



**Schunemann**  
**Self-Cleaning Automatic Filter**

# Company Profile



**Employees**  
**70**

**Private company**

**Business Units:**  
**Valves & Filters**

**Founded in 1937**

**More than 80 years of experience**

**Headquartered in Bremen – Germany**  
**Installations in over 100 countries**



# Our Workshop

## Timely Delivery and Outstanding Quality



- CNC milling machines
- Drilling and lathe machines
- In-house strainer fabrication
- Control cabinet construction
- Stock Management
- Product assembly & testing



Pressure  
directive  
2014/68/EU



**SCC\*\***



# Service Activities

Your Partner throughout the entire Product Life Cycle



## HOTLINE

Our 24/7 hotline is available for quick support, and if necessary, for remote analysis of electrical controls

## ENGINEERING

Conceptual and case studies, process engineering, mechanical and electrical engineering, programming, documentation, quality assurance

## ASSEMBLY

Assembly support and supervision, quality assurance

## TEST / COMMISSIONING

Functional testing and trials, optimisation of filter parameters, performance tests, acceptance test

## MAINTENANCE / INSPECTION

Realisation of inspections and revisions, repairs, spare part management

## MODERNISATION

Analysis of current state, development of modernisation concepts, implementation of modernisation measures

# Research and Development

## TESTING

Parameters and functions are checked on five of our own testing stations.

Strength and leak proof inspections as well as flow tests and pressure loss determinants are performed.

## CFD ANALYSIS

Flow analyses for, e.g., optimization of fluid flow and pressure drop reduction.

## MOBILE TEST EQUIPEMENT

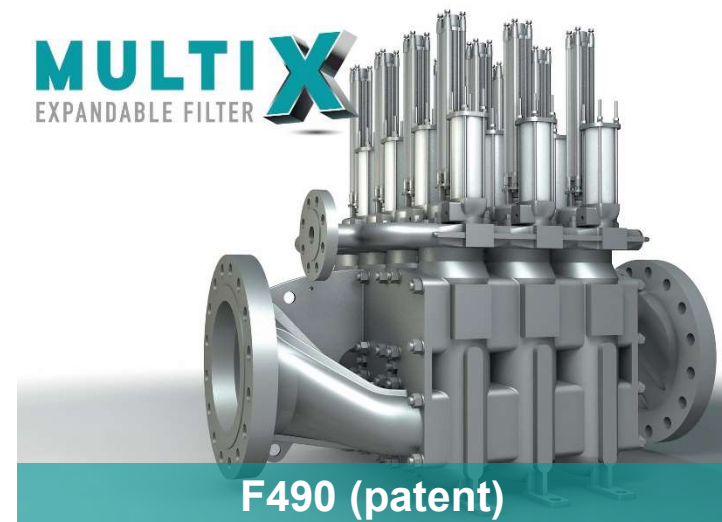
Mobile and customizable demo filters for use on site for the evaluation of particle characteristics under real operating conditions.

## R&D IS PART OF OUR COMPANY DNA

Our top priority is to respond at any time to the developments and challenges of our customers and markets.

Recent developments:

- **F451 – Standardized Automatic Filter**
- **F490 – Expandable Automatic Filter “MULTI X”**



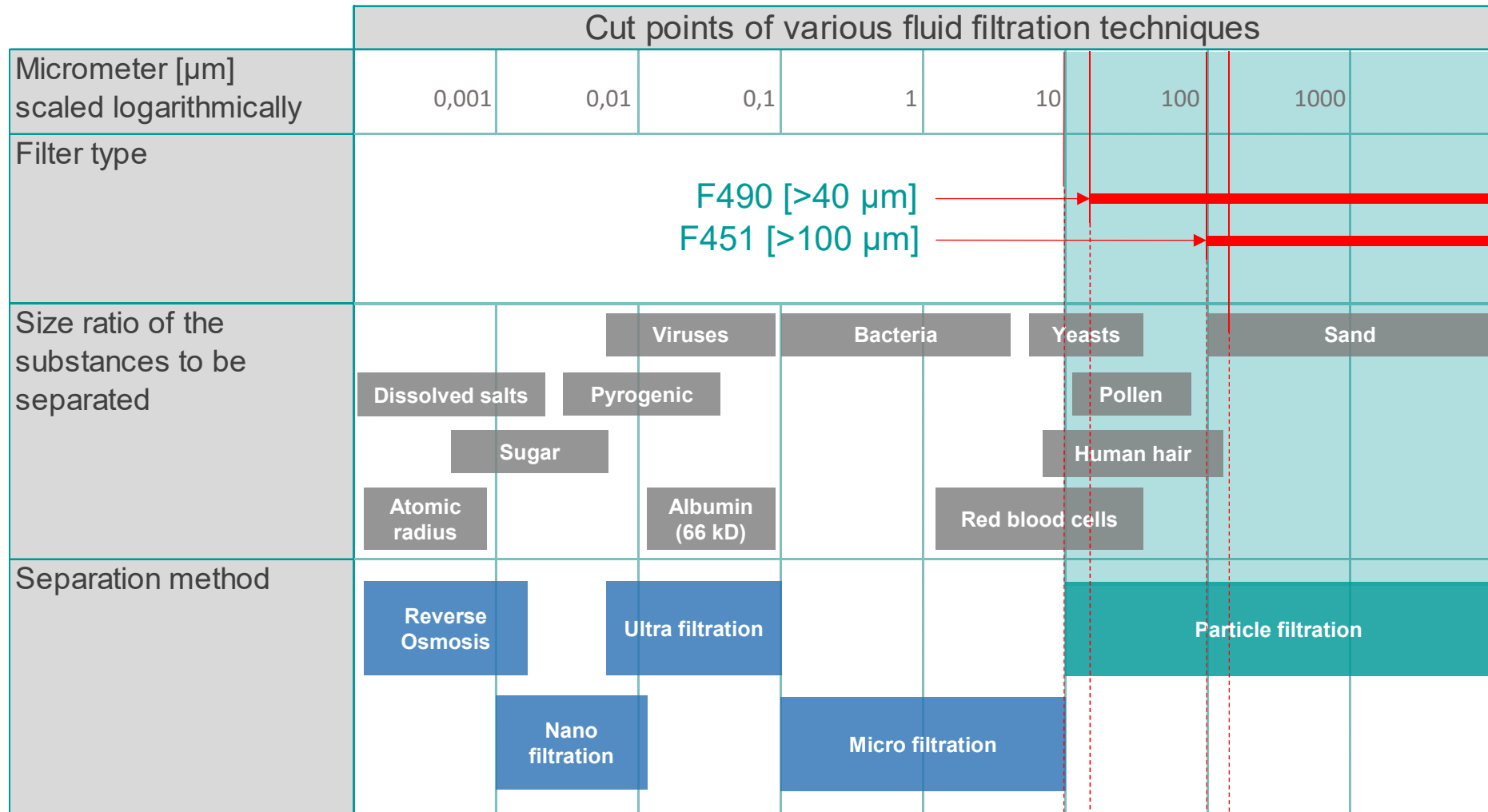
# Customer Base

- BASF
- BAYER
- DOW
- DL E&C
- SABIC
- Samsung
- Exxon Mobil
- Shell
- Chevron
- Petron
- Hyundai heavy Industries
- Daewoo Shipbuilding & Marine Engineering
- Petronas
- SEMBAWANG Shipyard
- Hamworthy/Wärtsillä
- Prosep Kolon
- BABCOCK NOELL
- Voith Turbo
- Andritz Hydro Power
- Siemens
- GE Power / GE Water
- Kelvion (GEA)
- ... and many more ...



# Filtration Methods

## Filter Types



# F451 Automatic Filter

## Summary and Value Proposition

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The **F451** series represents a new generation of automatic filters that combines innovative technical advantages with extremely economic prices.

- Compact design with 15% less space requirement
- Standardized design with 25% less parts
- Very short delivery time
- Screen size from 100µm up to 10mm
- Reduced maintenance efforts and cost
- Lowest inlet pressure of only 0,7 bar
- Broad range of Materials:  
Cast iron, stainless steel, super austenitic SS
- **Extremely economic investment cost!**





# F451 Automatic Filter

## Key Figures

### CONNECTION

DN32 – DN300 (1 ¼" – 12")

### OPERATING PRESSURE

0,7 bar – 16 bar (10 psi - 232 psi)

### STRAINER FINENESS

100 µm - 10 mm

### DESIGN CODE

EN13445, AD2000, PED 97/23,  
ASME VIII Div.1 [U Stamp],

### MATERIALS

Shell: GGG-40, Stainless Steel, Super Austenitic SS  
Internals: Stainless Steel, Super Duplex

### FLOW RATE

3,5 m<sup>3</sup>/h – 1.300 m<sup>3</sup>/h (15.4 - 5,724 gpm\*)

### ORIENTATION

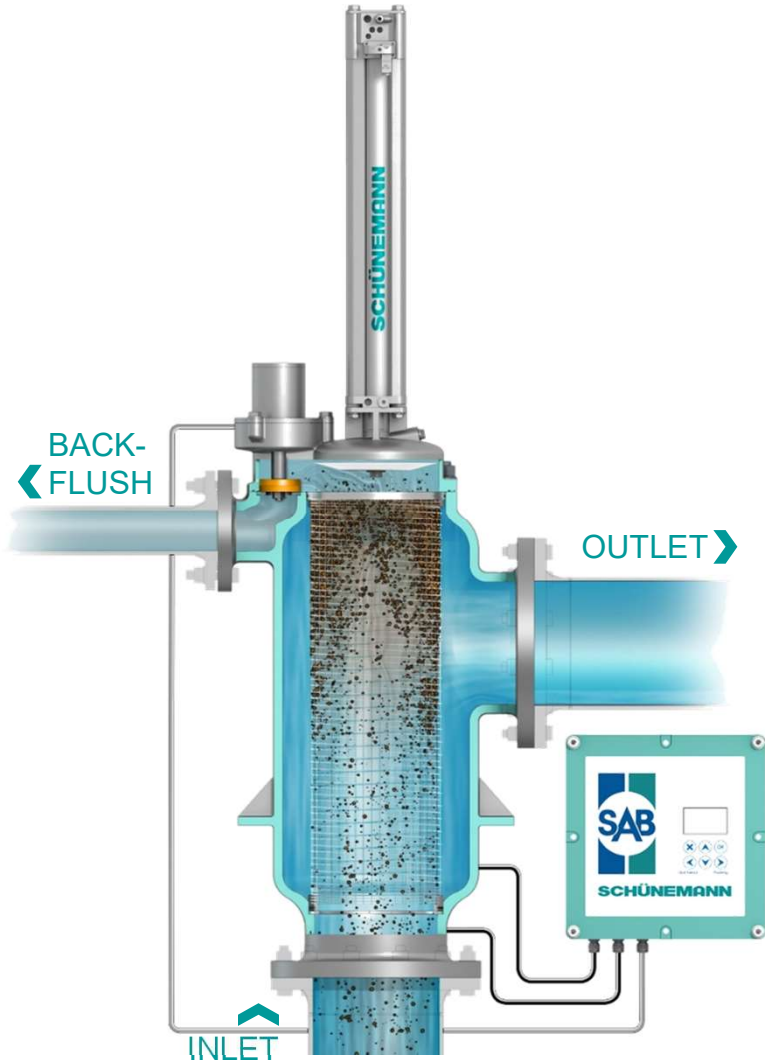
Vertical / horizontal

**PATENT**



\*gpm to be understood as US gpm

# F451 Automatic Filter Filtration and Cleaning (1)



## FILTRATION

During normal filtration, particles accumulate from top to bottom on the inside of the strainer

