

ECOTROC® | KSI ECOCLEAN®

High-end technology for generating medical and technical breathing air



Reliable compressed air processing for special applications



The „King’s discipline“ in compressed air processing

Even in standard compressed air applications, the demands on the compressed air provided are high: Moisture, particles and oil aerosols must be removed reliably and economically from the compressed air in order to protect the installations themselves as well as the application and user. When generating medical and technical breathing air, in the „King’s discipline of compressed air treatment“ so to speak, the requirements are of course much higher.

Here, too, KSI Filtertechnik demonstrates its manufacturing expertise and offers a bundle of solutions – always the right one for the specific application. This applies both to the various adsorption dryers of the **ECOTROC® ATM** and **ECOTROC® ATT** series as well as to sterile filters and medical vacuum filters of the successful **KSI ECOCLEAN®** series.

The ECOTROC® ATM | ATT Plus-Effects +++

- + certified high-end plant construction
 - high power reserves & safety
- + intelligent system solution ▸ low energy costs
- + powerful special desiccant & catalyst
 - high breathing air purity
- + user-friendly design ▸ easy service
- + brand components ▸ simplified maintenance & high operational reliability
- + dew point control optional
 - safety plus
 - energy saving
 - constant quality
- + coordinated process engineering ▸ safe compliance with the breathing air standard DIN EN ISO 7396-1

ECOTROC® ATM

High-end adsorption technology for generation

of medical breathing air from compressed air



With maximum responsibility and safety

Where health is at stake, operational safety, air quality and reliability of treatment play a decisive role. With the **ECOTROC® ATM** series, KSI Filtertechnik meets the strict requirements for medical breathing air. This technical performance is combined with a first-class price/performance ratio. Thus, this KSI high-end system solution provides breathing air that meets the applicable standards and limits of the Pharmacopée Européenne. Better safe than sorry!

KSI quality creates safety for pure breathing air

KSI Filtertechnik is certified according to DIN EN ISO 9001, and our high quality standards within the company enable us to provide premium solutions with maximum safety. System efficiency of the highest level, in combination with solution oriented advice, is key for KSI medical solutions.

ECOTROC® ATM: reliable, safe, universal

Suitable for medical breathing air requirements:

- hospitals
- (outpatient) doctor's offices
- laboratories

Flawless function through safe process engineering

Impurities such as particles, fine dusts, moisture and aerosols drawn in from the environment by the compressor are reliably separated by adsorption dryers of the **ECOTROC®** series. Industrial compressed air is turned into high-quality, pure breathing air by means of KSI treatment technology.

The prefilter combination reliably separates particles and water (condensate). In the adsorption stage, the physically induced moisture content (water vapor) is reduced to a pressure dew point of -40°C. Finally, in the activated carbon and catalyst cleaning stage, the compressed air is cleaned of odorous substances, hydrocarbon compounds and undesirable gas components, including carbon monoxide and sulphur dioxide. High quality medical breathing air is now available behind the high-performance after-filter.



Quality components (standard scope of delivery)

The components of a **ECOTROC® ATM** processing unit:

- **KSI ECOCLEAN® APF MFO + SMA**
pre-filter combination (1 micron / 0,01 micron)
- **ECOTROC® ATK**
fully automatic heatless regenerated adsorption dryer with special desiccant filling, including a third desiccant vessel with activated carbon + HC filling
- **ECOMATIC**
electronic control with compressor synchronization circuit
- **KSI ECOCLEAN® APF DSF**
high performance dust after-filter (0,01 micron)

Options

KONDRAIN® N5

electronic, level-controlled condensate drain, installed on the pre-filters **KSI ECOCLEAN® APF MFO / SMA**.

ETC4.0 / ETP4.0

A significant increase in safety and energy-saving performance

Intelligent dew point controls, among others with:

- pressure measurement at the dryer inlet and display
- temperature measurement at dryer inlet and display
- safety shutdown possible

(More information on page 8)



Limit values for breathing air

Residual values according to Pharmacopée Européenne / ECOTROC® ATM

				Pharmacopée Européenne	ECOTROC® ATM
Carbon monoxide	CO	(ppm)	<	5	5
Carbon dioxide	CO ₂	(ppm)	<	500	300
Water vapour		(ppm)	<	67	67
Sulphur dioxide	SO ₂	(ppm)	<	1	1
Nitrous gases	NO _x	(ppm)	<	2	2
Nitrogen oxide	NO ₂	(ppm)	<	2	2
Oil vapour/residual oil content		(mg/m ³)	<	0,1	0,1
Nitrogen	N ₂	(ppm)	<		2
Oxygen	O ₂	%	<	21(+/-1)	20,9(+/-1)
Dirt particles	<			0,01 micron at 99,9999%	
Odorants and flavourings				free	

