Product Range

Diesel Particulate Filters

Modular SMF® and SMF®-AR Systems

Mobile Machinery

Stationary Applications

www.hjs.com

HJS Emission Technology

Content

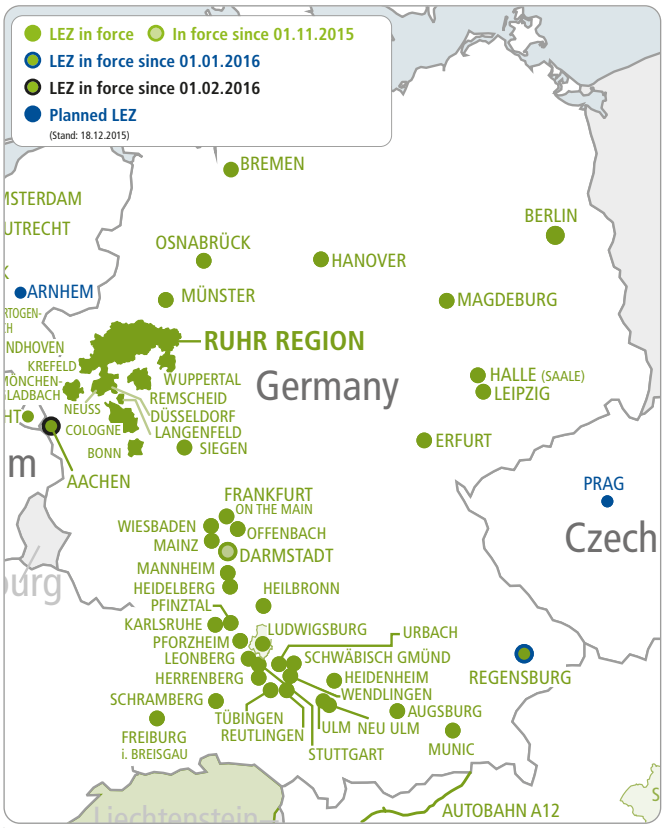
Clean Solution with Diesel Particulate Filters

1. Challenge: Clean Diesel Emissions for Mobile Machinery and Stationary Applications

Reducing diesel pollutant emissions

Diesel engines are powerful, long-lasting and offer low fuel consumption. These are precisely the reasons why they are to be found on small and large-scale construction sites, usually in continuous service. However, when diesel is combusted in a diesel engine, the process gives rise to pollutants such as soot particles. The smaller these soot particles are, the easier it is for them to pass through our lungs and on into our bloodstream and other vital organs. Soot particles from diesel engines, then, are known to represent a significant health hazard.

For this reason, numerous measures for reducing pollutant emissions are gradually coming into force at European and national levels. These measures include, for example, EU Directive 2008/50/EC on ambient air quality, which came into force at the beginning of 2005. The declared objective of this directive, its derivative directives and the implementations in national law by the member states (in Germany, the Federal Pollution Control Act, 'Bundesimmissionsschutzgesetz' or BImSchG for short) is to maintain ambient-air quality where it is good and improve it in other cases, and precisely this principle is applied with particular vigour in the case of Europe's major cities and conurbations.



• Low emission zones in Germany

Appreciable reduction in air pollution

The regulations oblige city and local authorities to take action against the increasing pollution levels in inner-city areas. Among the measures already taken is the setting-up of low emission zones in Germany and other European countries and the so-called "filter obligation" for construction machinery in Switzerland.

	Average over	PM_{10} limit (Particulate Matter)
since 01.01.2005	**24 h**	**50 µg/m³** No more than **35** violations p. a. permissible/year
	1 year	**40 µg/m³**

• EU Directive 2008/50/EC

Germany

Currently, the driving restrictions in force in low emission zones apply only to passenger cars, light- and heavy-duty trucks and buses. Depending on stipulations for each given LEZ, vehicles must have a red, yellow or green sticker affixed to the inside of their windscreen before they can access the zone.

In 2012, the World Health Organization (WHO) reclassified diesel exhausts as carcinogenic and reassigned them to the same class of hazardous materials as asbestos, arsenic and mustard gas.

Furthermore, some medical studies have identified that construction workers who work in the vicinity of diesel-engined machinery suffer from higher rates of cancer. To protect construction workers, Germany's BG BAU employers' liability insurance association for the construction industry and IG BAU union are demanding the use of "cleaner" construction machinery and consequently the retrofitting of filters to existing older machines as well. As a result, we can soon expect to see invitations to tender for public-sector civil engineering projects insist upon the use of filters in all machinery used on site. Deutsche Bahn (German Rail) is also going down this route, demanding a commitment on the part of engineering companies to use cleaner machinery before it considers awarding them a contract.

Over and above the EU directives that apply, other laws apply in Germany, such as **TRGS 554 (Technical Rules on Hazard Substances – Diesel Engine Emissions)**. This protection regulation covers activities in work areas that can be subject to diesel engines emitting exhaust gases into the ambient air. This includes, for instance, workshops, production shops, construction works below ground, tunnels and truck cargo spaces that are at least partially enclosed. The TRGS rules make the use of diesel particulate filters mandatory, with filtration efficiency rates of at least 90%.

Switzerland

Switzerland is benchmark when it comes to combatting diesel soot, a primary contributor to airborne particulate matter: particulate filters have been compulsory in construction machinery for a long time now. Since as long ago as 1983, numerous laws have been passed with respect to reducing emissions levels. Within the scope of the "VERT" project (Verminderung der Emissionen von Real-Dieselmotoren im Tunnelbau, or in English, "Reduction of Diesel Emissions in Tunnelling"), a quality test was defined specifically for diesel particulate filters. This test method has since become the internationally recognised standard for testing pollutant-reducing systems. Filters that meet the technically demanding criteria are listed by the Swiss Federal Office for the Environment (FOEN, or BAFU from the German).

Particulate Filter		Conformity Certification			
Manufacturer	Filter Family/Type Classification	Assessment Dept.	Certification No.	Date of Certification	Valid Until
HJS	SMF®-AR	BAFU	B195/12.06	11.2014	30. 6.2016*
HJS	SMF®-CRT	BAFU	B159/03.05	11.2014	31.12.2015
HJS	SMF®-FBC	BAFU	B195/12.06	11.2014	30. 6.2016*

*= Extension until 31.12.2020 in preparation

• BAFU filter list (extract)

Appreciable reduction in air pollution

Only VERT-certified systems that achieve a filtration efficiency rate of at least 97% are allowed to be used in Switzerland. Above all, this applies to particularly harmful ultra-fine particulate matter (particulates with a diameter < 0.1 µm).

Since January 2009, the diesel PM emissions of mobile machinery on construction sites are subject to more stringent regulations. The new provisions laid down in the Air Quality Control Regulation (LRV) are for the most part oriented to the VERT method and stipulate the use of diesel particulate filters for mobile machinery with a power output from as low as 18 kW.

BAFU filter list (extract)

HJS systems are VERT-certified and included on the BAFU filter list. As such, they meet the tough Swiss specifications for diesel particulate filters (More information: www.umwelt-schweiz.ch).

Tried-and-tested particulate filter systems for fitting to diesel engines

WORLDWIDE – Selection

Austria: In Tyrol and the redevelopment area of Vienna, construction machinery with a power output of 18 kW or more are only approved for use when fitted with a diesel particulate filter with a filtration rate of at least 95%.

UK: On selected construction sites in London, only construction machinery fitted with exhaust-gas aftertreatment systems are allowed to be used.

Italy: Particulate filters are mandatory for construction machinery deployed on public construction sites in South Tyrol.

USA: A range of different measures are being taken in the USA to reduce the level of pollutants emitted by construction machinery. The "Diesel Risk Reduction Plan" of the California Air Resources Board (CARB) envisages a reduction in particulate emissions in California of 85% by 2020. Other measures include the use of diesel particulate filters on construction sites in cities such as New York, Washington DC, Houston and Boston.

Well equipped for making bids

A step ahead with environmental protection technologies: Having particulate filters installed is increasingly becoming a crucial criterion if you are to win new contracts.

2. HJS Exhaust-gas Aftertreatment Systems

In order to cut the pollutant emissions of mobile machinery, HJS offers modular diesel particulate filter systems specifically developed for such applications. Our economical and environmentally sound solutions have proven themselves many times over.

SMF®-Sintered Metal Filter

The centrepiece of all HJS exhaust treatment systems is the Sintered Metal Filter (SMF®), with which the company sets new standards in the global marketplace. In 2003, HJS was awarded the 'Deutscher Umweltpreis' (German Environmental Award) for its development of the SMF®. This closed 100% filter reduces the emissions of soot particles, including fine particulate matter, down to the limit of detection, with a filter efficiency of over 99%.

Reliable and low on maintenance

The SMF® and the systems based on it are exceptionally reliable in operation, low-maintenance and also benefit from a long service life. HJS systems have proved their worth over many years in more than 250,000 cars, buses, trucks and construction machines.

The advantages offered by the SMF® technology result from its special design as well as its use of sintered metal. Exhaust backpressure is minimised by the fact that there is an unrestricted inflow of gas into the filter pockets from outside. What's more, the ash holding capacity of the SMF® is considerably higher compared with that of a conventional wall-flow (honeycomb) filter. This significantly increases the mileage before an HJS filter requires cleaning, including in the case of older construction machinery and stationary applications that suffer from particularly high oil consumption. The costs for servicing and maintenance as well as the associated downtime costs fall accordingly.

Thanks to their modular construction, HJS Sintered Metal Filters can be adapted to create a range of different versions to suit different applications. They are suitable both as original equipment (OE) and also for retrofitting in mobile machinery and stationary applications.

Flexible solutions for different applications

SMF® advantages at a glance

- ✔ Reduction of soot particles and fine particulate matter by more than 99% (Based on particle number)
- ✔ Suitable for OE and retrofitting applications
- ✔ Proven system already installed in more than 20,000 construction machines
- ✔ High ash holding capacity and low exhaust backpressure
- ✔ Low-maintenance and economical
- ✔ Reliable with long service life
- ✔ Easy DIY cleaning

• SMF®-Sintered Metal Filter – 100% soot-free

HJS diesel particulate filters satisfy global requirements

Servicing and maintenance

Automatic monitoring and maintenance indicator

The **HJS Service Unit** monitors a filter automatically by measuring the backpressure and temperature of the exhaust gases. Both pieces of information are displayed by the **HJS "ServiceCheck" display module**, which means the status of the filter is immediately visible at all times. The Service Unit is included in the scope of delivery and ensures the filter functions at optimum efficiency.

Benefits

- ✔ Constant monitoring of the exhaust backpressure and temperature
- ✔ Overload detection for the particulate filter
- ✔ Automatic indication that the filter needs to be cleaned
- ✔ Lower maintenance costs

• Automatic monitoring with the electronic Service-Check

The HJS Service Unit complies with the LRV/VERT specifications

Maintenance

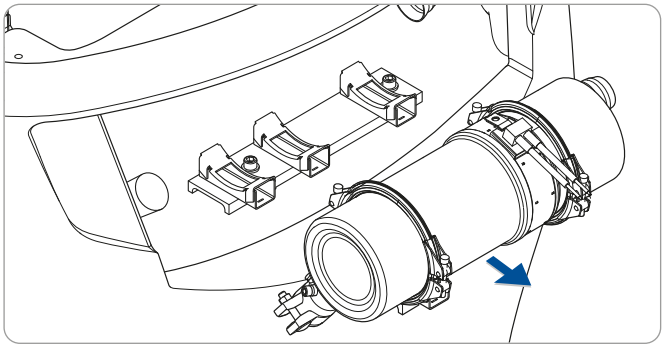
In addition to combustible soot particles, filter systems also remove all other solid particulate matter from the exhaust gases, above all ash from engine oils and additives. These residues must be removed from the filter at specific intervals by cleaning.

Cleaning intervals

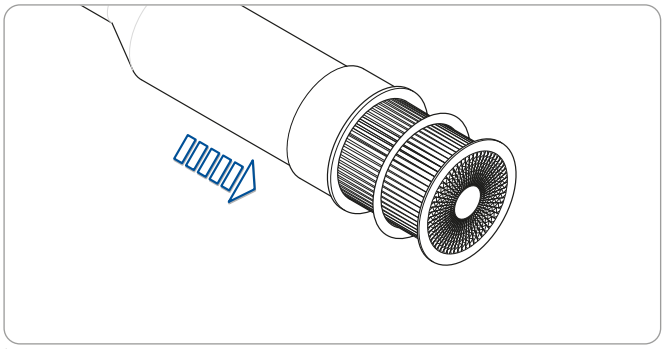
Thanks to the high ash holding capacity of the SMF®, the mileage it can cover before needing to be cleaned is considerably higher compared with that of a conventional wall-flow (honeycomb) filter. Experience shows that many machines can operate for longer than 2.000 hours before the first servicing work needs to be carried out. This makes it possible to keep the running costs for servicing and maintenance as well as the associated downtime costs to a minimum.

SMF® filter modules

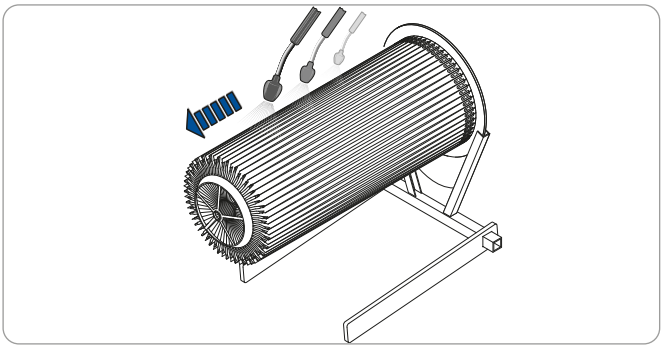
Cleaning a Sintered Metal Filter (SMF®) with a high-pressure cleaner results in a mixture of water, soot and ash. HJS recommends complete regeneration of the particulate filter before you start cleaning it, in order to degrade the soot particles that are collected in the filter.



• 1. Remove filter module



• 2. Remove SMF® filter from casing



• 3. Clean SMF® filter with high-pressure cleaner

NOTE: Observe all health and safety and environmental protection laws, directives and legal requirements applicable in your country.

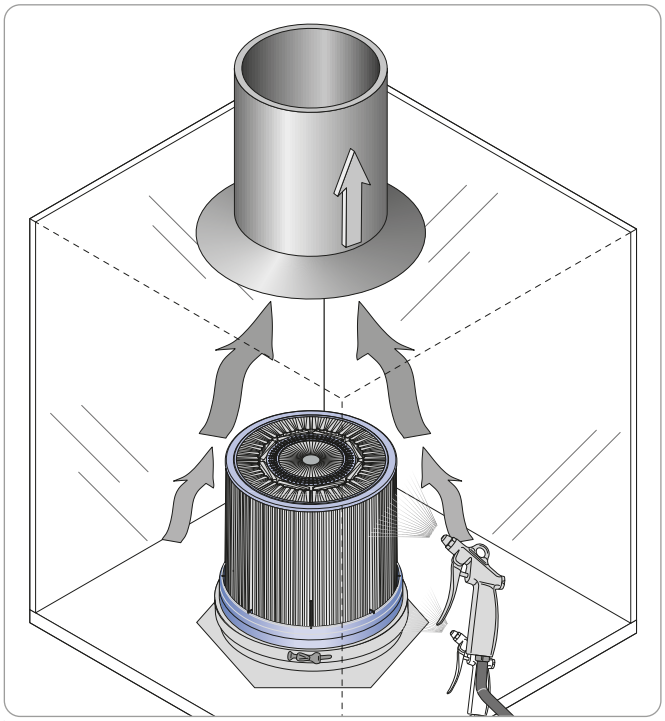
Disposing of soot and ash:

Aqueous solutions from particulate filters must be disposed of in accordance with waste disposal **code 190106** as listed in the European Waste Catalogue (EWC).

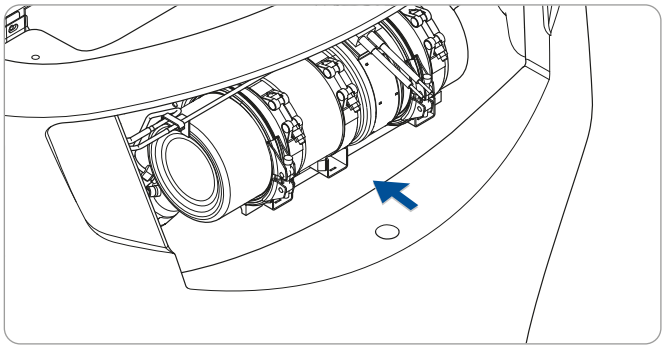
Solid matter from particulate filters must be disposed of in accordance with waste disposal **code 100118** as listed in the European Waste Catalogue (EWC).

CSMF filter modules

Coated Sintered Metal Filter modules (CSMF) may only be cleaned using compressed air. Manual or automatic cleaning equipment with an extractor unit is required.



• 3b. Clean CSMF with compressed air



• 4. Reinstall filter module

DPF® refurbishing – Made by HJS

HJS has its very own state-of-the-art system – designed and developed by our own engineers and technicians – for industrially refurbishing your used diesel particulate filters. The cleaning process is performed in a closed loop, so that no pollutants can escape into the environment.

Certification

HJS diesel particular filters for mobile machinery and stationary applications …

… are certified in accordance with the **internationally recognised VERT criteria**

… are included on the **Swiss BAFU filter** list and as such satisfy the tough specifications laid down by the national **Air Quality Control Regulation (LRV)**

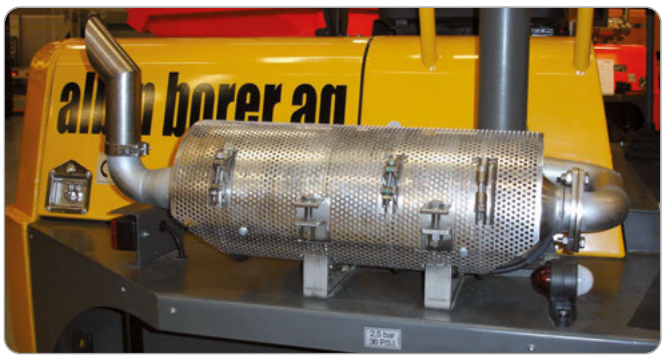
…. are approved by the US **Mine Safety and Health Administration (MSHA)**

… meet requirements of the Germany's **TRGS 554 2(4)**

On the safe side with HJS

Practical experience

HJS diesel particulate filter systems are suited for original equipment as well as retrofitting of mobile machinery and stationary applications. Many engine and machinery manufacturers are already convinced – and more than 20.000 applications, such as industrial fork-lift trucks and construction machines, have already been equipped with tailor-made HJS solutions. We see ourselves as a cost- and quality-oriented partner who supplies its customers – you – with effective systems and components.



• Application example – dependant on the available installation space HJS Systems fitted accordingly

3. Equipping of Diesel Engines with Particulate Filter Systems

The following procedures must be followed when installing an exhaust-gas aftertreatment system for mobile machinery and stationary applications:

Application of the Machinery

Exhaust-gas temperature 250 °C to 450 °C

SMF® system

Determine size of filter taking into account maximum permissible exhaust backpressure

Determine size of catalytic converter in line with machinery power rating and emissions standard

Check temperature profile

barely sufficient

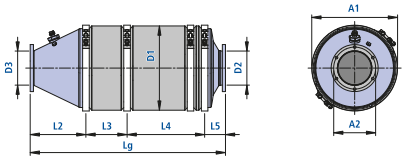
CSMF system (coated filter)

sufficient

SMF® system (uncoated filter)

Take insulation into account

Take installation space into account



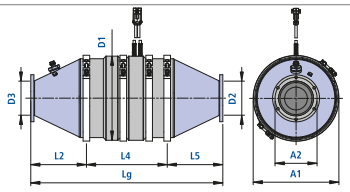
Exhaust-gas temperature from 150 °C

SMF®-AR system

Determine size of filter taking into account maximum permissible exhaust backpressure

Take insulation into account

Take installation space into account



All application specifications, installation guidelines and maintenance manuals provided by HJS Emission Technology GmbH & Co. KG must be complied with.