## CLEANING CYCLE

The cleaning sequence is initiated by a timer setting or alternatively triggered by:

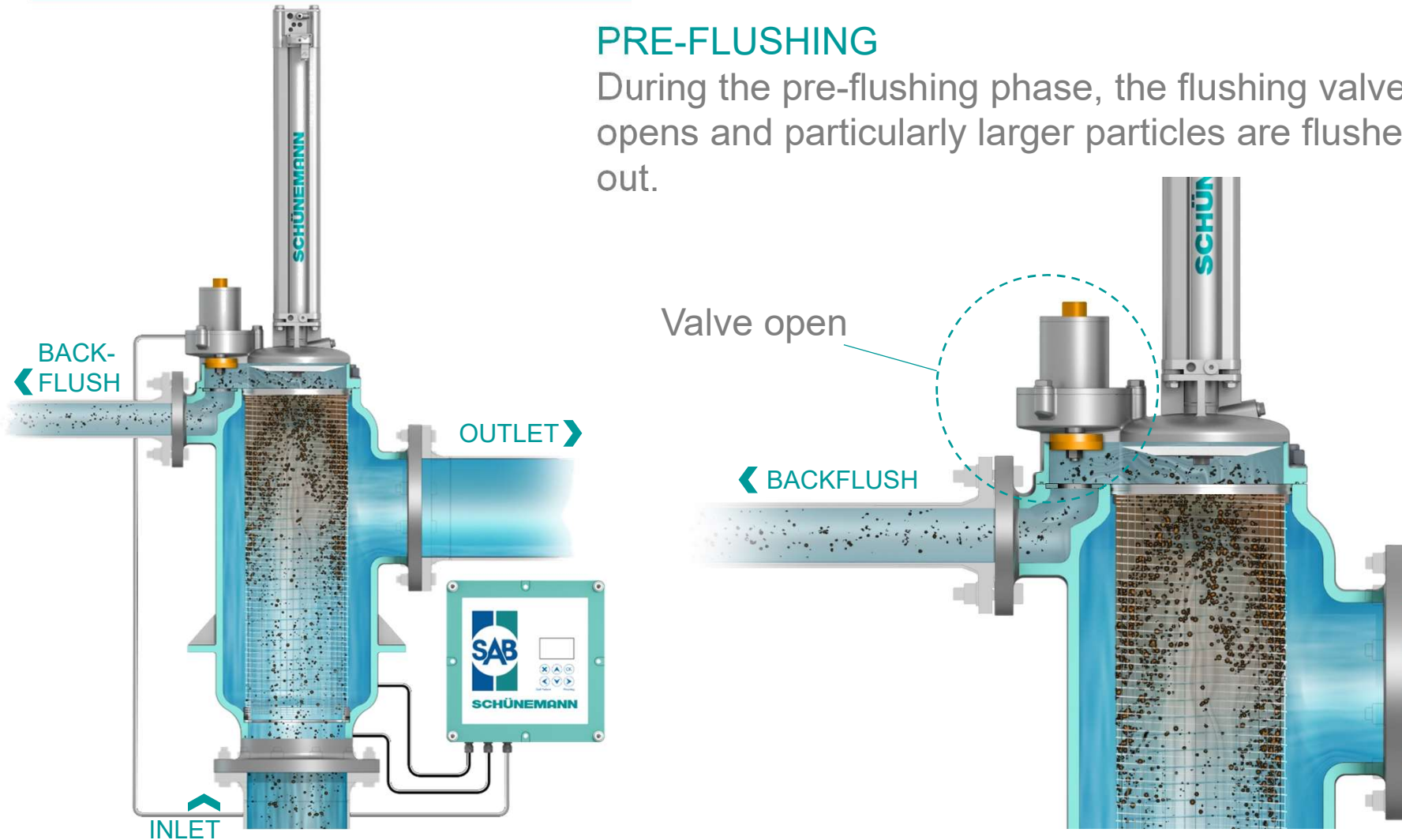
- differential pressure sensor (0.11 bar)
- button on the local control
- remote control in the main control room

Standard cleaning cycle trigger shall be the time interval with an adjustable default setting of 60 minutes

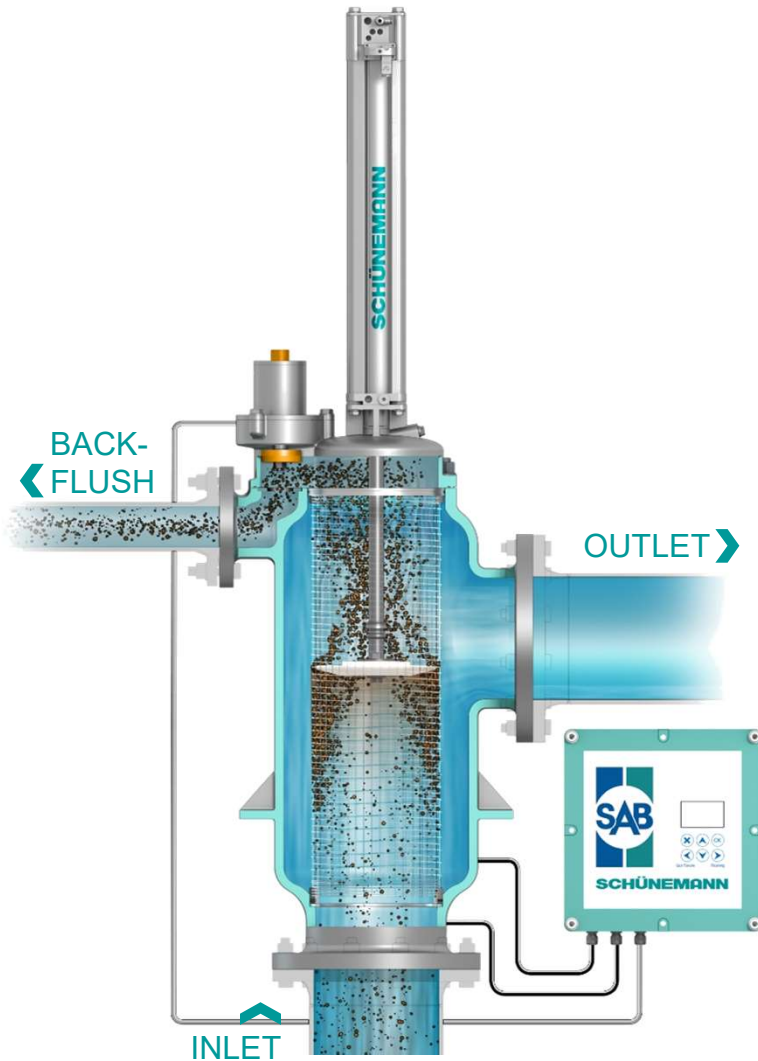
# F451 Automatic Filter Filtration and Cleaning (2)

## PRE-FLUSHING

During the pre-flushing phase, the flushing valve opens and particularly larger particles are flushed out.



# F451 Automatic Filter Filtration and Cleaning (3)



## CLEANING PHASE

The customized flushing disc moves two thirds of the way down the strainer and creates a gap between the disc and strainer.

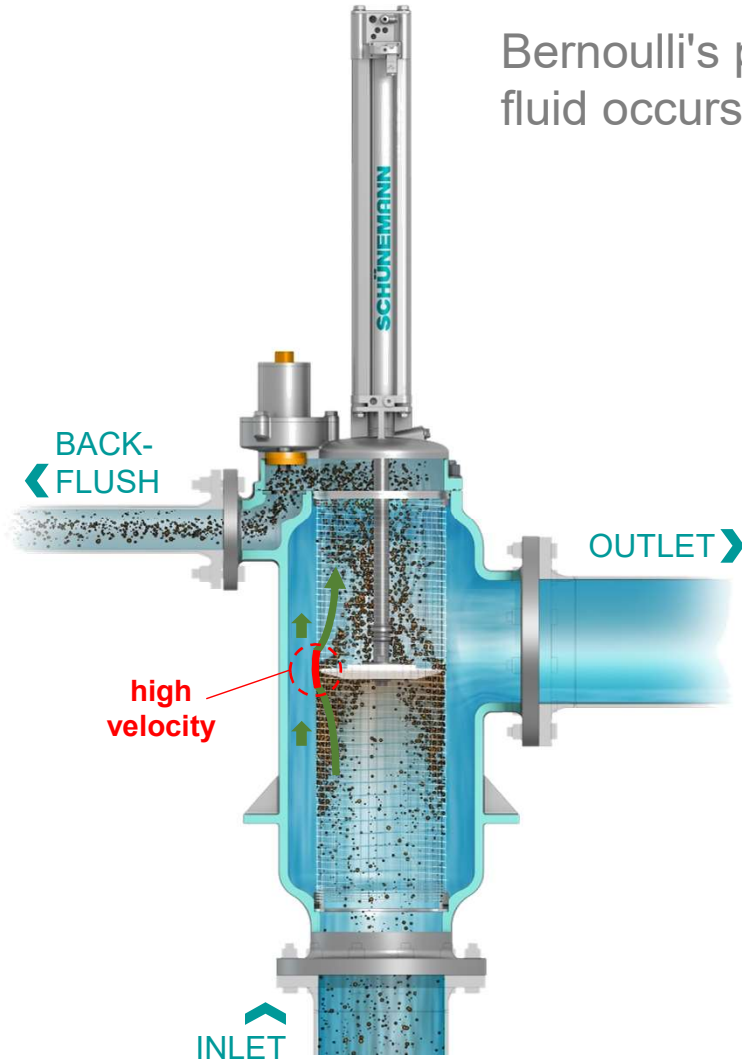
The flow velocity increases locally around the disc within the gap between the flushing disc and the strainer. The local pressure is reduced in accordance with the Bernoulli Principle and the direction of the flow is reversed which releases the particles from the surface of the strainer basket.

The released particles are flushed out from the filter via the flushing outlet. Finally the flushing valve is closed.

The filtration will not be interrupted during the entire cleaning cycle.

