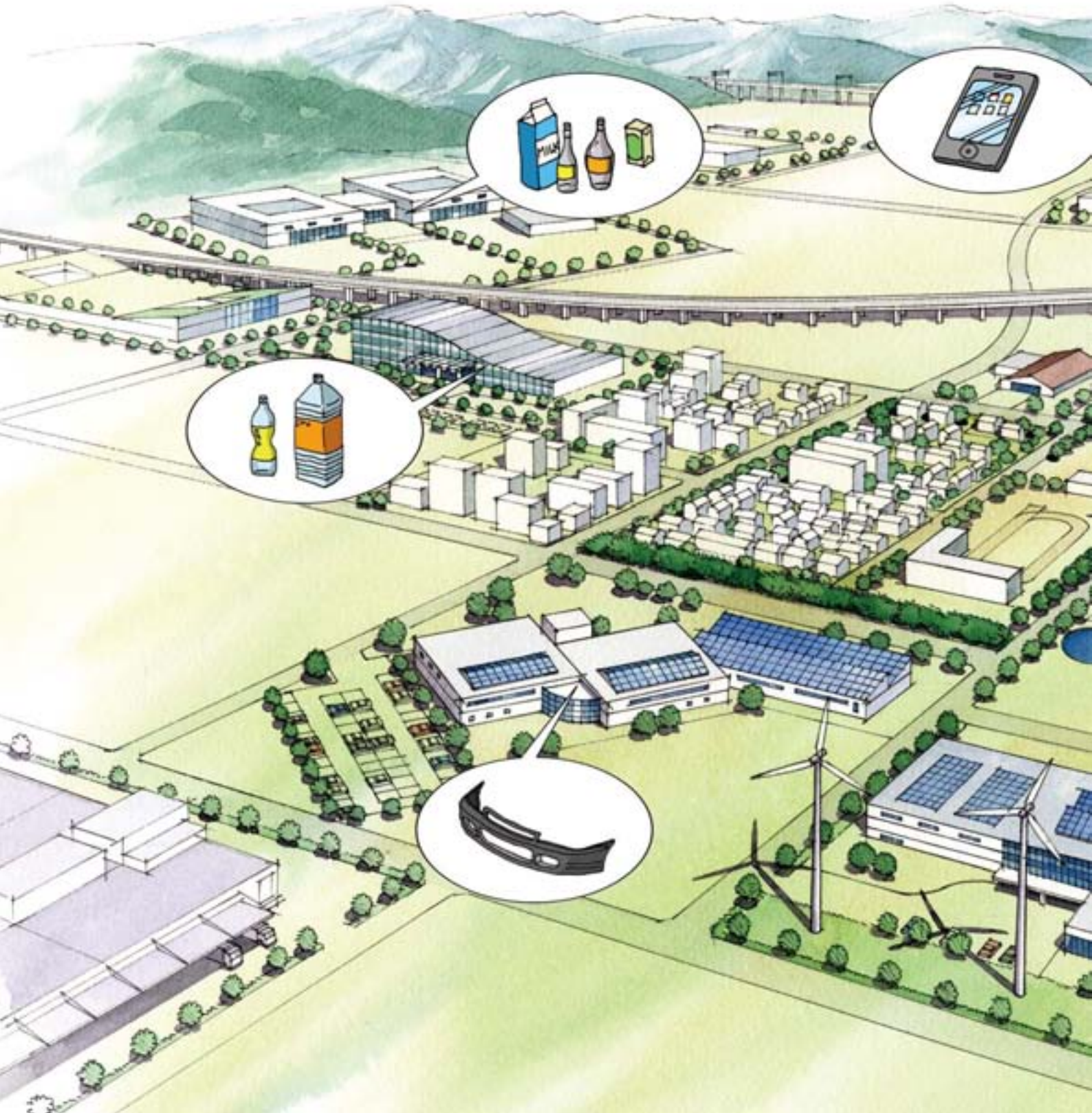
Explore the Engineering Edge

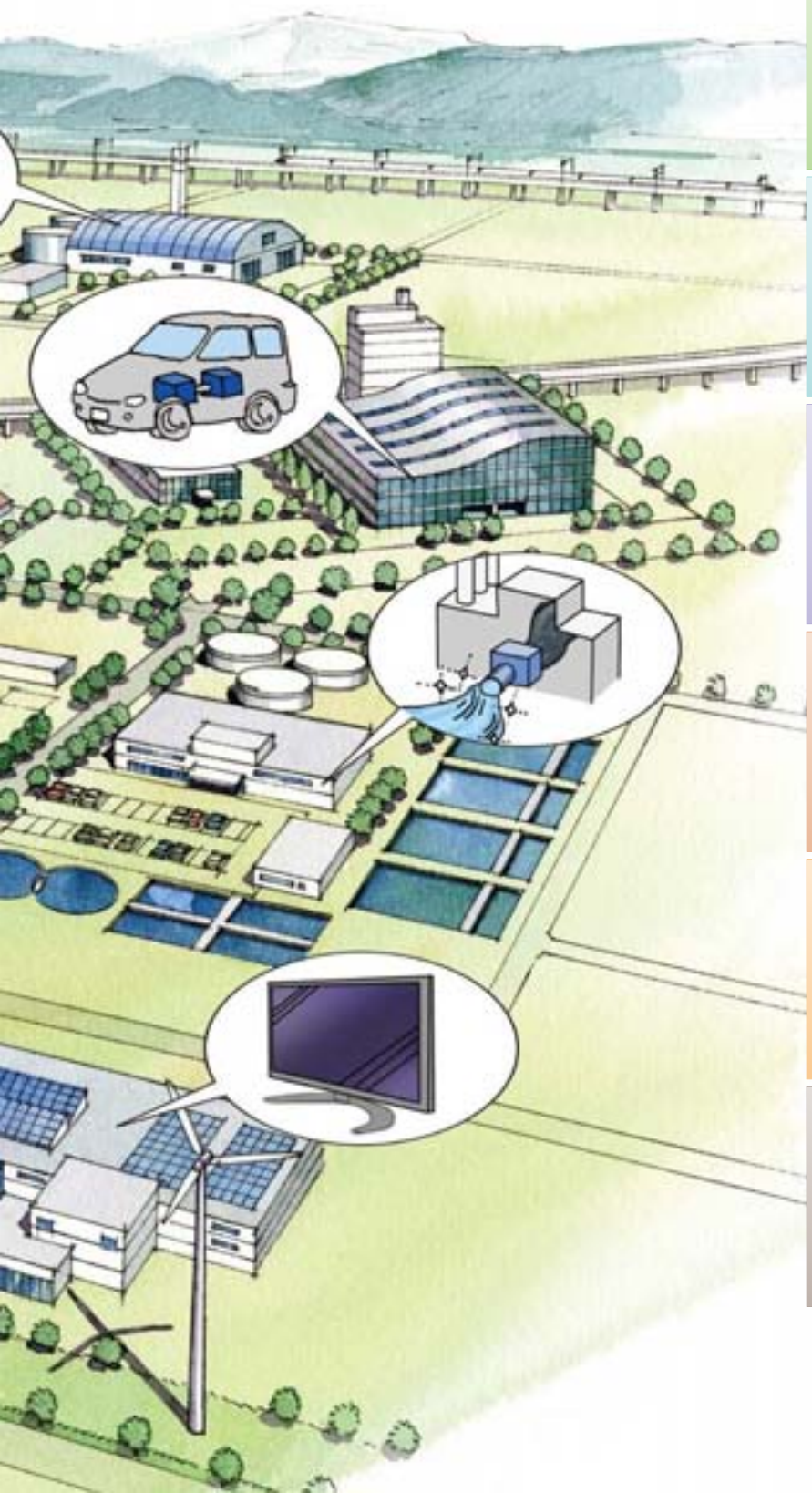
IHI

Centrifuges and Filters

IHI Corporation

IHI Products in the Community
Centrifuges and Filters





Screw Decanter Centrifuge

**The IHI Screw Decanter Centrifuge has been developed with our latest high speed rotation technology for use in every industry.
From big to small, we offer a variety of models to meet your needs.**

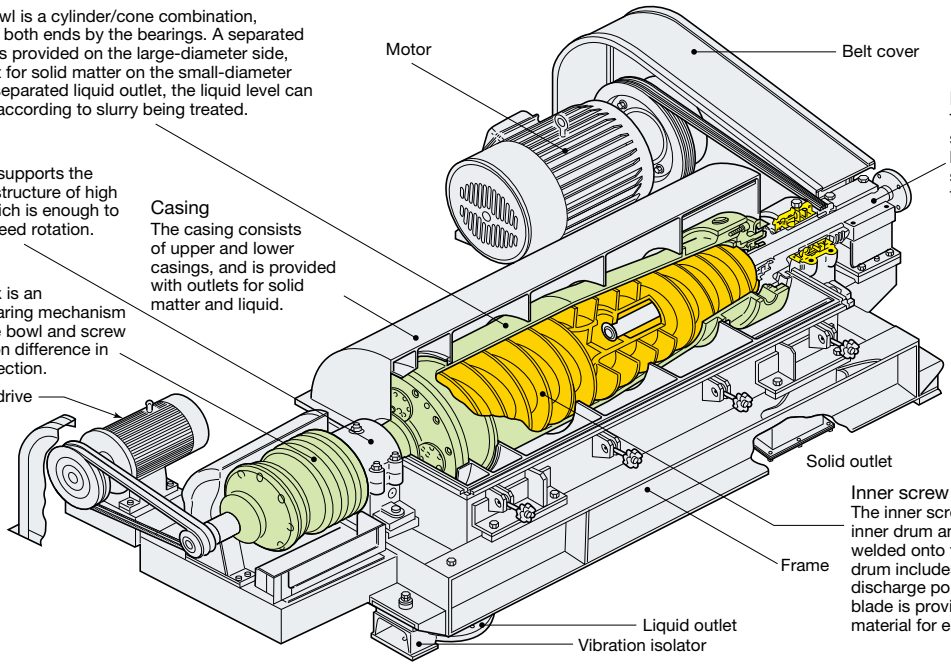
1 Structure of the Screw Decanter Centrifuge

Outer bowl
The outer bowl is a cylinder/cone combination, supported at both ends by the bearings. A separated liquid outlet is provided on the large-diameter side, and an outlet for solid matter on the small-diameter side. At the separated liquid outlet, the liquid level can be adjusted according to slurry being treated.

Bearing
The bearing supports the bowl with a structure of high accuracy which is enough to bear high-speed rotation.

Gear box
The gear box is an planetary gearing mechanism providing the bowl and screw with a rotation difference in the same direction.

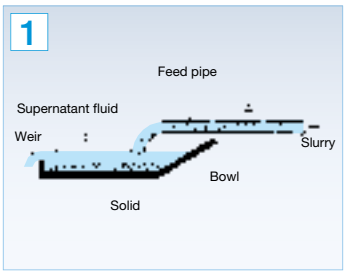
Casing
The casing consists of upper and lower casings, and is provided with outlets for solid matter and liquid.



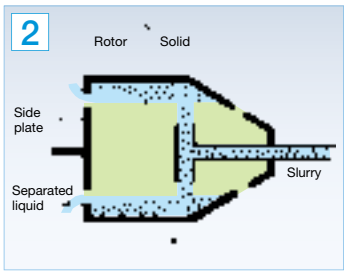
Feed pipe
The feed pipe is supported by the pipe holder and supplies slurry into the bowl from outside.

Inner screw
The inner screw consists of an inner drum and a screw blade welded onto the drum. The inner drum includes several liquid discharge ports. The top of the blade is provided with hardened material for excellent anti-wear.

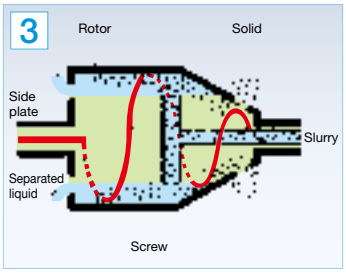
2 Principle of the Screw Decanter Centrifuge



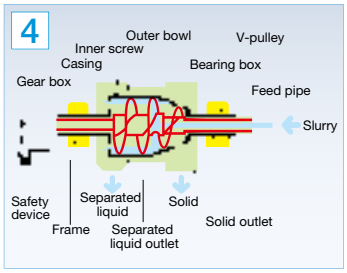
To separate the slurry into solid and liquid, settling ponds, which use the specific difference in gravity, have long been applied. In a structure that uses this principle, as shown in the figure, if you supply slurry from pipe A, solid matter settles and separates into bowl B, which results in outflow of supernatant fluid from weir C.



Rotating this device at high speed (2000-6000 rpm) helps the solids settle further by centrifugal force, and the solids rapidly accumulate onto the inner surface of the bowl.



Then, a screw conveyor with a slight rotational difference is installed in the rotor. The solid piled up in the bowl is compelled to move to the right, where it is dewatered and discharged by the conveyor. The slurry is converted into clear liquid and discharged from the outlet on the side plate.



When slurry is supplied, the separated and dewatered solid matter is continuously discharged from the solid outlet, and the separated liquid from the separated liquid outlet.

3 Features

1 Quick Treatment
Through continuous separation and dehydration, a large amount of slurry can be treated quickly.

2 Optimal Performance by Application
With a wide range of possible selections; including the bowl length, screw pitch, height of the weir on the liquid surface adjustment plate, and screw rotation speed; the optimal performance can be obtained for every type of slurry.

3 Broad Applications
The acceptable slurry solid concentration range is 0.1% to 50%, while solid particles in slurry with coarseness ranging from several microns to 5 mm can be treated.

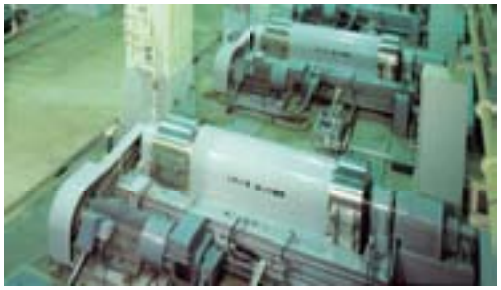
4 Easy Operation
Little effort is required for the pre-operation preparations and post-operation cleaning, which raises work efficiency and makes operations very simple.

5 Outstanding Durability
Parts that may wear have high anti-wear performance through the use of strong surface-hardening overlay. For slurry that may cause extreme wear, the use of ultra-anti-wear chips can raise the anti-wear performance another level.

6 Anti-noise
A wide selection of anti-noise models and accessories are available.

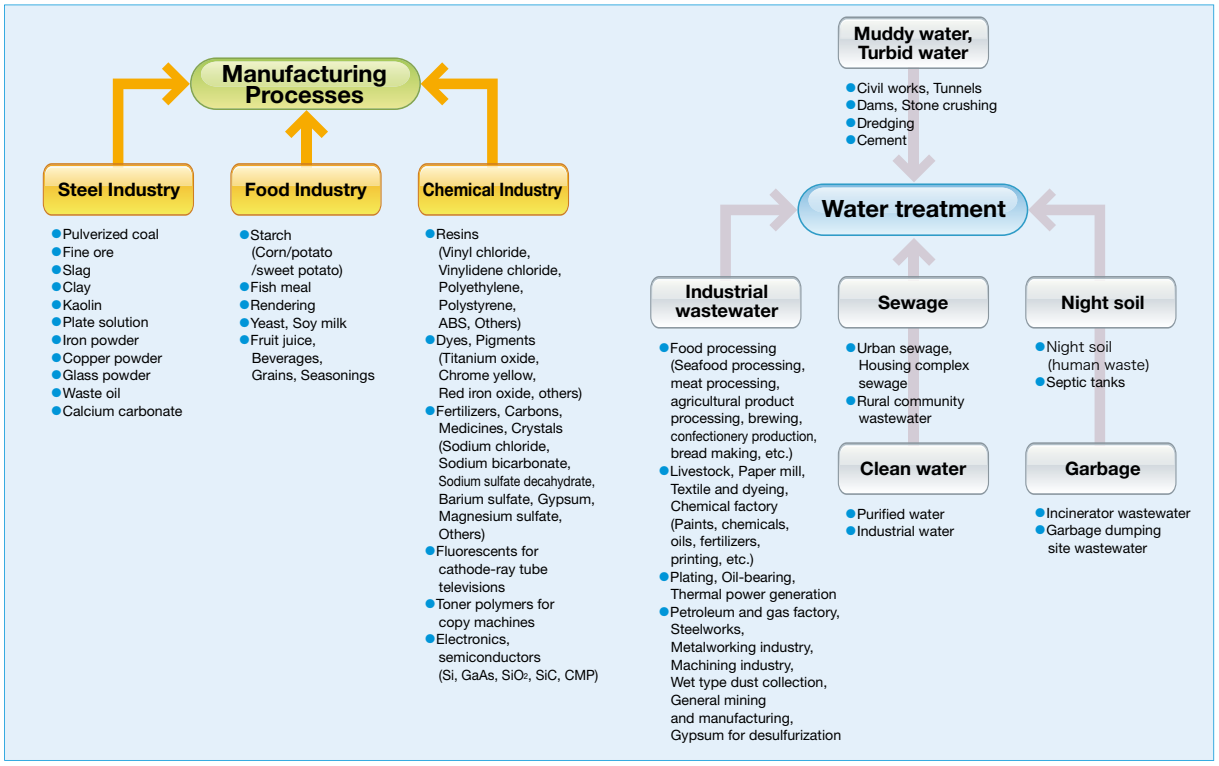
7 Safety
The safety device automatically starts working in the event of an overload during operations or a particle caught in the screw. Simultaneous alarms can notify operators about any problems.

8 Numerous Models
The products are manufactured at the newest facilities under strict quality management and have received praise for high quality. From Mini-Decanters to the Ultra Large type, from waste water to all types of slurry of manufacturing process, the product line-up includes a rich variety of models that can suit every application.



4 Applications

With its superior performance including a wide range of slurries that can be handled and large treatment volume through continuous operations, the IHI Screw Decanter Centrifuge is used in a large number of fields, centered around water treatment and manufacturing processes.

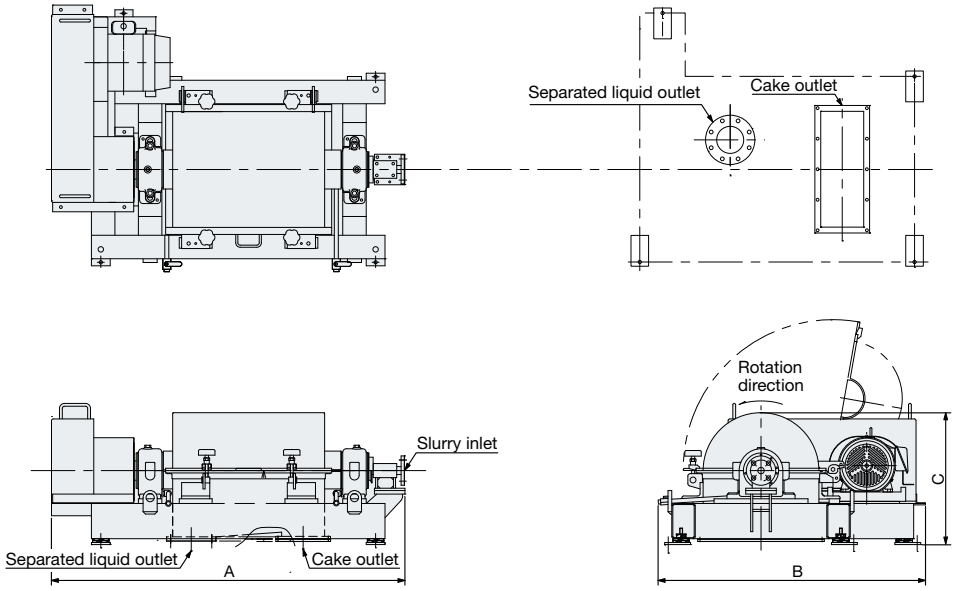


HS-L Type

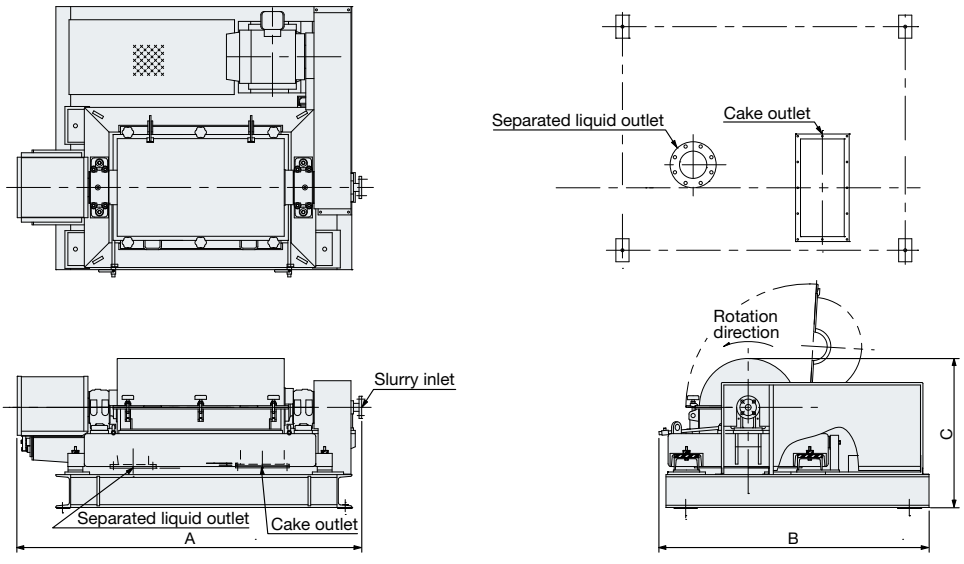
General-purpose type with high performance

Of all the Screw Decanter Centrifuges, the HS-L Type is the best for general purpose and is widely used in various fields.

Outline drawing (HS-204L, HS-205L, HS-255L)



Outline drawing (HS-324L or higher)



Specifications

Type	Normal capacity (m³/h)	Centrifugal force (G)		Dimension (mm)			Weight (kg)	Output (kW)	
		Normal	Maximum	A	B	C		Main drive motor	Lube oil unit
MD-10	0.6～0.9	2,000	2,000	1,260	940	420	250	2.2	—
HS-204L	1.0～1.5	2,000	3,500	1,500	1,030	560	390	3.7	—
HS-205L	1.5～2.5	2,000	3,500	1,635	1,060	560	410	3.7	—
HS-255L	2.5～3.5	2,000	3,500	1,870	1,380	560	390	3.7	—
HS-324L	3.0～4.0	2,000	3,500	2,100	1,440	700	1,030	11.0	—
HS-325L	4.0～6.0	2,000	3,500	2,300	1,440	700	1,160	15.0	—
HS-364L	3.0～5.0	2,000	3,500	2,150	1,890	830	1,200	15.0	—
HS-365L	5.0～8.0	2,000	3,500	2,380	1,950	830	1,440	22.0	—
HS-366L	8.0～12.0	2,000	3,000	2,690	1,950	830	1,700	30.0	—
HS-404L	4.0～6.0	2,000	3,500	2,520	2,000	870	1,970	22.0	—
HS-405L	7.0～10.0	2,000	3,500	2,780	2,000	870	2,260	30.0	—
HS-406L	10.0～15.0	2,000	3,000	3,120	2,000	870	2,820	30.0	—
HS-504L	6.0～10.0	2,000	3,500	3,050	2,380	1,040	3,435	30.0	—
HS-505L	10.0～16.0	2,000	3,500	3,400	2,380	1,040	3,840	45.0	—
HS-506L	16.0～23.0	2,000	3,000	3,830	2,380	1,040	4,350	55.0	—
HS-554L	8.0～12.0	2,000	3,000	3,500	2,700	1,080	4,070	45.0	0.40
HS-555L	13.0～19.0	2,000	3,000	3,860	2,700	1,080	4,750	55.0	0.40
HS-556L	19.0～28.0	2,000	3,000	4,330	3,000	1,080	5,150	55.0	0.40
HS-634L	10.0～15.0	2,000	3,000	3,980	3,000	1,330	5,850	55.0	0.75
HS-635L	17.0～25.0	2,000	3,000	4,390	3,000	1,330	6,500	75.0	0.75
HS-636L	25.0～37.0	2,000	2,600	4,920	3,000	1,330	7,200	90.0	0.75
HS-704L	13.0～19.0	2,000	2,600	4,430	3,350	1,480	8,100	75.0	0.75
HS-705L	20.0～31.0	2,000	2,600	4,880	3,350	1,480	8,900	90.0	0.75
HS-706L	31.0～47.0	2,000	2,600	5,470	3,500	1,480	10,500	110.0	0.75
HS-804L	17.0～25.0	2,000	2,600	5,060	3,500	1,790	11,700	90.0	0.75
HS-805L	27.0～40.0	2,000	2,600	5,740	3,500	1,790	12,900	110-132	0.75
HS-806L	40.0～60.0	2,000	2,600	6,420	3,500	1,790	15,100	132-160	0.75
HS-1005L	42.0～63.0	2,000	2,000	6,800	4,000	2,200	20,800	150-200	0.75
HS-1105L	51.0～76.0	2,000	2,000	7,500	4,200	2,300	25,000	180-250	0.75

Notes: 1. Normal capacity is based on settling performance standard for standard slurry (SS concentration=1.5-2.5%).
Treatment volume is different according to the slurry conditions (SS concentration, viscosity, particle size, or specific gravity, etc.), whether using flocculant or not, and desired performance (cake moisture content ratio, SS recovery ratio).
Furthermore, both the amount of solid (kg·DSS/h) and amount of slurry (m^3/h) should be considered when selecting the model type. Please ask IHI about features or applications.
2. Motor output for large types can be altered according to slurry conditions.

Performance The treatment volume and performance of centrifuges are different depending on the purpose of use (clarification, dehydration, concentration, sorting, etc.), slurry conditions (SS concentration, liquid viscosity, liquid and solid specific gravity, particle size of solids, etc.), whether using flocculant or not, and desired performance (SS recovery ratio, cake moisture content ratio).

Dehydration performance of sludge

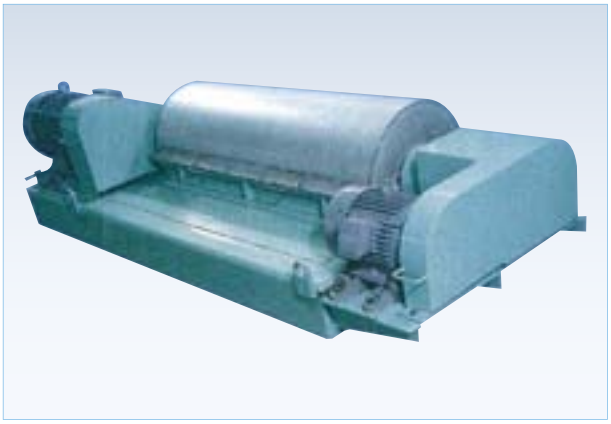
Types of sludge		Cake moisture content ratio	SS recovery ratio	Flocculant additive rate (For sludge solids)
Biological excess sludge	Sewage	76～83%	95～99%	0.5～1.2% C
	Night soil	80～85%	95～99%	0.6～1.6% C
	General factory	82～88%	95～99%	0.8～2.0% C
	Livestock	82～85%	95～99%	0.8～1.5% C
Plating sludge		70～85%	95～99%	0.2～0.5% A
Dye sludge		70～80%	95～99%	0.2～0.8% A, N
Paint factory supernatant sludge		75～85%	95～99%	0.5～0.5% N
Used paper sludge		60～75%	95～99%	0.1～1.0% A
Acid pickling sludge		70～80%	95～99%	0.2～0.5% A, N
Wet type dust collection sludge		60～75%	95～99%	0.3～0.5% A, N
Clean water sludge		70～80%	95～99%	0.1～0.5% A, N
Stone crushing sludge		30～50%	85～98%	0.0～0.4% A, N

C: Cationic, A: Anionic, N: Nonionic

IX-T Type

Energy saving, low noise, less space

Developed under the concept of "Gentle to the Earth", this is a light weight, low noise type slender-bodied decanter, requiring minimal installation space. It gives its best performance in the field of sewage treatment.



Features

1 Light weight, small installation space

We have succeeded in achieving 30% lighter weight and 40% less installation space compared to our regular types by creating an optimal design for the shape of the rotating unit, and casing size.

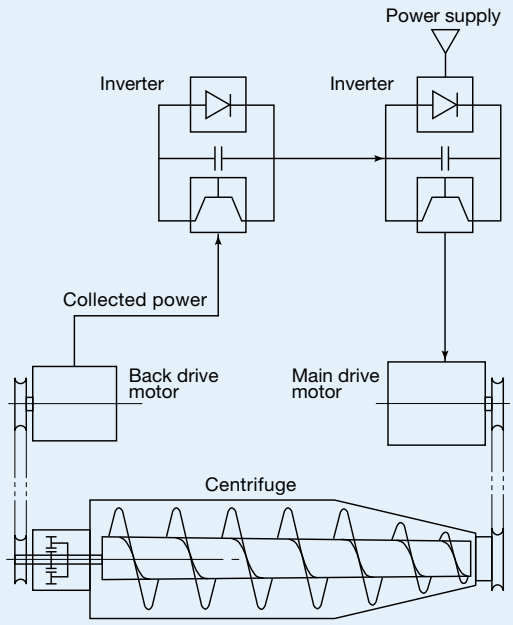
2 Low noise

By modifying the shape of the rotating part's cover, which has been a source of noise, we have realized 2 to 3 dB(A) less noise comparing with our normal machines.

3 Energy saving

IX-T Type adopts Inverters for the main drive and back drive units. This can bring you optimal G-Force and screw speed for your slurry by just turning the dial on the control panel. Also by connecting Inverters for the main drive motor and back drive motor, the back drive motor acts as generator and supplies the power to the main motor.