4. Modular SMF® System

SMF® technology has been developed specifically for applications in the medium to high power range. As a rule, the systems replace the original silencer, and they can be customised as required to match specific machines and stationary applications.

The modular SMF® systems require no extra regeneration aids, additives or intervention in the engine management system. The HJS Service Unit constantly displays the system's instantaneous operating state and indicates when the filter is in need of cleaning.

Catalytic coating

For low-temperature applications, the Sintered Metal Filter can be given a special coating in order to promote the regeneration process (CSMF = Coated Sintered Metal Filter).

• Modular SMF® system

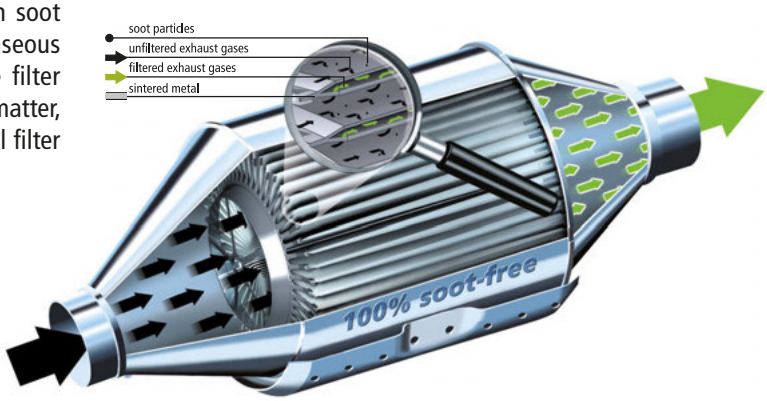
Application examples for SMF® systems:

Construction machinery, construction vehicles and construction equipment, such as industrial forklift trucks, wheel loaders, backhoe loaders, track loaders, special vehicles, power generating sets and district heating plants

The right system for your specific requirement

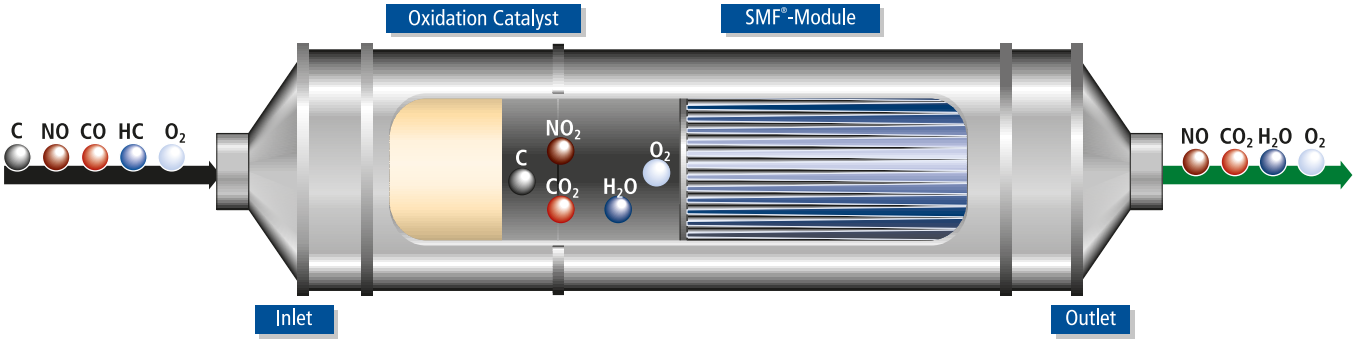
Functional description

The hot exhaust-gases from the engine – which contain soot particles – are fed into the housing of the SMF®. The gaseous components flow through the microscopic pores of the filter pockets; the soot particles, including the fine particulate matter, are trapped on the surface and deposited on the individual filter pockets.



HJS's proven SMF® technology with passive regeneration is used to break down the soot that collects in the SMF®. The HJS system combines a highly efficient, upstream diesel oxidation catalyst (DOC) with an SMF®.

Optimised tuning of the system results in the filter being continuously and effectively freed from the deposited soot.



• The proven HJS SMF® system with passive regeneration technology continuously frees the filter from the soot deposited

Benefits

- ✔ No need for time-consuming and costly replacement of mobile machinery and stationary applications
- ✔ Reduction of soot particles and fine particulate matter by more than 99% (Based on particle number)
- ✔ Catalytic coating provides extended temperature window
- ✔ Flexible adaptation to different machines and engine power outputs

SMF® system for retrofitting

4. Modular SMF® System

Technical data and requirements

Max. safe temperature operation for SMF®*: 650 °C exhaust-gas temperature

Max. safe temperature operation for CSMF:** 450 °C (max. 3% of operating time 450 °C < T < 500 °C)

Filter material: high-temperature-resistant chrome-nickel steel

Filter housing material: 1.4301

Filtration efficiency rate: (number concentration in range from 20 – 300 nm) > 99%

Filtration efficiency rate: (in relation to soot mass) > 95%

* SMF®: uncoated Sintered Metal Filter

** CSMF: coated Sintered Metal Filter

Application and operating conditions

The following application and operating conditions must be complied with in order to ensure the modular SMF®/CSMF systems from HJS function optimally:

> Engine fulfils Stage II, Stage III A/III B or Stage IV in Europe, Tiers II, III and IV in the USA

> Fuels used comply with DIN EN 590 (max. 50 ppm sulphur), DIN 51628 or DIN 14214 with a maximum phosphor concentration of 2 ppm and a maximum alkali concentration of 1 ppm

> Low-ash engine oils

> Exhaust-gas temperatures between 250 °C and 450 °C for > 35% of operating time for regeneration

> Strain-free, vibration-isolated installation of the systems and secure, gas-tight connection to the existing exhaust system

> Systems never mounted on the engine-gearbox unit

> Only components approved and released by the system supplier are fitted

Perfect connection of the system pipework ensures low exhaust backpressure. HJS offers insulating components for all its systems to reduce their surface temperature.

The systems must only ever be operated in conjunction with the HJS Service Unit and HJS insulation (included in the scope of delivery).

In order to ensure the systems operate as intended, HJS and its authorised partners offer a temperature-measurement service and one-on-one application consulting.

All application specifications, installation guidelines and maintenance manuals provided by HJS Emission Technology GmbH & Co. KG must be complied with.

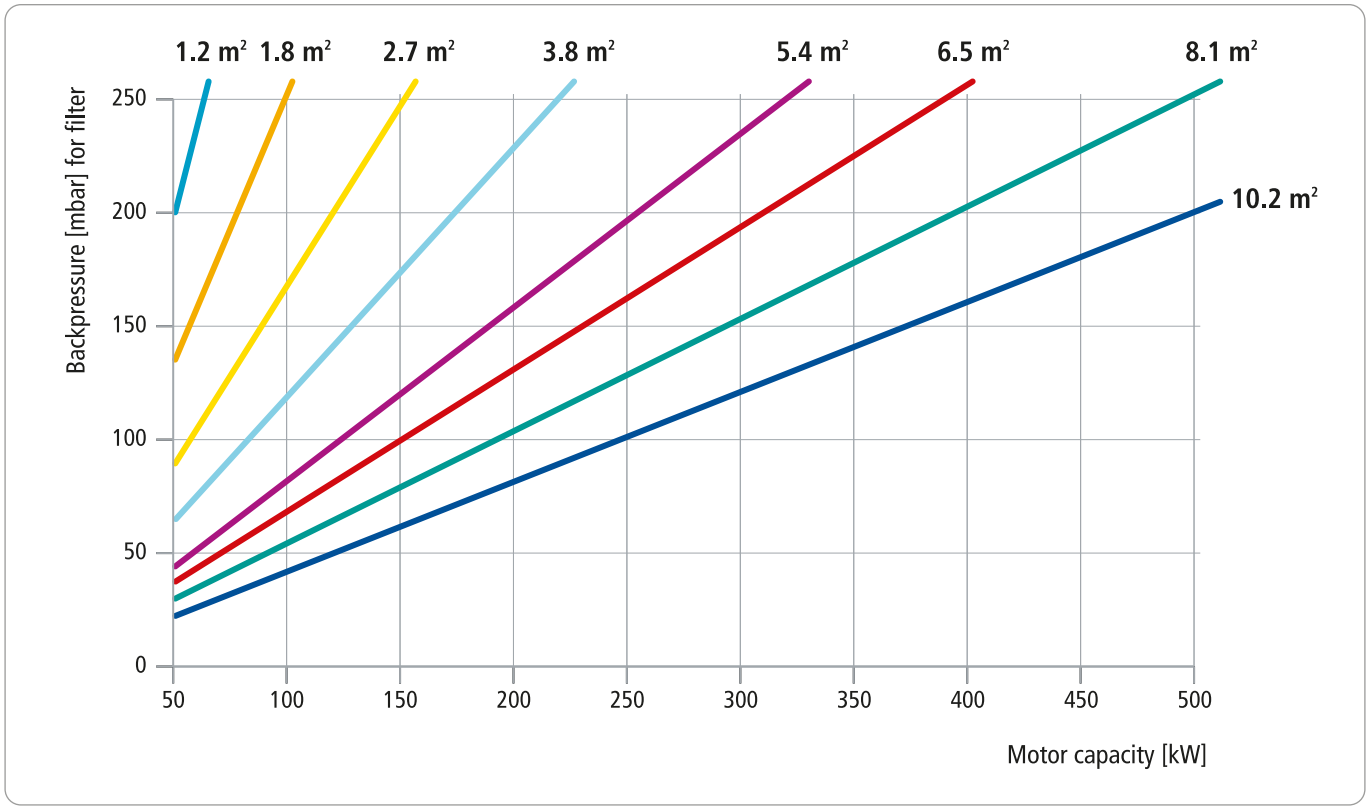
Dimensioning the filter

HJS offers modular SMF®/CSMF systems with filter surface areas ranging from 1.2 m² to 10.2 m².

To help you choose the right size of filter, the diagram below shows the exhaust backpressure generated by each size of filter (not taking the inlet and outlet modules into account).

• SMF®-Sintered Metal Filter – 100% soot-free

Filter surface areas* from 1.2 m² to 10.2 m²



* Refers to a filter module with a maximum temperature upstream of the DPF® of 450°C

• Backpressure of the individual filter units

Example calculation

In the case of a construction machine with a power output of e.g. 250 kW and a maximum permissible exhaust backpressure of 200 mbar (as specified by the engine manufacturer), a filter with a surface area of 5.4 m² can be installed. In this simplified example, it should be noted that the backpressure flow of the inlet and outlet modules is not taken into account. The modules tend to result in a slightly higher backpressure. Further technical data are required if the filter is to be dimensioned more precisely (see Enquiry Forms).

Dimensioning the catalytic converter

The vehicle and engine data (plus some other data) are required in order to determine the size of catalytic converter (3-inch or 6-inch cat) required. In order to ensure catalytic converters operate as intended, HJS and its authorised partners offer one-on-one assistance (see section HJS Enquiry Form).

4. Modular SMF® System

Considering the installation space available

After determining the size of the filter and catalytic converter, it's time to see how much space is available for installing them.

As a rule, the filter system replaces the original silencer. Alternatively, the particulate filter system can be installed at a different position in the exhaust system. In this case, note that the filter must be installed upstream of a silencer.

When selecting the installation position, make sure that there is sufficient clearance between the filter and other components and that the filter can be removed easily for servicing and maintenance work.

The filter unit can be installed horizontally or vertically. The matching inlet and outlet modules must be selected in line with the amount of installation space available in the machine (AXIAL-AXIAL, AXIAL-RADIAL, RADIAL-AXIAL, RADIAL-RADIAL).

To secure the filter, system mounts must be used.

Content of dimension tables

> Inlet module
> 3-inch or 6-inch cat module
> SMF® (uncoated filter) or CSMF (coated filter)
> Outlet module

Scope of delivery

The item numbers listed describe fully assembled filter units with inlet and outlet module, system clamp, gasket set and HJS Service Unit. In addition, all relevant technical documentations, such as the installation guidelines and maintenance manual, are included in the scope of delivery.

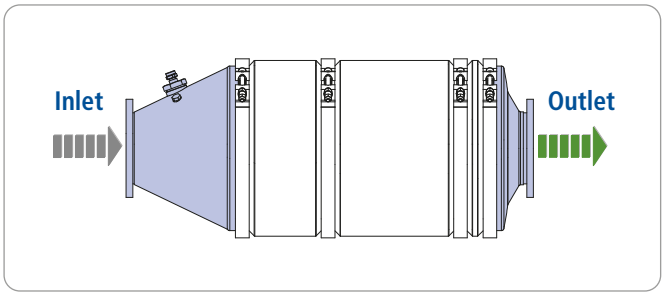
The system mounts and insulation set must be ordered separately. (see Section Individual components)

Dimension tables

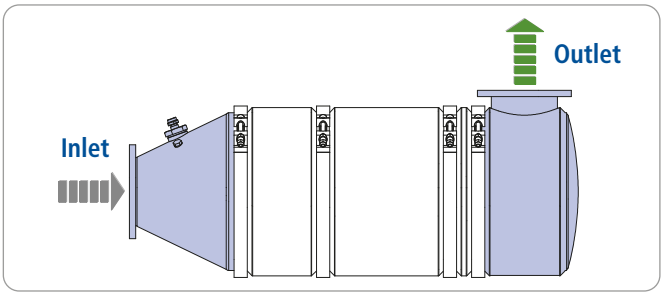
The dimension tables contain all dimensions of relevance to installation. All dimensions are stated in millimetres (mm).

This section describes and illustrates the different versions of filter systems with a surface area of 1.2 m^2 to 10.2 m^2.

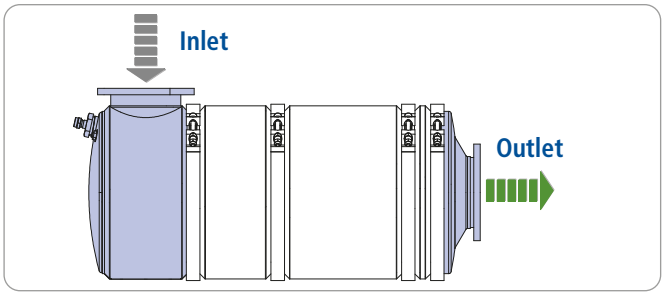
AXIAL - AXIAL



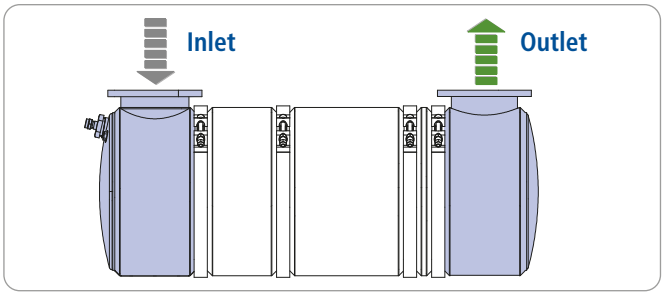
AXIAL - RADIAL



RADIAL - AXIAL

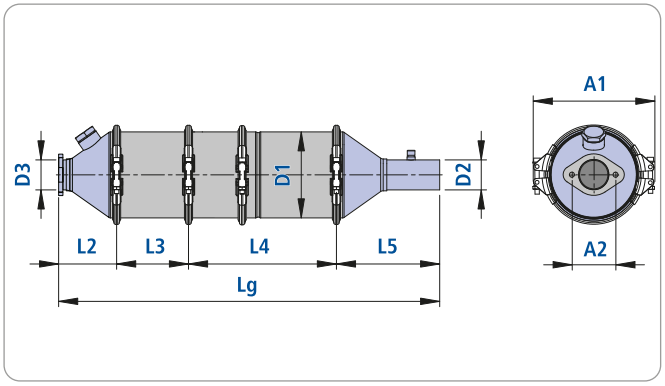


RADIAL - RADIAL

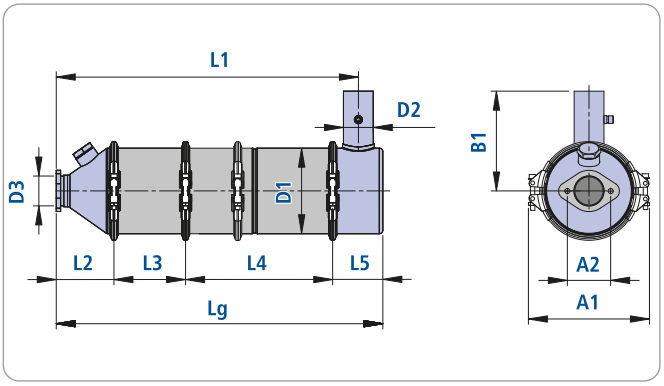


SMF® – 1.8 m²

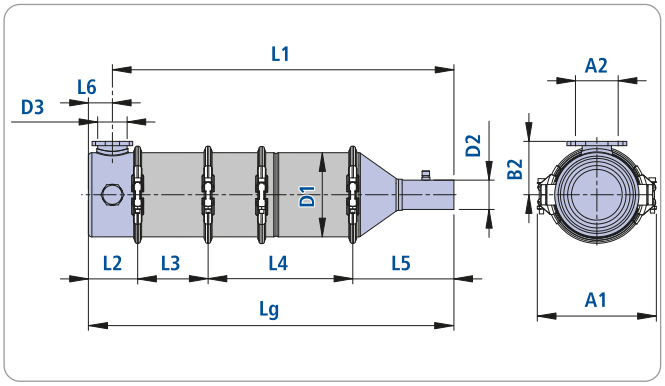
AXIAL - AXIAL



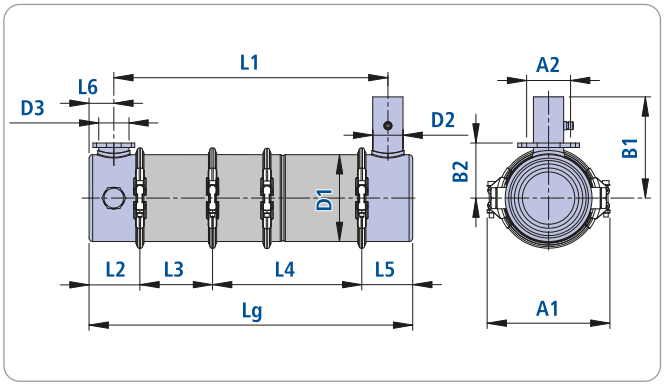
AXIAL - RADIAL



RADIAL - AXIAL



RADIAL - RADIAL



Measurement Table SMF® – 1.8 m²

HJS Item No.*1	System*2	Confi-guration	Lg		L1		L2	L3		L4	L5	L6	A1	A2	B1	B2	ø D1	ø D2	ø D3
			Cat 3-inch	Cat 6-inch	Cat 3-inch	Cat 6-inch		Cat 3-inch	Cat 6-inch										
93 72 0109	SMF® 1.8 m²	AX - AX	699	-	-	-	106	132	-	272	189	-	220	80	-	-	158	55	55
93 72 0110	SMF® 1.8 m²	AX - AX	-	758	-	-	106	-	191	272	189	-	220	80	-	-	158	55	55
93 76 0109	CSMF 1.8 m²	AX - AX	699	-	-	-	106	132	-	272	189	-	220	80	-	-	158	55	55
93 76 0110	CSMF 1.8 m²	AX - AX	-	758	-	-	106	-	191	272	189	-	220	80	-	-	158	55	55
93 72 0111	SMF® 1.8 m²	AX - RAD	602	-	557	-	106	132	-	272	92	-	220	80	184	-	158	55	55
93 72 0112	SMF® 1.8 m²	AX - RAD	-	661	-	616	106	-	191	272	92	-	220	80	184	-	158	55	55
93 76 0111	CSMF 1.8 m²	AX - RAD	602	-	557	-	106	132	-	272	92	-	220	80	184	-	158	55	55
93 76 0112	CSMF 1.8 m²	AX - RAD	-	661	-	616	106	-	191	272	92	-	220	80	184	-	158	55	55
93 72 0113	SMF® 1.8 m²	RAD - AX	685	-	640	-	92	132	-	272	189	45	220	80	-	100	158	55	55
93 72 0114	SMF® 1.8 m²	RAD - AX	-	744	-	699	92	-	191	272	189	45	220	80	-	100	158	55	55
93 76 0113	CSMF 1.8 m²	RAD - AX	685	-	640	-	92	132	-	272	189	45	220	80	-	100	158	55	55
93 76 0114	CSMF 1.8 m²	RAD - AX	-	744	-	699	92	-	191	272	189	45	220	80	-	100	158	55	55
93 72 0115	SMF® 1.8 m²	RAD - RAD	588	-	498	-	92	132	-	272	92	45	220	80	184	100	158	55	55
93 72 0116	SMF® 1.8 m²	RAD - RAD	-	647	-	557	92	-	191	272	92	45	220	80	184	100	158	55	55
93 76 0115	CSMF 1.8 m²	RAD - RAD	588	-	498	-	92	132	-	272	92	45	220	80	184	100	158	55	55
93 76 0116	CSMF 1.8 m²	RAD - RAD	-	647	-	557	92	-	191	272	92	45	220	80	184	100	158	55	55

*1 Scope of delivery does not include brackets and insulation

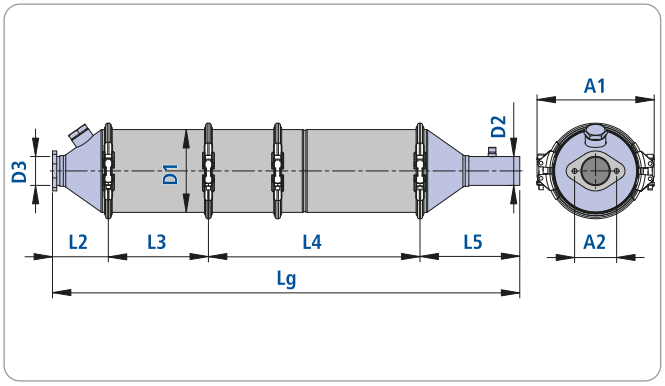
*2 SMF® = uncoated filter; CSMF = coated filter

Comment: The specified dimensions [in mm] are subject to tolerances. Precise dimensions on request.

