



# **GEOVENT**

## **INSTRUCTION MANUAL**



## **FAN**

**LSX/MSX 146 - 250**

Approved for zone 1 and 2 "G" for gas applications and  
zone 22 "D" for dust applications



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## 1.0 General safety precautions

**IMPORTANT** - Please study all the instructions before mounting and commissioning.

Please keep these instructions in a safe place and instruct all users in the function and operation of the product.

Do not dismantle any factory-mounted parts, since it impedes the commissioning of the equipment.

All electrical installations must be carried out by an authorised electrician.

### 1.1 Danger

**Explosive media** – The Fan is not suitable for the extraction of aluminium dust, flour, textile dust nor for sawdust or other media, which are connected with danger of explosion, without specific approval from Geovent A/S.

Removing the protection net on the fan whilst in operation involves a risk of mutilation.

Always switch off the current when mounting something on the Fan or when servicing it.

### 1.2 Field of application

The GEOVENT Fan LSX is typically used for comfort ventilation as well as for smaller process extraction jobs, where a high pressure is not required. The Fan MSX is applied for process extraction within the industry for the extraction of welding smoke, exhaust gasses, grinding dust and vapours.

The Fan is not suitable for the extraction of aluminium dust, flour, textile dust nor for sawdust or other media, which are connected with danger of explosion, without specific approval from Geovent A/S.

## 1.3 Technical data

Temperature extracted air	Max 80°C
Temperature surroundings	Max 40°C

Fans 1.400 min-1, noise emission to the surroundings

Type	Lp, dB(A)	Lp, 1m
LSX-146	51	45
LSX-180	56	50
LSX-200	61	55
LSX-225	63	57
LSX-250	67	61

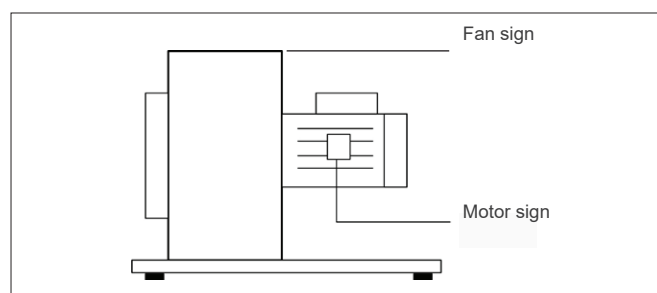
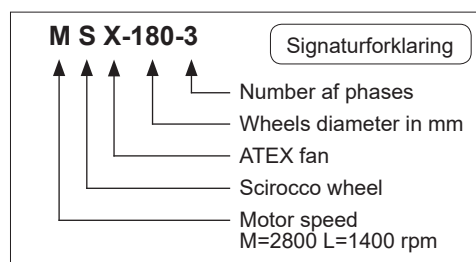
Fans 2.800 min-1, noise emission to the surroundings

Type	Lp, dB(A)	Lp, 1m
MSX-146	69	63
MSX-180	74	68
MSX-200	78	72
MSX-225	81	75
MSX-250	84	78

