GEOVENT

# INSTRUCTION MANUAL

# CHANNEL DUCT

Type 25

Version 2.0 23.04.10

www.geovent.com

## Contents



## 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.

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

Factory mounted parts must not be dismounted.

In order to secure correct suspension, in several places two persons are required during the installation.

## 1.1 Danger

Letting go of the hose/nozzle when demounting it from the exhaust pipe involves a risk of mutilation. Avoid being hit by the nozzle – and be careful not to hit someone else with it.

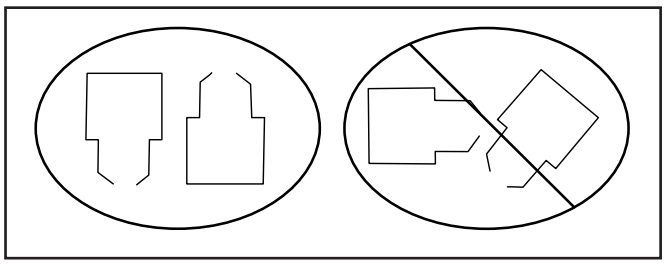
Hoses mounted on a trolley with spring balance F/LR: Do not let go of the hose, when it is completely pulled out, but keep a tight hold of the hose until it has been totally coiled up again. If the hose slips, it will coil up quickly, endangering people and machinery.

## 1.2 Field of application

The GEOVENT Channel Duct System is a rail system, developed for the extraction of exhaust fumes and welding smoke. When one or several trolleys have been correctly installed in the Channel Duct, the trolley may be moved linearly to the area, where it is requested. The hose is pulled down and the nozzle is fixed to the exhaust pipe.

It is also possible to mount the hose trolley with a hose reel (type LX or FB).

Alternatively, the Trolley may be mounted with a point extraction arm instead (type WING or COMPACT). The arm can rotate 360° and is suitable for the removal of welding smoke, etc.



The Channel Duct can only be installed in such a way that the rubber lips point either directly up or down.

The Channel Duct may not be used in areas classified as ATEX zones, for example extraction of aluminum, flour, textiles and wood dust and other media (eg. vapor / gas) which is associated with danger of explosion.

## 1.3 Technical data

| | |
|---|---|
| Temperature exhaust air | Max 150°C |
| Temperature surroundings | 0 - 50°C |

In special situations, where the temperature of the exhaust air is higher than 150°C, the standard hose may melt. In order to avoid such thing, various precautions may be taken: Please refer to the section regarding troubleshooting, item 4.1.

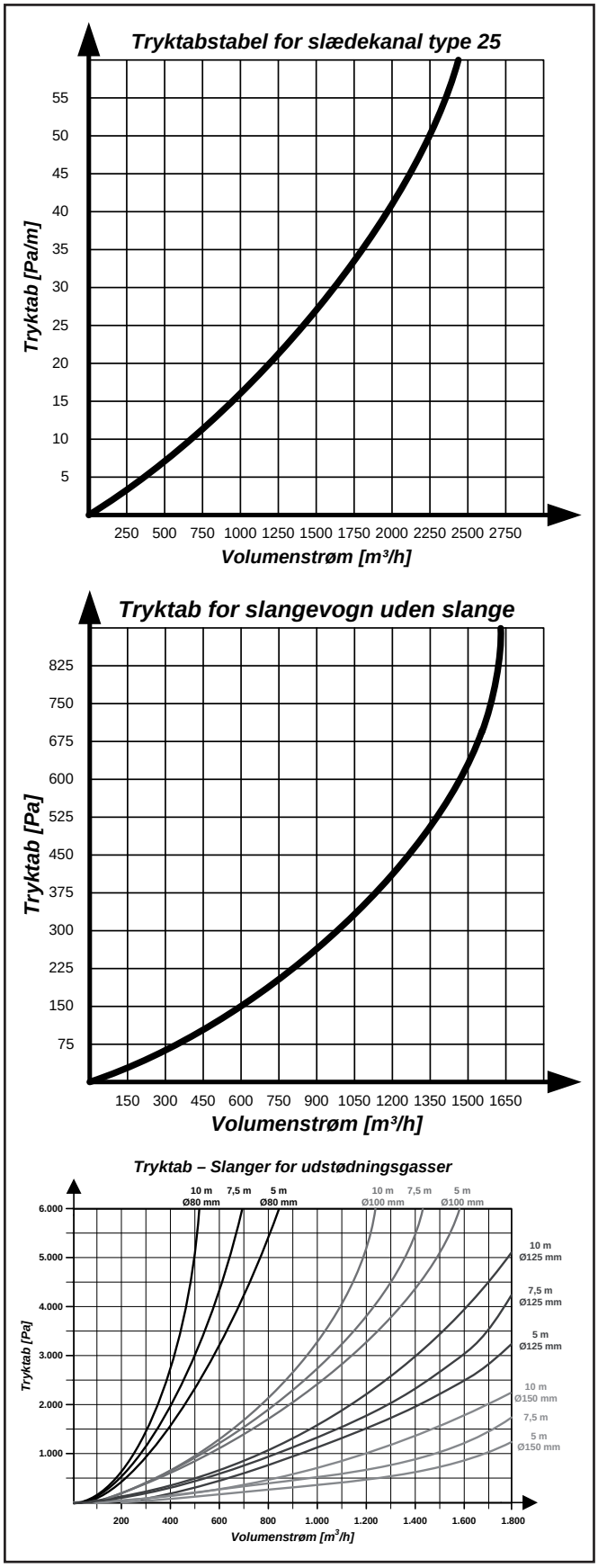
***Noise data***
The actual Channel Duct System does not emit any noise. The noise level depends on several factors, primarily the relation between the diameter of the hose and the extracted volume of air. If the hose has been under dimensioned in relation to the required volumes of air, wind roar may occur.

