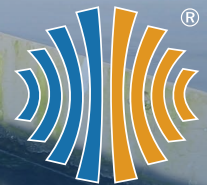


HANKE

Filter Application

Filtration Solutions for **Water Treatment**

We offer custom process filtration solutions including oil & gas filtration solutions, metallurgy filtration solutions, etc.



ONE-STOP
FILTRATION
SOLUTION PROVIDER

WATER TREATMENT FILTRATION SOLUTIONS

Water treatment refers to a wide range of physical and chemical measures taken to make water quality meet certain use standards and specific industry demands, and is widely used in industrial water, irrigation and other fields. Filtration can remove impurities from raw water, protect downstream equipment and improve water quality. Hanke is equipped with a professional technical team to provide you with a wide range of water treatment filtration solutions to meet your production water needs.

Water
Treatment

Part 1

Process Filtration Solutions



BOILER FEED WATER FILTRATION

? Background

Boilers are closed vessels that use a fuel source or electricity to heat water or produce steam for industrial heating and humidification applications, and are widely used in chemical, heating, food & beverage, oil & gas, pharmaceutical, pulp & paper, etc. The water supplied to boilers and converted into steam is called boiler feed water. Most of boiler feed water comes from natural sources such as rivers, reservoirs, lakes and groundwater.

💬 Problem

Untreated boiler feed water generally contains suspended matters such as mud, silt and bacteria. When steam is produced, the solid becomes concentrated and forms deposit at the bottom of the boiler, which leads to poor heat transfer and reduces the efficiency of the boiler.

✓ Solution

As a result, boiler feed water needs to be filtered before use. **Automatic backwash filters** are generally adopted for boiler feed water filtration as it can not only perform automatic continuous online filtration and uninterrupted filtration during backwashing, but also effectively remove impurities from water and protect boilers from corrosion.

FIRE WATER FILTRATION

? Background

Fire protection system require a large quantity of water and usually pumps water from sources such as water tanks, lakes, rivers or the sea.

... Problem

Water from these sources contains various kinds of debris, such as rust, stones and organic matters and other debris that fall from the inside of the pipes. These impurities will cause pipe corrosion and clogging, if sucked into the fire protection system, it will also lead to downstream equipment wear and increased equipment maintenance costs.

✓ Solution

Therefore, filters are a necessary in fire protection systems. **Basket strainers** are generally adopted for fire water filtration as they are equipped with strainer baskets inside to resist the impact of large size particles, effectively remove impurities from the pipeline and protect downstream equipment.



FARM IRRIGATION WATER FILTRATION

? Background

Filtration plays a vital role in irrigation. In agricultural irrigation systems, the water required comes from a wide range of sources, either a nearby source or a distant water body. It may come from rivers, springs, lakes, groundwater, wells, snow, etc.

... Problem

As irrigation water comes from various sources and contains a lot of organic suspended matters such as algae, clams, shells, snails, bedbugs, worms, sand, silt, etc., if not removed, it will clog drippers, injectors, sprinklers, control valves and fertilizer injectors, resulting in reduced crop production.

✓ Solution

Therefore, filtration equipment is needed to remove these substances from irrigation systems. **Scraper self cleaning filters** are generally adopted for farm irrigation water filtration. Compared with traditional filters, scraper self cleaning filters can not only effectively remove impurities from irrigation water, but also eliminate the need for manual cleaning and cartridge replacement, and achieve automatically filter online.



Trustworthy Filtration

Expert & Partner



Self-Cleaning Filters—Automatic Backwash Filter



Automatic backwash filter is a kind of self-cleaning filter that consists of multiple stainless steel filter elements and can continuously perform filtration for 24 hours. It can effectively filter out solid particle contaminants from various water and low-viscosity liquids like rolling emulsions to make the liquid cleanliness meet the system operation and downstream process requirements and protect key downstream equipment. It is widely used in oil & gas, metallurgy, marine filtration systems, water treatment, Pulp & paper and other industries.

