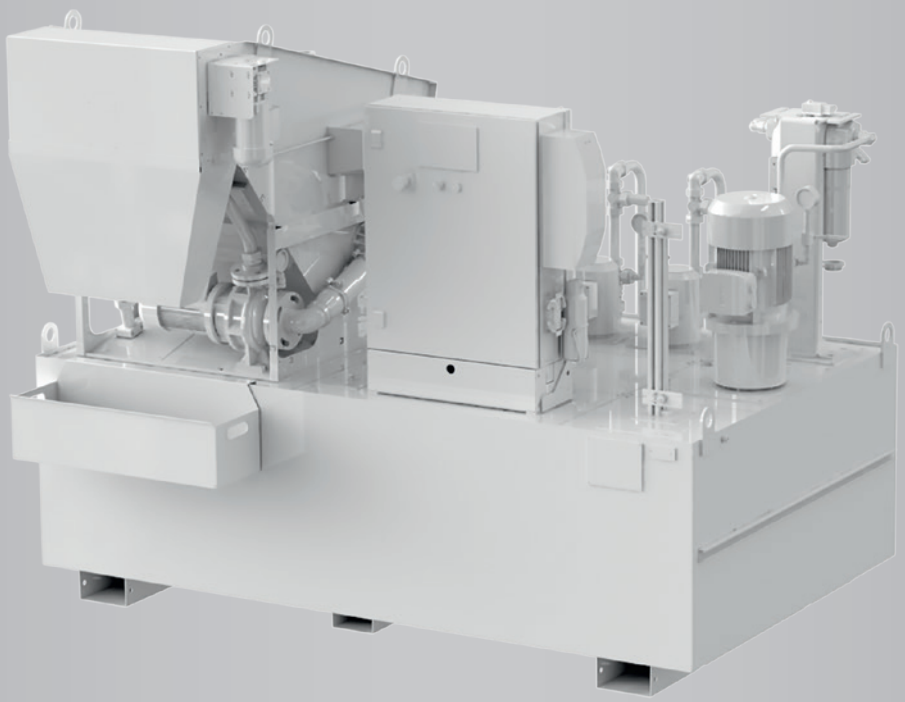
Vacuum rotation filter VRF

VRF

Issue 06-2025

KNOLL
.It works



Features	Benefits
Compact design	Space-saving installation
No filter consumables	Low operating costs
Integrated scraper belt	Problem-free discharge of chips, even from light metal
Universally applicable for different machining processes, materials, cooling lubricants, volume flows and levels of purity	Einfache Auslegung und Planung
Modular construction kit	• Specific system according to customer requirements • Short delivery time • Good availability of replacement parts
Plug and Play through universal, digital interfaces	Quick installation and start-up
Available as a modular system or special system	Individual choice with impact on price, delivery time, and configuration

Areas of application

KNOLL VRF vacuum rotation filters are backflush filters for cleaning cooling lubricants (KSS) from machining processes.

- Use as a stand-alone cleaning unit or in combination with chip conveyors (e.g., on machining centres)
- Local (for one machine tool) or centralized use (for several machine tools) possible

