

KRF



BACKFLUSH FILTER
DN 32–800 (ANSI 1 1/2–32")
PN 16–40

Applications

The KRF backflush filter is a versatile self-cleaning, maintenance-free filter for water and conditioned process water.

Brief description and operation

The electronic control monitors the differential pressure applied to the strainer by differential pressure switch. If the preset differential pressure of 0.3 bar (0.1–0.7 bar setting possible depending on the design and application) is reached, the cleaning function is triggered. In addition the cleaning function can be triggered by a timer or manually at the touch of a button, depending on the operating conditions (as optional).

The filter consists of an vessel with three different chambers. There is a coarse screen that is used as a prefilter in the first prefiltration chamber that coincides with the water inlet (see page 3).

The water goes from outside to inside the filter. Once, the water gets inside the filter, it goes into the second chamber that is called “filtration chamber”. It is in this chamber where the filtering element is: the FILTRATION SCREEN, made of stainless steel.

In this case water runs from the filter interior into the exterior. The solids remain in suspension held back in the filtering element.

The held back particles forms a layer on the screen that diminishes its load. The filter backwashing bases on a third chamber, the backwashing chamber whose output is connected to the drainage valve that allows water evacuation when the backwashing process starts. The backwashing chamber is separated from the filtering by a special sealing.

To finish with, as a very important element of this technology is the SUCTION SCANNER. This scanner is the same place as the filtering cartridge central shaft would be, and it is hydraulically connected to the backwashing chamber. At the same time, and in the filtering chamber area where it is, the SUCTION NOZZLES are displayed perpendicularly. The nylon brushes nearly reach the screen. The situation of these nozzles in the suction scanner has been studied for getting into contact with the screen internal surface, thanks to the spiral movement that the electric motor provides to the scanner: when combining a longitudinal and rotation movement.

KRONE FILTER SOLUTIONS GMBH
Industriestr. 19
28876 Oyten / Germany
Tel: +49 (0)4207 98 769-0
Fax: +49 (0)4207 98 769-27

Krone Filter
SOLUTIONS IN FILTRATION

filter@krone-filter.com
www.krone-filter.com
www.shop.krone-filter.com



Type Approval
Certificate No. 16/20086



ISO 9001:2008



The cleaning effect

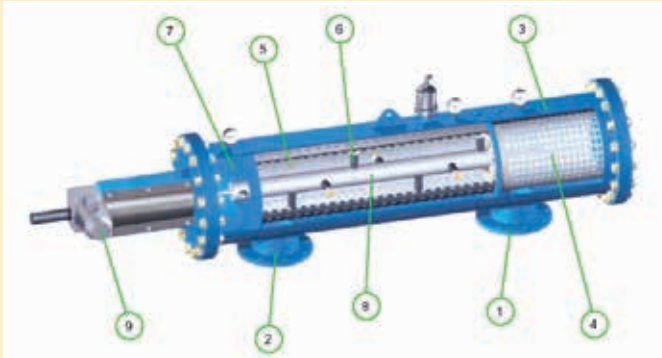
The filter cleaning effect is created by the described reverse of flow/back-flush through from the clean side of the screen (filtered water side) through the SS mesh, the nozzle, the cleaning chambers finally to the drain. Therefore the cleaning effect is influenced by the working pressure – or the pressure at the OUTLET of the filter. The higher this pressure during backflush is – the better the cleaning will be. The minimum pressure during backflush is 2.3 bar at 125 micron (example). When the filter mesh gets finer the necessary backflush pressure has to be higher. This is a project individual requirement and also based on the water quality. Therefore a dimensioning of KRF filter shall be done / checked by Krone experience. If the pressure is not sufficient there are possible measures like; increase of pressure during backflush activity only (signal to a external pump by PLC (optional) or other measures like reducing flow in outlet for a short time during backflush by control valve.

Technical data

Performance

- Water gets into the filter through the prefiltration chamber, where thick particles are retained, as it was a strainer.
- Water gets into the filtering chamber, goes through from inside to outside the FILTERING SCREEN. High quality water is obtained according to the filtration degree chosen for the filtration screen which can vary from 10 microns to 2000 microns.
- Dust remains on the thin screen interior what produces head loss between the filter inlet and outlet gradually. Two analogic transducers will indicate the backwashing sequence when the DP becomes 0.3 bar.
There are other possibilities to make the filter backwashing: Time backwashing's, time and pressure combination, continuous backwashing option.
- When the pressure switch indicates 0.3 bar, the drain valve receive the opening order, then it generates a pressure difference between outside (atmospheric pressure) and the inside of the filter (working pressure) that is why fast running water which is produced, goes through the screen and then goes outside