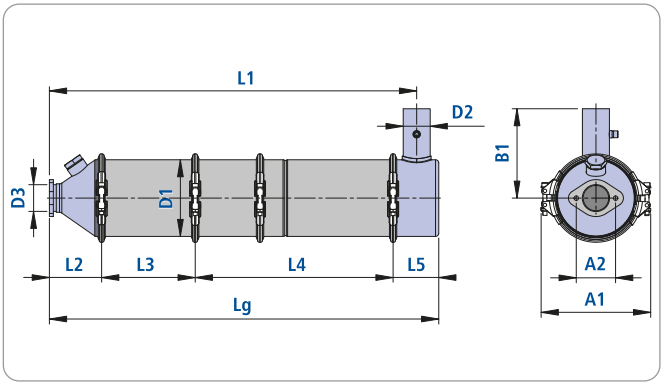
4. Modular SMF® System

SMF® – 2.7 m²

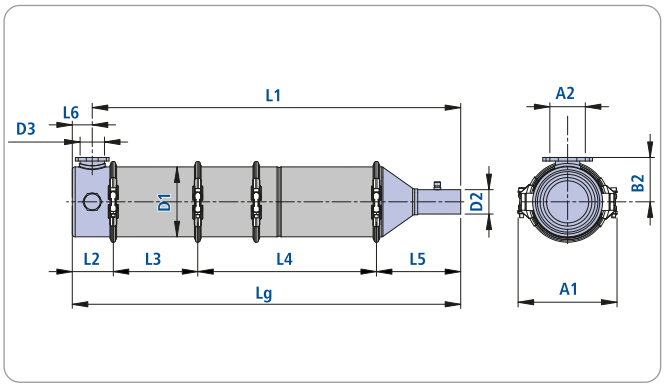
AXIAL - AXIAL



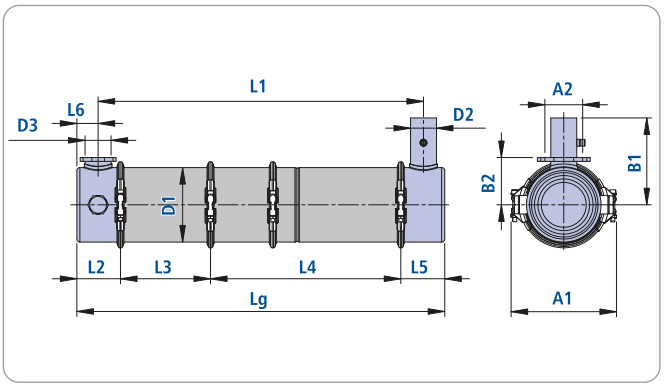
AXIAL - RADIAL



RADIAL - AXIAL



RADIAL - RADIAL



Measurement Table SMF® – 2.7 m²

HJS Item No.*1	System*2	Confi-guration	Lg		L1		L2	L3		L4	L5	L6	A1	A2	B1	B2	ø D1	ø D2	ø D3
			Cat 3-inch	Cat 6-inch	Cat 3-inch	Cat 6-inch		Cat 3-inch	Cat 6-inch										
93 72 0117	SMF® 2.7 m²	AX - AX	831	-	-	-	106	132	-	404	189	-	220	80	-	-	158	55	55
93 72 0118	SMF® 2.7 m²	AX - AX	-	890	-	-	106	-	191	404	189	-	220	80	-	-	158	55	55
93 76 0117	CSMF 2.7 m²	AX - AX	831	-	-	-	106	132	-	404	189	-	220	80	-	-	158	55	55
93 76 0118	CSMF 2.7 m²	AX - AX	-	890	-	-	106	-	191	404	189	-	220	80	-	-	158	55	55
93 72 0119	SMF® 2.7 m²	AX - RAD	734	-	689	-	106	132	-	404	92	-	220	80	184	-	158	55	55
93 72 0120	SMF® 2.7 m²	AX - RAD	-	793	-	748	106	-	191	404	92	-	220	80	184	-	158	55	55
93 76 0119	CSMF 2.7 m²	AX - RAD	734	-	689	-	106	132	-	404	92	-	220	80	184	-	158	55	55
93 76 0120	CSMF 2.7 m²	AX - RAD	-	793	-	748	106	-	191	404	92	-	220	80	184	-	158	55	55
93 72 0121	SMF® 2.7 m²	RAD - AX	817	-	772	-	92	132	-	404	189	45	220	80	-	100	158	55	55
93 72 0122	SMF® 2.7 m²	RAD - AX	-	876	-	831	92	-	191	404	189	45	220	80	-	100	158	55	55
93 76 0121	CSMF 2.7 m²	RAD - AX	817	-	772	-	92	132	-	404	189	45	220	80	-	100	158	55	55
93 76 0122	CSMF 2.7 m²	RAD - AX	-	876	-	831	92	-	191	404	189	45	220	80	-	100	158	55	55
93 72 0123	SMF® 2.7 m²	RAD - RAD	720	-	630	-	92	132	-	404	92	45	220	80	184	100	158	55	55
93 72 0124	SMF® 2.7 m²	RAD - RAD	-	779	-	689	92	-	191	404	92	45	220	80	184	100	158	55	55
93 76 0123	CSMF 2.7 m²	RAD - RAD	720	-	630	-	92	132	-	404	92	45	220	80	184	100	158	55	55
93 76 0124	CSMF 2.7 m²	RAD - RAD	-	779	-	689	92	-	191	404	92	45	220	80	184	100	158	55	55

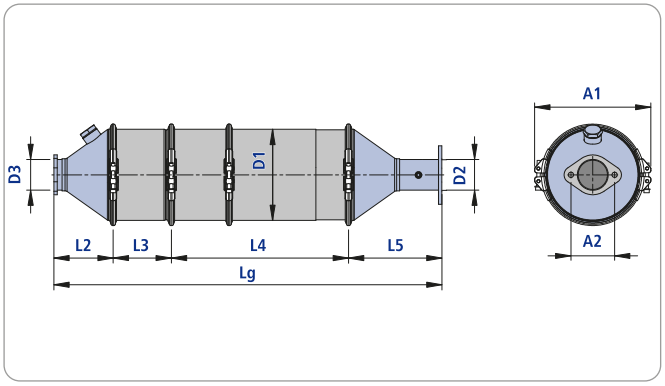
*1 Scope of delivery does not include brackets and insulation

*2 SMF® = uncoated filter; CSMF = coated filter

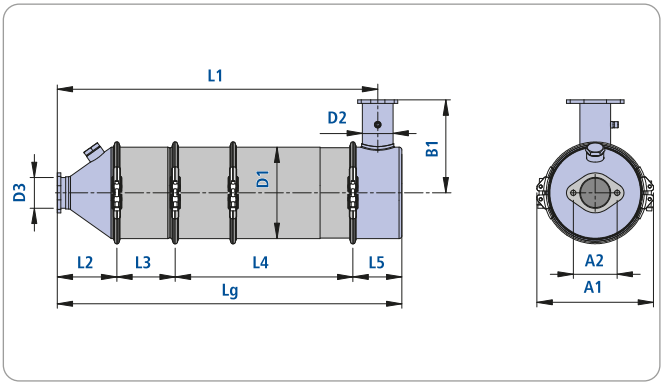
Comment: The specified dimensions [in mm] are subject to tolerances. Precise dimensions on request.

SMF® – 3.8 m²

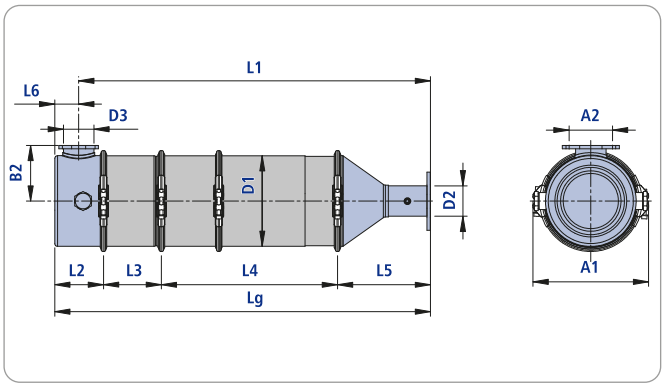
AXIAL - AXIAL



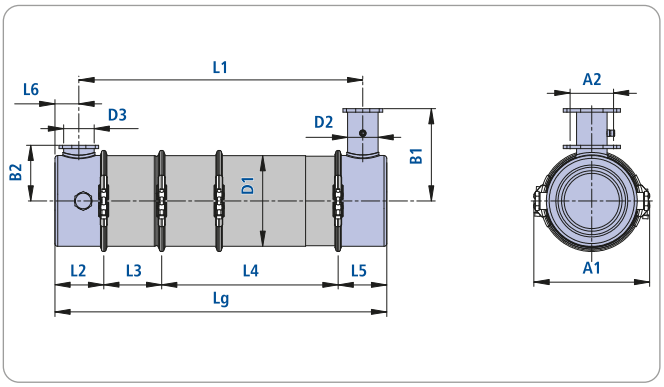
AXIAL - RADIAL



RADIAL - AXIAL



RADIAL - RADIAL



Measurement Table SMF® – 3.8 m²

HJS Item No.*1	System*2	Confi-guration	Lg		L1		L2	L3		L4	L5	L6	A1	A2	B1	B2	ø D1	ø D2	ø D3
			Cat 3-inch	Cat 6-inch	Cat 3-inch	Cat 6-inch		Cat 3-inch	Cat 6-inch										
93 72 0125	SMF® 3.8 m²	AX - AX	892	-	-	-	135	134	-	404	219	-	266	100	-	-	208	70	70
93 72 0126	SMF® 3.8 m²	AX - AX	-	966	-	-	135	-	208	404	219	-	266	100	-	-	208	70	70
93 76 0125	CSMF 3.8 m²	AX - AX	892	-	-	-	135	134	-	404	219	-	266	100	-	-	208	70	70
93 76 0126	CSMF 3.8 m²	AX - AX	-	966	-	-	135	-	208	404	219	-	266	100	-	-	208	70	70
93 72 0127	SMF® 3.8 m²	AX - RAD	786	-	731	-	135	134	-	404	113	-	266	100	216	-	208	70	70
93 72 0128	SMF® 3.8 m²	AX - RAD	-	860	-	805	135	-	208	404	113	-	266	100	216	-	208	70	70
93 76 0127	CSMF 3.8 m²	AX - RAD	786	-	731	-	135	134	-	404	113	-	266	100	216	-	208	70	70
93 76 0128	CSMF 3.8 m²	AX - RAD	-	860	-	805	135	-	208	404	113	-	266	100	216	-	208	70	70
93 72 0129	SMF® 3.8 m²	RAD - AX	868	-	813	-	111	134	-	404	219	55	266	100	-	127	208	70	70
93 72 0130	SMF® 3.8 m²	RAD - AX	-	943	-	888	111	-	208	404	219	55	266	100	-	127	208	70	70
93 76 0129	CSMF 3.8 m²	RAD - AX	868	-	813	-	111	134	-	404	219	55	266	100	-	127	208	70	70
93 76 0130	CSMF 3.8 m²	RAD - AX	-	943	-	888	111	-	208	404	219	55	266	100	-	127	208	70	70
93 72 0131	SMF® 3.8 m²	RAD - RAD	762	-	652	-	111	134	-	404	113	55	266	100	216	127	208	70	70
93 72 0132	SMF® 3.8 m²	RAD - RAD	-	836	-	726	111	-	208	404	113	55	266	100	216	127	208	70	70
93 76 0131	CSMF 3.8 m²	RAD - RAD	762	-	652	-	111	134	-	404	113	55	266	100	216	127	208	70	70
93 76 0132	CSMF 3.8 m²	RAD - RAD	-	836	-	726	111	-	208	404	113	55	266	100	216	127	208	70	70

*1 Scope of delivery does not include brackets and insulation

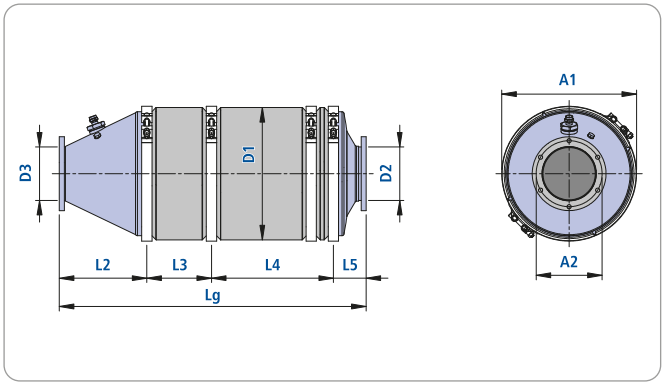
*2 SMF® = uncoated filter; CSMF = coated filter

Comment: The specified dimensions [in mm] are subject to tolerances. Precise dimensions on request.

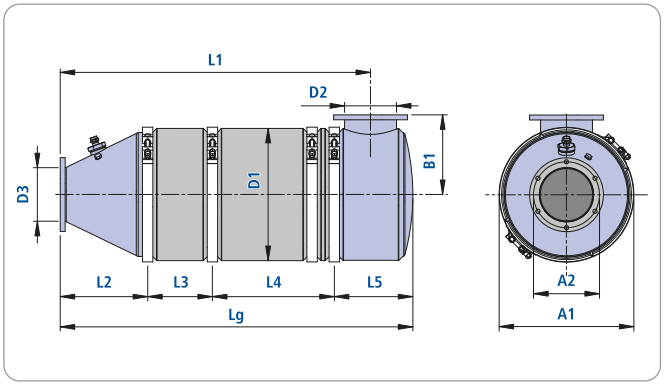
4. Modular SMF® System

SMF® – 5.4 m²

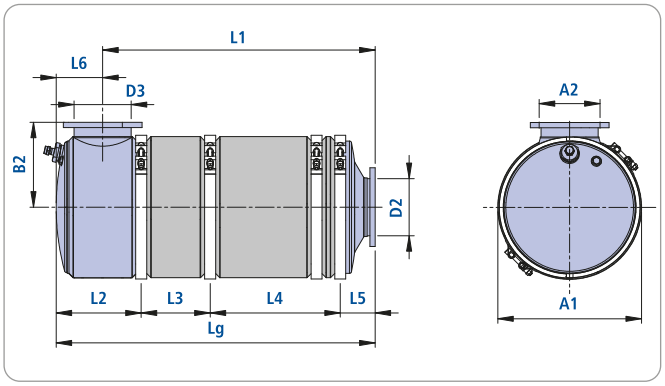
AXIAL - AXIAL



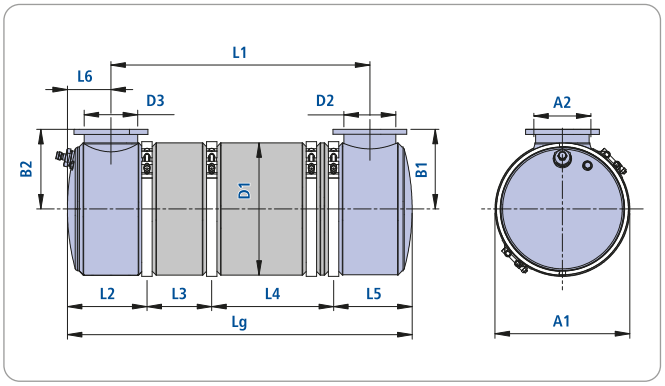
AXIAL - RADIAL



RADIAL - AXIAL



RADIAL - RADIAL



Measurement Table SMF® – 5.4 m²

HJS Item No.*1	System*2	Confi-guration	Lg		L1		L2	L3		L4	L5	L6	A1	A2	B1	B2	ø D1	ø D2	ø D3
			Cat 3-inch	Cat 6-inch	Cat 3-inch	Cat 6-inch		Cat 3-inch	Cat 6-inch										
93 72 0133	SMF® 5.4 m²	AX - AX	663	-	-	-	211	79	-	294	79	-	Ø 325	Ø 159	-	-	319	129	129
93 72 0134	SMF® 5.4 m²	AX - AX	-	740	-	-	211	-	156	294	79	-	Ø 325	Ø 159	-	-	319	129	129
93 76 0133	CSMF 5.4 m²	AX - AX	663	-	-	-	211	79	-	294	79	-	Ø 325	Ø 159	-	-	319	129	129
93 76 0134	CSMF 5.4 m²	AX - AX	-	740	-	-	211	-	156	294	79	-	Ø 325	Ø 159	-	-	319	129	129
93 72 0135	SMF® 5.4 m²	AX - RAD	773	-	672	-	211	79	-	294	189	-	Ø 325	Ø 159	192	-	319	129	129
93 72 0136	SMF® 5.4 m²	AX - RAD	-	850	-	749	211	-	156	294	189	-	Ø 325	Ø 159	192	-	319	129	129
93 76 0135	CSMF 5.4 m²	AX - RAD	773	-	672	-	211	79	-	294	189	-	Ø 325	Ø 159	192	-	319	129	129
93 76 0136	CSMF 5.4 m²	AX - RAD	-	850	-	749	211	-	156	294	189	-	Ø 325	Ø 159	192	-	319	129	129
93 72 0137	SMF® 5.4 m²	RAD - AX	644	-	539	-	192	79	-	294	79	105	Ø 325	Ø 159	-	192	319	129	129
93 72 0138	SMF® 5.4 m²	RAD - AX	-	721	-	616	192	-	156	294	79	105	Ø 325	Ø 159	-	192	319	129	129
93 76 0137	CSMF 5.4 m²	RAD - AX	644	-	539	-	192	79	-	294	79	105	Ø 325	Ø 159	-	192	319	129	129
93 76 0138	CSMF 5.4 m²	RAD - AX	-	721	-	616	192	-	156	294	79	105	Ø 325	Ø 159	-	192	319	129	129
93 72 0139	SMF® 5.4 m²	RAD - RAD	754	-	548	-	192	79	-	294	189	105	Ø 325	Ø 159	192	192	319	129	129
93 72 0140	SMF® 5.4 m²	RAD - RAD	-	831	-	625	192	-	156	294	189	105	Ø 325	Ø 159	192	192	319	129	129
93 76 0139	CSMF 5.4 m²	RAD - RAD	754	-	548	-	192	79	-	294	189	105	Ø 325	Ø 159	192	192	319	129	129
93 76 0140	CSMF 5.4 m²	RAD - RAD	-	831	-	625	192	-	156	294	189	105	Ø 325	Ø 159	192	192	319	129	129

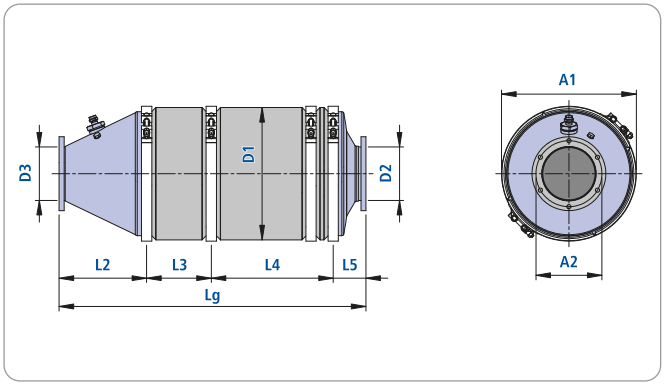
*1 Scope of delivery does not include brackets and insulation

*2 SMF® = uncoated filter; CSMF = coated filter

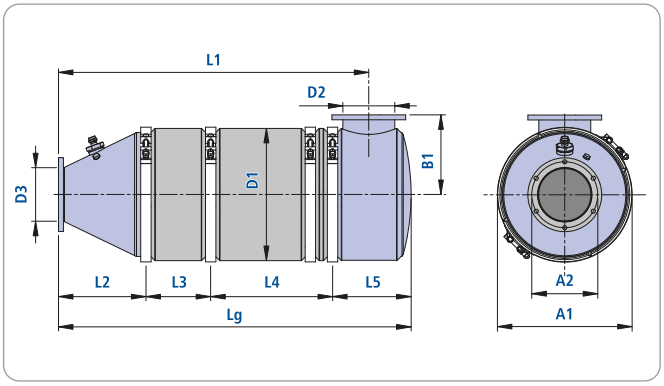
Comment: The specified dimensions [in mm] are subject to tolerances. Precise dimensions on request.

