

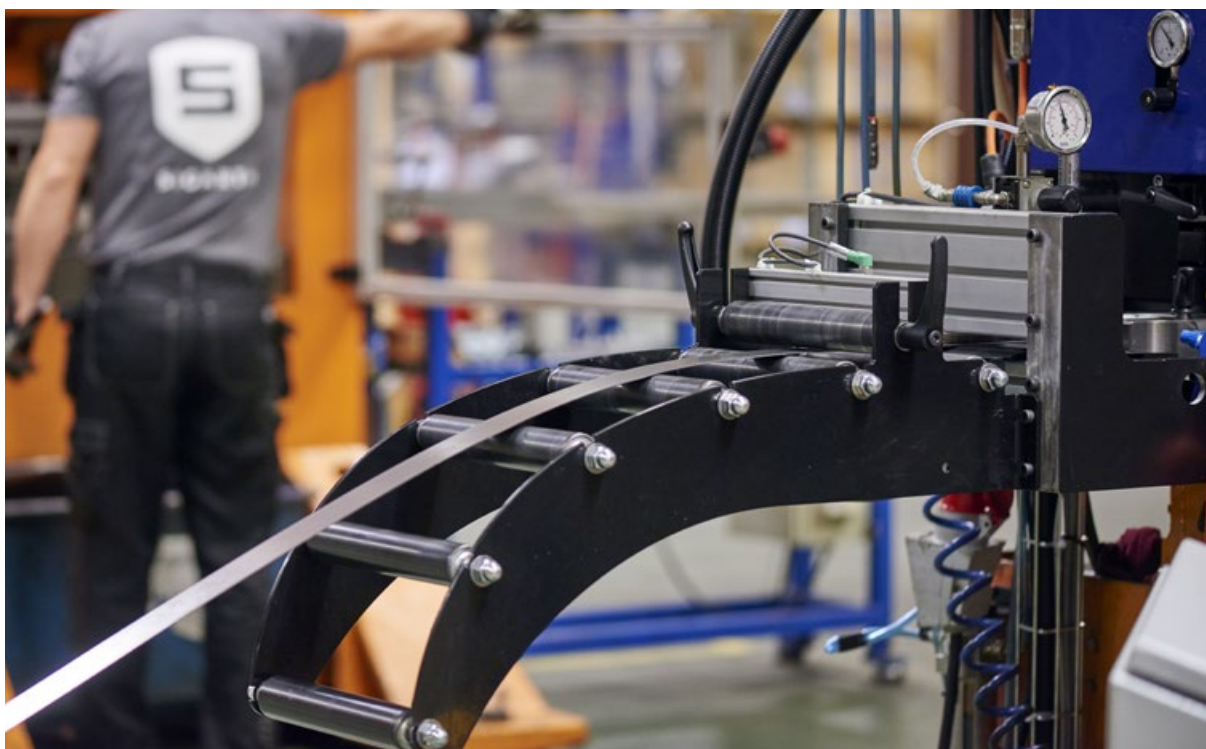


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## **AIR INTAKE DUCT**



SIGARTH



## SIGARTH AB

### OUR SOLUTIONS MAKE THE WORLD MORE SECURE

#### A MARKET LEADER IN THE HVAC INDUSTRY

Sigarth in Hillerstorp is a market leader in suspension systems and accessories to the radiator industry. We are an international company and are part of the already listed Midway Holding.

At Sigarth, we are market leaders who take responsibility and deliver on our promises. Market leaders who put in extra effort, rising beyond to see that little further. We know what it takes to be a leading and competent partner to the HVAC industry. Our MONCLAC® suspension system is well known in the HVAC branch for time saving and stability and has set the standard for an entire industry.

#### YOU CAN RELY ON US

With over 50 years of industry experience, and through close cooperation with radiator manufacturers in Europe, we have built up a knowledge base within the company over the years that is of great benefit to our clients.

At Sigarth we want to continue taking on new challenges, to be a step ahead and to find creative solutions for our clients' needs. With our own design department and skilled and experienced staff, we can continue to develop unique solutions for our customers. Continue to be a resource, a partner to clients in the radiator industry.



## A DEVELOPMENT RESOURCE AND PARTNER...

At Sigarth we like to be thought of as a close partner, not merely as a subcontractor. Through our close partnerships with radiator manufacturers across Europe and our focus on skills and experience, we will continue to be a resource for our clients when it comes to design and development. That way, we can deliver the best possible client benefits.

## ...IN EUROPE AND ACROSS THE WORLD

To further consolidate our position as the market leader, we will continue to develop, produce and market new products and solutions in Europe and across the world. Products and solutions that set the benchmark for safety. Products and solutions that make the world a little safer.





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## AIR INTAKE DUCTS TO AIR SUPPLY APPLIANCES, RADIATORS

Cities are becoming ever more populated and is necessary if we are to cater to these demands. This also means that they are being built in places with higher noise levels in the outdoor environment while more are being built using precast concrete. This means that there are higher demands on noise reduction in the indoor environment.

