



# Turbo-HKS GmbH

## Cleaning Technology for Fluids

### Guide to our Products:

Centrifuges with Manual Solids Discharge

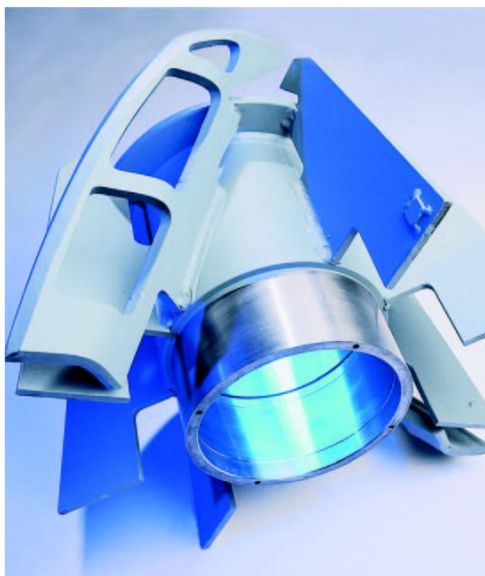
Centrifuges with Automatic Solids Discharge

Equipment and Standard Systems

Customized Systems and Individual Solutions

Band Filters

Magnetic Separators



Sludge Press

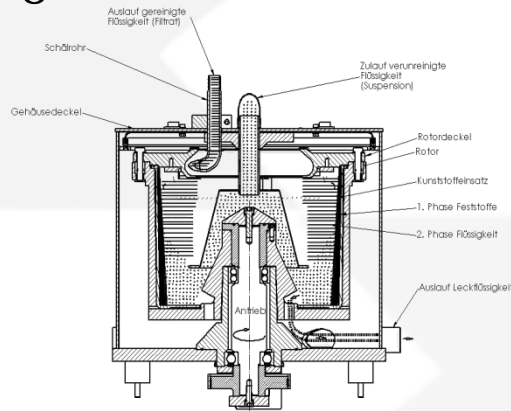


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# Centrifuges and Separators with manual solids discharge

The technology of the HKS centrifuges and separators is based on the principle of sedimentation in liquids: As a consequence of the different specific weights heavier particles sink down to the bottom whereas lighter particles float on top. HKS-centrifuges and separators make use of this process and accelerate the sedimentation by up to 2500 times by virtue of the centrifugal forces. Hereby a purity degree can be obtained at which even most minute sized particles, that can no longer be seized by ordinary filtration, can be separated reliably from contaminated liquids.



### Fields of Application:

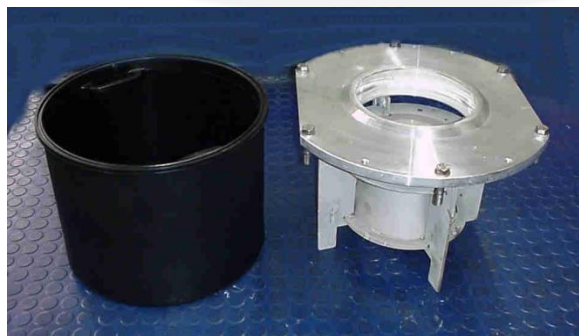
- Cleaning of coolants (emulsions, oils and solutions) when high demands are applied with regard to the purity degree such as in the processing of metal, glass, ceramics and other material.
- Separation of oils from water-based liquids
- Treatment of washing liquids in industrial washing plants
- Recovery of recyclable solid material

From time to time the separated solid material has to be discharged manually. For this purpose the housing cover is opened, the rotor cover disc is removed of the centrifuge rotor and the rubber insert that contains the solid material is lifted out. This process takes about 2 minutes.

### Mode of Operation:

The contaminated liquid is supplied onto the centrifuge from the top via an inlet tube in the cover of the centrifuge housing. The liquid enters the rotor from the bottom side and flows up to the top where it is diverted across the rotor fringe or under pressure by a skimmer tube. While the liquid flows through the centrifuge rotor it is separated into its individual components by their weight, i.e. the heavier solid particles are carried towards the outside and settle along the rotor wall.

The HKS three phase separator allow a separation of lighter components (such as oil) from water-based liquids in addition to the heavier solid particles. In this case the specifically heavier liquid phase is built up in the outer field, the specifically lighter liquid phase in the inner field of the rotating liquid ring. By means of a special separating disc on the upper part of the rotor fringe both phases can be diverted separately from the centrifuge. The solid particles settle along the wall of the rotor as described above.

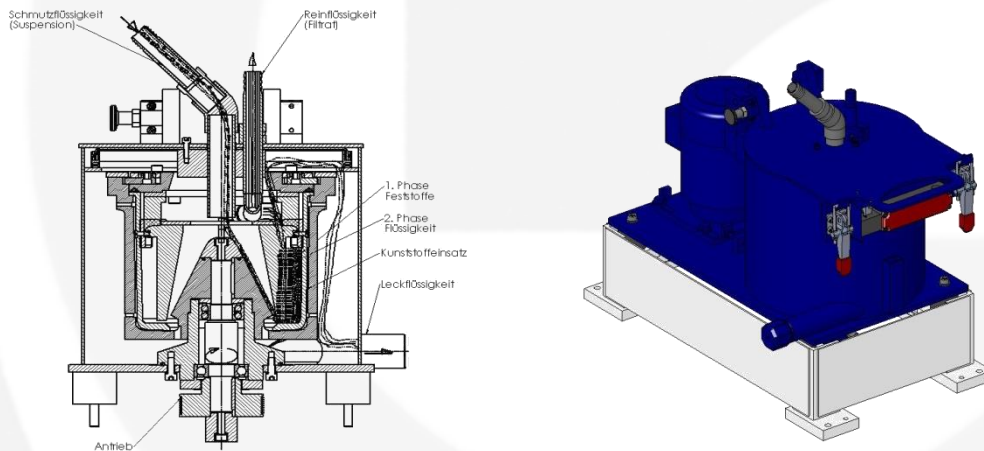


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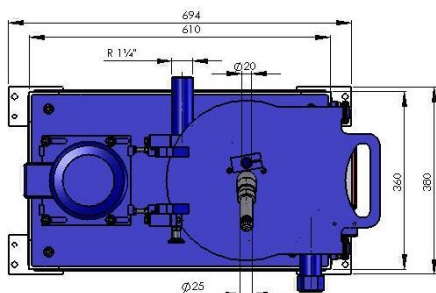