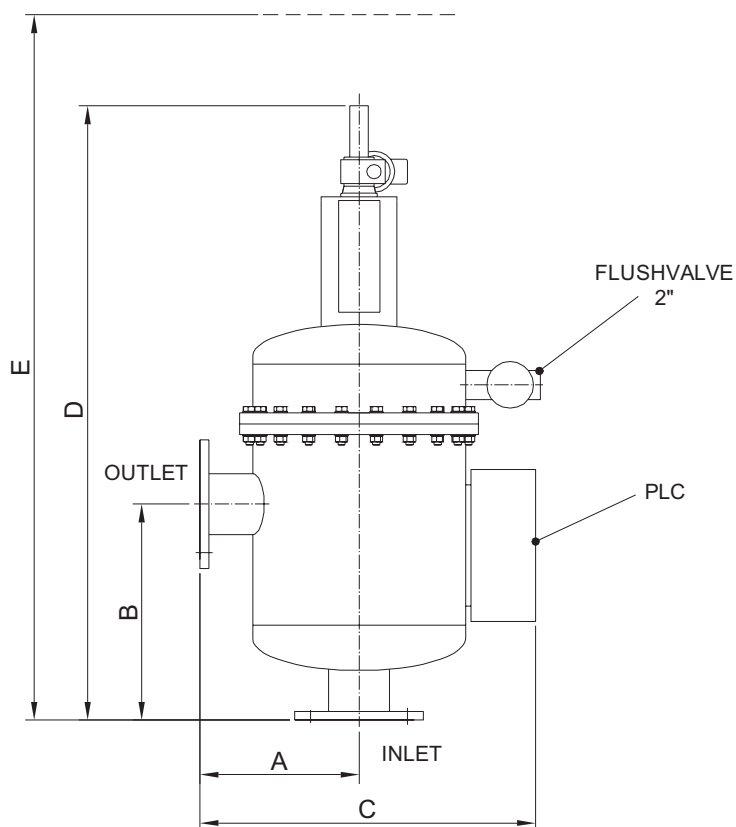
- through the nozzles internal orifice. Besides this, at this very moment the starting order is also sent to the engine.
 - The result of these actions is: the suction effect of the nozzles on the screen dust and the suction scanner spiral movement in the inside of the filter. The necessary working pressure at filter outlet is minimum 2.3 bar – see also point NOTE at “Brief description”. For fine filtering below 100 micron and depending on water quality the necessary working pressure shall be over 3.0 bar. Higher working pressure is positive for cleaning.
 - During the backwashing process that lasts 25 seconds for most models, water is still being filtered and goes on flowing to the system or application. This fact whiz is due to the filters design allows that the backwashing water consumption is MINIMUM and the working system is CONTINUOUS.
- Filtration is not interrupted during the backflush process in a system. After the set flushing period elapses the contaminant outlet valve closes automatically.



- 1 Inlet
- 2 Outlet
- 3 Strainer chamber
- 4 Strainer cartridge
- 5 Filtering cartridge
- 6 Filtering chamber
- 7 Flushing chamber
- 8 Scanner
- 9 Motor drive

	Standard version	Special version or optional extras equipment
Filter insert	10–3.000 µm	
Filter cover	Cover with bolts and nuts	
Venting device	Screw	Ball valve
Drain unit	Screw	Ball valve
Connections	Flange in accordance with DIN 2632/Form C PN 10	ANSI or in accordance with customer specifications, PN 16, PN 25
Materials		e.g. ANSI
Housing	CS carbon steel (Epoxy + Polyester)	SS304, SS316/1.4571, H II steel, CrNi, 1.0425
Seals	NBR	PTFE/FPM, other
Perforated plate/mesh	1.4301/SS304/PVC	1.4404/SS 316L/POM
Cleaning nozzle		
Drain valve	By client	St, Ms, A , A4
Electric gear motor	3 x 400 V/50 Hz protection class IP 65	As specified by customer
Control	not attached With transformer 500 V/400 V/230 V – 50 Hz/ 60 Hz, protection class IP 65, programmable	Attached on the filter as specified by the customer
Flush outlet valve	Hydraulic operated valve brass MOC	Rg 5, A4 Electro-pneumatic (230 V - 6 bar)/ (24 V - 6 bar) Protection class IP65
Surface treatment		
Interior	Epoxy + Polyester	
Steel housing	CS (Epoxy + Polyester)	epoxy-resin paint, hard rubber
Surface treatment		
Exterior	Epoxy + Polyester	
Housing	Glass balls sand blasting	
Steel 304 housing steel		
Stainless steel 316 housing	Glass bead blasted	Pickled and passivated

