



# Sanitary - Clean Steam Applications

## TC Series Clean Steam Thermostatic Traps

### For Clean Steam Systems

For Pressures to 120 psig (8 bar)...Capacities to 3,775 lb/hr (1,712 kg/hr)

Armstrong offers a complete range of T-316L stainless steel clean steam thermostatic traps to handle the special requirements of clean steam systems. Different body configurations allow for choice of piping and ease of cleaning.

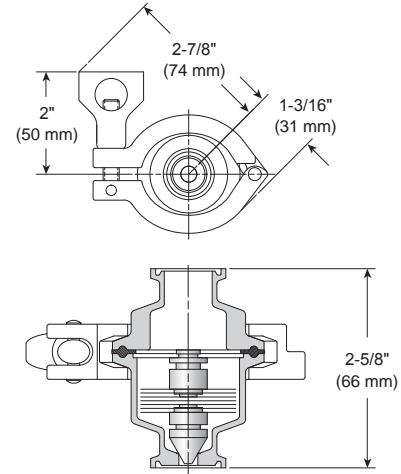
The thermostatic design is free-draining and can operate close to steam temperature at any given pressure.

#### Features

- Constructed of 316L stainless steel for corrosion resistance
- Highly polished for cleanability
- Self-draining to minimize contamination
- Compact and lightweight
- Easy to install
- Provide easy disassembly for cleaning

#### Typical Applications

- Fermentors
- Sterilizers/autoclaves
- Process piping
- Block and bleed
- Bioreactors
- CIP/SIP systems
- Equipment sterilization
- Sterile barriers



#### How to Order:

Specify:

- Model number
- Pipe connection size
- End connection type

**Example:**

TC-C, 1/2" sanitary end connections.

For a fully detailed certified drawing, refer to:

TC-C CD #1161

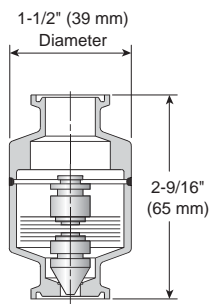
TC-R CD #1162

TC-S CD #1163

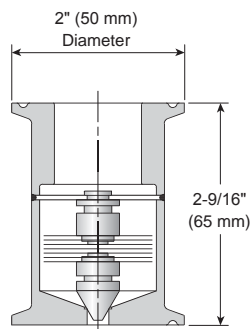
#### Model TC-C Clamp

With Sanitary Body Clamp

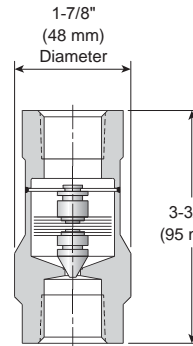
1/2" (15 mm), 3/4" (20 mm), 1" (25 mm)  
Sanitary End Connections



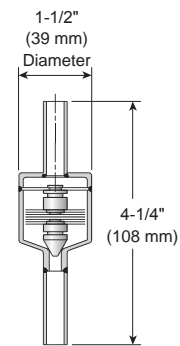
**Model TC-S Sealed**  
1/2" (15 mm), 3/4" (20 mm)  
Sanitary End Connections



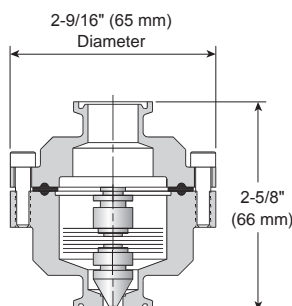
**Model TC-S Sealed**  
1" (25 mm)  
Sanitary End Connections



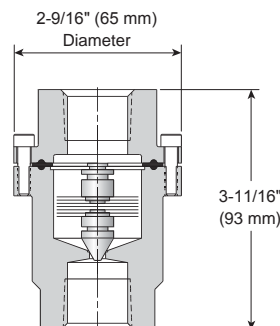
**Model TC-S Sealed**  
1/2" (15 mm), 3/4" (20 mm)  
Threaded End Connections



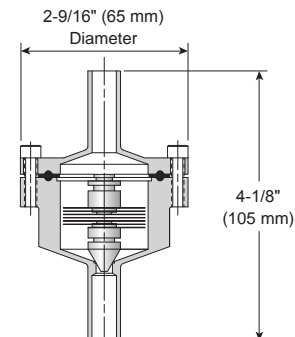
**Model TC-S Sealed**  
1/2" (15 mm), 3/4" (20 mm)  
Tube End Connections



**Model TC-R Repairable**  
With Bolted Body and Cap  
1/2" (15 mm), 3/4" (20 mm), 1" (25 mm)  
Sanitary End Connections



**Model TC-R Repairable**  
With Bolted Body and Cap  
1/2" (15 mm), 3/4" (20 mm)  
Threaded End Connections



**Model TC-R Repairable**  
With Bolted Body and Cap  
1/2" (15 mm), 3/4" (20 mm)  
Tube End Connections

## TC Series Clean Steam Thermostatic Traps

### For Clean Steam Systems

For Pressures to 120 psig (8 bar)...Capacities to 3,775 lb/hr (1,712 kg/hr)

#### Materials

Model	TC-C Clamp	TC-R Repairable	TC-S Sealed
Cap and body	ASTM A479 316L		
Bellows	316L Stainless Steel		
Body gasket	Viton®		—
Retainer	Stainless Steel		
Clamp	Stainless Steel	—	—
Screws	—	Stainless Steel	—
Finish	180 grit electro polish to 20 µin Ra or below inside, and 150 grit electro polish to 30 µin Ra or below on outside		Mechanical finish to 63 µin Ra interior and 32 µin Ra exterior

NOTE: µin = microinches

#### Physical Data

Model	TC-C Clamp	TC-R Repairable	TC-S Sealed
Maximum Allowable Pressure (Vessel Design)	120 psig (8.3 bar)	150 psig (10 bar)	150 psig (10 bar)
Maximum Allowable Temperature	350°F (177°C)	366°F (186°C)	366°F (186°C)
Maximum Operating Pressure	100 psig (7 bar)	120 psig (8.3 bar)	120 psig (8.3 bar)
Weight lb (kg)	1-1/4 (0.57)	1-1/2 (0.68)	3/4 (0.34)

TC Series Clean Steam Trap Capacities					
psig	bar	10°F (5.6°C) Subcool		20°F (11.2°C) Subcool	
		lb/hr	kg/hr	lb/hr	kg/hr
5	0.35	180	82	320	145
10	0.70	360	163	645	293
20	1.4	676	307	1,108	503
30	2.1	1,009	458	1,563	709
40	2.8	1,236	561	1,830	830
50	3.5	1,542	699	2,016	915
60	4.1	1,845	837	2,505	1,136
70	4.8	2,037	924	2,668	1,210
80	5.5	2,360	1,071	2,990	1,356
90	6.2	2,460	1,116	3,237	1,468
100	6.9	2,547	1,155	3,450	1,565
110	7.6	2,610	1,184	3,640	1,651
120	8.3	2,660	1,206	3,775	1,712

### SANITARY PRESSURE REDUCING VALVE

#### P-130

##### DESCRIPTION

The ADCA P-130 series **direct acting, spring-loaded diaphragm sensing**, pressure reducing valves, are designed for use on compressed air, water and other gases or liquids compatible with the materials of construction.

##### MAIN FEATURES

Compact design.  
Completely machined from barstock material, no castings or forgings used on the standard version.  
No rising stem

##### STANDARD SURFACE FINISH

Internal wetted parts: 0,5 microns Ra

External :

Body and cover– Fine machined  
(mechanical or electro polished as option)

**OPTIONS:**

- Self relieving
- Leakage line connection 1/8" (captured vent).
- Panel mounting version (thread M45)
- Gauge connection on body
- Different soft valves for liquids and gases.
- Casted cover (CF8M) with rising stem handwheel for economic reasons.
- Special execution for steam.

**USE:** Compressed air, water and other gases and liquids compatible with the construction.

##### AVAILABLE

**MODELS:** P-130

**SIZES:** DN1/2" to DN 1" ; DN15 to DN25

##### OUTLET SPRING

**RANGES:** 0,2 – 1,5 bar; 0,3 – 3 bar; 0,8 – 8 bar.

**CONNECTIONS:** Clamp ends or others on request

**INSTALLATION:** Horizontal installation.

##### ORDER

**REQUIREMENTS:** Type of fluid  
Maximum operating temperature  
Inlet pressure and required outlet pressure  
Capacity (maximum and minimum).

CE MARKING (PED - European Directive 97/23/EC)	
PN 16	Category
DN1/2" to DN 1"	SEP - art. 3, paragraph3



St.Steel hand wheel



Aluminium hand wheel

LIMITING CONDITIONS	
Valve model	P-130
Body design conditions	PN 16
Max.upstream pressure	16 bar
Max.downstream pressure	8 bar
Min.downstream pressure	0,2 bar
Max.design temperature *	150 °C

\*Other on request.

### SANITARY PRESSURE REDUCING VALVE




#### P-130

DIMENSIONS (mm)							
SIZE DN	A ASME BPE	A ISO 1127	B	C	D	WGT. Kgs BPE	WGT. Kgs ISO
1/2" - 15	130	115	37	135	80	2,7	3,2
3/4" - 20	130	115	37	135	80	2,9	3,2
1" - 25	130	115	37	135	80	3,3	3,3

Valves with aluminium hand wheel weights less 0,24 kgs.  
Different dimensions and standards on request.  
Consult factory for certified dimensions and weights.