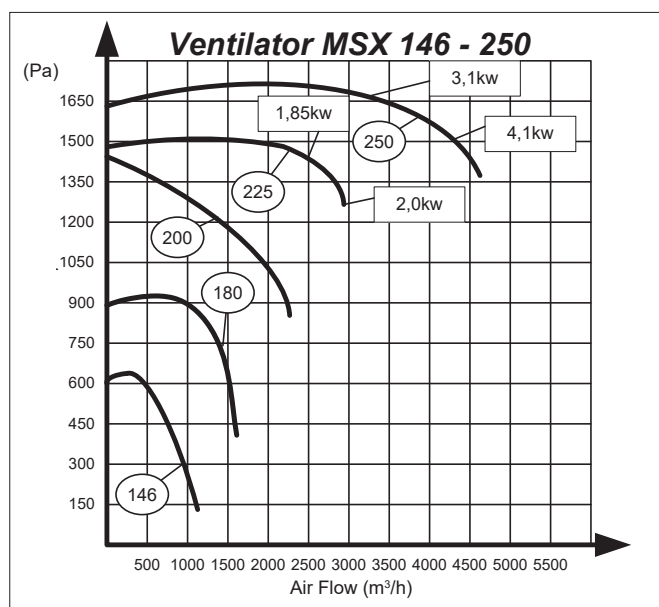
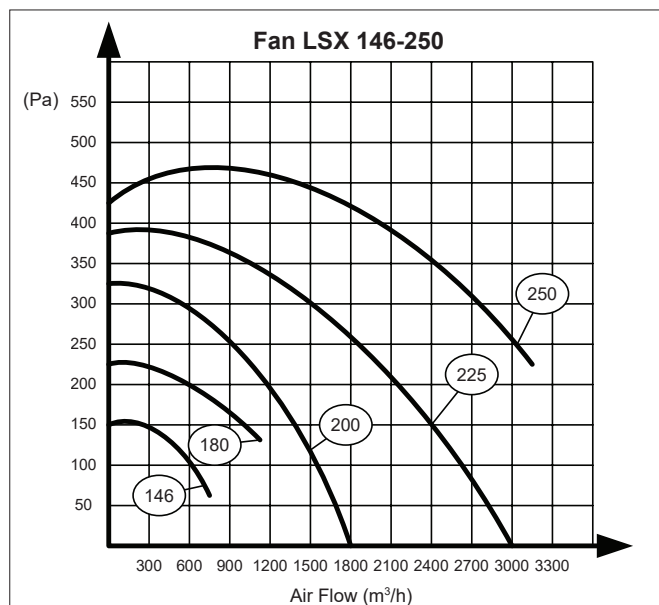
The sound level depends on various factors under various circumstances. For instance, where in the room the Fan has been installed, the size of the room, the temperature in the room, the sound of the room and also the connection (hose><pipe) of the Fan influences the sound level of the Fan. For more sound measurements – please refer to the data sheet for LSX/MSX-146 - 250.

As a main rule, a sound box will reduce the actual sound level to only half the level without a sound box.

The actual ampere consumption and the kW of the motor are shown on the metal sign on the Fan.



### Graphs showing the pressure drop of the Fans



## 1.4 Construction

**Fan housing:** 100% hot-galvanized steel for optimal corrosion resistance. Carrying feet have been mounted on all Fans with fitted vibration dampers as well as inlet nozzle with safety net.

Fan wheel: Forward curved sirocco-fan wheel (F-wheel) in hot-galvanized steel sheet.

**Motor:** B5 flange motor, directly driven in protection class IP 54.

For gas applications zone 1 and 2:

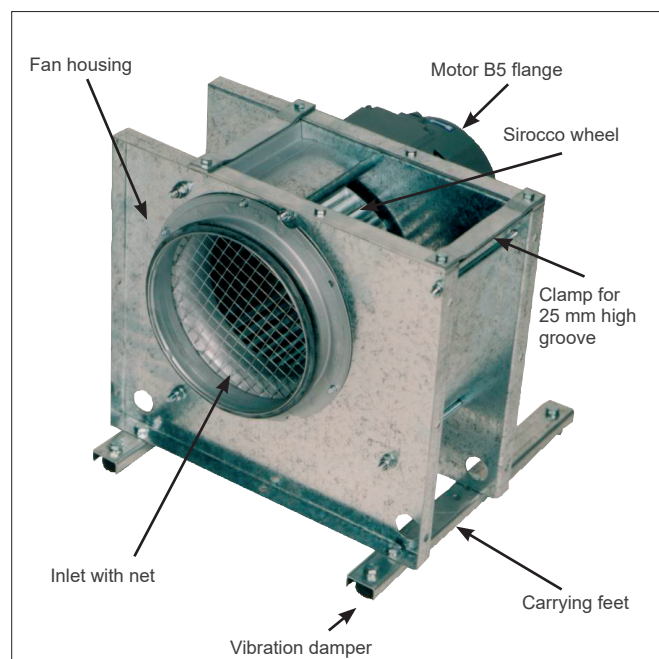
B5 EX II 2G, EEXe-II T3, IP55, ATEX 95, EN 60079-7 or equivalent. See manufacturers manual.