Technical data and dimensions KRF-C

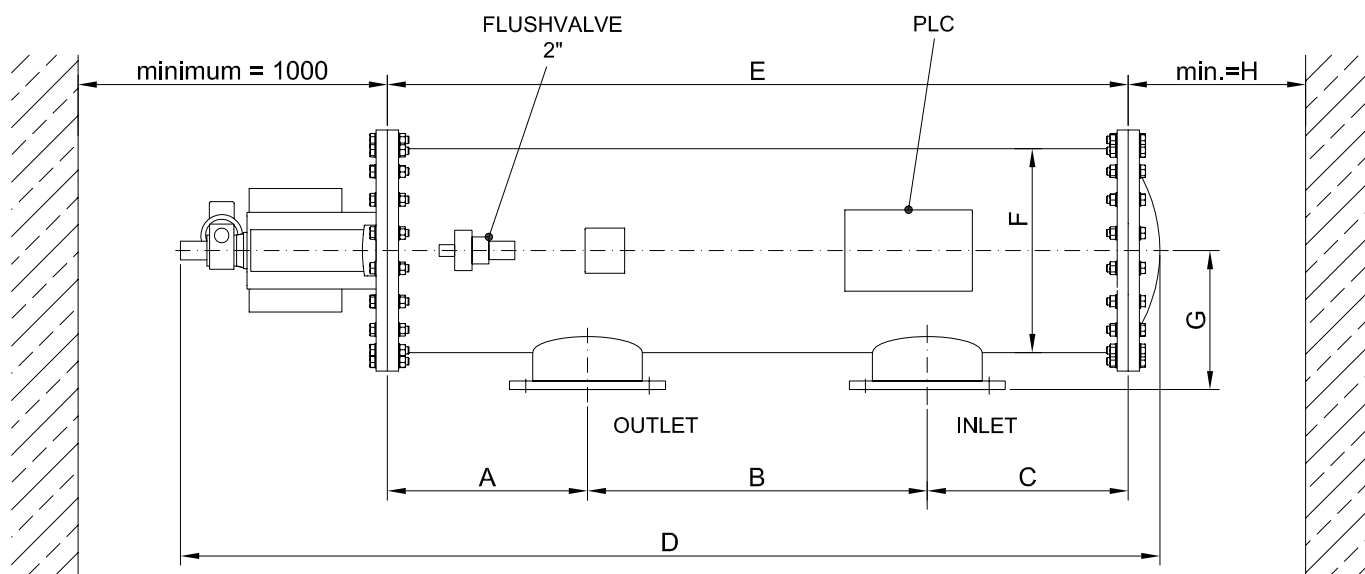


Model	In/Out Connect	Dimensions (mm)				
		DN	A	B	C	D
KRF-C GR2	50	220	220	480	900	1.150
KRF-C GR3	80	220	250	480	980	1.230
KRF-C GR4	100	260	320	590	1.100	1.340
KRF-C GR6	150	260	470	590	1.375	1.615

* Flow figures are based on 100/125 micron and depend on water quality and filter mesh. So the actual allowed flow may vary. Contact Krone for exact dimensioning.

Model	Filtering surface (cm ²)	Backwashing water consumption (l)	Weight (kg)	Flow rate (m ³ /h)*			
				Max. flow rate	High quality water	Medium quality water	Low quality water
KRF-C GR2	1.015	8	43	70	35	25	10
KRF-C GR3	1.770	12,5	54	140	60	40	20
KRF-C GR4	2.655	15,5	68	200	80	60	30
KRF-C GR6	5.315	53	89	350	120	100	60

