

# Use and Maintenance Manual



## Explosion-proof extraction arms

**ERGO-L/Z{2;3;4}/Ex**

**ERGO-L/Z{2;3;4}R/Ex**



II 2 G/D c

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814R21	ERGO-L/Z-2/Ex	10.01.2019/EN
814R22	ERGO-L/Z-3/Ex	10.01.2019/EN
814R23	ERGO-L/Z-4/Ex	10.01.2019/EN
814R24	ERGO-L/Z-2-R/Ex	10.01.2019/EN
814R25	ERGO-L/Z-3-R/Ex	10.01.2019/EN
814R26	ERGO-L/Z-4-R/Ex	10.01.2019/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 **ERGO/Ex explosion-proof extraction arms**.

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

Construction of the **ERGO-L/Z{2;3;4}/Ex** and **ERGO-L/Z{2;3;4}-R/Ex** explosion-proof extraction arms 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 17<sup>th</sup>, 2006 on machinery – amending the 95/16/EC (recast) /*Journal of Laws EC L157 of 09.06.2006, page 24/*
- **2014/34/EC ATEX Directive** of the European Parliament and of the Council of February 26<sup>th</sup>, 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:

- |                                  |   |
|----------------------------------|---|
| ● <b>EN ISO-12100:2012</b>       | - "Safety of machinery – Basic concepts, general principles for design. Risk assessment and risk reduction"   |
| ● <b>EN 1127-1:2011</b>          | - "Explosive atmospheres. Explosion prevention and protection. Basic terminology and methodology"   |
| ● <b>EN ISO 80079-36:2016-07</b> | - "Explosive atmospheres – Part 36: Non-electrical equipment for explosive atmospheres. Methodology and requirements"                                 |
| ● <b>EN ISO 80079-37:2016-07</b> | - "Explosive atmospheres – Part 37: Non-electrical equipment for explosive atmospheres. Non-electrical types of protection. Constructional safety "c" |
| ● <b>E-05204; 1994</b>           | - "Protection against the static electricity. Requirements"   |
| ● <b>E-05205; 1997</b>           | - "Protection against the static electricity in manufacturing and in applications with explosives – Requirements"                                     |

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.

## 2. Application

**ERGO-L/Z{2;3;4}/Ex** and **ERGO-L/Z{2;3;4}-R/Ex** explosion-proof extraction arms are designed for extraction the dust particles and gases arising during technological processes, whereby, (depending on the local and operational conditions) **exists the occurrence of explosive atmosphere**, i.e. a mixture of flammable substances – in a form of dust particles and gases with the air, in atmospheric conditions, in case of which (after the ignition) the burning mass expands within the whole rest of the not burnt mixture.

**Do not apply the extraction arms for corrosive aggressive atmospheres and for environments containing viscous dusts.**

**ERGO-L/Z-{2;3;4}/Ex, ERGO-L/Z-{2;3;4}-R/Ex extraction arms** are classified as appliances of group II, category 2, of gas hazard **G** and dust hazard **D** and they carry the marking:

 **II 2 G/D c**

- **group II** – the device is designed for on-ground work in factories, in areas of explosion hazard,

- **category 2** – the device should be constructed in such a way that it can work according to the operational parameters, as appointed by manufacturer, providing high level of protection; devices of this category:
  - are adapted for use in areas where occurrence of explosive atmosphere is possible – **area 1(G) or 21(D)**
  - are equipped with explosion protection measures – ensuring the required protection level – even in situation of frequent interferences or faults that are taken into account.
- **gas / dust hazard G/D**
- admissible **temperature** of the forwarded air **+70°C**

### 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 flexible elements and the duct segments 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.

