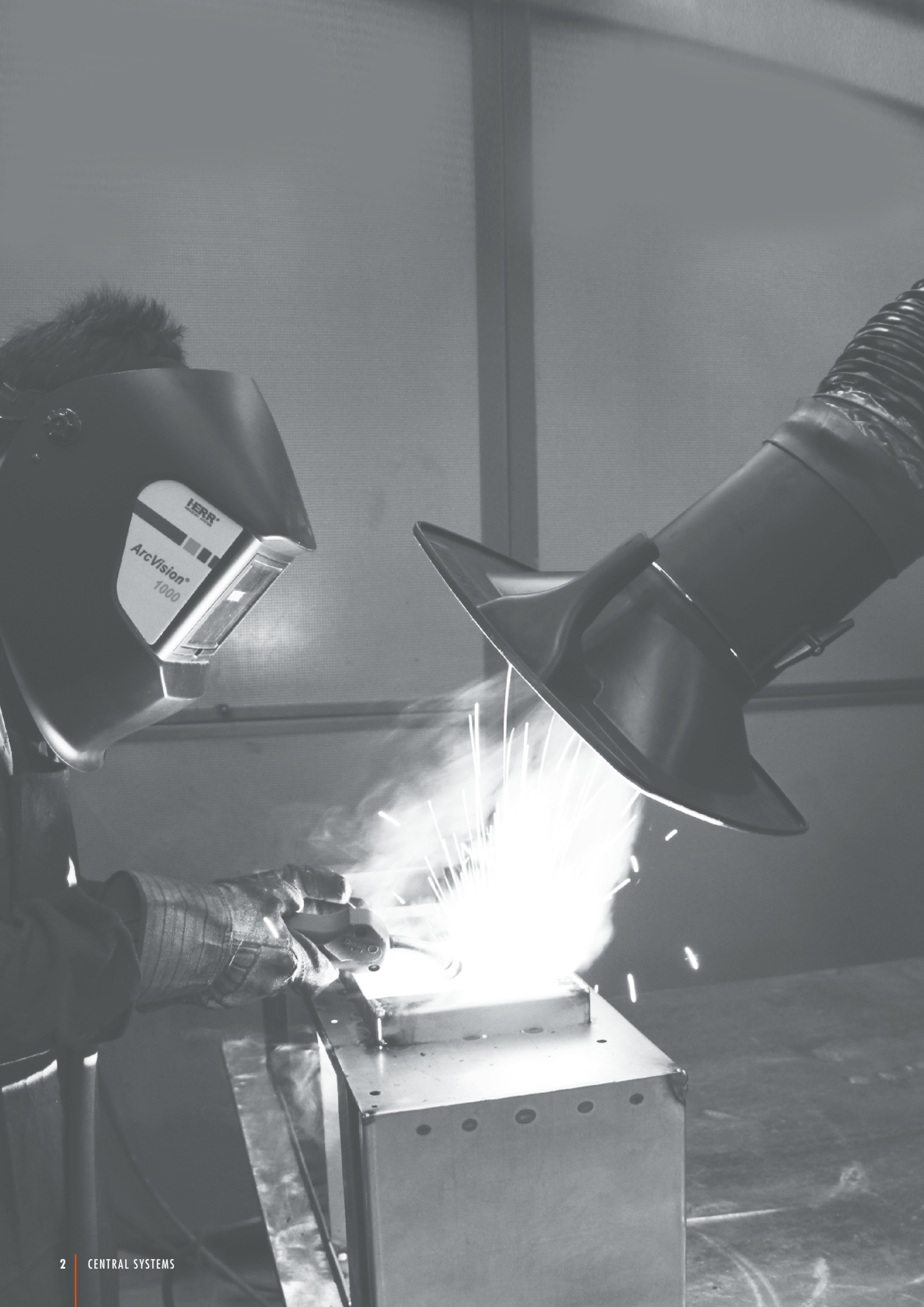




Central systems



- 600/610 series filter system
- 880 series filter system
- AirVent application examples



HERR – professional, competent and reliable



Our filter systems exceed legal requirements and thus make a valuable contribution to the protection of your employees and the environment. Our objective is to offer our customers safe and reliable filter systems with an excellent price-performance ratio. Filter systems from HERR filter the finest of dusts despite longest service life and lowest service effort. This helps you keep your investment costs down and reduce costs per workpiece. When you buy a filter system from HERR you can rely on safety, low procurement costs, energy-efficient cleaning technology, durable filter cartridges and minimum service costs.

How do we do it?

- Modern automated production and one-hundred-percent quality control.
- Constant further development of our products in our in-house R&D department.
- Continual and fast implementation of ideas and suggestions for improvement from our customers.
- Consistency in product design: "Form follows functionality." We rely on simplicity in manufacturing and operation.

We from HERR are thus convinced that our filters are the most efficient and durable on the market with the highest safety standard.

How to contact us:



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Industrial dust and fumes

What are fumes and dusts?

Dust is a term used for the finest particles swirled in the air which can be suspended for a long time. This suspended particulate matter contains fume and soot particles among other things. Dust can be categorised on the basis of particle size. Particle size has a direct influence on how harmful the dust is. Dust particles larger than 10 µm are visible to the naked eye and are termed coarse dust. Particles smaller than 10 µm are termed particulate matter and can easily be inhaled. Particles smaller than 5 µm can no longer be perceived by the naked eye. Particles smaller than 2.5 µm are respirable, in other words they are no longer filtered out by nose hairs and mucous membranes. If particles are smaller than 0.4 µm they can get directly into the blood and accumulate at vessel walls. Dusts with a particle size smaller than 0.1 µm are termed ultrafine particles.

Industrial dust and fumes

Harmful industrial dust and fumes are produced during the machining of metals. In order to protect health, these dust and fumes must be filtered out. The contaminated air is extracted and routed to a filter for cleaning. The type of extraction and filtration depends on the material, the machining

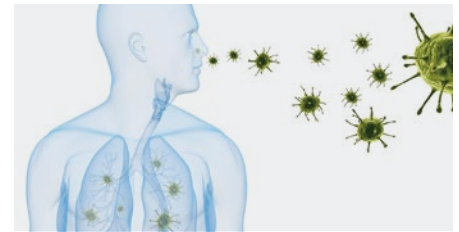
process and the dusts, fumes, gases and liquids produced in the process. Contamination in the air is caused in particular by:

- Machining and processing raw material,
- Additives to the raw material – such as e.g. welding fillers,
- Soiling,
- Evaporation,
- Oxidation.