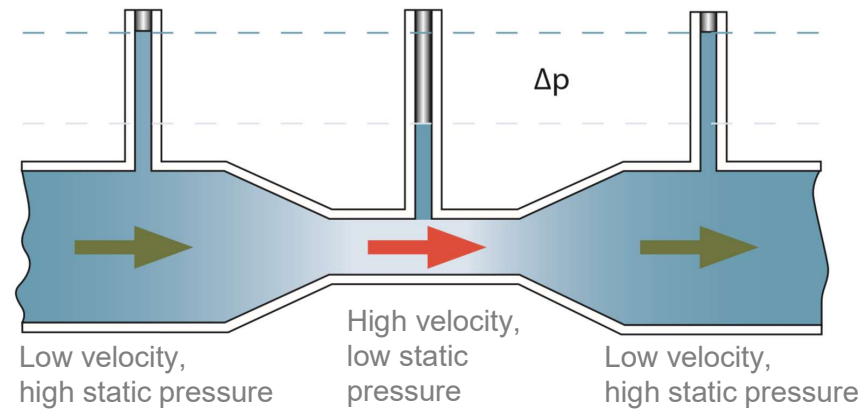
# The Bernoulli Principle

Bernoulli's principle states that an increase in the speed of a fluid occurs with a decrease in local pressure

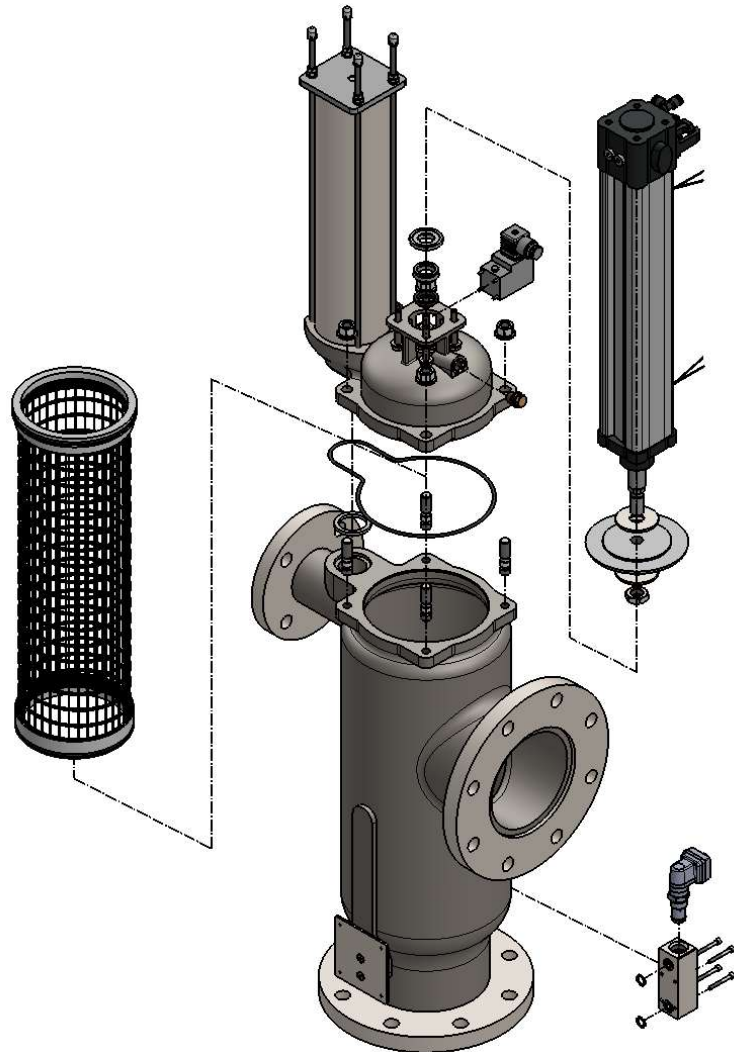


$$\frac{1}{2} \rho v^2 + \rho g h + P = \text{constant}$$

$\frac{1}{2} \rho v^2$  Kinetic energy per unit volume  
 $\rho g h$  Potential energy per unit volume  
 $P$  Pressure energy



# F451 Features: Simplification and Standardization



The smart and simplified cast design of the F451 filter is absolutely exclusive on the market. The reduced complexity and streamlined components offer multiple unique advantages.

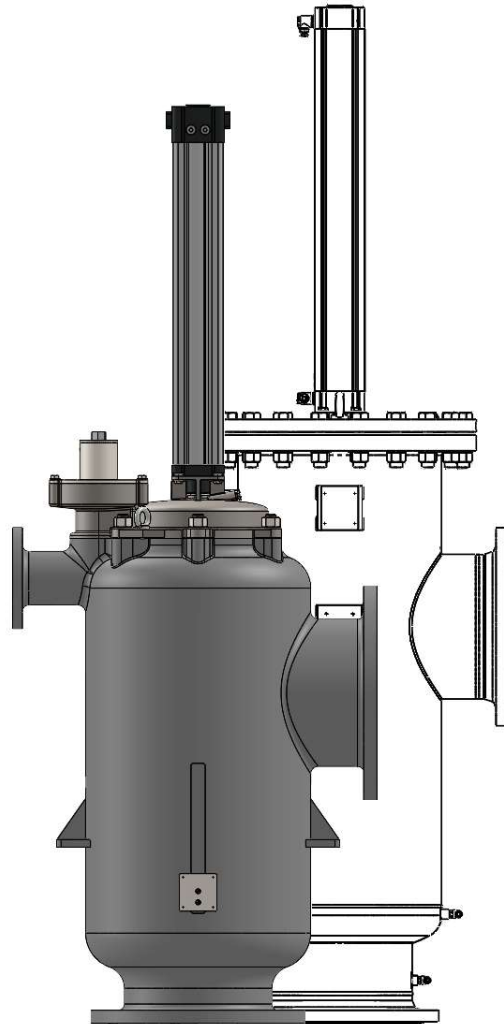
## BODY MATERIAL:

- Ductile Cast Iron (GGG-40)
- Austenitic Stainless Steel (1.4581 / 316SS)
- Super Austenitic Stainless Steel (1.4557)

## VALUE PROPOSITION

- Approximately 25% fewer parts
- Easier and quicker maintenance due to fewer screws for accessibility
- Less stock required for spare parts
- Very attractive investment cost due to standardized design

# F451 Features: Compact Design

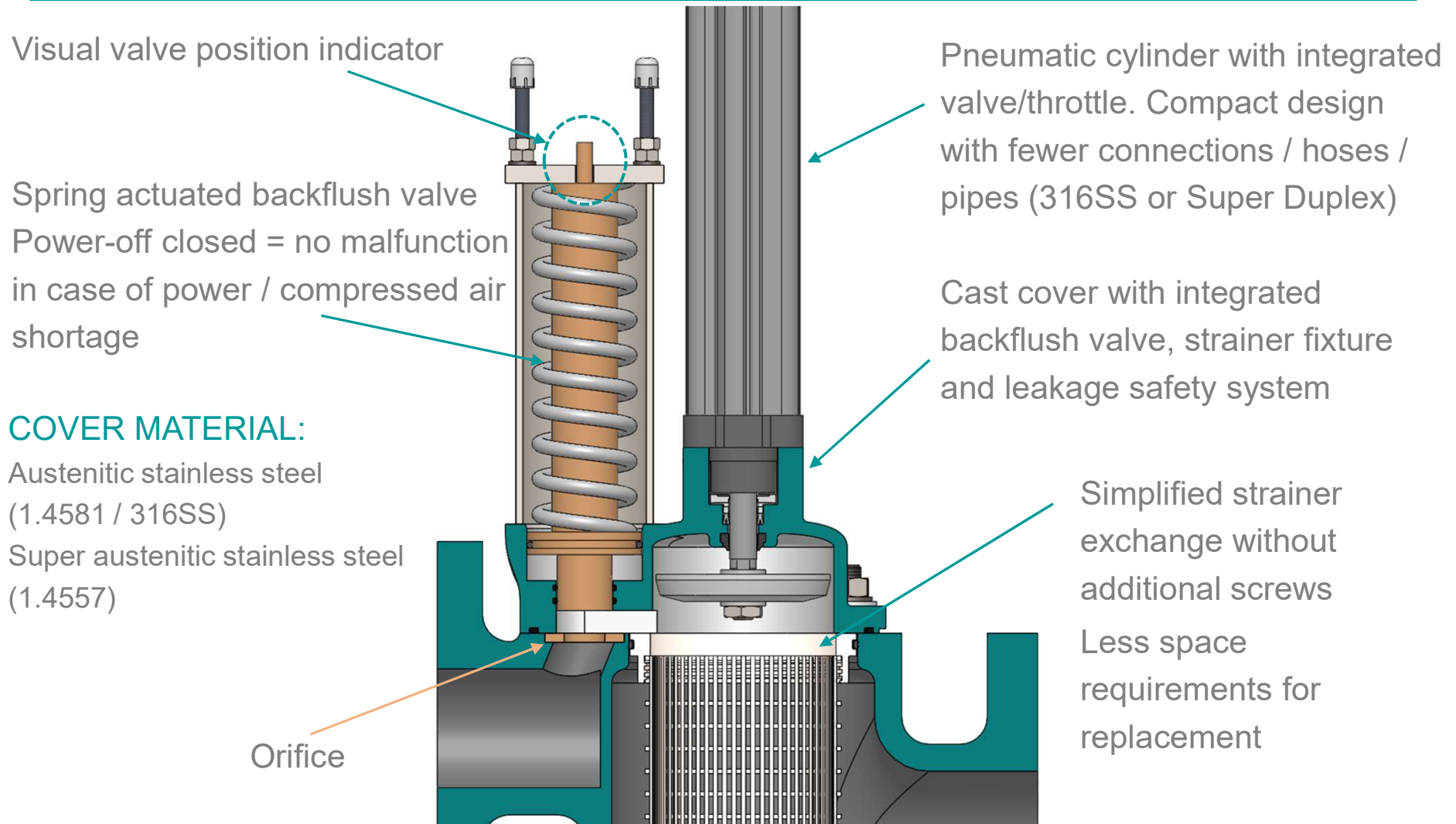


With its smartly cast design the F451 offers a considerably smaller footprint compared to other available filters in the market.

## VALUE PROPOSITION

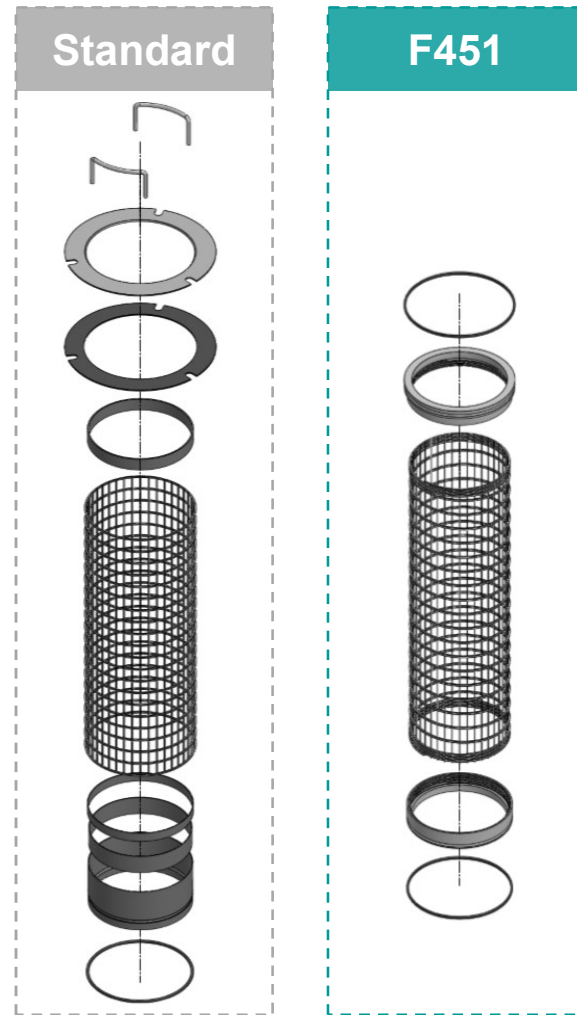
- Compact design
- Approximately 20% less space required
- Less space necessary for the installation and maintenance
- No additional height required for strainer replacement
- Less weight

# F451 Features: Cover and Cylinder design





# F451 Features: Strainer Design



The F451 introduces a new, innovative strainer concept and a design that is developed from scratch.

The smart design with fewer parts, especially no screws, allows for much quicker and easier maintenance on-site.

The recently adapted *helicoidal welded strainer* increases the rigidity considerably, ensuring unmatched durability and reliability.