Features

- Automatic online continuous filtration, continuous filtration during backwashing to reduce downtime and maintenance costs.
- The control system can be tailored to monitor pressure and time settings for various fluids.
- Gap type high performance filter is adopted, which features high precision, large effective filter area, small pressure drop and high backwash efficiency.
- Compact design ensures that installation requires minimal space and is easy to install. The inlet and outlet ports are adjustable according to end users' requirements.
- Filter rating 50–2000 μm , suitable for the filtration of all kinds of raw water, cooling water, process water and low viscosity fluids with a viscosity of less than 40 mPa.s and impurity content less than 300 ppm.




✧ Specification

Applicable liquid:  Raw water, cooling water, process water and low viscous liquid ($< 40 \text{ mPa.s}$),
 impurity $< 300 \text{ ppm}$

Filter Rating:  \rightarrow  **Flow rate range:** 

Inlet & outlet size:  2"– 24"/DN 50 – DN 1000

Fluid working temperature:  0°C \rightarrow 95 °C

Standard design pressure: 0.7 MPa  1.0 MPa

Self-cleaning differential pressure: 0.05 MPa  0.07 MPa

Minimum operating differential pressure:
Differential pressure between the outlet and back-flushing outlet $> 0.15 \text{ MPa}$

Control system: Based on SIMENS controller, parallel control mode of differential pressure and time

Gear motor: 180W/370W, 3-phases, 380V, protection class IP55, CCWU

Valve actuator: Pneumatic or electric, IP65

Back-flushing valve: Wafer butterfly valve/full-port ball valve

Supply facility requirement: 0.4–0.6 MPa clean and dry air, 380V AC

Filter element type:

V-slot slotted metal filter element,
● SS304 ● SS316L

Filter housing material:

● SS304 ● SS316L ● Carbon steel ● Customized.

Inner corrosion protection:

Epoxy paint, PA11 or rubber Lining for sea water resistance

Housing seal material:

NBR/EPDM/VITON

Basket Strainer

Taking basket strainers as filter elements, basket strainers are used to filter out particulate impurities from liquids and gases to protect liquid pipelines such as seawater, fuel oil and slurry pipelines, gas pipelines such as natural gas and argon pipelines, and fittings downstream.

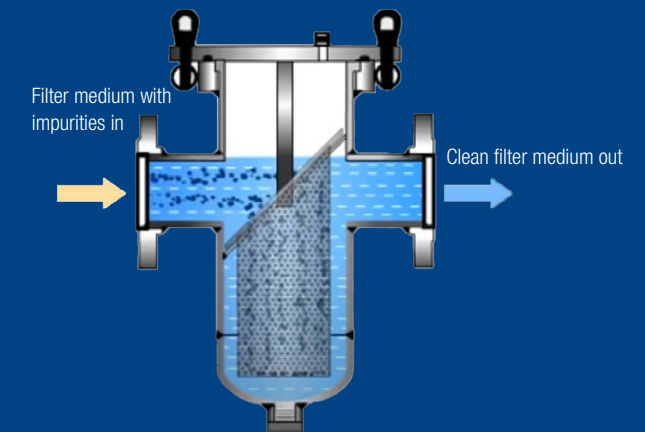
Features

- Stainless steel or carbon steel housing, or customized;
- Large screen area ensures efficient filtration with low pressure drop.
- Remove large particles, clean fluids and gases, and protect key devices.
- Easy to disassemble and clean, reusable.