# Centrifuge MR 25

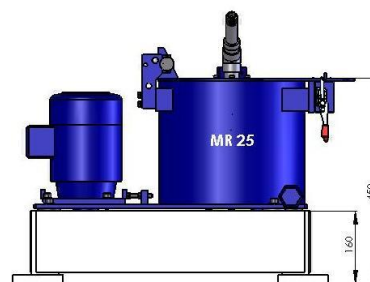
Full-jacket Centrifuge for Separation of Solids from Liquids



Technical Data	
Continuous liquid throughput	max. 35 l/min. coolant
Rotor capacity	2,6 dm <sup>3</sup>
Solids volume	1,8 dm <sup>3</sup>
Rotor speed	3950 1/min
Separating Factor	1.800 g (1 g = gravity acceleration)
Drive	Via poly-V belt
Drive power	0,75 kW at 50 Hz
Solids discharge	manually
Clean liquid return	Under pressure on housing cover
Remaining liquid	when the centrifuge is stopped pressureless drain on the side of housing
Inlet tank	-
Clean liquid tank	-
Remarks/Other	The smallest HKS-model



Draufsicht



Seitenansicht



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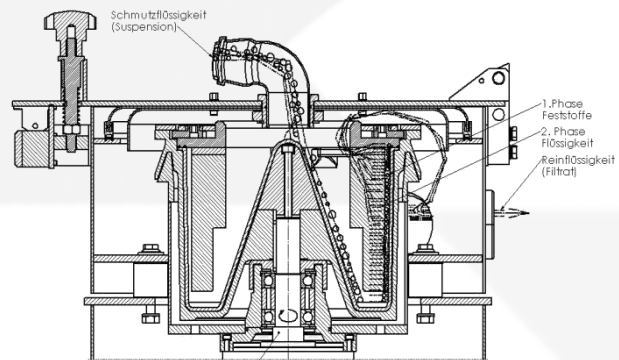


# Centrifuge KM 50

Fully Jacketed Centrifuge for Separation of Solids from Liquids

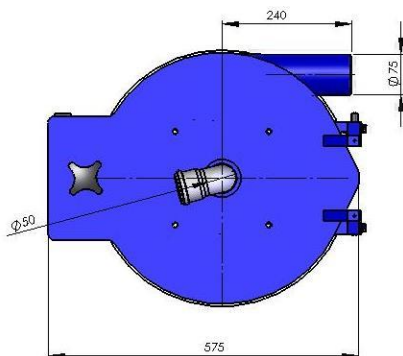


Centrifuge KM 50

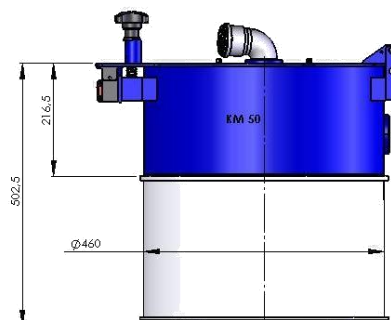


Operational Principle of KM 50

Technical Data	
continuous liquid throughput	max. 50 l/min. water/emulsion
rotor capacity	4,5 dm <sup>3</sup>
solids capacity	3,0 dm <sup>3</sup>
rotor speed	2.850 rpm 50 Hz / 3.420 rpm 60 Hz
separating factor	1000 g (g = gravity acceleration) 50 Hz / 1.100 g 60 Hz
drive	direct drive
drive power	1,0 kW 50 Hz / 1,5 kW 60 Hz
solids discharge	manually
liquid return	pressureless by a lateral outlet on the centrifuge housing
inlet tank	-
clean liquid tank	-
remarks /other	compact dimensions, favorable price



View from above



Side view



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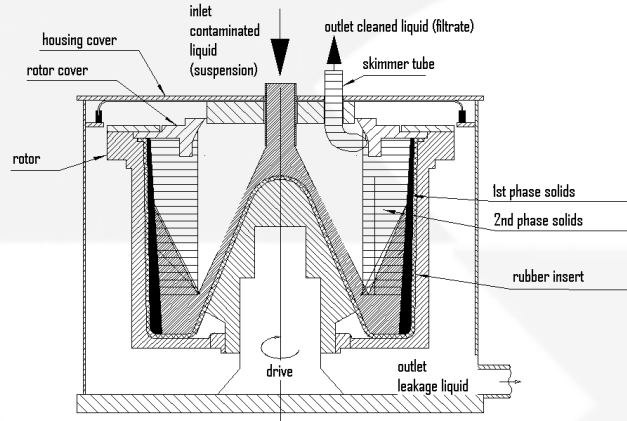


# Centrifuge MR 56

Full-jacket Centrifuge for the Separation of Solids from Liquids

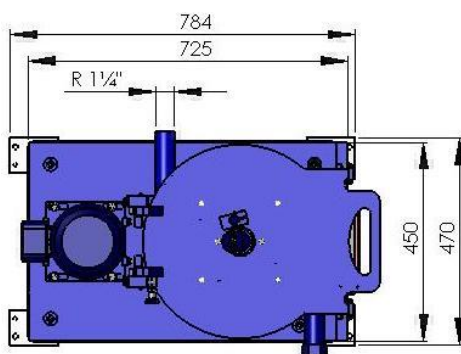


Centrifuge MR 56

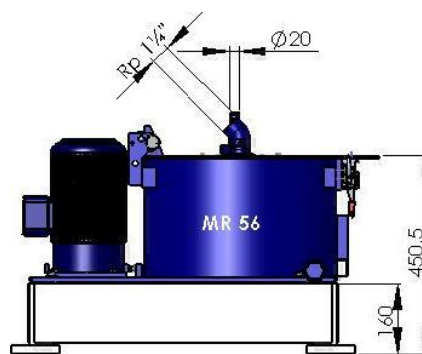


Operational Principle of MR 56

Technical Data	
continuous liquid throughput	max. 60 l/min. water/emulsion
rotor capacity	4,5 dm <sup>3</sup>
solids capacity	3,0 dm <sup>3</sup>
rotor speed	50 Hz 4.050 rpm
separating factor	2.255 g (g = gravity acceleration) 50 Hz / 2.395 g 60 Hz
drive	via poly-V belt
drive power	2,4 kW 50Hz / 60 Hz
solids discharge	manually
liquid return	by pressure on housing cover (via skimmer tube)
Remaining liquid	when the centrifuge is stopped pressureless drain on the side of housing
inlet tank	-
clean liquid tank	-
remarks/ other	optimum cleaning quality



View from above



Side view



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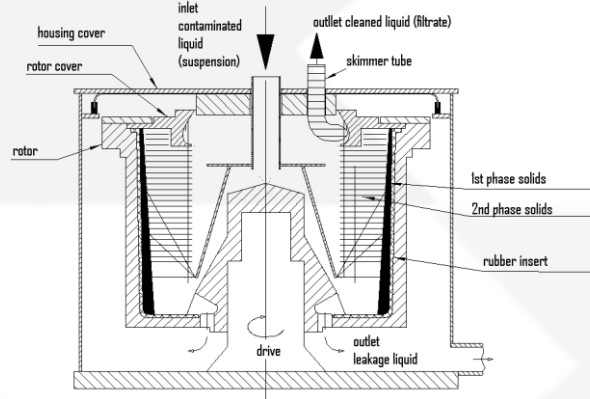


# Centrifuge MR 120

Full-jacket Centrifuge for Separation of Solids from Liquids

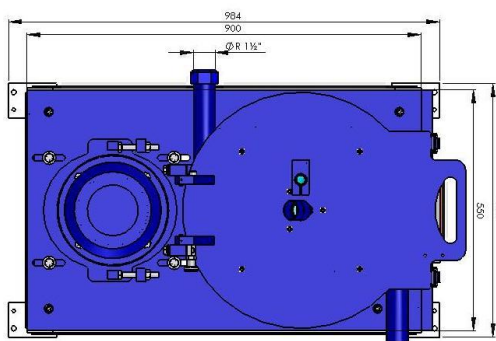


Centrifuge MR 120

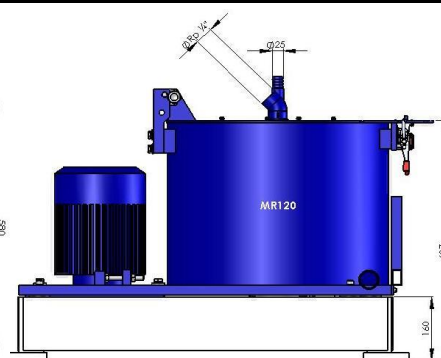


Operational Principle of MR 120

Technical Data	
continuous liquid throughput	max. 120 l/min. water/emulsion
rotor capacity	15 dm <sup>3</sup>
Solids volume	10 dm <sup>3</sup>
rotor speed	3.000 rpm
separating factor	1.800 g (g = gravity acceleration)
drive	via poly-V belt
drive power	4,0 kW
solids discharge	manually
liquid return	under pressure on housing cover (skimmer tube)
Remaining liquid	When the centrifuge is stopped pressureless drain on the side of housing.
inlet tank	-
clean liquid tank	-
remarks/ other	the powerful „great“ manual centrifuge



View from above



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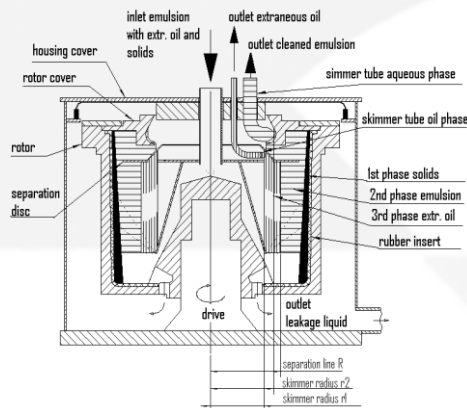


# Centrifuge SMR 120

Full-jacket Centrifuge for Separation of Solids and Extraneous Oil from Aqueous Liquids

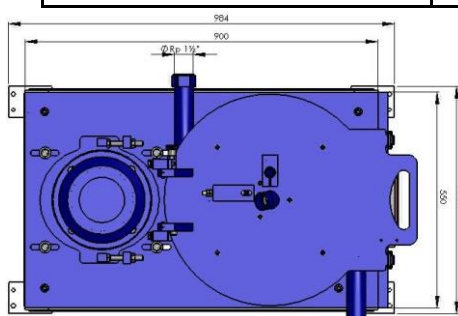


Cleaning System SMR 120-B 20 -0-2

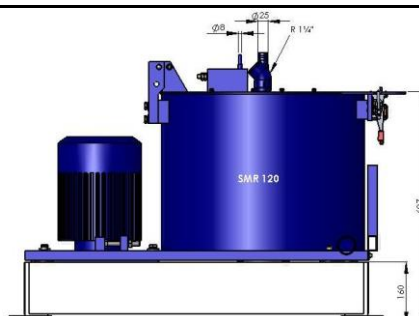


Operational Principle of SMR 120

Technical Data	
continuous liquid throughput	max. 120 l/min. water/emulsion in 2-phase operation max. 1200 l/h water/emulsion in 3-phase operation
rotor capacity	15 dm <sup>3</sup>
solids capacity	10 dm <sup>3</sup>
rotor speed	3.000 rpm
separating factor	1800 g (g = gravity acceleration)
drive	via poly-V belt
drive power	5,5 kW 50 Hz or 6,6 kW 60 Hz ( with stainless steel rotor)
solids discharge	manually
liquid return	aqueous phase and oil phase under pressure on housing cover (skimmer tubes, for oil phase adjustable)
Remaining liquid	When the centrifuge is stopped pressureless drain on the side of housing.
inlet tank	-
clean liquid tank	-
remarks/ other	solids and extraneous oil separation in one operation



View from above



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# Centrifugen and Separatoren with automatic solids discharge

The technology of the centrifuges and separators of HKS is based on the principle of sedimentation in liquids: As a consequence of different specific weights the heavier solid particles sink towards the bottom whereas the lighter particles float on top. HKS-centrifuges and –separators make use of this process and accelerate the sedimentation by up to 2500 times by virtue of the centrifugal forces. Hereby a purity degree can be obtained at which even most minute sized particles, that can no longer be seized by ordinary filtration, can be separated reliably of contaminated liquids.

### Fields of Application:

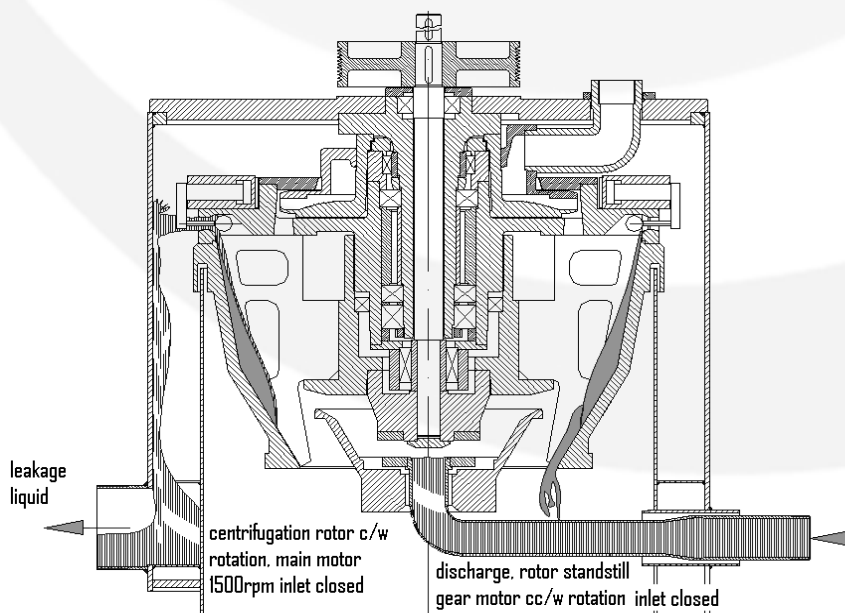
Cleaning of coolants (emulsions, oils and solutions) when high demands are applied with regard to the purity degree such as in the processing of metal, glass, ceramics and other materials. Hereby high flow rates and /or solid quantities can be handled.