## FEATURES

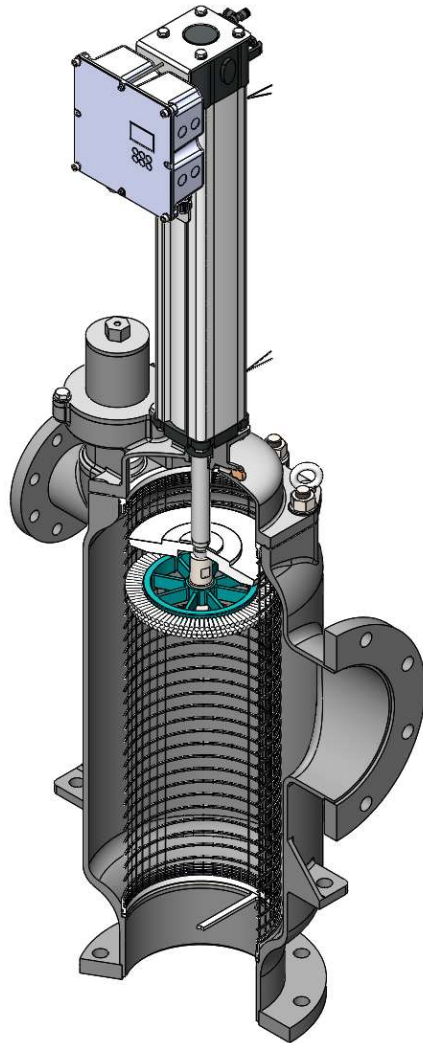
- Standard mesh sizes:
  - Up to DN 200: 100µm, 300µm
  - DN 300: 150µm, 300µm
- Material:
  - 316SS or Super Duplex

## VALUE PROPOSITION

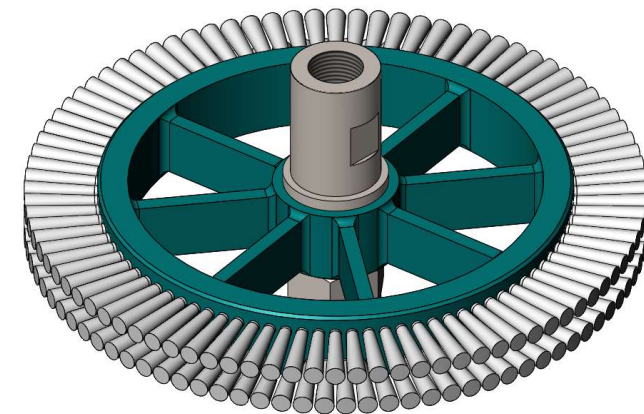
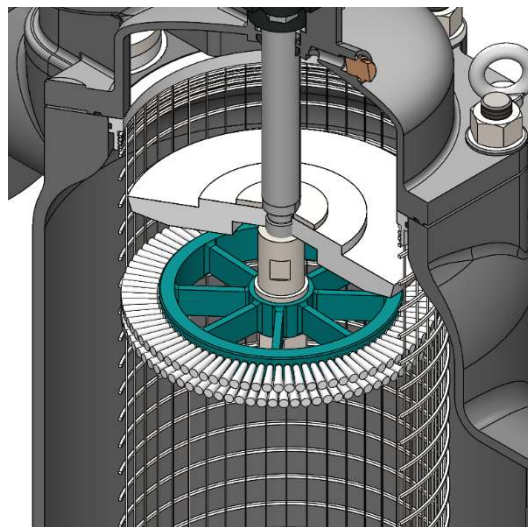
- Approximately 50% less parts
- No additional welding and post-treatment required (less corrosion risk)
- Quick and easy maintenance
- Less stock required for spare parts



# F451 Features: Optional Brush Upgrade

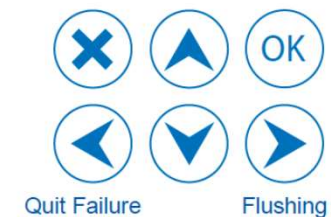


- Unique combination of mechanical cleaning and Bernoulli effect cleaning
- For fibrous, gluey, sticky and hard to remove contamination (e.g. algae)
- Available for all filter sizes
- Multiple brush materials available



# F451 Automatic Filter Control Panel

- Display and function buttons integrated in plastic casing
- IP65
- Inputs:
  - Flushing / pre-flushing
  - Error quitting
  - Flushing lock
- Outputs:
  - Operation
  - Flushing / pre-flushing
  - Error
- Dimensions: 200x200x80mm



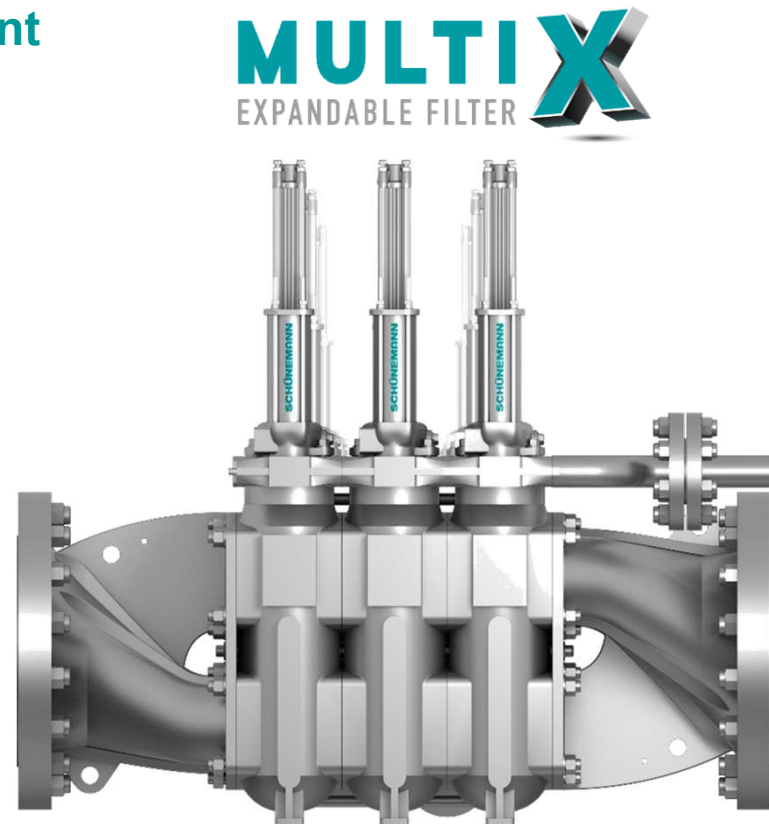
**SCHÜNEMANN**

# F490 Automatic Filter **MULTI X**

## Summary and Value Proposition

The revolutionary design of the **F490** series combines innovative technical advantages with maximum flexibility.

- **Modular design with 40-50% less footprint**
- **Unmatched low backflush volume flow**
- Significantly larger operational volume flow range
- **Screen fineness down to 40µm**
- Short delivery time
- Reduced maintenance efforts and cost
- Lowest inlet pressure of only 0,7 bar
- **Easy maintenance -> Less spares and less weight, less efforts**
- In line design