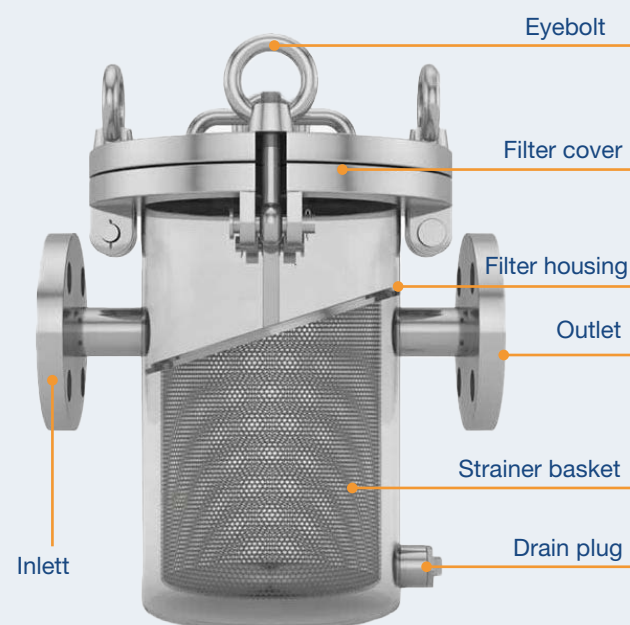
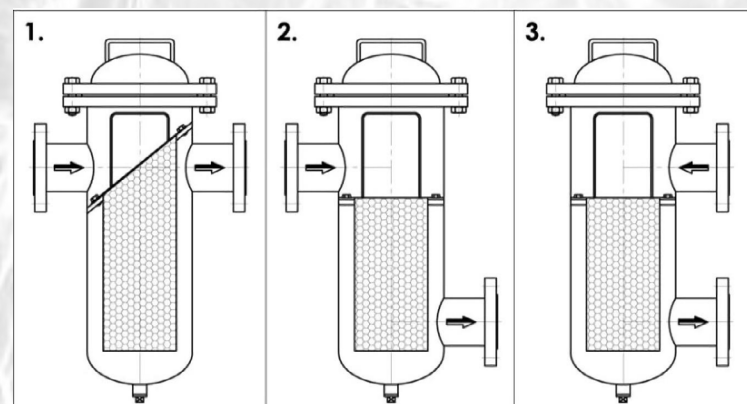
Working Principle

When the filter medium enters the chamber from the filter inlet, the solid impurity particles are retained in the filter basket and clean filtrate flows out from the filter outlet.

When cleaning or replacing the filter basket, close the pipeline system, unscrew the drain plug at the bottom of the main pipe and drain the fluid. And then open the filter cover, re-install the filter basket after cleaning, and fasten the filter housing and filter cover.



Nozzle Type



✧ Specification

Housing material: ● Carbon steel ● Stainless steel ● Customized.

Filtration efficiency: 95% **Filter rating:** 10 μm → 5000 μm **Operating pressure:** 0.6 MPa — 1.6 MPa

Nominal diameter: DN 15–400 mm (1/2" – 16"), or customized upon request.

Seal type: O-ring or flat gasket

Sealing material: NBR gasket, PTFE gasket, metal gasket

Surface treatment: Carbon steel: anti-corrosion paint;

Stainless steel: acid dipping or anti-corrosion paint

Connection type: Flange, female thread, male thread, quick opening clamp.

Lid / Cover type: Swing bolts, flange, etc.

