KAESER COMPRESSORS®




# KAESER FILTERS

**KF F6 to F320 Series**

Pure compressed air at low cost

Flow rate 0.6 to 32.0 $m^3$/min, Pressure 2 to 16 bar

**www.kaeser.com**

KF F6 to F320 series

# Pure compressed air at low cost

**KAESER FILTER** products are the key components for providing compressed air to all purity classes in accordance with ISO 8573-1 at very low differential pressure.

Furthermore, their service-friendly design not only allows simple, error-free opening and closing of the filter housing, but also enables quick, clean element changes. KAESER FILTERs are available in four degrees of filtration. Twelve different housing sizes provide efficient filtration for flow rates from 0.6 to 32.0 m³/min.

## Standard-compliant purity

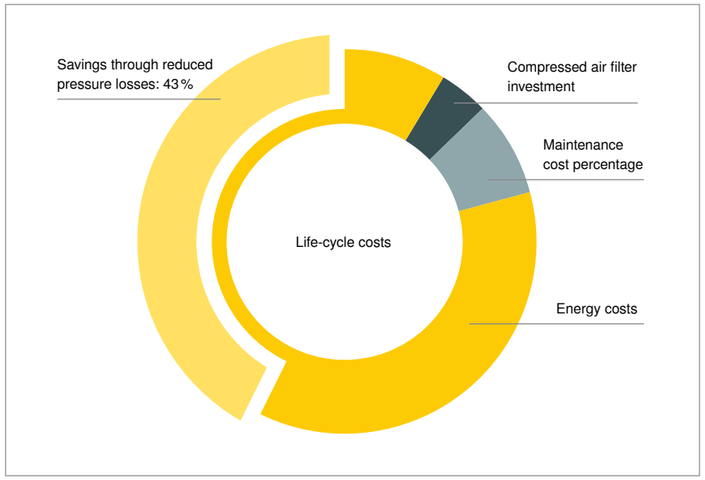
The KAESER FILTER range uses modern deep-pleated filter media to remove particles and aerosols, whilst highly effective carbon fleeces trap oil vapours. Together with innovative flow dynamics, they deliver exceptional filtration efficiency with minimal pressure loss. The impressive performance data for KAESER FILTERs have been determined in accordance with ISO 12500 and confirmed by the independent testing agency “Lloyd’s Register”.

## Service-friendly design, safe handling

KAESER FILTERs feature a corrosion-protected aluminium housing and sturdy filter elements. The practical bayonet lock assures automatic positioning of the housing and element seals. Both seals are components of the filter element, which ensures that the filter housing can only be sealed if a filter element has been inserted. A locking screw provides venting and prevents unintentional opening of the housing whilst under pressure.

## Minimal pressure loss, maximum savings

Pressure loss is decisive when it comes to the cost efficiency of a compressed air filter. KAESER FILTERs feature generously dimensioned housings and filter surfaces, innovative flow dynamics, and high-performance filter media. The result is up to 50% lower pressure loss when compared to conventional filters on the market – a figure that remains virtually constant throughout the service life of the filter element. This relieves the burden on the upstream compressors and delivers significantly lower energy costs, as well as a reduced $CO_2$ footprint.




## Coalescence filter example

- Flow rate 17.7 m³/min
- 50% lower pressure loss
- 6.55 kW/(m³/min)
- Additional energy requirement 6% per bar
- Electricity cost € 0.2/kWh
- 8760 operating hours p.a.
- Annual debt service over 10 years




(1) Compressed air inlet
(2) Element head with housing and element seals
(3) Filter element
(4) Condensate outlet (here: with automatic condensate drain, internal)
(5) Compressed air outlet
(6) Locking screw for safe opening
(7) Bayonet lock with limit stop
(8) Venting bore

Image: Functional diagram, coalescence filter

KAESER FILTER products are available in four high-performance degrees of filtration and can easily be connected to create filter combinations.

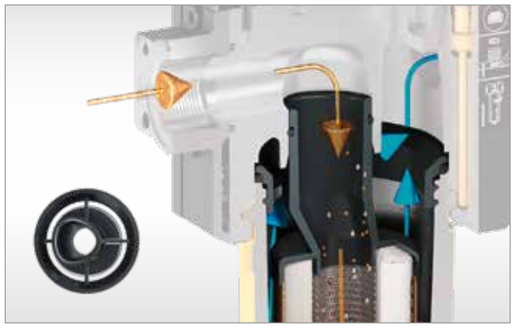
When used in conjunction with KAESER compressed air dryers and air-main charging systems, they ensure dependable and energy-efficient compressed air treatment at all times.