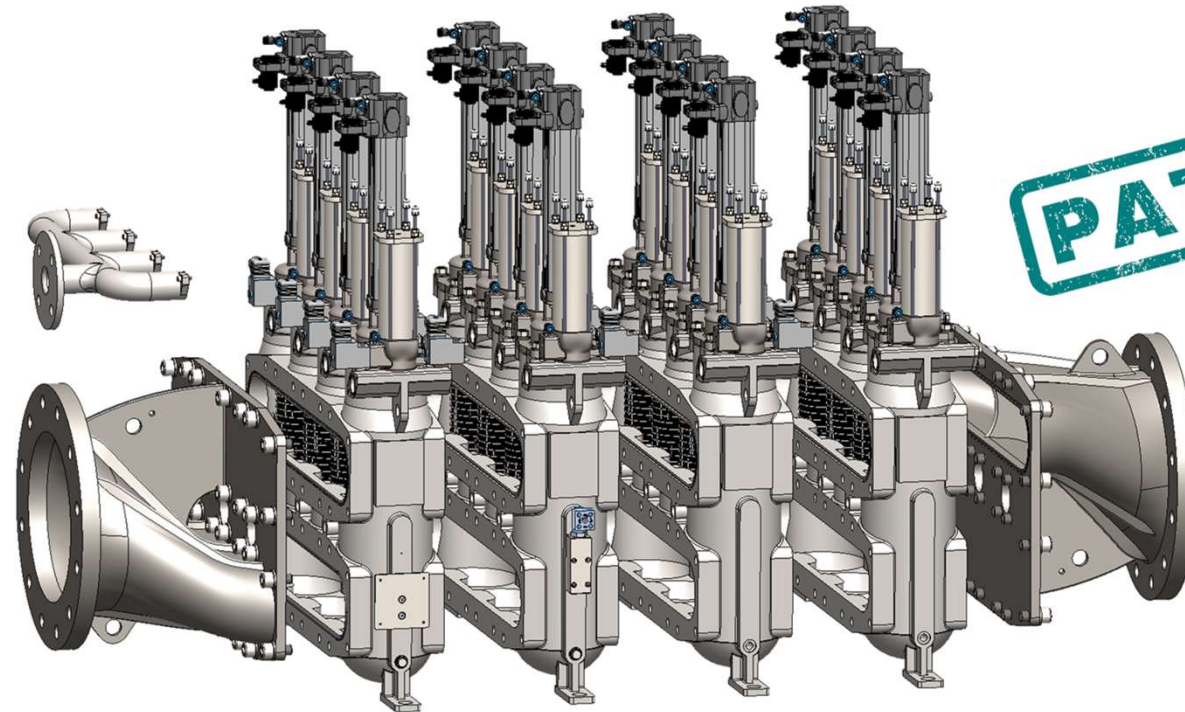


# F490 Automatic Filter MULTI X



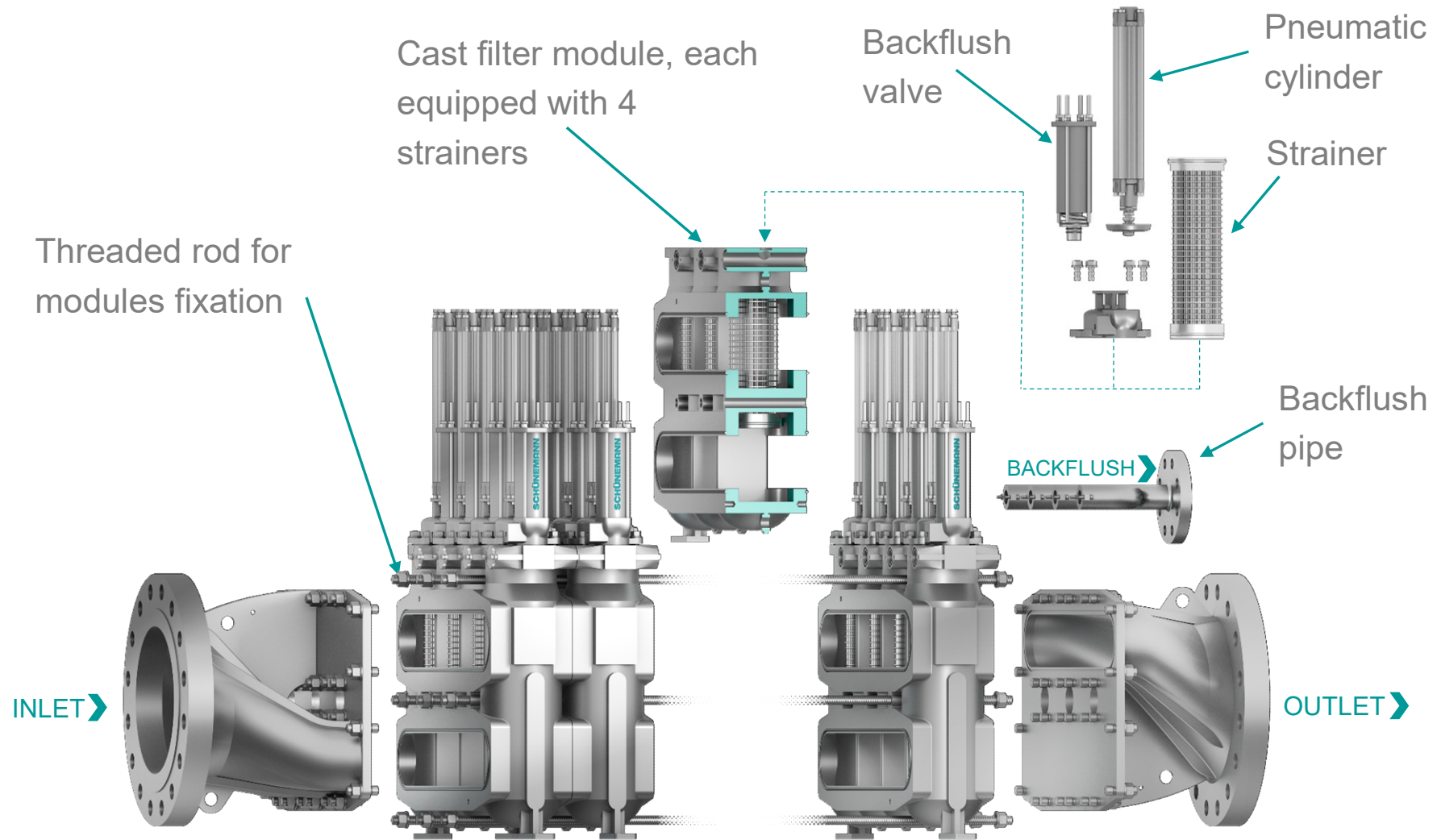
The inventor of the Multi-Bernoulli Filter launches the next generation:

**MULTI X**  
EXPANDABLE FILTER



The innovative design is based on standardized cast strainer modules which can be combined by screws and thus precisely adapted to customer requirements.

# F490 Automatic Filter MULTI X



# F490 Automatic Filter MULTI X

## Key Figures

### CONNECTION

DN100 – DN800 (4" – 32")

### OPERATING PRESSURE

0,7 bar – 16 bar (10 psi - 232 psi)

### STRAINER FINENESS

40 µm - 10 mm

### DESIGN CODE

EN13445, AD2000, PED 97/23,  
ASME VIII Div.1 [U Stamp],

### MATERIALS

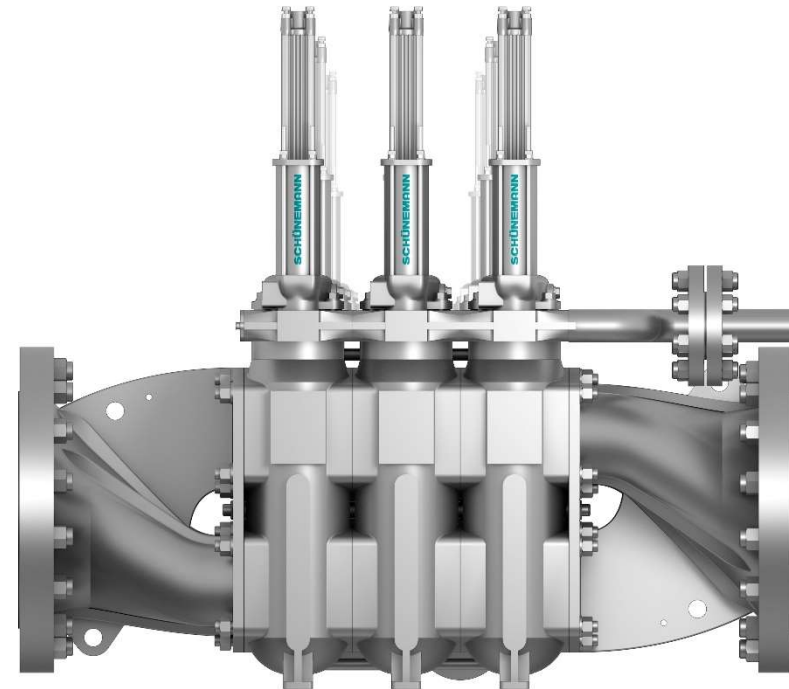
Shell: GGG-40, Stainless Steel,  
Super Austenitic SS  
Internals: Stainless Steel, Super Duplex

### FLOW RATE

50 m<sup>3</sup>/h – 8.000m<sup>3</sup>/h (220 – 35,200 gpm\*)

### ORIENTATION

Horizontal / vertical



\*gpm to be understood as US gpm

# F490 Automatic Filter MULTI X Filtration and Cleaning (1)

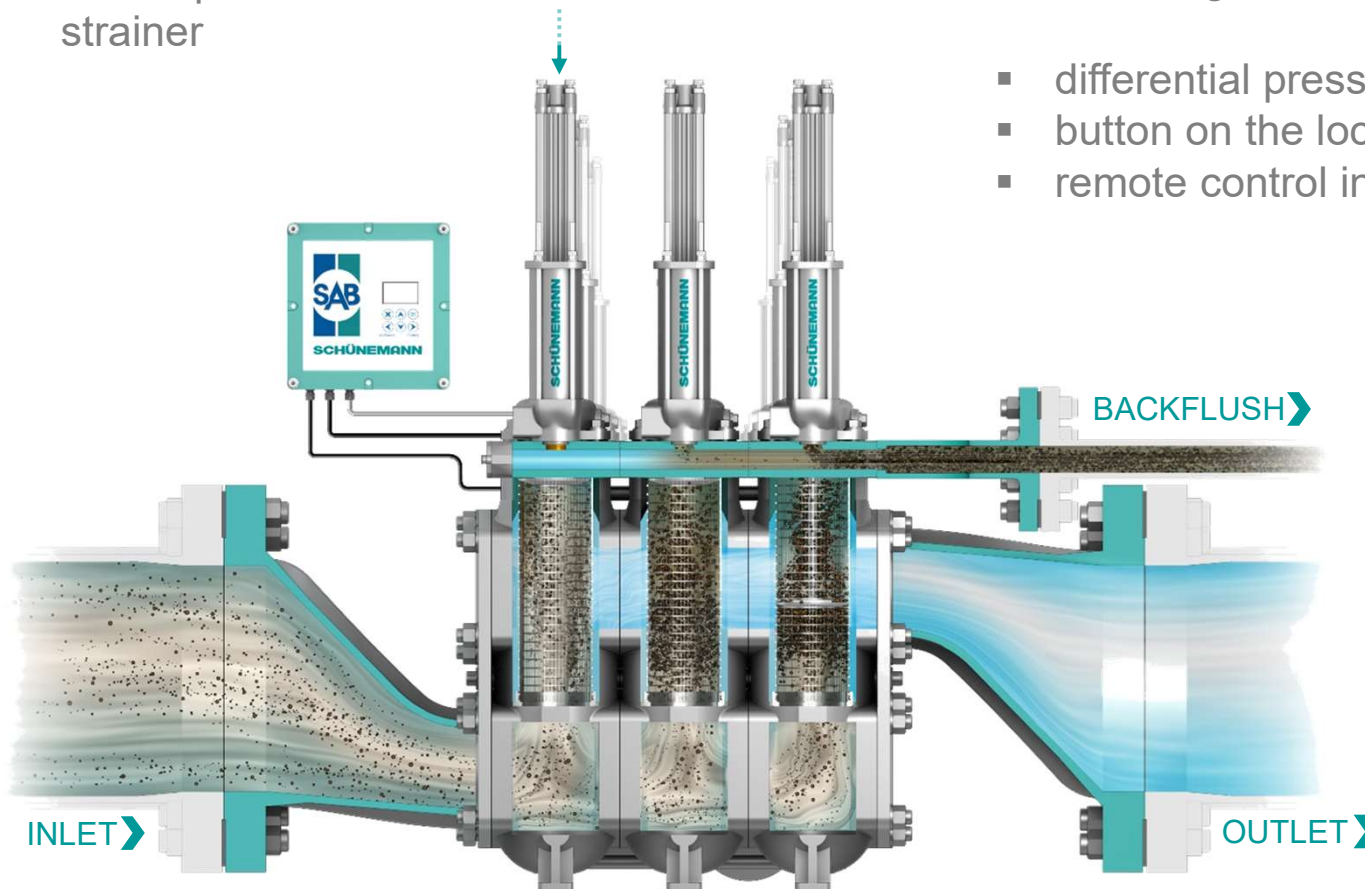
## FILTRATION

During normal filtration, particles accumulate from top to bottom on the inside of the strainer

## CLEANING CYCLE

The cleaning sequence is initiated by a timer setting or alternatively triggered by:

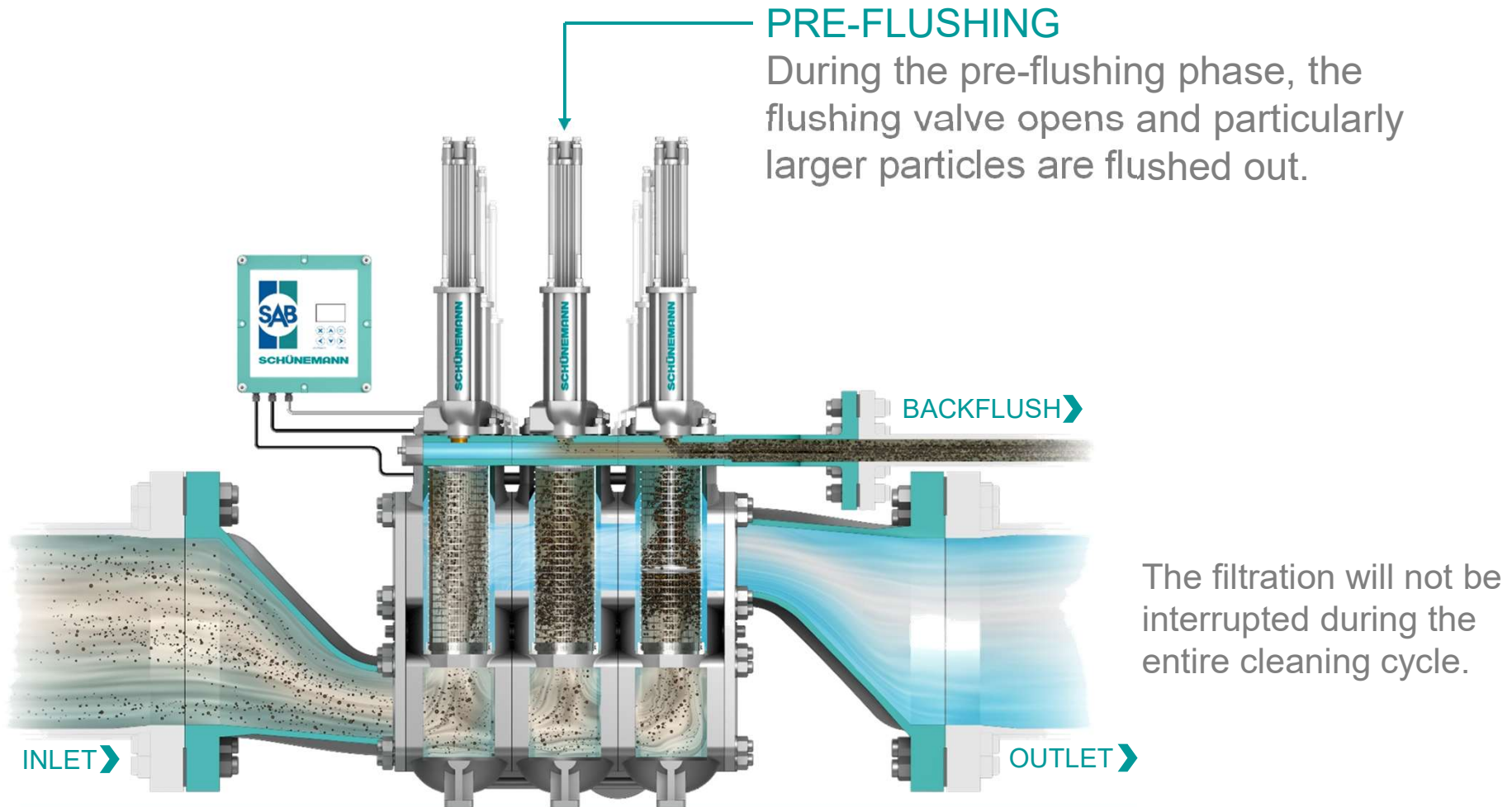
- differential pressure sensor (0.11 bar)
- button on the local control
- remote control in the main control room



