

Laboratory and Pilot Centrifuges, Filters und Dryers





Vertical Centrifuges

V 200 TP – V 400 TP

The vertical centrifuges Type V 200 TP, V 300 TP, V 400 TP, have been designed for basic tests of centrifugal separation technology.

Customer benefits:

- Mobile design with small foot print
- Easy installation; "plug and use"
- Ideal for scale-up
- Simplest handling
- CIP cleaning
- Installation in isolator housing/glove box possible

Standard specification:

Bowl diameter	200–400 mm
Filter surface	0.062–0.31 m ²
Nominal volume	1.5–16 liter
Maximum load	2.0–20 kg
Max. centrifugal force	900–2055
Material	1.4571 or 2.4602 (Alloy C22)
Surfaces in contact with product	Ra <0.8 µm

Standard configuration:

- Housing
- Base frame with bearing
- Sieve drum with removable collar
- Feed pipe
- Washing pipe
- Sight and light glass
- Control
- Variable speed drive

Options:

- Mobile design
- ATEX execution
- CIP cleaning
- Heating and cooling jacket
- Electro-polished surfaces
- Several types of bowls (see fig. page 6)
- Filtrate reservoir
- Can be integrated in isolator/glovebox
- Further special equipment on request



Pilot Plant Centrifuges

H 250 P – H 500 P, HF 300, F I

The HEINKEL Inverting Filter Centrifuge, type F and HF, and the Horizontal Peeler Centrifuge, types H 250 P, H 320 P and H 500 P, are especially designed for demanding laboratory and test operations as well as production of small quantities.

Customer benefits:

- Small foot print
- Easy installation; "plug and use"
- Ideal for scale-up
- Fully automated operation
- cGMP conformity

Standard specification:

Bowl diameter	200–500 mm
Filter surface	0.098–0.39 m ²
Nominal volume	2.5–20 liter
Maximum load	3.1–25 kg
Max. centrifugal force	1500–2020
Material	1.4571 or 2.4602 (Alloy C22)
Surfaces in contact with product	Ra <0.8 µm

Standard configuration:

- Housing
- Base frame with bearing
- Sieve drum
- Feedpipe
- Washing pipe
- Discharging system
- Sight and light glass
- Control
- Variable speed drive

Options:

- Mobile design
- ATEX execution
- CIP cleaning
- Clean room separation
- Electro-polished surfaces
- Filtrate reservoir
- Filling systems
- PAC system (inverting filter centrifuge)
- Removal of residual heel (peeler centrifuge)
- Further special equipment on request



Lab Dryer and Mixer BS-miniDry®

The **BS-miniDRY®** has specifically been designed for research and development with small amount of product. Tailor made for the requirements in the laboratory, it can be installed in a ventilation booth and be operated under many process conditions.

Customer benefits of the Lab Dryer with 0.15 to 1.5 liter nominal volume:

- Flexible working volume from 10% to 100% of nominal volume
- Mobile and compact design
- Easy "plug and use" installation
- Excellent for scale-up
- Easy to operate
- CIP cleaning
- Installation in ventilation booth

Standard specification:

Material	1.4404 (SS316L) or 2.4602(Alloy C22)
Working volume	Type DKL015: 0.15–1.5 liter
Working pressure	–1.0 – 0.5 barg
Working temp.	–20 – 120°C
Heating/cooling	Water/thermal oil at 0–6 barg
Surfaces in contact with product	Ra <0,8 µm

Standard configuration:

- Heating/cooling jacket
- Insulation jacket
- Dust filter
- Two drives with variable speeds
- Manual ball discharge valve
- Pressure and temperature sensors
- Manual sampler
- Height adjustable support frame

Options:

- Hybrid stirrer with central shaft mixer
- Vacuum system with solvent recovery
- Heating/cooling system
- SPS control with lab software
- Operation via PC or laptop
- Free programmable process control
- ATEX configuration
- Additional options are available



Pilot Dryer and Mixer BS-pilotDry®

For processes in pilot plants and small scale production, the **BS-pilotDRY®** has been designed. It can easily be moved from one place to another and is fully equipped with the necessary instrumentation.