Electricity regeneration system



Energy-saving: The back drive motor installed as a gearbox generates electricity, which is used for driving the centrifuge.

Performance

		Human waste treatment			Rural community wastewater	Garbage landfill wastewater		Industrial wastewater
		High load treatment method Excess + precipitated	Septic tank sludge	Human waste debris removal	Activated excess sludge	Activated excess sludge	Flocculation sludge	Activated excess sludge
Flocculant additive rate (%/DS)		1.4~1.8	1.0~1.5	Without flocculants feed	1.0~1.5	1.0~1.5	1.5~2.0	1.0~1,5
Cake moisture content ratio (%)		83~85	80~85	70~80	84~85	84~85	84~85	84~85
SS recovery ratio (%)		95 or higher	95 or higher	50~70	95 or higher	95 or higher	95 or higher	95 or higher
Treatment volume (kg·DSS/h)	IX-18S	15	10	*2~3	10	10	15	10
	IX-18T	30	25	*3~5	25	25	30	25
	IX-25T	70	50	*7~9	50	50	70	50
	IX-32T	140	110	*12~15	110	110	140	110
	IX-36T	180	140	*16~20	140	140	180	140
	IX-40T	220	170	*20~25	170	170	220	170
	IX-50T	360	270	*30~38	270	270	360	270

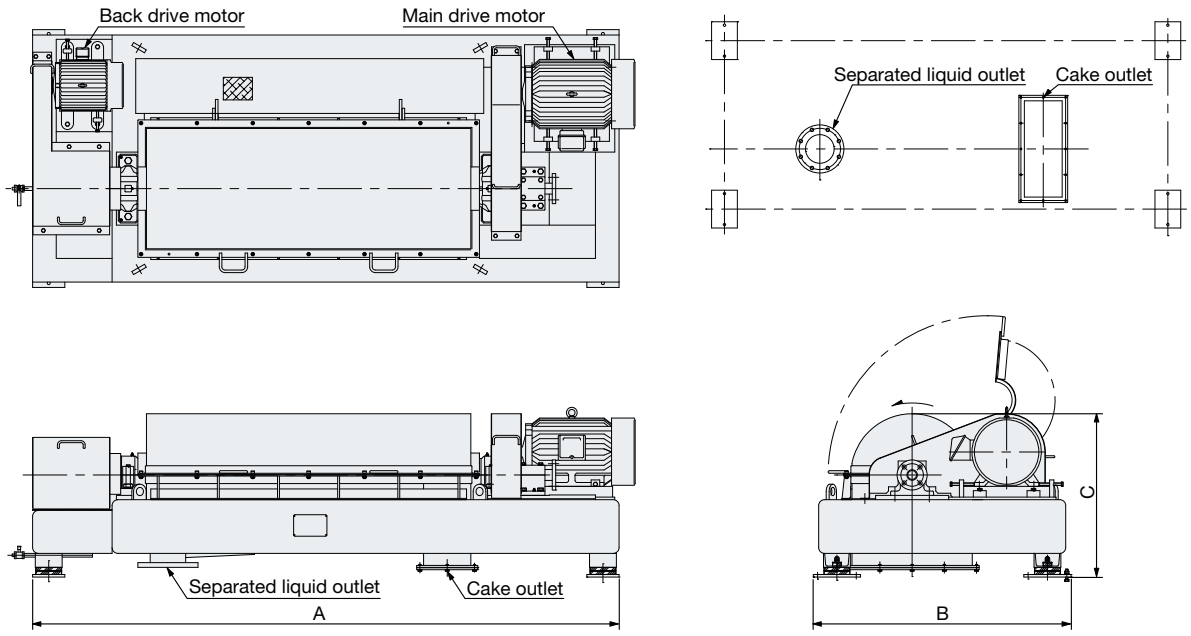
*The treatment volume for human waste debris removal is displayed in m^3/h.

Specifications

Type	Normal capacity (m³/h)	Centrifugal force (G)	Output (kW)		Weight (kg)	Dimension (mm)		
			Main drive motor	Back drive motor		A	B	C
IX-18S	0.7～1	2,000	3.7	0.75	300	1,250	800	400
IX-18T	1.5～2	2,000	3.7	0.75	400	1,550	800	400
IX-25T	3.5～4.5	2.000	5.5	1.5	700	2,000	900	500
IX-32T	7～9	2,000	11	3.7	1,100	2,500	1,050	630
IX-36T	9～12	2,000	15	3.7	1,500	2,750	1,200	750
IX-40T	11～16	2,000	18.5	5.5	2,200	3,000	1,300	800
IX-50T	18～25	2,000	30	7.5	3,500	3,550	1,500	900

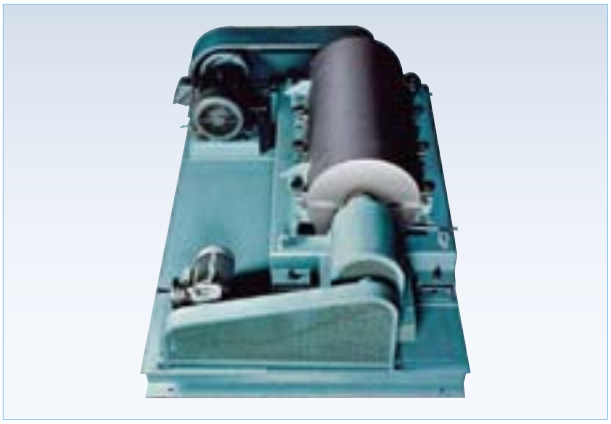
1. Motor output can be altered according to slurry conditions.
2. The specifications may be modified without advanced notice. Please confirm the details with IHI.

Outline drawing



HS-DP Type

Energy saving with a deep pool-shaped rotor. The back drive system is fitted as standard.

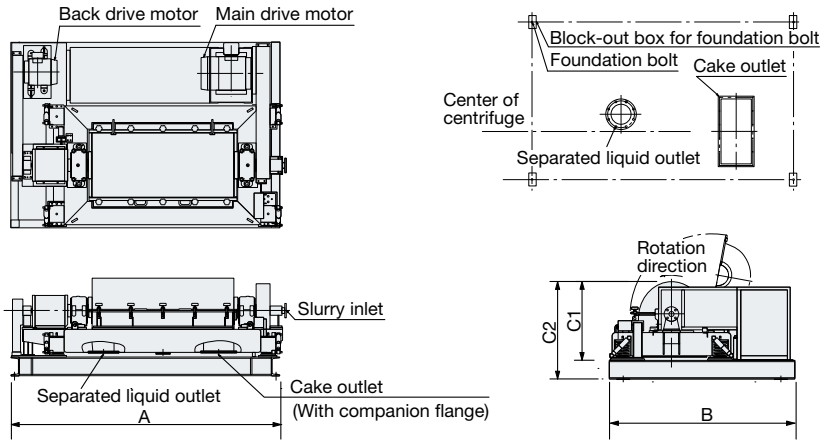


Specifications

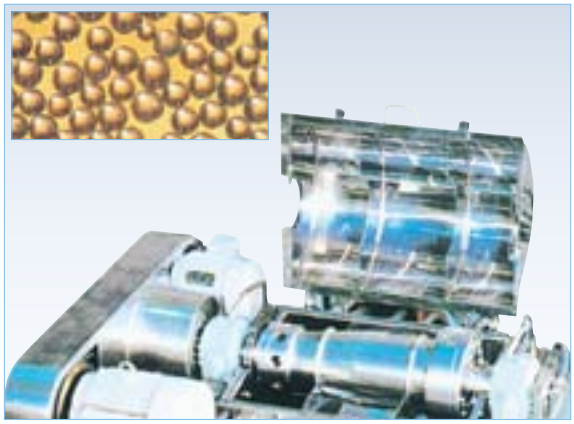
Type	Normal capacity (m³/h)	Centrifugal force (G)	Output (kW)			Weight (kg)	Dimension (mm)			
			Main drive motor	Back drive motor	Lube oil unit	with common bed	A	B	C_1	C_2
HS-40DP	1.5–2.5	2,000	3.7	0.75	–	* 720	1,675	1,320	573	–
HS-100DP	3–4	2,000	5.5	1.5	–	* 890	1,865	1,500	600	–
HS-120DP	4–6	2,000	7.5	1.5	–	* 1,000	2,075	1,500	600	–
HS-200DP	3–5	2,000	11	2.2	–	1,750	2,260	1,600	–	930
HS-300DP	5–8	2,000	11	2.2	–	1,900	2,460	1,600	–	930
HS-320DP	7–11	2,000	11	2.2	–	2,100	2,730	1,600	–	930
HS-340DP	4–6	2,000	11	3.7	–	2,000	2,580	1,950	–	986
HS-360DP	6–10	2,000	15	3.7	–	2,200	2,510	1,950	–	986
HS-380DP	9–14	2,000	18.5	3.7	–	2,400	2,810	1,950	–	986
HS-400DP	6–8	2,000	15	3.7	–	2,600	2,710	2,000	–	1,060
HS-500DP	8–12	2,000	18.5	3.7	–	3,000	2,970	2,000	–	1,060
HS-520DP	11–17	2,000	18.5	3.7	–	3,300	3,310	2,000	–	1,060
HS-600DP	9–13	2,000	22	5.5	–	4,500	3,280	2,300	–	1,260
HS-700DP	13–19	2,000	30	5.5	–	4,900	3,630	2,300	–	1,260
HS-720DP	18–27	2,000	30	5.5	–	5,500	4,030	2,300	–	1,260
HS-760DP	15–23	2,000	37	7.5	0.4	5,700	4,130	2,380	1,129	1,300
HS-800DP	20–30	2,000	55	7.5	0.75	11,600	4,785	3,065	1,390	1,720

1. Normal capacity is based on the assumption of dehydration of mixed sludge (SS concentration=1.5-2.5%), using the standard nitrogen removal method. Treatment volume is different according to the type of sludge, the slurry conditions (SS concentration, viscosity, particle size, or specific gravity, etc.), whether using flocculant or not, and desired performance (cake moisture content ratio, SS recovery ratio). Please ask IHI about features or applications.
2. Motor output can be altered according to slurry conditions. * = In case of no common bed

Outline drawing



RS/RW Type



Exclusive dehydrator for synthetic resin

RS Type High Dehydration Resin Exclusive Screw Decanter

IHI's original unique rotor reduces the water content of separated matter by 5-10% compared to the previous general purpose machines.

RW Type Resin Washing Screw Decanter

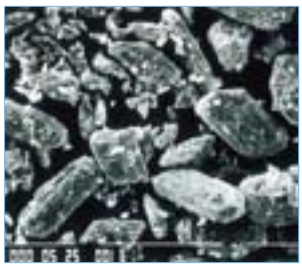
Through the use of a unique mechanism, the product can be cleaned and dehydrated.

Specifications

Type		Normal capacity (kg·DSS/h)	Centrifugal force (G)		Dimension (mm)			Weight (kg)	Output (kW)	
For resin dehydration	For resin dehydration and washing		Normal	Maximum	Length	Width	Height		Main drive motor	Lube oil unit
HS-204RS(HS-10RS)	HS-204RW(HS-10RW)	800	2,000	3,500	1,500	1,030	560	390	5.5	–
HS-254RS	HS-254RW	1,200	2,000	3,500	1,710	1,380	590	600	11	–
HS-324RS(HS-20RS)	HS-324RW(HS-20RW)	2,000	2,000	3,500	2,100	1,440	700	850	22	–
HS-364RS	HS-364RW	2,600	2,000	3,500	2,160	1,950	830	1,000	30	–
HS-404RS(HS-40RS)	HS-404RW(HS-40RW)	3,200	2,000	3,500	2,520	2,000	870	1,730	45	–
HS-504RS(HS-60RS)	HS-504RW(HS-60RW)	5,000	2,000	3,500	3,050	2,380	1,040	3,120	75	–
HS-554RS	HS-554RW	6,000	2,000	3,000	3,500	2,700	1,080	3,700	90	0.4
HS-634RS(HS-80RS)	HS-634RW(HS-80RW)	8,000	2,000	3,000	3,980	3,000	1,330	5,400	132	0.75

1. Motor output may be altered according to the centrifugal force, slurry concentration, and treatment volume.
2. To provide variability in the differential speed of the screw, a variable differential speed device can be added.
3. Depending on the installation conditions, an explosion protection structure and airtight structure can be added.
4. Normal capacity is approximate treatment volume of chloroethylene for general purpose.

GS Type



Exhaust Gas Desulfurizer Continuous Centrifuge for Gypsum Dehydration

The tapered part of the machine consists of a primary dehydration part with an acute angle and a secondary dehydration part with an obtuse angle, enabling high dehydration.
The use of anti-wear chips on the edges of screw blades and anti-wear ceramics on the inner outlet chamber, inner outlet, and solid outlet add considerable improvements for better durability.

Specifications

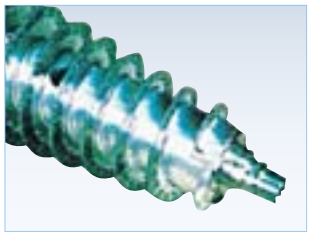
Type	Normal capacity (kg·DSS/h)	Dimension (mm)			Main drive motor (kW)	Weight (kg)
		Length	Width	Height		with common bed
HS-324GS	800–1200	2,170	1,600	912	11–15	1,430
HS-364GS	1.000–1,600	2,230	2,000	1,055	15–22	2,100
HS-404GS	1,300–1,900	2,616	2,000	1,062	18.5–30	2,600
HS-504GS	2.000–3,000	3,410	2,500	1,305	37–55	4,500
HS-554GS	2.400–3,600	3,675	2,700	1,305	45–75	5,700
HS-634GS	3,000–4.800	4,135	2,850	1,629	55–90	7,800
HS-704GS	4,000–5,500	4,385	2,920	1,629	55–110	9,500
HS-804GS	5,000–7.500	5,430	3,650	*1,780	75–132	*9,600

Note: Treatment volume is for gypsum byproduct when using an ash separation method desulfurization system with a coal-fired boiler or when using a desulfurization system with a heavy oil-fueled boiler. Treatment volume is different depending on the slurry conditions (SS concentration, particle size, fly ash, etc.). Please ask IHI about features or applications. * = In case of no common bed

MW Type

Anti-wear screw decanter for powerful treatment of muddy and turbid water

MW Type can be used for high wearing slurry, such as turbid water, muddy water or dredging slurry.


Inner screw with ultra anti-wear chip


Ceramic liner


Ceramic bushing

Features

1 Greatly improves anti-wear performance, while the compact size allows the installation space to be smaller.

2 Abrasive slurry can be processed quickly and at high volume.

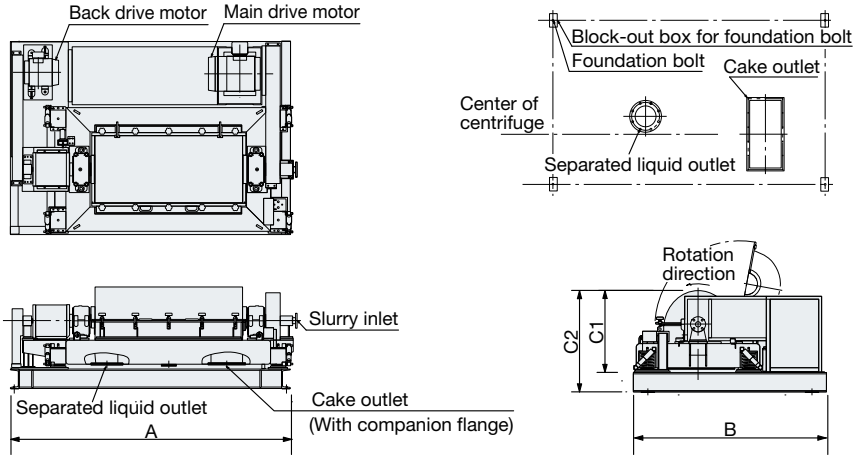
3 By equipping a variable differential speed device, changes to the slurry condition can be handled quickly.

Specifications

Type	Normal capacity (m³/h)	Normal centrifugal force (G)	Dimension (mm)				Weight (kg)	Main drive motor (kW)	Back drive motor (kW)	Lube oil unit (kW)
			A	B	C_1	C_2	with common bed			
HS-200MW	3–5	900–1300	1,550	1,320	570	730	850	3.7	1.5	–
HS-250MW	6–8	900–1300	1,810	1,500	600	860	1,100	5.5	2.2	–
HS-300MW	9–13	900–1300	2,460	1,600	700	930	1,900	15	3.7	–
HS-360MW	12–17	900–1300	2,500	1,950	830	1,060	2,400	22	5.5	–
HS-400MW	15–21	900–1300	2,970	2,000	870	1,060	3,000	30	7.5	–
HS-500MW	23–32	900–1300	3,630	2,300	1,040	1,260	4,900	45	11	–
HS-550MW	28–39	900–1300	4,080	2,300	1,080	1,300	5,700	55	15	0.4
HS-600MW	37–51	900–1300	4,500	3,050	1,390	1,720	11,600	75	18.5	0.75
HS-600MWC	55–75	900–1300	5,080	3,050	1,390	1,720	13,000	90	22	0.75
HS-800MW	60–80	900–1300	5,560	3,260	1,740	2,120	17,500	110	30	0.75
HS-800MWC	85–120	900–1300	6,240	3,260	1,740	2,120	20,000	132	37	0.75

Note: Normal capacity and normal centrifugal force are the examples when the specific gravity of bentonite mud is lowered when the underground continuous wall construction method is applied.
Motor output can be altered according to slurry conditions.

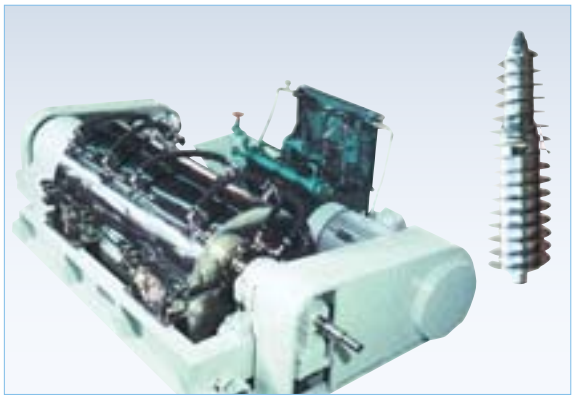
Outline drawing



LS Type

Sanitary type equipped with a washing device

IHI's original CIP automatic washing device is fitted as standard.
It is used in a wide range of fields, including food, medicines, and fine chemicals.



Features

1 Buffing finish for wet parts

2 Automatic discharging of rest liquid inside the outer bowl

3 Reverse washing of the inner screw

4 Automatic washing inside the casing

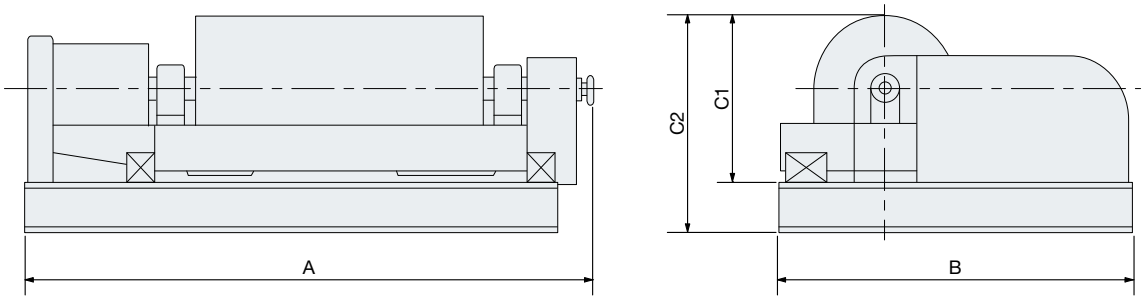
5 Automatic washing of outer surface of the rotor

Specifications

Type	Normal capacity (m³/h)	Centrifugal force (G) (MAX)	Output (kW)			Weight (kg)	Dimension (mm)			
			Main drive motor	Back drive motor	Lube oil unit	with common bed	A	B	C_1	C_2
HS-204LS	1.0–1.5	3,500	3.7	0.75	(0.4)	*670	1,545	1,320	573	–
HS-205LS	1.5–2.5	3,500	3.7	0.75	(0.4)	*720	1,675	1,320	573	–
HS-255LS	2.5–3.5	3,500	5.5	1.5	(0.4)	*890	1,865	1,500	600	–
HS-324LS	3–4	3,500	11	2.2	(0.4)	1,750	2,260	1,600	–	930
HS-325LS	4–6	3,500	15	3.7	(0.4)	1,900	2,460	1,600	–	930
HS-365LS	5–8	3,500	22	5.5	(0.4)	2,200	2,510	1,950	–	986
HS-366LS	8–12	3,000	30	5.5	(0.4)	2,400	2,810	1,950	–	986
HS-405LS	7–10	3,500	30	5.5	(0.4)	3,000	2,970	2,000	–	1,060
HS-406LS	10–15	3,000	30	5.5	(0.4)	3,300	3,310	2,000	–	1,060
HS-505LS	10–16	3,500	45	7.5	(0.4)	4,900	3,630	2,300	–	1,260
HS-506LS	16–23	3,000	55	7.5	(0.4)	5,500	4,030	2,300	–	1,260

* = In case of no common bed

Outline drawing

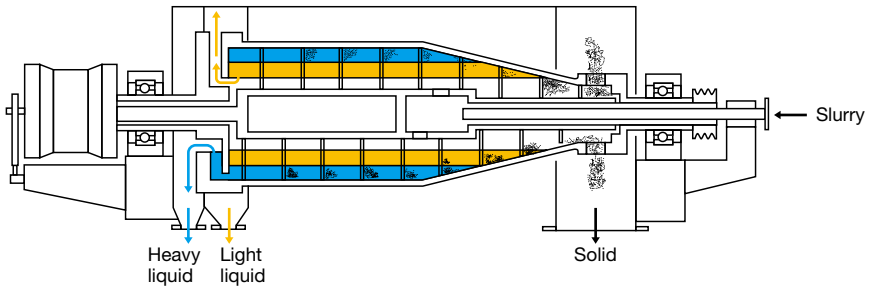


TP Type

Three-phase separation of oil, water and solid matter in one step.

One unit can perform three-phase separation of oil, water and solid matter.
This greatly contributes to energy saving in processes and improved economic efficiency.

Cross section diagram

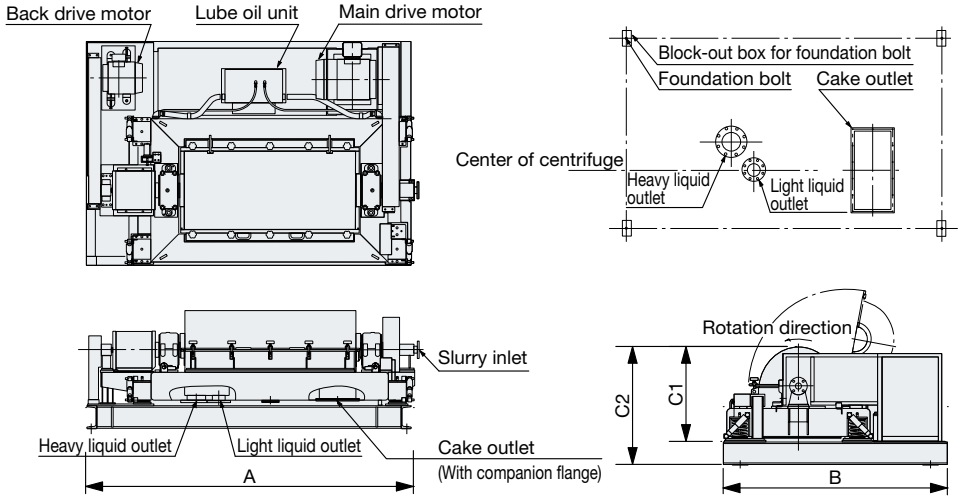


Specifications

Type	Normal capacity (m³/h)	Maximum centrifugal force (G)	Dimension (mm)				Weight (kg)	Output (kW)	
			A	B	C_1	C_2	with common bed	Main drive motor	Lube oil unit
HS-255TP (HS-25TP)	1.5–2.5	3,500	1,870	1,380	600	–	*660	5.5	(0.4)
HS-324TP (HS-34TP)	2–3	3,500	2,100	1,440	700	930	1,350	11	(0.4)
HS-325TP (HS-35TP)	3–4	3,500	2,300	1,440	700	930	1,500	15	(0.4)
HS-365TP	4–5	3,500	2,390	1,950	830	1,050	2,000	22	(0.4)
HS-366TP	6–8	3,000	2,700	1,950	830	1,050	2,300	30	(0.4)
HS-405TP (HS-45TP)	5–7	3,500	2,780	2,000	870	1,060	2,900	30	(0.4)
HS-406TP (HS-46TP)	7–10	3,000	3,120	2,000	870	1,060	3,600	30	(0.4)
HS-505TP (HS-55TP)	7–11	3,500	3,400	2,380	1,040	1,260	5,000	45	(0.4)
HS-506TP (HS-56TP)	11–16	3,000	3,830	2,380	1,040	1,260	5,500	45	(0.4)

1. Treatment volume above is in the case of press water for fish meal, and can be altered according to the liquid treated.
2. Motor output can be altered according to the adopted centrifugal force. * = In case of no common bed

Outline drawing



HV Type

Sealed and pressure-tight

A pressure-tight and airtight decanter.
It can be used for dehydration in various fields, including for hazardous materials such as solvents or poisonous substances.

*The image shows a model with included options.

Features

1 Non-contact shaft seal method

Due to the non-contact gas seal, there is no loss of power from the seal and contamination will not occur. Furthermore, the non-contact seal ensures a long lifespan. Also, flushing liquid, necessary for mechanical type contact seal methods and the refrigeration or circulation equipment needed for it are not required.
It uses an extremely low amount of seal gas as well.

2 Simple and compact design

Because it utilizes a horizontal format, it offers a high degree of freedom when planning plant equipment layout.

3 Original seal embedded structure

By using an original seal embedded structure, the total length has been reduced to the length of our standard machines and through this, it is possible to operate it with high centrifugal force.

Specifications

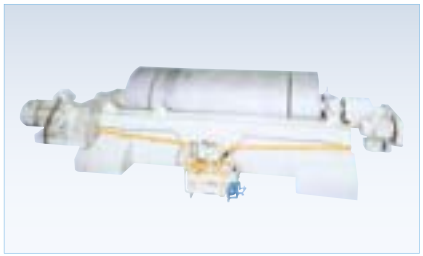
Type	Normal capacity (m³/h)(1)	Centrifugal force (G) (MAX)	Normal design pressure	Normal design temperature	Output (kW)(2)		Dimension(3)			Weight (kg)(3)
					Main drive motor	Back drive motor	A	B	C	
HS-206L-HV	2	3,000	0.1MPaG	120℃	5.5	2.2	1,970	1,250	580	800
HS-256L-HV	3	3,000	0.1MPaG	120℃	7.5	3.7	2,850	1,600	1,200	2,000
HS-366L-HV	10	3,000	0.1MPaG	120℃	37	11	3,150	2,200	1,200	4,400

Note 1: The normal capacity stands only as a rough guide, and will largely change depending on the slurry condition of your plan.
Note 2: Motor output can be altered according to slurry conditions.
Note 3: Weight and dimension may differ according to specifications.

Outline drawing

Centrifugal Thickener ISC-H Type

Energy-saving and thickening without the need for flocculants



Based on IHI's long-term centrifugal and dehydration technology research and our achievements, the ISC-H Type has been developed as a centrifugal thickener. Compared to the former methods, energy saving efficiency is much greater for both power consumption and motor output. Incredible treatment performance can be achieved in a short period of time. The amount of concentration can be freely adjusted. The product is manufactured at the newest facilities under strict quality management for optimum reliability.

Applications

●Sewage and mini sewage water treatment plant

Raw sludge, mixture sludge, activated excess sludge, and others (tertiary treatment sludge, etc.)

●Human waste treatment

Activated excess sludge, digested sludge, mixture sludge (digested sludge + activated excess sludge), septic tank sludge, and others (tertiary treatment sludge, etc.)