***Optimum volume of air***
Several factors are of importance when selecting the optimum Channel Duct solution. Depending on the application, the table below may be used as a guideline for the volume of air, which is requested for the various requirements.

| **Type of vehicle** | **Recomm. airvolume** | **Recomm. hose dia.** |
|---|---|---|
| Small cars | 300 m³/h | ø80/ø100 |
| Smaller private cars | 400 m³/h | ø100 |
| Private cars > 3000 ccm | 600 m³/h | ø125 |
| Vans/smaller trucks | 800 m³/h | ø125 |
| Trucks | 1000 m³/h | ø150 |
| Contractors machinery | 1000 m³/h | ø150 |
| Test stand | 1-2.000m³/h | ø150/ø200 |

The previous mentioned data cover idle running and are only intended as a guideline. Different projects may involve situations, where deviations from the table occur.

## Pressure drop for Channel Duct System

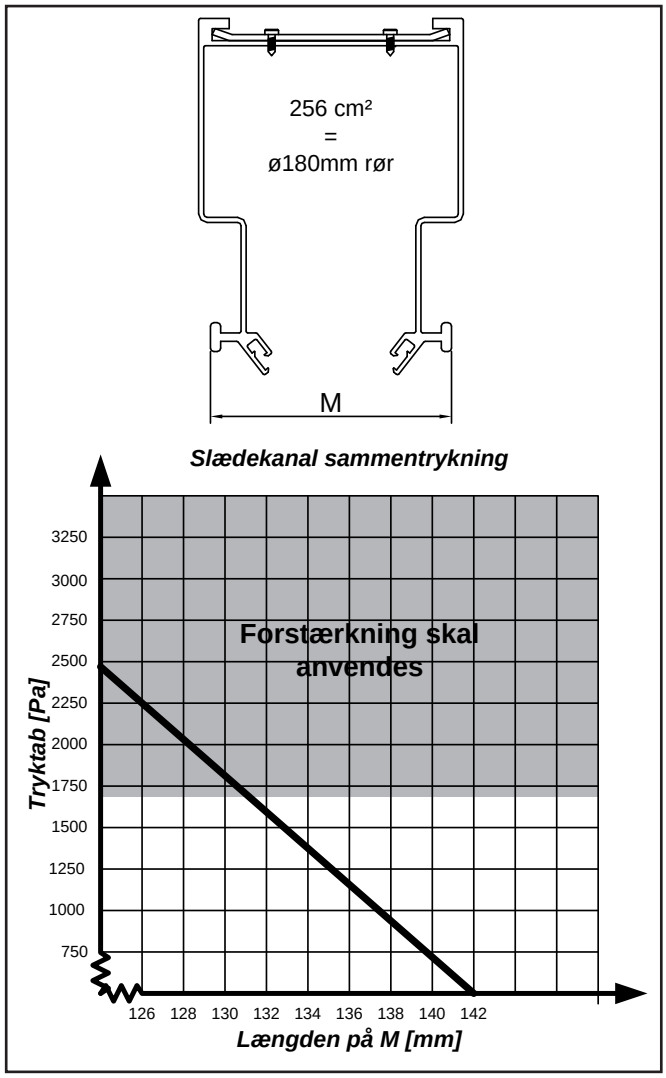



At the adjustment, the Hose Trolley is placed on the rail system in such a way, that the trolley is as far away from the fan as possible.

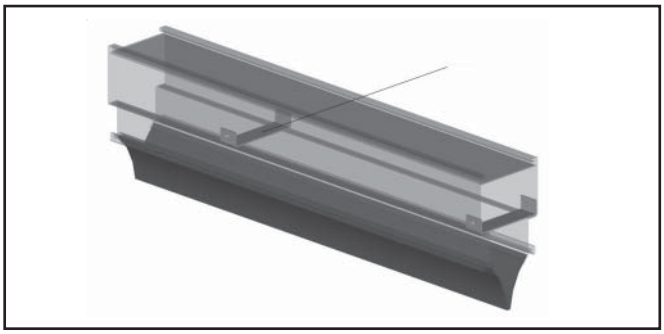
A number of factors may influence the drop of pressure in the system. For example, it depends on how many trolleys that are connected to the Channel Duct System, where they are placed as well as how many duct connections – and how the duct connections for the fan are placed. In addition to this, the length and the dimension of the hose as well as the way in which it is suspended are decisive for the drop of pressure.