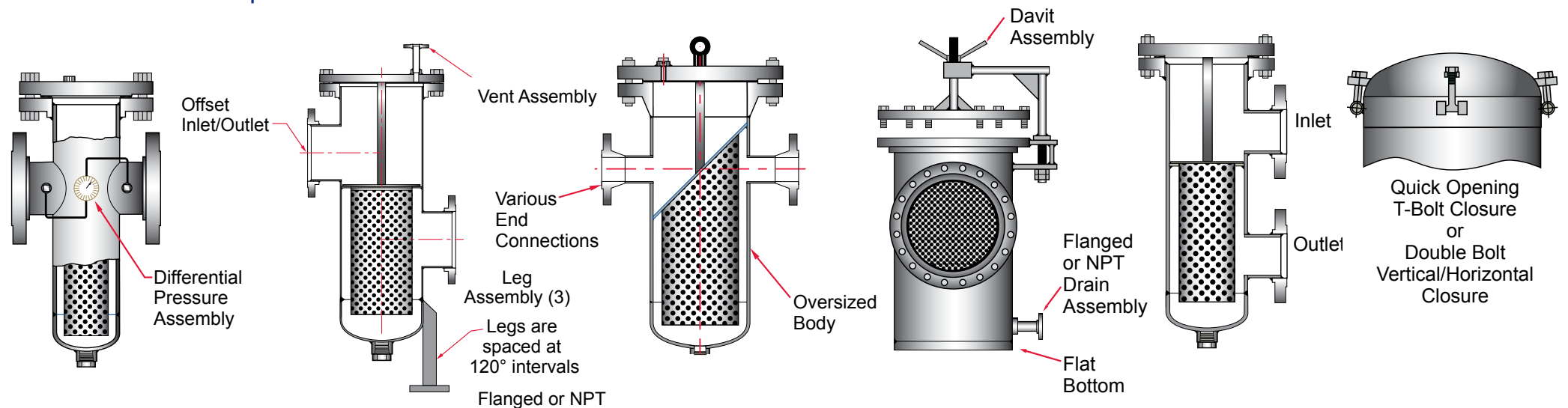
Usage type: Liquid filtration

Operating temperature:

Carbon steel
30 °C → 350 °C

Stainless steel
-80 °C → 480 °C

Custom Strainer Options



Self-Cleaning Filters—Inner Scrape Self-Cleaning Filter

Inner scraper self cleaning filter is a kind of self-cleaning filter that is designed to remove impurities on the inner surface of filter screen through scraper rotation driven by motor or air cylinder. It applies to the filtration in medium and highly viscosity liquids. Both stainless steel sheet scrapers and stainless steel brush scrapers are available.

Features

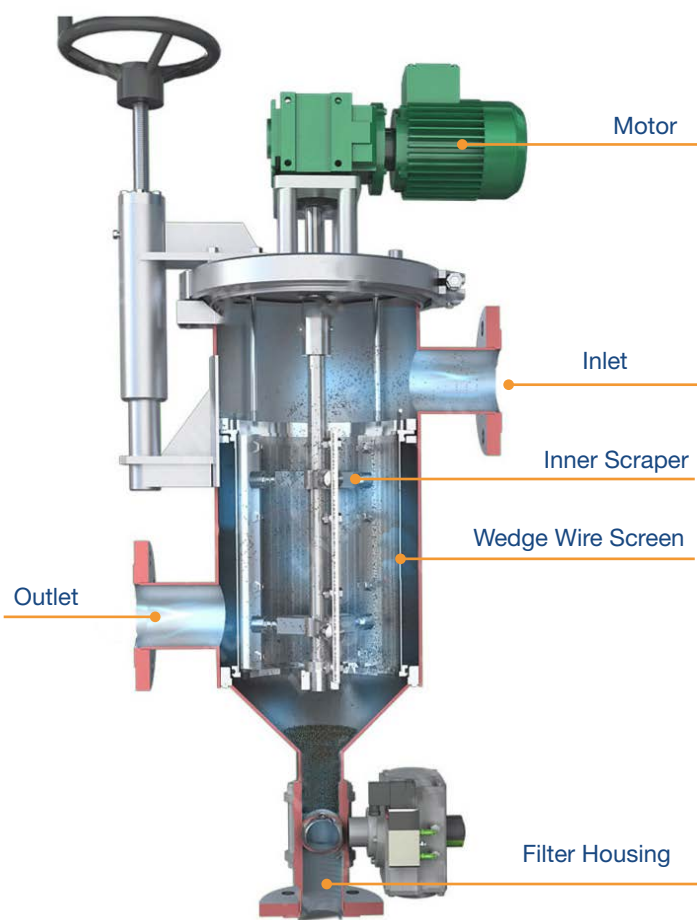
- Fully automatic operation, 24-hour continuous on-line filtration;
- Automatically discharge waste liquids containing high concentration impurities that can be recycled to reduce the loss of high value materials;
- Closed filtration to prevent the leakage of hazardous materials and ensure the work safety and employee health;
- Stainless steel sheet scraper and stainless steel brush scraper are employed to offer great scraping effect, which significantly improves its impurity removal capacity and avoids crushing impurities;
- Backwash function can be added to help cleaning filter elements;
- PLC-based control system is adopted to control scraping and draining time.