●Others

Various industrial wastewater treatment sludge, drinking water treatment sludge, process liquid

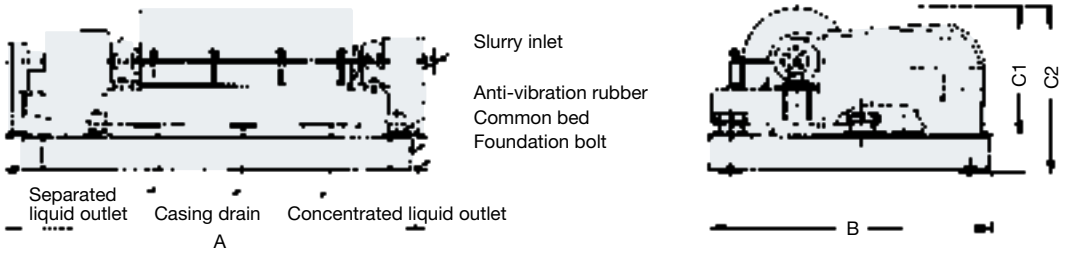
Specifications

Type	Normal capacity (m^3/h)		Maximum centrifugal force (G)	Output (kW)			Weight (kg)	Dimension (mm)			
	Sewage excess sludge	Human waste excess sludge		Main drive motor	Back drive motor	Lube oil unit	with common bed	A	B	C_1	C_2
ISC-1H	1.5	1.2	2,000	2.2	0.75	–	*720	1,675	1,320	573	–
ISC-2H	4	3	2,000	3.7	0.75	–	*820	1,865	1,380	594	–
ISC-2HC	5.5	4	2,000	3.7	0.75	–	*1,000	2,080	1,380	594	–
ISC-3H	6	5	2,000	5.5	1.5	–	1,900	2,135	1,600	707	929
ISC-3HC	9	7	2,000	7.5	1.5	–	2,100	2,400	1,600	707	929
ISC-4H	10	8	2,000	11	2.2	–	3,000	2,725	2,000	834	1,056
ISC-4HC	14	11	2,000	15	2.2	–	3,300	3,070	2,000	834	1,056
ISC-5H	16	12	2,000	18.5	3.7	–	5,200	3,450	2,300	1,031	1,256
ISC-5HC	22	17	2,000	22	3.7	–	5,500	3,880	2,300	1,031	1,256
ISC-6H	28	21	2,000	37	5.5	0.75	11,000	4,600	2,900	1,400	1,650
ISC-7H	36	27	2,000	45	7.5	0.75	*8,200	5,000	3,200	1,600	–
ISC-8H	50	38	2,000	75	11	0.75	*11,400	5,500	3,600	1,800	–
ISC-9H	70	50	2,000	110	15	0.75	*15,000	7,200	3,800	2,000	–
ISC-11H	110	80	2,000	150	22	0.75	*25,000	8,700	4,200	2,300	–
ISC-13H	170	130	1,800	250	30	1.5	*38,000	10,000	4,700	2,700	–

1. Normal capacity of sewage excess sludge is under the conditions of: without flocculants feed, SS concentration treatment = 0.6-0.8%, thickened sludge concentration = 4% or higher, SS recovery ratio = 90% or higher. Treatment volume will be 1.2 times as great when SS recovery ratio is 85% and 1.3 times when SS recovery ratio is 80%.
2. Normal capacity of human waste excess sludge is under the conditions of: the sludge is treated with high load treatment, without flocculants feed, SS concentration of treatment matter = 1.5-2.0%, thickened sludge concentration = 4-5%, SS recovery ratio = 90% or higher. Treatment volume will be 1.2 times as great when SS recovery ratio is 85% and 1.3 times when SS recovery ratio is 80%.
3. The power of the main motor drive and back drive motor is when the inverter drive is used. It can be altered according to the type of drive, adopted centrifugal force, and treatment volume.

* = In case of no common bed

Outline drawing

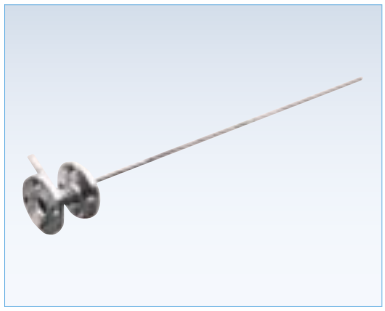


Increased Functionality, Increased Efficiency
Screw Decanter Options

Various peripheral devices are assembled to improve functionality and handle a wide range of slurry.

(A) Lube oil unit

This device contains an oil tank, cooler, and feed oil pump in a compact package to forcibly lubricate bearings.

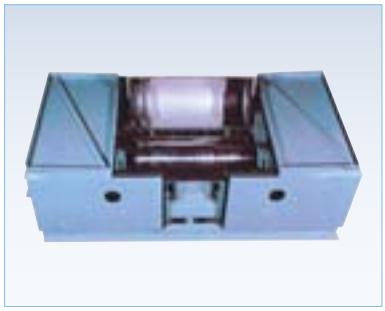


(B) Internal flocculant feed pipe

This pipe is used to feed the flocculant into the centrifuge.
The internal flocculant feed method can be used depending on the slurry condition.

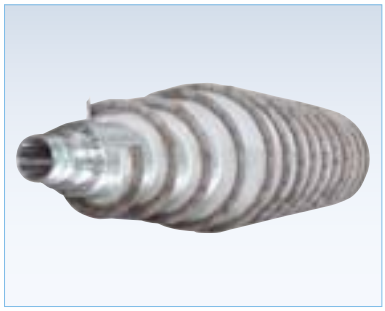
(C) Installation stand

The unit and motor can both rest on this steel framed stand with legs. Installation can be performed easily, and it is also convenient for piping the separated liquid and removing solids.



(C) Noise-proof cover

This compact cover combines a common baseplate and noise-proof box. It can reduce noise by about 5 dB(A).



(D) Stellite chips

The anti-wear performance can be improved by installing these onto the blades of the inner screw.

(E) Ultra-anti-wear chips

For slurry that may cause extreme wear, installing ultra-anti-wear chips made of cemented carbide onto the blades of the inner screw can further improve the anti-wear performance.

(F) Flexible joints

Flexible joints can be installed to the slurry supply inlet, separated liquid outlet, and solid outlet to prevent device vibrations from transferring to the pipes.

(G) Skimming structure

This can suppress foam in the separated liquid.

PD Dehydrator

*PD stands for Piled Disc.

Its basic principle is gravity filtration. Because of its low vibration, low noise, low odor and energy saving performance it is gentle for the environment and also your workplace.
From general drainage to oil containing sludge at food factories or slaughterhouses etc., excellent performance is assured.

IHI develops the industry's largest model with a width of 2m

Based on IHI's long-term fundamental technology research, the world's largest PD Dehydrator has been added to the lineup. The PD Dehydrator can treat large amounts of sludge, which has never been done by a single machine before, and it greatly contributes to smaller space, energy saving, and reduction in required accessories.

Lower power

IHI's original new filter reduces the amount of power required to drive the filter.
The total power for the dehydrator is also extremely small, which greatly contributes to energy saving.

Safety device uses torque limiter methods (Note 1)

When a massive load is placed on the filter, torque limiter methods protect the drive device.
The torque limiter can easily be reset if the overload is removed. Unlike a Charpin system torque clutch, this method does not require complicated work, such as exchanging parts.

Note 1: Excluding PD-250II Type.

Equipped with a filter reversal mechanism (Note 2)

The filter can reverse rotation with a single switch. This makes maintenance and control simple.

Note 2: For PD-250II Type to PD-1000II Type only.

Circular flocculation tank

The flocculation tank is circular, so compared to rectangular tanks, there is efficient agitation without deposits for easy care.

1 Features of the PD Dehydrator

Oil-containing wastewater dehydration

Food manufacturers often see sludge with large amounts of oil, such as flotation scum or kitchen wastewater. The PD Dehydrator safely dehydrates this type of sludge without clogging. Using the basic principle of separation through filtering, sludge can be dehydrated without settling.

Less noise/vibration/odor/stench

The rotation speed for the filter is extremely slow at less than 1 rpm, so there is hardly any vibration or noise. Also, since separation and dehydration is performed in an airtight box, there are no odors, stenches, or scattered liquids.

Easy to install

The flocculation tank and washing water pump are packaged with the main unit for easy installation. Since there is hardly any vibration, there is no need for special foundation work, either.

Easy & fully automatic operation

Operations are fully automatic, requiring very little manpower. The control panel is a touch panel for easy operations that make setting and changing operating conditions easy.

Easy maintenance

The filter is composed of stainless discs, and since filter cloths are not used, maintenance is easy.

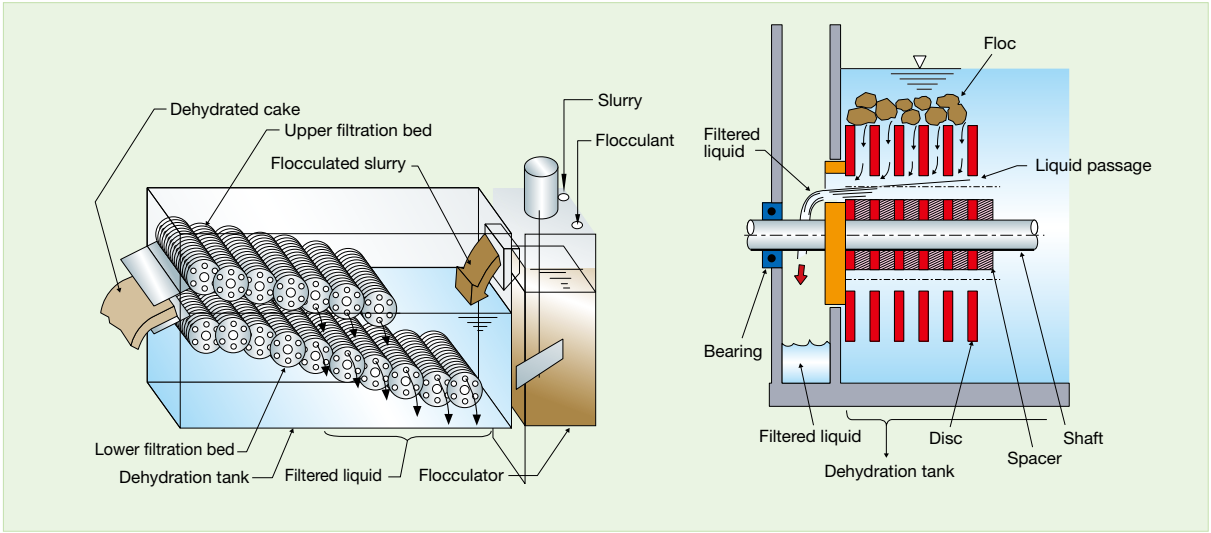
Energy-saving

The filter rotates at slow speed, requiring only a touch of drive power.

Less cleaning water

The filter constantly cleans itself to prevent clogging. Washing occurs intermittently, so little washing water is required.

2 Principle of PD Dehydrator



Separation and dehydration through gravity filtration

The basic principle is gravity filtration.
The action of gravity performs filtration, so there is no need for the power from pressurizers or vacuums.
The piled disk assembly consists of spacers and many thin discs made from wire mesh and filter that are piled together. Multiple cylindrical filters are inserted into the dehydration tank to maintain a large filtration bed area.
The floc is captured on the filter as cake, while liquids run through the gaps between the thin discs, where the liquid is separated, collected, and expelled through the filtered liquid outlet.

Auto-renewal of the filtration surface through cake removal

The floc accumulated on the filter is automatically removed by gently rotating the filter, and then it is transferred in the direction of the dehydrated cake outlet.
In this manner, the filter surface is constantly renewed, which guarantees a channel for the liquid and maintains an efficient filtration rate.

Dehydration through draining and consolidation

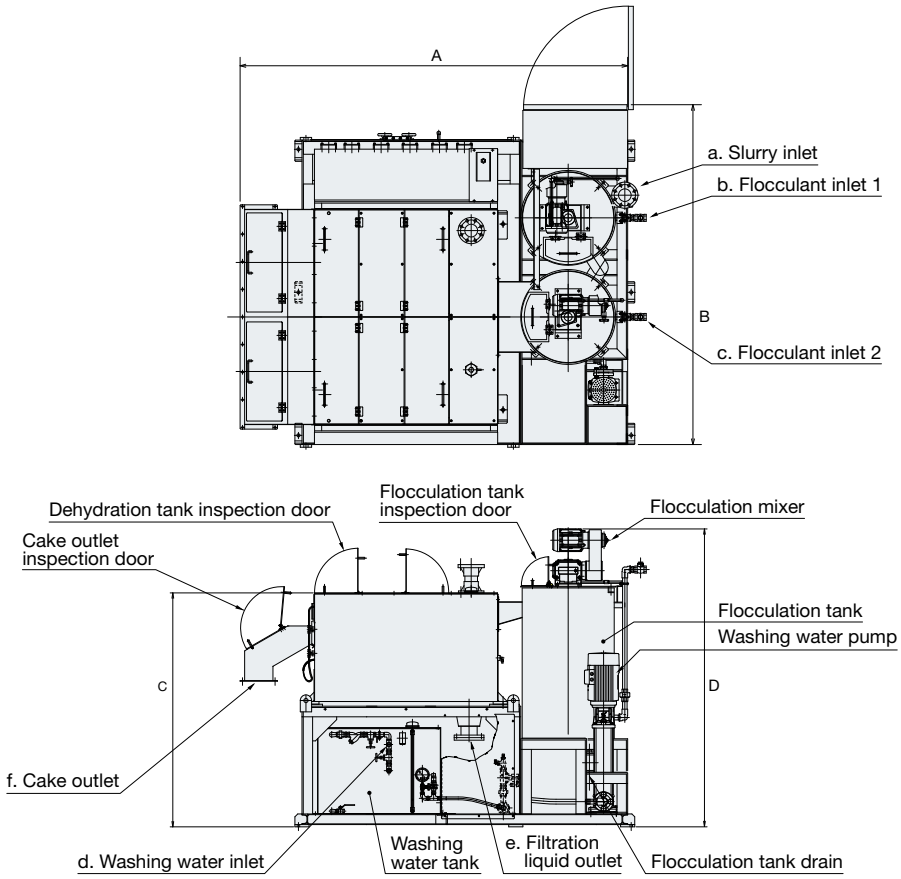
The filters are gently rotated in a fixed direction, the cake created from coagulated floc is transferred towards the cake outlet, and finally it is removed from the surface of the water and the water content of the cake is lowered through draining. The number of rotations for the filter near the cake outlet is significantly lower, which causes consolidation in the cake and further promotes dehydration. As a result, the cake that has been dehydrated through both draining and consolidation is pushed in the direction of the outlet.

Cleaning the filter

Filters scrape clean the surfaces of other filters, constantly renewing the filter surfaces. In order to ensure cleanliness, pressurized water sprays the filters clean at fixed time intervals, thus removing clogs in the filter paths and maintaining filtration ability.

PD-250II - PD-2000II

Overall outline drawing



Overview of specifications

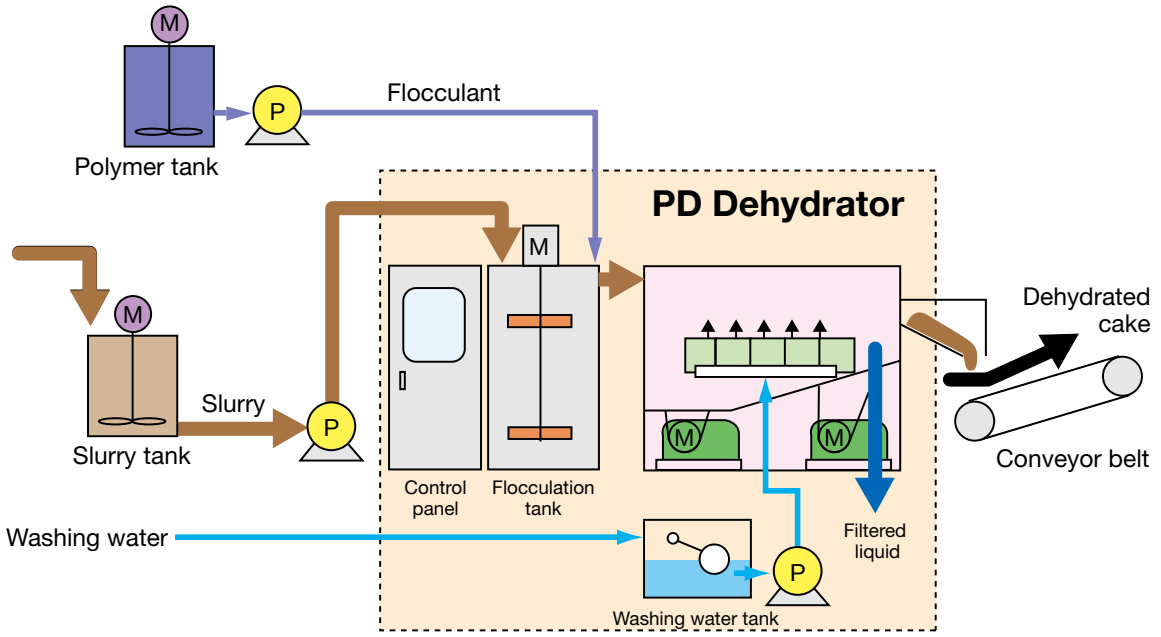
Type	Width (mm)	Dimension (mm)				Output (kW)			Weight (ton) (when dry)	Washing water (m^3/day) (Note 1)
		A	B	C	D	Drive unit	Mixer	Washing water pump		
PD-250II	250	2647	1035	1540	1845	0.4	0.2	1.1	2.00	1.0～1.5
PD-500II	500	2647	1120	1540	1845	0.4	0.2	1.1	2.45	1.0～1.5
PD-750II	750	2647	1230	1540	1930	0.6	0.4	2.2	2.85	2.0～2.5
PD-1000II	1000	2647	1480	1540	1930	0.6	0.4	2.2	3.10	2.0～2.5
PD-1500II	1500	2737	2400	1652	2150	1.15	0.75×2	3.0	5.40	3.5～4.0
PD-2000II	2000	2737	2650	1652	2150	1.15	0.75×2	3.0	6.50	3.5～4.0

Note 1: The volume of washing liquid is for six minutes every hour of ten hours in one day.

Connecting

Type	Slurry inlet	Flocculant inlet 1	Flocculant inlet 2	Washing water inlet	Filtered liquid outlet	Flange size of cake outlet
	a	b	c	d	e	f
PD-250II	25A	Rc1/2	Rc1/2	Rc3/4	80A	318x264mm
PD-500II	25A	Rc1/2	Rc1/2	Rc3/4	100A	568x264mm
PD-750II	40A	Rc1/2	Rc1/2	Rc3/4	100A	818x264mm
PD-1000II	40A	Rc1/2	Rc1/2	Rc3/4	100A	1068x264mm
PD-1500II	80A	Rc1	Rc1	Rc3/4	100A	1584×264mm
PD-2000II	80A	Rc1	Rc1	Rc3/4	100A	2084×264mm

Flow sheet for PD Dehydrator facilities



Note) Inside the broken line is packaged

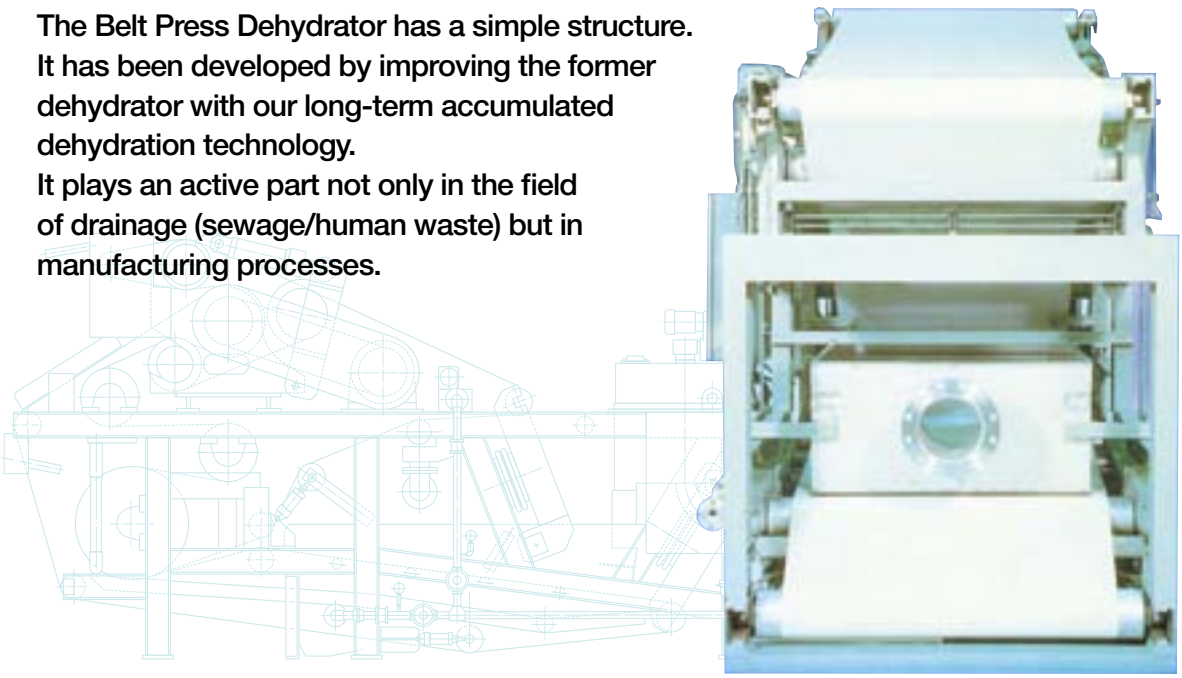
Treatment performance

Field	Sludge name	SS concentration (%)	Solid treatment volume (kg·DSS/h/m)	Polymer dosage per DSS (%)	Cake moisture content ratio (%)	SS recovery ratio (%)
Sewage	Sewage mixed sludge	1.0～2.5	70～90	0.5～1.0	70～78	95 or higher
	Sewage digested sludge	1.5～2.5	70～90	1.0～1.5	78～84	98 or higher
Night soil	Human waste septic tank sludge	0.5～1.0	70～110	1.0～1.5	78～83	98 or higher
	Human waste excess sludge	1.0～2.0	60～90	1.0～1.5	80～85	95 or higher
	Human waste mixed sludge (biological + precipitated)	1.0～2.0	50～70	1.0～1.5	80～85	95 or higher
Food	Packaged lunch factory mixed sludge (excess + flotation)	1.5～2.5	40～60	Anion: 0.5 Cation: 1.0	77～82	95 or higher
	Packaged lunch factory excess sludge	1.5～2.5	40～60	Anion: 0.5 Cation: 1.0	77～82	95 or higher
	Confectionery excess sludge	1.5～2.0	60～70	Anion: 0.5 Cation: 1.0	82～85	95 or higher
	Drink factory excess sludge	1.5～2.0	40～60	1.5～2.0	82～85	95 or higher
	Ham manufacturing factory mixed sludge (excess + flotation)	1.5	60	1.5～2.0	81～83	95 or higher
	Pig manure excess sludge	1.5	60～70	1.0～1.5	83～85	95 or higher
	Broiler machining factory excess sludge	1.5	60～70	Anion: 0.5 Cation: 1.0	84～86	90 or higher
	Slaughterhouse excess sludge	1.5～2.0	80～100	0.5	82～85	95 or higher
	Slaughterhouse mixed sludge (excess + flotation)	2.7	100～120	Anion: 0.1 Cation: 0.5	71～78	95 or higher
	Hotel kitchen wastewater flotation sludge	1.0～2.0	50～60	Anion: 0.5 Cation: 1.0	72～85	95 or higher
	Airport wastewater excess sludge	1.0	50～60	Anion: 0.5 Cation: 1.0	85	95 or higher
Chemical	Chemical plant excess sludge	1.0～1.5	60	1.5	85	95 or higher
	Detergent plant flotation sludge	0.8	40	Anion: 1.5 Cation: 0.5	83～85	98 or higher

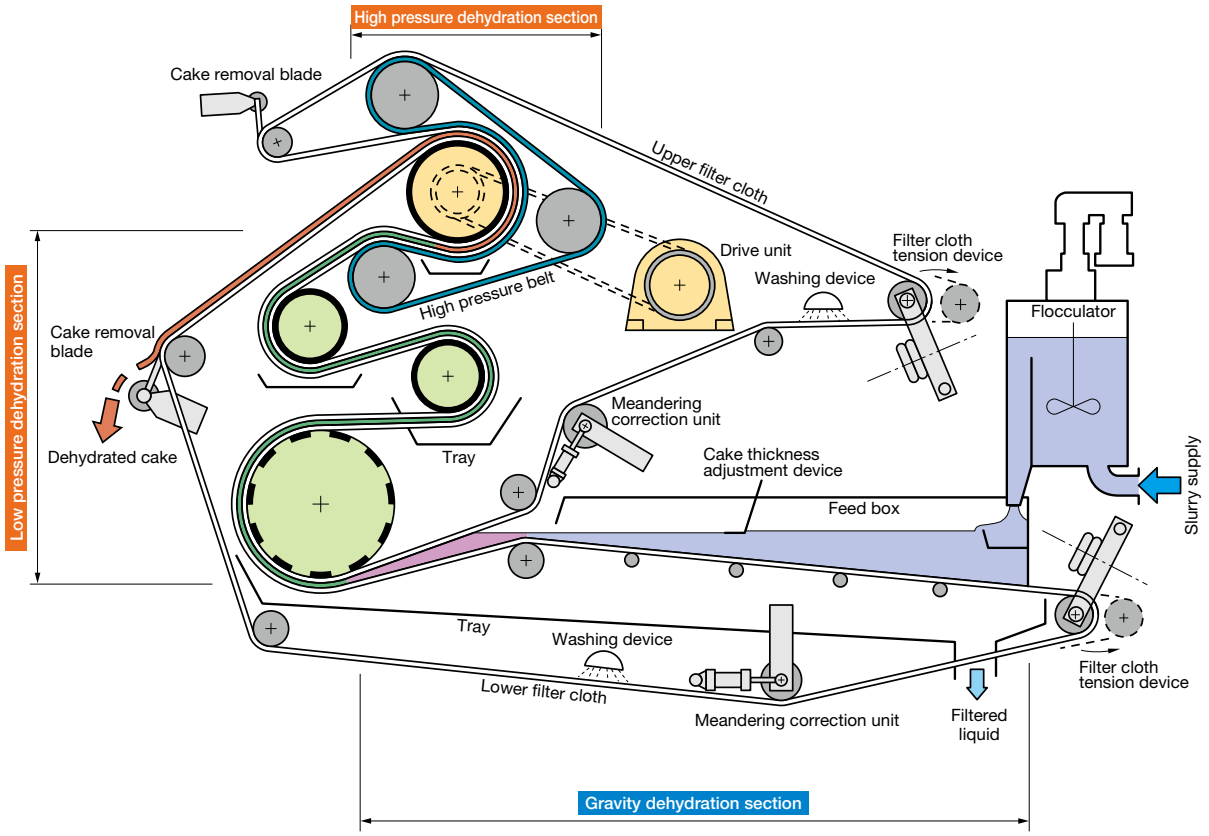
Performance is different depending on the sludge state. Please contact IHI for more information.

Belt Press Dehydrator

The Belt Press Dehydrator has a simple structure. It has been developed by improving the former dehydrator with our long-term accumulated dehydration technology.
It plays an active part not only in the field of drainage (sewage/human waste) but in manufacturing processes.



1 Belt Press Dehydrator System Diagram



2 Five Features for Improved Dehydration Efficiency

1 High pressure dehydration

Low water content cake

The dehydrator consists of a hydraulic cylinder and a special high pressure belt. Compared to previous dehydrators, cake with 5-10% lower water content is produced. The high pressure belt consists of long, narrow belts arranged in parallel, so there is uniform pressure for effective removal of filtered liquid.

2 Large diameter pressure roller

Smooth increase in pressure

A large roller is used as the first high pressure dehydration roller. Guided by the filter cloths, sludge passes through smaller rollers for the best increase in pressure. This leads to reliable dehydration without requiring an unreasonable series of processes in the Gravity dehydration section, Low pressure dehydration section, and High pressure dehydration section. Therefore, even sludge that was difficult to dehydrate previously can be processed effectively.

3 Proper pressure roller arrangement

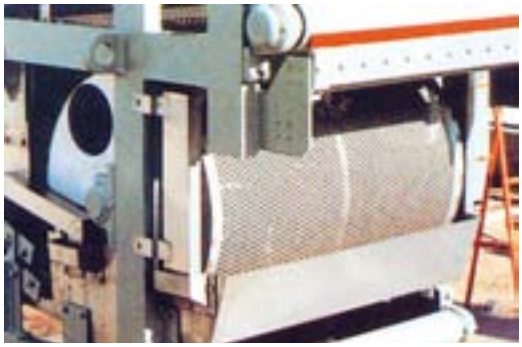
Multi-level structure for compact design

The filter cloths lead from bottom to top, so the filtered liquid does not flow through the next dehydration roller, but instead the filtered liquid is reliably stripped away at each roller. Furthermore, the rollers are effectively arranged in multiple stories for a comparatively large dehydration surface using the fewest possible rollers in an exceedingly compact installation area.

4 Perforated roller

Four times more effective than single-sided dehydration

The surface of the main dehydration roller is perforated, so the filtered liquid can be removed from both sides of the filter cloth for dehydration performance that is four times higher than single-sided dehydration. The perforated roller also prevents cake clogging, ensuring stable performance.



Porous plate dehydration roller

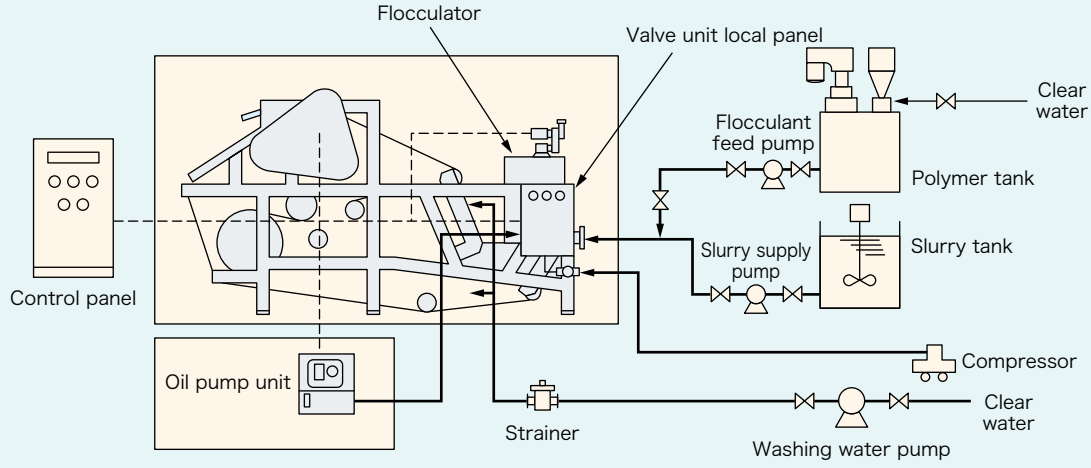
5 Effective dehydration

Drastic increase in dehydration performance

The filtration and dehydration performance throughout the machine produces consistent Cake. As a result, the High pressure dehydration section works more effectively and many types of sludge in a wide range of applications can be treated.