***Weight:***
The Channel Duct weighs 9 kg/m without rubber lips, mounting parts, trolley etc.

***Capacity:***
The profile of the Channel Duct corresponds to a ø180 mm spiro pipe. Recommended max. volume of air per trolley = 2.000 m³/h
For airvolumes > 1.200m³/h a special trolley is necessary



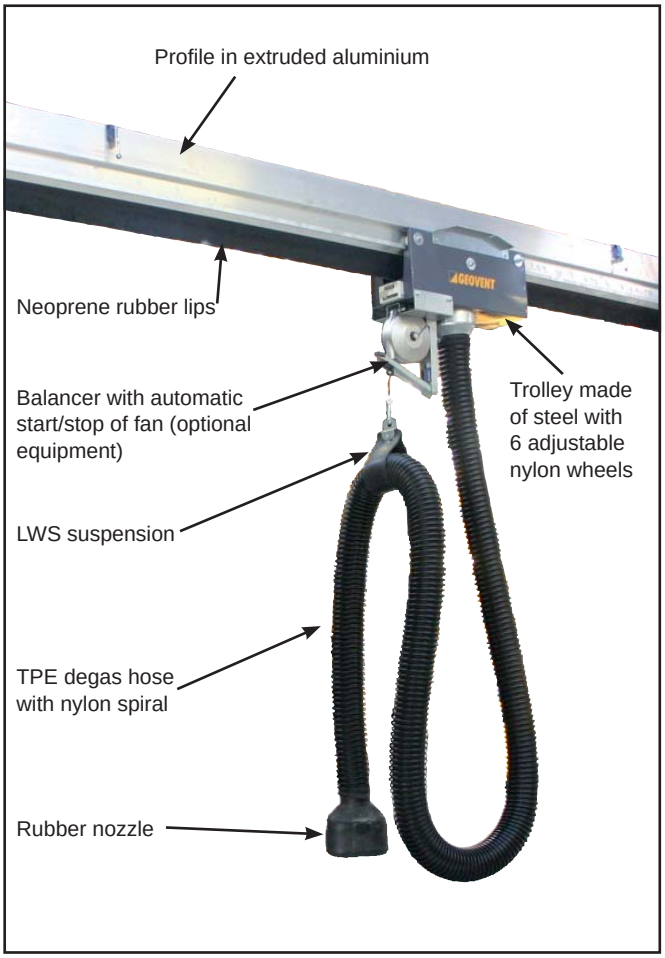
***Guide strap***
– for increased under pressure in the Channel Duct. In some situations with high under pressure it will be necessary to use a guide strap in order to stabilise the Channel Duct. The strap should always be used, when a welding arm is mounted on the trolley or if the drop of pressure exceeds 1,700 Pa.



*The guide strap is mounted at intervals of 2 meters.*

## 1.4 Construction

Standard layout for exhaust:




The rail: The actual Channel Duct (the rail) is made of extruded aluminium profile. Neoprene rubber lips are fixed to the rail and are completely tight-fitting at a 5-600 Pa vacuum. They are self-sealing. The neoprene rubber lips cannot be used for oil/oil vapours. Please order the Channel Duct with nitrile rubber lips instead in such cases.

Trolley: Powder enamelled steel, complete with 6 smooth-running nylon wheels.

Balancer: Safeguards that the hose does not take up floor space and that it is easy to operate. Extension length and capacity vary from system to system (optional extras).

Hose: TPE degas-hose with nylon spiral. The hose may conditionally be run over. Temperature resistant up to 150 C°, however briefly up to 170° C. Alternatively, a silicone high-temperature hose, type GeoFlex HT is available, offering a temperature resistance of up to 300°C

Nozzle: To be fixed to the exhaust pipe of the vehicle. Available in many different executions, such as rubber and steel, with or without tools, etc.

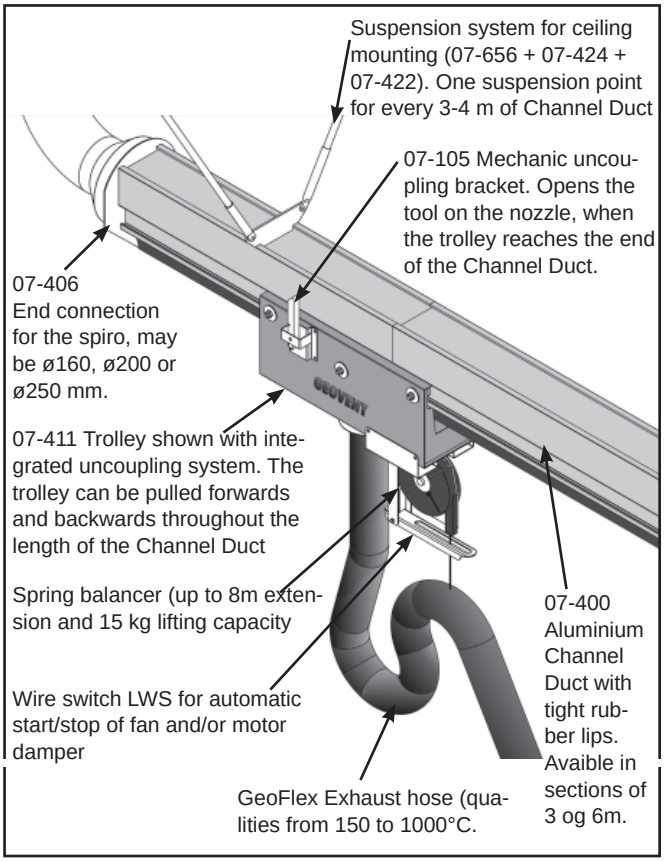
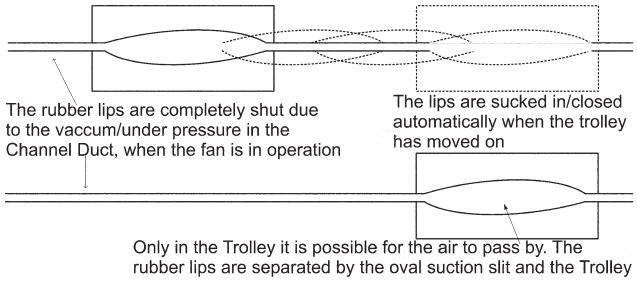



***Table of dimensions of the Hose Trolley***

**Functioning of a Channel Duct:**

On the drawing it is illustrated how a Channel Duct System is functioning. The system is seen from below and it shows how the rubber jaws are expanded, when the trolley is moved.