### Mode of Operation:

The contaminated liquid is supplied onto the centrifuge by means of a pump and transported into the rotor. The liquid enters the rotor from the bottom side and flows up to the top where it is diverted by a skimmer. While the liquid flows through the centrifuge rotor it is separated into its individual components by their weight, i.e. the heavier solid particles are carried towards the outside and settle along the rotor wall.

After collection of a certain quantity the solids are scratched off the wall by a discharge blade and drop into a tank, container or onto a conveyor belt situated below the centrifuge. Prior to the solids discharge the liquid supply is stopped and remaining liquid in the rotor drains.

The entire process is controlled by a PLC - unit. The process data can be entered and adjusted easily and fast on the operating panel in the switchboard.



P 220



P 100



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# Centrifuge P 100

Solid-jacket Centrifuge for the Separation of Solids from Liquids

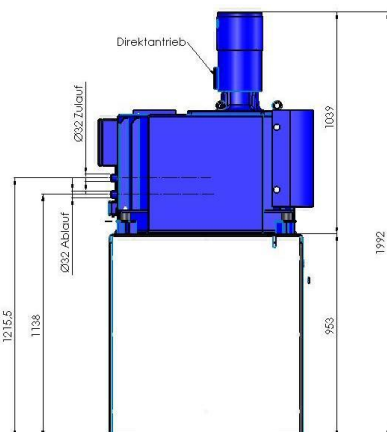


Centrifuge P 100

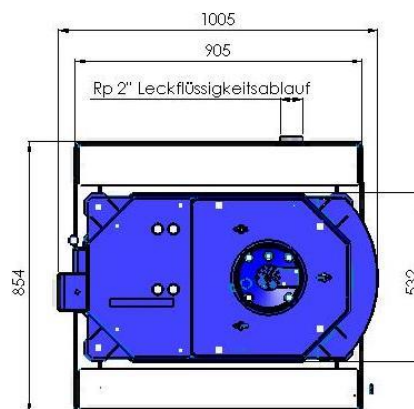


Centrifuge P 100 integrated in a complete cleaning system

Technical Data	
continuous liquid throughput	max. 100 l/min. water/emulsion
rotor capacity	12 dm <sup>3</sup>
solids capacity	5 dm <sup>3</sup>
rotor speed	3000 rpm
separating factor	1.550 g (g = gravity acceleration)
drive	direct drive with frequency converter
drive power	3 kW
solids discharge	automatically
liquid return	under pressure
inlet tank	-
clean liquid tank	-
remarks/ other	compact system



Side view



View from above



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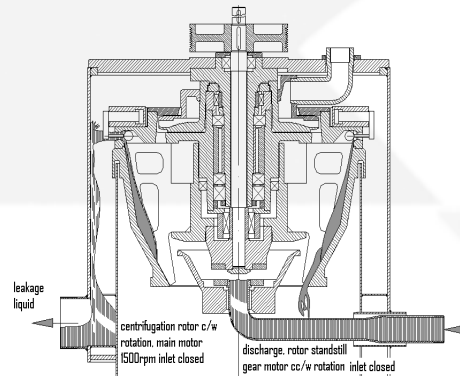


# Centrifuge P 220

With Automatic Solids Discharge

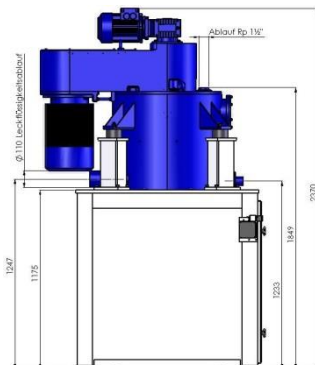


Centrifuge P 220

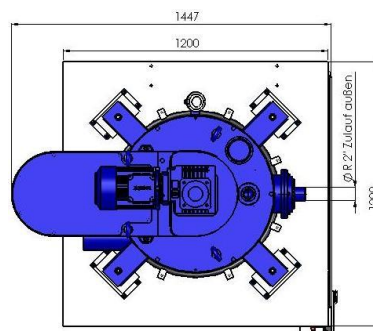


Solids Discharge on P220

<b>Technical Data</b>	
continuous liquid throughput	max. 220 l/min. water/emulsion
rotor capacity	38 dm <sup>3</sup>
solids capacity	10 kg (depending on density max. 10 l)
rotor speed	1860 rpm / 2450 rpm / 2.900 rpm
separating factor	1.060 g (g = gravity acceleration) 1.400 g /1.800 g
drive	via poly-V belt
drive power	9/11 kW
solids discharge	automatically
liquid return	under pressure in the upper section of the centrifuge
inlet tank	--
clean liquid tank	--
remarks/ other	ideal for centralized systems



Side view



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# Equipment and Standard Systems