The specified values are maximum values (under standard conditions)

Spezifikationen		Specifications
Drucktaupunkt	-40°C	Pressure dew point
Medium	Druckluft Compressed air	Medium
min. Betriebsdruck	4 bar ü g	Min. working pressure
max. Betriebsdruck	16 bar ü g (ATM-APN 10: 13,5 bar ü g)	Max. working pressure
Spannungsversorgung	230 V / 50-60 Hz AC	Power supply
Farbausführung	Blau, RAL 5010 Blue, RAL 5010	Colour
ATMN-APN: Profile eloxiert – Farbe weiß Profiles anodised – white coloured		
ATMN: Behälter weiß (RAL 9003) – vessel white coloured (RAL 9003)		

Performance Levels

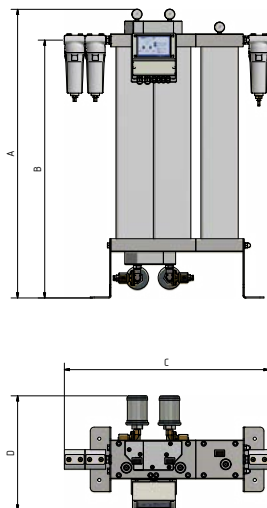
Typ	Leistung*		Abmessungen (mm)				Anschluss	Anschluss	Gewicht	Prod.
Type	Capacity*		Dimensions (mm)				Connection	Connection	Weight	Grp.
	m³/h	cfm	A	B	C	D	Eingang/Inlet	Ausgang/Outlet	kg	
ATM-APN 1	6	4	623	535	725	306	3/8"	3/8"	21	340
ATM-APN 2	12	7	723	635	725	306	3/8"	3/8"	26	340
ATM-APN 3	24	14	823	735	725	316	3/8"	3/8"	38	340
ATM-APN 4	42	25	872	767	841	419	3/8"	3/8"	47	340
ATM-APN 6	61	36	972	867	841	419	3/8"	3/8"	48	340
ATM-APN 7	73	43	1080	967	841	419	1/2"	1/2"	53	340
ATM-APN 8	84	49	979	860	931	442	1/2"	1/2"	70	340
ATM-APN 9	109	64	1119	1000	931	442	1/2"	1/2"	77	340
ATM-APN 10	134	79	1299	1180	931	442	1/2"	1/2"	94	340
ATMN 15	183	108	1184	731	1307	575	1"	1"	224	345
ATMN 18	219	129	1364	911	1307	575	1"	1"	258	345
ATMN 22	256	151	1488	1035	1307	575	1"	1"	280	345
ATMN 34	414	244	1543	1049	1638	680	1 1/2"	1 1/2"	533	345
ATMN 45	585	344	1642	1148	1638	680	1 1/2"	1 1/2"	559	345
ATMN 55	732	431	2102	1608	1638	680	1 1/2"	1 1/2"	713	345

*bezogen auf 1 bar (abs.) und 20°C bei 9 bar ü Betriebsdruck, 35°C Eingangstemperatur | calculated at 1 bar (abs.) and 20°C at 9 bar g working pressure, 35°C inlet temperature

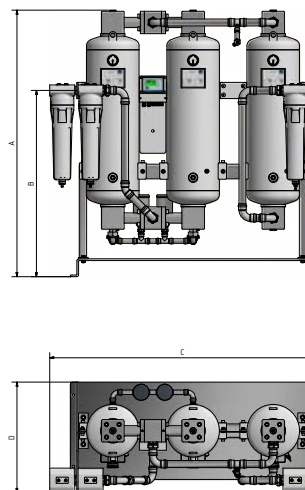
Höhere Volumenströme auf Anfrage | Higher capacities on request

Maßzeichnungen | Dimensional drawings

ATM-APN 1 – ATM-APN 10



ATMN 15 – ATMN 55



Korrekturfaktoren | Correction factors

Eintrittstemperatur | inlet temperature

°C	< 25	25	30	35	38	40	45	48	50
F(t)	1,2	1,1	1,09	1	0,84	0,78	0,72	0,65	0,58

Korrekturfaktoren Arbeitsdruck | Correction factors working pressure

bar ü g	4	4,5	5	5,5	6	6,5	7	7,5	8	8,5	9	9,5	10	10,5	11	11,5	12	12,5	13	13,5	14	14,5	15	15,5	16
F(p)	0,49	0,55	0,61	0,67	0,73	0,80	0,82	0,89	0,91	0,95	1	1,06	1,11	1,16	1,23	1,29	1,34	1,39	1,43	1,50	1,58	1,61	1,66	1,72	1,75

Multiplizieren Sie bitte die Leistung des ATM mit den Korrekturfaktoren in den oberen Tabellen. Beispiel: Leistung ATM-APN 7 bei 11 bar ü / 45°C t Leistung nom (73 m³/h) x F(p) (1,23) x F(t) (0,72) = Leistung korrigiert (64,65 m³/h)
Please multiply the capacity of ATM with the correction factor in the above table. Example: Capacity ATM-APN 7 at 11 bar g / 45°C t Capacity nom (73 m³/h) x F(p) (1,23) x F(t) (0,72) = Capacity corrected (64,65 m³/h)

When it matters

Breathing air from compressed air helps people to stay fit and healthy wherever it really matters. This means that people can still work even where the ambient conditions no longer provide sufficiently health-preserving breathing air quality. Therefore, technical breathing air offers not only health protection but also high operational safety. Additionally you have more independency to achieve goals that require a special effort.

ECOTROC® ATT: reliable, safe, universal

Some fields of applications for industrial breathing air:

- surface treatment and processing
- sand blasting work
- fire departments
- disaster relief
- paint shops, breathing mask applications in general
- diver air and deep sea applications, compressed air tank filling
- civil protection
- chemical and petrochemical industry
- mining & tunnel construction
- tank cleaning
- bio laboratories

Flawless function due to safe process engineering

Impurities such as odorants, particles, fine dusts, moisture and aerosols sucked in from the environment by the compressor are reliably separated by adsorption dryers of the **ECOTROC®** series. Industrial compressed air is transformed by KSI treatment technology into the best breathing air for safe technical applications.

The **KSI ECOCLEAN® APF** prefilter reliably separates particles with a separation efficiency of 0.01 microns and the water content (condensate). In the adsorption stage, the physically induced moisture content of the compressed air (water vapor) is reduced to a pressure dew point of -40°C. Finally, in the activated carbon and catalyst cleaning stage, the compressed air is freed from undesirable air constituents, including carbon monoxide and sulphur dioxide. High quality technical breathing air is now available behind the **KSI ECOCLEAN® APF** high performance after-filter.



Quality components (standard scope of delivery)

The components of a **ECOTROC® ATT** processing unit:

- **KSI ECOCLEAN® APF SMA**
pre-filter combination (0,01 micron)
- **ECOTROC® ATK**
fully automatic heatless regenerated adsorption dryer with special desiccant filling, including a third desiccant vessel with activated carbon + HC filling
- **ECOMATIC**
electronic control with compressor synchronization circuit
- **KSI ECOCLEAN® APF DSF**
high performance dust after-filter (0,01 micron)

Options

KONDRAIN® N5

electronic, level-controlled condensate drain, installed on the pre-filters **KSI ECOCLEAN® APF SMA**.

ETC4.0 / ETP4.0

A significant increase in safety and energy-saving performance

Intelligent dew point controls, among others with:

- pressure measurement at the dryer inlet and display
- temperature measurement at dryer inlet and display
- safety shutdown possible

(More information on page 8)



Limits for Industrial Breathing Air

Region				Europe	United Kingdom	USA	Australia	ECOTROC® ATT
Norm				EN 12021	BS 4275	ANSI/CGA	AS 1715	
Carbon monoxide	CO	(ppm)	<	5	5	10	10	5
Carbon dioxide	CO ₂	(ppm)	<	500	500	1000	800	500
Water vapour	H ₂ O		<	5 °C	5 °C	10 °F	100 mg/m ³	-40 °C
Nitrous gases	NO _x	(ppm)	<	–	–	–	–	2
Nitrogen dioxide	NO ₂	(ppm)	<	–	–	–	–	2
Oil vapour/residual oil content	(mg/m ³)	<		0.5	0.5	0.5	1.0	0.003
Oxygen	O ₂	%	<	21(+/-1)	20-23	21,5	–	20.9(+/-1)
Odorous and flavourings				free	free	free	free	free

The specified values are maximum values (under standard conditions)

High-end adsorption technology for generation of technical breathing air from compressed air

Performance Levels

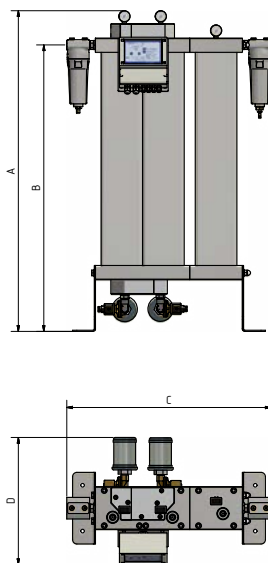
Typ	Leistung*		Abmessungen (mm)				Anschluss	Anschluss	Gewicht	Prod.
Type	Capacity*		Dimensions (mm)				Connection	Connection	Weight	Grp.
	m³/h	cfm	A	B	C	D	Eingang/Inlet	Ausgang/Outlet	kg	
ATT-APN 1	5	3	623	535	635	306	3/8"	3/8"	20	347
ATT-APN 2	10	6	723	635	635	306	3/8"	3/8"	25	347
ATT-APN 3	20	12	823	735	635	316	3/8"	3/8"	37	347
ATT-APN 4	35	21	872	767	751	419	3/8"	3/8"	46	347
ATT-APN 6	50	29	972	867	751	419	3/8"	3/8"	47	347
ATT-APN 7	60	35	1072	967	751	419	1/2"	1/2"	40	347
ATT-APN 8	70	41	979	860	841	442	1/2"	1/2"	69	347
ATT-APN 9	90	53	1119	1000	841	442	1/2"	1/2"	76	347
ATT-APN 10	110	65	1299	1180	841	442	1/2"	1/2"	93	347
ATTN 15	150	88	1304	853	1037	650	1"	1"	182	348
ATTN 18	180	106	1420	853	1037	650	1"	1"	205	348
ATTN 22	210	124	1545	853	1100	650	1"	1"	306	348
ATTN 34	340	200	1531	1008	1414	700	1 1/2"	1 1/2"	510	348
ATTN 45	480	283	1631	1008	1414	700	1 1/2"	1 1/2"	575	348
ATTN 55	600	353	2091	1008	1414	700	1 1/2"	1 1/2"	733	348

*bezogen auf 1 bar (abs.) und 20°C bei 7 bar ü Betriebsdruck, 35°C Eingangstemperatur | calculated at 1 bar (abs.) and 20°C at 7 bar g working pressure, 35°C inlet temperature

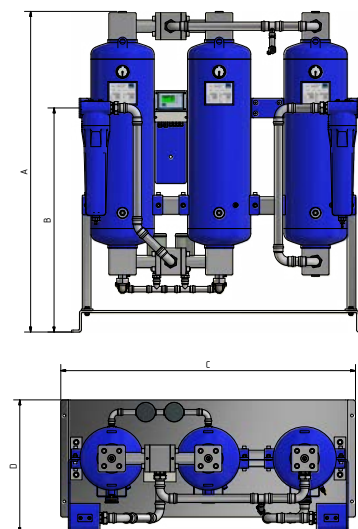
Höhere Volumenströme auf Anfrage | Higher capacities on request

Maßzeichnungen | Dimensional drawings

ATT-APN 1 – ATT-APN 10



ATTN 15 – ATTN 55



Korrekturfaktoren | Correction factors

Eintrittstemperatur | inlet temperature

°C	< 25	25	30	35	38	40	45	48	50
F(t)	1,2	1,1	1,09	1	0,84	0,78	0,72	0,65	0,58

Korrekturfaktoren Arbeitsdruck | Correction factors working pressure

bar ü g	4	4,5	5	5,5	6	6,5	7	7,5	8	8,5	9	9,5	10	10,5	11	11,5	12	12,5	13	13,5	14	14,5	15	15,5	16
F(p)	0,6	0,7	0,74	0,82	0,89	0,97	1	1,08	1,11	1,16	1,22	1,29	1,36	1,42	1,5	1,57	1,63	1,69	1,75	1,83	1,9	1,96	2,03	2,1	2,14

Multiplizieren Sie bitte die Leistung des ATT-AP mit den Korrekturfaktoren in den oberen Tabellen. Beispiel: Leistung ATT-AP 4 bei 13 bar ü / 30°C t Leistung nom (35 m³/h) x F(p) (1,75) x F(t) (1,09) = Leistung korrigiert (66,76 m³/h)

Please multiply the capacity of ATT-AP with the correction factor in the above table. Example: Capacity ATT-AP 4 at 13 bar g / 30°C t Capacity nom (35 m³/h) x F(p) (1,75) x F(t) (1,09) = Capacity corrected (66,76 m³/h)

High-end adsorption technology for generation of technical breathing air from compressed air

NEW: Advanced dew point controls with intelligent functions (ETC 4.0 / ETP 4.0)

- wifi transmission / parameterization
- GSM module
- control as „master“ with touch display for connectable sensor boxes
- can be used as a master for internet-based monitoring and planning
- configurable inputs through selectable signal reception: potential-free or 4-20 mA (2-wire)
- 5 valves controllable