Description

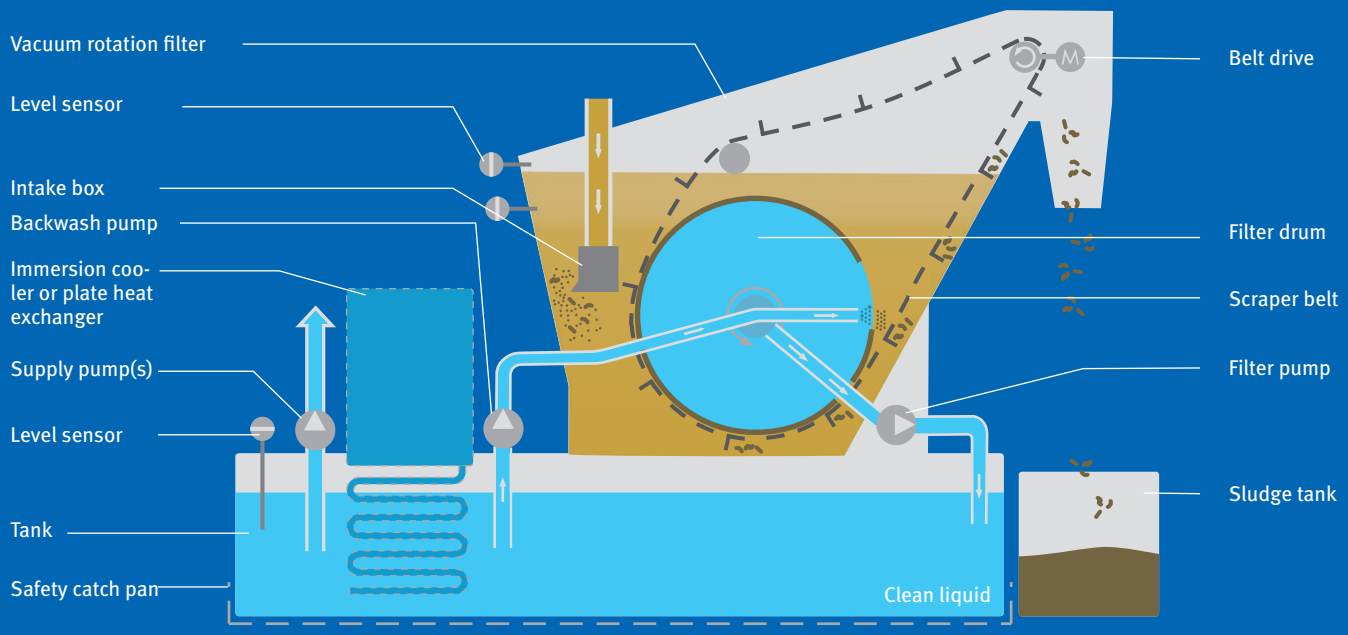
Filtering process

1. Contaminated liquid flows through the intake box into the filter.
2. The filter pump draws contaminated liquid into the interior of the filter drum.
3. The filter element on the filter drum retains dirt particles as they flow through.
4. The dirt particles form a filter cake that also separates smaller particles.
5. The filter pump conveys the cleaned liquid into the tank.
6. Low and high-pressure pumps supply the machine tool with cleaned cooling lubricant as required.

Regeneration process

1. The growing filter cake increases the flow resistance; the underpressure rises.
2. At a defined underpressure, the filter drum rotates and the backwash pump loosens the filter cake.
3. The scraper belt transports the settled sludge out of the filter into the sludge tank.

Diagram



Basic equipment

- Vacuum rotation filter
- Supply pump(s)
- Level measurement technology
- Control unit
- Tank

Powerful electronics

Customized electronics with modular design - perfectly prepared for your application

Modular construction

Vacuum rotation filter

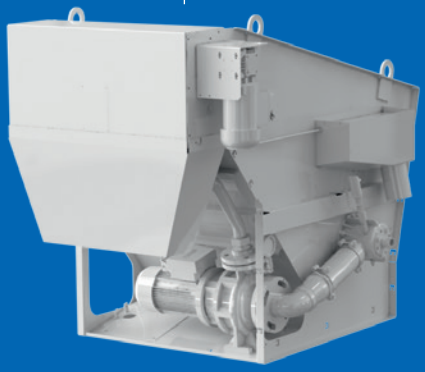
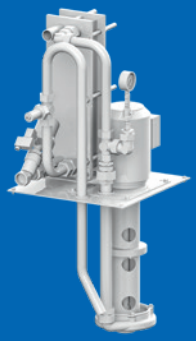
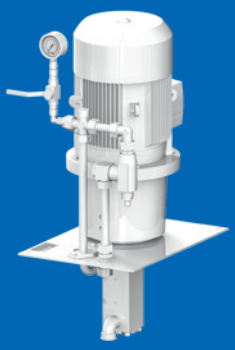


Plate heat exchanger



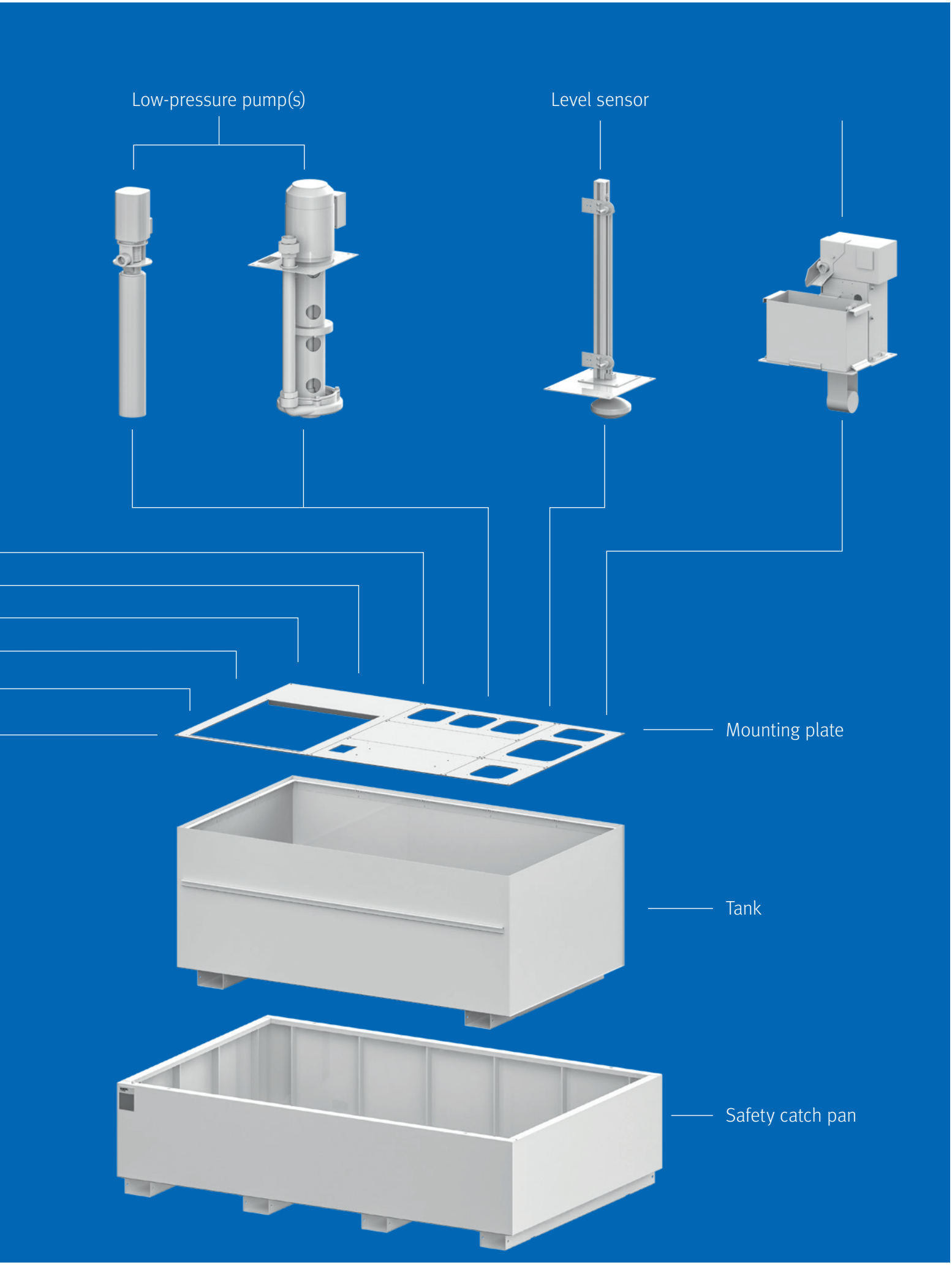
Duplex filter

High-pressure pump(s)

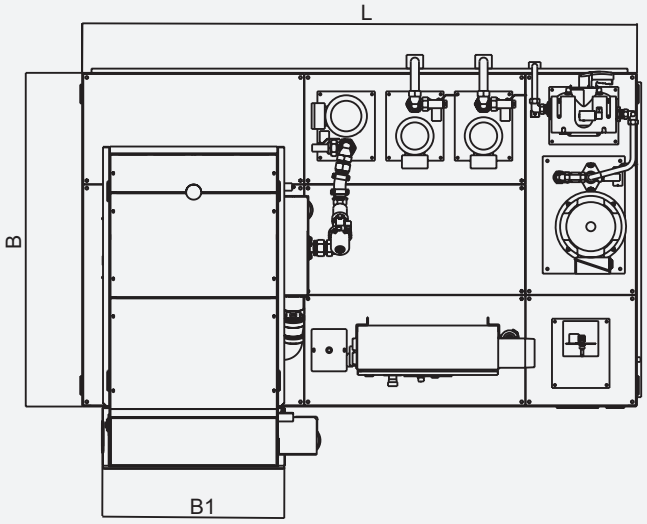


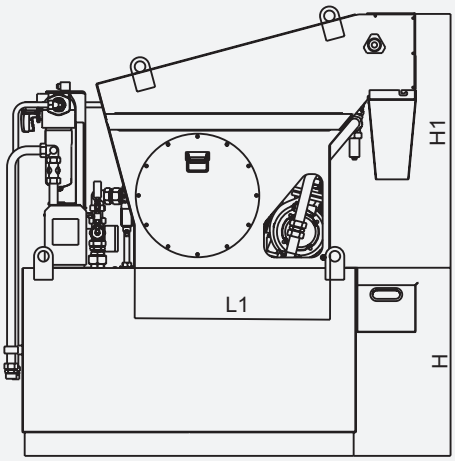
Control cabinet

Immersion cooler


Low-pressure pump(s)
Level sensor
Mounting plate
Tank
Safety catch pan

Dimensions





Configuring an individual filter system

1. Select a vacuum rotation filter

Type	Filter capacity*		Intake	L1	B1	H1
	Emulsion**	Oil***	DN	[mm]	[mm]	[mm]
VRF 150	150	75	40	835	602	1100
VRF 300	300	150	40	835	772	1100
VRF 500	500	250	65	1095	1032	1255
VRF 700	700	350	80	1200	1032	1635

* Chip removal machining with standard mesh
** v= 1 mm^2/s
*** v= 10 mm^2/s

2. Select a pump assembly and design

Maximum number of high-pressure pumps	Maximum number of low-pressure pumps
2	3
1	4
0	5

Pumps 1-5	High-pressure	Low-pressure	
Motor circuit	Direct	Plug connection	Inverter
Valve	Vario	Standard	
Pressure sensor	○		
Duplex filter	○		

3. Select variants

Filter element	**SQ 170 X160**	SQ 130 X 160	SQ225 X 216	LAM-PET 40
Level indicator	**optical**	digital		
Level sensor	**digital**	analogue		
Cooler	Side cooler	Immersion cooler	Plate heat exchanger	
Control	**Absolute Temperature**	Room temperature		
Control panel	**KTP 400**	KTP 700	SmartConnect	
Interface connection	**Mating connector**	open end	customized	
BUS interface	No	Profinet	Profibus	

Highlighted= recommended standard

4. Select options

Belt skimmer	○
Magnetic roller as pre-separator	○
Fill level measuring technology according to the WRA	○
Safety catch pan according to the WRA	○
Integrated lifting unit (dirty medium)	○

5. Select tank

Filter	Tank	Dimensions LxWxH [mm]	Volume [l] approx.
VRF 150 **VRF 150**	R0	1431 x 950 x 800 1431 x 950 x 1000	800 1100
VRF 150 **VRF 150, VRF 300**	R1	1902 x 950 x 800 1902 x 950 x 1000	1100 1500
VRF 150, VRF 300 VRF 150, **VRF 300**	R2	2373 x 950 x 800 2373 x 950 x 1000	1400 1850
VRF 300 **VRF 300, VRF 500**	R3	1902 x 1421 x 800 1902 x 1421 x 1000	1700 2200
VRF 300, VRF 500 **VRF 300, VRF 500**	R4	2373 x 1421 x 800 2373 x 1421 x 1000	2100 2800
VRF 300, VRF 500 **VRF 300, VRF 500,** VRF 700	R5	2844 x 1421 x 800 2844 x 1421 x 1000	2500 3300
VRF 300, VRF 500 VRF 300**, VRF 500, VRF 700**	R6	2373 x 1892 x 800 2373 x 1892 x 1000	2800 3700
VRF 300, **VRF 500,** VRF 700 VRF 300, **VRF 500, VRF 700**	R7	2844 x 1892 x 800 2844 x 1892 x 1000	3350 4400
VRF 150 **VRF 150, VRF 300**	Q1	1431 x 1421 x 800 1431 x 1421 x 1000	1300 1700
VRF 300, VRF 500 **VRF 300, VRF 500**	Q2	1902 x 1892 x 800 1902 x 1892 x 1000	2200 3000
VRF 500, VRF 700 **VRF 500, VRF 700**	Q3	2373 x 2363 x 800 2373 x 2363 x 1000	3500 4600

Highlighted = standard filter for the tank size

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VRF

6. Place the components with mounting plates on the tank

Mounting plate

XS = 469 x 469 mm
Components
(except for the vacuum rotation filter, control cabinet, immersion cooler, high-pressure pump)

S = 469 x 940 mm
Components
(except for the vacuum rotation filter, immersion cooler)

M = 940 x 940 mm
VRF 150, 300
Components
(except for the plate heat exchanger)

L = 469 x 1411 mm
Components
(except for the vacuum rotation filter, immersion cooler, plate heat exchanger)

XL = 940 x 1411 mm
Components
(except for the immersion cooler, high-pressure pump, plate heat exchanger)

XXL = 1411 x 1411 mm
VRF 500, 700
Components
(except for the immersion cooler, high-pressure pump, plate heat exchanger)

Examples