For dust applications zone 1 and 2:

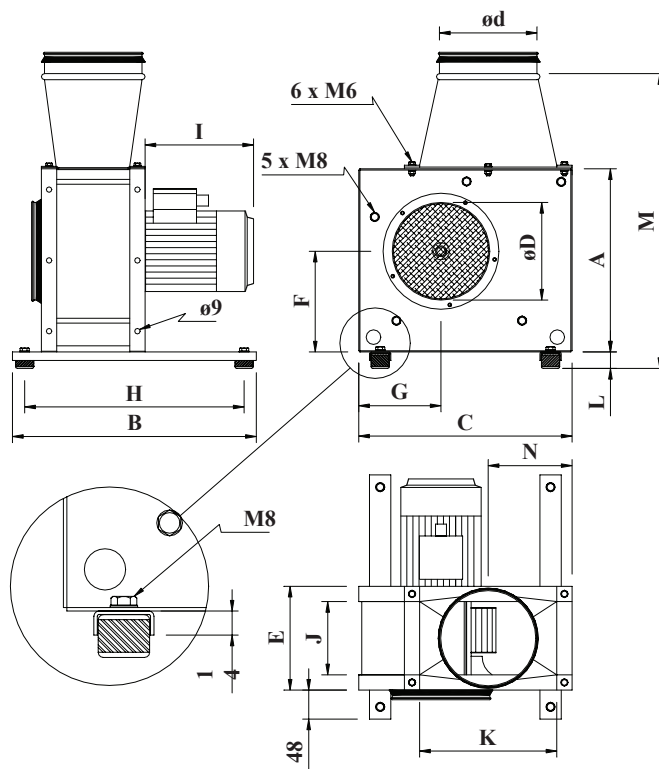
B5 EX II 3D, Zone 22, T=125°C, IP55, EN 61241-1, ATEX 95, or equivalent. See manufacturers manual.

For frequency inverters use (Zone 1 (gas)):

ATEX II 2G IIABC T6



### Table of dimensions



### Table of dimensions LSX/MSX 146 - 250

LSX/MSX 146 - 250					
Type	146	180	200	225	250
<b>A</b>	245	300	350	370	410
<b>B</b>	400	400	400	500	500
<b>C</b>	295	350	400	450	500
<b>D</b>	160	160	200	250	250
<b>E</b>	145	168	180	195	215

<b>F</b>	134	165	205	210	230
<b>G</b>	113	135	165	190	210
<b>H</b>	360	360	360	460	460
<b>I</b>	178	178	205	219	300
<b>J</b>	95	120	130	145	170
<b>K</b>	185	225	250	280	320
<b>L</b>	27	27	27	27	27
<b>M</b>	402	527	577	597	637
<b>N</b>	118	138	150	165	185
<b>Weight</b>	12 kg	14 kg	18 kg	24 kg	38 kg

The dimensions shown in the table are similar for the Fans LSX and MSX.

## 1.6 Soundbox

Sound box is optional and ordered together with the fan. A sound box can general reduce the noise level. 8–15 Db(A).

Besides soundproffing, the sound box will also protect the fan against wind and weather.

The Soundbox is made of galvanised plate and supplied with 50 mm thick insulating materials (glass wool). Inside the box is lined with a galvanised and perforated steel plate.

