



# AFE Series Bernoulli Self-cleaning Filter

# **Installation Manual**

Shanghai LIVIC Filtration System Co., Ltd.





- Prohibit non professionals or untrained operator operating control box;
- Prohibit in the exhaust pressure relief not completed under the condition of opening the filter;
- Differential pressure is not allowed to exceed the warning value 0.12MPa, and the Differential pressure is strictly monitored;
- Please use clean compressed air source, the pressure is maintained between 0.4~0.5 MPa, otherwise, the cylinder and butterfly valve may not work properly.

## **Product Introduction and Typical Applications**

The AFE Series Bernoulli Self-cleaning Filter (AFE filter for short) is designed for continuous water filtration in pressurized systems. AFE filter is widely used in the typical applications such as water treatment, circulating cooling system, heat exchanger protection, UV &UF system, spraying nozzle protection, ballast water treatment system and etc.. AFE Filter removes impurities from liquids such as underground water, sea water, lake water, river water, circulating cooling water, sewage water, process water, cleaning water and etc..

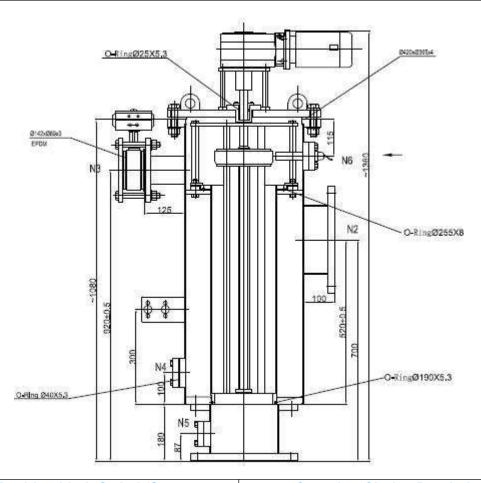
## **General Main Specification**

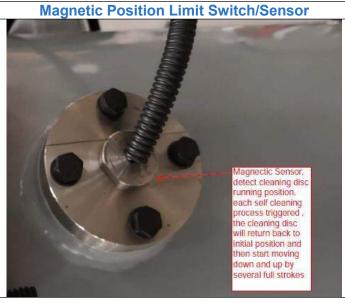
Sub-Series	S Series (steel housing), G Series (GRP housing)
Working Pressure	0.03MPa
Filtration Rating	150-2000µm
Large Removable Particle	8mm
Design Pressure	0.6MPa/1.0MPa/1.6MPa/2.0MPa/2.5MPa
Design Temperature	80°C (S Series), 60°C(G Series)
Flow rate Range	30-7000m3/h
Cleaning Pressure Drop	16-35kpa
Control Mode	differential pressure(DP) and timer mode
Pressure Drop Sensor	pressure drop switch(Standard) or pressure drop transmitter
Inlet And Outlet Size	DN65-DN900
Connection Standard	flange, HG20592-2009 (DIN compatible)
Connection Standard	HG20615-2009 (ANSI B16.5 compatible)
Filter Element Type	V-SLOT series slotted screen (200-2000µm)
riitei Element Type	POR series perforated screen(1000-2000µm)
Filter Element Material	316L/Super Duplex 2507/Ti2
Piston Rod Material	316L
Housing Material	304/316L/CS/GRP/2205/2507
Anti-Corrosion Coating	PA11, Rubber Lining
Housing Seals	EPDM/NBR(Standard)/VITON(FKM)
Flushing Valve	Pneumatic butterfly, protection class IP65

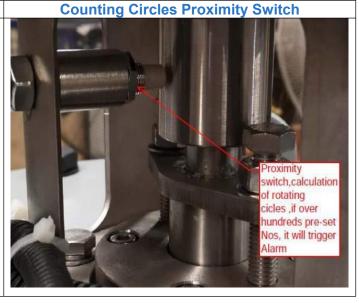
LIVIC provides the powerful and professional filtration support



Flushing Valve Material	PVC /304/316
Facility Supply	0.4-0.6MPa clean and dry compressed air
	110V/220V(Standard)/380V/440V AC,24V DC