Hazards caused by welding dust and cutting fumes

As described above, the composition of the harmful dusts and fumes depends on the materials and manufacturing process used. Suitable health protection measures are required depending on the composition and concentration. The necessary measures can be derived from laws, directives and ordinances.

According to studies carried out by the German Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA), welding and cutting fume particles measure 0.1 – 1.0 µm. 90 % of the dusts produced are smaller than 0.4 µm. The proportion of dust particles smaller than 0.2 µm is



as high as 75.3 %. These particles count as particulate matter and, as already mentioned, they are respirable. They present an extremely high hazard potential for humans. The hazard potential is determined on the basis of the composition of the particles in the exhaust gases, the size of the particles, concentration of the exhaust gases and time the human body is exposed to the exhaust gases (exposition). Studies by pathological institutes show that the industrial exhaust gas pollution damages eyes and skin, leads to respiratory problems and vomiting and can trigger sudden palpitations, stomach pain and fever. Breathing in over longer periods can lead to serious poisoning, organ dysfunction or cancer. Filtering the exhaust gases avoids these damaging effects and protects the health of your employees.

Since different exhaust gases have to be treated in different ways, filter selection is extremely important. Water filters and cyclones can be used for coarse dust e.g. tobacco smoke. The situation is different with cutting fumes, where steel is melted by a plasma torch at 25,000 degrees Celsius. The particulate matter of the size 0.1 µm which occurs here needs finer filtering.

HERR will be happy to help you select a suitable filter for your application.



Filters from HERR

Capacity of HERR filters

HERR uses mechanical filters and specially coated cartridge filters to guarantee safe and reliable filtration in the nano range. The collection efficiency achieved by HERR filters for dusts from a particle size of 0.1 µm is 99.9 %.

The use of electrostatic filters is often the only alternative for cleaning oil exhaust gases or oil mists. Our electrostatic filters achieve a degree of efficiency of 95 % for cleaning oil and dust particles. At the end of the day, which filter is the right one for you depends on the concentration of the oil. If the oil concentration is lower than 5 %, it makes economic sense to use a mechanical filter. For higher oil concentration we recommend the use of electrostatic filtration to clean the exhaust gases.

Grinding dust, welding dust and vehicle exhaust gases contain comparatively large particles. These can be removed by mechanical systems in which both pre-filters and fine filters are fitted.

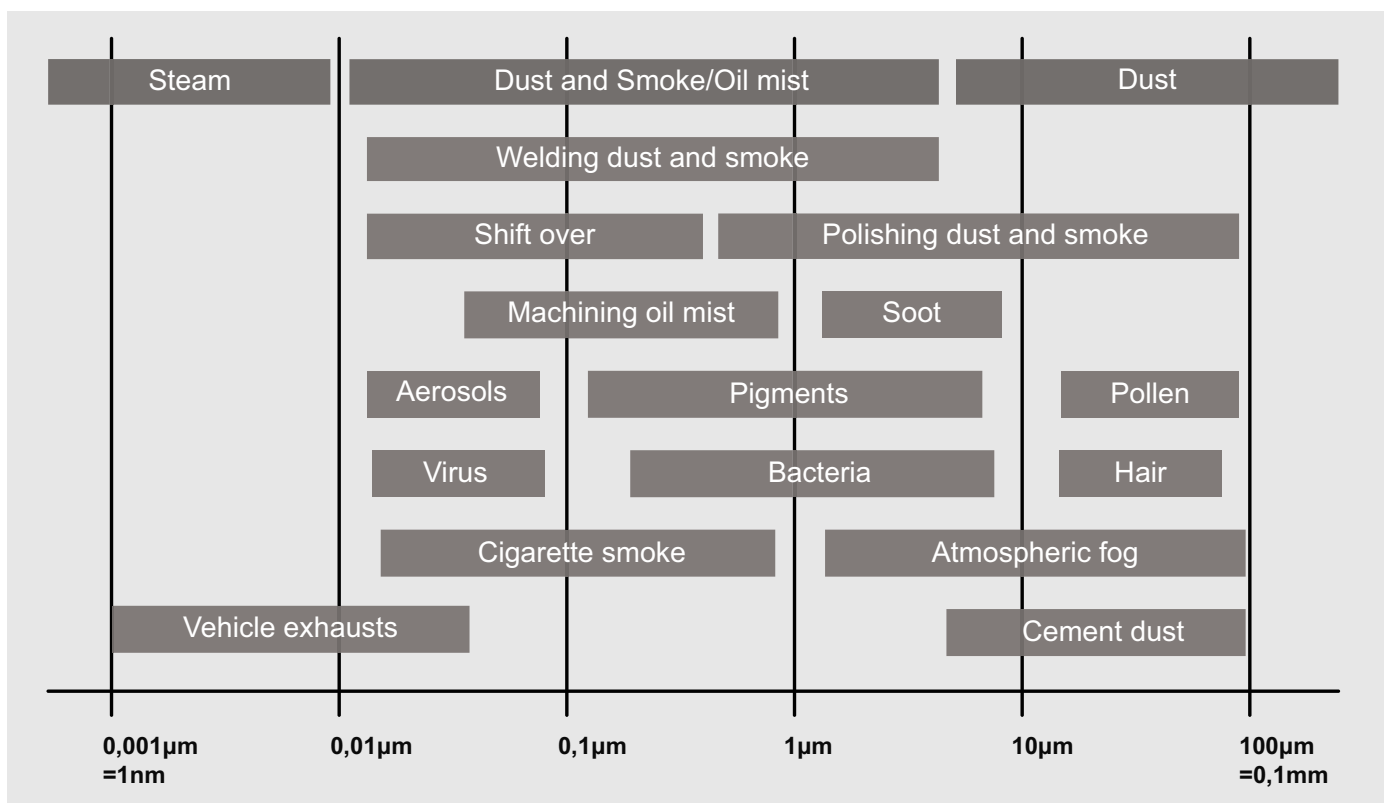
These exhaust gases often also tend to have an unpleasant odour. In this case, activated carbon filters can be used to eliminate the odours.