ECOTROCONOMY-Comfort (ETC 4.0)

- available for the entire **ECOTROC®** AT series
- sending of notification and alarm messages by email
- all **ECOTROC®** AT dryers can easily be upgraded (even older models and models from other manufacturers)
- dew point measurement and display up to -100°C
- demand-oriented regeneration control by measuring the operational conditions
- integrated load change counter (makes vessel inspections at a later time possible)
- saves the operating parameters in combination with date and time (still available after power failure)
- password protection on all levels (can be modified)
- connection for optical and acoustic signals (flashing light, horn etc.)
- automatic service indicator
- service interval display, adjustable intervals
- potential-free alarm output
- external 2-20mA-signal to transfer the displayed dew point value, i.e. to a master display or control room

ECOTROCONOMY-Premium (ETP 4.0)

Functions like ETC 4.0, plus:

- pressure measurement at the dryer inlet and indication on the control display
- temperature measurement at the dryer inlet and indicator in the control display
- safety shutdown in case of divergence from specified values is possible



ECOTROCONOMY Comfort: ETC 4.0



ECOTROCONOMY Premium: ETP 4.0

Control with Fixed Cycle Times

ECOMATIC

Standard scope of supply with all ECOTROC® AT (heatless)

- display of the adsorption / regeneration cycle
- fully electronic microprocessor
- energy-saving compressor synchronizing circuit
- adjustable cycle times (selectable)
- Status display and potential-free alarm signal for service requirements
- 24 V optional



ECOMATIC

For the highest requirements

KSI ECOCLEAN® stainless steel sterile filters are used in the food and beverage industry, the pharmaceutical industry, the chemical industry, the packaging industry or medical technology, among others. These applications include the filtration of chemicals, oil, air and gas or water treatment.

Sterile filters are designed for the highest purity requirements in the pharmaceutical, cosmetics, beverage and electronics industries and provide sterile and bacteria-free compressed air. The special feature of **KSI ECOCLEAN®** stainless steel sterile filters is that the filter element is sterilized while the process is running, so that the application does not have to be interrupted in the case of redundant designs. The system is protected against the penetration of viruses.



Scope of supply

Compressed air filter including:

KSI ECOCLEAN® Filter housing incl. filter element

Type	Leistung*		Abmessungen (mm)			Anschluss	Prod.	Element	Anzahl	Prod.
Type	Capacity*		Dimensions (mm)			Connection	Grp.	Element	Quantity	Grp.
	m³/h	m³/h	A	B	C					
FES005 ▶	75	44	116	74	223	1/4"	018	FE005 ▶	1	118
FES007 ▶	105	62	120	74	254	3/8"	018	FE007 ▶	1	118
FES010 ▶	150	88	125	74	254	1/2"	018	FE010 ▶	1	118
FES018 ▶	225	132	125	74	276	3/4"	018	FE018 ▶	1	118
FES030 ▶	315	185	136	81	295	1"	018	FE030 ▶	1	118
FES047 ▶	420	247	155	81	357	1 1/4"	018	FE047 ▶	1	118
FES070 ▶	600	353	180	106	408	1 1/2"	018	FE070 ▶	1	118
FES094 ▶	900	530	180	106	476	2"	018	FE094 ▶	1	118
FES150 ▶	1260	742	180	106	602	2"	018	FE150 ▶	1	118
FES175 ▶	1680	989	224	121	762	2 1/2"	018	FE175 ▶	1	118
FES200 ▶	2400	1413	224	131	1030	3"	018	FE200 ▶	1	118
FES240 ▶	3600	2119	255	136	1062	3"	018	FE240 ▶	1	118

*bezogen auf 1 bar (abs.) und 20°C bei 7 bar ü Betriebsdruck | calculated at 1 bar (abs.) and 20°C at 7 bar g working pressure

▶ = Abscheidegrad | filtration-grade

Beispiel Bestellnummer für FES010 mit 20 Mikron Abscheidung: FES010ENS | Example order code for FES010 with 20 microns efficiency: FES010ENS