High pressure dehydration section

Flow sheet

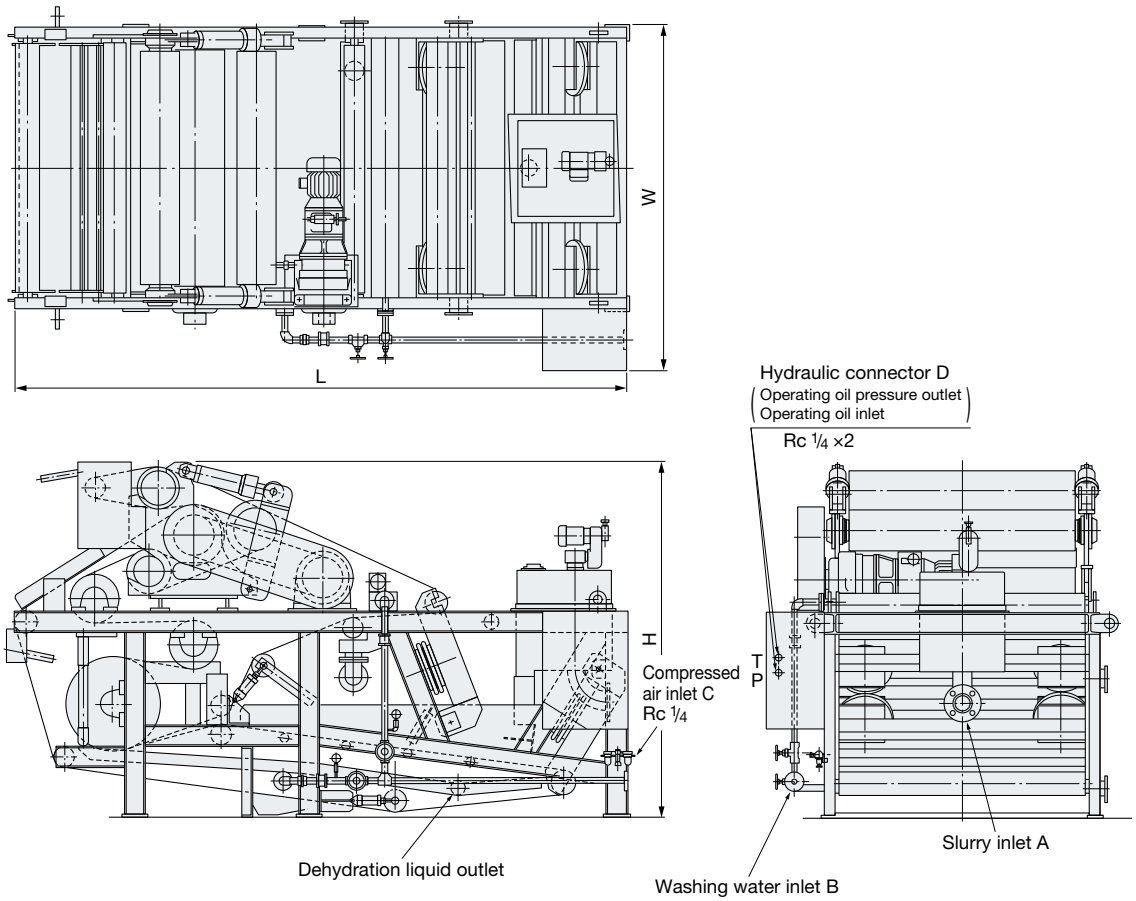


Belt Press Dehydrator

Performance

Types of slurry		SS concentration (%)	Flocculant additive rate (%/DSS)	Cake moisture content ratio	Treatment volume (kg·dss/h)					
					NI-M50	NI-M100	NI-M150	NI-M200	NI-M250	NI-M300
Human waste treatment	Mixed sludge using the normal nitrogen removal method	2.0	1.2–1.6	80–82	35–45	70–85	140–170	180–220	230–280	270–330
	Mixed sludge using the high load treatment method	2.0	1.0–1.4	79–81	35–45	70–85	140–170	180–220	230–280	270–330
	Septic tank sludge	1.5	1.0–1.6	80–82	30–40	60–80	120–160	160–210	200–260	230–310
Urban sewage	Digested sludge	2.0–5.0	0.7–1.3	68–83	35–100	70–200	105–300	140–400	175–500	210–600
	Mixed raw sludge	2.0–5.0	0.6–1.2	65–83	35–125	70–250	105–375	140–500	175–625	210–750
Garbage landfill	Activated excess sludge	1.5	1.2–1.6	81–83	30–35	60–70	120–140	160–180	200–230	230–270
	Precipitated sludge	1.5	0.8–1.2	81–83	30–35	60–70	120–140	160–180	200–230	230–270
Paper manufacturing wastewater	Activated excess sludge	1.5–2.0	1.3–1.7	75–80	40–45	80–90	160–180	160–230	260–290	310–350
	Precipitated sludge	5.0–8.0	0.3–0.5	65–70	100–120	200–240	390–470	520–620	650–780	780–940
	Excess + precipitated mixed sludge	3.0	0.4–0.6	70–75	70–90	140–180	270–350	360–470	460–590	650–700
Industrial wastewater	Grit washing wastewater	45–50	0.04	30	1,000	2,000	3,900	5,200	6,500	7,800
	Food factory active excess sludge	1.5	1.0–1.5	79–83	25–35	50–70	100–140	130–180	160–230	200–270
	Metalworking plant precipitated sludge	1.5	0.5–1.0	78–82	30–35	60–70	120–140	160–180	200–230	230–270

Outline drawing

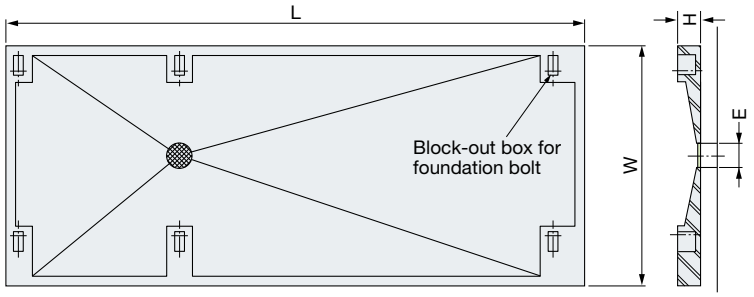


Specifications

			NI-M50	NI-M100	NI-M150	NI-M200	NI-M250	NI-M300
Filter cloth	Filter cloth effective width	m	0.5	1.0	1.5	2.0	2.5	3.0
	Filter cloth width	m	0.6	1.1	1.6	2.1	2.6	3.1
	Filter cloth speed		0.5–5.0	0.5–5.0	0.5–5.0	0.5–5.0	0.5–5.0	0.5–5.0
Dimension	Width W	mm	1,200	1,700	2,270	2,770	3,300	3,800
	Length L	mm	3,100	3,100	4,470	4,470	4,540	4,540
	Height H	mm	1,920	1,920	2,470	2,470	2,970	2,970
Output	Drive unit	kW	0.75	1.5	1.5	1.5	2.2	2.2
	Hydraulic device	kW	0.75	1.5	1.5	1.5	1.5	1.5
	Flocculator	kW	0.4	0.4	0.4	0.4	0.4	0.4
	Feed mixer	kW	—	—	—	—	0.2	0.2
Washing water	Volume	ℓ/min	70	120	175	225	275	325
	Pressure	MPa(Pe)	0.5	0.5	0.5	0.5	0.5	0.5
Compressed air	Volume	ℓ/min	60	60	120	120	120	120
	Pressure	MPa(Pe)	0.7	0.7	0.7	0.7	0.7	0.7
Weight / Load	Product weight	ton	2	3.5	7	9	14	17
	Operation load	kN	25	39	79	98	152	182
Connection	Slurry inlet	A	65A	65A	100A	100A	150A	150A
	Washing water inlet	B	25A	25A	40A	40A	65A	65A
	Compressed air inlet	C	Rc1/4	Rc1/4	Rc1/4	Rc1/4	Rc1/4	Rc1/4
	Hydraulic connector	D	Rc1/4	Rc1/4	Rc1/4	Rc1/4	Rc1/4	Rc1/4
Normal treatment volume		m^3/h	1.5–2.5	3.5–4.5	7–9	9–11	11–14	13–17

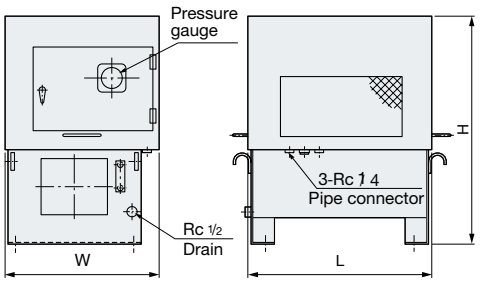
Notes:
Normal treatment volume to the left is based on the assumption of dehydration (cake moisture content ratio=80-82%) of mixed sludge (SS concentration=2%) using the standard nitrogen removal method. Treatment volume differs according to the type of sludge, SS concentration, use of flocculants, or desired cake moisture content ratio. Please ask IHI about features, applications, or options.

Foundation



			NI-M50	NI-M100	NI-M150	NI-M200	NI-M250	NI-M300
Concrete foundation	Width	W mm	1,435	1,935	2,505	3,005	3,530	4,030
	Length	L mm	2,795	2,795	3,795	3,795	3,790	3,790
	Height	H mm	200	200	200	200	200	200
	Wastewater outlet	E mm	150	150	200	200	250	250

Accessories



Width	W mm	500
Length	L mm	620
Height	H mm	775
Oil tank capacity	ℓ	40
Power	kW	1.5
Weight	kg	120

Notes:
For use with AC 400 V.
The specifications are different for use with AC 200 V.

Oil pump unit

This is the oil pressure generation device that applies compressive force in the High pressure dehydration section. It is supplied as a separate unit.

Valve unit local panel

This device includes the electromagnetic valve for air pressure and oil pressure operations, relay terminal limit switch for detecting positioning of the filter cloth, and others.

Options

Flocculator (single feed)

This feeds the flocculant solution into the slurry in the Slurry supply pipe, mixes together this mixture, and forms flocs.

	NI-M50	NI-M100	NI-M150	NI-M200	NI-M250	NI-M300
Effective volume ℓ	72	72	158	158	317	317
Mixer power kW	0.4	0.4	0.4	0.4	0.4	0.4
Rotations (50 Hz) min^{-1}	48 – 192	48 – 192	48 – 192	48 – 192	48 – 192	48 – 192
Slurry inlet A	65A	65A	100A	100A	150A	150A

Flocculator (dual feed)

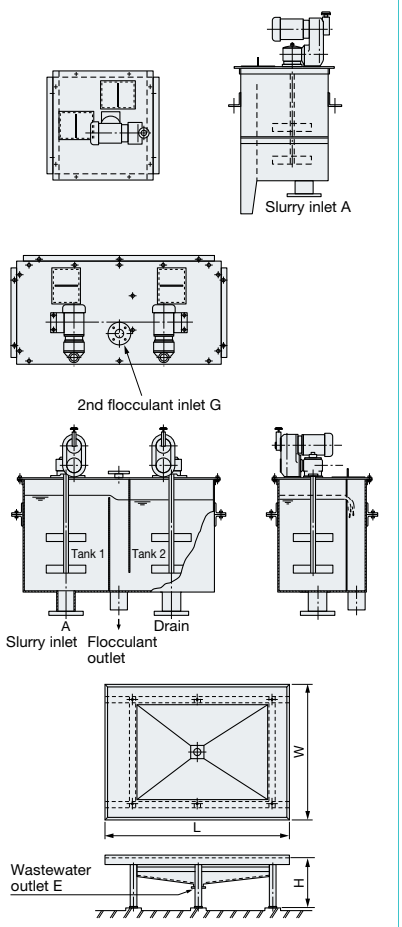
This first mixes Cationic flocculant into the slurry, then it adds Anionic flocculant to reduce the water content of the cake.
A dual tank flocculator is used for this method. The first flocculant is fed into the Slurry supply pipe, while the second flocculant is fed into the Flocculator.

	NI-M50	NI-M100	NI-M150	NI-M200	NI-M250	NI-M300
Effective volume ℓ	38+34	38+34	135+129	135+129	280+260	280+260
Mixer power kW	0.4 × 2	0.4 × 2	0.4 × 2	0.4 × 2	0.4 × 2	0.4 × 2
Rotations (50 Hz) min^{-1}	48–192	48–192	48–192	48–192	48–192	48–192
Slurry inlet A	65A	65A	100A	100A	150A	150A
Flocculant inlet G	25A	25A	40A	40A	50A	50A

Filtered liquid tray

The filtered liquid and washing wastewater are collected in the concrete foundation with a standard configuration, but by installing a steel filtered liquid tray, a belt press can be installed.

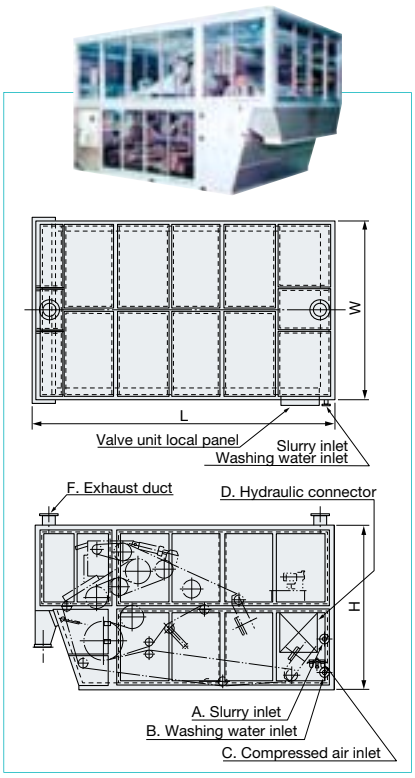
	NI-M50	NI-M100	NI-M150	NI-M200	NI-M250	NI-M300
Width W mm	1,040	1,580	2,195	2,695	3,290	3,790
Length L mm	2,980	3,000	4,310	4,310	4,420	4,420
Height H mm	800	800	800	800	1,000	1,000
Wastewater outlet E	150A	150A	200A	200A	250A	250A
Weight kg	450	650	1,000	1,200	2,000	2,200



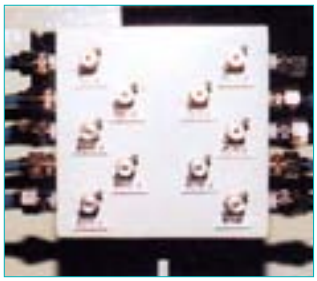
Anti-odor cover

The Anti-odor cover is removed for delivery and must be reinstalled on location.

		NI-M50	NI-M100	NI-M150	NI-M200	NI-M250	NI-M300
Dimension	Width W mm	1,600	2,200	2,650	3,150	3,980	4,480
	Length L mm	3,610	3,610	5,170	5,170	5,340	5,340
	Height H mm	2,320	2,320	3,040	3,040	3,540	3,540
Weight	Cover weight kg	600	900	1,200	1,500	1,800	2,000
Connecting	Slurry inlet A	65A	65A	100A	100A	150A	150A
	Washing water inlet B	25A	25A	40A	40A	65A	65A
	Compressed air inlet C	Rc1/4	Rc1/4	Rc1/4	Rc1/4	Rc1/4	Rc1/4
	Hydraulic connector D	Rc1/4	Rc1/4	Rc1/4	Rc1/4	Rc1/4	Rc1/4
	Exhaust duct	100A	100A	150A	150A	200A	200A
Concrete foundation	Width W mm	1,700	2,200	2,750	3,250	4,080	4,580
	Length L mm	3,250	3,250	4,525	4,525	4,700	4,700
	Height H mm	200	200	200	200	200	200
	Wastewater outlet E ϕ mm	150	150	200	200	250	250
Filtered liquid tray	Width W mm	1,760	2,300	2,750	3,250	4,080	4,580
	Length L mm	3,250	3,250	4,625	4,625	4,820	4,820
	Height H mm	800	800	800	800	1,000	1,000
	Wastewater outlet E ϕ mm	150A	150A	200A	200A	250A	250A
	Weight kg	550	750	1,200	1,400	2,400	2,700



Grease centralized oiling



A grease oiling board is installed, and the area between each bearing is connected with pipes so that oil can be easily delivered to each bearing. One grease oiling board is installed on each side of the belt press.

Onboard drive wiring

A relay terminal board is installed to the valve unit panel that can also perform onboard drive wiring to the drive unit and flocculator.

Washing water strainer

If there is a danger of suspended particles becoming mixed in the washing water, install a strainer to the washing water pipe.

Reserve concentration machine

Install this machine to increase the slurry concentration levels and increase treatment volume.

Roller nylon coating

In order to improve anti-corrosion performance, nylon coating can be applied to rollers. This not only improves anti-corrosion, but also anti-wear and appearance.

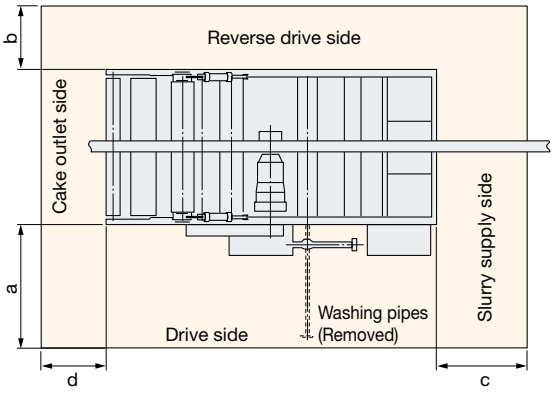
Side panel

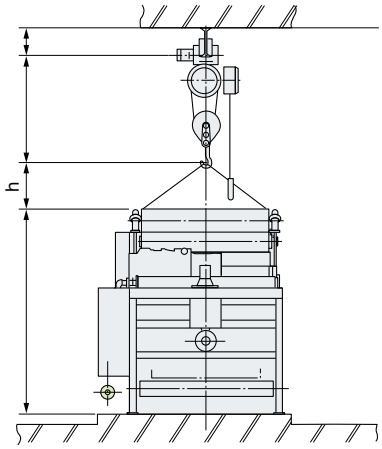
This side-mounted control panel can be installed to the side of the belt press dehydrator.
Switches are installed to perform start and stop operations. A separate control panel with control circuits and drive circuits must be installed.

Control panel

The control panel combines the drive circuits for the drive unit, flocculator, and oil pump unit. It is located separately.
If the drive circuits or control circuits for the slurry supply pump, flocculant feed pump, or washing water pump are required, please mention upon ordering that these should also be controlled.

Foundation





		NI-M50	NI-M100	NI-M150	NI-M200	NI-M250	NI-M300
Drive side	a mm	1,000	1,000	1,500	1,500	2,000	2,000
Reverse drive side	b mm	1,200	1,200	1,500	1,500	1,500	1,500
Supply liquid side	c mm	1,000	1,000	1,000	1,000	1,000	1,000
Cake outlet side	d mm	1,000	1,000	1,000	1,000	1,000	1,000
Up	h mm	390	580	660	860	960	1,240
Elevation weight	ton	1	1.5	2.5	3.5	6	7

Features of IHI Filters

1 Fully automated

Filtration, washing and cake discharge operations can be fully automated.

2 Completely closed

Since all operations can be performed in completely closed conditions, operations including solvents and dangerous substances can be processed in a safe and comfortable work environment. There is no contamination to the products from the outside.

3 Space saving

A vertical structure does not require a large space for installation.

4 Suitable for high temperature, pressure and viscosity filtration (IHI-Leaf Filter only)

Filtration is possible under a high temperature of 400°C, pressure of 4MPa (40Kg/cm2·G), and viscosity of 150Pa·s(150,000 c.P).

5 Rest Volume filtration (IHI-Leaf Filter only)

A unique filter mechanism for rest volume enables filtration leaving almost zero residual liquid.
A single filter is enough for high-mix low-volume production lines.

6 Corrosion resistant

Depending on the properties of the liquids to be processed, materials for liquid contact are selectable (stainless steel, titanium, hastelloy). The FUNDABAC Filter can use plastic filter elements, making it particularly suitable for corrosive liquids.

7 No movement (FUNDABAC Filter only)

Filtered cake can be removed completely by back blow or back washing. There are no drive units on the filter main body, which makes maintenance much easier.

Main Applications

Petrochemical industry

- Synthetic resin (MMA, TDI, PVC, MDI, etc.)
- Terephthalic acid
- Epoxy resin
- Organic solvent
- Petroleum resin
- Adipic acid
- Plasticizers (e.g., DOP)
- Caprolactam

etc.

Organic chemical industry

- Surfactant
- Catalysts
- Decolorizing filtration with activated carbon
- Ethylene glycol
- Propylene glycol
- Polypropylene glycol
- Organic pigment
- Dye

etc.

Inorganic chemical industry

- Sodium sulfate, sodium phosphate, other solutions
- Purification processes for cobalt, titanium and zinc, etc.
- Inorganic pigment
- Waste acid
- Agrichemical
- Titanium oxide
- Pesticide
- Nitrocellulos

etc.

Pharmaceutical industry

- Fermented liquid
- Culture media
- Crystal slurry filtration, washing and drying
- Amino acid
- Glycerol filtration with activated charcoal
- Sorbose
- Sorbitol
- Enzyme

etc.

IHI Filters

Resins/Coatings

- Rosin
- Varnishes (acrylic resin)
- Natural resin
- Coating
- Lacquer

etc.

Mineral oil

- Mineral oil filtration with bleaching earth
- Grinding oil
- Machining oil
- Rolling oil
- Waste oil

etc.

Food industry

- Carbohydrate solution (e.g., glucose)
- Tea
- Juice
- Wine
- Noodle sauce
- Soy sauce
- Vinegar
- Sodium alginate
- Dairy product
- Caramel

etc.

Oil and fat industry

- Plant and animal oil filtration with bleaching earth
- Crude soy oil filtration for lecitin
- Nickel catalyst filtration for hardened oils and fatty acid
- Dewaxing
- Food oil filtration for purification
- Process for waste white earth

etc.

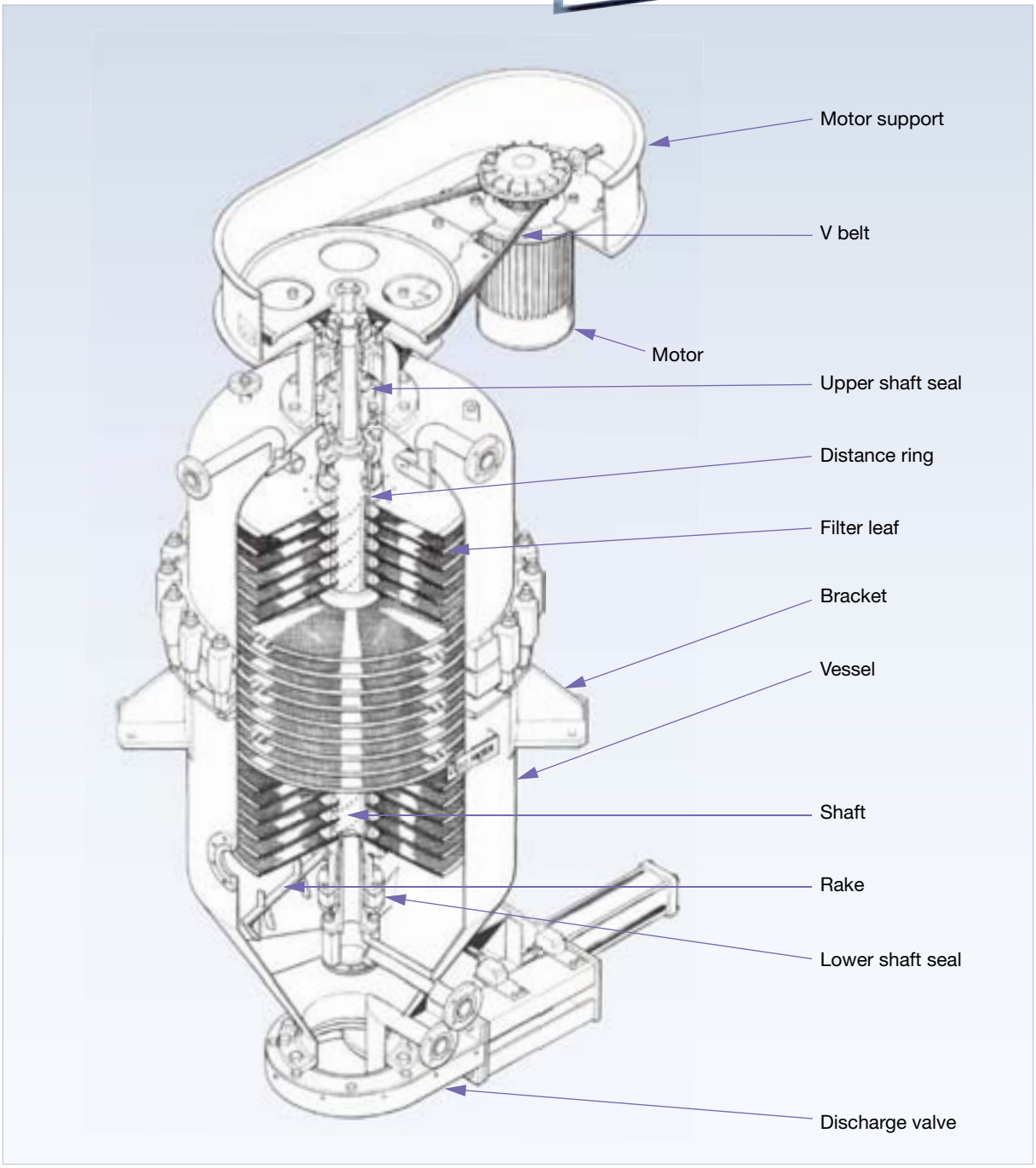
Fiber industry

- Viscose
- Acetate dope
- Intermediary product for chemical fiber
- Mercerization

etc.

IHI-Leaf Filter

The IHI-Leaf Filter is a Horizontal Filter Leaf Pressure Filter with excellent filtration performance and a fully automatic operation. Residual liquid, the long-standing problem for a pressure filter, is also completely filtered by IHI's original Rest Volume Filtration system.

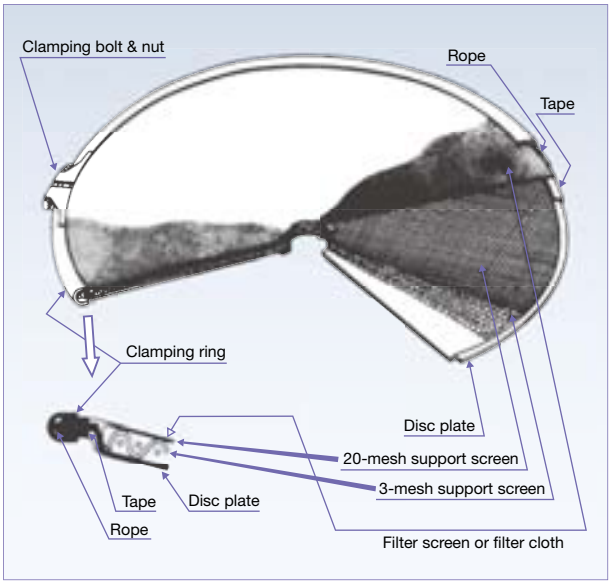


1 Structure of IHI-Leaf Filter

The upper part of the vessel for the CFR Type incorporates a mirror plate, and the lower part is formed in a reversed conical shape with a discharge valve at the end. An IHI-specialized pneumatic rubber seal or pneumatic ball valve is used as the discharge valve. The lower part of the vessel in the CFA Type incorporates a mirror plate with a slurry discharge outlet.

Both CFR and CFA Types incorporate horizontal circular filter leaves, which are piled along a shaft (vertical hollow centered shaft) via distance rings. The distance rings adjusts the space between leaves. Cake is only deposited on the upper surfaces of the leaves and filtered liquid flows downward through the shaft. The disc plates have slightly concaved centers to facilitate the flow of the filtered liquid. The filter media are easily attached/detached with clamp rings. The filter media can be selected from filter fabrics made of Teflon, polypropylene and polyester as well as from wire meshes made of anti-corrosion alloys such as stainless steel to meet the required application.

The vessel is highly pressure resistant and it is possible to incorporate jackets to maintain temperature control if necessary.



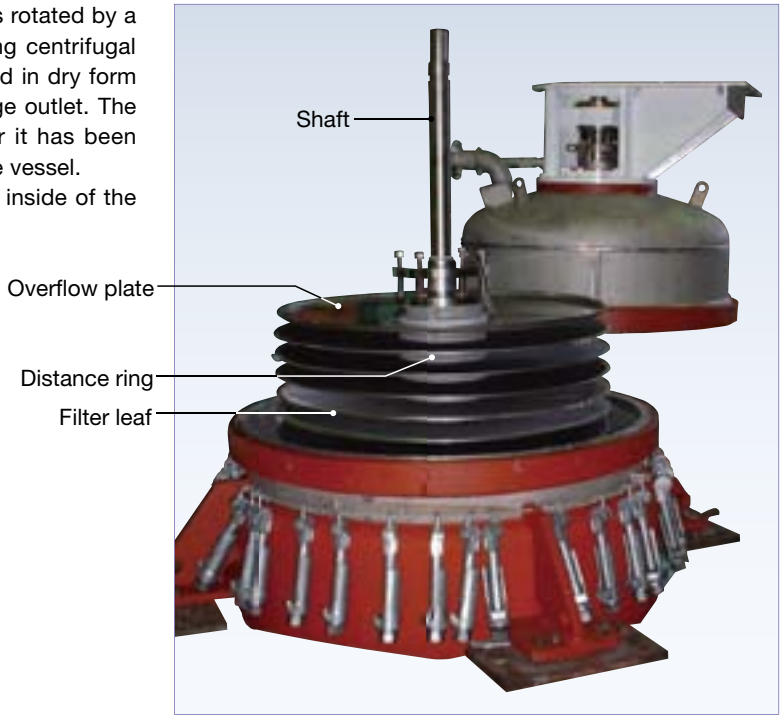
Filter media lineup

Filter mesh	110 mesh - 1000 mesh (special: up to 3000 mesh)		
Filter fabric	Material	Air permeability (cc/cm²·sec)	Nominal allowable temperature(°C)
	Teflon	medium	180
	PP (Polypropylene)	small - extra large	80
	PE (Polyester)	small - medium	100
	PPS (Polyphenylene sulfide)	small - large	150

Note: The allowable temperatures differ by type of liquid.