CAPACITIES			
Valve Size	1/2" - 15	3/4" - 20	1" - 25
KVs (m3/h)	3	3,2	3,3

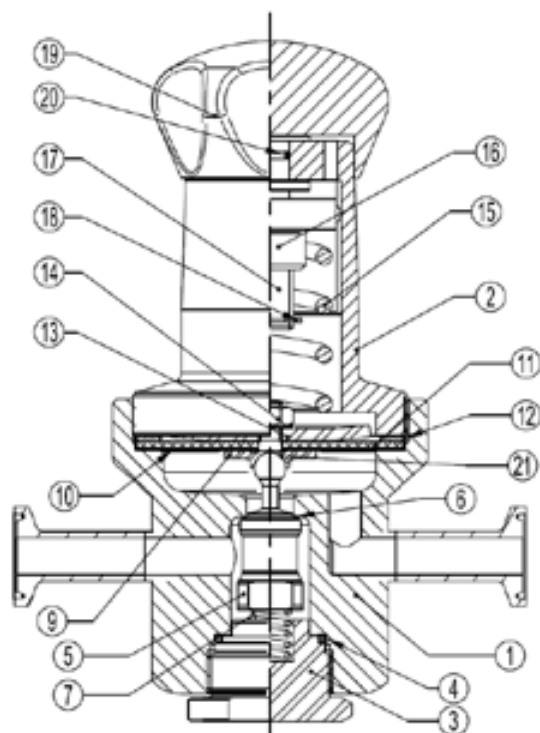
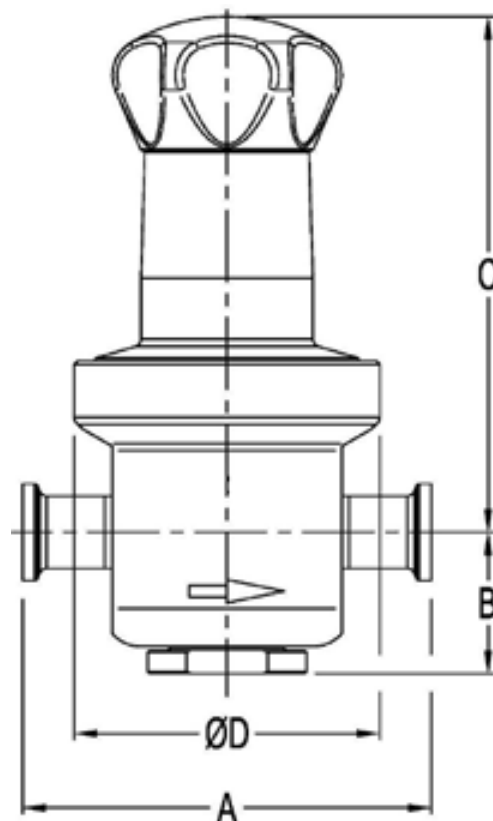
Reduced Kv on request

Connection examples		
Clamp	Round thread	Flange
		

MATERIALS		
POS.	DESIGNATION	MATERIAL
1	Valve body	AISI316L / 1.4406
2	Cover	AISI316L / 1.4404
3	Seat cover	AISI316L / 1.4404
4	* O-ring	Viton / EPDM
5	* Piston	AISI316L / 1.4404
6	* Valve head	AISI316L / 1.4404 ; Viton , PTFE
7	* Valve spring	AISI302 / 1.4300 ( Polished )
9	Pusher disc	AISI 316L / 1.4404
10	* Lower diaphragm	PTFE
11	* Upper diaphragm	EPDM
12	Washer	AISI304 / 1.4301
13	Spring plate	AISI304 / 1.4301
14	Nut	St steel A2-70
15	* Adjustment spring	AISI302 / 1.4300
16	Spring plate	AISI304 / 1.4301
17	Adjustment screw	AISI304 / 1.4301
18	Retaining ring	St steel A2-70
19	Handwheel	AISI316L / 1.4404
19	Handwheel	Aluminium white painted
20	O-ring	EPDM
21	** O-ring	EPDM

\* Available spare parts. \*\* On request

Remarks: FDA/USP Class VI seals certificate on request  
All valves have a serial number. In case of non-standard



### PRESSURE REDUCING VALVE - Clean Steam

#### P-160

##### DESCRIPTION

The ADCA P-160 series **direct acting, spring-loaded diaphragm sensing**, pressure reducing valves, are designed for use on clean steam, compressed air, water and other gases or liquids compatible with the materials of construction.

##### MAIN FEATURES

Compact design.  
Completely machined from barstock material, no castings or forgings used on the standard version.  
No rising stem

##### STANDARD SURFACE FINISH

Internal wetted parts: 0,5 microns Ra

External :

Body and cover– Fine machined  
(mechanical or electro polished as option)

**OPTIONS:** Leakage line connection 1/8" (captured vent).  
Different soft valves for liquids and gases.  
Casted cover (CF8M) with rising stem handwheel for economic reasons.  
Lock system, allows clean-in-place (CIP) and sterilization-in-place (SIP) operations with valve in line.

**USE:** Clean steam, compressed air, water and other gases and liquids compatible with the construction.

##### AVAILABLE

**MODELS:** P-160

**SIZES:** DN3/4", 1", 1 1/2", 2" ; DN 20, 25, 40, 50

**OUTLET SPRING RANGES:** 0,8 – 1,5 bar; 1 – 3 bar; 1,5 – 5 bar.

**CONNECTIONS:** Clamp ends or others on request

**INSTALLATION:** Horizontal installation. Inlet vertical and horizontal outlet angle connection.

##### ORDER

**REQUIREMENTS:** Type of fluid  
Maximum operating temperature  
Inlet pressure and required outlet pressure  
Capacity (maximum and minimum).



##### LIMITING CONDITIONS

Valve model	P-160
Body design conditions	PN 16
Max.upstream pressure	8 bar DN 2" only 4bar**
Max.downstream pressure	5 bar
Min.downstream pressure	0,8 bar
Max.design temperature *	150 °C

\*Other on request.

\*\*Special execution on request with lower Kvs

##### CE MARKING (PED - European Directive 97/23/EC)

PN 16	Category
DN 3/4" to 2"	SEP - art. 3, paragraph3



### PRESSURE REDUCING VALVE - Clean Steam

#### P-160

DIMENSIONS (Clamp conn.)					
SIZE DN	A	B	C	D	WGT. Kgs
3/4"-20	85	55	200	130	6,7
1"-25	85	55	200	130	6,8
1 1/2"-40	85	65	210	130	7,6
2"-50	85	70	210	130	7,8

\* Different lenghts on request.

Consult factory for certified dimensions

Dimensions subject to change without notice

CAPACITIES				
Valve Size	3/4"-20	1"-25	1 1/2"-40	2"-50
KVs (m3/h)	1,3* - 3	3,5* - 4,5	5,3	** 5,5 - 8,5

\*Max.available Kvs with ASME BPE clamp connection

\*\* On request, for maximum inlet pressure higher than 4 bar

Connection examples		
Clamp	Round thread	Flange
		

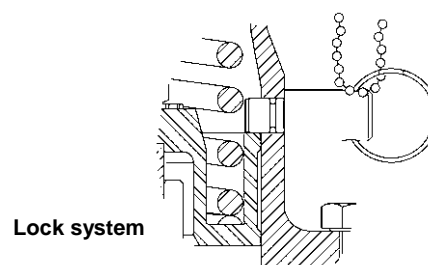
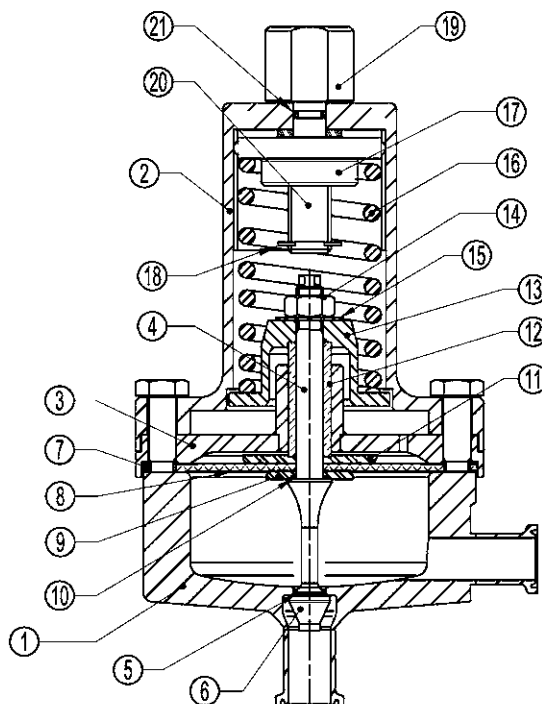
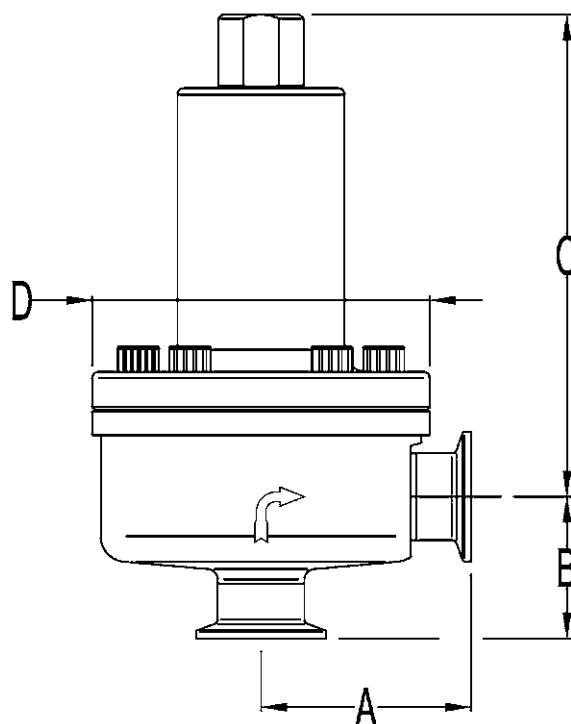
MATERIALS		
POS.	DESIGNATION	MATERIAL
1	Valve body	AISI316L / 1.4404
2	Cover	AISI316L / 1.4404
3	Centering plate	AISI316L / 1.4404
4	* Valve stem	AISI316L/1.4404
5	* Soft plug	EPDM; PTFE **
6	* Valve plug	AISI316L / 1.4404
7	* Upper diaphragm	EPDM;VITON**
8	* Lower diaphragm	PTFE
9	Diaphragm plate	AISI316L / 1.4404
10	* O-ring	EPDM
11	Diaphragm plate	AISI316L / 1.4404
12	Stem guide	AISI316 / 1.4401
13	Spring plate	AISI316 / 1.4401
14	Nut	St.Steel A2 - 70
15	Washer	AISI316 / 1.4401
16	* Adjustment spring	AISI 302 / 1.4300
17	Top spring plate	AISI316 / 1.4401
18	Retaining ring	St.Steel A2 - 70
19	Regulating nut	AISI316L / 1.4404
20	Adjustment screw	AISI304 / 1.4301
21	O-ring	EPDM

\* Available spare parts; \*\*Others according to the fluid

FDA/USP Class VI seals certificate on request

Viton diaphragm only with FDA approval (Pos.7)

Remarks: All valves has a serial number. In case of non-standard valves this number must be supplied if spare parts are ordered.



