotation sense according to the arrow on the housing**).
Electrical connections ought to be carried out according to the enclosed Connection Diagrams and performed by an authorized person with adequate qualifications.

7. Operational Use

The appliance does not require any additional routine technical supervision after the start-up. In case, the place of use is changed, repeat the steps described in Section 6 on installing and adaptation of the ventilation system to the new application. The waste container is equipped with sight-glasses for filling-up ratio monitoring. When the waste container is filled up, switch off the device and empty the container according to the instructions on pages 12, 14. Having cleaned the container, put it underneath the cyclone separator again.

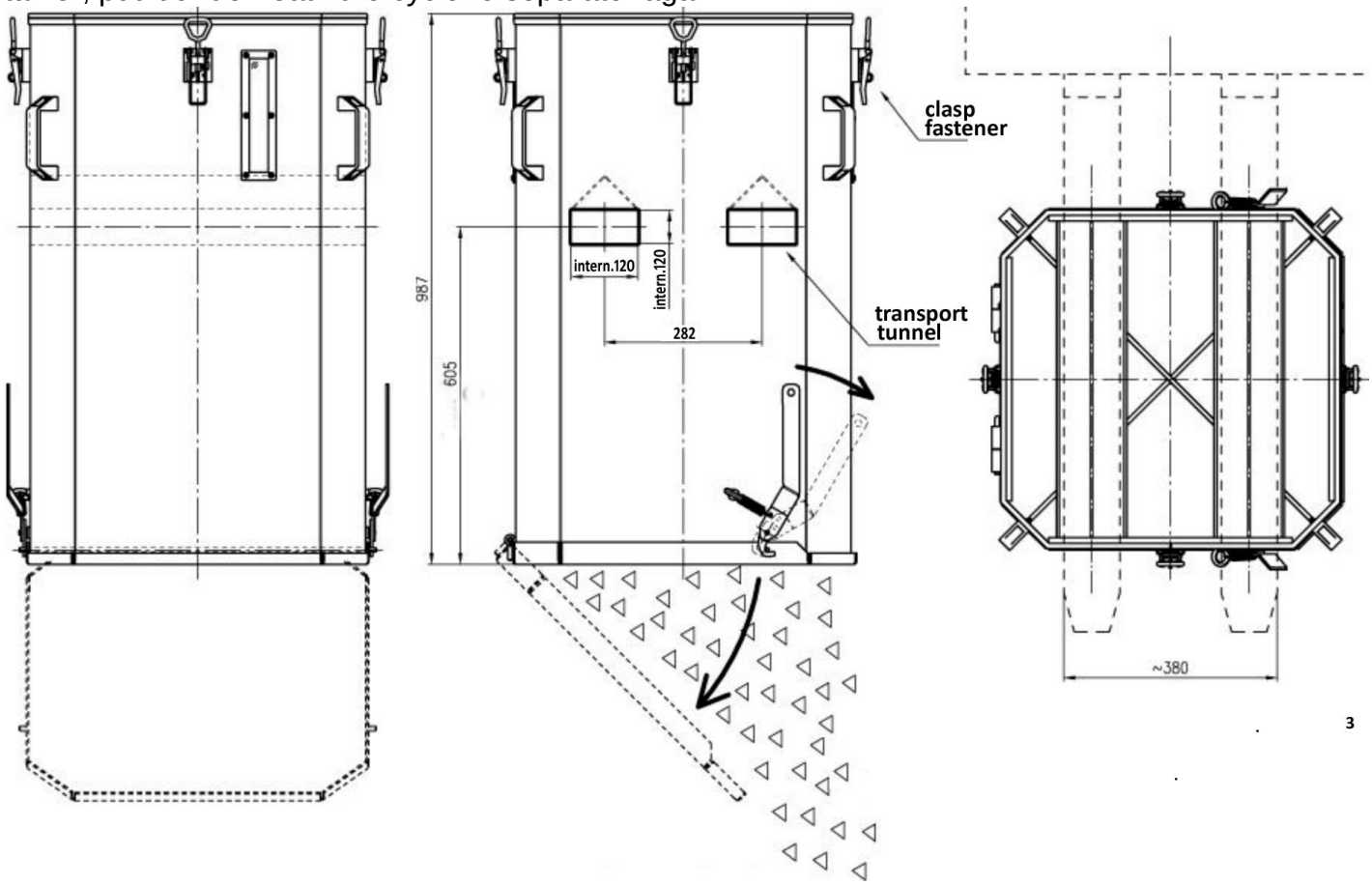


Fig. No.7 – Waste container

CAUTION: Capacity of the waste container: **330 dm^3**
Total capacity of waste – up to the maximum sight-glass level: **285 dm^3**
Maximum weight of waste: **500 kg**.