The modular structure of HERR filter systems makes it possible to cater to your special requirements and fulfil these cost-efficiently.

Extremely fine dusts are produced during plasma- and laser-cutting. To filter these out efficiently, HERR has developed its own coated ePTFE filter membrane known as HISTec®. This laminated membrane coating is extremely effective and filters out particles smaller

than 0.1 µm. It also allows almost 100 % filter cleaning, which means that the filter material is restored to its original state. A special air purging system is used to clean the filter off, thus minimising the mechanical load on the filter surface. The dust is not accumulated in the filter material, it accumulates on the outer skin of the filter. This allows it to be cleaned off and collected easily, in an energy-efficient way and quietly.

As protection against potentially explosive dusts, HERR can install explosion-reducing components in the filter systems and pipes. In the event of an explosion, damage to machines and systems is thus minimised. It may be possible to install other possibilities for explosion-reducing components such as e.g. water filters. Talk to your HERR consultant about your requirements.



Why a HERR filter?



These days, companies face global competition. This means that in high-wage countries such as Germany, Austria or Switzerland in particular, they are forced to optimise and rationalise internal processes even further in order to increase productivity and remain competitive. Filter systems from HERR support you in three different ways: Firstly, the comparatively low investment and servicing costs reduce the costs per workpiece. Secondly, they protect your employees' health, which leads to noticeably lower absence and illness. Thirdly, they ensure that official requirements are not only met but are exceeded.

HERR is ready to work with customers to turn new ideas into innovative products and develop customer-specific solutions. We strive to achieve perfection and rely on customer feedback for this. We not only listen to you, we implement your ideas! HERR doesn't only deliver the right filter system for your application, if required we can also install systems, pipes and extraction hoods on site. Exhaust gas control, air measurements, consultation, project planning, design, training, repairs and service are all part of our day-to-day business.

Selection of the right filter

The welding process has become indispensable in the metal industry. However, the gases and fumes

produced during welding should be avoided due to the resulting health hazard. The type of process involved makes avoidance extremely difficult or limited. This is why, for reasons of health protection and efficiency, the harmful dusts and fumes are extracted as close as possible to where they occur, then the air-pollutant mixture is filtered and the cleaned air is returned to the environment.

Inert gas welding of non-alloyed steels (structural steel) is the method often used. In contrast to the welding of non-alloyed steels, oily fumes are often produced when extruded components are welded. In addition, unpleasant odours often occur during the welding of aluminium or soldering work. In order to do justice to the different requirements, HERR produces numerous filter systems for different applications:

- Mechanical filter systems are flexible to use and suitable for the elimination of the types of fumes and dusts which occur most frequently. Customisation in various types and levels of filtration are possible here, too.
- High-vacuum extraction in combination with extraction torches and small extraction nozzles are a very good way of extracting welding fumes immediately where they occur.

- The ePTFE membrane filter is the best solution for large quantities of dust. These filters are extremely robust and have a long service life. Cleaning is carried out by automatic cleaning nozzles controlled by differential pressure.
- Electrostatic filter systems are used for the filtration of oily fumes and dust. They can be combined with mechanical pre- and post-filters. A combination with an activated carbon filter to absorb unpleasant odours is also possible.
- Low- and medium-pressure systems on the other hand allow large volumes of air to be cleaned. Filter systems switched in series achieve an extraction capacity of up to 100,000 m³/h.

The central filter systems from HERR have been developed for numerous different applications and circumstances at the customer's. The filters have outstanding spark protection as standard. They have a modular design, making expansion or retrofitting relatively easy.

We offer a complete product range for your production line. Accessories such as extraction arms, extraction and grinding tables, extraction hoods and other professional options for dust collection are available from HERR on request. Contact us.

Filter selection – overview

Here is an overview of the selection criteria for a HERR filter systems for welding fumes, cutting fumes and other types of dust and fumes:

According to type of filtration:

- Mechanical
- ePTFE membrane filter
- Electrostatic

According to extraction volume:

- Single units
- Central filter systems

According to fan pressure:

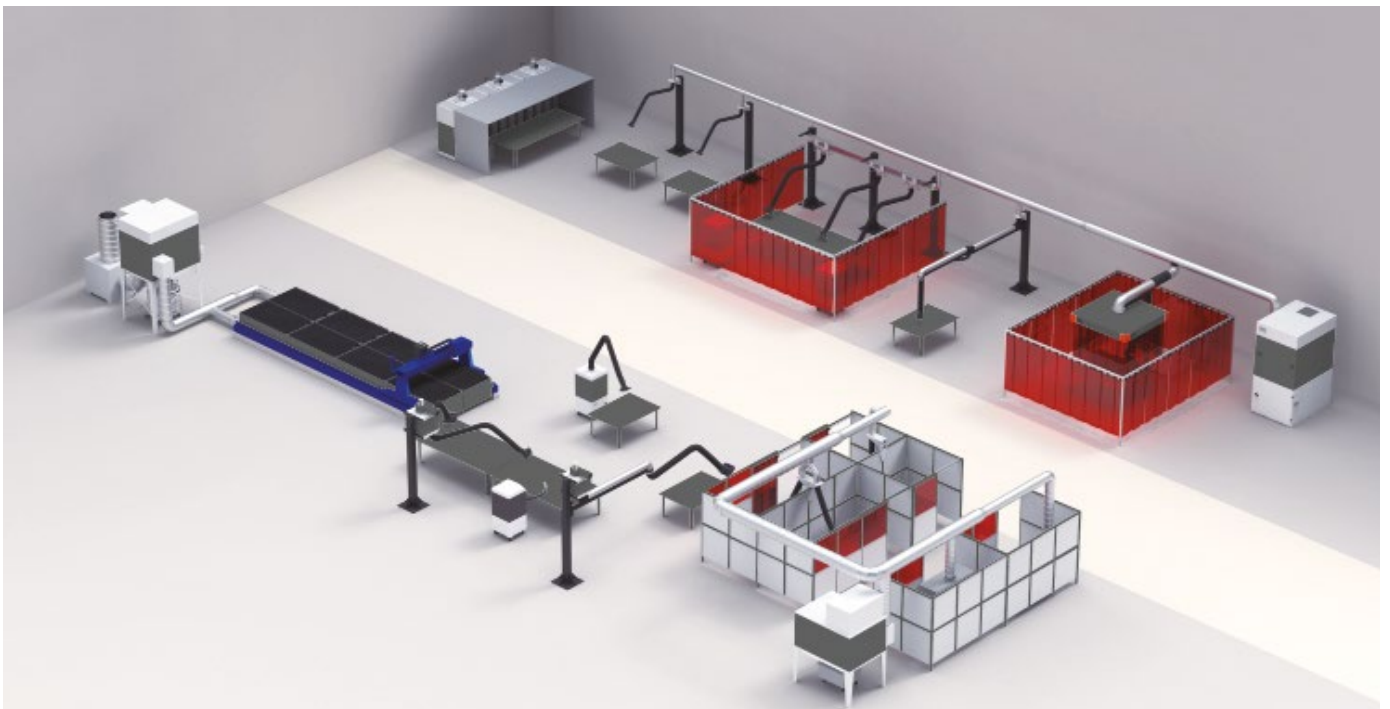
- Low pressure
- Medium pressure
- High pressure/high vacuum