Sigarth has therefore developed a standard series outside air duct with a noise reduction of up to 62 dB independent of the type of wall

and insulation. The basic idea to Sigarths outside air duct is that all sound reduction occurs in the outside air duct.

The outdoor air duct is in the S channel in three standard heights which are 300, 470 and 570 as well as a straight circular channel. S-channels are equipped with a telescope, which means that the channel is very flexible and suitable for wall thickness of 300 upward. They are also equipped with a hatch to facilitate cleaning of the canal.



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### **MATERIALS AND VARNISH**

- All metal parts are made of galvanized sheet.
- Rock wool(stone wool) is used in all insulation and protection against fiber release with woven press felt.
- RAL 9016 on all painted details.

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### **TESTS AND TECHNICAL REQUIREMENTS**

The requirements placed on the outside air ducts include:

- Must be cleanable for its entire length
- Filter F7 has a final pressure drop of 15 Pa at air flow of 10 l/s.
- The channels opening is fitted with a pest-proof grid
- The outdoor air duct should be provided with supplementary wind / storm flap inside the apartment
- Noise reduction to minimum 58 dB (Sound class B 57 db)

To ensure that Sigarth's S channels noise reductions meet the requirements set, extensive tests were carried out in December 2015 at SP in Borås in regulation with EN ISO 10140-2.