TRANSPORT OF THE WASTE CONTAINER

1. The construction of the container is adapted for transporting by a fork-lift of forks not broader than 100mm.
2. Prior to transport, insert the forks into the transporting guide tunnels of the container suspended underneath the cyclone, (dimension and spacing between the forks are as in the drawing above), and subsequently release the clasp fasteners.
3. Having removed the clasp fasteners, slide out the container from underneath the cyclone and carry it into the dumping (reloading) site.
4. During the transport handle with care – THE WASTE CARGO IS HIGH WEIGHT – **500 kg**.

EMPTYING OF THE WASTE CONTAINER

1. The container is equipped with a swinging discharge bottom, protected with a clasp mechanism on both sides of the bottom.
2. Transport the waste container (with a forklift) above a larger collective container, then open the bottom cover (release the locking hooks). Take precaution while dumping – the unloading mass would cause a sudden bottom cover drop.
3. Having emptied and cleaned the waste container, shut the bottom cover and close its hook fastenings (of the bottom cover).
4. Transport the waste container back and install it underneath the cyclone separator.

8. Troubleshooting Guide

Table No.4

	Problem	Possible reason	Corrective action
1.	Sudden drop in the suction volume flow.	Objects, impurities, causing obstacle to the air flow, got stuck at the inlet grill.	Clean the inlet grill and remove the clogging objects.
2.	Abrupt vibration of the fan occur.	Clogging objects, causing obstacle to the air flow, got stuck at the impeller.	Disconnect the fan from the power supply and remove the object.
		The impeller is faulty.	Replace the impeller and the motor for new.
3.	Cleaning efficiency of the dust laden air is decreasing.	Ventilation ducting got damaged.	Replace the ventilation ducting for new.
		The waste container is overloaded (over-filled).	Empty the waste container (see Fig. No.7).

9. Maintenance

The construction provides long-lasting and efficient work without routing technical supervision. In the course of operational use, simply it is sufficient to control the systematic waste container emptying. Examine the mechanical efficiency of connections with the devices of local exhausts.

After a year of use, the fan ought to be submit to a detailed technical supervision. Additionally, the fan motor is subject to technical revision, according to the instructions of the motor manufacturer.

10. Occupational Health and Safety

Startup and operational use are possible after getting acquainted with the present Use and Maintenance Manual.

The use is easy and safe and do not cause hazard to operators. Manufacturer is not responsible for effects caused during the incorrect use, in contradiction to the purpose of application. The cyclone separator ought to be fastened to the floor by means of four foundation bolts **M16**. Any activity related to connection to the power supply system should be carried out according to the instructions of Section 6 of the present User's Manual. This must be executed by an authorized person with qualification (according to the valid regulations).

The fan motor ought to be protected against short-circuit- and overload effects. During the use, examine connection between the fan and the PE protective cable.

The appliance meets the safety requirements of the Machinery Directive 2006/42/EN and do not require any additional means of protection for a safe use.

WARNING **Any supervision activity and repar on the fan ought to be performed after the appliance is disconnected from the power supply system**.

11. Transport and Storage

Cyclone separators are wrapped in foil and placed on palettes, on which is written their eight. During the loading and transport the appliance must not be thrown, or knocked down. Within the time of transporting, protect the device from weather conditions and damage.
Cyclone separators should be stored in dry rooms and in areas 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 damage and malfunctions caused by User,
- device failures caused during the use which is in contradiction with the purpose of application and with the present Use and Maintenance Manual,
- changes or structural modifications carried out on one's own,
- malfunctions resulting from the improper transport, storage or incorrect maintenance.

Infringement of the 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: **cyclone separator**
type/model: **STORM-H**
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 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. */Journal of Laws EC L96 of 29.03.2014/*

The appliance meets the requirements included in:

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- **327/2011** (**EU**) **Guideline** 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/*

The appliance meets following harmonized standard:

● **EN ISO-12100:2012**	– "Safety of machinery – Basic concepts, general principles for design. Risk assessment and risk reduction"
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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** 81-571 Gdynia, ul. Chwaszczyńska 194 phone: +49 58 829 64 80 email: klimawent@klimawent.com.pl www.klimawent.com.pl	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: