

KSI ECOCLEAN® APF

Compressed Air Filtration



Rev 01_0226

High performance filtration and separation for processing of compressed air and compressed gases in industrial supplier quality

110
mbar

SMA, wet/saturated

APF / ADVANCED
PREMIUM
FILTRATION

High quality through manufacturer competence

KSI Filtertechnik produces **KSI ECOCLEAN®** compressed air filters and filter elements itself. This ensures complete control to ensure certified KSI industrial equipment quality. Our compressed air treatment components exceed customer expectations. Many years of continuous cooperation with specialists in the market, the compressed air trade and institutes, as well as our own intensive development work ensure this.

The KSI ECOCLEAN® approach

The combination of operational safety and economy in one product – this is the **KSI ECOCLEAN®** approach, perfectly implemented also for high-performance filter elements.

The KSI ECOCLEAN® APF | APE Plus-Effects

- + up to **55 %** less differential pressure loss
 - ▶ significantly reduced energy requirements and thus significantly reduced energy costs
- + **NEW:** high-density deep-bed pleating, made possible by new pleating machines, narrower pleating and new filter medium
 - ▶ approximately 250% larger filtration surface compared to a conventional pleated element
 - ▶ about 25% larger filtration surface compared to a conventional deep-bed pleated element

The significant reduction in flow velocity within the filtration medium makes the APF series the market leader in efficiency and lowest pressure drop.

We have received written confirmation of the outstanding performance of our elements from an independent testing institute.

KSI ECOCLEAN® APF

Compressed Air Filtration

High quality through manufacturer competence

The increasing demands of modern production processes also place ever higher demands on the quality of compressed air. Compressors compress the intake air, which contains substances harmful to production, many times over and usually release oils in the finest form as aerosols to the compressed air. In addition, impurities such as fine dust, oil droplets, rust particles, scale, parts of sealing material etc. from the compressed air network are added – and of course condensate (water). Filtration technology of the **KSI ECOCLEAN®** series protects pneumatic production plants, machines, tools, measuring instruments or products against contamination by means of high-performance filtration.

The heart of a compressed air filter is its filter insert (element), which must be optimally adapted to the respective requirement, as compressed air filters ensure, among other things, that solid particles, oil components, condensate, oil vapour, odours and much more are safely removed from the compressed air system.



An enormous service simplification: the internal condensate drain, which is inserted into the filter housing with the adapter.

The KSI ECOCLEAN® APF | APE Plus-Effects +++

- + highly efficient polyester drainage layer to improve performance and reduce differential pressure
 - ▶ anti-re-entry layer favors coalescence and drainage
- + cathodic dip coating (KTL) of the housing
 - ▶ prevents corrosion and thus offers optimum protection
- + housings made in aluminum die casting process
 - ▶ powerful and at the same time very light filter housing
 - ▶ easy handling during installation and service
- + element optimized in length and diameter
 - ▶ lowest differential pressures and best filtration and separation at full flow capacity
- + coloured end caps suitable for separation efficiency

APF / ADVANCED
PREMIUM
FILTRATION



The functional principle

Water separation

To ensure maximum compressed air quality, a water separator should be installed before using a compressed air filter. This separates condensate using a simple physical principle: centrifugal force.

The installation of a water separator not only increases the quality of the compressed air, but also the service life of the downstream filter elements.

Compressed air filtration

Due to the arc-shaped compressed air inlet, the flow through of the filter is optimal: the flow resistance is 75% lower. Filtration takes place through the various layers of the filter element, which is passed through from the inside to the outside, thus removing the unwanted components. After the compressed air filter, high-quality compressed air is now ready for further use.

Lowest Differential Pressure at highest capacity

Moisture, residual oil, particles: The performance of a compressed air system and the service life of the downstream components depend to a large extent on filtration. In recent years, we have continuously developed our **KSI ECOCLEAN®** filters and filter elements in our own well-equipped test centre (photo) in order to further increase performance, reliability and operational safety without affecting the favourable price.

The result: The independent and renowned IUTA Institute has once again confirmed the performance of the KSI elements. In the tests, a differential pressure loss of 103 mbar (SMA; wet, saturated) was determined.

Institut für Energie- und Umwelttechnik e.V. (IUTA)

Am Gürtel 8-10
Bismarckstraße 55-60
42699 Solingen
Germany



IUTA-CERTIFICATE

Validation of compressed air filters
according to ISO 12801-1:2007
(Filter for compressed air - Test methods - Oil aerosols)

Customer: KSI, Unit 8 Gaby Close, Norwich, NR3 2BL, Great Britain

Tested product: 3 cartridges model "APF2658A"

IUTA Project: 040-2016-01-01-01-01

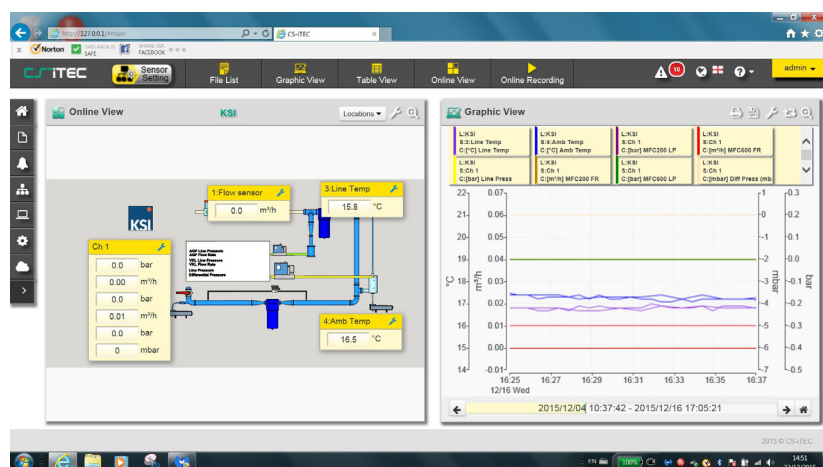
Test parameters	Test results
Test pressure	2 bar (2)
Air flow	28 m³/h (val. to 1 bar, 20 °C) + 100% nominal flow
Test area of concentration	100
Concentration of aerosols	100 mg/m³
Test results	Cartridge 1 Cartridge 2 Cartridge 3 Average
Dry pressure drop (mbar)	35 35 35 35
Saturated pressure drop (mbar)	103 107 100 103.3
Water content of test air (g/m³)	6.922 6.922 6.922 6.922
Filtering efficiency (%)	99.99 99.99 99.99 99.99

Values are rounded up or down to the nearest integer. * Your value of pressure per cartridge (see report)

Darmstadt, 19 December 2012

Head of Institute

Head of Department



Our KSI-owned test center provides us with all relevant data at the push of a button and offers the best conditions for product development.

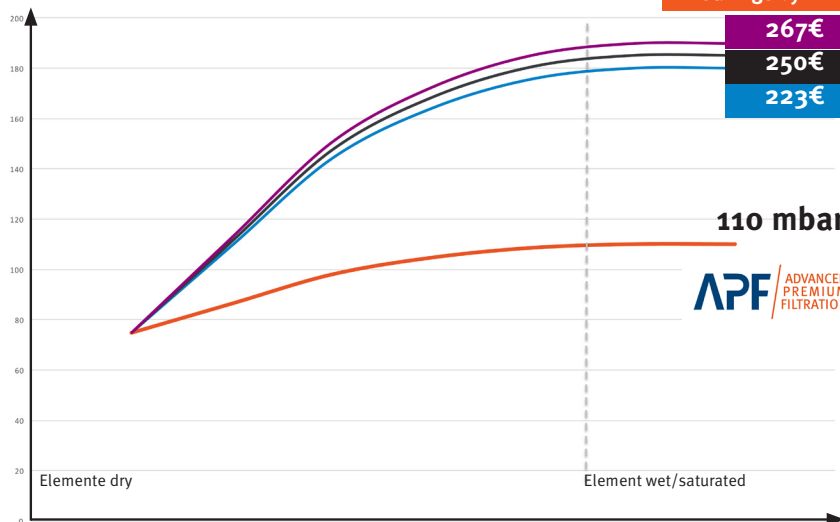
110 mbar differential pressure thanks to high-density deep-bed pleating