Lock system

### PNEUMATIC CONTROL VALVES - PV 928

( V928 angle type valves with linear actuators PA series )

#### DESCRIPTION

The PV928 are two or three way control valves with angle connections, specially designed for food, chemical pharmaceutical and cosmetic industries among others. The PA pneumatic actuator is rubber diaphragm and multi-springs. It's action can be DA - direct action (air to close) or RA-reverse action (air to open). The PV928 valves have been designed to assure an accurate control in any process condition and they have self draining design.

#### MAIN FEATURES

Quick disassembling through clamp body bonnet coupling  
Metal to metal or soft sealing.  
Self draining design

#### STANDARD SURFACE FINISH

Internal parts: 0,8 microns Ra

0,4 microns Ra on request

External:

Body:

Fine machined (mechanical or electro polished as option)

Actuator:

Stainless steel satin bead blast finish – 1,6 microns Ra

Steel painted

#### OPTIONS:

Soft sealing  
Steam barrier  
Position transmitter  
Pneumatic pilot positioner  
Air filter regulator  
Top-work manual handwheel

#### USE:

Saturated steam liquids and gases compatible with the construction

#### AVAILABLE MODELS:

PV928A-Two way angle valve  
PV928H-Two way horizontal valve  
PV928M-Three way mixing valve  
PV928D-Three way diverting valve

#### VALVE SIZES:

DN1/2" to DN4" ; DN15 to DN100

#### CONNECTIONS:

Tube weld, screwed, flanged and sanitary clamp.

#### PNEUMATIC ACTUATORS:

PA-205,PA-280,PA-340,PA-435

#### ACTUATOR CONN:

1/4" NPT-F

#### CONTROL SIGNAL:

0,2 – 1bar; 0,4 – 1,2 bar; 0,4 – 2 bar

#### ELECTRIC ACT.:

Consult catalogue IS EL20.00 E

MAX.AIR SUPPLY: 3,5 bar

#### AMBIENT

TEMPERATURE: -20°C .....+70°C

#### STEM SEALING:

EPDM or PTFE  
Considering the medium and temperature

#### PLUG TYPES:

Equal percentage (EQP)  
Linear (PL)  
On-Off (PT)

#### PORT:

Full port as standard  
Reduced or microflow on request



#### VALVE BODY LIM. CONDITIONS

#### PRESSURE/TEMPERATURE

10 bar	-10/170°C
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Higher limits on request

#### CE MARKING (PED - European Directive 97/23/EC)

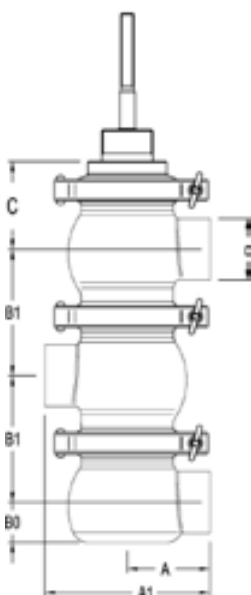
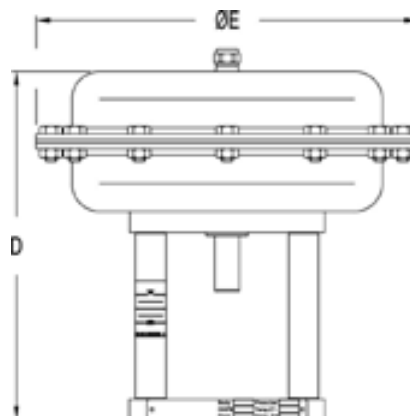
PN 10	Category
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DN1/2" to DN4" - DN15 to DN100	SEP - art. 3, paragraph3
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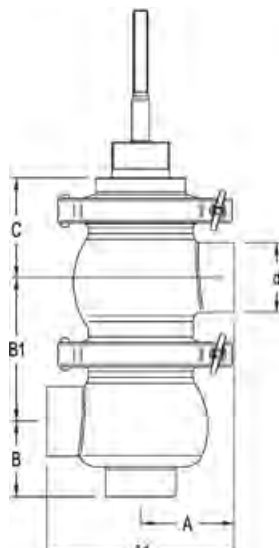


MATERIALS	
DESIGNATION	MATERIAL
Valve Body	AISI316L / 1.4404
Bonnet	AISI316L / 1.4404
Actuator (Steel)	S235JRG2 / 1.0038
Actuator (Stain.steel)	AISI304 / 1.4301
* Diaphragm	NBR 70
Yoke (Steel)	C45E / 1.1191
Yoke (Stainless steel)	AISI304 / 1.4301
*Valve plug	Metal, EPDM, PTFE, VITON
*Valve Seal	EPDM, FEP, VMQ
*Packing	EPDM, PTFE, VITON

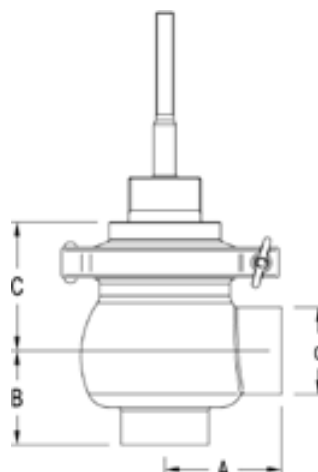
\* Available spare parts



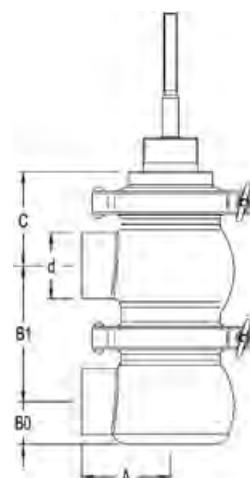
V928D



V928M



V928A



V928H

Connection examples		
Clamp	Round thread	Flange

DIMENSIONS AND FLOW RATE												
VALVE BODY										ACTUATOR		
DN	Kvs m <sup>3</sup> /h	Stroke mm	ø d * DIN 11850	A (mm)	A1 (mm)	B (mm)	B0 (mm)	B1 (mm)	C (mm)	Type	D (mm)	ø E (mm)
1/2"-15	4,2	20	18	38	76	38	14	66	38	PA-205	235	210
3/4"-20	6,8	20	22	38	76	38	16	66	38	PA-280	240	275
1"-25	11	20	28	52	104	52	22	72	52	PA-340	265	335
1 1/4"-32**	15	20	34	56	112	56	25	78	56	PA-435	295	430
1 1/2"-40	22	20	40	64	128	64	28	86	64			
2"-50	38	20	52	72	144	72	34	96	72			
2 1/2"-65	61	30	70	86	172	86	45	114	86			
3"-80	89	30	85	109	218	109	54	135	109			
4"-100	136	30	100	119	238	119	61	152	119			

\* Tube weld , other connections and standards on request. \*\* Not available with ASME BPE  
Consult factory for certified dimensions. Dimensions subject to change without notice.

### PNEUMATIC CONTROL VALVES - PV926

( V926 angle valves series with linear actuators PA series )

#### DESCRIPTION

The PV926 control valves are single seated, two-way body constructed with angle connections. The PA pneumatic actuator is rubber diaphragm and multi-springs. It's action can be DA - direct action (air to close) or RA-reverse action (air to open). The PV926 valves have been designed to assure an accurate control in any process condition. The self draining design is ideally suited to applications in clean steam service.

#### MAIN FEATURES

Single seated, two way, direct or reverse action valve.  
Valve top flange permanently attached to the body, removal is unnecessary for replacing the actuator.  
Metal to metal or soft sealing.  
Self draining design

#### STANDARD SURFACE FINISH

Internal parts: 0,5 microns Ra

External:

Body

Fine machined (mechanical or electro polished as option)

Actuator

Stainless steel satin bead blast finish – 1,6 microns Ra

Steel painted

OPTIONS:

Soft sealing

Position transmitter

Pneumatic pilot positioner

Air filter regulator

Top-work manual handwheel

USE:

Saturated steam

Hot and superheated water

Air and gases compatible with the construction

AVAILABLE

MODELS:

PV926

VALVE SIZES:

DN1/2" to DN2" ; DN15 to DN50

CONNECTIONS:

Clamp ends or other on request

PNEUMATIC

ACTUATORS:

PA-205,PA-280,PA-340,PA-435

ACTUATOR CONN:

1/4" NPT-F

CONTROL SIGNAL:

0,2 – 1bar; 0,4 – 1,2 bar; 0,4 – 2 bar

ELECTRIC ACT.:

Consult catalogue IS EL20.00 E

HOW TO SELECT: Never size the valve according to the pipe diameter in which it has to be fitted, but according to the required actual flow of steam or water. Refer to the valve calculation data sheet or consult the factory.



MAX.AIR SUPPLY: 3,5 bar

AMBIENT

TEMPERATURE: -20°C ....+70°C

STEM SEALING:

VITON/PTFE O-Rings 170°C

PLUG TYPES:

Equal percentage (EQP)

Linear (PL)

On-Off (PT)

PORT:

Full port as standard

Reduced or microflow on request

CE MARKING (PED - European Directive 97/23/EC)

PN 16

Category

DN1/2" to DN2"

SEP - art. 3, paragraph3

### PNEUMATIC CONTROL VALVES - PV926

( V926 angle valves series with linear actuators PA series )

MATERIALS		
POS.	DESIGNATION	MATERIAL
1	Valve Body	AISI316L / 1.4404
1.1	Ferrule	AISI316L / 1.4404
2	Bonnet	AISI316L / 1.4404
2.1	Bolts	DIN 933 A-2
3	Actuator (Steel)	S235JRG2 / 1.0038
	Actuator (Stainless steel)	AISI304 / 1.4301
4	* Diaphragm	NBR 70
5	Yoke (Steel)	C45E / 1.1191
	Yoke (Stainless steel)	AISI304 / 1.4301
6	Valve Seal	PTFE
7	Standard packing	AISI316L / 1.4404
8	O-ring	EPDM
9	O-ring	VITON
10	Seal washer	VITON

#### VALVE BODY LIM. CONDITIONS

##### PRESSURE/TEMPERATURE

16 bar	100 °C
15 bar	150 °C
14 bar	200 °C

#### DIMENSIONS (Clamp conn.)

VALVE BODY				ACTUATOR		
DN	A (mm)	B (mm)	C (mm)	Type	D (mm)	ø E (mm)
1/2"-15	60	49	62,5	PA-205	235	210
3/4"-20	60	49	62,5	PA-280	240	275
1"-25	60	49	62,5	PA-340	265	335
1 1/4"-32*	60	65	75,5	PA-435	295	430
1 1/2"-40	67,5	70	84			
2"-50	67,5	80	77,5			

Consult factory for certified dimensions.