SMF® – 6.5 m²

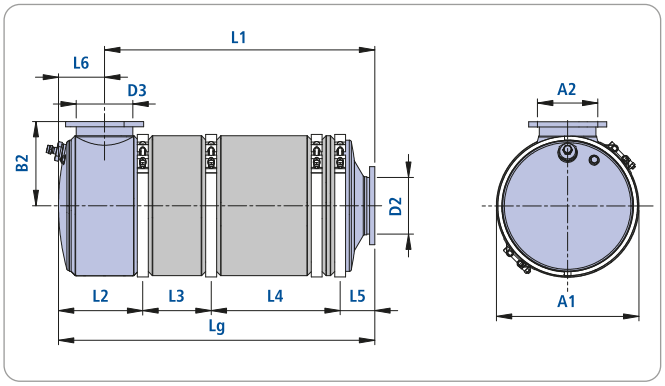
AXIAL - AXIAL



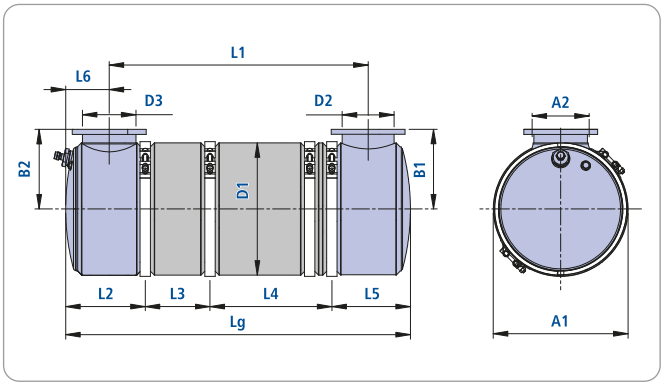
AXIAL - RADIAL



RADIAL - AXIAL



RADIAL - RADIAL



Measurement Table SMF® – 6.5 m²

HJS Item No.*1	System*2	Confi-guration	Lg		L1		L2	L3		L4	L5	L6	A1	A2	B1	B2	ø D1	ø D2	ø D3
			Cat 3-inch	Cat 6-inch	Cat 3-inch	Cat 6-inch		Cat 3-inch	Cat 6-inch										
93 72 0141	SMF® 6.5 m²	AX - AX	706	-	-	-	211	79	-	337	79	-	Ø 325	Ø 159	-	-	319	129	129
93 72 0142	SMF® 6.5 m²	AX - AX	-	783	-	-	211	-	156	337	79	-	Ø 325	Ø 159	-	-	319	129	129
93 76 0141	CSMF 6.5 m²	AX - AX	706	-	-	-	211	79	-	337	79	-	Ø 325	Ø 159	-	-	319	129	129
93 76 0142	CSMF 6.5 m²	AX - AX	-	783	-	-	211	-	156	337	79	-	Ø 325	Ø 159	-	-	319	129	129
93 72 0143	SMF® 6.5 m²	AX - RAD	816	-	715	-	211	79	-	337	189	-	Ø 325	Ø 159	192	-	319	129	129
93 72 0144	SMF® 6.5 m²	AX - RAD	-	893	-	792	211	-	156	337	189	-	Ø 325	Ø 159	192	-	319	129	129
93 76 0143	CSMF 6.5 m²	AX - RAD	816	-	715	-	211	79	-	337	189	-	Ø 325	Ø 159	192	-	319	129	129
93 76 0144	CSMF 6.5 m²	AX - RAD	-	893	-	792	211	-	156	337	189	-	Ø 325	Ø 159	192	-	319	129	129
93 72 0145	SMF® 6.5 m²	RAD - AX	687	-	582	-	192	79	-	337	79	105	Ø 325	Ø 159	-	192	319	129	129
93 72 0146	SMF® 6.5 m²	RAD - AX	-	764	-	659	192	-	156	337	79	105	Ø 325	Ø 159	-	192	319	129	129
93 76 0145	CSMF 6.5 m²	RAD - AX	687	-	582	-	192	79	-	337	79	105	Ø 325	Ø 159	-	192	319	129	129
93 76 0146	CSMF 6.5 m²	RAD - AX	-	764	-	659	192	-	156	337	79	105	Ø 325	Ø 159	-	192	319	129	129
93 72 0147	SMF® 6.5 m²	RAD - RAD	797	-	591	-	192	79	-	337	189	105	Ø 325	Ø 159	192	192	319	129	129
93 72 0148	SMF® 6.5 m²	RAD - RAD	-	874	-	668	192	-	156	337	189	105	Ø 325	Ø 159	192	192	319	129	129
93 76 0147	CSMF 6,5 m²	RAD - RAD	797	-	591	-	192	79	-	337	189	105	Ø 325	Ø 159	192	192	319	129	129
93 76 0148	CSMF 6.5 m²	RAD - RAD	-	874	-	668	192	-	156	337	189	105	Ø 325	Ø 159	192	192	319	129	129

*1 Scope of delivery does not include brackets and insulation

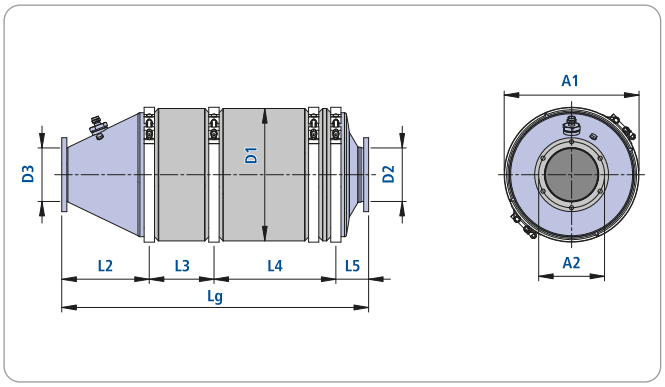
*2 SMF® = uncoated filter; CSMF = coated filter

Comment: The specified dimensions [in mm] are subject to tolerances. Precise dimensions on request.

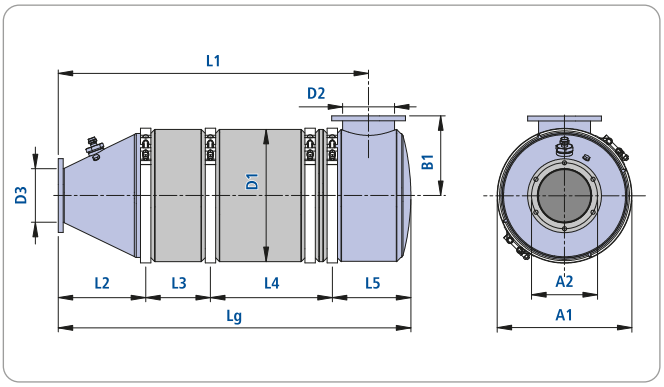
4. Modular SMF® System

SMF® – 8.1 m²

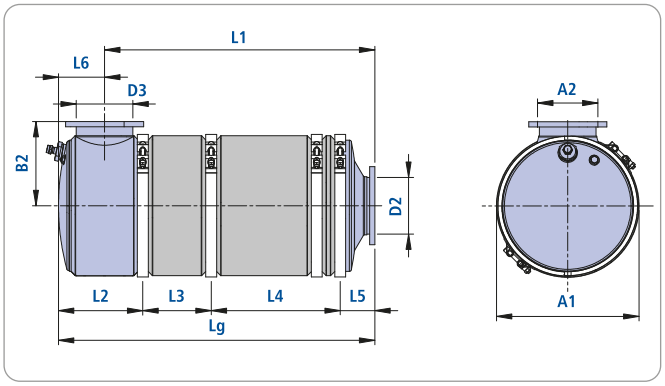
AXIAL - AXIAL



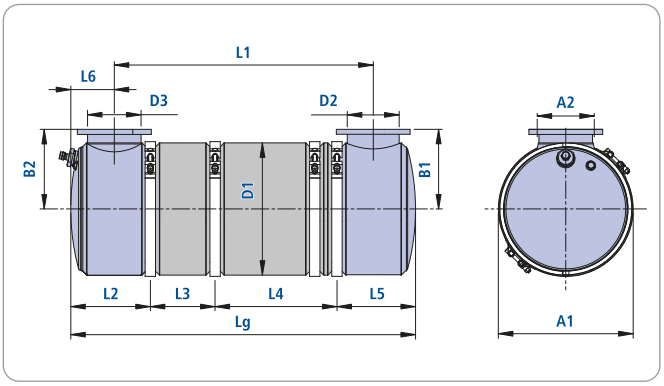
AXIAL - RADIAL



RADIAL - AXIAL



RADIAL - RADIAL



Measurement Table SMF® – 8.1 m²

HJS Item No.*1	System*2	Confi-guration	Lg		L1		L2	L3		L4	L5	L6	A1	A2	B1	B2	ø D1	ø D2	ø D3
			Cat 3-inch	Cat 6-inch	Cat 3-inch	Cat 6-inch		Cat 3-inch	Cat 6-inch										
93 72 0149	SMF® 8.1 m²	AX - AX	795	-	-	-	211	79	-	426	79	-	Ø 325	Ø 159	-	-	319	129	129
93 72 0150	SMF® 8.1 m²	AX - AX	-	872	-	-	211	-	156	426	79	-	Ø 325	Ø 159	-	-	319	129	129
93 76 0149	CSMF 8.1 m²	AX - AX	795	-	-	-	211	79	-	426	79	-	Ø 325	Ø 159	-	-	319	129	129
93 76 0150	CSMF 8.1 m²	AX - AX	-	872	-	-	211	-	156	426	79	-	Ø 325	Ø 159	-	-	319	129	129
93 72 0151	SMF® 8.1 m²	AX - RAD	905	-	804	-	211	79	-	426	189	-	Ø 325	Ø 159	192	-	319	129	129
93 72 0152	SMF® 8.1 m²	AX - RAD	-	982	-	881	211	-	156	426	189	-	Ø 325	Ø 159	192	-	319	129	129
93 76 0151	CSMF 8.1 m²	AX - RAD	905	-	804	-	211	79	-	426	189	-	Ø 325	Ø 159	192	-	319	129	129
93 76 0152	CSMF 8.1 m²	AX - RAD	-	982	-	881	211	-	156	426	189	-	Ø 325	Ø 159	192	-	319	129	129
93 72 0153	SMF® 8.1 m²	RAD - AX	776	-	671	-	192	79	-	426	79	105	Ø 325	Ø 159	-	192	319	129	129
93 72 0154	SMF® 8.1 m²	RAD - AX	-	853	-	748	192	-	156	426	79	105	Ø 325	Ø 159	-	192	319	129	129
93 76 0153	CSMF 8.1 m²	RAD - AX	776	-	671	-	192	79	-	426	79	105	Ø 325	Ø 159	-	192	319	129	129
93 76 0154	CSMF 8.1 m²	RAD - AX	-	853	-	748	192	-	156	426	79	105	Ø 325	Ø 159	-	192	319	129	129
93 72 0155	SMF® 8.1 m²	RAD - RAD	886	-	680	-	192	79	-	426	189	105	Ø 325	Ø 159	192	192	319	129	129
93 72 0156	SMF® 8.1 m²	RAD - RAD	-	963	-	757	192	-	156	426	189	105	Ø 325	Ø 159	192	192	319	129	129
93 76 0155	CSMF 8.1 m²	RAD - RAD	886	-	680	-	192	79	-	426	189	105	Ø 325	Ø 159	192	192	319	129	129
93 76 0156	CSMF 8.1 m²	RAD - RAD	-	963	-	757	192	-	156	426	189	105	Ø 325	Ø 159	192	192	319	129	129

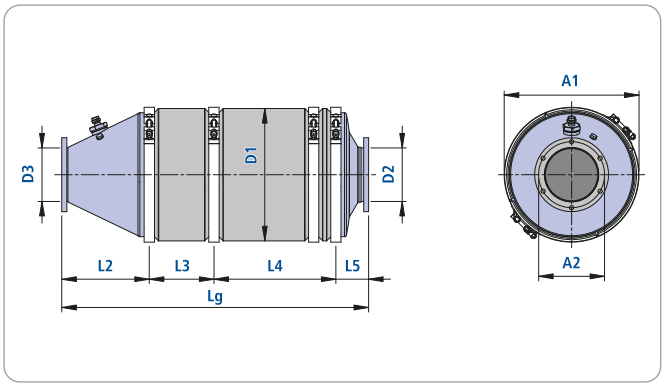
*1 Scope of delivery does not include brackets and insulation

*2 SMF® = uncoated filter; CSMF = coated filter

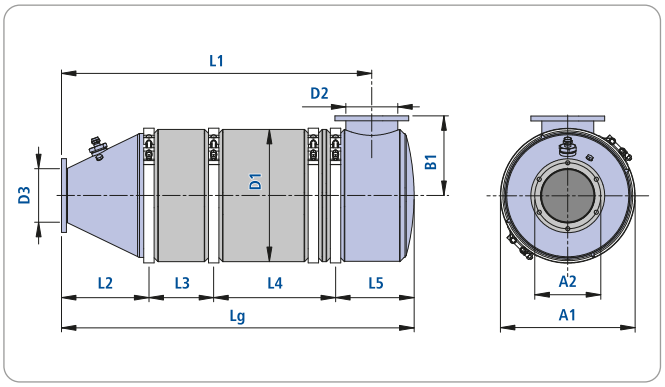
Comment: The specified dimensions [in mm] are subject to tolerances. Precise dimensions on request.

SMF® – 8.0 m²

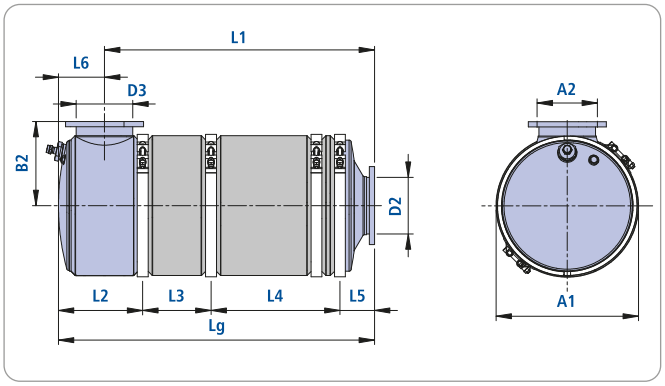
AXIAL - AXIAL



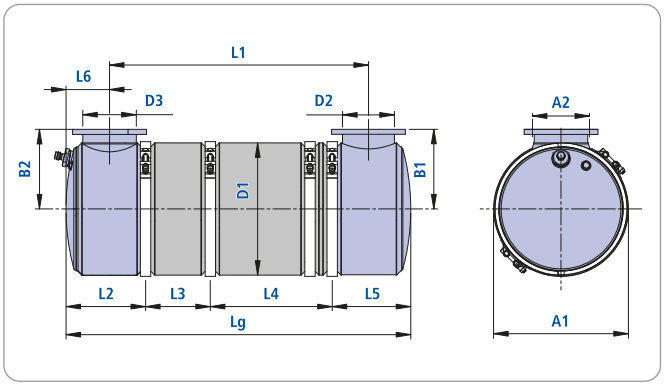
AXIAL - RADIAL



RADIAL - AXIAL



RADIAL - RADIAL



Measurement Table SMF® – 8.0 m²

HJS Item No.*1	System*2	Confi-guration	Lg		L1		L2	L3		L4	L5	L6	A1	A2	B1	B2	ø D1	ø D2	ø D3
			Cat 3-inch	Cat 6-inch	Cat 3-inch	Cat 6-inch		Cat 3-inch	Cat 6-inch										
93 72 0157	SMF® 8.0 m²	AX - AX	707	-	-	-	211	79	-	338	79	-	Ø 350	Ø 159	-	-	343	129	129
93 72 0158	SMF® 8.0 m²	AX - AX	-	784	-	-	211	-	156	338	79	-	Ø 350	Ø 159	-	-	343	129	129
93 76 0157	CSMF 8.0 m²	AX - AX	707	-	-	-	211	79	-	338	79	-	Ø 350	Ø 159	-	-	343	129	129
93 76 0158	CSMF 8.0 m²	AX - AX	-	784	-	-	211	-	156	338	79	-	Ø 350	Ø 159	-	-	343	129	129
93 72 0159	SMF® 8.0 m²	AX - RAD	817	-	715	-	211	79	-	338	189	-	Ø 350	Ø 159	204	-	343	129	129
93 72 0160	SMF® 8.0 m²	AX - RAD	-	894	-	792	211	-	156	338	189	-	Ø 350	Ø 159	204	-	343	129	129
93 76 0159	CSMF 8.0 m²	AX - RAD	817	-	715	-	211	79	-	338	189	-	Ø 350	Ø 159	204	-	343	129	129
93 76 0160	CSMF 8.0 m²	AX - RAD	-	894	-	792	211	-	156	338	189	-	Ø 350	Ø 159	204	-	343	129	129
93 72 0161	SMF® 8.0 m²	RAD - AX	685	-	583	-	189	79	-	338	79	102	Ø 350	Ø 159	-	204	343	129	129
93 72 0162	SMF® 8.0 m²	RAD - AX	-	762	-	660	189	-	156	338	79	102	Ø 350	Ø 159	-	204	343	129	129
93 76 0161	CSMF 8.0 m²	RAD - AX	685	-	583	-	189	79	-	338	79	102	Ø 350	Ø 159	-	204	343	129	129
93 76 0162	CSMF 8.0 m²	RAD - AX	-	762	-	660	189	-	156	338	79	102	Ø 350	Ø 159	-	204	343	129	129
93 72 0163	SMF® 8.0 m²	RAD - RAD	795	-	591	-	189	79	-	338	189	102	Ø 350	Ø 159	204	204	343	129	129
93 72 0164	SMF® 8.0 m²	RAD - RAD	-	872	-	668	189	-	156	338	189	102	Ø 350	Ø 159	204	204	343	129	129
93 76 0163	CSMF 8.0 m²	RAD - RAD	795	-	591	-	189	79	-	338	189	102	Ø 350	Ø 159	204	204	343	129	129
93 76 0164	CSMF 8.0 m²	RAD - RAD	-	872	-	668	189	-	156	338	189	102	Ø 350	Ø 159	204	204	343	129	129

*1 Scope of delivery does not include brackets and insulation

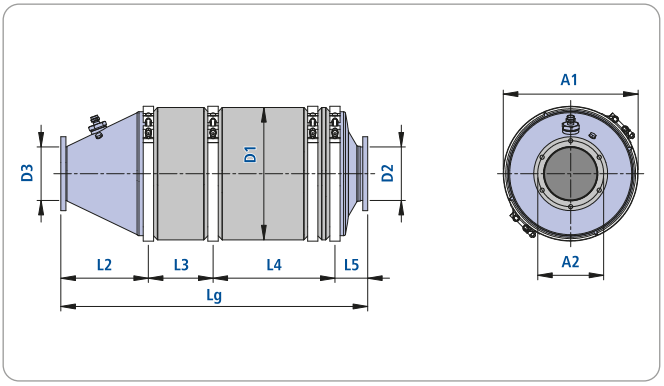
*2 SMF® = uncoated filter; CSMF = coated filter

Comment: The specified dimensions [in mm] are subject to tolerances. Precise dimensions on request.