Up to 55 % less differential pressure, significantly lower energy requirements and thus significantly reduced energy costs – these outstanding properties of the **KSI ECOCLEAN®** APF series are made possible by the high-density deep-bed pleating. Innovative pleating machines, tighter pleating and the new filter medium, in combination with the new filter housing, ensure that the flow rate within the filtration medium is reduced, making the APF series the market leader in efficiency and minimum pressure loss.

Differential pressure by comparison

SMA Submicrofilter (0,01 micron, 0,01 mg/m³)

Differential pressure



Savings by APF/year

267€

250€

223€

110 mbar

APF

ADVANCED
PREMIUM
FILTRATION

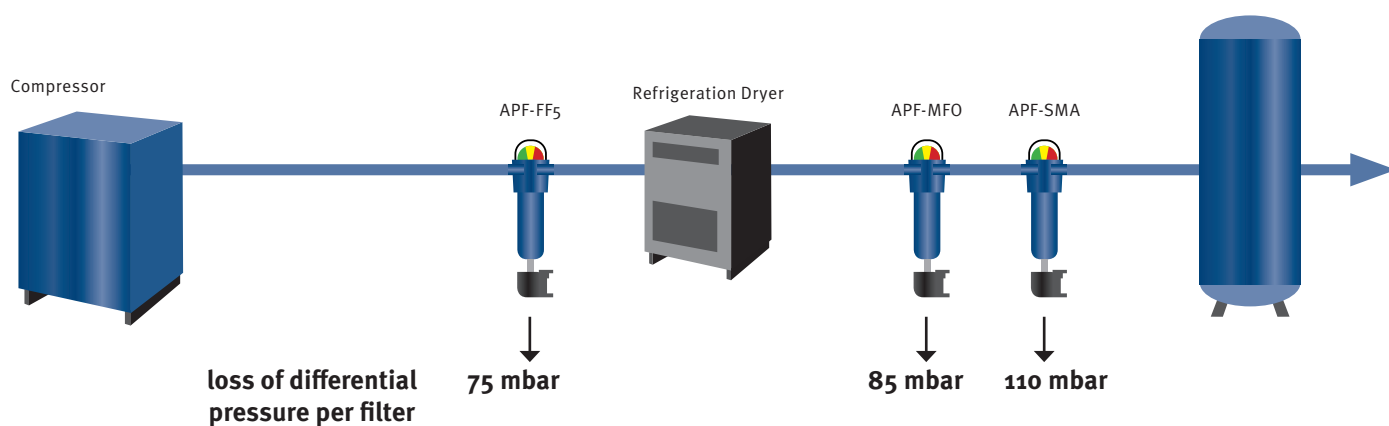
Time

**What does the differential pressure loss cost?
How much can I save if I minimize the pressure loss?**

SMA submicrofilter (0,01 micron, 0,01 mg/m³)

Calculation basis: 0,15 €/ kWh, 6000 operating hours p.a., compressor output 37 KW

Type	Differential pressure loss	Costs per year	Savings by APF per year
APF	270 mbar	899 €	--
Filter purple	430 mbar	1.431 €	532 €
Filter black	475 mbar	1.581 €	682 €
Filter blue	460 mbar	1.531 €	632 €



KSI ECOCLEAN® APF

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Highest quality standards for most economical company

KSI ECOCLEAN® compressed air filters meet the highest quality requirements and are extremely economical in operation, purchase and maintenance. The housing is made of die-cast aluminium, protected inside and outside with a cathodic dip coating (KTL) and powder-coated outside.