KF F6 – F320 series

# Low differential pressure for maximum efficiency

6% lower electricity costs per m³/min of compressed air for every bar of reduced pressure loss. This rule of thumb demonstrates that generously dimensioned KAESER FILTERs quickly pay for themselves.



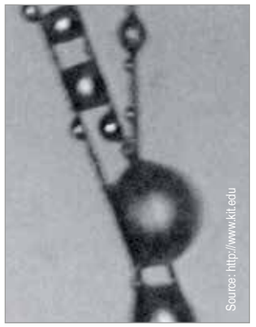
## Large flow cross section

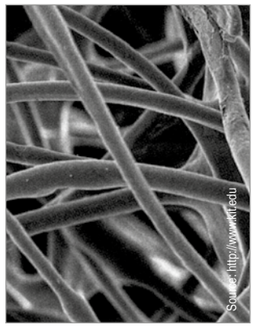
KAESER FILTER products use filter elements with special, flow-optimised element heads. The inlet is offset towards the compressed air inlet, which increases the flow cross section on the discharge side and contributes decisively to the low pressure loss.



## Large connection width

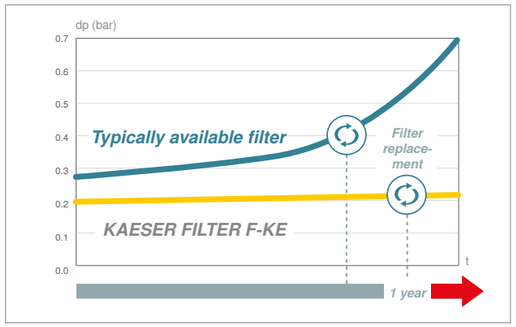
The generously dimensioned compressed air connections on KAESER FILTERs help to reduce pressure losses. Since the filters are available with alternative connection widths, reducers are not required when connecting to different piping networks.




## Low flow resistance

The polyester material used in the drainage layer ensures rapid draining of the oil (left). For best possible filtration and contaminant retention with low pressure loss, KAESER dust and coalescence filters use filter media that feature a high void ratio (right).



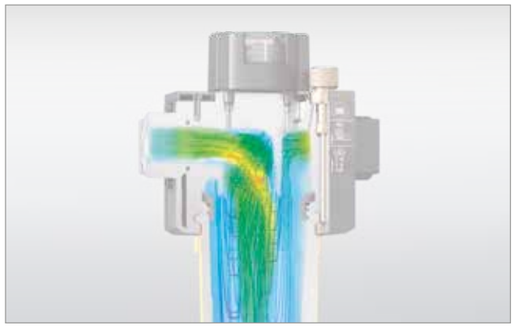

## High contaminant retention capacity

KAESER FILTERs operate with a significantly lower initial pressure loss than conventional filters. Thanks to the high retention capacity of the filter elements, dust and aerosols remain at a constantly low level over the long term. The result? Permanently low operating costs. Annual maintenance of dust and coalescence filters prevents age-related risks and ensures optimal, reliable compressed air purity.

KF F6 – F320 series

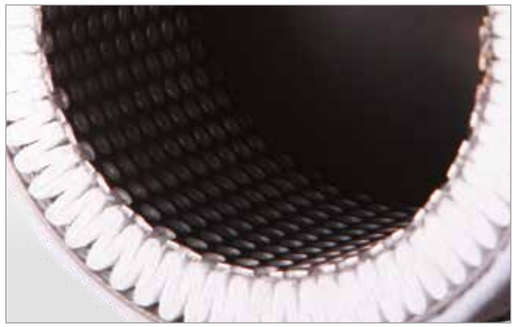
# Standard-compliant purity in every quality class

The generous dimensioning of KAESER FILTERs has proven itself on the most sophisticated test benches and in stringent measurement programmes. Tried and tested KAESER FILTER products operate dependably and energy-efficiently – and are officially certified to prove it.