2 Filter Nest

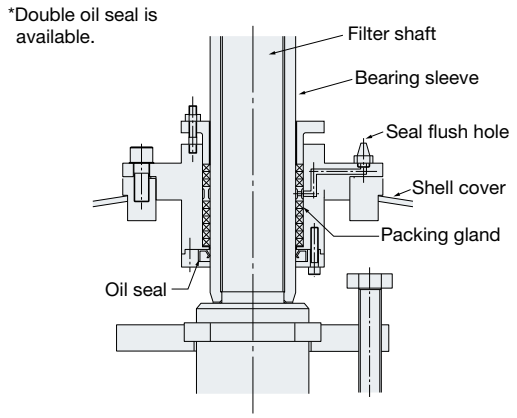
When cake is discharged, the filter nest is rotated by a motor to detach cake on the leaves using centrifugal force. In the CFR model, cake is collected in dry form after being dropped through the discharge outlet. The CFA model collects cake as slurry, after it has been sprayed or rotated within liquid, inside the vessel.
(In some cases, filtration surfaces on the inside of the filter may be washed in this operation.)



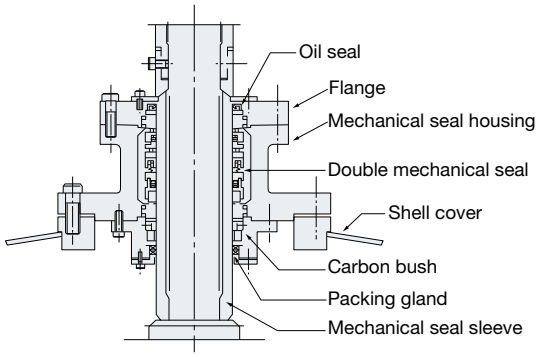
3 Upper Shaft Seal

Packing glands, oil seals or mechanical seals can be installed if necessary, on the shaft at the top of the vessel. The sleeve assembly structure allows easy assembly and disassembly.

Gland packing + Oil seal



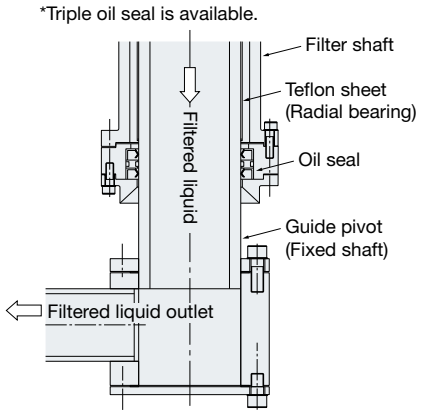
Mechanical type



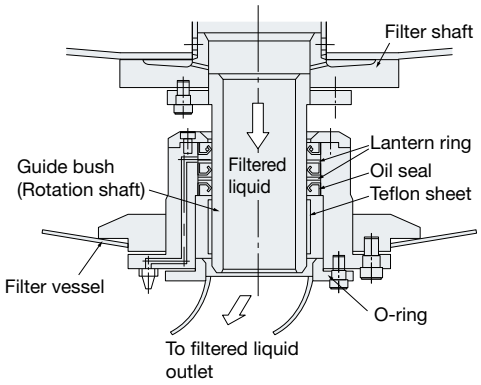
4 Lower Shaft Seal

The CFR Type incorporates an oil seal for shaft sealing at the bottom of the filter. Teflon sheet is also mounted as a lower bearing.

CFR Type with double oil seal



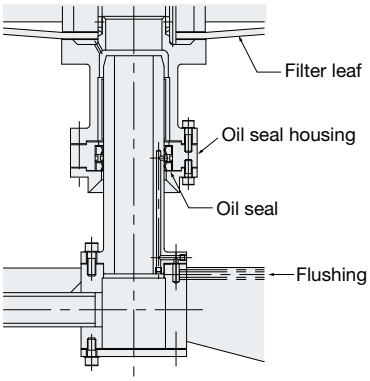
CFA Type with triple oil seal



Options

Seal flushing mechanism for the lower shaft: (for the CFR Type)

Seal life can be extended by supplying flushing liquid to the seal part of the lower shaft while the filter nest is rotating.



5 Inverter Drive/ Hydraulic Motor Drive/ Air Motor Drive

In addition to regular belt drive by motors, direct drive by an inverter, hydraulic motor drive, and air motor drive are also available. The hydraulic type drives multiple leaf filters by a single hydraulic unit, offering many advantages in filter maintenance and cost. The hydraulic, air and inverter drives allow arbitrary rotation speeds, facilitating cake repulping and cleaning of filter media.

Inverter drive

Hydraulic motor drive

Air motor drive

Hydraulic unit

6 Operation Process

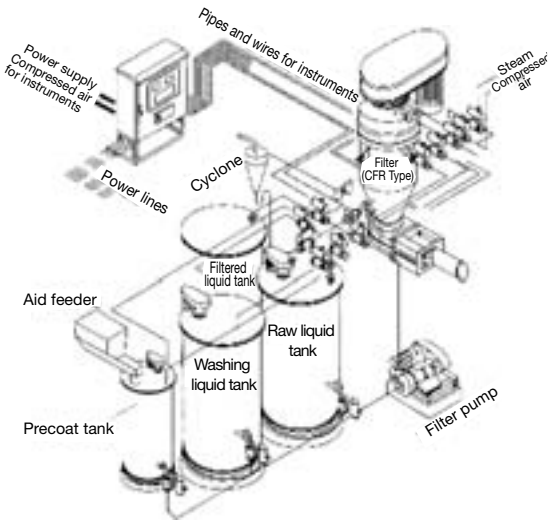
The IHI-Leaf Filter uses a pioneering system for unmanned automated operation, which can run with almost no human intervention for all processing stages. The unique control system enables anyone to operate the system easily.

Program table

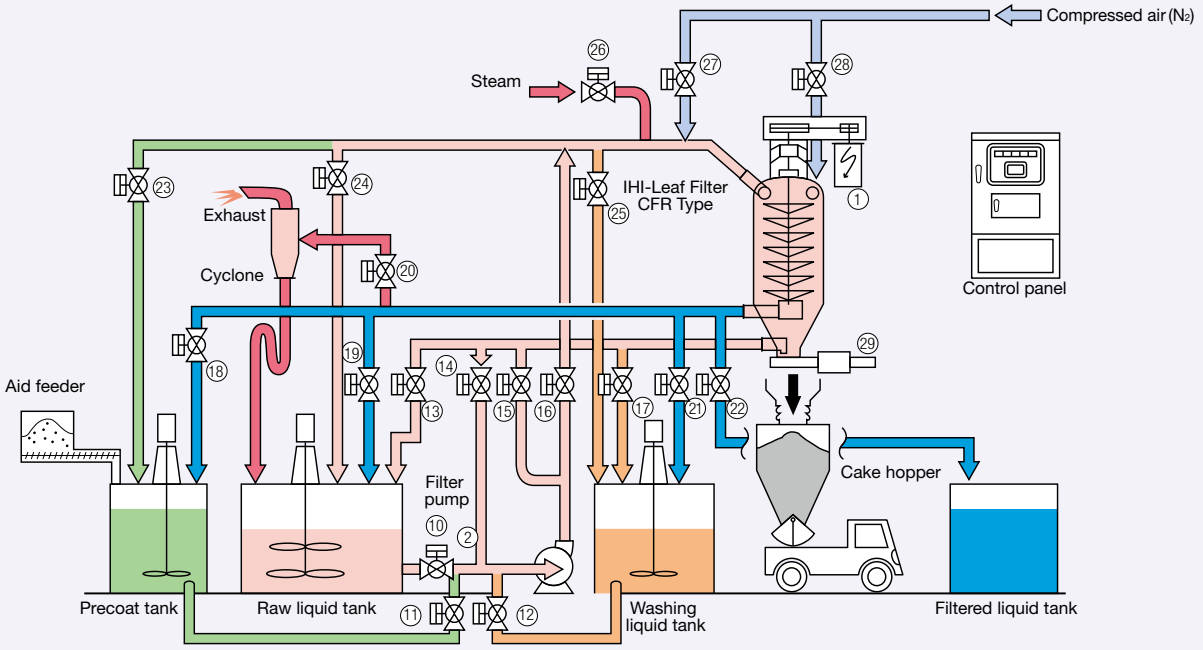
Process	Time	Operation point (Valve & Equipment) ① ② ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ ⑲ ⑳ ㉑ ㉒ ㉓ ㉔ ㉕ ㉖ ㉗ ㉘ ㉙
1. Rest	~	
2. Filling	6'	● ● ● ●
3. Precoat	12'	● ● ● ● ●
4. Precoat recovery	12'	● ● ● ● ●
5. Prefiltration	6'	● ● ● ● ●
6. Filtration	~	● ● ● ● ●
7. Rest Volume filtration	~	● ● ● ●
8. Emptying	6'	● ● ●
9. Filling (washing liquid)	6'	● ● ● ● ●
10. One-pass washing	12'	● ● ● ●
11. Recycle Washing	24'	● ● ● ●
12. Emptying	6'	● ● ●
13. Steam blowing	10'	● ●
14. Air blowing	10'	● ● ●
15. Drainage	2'	● ●
16. Pressure Release	1'	● ●
17. Open discharge valve	0.5'	● ●
18. Cake discharge A	0.5'	● ● ●
19. Cake discharge B	1'	● ●
20. Close discharge valve	0.5'	● ●

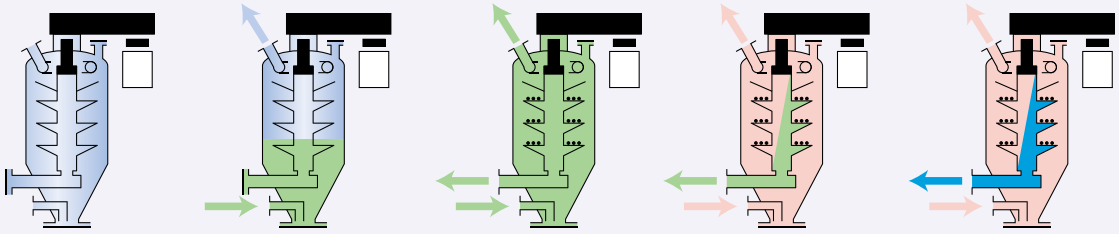
Note: The indicated time is approximate. Mark "●" in the table represents that the equipment is in operation.

The figure shows an operation example. Necessity of precoat, residual liquid filtration and cake washing is determined based on processes.



Operation flow





1. Rest

The filter is empty and ready for operation.

2. Filling

The filter is filled with precoat by pump. The air in the filter exits from the top.

3. Precoat

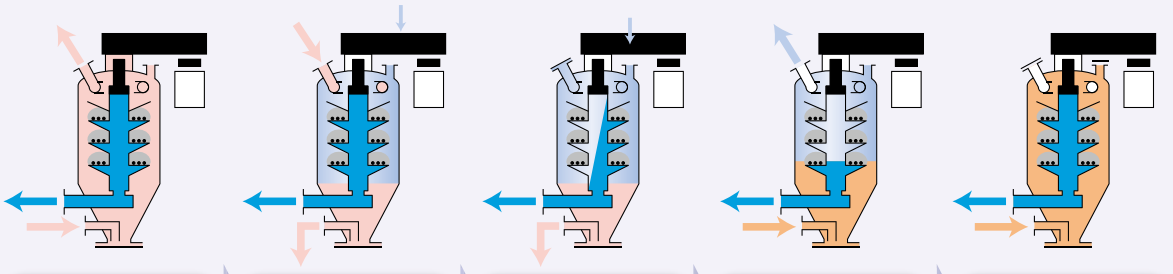
The filtered liquid is returned to the precoat tank and circulated to form an aid layer on the leaves.

4. Precoat recovery

The raw liquid is filtered and a part of the filtered liquid is stored in the precoat tank for use in the next operation.

5. Prefiltration

The filtered liquid is returned to the raw liquid tank and circulated by filtration until it is clear. Use of overflow is needed in principle to prevent solid components from precipitating.



6. Filtration

The filtered clear liquid is removed from the system. Each leaf can hold cake up to 35 mm thick.

7. Rest Volume filtration

By adding pressurized air (N_2) to the residual liquid in the filter, the liquid in the filter is sprayed from the top of the filter to thoroughly filter the liquid using all leaves.

8. Emptying

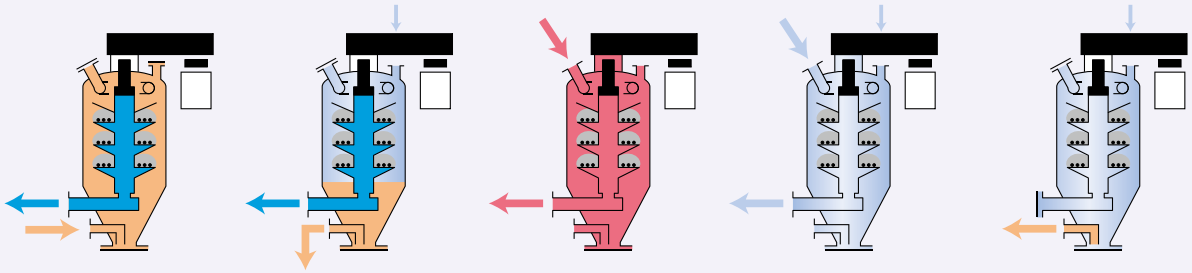
When residual liquid filtration is not necessary, the liquid in the filter is discharged to the raw liquid tank using pressurized air (N_2) from the top.

9. Filling (washing liquid)

The filter can be filled with washing liquid when the filtered liquid outlet is open.

10. One-pass washing

The washing liquid passes through the cake layers, to wash the cake or extract the liquid. The first part of the washing liquid is sent to the filtered liquid tank.



11. Recycle washing

After one-pass washing, the filtered washing liquid is returned to the washing liquid tank and circulated.

12. Emptying

The washing liquid is discharged using pressurized air (N_2). The washing liquid may be filtered using the residual liquid filtration.

13. Steam blowing

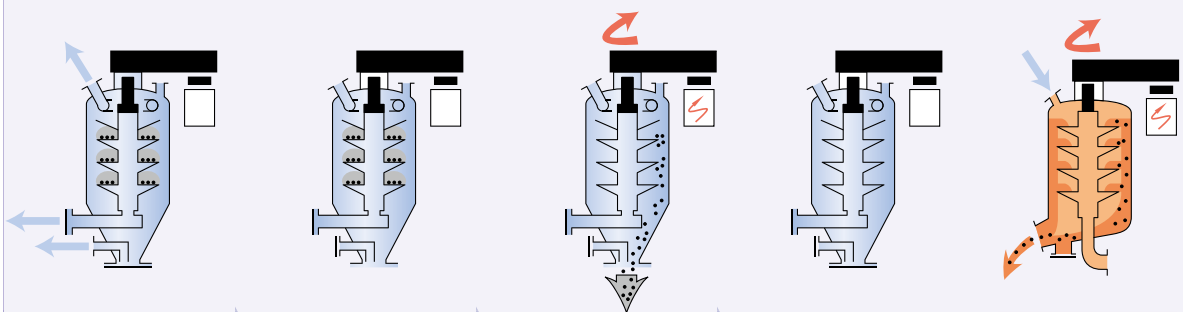
Cake is dried by blowing steam.

14. Air blowing

Cake is dried by blowing air (N_2). Additional air (N_2) blowing may be conducted after blowing steam to eliminate steam drainage.

15. Drainage

Under air pressure (N_2), any remaining liquid is drained from the machine.



16. Pressure release

Pressurized air (N_2) in the filter is released.

17. Open discharge valve

Before discharging cake, the discharge valve is fully opened.

18. Cake discharge

Cake on the leaves are spun off to the bottom by rotating the filter nest. The rotation is performed intermittently two to three times.

19. Close discharge valve

The discharge valve is closed, then the machine is ready for the first process. This flow of processes is repeated.

20. Slurry discharge

For the CFA Type, cake are discharged in a slurry form using showering or rotation within liquid.

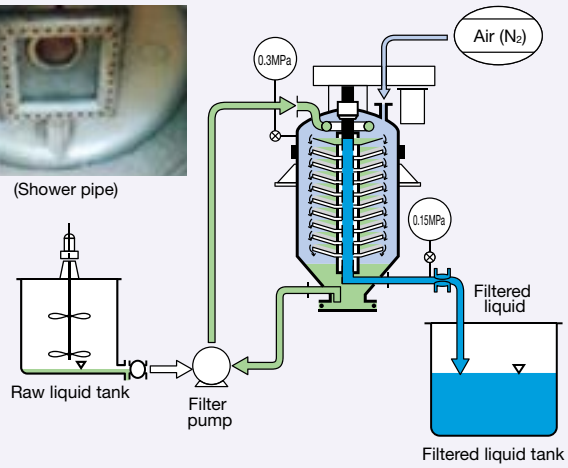
[Cake discharge for the CFA Type]

7 Mechanism for Rest Volume Filtration

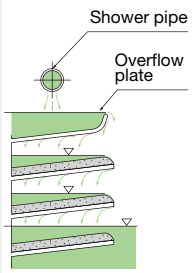
IHI-Leaf Filters, for both CFR and CFA Types, perform Rest volume filtration using all leaves. This enables filtration to be efficient and thorough, as well as enabling different products to be processed easily with only one IHI-Leaf Filter.

Residual liquid filtration system

(Shower pipe)



Initial step



When the raw liquid tank becomes empty, pressurized air (N_2) is applied.

The residual liquid is supplied equally from shower pipes on the top of the filter.

The liquid is collected on the overflow plates, and then flows down to the lower leaves.

Continuous filtration is realized with all leaves immersed.

(1) Residual liquid filtered quickly

Filtration is performed using the entire area of leaves, making the process efficient and quicker. (The filtration speed, however, is slightly slower than the normal filtration.)

(2) Cake formed uniformly

Since filtration is performed using all leaves, cake is formed uniformly.

*The ultimate residual liquid only remains in dead space in the discharge valve in a small amount in pipes and pumps.

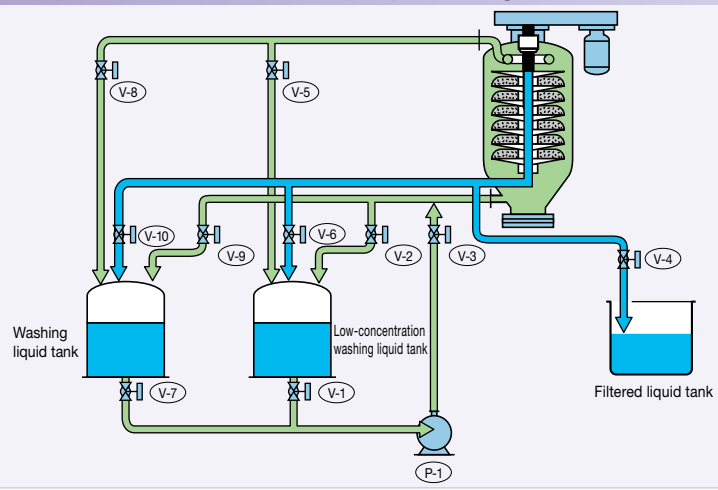
8 Mechanism for Cake Washing

IHI-Leaf Filter employs upper surface and horizontal leaf filtration, featuring good stability of filtered cake. A selection of cake washing methods are available. Cake washing may provide improved yield and detoxification of cake.

Basics for cake washing

- (1) One-pass washing
- (2) Recycle washing
- (3) Repulping washing
- (4) Counterflow multi-step washing
- (5) Residual liquid filtration washing

Example of counterflow multi-step washing



	Step	Liquid flow	Remarks
1	Washing liquid filling I	V-1 → P-1 → V-3 → V-4 V-5	Filters are immersed in high concentration washing liquid.
2	Cake washing I	V-1 → P-1 → V-3 → V-4	Washing liquid (high concentration) is recovered.
3	Circulation washing I	V-1 → P-1 → V-3 → V-6	The liquid is circulated at Low Level in the tank.
4	Liquid discharge I	V-5 → V-2 V-6	Liquid in the filters is discharged.
5	Washing liquid filling II	V-7 → P-1 → V-3 → V-6 V-8	Filters are immersed by fresh washing liquid.
6	Cake washing II	V-8 → P-1 → V-3 → V-6	Filtered washing liquid is sent to the washing liquid tank.
7	Liquid discharge II	V-8 → V-9 V-10	Liquid in the filters is discharged.

9 Mechanisms for Filtration and Drying

In addition to filtration, IHI-Leaf Filter CFR Type can be used as a high efficiency shelf drier by installing a hot air generator or a vacuum generator. IHI-Leaf Filter will be helpful for the streamlining of production processes for crystallized or powdered products in chemical, pharmaceutical or food industries.

(1) Eliminates human intervention with fully automated operation

The entire operation can be fully automated including filtration, drying and cake discharge.

(2) Performs thorough Rest volume filtration

Thorough filtration is possible using all leaves with special internal circulation.

(3) Performs washing and extraction for cake

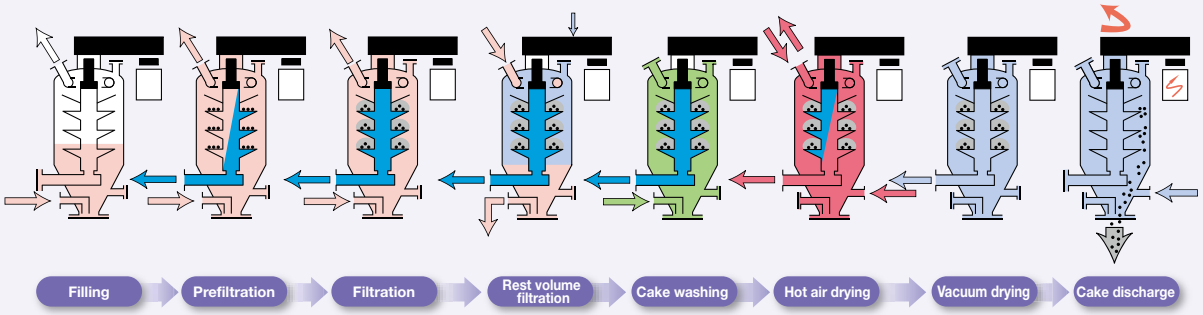
Horizontal leaves and upper surface filtration assure that no cake have dropped off the leaves. Following filtration, cake washing or extraction can be performed efficiently by using, for example, washing liquid.

(4) Maintains comfortable work environment

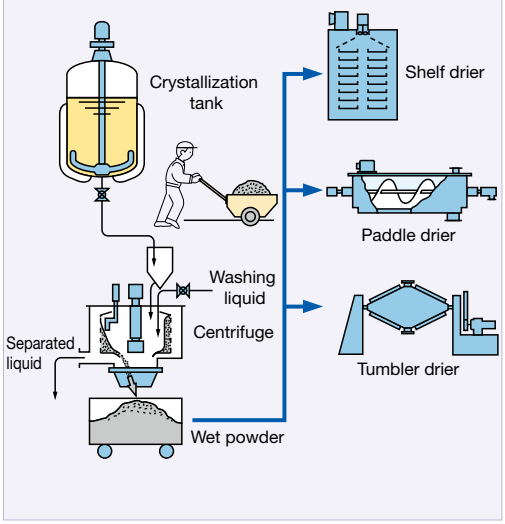
All operations are performed in closed condition. This eliminates handling solid products which would be required if a filter and drier were installed separately. This maintains a safe and clean work environment even in the case of processing dangerous materials including toxic substances and solvents. There is no contamination to products during the process, which also improves the product quality.

(5) Small installation space required

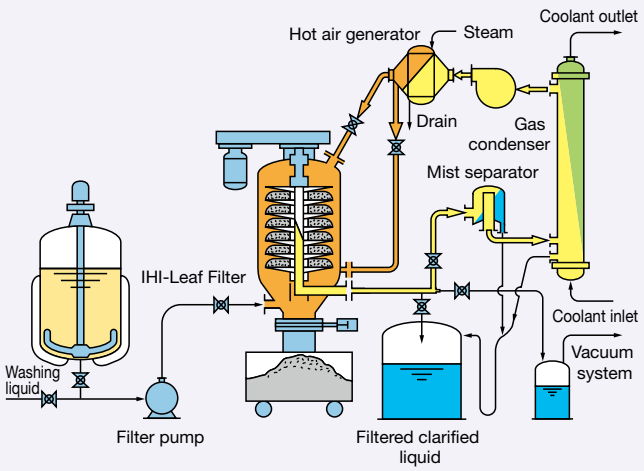
The vertical structure requires a small installation space compared to parallel filter, separator and drier installation.



General solid-liquid separation and drying



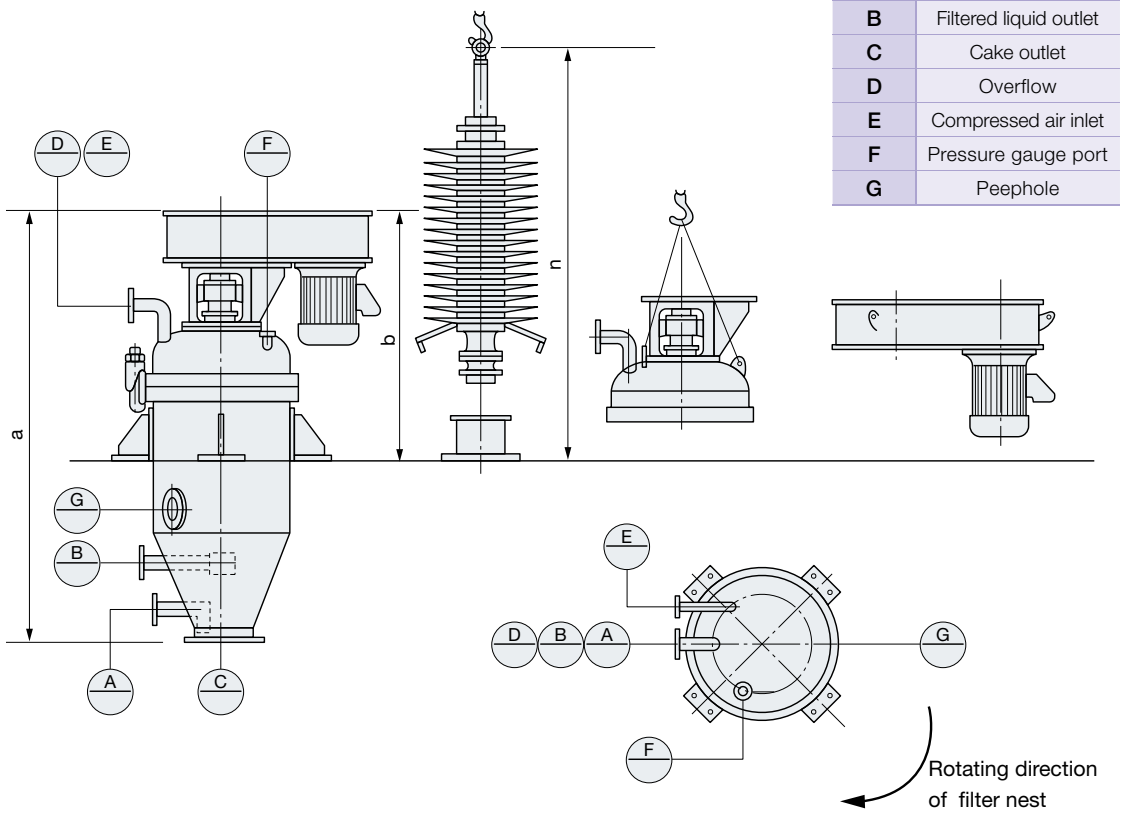
Filtration and cake drying with IHI-Leaf Filter



CFR Type

Dimensions

Nozzle symbol	Nozzle name
A	Raw liquid inlet
B	Filtered liquid outlet
C	Cake outlet
D	Overflow
E	Compressed air inlet
F	Pressure gauge port
G	Peephole