Dimensions subject to change without notice.

\*Not available with ASME BPE

#### FLOW RATE COEFFICIENTS

SIZES					
1/2"-15	3/4"-20	1"-25	1 1/4"-32	1 1/2"-40	2"-50
Kvs 1,7* - 3	3,7* - 5,1	6,3* - 9,4	15,4	19,2* - 22,2	27,7* - 40,1

\* Max. available Kvs with ASME BPE clamp connections



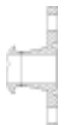
Kvs in m3/h , see data sheet IS PV10.00 E ;

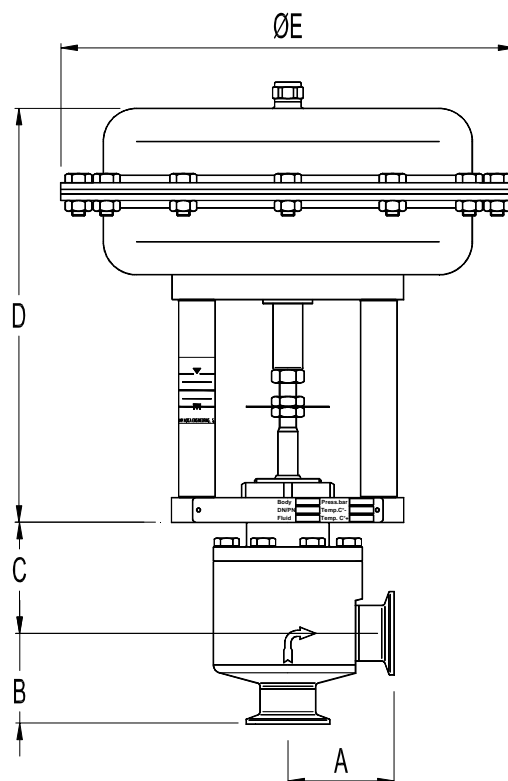
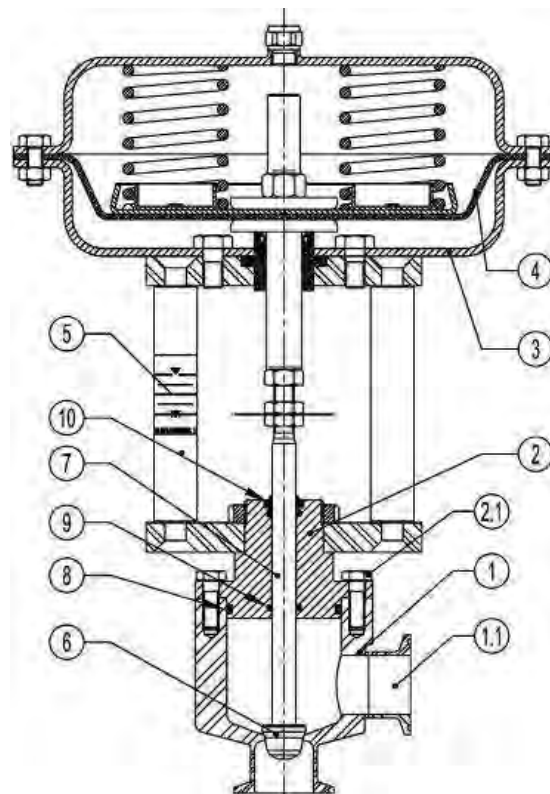
For conversion Kvs = Cv(US) x 0,855

#### ACTUATOR STROKE IN mm

SIZES					
1/2"-15	3/4"-20	25-1"	1 1/4"-32*	1 1/2"-40	2"-50
Stroke	20	20	20	20	20

#### Connection examples

Clamp	Round thread	Flange
		





### Free of particles and sterile

■ Compressed air, technical gases and liquids require a certain purity in most applications. In most cases, the media has to be free of particles.

■ Especially the food and beverage, pharmaceutical or chemical industries require a special degree of purity of the used media. Compressed air and technical gases must be free of particles, but also free of bacteria, microorganism and viruses.

■ As opposed to their size, microorganism are a serious problem for most sensitive production areas. As living organisms, they are able to proliferate in the right ambient condition and to contaminate the production.

■ Only a few viable organism in a clean or sterile production process can result in immense damages. Not only resulting in a lower product quality but also by complete uselessness of the production charge.

### Sterile filter elements and filter housings from ultrafilter

■ ultrafilter offers a complete range for process filtration of compressed air, technical gases and liquids.

■ ultrafilter GmbH offers a wide range of sterile filters for different applications. Depending on the application a wide range of filter elements with nominal or absolute retention rates can be offered.

■ Within the production of our process filters, only the highest quality materials are used.

■ All process filters are made of inert materials, without adhesives, additives or surface active components.

■ ultrafilter GmbH offers a wide range of stainless steel filter housings for the individual filtration requirements.

■ All ultrafilter stainless steel filter housings are build and designed according to international requirements.

■ Depending on the requirements, stainless steel filter housings can be offered in different stainless steel qualities (304, 316L) and different connections.

■ ultrafilter filter housings achieve high volumes flow at low differential pressures due an improved construction.

■ Due to the modular design different element types can be installed.

## Sterile filter P-SRF for compressed air and technical gases



### ultrafilter P-SRF

■ The P-SRF is a wounded depth filter with inner and outer guard end caps made of stainless steel. Consisting of a three-dimensional borosilicate depth media, the P-SRF achieves a void volume of 95 %, ensuring a high containment capacity at high flow rates and low differential pressure. A retention rate of > 99.99998 % related to 0.01 µm is achieved during operation.

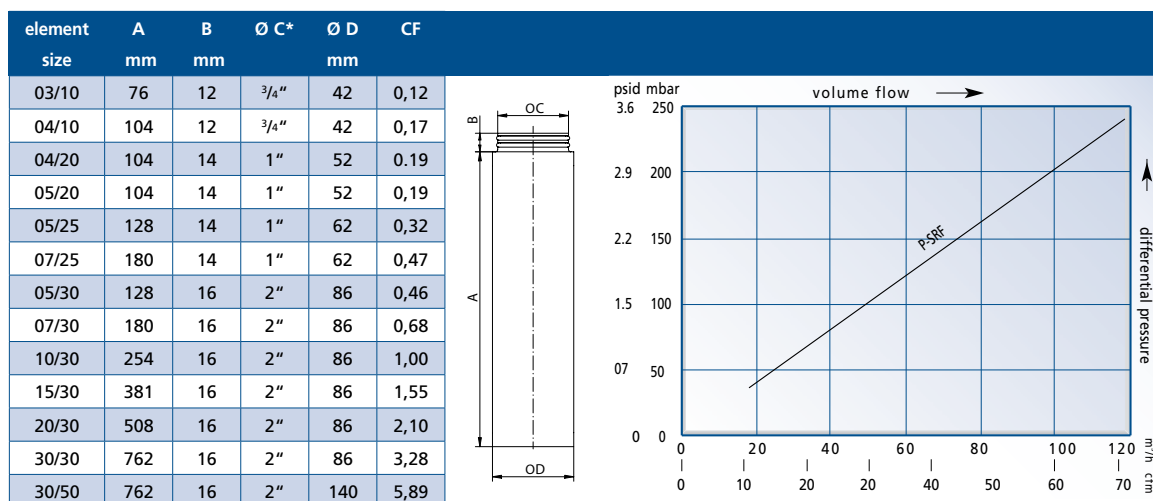
■ All components meet the FDA requirements for the contact with food in accordance with the CFR requirements (code of federal regulations) title 21.

### Features and advantages

- Non-fibre releasing filter element.
- Manufactured without use of binders or other chemical additives.
- Corresponds to cGMP requirements (current Good Manufacture Practice) and is manufactured according to DIN EN ISO 9001.
- P-SRF has passed the toxicological test according to USP XX Class VU for plastics.

### Applications

- Packing industry
- Biotechnology
- Breweries
- Chemical industry
- Diaries
- Fermentation processes
- Food & beverage industry
- Pharmaceutical industry
- Hospitals



## Vent filter P-BE for storage tanks



### ultrafilter P-BE

■ The P-BE is a wound depth filter with inner and outer guard end caps made of stainless steel. Consisting of a three-dimensional borosilicate depth media, the P-BE achieves a void volume of 95 %, ensuring a high containment capacity at high flow rates and low differential pressure. A retention rate of > 99.999 % related to 0.01 µm is achieved during operation.