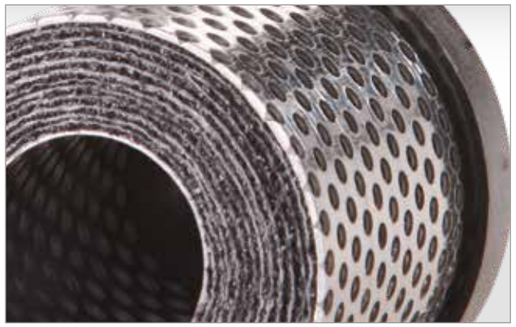
## Optimal flow distribution

The element head on KAESER FILTERs is optimised for best possible air flow. Its internal contour channels the compressed air towards the centre of the element interior for even loading of the filter media. The result: high filtration efficiency with minimal pressure loss.



## Deep-pleated filter elements

The deep-pleated KAESER dust and coalescence filter elements feature exceptionally large filter surfaces. The resulting increase in efficiency means operating costs are significantly reduced in comparison with conventional filter components.



## High-efficiency carbon fleece

Unlike on conventional filters, the high-efficiency carbon fleece used in KAESER's activated carbon filters prevents channelling whilst at the same time ensuring reduced differential pressure. Moreover, the fleece provides effective protection against particle release.



## Needs-based combinations

KAESER FILTERs can be flexibly combined at the user-end by means of optional connection kits. For example, the "Carbon Combination" – consisting of a KE coalescence filter (left) and a KA activated carbon filter (right) – not only retains aerosols and particles, but oil vapours as well.






Image: Selection from the filter element range

| Degree of filtration | KB<br>Coalescence filter Basic | KE<br>Coalescence filter Extra | KD<br>Dust filter Dust | KA<br>Activated carbon filter Adsorption | KBE<br>Extra Combination | KEA<br>Carbon Combination |
|---|---|---|---|---|---|---|
| Initial differential pressure at saturation | < 140 mbar | < 200 mbar | < 30 mbar (New, dry) | < 95 mbar (New, dry) | < 255 mbar | < 295 mbar |
| Aerosol content at inlet | 10 mg/m³ | 10 mg/m³ | – | – | 10 mg/m³ | 10 mg/m³ |
| Residual aerosol content at outlet as per ISO 12500-1 *) | < 0.1 mg/m³ | < 0.01 mg/m³ | – | – | < 0.01 mg/m³ | 0.003 mg/m³ (Total oil content) |
| Filter medium | Deep-pleated with support structure and polyester drainage fleece | | Deep-pleated with support structure | High-efficiency carbon fleece | – | – |
| Use | Filtration of solid and liquid aerosols and solid particles | Same use as KB, but for higher compressed air quality Alternatively: Ultra-fine particle filter to KD degree of filtration | Exclusively for filtration of solid particles | Exclusively for removal of oil vapours | Combination of KB and KE; use as per KE, but for greater reliability of compressed air quality | Combination of KE and KA; filtration of aerosols, solid particles and oil vapours |

*) In accordance with ISO 12500-1:06-2007



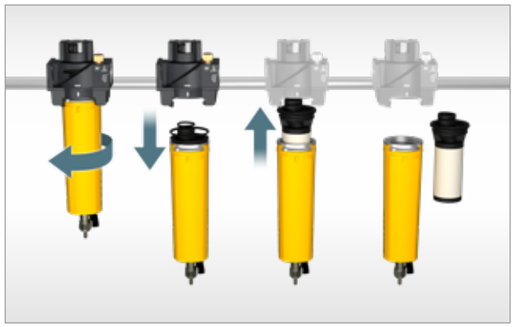

Image:
Coalescence filter with ECO-DRAIN 31, horizontally pivotable



KF F6 – F320 series

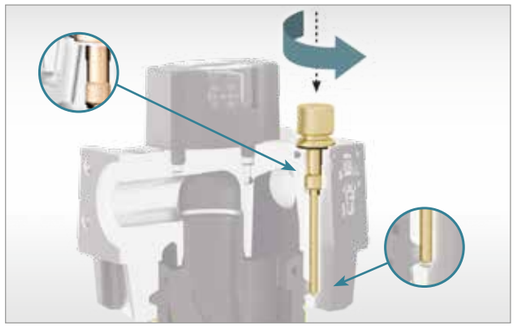
# Safe handling, service-friendly design

KAESER understands its customers' needs very well, since the company itself operates numerous compressed air stations. From first-hand experience, we are well versed in every aspect of compressed air station planning, commissioning, operation and maintenance. We draw on this expertise to create user-friendly and low-maintenance products.