See compilation and the individual test protocols

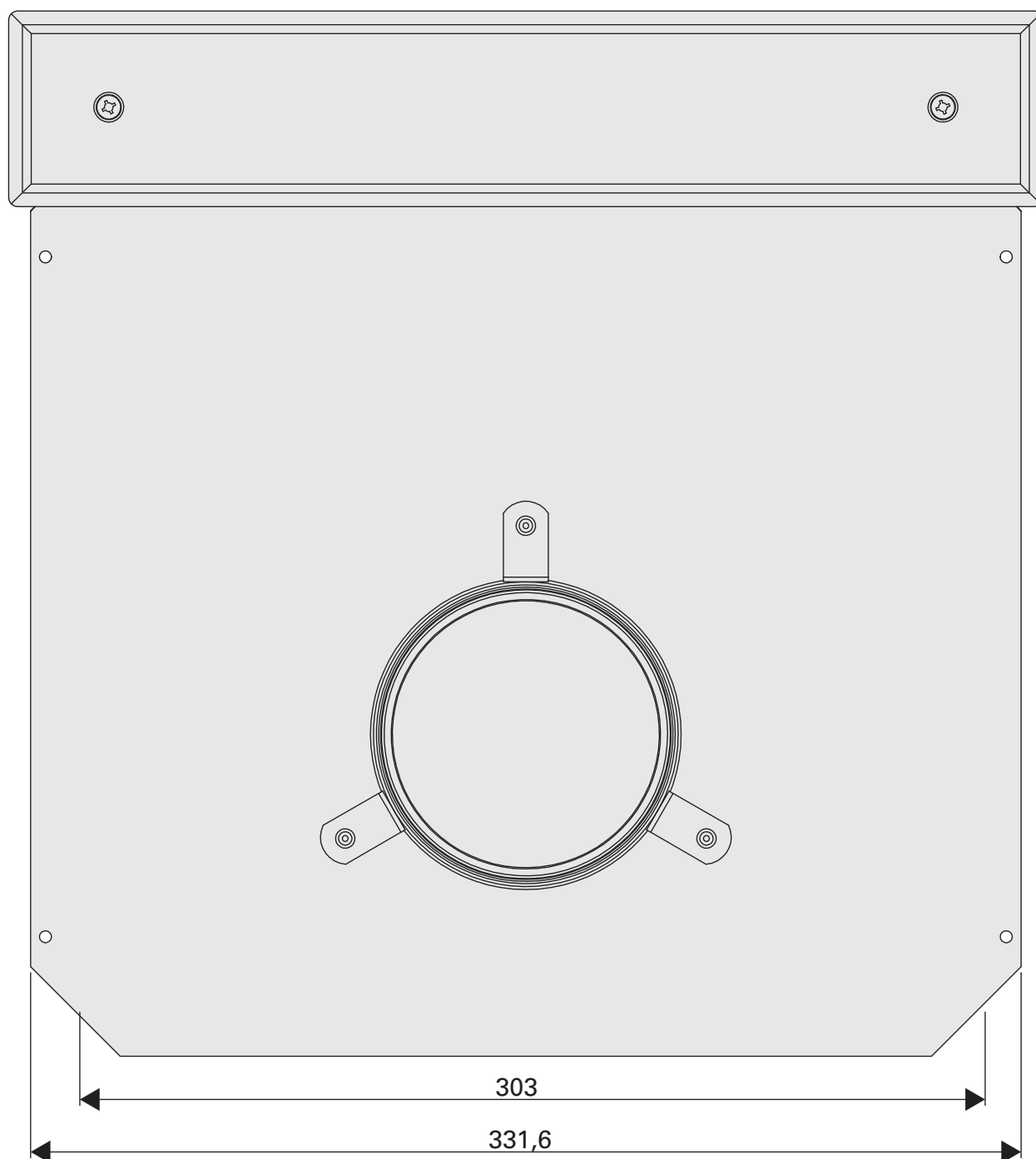


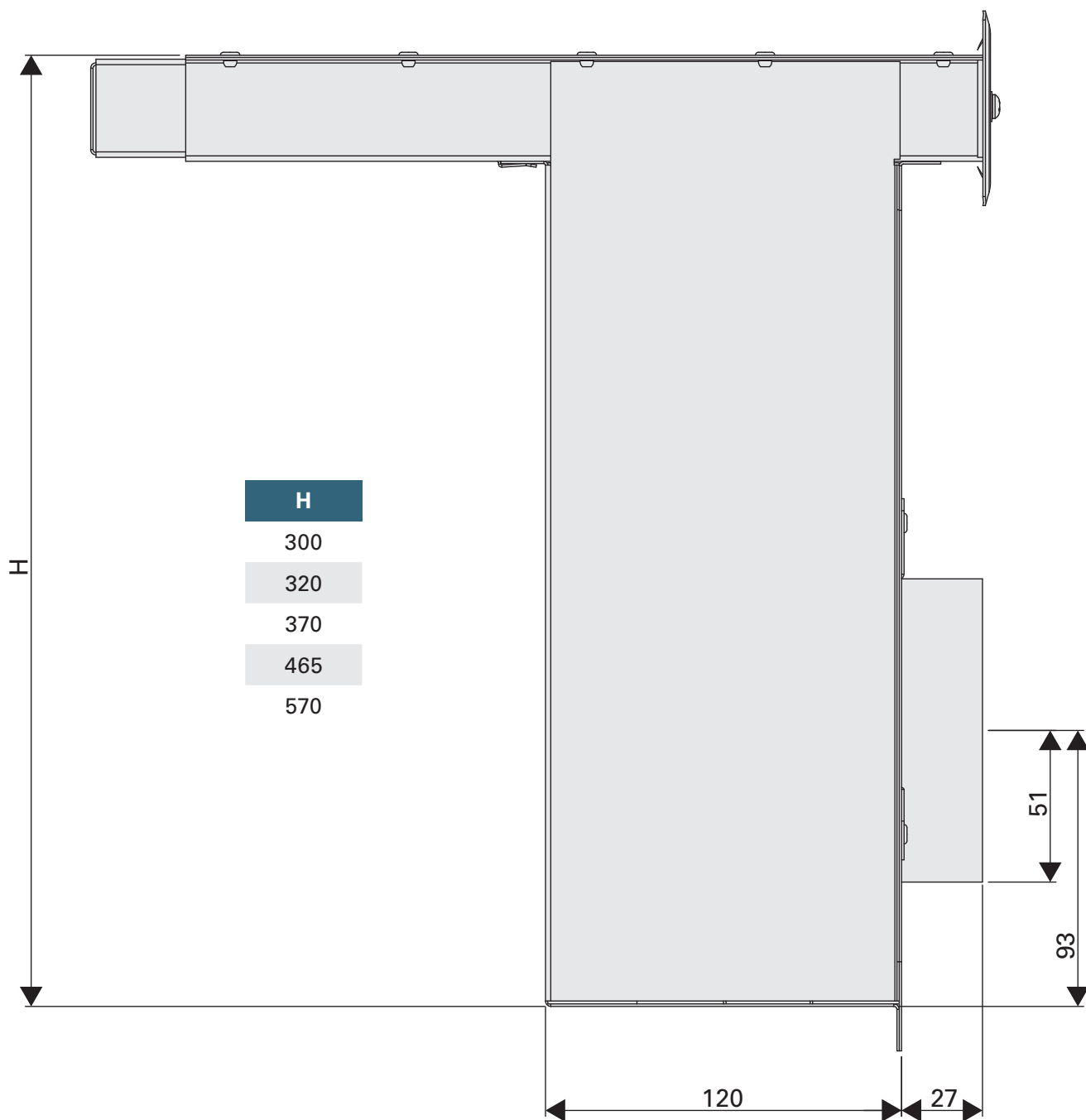


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## MEASUREMENT

All measurements are in millimeters.