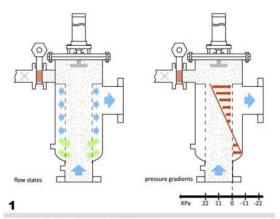
## **Working Principle**

LIVIC provides the powerful and professional filtration support



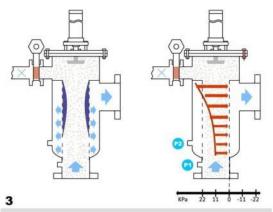
The filter element of AFE filter is cleaned by the cleaning disc mounted on the gear motor driven rod. When the cleaning action is triggered, the disc moves into the filter element and water passes through the gap between the disc and the filter element. Flow velocity increases around the disc and the static pressure around the disc decreases because of the Bernoulli principle. Around the edge of the disc, the vacuum effect of lower static pressure makes the filtered water back-flush the filter element surface. The impurities flushed out through the flushing valve. The figures below show the complete AFE working stages(take pneumatic driven one as example).

#### www.livicfilter.com

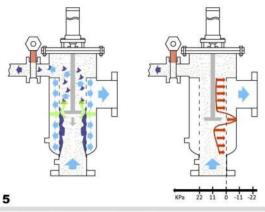


HD Process NZ 8

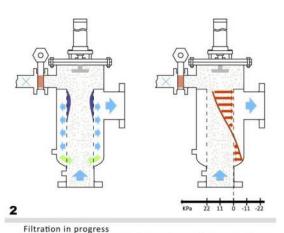
Filtration in the upper 2/3 screen In the lower 1/3 reverse flow takes place as a result of high flow velocities in the filter screen entrance. This causes no impurity deposit.



Filtration and self-cleaning action triggered 2/3 upper screen gets almost clogged Filtration starts on the whole screen surface The self-cleaning action is triggered by differential pressure

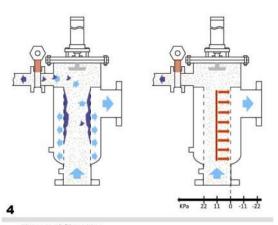


Cleaning and continuous filtration
The cleaning disc moves down into the screen (down to 2/3)
Cleaning takes palce on the screen surface around the disc
because of the BERNOULLI principle

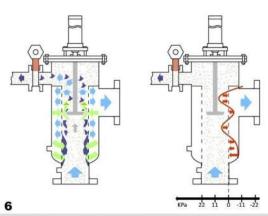


The screen starts to gradually get clogged from top to down. Filtration also begins in the 1/3 screen.

Reverse flow in the screen entrance area still takes place.



Clean and filtration
The cleaning discharging valve opened
The clean disc keeps still in the initial position
The coarse particles are easily washed out of the filter
The lower 1/3 screen also takes part in the filtration



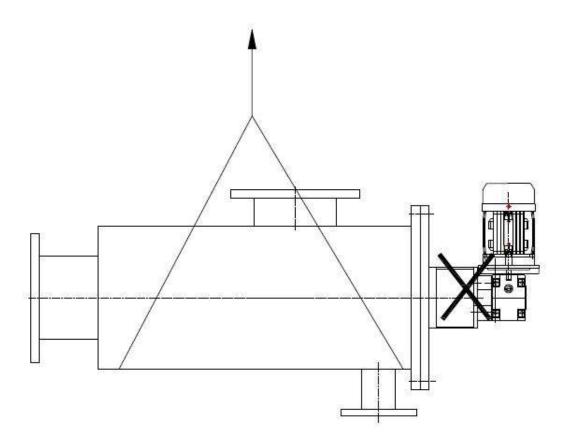
the disc moves up and down and cleaned the upper 2/3 screen

Reverse flow takes place and cleans the lower 1/3 screen Particles are flushed out. The whole screen is cleaned



### **Unpacking and Moving Warning!**

Lift the filter on the inlet flange and the housing closure flange or strap it as the figure below. Never lift the filter on the pneumatic cylinder or gear motor made of Aluminum. Or the cylinder or gear motor will be broken.