Standard cleaning cycle trigger shall be the time interval with an adjustable default setting of 60 minutes



# F490 Automatic Filter MULTI X Filtration and Cleaning (2)

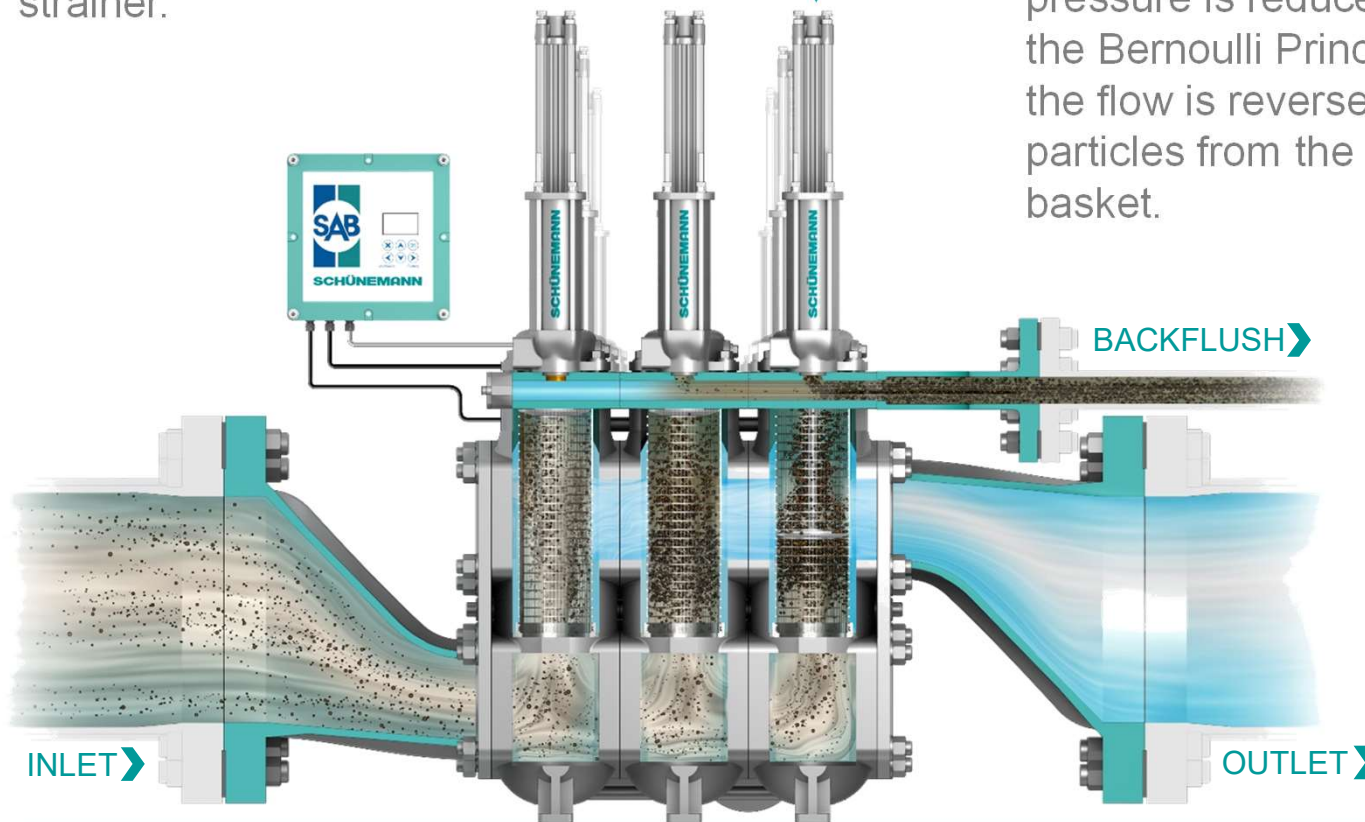


# F490 Automatic Filter MULTI X Filtration and Cleaning (3)

## CLEANING PHASE

The customized flushing disc moves two thirds of the way down the strainer and creates a gap between the disc and strainer.

The flow velocity increases locally around the disc within the gap between the flushing disc and the strainer. The local pressure is reduced in accordance with the Bernoulli Principle and the direction of the flow is reversed which releases the particles from the surface of the strainer basket.



The released particles are flushed out from the filter via the flushing outlet.

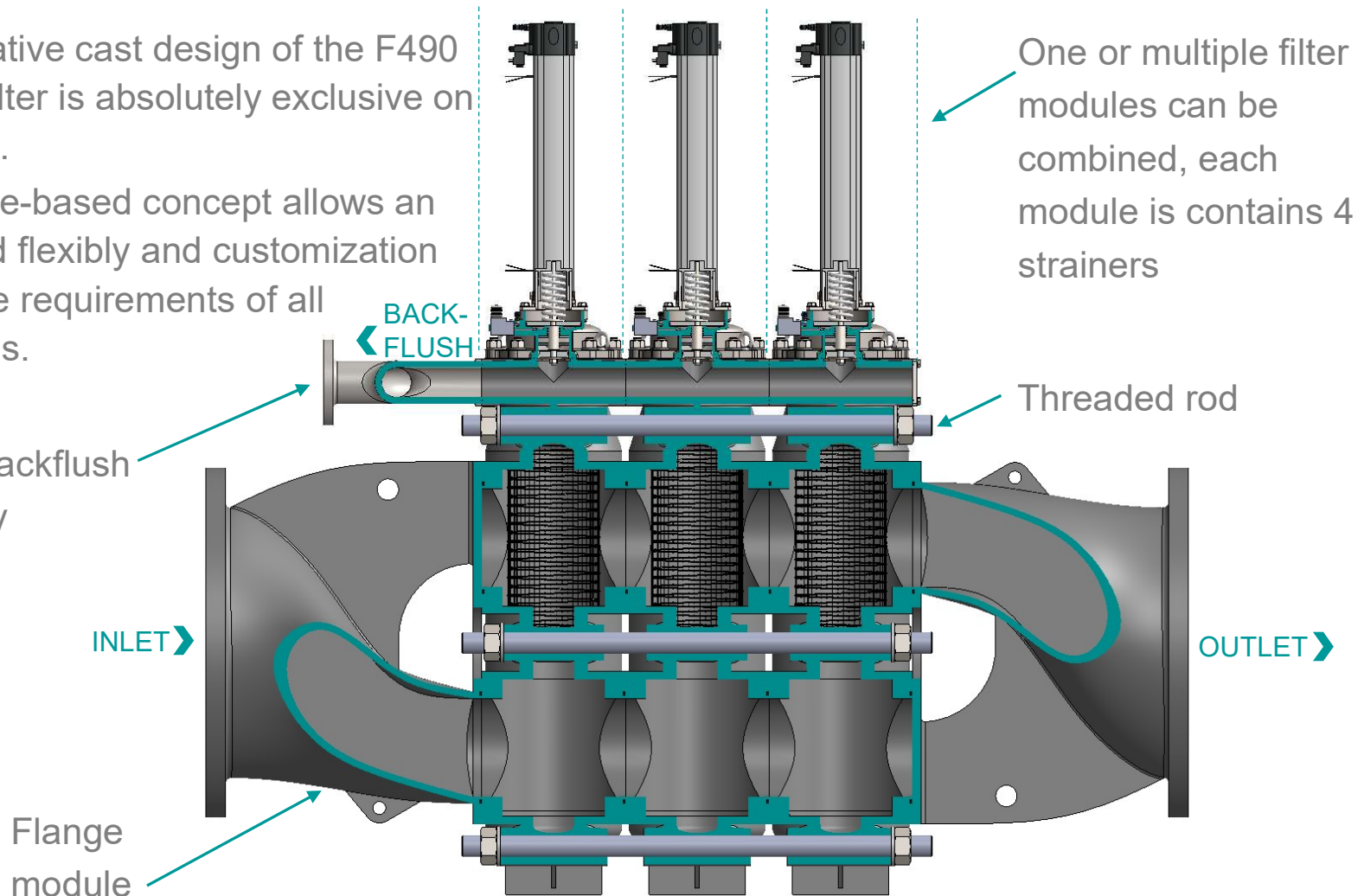
Finally the flushing valve is closed.

# F490 MULTI X Filter Cross Section

The innovative cast design of the F490 MULTI X filter is absolutely exclusive on the market.