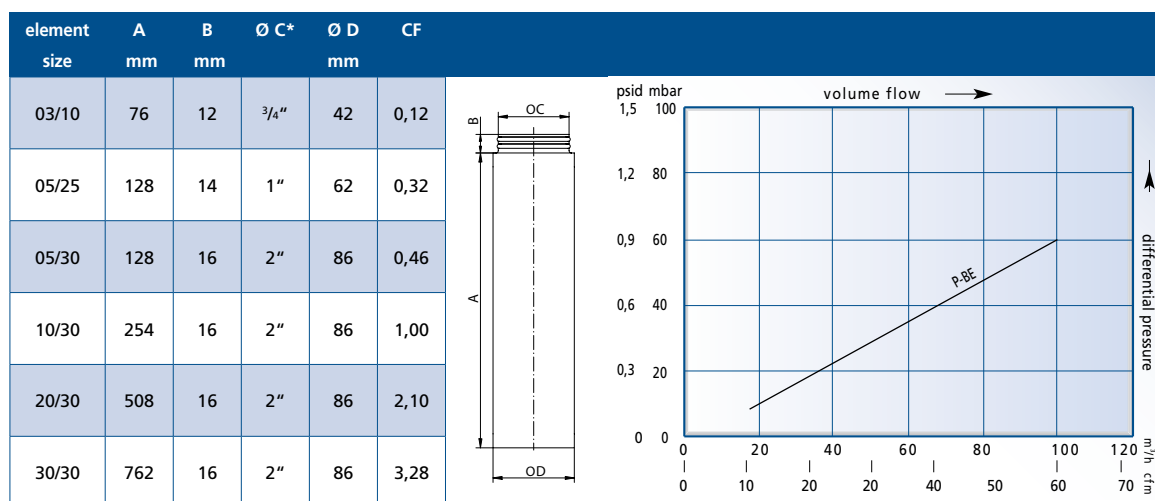
■ All components meet the FDA requirements for the contact with food in accordance with the CFR requirements (code of federal regulations) tilte 21.

### Features and advantages

- Non-fibre releasing filter element.
- Manufactured without use of binders or other chemical additives.
- Corresponds to cGMP requirements (current Good Manufacture Practice) and is manufactured according to DIN EN ISO 9001.
- P-BE has passed the toxicological test according to USP XX Class VU for plastics..

### Applications

- Chemical Industry
- Aseptic packing
- Pharmaceutical Industry
- Biotechnology
- Cosmetics Industry
- Breweries
- Dairies
- Food and beverages
- Water treatment systems
- Fermentation processes





## P-GS filter of sintered stainless steel for gases, liquids and steam



### Features and advantages

- Good durability against most liquids, aggressive gases and steams.
- The porosity level is more than 50 % ensuring high particle and dirt load capacity as well as a good flow rate at a low differential pressure.
- Regeneration by ultrasonic bath.

### Applications

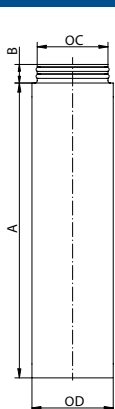
- Aseptic packing
- Breweries
- Chemical Industry
- Dairy industry
- Electronic industry
- Fermentation processes
- Food and beverages
- Pharmaceutical Industry
- Plastic industry

### ultrafilter P-GS

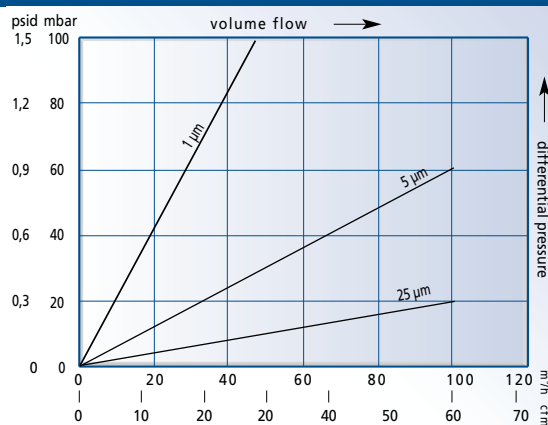
■ The ultrafilter P-GS filter ist designed for removal of particles from gases, liquids and steam.

■ The P-GS consists of a regenerable weldless filter pipe made from sintered stainless steel. The retention rate extends from 1 µm to 25 µm.

element size	A mm	B mm	Ø C* mm	Ø D mm	CF
03/10	76	12	3/4"	42	0,12
04/10	104	12	3/4"	42	0,17
04/20	104	14	1"	52	0,19
05/20	128	14	1"	52	0,19
05/25	128	14	1"	62	0,32
07/25	180	14	1"	62	0,47
05/30	128	16	2"	86	0,46
07/30	180	16	2"	86	0,68
10/30	254	16	2"	86	1,00
15/30	381	16	2"	86	1,55
20/30	508	16	2"	86	2,10
30/30	762	16	2"	86	3,28
30/50	762	16	2"	140	5,89



volume flow of a 10" P-GS element  
at 121 °C saturated steam



## P-SM sterile filter made of stainless steel mesh



### Features and advantages

- The P-SM offers an especially economical pre- and final filtration.
- Regeneration of stainless steel mesh by ultrasonic bath or back flush.
- Welded contact points, guaranteeing a constant pore diameter, even under extreme operating conditions.
- Also suitable for high viscosity liquids.
- Withstands a differential pressure of up to 5 bar (flow from outside to inside).
- Suitable for operating temperatures of up to 200 °C.

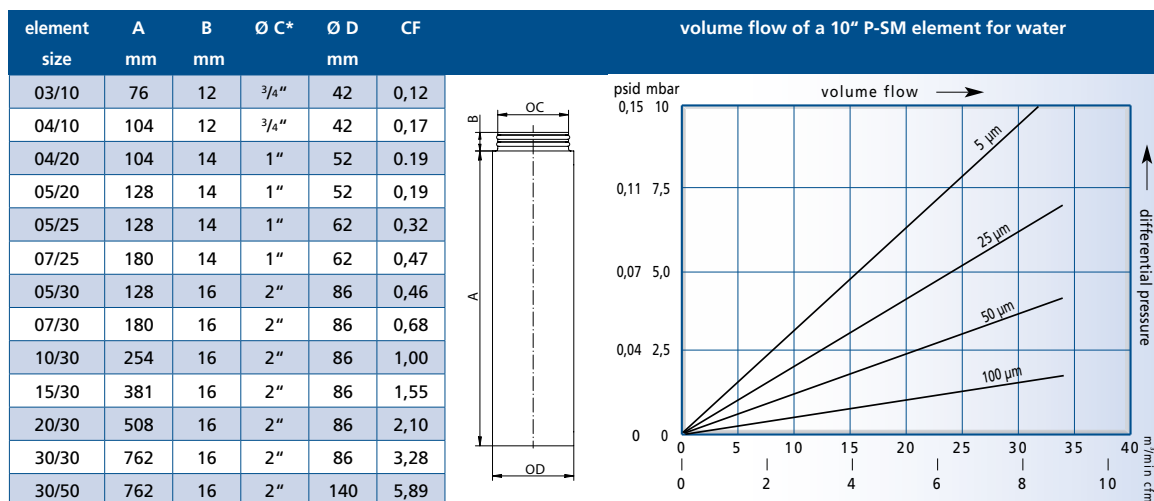
### Applications

- Water filtration
- Chemicals
- Solvents
- Biological liquids
- Pharmaceuticals
- Cosmetics
- Oils
- Food and beverages
- Syrup
- Collants
- Compressed air and other gases

### ultrafilter P-SM

■ Pre and final filter with absolute retention rate for particle removal from aqueous solutions, water and other liquids, as well as gases.

■ The P-SM consists of a regenerable stainless steel mesh, with stainless steel outer guard and endcaps. The retention rate extends from 5 µm up to 250 µm.



## PP-TF process filter for particle retention out of liquids



■ This filter element distinguishes itself by an exceedingly high dirt hold capacity as well as a high flow rate with a low differential pressure and a long service life.

### Features and advantages

- Manufactured in accordance with cGMP requirements (current Good Manufacture Practice).
- no migration of filter medium, non-fibre releasing
- thermally, binderfree welded without chemical additives

### Applications

Particle removal from

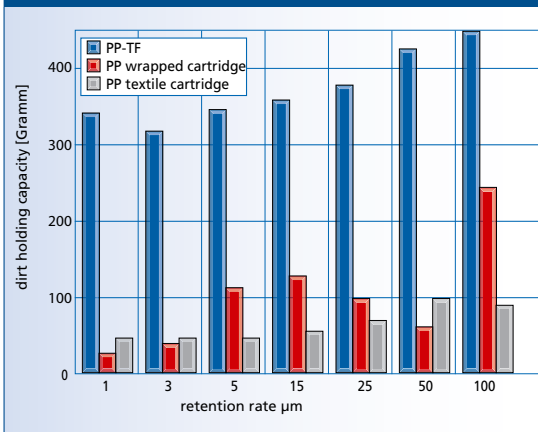
- Biological liquids
- Chemicals
- Collants
- Compressed air and other gases
- Cosmetics
- Etchants
- Food and beverages
- Jet printer inks
- Oils
- Photolithographical liquids
- Pharmaceuticals
- Solvents
- Water

### ultrafilter PP-TF

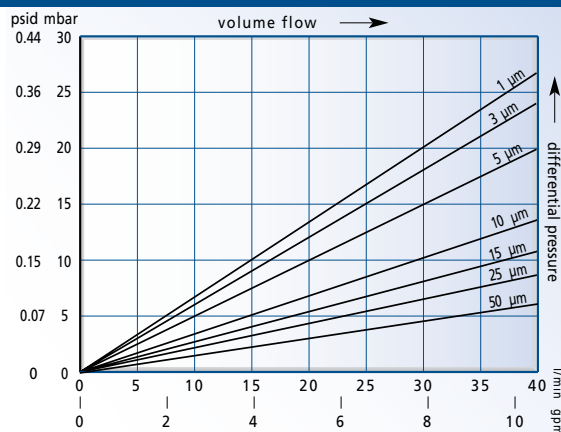
■ Depth filter for particle removal from water and aqueous solutions with a nominal retention rate of 1 µm to 50 µm.

■ The PP-TF is a pleated polypropylene filter with an inner and outer guard of polypropylene.

Dirt holding capacity of a PP-TF element



volume flow of a 10" PP-TF element



## PP process filter depth filter for particle retention out of liquids



### ultrafilter PP

■ Depth filter for particle removal from water and aqueous solutions and gases with a nominal retention rate of 1 µm to 30 µm.

■ The P-PP is a pleated polypropylene filter with an inner and outer guard of propylene.

■ This filter element distinguishes itself by an exceedingly high dirt hold capacity as well as a high flow rate with a low differential pressure and a long service life.