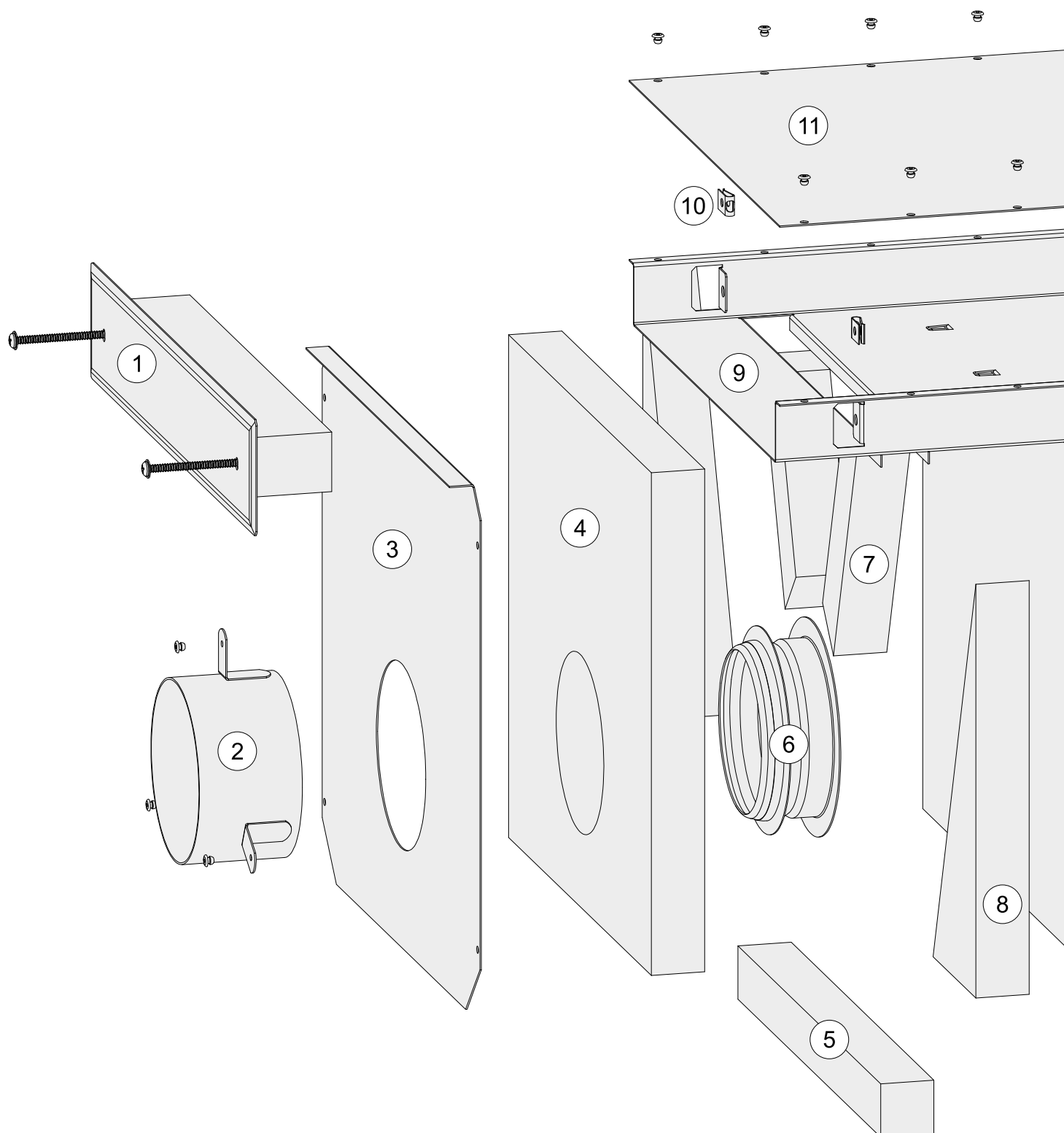




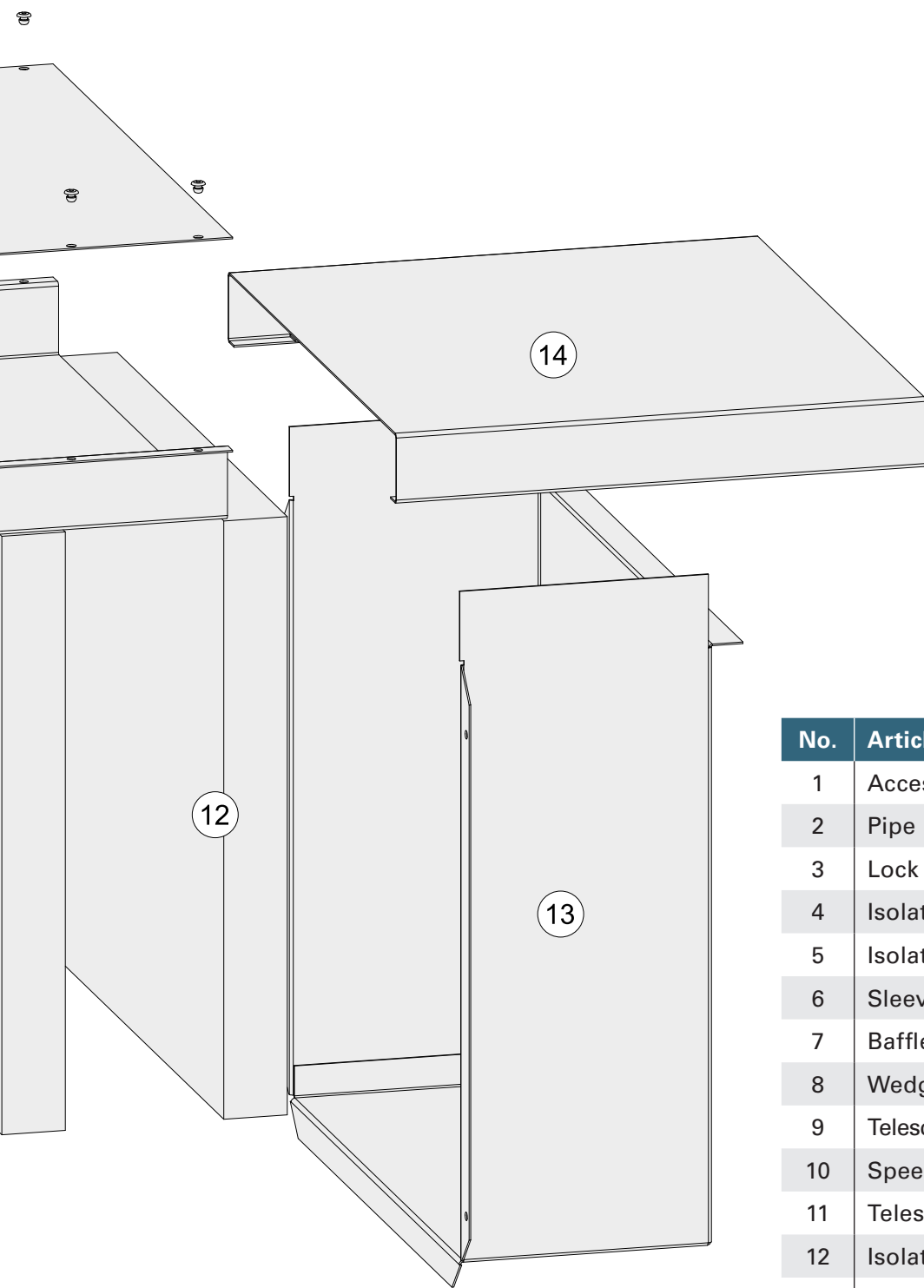


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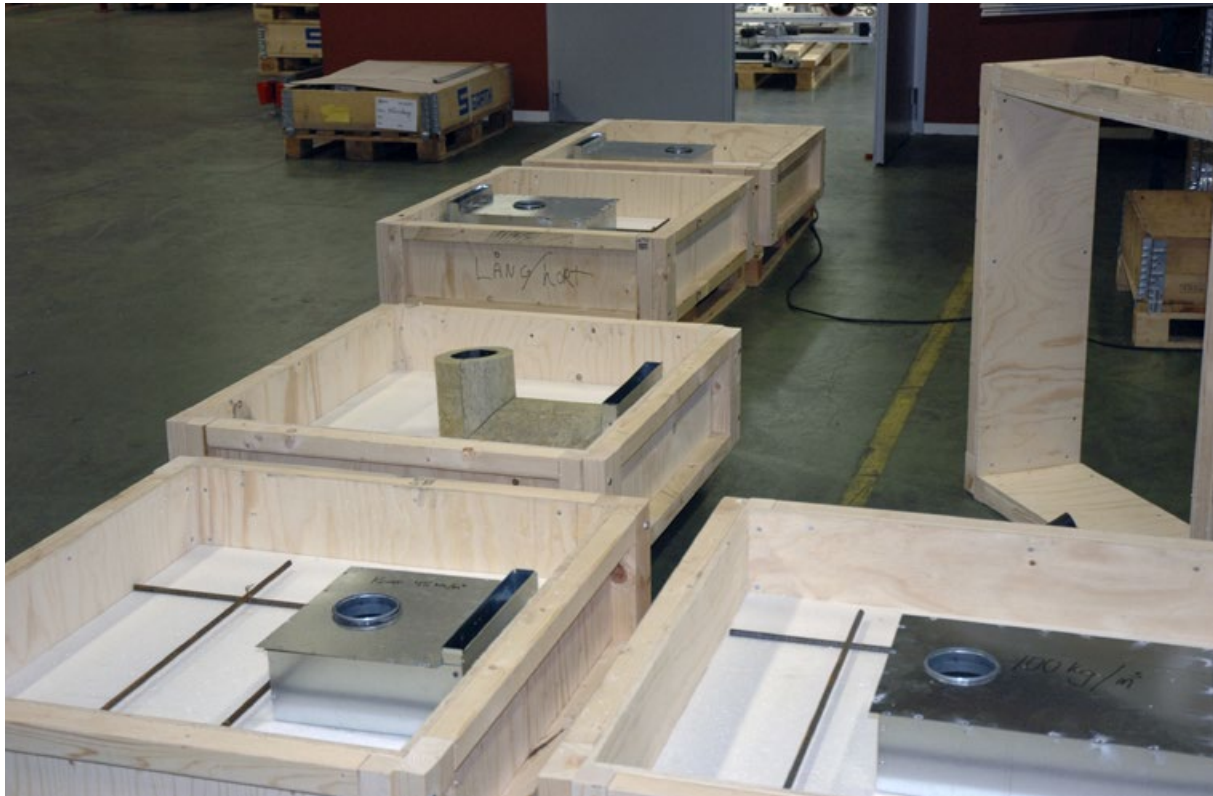
## EXPLODED VIEW







No.	Article	Quantity
1	Access hatch	1
2	Pipe	2
3	Lock house	1
4	Isolation front	1
5	Isolation Bottom	1
6	Sleeve coupling	1
7	Baffle	2
8	Wedge	2
9	Telescopic Channel	1
10	Speednut	2
11	Telescopic Lock	1
12	Isolation Rear	2
13	House	1
14	Telescope	1



## TESTS NOISE REDUCTION

### NOISE (dB)

To create a pleasant acoustic indoors, we must reduce the sound from the audio sources which are outside the house or room.