Technical data and dimensions KRF

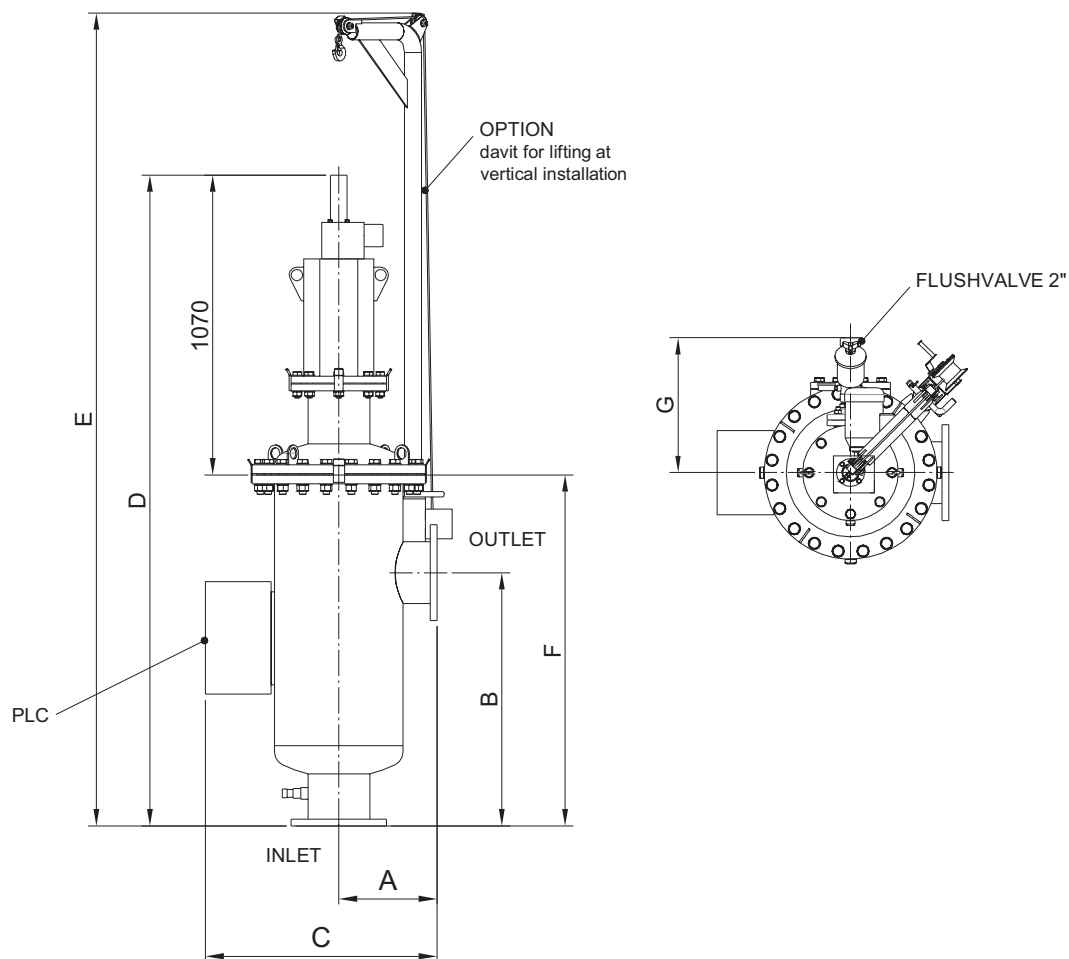


Model	In/Out Connect DN	Dimensions (mm)							
		A	B	C	D	E	F	G	H
KRF GR3	80	302	360	219	1.625	881	457	325	400
KRF GR4	80, 100	315	770	220	2.140	1.305	457	325	690
KRF GR6	80, 100, 150	340	1.000	240	2.415	1.580	457	325	970
KRF GR8	100, 150, 200	367	1.100	388	2.690	1.855	457	325	1.240
KRF GR10	150, 200, 250	446	1.370	314	2.965	2.130	457	325	1.520
KRF GR12	200, 250, 300	430	1.100	325	2.707	1.855	660	450	1.240
KRF GR14	250, 300, 350	433	1.370	327	2.982	2.130	660	450	1.520

* Flow figures are based on 100/125 micron and depend on water quality and filter mesh. So the actual allowed flow may vary. Contact Krone for exact dimensioning.

Model	Filtering surface (cm ²)	Backwashing water consumption (l)	Weight (kg)	Flow rate (m ³ /h)*			
				Max. flow rate	High quality water	Medium quality water	Low quality water
KRF GR3	2.657	35	265	120	60	48	34
KRF GR4	5.383	70	307	235	110	90	70
KRF GR6	7.997	105	388	500	215	173	129
KRF GR8	10.608	140	444	700	320	256	192
KRF GR10	13.215	175	501	1.150	580	464	348
KRF GR12	16.509	140	682	1.400	700	560	420
KRF GR14	21.304	175	757	1.800	900	720	540