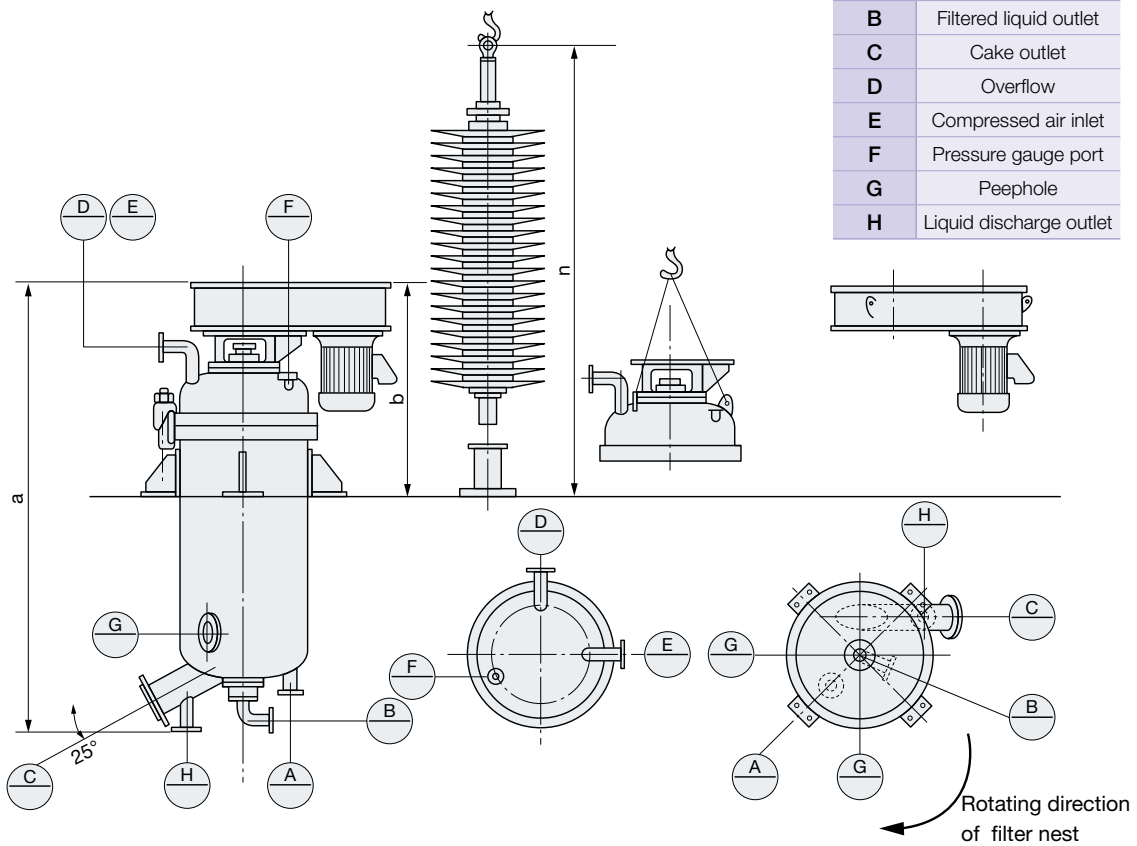
Specifications

Model name	Filtration area (m^2)	Leaf diameter (mm)	Number of filter leaf (pcs.)	Rotation speed 50Hz/60Hz (min^{-1})	Motor (kW)	Tank capacity (m^3)	Filled mass (ton)	Designed load (kN)	a (mm)	b (mm)	n (mm)	Cake outlet C	Hoist capacity (ton)
CFR2-4-50	2	400	18	510/610	5.5	0.45	1.450	60	2245	968	2350	200A	1
CFR3-6-50	3	600	12	406/490	7.5	0.65	2.4	100	2304	1226	2300	300A	1
CFR5-6-50	5	600	20	406/490	11	0.9	3.3	120	2744	1266	2600	300A	1
CFR7-8-50	7	800	16	330/400	11	1.25	3.95	150	2674	1347	2500	300A	1
CFR10-8-50	10	800	22	330/400	15	1.55	4.25	200	3032	1735	3200	400A	2
CFR15-10-50	15	1000	21	280/330	18.5	2.15	6.2	235	3178	1567	3000	400A	2
CFR20-10-50	20	1000	28	280/330	22	2.60	7.0	275	3598	1717	3400	400A	3
CFR25-10-50	25	1000	35	300/330	30	3.15	8.25	325	4055	1749	3800	400A	3
CFR30-10-50	30	1000	42	270/330	30	3.7	9.5	365	4602	2230	4400	400A	5
CFR45-12-50	45	1250	45	240/280	37	6.9	15.9	550	5520	3004	5050	500A	7.5

CFA Type

Dimensions

Nozzle symbol	Nozzle name
A	Raw liquid inlet
B	Filtered liquid outlet
C	Cake outlet
D	Overflow
E	Compressed air inlet
F	Pressure gauge port
G	Peephole
H	Liquid discharge outlet

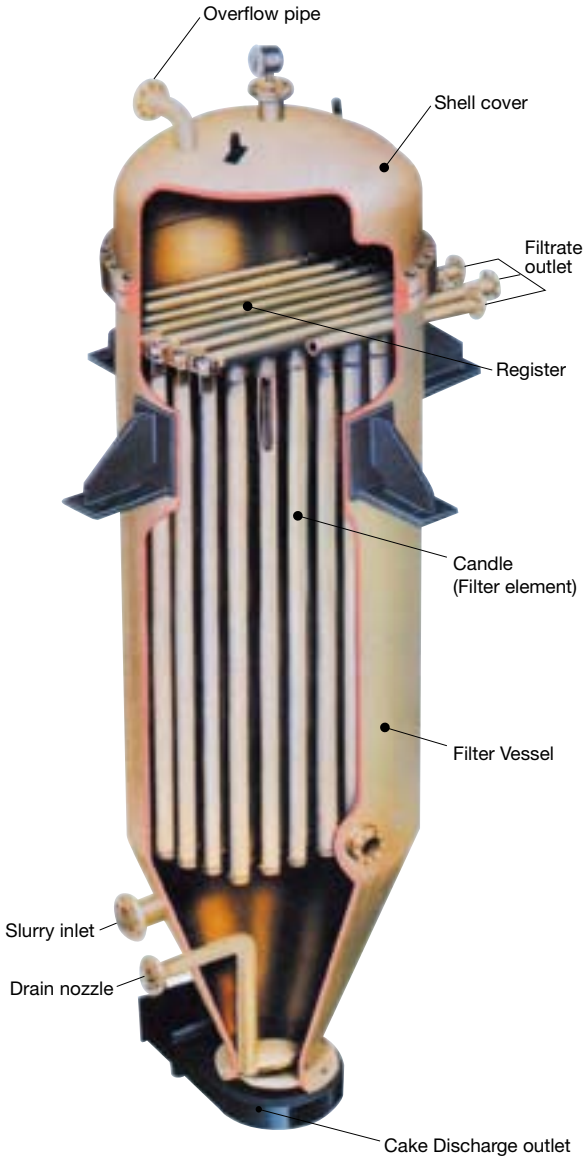


Specifications

Model name	Filtration area (m^2)	Leaf diameter (mm)	Number of filter leaf (pcs.)	Rotation speed 50Hz/60Hz (min^{-1})	Motor (kW)	Tank capacity (m^3)	Filled mass (ton)	Designed load (kN)	a (mm)	b (mm)	n (mm)	Hoist capacity (ton)
CFA2-4-40	2	400	18	510/610	3.7	0.23	1.03	40	1816	1031	2200	1
CFA5-6-40	5	600	20	406/490	5.5	0.52	2.02	80	2252	1271	2500	1
CFA10-8-40	10	800	22	330/400	11	0.9	3.05	120	2433	1397	2600	2
CFA15-10-40	15	1000	21	250/300	15	1.3	4.6	220	2536	1517	2650	2
CFA20-10-40	20	1000	28	250/300	18.5	1.6	5.4	235	2906	1517	3050	3
CFA30-10-40	30	1000	42	250/300	22	2.3	6.9	275	3616	2117	3750	5
CFA40-10-30	40	1000	56	240/270	30	2.5	8.1	325	3949	2230	4050	5
CFA45-10-30	45	1000	63	240/270	30	2.8	8.8	345	4239	2230	4350	5
CFA55-12-40	55	1250	55	180/216	55	5.8	14.5	570	5081	2400	5100	7.5
CFA65-12-40	65	1250	65	180/216	55	6.7	16.6	670	5591	2400	5600	7.5

FUNDABAC Filter

IHI's fully automatic FUNDABAC Filter is playing an active part in the manufacturing process fields of chemicals, pharmaceuticals and medicines, food etc. Resin-made parts can be used for the liquid contact components. Particularly when using highly corrosive liquids or when avoiding metal contamination is required, we recommend the FUNDABAC Filter.



1 Structure of FUNDABAC Filter

FUNDABAC consists of three major parts: filter vessel, candles (filter elements) and register pipes. The filter vessel is made of stainless steel or carbon steel, with a rubber or titanium lining. The filter elements are made of synthetic resins such as reinforced polypropylene resin (PPR), polyvinylidene fluoride resin (PVDF) or stainless steel, and the filter fabric is made of synthetic fibers such as polyester, polypropylene, polyphenylene sulfide (PPS), nylon or Teflon.

2 Principle of Filtration

Filtration

Raw liquid is pressurized and fed into the filter vessel using a pump. The filtered liquid is collected from the filtered liquid outlet for each register pipe at the top of the filter vessel.

Cake discharge

Cake attached to candles (filter elements) is dried by air and collected in solid form from the bottom of the filter vessel using back blow. The cake can also be collected in slurry form using back washing.

Specifications for filter cloth

Item / Name	Material	Air permeability (cc/cm²·sec)	Allowable temperature (nominal, ˚C)
PP5UU	Polypropylene	Small	80
PP20UU	Polypropylene	medium	80
PP30MU	Polypropylene	large	80
PP150MM	Polypropylene	extra large	80
PE5UU	Polyester	Small	100
PE20UU	Polyester	medium	100
PS5UU	Polyphenylene sulfide	Small	150
PS20UU	Polyphenylene sulfide	large	150

Note: Allowable temperatures are approximate values since they depend on liquid types.

3 Structure and Principle of Candle (Filter Element)

Candle pieces (2) are attached to a riser pipe (1) and hose-like filter fabric (3) is fixed to this by hose bands (5) at both ends. The hose bands, which are dedicated for FUNDABAC Filter, secure the filter fabric firmly.

Fig.1 illustrates how filtration is performed.

Raw liquid (A) pressurized and fed into the vessel by a pump is filtered with filter fabric (3) and flows into the candle pieces (2) through slots (4). The liquid flows downward (5) and converges on the riser pipe (1) and flows upward (6) and is collected into the register pipe (7). The filter cloth is tightly pressed against candle pieces (2) by pump pressure and cake (7) is formed on the filter fabric.

Candle pieces (2) are designed to have sufficient strength against filtration pressure, and also for cake (7) to form uniformly over the filter fabric (* The profile of the candle piece is patented). The structure with the riser pipe (1) enables slurry (A) in the filter to be discharged without causing cake on the fabric to come off when air is applied during the process.

Fig.2 illustrates cake being discharged.

Cake (8) is detached using back blow air (B). Filter fabric (3) attached on the candle pieces makes a large movement, dropping dried cake efficiently. Alternatively, cake is discharged in slurry form by alternately applying reverse washing liquid and back blowing air (B).

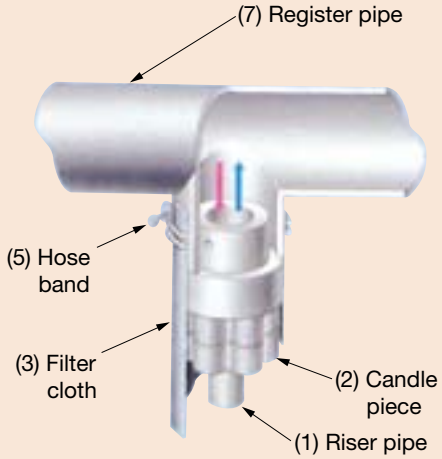


Fig.1

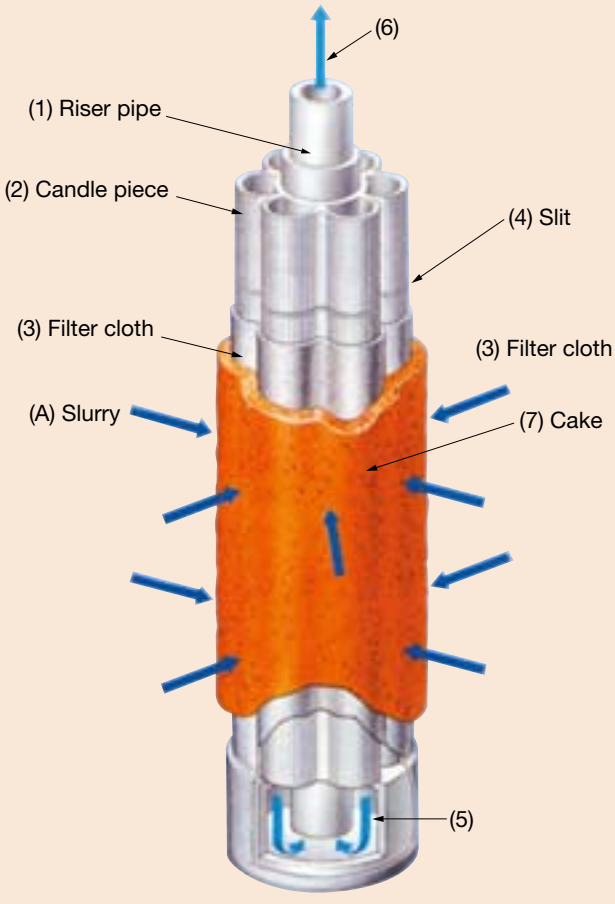
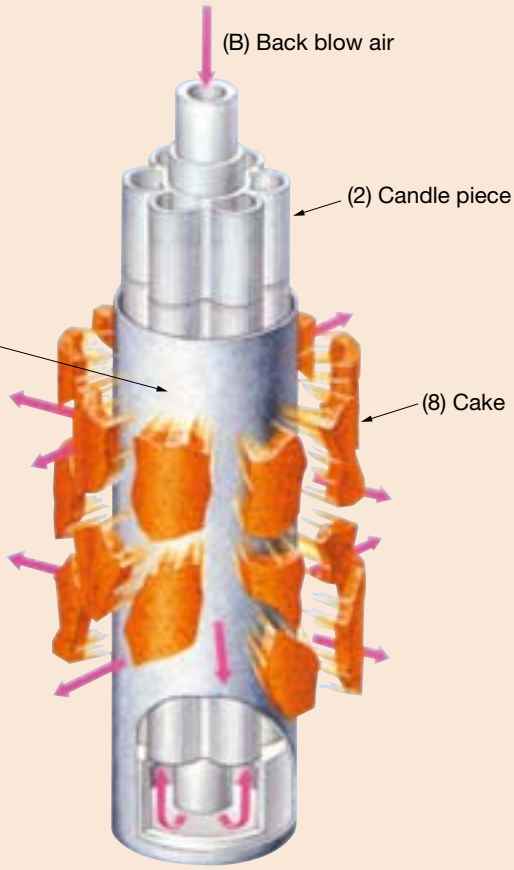


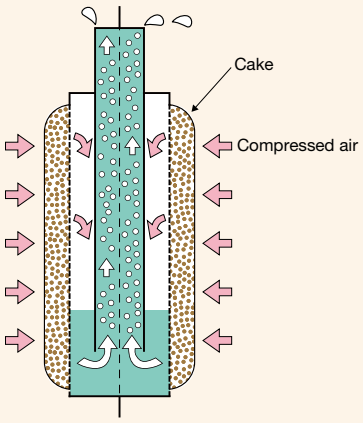
Fig.2



4 Effects of Riser Pipe

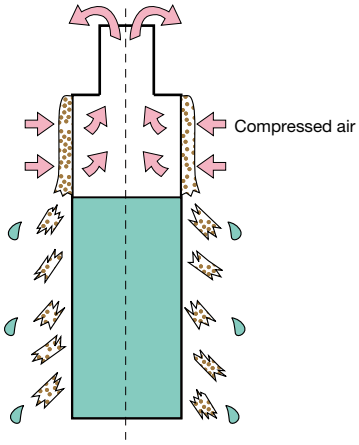
Drying

FUNDABAC Filter



With the FUNDABAC Filter, liquid in the cake is led into the candle with compressed air passing through the cake layers and, together with liquid remaining in the candle, flows upward in the riser pipe to exit from the filter. This enables cake to be uniformly dried over candles and then discharged.

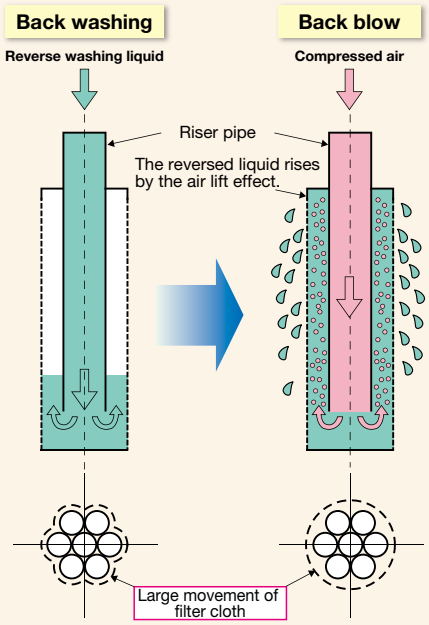
Conventional filter with circular candle



With conventional filters, compressed air passing through cake layers will take shorter paths in the upper parts of candles, causing cake on lower parts of the candles to flow off with the remaining filtered liquid in the element. For this reason, dried cake discharge cannot be expected.

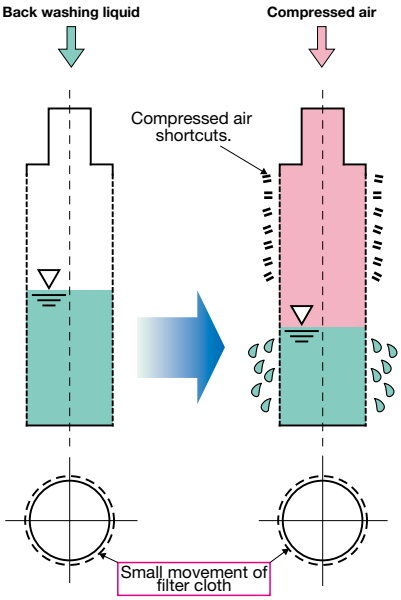
Reverse washing & back blow

FUNDABAC Filter



With the FUNDABAC Filter, washing liquid is reverse-fed into the riser pipe in an amount slightly more than the capacity of the riser pipe, immediately followed by compressed air. The washing liquid rises to the top of the element by the air lift effect, resulting in efficient washing.
(For dried cake discharge, the profiles formed by the riser pipe and special candle pieces cause the filter fabric to freely expand for effective cake discharge.)

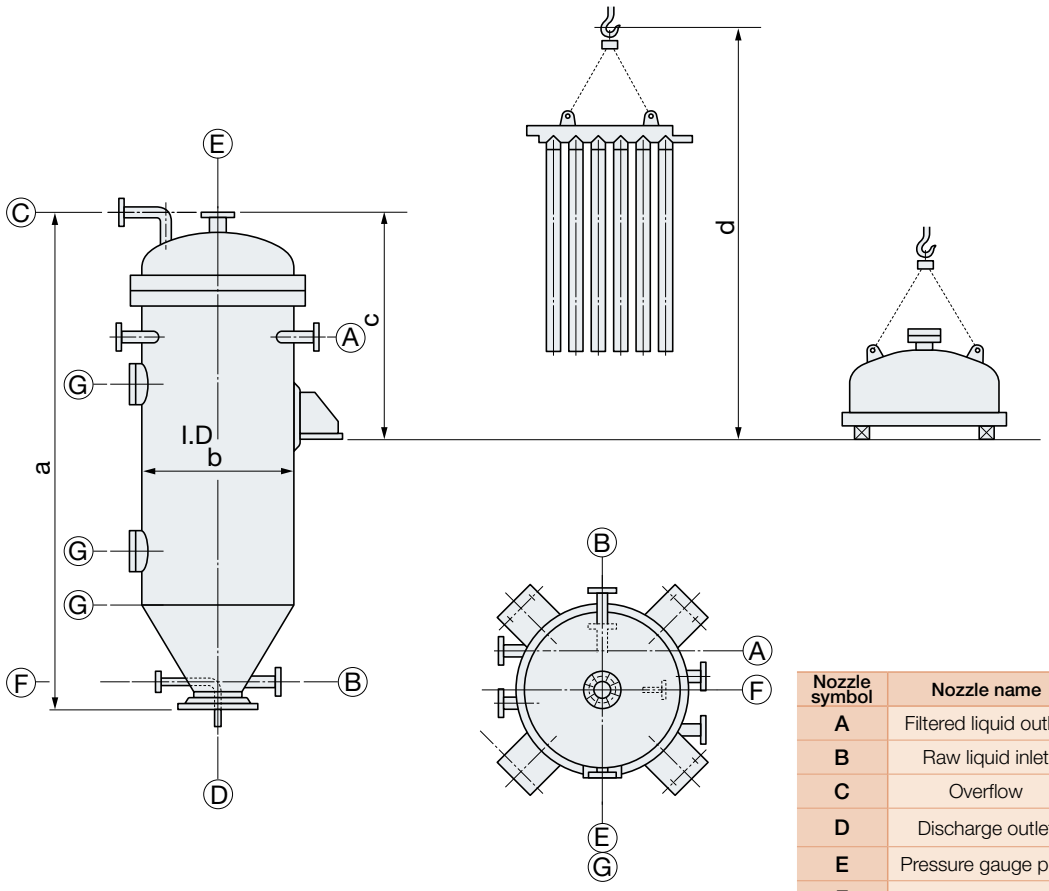
Conventional filter with circular candle



With conventional filters, which do not incorporate riser pipes, washing liquid reverse-fed into the element does not reach the top of the element by itself. Compressed air will be used only to wash lower parts of the element and will easily escape from upper parts, resulting in poor washing performance.

5 Specifications

Dimensions



Nozzle symbol	Nozzle name
A	Filtered liquid outlet
B	Raw liquid inlet
C	Overflow
D	Discharge outlet
E	Pressure gauge port
F	Drain outlet
G	Peephole

Specifications

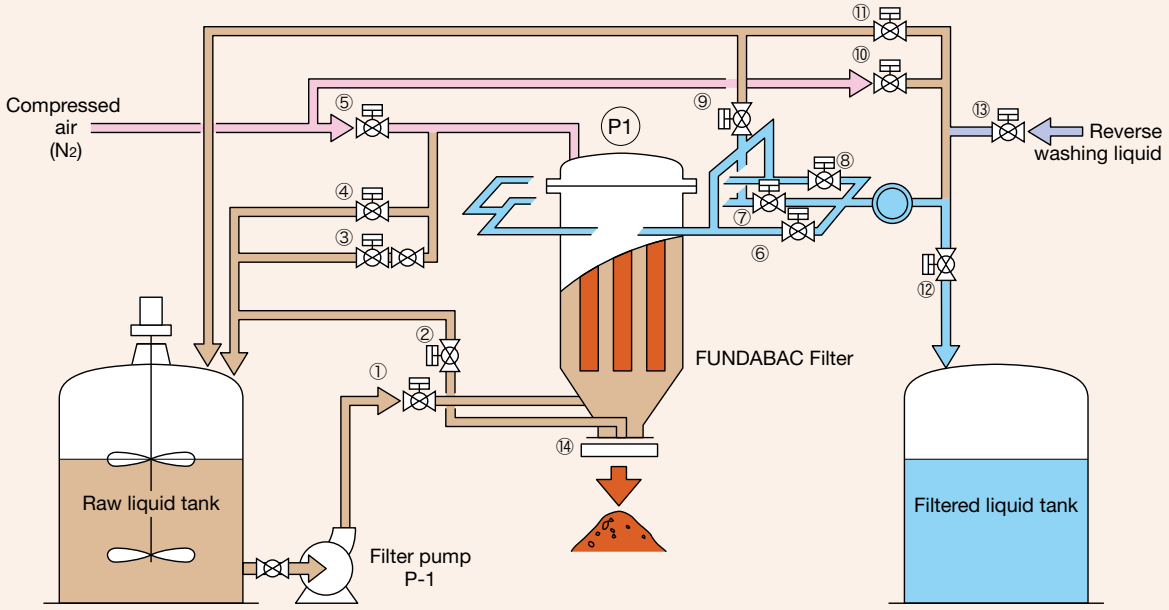
Model name	Filtration area (m^2)	Candle length (mm)	Number of candles (pcs.)	Equipment mass (empty, ton)	Tank capacity (m^3)	Designed load (kN)	a	b	c	d	Discharge outlet D	Hoist capacity (ton)
RZ4.5-14-12	4.5	1250	14	0.75	0.9	21	2517	750	1265	2665	300A	0.2
RZ6-14-16	6	1650	14	0.8	1.1	24	2917	750	1265	3050	300A	0.2
RZ9-27-12	9	1250	27	0.9	1.5	31	2758	950	1535	2865	300A	0.2
RZ15-36-16	15	1650	36	1.2	2.2	44	3187	1050	1535	3250	300A	0.2
RZ23-36-25	23	2500	36	1.3	3.0	55	4037	1050	1535	4110	400A	0.3
RZ35-54-25	35	2500	54	1.7	4.3	77	4262	1250	1585	4110	400A	0.3
RZ54-83-25	54	2500	83	2.8	6.8	123	4547	1550	1390	3810	400A	0.3
RZ83-128-25	83	2500	128	3.9	10.1	179	4932	1850	1565	3910	500A	1
RZ121-186-25	121	2500	186	5.5	15.1	262	5402	2200	1715	3910	500A	1.5
RZ171-264-25	171	2500	264	7.1	22.0	370	5872	2600	1815	3910	500A	1.5

Note:

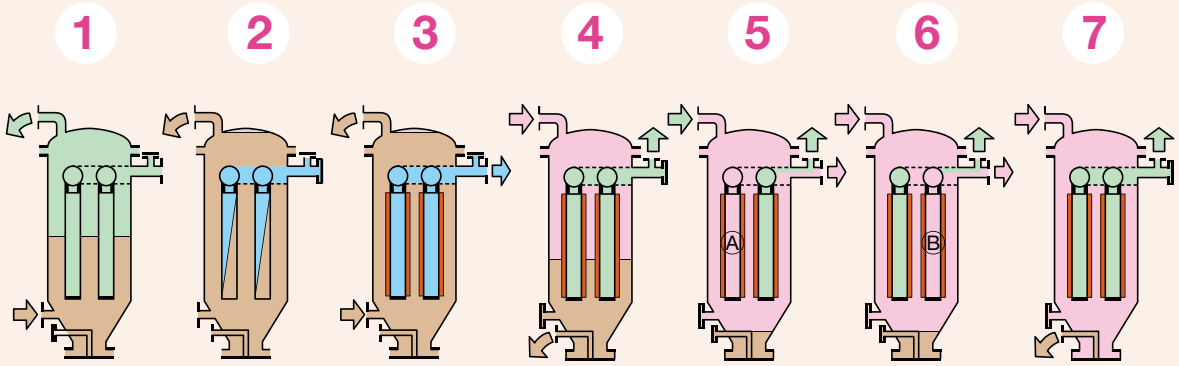
1. Major specifications and dimensions are subject to change without notice.
2. The values in the table are for the candle PP with designed pressure of 0.5MPaG and the vessel material of SUS304.
3. Designed load does not include those for discharge valves, other valves and pipes which may be attached to the filter main body.

6 Operation Process

Operation flow



Operation of filter



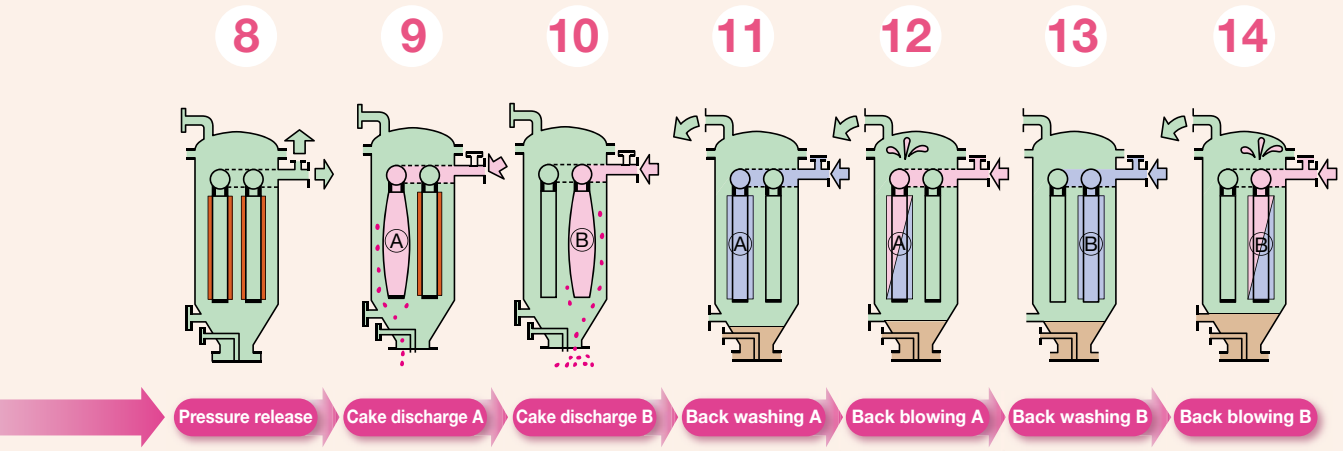
1 Filling	2 Prefiltration	3 Filtration	4 Emptying	5 Air blowing A	6 Air blowing B	7 Drainage
The filter is filled with precoat by pump. The air in the filter exits from the top.	Filtered liquid is returned to the raw liquid tank and circulated with filtration until it is clear. Use of overflow is needed in principle to prevent any solids from precipitating.	The filtered clear liquid is removed from the system. Each leaf can hold cake up to 20mm thick.	The washing liquid is discharged using pressurized air (N_2).	Cake on the filter fabric are dehydrated by air (N_2) blow. Air blow is applied to each filtration line separately to reduce peak usage of water and electricity.		Under air pressure (N_2), any remaining liquid is drained from the machine.

Program table

Mark "●" in the table represents that the equipment is in operation.

Process	Time	Operation point (Valve & Equipment)														
		①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	P-1
1. Filling	10′	●			●					●						●
2. Prefiltration	3′	●		●			●	●	●			●				●
3. Filtration	～	●		●			●	●	●				●			●
4. Emptying	10′		●			●				●						
5. Air blowing A	5′					●	●			●		●				
6. Air blowing B	5′					●		●		●		●				
7. Air blowing C	5′					●			●	●		●				
8. Drainage	1′		●			●				●						
9. Pressure Release	2′						●	●	●	●		●				
10. Discharge valve opening	1′				●						●				●	
11. Cake discharge IA	0.1′				●		●				●				●	
12. Cake discharge IIA	0.1′				●						●				●	
13. Cake discharge IB	0.1′				●			●			●				●	
14. Cake discharge IIB	0.1′				●						●				●	
15. Cake discharge IC	0.1′				●				●		●				●	
16. Cake discharge IIC	0.1′				●						●				●	
17. Discharge valve closing	1′															
18. Back washing A	0.1′				●		●							●		
19. Back blowing A	0.1′				●		●				●					
20. Back washing B	0.1′				●			●						●		
21. Back blowing B	0.1′				●			●			●					
22. Back washing C	0.1′				●				●							
23. Back blowing C	0.1′				●				●		●					

Note: The processing time is approximate.