Working Principle

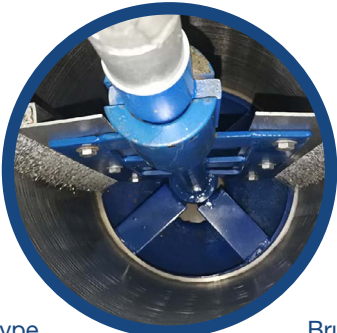
The liquid flows in from the inlet, flows through the filter element and then flows out from the outlet. Impurities are trapped on the inner surface of the filter element. When impurities trapped on the surface of the filter element accumulate to a certain amount, the cleaning procedure is initiated by a timer setting or triggered by a differential pressure sensor. The speed reducer or cylinder drives the scraper blades attached to the surface of the filter element to rotate and scrap off the impurities. These impurities fall into the bottom of the filter. Drain valve at the bottom of the filter shall be opened regularly to drain out the high concentration liquid for recycling.



Strainer basket inside



Scraper type



Brush type

Specification

Maximum flow: 1.5–110 m³/h

Operating pressure: 0.1 MPa – 1.6 MPa (10 bar)

Inlet & outlet nominal diameter: DN 50 – DN 200

Drain outlet nominal diameter: DN 25 – DN 50

Operating temperature: 0 – 200°C

Filter rating: 25 μm → 3000 μm

Filter area: 5600 cm² / 2200 cm²

Electronic control parameter: 0.37 kW, 380 V / 50 Hz / three-phase

Scraper material:

● SS304 ● SS316L ● Stainless steel wire

Filter element material:

● SS304 ● SS316L

Filter housing material:

● Carbon steel ● SS304 ● SS316L ● Customized.

Pneumatic drain valve:

Air supply requirements: 5 SCFM / (m³/h):

Mini. Pressure: 0.4 MPa,

Max. Pressure: 0.8 MPa.

Control cabinet: Two-phase 220 V / 50 Hz

Self-Cleaning Filters

Outer Scraper Self-Cleaning Filter

Outer scraper self cleaning filter is a kind of self-cleaning filter that is designed to remove impurities on the outer surface of filter screen through scraper rotation driven by motor. It has a filter rating of 50–500 μm and applied to highly viscosity liquid filtration with high accuracy requirements.

Features

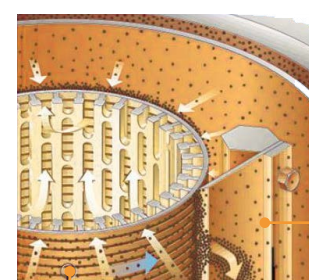
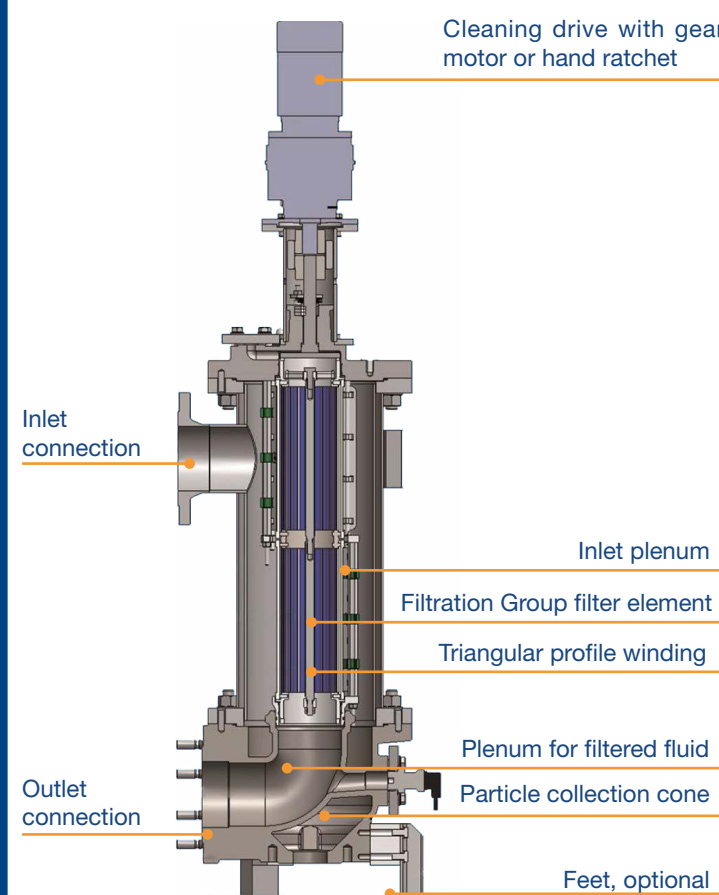
- Fully automatic operation, 24-hour continuous on-line filtration;
- Automatically discharge waste liquids containing high concentration impurities that can be recycled to reduce the loss of high value materials;
- Closed filtration to prevent the leakage of hazardous materials and ensure the work safety and employee health;
- Metal sheet scraper is employed, which makes the gap between the scraper and the filter element is small. Filter elements are provided with accurate slots and extremely smooth surface, which makes it easy to clean and avoid crushing impurities;
- Backwash function can be added to help cleaning filter elements;
- PLC-based control system is adopted to control scraping and draining time;
- Pre-assembled and tested for easy installation.