When a vent lets in so-called airborne sound (sound that moves with the air flow) there must be limitations in the channel to absorb such large quantities of sound as possible.

Through a variety of sound-absorbing materials and design solutions can thus minimize the sound propagated through the ventilation.

A sound wave that passes through the air causes small pressure variations. Sound intensity is usually stated in (dB) sound pressure level.

The sound pressure level gives a measurement of the actual sound pressure relative to the minimum level that a healthy ear can hear. If the sound doubles, the level will increase by about 6 dB.

In practice, a perceived increase of 6-10 dB is seen as a doubling of the sound pressure.

The insulation reduces the transmission of airborne sound by a design in two ways:

- Air movement in the cavity is converted into heat by the friction that occurs when air molecules collide with the rock wool fibers.
- Rock wool fibers absorb the heat energy generated when the air pressure increases (local) in the cavity when the cavity is compressed by the movement of the discs.

## SPECIMENS

A fresh air duct is cast in a concrete block (880 mm wide x 800mm high x 155mm deep) and placed in a 330mm thick wall where the concrete block is formed on the inside bottom.

Other surfaces consist of three layers, each plate measuring 13mm. Columns behind and between the sheets are filled with mineral wool. On the indoor side sits a Type 22 radiator (400mm high x 1.000mm long).

The walls glasswool sound absorption was not meant to contribute to the development of sound insulation when the duct was covered by sheet metal.

Different types and sizes of the ducts were tested according to the summary table. The insulation used inside the ducts had a measured density of 70-75 kg / m<sup>3</sup>.

## RESULTS

*Without the advantages of the sheet metal*

- Outdoor air duct 300-56 dB
- Outdoor air duct 570-60 dB

*With sheet metal*

- Outdoor air duct 300-59 dB
- Outdoor air duct 570-62 dB
- Straight outdoor duct - 53 dB

## TEST METHOD

The measurements are performed according to the international standard EN ISO 10140-2: of 2010.

The sound pressure levels have been established with the help of rotating microphones and a moveable speaker has been used in the transmitter room.



## EVALUATION

The results have been evaluated according to ISO 717-1 (second edition). The tolerance level has been evaluated according to ISO 140- 2:91.

The repeatability when measuring was done in accordance with ISO 140-2: 91 (however, the repeatability is normally significantly better in the laboratory, that is to say that the variation in the result is less than what the standard requires).

Measurement room size (sender room 106m<sup>3</sup> and 129m<sup>3</sup> receiver room).

All instruments (microphones, amplifiers, power supplies, etc.) are calibrated and traceable according to SP criteria.

The test was conducted by the SP Technical Research Sveriget, Energy Technology - Acoustics, Joachim Stadig and the results were examined by Krister Larsson.



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## TESTS AIRFLOW / PRESSURE DROP

### AIR FLOW / PRESSURE DROP (PA)

In addition to the air flow for each space being determined, the ventilation system must be designed with care and with respect to the draft, pressure drop, sound, and energy efficiency.

Ventilation involves the movement and exchange of air in buildings. This is used for several purposes. The most common reason is that one wants to attain a comfortable indoor climate. With ventilation, moisture is transported, contaminants, and more is removed from the room and "fresh" air is supplied instead.

You can use several different methods to achieve the desired results, such as natural ventilation, mechanical exhausts, mechanical air supply and extractor, with or without recycling.

The exhaust air flow should be slightly bigger than the outdoor air flow (about 10%). This

is to create a slight negative pressure in the building, reducing the risk of moist indoor air being pushed out of the walls, floors and ceilings. The moist air may condense when it meets the dew point and creates moisture damage harmful to the building.

Low air pressure or low air velocities in the duct system create little noise, low pressure and hence low power consumption.

### SPECIMENS

An outdoor duct has been built into a wall. Other surfaces consist of three layers, each plate measuring 13mm. The gaps between the boards were filled with modelling clay. On the indoor side sits a Type 22 radiator (400mm high x 1.000mm long).

### RESULTS

The results are summarized in the charts in the following pages.

## TEST METHOD

The measurements were taken using Kimo AMI310, an instrument that measures, among other things, temperature, air velocity, flow and pressure.

To obtain an average value, the test was performed all measurements over a 5 minute period.