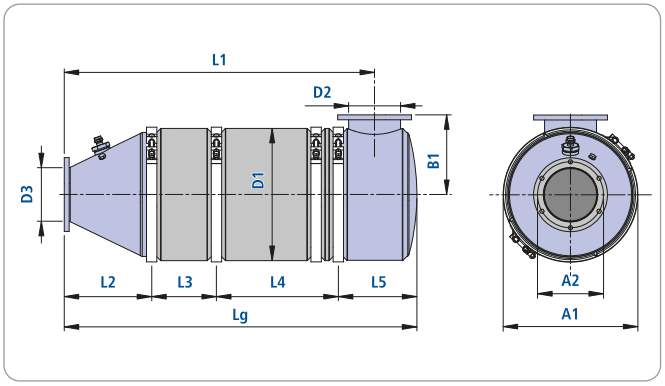
4. Modular SMF® System

SMF® – 10.2 m²

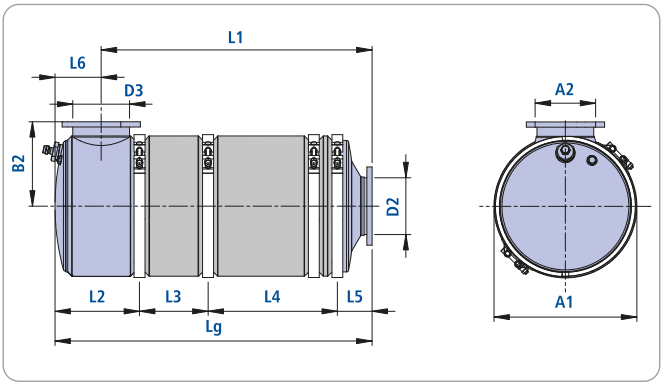
AXIAL - AXIAL



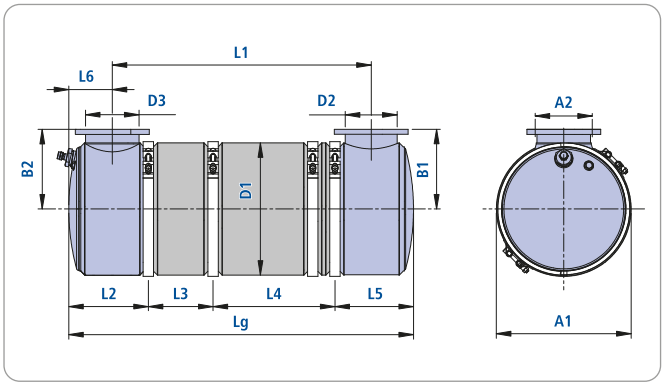
AXIAL - RADIAL



RADIAL - AXIAL



RADIAL - RADIAL



Measurement Table SMF® – 10.2 m²

HJS Item No.*1	System*2	Confi-guration	Lg		L1		L2	L3		L4	L5	L6	A1	A2	B1	B2	ø D1	ø D2	ø D3
			Cat 3-inch	Cat 6-inch	Cat 3-inch	Cat 6-inch		Cat 3-inch	Cat 6-inch										
93 72 0165	SMF® 10.2 m²	AX - AX	795	-	-	-	211	79	-	426	79	-	Ø 350	Ø 159	-	-	343	129	129
93 72 0166	SMF® 10.2 m²	AX - AX	-	872	-	-	211	-	156	426	79	-	Ø 350	Ø 159	-	-	343	129	129
93 76 0165	CSMF 10.2 m²	AX - AX	795	-	-	-	211	79	-	426	79	-	Ø 350	Ø 159	-	-	343	129	129
93 76 0166	CSMF 10.2 m²	AX - AX	-	872	-	-	211	-	156	426	79	-	Ø 350	Ø 159	-	-	343	129	129
93 72 0167	SMF® 10.2 m²	AX - RAD	905	-	803	-	211	79	-	426	189	-	Ø 350	Ø 159	204	-	343	129	129
93 72 0168	SMF® 10.2 m²	AX - RAD	-	982	-	880	211	-	156	426	189	-	Ø 350	Ø 159	204	-	343	129	129
93 76 0167	CSMF 10.2 m²	AX - RAD	905	-	803	-	211	79	-	426	189	-	Ø 350	Ø 159	204	-	343	129	129
93 76 0168	CSMF 10.2 m²	AX - RAD	-	982	-	880	211	-	156	426	189	-	Ø 350	Ø 159	204	-	343	129	129
93 72 0169	SMF® 10.2 m²	RAD - AX	773	-	671	-	189	79	-	426	79	102	Ø 350	Ø 159	-	204	343	129	129
93 72 0170	SMF® 10.2 m²	RAD - AX	-	850	-	748	189	-	156	426	79	102	Ø 350	Ø 159	-	204	343	129	129
93 76 0169	CSMF 10.2 m²	RAD - AX	773	-	671	-	189	79	-	426	79	102	Ø 350	Ø 159	-	204	343	129	129
93 76 0170	CSMF 10.2 m²	RAD - AX	-	850	-	748	189	-	156	426	79	102	Ø 350	Ø 159	-	204	343	129	129
93 72 0171	SMF® 10.2 m²	RAD - RAD	883	-	680	-	189	79	-	426	189	102	Ø 350	Ø 159	204	204	343	129	129
93 72 0172	SMF® 10.2 m²	RAD - RAD	-	960	-	757	189	-	156	426	189	102	Ø 350	Ø 159	204	204	343	129	129
93 76 0171	CSMF 10.2 m²	RAD - RAD	883	-	680	-	189	79	-	426	189	102	Ø 350	Ø 159	204	204	343	129	129
93 76 0172	CSMF 10.2 m²	RAD - RAD	-	960	-	757	189	-	156	426	189	102	Ø 350	Ø 159	204	204	343	129	129

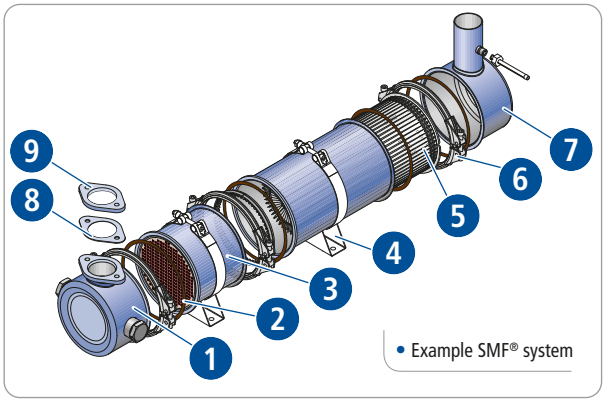
*1 Scope of delivery does not include brackets and insulation

*2 SMF® = uncoated filter; CSMF = coated filter

Comment: The specified dimensions [in mm] are subject to tolerances. Precise dimensions on request.

Individual components

The table below contains the data of the individual components of a SMF® system.



1. Inlet Module
2. System Gasket
3. Cat Module
4. System Mount
5. SMF®/CSMF Filter
6. System Clamp
7. Outlet Module
8. Flange gasket
9. Flange

SMF® system	Cat capacity [l] 3"	6"	Weight [kg] 3"	6"
SMF® 1.8 m²	1.2	2.4	12.5	13.5
SMF® 2.7 m²	1.2	2.4	16.5	17.5
SMF® 3.8 m²	2.1	4.3	22	24
SMF® 5.4 m²	4.2	8.5	45	50
SMF® 6.5 m²	4.2	8.5	50	55
SMF® 8.1 m²	4.2	8.5	57	62
SMF® 8.0 m²	4.2	8.5	55	60
SMF® 10.2 m²	4.2	8.5	60	65

Service-Unit	
SMF® 94 10 4106	CSMF 94 10 4107

	Confi-guration	Inlet Module 1	System Gasket 2	Cat Module 3-inch 3	Cat Module 6-inch 3	System Mount 4	SMF® Filter uncoated 5	CSMF Filter coated 5	System Clamp 6	Outlet Module 7	Flange gasket 8	Flange 9	Insulation 3-inch	Insulation 6-inch
SMF® 1.8 m²	AX - AX	93 02 4184	93 02 4189	93 02 4954	93 02 4958	93 02 4365	93 62 6050	93 75 6050	93 02 4179	93 02 4186	93 02 4194	93 02 4191	94 10 3200	94 10 3029
	AX - RAD	93 02 4184	93 02 4189	93 02 4954	93 02 4958	93 02 4365	93 62 6050	93 75 6050	93 02 4179	93 02 4188	93 02 4194	93 02 4191	94 10 3201	94 10 3030
	RAD - AX	93 02 4190	93 02 4189	93 02 4954	93 02 4958	93 02 4365	93 62 6050	93 75 6050	93 02 4179	93 02 4186	93 02 4194	93 02 4191	94 10 3202	94 10 3032
	RAD - RAD	93 02 4190	93 02 4189	93 02 4954	93 02 4958	93 02 4365	93 62 6050	93 75 6050	93 02 4179	93 02 4188	93 02 4194	93 02 4191	94 10 3203	94 10 3031
SMF® 2.7 m²	AX - AX	93 02 4184	93 02 4189	93 02 4954	93 02 4958	93 02 4365	93 62 6052	93 75 6052	93 02 4179	93 02 4186	93 02 4194	93 02 4191	94 10 3204	94 10 3033
	AX - RAD	93 02 4184	93 02 4189	93 02 4954	93 02 4958	93 02 4365	93 62 6052	93 75 6052	93 02 4179	93 02 4188	93 02 4194	93 02 4191	94 10 3205	94 10 3034
	RAD - AX	93 02 4190	93 02 4189	93 02 4954	93 02 4958	93 02 4365	93 62 6052	93 75 6052	93 02 4179	93 02 4186	93 02 4194	93 02 4191	94 10 3206	94 10 3036
	RAD - RAD	93 02 4190	93 02 4189	93 02 4954	93 02 4958	93 02 4365	93 62 6052	93 75 6052	93 02 4179	93 02 4188	93 02 4194	93 02 4191	94 10 3207	94 10 3035
SMF® 3.8 m²	AX - AX	93 02 4196	93 02 4185	94 62 4964	94 62 4968	93 02 4357	93 62 6054	93 75 6054	93 02 4201	93 02 4197	93 02 4207	93 02 4206	94 10 3208	94 10 3037
	AX - RAD	93 02 4196	93 02 4185	94 62 4964	94 62 4968	93 02 4357	93 62 6054	93 75 6054	93 02 4201	93 02 4199	93 02 4207	93 02 4206	94 10 3209	94 10 3038
	RAD - AX	93 02 4198	93 02 4185	94 62 4964	94 62 4968	93 02 4357	93 62 6054	93 75 6054	93 02 4201	93 02 4197	93 02 4207	93 02 4206	94 10 3210	94 10 3040
	RAD - RAD	93 02 4198	93 02 4185	94 62 4964	94 62 4968	93 02 4357	93 62 6054	93 75 6054	93 02 4201	93 02 4199	93 02 4207	93 02 4206	94 10 3211	94 10 3039
SMF® 5.4 m²	AX - AX	94 62 4006	94 03 0006	94 62 2317	94 62 2034	94 03 6275	93 62 4096	93 75 4096	94 62 2033	94 11 2208	94 03 0026	94 20 2200	94 10 3212	94 10 3053
	AX - RAD	94 62 4006	94 03 0006	94 62 2317	94 62 2034	94 03 6275	93 62 4096	93 75 4096	94 62 2033	94 11 4019	94 03 0026	94 20 2200	94 10 3213	94 10 3054
	RAD - AX	94 11 4012	94 03 0006	94 62 2317	94 62 2034	94 03 6275	93 62 4096	93 75 4096	94 62 2033	94 11 2208	94 03 0026	94 20 2200	94 10 3214	94 10 3056
	RAD - RAD	94 11 4012	94 03 0006	94 62 2317	94 62 2034	94 03 6275	93 62 4096	93 75 4096	94 62 2033	94 11 4019	94 03 0026	94 20 2200	94 10 3215	94 10 3055
SMF® 6.5 m²	AX - AX	94 62 4006	94 03 0006	94 62 2317	94 62 2034	94 03 6275	93 62 4099	93 75 4099	94 62 2033	94 11 2208	94 03 0026	94 20 2200	94 10 3216	94 10 3057
	AX - RAD	94 62 4006	94 03 0006	94 62 2317	94 62 2034	94 03 6275	93 62 4099	93 75 4099	94 62 2033	94 11 4019	94 03 0026	94 20 2200	94 10 3217	94 10 3058
	RAD - AX	94 11 4012	94 03 0006	94 62 2317	94 62 2034	94 03 6275	93 62 4099	93 75 4099	94 62 2033	94 11 2208	94 03 0026	94 20 2200	94 10 3218	94 10 3060
	RAD - RAD	94 11 4012	94 03 0006	94 62 2317	94 62 2034	94 03 6275	93 62 4099	93 75 4099	94 62 2033	94 11 4019	94 03 0026	94 20 2200	94 10 3219	94 10 3059
SMF® 8.1 m²	AX - AX	94 62 4006	94 03 0006	94 62 2317	94 62 2034	94 03 6275	93 62 3736	93 75 3736	94 62 2033	94 11 2208	94 03 0026	94 20 2200	94 10 3220	94 10 3061
	AX - RAD	94 62 4006	94 03 0006	94 62 2317	94 62 2034	94 03 6275	93 62 3736	93 75 3736	94 62 2033	94 11 4019	94 03 0026	94 20 2200	94 10 3221	94 10 3062
	RAD - AX	94 11 4012	94 03 0006	94 62 2317	94 62 2034	94 03 6275	93 62 3736	93 75 3736	94 62 2033	94 11 2208	94 03 0026	94 20 2200	94 10 3222	94 10 3064
	RAD - RAD	94 11 4012	94 03 0006	94 62 2317	94 62 2034	94 03 6275	93 62 3736	93 75 3736	94 62 2033	94 11 4019	94 03 0026	94 20 2200	94 10 3223	94 10 3063
SMF® 8.0 m²	AX - AX	94 62 4242	94 03 0005	94 62 2416	94 62 2006	94 03 6276	93 62 4301	93 75 4301	94 62 1994	94 11 4245	94 03 0026	94 20 2200	94 10 3224	94 10 3065
	AX - RAD	94 62 4242	94 03 0005	94 62 2416	94 62 2006	94 03 6276	93 62 4301	93 75 4301	94 62 1994	94 11 4574	94 03 0026	94 20 2200	94 10 3225	94 10 3066
	RAD - AX	94 11 4565	94 03 0005	94 62 2416	94 62 2006	94 03 6276	93 62 4301	93 75 4301	94 62 1994	94 11 4245	94 03 0026	94 20 2200	94 10 3226	94 10 3068
	RAD - RAD	94 11 4565	94 03 0005	94 62 2416	94 62 2006	94 03 6276	93 62 4301	93 75 4301	94 62 1994	94 11 4574	94 03 0026	94 20 2200	94 10 3227	94 10 3067
SMF® 10.2 m²	AX - AX	94 62 4242	94 03 0005	94 62 2416	94 62 2006	94 03 6276	93 62 4248	93 75 4248	94 62 1994	94 11 4245	94 03 0026	94 20 2200	94 10 3228	94 10 3069
	AX - RAD	94 62 4242	94 03 0005	94 62 2416	94 62 2006	94 03 6276	93 62 4248	93 75 4248	94 62 1994	94 11 4574	94 03 0026	94 20 2200	94 10 3229	94 10 3070
	RAD - AX	94 11 4565	94 03 0005	94 62 2416	94 62 2006	94 03 6276	93 62 4248	93 75 4248	94 62 1994	94 11 4245	94 03 0026	94 20 2200	94 10 3230	94 10 3072
	RAD - RAD	94 11 4565	94 03 0005	94 62 2416	94 62 2006	94 03 6276	93 62 4248	93 75 4248	94 62 1994	94 11 4574	94 03 0026	94 20 2200	94 10 3231	94 10 3071

5. Modular SMF®-AR System

Owing to greatly differing application profiles with exhaust-gas temperatures that are frequently too low, mobile machinery and stationary applications are usually fitted with active systems, such as the SMF®-AR (Sintered Metal Filter with thermoelectric self-regeneration) system developed by HJS. With this system, the particulate filter can be regenerated at almost any engine operating point, irrespective of exhaust-gas temperature. The heat necessary to burn off the particulate matter is generated by the SMF®-AR system itself.

Thanks to the compact and modular design of the SMF®-AR system, it can be put to use in many different applications. Pipes and brackets can be modified as required to match the different machines and vehicles. As a rule, SMF®-AR systems replace the original silencer.

Application examples for SMF®-AR systems:

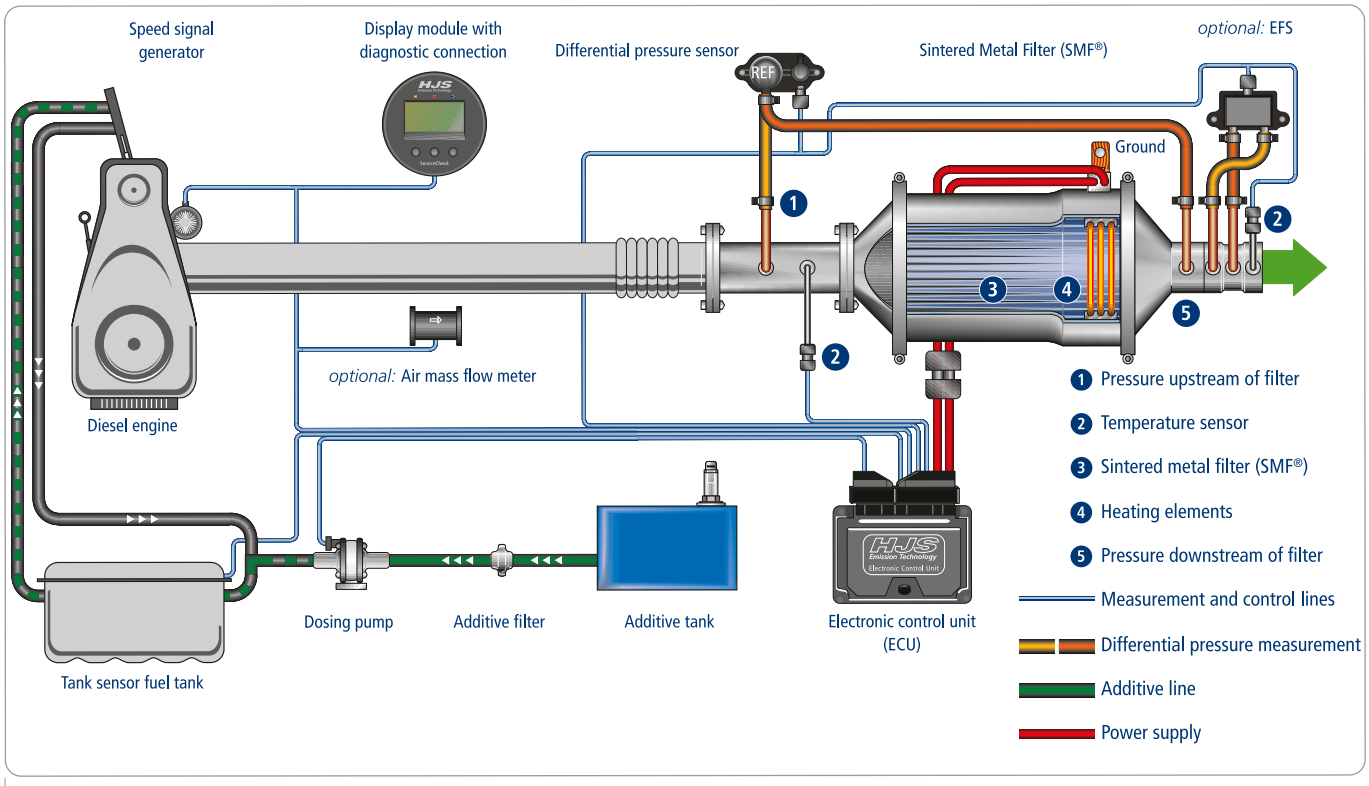
Construction machinery and construction equipment, such as forklift trucks, mini hydraulic excavators, wheel loaders, industrial trucks and power generating sets.

