



GEOVENT

INSTRUCTION MANUAL



PLASTIC FAN

RPV, LPV and MPV
202 - 456

Contents

1.0 General safety precautions	3
1.2 Field of application	3
1.3 Technical data	3
1.4 Construction – table of dimensions	4
2.1 Connection of fan to the mains	5
4.1 Resistance	6
4.1 General information	6
5.0 Maintenance	7
5.1 Trouble shooting	7
6.0 Liability	8
6.1 Declaration of conformity	9

1.0 General safety precautions

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

This instruction manual is valid for Geovent Plastic fans.

Please retain this manual for future reference and instruct all users in the function and operation of the product.

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

All electrical installations must be carried out by an authorised electrician

1.1 Danger

Explosive media – By default the plastic fan is not suitable for the extraction of aluminium dust, flour, textile dust nor for sawdust or other media, which are associated with danger of explosion, without specific approval from Geovent A/S.

The plastic fan is available in an ATEX version.

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

1.2 Field of application

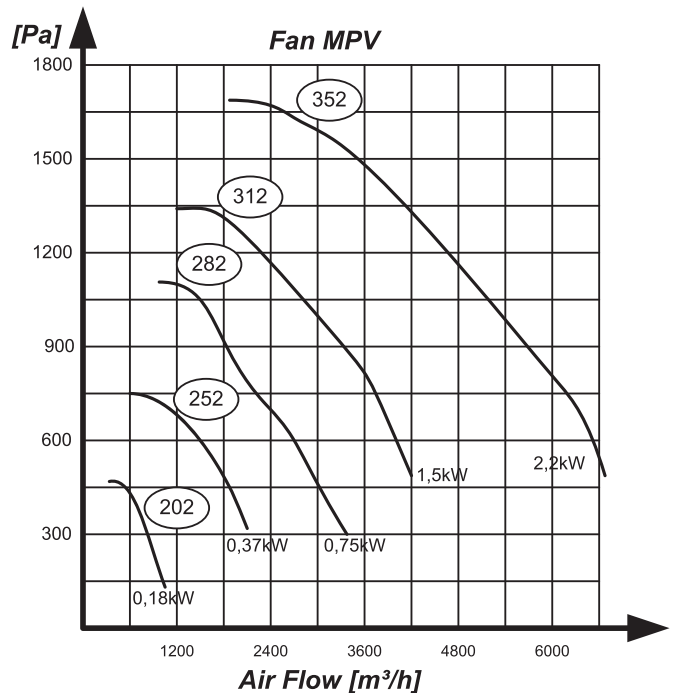
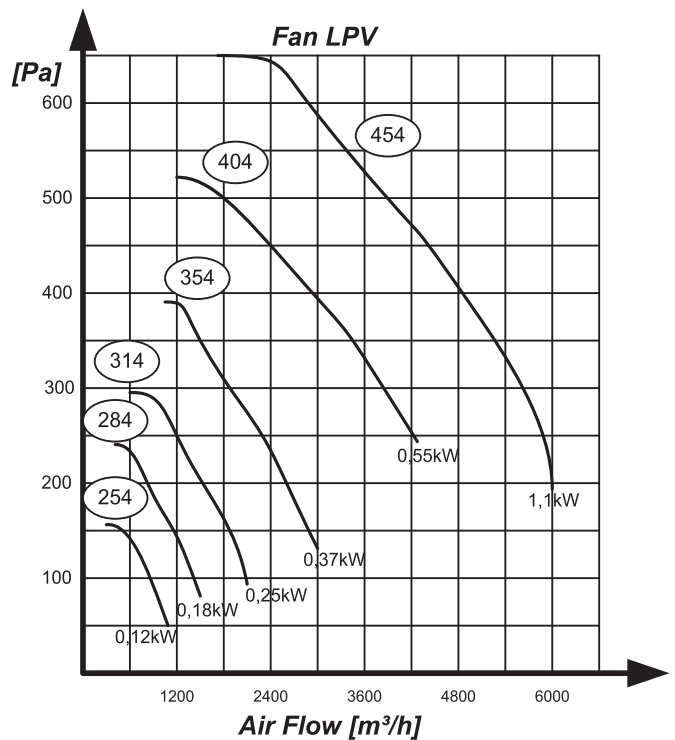
The GEOVENT plastic fan is typically used for general ventilation as well as for smaller process extraction jobs, where corrosive gases and fumes are extracted.