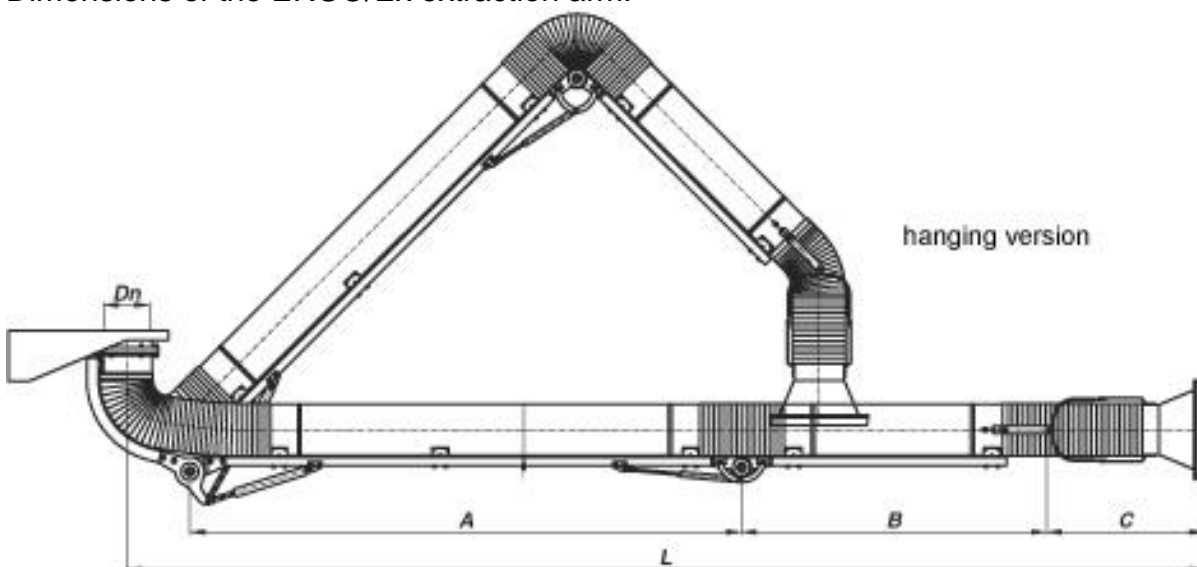
### 4. Technical Data

Ex extraction arms are manufactured in:

- hanging version ERGO-L/Z-(2; 3; 4)/Ex – diameter Ø160 mm
- standing version ERGO-L/Z-(2; 3; 4)-R/Ex – diameter Ø160 mm

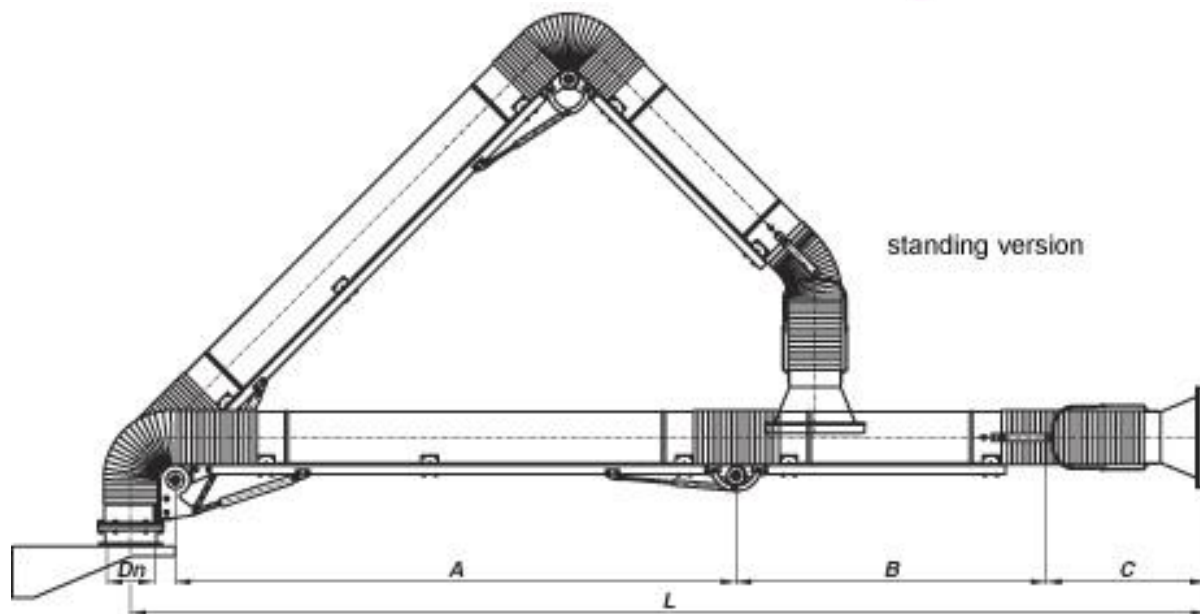
Extraction arms are manufactured in three sizes: of maximum range 2m, 3m, 4m

Dimensions of the ERGO/Ex extraction arm:



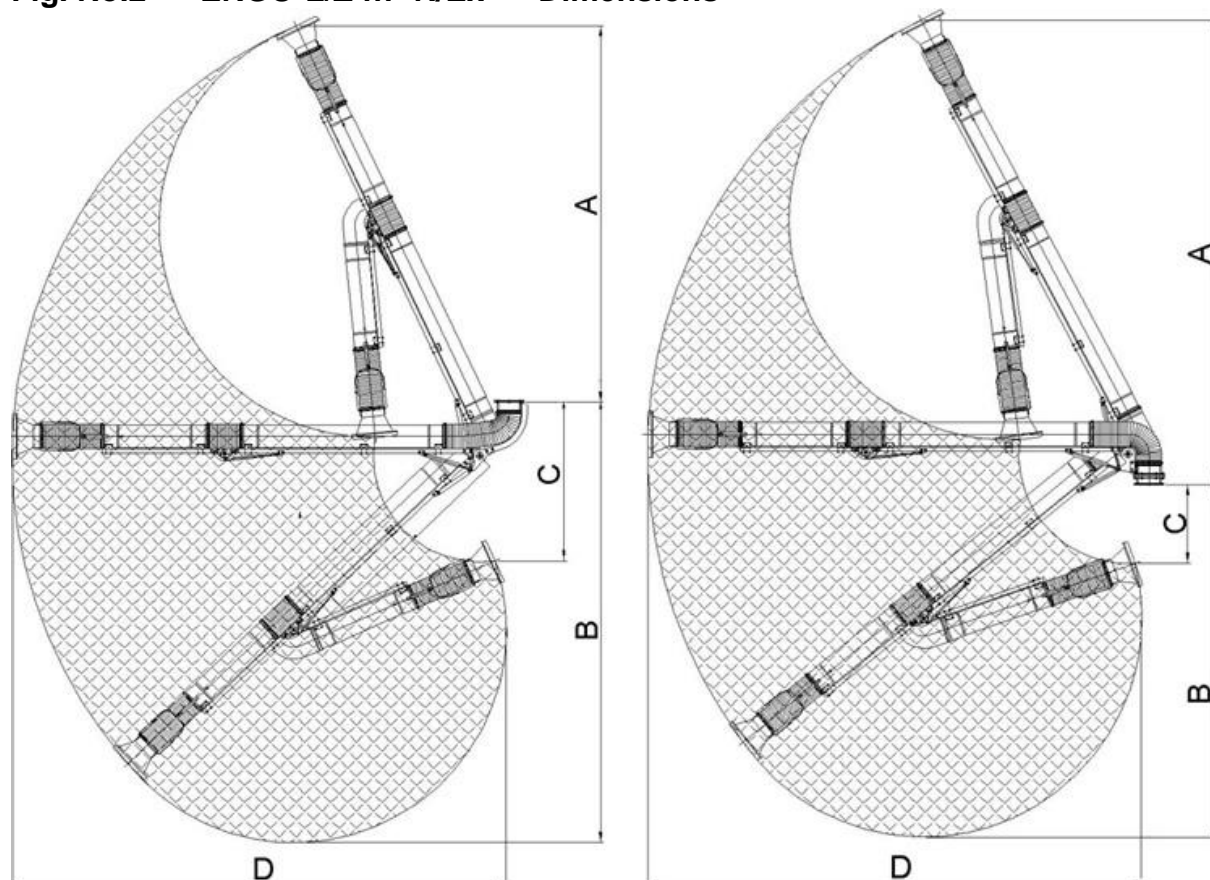
No.	Type	Dimensions					Weight [kg]
		Dn [mm]	L [mm]	A [mm]	B [mm]	C [mm]	
1	ERGO-L/Z-2/Ex	160	2280	947	580	534	22,5
2	ERGO-L/Z-3/Ex	160	3100	1527	820	534	25,5
3	ERGO-L/Z-4/Ex	160	3710	1907	1050	534	28,0