According to structure and installation:

- Stationary
- Mobile
- Central extraction system 600 series
- Central extraction system 610 series
- Central extraction system 880 series

Collection elements:

- Extraction arms
- Extraction tables/side extractors
- Grinding tables (cutting/polishing)
- Extraction hoods
- Workshops extraction systems
- Sliding suction channels
- Fans and pipes
- Customer-specific elements



600 series



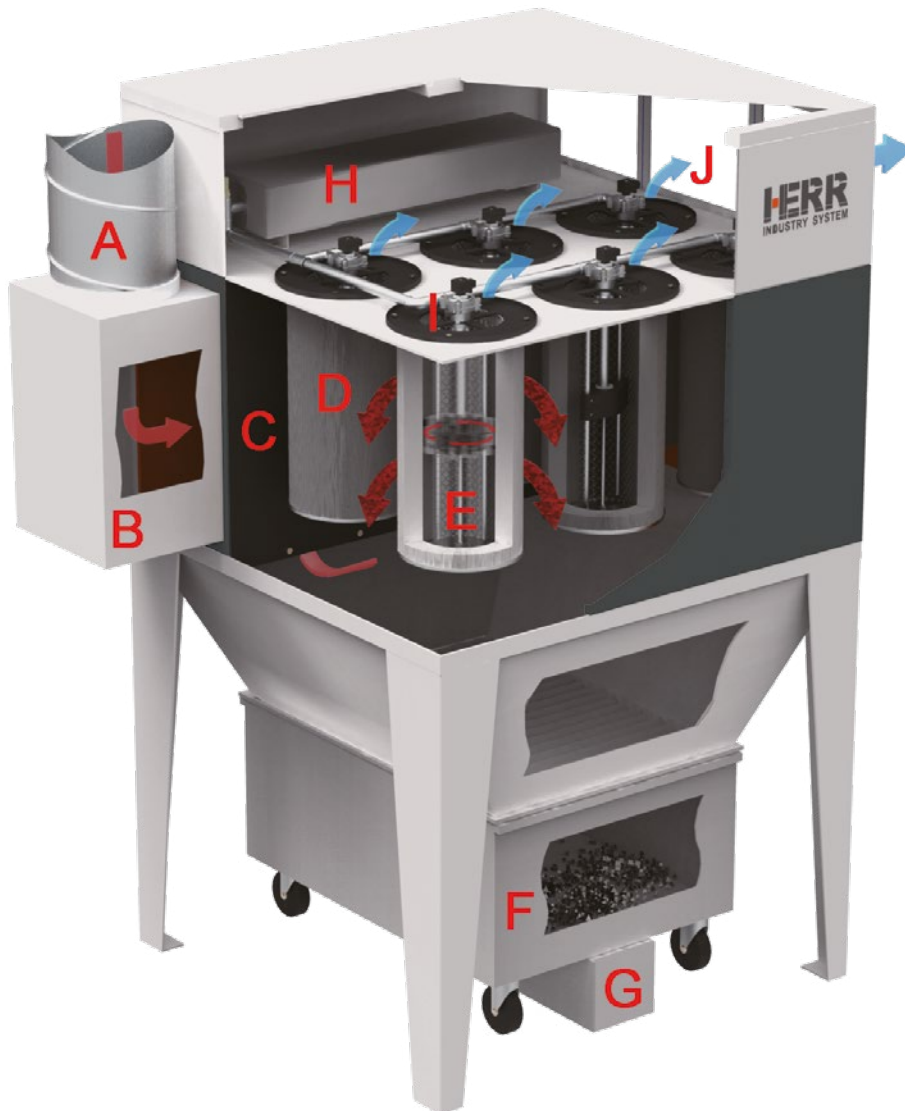
610 series



880 series

Central cartridge filter systems

Diagram



- A. Contaminated air is drawn into the filter
- B. Air connection filter housing
- C. Baffle separator with settling chamber
- D. HiSTec® cartridge filter
- E. Cleaning nozzle
- F. Dust box
- G. Lifting device for the dust box
- H. Compressed air tank
- I. HiRoto® valve
- J. Air outlet for cleaned air



Central cartridge filter systems

Introduction

Central extraction and filter systems were developed by HERR with the focus on the extraction of large quantities of dust particles in the nano range. The integrated spark protection makes allowances for flame, plasma or laser cutting. The systems are also available in explosion-protected variants and can be configured and expanded thanks to their modular design.

The filter design makes lightweight yet extremely robust construction possible. All the filter system are bolted and bonded using formed sheet metal modules. These guarantee greater pressure resistance while at the same time keeping the overall weight to a minimum. The filter system also offers low, energy cost-efficient air resistance. The modular design guarantees individual adaptation to the respective circumstances on the customer's premises, e.g. the air inlet and outlet can be installed flexibly. Equipment with bursting discs is possible.