Working Principle

The liquid enters the filter from the inlet and flows through the filter element surface from outside to inside. The filter element bottom is connected to the outlet, through which the liquid flows out. When impurities trapped on the surface of the filter element accumulate to a certain amount, the cleaning action is triggered by the preset time or differential pressure value. The speed reducer drives the scraper blades attached to the surface of the filter element to rotate and scrap off the impurities. The impurities move off along the blades, fall down to the filter bottom and enters the particle collection cone. These impurities are collected at the filter bottom. Drain valve at the bottom of the filter shall be opened regularly to drain out waste liquid with high impurity concentration. Discharged waste liquid can be recycled if necessary.



Scraper and filter basket inside



Triangular wire

✧ Specification

Operating pressure: 1.0 MPa

Inlet & outlet nominal diameter: DN 50 – DN 200

Drain outlet nominal diameter: DN 40

Operating temperature: 0 – 200°C

Filter rating: 50 μm → 500 μm

Filter area: 13600 cm^2 (up) / 1100 cm^2 (down)

Applicable liquid: Water and viscous liquid (< 80,000 mPa.s), Impurity < 1000 ppm

Clean differential pressure: 0.05 MPa (depends on the liquid viscosity)

Differential pressure instrument: Differential pressure transmitter (DPT), differential pressure switch (DPS)

Drain valve: Pneumatic ball valve, protection class IP65

Gear motor: 180W, three-phase, 380V, IP55, worm reduction gear motor

Supply facility requirement: Control system 380 V AC, 0.4–0.6 MPa clean and dry compressed air

Filter housing material:

Carbon steel ● SS304 ● SS316L ● Customized.

Scraping blade material:

SS304 ● SS316L

Seal material:

NBR (standard), VITON

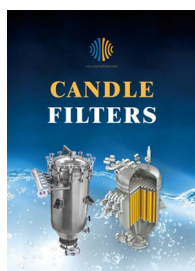
Filter element type:

V-slot slotted metal filter element, SS316L

10⁺
years
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BASKET STRAINERS,
BAG FILTERS,
SELF-CLEANING FILTERS,
CANDLE FILTERS,
PRESSURE LEAF FILTERS,
FILTER CARTRIDGES



ANPING HANKE FILTER TECHNOLOGY CO., LTD

No. 21 Jingsi Rd., Industry Park, Anping, Hebei, China.
Tel: +86-318-7999978
Skype: +86-13831829720 Dina Yang

WE ARE HERE FOR YOU:

E-mail: sales1@hanke-filter.com

Website: <https://www.hankefilters.com>