## Easy element changes

KAESER FILTERs can be easily opened by hand. Maintenance is quick and virtually contaminant-free. Once the filter bowl containing the filter element has been released from the head, the element can simply be unscrewed. Minimal installation space is required beneath the filter.



## Safe opening

A locking screw protects the filter bowl from unintentional opening. If opened, a seal is broken and a venting bore uncovered. Should the device be under pressure, the warning sound of escaping air can be heard.



Simple design: Corrosion



KAESER: No corrosion

## Corrosion-resistant housing

The housings of KAESER FILTER products are cast from seawater-resistant aluminium. Several hundred hours of salt spray testing demonstrate their outstanding corrosion resistance.



Simple expanded metal



KAESER Sturdy profiled steel

## Robust stainless steel cage

KAESER filter elements are protected by inner and outer cages constructed from robust, continuously welded profiled stainless steel, which are more resistant to mechanical stress than simple expanded metal cages.

KF F6 – F320 series

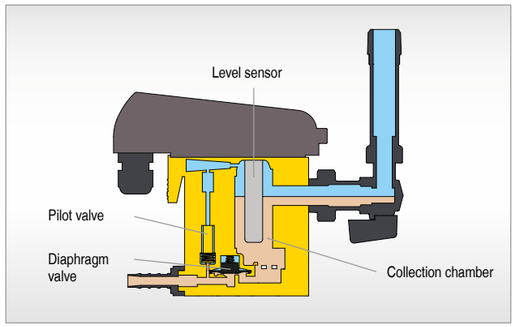
# KAESER FILTERS

To ensure that low energy costs and the required degree of compressed air purity are consistently maintained, the filter elements must be replaced at the end of their service life. The standard-equipped FILTER CHANGE supports this process. When it comes to the reliable filtration of aerosols, dependable condensate drainage is also essential. The automatic ECO-DRAIN condensate drain provides reliable and economical draining of coalescence filters without compressed air loss.



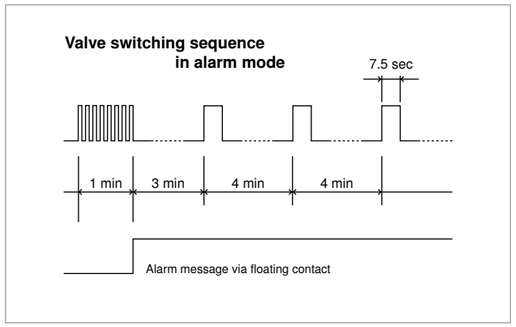
## FILTER CHANGE

The FILTER CHANGE display provides information regarding the remaining service life of the filter elements via accumulating arrow segments. A flashing LED indicates when a change is due. The change can be acknowledged via a button on the rear side. The monitored interval can be set to one of 4 levels. The replaceable battery has a service life of up to 7 years. FILTER CHANGE is affixed to the filter housing by means of industrial hook-and-loop fastener.




## Dependable and loss-free

ECO-DRAIN condensate drains detect the fill level using a contact-free sensor and then drain the condensate without compressed air loss via a pilot-operated diaphragm valve. The large cross sections mean maintenance-intensive strainers are not required.




## Self-monitoring

In the event of a condensate drainage fault, the ECO-DRAIN valve opens at short intervals for one minute. If the condensate is not removed, a message is triggered and the valve opens for 7.5 seconds every 4 minutes. Once the condensate drains, the ECO-DRAIN reverts to normal operation.



## Tested for leaks and proper function

The maintenance parts in the ECO-DRAIN can be replaced by changing the service unit – replacement of the seal is not required. To ensure error-free maintenance, the condensate drain and service unit are 100% factory-tested for leaks and proper function.