## 2.0 Installation

The Channel Duct System is supplied in disassembled state. The Channel Duct is supplied in lengths of either three or six meters.
The Channel Duct should be fixed for every two to four meters.

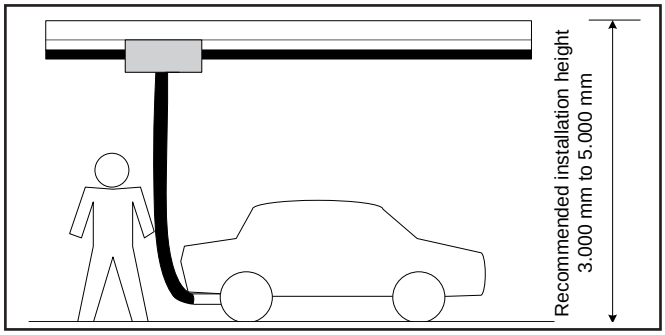
The following installation should only be carried out by a skilled fitter.

Before mounting, please consider the following:

- Space requirements for the satisfactory installation and service of the Channel Duct System.
- Optimum connection possibilities for piping and automatics

The Channel Duct may be mounted both in an even and in a sloping ceiling, on a concrete girder/rafter and on the wall. Furthermore, the Channel Duct may also be mounted on a column or on a carrying arm (special equipment).

The drawing below shows the recommended installation height.

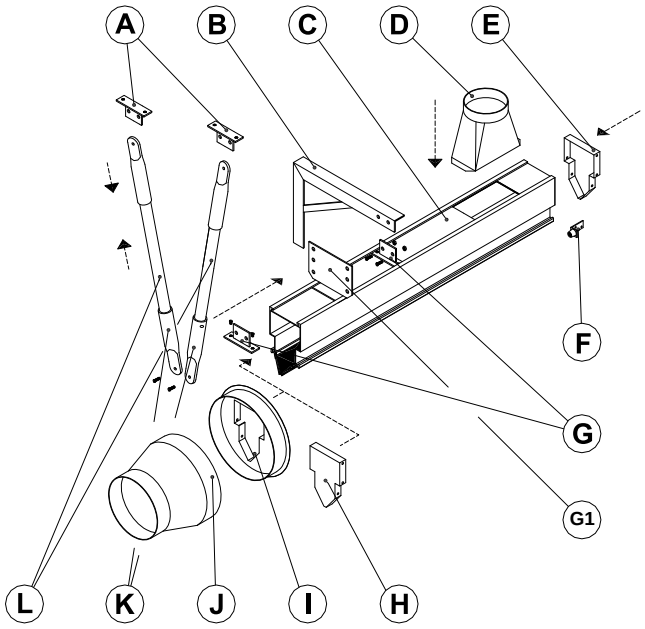



Tools to be used
Drilling/screwing machine, mounting kit (accessory bag with screws, etc.) compass saw, felt tip, spanner or socket wrench set, silicone or aluminium filler.

For Channel Ducts of more than 50 meters also a 3M quick glue for the joining of the rubber lips is requested (optional equipment).

We also recommend using two lifts for lifting the Channel Duct up to the required mounting height.

Depending on the individual application, one or several of these components may not be included in the individual project.




A: Ceiling bracket, capable of tilting, depending on the angle and the inclination of the roof. Two brackets are required for every attachment point.

B: Wall bracket for the mounting of the Channel Duct on a wall.

C: Channel Duct, type 25 in extruded aluminium with heat resistant neoprene rubber lips.

D: Transition piece (pressure connecting piece) for round channel for top mounting.

E: End cover, type 25 in galvanised steel (remember to use sealing agent).

F: Stop. To be mounted on the rail system at the end of the Channel Duct length approx. 5 cm from the end.

G: Suspension brackets, type 60 in galvanised steel. To be used both for mounting in the ceiling and on the wall. For suspension on the side of a concrete girder, please use suspension bracket, type160 (G1) instead.

H: End cover, type 25 in galvanised steel.

I: End transition piece, nipple ø250 mm, the end of the Channel Duct to round channel. Remember to use sealing agent.

K: Coupling bracket for distance pipes (set of two) galvanised. Two sets are necessary per attachment point.

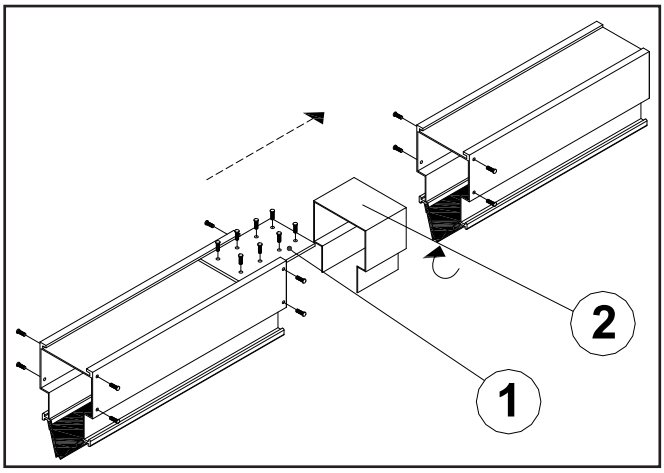
L: Distance pipe 3/8”, galvanised. To be joined by means of coupling brackets in both ends. Two items are necessary per attachment point.