for any field of application



MR25- B75



M56- B200



SMR120 Mobile „Clean-Boy“



Bath Treatment System WS 1200



MR56- B300



MR120 - B1000 with cooling unit

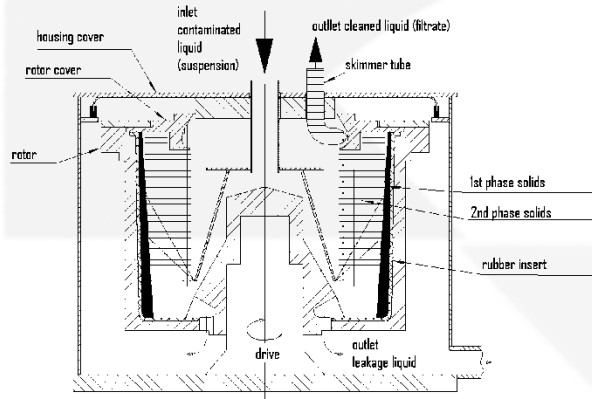


# MR 25 - B 35 / 40

Full-jacket Centrifuge for Separation of Solids from Liquids

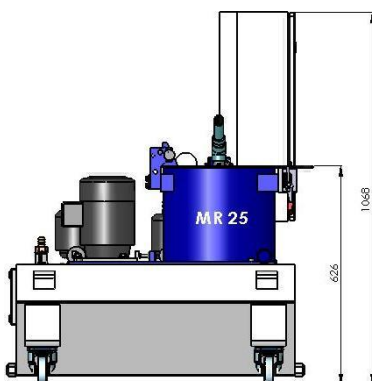


MR 25 - B 35/40

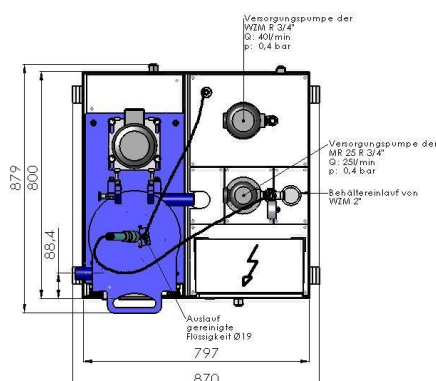


Operational Principle of MR 25

Technical Data	
Continuous liquid throughput	max. 35 l/min. coolant
Rotor capacity	2,6 dm <sup>3</sup>
Solids volume	1,8 dm <sup>3</sup>
Rotor speed	3950 1/min
Separating Factor	1.800 g (1 g = gravity acceleration)
Drive	Via poly-V belt
Drive power	0,75 kW at 50 Hz
Solids discharge	manually
Clean liquid return	Under pressure on housing cover
Remaining liquid	when the centrifuge is stopped pressureless drain on the side of housing into the dirt tank
Inlet tank	-
Clean liquid tank	-
Remarks/Other	The smallest HKS-model



Side view



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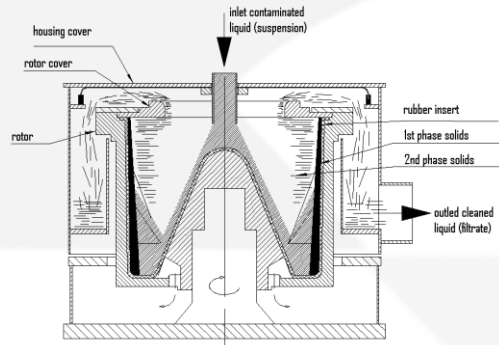


# KM 50 - B 0 / 125

Compact Coolant Cleaning System for Smaller Liquid Quantities

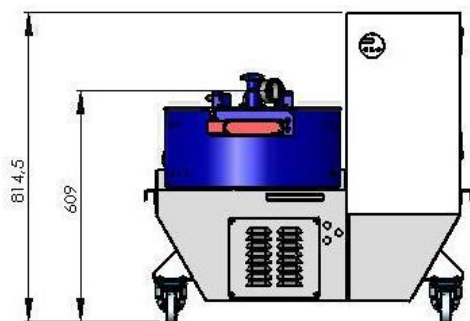


Cleaning System KM 50 - B / 125

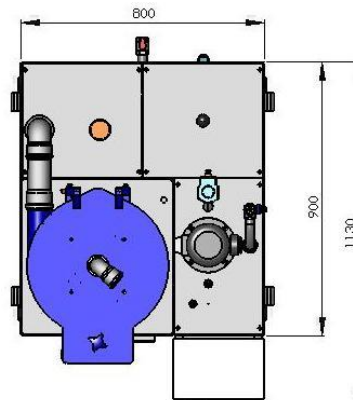


Operational Principle of the Centrifuge

Technical Data	
continuous liquid throughput	max. 50 l/min. water/emulsion
rotor capacity	4,5 dm <sup>3</sup>
solids capacity	3,0 dm <sup>3</sup>
rotor speed	2850 rpm 50 Hz / 3.420 rpm 60 Hz
separating factor	1.000 g (g = gravity acceleration) 50 Hz / 1.100 g 60 Hz
drive	direct drive
drive power	1,0 kW 50 Hz / 1,5 kW 60 Hz
solids discharge	manually
liquid return	pressureless by a lateral outlet on the centrifuge housing
inlet tank	-
Clean liquid tank	125 l
Remarks/ other	system requiring little floor space for small machine tools



Side view



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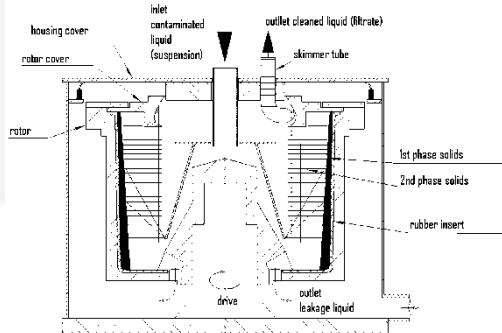


# MR 56 - B 75 / 225

Compact Coolant Cleaning System for Minor Liquid Quantities

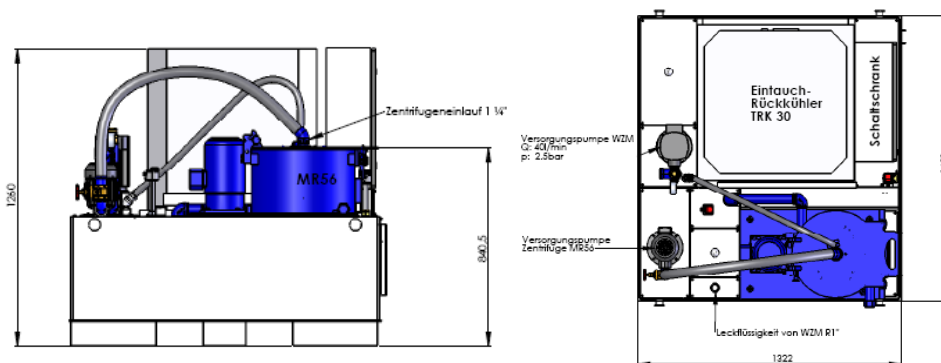


Cleaning System MR 56 - B 75 / 225



Operational Principle of the Centrifuge

Technical Data	
continuous liquid throughput	max. 60 l/min. water/emulsion
rotor capacity	4.5 dm <sup>3</sup>
solids capacity	3.0 dm <sup>3</sup>
rotor speed	4.050 rpm 50 Hz
separating factor	2.255 g (g = gravity acceleration) 50 Hz / 2.395 g 60 Hz
drive	via poly-V belt
drive power	2.4 kW
solids discharge	manually
liquid return	pressureless by a lateral outlet on the centrifuge housing
inlet tank	-
Remaining liquid	when the centrifuge is stopped pressureless drain on the side of housing into the dirt tank
liquid tank	75 l dirt tank, 125 l clean tank
remarks/ other	compact system for smaller machine tools