**Fig. No.1 – ERGO-L/Z ... /Ex – Dimensions**



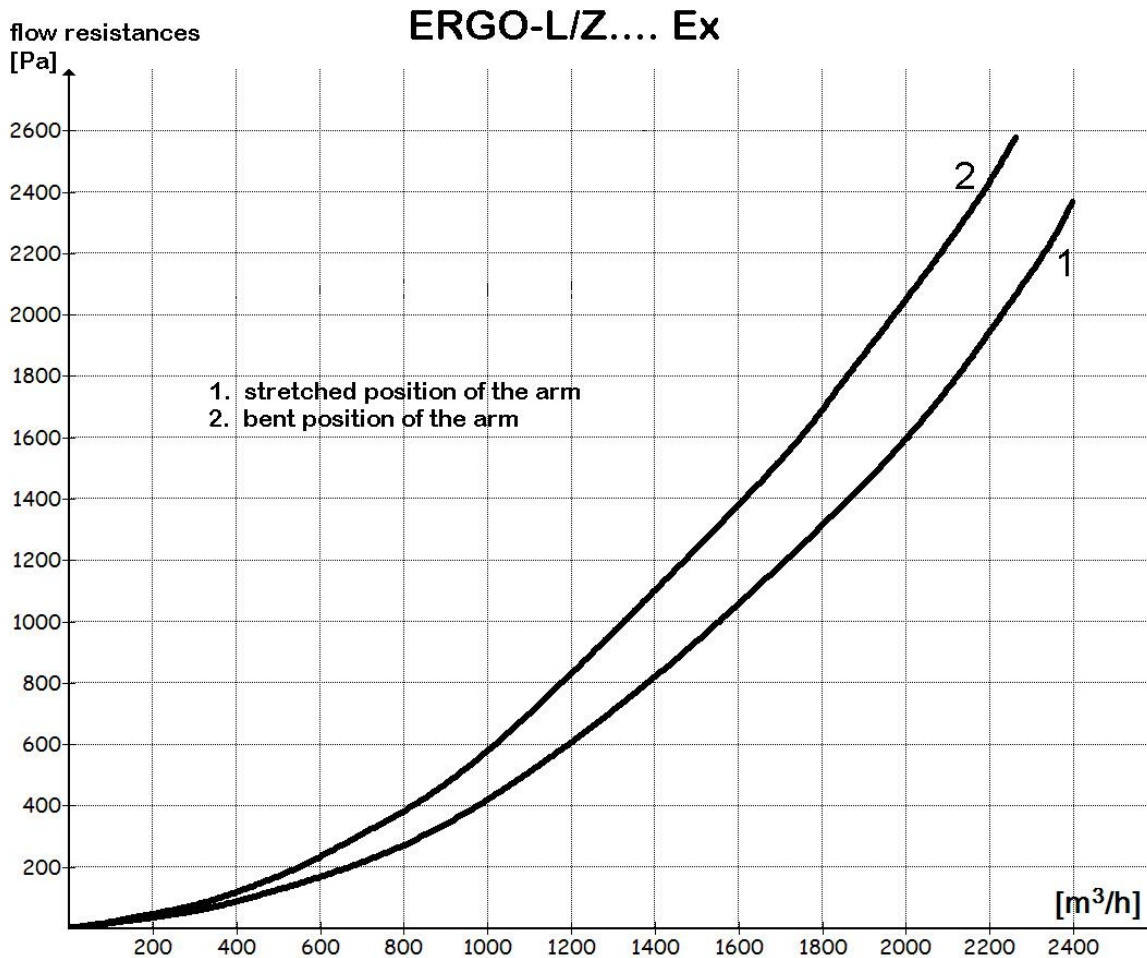
No.	Type	Dimensions					Weight [kg]
		Dn [mm]	L [mm]	A [mm]	B [mm]	C [mm]	
1	ERGO-L/Z-2R/Ex	160	2213	947	580	534	19,5
2	ERGO-L/Z-3R/Ex	160	3033	1527	820	534	22,5
3	ERGO-L/Z-4R/Ex	160	3643	1907	1050	534	25,0

**Fig. No.2 – ERGO-L/Z ... -R/Ex – Dimensions**



Type	A [mm]	B [mm]	C [mm]	D [mm]
ERGO-L/Z-2/Ex	1440	1650	800	2280
ERGO-L/Z-3/Ex	2195	2888	922	3100
ERGO-L/Z-4/Ex	2732	3372	1266	3710

Type	A [mm]	B [mm]	C [mm]	D [mm]
ERGO-L/Z-2-R/Ex	2110	1487	122	2213
ERGO-L/Z-3-R/Ex	2835	2092	409	3033
ERGO-L/Z-4-R/Ex	3374	2561	573	3643



**Fig. No.3 – ERGO-L/Z-{2;3;4}/Ex, ERGO-L/Z-{2;3;4}-R/Ex – Flow charts (hanging and standing version)**

## 5. Structure and Function

Extraction arms type **ERGO-L/Z-(2,3,4)/Ex** and **ERGO-L/Z-(2,3,4)-R/Ex** consist of subsequent assemblies – as specified in the drawings (see pages 9 and 10).

- full-rotation swivel (stainless steel),
- lower joint – (connector, hose, hose clamps),
- upper duct segment (stainless steel),
- middle joint – (connector, hose, hose clamps),
- lower duct segment with a shut-off damper, handle and hood joint (stainless steel),
- suction hood – of non-sparking metal (stainless steel),
- gas spring (stainless steel),
- a set of copper cables – joining all the constructional elements of the whole ERGO/Ex extraction arm and discharging the electrostatic loads to the grounding (dissipation).

A full-rotation swivel, of stainless steel (spark-proof execution) provides 360° rotation of the extraction arm around its vertical axle – thus giving the possibility of easy manoeuvring with the extraction arm in the operational field.

To the swivel are connected ducts (upper segment and lower segment). These segments are assembled together by means of flexible joints (**i.e. hose-section of special execution for application in areas of explosion risk, abrasion-resistant, surface impedance <1 GΩ**).

The full-rotation swivel, the elements of the ventilation ducts (connected with flexible joints) are forming a ventilation duct through which is extracted the contaminated air.

Position adjustment of the extraction arm (to the User's requests within the operational field) can be achieved within the normal workrange of the type of the specific device (2, 3 or 4m).