Procedure:

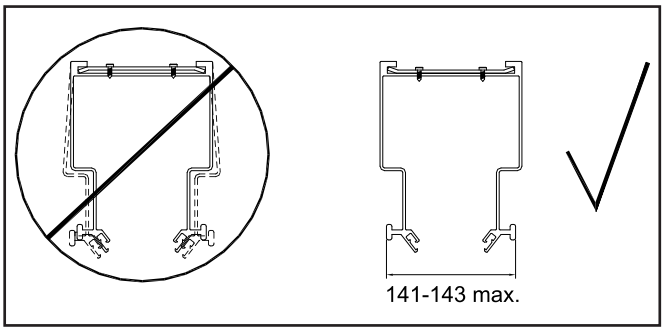
1. Start by fixing the bracket in the ceiling, on the wall or on a concrete girder with a suitable distance on the required surface. (Please refer to symbol A, B or G1 (see previous figure), for example.) Remember that the mounted Channel Duct is utilized in the very best way, if it is mounted in a height of 3-5 meters.

2. When using a tilting bracket and distance pipes, please make sure that the Channel Duct is mounted true to spirit level, since the trolley is operated optimally, when the installation is completely on level.

3. Then the Channel Duct pieces are to be assembled to the required length. Do so by laying the Channel Duct lengths end to end; then assemble the pieces individually. Half of the smaller union is mounted in one of the Channel Duct lengths, where it is fixed as shown on the picture.



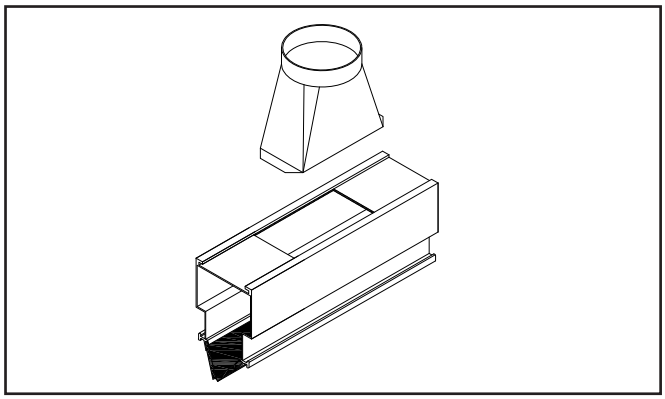

4. Remember to turn the junction plate (above) the correct way. I.e. with the bend turning up.




5. Then the other Channel Duct length is assembled by means of the union, which is fastened. Follow this procedure until the required total Channel Duct length is assembled.

6. If the connection of the Channel Duct to the fan/ piping system is to be top mounted (like symbol D (figure 1)), then the holes for the duct connections must be made now. As a rule of thumb, top mounting is always an option. The connection at the end of the Channel Duct should only be used on Channel Duct lengths of up to 18 meters. Go to item 8, if the connection is to be made at the end of the Channel Duct.

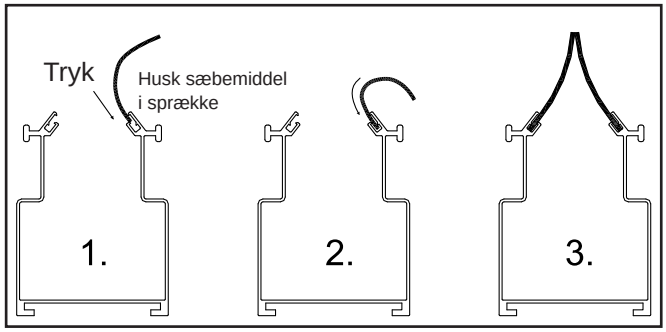
7. Now the pressure connecting piece is placed in the required place, and subsequently the hole to be sawn is drawn up by means of a felt tip from the inner side of the pressure connecting piece. The pressure connecting piece is removed and a hole is drilled on the line drawn up. Make sure that the line is long enough so that a compass saw can be used. The same procedure is followed in all places, where top duct connections are to be made. The hole should not be any closer than 1 meter from the end of the Channel Duct. Remember to place the duct connections at regular intervals on the Channel Duct in order to even out the drop of pressure over the whole length of the Channel Duct.



8. Then the rubber lips are fastened to the profile (after the assembly of the Channel Duct lengths). Do this before the suspension of the Channel Duct. Quite a lot of the supplied soap (the brown substance in a bag!) is applied to the slit of the Channel Duct.

**NEVER use grease or oilcontaing substances**

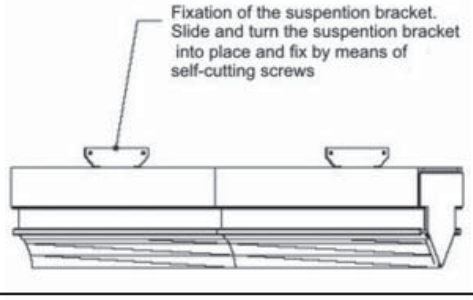
Now press approx. 30 cm of the neoprene rubber lips into place (in the slit) at a time. Get a good hold with both hands and press a small part down at a time. This is an operation requiring a great deal of patience. A screwdriver may be used for pressing down the rubber.