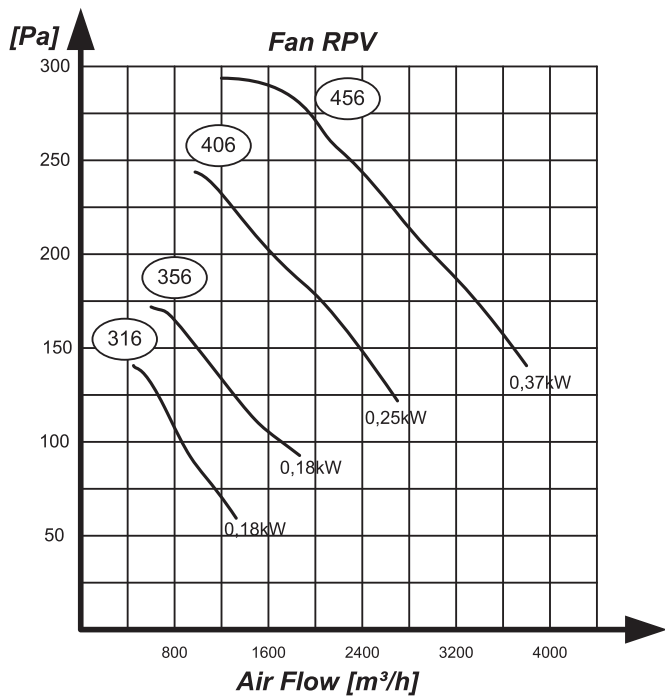
The Fan MEF is applied for process extraction within the industry for the extraction of welding smoke, exhaust gasses, grinding dust and vapours.

Temperature extracted air:	Max 70°C
Temperature surroundings:	Max 40°C

1.3 Technical Data

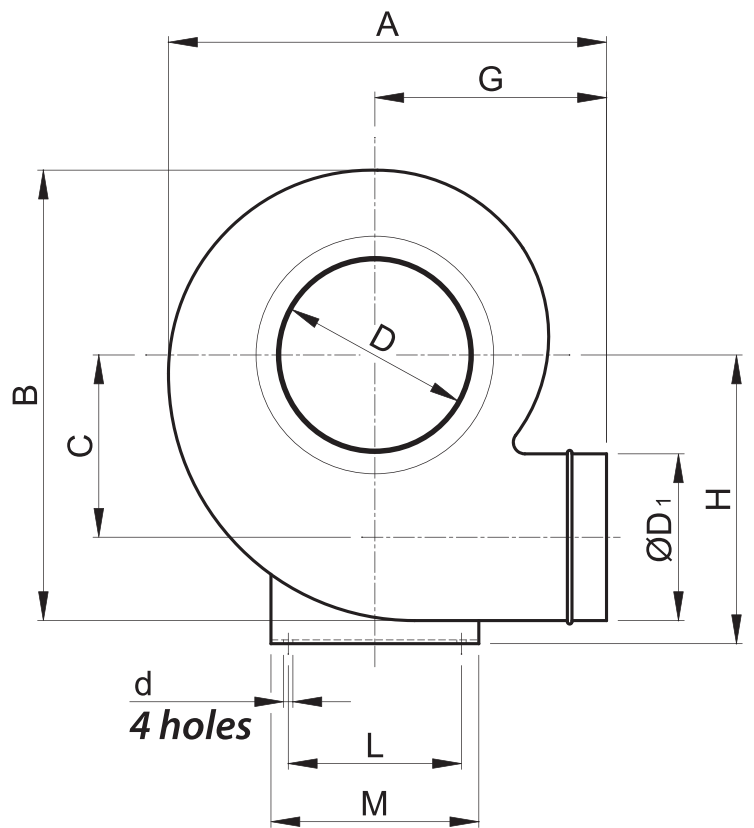
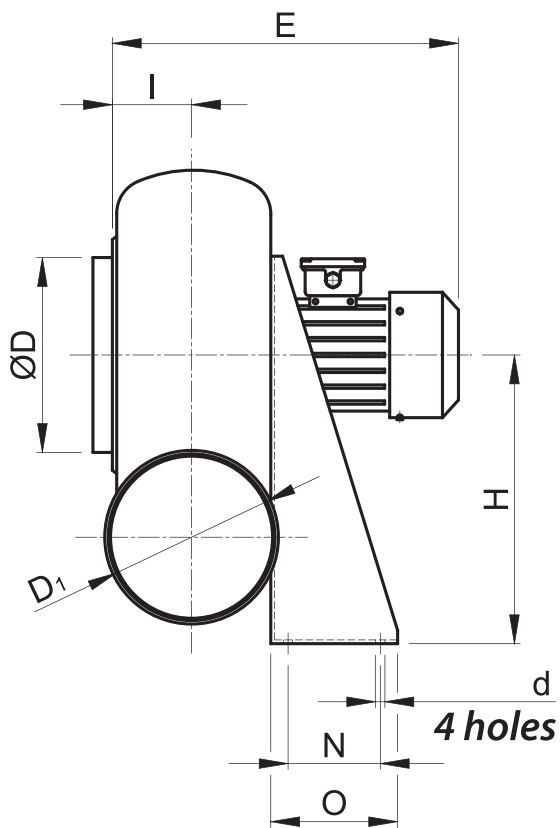
Pressure drop curves