Customer benefits of the Pilot Dryer with 10, 30 and 50 liter nominal volume:

- Flexible working volume from 10% to 100% of nominal volume
- Mobile and compact design
- Easy "plug and use" installation
- Ideal for scale-up
- Easy to operate
- CIP cleaning

Standard specification:

Material	1.4404 (SS316L) or 2.4602(Alloy C22)
Working volume	Type DKL015–ML005: 10–15 liter
Working pressure	–1.0 – 3.0 barg
Working temp.	–20 – 120°C
Heating/cooling	Water/thermal oil at 0–6 barg
Surfaces in contact with product	Ra <0,8 µm

Standard configuration:

- Heating/cooling jacket
- Insulation jacket
- Dust filter
- Two drives with variable speeds
- Manual ball discharge valve
- Pressure and temperature sensors
- Manual sampler
- Height adjustable support frame

Options:

- Hybrid stirrer with central shaft mixer
- Vacuum system with solvent recovery
- Heating/cooling system
- SPS control with lab software
- Operation via PC or laptop
- Free programmable process control
- ATEX configuration
- Additional options are available



Pilot Paddle Dryer

Pharmadry® PH100

For processes in pilot plants and small scale production, the Pharmadry® has been designed. It can easily be moved from one place to another and is fully equipped with the necessary instrumentation.

Customer benefits of the Pilot Dryer with 90 liter nominal volume:

- Mobile and compact design
- Easy "plug and use" installation
- Ideal for scale-up
- Easy to operate
- CIP cleaning

Standard specification:

Material	1.4404 (SS316L) or 2.4602(Alloy C22)
Heated area	1.3 m ²
Usable volume	90 liter
Working pressure	-1 – 2 barg
Agitator RPM	3 – 35 UPM
Agitator drive	4.0 kW
Surfaces in contact with product	Ra 0.38µm

Standard configuration:

- Heating/cooling jacket
- Insulation jacket
- Dust filter
- Drives with variable speeds
- Manual ball discharge valve
- Pressure and temperature sensors
- Manual sampler

Options:

- Vacuum system with solvent recovery
- Heating/cooling system
- SPS control with lab software
- Operation via PC or laptop
- Free programmable process control
- ATEX configuration
- Additional options are available



Labor PF/TD Filter Dryer – Pan Dryer

Pressofiltro® PF/TD 5 – PF/TD 100

For processes in pilot plants and small scale production, Filter/Filter dryer has been designed. It can easily be moved from one place to another and is fully equipped with the necessary instrumentation.

Customer benefits of the Pilot Dryer with 10, 30 and 50 liter nominal volume:

- Easy "plug and use" installation
- Ideal for scale-up
- Easy to operate
- CIP cleaning

Standard specification:

Filter area	0.03 – 0.2 m ²
Usable slurry volume	0.6 – 80 liter
Usable cake volume	0.2 – 25 liter
Agitator rotation speed	15 – 70 min ⁻¹
Agitator drive	1.1 – 4,0 kW
Agitator stroke	200 – 300 mm
Working pressure	-1 – 2 barg
Working temperature	-10 – +135°C
Surfaces in contact with product	Ra 0.4 µm

Standard configuration:

- In accordance with PED 97/23/EC or/and ASME
- cGMP and FDA guide-lines
- ATEX Group II 2 G/D (Zone 1/21) environments
- Suitable for use as a vacuum dryer, filter dryer or agitated nutsche filter
- Shaft sealing with stuffing box
- Unit mounted on wheeled trolley
- Explosion proof control panel (EEx-d)

Optionen:

- Multilayer filter elements
- PLC based controls
- Other special versions available on request



Pilot Units

Pressofiltro[®] PF 5 – PF 500

For processes in pilot plants and small scale production, the Pharmadry[®] has been designed. It can easily be moved from one place to another and is fully equipped with the necessary instrumentation.