- + connections: 1/4" to 3"
- + output levels 35 m³/h - 2,200 m³/h
- + protects production & processes
 - ▶ extended machine & system service life
- + minimises operating costs ▶ saves energy
- + maximizes operational safety
 - ▶ protection against production or machine failure
- + best industrial equipment quality ▶ long service life
- + high service friendliness ▶ minimized service costs

Product range standard filtration

- | | |
|------------------------|--|
| Threaded filter | 15 types: APF23 with 35 m³/h and 1/4" connection up to APF193 with 2,200 m³/h and 3" connection |
| Flanged filter | 9 types: FFO80-01 with 1,400 m³/h and DN80 connection up to FF200-09 with 12,600 m³/h and DN200 connection |
- Higher capacities available on request.

- + fast and safe installation ▶ fast commissioning
- + user-oriented filtration (25, 5, 1, 0.1 and 0.01 micron, as well as activated carbon) ▶ optimal selection
- + activated carbon, molecular sieve & hopkalite cartridges
 - ▶ individually combinable
- + best quality due to 100% leak test
- + **KSI ECOCLEAN®** filters are equipped with an automatic condensate drain

Further filter types:



Cartridge Filters

Activated carbon cartridge
Molecular sieve cartridge
Catalyst cartridge



Flanged Filters

up to 12.600 m³/h, DN 200

Flanged Water Separators

up to 8.400 m³/h, DN 150



Water Separators

up to 2.200 m³/h, 3"



High-Pressure Filters

50 bar – 500 bar



Medical Sterile Filters

Up to 1.500m³/h, 2 1/2"



Stainless Steel Filters

Sterile stainless steel filters and process filters



Vacuum Filters

Vacuum pump protection filters
Vacuum pump exhaust filters



Vacuum Filters

Medical vacuum filters

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Operational safety and economic efficiency

The **KSI ECOCLEAN®** combines operational safety and economy in one product:

- through the constructive structure of the internal and external support frame up to 55% less differential pressure compared to conventional support cylinders
- maximum filter area due to the specially optimized pleating ► for maximum surface filtration
- special component adhesive securely fixes the end caps
- plastic end caps prevent blooming and bacterial growth
- filter drainage layer made of special fleece stabilizes the filter medium and protects against inflating effects and crack formation
- high-performance filter fleece is chemically, mechanically and thermal (up to 120° C) high load capacity and technically silicone-free
- filter depth volume enables highest dirt holding capacity
- capacity at maximum filtration performance

Compressed air quality with KSI ECOCLEAN® filter elements according to ISO 8573.1*

Element Type	SMA					MF1					MFO					FF5					VF25					CA				
max. particle Ø [micron]	▼					▼					▼					▼					▼									
Compressed air class	5	4	3	2	1	5	4	3	2	1	5	4	3	2	1	5	4	3	2	1	5	4	3	2	1	5	4	3	2	1
max. residual oil content	▲					▲					▲					▲					▲					▲				

*KSI ECOCLEAN® high performance filter elements exceed ISO 8573.1 by far.



Element SMA



APF-high performance element:
high-density deep-bed pleating

For KSI filter housings:

CAK activated carbon cartridge
MSK molecular sieve cartridge
HC catalyst cartridge

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Threaded filter

Scope of supply

Compressed air filter consisting of:

KSI ECOCLEAN® Filter housing incl. filter element

D150 Automatic condensate drain for APF23 - APF133

D200 Automatic condensate drain for APF143 - APF193

Type	Capacity*		Dimensions (mm)				Connection	AG
	m³/h	cfm	A	B	C	D		
APF23 ▶	35	21	234	18	80	75	1/4"	010
APF53 ▶	60	35	234	18	80	75	3/8"	010
APF63 ▶	60	35	234	18	80	75	1/2"	010
APF73 ▶	90	53	234	18	80	75	1/2"	010
APF79 ▶	120	71	328	23	104	98	1/2"	010
APF83 ▶	120	71	328	23	104	98	3/4"	010
APF93 ▶	250	147	328	23	104	98	3/4"	010
APF103 ▶	250	147	328	23	104	98	1"	010
APF113 ▶	360	212	612	34	154	150	1"	010
APF129 ▶	540	318	612	34	154	150	1 1/4"	010
APF133 ▶	700	412	612	34	154	150	1 1/2"	010
APF143 ▶	800	471	744	45	196	195	2"	010
APF163 ▶	1300	765	744	45	196	195	2"	010
APF173 ▶	1500	883	732	56	215	210	2 1/2"	010
APF193 ▶	2200	1295	899	56	215	210	3"	010

*calculated at 1 bar (abs.) and 20°C at 7bar g working pressure

▶ = filtration grade

Example order code for APF73 with 1 micron efficiency: APF73MFO

Replacement filter element

Element	AG
APE26 ▶	110
APE26 ▶	110
APE26 ▶	110
APE70 ▶	110
APE78 ▶	110
APE78 ▶	110
APE91 ▶	110
APE91 ▶	110
APE110 ▶	110
APE123 ▶	110
APE123 ▶	110
APE140 ▶	110
APE160 ▶	110
APE170 ▶	110
APE190 ▶	110

Flange filter

Type	Capacity*		Dimensions (mm)				Connection	AG
	m³/h	cfm	A	B	C	D		
APFF080-01 ▶	1400	824	872	116	360	285	DN 80	011
APFF080-02 ▶	2800	1684	1152	177	550	405	DN 80	011
APFF100-02 ▶	2800	1684	1152	177	550	405	DN 100	011
APFF100-03 ▶	4200	2472	1152	177	550	405	DN 100	011
APFF150-04 ▶	5600	3296	1222	207	620	460	DN 150	011
APFF150-06 ▶	8400	4944	1317	223	680	580	DN 150	011
APFF200-07 ▶	9800	5769	1706	288	800	715	DN 200	011
APFF200-08 ▶	11200	6592	1706	288	800	715	DN 200	011
APFF200-09 ▶	12600	7416	1706	288	800	715	DN 200	011

*calculated at 1 bar (abs.) and 20°C at 7bar g working pressure

▶ = filtration grade

Example order code for APFF150-04 with 0,01 micron efficiency: APFF150-04SMA

Replacement filter element

Element	Quantity	AG
APE8601 ▶	1	110
APE8601 ▶	2	110
APE8601 ▶	2	110
APE8601 ▶	3	110
APE8601 ▶	4	110
APE8601 ▶	6	110
APE8601 ▶	7	110
APE8601 ▶	8	110
APE8601 ▶	9	110

Other connections and capacities on request

Correction factors

Operating pressure	bar g	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	factor	0,38	0,50	0,63	0,75	0,88	1	1,12	1,25	1,37	1,49	1,62	1,74	1,86	1,98	2,10

Multiply the capacity of the filter by the correction factor in the table above. Example: Capacity Type APF79 at 10 bar g - capacity nominal (120 m³/h) x factor (1,37) = capacity corrected (164,4 m³/h).

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Threaded filter

Specifications	VF25	FF5	MFO	MF1	SMA
Colour end cap (filter element)	■	■	■	■	■
Particle removal	25 micron	5 micron	1 micron	0,1 micron	0,01 micron
Residual oil content at 20°C	10 mg/m³	5 mg/m³	0,5 mg/m³	0,1 mg/m³	0,01 mg/m³
Differential pressure dry	45 mbar	50 mbar	55 mbar	65 mbar	75 mbar
Diff. pressure wet, saturated	50 mbar	75 mbar	85 mbar	90 mbar	110 mbar
Operating pressure (max)	APF23 - APF163: 16 bar g APF173: 13,5 bar g APF193: 10,5 bar g				
Temperature (max)	housing: 120°C · filter elements : 120°C				
Temperature (min)	1°C				
Housing material	Aluminum, inside and outside cathodic dip-paint coating				
Colour	blue powder coated / RAL 5010				