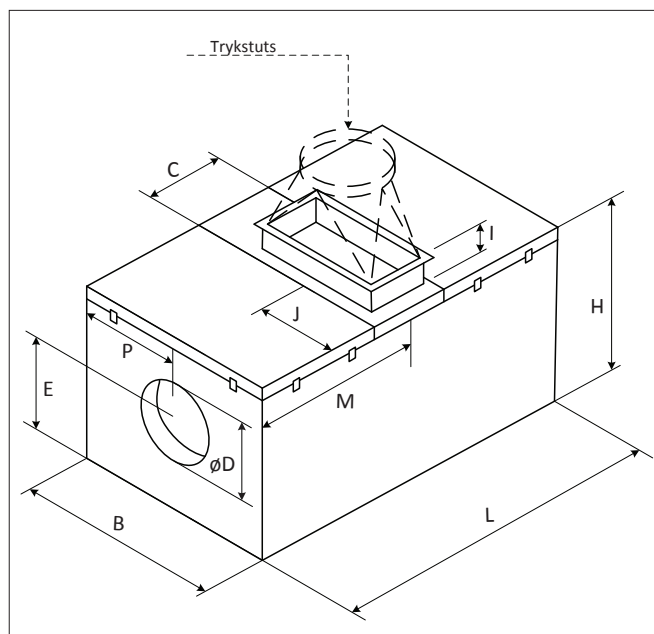
The inlet champer in the soundbox....

On the motor side of the box it is provided with an air intake for cooling the motor.

## Weights and Measures

Soundbox 146 - 250					
Type	146/180	200	225	250	
<b>B</b>	470	510	560	620	
<b>H</b>	405	455	475	510	
<b>L</b>	720	820	910	1015	
<b>øD</b>	160	200	250	250	
<b>E</b>	205	230	240	260	
<b>P</b>	230	355	285	330	
<b>M</b>	362	410	465	510	
<b>J</b>	230	255	280	325	
<b>C</b>	190	200	215	245	
<b>I</b>	105	100	105	105	
<b>Weight</b>	29 kg	35 kg	43 kg	49 kg	

OBS: Use gloves when you are handling the soundbox.



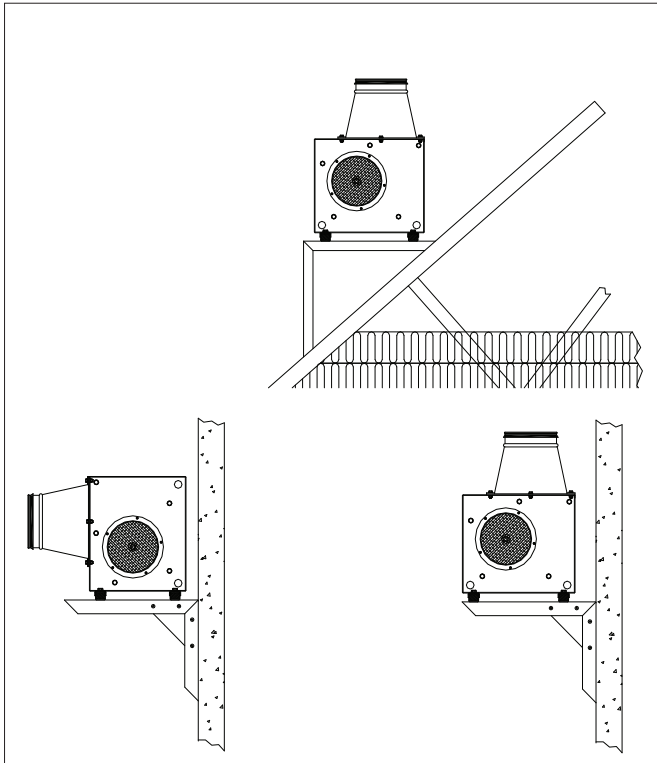
## 2.0 Installation

The Fan is supplied in complete/assembled condition, ready for connection to piping and to the mains.

Before mounting the Fan, please make sure that the optimum installation area is selected. Is outdoor or indoor installation best? Is there space enough for carrying out satisfactory installation/service of the Fan? What about optimum connection possibilities for piping and automatics? If at all possible, please avoid bends just before the intake and after the outlet, since otherwise this would reduce the yield of the Fan. For outdoor mounting, any noise nuisances for neighbours should be taken into account and also ensure that the motor is kept out of heavy showers.