The filter system is divided into two chambers. In the settling chamber, a baffle separator ensures coarse particles are separated off first.

Coarse particles, including sparks and embers, drop into the dust box immediately after separation in the pre-filter chamber. The dust box cover has angled slats fitted in it. This chamfering prevents sparks, embers and other particles from rising again, thus protecting the filters mounted above the cover from filter fire.

The finer particles are guided downwards with the air flow, heavy particles separate out and drop into the dust box. Only the lighter particles are drawn into the cartridge filter from below. These particles then stick to the filter material. The cleaned air is routed through the ePTFE membrane and the clean air chamber to the exterior. If the degree of filter contamination is specified, an integrated controller starts automatic cleaning of the filter cartridges. The dust sticking to the filter surface then falls down into the

dust box. The HERR ePTFE cartridge filters are in a vertical position to prevent large dust particles accumulating on the filter. The vertical arrangement of the filters also provides further protection from sparks and embers, since it is much more difficult for these to stick to vertically installed filters. In addition, the dust cleaned off does not fall from the upper filter cartridges onto the ones below. At the end of the working day, integrated control automatically triggers two cleaning cycles.

This ensures that the filter works at full capacity right from the start the next day, and that no particles can stick over night. This prevents self-ignition.

Central filter systems from HERR are delivered as a complete system comprising filter system and fan. Depending on the series, the fan is integrated in the filter or positioned next to the filter:

- 600 series with integrated fan
- 880 series with integrated fan
- 610 series with external fan

Central filter unit

Central filter systems of the 600 and 880 series have integrated fans. Depending on the unit, they use between two and nine cartridge filters with 10 m² filtration area each. The filter housing helps to reduce fan noise. Operation is very quiet and is not noticeable among the general noise in the workshop. This means that employees are able to perceive unexpected noises in their surroundings and avoid dangers if necessary.

The filter systems of 610 series use between four and twenty four cartridge filters with 20 m² filtration area each depending on the unit. This large filtration area makes it necessary for the fan to be positioned next to the filter system. The fan can be connected from different sides. A fitted silencer reduces the noise made by the 610 series filter systems to a noise level that makes it possible to operate the filter system in mixed areas outside the workshop.



Central cartridge filter systems

Advantages



Fan

The selection of a suitable fan not only saves energy it is important for the service life of the filter cartridges. As the filter ages, air resistance in the filter cartridge increases slightly but steadily. The fan must be able to cope with this.

The best way is with a control unit through a frequency converter.



Frequency converter

Frequency converters are used especially for extraction from several welding workstations. They adjust the airflow to the workload. Through sensors, the filter system calculates the air pressure required. The frequency converter then adapts the fan speed

to the conditions. This increases the service life of the filter cartridges, reduces the need for exhaust air and thus helps to reduce power consumption. The additional cost of the frequency converter pays for itself very quickly.



Intelligent control

The central extraction systems from HERR use Siemens control units and software developed by HERR. All the important control functions and messages are shown on a screen. In order to prevent parameters being deleted or changed by mistake,

important areas are password-protected. The convenient control unit makes operation easier and provides important information about maintenance and problem diagnosis.



HISTec® cartridge filter

The filter material of HERR filter cartridges is pleated like the bellows of an accordion. The distance between the pleats is constant and is fixed by gluing into the cartridge base and cover. The pleating angle of the filter cartridges is less than 2°. Thus the

pleating angle offers an optimum filter area coupled with high air flow efficiency. An even steeper pleat angle would increase the filter area but have a negative impact on the efficiency of the filter cartridge.



HiRoto® backflush nozzle

The HERR HiRoto® nozzle (patent no. 200 720 073 660) is located in the filter cartridge and flushes compressed air back in 360°. It covers every area of the filter evenly, resulting in gentle cleaning off. The HiRoto® nozzle is made up of two metal pipes installed parallel and connected by an axle. Compressed air escapes through evenly spaced holes in the pipes, causing the nozzle to rotate. The escaping air is pressed evenly from the inside through the filter material and loosens the dust particles. The method is less noisy and requires less compressed air

than cleaning by compressed air pulses. Cleaning with the HiRoto® nozzle goes easy on the filter material and prevents excessive bulging of the filter cartridge. The result is a longer service life for the filter cartridges. The combination of HiRoto® nozzle with HISTec® ePTFE-coated filter material increases filter efficiency, and service life of the filter cartridges can be increased even further. A filter cartridge service life of up to three years and lower energy consumption significantly lower its operating costs.

Central cartridge filter systems

Safety

Fire protection

HERR filter systems are among the safest filter systems on the market: pre-filter chamber, vertically installed filter cartridges, special routing of the air in the filter chamber, complete cleaning of the filter cartridges at the end of the working day as well as a special design for the dust box cover effectively prevent the occurrence of filter fires. Additional options are available for fire-fighting: sensors for monitoring spark temperature, extinguishing using argon or CO₂ gas, automatic partitioning of the filter.



Convenient and safe dust disposal

The dust is collected in a dust box under the system. During operation, the box is pneumatically pressed against the filter. It can be lowered and wheeled out for emptying. Cheap PVC waste bags minimise contact to dust and can be easily removed and replaced. The box should be checked and emptied at regular intervals. Emptying into barrels or by rotary valve are options available at an extra charge.



Explosion protection

The filter system is equipped with bursting discs and installed outside the workshop. In the event of a dust explosion, the pressure can escape at these artificial weak spots and thus protect workers and systems from more serious damage. A sufficient safety distance to works traffic and people must be observed when positioning the filter system. Please also note the fire protection regulations.