Specifications	DMF	DF1	DSF
Colour end cap (filter element)	■	■	■
Particle removal	1 micron	0,1 micron	0,01 micron
Differential pressure	55 mbar	65 mbar	75 mbar
Operating pressure (max)	APF23 - APF163: 16 bar g APF173: 13,5 bar g APF193: 10,5 bar g		
Temperature (max)	Housings: 120°C · Elements: 120°C		
Temperature (min)	1°C		
Housing material	Aluminum, inside and outside cathodic dip-paint coating		
Colour	blue powder coated / RAL 5010		

Specifications	CA
Colour end cap (filter element)	■
Residual oil content at 20°C	0,003 mg/m³
Differential pressure	100 mbar
Operating pressure (max)	APF23 - APF163: 16 bar g APF173: 13,5 bar g APF193: 10,5 bar g
Temperature (max)	Housing: 120°C , Elements: 50°C; recommended: 25°C
Temperature (min)	1°C
Housing material	Aluminum, inside and outside cathodic dip-paint coating
Colour	blue powder coated / RAL 5010

Flange filter

Specifications	
Operating pressure (max)	16 bar g
Temperature (max)	80°C
Temperature (min)	1°C
Housing material	Carbon steel, inside and outside protective coating
Colour	blue powder paint / RAL 5010