Figure 1

The following installation should only be carried out by a trained fitter

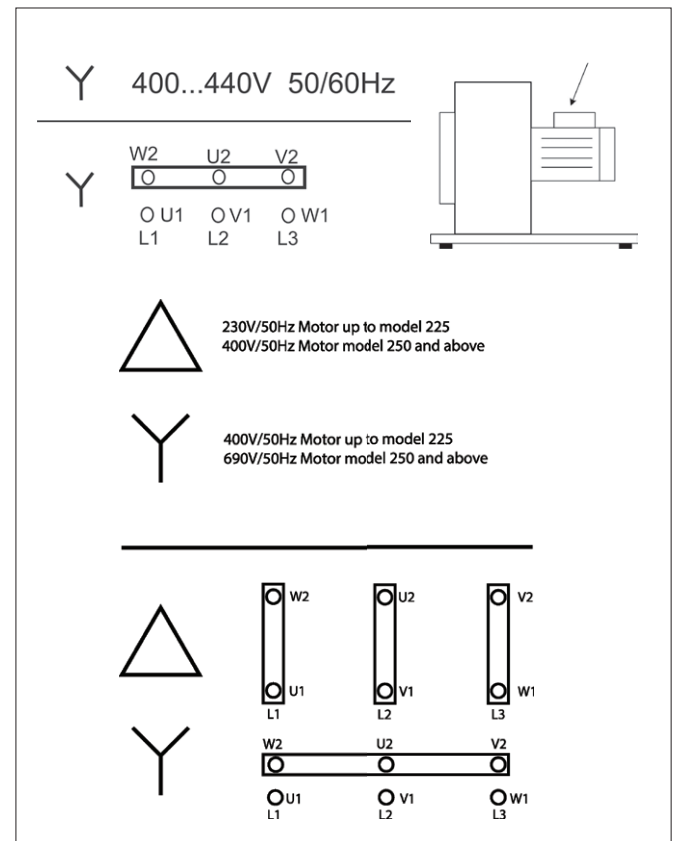


### Procedure:

1. The Fan is solidly fixed to the roof/floor or to a ceiling bracket or wall bracket (see figure 1). The Fan is fixed by attaching the vibration dampers with 4 off M8 bolts. The Fan is to be mounted in one of the shown ways. Do not install the Fan with the intake in vertical direction.
2. The piping is connected to the Fan. On the inlet side, the pipe may be fastened by means of self cutting screws. Remember to seal the connection with filler!
3. On the outlet side, the pressure connecting piece (optional equipment) is attached to the Fan by means of the supplied clamps. Remember to seal the connection with filler!
4. The pressure connecting piece is then attached to the piping on the outlet side by means of self-cutting screws. Remember to seal the connection with filler!
5. For outdoor mounting, it is important to protect the Fan from heavy rain and to seal the piping against leaks.

Connection of the Fan to the mains:

6. The Fan should only be connected to the mains by a certified electrician and a motor protection switch should always be used.
7. Our 3-phase motors may be configured to both 3x230V and 3x400V. From the factory, the motor has not been configured and the enclosed metal cover plates are to be mounted in such a way in the terminal box that they fit the voltage.



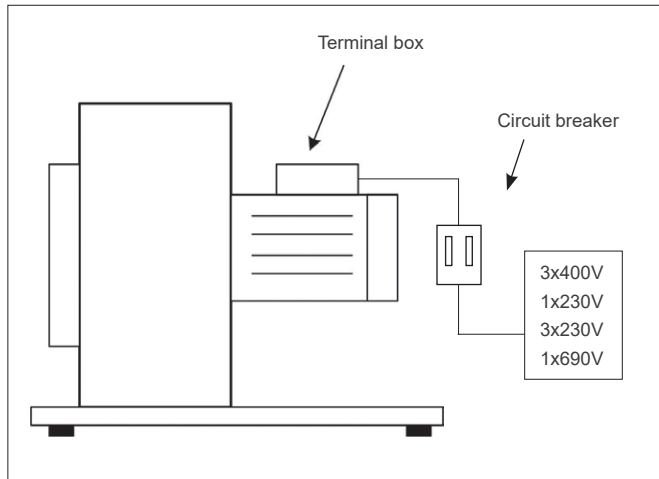


## 2.1 Mounting of optional equipment

### Mounting of sound box

From the factory, the Fan will be installed in the sound box (optional equipment). The box must be mounted on horizontal surfaces and may only be mounted with vertical outlet.