Technical data and dimensions KRF-RL

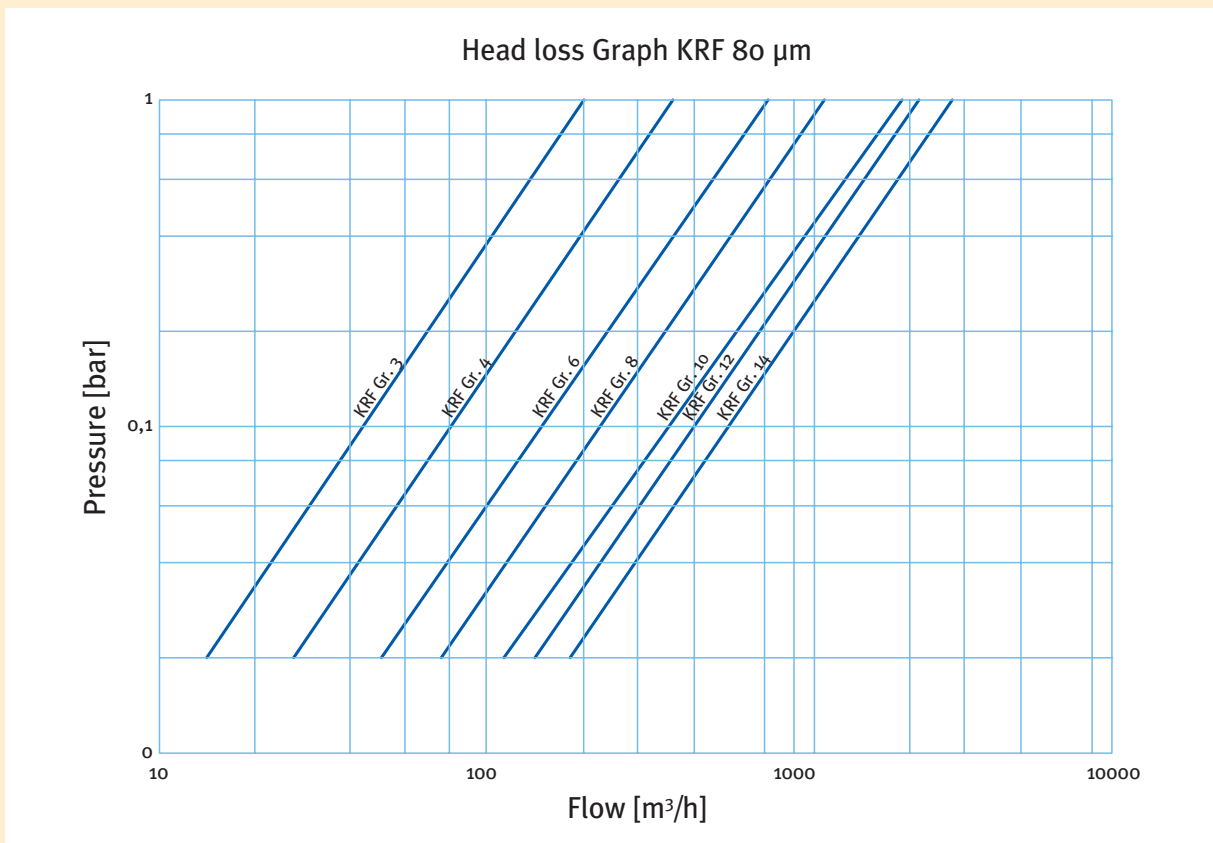