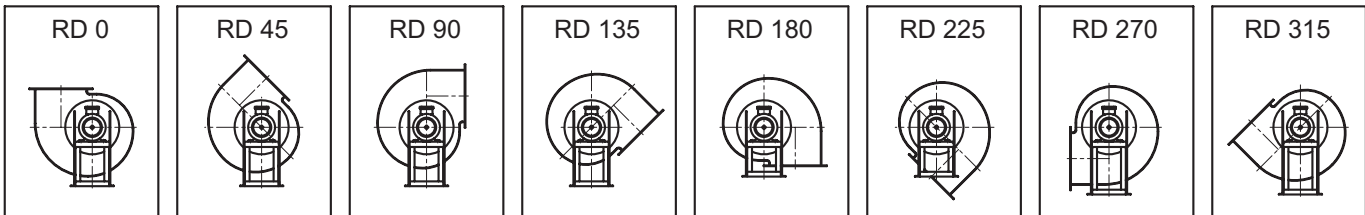
Type	Motor			Weight kg	Sound dB (A)
	A	rpm	kw		
MPV 202	0,49	2750	0,18	10	62
MPV 252	0,87	2820	0,37	12	71
LPV 254	0,42	1370	0,12	10	54
MPV 282	1,66	2820	0,75	22	75
LPV 284	0,58	1370	0,16	17	55
MPV 312	3,15	2850	1,5	31	79
LPV 314	0,8	1400	0,25	23	59
MPV 352	4,4	2870	2,2	38	80
LPV 354	1,13	1400	0,37	28	61
LPV 404	1,75	1420	0,55	38	69
RPV 406	1,0	920	0,25	34	56
LPV 454	2,6	1420	1,1	48	70
RPV 456	1,25	920	0,37	37	59