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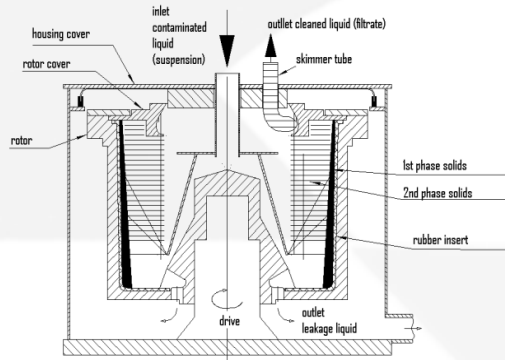


# MR 120 - B 200 / 1000

Complete Coolant Cleaning System with Centrifuge for Larger Machine Tools

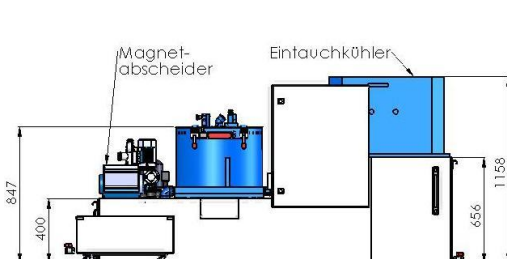


Cleaning System MR 120 - B 200 / 1000

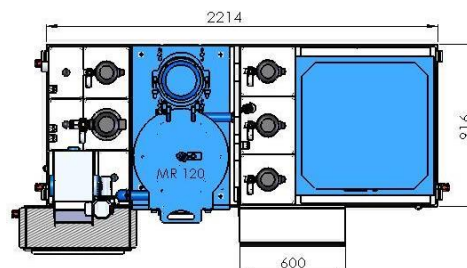


Operational Principle of MR 120

Technical Data	
continuous liquid throughput	max. 120 l/min. water/emulsion
rotor capacity of centrifuge	15 dm <sup>3</sup>
solids capacity of centrifuge	10 dm <sup>3</sup>
rotor speed of centrifuge	3.000 rpm 50 Hz / 60 Hz
separating factor of centrifuge	1.800 g (g = gravity acceleration)
drive of centrifuge	via poly-V belt
drive power	4,0 kW 50 Hz or 4,8 kW 60 Hz
solids discharge	manually by the centrifuge
liquid return	Under pressure on housing cover (skimmer tube)
Remaining liquid	when the centrifuge is stopped pressureless drain on the side of housing into the dirt tank
inlet tank	100 l capacity
liquid tank	200l dirt tank, 1000 l clean tank
remarks/ other	complete system with powerful separation technology



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# KP 60

## Equipment for Separation, Cutting up and Compressing of Plastic Material Chips

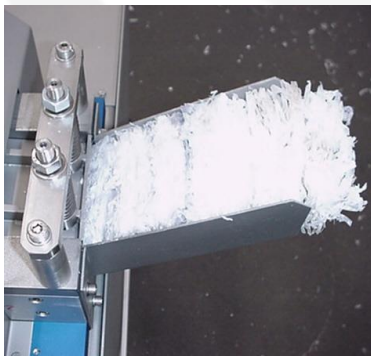
In the field of optical lenses there has been a significant change in the past few years with regard to the employed materials. Whereas in the past the prevailing part of the processed lenses was of Silicate today an increasing number of different plastic materials is employed.

Since almost two decades HKS TECHNOLOGY GmbH has supplied treatment systems for coolants to the optical industry. The very fine solid particles resulting from the processing of silicate and CR 39 are separated reliably by the cleaning centrifuges employed in the HKS systems.

However, when high fraction plastic material and Polycarbonate are used chips are produced which so far could be separated only unsatisfactorily or involving great manual effort with the equipment available.

For this application HKS have now developed the optimum solution: an equipment which is connected directly to the coolant outlet of the treatment machine and separates the chips produced. Plastic material press KP 60 cuts up the chips and compresses them to ten percent of their original volume. The pre-cleaned liquid is then supplied onto a centrifuge or an existing central treatment system for precision cleaning. The equipment can easily be connected to machines that process different materials.

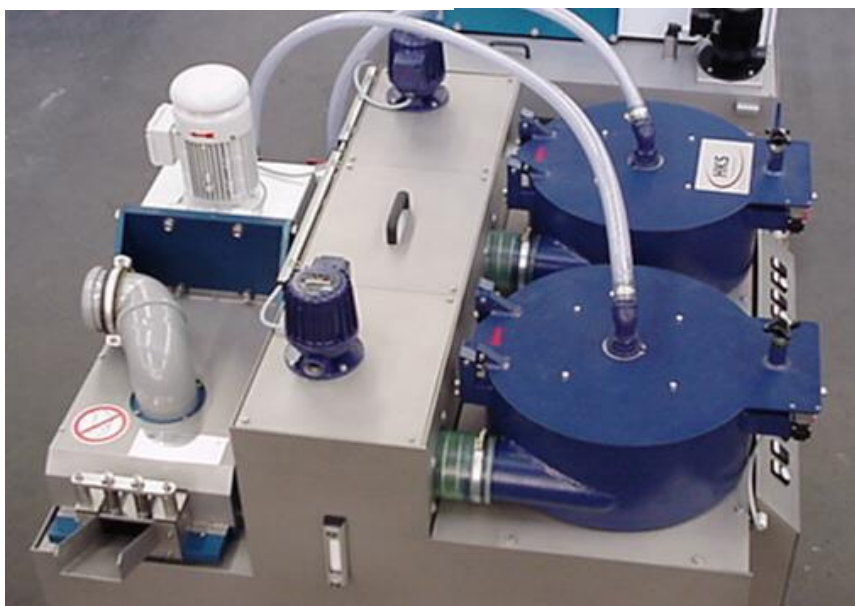
The advantages of such an equipment are obvious: the plastic material press requires considerably less space than the filter equipment or conveyor systems used so far, there is practically no loss of coolant and there is no need for a costly manual handling of the chips.



Only 10 percent of the original volume left: Polycarbonate chips in the KP 60 ejector



KP 60 - B 150  
Plastic material press with collecting tank



KP 60 - B 250 TwinZ:  
complete treatment system for two processing machines with plastic material press KP 60 and two centrifuges KM 50.