#### Filter Installation Warning!

Make sure that the flushing outlet pipe must be longer than 1 meter in horizontal direction and can be filled with water when not flushing. If not, fatal impact (water hammer) may happen and destroy the filter in the service condition of high operating pressure and the directly open flushing outlet pipe.

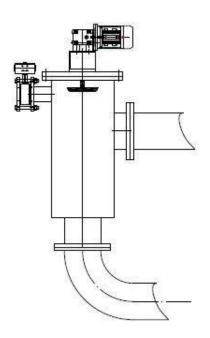
The pressure differential (DP for short) between the filter inlet and flushing outlet must exceed 0.3 bar. If lower DP, the cleaning ability will reduced.

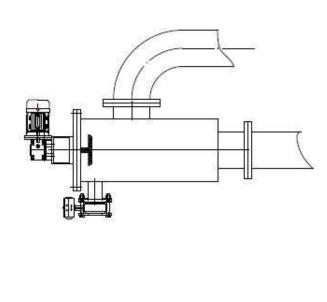
## Installation

AFE Filter can be mounted vertically or horizontally, which makes AFE be able mounted at any possible directions. The filter (AFE65~AFE150) can be supported directly by the pipe. But for larger filter (AFE200~AFE600), add the support frame onto the filter if the pipe is not solid enough to support. Make sure that the filter lid with the motor is easily accessible for the maintenance. To reduce the nozzle load, please use the expansion joint.

LIVIC provides the powerful and professional filtration support







Vertical Mounting

horizontal Mounting



## **Cabinet & Front of Filter**



## **Cabinet & Back of Filter**

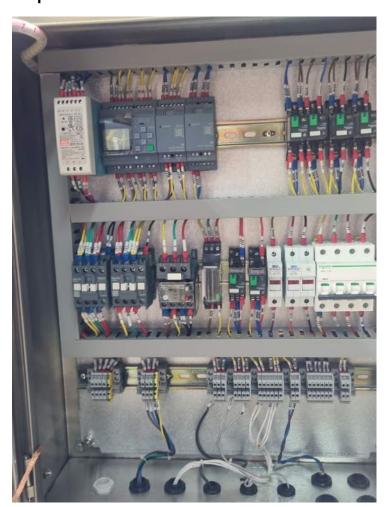




## **Inside of Cabinet overall**

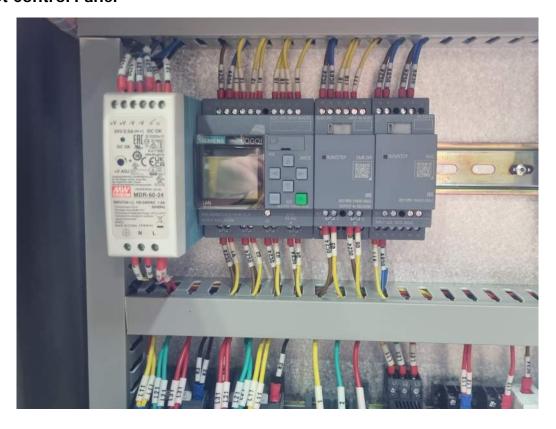


# **Cabinet Electrical Close-Up**

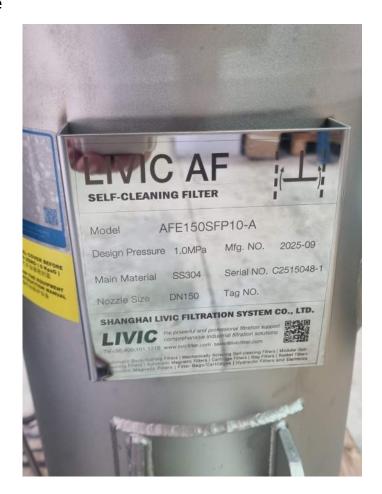




## **Cabinet Control Panel**



# Filter Nameplate





# **Pressure Gauge Panel**



# **Pressure Gauge Nameplate**





# **Actuated waste output valve**



# **Electrical Motor for plunger**