## EVALUATION

### ROOM MEASUREMENTS SIZE:

Room #1, 5 m<sup>2</sup>

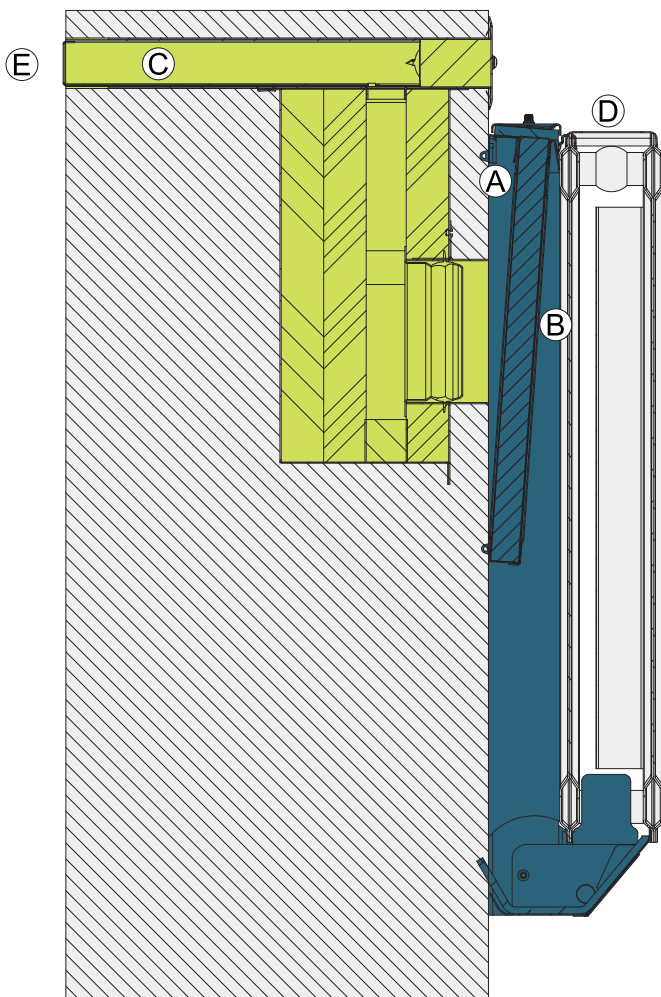
Room #2, 5 m<sup>2</sup>

### MEASURING EQUIPMENT:

- AMI310 Multifunction
- Pressure module
- Hotwire
- Vane probe Wireless  $\varnothing$  70 mm
- Pitot tube  $\varnothing$  3 mm

All instruments are calibrated annually to ensure measurement accuracy in accordance with quality standard ISO 9001 certified. All calibration is done in the Kimo calibration laboratory in Gothenburg.

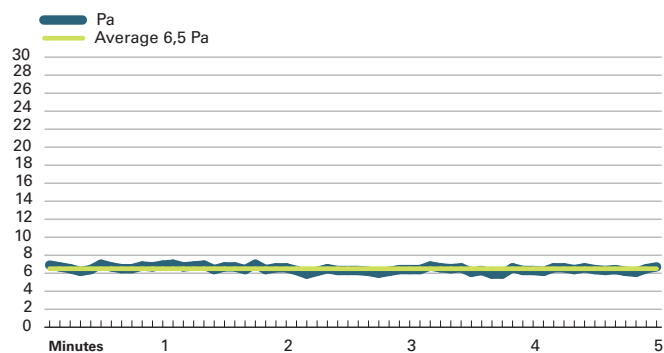
The test is performed by Sigarths design and quality control department.



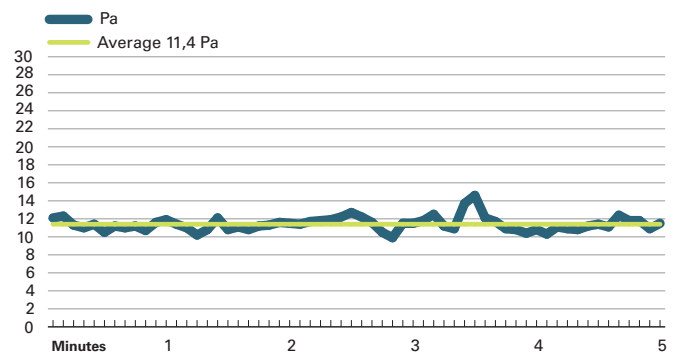


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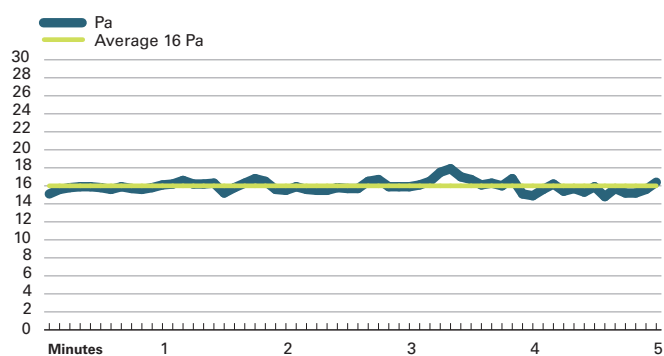
### PRESSURE DROP (A-B) FILTER 8 L/S