• SMF®-AR system with heating elements that encircle the filter

Functional description

The SMF®-AR system filters the exhaust gases until an optimum quantity of soot for regeneration has been collected in the filter. The system makes use of the positive active properties of a fuel additive that on the one hand lowers the soot's ignition temperature and on the other hand increases its burn-off speed.

The soot trapped in the filter can, therefore, be burned off automatically in a regeneration process when the exhaust-gas has a temperature of around 400°C. If, however, the necessary temperature is not reached – which is frequently the case in the low-load range – the system's active, thermoelectric regeneration function cuts in.



• Functional Principle SMF®-AR

Technical description of the Air Mass Flow Meter (AMFM) or Exhaust Flow Sensor (EFS) options

A key variable used by the HJS ECU is the air/exhaust mass flow that passes through the engine. To measure this flow, the HJS SMF®-AR system has two measurement variants, which can be used depending on the installation situation. The cable harness supplied with the system supports both of these variants. The **AMFM** forwards the intake air mass flow measured to the ECU.

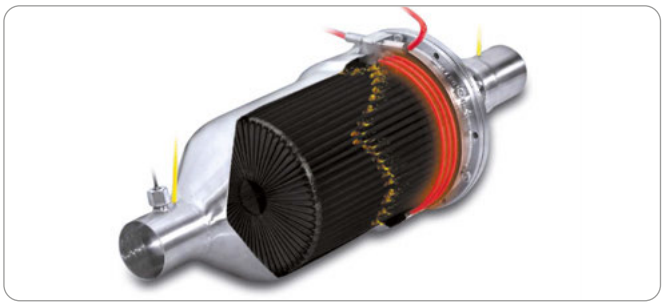
The **HJS EFS** (Exhaust Flow Sensor) uses the pressure difference in a Venturi nozzle to measure the exhaust-gas volumetric flow or mass flow that flows through this nozzle. With the aid of a temperature sensor, the exhaust-gas volumetric flow is converted to a mass flow. The mass flow is used to control filter regeneration.

Active, thermoelectric regeneration

The control unit triggers (active) regeneration by means of the heating elements that encircle the filter. The soot that has built up in the filter is ignited by the energy radiated by the heating elements. After the initial ignition of the soot layer, the regeneration process runs automatically. Combustion of the soot occurs at regular intervals. However, the control unit not only triggers ignition of the soot, but also doses the optimum amount of additive, monitors the filter load and calculates the best timing for regeneration. In addition, a self-learning driving-cycle recognition functionality ensures that regeneration is triggered when the operating conditions are ideal.

Thanks to the high soot holding capacity of the SMF®-AR system, there isn't just one single ideal moment for regeneration, rather regeneration takes place within a wide time slot. One-off termination of the regeneration process by switching off the engine therefore poses no problem as regards reliable and safe operation of the SMF®-AR system.

A further advantage of the SMF® is its high ash holding capacity, which allows for long servicing and cleaning intervals.



• Soot ignition following initial ignition

SMF®-AR advantages at a glance

- ✔ Suitable for OE and retrofitting applications
- ✔ Reduction of soot particles and fine particulate matter by more than 99% (Based on particle number)
- ✔ Particularly suitable for low-temperature applications
- ✔ Fully automatic, active regeneration
- ✔ Robust thanks to the use of sintered metal (SMF®) => Suitable for use in construction machinery
- ✔ Reliable operation
- ✔ Low maintenance
- ✔ Long service life
- ✔ NO_2-neutral regeneration
- ✔ Use of fuels with a high share of sulphur as well as other "special" fuels (e.g. kerosene) on request

5. Modular SMF®-AR System

Technical data and requirements

Max. safe temperature operation for SMF®*:
650°C exhaust-gas temperature

Filter material: high-temperature-resistant chrome-nickel steel

Filter housing material: 1.4301

Filtration efficiency rate: (number concentration in range from 20 – 300 nm) > 99%

Filtration efficiency rate: (in relation to soot mass) > 95%

Length of regeneration period: 10 minutes

Max. power consumption of heater: SMF®-AR 1.2 m² - 3.8 m²: 1 kW with 12-V on-board supply system

Max. power consumption of heater: SMF®-AR 5.4 m² - 8.1 m²: 2.2 kW with 24-V on-board supply system

Required alternator rating for SMF®-AR regeneration:
80 A

Particulate load before regeneration: 20 – 30 g/m²

Surface temperature during regeneration without insulation: max. 800°C (peak)

Surface temperature during regeneration with insulation: max. 300°C

Additive consumption: 1 l/2000 l diesel (depending on volume of particulates emitted by engine)

Additive contents: organometallic iron compound

Additive pollutant categories: Xn; R48/22, R65, R66

Servicing interval dependent upon additive consumption per SMF®-AR system:

SMF®-AR system	Additive [l]
SMF® 1,2 m²	1,38
SMF® 1,8 m²	2,65
SMF® 2,7 m²	4
SMF® 3,8 m²	7,95
SMF® 5,4 m²	10,48
SMF® 8,1 m²	16,47

Application and operating conditions

The following application and operating conditions must be complied with in order to ensure the modular SMF®-AR systems from HJS function optimally:

> Engine fulfils Stage II, Stage III A/III B or Stage IV in Europe, Tiers II, III and IV in the USA

> Fuels used comply with DIN EN 590 (max. 50 ppm sulphur), DIN 51628 or DIN 14214 with a maximum phosphor concentration of 2 ppm and a maximum alkali concentration of 1 ppm

> Exhaust-gas temperatures from 150°C for regeneration

> Crucial factors when selecting the additive tank (sizes available: 2 l, 3 l and 5 l) are the installation space available and the maintenance interval desired

> Tank size in line with the average consumption figure and annual mileage covered or number of operating hours

> Strain-free, vibration-isolated installation and secure, gas-tight connection to the existing exhaust system

> Systems never mounted on the engine-gearbox unit

> Only components approved and released by the system supplier are fitted

Perfect connection of the system pipework ensures the exhaust backpressure is low. HJS offers insulating components for all its systems to reduce their surface temperature. The systems are operated in conjunction with the HJS Service Unit (included in the delivery scope).

In order to ensure the systems operate as intended, HJS and its authorised partners offer a temperature-measurement service and one-on-one application consulting.

Make sure that personnel are protected against (accidental) contact with hot components!

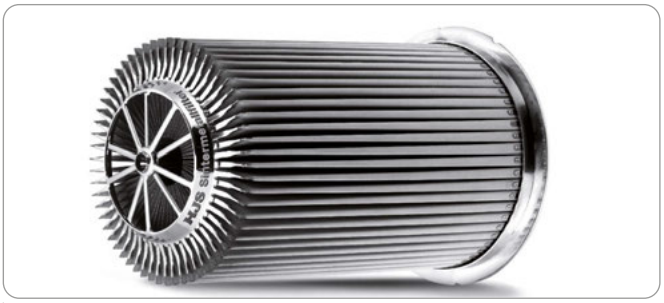
The systems must only ever be operated in conjunction with the HJS Service Unit and HJS insulation .

All application specifications, installation guidelines and maintenance manuals provided by HJS Emission Technology GmbH & Co. KG must be complied with (www.hjs.com/retrofit/media/downloads).

Dimensioning the filter

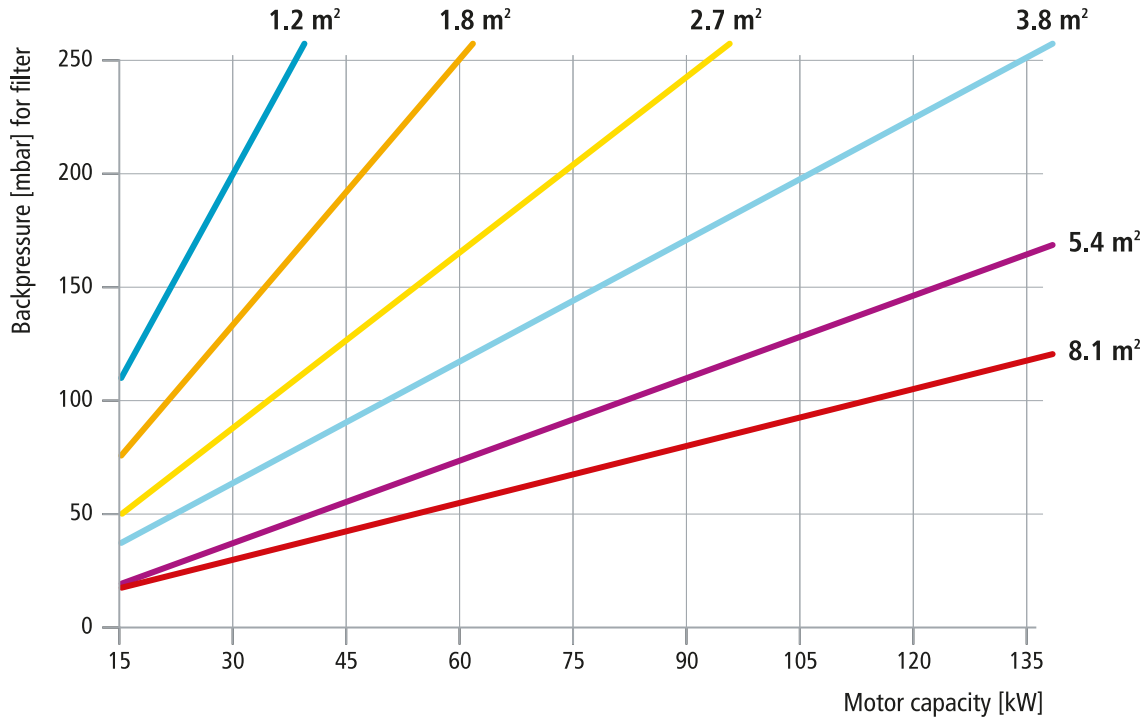
HJS offers SMF®-AR systems with filter surface areas ranging from 1.2 m² to 8.1 m².

To help you choose the right size of filter, the diagram below shows the exhaust backpressure generated by each size of filter (not taking the inlet and outlet modules into account).



• SMF®-Sintered Metal Filter – 100% soot-free

Filter surface areas* from 1.2 m² to 8.1 m²



*Refers to a filter module with a maximum temperature upstream of the DPF® of 200°C

• Backpressure of the individual filter units

Example calculation

In the case of a construction machine with a power output of e.g. 75 kW and a maximum permissible exhaust backpressure of 150 mbar (as specified by the engine manufacturer), a filter with a surface area of 3.8 m² can be installed. In this simplified example, it should be noted that the backpressure flow of the inlet and outlet modules is disregarded. Radial modules tend to result in a slightly higher backpressure. Further technical data are required if the filter is to be dimensioned more precisely (see Section HJS Enquiry Form).

5. Modular SMF®-AR System

Considering the installation space available for SMF®-AR systems

After determining the size of the filter, it's time to see how much space is available for installing them.

As a rule, the filter system replaces the original silencer. Alternatively, the particulate filter system can be installed upstream of the silencer.

When selecting the installation position, make sure that there is sufficient clearance between the filter and other components and that the filter can be removed easily for servicing and maintenance work.

The filter unit can be installed horizontally or vertically. The matching inlet and outlet modules must be selected in line with the amount of installation space available in the machine (AXIAL-AXIAL, AXIAL-RADIAL, RADIAL-AXIAL, RADIAL-RADIAL).

To secure the filter, system mounts must be used. The insulating materials available from HJS are designed for use with two system mounts for filter installation.

Dimension tables

The dimension tables contain all dimensions of relevance to installation. All dimensions are stated in millimetres (mm). This section describes and illustrates the different versions of filter systems with a surface area of 1.2 m^2 to 8.1 m^2.

The dimension tables contain the data of the:

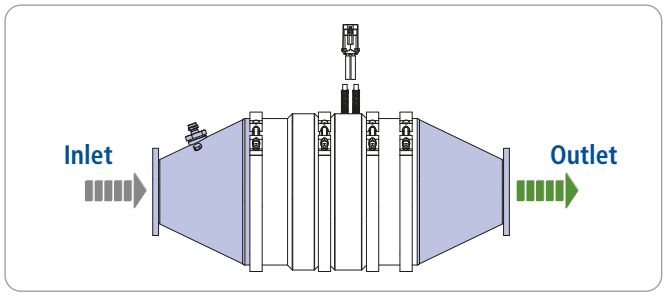
> Inlet module
> SMF®-AR
> Outlet module

Scope of delivery

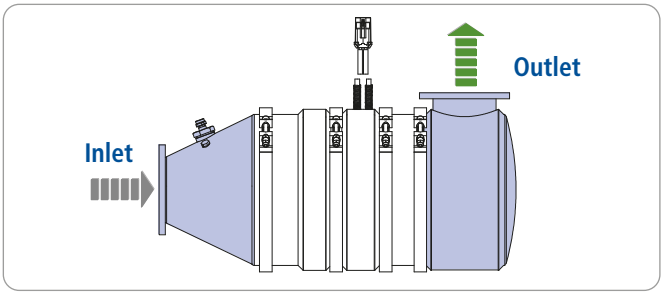
The item numbers listed describe fully assembled filter units with inlet and outlet module, regeneration unit, system clamp, gasket set, wire mesh set, dosing pump (12V/24V)and HJS Service Unit. In addition, all relevant technical documentations, such as the installation guidelines and maintenance manual, are included in the scope of delivery.

The system mounts, additive, air mass flow meter/EFS, transformer, insulation set and additive tank must be ordered separately. (see page 35 / 36)

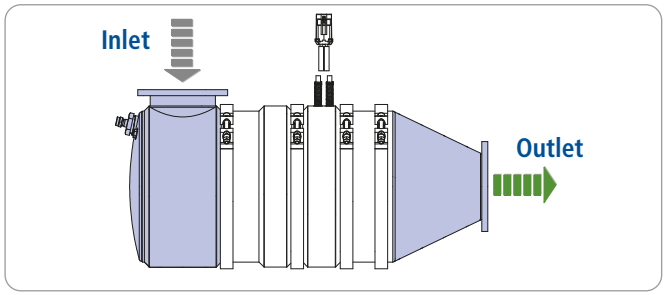
AXIAL - AXIAL



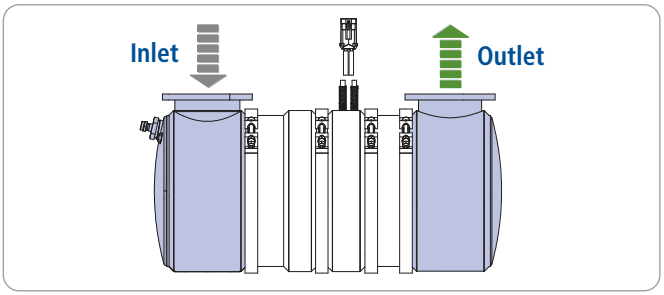
AXIAL - RADIAL



RADIAL - AXIAL

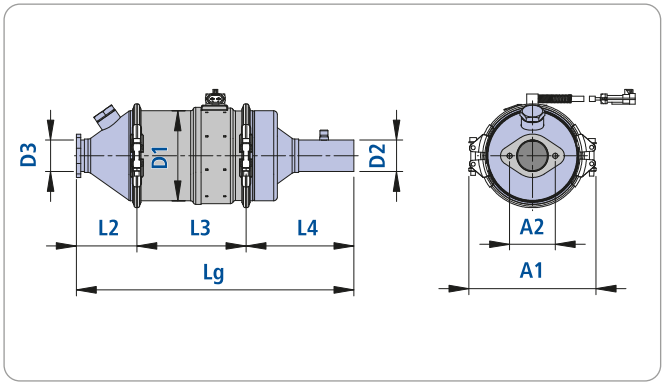


RADIAL - RADIAL

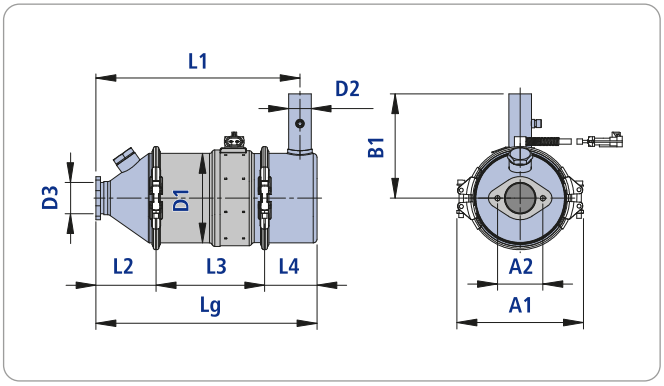


1.2-m² SMF®-AR system

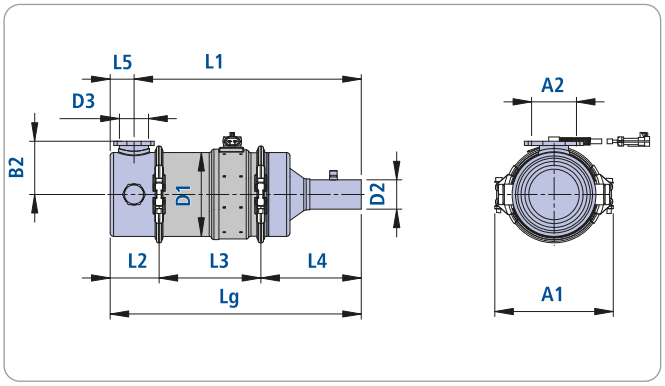
AXIAL - AXIAL



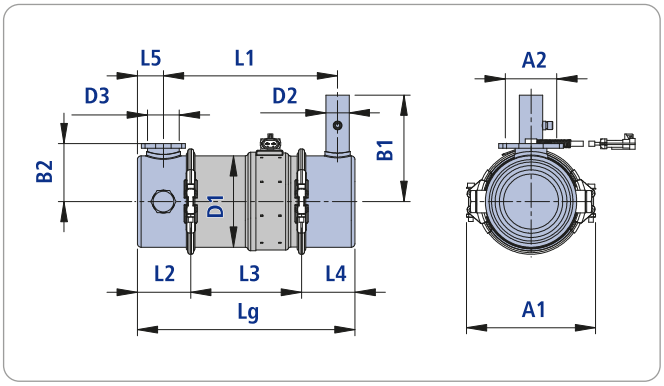
AXIAL - RADIAL



RADIAL - AXIAL



RADIAL - RADIAL



Dimension table for 1.2-m² SMF®-AR system

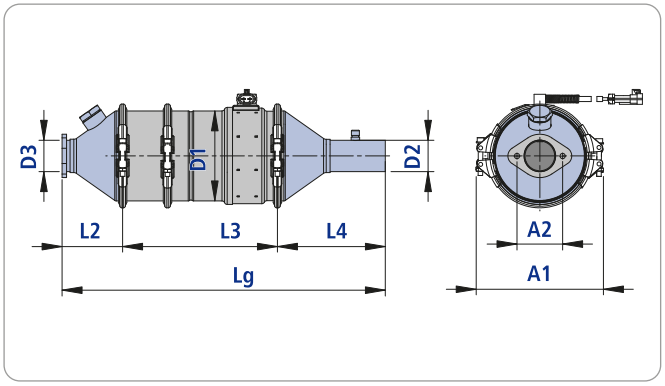
Item No.*[1]	System	Confi-guration	Lg	L1	L2	L3	L4	L5	A1	A2	B1	B2	ø D1	ø D2	ø D3
93 71 3001	SMF®-AR 1.2 m²	AX - AX	487	-	106	192	189	-	220	80	-	-	Ø 158	Ø 55	Ø 55
93 71 3002	SMF®-AR 1.2 m²	AX - RAD	390	360	106	192	92	-	220	80	184	-	Ø 158	Ø 40	Ø 55
93 71 3003	SMF®-AR 1.2 m²	RAD - AX	473	428	92	192	189	45	220	80	-	100	Ø 158	Ø 55	Ø 55
93 71 3004	SMF®-AR 1.2 m²	RAD - RAD	367	301	92	192	92	45	220	80	184	100	Ø 158	Ø 40	Ø 55

*[1] Scope of delivery does not include the system mounts, insulation, additive, air mass flow meter/EFS and tank.
Comment: The specified dimensions [in mm] are subject to tolerances. Precise dimensions on request.