Customer benefits of the Pilot Filter with filter area from 0.03–0.7 m²:

- Mobile and compact design
- Easy "plug and use" installation
- Ideal for scale-up
- Easy to operate
- CIP cleaning



Standard specification:

Filter area	0,03–0,7 m ²
Internal diameter	200–955 mm
Usable slurry volume	8–640 liter
Usable cake volume	3–210 liter
Bottom opening stroke	120–500 mm
Heated area	0,0–1,04 m ²
Agitator RPM	10–100
	5–46 min ⁻¹
Agitator drive	0,75–7,5 kW
Working pressure	–1 – 4 barü
Working temperature	–10 – +150°C

Standard specification for pilot units:

- Calculation, design and manufacture in accordance with PED 97/23/EC or/and ASME pressure vesselcode, Section VIII with U-Stamp as well as in compliance with cGMP and FDA guidelines.
- EC type examination certificate 03ATEX0246X per the 94/9/EC directive or with electrical componentsUL approved for operation in a Class I, Division I or 2, Groups C & D environment.
- Double mechanical seals, externally interchangeable, dry running contacting or non contacting lift-off type seals as well as liquid lubricated seals.
- Vessel base column mounted for excellent access to the filter plate or dryer base.

Options:

- Vessel base column mounted for excellent access to the filter plate or dryer base
- Skid mounted vessel or vessel mounted on a support column
- Supplemental microwave heating to reduce time required for drying
- Aseptic versions, heel removal systems, contained discharge (Glove Box), DQ, IQ, OQ qualification
- PLC controls, autonomous or slaved to DCS, MCC

Filter und Filtration Units

Tubular-Filter TF

Solids-separation under contamination- and emission-free conditions.

The **Heinkel Tubular Filter TF** is compactly built filtration equipment for batch separation of 2 to 200 litre solids from organic or aqueous suspensions. The apparatus is characterized by simple operation, fully enclosed product handling and automatic, residual free solid discharge.

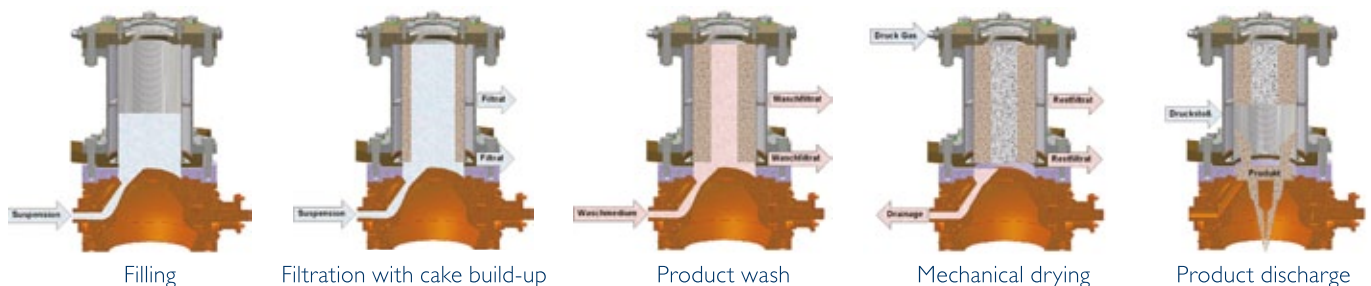
Design of the tubular filter

The filter essentially consists of a pressure vessel with multiple superposed filtrate chambers, separated from the process area by a filter insert. The filter insert made either of metal or plastic material is engineered in cartridge design and is easily exchangeable for different process requirements.

The filter is closed at the bottom by a ball segment valve, which provides full opening over the complete vessel cross sectional area for fast and complete product discharge. For optimum execution of the process steps it is essential, that the slurry inlet and residual liquid outlet is located at the lowest position inside the process housing, which is realized by integration of a port into the discharge valve.



Operating mode:



Standard specification:

Diameter	150–400 mm
Length/Diameter	
Ratio	2–6
Height of filter element	300–2400 mm
Filtration area	0,14–3,02 m ²
Internal volume without filtrate chamber	5,3–301,6 liter
Cake thickness/ Diameter	0,15–0,25
Cake volume	2,7–226,2 liter

User benefits:

- Totally contained product handling
- Full automatic, contamination free and complete product discharge
- Thin product cakes, fast filtration, short cycle times, ideal for difficult to filter products
- Minimum dead zones due to special discharge valve arrangement with integrated slurry supply
- Optimum cake wash efficiency due to minimum risk for crack formation
- Easy and accurate process control
- Simple mechanical setup
- No electrical drives
- Easy to maintain and to access
- Easy to clean and to inspect
- Use as Filter-Dryer in combination with vacuum dryers or as Vapour Filter for contact dryers
- Suitable for sterile applications



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