1.4 Dimensions

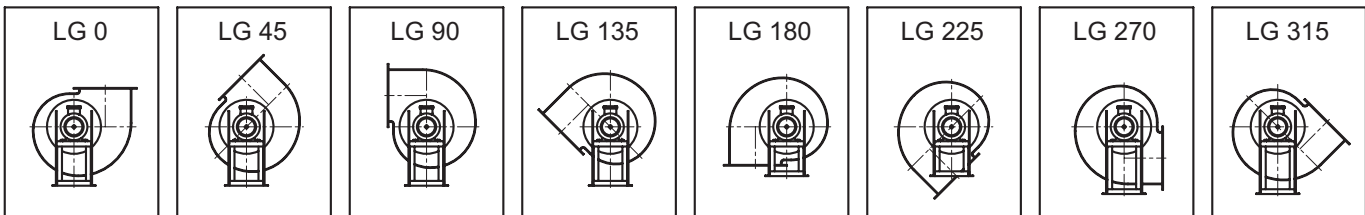


Type	A	B	C	E	G	H	I	D	D1	L	M	N	O	d
MPV 202	398	370	140	340	218	250	75	160	160	195	245	100	150	10
MPV 252	478	465	183	390	250	310	90	200	200	252	302	100	150	10
LPV 254	478	465	183	370	250	310	90	200	200	252	302	100	150	10
MPV 282	555	520	208	422	300	350	95	225	225	277	327	120	170	10
LPV 284	555	520	208	380	300	350	95	225	225	277	327	120	170	10
MPV 312	600	580	240	445	320	410	100	250	250	315	365	150	200	10
LPV 314	600	580	240	410	320	410	100	250	250	315	365	150	200	10
MPV 352	552	640	260	490	340	445	110	280	280	345	395	150	200	10
LPV 354	652	640	260	430	340	445	110	280	280	345	395	150	200	10
LPV 404	726	723	290	472	374	495	120	315	315	465	515	170	220	10
RPV 406	726	723	290	450	374	495	120	315	315	465	515	170	220	10
LPV 454	792	810	324	510	400	550	133	355	355	510	560	170	220	10
RPV 456	792	810	324	497	400	550	133	365	355	510	560	170	220	10

CLOCK WISE ROTATION. RD. (As seen from motor- or transmission side.)

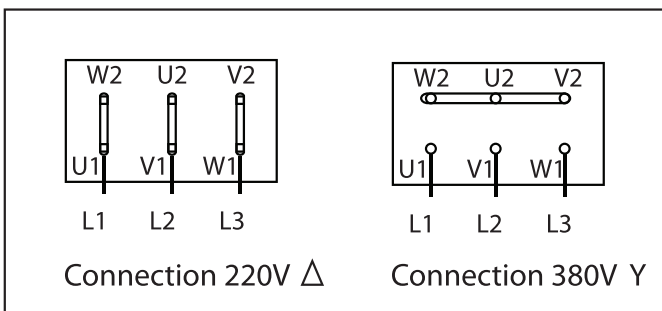


ANTI CLOCK WISE ROTATION. LG. (As seen from motor- or transmission side.)

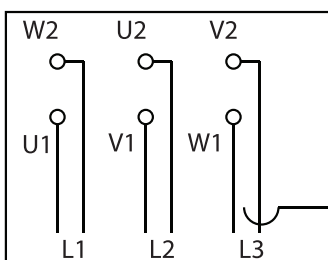


2.1 Connection of fan to the mains - standard motor

Motor voltage 230/400



Connection Y Δ



NOTE: The electric equipment should include the following components:
Fuses to protect against overload and voltage drop.

Adsorbed Ampere = Measured Ampere $\times (\sqrt{3})$

To the commutator Y Δ

- The direction of rotation should correspond to that indicated by the arrow.
- The absorbed current should not exceed that indicated by the motor plate.
- The fan should not show excessive vibrations.
- The bearing temperature should be constant (a temporary temperature increase and successive decrease is considered to be normal).
The temperature to be checked is the working temperature, i.e. the temperature should be constant.
- After some functioning hours, check the bolt tightening and the belt stretch and tighten if necessary.

IMPORTANT:

When starting the fan, it is advisable to keep the flap or the delivery regulator completely closed. The starting time is thus lowered avoiding overload. For the same reason, unless indicated otherwise, successive starting according to the instructions in the motor order.
Measure the electrical input on the three line wires (L1,L2,L3). In the connection Y
The reading should be carried out before the commutator, if impossible, measure the phase current on one of the 6 terminal board wires and multiply the value by $1.73 \times (\sqrt{3})$.

4.1 RESISTANCE

Radial fans equipped with impellers with radial or forward-curved blades should always be connected to ducts, which offers resistance to the fan. If the fan is turned on and not connected to ducts (with free inlet), the motor could burn, since the fan produces the maximum delivery and overloads the motor.