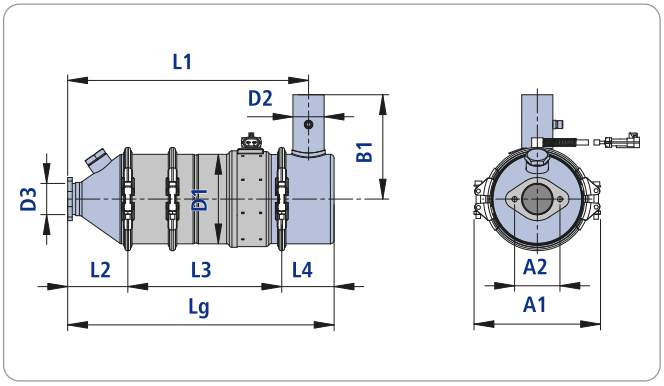
5. Modular SMF®-AR System

1.8-m² SMF®-AR system

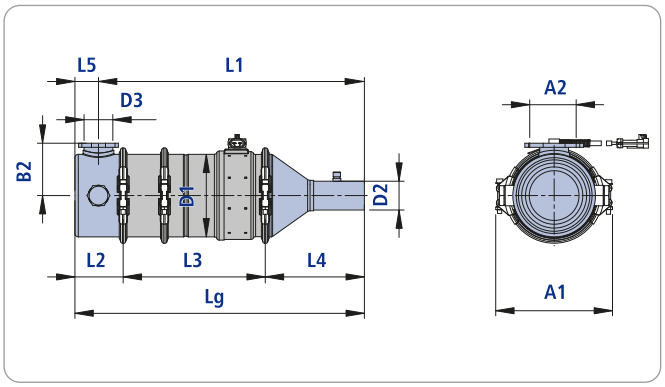
AXIAL - AXIAL



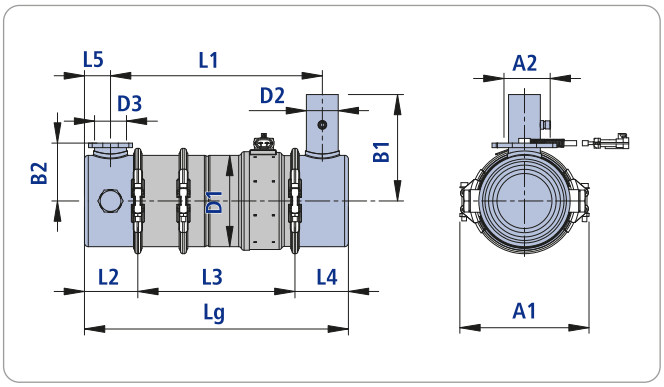
AXIAL - RADIAL



RADIAL - AXIAL



RADIAL - RADIAL



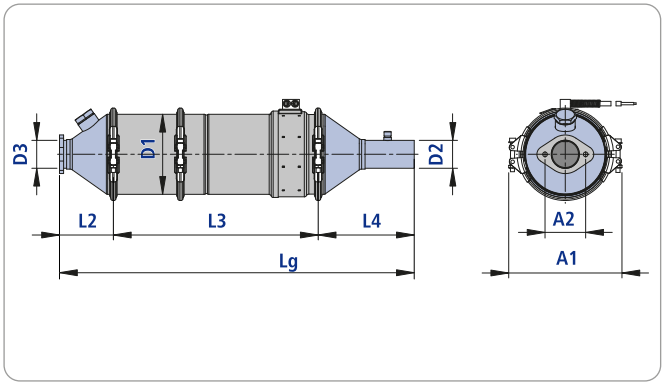
Dimension table for 1.8-m² SMF®-AR system

Item No.*1	System	Confi-guration	Lg	L1	L2	L3	L4	L5	A1	A2	B1	B2	ø D1	ø D2	ø D3
93 71 3005	SMF®-AR 1.8 m²	AX - AX	567	-	106	272	189	-	220	80	-	-	Ø 158	Ø 55	Ø 55
93 71 3006	SMF®-AR 1.8 m²	AX - RAD	470	424	106	272	92	-	220	80	184	-	Ø 158	Ø 55	Ø 55
93 71 3007	SMF®-AR 1.8 m²	RAD - AX	553	508	92	272	189	45	220	80	-	100	Ø 158	Ø 55	Ø 55
93 71 3008	SMF®-AR 1.8 m²	RAD - RAD	456	366	92	272	92	45	220	80	184	100	Ø 158	Ø 55	Ø 55

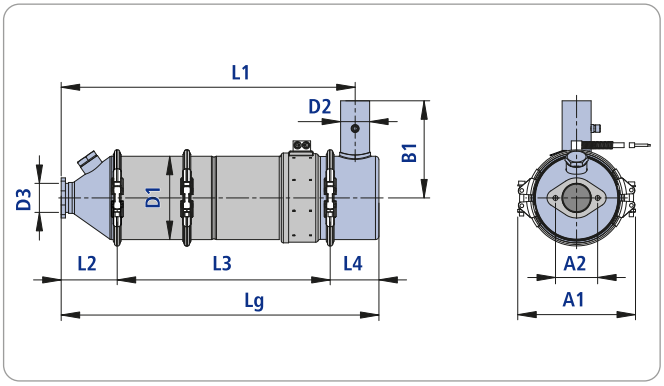
*1 Scope of delivery does not include the system mounts, insulation, additive, air mass flow meter/EFS and tank.
Comment: The specified dimensions [in mm] are subject to tolerances. Precise dimensions on request.

2.7-m² SMF®-AR system

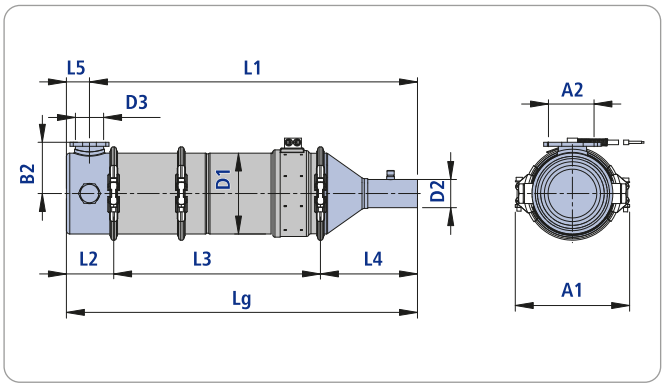
AXIAL - AXIAL



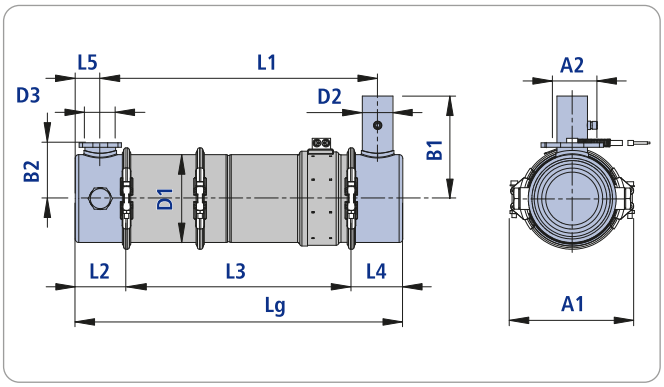
AXIAL - RADIAL



RADIAL - AXIAL



RADIAL - RADIAL



Dimension table for 2.7-m² SMF®-AR system

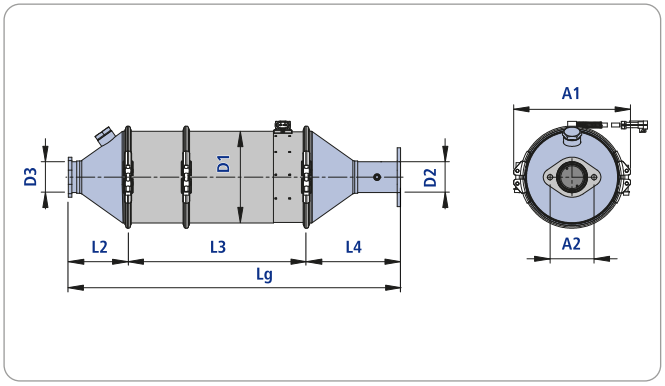
Item No.*[1]	System	Confi-guration	Lg	L1	L2	L3	L4	L5	A1	A2	B1	B2	ø D1	ø D2	ø D3
93 71 3009	SMF®-AR 2.7 m²	AX - AX	699	-	106	404	189	-	220	80	-	-	Ø 158	Ø 55	Ø 55
93 71 3010	SMF®-AR 2.7 m²	AX - RAD	602	557	106	404	92	-	220	80	184	-	Ø 158	Ø 55	Ø 55
93 71 3011	SMF®-AR 2.7 m²	RAD - AX	685	640	92	404	189	45	220	80	-	100	Ø 158	Ø 55	Ø 55
93 71 3012	SMF®-AR 2.7 m²	RAD - RAD	588	498	92	404	92	45	220	80	184	100	Ø 158	Ø 55	Ø 55

*[1] Scope of delivery does not include the system mounts, insulation, additive, air mass flow meter/EFS and tank.
Comment: The specified dimensions [in mm] are subject to tolerances. Precise dimensions on request.

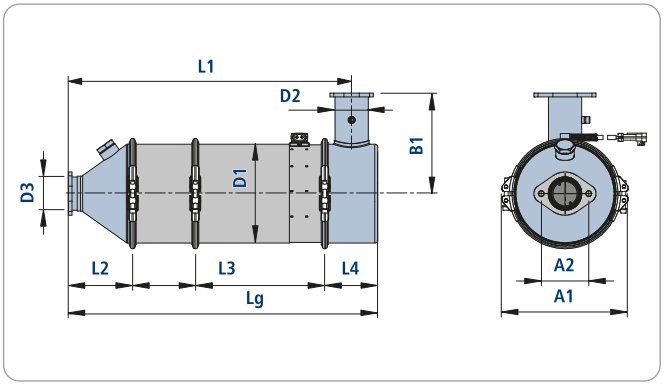
5. Modular SMF®-AR System

3.8-m² SMF®-AR system

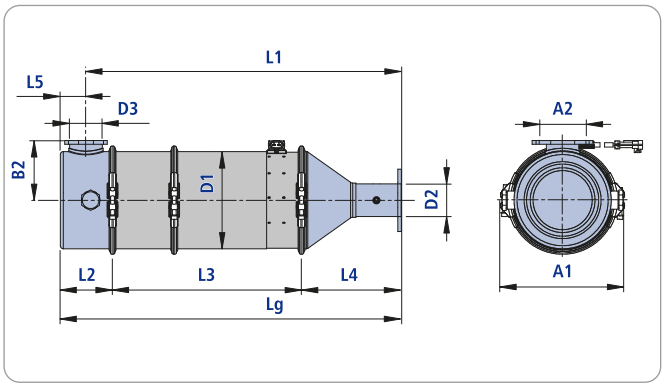
AXIAL - AXIAL



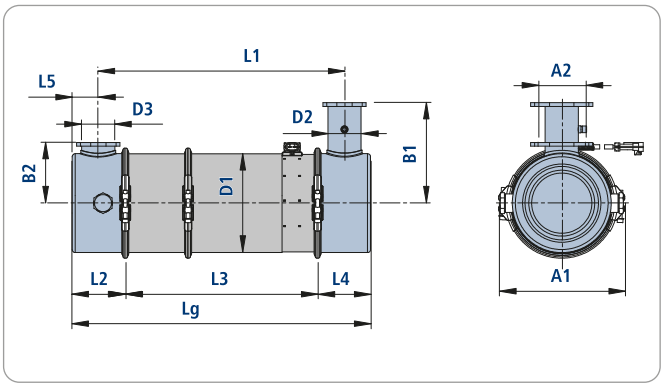
AXIAL - RADIAL



RADIAL - AXIAL



RADIAL - RADIAL



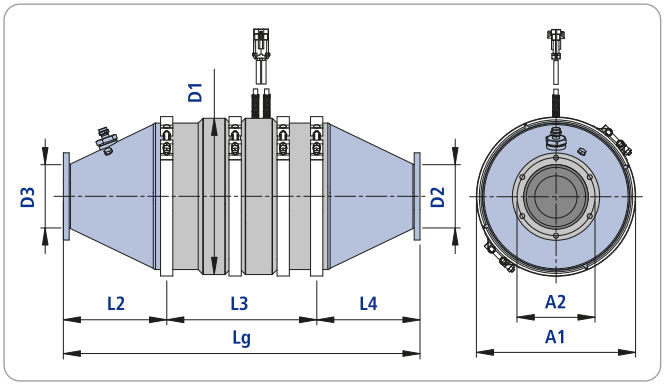
Dimension table for 3.8-m² SMF®-AR system

Item No.*[1]	System	Bauform	Lg	L1	L2	L3	L4	L5	A1	A2	B1	B2	ø D1	ø D2	ø D3
93 71 3013	SMF®-AR 3.8 m²	AX - AX	755	-	135	405	215	-	266	100	-	-	Ø 208	Ø 70	Ø 70
93 71 3014	SMF®-AR 3.8 m²	AX - RAD	653	598	135	405	113	-	266	100	216	-	Ø 208	Ø 70	Ø 70
93 71 3015	SMF®-AR 3.8 m²	RAD - AX	731	643	111	405	215	55	266	100	-	127	Ø 208	Ø 70	Ø 70
93 71 3016	SMF®-AR 3.8 m²	RAD - RAD	629	519	111	405	113	55	266	100	216	127	Ø 208	Ø 70	Ø 70

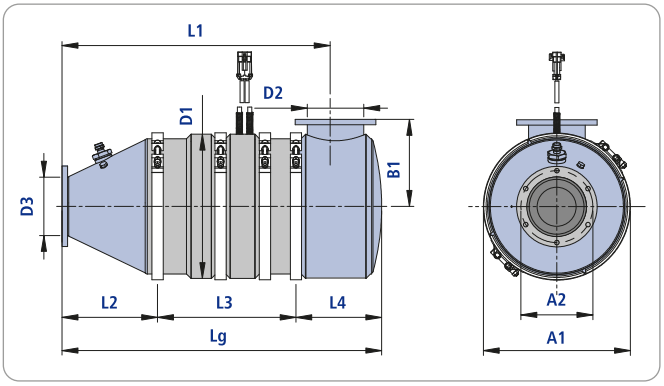
*[1] Scope of delivery does not include the system mounts, insulation, additive, air mass flow meter/EFS and tank.
Comment: The specified dimensions [in mm] are subject to tolerances. Precise dimensions on request.

5.4-m² SMF®-AR system

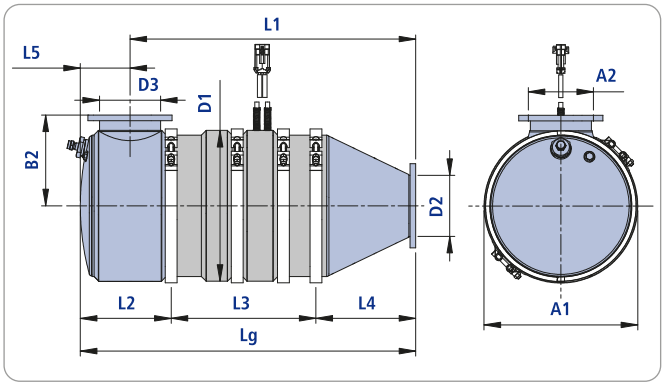
AXIAL - AXIAL



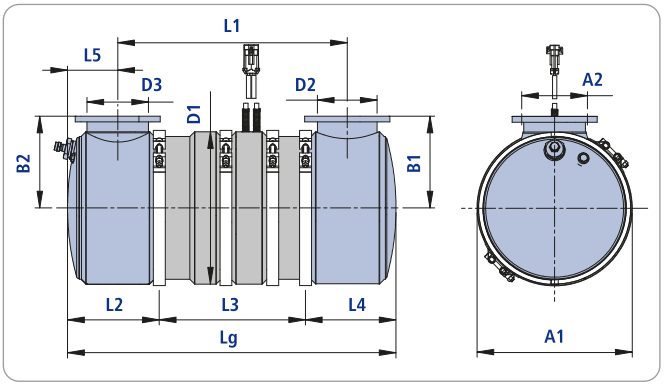
AXIAL - RADIAL



RADIAL - AXIAL



RADIAL - RADIAL



Dimension table for 5.4-m² SMF®-AR system

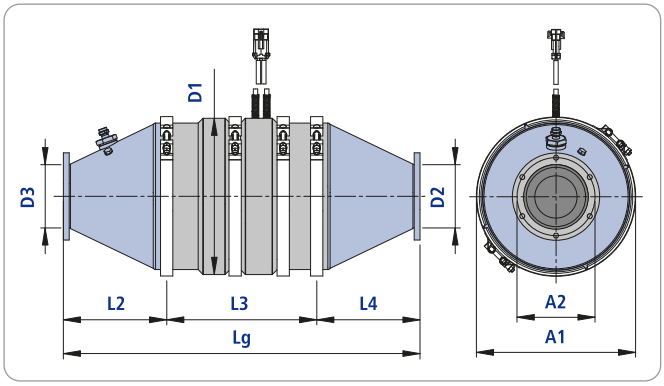
Item No.*[1]	System	Confi-guration	Lg	L1	L2	L3	L4	L5	A1	A2	B1	B2	ø D1	ø D2	ø D3
93 71 3017	SMF®-AR 5.4 m²	AX - AX	728	-	211	306	211	-	Ø 325	Ø 159	-	-	Ø 319	Ø 129	Ø 129
93 71 3018	SMF®-AR 5.4 m²	AX - RAD	706	605	211	306	189	-	Ø 325	Ø 159	192	-	Ø 319	Ø 129	Ø 129
93 71 3019	SMF®-AR 5.4 m²	RAD - AX	709	604	192	306	211	105	Ø 325	Ø 159	-	192	Ø 319	Ø 129	Ø 129
93 71 3020	SMF®-AR 5.4 m²	RAD - RAD	687	480	192	306	189	105	Ø 325	Ø 159	192	192	Ø 319	Ø 129	Ø 129

*[1] Scope of delivery does not include the system mounts, insulation, additive, air mass flow meter/EFS, tank and transformer.
Comment: The specified dimensions [in mm] are subject to tolerances. Precise dimensions on request.