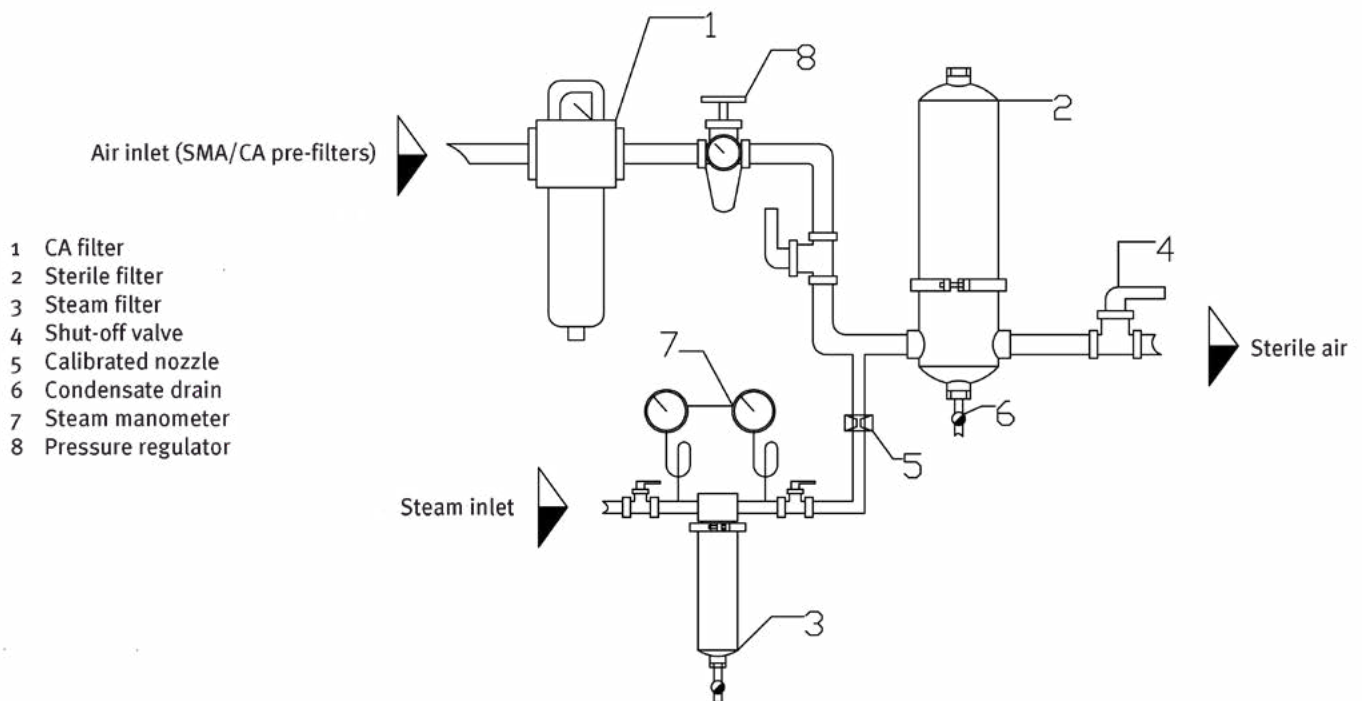
Abscheidegrade auf der nächsten Seite. | Filtration grades on the following page.

Filtration grades

Spezifikationen	► S	► ENS	► ESS	► SMS	Specifications
Partikelfiltration	0,01 Mikron	20 Mikron	25 Mikron	0,01 Mikron	Particle removal
Anwendungsbereich	Sterilfilter <i>Sterile filter</i>	Industriefilter <i>Industrial filter</i>	Industriefilter <i>Industrial filter</i>	Industriefilter <i>Industrial filter</i>	Range of application
Filtermaterial	Nomex <i>Nomex</i>	Inox Netz mit Gewebe <i>Inox grid with mesh</i>	Sintermetall <i>Sintered Inox</i>	Borosilikatpapier <i>Borosilicate paper</i>	Filter material
Höchsttemperatur	150°C	150°C	150°C	150°C	Max. temperature
Druckverlust - sauber und trocken	30 mbar	30 mbar	30 mbar	120 mbar	Pressure loss - clean and dry
Druckverlust - Elementwechsel	600 mbar	600 mbar	600 mbar	600 mbar	Pressure loss - change element
Max. Arbeitsdruck	FES005 - FES175: 16 bar ü/g FES200 - FES240: 12 bar ü/g				Max. working pressure
Material Gehäuse	Edelstahl 1.4301, Polierung Ra 0,8 <i>Stainless steel 1.4301, polished Ra 0,8</i>				Housing material
Material Endkappen Filterelement	Edelstahl <i>Stainless steel</i>				End cap material filter element

Andere Abscheidegrade auf Nachfrage. | *Further filtration grades on request.*

Structure and functional diagram for sterilization



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	1,00	1,12	1,25	1,37	1,49	1,62	1,74	1,86	1,98	2,10

Please multiply the capacity of the filter by the correction factor in the above table. Example: Capacity type F70 at 10 bar g - Capacity nominal (120 m³/h) x Factor (1,37) = Capacity corrected (164,4 m³/h)

When it comes to the point

KSI ECOCLEAN® APF compressed air filters meet the most stringent quality requirements and are very economical in terms of purchase price, operation and maintenance.