The shut-off damper (installed in the lower arm) serves for adjustment of the intake air volume, depending on the needs. The flow velocity ought to be sufficiently high, so that the dust particles would not build up inside the extraction arm. The velocity ought to be specified according to the technological process and the sort of the dust.

To protect the device from atmosphere ignition (caused by electrostatic discharge) are introduced cooper cables, to discharge / dissipate the electrostatic loads from all parts of the device. The cable at the swivel (see Photo. 1 page 11) ought to be connected with the proper grounding installation of the appliance.

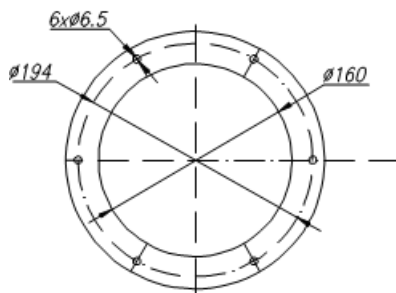
## 6. Assembly and Start-up

Extraction arms are delivered in cardboard packages in a completely assembled state. **Having installed the ERGO extraction arm, check the continuity of the equilibrating cables and measure the resistance (it should not exceed 1Ω).** It is recommended to keep the electrical measuring results in files.

ERGO/Ex extraction arms have to be installed on wall brackets type **WB-ERGO-L/G**, (delivery on separate order).

Diameters and spacing between the holes (for mounting bolts) are identical in the brackets and in the swivels.

For the ERGO-L/Z the dimensions are given in the drawing below. The arms have to be mounted by means of **6 bolts M6x40 – stainless steel**.



The construction of the **WB-ERGO-L/G** wall brackets (manufactured by KLIMAWENT S.A.) additionally provides installing the extraction fans.

Wall brackets can be mounted on the wall (or on another construction) through stainless steel bolts M10.

### CAUTION:

Installing of the ERGO-L/Z-(2;3;4)/Ex and ERGO-L/Z-(2;3;4)-R/Ex extraction arms ought to be carried out according to the being in force regulations of building construction and in a way providing the continuity of electrical grounding connections.

- Prior to beginning of the work, make sure whether the **extraction system is functioning properly** and the **grounding cable is connected with the efficient grounding installation of the building**.
- Set the hood into suitable position approx. 20 cm from the processed element. Simultaneously the hood should be able to capture efficiently the fume and dust and not to constitute obstacle barrier for User. Adjustment of the position of the ERGO arm and the hood can be carried out by the metal elements of the lower joint.
- By means of a shut-off damper lever adjust the intake air volume to eliminate the dust / fume most efficiently. The air velocity ought to be sufficiently high to avoid accumulating the dust particles inside the arm segments. Velocity has to be adjusted to the needs of the technological process and the sort of the dust sort.

During the work, the position of the hood and the damper lever can be changed many times, so User can adjust them best to the current needs. After the completed work, the extraction arm can be left in the ultimate position (operational state), or if it causes obstacle, set the arm into home position. Finally, stop the extraction fan, if the device works with a ventilation system, close the shut-off damper.

## 7. Operational Use

Construction of the device assures reliable function without continuous routine technical supervision. Adjustment of the ERGO extraction arms consists in setting the frictional brakes that are in each joint. Frictional brakes provide self-supporting properties and position balance of the device during the function. Tightening the nut tension (upon the frictional element) increases the friction moment, whereas its releasing reduces the friction.

The brake adjustment in the following joints ought to be executed in such a way that provides stability and self-supporting features of the extraction arm (which is important to keep the stable arm position), whereas on the other hand, this cannot cause any excessive friction resistance while User is changing the arm position.

Having completed the adjustment, tighten up the counter-nuts. Placement of the adjustment nuts is illustrated in dimensional drawings of the extraction arms.

## 8. Troubleshooting Guide

Table No.1

	<b>problem</b>	<b>possible reason corrective action</b>
1.	The extraction arm is falling.	Improperly adjusted frictional brake. Increase the tension upon frictional disks of the brake in the joint by tightening the adjustment nuts.
2.	The extraction arm is automatically setting always in the same position.	The rotation axis of the arm is not positioned vertically. Carry out the positioning of the mounting flange of the ERGO/Ex extraction arm to set the rotation axis vertically.
3.	Drop in the air suction rate along with the increased noise level.	Improper impeller rotation sense of the extraction fan. Change the phase connection sequence (3-phase motor only).