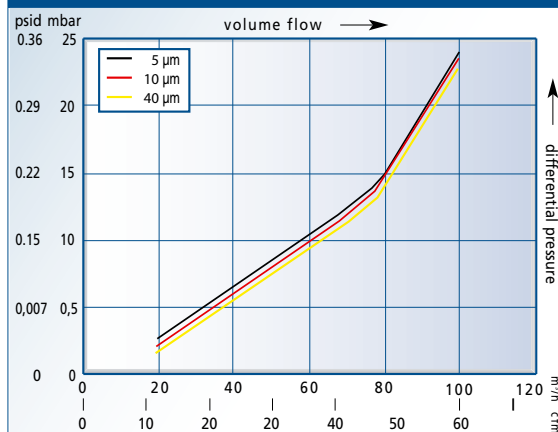
### Features and advantages

- Manufactured in accordance with cGMP requirements (current Good Manufacture Practice) and complies with FDA requirements for the contact with food.
- no migration of filter medium, non-fibre releasing
- thermally, binderfree welded without chemical additives
- Pre-rinsed with 18MΩ • cm water, which leads to extremely low extractables

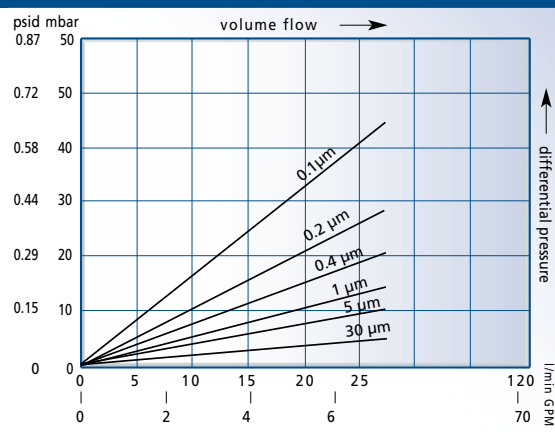
### Applications

- Biological liquids
- Chemicals
- Collants
- Compressed air and other gases
- Cosmetics
- Etchants
- Food and beverages
- Jet printer inks
- Oils
- Pharmaceuticals
- Syrup
- Solvents
- Water

volume flow of a 10" element - air



volume flow of a 10" element - water



## PP100 process filter for particle retention out of liquids



### ultrafilter PP100

■ Depth filter for particle removal from water and aqueous solutions with an absolute retention rate of 0.45  $\mu\text{m}$  to 40  $\mu\text{m}$ .

■ The PP100 is a pleated polypropylene filter with an inner and outer guard of propylene.

■ This filter element distinguishes itself by an exceedingly high dirt hold capacity as well as a high flow rate with a low differential pressure and a long service life.

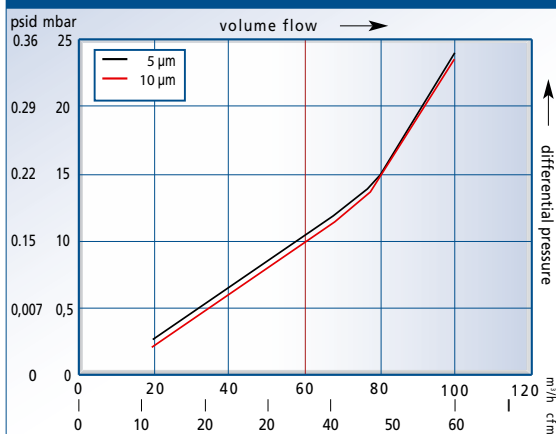
### Features and advantages

- Manufactured in accordance with cGMP requirements (current Good Manufacture Practice) and complies with FDA requirements for contact with Food in accordance with CFR Title 21.
- no migration of filter medium, non-fibre releasing
- thermally, binderfree welded without chemical additives
- Pre-rinsed with 18M $\Omega$  • cm water, which leads to extremely low extractables

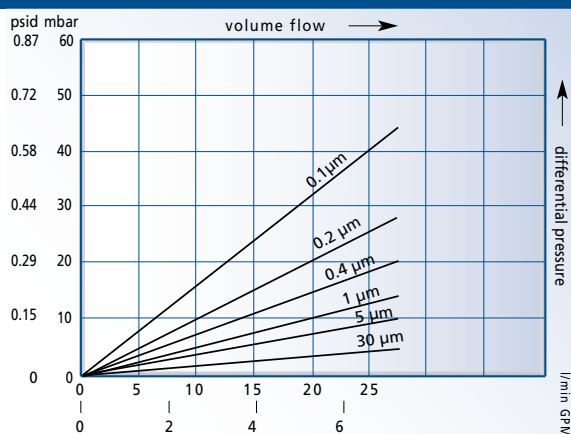
### Applications

- Biological liquids
- Chemicals
- Collants
- Compressed air and other gases
- Cosmetics
- Etchants
- Food and beverages
- Jet printer inks
- Pharmaceuticals
- Serums
- Syrup
- Solvents
- Water

volume flow of a 10" element - air



volume flow of a 10" element - water



## PF-BEV process filter membrane filter with absolute retention rate



### ultrafilter PF-BEV

■ Membrane filter for particle removal from water and aqueous solutions with an absolute retention rate of 0.2  $\mu\text{m}$  to 0.45  $\mu\text{m}$ .

■ The P-PF-BEV is a polyethersulfone membrane filter with an inner and outer guard of propylene.

■ The filter media polyethersulfone is inherently hydrophilic and distinguishes itself by having an asymmetrically designed pore structure. The pore size steadily decreases towards the center of the medium.

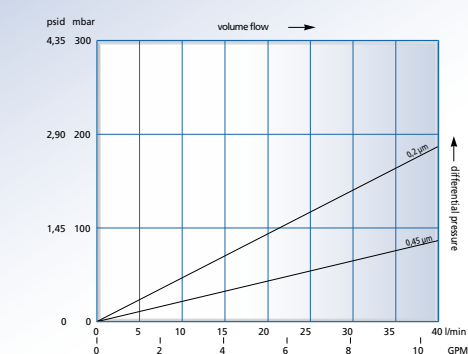
### Features and advantages

- Manufactured in accordance with cGMP requirements (current Good Manufacture Practice).
- P-PF-BEV meets the FDA requirements for the contact with food in accordance with CFR (Code of Federal Regulations) Title 21. P-PF-BEV has passed the USP XX Class VI tests for plastics.
- thermally, binderfree welded without chemical additives

### Applications

- Food and beverages
- Rinsing or cleaning water
- Sterile water
- Mixing or blending water

volume flow of a 10" element - water





## PF-PES process filter for sterile filtration of aqueous solutions



### ultrafilter PF-PES

■ Membrane filter for particle removal from water and aqueous solutions and solvents with an absolute retention rate of 0.04  $\mu\text{m}$  to 0.6  $\mu\text{m}$ .

■ The P-PF-PES is a polyethersulfone membrane filter with an inner and outer guard of propylene.

■ The filter media polyethersulfone is inherently hydrophilic and distinguishes itself by having an asymmetrically designed pore structure. The pore size steadily decreases towards the center of the medium.

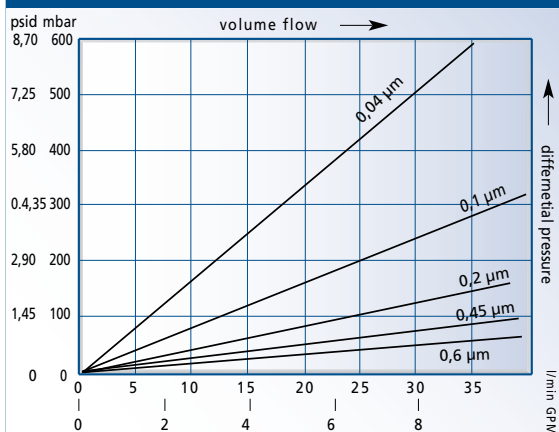
### Features and advantages

- Manufactured in accordance with cGMP requirements (current Good Manufacture Practice).
- P-PF-PES meets the FDA requirements for the contact with food in accordance with CFR (Code of Federal Regulations) Title 21. P-PF-PES has passed the USP XX Class VI tests for plastics.
- Pre-rinsed with 18M $\Omega$  - cm water, which leads to extremely low extractables

### Applications

- Serum & blood-based products
- Antibiotics
- Injectables
- Diagnostic reagents
- Deionised water
- Sterile water
- Chemically treated water
- Acids and bases
- Alcohols
- Aldehydes
- Ketones etc.

volume flow of a 10" element - water



## PF-PP process filter membrane filter with absolute retention rate



### Features and advantages

- Manufactured in accordance with cGMP requirements (current Good Manufacture Practice).
- P-PF-PP meets the FDA requirements for the contact with food in accordance with CFR (Code of Federal Regulations) Title 21. P-PF-PP has passed the USP XX Class VI tests for plastics.
- The membrane is non-fibre realising and thermally welded without use of binders or chemical additives

### Applications

- Alcohols
- Bases
- Etchants
- Solvents
- Photoresists
- Photo-lithografical solutions
- Fermentation gases
- Technical gases
- Tank ventilation
- Compressed air

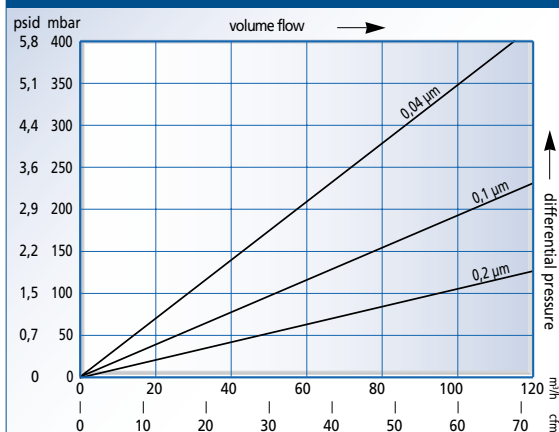
### ultrafilter PF-PP

■ Membrane filter for filtration of solvents, alcohols, chemicals and gases with an absolute retention rate of 0.04  $\mu\text{m}$  to 0.2  $\mu\text{m}$ .