The housing is made of die-cast aluminium, with a cathodic dip coating inside and outside. It is also powder coated on the outside.

KSI ECOCLEAN® APF SE filters are used to retain germs and bacteria in medical compressed air systems.



Scope of supply

Compressed air filter including:

KSI ECOCLEAN® Filter housing incl. filter element

HAM12 Manual drain

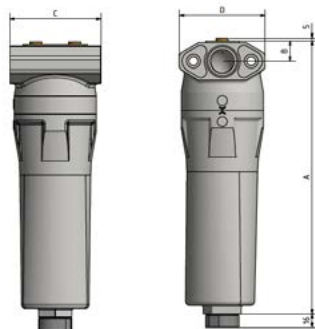
									Austauschelement Replacement element		
Typ	Leistung*		Abmessungen (mm)				Anschluss	Prod.	Element	Anzahl	Prod.
Type	Capacity*		Dimensions (mm)				Connection	Grp.	Element	Quantity	Grp.
	m³/h	cfm	A	B	C	D					
APF23SE	35	21	234	18	80	75	1/4"	017	APE26	1	117
APF53SE	60	35	234	18	80	75	3/8"	017	APE26	1	117
APF63SE	60	35	234	18	80	75	1/2"	017	APE26	1	117
APF73SE	90	53	234	18	80	75	1/2"	017	APE70	1	117
APF79SE	120	71	328	23	104	98	1/2"	017	APE78	1	117
APF83SE	120	71	328	23	104	98	3/4"	017	APE78	1	117
APF93SE	220	129	328	23	104	98	3/4"	017	APE91	1	117
APF103SE	220	129	328	23	104	98	1"	017	APE91	1	117
APF113SE	360	212	612	34	154	150	1"	017	APE110	1	117
APF129SE	540	318	612	34	154	150	1 1/4"	017	APE123	1	117
APF133SE	700	412	612	34	154	150	1 1/2"	017	APE123	1	117
APF143SE	800	471	744	45	196	195	2"	017	APE140	1	117
APF163SE	1300	765	744	45	196	195	2"	017	APE160	1	117

*bezogen auf 1 bar (abs.) und 20°C bei 7 bar ü Betriebsdruck | calculated at 1 bar (abs.) and 20°C at 7 bar g working pressure

Spezifikationen	SE	Specifications
Partikelfiltration	0,01 Mikron	Particle filtration
Höchsttemperatur empfohlen	50°C	Max. temperature recommended
Max. Sterilisationstemperatur***	145°C Sattedampf saturated steam	Max. sterilising temperature***
Max. Arbeitsdruck	16 bar ü/g	Max. working pressure
Material Gehäuse	Aluminium, Schutzschicht innen und außen Aluminium, inside and outside protective coating	Housing material
Farbausführung	weiße Pulverbeschichtung / RAL 9003 white powder paint / RAL 9003	Colour

***Note: The maximum sterilization temperature refers only to the filter elements. It can be sterilized 50 times.
Each element must be sterilized in an autoclave before each use.

Dimensional drawings



Korrekturfaktoren																
Arbeitsdruck	bar ü	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Faktor	0,38	0,50	0,63	0,75	0,88	1,00	1,12	1,25	1,37	1,49	1,62	1,74	1,86	1,98	2,10

Please multiply the capacity of the filter by the correction factor in the above table. Example: Capacity type F70 at 10 bar g - Capacity nominal (120 m³/h) x Factor (1,37) = Capacity corrected (164,4 m³/h)

High-end filtration technology: medical vacuum filters

The medical vacuum filters of the **KSI ECOCLEAN® APF** series are used to separate liquids, solid particles and bacteria in medical vacuum systems. The VMS filters are installed on the suction side to prevent damage to the vacuum pump. They also protect against possible bacterial contamination to the environment.