## 9. Maintenance

Maintenance consists in following steps executed periodically:

- In case when the extraction arm loses the self-supporting property in the joint system – undertake its adjustment.
- Every three months lubricate the swivel with solid grease (lubrication nipple is placed on the swivel collar).
- Periodically, (more frequently than once a half a year of use) undertake technical revision and **replace the faulty or worn out elements**.
- Systematically check the cleanness of the extraction arm, remove the dust that built up inside and on the device surface, in order to avoid self-ignition of the deposited impurities. **Cleaning can be executed beyond the area of explosion hazard.**
- **In case of replacement necessity of any element in the extraction arm (i.e. gas spring, hose, pipe segments, hood, grounding cables), use original parts only, delivered by KLIMAWENT S.A.**
- **Any repairs ought to be executed in rooms not being in explosion hazard zone.**
- **After every disassembling, assembling, check the continuity of the grounding cables.**
- **Periodically, (depending on the conditions of work) measure the surface resistance of the hoses – it should not exceed 1 GΩ. Execute the measuring according to the EN 13463-1 Clause 7.4.4 a. Similarly, measure the resistance of the device (continuity of the grounding cables) – should not exceed 1Ω. Collect the electrical measuring results in a file.**

## 10. Occupational Health and Safety

- In application where the extraction arms are used in dust-laden atmospheres, systematically check the cleanness of the extraction arms, remove the dust deposited inside and on the device – to avoid self-ignition of the residues dust layers. Execute the cleaning in a zone free from explosion hazard.
- **SYSTEMATICALLY CHECK THE STATE OF THE GROUNDING.** Every three months check the continuity of the grounding connections and measure the resistance – **the result ought to be less than 1Ω. It is recommended to collect the electrical results in a file.**

ERGO extraction arms in Ex execution will not cause any risk under the condition that they are firmly and correctly mounted to the wall or another structural element of the building.

Unsure installing could result in an uncontrolled detachment of the device and cause serious risk to personnel / people in the vicinity. Having completed the work, leave the extraction arm in the ultimate operational position, in case when it constitutes obstacle to personnel, set in into home position.

## 11. Transport and Storage

Extraction arms have to be stored and transported in fully assembled state and in packages especially designed for this device. During the transport / reloading protect the device from mechanical damage, scratching, indents, package damage and pay attention that the surface markings do not get detached / obliterated.

The devices ought to be stored in dry room 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 and electrical damages and malfunctions caused by User,
- changes and modifications introduced by User on one’s own,
- malfunction resulting from normal operational wear.

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.



## Extraction arm – ERGO-L/Z-[2;3;4]/Ex

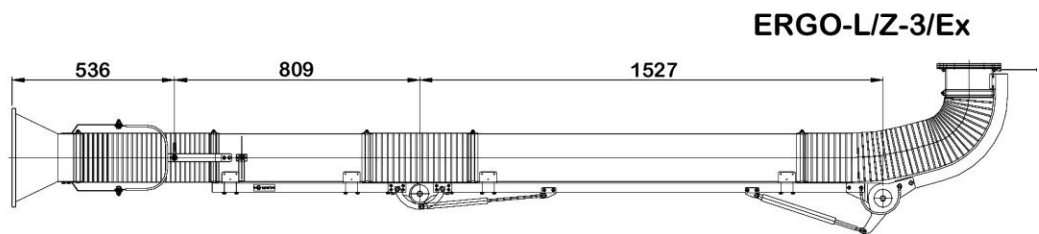
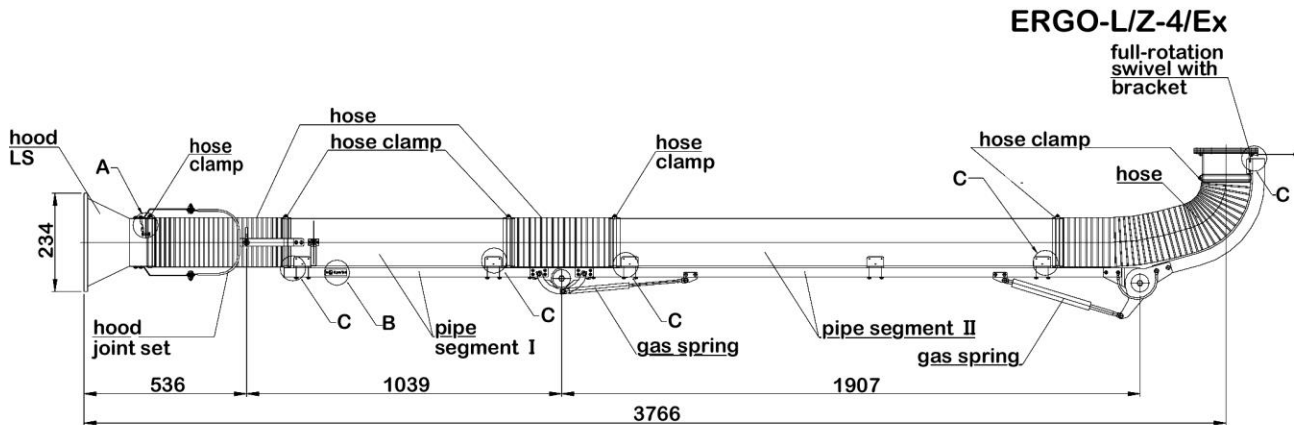
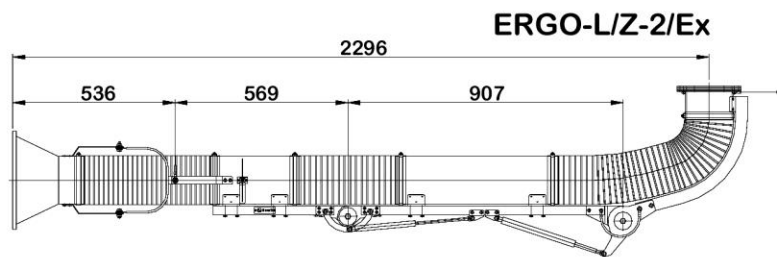
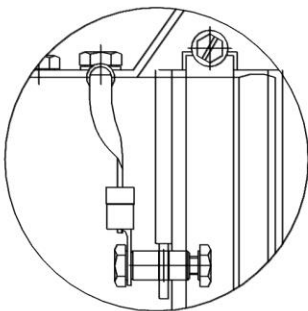