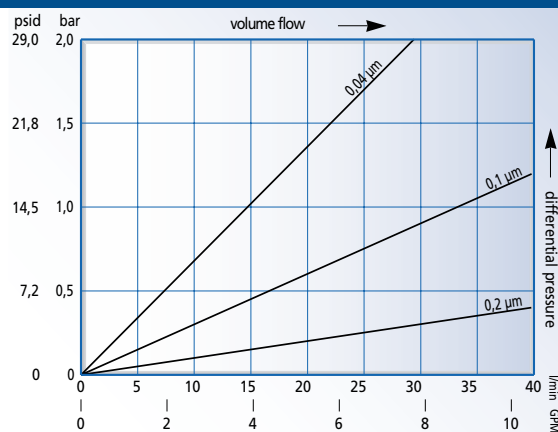
■ The P-PF-PP is a pleated propylene membrane filter with an inner and outer guard of propylene.

■ The filter media propylene is inherently hydrophobic with a highly porous membrane structure.

volume flow of a 10" element - air



volume flow of a 10" element - water



## PF-PT process filter for aggressive liquids and gases



### ultrafilter PF-PT

■ Pleated membrane filter for particle removal from aggressive solvents, chemicals and gases with a nominal retention rate.

■ The PF-PP filter is a high quality Teflon filter media, offering maximum assurance of filtration performance and durability against chemicals in severe process conditions.

■ The retention rate extends from 0.1  $\mu\text{m}$  to 1  $\mu\text{m}$ . The Teflon® filter media is inherently hydrophobic with a highly porous membrane structure.

■ All components meet the FDA requirements for the contact with food in accordance with the CFR (Code of Federal Regulations) Title 21. PF-PT filter elements have passed the toxicological tests according to USPXX Class VI for plastics. In particular, the requirements of the chemical, biological, cosmetic, electronic and the pharmaceutical industries are fulfilled.

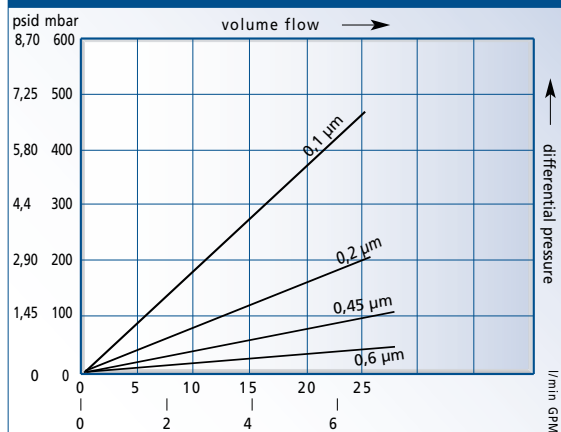
### Features and advantages

- Manufactured in accordance with cGMP requirements (current Good Manufacture Practice).
- The membrane is non-fibre realising and thermally welded without use of binders or chemical additives

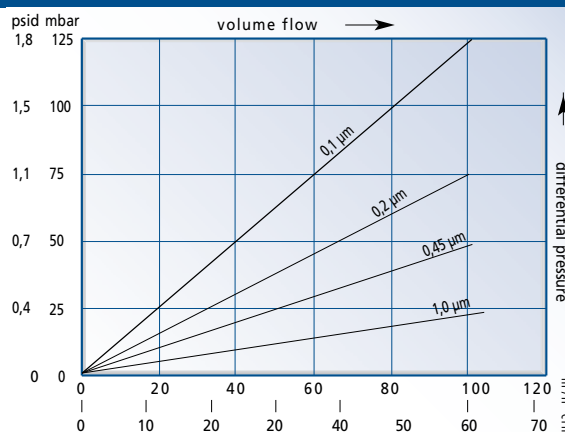
### Applications

- Particle removal from water
- Chemicals
- Biological liquids
- Solvents
- Cosmetics
- Photo-lithographical solutions
- Paints & dyes
- Jet printer inks
- Coatings

volume flow of a 10" element - water



volume flow of a 10" element - air



## process filter

### Conformity and durability

#### Chemical durability of filter media

Media	Filtertyp			
	PP 100 PP	PF-PES PF-BEV	PF-PP	PP-PT
acetone	1	3	1	1
benzole	3	1	3	2
benzyl alcohol	1	-	1	1
butanol	1	1	1	1
chloroform	2	3	2	2
cyclohexanon	1	3	1	1
steam	1	1	1	1
acetic acid	1	1	1	1
ethanole	1	1	1	1
hydrogen fluoride 50 %	1	-	1	1
formamide	1	-	1	1
formaldehyde	1	1	1	1
fluorosilicic acid	2	-	2	2
hydraulic fluid	1	2	1	1
caustic potash 32 %	1	1	1	1
kerosine	1	-	1	1
adhesives	-	1	-	-
paint	-	1	-	-
methanole	1	1	1	1
motor oil	-	1	-	-
caustic soda 32 %	1	1	1	1
n-hexane	2	1	2	1
ozone	-	1	-	-
perchloric acid 25 %	1	-	1	1
vegetable oil	-	1	-	-
phosphoric acid 25 %	1	-	1	1
phosphoric acid 85 %	1	-	1	1
pyridine	2	3	2	1
nitric acid 25 %	1	3	1	1
lubricant	1	1	1	1
sulfuric acid 25 %	1	1	1	1
sulfuric acid 98 %	2	3	1	1
silicone	1	1	1	1
toluole	3	3	3	2
trichloroacetic acid 25 %	1	-	1	1
water	1	1	1	1
citric acid	1	1	-	-

1 = recommended  
2 = limited recommendable  
3 = not recommended  
- = not tested

A complete list for all filter elements and media can be achieved upon request.

#### Declaration of Conformity

■ Quality starts with the right choice of raw materials. Only the best materials are used in our production. We pay total attention to ensuring the highest quality and efficiency levels. This is ensured by continuous quality approvals.

■ All products perfectly match to each other and comply highest quality requirements. System solutions with highest operational safety and efficiency can be achieved at any time.

■ All process filters are made of inert materials, without adhesives, additives or surface active components.

■ To comply with the stringent regulations of the FDA for contact with food the ultrafilter plastic filters have passed the toxicological tests according to USP Class VI and are biologically inert.

■ All ultrafilter sterile filter are integrity tested to ensure highest operational safety and continuously high quality.

## P-EG stainless steel housing for sterile filtration of gases



### ultrafilter P-EG

■ The P-EG stainless steel housing was developed for purification of compressed air and other technical gases.

■ With the optimized construction they offer low differential pressure at high flow rates.

### Features and advantages

- 18 different sizes for operating volumes from 60 to 23.040 Nm<sup>3</sup>/h related to 7 bar.
- Complies to the requirements of the European directive 97/23/EG for pressure vessels.
- Plug connection guarantees that the elements remain safely fixed at all times.
- Different element sizes can be installed due to the modular design.

### Applications

- Chemical & pharmaceutical Industry
- Aseptic packing
- Biotechnology
- Cosmetics Industry
- Breweries
- Dairies
- Food and beverages
- Water treatment systems

type P-EG	volume flow at 7 bar m <sup>3</sup> /h		connect.	filter element		dimension in mm					weight in kg
	nom	max		size	qty.	A	B	C	D	E	
0006	60	90	R 1/4"	03/10	1	215	105	70	55	90	1,7
0009	90	120	R 3/8"	04/10	1	243	105	70	55	120	1,9
0012	120	180	R 1/2"	04/20	1	243	108	70	55	120	1,9
0018	180	270	R 3/4"	05/20	1	266	125	70	55	150	2,0
0027	270	360	R 1"	05/25	1	293	125	85	74	150	2,6
0036	360	480	R 1 1/4"	07/25	1	344	140	85	74	200	3,0
0048	480	720	R 1 1/2"	07/30	1	386	170	104	94	200	4,3
0072	720	1080	R 2"	10/30	1	460	170	104	94	280	4,8
0108	1080	1440	R 2"	15/30	1	587	170	104	94	450	5,3
0144	1440	1920	R 2 1/2"	20/30	1	732	216	129	106	580	9,0
0192	1920	2880	R 3"	30/30	1	987	216	129	106	850	10,8
0288	2880	4320	R 3"	30/50	1	1026	240	154	119	850	16,2
0432	4320	5760	DN 100	20/30	3	1090	410	219,1	200	580	43
0576	5760	7680	DN 100	30/30	3	1350	410	219,1	200	850	44
0768	7680	11520	DN 150	30/30	4	1410	480	273	240	850	70
1152	11520	15360	DN 150	30/30	6	1460	540	323,9	250	850	80
1536	15360	19200	DN 200	30/30	8	1600	660	406,4	300	850	135
1920	19200	23040	DN 200	30/30	10	1600	660	406,4	300	850	135

## P-BE stainless steel vent filter for aeration of storage tanks



### ultrafilter P-BE

■ P-BE filter are used to ensure 100 % sterility in the storage of pharmaceutical products, chemicals, food or of fermenters.

■ The two-part housing is user-friendly designed and has a splash protection to prevent liquids come in contact with the filter media.

### Features and advantages

- 12 different sizes for operating volumes from 3 to 1980 Nm<sup>3</sup>/h related to 1 bar.
- Complies to the requirements of the European directive 97/23/EG for pressure vessels.
- Different element sizes can be used due to the modular design. Apart from sterile filters, polypropylene or Teflon\* membrane filters can be used.

### Applications

- Chemical & pharmaceutical Industry
- Biotechnology
- Cosmetics Industry
- Breweries
- Dairies
- Food and beverages
- Fermentation processes

type P-BE	volume flow in m <sup>3</sup> /h at		connect.	filter element		dimensions in mm		weight in kg
	Δp20 mbar	Δp40 mbar		size	qty.	height	ø	
0006	4,5	9	DN 32	03/10	1	110	85	1,5
0027	12	24	DN 40	05/25	1	168	104	2,2
0032	17	35	DN 50	05/30	1	186	114	2,4
0072	35	70	DN 50	10/30	1	312	114	3,3
0144	70	140	DN 80	20/30	1	550	154	9,2
0192	105	210	DN 80	30/30	1	805	154	11,6
0432	210	420	DN 100	20/30	3	670	219	43
0576	315	630	DN 100	30/30	3	925	219	44
0768	420	840	DN 150	30/30	4	950	273	70
1152	630	1260	DN 150	30/30	6	950	324	80
1536	840	1680	DN 200	30/30	8	960	406	135
1920	1050	2010	DN 200	30/30	10	960	406	135



## PG-EG stainless steel housing for gas filtration in sanitary quality



### ultrafilter PG-EG

■ The PG-EG stainless steel housing was developed for purification of compressed air and other technical gases in pharmaceutical, biotechnology or chemical industry.