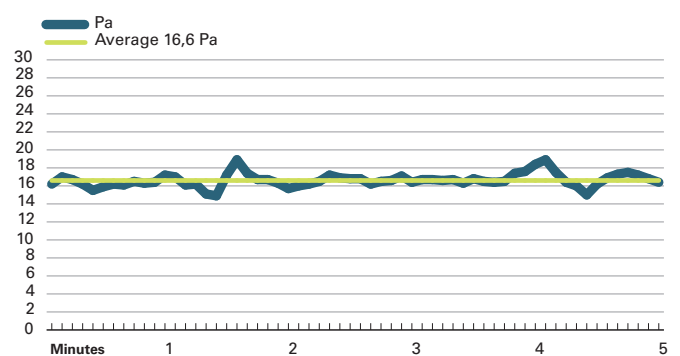
### PRESSURE DROP SYSTEM (C-D) WITHOUT FILTER 8 L/S



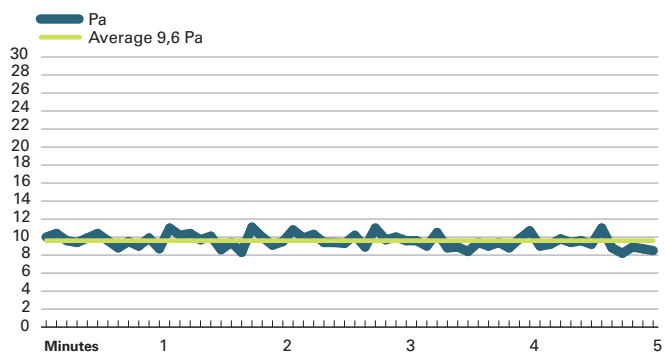
### PRESSURE DROP SYSTEM (C-D) WITH FILTER 8 L/S



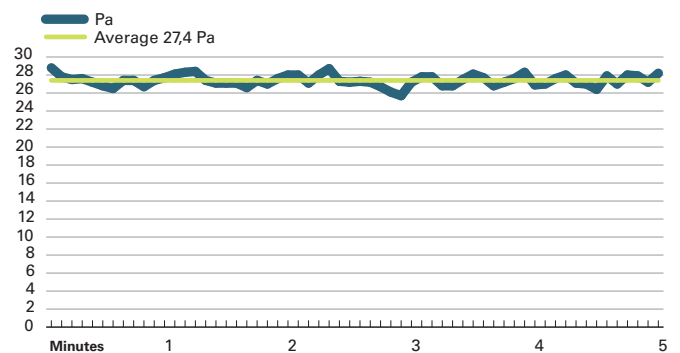
### PRESSURE DROP SYSTEM (E-D) WITH FILTER 8 L/S



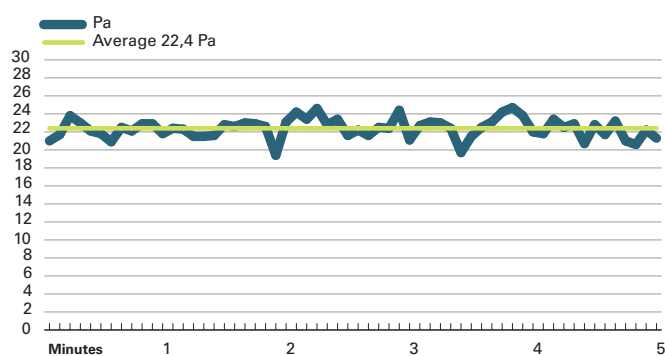
### PRESSURE DROP (A-B) FILTER WITH DISTRIBUTOR PLATE 8 L/S



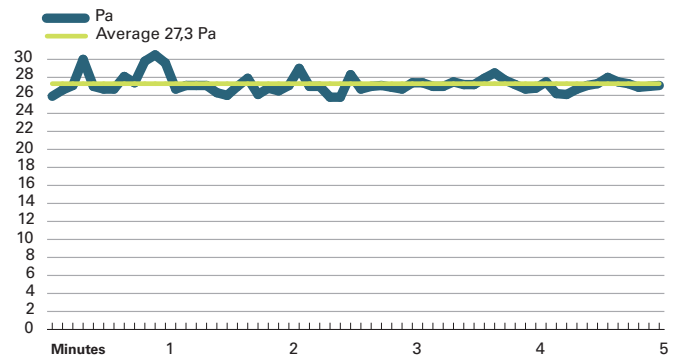
### PRESSURE DROP SYSTEM (C-D) FILTER WITH DISTRIBUTOR PLATE 8 L/S



### PRESSURE DROP SYSTEM (C-D) FILTER WITH DISTRIBUTOR PLATE 8 L/S



### PRESSURE DROP SYSTEM (E-D) FILTER WITH DISTRIBUTOR PLATE 8 L/S





## *a safer solution*

At Sigarth, we are convinced that there is always a better solution. We believe that our solutions make the world a little more secure. Whether it's a suspension system for the radiator industry or another solution that requires our ingenuity. With over 50 years of industry experience, we are a reliable resource for development and a market-leading partner for our clients, who are primarily within the HVAC industry.



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[www.sigarth.com](http://www.sigarth.com)