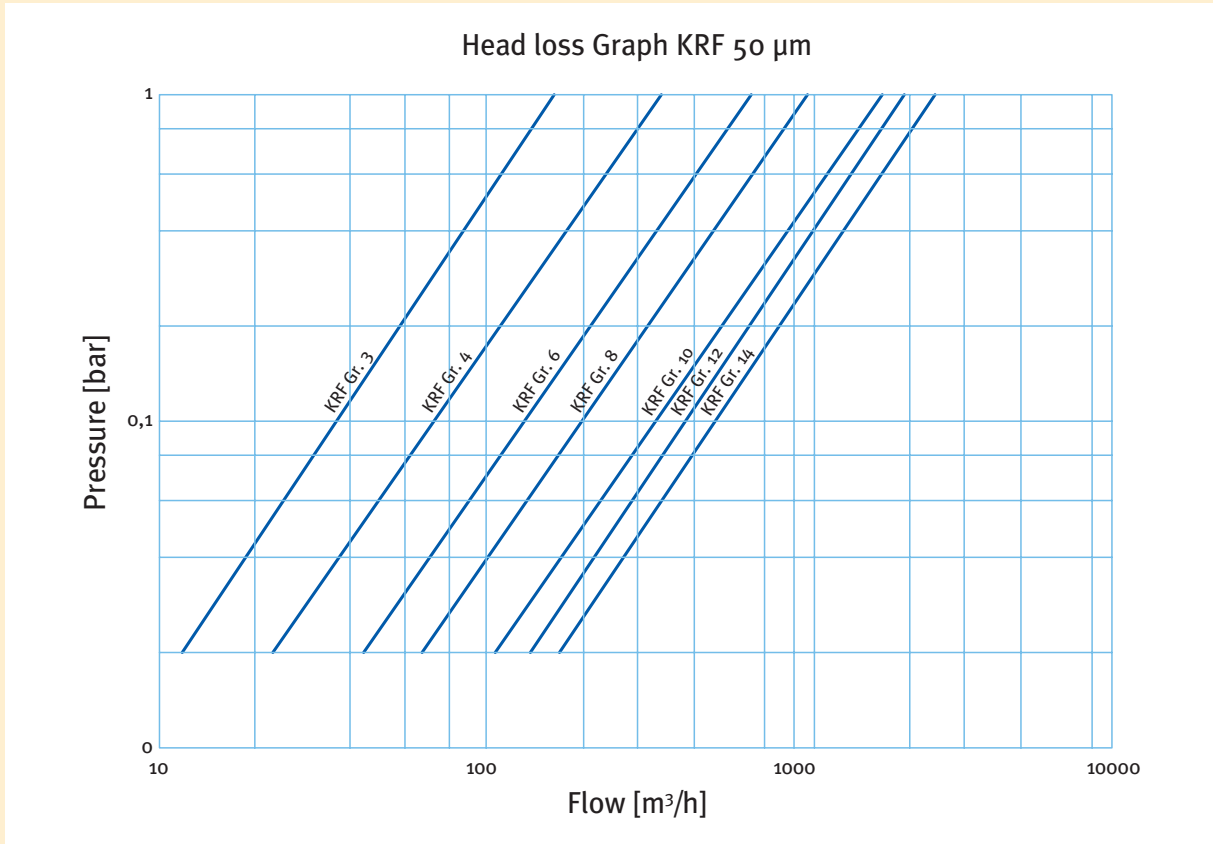