Pressurized air (N_2) in the filter is released.

Cake is discharged by opening the cake discharge valve at the bottom of the filter and applying back blow air (N_2). The discharge operation is conducted with each register separately to reduce peak usage of water and electricity.

Filter fabric is reverse washed with washing liquid and air (N_2). The reverse washing is conducted with each filtration line separately to reduce peak usage of water and electricity.

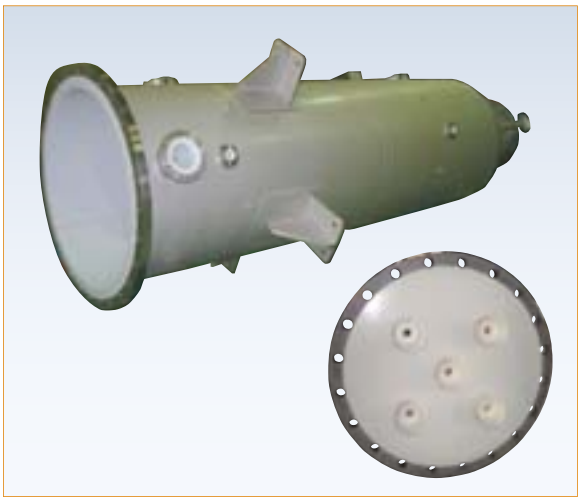
* FUNDABAC is a registered trademark of DrM.

Metal-Free RML Type FUNDABAC Filter

IHI has developed the Metal-Free RML type FUNDABAC Filter, which does not use metals at liquid contact, to process strong corrosive liquids and to solve metal contamination problems which conventional FUNDABAC Filters could not handle. This filter solves corrosion and metal contamination problems without compromising the advantages of the FUNDABAC Filter.

1 Features

- Vessel lining is used (Teflon lining or rubber lining).
- Non-metal materials (plastic or coating) are used for liquid contact internal parts.
- Used strong acids, which have been disposed of conventionally, can be reused by removing impurities using this product. This improves production efficiency and minimizes treatment issues.



2 Example applications

- Various etching processes using strong acids such as hydrofluoric acid, phosphoric acid and sulfuric acid
- Acid washing processes
- Purification processes for fine chemicals such as pharmaceuticals, semiconductors and chemical products

3 Operation

Refer to the operation on the previous page.
*Steam can be used by selecting plastic materials.

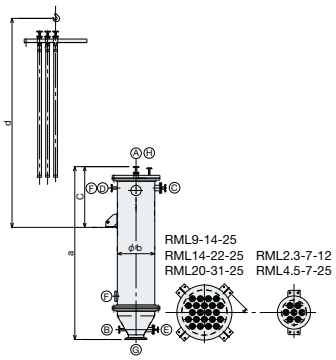
4 Design specifications

Designed pressure: 0.5MpaG
Designed temperature: Max 120˚C, depending on plastic materials
(at 80˚C for candles made of PP)

5 General materials

Vessel: Loose type Teflon lining (PFA)
(Rubber lining available)
Candle: PVDF (PP available)
Filter cloth: PP, PPS
Seal material: Teflon (PTFE)
Wedge ring, seal Rope: PP, PVDF
Candle connection pin: SUS/Teflon lining
* No register is used in this product.

Dimensions



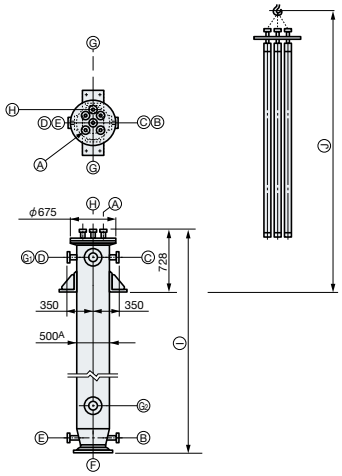
Nozzle symbol	Nozzle name
A	Filtered liquid outlet
B	Raw liquid inlet
C	Overflow
D	Spare nozzle
E	Drain outlet
F	Peephole
G	Cake outlet
H	Pressure gauge port

Specifications

Model name	Filtration area (m²)	Candle length (mm)	Number of candles (pcs.)	Equipment mass (kg)	Tank capacity (L)	Designed load (ton)	a	b	c	d	Shell cover suspending mass (kg)
RML2.3-7-12	2.3	1250	7	445	340	0.9	2120	500A	832	2550	150
RML4.5-7-25	4.5	2500	7	555	580	1.3	3360	500A	1232	4200	170
RML9-14-25	9	2500	14	1100	1360	2.7	3515	750A	1232	4350	460
RML14-22-25	14	2500	22	1460	2000	3.8	3650	900A	1232	4400	700
RML20-31-25	20	2500	31	2000	2750	5.3	3700	(outside diameter) ϕ1050	1232	4500	1050

Penta-Candle Specifications

Dimensions



Main specifications

Model name	Filtration area (m^2)	Candle length (mm)	Number of candles (pcs.)	Equipment mass (empty, kg)	Tank capacity (L)	Designed load (kN)	Filtered liquid outlet A	Raw liquid inlet B	Overflow C	Spare nozzle D	Raw liquid discharge outlet E	Cake Outlet F	Peephole G	Pressure gauge port H	I (mm)	J (mm)	Hoist capacity (ton)
R1.5-5-12	1.5	1250	5	350	320	10	25A×5	40A	40A	40A	15A	200A	ϕ100×2	20A	1961	2438	0.5
R2-5-16	2.0	1650	5	400	400	11	25A×5	40A	40A	40A	15A	200A	ϕ100×2	20A	2361	2838	0.5
R3-5-25	3.0	2500	5	540	590	13	25A×5	40A	40A	40A	15A	200A	ϕ100×2	20A	3261	3632	0.5

Note:
1. Main specifications and dimensions are subject to change without notice.
2. The values in the table are for the candle PP with designed pressure of 0.5MPaG and the vessel material of SUS304.
3. Designed load does not include those for discharge valves, other valves and pipes which may be attached to the filter main body.

Filtration Plant Design and Construction

IHI will comprehensively coordinate optimized filtration plants for various processes to meet customers' needs using IHI's broad experience and advanced technologies.

Filtration plant

IHI can provide a filtration plant as a system including not only the filter main body, but also tanks such as precoat tanks and body feed tanks, piping, platforms, control panels and meters. Based on reliable quality for applications and installation environments, IHI provides various sizes of filtration plants to meet customers' individual requirements.
Examples include filtration for absorbing liquid of exhaust gas desulfurization, filtration for crude soy oil, decolorizing filtration for carbohydrate solutions with activated charcoal, nickel catalyst filtration, dewaxing, etc.

Skid option

The skid type provides a compact filtration plant installed on a common platform, which incorporates filters, pumps, tanks, pipes, valves, control panels and wiring for electricity and meters. Since most parts of construction can be completed in our factory, it provides a drastically reduced on-site construction period and labor, yet with excellent quality control and reduced cost. It enables customers to quickly start operation just by connecting the primary electricity and pipes for the raw liquid inlet, filtered liquid outlet and air (N_2, steam).

Equipment to Support Filters

IHI has been providing products as a pioneer of filters and filtration plants to meet customers' advanced needs. Peripheral and related equipment, which has been developed in response to customers' needs, now spans a wide range. IHI is seeking the best way to fully exploit the filters' capability and to achieve the best total performance of the systems.

Full automatic control panel

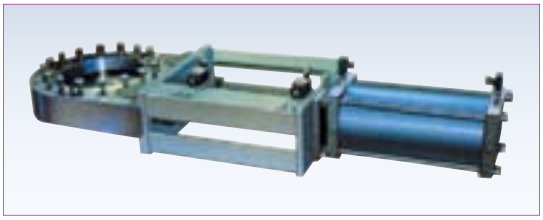
This controls automated operation for filters with a predetermined program to activate equipment such as pumps and valves. IHI proudly provides easy operation and a reliable control mechanism with extremely low failure rates.

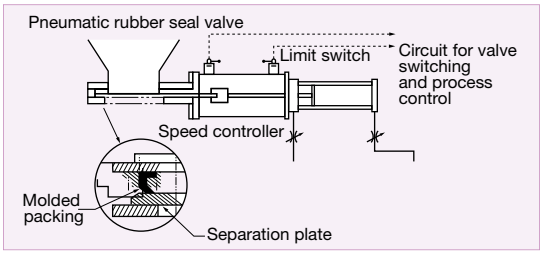
Full automatic filter aid feeder

The filter aid feeder automatically measures and feeds aids in powder form. They are generally used for precoat or body feed.

Pneumatic rubber seal valve

This valve is used as a cake discharge valve. This was developed to withstand harsh conditions requiring a liquid seal during filtration while allowing solid matter to pass through upon cake discharge. It is a plate type valve, which holds only a small amount of residual liquid, allowing liquid to discharge completely. The valve has an assembly structure to ease maintenance.



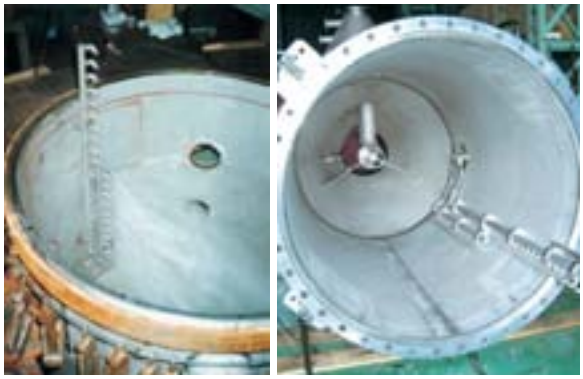


Cake being discharged

1 IHI-Leaf Filter Options

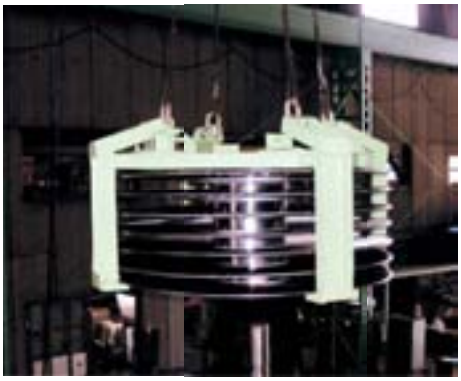
Spray nozzle

High pressure spray nozzles can be installed in the filters to clean surfaces of filter media to remove clogging matter or prevent clog formation.



Leaf suspension jig

Saves labor and time when assembling leaves into filter nests.



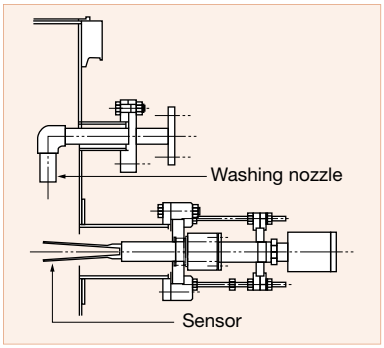
2 FUNDABAC Filter Options

Spiral spray nozzle

Effective for cleaning inside the filters, especially for upper parts of registers and candles.

Cake thickness detection switch

Especially useful for filtration for high density or varying concentration liquids, in which cake thickness control is difficult. When cake thickness exceeds a certain value, sensors installed near the filter fabric shall detect, enabling precise thickness control. After cake discharge, substances attached on the sensors are washed away by washing nozzles.

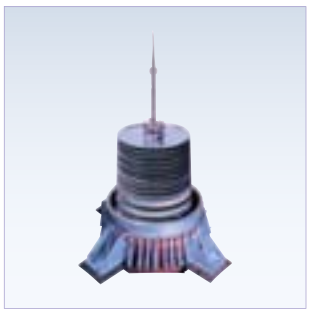


Easy Installation and Maintenance

IHI-Leaf and FUNDABAC Filters provide fully automated continuous operation for 24 hours with one or two inspections per year by opening the filters. The vertical structure of the filters means they do not require a large space for installation and maintenance.

1 Installation and Maintenance for IHI-Leaf Filters

Filter vessel installation → Filter nest assembly → Shell cover assembly → Driving part assembly → Piping and wiring



Filter nest assembly

Shell cover assembly

2 Installation and Maintenance for FUNDABAC Filters

Filter vessel installation → Filter nest assembly → Shell cover assembly → Piping and wiring

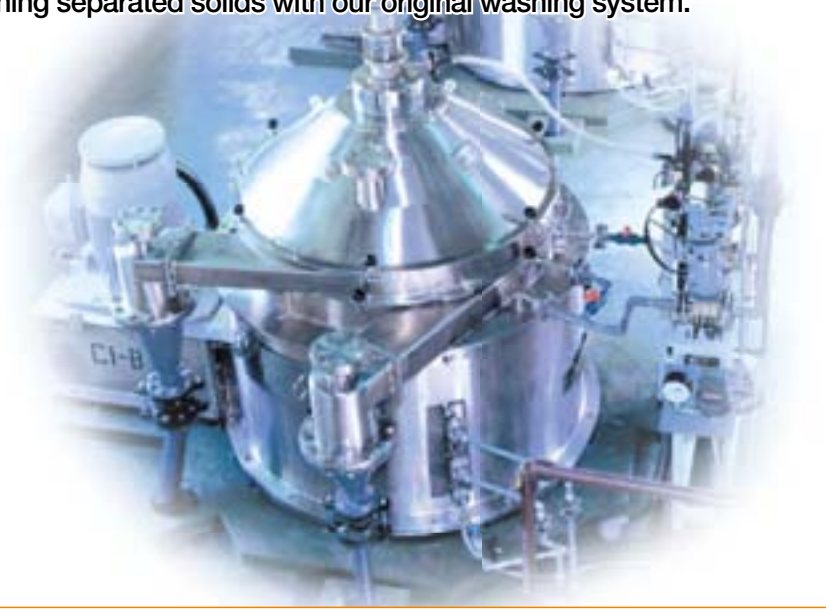
Nest assembly

Vessel installation

Completed assembly

Guinard Centrifuge

The Guinard Centrifuge is a solid-liquid separator manufactured with IHI's high speed rotation technology using the fully automatic and continuous centrifugal method. This machine is suitable for dehydrating comparatively coarse solids such as crystallizations or synthetic resins, and capable of washing separated solids with our original washing system.



1 Characteristics of the IHI Guinard Centrifuge

Continuous Operation

After supplying slurry from the upper part of the centrifuge, the liquid contained in the slurry is separated through the slits of the screen when centrifugal force is applied. On the other hand, solid particles remain in the inner side of the screen, and are discharged to the lower section by the scraper. This principle enables the separation and dehydrating process to be operated continuously and automatically, without manpower.

Excellent Dehydration

The solid particles which remain in the inner side of the screen are continuously conveyed by the scraper, and form a thin accumulation. This thin accumulated layer of solid particles has less filtration resistance, and prevents clogging by IHI's original taper-slit screen (TIS Type). This gives a high dehydration performance.

Outstanding Washing Performance

Dehydrating and washing of separated solids are performed simultaneously and continuously (HL Type). The washing solution is supplied to the whole circumference evenly from the unique washing device to the thin solid layer, enabling an excellent washing performance with a small amount of washing solution. Furthermore, the 2 types of washing liquid are used from the 2-stage washing pipe (HL2 Type), and the separated liquid and washing liquid can be collected separately (HLS Type and HL2S Type).

Compact Size, Low Vibration, and Easy Installation

The unit is vertical with a rational structure. The balanced rotating body means low vibration, and easy installation, in a small space.

Easy Maintenance

The upper casing, basket, screen, etc., can be dismantled easily from above, which leads to easy maintenance.

A Variety of Models and Equipment for Various Applications

Various models are available from the washing types (HL), and 2-stage washing types (HL2), to washing liquid separating types (HLS and HL2S). Furthermore, various options are available such as the basket washing mechanism, sealed type machine for treatment of combustible or hazardous materials such as solvents, concentrated discharging type, prevention of adhesion of solid material, etc.

Complete After-Sales Service

IHI's service network perform an attentive and thorough after-sales service.

2 Application

Inorganic chemical industry

- Potassium chloride
- Sodium chloride
- Sodium dichromate
- Iron sulfate
- Copper sulfate
- Sodium carbonate
- Sodium sulfate
- Sodium thiosulfate
- Sodium chlorate
- Nickel sulfate
- Sodium hypochlorite

etc

Organic chemical industry

- Polyethylene
- Expanded polystyrene (EPS)
- ABS resin
- Fumaric acid
- Sodium glutamate
- Polyvinyl chloride
- Glycine
- Terephthalic acid
- Ion-exchange resin
- Caprolactam
- Bisphenol-A
- Pentaerythritol
- Nylon pellet
- Poval, Eval

etc

Guinard Centrifuge

Food

- Apple juice
- Corn fiber
- Citric acid
- Tartaric acid
- Salt
- Sesame
- Fruit juice
- Wax
- Seasoning
- Aspirin

etc

Chemical fertilizer

- Urea
- Sodium nitrate
- Ammonium nitrate
- Ammonium sulfate
- Ammonium phosphate

etc

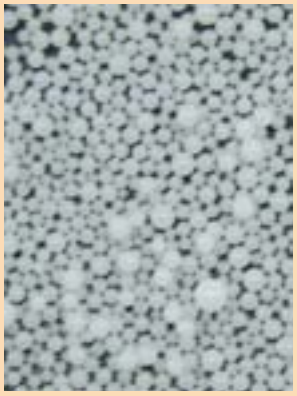
Experiment data

Sodium chloride (NaCl)
(Collected salt of sodium hypochlorite)

Model	C30HLS
Total volume of crystal	1300kg/Hr
Concentration	35wt%
Volume of separated liquid	1790 ℓ /Hr
Particle size	100MESH ON 80%
Temperature	25℃
Washing water	water (100 ℓ /Hr)
Centrifugal force	750G
Moisture ratio	3.0wt% or less
Material	TITANIUM

Citric acid

Model	C30HL
Total volume of crystal	1700kg/Hr
Concentration	30wt%
Volume of separated liquid	1850 ℓ /Hr
Particle size	80MESH ON 90%
Temperature	20～40℃
Washing water	water (150 ℓ /Hr)
Centrifugal force	2000G
Moisture ratio	1.5wt%



Polystyrene (synthetic resin)

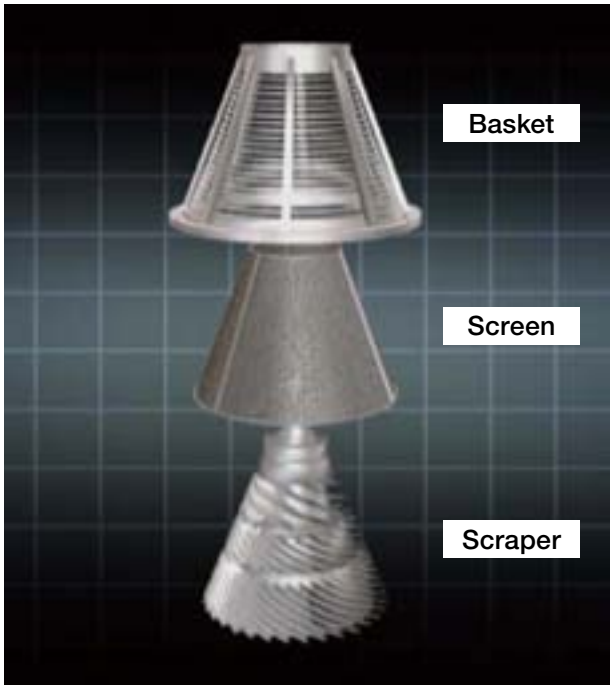
Model	C55H
Volume of solids	4000kg/Hr
Concentration	30wt%
Volume of separated liquid	9000 ℓ /Hr (water)
Particle size	10 ～ 24MESH
Temperature	Normal temperature
Centrifugal force	1000 ～ 1300G
Moisture ratio	0.2wt%

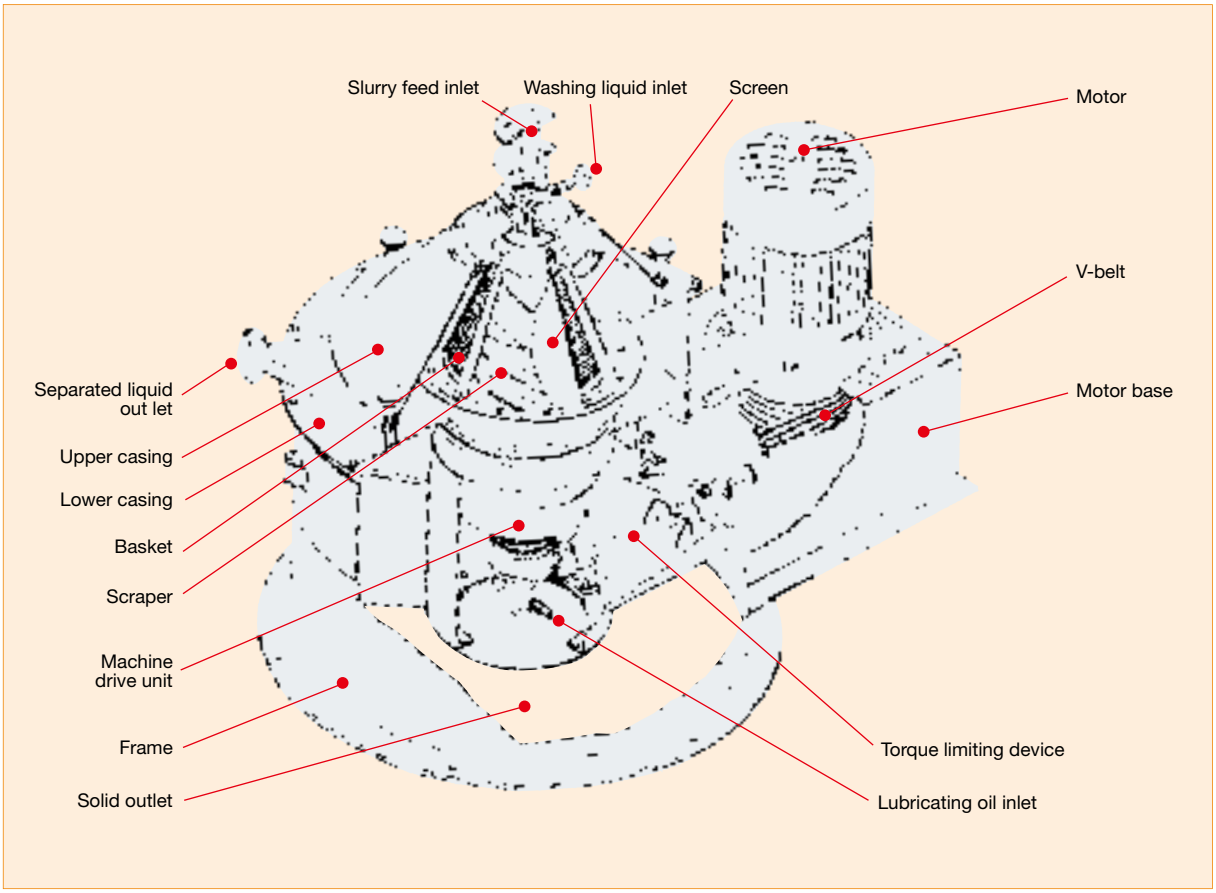
Nylon pellets

Model	C30HL
Volume of solids	2000kg/Hr
Concentration	50wt%
Volume of separated liquid	2000 ℓ /Hr
Particle size	φ2mm
Temperature	Normal temperature
Centrifugal force	1800G
Moisture ratio	—

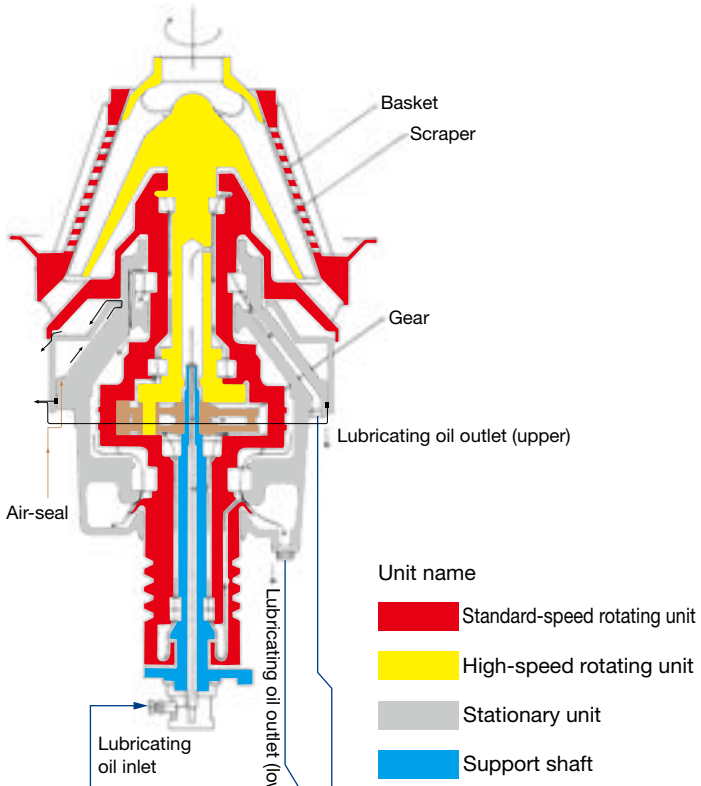
3 Structure and Principle

The GUINARD Centrifuge is composed of a cylindrical frame and a conical cover (upper and lower casings) mounted on the frame and equipped with a slurry feed inlet and a separated liquid outlet.
A rotary conical basket is provided inside the casing, and a screen having a number of slits is set inside the basket. A scraper consisting of spiral blades built on the surface of a rotor rotates along the inner surface of the screen at a given relative speed with the necessary clearance maintained from the screen. This relative speed is controlled by the reduction gear.
All the movements are effected by the motor mounted on the motor base through the V-belt.
The slurry fed through the slurry feed inlet is spread in the form of a thin layer on the inner wall of the conical screen. The solid in the slurry is separated from the liquid while being scraped out and pushed downward by the rotation of the scraper, and falls down to the bottom of the frame. The separated liquid is passed through the slits of the screen by centrifugal force and discharged from the separated liquid outlet. When a washing liquid is to be used, it is supplied from the washing liquid inlet.





4 Rotating Mechanism / Lubricating Oil Mechanism



Lube oil unit

Model	C20	C30	C40	C55
Oil tank capacity(ℓ)	13	13	13	13
Flow rate of lubricating oil(ℓ/Hr)	5~6	6~9	9~12	12~15

Rotating drive

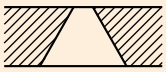
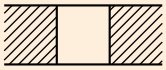
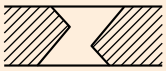
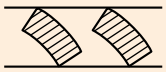
The rotating drive unit is built with the gear in the center.
The motor rotation is transmitted through the V-pulley and V-belt as the basic revolution. On the other hand, a slightly faster revolution than the basic revolution is transmitted from the gear through the center shaft, to the scraper. This relative rotating mechanism scrapes out the solids on the inner screen evenly, by the scraper.
The plunger pump attached to the rotating drive unit is a forced lubrication system which ensures safe lubrication with a small amount of lubricant.

5 Screen

The screen is the important component for separating solids for the centrifugal separator.
IHI provides a variety of screens for a multitude of applications.

The Tyler Normal Screen Scale Sieves		
Mesh (Sieve designation/in)	Sieve opening (mm)	Nominal wire diameter (mm)
2 1/2	7.925	2.235
3	6.680	1.778
3 1/2	5.613	1.651
4	4.699	1.651
5	3.962	1.118
6	3.327	0.914
7	2.794	0.833
8	2.362	0.813
9	1.981	0.839
10	1.651	0.889
12	1.397	0.711
14	1.168	0.635
16	0.991	0.597
20	0.833	0.437
24	0.701	0.358
28	0.589	0.318
——	——	——
32	0.495	0.300
35	0.417	0.310
42	0.351	0.254
48	0.295	0.234
60	0.246	0.178
65	0.209	0.183
80	0.175	0.142
100	0.147	0.107
115	0.124	0.097
150	0.104	0.066
170	0.088	0.061
200	0.074	0.053
250	0.061	0.041
270	0.053	0.041
325	0.043	0.036
400	0.038	0.025

Standard screens

Type	Plate thickness (mm)	Nominal slit dimensions (mm)	Opening ratio (%)	Material	Cross-sectional shape
TIS5007S	0.50	0.07×4.0	5.4	SUS316L-CSP Titanium	
TIS5010	0.50	0.10×4.0	7.7		
TIS5015	0.50	0.15×4.0	11.4		
TIS5020	0.50	0.20×4.0	12.7		
TIS5025	0.50	0.25×4.0	15.8		
TIS8025	0.80	0.25×4.0	15.8	SUS304-CSP	
KIP6030	0.60	0.30×3.0	18.0	SUS316 SUS316L	
KIP6050	0.60	0.50×3.0	25.0		
NIP7040	0.70	0.40×4.0	20.0		
NIS3012	0.30	0.12×2.5	8.4	SUS316 SUS316L Titanium	
NIS5025	0.50	0.25 dia.	6.0	SUS316 SUS316L Titanium	

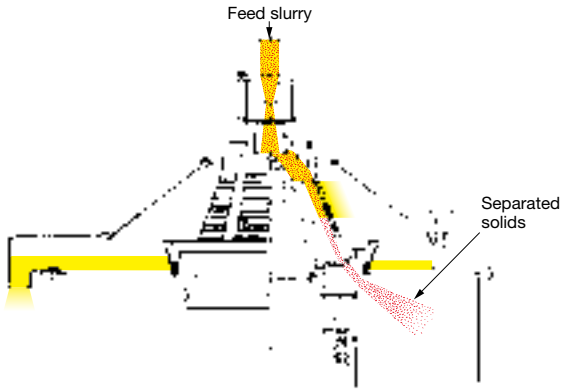
Mounting of screen

6 Centrifuge Variations

Feed slurry
Washing liquid I
Crystal or solid
Separated liquid
Washing liquid II
Separated liquid and washing liquid

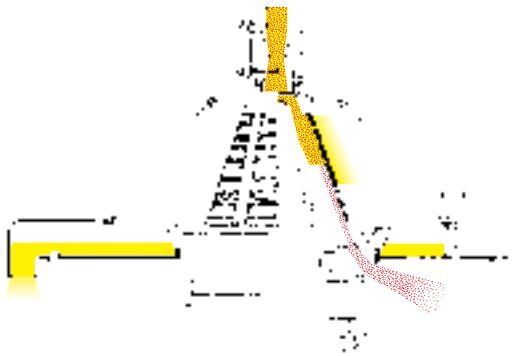
N Type (with short basket)

Large slurry feed inlet, ideal for coarse solid treatment.