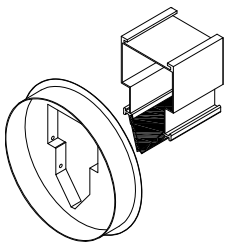
9. Geovent can also offer the use of an assembly trolley to facilitate the mounting of the rubber lips on the Channel Duct. Use the soapy substance in the slit on the Channel Duct and start from one end. Assembly with tools is an option, when the Channel Duct has been suspended. Please note: Two fitters are required for this process – one to operate the rubber tool, while the other one holds the roll with rubber lamella.

10. Now test that the neoprene rubber lips have been properly fixed to the Channel Duct. Subsequently they are fastened with a self-cutting screw in both ends of the Channel Duct, approx. 2 cm from the end.

11. Suspension of the Channel Duct in the ceiling, on the wall or on a concrete girder: We recommend using two lifts, so that the Channel Duct can be lifted at the same time. The suspension brackets are turned onto and are fastened on the bracket from the wall or from the ceiling. Subsequently, the bracket is to be fixed to the Channel Duct by means of self-cutting screws.



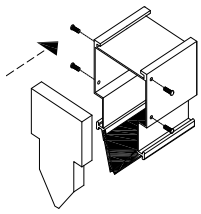

12. The connection of the Channel Duct to the fan/ piping system may take place either via top-mounting or by connecting a transition piece to the end of the Channel Duct. To be fixed by means of self-cutting screws.



13. Preparation and mounting of the Trolley (some spring balancers may be factory-mounted (optional extras)).

14. Adjustment of the friction of the Channel Duct. Please see the last page.

15. Now the stop and the end cover are to be mounted. The end cover is fixed by means of self-cutting screws, and the stop is fixed with a bolt.

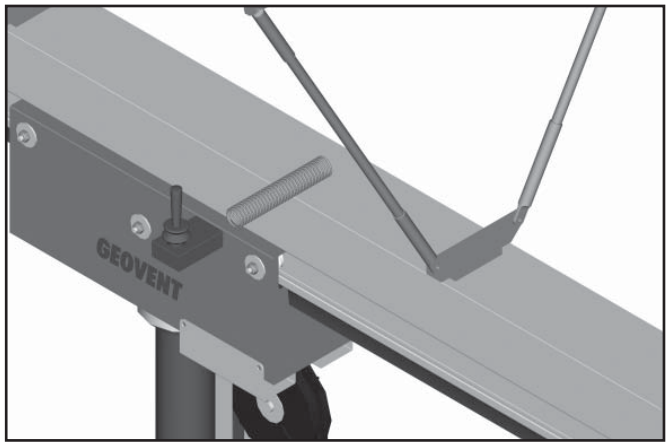


16. Now the Channel Duct System is to be sealed. Do so carefully by using silicone or the aluminium sealing agent in places, where the system is not tight. Often, this is the case at the end of the Channel Duct and by the duct connections.

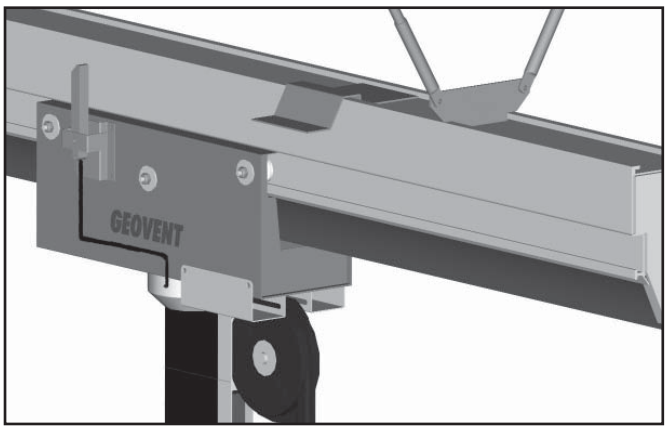
## 2.1 Optional equipment

The Channel Duct System may be supplied with quite a few optional extras. Below, you will find some pieces of good advice for the installation/connection of some of the most common types of optional equipment.

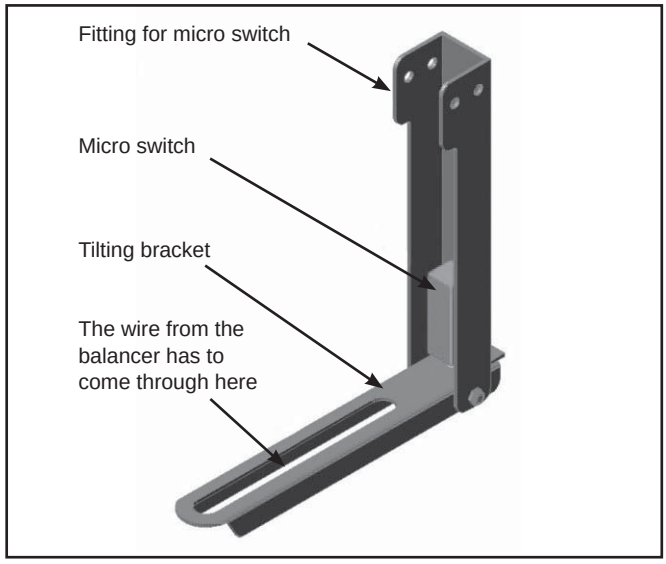
***Automatic uncoupling, pneumatically***
By using a compressed air nozzle (pneumatic), the nozzle can be uncoupled at the end automatically.