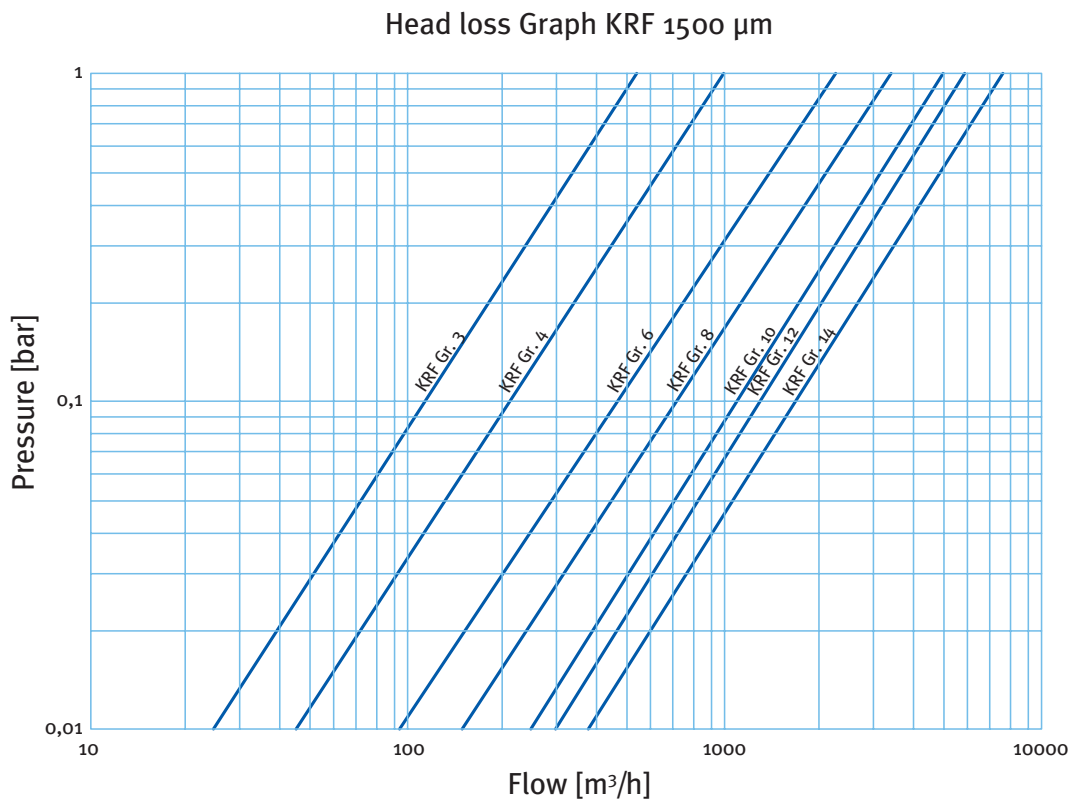
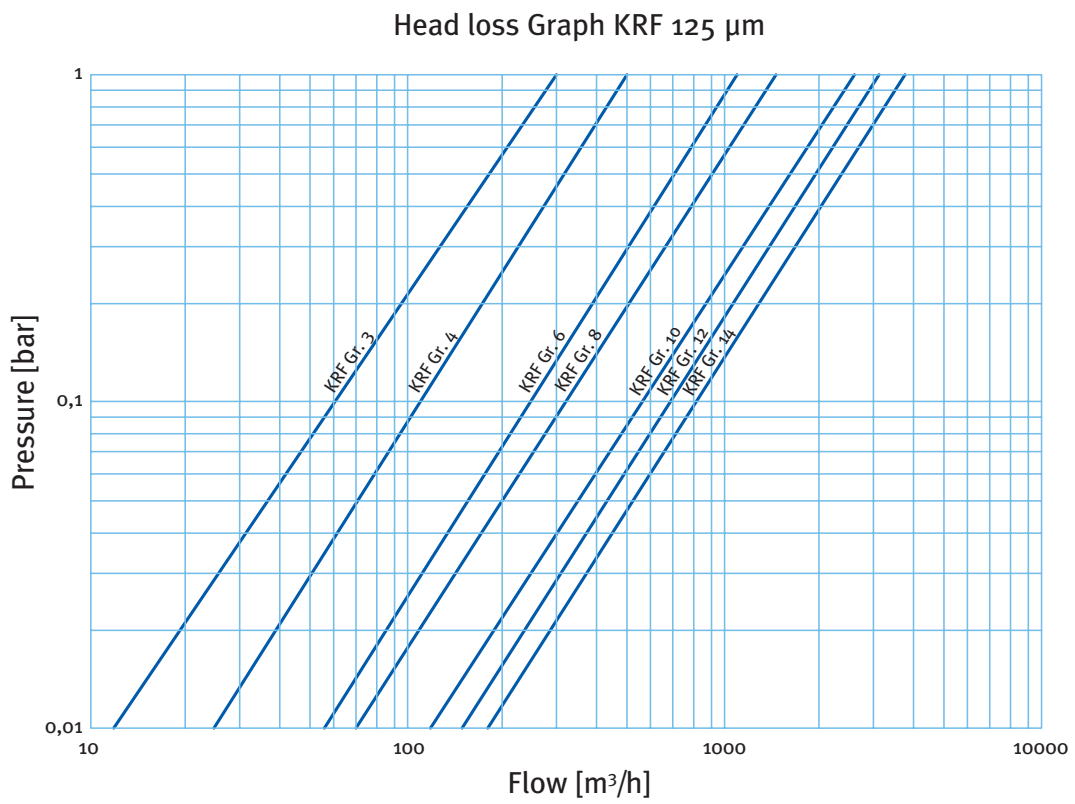
Model	In/Out Connect	Dimensions (mm)				
	DN	A	B	C	D	E
KRF-RL 6	150	350	600	824	2.040	2.700
KRF-RL 8	200	350	900	824	2.320	2.975
KRF-RL 10	250	350	900	824	2.600	3.300
KRF-RL 12	300	400	900	1.025	2.320	2.975
KRF-RL 14	350	400	900	1.025	2.600	3.300