Image: Coalescence filter with ECO-DRAIN 31

| Degree of filtration | | ECO-DRAIN 31 | ECO-DRAIN 30 | Automatic condensate drain | Manual condensate drain | Mechanical differential pressure gauge | Differential pressure transducer |
|---|---|---|---|---|---|---|---|
| KE | Up to F142 | Selectable | Selectable | Selectable | Selectable (use as ultra-fine particle filter to KD degree of filtration) | Selectable | Selectable |
| | From F184 | Selectable | – | – | | | |
| KB | Up to F142 | Selectable | Selectable | Selectable | – | Selectable | Selectable |
| | From F184 | Selectable | – | – | | | |
| KD | Up to F142 | – | – | – | Standard | Selectable | Selectable |
| | From F184 | | | | | | |
| KA | Up to F142 | – | – | – | Standard | – | – |
| | From F184 | | | | | | |

# Optimum compressed air quality for your applications



## Consistently high efficiency

Fitted as standard to KAESER dust and coalescence filters, the differential pressure gauge enables users to keep a constant eye on the low pressure loss (= efficiency). Unlike other systems commonly available on the market, the contaminated and clean-air sides are separated from one another.

# Equipment



## Coalescence filter with ECO-DRAIN 31

Corrosion-protected, painted aluminium housing (configurable nominal widths), locking screw, differential pressure gauge and rotatable angle ball valve (components fully installed); KB or KE filter element, with FILTER CHANGE and ECO-DRAIN 31 electronic condensate drain (supplied loose).



## Coalescence filter with ECO-DRAIN 30

Corrosion-protected, painted aluminium housing (configurable nominal widths), locking screw, differential pressure gauge and rotatable angle ball valve (components fully installed); KB or KE filter element, with FILTER CHANGE and ECO-DRAIN 30 electronic condensate drain (supplied loose); up to model F142.



## Coalescence filter with automatic condensate drain

Corrosion-protected, painted aluminium housing (configurable nominal widths), locking screw, differential pressure gauge and internal automatic condensate drain (components fully installed); FILTER CHANGE and KB or KE filter element (supplied loose); up to model F142.



## Dust filter

Corrosion-protected, painted aluminium housing (configurable nominal widths), locking screw, differential pressure gauge and manual condensate drain (components fully installed); FILTER CHANGE and KD or KE filter element (supplied loose)



## Activated carbon filter

Corrosion-protected, painted aluminium housing (configurable nominal widths), locking screw, manual condensate drain (components fully installed); FILTER CHANGE and KA filter element (supplied loose)



## ECO-DRAIN 30/31

Exceptionally safe, reliable condensate drainage without compressed air loss; remains dependable even when condensate accumulation fluctuates heavily and contaminant / oil content is high; simple function monitoring at the touch of a button; service unit 100% factory-tested for convenient, error-free maintenance: ECO-DRAIN 31 with floating alarm contact.



## FILTER CHANGE

Indicates remaining filter element service life, LED for visualisation of pending element changes; button for resetting message and configuring change intervals; replaceable battery with up to 7 years' service life; attached via industrial hook-and-loop fastener.

# Further options



### Variable connections

Different nominal widths are available within each KAESER FILTER housing size range. You can also select between BSP and NPT thread types. KAESER FILTERs can therefore be adapted to the respective piping network without need of a reducer.



### Wall-mount kit

Perfectly matched, sturdy wall-mount brackets are optionally available for KAESER FILTERs, attaching easily to the connection flanges. The kit enables attachment of filter combinations up to a maximum of three filters. The installation tool required for attachment to the filter head is included.



### Differential pressure transducer

In place of the mechanical differential pressure gauge, KAESER FILTERs can optionally be equipped with a differential pressure transducer (factory-fitted).
In addition to the differential pressure, the sensor uses 3-wire technology to transmit the network pressure downstream from the filter as a 4–20 mA signal. Both values can be forwarded to a master controller such as the SIGMA AIR MANAGER 4.0, and from there can also be transmitted to the KAESER SIGMA NETWORK.




### Silicone-free version

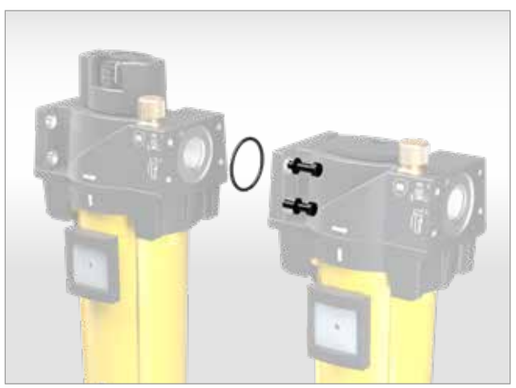
KAESER FILTERs are optionally available as silicone-free versions compliant with the VW test standard PV 3.10.7. Each filter undergoes an individual paint test to confirm compliance. The manufacturer‘s certificate provided attests that the product is silicone-free. Moreover, all filter elements for KAESER FILTERs are manufactured silicone-free in accordance with this regulation as standard.