■ PG-EG housings are first choice in critical applications in sterile filtration.

### Features and advantages

- 14 different sizes for operating volumes from 7,5 to 2.700 Nm<sup>3</sup>/h related to 7 bar.
- Complies to the requirements of the European directive 97/23/EG for pressure vessels.
- Plug connection guarantees that the elements remain safely fixed at all times.
- Different element sizes can be installed due to the modular design.
- Condensate drain and de-aeration are equipped with pharma valves

### Applications

- Chemical & pharmaceutical Industry
- Biotechnology
- Breweries
- Food and beverages
- Water treatment systems
- Fermentation processes

type PG-EG	volume flow at 1 bar m <sup>3</sup> /h	connect.	filter element		dimensions in mm					weight in kg
	nom		size	qty.	A	B	C	D	E	
0006	7,5	DN 10	03/10	1	260	120	70	98	90	1,2
0018	22,5	DN 15	05/20	1	315	120	70	98	150	1,4
0032	45	DN 25	05/30	1	360	160	114,3	136	150	2,8
0048	60	DN 32	07/30	1	410	160	114,3	126	200	3,1
0072	90	DN 40	10/30	1	485	160	114,3	117	280	3,5
0108	135	DN 50	15/30	1	610	160	114,3	125	450	4,0
0144	180	DN 65	20/30	1	820	185	129	150	580	7,0
0192	270	DN 80	30/30	1	1080	185	129	150	850	8,8
0432	540	DN 100	20/30	3	1090	410	219,1	200	580	43
0576	810	DN 100	30/30	3	1350	410	219,1	200	850	44
0768	1080	DN 150	30/30	4	1410	480	273	240	850	70
1152	1620	DN 150	30/30	6	1460	540	323,9	250	850	80
1536	2160	DN 200	30/30	8	1600	660	406,4	300	850	135
1920	2700	DN 200	30/30	10	1600	660	406,4	300	850	135

## PF-EG stainless steel housing for filtration of liquids



### ultrafilter PF-EG

■ The PF-EG stainless steel housing was developed for purification of liquids in pharmaceutical, biochemical and chemical processes, as well as for beverages.

■ PF-EG housings are first choice in critical applications in sterile filtration.

### Features and advantages

- 11 different sizes for operating volumes from 3 to 600 l/min.
- Complies to the requirements of the European directive 97/23/EG for pressure vessels.
- Bajonet-connection guarantees that the elements remain safely fixed at all times.
- Different element sizes can be installed due to the modular design.
- DN 40 clamp connection at housing top

### Applications

- Chemical & pharmaceutical Industry
- Biotechnology
- Breweries
- Dairies
- food and beverages
- Water treatment systems
- Fermentation processes

type PF-EG	volume flow in l/min.	connect.	filter element		dimensions in mm		weight in kg
			size	qty.	height	ø	
0003	3	DN 10	03/10	1	280	180	1,4
0012	12	DN 25	5/3 Code 7	1	375	250	3,9
0025	25	DN 25	10/3 Code 7	1	505	250	4,8
0050	50	DN 25	20/3 Code 7	1	765	250	6,1
0075	75	DN 25	30/3 Code 7	1	1025	250	7,4
0080	75	DN 40	10/3 Code 7	3	690	330	14,1
0150	150	DN 40	20/3 Code 7	3	935	330	16,5
0225	225	DN 40	30/3 Code 7	3	1205	330	19,6
0250	250	DN 50	20/3 Code 7	5	965	400	20,6
0375	375	DN 50	30/3 Code 7	5	1215	400	23,6
0400	400	DN 65	20/3 Code 7	8	985	500	33,6
0600	600	DN 65	30/3 Code 7	8	1235	500	37,9

### Clean Steam Centrifugal Separator - S-10HV

( Horizontal inlet – Vertical outlet)

#### DESCRIPTION

When wet steam is used in sterilization, moisture in suspension reduces the heat transfer efficiency and the validity of the sterilization process can be compromised.

S-10HV series centrifugal separators remove moisture from steam pipelines. Steam passing through the separator and as a result of centrifugal forces, impact and swirling effects, separate the particles with a heavier specific gravity, such as water droplets and moisture in suspension.

The condensate collected at the bottom of the separator, must be automatically drained by a suitable steam trap.

#### MAIN FEATURES

316L stainless steel construction

No moving parts.

Self draining design

#### STANDARD SURFACE FINISH

Internal parts: 0,5 microns Ra

External : Satin bead blast finish – 1,6 microns Ra

Mechanical polished as option

OPTIONS: Different kind of connections and dimensions

USE: Steam, compressed air and other gases (Group 2).

AVAILABLE MODELS: S10HV

SIZES: DN1/2", 3/4", 1", 1 1/2" and 2"

PIPE CONNECTIONS: Clamped ends ASME BPE  
Other sanitary clamp or tube weld connections available on request.

INSTALLATION: Always with the condensate discharge pointing downwards.

HOW TO SELECT: Generally, in an existing plant it is advisable to fit a separator with the same size of the pipe line. Pressure drop is normally negligible. For approximate pressure drop calculation please consult.



CE MARKING - GROUP 2 GASES CAT.		
RATING	SIZE	CAT.
PN10	DN1/2" to DN2"	SEP

#### CE Marking

This product has been designed for use on water, steam, air and other gases which are in Group 2 of the PED- European Pressure Equipment Directive 97/23/EC and it complies with those requirements.

The product carries the CE mark when falling in category 1 and above.

LIMITING CONDITIONS		
Rating	Press. bar	Temp. °C
PN10	10	50
	8 *	175
	7,4	200

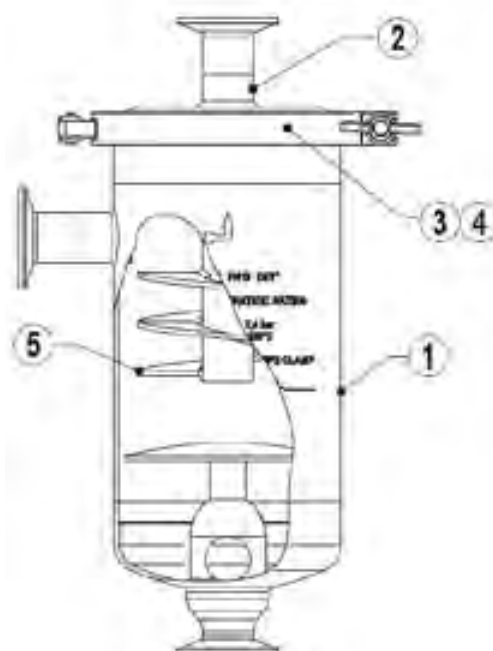
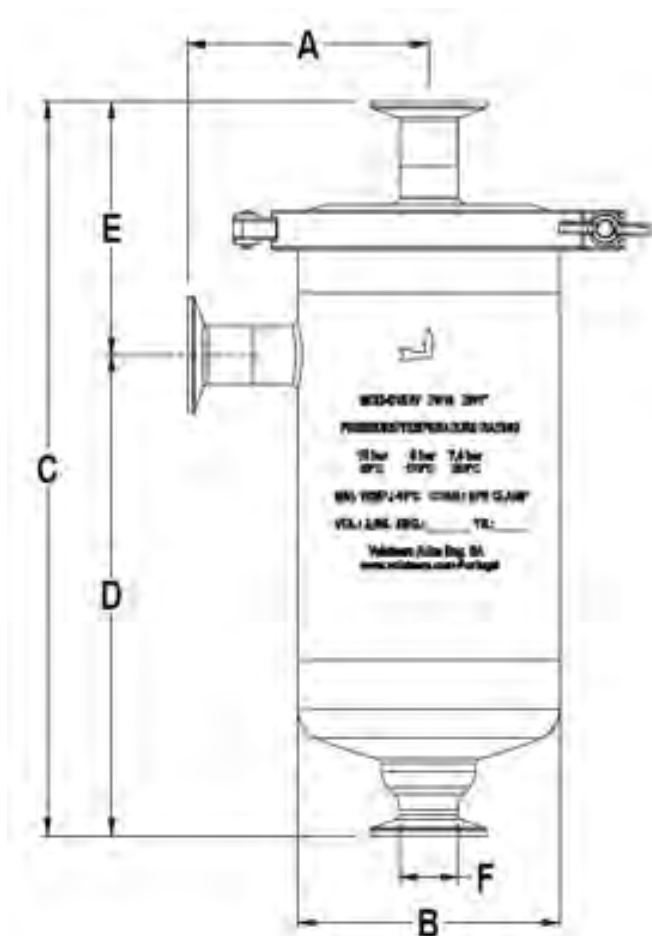
\*PMO-Max.operating pressure for saturated steam.  
Minimum operating temp.: -10°C.  
Design code: AD-Merkblatt

### Clean Steam Centrifugal Separator - S-10HV

(Horizontal inlet – Vertical outlet)

APPROXIMATE DIMENSIONS (mm)								
SIZE DN	A	B	C	D	E	F	VOL dm3	WGT Kg
1/2"	105	114	307	195	112	1"	2,84	3,8
3/4"	105	114	307	195	112	1"	2,87	3,9
1"	105	114	320	210	112	1"	2,9	4,2
1 1/2"	120	141	400	260	140	1"	5,82	7,25
2"	120	141	400	260	140	1"	5,93	7,28

Consult factory for certified dimensions. Dimensions subject to change without notice.



MATERIALS		
POS.	DESIGNATION	MATERIAL
1	Body	AISI 316L / 1.4404
2	Cover	AISI 316L / 1.4404
3	*Clamp	AISI 316L / 1.4404
4	*Seal	VITON
5	Internals	AISI 316L / 1.4404

\* Available spare parts.

EN10204 3.1 certificate available if requested along with the order.

Remarks: FDA/USP Class VI seals certificate on request.

All separators have a serial number. In case of non-standard separator this number must be supplied if spare parts are ordered.