HISTec® ePTFE filter cartridges

Properties



HISTec® ePTFE-coated filter cartridges

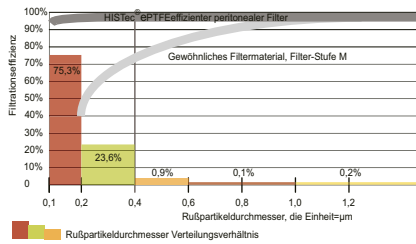
Welding and cutting dusts are extremely fine. According to the test data provided by the German IFA Institute, welding and cutting dust particles are between 0.1 - 1.0 µm in diameter. More than 90 % of all dusts are less than 0.4 µm in diameter. The proportion of dust particles that is even smaller than 0.2 µm is 75.3 %. In comparison: most bacteria are not smaller than 0.2 µm! Particles with a diameter smaller than 0.4 µm may access the lungs directly

through the alveoli, penetrate into the bloodstream and cause diseases such as cancer, allergies or damage the respiratory tract. Welding and cutting dusts therefore represent a major health risk. With conventional filter material, particles smaller than 0.4 µm are not filtered adequately. More than 90 % of the particles can thus develop their harmful effects despite filtration. HISTec® ePTFE filter membrane helps you to effectively prevent this!



IFA
Institut für Arbeitsschutz der
Deutschen Gesetzlichen Unfallversicherung

HISTec® ePTFE effizienter partikelreiner Filter
IFA-Zertifizierungsnummer: 2010219828210

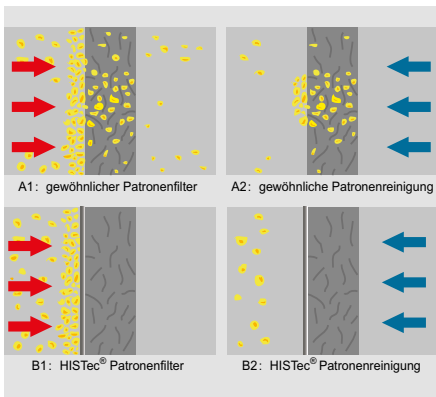


Certification by IFA

The German Institute for Occupational Safety and Health (IFA) confirms that the HISTec® ePTFE-coated filter cartridges filter welding and cutting particles smaller than 0.1 µm in size. The filter efficiency is

up to 99.9 %. In accordance with the German IFA Institute, the welding fume particles are distributed as follows:

Particle diameter	<0.2	<0.4	<0.6	<0.8	<1.0	<1.0
Quantity	800	251	9	0	1	2
Size (%)	75.3	23.6	0.9	0	0.1	0.2
Weight (%)	15.9	38.7	7.5	0	8.2	29.7



Filtration and cleaning

Figure A1 shows a conventional, non-coated filter. The filter is penetrated by smaller particles.

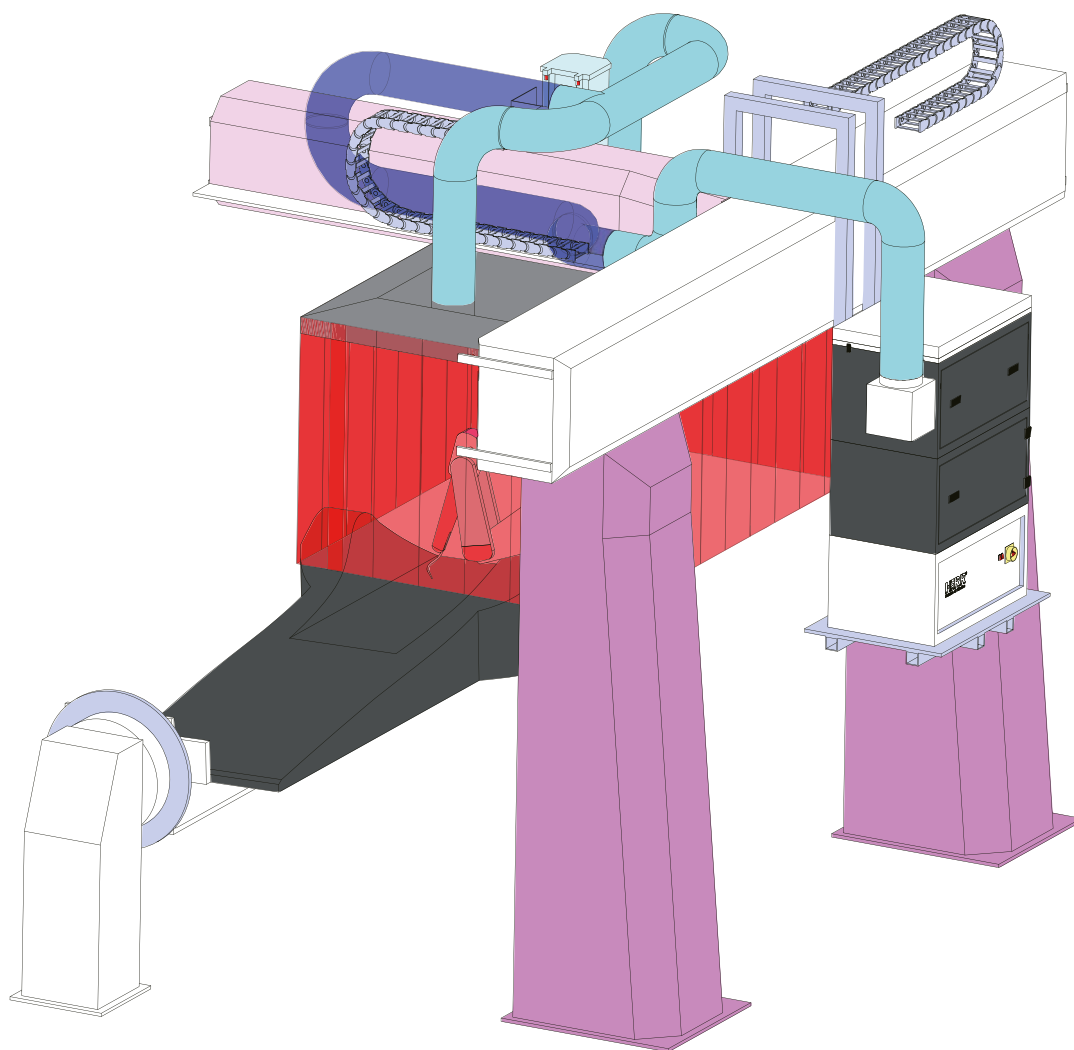
Figure A2 shows that particles are still sticking even after the filter has been cleaned.

Figure B1: HISTec® ePTFE filter offers a filtration up to 0.1 µm; dust cannot easily penetrate the filter matrix.