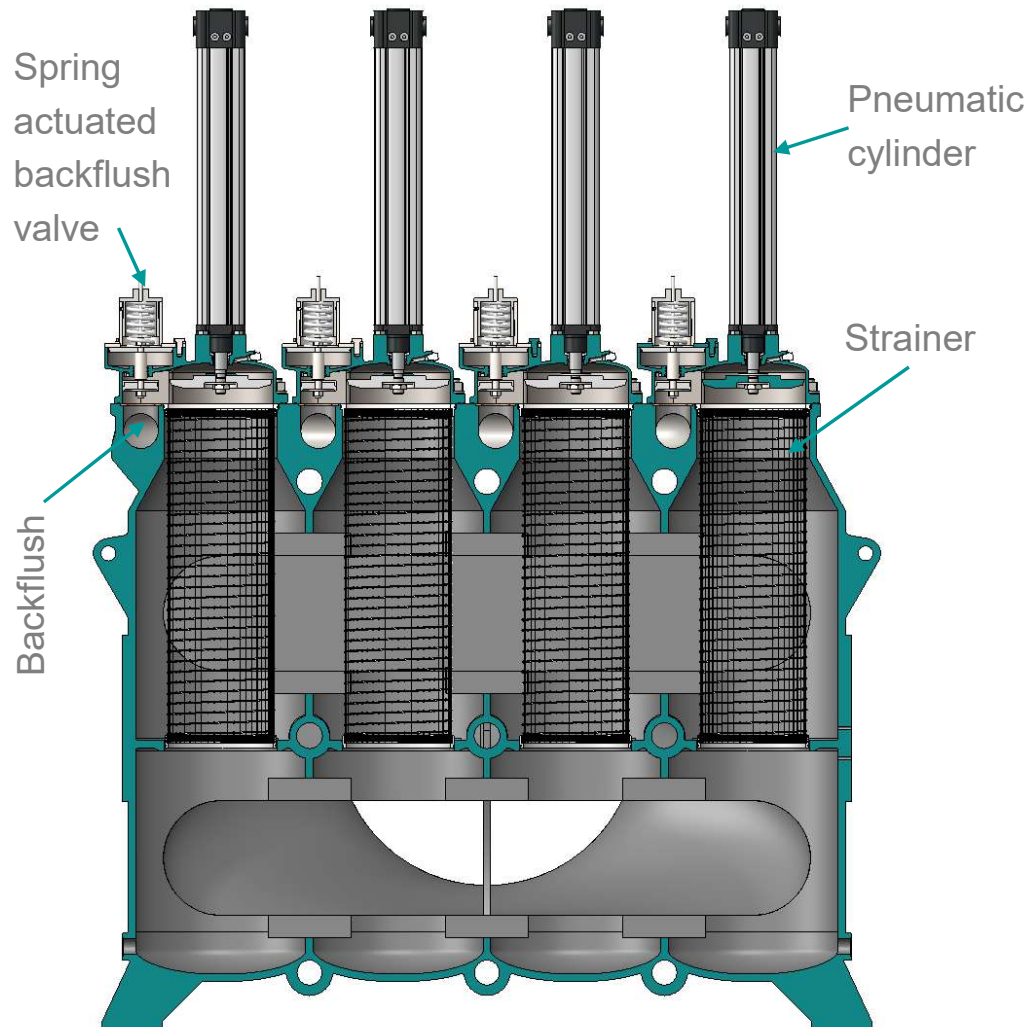
The module-based concept allows an unmatched flexibility and customization to meet the requirements of all applications.

Very low backflush rate of only



# F490 MULTI X

## Module Cross Section



Cross section of one filter module, each containing 4 strainers

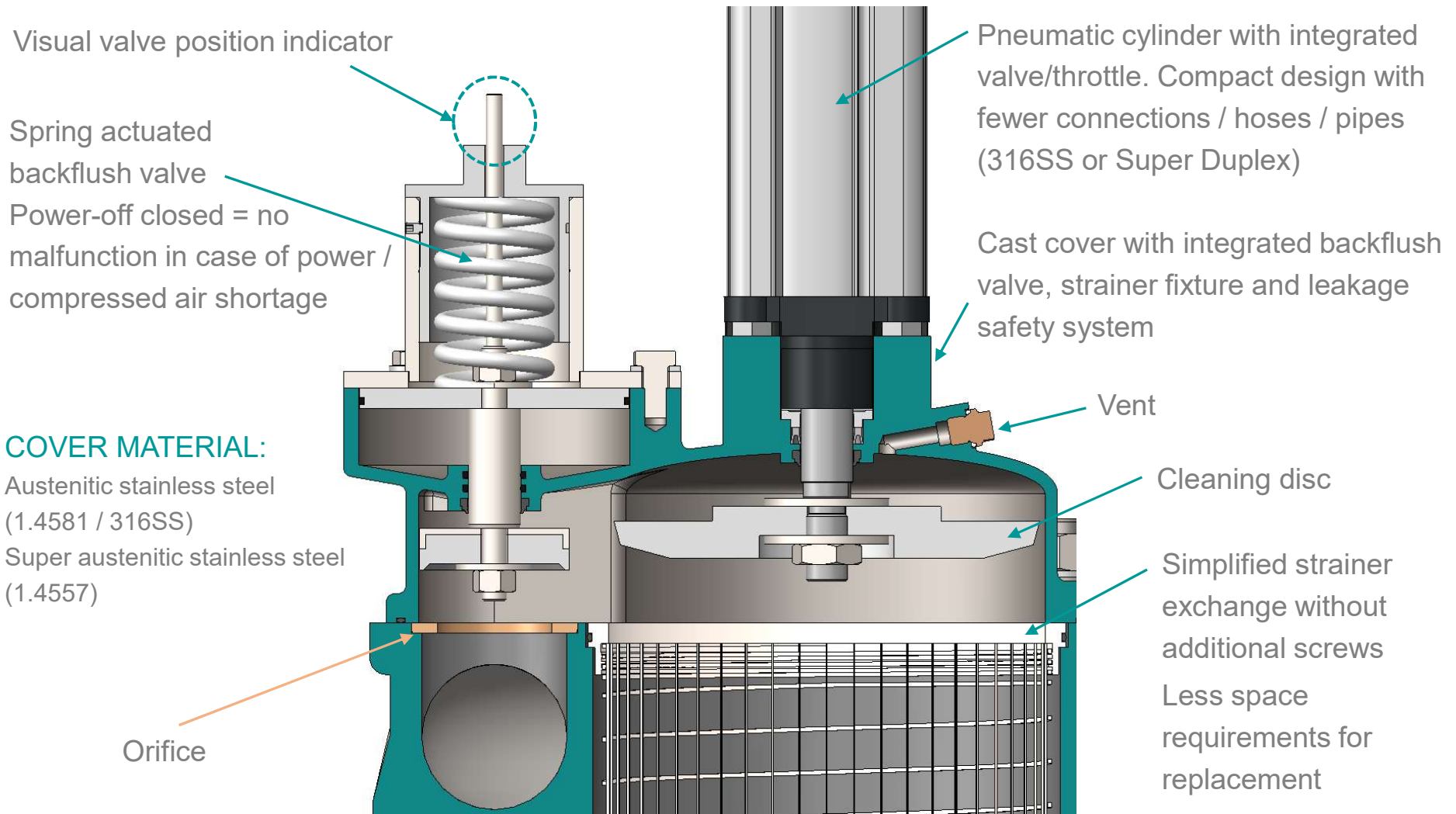
### BODY MATERIAL:

- Ductile cast iron (GGG-40)
- Austenitic stainless steel (1.4581 / 316SS)
- Super austenitic stainless steel (1.4557)

### VALUE PROPOSITION

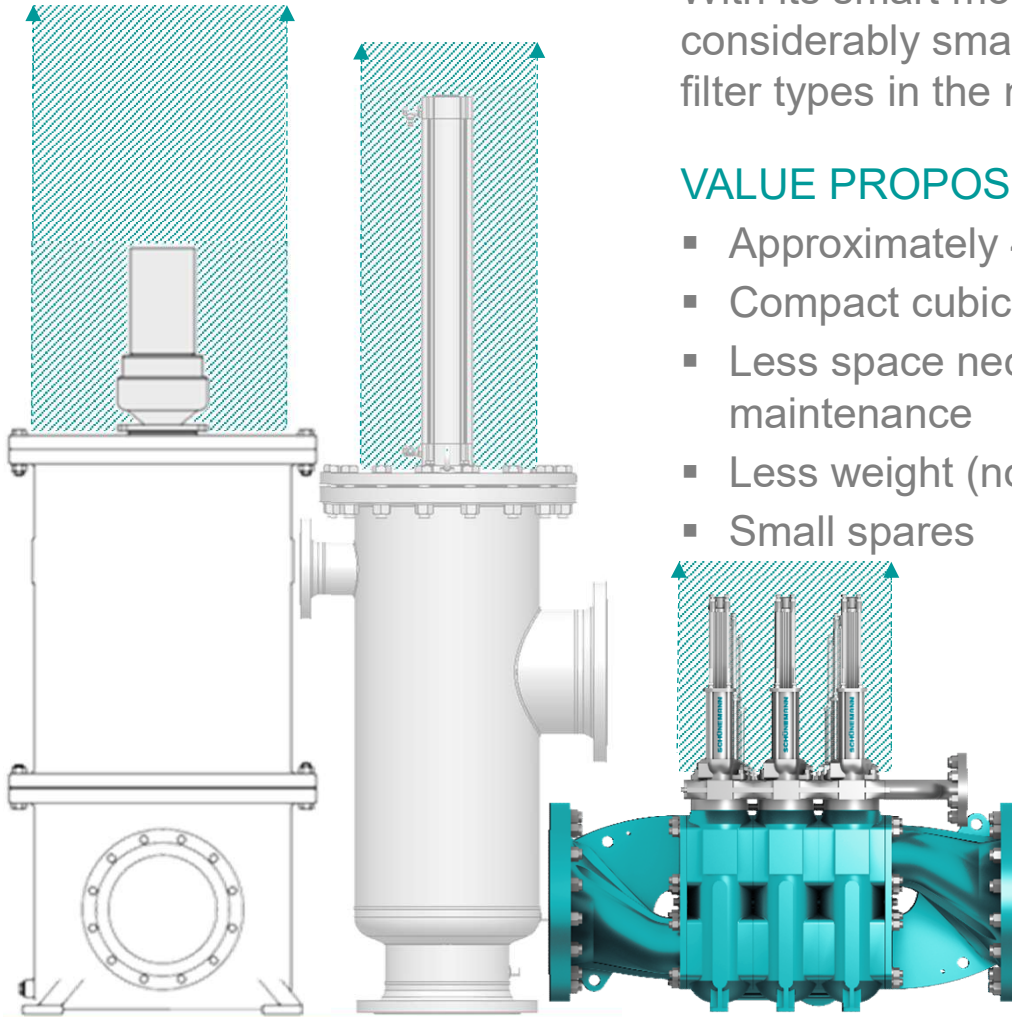
- Easy and quick maintenance due to fewer required screws for access
- Less stock required for spare parts
- Very attractive investment cost due to standardized design

# F490 MULTI X Features: Cover and Cylinder design



# F490 MULTI X Features: Dimensions

Required space for strainer replacement



With its smart modular and cast design the F490 offers a considerably smaller footprint compared to other available filter types in the market.

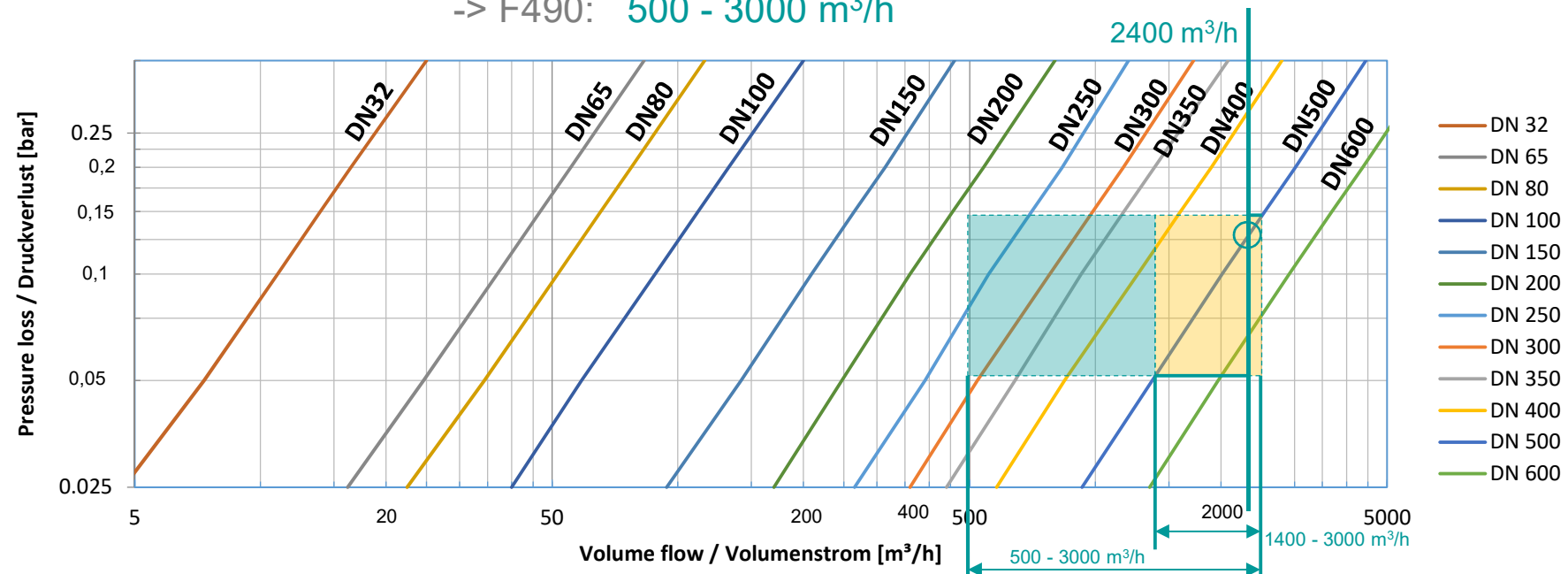
## VALUE PROPOSITION

- Approximately 40 - 50% less space required
- Compact cubic “in-line” design
- Less space necessary for the installation and maintenance
- Less weight (no crane required)
- Small spares