# Accessories



### Flange adapter DN 80 / 3 FLG

For 3-inch connections, flange adapters (DN 80 / 3 FLG) with a nominal pressure rating of PN16 are available as accessories from model F184 upwards. The DIN version corresponds to the DIN EN 1092-1 standard, whilst the ASME version complies with ANSI B16.5 – Class 150. The flange adapters feature a high-quality anti-corrosion coating and finish.



### Connection kit

Multiple KAESER FILTERs can be easily combined at the user-end with the optional connection kit, which contains the required screws, seal, and installation tool.

# Dimensions

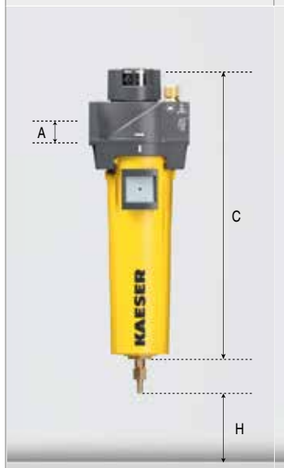
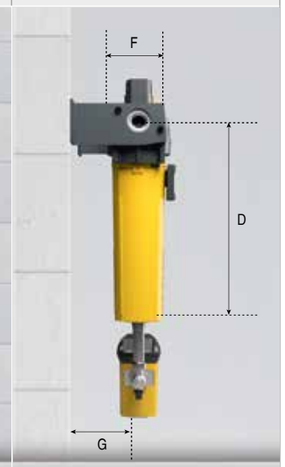
Model F6 to F320

| Model | A<br>G | B<br>mm | C<br>mm | D<br>mm | E<br>mm | F<br>mm | G<br>mm | H<br>mm |
|---|---|---|---|---|---|---|---|---|
| **F6** | ¾<br>(½, ⅜) | 274 | 296 | 231 | 121 | 91 | 90 | ≥ 40 |
| **F9** | | | | | | | | |
| **F16** | 1<br>(¾) | 305 | 327 | 259 | 132 | 102 | 100 | ≥ 40 |
| **F22** | | 355 | 377 | 309 | | | | |
| **F26** | | 355 | 377 | 309 | | | | |
| **F46** | 2<br>(1½, 1¼) | 375 | 398 | 312 | 198 | 153 | 130 | ≥ 50 |
| **F83** | | 460 | 483 | 397 | | | | |
| **F110** | | 660 | 683 | 597 | | | | |
| **F142** | | 660 | 683 | 597 | | | | |
| **F184** | 3<br>(2, 2½) | 715 | 738 | 643 | 242 | 196 | 150 | ≥ 50 |
| **F250** | | 843 | 866 | 771 | | | | |
| **F320** | | 985 | 1008 | 913 | | | | |

Compressed air connection G in accordance with ISO 228, or alternatively, NPT in accordance with ANSI B 1.20.1

# Views

Drawings show type F16/F22/F26

| View from front | View from front | View from front (wall-mounted) | View from left (wall-mounted) |
|---|---|---|---|
|  |  |  |  |
| Bottom | Bottom | Bottom | Bottom |



# Technical data

For models F6 to F320 and degrees of filtration KB/KE/KA/KD

| Model | Flow rate [1]<br>m³/min | Gauge pressure<br>bar | Ambient temperature<br>°C | Compressed air inlet temperature<br>°C | Maximum weight<br>kg | ECO-DRAIN power supply |
|---|---|---|---|---|---|---|
| **F6** | 0.60 | 2 to 16 | +3 to +50 | +3 to +66 | 3.6 | 95–240 VAC ±10% (50–60 Hz) / 100–125 VDC ±10% |
| **F9** | 0.90 | | | | 3.7 | |
| **F16** | 1.60 | 2 to 16 | +3 to +50 | +3 to +66 | 4.2 | |
| **F22** | 2.20 | | | | 4.4 | |
| **F26** | 2.60 | | | | 4.5 | |
| **F46** | 4.61 | 2 to 16 | +3 to +50 | +3 to +66 | 8.4 | |
| **F83** | 8.25 | | | | 9.3 | |
| **F110** | 11.00 | | | | 10.9 | |
| **F142** | 14.20 | | | | 11.1 | |
| **F184** | 18.40 | 2 to 16 | +3 to +50 | +3 to +66 | 16.9 | |
| **F250** | 25.00 | | | | 18.6 | |
| **F320** | 32.00 | | | | 20.6 | |