* Flow figures are based on 100/125 micron and depend on water quality and filter mesh. So the actual allowed flow may vary. Contact Krone for exact dimensioning.

Model	Filtering surface (cm ²)	Backwashing water consumption (l)	Weight (kg)	Flow rate (m ³ /h)*
				Max. flow rate
KRF-RL 6	7.990	105	310	500
KRF-RL 8	10.600	140	365	700
KRF-RL 10	13.210	175	405	1.150
KRF-RL 12	16.500	140	550	1.400
KRF-RL 14	21.300	175	610	1.800

Head loss Graph





Automatic filter

- KAF self cleaning Bernoulli-filter
- KRF Backflush-filter



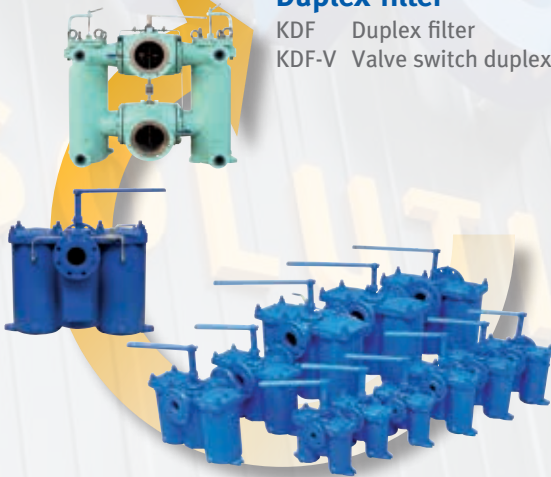
Single filter

- KSF single basket filter (flanged)
- KMF threaded basket filter
- KWF welded/custom made basket filter
- KWF-Inline Inlet flange and outlet flange inline



Duplex filter

- KDF Duplex filter
- KDF-V Valve switch duplex filter



Other filter solutions

- KBF Bag filter
- KOW Oil and water separator
- SEPARATOR



Others/accessories

- DeltaP Differential pressure indicator
- Contaminant level indicator
- Filterbags



Strainer inserts

- Basket strainers - ring strainers- wedged wire inserts





Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

This certificate is issued to:

PRODUCER	Krone Filter Solutions GmbH Industriestrasse 19 28876 Oyten Germany			
DESCRIPTION	Single, duplex and self-cleaning automatic filter with several housing sizes and combinations made from standard materials spheroidal iron castings EN-GJS-500-7 (GGG 50)* or EN-GJS-400-15 (GGG 40), carbon steel optional rubber lined or stainless steel.			
TYPES	KSF, KMF, KDF-K, KDF-V, KAF, KRF			
APPLICATION	Filter depending on type for diesel oil, oil or water piping systems in ship and offshore installations classed or intended for Classification with Lloyd's Register.			
RATINGS	Filter type:	Nominal pressures: [bar]	Size range:	Material:
	KSF	6, 10, 25	DN 15 - DN 600	Spheroidal iron casting
	KMF	6, 10, 25	G ½" - 2 ½"	Spheroidal iron casting
	KDF-K	6, 10, 25	DN 15 - DN 200	Spheroidal iron casting
	KDF-V	6, 10, 25	DN 100 - DN 600	Spheroidal iron casting, carbon steel
	KRF	6, 10	DN 32 - DN 400	Spheroidal iron casting, carbon steel
	KAF	6, 10	DN 50 - DN 1000	Spheroidal iron casting, carbon or stainless steel,

Certificate No.	16 / 20086
Issue Date	09 September 2016
Expiry Date	08 September 2021
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Torsten Schröder
Hamburg Technical Support Office
Lloyd's Register EMEA

Lloyd's Register EMEA
71 Fenchurch Street, London EC3M 4BS

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RATINGS, cont.

Material:	Temperature range:	For fluids**:
Spheroidal cast iron	-10 up to +300°C	MDO, oil, water, seawater
Austenitic stainless steel: 1.4571, 1.4401, 1.4404, 1.4408, 1.4539, 1.4301, 1.4541, SA240-304L, SA240-316Ti, SA240-321, SA240-316L, SA240-904L,	-196 up to +300°C	MDO, oil, nitrogen
Duplex stainless steel: 1.4462, 1.4463, UNS S31803	-40 up to +250°C	seawater
Super duplex: 1.4410, UNS 32750		
Carbon steel: St 50, P235GH, P245GH, P250GH, P265GH, SA516 Gr60, SA516 Gr70	-40 up to +100°C	MDO, oil, water, seawater

**) including fluids and mixture of similar evaluation class
Pressure reductions at elevated temperatures are to be considered.

Media depending on type: KAF, KRF: water, seawater
KSF, KMF, KDF-K and KDF-V: MDO, oil, nitrogen, water, seawater

OTHER CONDITIONS

The manufacturer's installation instructions are to be sought.
*) Not to be used for applications with expected significant chock or vibration loads.

STANDARD

Lloyd's Register Rules and Regulations for the Classification of Ships, July 2016

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The Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations.

If the specified standards are amended during the validity of this certificate, the product is to be re-approved prior to it being supplied to vessels to which the amended standards apply.

The Design Appraisal Document No. HTS/ENS 34963-16 and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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