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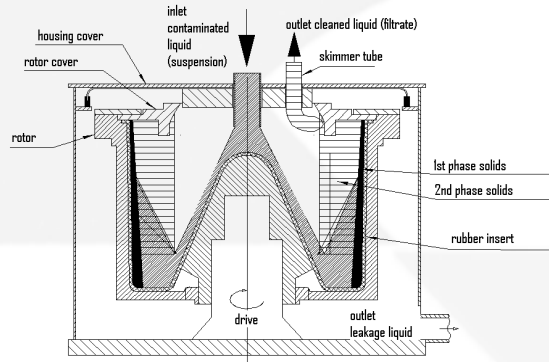


# M 56 Mobil

Cleaning System – Compact and Mobile

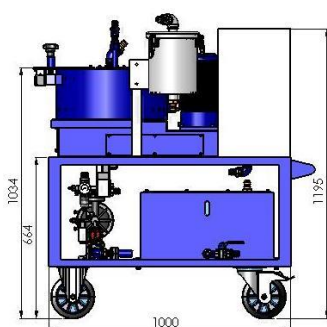


3-D View

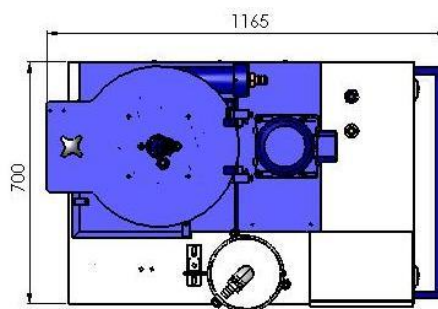


Operational principle of M56

Technical Data	
continuous liquid throughput	freely adjustable up to abt. 35l / rpm
rotor capacity	4,5 dm <sup>3</sup>
solids capacity	3,0 dm <sup>3</sup>
rotor speed	4.050 rpm
separating factor	2.255 g (g = gravity acceleration)
drive	via poly-V belt
drive power	2,4 kW
solids discharge	manually
liquid return	by pressure on housing cover (via skimmer tube)
Remaining liquid	when the centrifuge is stopped pressureless drain on the side of housing into the dirt tank
inlet tank	-
clean liquid tank	-
remarks/ other	A compact and mobile cleaning system for the separation of finest particles on cooling lubricant tanks (emulsion / cooling oils) in bypass operation. Highest quality of cleaning.



Side View



View from above



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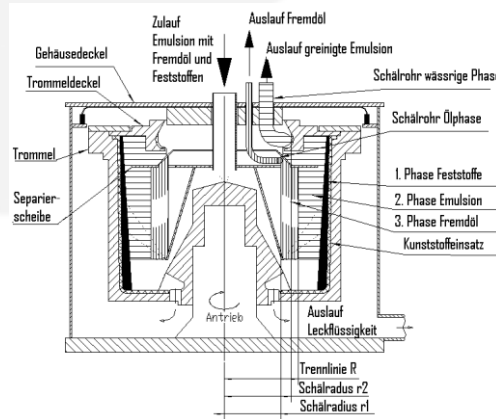


# HKS Clean - Boy

Mobile Treatment System SMR120 - B 35 for Emulsions and Washing Fluids



Compact Construction and all Component Parts Mounted



Operational principle of SMR 120

The mobile treatment system SMR120 - B 55 „CLEAN-BOY“ has been designed in order to be able to profit of the excellent cleaning capacity of the HKS Three Phase Separator at different sites. It is a mobile equipment and can easily be moved to individual machine tools and set into operation. All system component parts required for continuous operation have been integrated into the equipment.

By means of the CLEAN-BOY solid particles up to a size of  $\geq 1$  micron are removed from emulsions, washing fluids and other liquids. At the same time extraneous oils are separated optimally. It is also possible to clean oils.

By employing this equipment the life times of the liquids are increased by many times and the waste treatment costs considerably reduced. Bacteria creation is prevented and a high quality of the liquids is ensured.

The system is designed for bypass operation in a circle. On the one side the contaminated liquid is taken in and supplied onto the three phase separator. On the other side the purified liquid (freed from extraneous oil and solid particles) is led back to the corresponding liquid tank. The cleaning of the liquid is done simply and solely by making use of the centrifugal forces of the separator. The fact that filtration equipment of any kind is not required means a considerable contribution to taking the strain off the environment.

For special applications (such as the cleaning of liquids on the outer sides of the pH scale) the equipment is available in special versions.

### Technical Details:

Three Phase Separator:	
drive power	4,0 kW/5,0 kW
rotor speed	3000 U/min
Separating factor	1800 g
rotor capacity	15 dm <sup>3</sup>
Sludge room capacity max.	10 dm <sup>3</sup>

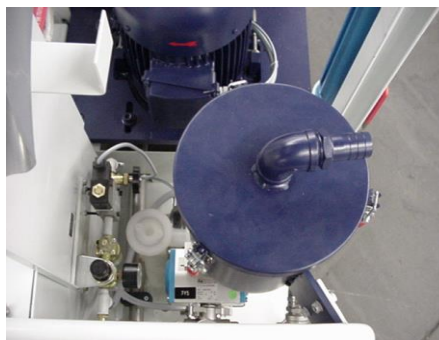
flow rates of the equipment:	
three phase operation	5 - 20 l/min
two phase operation	max. ca. 100 l/min

Suction capacity of the diaphragm pump:	
transportation height	max. 3 m

extraneous oil tank	20 l
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Three phase separator SMR 100 - the core of the system



Coarse particles are held back in the prefilter



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# Bath Treatment System WS 1200

Stationary Treatment System for Washing Fluids and Degreasing Baths

Washing and degreasing baths in cleaning systems for industrially manufactured parts serve their purpose only if they are in a perfect condition. Dirt particles and oils/ greases that have been washed off the parts contaminate the baths and very often render an exchange of the bath indispensable within the shortest period of time. The initiating of a new bath set and the waste treatment of the used fluid, as well as the standstill of the washing system during the change result in high costs. These can be avoided if the washing fluid is being processed regularly.

For this purpose HKS have developed the bath treatment system WS 1200. It is connected to the liquid tank for bypass operation. Oils and greases are separated and at the same time smallest size solid particles are discharged reliably. For this processing the excellent cleaning capacity of HKS Three Phase Separator SMR 100 integrated in system WS 1200 is made use of.

By means of the installed pneumatic diaphragm pump the fluid is taken in and carried to the separator. Particles up to a size of 5 microns are collected in the separator rotor. The cleaned fluid and the separated oil are carried off separately.

For this kind of cleaning it is exclusively the centrifugal forces of the separator that are taken advantage of. In addition, the fact that the system does not require filtration material of any kind means a considerable contribution to easing the burden on the environment.

The bath treatment system has proved a success in numerous applications. Different customers have reported of savings in amounts of over € 5.000,— per month that were obtained by continuous processing and treatment of the washing baths.