KSI ECOCLEAN® APF

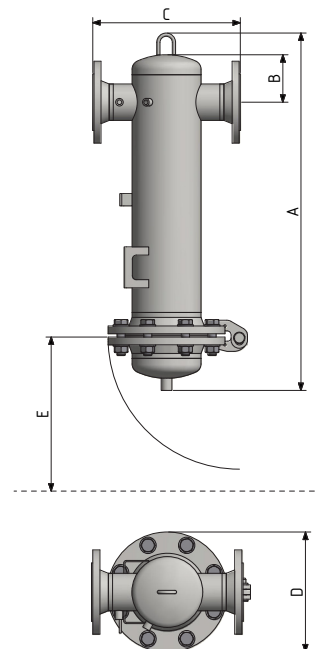
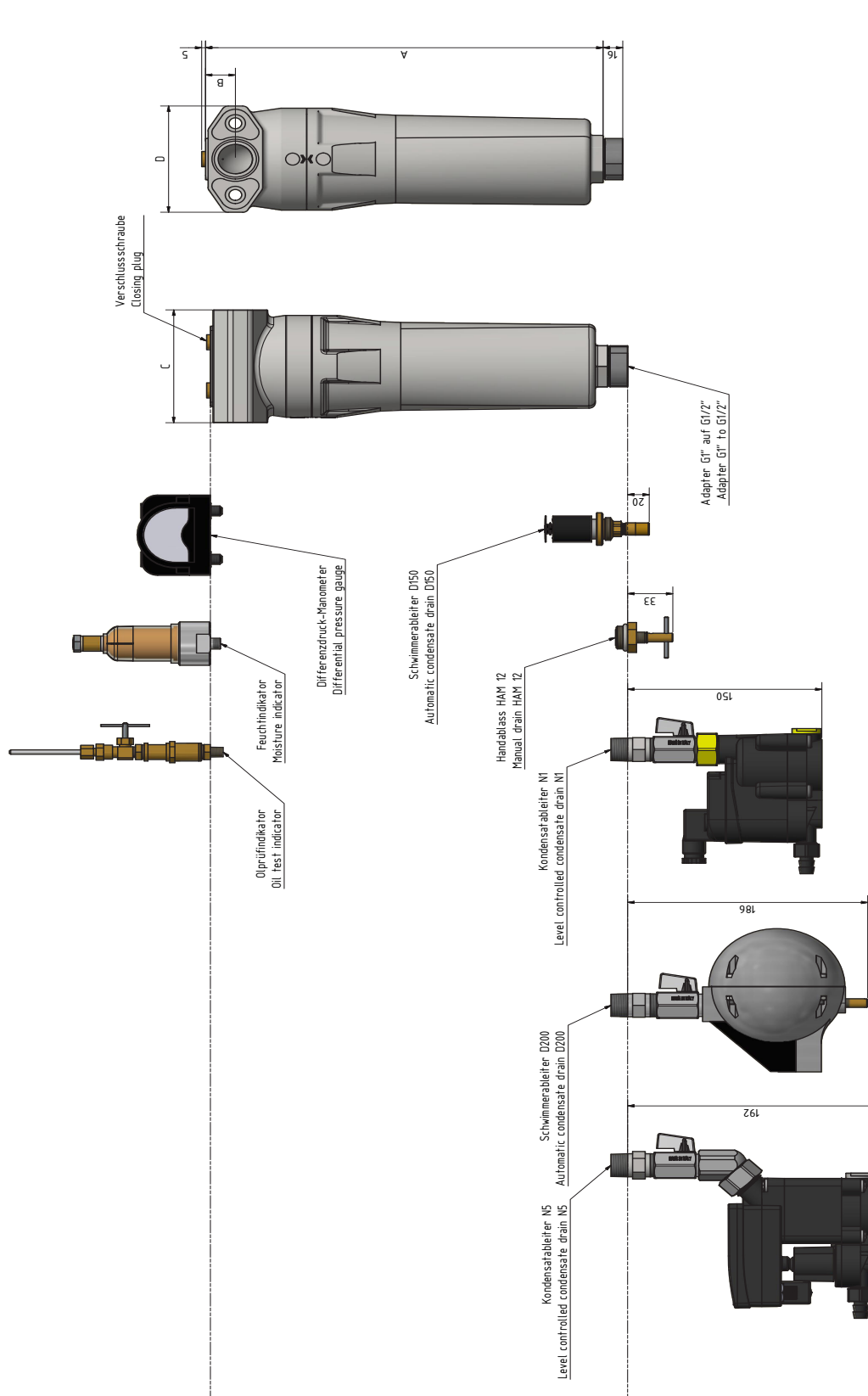
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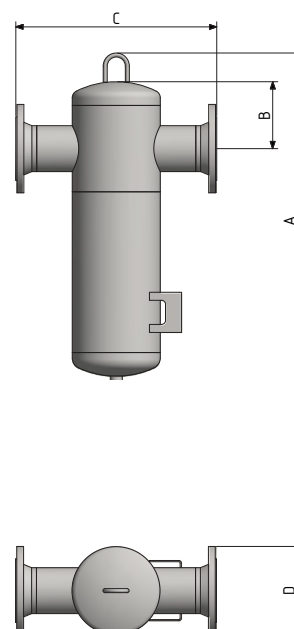


Dimensional Drawing

APFFo80-03 - APFF200-09



APFFo80WS - APFF150-WS



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Approvals for pressure equipment

EU	Approval for fluid group 2 according to Pressure Equipment Directive 2014/68/EU, module B+D (category IV)
Other	ASME

Quality assurance

Development/production	DIN EN ISO 9001
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Air purity class according to ISO 8573-1:2010

Solid particles	vary by filter element, see page 6
Moisture (gaseous)	vary by filter element, see page 6
Total oil	vary by filter element, see page 6

Options



Differential pressure
indicator



Potential-free, digital
differential pressure manometer



Moisture
indicator



Oil indicator



Compressed air heater



Filter connection set



Wall mounting incl.
filter connection set

Condensate drain



automatic drain D150,
standard for threaded filters
APF23 - APF133



automatic drain D200,
standard for threaded filters
APF143 - APF193 and all
flanged filters



level-controlled condensate
drain **KONDRAIN®** N1
(option for **KSI ECOCLEAN®**
standard filter)



manual drain HAM12,
standard in CA activated carbon
filters and in all cartridge filters