Comparison of different filter types to scale and designed/sized based on identical operational parameters

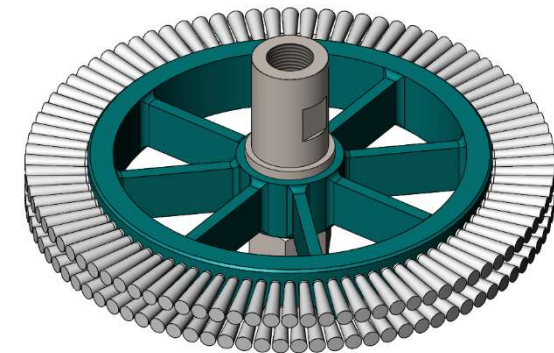
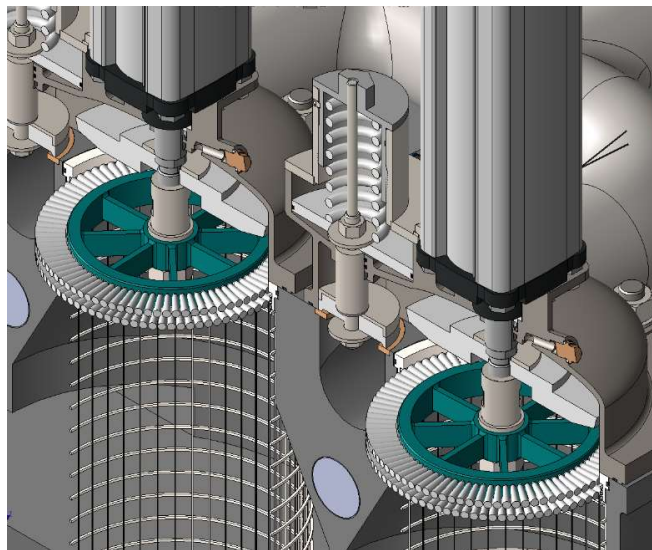
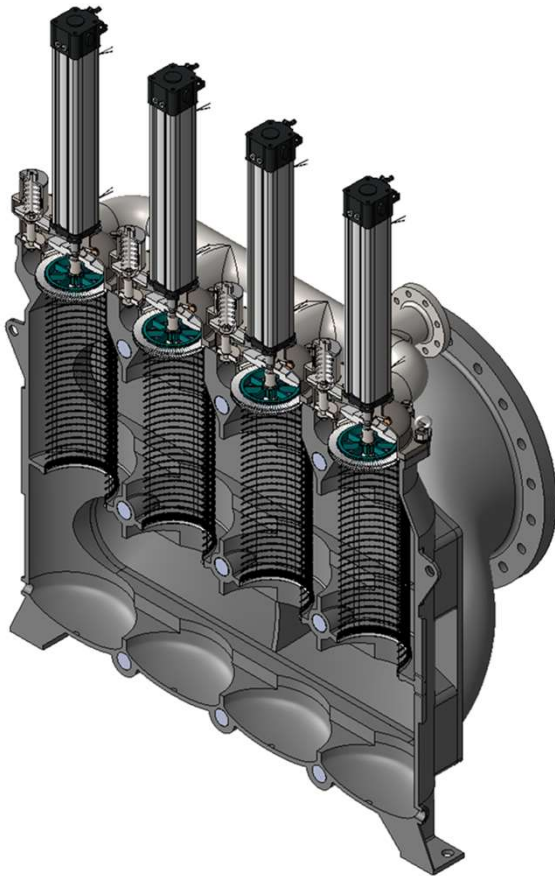
# F490 MULTI X Features: Volume flow & operational pressure

- Compared to conventional automatic filters the F490 covers an approx. double the operational volume flow range
- Simultaneously the F490 offers an unmatched flexibility with regard to operational pressure changes
- Example: Operational volume flow of 2400 m<sup>3</sup>/h **4400**  
 -> Standard Automatic Filter: 1400 - 3000 m<sup>3</sup>/h  
 -> F490: 500 - 3000 m<sup>3</sup>/h



# F490 Features: Optional Brush Upgrade

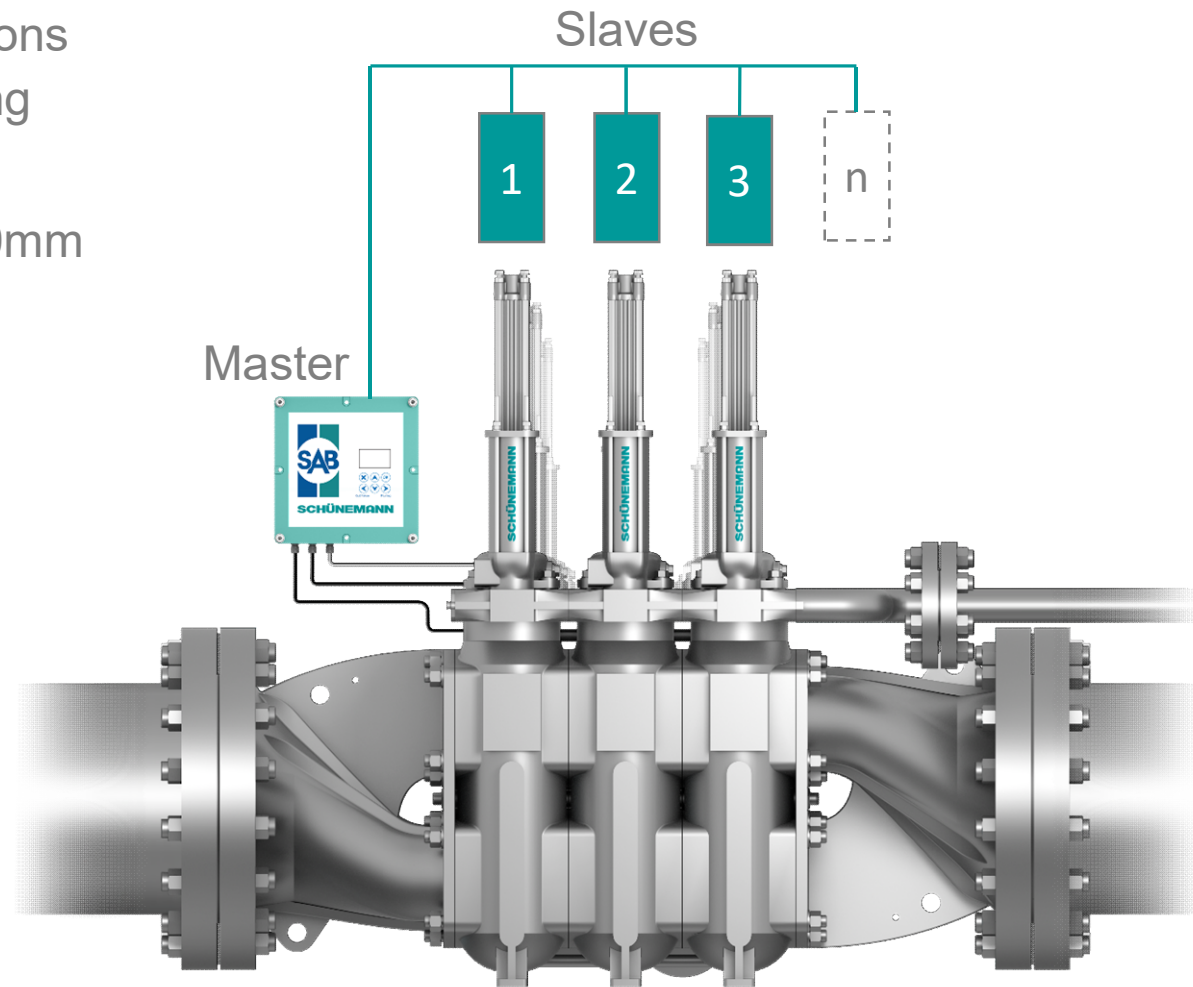
- Unique combination of mechanical cleaning and Bernoulli effect cleaning
- For fibrous, gluey, sticky and hard to remove contamination (e.g. algae)
- Available for all filter sizes
- Multiple brush materials available





# F490 Automatic Filter Control Panel

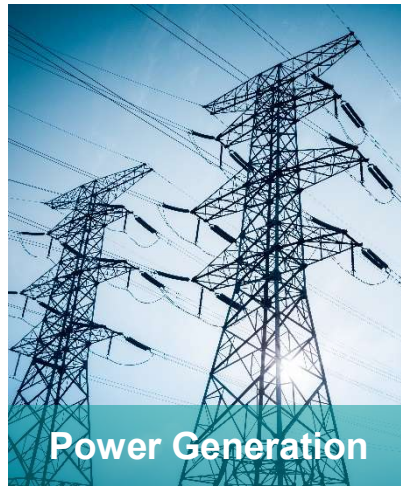
- Display and function buttons integrated in plastic casing
- IP65
- Dimensions: 200x200x80mm
- Inputs:
  - Flushing / pre-flushing
  - Error quitting
  - Flushing lock
- Outputs:
  - Operation
  - Flushing / pre-flushing
  - Error



# Markets



**Water and Wastewater Treatment**



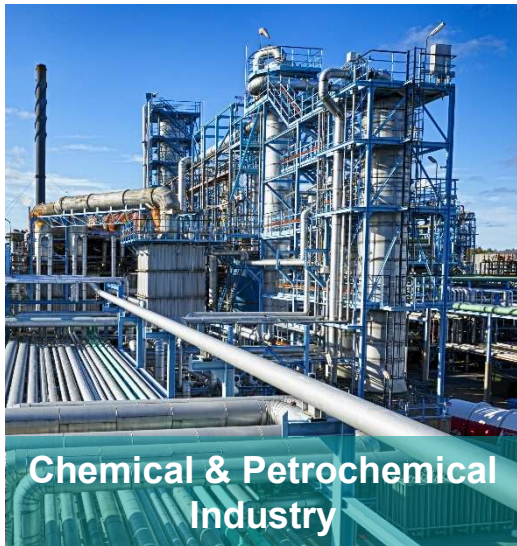
**Power Generation**



**HVAC**



**Irrigation**



**Chemical & Petrochemical Industry**



**Offshore**



**Maritime**



# Thank You

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