- + proven in decades of practice in hospitals worldwide
- + filter according to the international specifications of the DIN EN ISO 7396-1, HTM 02-01, NFPA 99 and AS286
- + highly efficient separation of 99.9999 % of all solids through high-quality pleated filter material for all vacuum systems
- + simple and fast element change by APF / APE design



Scope of supply

Vacuum filter including:

KSI ECOCLEAN® Filter housing with filter element

SG Drain flask

KH12 Ball valve 1/2"

Type	Leistung*		Abmessungen (mm)				Anschluss	Prod.
Type	Capacity*		Dimensions (mm)				Connection	Grp.
	m³/h	cfm	A	B	C	D		
APF23VMS	3	2	234	18	80	75	1/4"	016
APF53VMS	6	4	234	18	80	75	3/8"	016
APF63VMS	6	4	234	18	80	75	1/2"	016
APF73VMS	9	5	234	18	80	75	1/2"	016
APF79VMS	15	9	328	23	104	98	1/2"	016
APF83VMS	15	9	328	23	104	98	3/4"	016
APF93VMS	28	16	328	23	104	98	3/4"	016
APF103VMS	28	16	328	23	104	98	1"	016
APF113VMS	50	29	612	34	154	150	1"	016
APF129VMS	75	44	612	34	154	150	1 1/4"	016
APF133VMS	90	53	612	34	154	150	1 1/2"	016
APF143VMS	140	82	744	45	196	195	2"	016
APF163VMS	170	100	744	45	196	195	2"	016
APF173VMS	200	118	732	56	215	210	2 1/2"	016

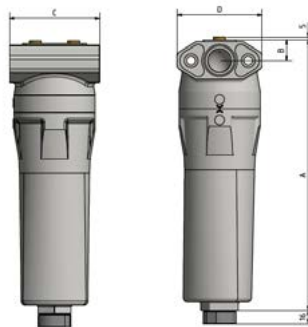
Austauschelement | Replacement element

Element	Anzahl	Prod.
Element	Quantity	Grp.
APE26 ▶	1	116
APE26 ▶	1	116
APE26 ▶	1	116
APE70 ▶	1	116
APE78 ▶	1	116
APE78 ▶	1	116
APE91 ▶	1	116
APE91 ▶	1	116
APE110 ▶	1	116
APE123 ▶	1	116
APE123 ▶	1	116
APE140 ▶	1	116
APE160 ▶	1	116
APE170 ▶	1	116

*bezogen auf 1 bar (abs.) und 20°C bei 7bar ü Betriebsdruck | calculated at 1 bar (abs.) and 20°C at 7bar g working pressure

Spezifikationen	VMS	Specifications
Höchsttemperatur	60°C	Max. temperature
Mindesttemperatur	1,5°C	Min. temperature
Max. Arbeitsdruck	- 917 mbar Unterdruck / <i>negative pressure</i>	Max. working pressure
Material Gehäuse	Aluminium, KTL-Schutzschicht innen und außen <i>Aluminum, inside and outside cathodic dip-paint coating</i>	Housing material
Farbausführung	weiße Pulverbeschichtung / RAL 9003 <i>white powder paint / RAL 9003</i>	Colour

Dimensional drawings



Korrekturfaktoren <i>Correction factors</i>													
Vakuum <i>Vacuum</i>	mbar	10	50	100	200	250	300	400	500	600	700	800	900 1000
	torr / mm Hg	8	38	75	150	188	225	300	375	450	525	600	675 750
	Faktor <i>factor</i> F1	0,01	0,05	0,1	0,2	0,25	0,3	0,4	0,5	0,6	0,7	0,8	0,9 1
	Faktor <i>factor</i> F2	100	20	10	5	4	3,33	2,5	2	1,67	1,43	1,25	1,11 1

Um die Leistung eines Vakuumfilters bei gegebenen Vakuumbedingungen zu bestimmen, multiplizieren Sie bitte die Leistung des Filters mit dem passenden Korrekturfaktor F1.
Beispiel: Leistung Typ APF113 bei 200 mbar · Leistung nominal (50 m³/h) x Faktor F1 (0,2) = Leistung APF113 korrigiert (10 m³/h)

Um den passenden Vakuumfilter bei bekannten Vakuumbedingungen zu bestimmen, multiplizieren Sie die Durchflussmenge im System mit dem Korrekturfaktor F2 und wählen Sie den passenden Filter aus.
Beispiel: Durchfluss im System 10 m³/h bei 200 mbar · 10 m³/h x Faktor F2 (5) = nominale Filterleistung (50 m³/h) => Filter mit nominale Leistung 50 m³/h: APF113

To find the capacity of a vacuum filter at a known vacuum condition, multiply the filter capacity with correction factor F1.
Example: Capacity type APF113 at 200 mbar · Capacity nominal (50 m³/h) x factor F1 (0,2) = Capacity APF113 corrected (10 m³/h)

To select a vacuum filter at a known system flow, multiply the correction factor F2 with the given system flow and select the appropriate filter.
Example: System flow 10 m³/h at 200 mbar · 10 m³/h x factor F2 (5) = nominal filter capacity (50 m³/h) => filter with nominal capacity of 50 m³/h: APF113