Figure B2 shows that the dust has been removed effectively from the filter surface. If any particles at all remain, then only the tiniest.

Central cartridge filter systems 880 series

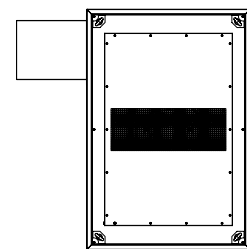
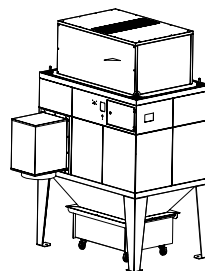
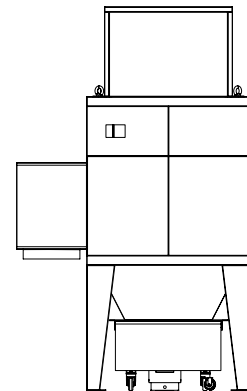
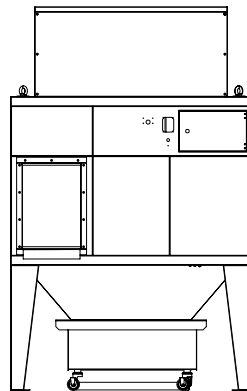
Article number	Volume	Elec. connection	Dimensions (L x W x H)	Weight
880200W	3,000 m ³ /h	1.5 kW x 2 / 380 - 400 V / 50 Hz	1,120 x 700 x 1,810 mm	370 kg
880200P	3,000 m ³ /h	1.5 kW x 2 / 380 - 400 V / 50 Hz	1,120 x 700 x 2,445 mm	490 kg



Central cartridge filter system 600 series

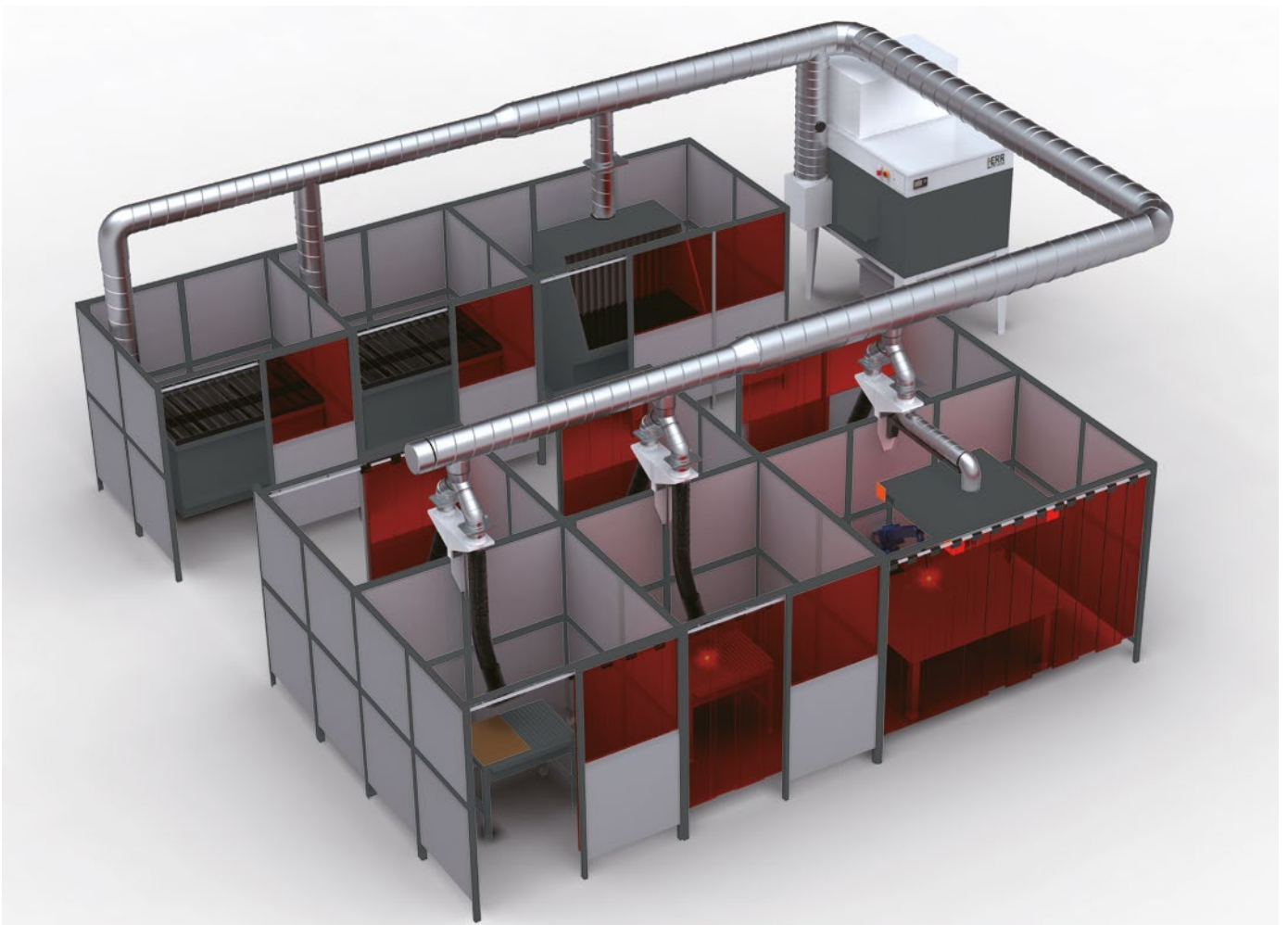
Filter systems of the 600 series are compact and ideal for welding and cutting applications which cause light to medium amounts of contamination in the air. Since the fan is integrated, the filters have a small footprint and are thus suitable for installation within the workshop. HISTec® ePTFE filter cartridges 600 mm high with 10 m² filtration area each are used. The reliable and gentle HiRoto® cleaning nozzle is used for cleaning. The filters are installed upright or vertically. The filter is controlled by a Siemens® control unit. Depending on the cleaning volume required, filter systems of the 600 series are

available with a capacity of up to 9,000 m³/h. We recommend the filter system for the filtration of air contaminated by the welding process, for example, as well as for plasma cutting applications up to 200A or a material thickness of no more than 20 mm. 600 series filters can be equipped with a frequency converter for cleaning the air from several welding workstations. This adapts the extraction capacity to the workload, thus saving energy and helping to reduce costs. A remote on/off switch and other accessories are available as options. Talk to your HERR consultant about your requirements.