### Mounting of the motor protection switch



### Flow guard

In Denmark, all Fans must be supplied with a control device for the control of correct suction in compliance with The Danish Working Environment Service. Please refer to the separate instructions in this matter.

## 2.2 Trial run – exact adjustment

After the installation has been completed, please check whether there are any vibrations in the Fan.

We recommend checking whether the Fan supplies the correct volume of air, for which the equipment has been dimensioned. I.e. control the volume of air and make sure that it does not exceed the ampere capacity of the motor.

## 3.0 User instruction – application

When extracting large quantities of air, containing dust, the fan wheel may get out of balance due to dirt on the wheel. In order to avoid this, we recommend using a filter.

In many cases, the Fan is started by pushing the green button on the motor protection switch (if automatics are not used).

The Fan does not work according to the purposes, if ...

- unauthorised parts have been mounted on the Fan (e.g. unauthorised wheel).
- the wheel runs in the wrong direction. It will still work, but the capacity will be reduced to a third of the normal capacity.
- no motor protection switch is used.

### Recommendations:

For installation we recommend following EN-60079-14

For service and inspection: EN-60079-17

In order to fully comply with the ATEX directive.

## 4.0 Maintenance

### Periodic maintenance

- In principle, the motor is maintenance-free because of the factory-mounted, completely closed special ball bearings, which do not require any maintenance. Exchange of worn bearings should only be carried out by an electrician.
- The wheel and the fan housing should be cleaned every year or according to requirement. The wheel and the housing may be cleaned by means of a washing-up brush and dishwater. Remember to disconnect the power before the washing and to wipe the parts afterwards with a dry cloth. This operation results in a longer life of the Fan.
- Keep motor free of dust and dirt to avoid overheating. Clean regularly.

At least once annually, the whole point extraction plant should be overhauled by an authorised serviceman.

## 4.1 Trouble-shooting

Remember always to use a motor protection switch!  
Always use adjustment damper!

In case of problems with the Fan, the following items may be reviewed in order to check whether:

### The volume of air or the pressure is below the stated level:

- Wrong direction of operation of the wheel. May be due to wrong electrical installation. Please double-check the direction of rotation. Swop two phases, if necessary.
- Leaky channel system.
- Poor inlet/outlet possibilities near the Fan may reduce the yield (e.g. 90° bend before the inlet).
- Damaged wheel.
- The rotation speed has been set lower.
- If the temperature deviates substantially from the lab measurements, where the temperature was 20°C with an atmospheric pressure of 101.4 kPa.
- The dampers have not been correctly adjusted.
- The central lid on the sound box is turned the wrong way and thus blocks the air.
- The suction net has been blocked by cotton waste, a cloth or the like.

### Vibrations and noise

- The base is not level/stable.
- Elements coming from the outside are stuck in the Fan.
- Damaged wheel or motor.

- The wheel is loose.
- The wheel may have become unstable, for instance as a result of dirt on the impellers.
- The wheel is rotating in the wrong direction.
- The Fan supplies more air than for which the equipment has been dimensioned. Use adjustment damper.
- Loose bolts or screws.

#### The motor is overtaxed

- The cabling of the motor is not correct.
- The shaft has been bent.
- The Fan has over-capacity in relation to the resistance in the system. Use adjustment damper.
- The speed of the motor is too high.
- Defective motor – please contact your dealer!