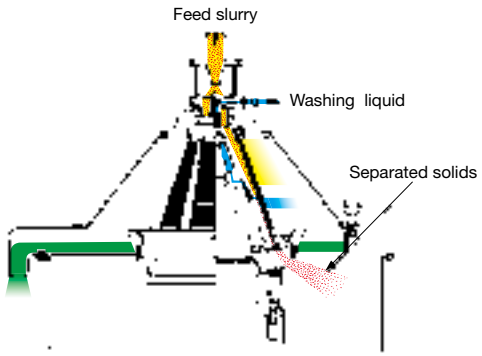
H Type (with tall basket)

Ideal for treatment of slurries of low concentration, viscous liquids.



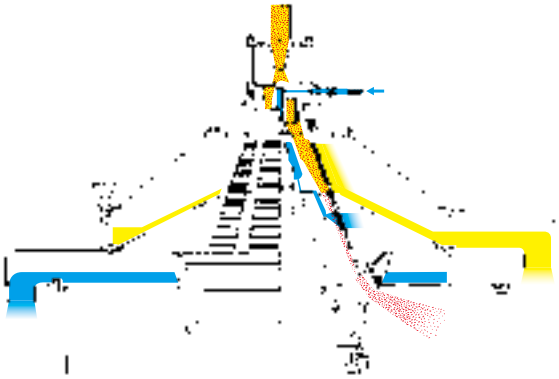
HL Type (1-stage washing type)

1-stage washing. Washing is performed by spraying washing liquid at separated solids.



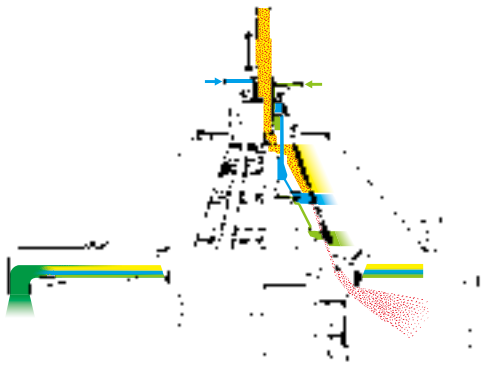
HLS Type (Washing liquid separating type)

Washing liquid and separated liquid is separated when collecting.



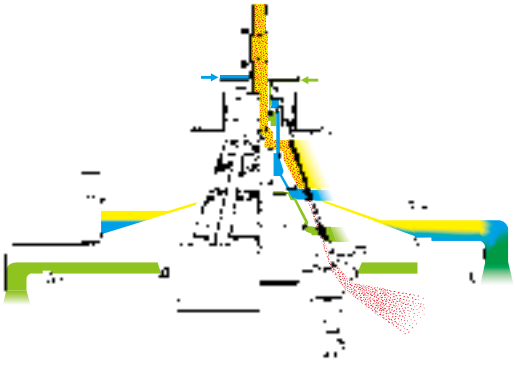
HL2 Type (2-stage washing type)

Used for 2-stage washing when further washing is required, or used when two types of washing liquids are required.



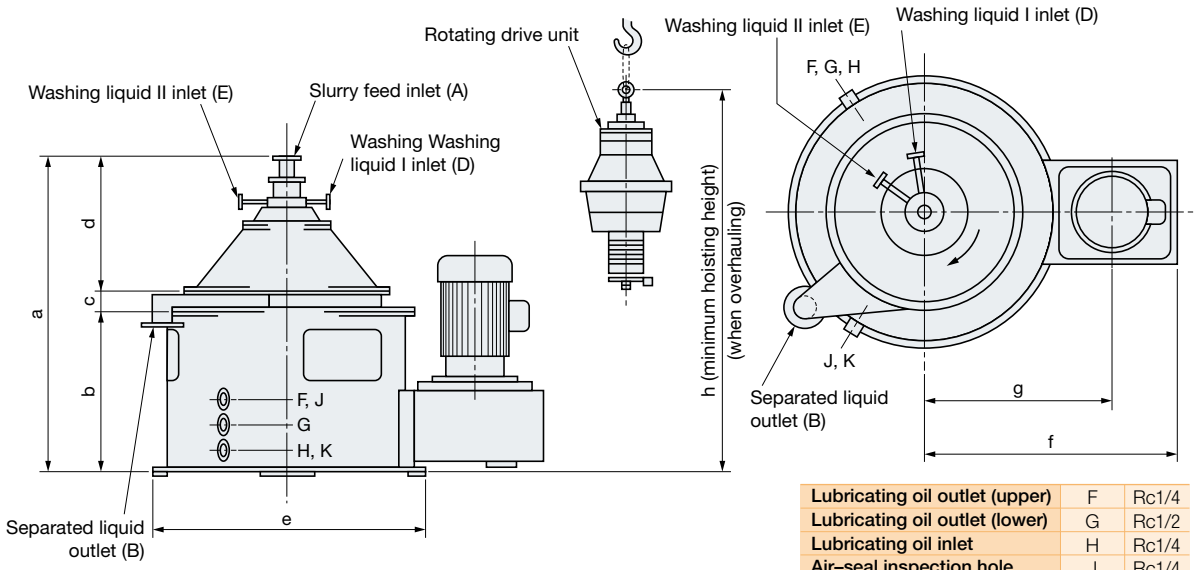
HL2S Type (2-stage washing liquid separating type)

Used for 2-stage washing for further washing, or two types of washing liquids can be used. The separated liquid and washing liquids can all be collected separately.



N, H, HL, HL2 Type

Outline drawing



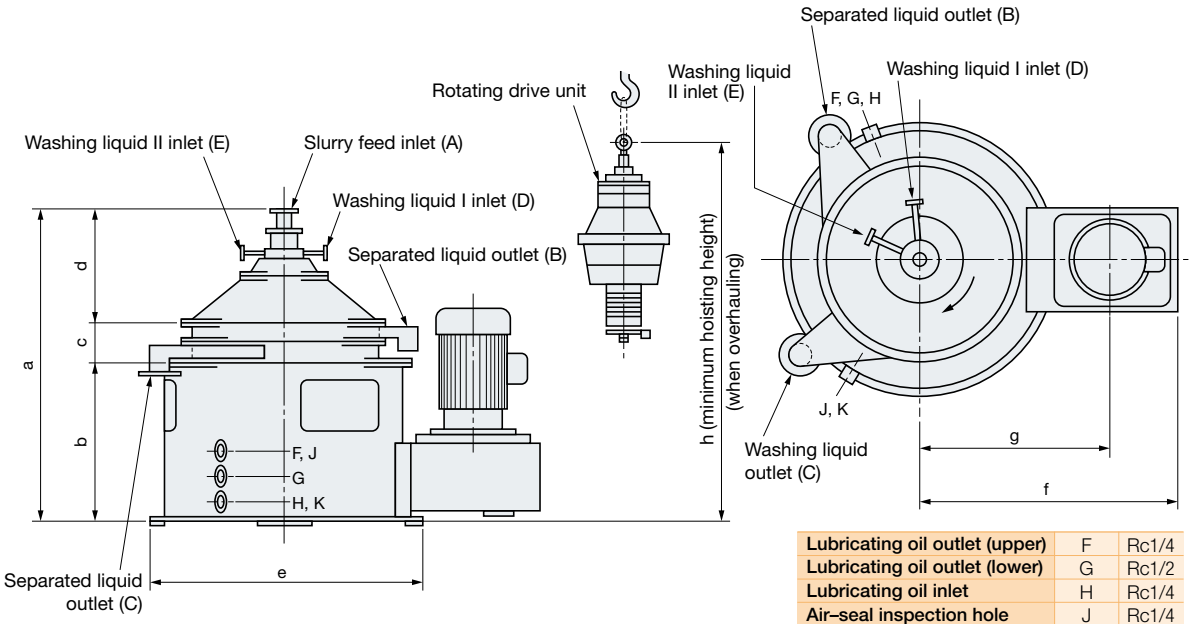
Lubricating oil outlet (upper)	F	Rc1/4
Lubricating oil outlet (lower)	G	Rc1/2
Lubricating oil inlet	H	Rc1/4
Air–seal inspection hole	J	Rc1/4
Air–seal inlet	K	Rc1/4

Main dimensions

Model		Dimensions (mm)								Slurry feed inlet	Separated liquid (outlet)	Washing liquid (outlet)	Washing liquid I (inlet)	Washing liquid II (inlet)
		a	b	c	d	e	f	g	h	A	B	C	D	E
C20	H	905	515	70	320	725	790	570	1300	25A	50A	—	—	—
	HL	935	515	70	350	725	790	570	1300	25A	50A	—	15A	—
	HLS	935	515	130	290	725	790	570	1300	25A	50A	50A	15A	—
C30	N	1100	600	75	425	1000	980	735	1600	50A	65A	—	—	—
	H	1155	600	75	480	1000	980	735	1600	50A	65A	—	—	—
	HL	1180	600	75	505	1000	980	735	1600	50A	65A	—	15A	—
	HLS	1185	600	155	430	1000	980	735	1600	50A	65A	65A	15A	—
	HL2	1200	600	75	525	1000	980	735	1600	50A	65A	—	15A	15A
	HL2S	1200	600	155	445	1000	980	735	1600	50A	65A	65A	15A	15A
C40	N	1300	680	115	505	1350	1325	1000	1900	50A	80A	—	—	—
	H	1375	680	115	580	1350	1325	1000	1900	50A	80A	—	—	—
	HL	1400	680	115	605	1350	1325	1000	1900	50A	80A	—	15A	—
	HLS	1405	680	230	495	1350	1325	1000	1900	50A	80A	80A	15A	—
	HL2	1460	680	115	665	1350	1325	1000	1900	50A	80A	—	15A	15A
	HL2S	1460	680	230	550	1350	1325	1000	1900	50A	80A	80A	15A	15A
C55	N	1640	800	145	695	1570	1550	1200	2300	65A	200A	—	—	—
	H	1835	800	145	890	1570	1550	1200	2300	65A	200A	—	—	—
	HL	1835	800	145	890	1570	1550	1200	2300	65A	200A	—	15A	—
	HLS	1835	800	275	760	1570	1550	1200	2300	65A	200A	200A	15A	—
	HL2	1885	800	145	940	1570	1550	1200	2300	65A	200A	—	15A	15A
	HL2S	1885	800	275	810	1570	1550	1200	2300	65A	200A	200A	15A	15A

HLS, HL2S Type

Outline drawing



Lubricating oil outlet (upper)	F	Rc1/4
Lubricating oil outlet (lower)	G	Rc1/2
Lubricating oil inlet	H	Rc1/4
Air–seal inspection hole	J	Rc1/4
Air–seal inlet	K	Rc1/4

Main dimensions

Model		Specification							
		Basket	Motor	Weight of equipment	Drive unit	Design load	Amount of treatment (reference value)	Maximum centrifugal force	Utilities (reference value)
		Inner diameter (mm)	(kW)	(kg)	Weight (kg)	(kN)	Amount of clarified liquid (m³/hr)	(G)	Air-seal (Lit/min)
C20	H	200	2.2	190	40	5	1.0	1800	50～100
	HL								
	HLS								
C30	N	300	5.5	700	105	20	3.0	1800	100～200
	H								
	HL								
	HLS								
	HL2								
	HL2S								
C40	N	400	15	1350	195	35	5.5	1800	100～300
	H								
	HL								
	HLS								
	HL2								
	HL2S								
C55	N	550	30	2300	425	60	11	1500	200～500
	H								
	HL								
	HLS								
	HL2								
	HL2S								

Note:

1) The treatment capacity of the unit mainly depends on the amount of separated liquid. The separated liquid (including washing liquid) varies by the characteristics of the treated substance. Please use this as a reference for model selection.
2) The centrifugal force (500G-1800G), and treatment capacity are determined by the test results and performances.
3) Air-seal is necessary for reducing negative pressure. The values are for reference (normal), and may vary depending on the pressure balance of before/after separation.
4) The standard material is SUS304. In addition, SUS316, SUS316L, hastelloy, or titanium can be used as a material for manufacturing, depending on the substance for treatment.
5) Legend of types (example: C40HL)
   C40: The Scales are indicated by types. The value indicates the inner diameter (unit: cm) of the bottom of basket.
   HL: Indicates the variations. In this case, this indicates “high basket, 1-stage washing type”.
   S: Indicates variations. In this case, this indicates “washing liquid separated type”.

Increased Functionality and Efficiency
Guinard Centrifuge Options

Various peripheral devices can be added to improve functionality and handle a wide range of products.

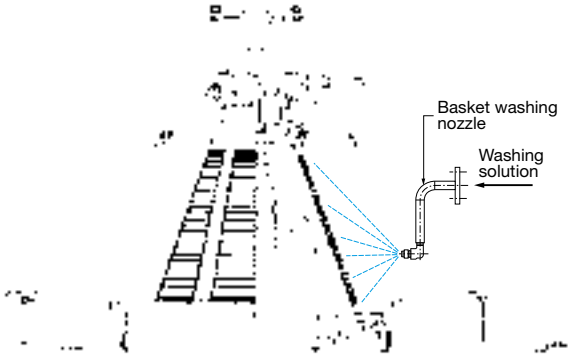
1 Fully-sealed type

A fully-sealed vertical separator, with a compact design. Ideal for explosive materials or hazardous solvents, etc. The fully-sealed type is designed for N_2 gas seal nozzle, or pressure equalization nozzle, in order to seal the unit.

Design pressure: max 5.0kPa (Pe)

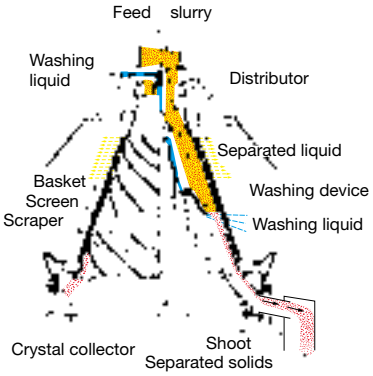
2 Basket washing

When performing continuous operation for a long period of time, slit clogging may occur from the outer side of the basket, depending on the characteristics of the slurry. The basket washing mechanism is designed for continuous and stable operation, by spraying the washing liquid intermittently, from the outside of the basket.



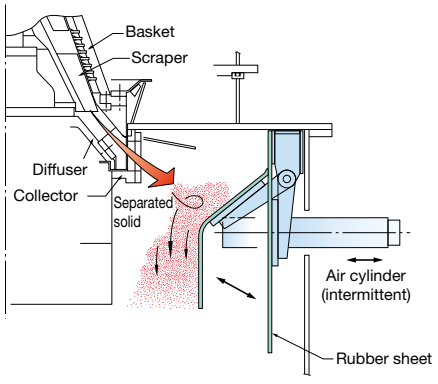
3 Crystal collector

The discharge of separated solids is centralized for effective treatment of substances of high adherence. The solids are conveyed downwards by the scraper, and collected in the crystal collector. Inside the collector is a scraping blade, transferring the solids through a collector-shoot, and discharging through from a cylindrical discharge-shoot.



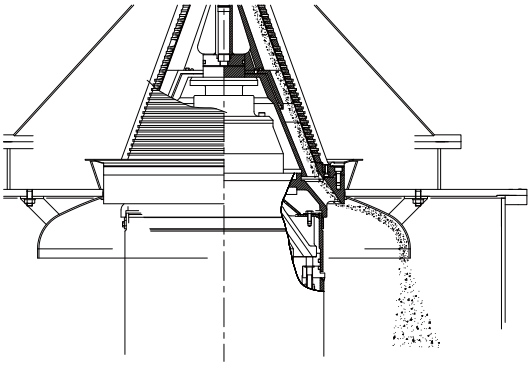
4 Anti-adhesion system
(Oscillator plate, air cylinder drive)

The intensively discharged solids are received by an oscillator plate (natural rubber, etc.), which is activated by an air cylinder. This forces the solids to drop off, and prevents adhesion or build-up of solids.
Proven high performance for high adhesion by-product salt.



5 Deflector

Adhesion of solids to the frame is reduced by changing the discharging direction of the solids discharged from the diffuser.



6 Hopper, air knocker

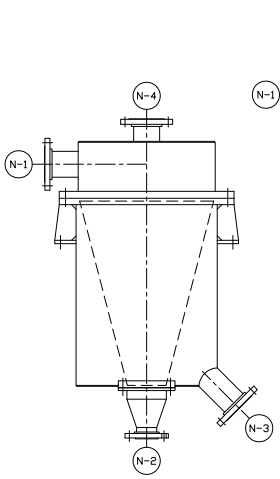
Receives the discharged solids, and prevents the discharge failure of bridge-formed solids with an air knocker.

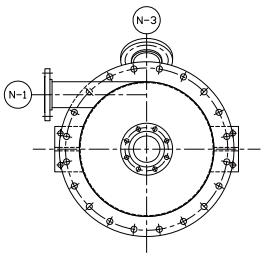
7 Preconcentration unit

When solid concentration is diluted (less than 5% in general), preconcentration units are installed on the anterior section of the Guinard, to accelerate dehydration.

1 Tamiclone (Hydroclone Separator)

Used when the difference in specific gravity between solid and liquid is small. A screen is installed inside to utilize the centrifugal force of the vortex for centrifugal filtration and concentration.

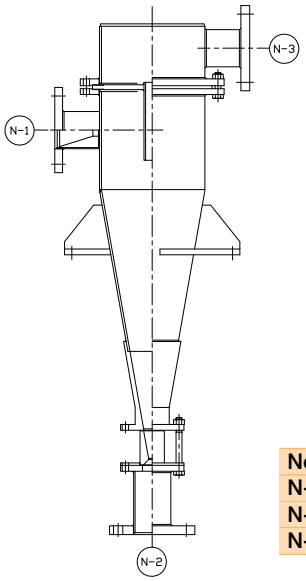


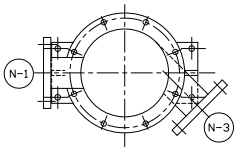


No.	Purpose
N-1	Slurry feed inlet
N-2	Concentrated liquid outlet
N-3	Separated liquid outlet
N-4	Overflow

2 Liquid cyclone

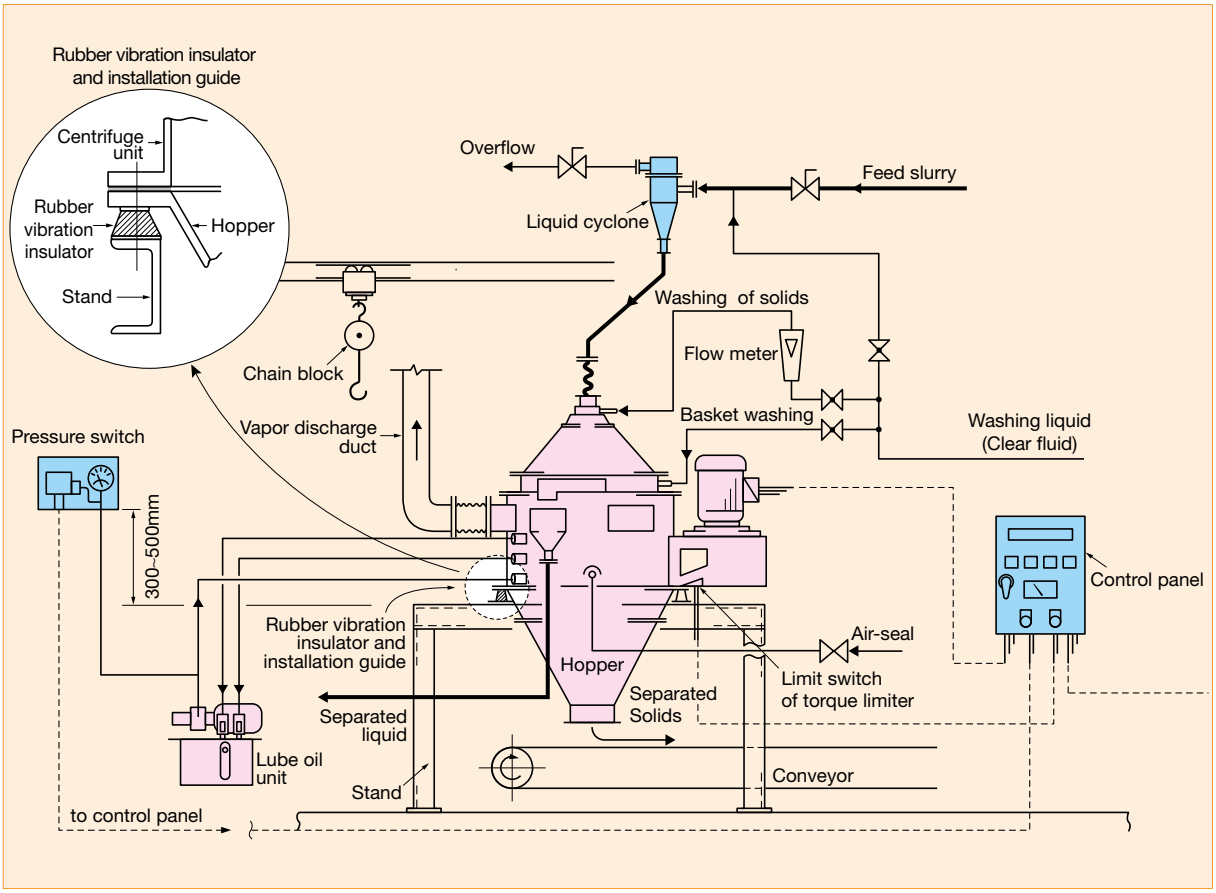
Used when the difference in specific gravity between solid and liquid is large. The centrifugal force of the vortex of liquid is utilized for centrifugal concentration.



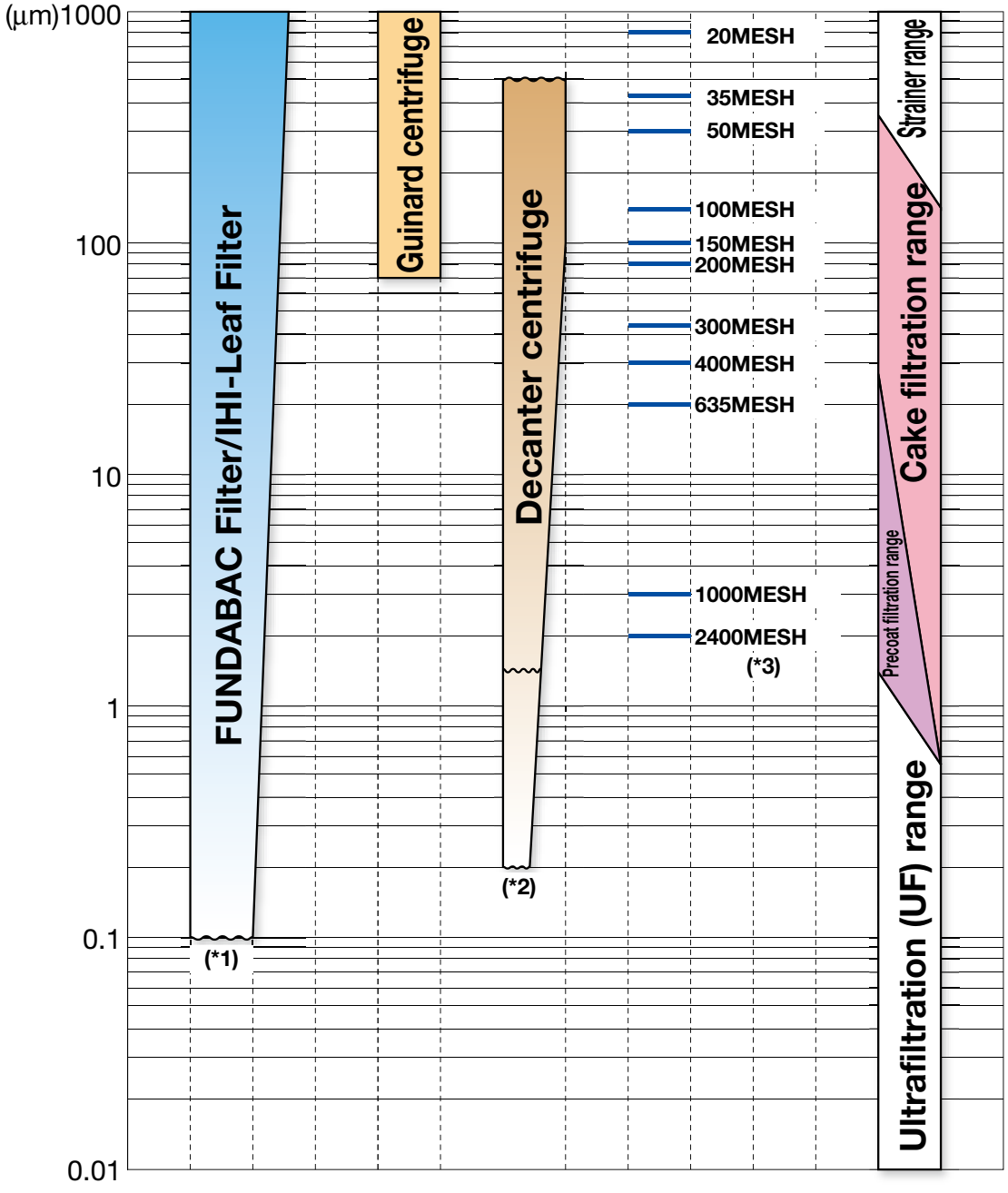


No.	Purpose
N-1	Slurry feed inlet
N-2	Concentrated liquid outlet
N-3	Low-concentrated liquid outlet

7 Example Flow



Application Scope for IHI Filters and Centrifuges



Note
1) Filtration limit may vary by filtration aid.
2) Separation limit may vary by specific gravity of the liquid to be filtered.
3) MESH may vary by wire diameter and the values in the table are approximate.
4) This table is provided as a reference only. For actual application, tests are conducted for confirmation.

Pilot Test

What is the Pilot Test?

IHI has a selection of pilot test machines available. Customers considering purchasing any of these machines are invited to try them out and confirm the performance for themselves.

Nutsche test equipment
(Filtration area: 0.001m²)

CFR0.06m²
IHI-Leaf Filter test equipment
L1700mm×W1000mm×H1500mm

R0.3m²
FUNDABAC Filter test equipment
L1750mm×W1000mm×H1900mm

R0.06m²
FUNDABAC Filter test equipment
L692mm×W281mm×H685mm

*Test equipment is also available.

Test Enquiry Form

Before performing tests, please send the below information to IHI.

1.	Name		
2.	Company		
3.	Department/Division Name		
4.	Industry		
5.	Contact Information	Postal Code	
		Address	
		Phone	– –
6.	E-mail		

Test Enquiry Data

Please answer the following questions to the best of your knowledge.

7.	**Raw Material**	
(1)	Name of the raw material	
(2)	PH	
(3)	Operation temperature	℃
(4)	Viscosity	C.P.

8.	**Suspended Solid in the Raw Material**	
(1)	Name of the solid	
(2)	Composition of the solid	
(3)	Concentration of solids included within the raw material	
(4)	Absolute specific gravity of the solid parts	
(5)	Bulk specific gravity of the solid parts	
(6)	Particle size and distribution of the solid parts	

9.	**Liquid in the Raw Material**	
(1)	Name of the liquid	
(2)	Specific gravity of the liquid	

10.	**Treatment Conditions**	
(1)	Treatment volume	㎥/h
		kg･DSS/h
(2)	Desired solid recovery rate	%
(3)	Desired moisture in the recovered solids	wt%

11.	**Is It Possible to Use Additives Such As Filter Aids and High-Polymer Coagulants?**	Yes / No

12.	**Current Treatment Flow**	
(1)	The type, manufacturer and model of the separator currently in use	
(2)	Problems with the separator currently in use	

Precautions

*1 We regret to inform you that we cannot conduct a test on our premises if your slurry is one with properties like the ones below.
1. Toxic slurry
2. Explosive slurry
3. Volatile slurry
4. Slurry that would be difficult for our company to dispose of

*2 We regret to inform you that testing cannot be conducted under the following instances.
1. An instance where our company is in possession of many records, making it possible to predict performance with a high-degree of accuracy.
2. An instance where we have determined from the submitted data sheet, that it would be difficult for our machines to process your materials.

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URL : www.ihi.co.jp/separator/en/
E-mail : nh0046@ihi.co.jp

⚠ Safety warning

- Read and understand the operator's manual before using any of the machines featured in this catalog.

- Product and contact information is correct as of March 2012.
- Specifications are subject to change without notice to improve product performance or functionality.
- Please note colors of actual products may appear different for reasons attributable to printing.

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