Apart from the standard system special versions, too that are adapted to the customer's individual needs are supplied by HKS.



Technical Data	
continuous liquid throughput	max. 150 l/min. water/emulsion in 2-phase operation max. 120 l/h water/emulsion in 3-phase operation
rotor capacity	15 dm <sup>3</sup>
solids capacity	10 dm <sup>3</sup>
rotor speed	3.000 rpm
separating factor	1.800 g
drive	Via poly-V belt
drive power	4,0 kW or 5.5 kW
solids discharge	manually
liquid return	under pressure
inlet tank	--
clean liquid tank	--
remarks/ other	complete treatment system for emulsions and washing fluids



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# Customized Systems and individual Solutions

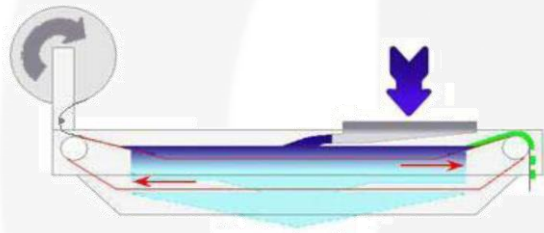
for any application in accordance with the customer's requirements



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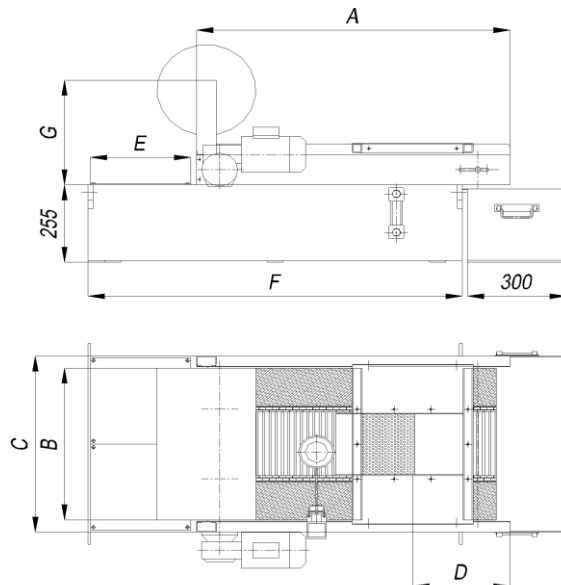


# HKS Flat-Bed Band Filter



Via an inlet and a distributor the contaminated coolant (emulsion/ cooling oil) from the machine tool is led onto the filtration fabric of the cleaning system. The liquid passes through the fabric and the solid particles are retained and form the so-called filter-cake. The cleaned emulsion is collected in the clean tank below the filter and taken back to the machine-tool by means of a pump. With increasing thickness the filter-cake becomes increasingly impermeable and the liquid level rises. As soon as the max. level is reached the band transport is released by the floater switch. New fabric is pulled in while the contaminated used material drops into the sludge tank.

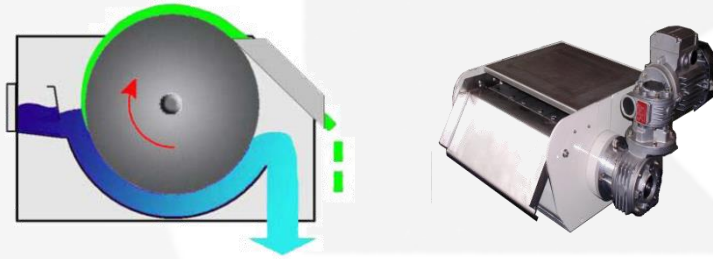
Type	l/min		A	B	C	D	E	F	G
	1-8 cSt	8-30 cSt							
Beta 1	40	20	950	500	580	280	305	1135	
Beta 12	60	30	1250	500	580		315	1435	
Beta 2	120	60	1400	700	780		305	1575	
Beta 3-1500	180	90	1500				385	1755	
Beta 3-2000	250	125	2000				370	2240	
Beta 3-2500	325	160	2500			383		2740	285
Beta 3-3000	400	200	3000	1000	1080			3240	
Beta 3-3500	475	230	3500					3740	
Beta 3-4000	550	270	4000					4240	
Beta 3-4500	625	310	4500					4740	
Beta 3-5000	700	350	5000					5240	



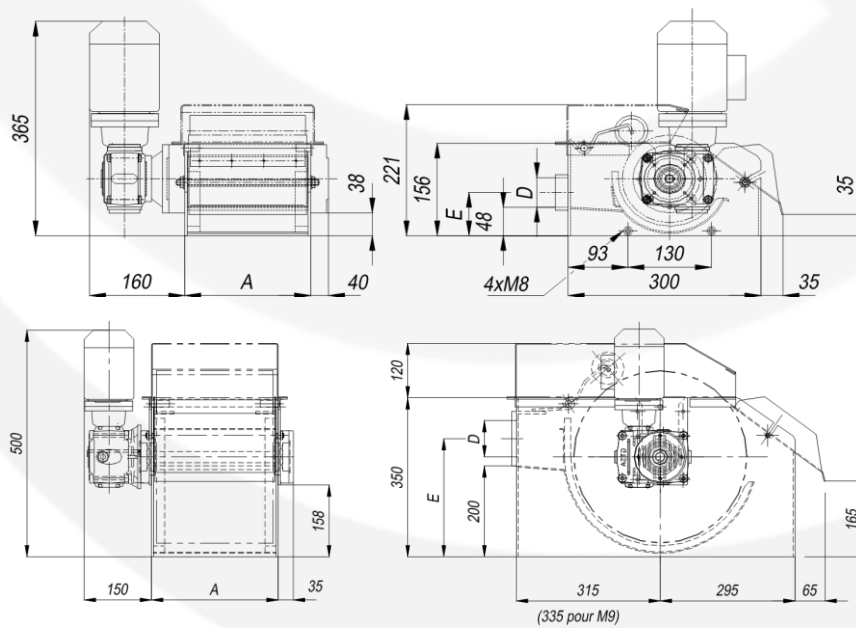
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# Magnetic Separator SMD



Its function is identical with that of a regular magnetic separator. However, installed additional discs extend the surface of the magnet thus leading to an improved separation performance. This allows to operate the unit at a higher flow rate without having to increase the size of the unit.



Type	l/min		A	E	D
	1 - 8 cSt	8 - 30 cSt.			
701	60	30	196	73	1½ "
702	100	50	397	78	2 "
703	180	90	780	93	3 "
M 2	130	70	277	240	2½ "
M 3	190	90	403	245	3 "
M 4	250	120	534	245	90 x 400
M 6	370	180	787	245	90 x 400
M 9	560	270	1173	245	90 x 400



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