- a) If the duct system supplies the calculated resistance, the fan shows the calculated delivery and the motor electrical input correspond to that indicated in the table.
- b) If the duct resistance is higher than calculated, the fan shows a lower delivery and the motor electrical input is lower.
- c) If the duct resistance is lower than calculated, the fan shows a higher delivery and the motor electrical input is higher. Therefore, it is advisable to install a flap on the circuit to be adjusted when starting the installation.

4.3 GENERAL INFORMATION

a) Noise
The fan noise mainly comes from the base plate and on the connections to the intake and supply ducts. It is suggested to install the fan on a vibration-damping plate in order to reduce vibration propagation to the base plate. Also we suggest you isolate the fan from the duct system using vibration-damping flexible connections.

b) Electric motor protection.
The intensity of the current absorbed by the motor at steady state should not exceed the value indicated on the plate. If the current exceeds the value indicated on the plate, the absorbed current should be adjusted by decreasing the fan delivery by partially closing the damper.
To protect the motor, it is advisable to install an automatic damper equipped with thermomagnetic components. Check the switch contacts periodically.

c) Protection from accidental contacts.
All fans are equipped with protections against contact risks according to UNI 9219 specifications. Before starting the plant, technician and final user should check that all protections are correctly assembled, especially the housing protecting the transmission and the cooling impeller. It is strictly forbidden to start the machine without these protections.
It is also strictly forbidden to open the cleaning door when the fan is in motion. The door should be assembled when the machine is standing still.
NOTE: The risks due to foreign bodies and dangerous gas (explosive, flammable, toxic etc.) inlet should also be considered. Maintenance operations (cleaning, balancing, lubrication, door opening) should be carried out under SECURITY conditions. Therefore, it is necessary to electrical insulate the fan from the main engine before starting maintenance operations.

- ATEX version of the plastic fan. (Optional)

According to ATEX specifications, plastic fans from GEOVENT conform to 1/21 (2G/2D) zone and to 2/22 (3G/3D) zone, keeping in mind these following technical characteristics;

- Fully welded scroll house.
- Inspection fan door.
- Viton seal for motor shaft and scroll.
- Copper inserts for nozzle and impeller.
- Self-locking tightening bolt.

RADIAL FAN WITH IMPELLER WITH BACKWARD-CURVED BLADES

The plastic fan can also work in a duct system lower resistance without running the risk of burning the motor, since the fan causes a slight increase in supply with decreasing circuit resistance.
The plastic fans show their maximum power consumption near their maximum efficiency point. Therefore, the observations at a), b), c) mentioned above is also relevant for the plastic fan, except for power consumption.

NOTE: The impeller direction of rotation is indicated by the arrow on the housing side. If the impeller turns in the opposite direction, reverse the connections of two phases of the feeder line (threephase motor).

5.0 Maintenance

- HOUSING - NOZZLES Periodically clean inner parts and remove possible foreign bodies.
- IMPELLER
- Remove dirt and deposits that can cause unbalance. In case of abrasive powder suction, vibrations can depend on component wear, in this case replace the impeller as soon as possible. Periodically check the impeller welding. Do not separate hub and impeller, since it may endanger the balance.
- PULLEYS
- Check the alignment and adjust it, if necessary. Periodically clean the belts races accurately.
- BELTS
- Clean each side.
 - Check the tension and adjust it, if necessary.

Remember to always use a motor protection switch!

Always use adjustment damper!

5.1 Trouble-shooting

Trouble with the operation of the plastic fan may come from one of the following causes:

- Insufficient Supply.
- Excessive supply.
- Excessive power consumption
- Wrong starting.
- Air pulses, noise and vibrations.

INSUFFICIENT AIR DELIVERY

For radial fans, especially with forward-curved or radial blades, insufficient air delivery is combined with power decrease.

For radial fans with backward-curved blades power consumption does not show considerable changes.

For some special applications it shows a slight increase, this is true also for some axial fans.

Carry out the following operations:

-Check the direction of impeller rotation, a radial fan turning backwards blows anyway air into the circuit, but the air delivery is insufficient.

- Check the motor rotation speed and that the belts are not loose

a) Choose a straight air tube segment, preferably before the fan, and measure the immediate air supply at the connection piece.

b) Measure the static pressure during suction and supply, the difference indicates the fan static pressure.