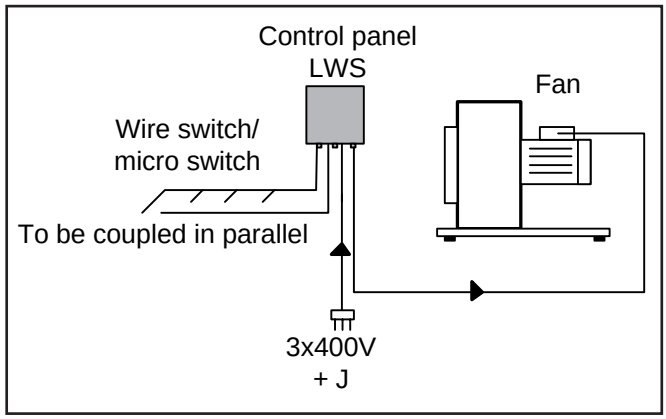

***Automatic uncoupling, mechanically***
For mechanic uncoupling, a Bowden cable and a nozzle with tool and release device must be used.



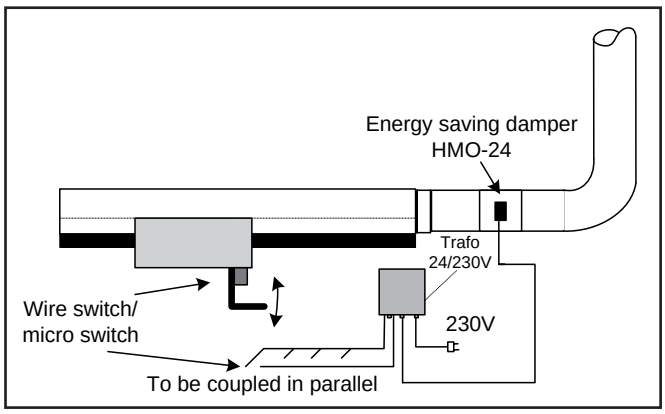

***Automatic start/stop***
Wire switch for automatic start/stop of the fan. To be used in connection with conductor rail and LWS control panel. May be connected to either 24V (recommended) or 230V.



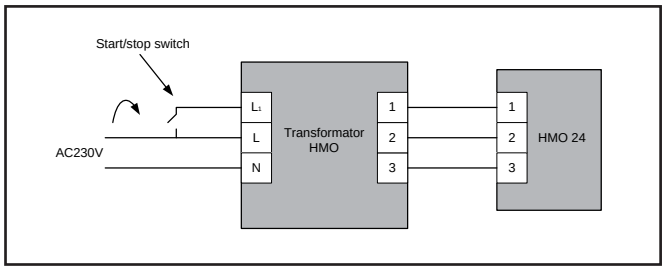

***Connection diagram for automatic start/stop***




The start/stop automatics may also be used together with a quick-action motor damper (for connection, please refer to the drawing below).




***Connection diagram for HMO damper***



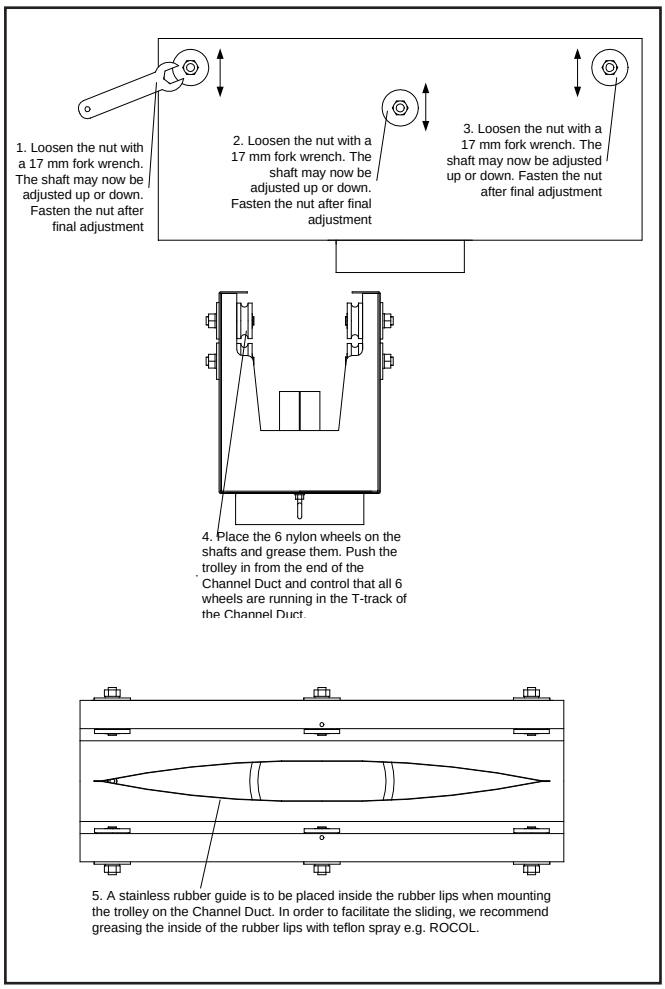

## 2.2 Trial run – exact adjustment

After the installation has been completed, please check whether the Trolley can be operated satisfactorily. The hose is moved to the required working area and subsequently it is returned. If this is not satisfactory, then the trolley can be adjusted according to the instructions in item 2.3.