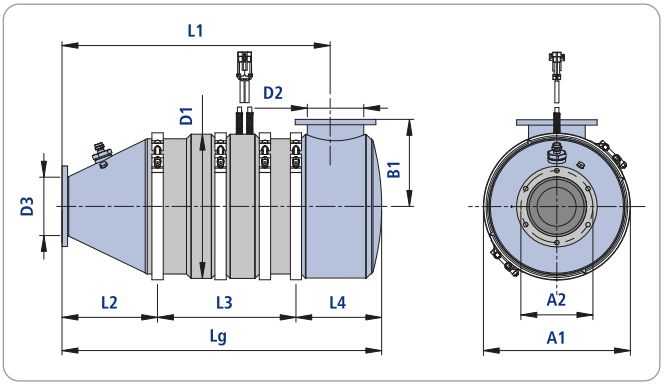
5. Modular SMF®-AR System

8.1-m² SMF®-AR system

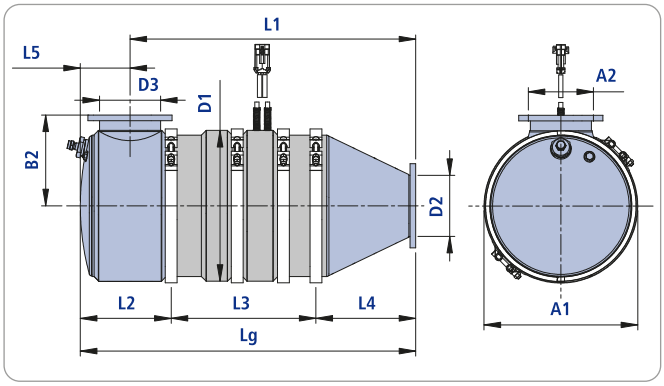
AXIAL - AXIAL



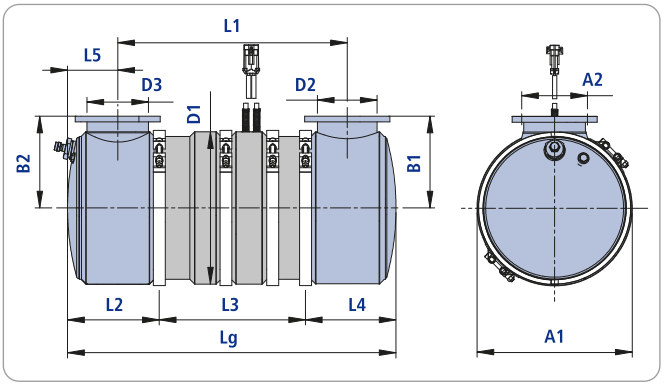
AXIAL - RADIAL



RADIAL - AXIAL



RADIAL - RADIAL



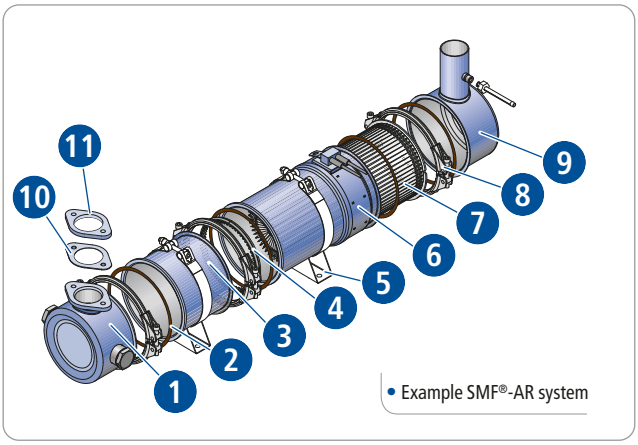
Dimension table for 8.1-m² SMF®-AR system

Item No.*[1]	System	Confi-guration	Lg	L1	L2	L3	L4	L5	A1	A2	B1	B2	ø D1	ø D2	ø D3
93 71 3021	SMF®-AR 8.1 m²	AX - AX	863	-	211	441	211	-	Ø 325	Ø 159	-	-	Ø 319	Ø 129	Ø 129
93 71 3022	SMF®-AR 8.1 m²	AX - RAD	842	740	211	441	189	-	Ø 325	Ø 159	192	-	Ø 319	Ø 129	Ø 129
93 71 3023	SMF®-AR 8.1 m²	RAD - AX	844	739	192	441	211	105	Ø 325	Ø 159	-	192	Ø 319	Ø 129	Ø 129
93 71 3024	SMF®-AR 8.1 m²	RAD - RAD	823	616	192	441	189	105	Ø 325	Ø 159	192	192	Ø 319	Ø 129	Ø 129

*[1] Scope of delivery does not include the system mounts, insulation, additive, air mass flow meter/EFS, tank and transformer.
Comment: The specified dimensions [in mm] are subject to tolerances. Precise dimensions on request.

Individual components

The table below contains the data of the individual components of a SMF®-AR system.



• Example SMF®-AR system

1. Inlet Module
2. System Gasket
3. Middle Module
4. Wire Mesh
5. System Mount
6. Heating cabinet
7. SMF® Filter
8. System Clamp
9. Outlet Module
10. Flange gasket
11. Flange

SMF®-AR system	Weight [kg]
SMF® 1.2 m²	9
SMF® 1.8 m²	11
SMF® 2.7 m²	15
SMF® 3.8 m²	20
SMF® 5.4 m²	35
SMF® 8.1 m²	45

Additive	
1 liter	94 60 0250
5 liter	94 60 0258

Additive tank, incl. venting valve	
2 liter	93 02 4272
3 liter	93 02 4273
5 liter	93 02 4275

	Configuration	Inlet Module 1	System Gasket 2	Middle Module 3	Wire Mesh 4	System Mount 5	Heating cabinet 6	SMF®-Filter 7	System Clamp 8	Outlet Module 9	Flange gasket 10	Flange 11	Regeneration unit	Insulation set
SMF® 1.2 m²	AX - AX	93 02 4184	93 02 4189	-	-	93 02 4365	93 02 6001	93 02 4378	93 02 4179	93 02 4215	93 02 4194	93 02 4191	93 02 6026	93 02 4352
	AX - RAD	93 02 4184	93 02 4189	-	-	93 02 4365	93 02 6001	93 02 4378	93 02 4179	93 02 4218	93 02 4194	93 02 4191	93 02 6026	93 02 4353
	RAD - AX	93 02 4190	93 02 4189	-	-	93 02 4365	93 02 6001	93 02 4378	93 02 4179	93 02 4215	93 02 4194	93 02 4191	93 02 6026	93 02 4354
	RAD - RAD	93 02 4190	93 02 4189	-	-	93 02 4365	93 02 6001	93 02 4378	93 02 4179	93 02 4218	93 02 4194	93 02 4191	93 02 6026	93 02 4351
SMF® 1.8 m²	AX - AX	93 02 4184	93 02 4189	93 02 4168	93 02 4178	93 02 4365	93 02 6001	93 02 4177	93 02 4179	93 02 4186	93 02 4194	93 02 4191	93 02 6026	93 02 4315
	AX - RAD	93 02 4184	93 02 4189	93 02 4168	93 02 4178	93 02 4365	93 02 6001	93 02 4177	93 02 4179	93 02 4188	93 02 4194	93 02 4191	93 02 6026	93 02 4316
	RAD - AX	93 02 4190	93 02 4189	93 02 4168	93 02 4178	93 02 4365	93 02 6001	93 02 4177	93 02 4179	93 02 4186	93 02 4194	93 02 4191	93 02 6026	93 02 4318
	RAD - RAD	93 02 4190	93 02 4189	93 02 4168	93 02 4178	93 02 4365	93 02 6001	93 02 4177	93 02 4179	93 02 4188	93 02 4194	93 02 4191	93 02 6026	93 02 4317
SMF® 2.7 m²	AX - AX	93 02 4184	93 02 4189	93 02 4193	93 02 4178	93 02 4365	93 02 6003	93 02 4175	93 02 4179	93 02 4186	93 02 4194	93 02 4191	93 02 6026	93 02 4319
	AX - RAD	93 02 4184	93 02 4189	93 02 4193	93 02 4178	93 02 4365	93 02 6003	93 02 4175	93 02 4179	93 02 4188	93 02 4194	93 02 4191	93 02 6026	93 02 4320
	RAD - AX	93 02 4190	93 02 4189	93 02 4193	93 02 4178	93 02 4365	93 02 6003	93 02 4175	93 02 4179	93 02 4186	93 02 4194	93 02 4191	93 02 6026	93 02 4322
	RAD - RAD	93 02 4190	93 02 4189	93 02 4193	93 02 4178	93 02 4365	93 02 6003	93 02 4175	93 02 4179	93 02 4188	93 02 4194	93 02 4191	93 02 6026	93 02 4321
SMF® 3.8 m²	AX - AX	93 02 4196	93 02 4202	93 02 4211	93 02 4204	93 02 4357	93 02 6004	93 02 4174	93 02 4201	93 02 4197	93 02 4207	93 02 4206	93 02 6026	93 02 4323
	AX - RAD	93 02 4196	93 02 4202	93 02 4211	93 02 4204	93 02 4357	93 02 6004	93 02 4174	93 02 4201	93 02 4199	93 02 4207	93 02 4206	93 02 6026	93 02 4324
	RAD - AX	93 02 4198	93 02 4202	93 02 4211	93 02 4204	93 02 4357	93 02 6004	93 02 4174	93 02 4201	93 02 4197	93 02 4207	93 02 4206	93 02 6026	93 02 4326
	RAD - RAD	93 02 4198	93 02 4202	93 02 4211	93 02 4204	93 02 4357	93 02 6004	93 02 4174	93 02 4201	93 02 4199	93 02 4207	93 02 4206	93 02 6026	93 02 4325
SMF® 5.4 m²	AX - AX	94 62 4006	94 03 0006	93 02 9453	93 02 4345	93 02 4358	93 02 6005	93 02 9522	94 62 2033	93 02 4167	94 03 0026	94 20 2200	93 02 6026	93 02 4580
	AX - RAD	94 62 4006	94 03 0006	93 02 9453	93 02 4345	93 02 4358	93 02 6005	93 02 9522	94 62 2033	93 02 4169	94 03 0026	94 20 2200	93 02 6026	93 02 4581
	RAD - AX	94 11 4012	94 03 0006	93 02 9453	93 02 4345	93 02 4358	93 02 6005	93 02 9522	94 62 2033	93 02 4167	94 03 0026	94 20 2200	93 02 6026	93 02 4582
	RAD - RAD	94 11 4012	94 03 0006	93 02 9453	93 02 4345	93 02 4358	93 02 6005	93 02 9522	94 62 2033	93 02 4169	94 03 0026	94 20 2200	93 02 6026	93 02 4583
SMF® 8.1 m²	AX - AX	94 62 4006	94 03 0006	93 02 9453	93 02 4345	93 02 4358	93 02 6006	93 02 9454	94 62 2033	93 02 4167	94 03 0026	94 20 2200	93 02 6026	93 02 4584
	AX - RAD	94 62 4006	94 03 0006	93 02 9453	93 02 4345	93 02 4358	93 02 6006	93 02 9454	94 62 2033	93 02 4169	94 03 0026	94 20 2200	93 02 6026	93 02 4585
	RAD - AX	94 11 4012	94 03 0006	93 02 9453	93 02 4345	93 02 4358	93 02 6006	93 02 9454	94 62 2033	93 02 4167	94 03 0026	94 20 2200	93 02 6026	93 02 4586
	RAD - RAD	94 11 4012	94 03 0006	93 02 9453	93 02 4345	93 02 4358	93 02 6006	93 02 9454	94 62 2033	93 02 4169	94 03 0026	94 20 2200	93 02 6026	93 02 4587

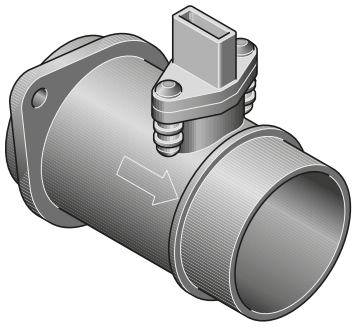
A 130 - 100 mm reducing flange (HJS No. 94 01 2235) can be used for the SMF® 5.4 m² and 8.1 m² systems.

5. Modular SMF®-AR System

Selecting the air mass flow meter (AMFM) or exhaust flow sensor (EFS)

1.2 m² - 8.1 m² regeneration unit
(part of the complete system)
Item No. 93 02 6026

Air mass flow meter (AMFM)



Item No.	AMFM inside Ø [mm]	AMFM inlet outside Ø [mm]	AMFM outlet outlet Ø [mm]	Mass flow rate range min. [kg/h]	max. [kg/h]	Rated power output [kW]
93 02 0133	50	60	60	65	430	15 - 70
93 02 4404	60	70	70	50	580	30 - 100
93 02 0132	62	70	70	105	540	20 - 90
93 02 0131	78	86	84	230	860	40 - 145
93 02 0134	82	92	92	250	1140	100 - 135

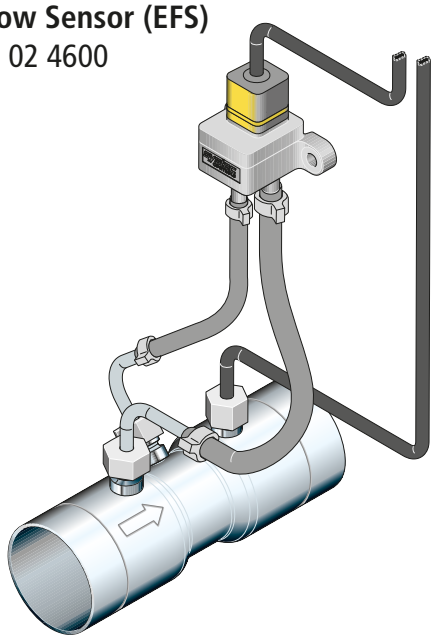
Note: All data stated must be checked against the actual mass flow values of the respective engine. System serviceability is guaranteed only if the engine's mass flow is within the measurement range of the air mass flow meter.

Dosing pump 12 V
(part of the complete system)
Item No. 94 60 0028

Dosing pump 24 V
(part of the complete system)
Item No. 94 60 0240

Voltage transformer for AMFM
Item No. 93 02 4350

Exhaust Flow Sensor (EFS)
Item No. 93 02 4600



Venturi tube

Item No. Venturi tube	HJS-EFS outside Ø [mm]	Mass flow rate range min. [kg/h]	max. [kg/h]
93 02 4610	55,0	60	500
93 02 4611	60,0	75	600
93 02 4612	70,0	90	900
93 02 4613	105,0	220	1200

Dosing pump 12 V
(part of the complete system)
Item No. 94 60 0028

Dosing pump 24 V
(part of the complete system)
Item No. 94 60 0240

In the case of 24-V systems, a voltage transformer must be used in the power supply circuit for the air mass flow meter!

6. Enquiry Form

To ensure an HJS exhaust-gas aftertreatment system is dimensioned correctly for a particular application, please fill in the enquiry form below in full and send it to HJS or one of our authorised partners.

You can download the enquiry form from the Retrofit / Downloads section of our website at www.hjs.com.

Enquiry Form Exhaust Aftertreatment Systems
for Mobile Machinery and Stationary Applications

To send by:
Fax: +49 2373 987-209

Company*			
Contact*			
Street/No.*		Postcode/Town*	
Phone*		Fax	
E-Mail			

*Mandatory fields

Machinery manufacturers*		Machinery type*			
Engine manufacturer*		Motor type*			
Year of construction		Engine capacity [cm³]		Engine running time/annum [op. h]	
Power output [kW]*		Engine speed [rpm]		No. of cylinders	

Vehicle voltage* 12 V ☐ 24 V ☐ Turbocharger* yes ☐ no ☐

Exhaust gas recirculation EGR* yes ☐ no ☐

Emission class*

EU directive on emissions from non-road mobile machinery Stage I ☐ Stage II ☐ Stage III A ☐ Stage III B ☐ Stage IV ☐

U.S. EPA nonroad regulations TIER 1 ☐ TIER 2 ☐ TIER 3 ☐ TIER 4 interim ☐ TIER 4 ☐ other

Fuel (if different from DIN 590 Diesel)*

Max. permissible exhaust backpressure [mbar]* Max. exhaust-gas temperature [C°]

Description of the application range (e.g. wheel loader for excavation work, forklift truck for logistics work, stationary applications,

Operating times [%] Idle Part load Full load

6. Enquiry Form

Company*

Contact*

Technical Data

Motor oil (we recommend low-ash oils) Manufacturer | Type | Consumption [l/100 Op. h]

Max. exhaust mass flow/volume flow rate [kg/h] / [m^3/min] | PM emissions [g/h, g/KWh]

NO_X emissions [g/KWh] | For stationary application (engine speed/load range)

Max. permissible surface temperature of exhaust-gas aftertreatment system [°C]

Diameter of exhaust pipework at future DPF position [mm]

Internal exhaust-gas recirculation ☐ External exhaust-gas recirculation ☐ No exhaust-gas recirculation ☐

Data for a SMF® system

Exhaust-gas temp. measurements over min. 30 op. h available

yes[1] ☐ no[2] ☐

[1] Temperature measurement data under all application conditions over a period of approx. 30 h engine running time.

The temperature measurements must be taken at the future installation position of the exhaust-gas aftertreatment system using a NiCrNi or PT-200 temperature sensor and 1-Hz recording rate at the centre of the exhaust-gas flow.

[2] On request, we can provide a data logger for temperature measurement purposes.

Data for a SMF®-AR system

Fuel tank capacity [l] | Fuel consumption [l/h]

Alternator rating [Ah]*

Battery capacity [Ah]

Diameter of inlet manifold between air filter and turbocharger [mm]*

outer | inner

Availability at terminal W (alternator speed signal)*

yes ☐ no ☐

*Mandatory fields

I am sending the following additional information:

- ☐ Layout of installation space
- ☐ Technical data sheet of the engine
- ☐ Result of the exhaust-gas temperature measurement
- ☐ Engine data (exhaust-gas temperature, fuel consumption, NOx/PM emissions)
- ☐ Measurements of the NOx/PM emissions under operating conditions

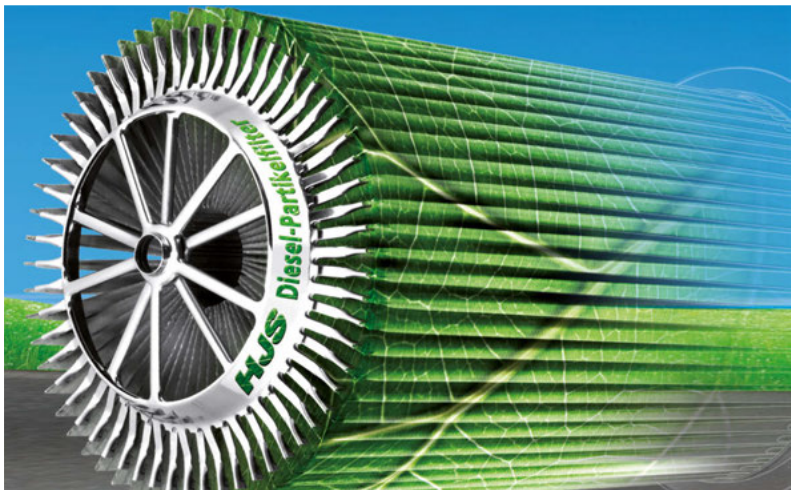
Notes (e.g. special safety requirements):

Made in Germany

INFO-HOTLINE
+49 2373 987-577
tech-support@hjs.com

Put your trust in HJS DPF® and benefit from our many years of experience in the business

- ✔ Minimal downtime
- ✔ Extremely low-maintenance
- ✔ Low servicing costs
- ✔ Active protection of health and the environment



A clean future with HJS!

HJS Emission Technology
GmbH & Co. KG

Dieselweg 12
D-58706 Menden/Sauerland

Phone +49 2373 987-0
Fax +49 2373 987-199

E-Mail hjs@hjs.com
Internet www.hjs.com

HJS Emission Technology

26 03 5122