-If the value obtained for a) is low and b) is equal or lower than the project value, the defect probably depends by the circuit and not by the fan. Check the circuit sections to detect too high flow resistance by checking the static and total pressure in the main points of the circuit.

Excluding estimation errors, flow resistance can depend by one of the following causes:

- Improper damper adjustment.
- There are two or more clogged bends or section, or very narrow sections of the ducts.

-A suction or diffusion grid is too close-meshed, an air delivery decrease through sharp edge openings. This type of punched or expanded metal protection placed on an opening can provide a free area 30% or more lower than the measurable passage area.

-Filter is clogged.

-There is a foreign body accumulation.

- Dampers are not positioned correctly or circuit components have not been installed.

-There are air leaks beyond the test points (for example opened inlet doors, wrong construction or installation of ducts or components) or beyond the masonry ducts.

-The bypass dampers are not completely closed (for example in a boiler installation).

- Imbalance between parallel-working fans, contact the distributor in this case.

- Excessive estimation of the circuit flow resistance, in this case the fan rotation speed should be decrease (or close the dampers) until reaching the desired performance.

NOTE: The risks due to foreign bodies and dangerous gas (explosive, flammable, toxic etc.) inlet should also be considered. Maintenance operations (cleaning, balancing, lubrication, door opening) should be carried out under SECURE conditions. Therefore, it is necessary to electrically separate the fan from the mains before performing maintenance work.

Excessive power consumption

It may depend on the following causes:

-A radial fan with forward-curved or radial blades delivers too much air.

- A radial fan with backward-curved blades turns in the opposite direction or an impeller with wrong direction of rotation turns correctly.

-There is an air pre-rotation during suction in the opposite direction with respect to the sense of direction of the fan. Check the suction hood.

-An AC motor turns at a lower rotation speed because of a defective winding or starting or because of a low supply voltage.

- DANGEROUS STARTING

It may depend on an excessive power consumption or one the following causes:

- The supply voltage is too low.
- The starting voltage on the transformer is too low.
- The maximum relay is not suitable for the starting conditions.
- There is a defect in the motor causing a static characteristic decrease.
- The evaluation of the moment of inertia of the fan rotating parts, with respect to the selected motor and its starting type, is wrong.

When starting radial fan, it is possible to restrict the load by closing the flaps completely until reaching full speed.

- Pulsing air, noise or vibrations Air pulses are caused by unstable air supply and may depend on the following causes:
 - An axial fan works within the initial area of its functioning characteristics under stall conditions.
 - Most fans working close to zero supply conditions may cause air pulses.
 - There are fan fluctuations in the parallel arrangement.
 - The suction has been connected improperly or is obstructed thus unsteady air inlet conditions (ex.: vortex)
 - The flow alternately touches or is detached from divergent duct walls.

Generally, all fans produce noise that should be reduced only if it is unacceptable. Noise may be caused by air, mechanical components, electrical hum or a combination of them.

Noise produced by air may increase because of obstructions near the fan suction and delivery. Noise is commonly due to a wrong fan choice. In this case, replace the fan by a noiseless one (generally having a larger diameter and a lower speed) or apply soundproof devices. The mechanical noise may depend on friction of moving parts, wrong bearing choice, sheet vibrations etc.

6.0 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 impellers 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 manual in all respects.

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

6.1 Declaration of conformity



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

Hereby declares that:

Product: Fan
Model: MPV/LPV/RPV

has been manufactured in compliance with the following directives and standards:
European Parliament and Council Directive 2006/42/EC of 17 May 2006 on machinery, and amendments to Directive 95/16/EC.

EN ISO 14121-1:2007
Risk assessment – part 1

EN ISO 12100-1:2005
Basic concepts and general principles for design.

EN ISO 12100-1:2009
construction and design Part 1: Basic terminology and methodology

EN ISO 12100-2:2005
Basic concepts and general principles for design.

EN ISO 12100-2:2009
Construction and design Part 2: Technical principles

Authorized to assemble the technical file:

Ole Madsen

Dato: 9/1-16

Stilling: Direktør
Navn: Thomas Molsen

Underskrift :



GEOVENT

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