[1] Performance data at 7 bar gauge pressure, relative to 1 bar(a) ambient pressure and 20 °C. The flow rate will change under deviating operating conditions.

# Degrees of filtration

| Degree of filtration | KB<br>Coalescence filter Basic | KE<br>Coalescence filter Extra | KD<br>Dust filter Dust | KA<br>Activated carbon filter Adsorption | KBE<br>Extra Combination | KEA<br>Carbon Combination |
|---|---|---|---|---|---|---|
| Initial differential pressure at saturation | < 140 mbar | < 200 mbar | < 30 mbar (New, dry) | < 95 mbar (New, dry) | < 255 mbar | < 295 mbar |
| Aerosol content at inlet | 10 mg/m³ | 10 mg/m³ | – | – | 10 mg/m³ | 10 mg/m³ |
| Residual aerosol content at outlet as per ISO 12500-1 [1] | < 0.1 mg/m³ | < 0.01 mg/m³ | – | – | < 0.01 mg/m³ | 0.003 mg/m³ (Total oil content) |
| Filter medium | Deep-pleated with support structure and polyester drainage fleece | | Deep-pleated with support structure | High-efficiency carbon fleece | – | – |
| Use | Filtration of solid and liquid aerosols and solid particles | Same use as KB, but for higher compressed air quality Alternatively: Ultra-fine particle filter to KD degree of filtration | Exclusively for filtration of solid particles | Exclusively for removal of oil vapours | Combination of KB and KE; use as per KE, but for greater reliability of compressed air quality | Combination of KE and KA, filtration of aerosols, solid particles and oil vapours |

[1] In accordance with ISO 12500-1:06-2007

# Calculating flow rate

Correction factors for deviating operating conditions (flow rates in m³/min x k...)

**Deviating working pressure at filter inlet p**

| p bar (g) | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $k_p$ | 0.38 | 0.50 | 0.63 | 0.75 | 0.88 | 1.00 | 1.06 | 1.12 | 1.17 | 1.22 | 1.27 | 1.32 | 1.37 | 1.41 | 1.46 |

**Example:**

**Gauge pressure:** 10 bar(g) (See table) $k_p$ = 1.17

**Selected compressed air filter: F83 with 8.25 m³/min ($V_{Reference}$)**

Max. possible flow rate under operating conditions

$V_{max}$ Operation = $V_{Reference}$ x $k_p$

$V_{max}$ Operation = 8.25 m³/min x 1.17 = 9.65 m³/min

## Vairāk saspiesta gaisa, izmantojot mazāk enerģijas

# Mājās visā pasaulē

Kā viens no lielākajiem kompresoru, pūtēju un saspiestā gaisa sistēmu piegādātājiem KAESER KOMPRESSOREN ir pārstāvēts visā pasaulē:

Vairāk nekā 140 valstīs mūsu pašu meitasuzņēmumi un partneruzņēmumi, nodrošina, ka lietotāji var gūt labumu no jaunākajiem sasniegumiem, efektīvām un uzticamām saspiestā gaisa sistēmām un pūtējiem.

Pieredzējuši speciālisti konsultanti un inženieri piedāvā visaptverošus padomus un izstrādā individuālus, energoefektīvus risinājumusvisās saspiestā gaisa un pūtēju pielietojuma jomās. Starptautiskās KAESER uzņēmumu grupas globālais datortīkls padara šī sistēmu piegādātāja zinātību pieejamu visiem klientiem visā pasaulē.

Augsti kvalificēta, globālā tīklā savienota pārdošanas un servisa organizācija ne tikai nodrošina optimālu efektivitāti visā pasaulē, bet arī visaugstāko pieejamību ikvienam KAESER produktam un pakalpojumam.




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P-726LT Specifications subject to change without notice. /26