Table of series – extraction arm  
ERGO-L/Z-[...]/Ex

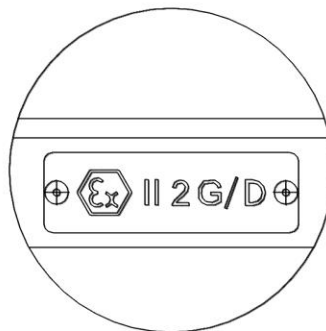
Type	Dwg.No.	Weight [kg]
ERGO-L/Z-2/Ex	012464/1	22.5
ERGO-L/Z-3/Ex	012464/2	25.5
ERGO-L/Z-4/Ex	012464/3	28



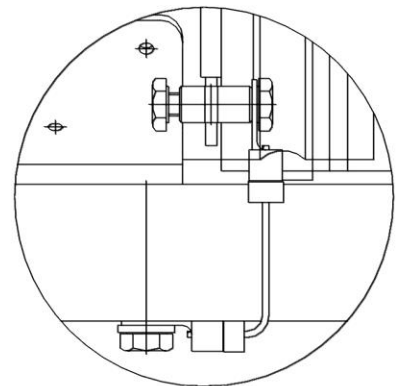
Detail A



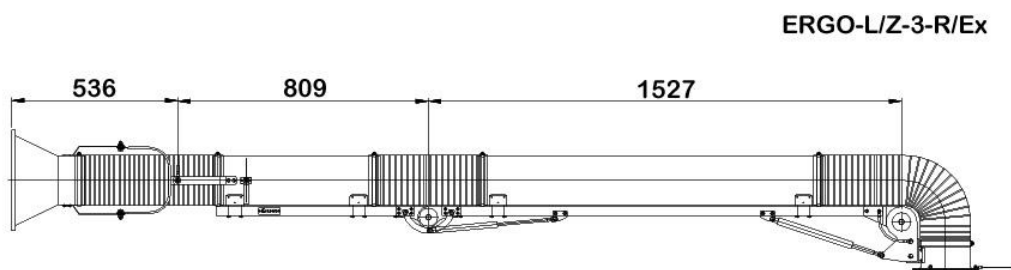
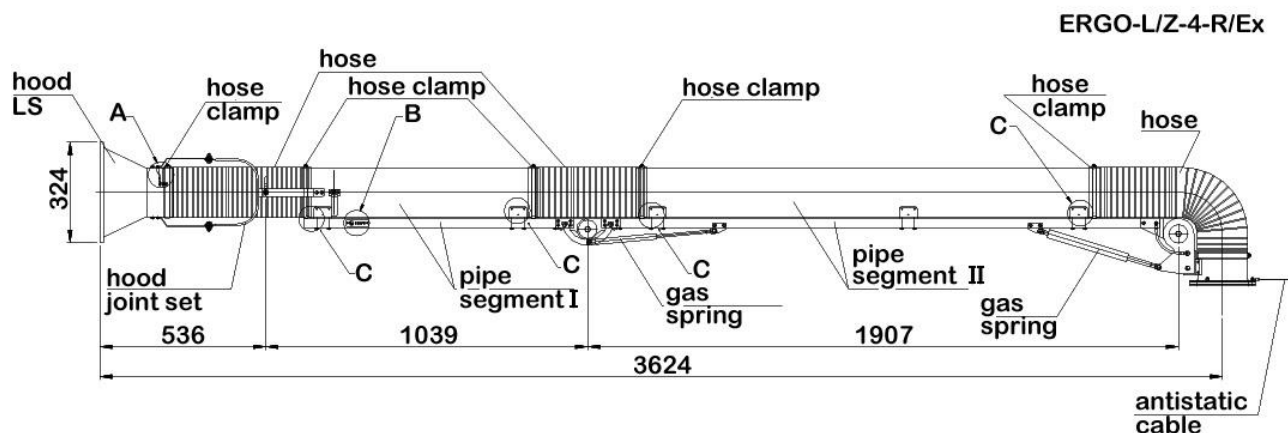
Detail B