We also recommend checking if the fan is supplying the volume of air, for which the system has been dimensioned. If the suction is not sufficient, then the risk of the hose melting is increased, and if the suction is too high, then the trolley will be sluggish to move.

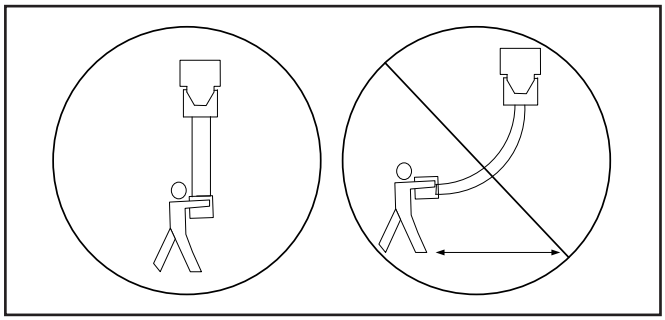
## 2.3 Adjustment of the Trolley

The trolley has been adjusted by the factory, and therefore only an exact adjustment should be carried out, if the trolley moves slowly. For the adjustment of the Trolley, please follow the instructions below:




## 3.0 User instruction - application

After the installation, the Channel Duct does not require any special instructions. However, the Trolley is often moved by the operator. In order to secure a long working life of the system, the trolley must always be shifted/pulled below the Channel Duct, as shown on the drawing below. If this is not complied with, the life of the system will be substantially reduced.



The Channel Duct System will not work according to the intentions if …

- Unauthorised parts are mounted on the rail system, the Trolley, the hose or on the nozzle.
- The rail system is used for other purposes than for which it was originally intended.
- The fan is not switched on – the hose will melt!

## 4.0 Maintenance

Periodic maintenance

- At regular intervals, the Trolley must be serviced in order to secure optimum operation.
- In continuation of the above, we also recommend treatment of the rubber lips with Rocol Teflon spray, for example, in order to reduce the friction.
- The hose cannot be maintained, however, in order to secure a long working life overrunning the hose with any vehicles should always be avoided, check that the correct volume of air is extracted, and that the hose does not bend/evert too much just after the exhaust pipe.
- Measure the volume of air on the Channel Duct System at least once every year. If the volume of air is too small, a hole in the hose may be burnt.

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

## 4.1 Troubleshooting

In case of problems with the Channel Duct, the points mentioned below may be followed when attempts are made to solve the problems:

***Typical problems with the installation/ mounting of the Channel Duct:***

- Fixation of the neoprene rubber lips. Follow the mounting instruction in item 2.0.8

***Problems with the operation of the Channel Duct.***

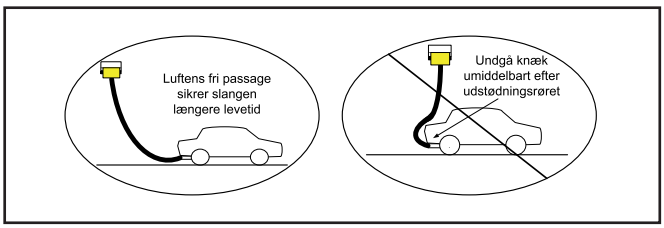
- The Trolley moves slowly – a pull of more than 10 kg to move the trolley is needed. Adjust the wheels, reduce the under pressure, mount guide straps and check that the Channel Duct does not bend. The rubber lips may have turned brittle, if they have been exposed to oil/oil vapours. Exchange the rubber lips with nitrile lips.

***Noise problems:***

- The base on which the Channel Duct and/or the fan are/is placed is unstable.
- More air is extracted than for which the equipment has been dimensioned. Use an adjusting damper.

***Problems with the hose:***

- The hose melts near the nozzle. This happens if there is not sufficient suction on the equipment or if the hose bends much just by the nozzle. May be rectified by increasing the volume of air or by exchanging the hose near the suction nozzle with 1 – 2 m of high-temperature hose.




- For vertical exhaust pipes we recommend using a 06-200 “gooseneck nozzle”.

## 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 trolley wheels, hoses, etc. 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 or reconstructed in any way. Any changes causes abolition of the responsebility of Geovent A/S.

Moreover, we refer to the current terms of sale and delivery at www.geovent.com.

## 6.0 Declaration of Conformity according to Bilag IIA

GEOVENT

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

Declares as producer hereby that:

Product: Channel Duct System
Model: Type 25

is in accordance with the following Directives and Standards:

European Parliament and Council Directive 2006/42/EC of 17 May 2006 on machinery and amending Directive 95/16/EC

| | |
|---|---|
| EN ISO 14121-1:2007 | Risk assessment - Part 1 |
| EN ISO 12100-1:2005 | Basic concepts, general principles for design |
| EN ISO 12100-1:2009 | Construction and design Part 1: Basic terminology, methodology |
| EN ISO 12100-2:2005 | Basic concepts, general principles for design |
| EN ISO 12100-2:2009 | Construction and design Part 2: Technical principles |

Authorized to collect the technical file:

Ole Madsen

Date: 01/04-10

Position: Technical Director
Name: Thomas Molsen

Signature :

CE