Central cartridge filter system 600 series

Article number	Volume	Elec. connection	Dimensions (L x W x H)	Weight
600400	4,000 m ³ /h	5.5 kW / 380 - 400 V / 50 Hz	1,020 x 1,500 x 2,380 mm	620 kg
600600	6,000 m ³ /h	7.5 kW / 380 - 400 V / 50 Hz	1,500 x 2,000 x 2,560 mm	870 kg
600900	9,000 m ³ /h	11 kW / 380 - 400 V / 50 Hz	1,500 x 2,000 x 2,580 mm	1,020 kg

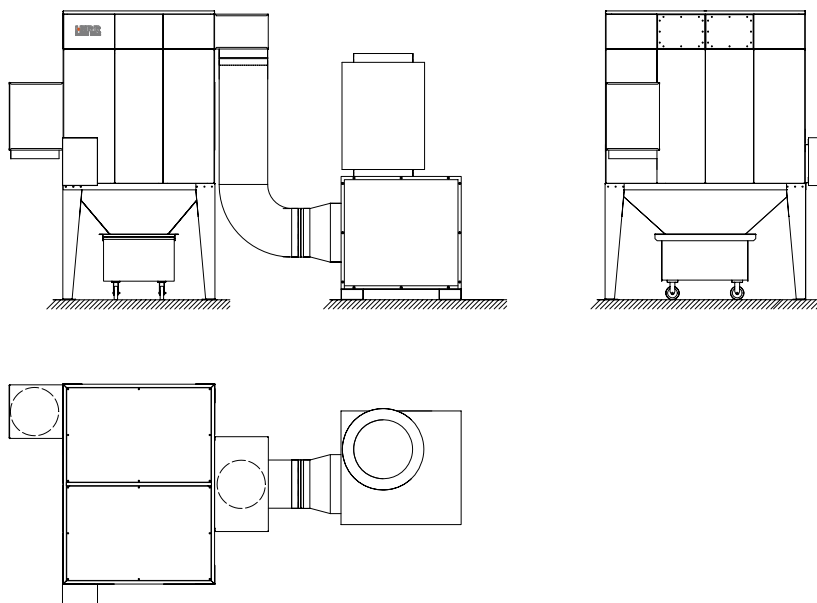


Central cartridge filter system 610 series

610 series filter systems have a free-standing radial fan with silencer. They can be set up inside or outside the workshop. If the system is set up outside the workshop, it has an angled air outlet and a separate control cabinet. In addition, there is a version with bursting discs available for outdoor set-up.

HISTec® ePTFE filter cartridges 1,200 mm high with 20 m² filtration area each are used. The reliable and gentle HiRoto® cleaning nozzle is used for cleaning. The filters are installed upright or vertically. The filter is controlled by a Siemens® control unit. Depending on the cleaning volume required, filter systems of the 610 series are available with a capacity of up to

48,000 m³/h. We recommend the filter system for the filtration of air contaminated by the welding process, for example, as well as for grinding, blasting and heavy-duty plasma cutting applications. If more extraction volume is required, several 610 series filter systems can be connected. 610 series filters can be equipped with a frequency converter for cleaning the air from several welding workstations. This adapts the extraction capacity to the workload, thus saving energy and helping to reduce costs. A remote on/off switch and other accessories are available as options. On request we can deliver your 600 or 610 filter system with IFA certification – suitable for dusts of welding fume class W3. Talk to your HERR consultant about your requirements.



Central cartridge filter system 610 series

Article number	Volume	Elec. connection	Dimensions (L x W x H)	Weight
610400P	4,000 m ³ /h	5.5 kW / 380 - 400 V / 50 Hz	3,384 x 1,500 x 2,700 mm	940 kg
610400W	8,000 m ³ /h	7.5 kW / 380 - 400 V / 50 Hz	3,384 x 1,500 x 2,700 mm	915 kg
610600P	6,000 m ³ /h	7.5 kW / 380 - 400 V / 50 Hz	3,758 x 1,500 x 2,700 mm	1,050 kg
610600W	12,000 m ³ /h	11 kW / 380 - 400 V / 50 Hz	3,758 x 1,500 x 2,700 mm	1,200 kg
610900P	9,000 m ³ /h	11 kW / 380 - 400 V / 50 Hz	4,215 x 1,890 x 2,700 mm	1,260 kg
610900W	18,000 m ³ /h	15 kW / 380 - 400 V / 50 Hz	4,215 x 1,890 x 2,700 mm	1,660 kg
611200P	12,000 m ³ /h	15 kW / 380 - 400 V / 50 Hz	5,381 x 1,890 x 2,900 mm	1,765 kg
611200W	24,000 m ³ /h	30 kW / 380 - 400 V / 50 Hz	5,381 x 1,890 x 2,900 mm	2,515 kg
611800P	18,000 m ³ /h	30 kW / 380 - 400 V / 50 Hz	6,388 x 2,100 x 2,900 mm	3,010 kg
611800W	36,000 m ³ /h	37 kW / 380 - 400 V / 50 Hz	6,750 x 2,820 x 2,900 mm	3,420 kg
612400W	48,000 m ³ /h	55 kW / 380 - 400 V / 50 Hz	Size on request	

Special sizes on request



Application examples

Case study with movable hood



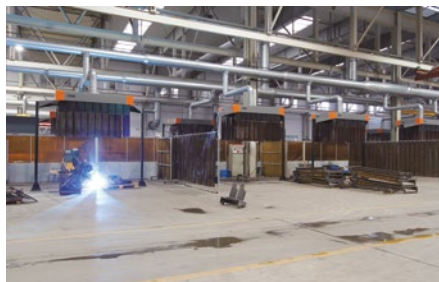
Case study manual welding



Aluminium hood for robot



Customised solutions



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