Detail C



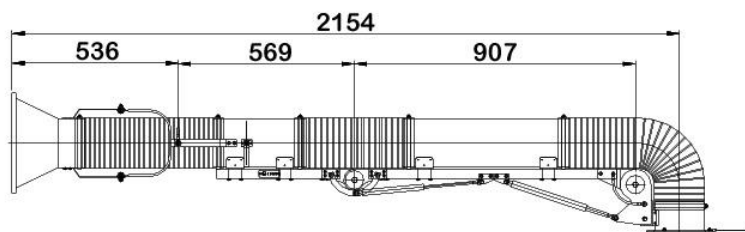
## Extraction arm – ERGO-L/Z-[2;3;4]-R/Ex



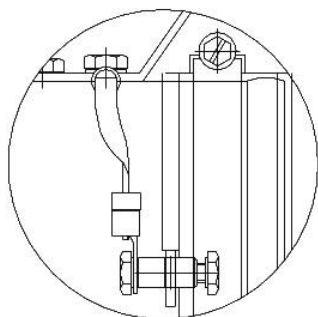
**ERGO-L/Z-2-R/Ex**

Table of series – extraction arm  
ERGO-L/Z-[...]-R/Ex

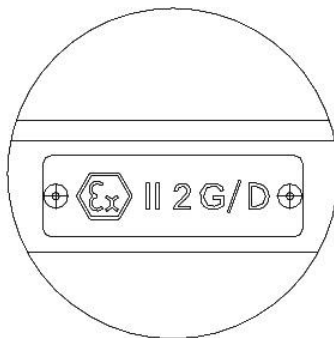
Typ	Dwg. No.	Weight [kg]
ERGO-L/Z-2-R/Ex	012495/1	19.5
ERGO-L/Z-3-R/Ex	012495/2	22.5
ERGO-L/Z-4-R/Ex	012495/3	25



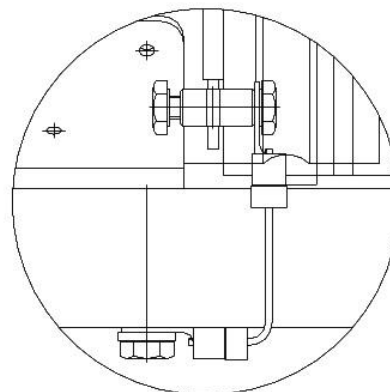
**Detail A**



**Detail B**



**Detail C**



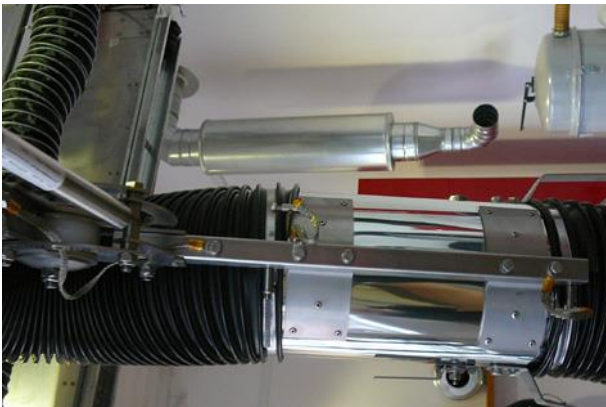
**Grounding cables of the extraction arms ERGO-L/Z-(2;3;4)/Ex  
oraz ERGO-L/Z-(2;3;4)-R/Ex**



1.



2.



3.



4.



5.



6.

## 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 extraction arms**

type/model: **ERGO-L/Z-[2,3,4]/Ex, ERGO-L/Z-[2;3;4;]-R/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 17<sup>th</sup>, 2006 on machinery – amending the 95/16/EC (recast) / *Journal of Laws EC L157 of 09.06.2006, page 24*
- **2014/34/EC ATEX Directive** of the European Parliament and of the Council of February 26<sup>th</sup>, 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. Risk assessment and risk reduction”
- **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”
- **E-05204; 1994** – “Protection against the static electricity. Requirements”
- **E-05205; 1997** – “Protection against the static electricity in manufacturing and in applications with explosives – Requirements”

Marking of the appliance:  **II 2 G c**

.....  
place, date

**KLIMAWENT S.A.**  
**Supported Employment Enterprise**  
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phone: +49 58 829 64 80  
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[www.klimawent.com.pl](http://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