#### Copper inlet



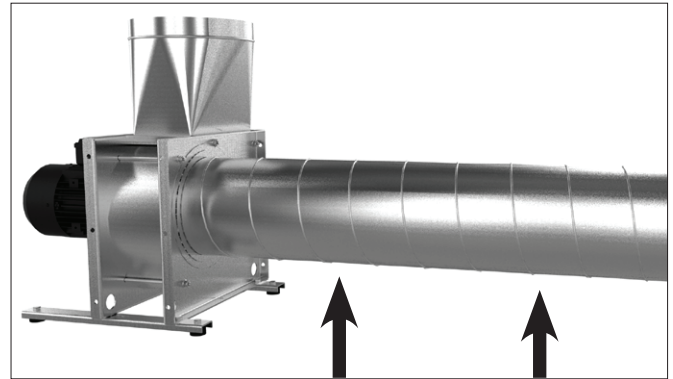
Example of spark protection on inlet (Copper ring)

#### Underpinning

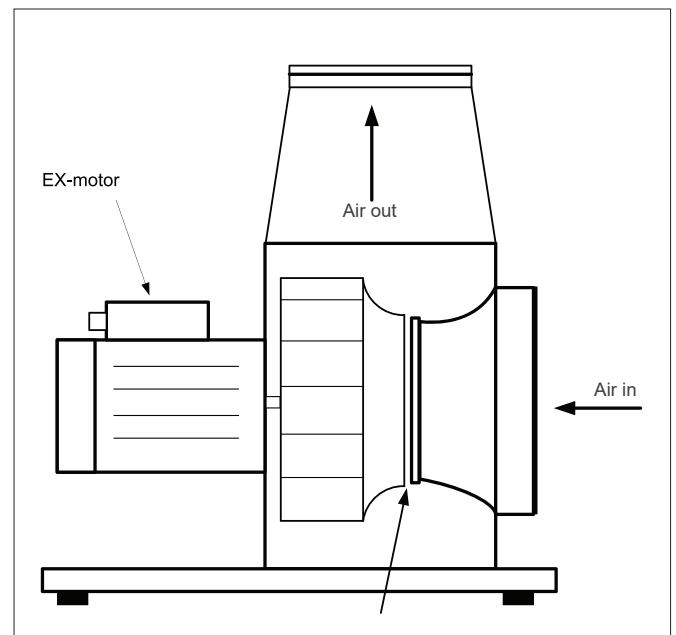


In order to avoid that the inlet twisted and pressed against the impeller must the spiro duct be supported as shown above.

#### Ground connection



Connect the ground cable to the fan



Copper spark protection between the inlet and the impeller



## **5.0 Liability**

### **Warranty**

Geovent A/S grants a warranty for products, which are defective; when it can be proved that the defects are due to poor manufacture or materials on the part of Geovent. The warranty comprises remedial action (reparation or exchange) until one year after date of shipment. No claims can be made against Geovent A/S in relation to loss of earnings or consequential loss as a result of defects on products from Geovent.

Wear parts like fan wheels are not included in the warranty.

### **User liability**

In order for Geovent to be capable of granting the declared warranty, the user/fitter must follow this Instruction Manual in all respects.

Under no circumstances may the products be changed in any way, without prior written agreement with Geovent A/S.



## 6.0 Declaration of conformity



HOVEDGADEN 86 • DK-8831 LØGSTROP  
(+45) 8664 2211 • salg@geovent.dk

Hereby declares that:

The product: Fan  
Models: LSX/MSX 146-250

have been manufactured in compliance with the  
directions of the

Directive Council of 2006/42/EF of 17. may 2006 regarding machines.

Directive 2014/34/EU of 26 of February concerning equipment and protective systems intended for use in potentially explosive atmospheres.

The following harmonized standards have been applied:

EN ISO 12100:2011 Safety of machinery –  
General principles for  
design – Risk assessment  
and risk reduction

EN ISO 1127-1:2011 Explosive atmospheres - Explosion prevention and protection  
- Part 1: Basic concepts and methodology

DS/EN 14986:2017 Design of fans working in potentially explosive atmospheres

The Technical Construction File is maintained at Geovent A/S.

Date: 07/04-17

Position: Managing Director  
Name: Thomas Molsen

Signature:





***GEOVENT***

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