

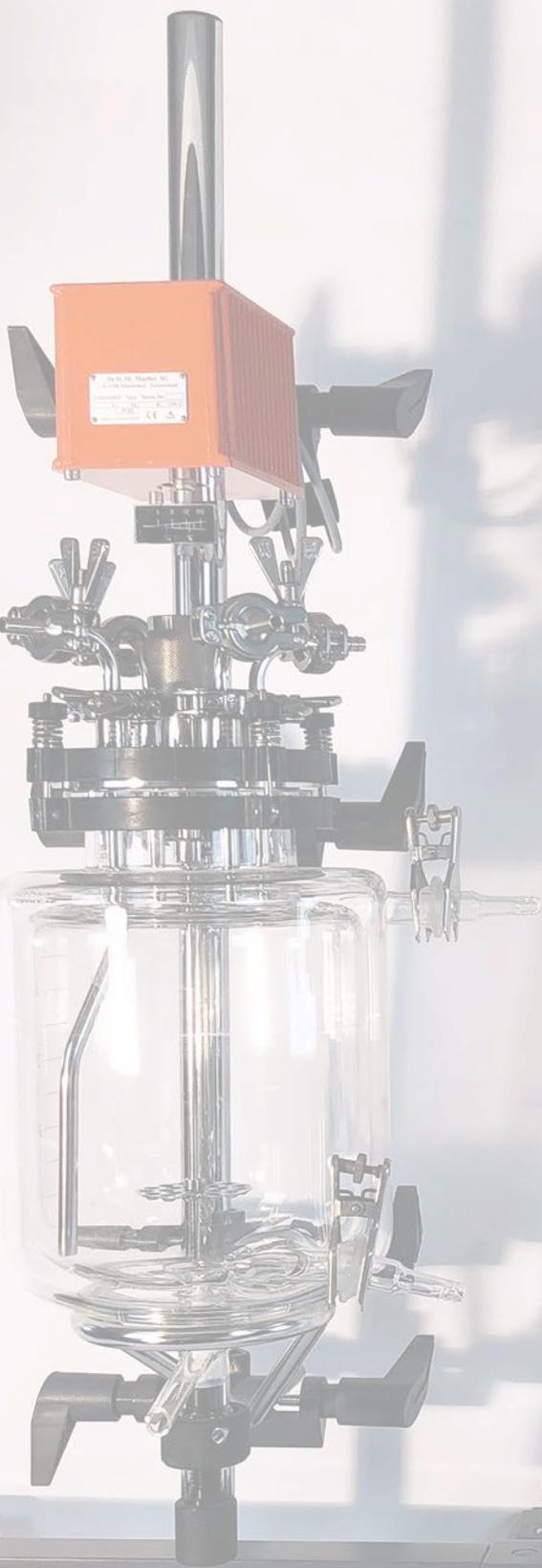
Laboratory Filtration & Mixing Systems

The indispensable bench tools for a successful scale-up



DrM

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Lab Filter Unit

The TSD (Totally Scaled Down) Pocket Filter offers the same features as the full-scale industrial FUNDABAC® Filter but on a bench scale. The unique features of the full scale FUNDABAC® filter candle (OD 82 mm) have been scaled down to 30 mm. The same types of filter media used on the industrial filter have been made available for the TSD. The filters have the same functions: filtration, cake washing under pressure and solids discharge either as a slurry by back-wash or as a dry cake.

The TSD enables the chemist to demonstrate process concepts to the chemical engineer and the project manager. The chemist's work will even demonstrate the optimum manner of cake discharge. The filter ability can be determined at various cake thicknesses and pressures as well as the correct levels of pre-coat and body feed to be used. The heating/cooling jacket (SS execution only) further enhances the flexibility of the TSD Pocket Filter.



STAINLESS STEEL TSD

850151.88

Material	SS 316L
Filter Area (m ²)	0.012
Filling Volume (lt)	0.95
Weight (kg)	10.7
Max. Pressure (barg)	-1/20
Max. Temperature (°C)	250
Heating Jacket	Yes
Accessories	Filter candle, various ball valves, pressure gauge, gas flow meter, gas pressure reducers, gaskets in FKM or PTFE



STAINLESS STEEL TSD - XL

850218.88

Material	SS 316L
Filter Area (m ²)	0.048
Filling Volume (lt)	4.5
Weight (kg)	15.2
Max. Pressure (barg)	-1/10
Max. Temperature (°C)	250
Heating Jacket	yes
Accessories	Filter candle, various ball valves, pressure gauge, gas flow meter, gas pressure reducers, gaskets in FKM or PTFE



PVDF TSD

850150.31

Material	PVDF
Filter Area (m ²)	0.012
Filling Volume (lt)	0.95
Weight (kg)	7.3
Max. Pressure (barg)	5
Max. Temperature (°C)	80
Heating Jacket	No
Accessories	Filter candle, various ball valves, pressure gauge, gas flow meter, gas pressure reducers, gaskets in FKM or PTFE

STAINLESS STEEL TSD FEED TANK

850149.88



Custom designed feed tank for perfect integration with the DrM TSD lab filter and pump.

850139.88

881139.00 / 881140.00 / 881141.00



Material	SS 316L
Volume Vessel / Jacket (lt)	20.3 / 3.2
Max. Pressure Vessel / Jacket (barg)	0.95 / 5.2
Max. Temperature (°C)	160
Weight (kg)	~25
Agitation Options:	1) Pneumatic mixer, 6 barg max drive gas pressure 2) FUNDAMIX® type 1 (see page 10)

STAINLESS STEEL NUTSCHE

850226.35



For initial evaluation of the suspension and preliminary selection of the most suitable filter cloth, Nutsche type pressure filters are available.

Material	SS 316L
Filter Area (m²)	0.001
Filling Volume (lt)	0.2
Weight (kg)	6
Max. Pressure (barg)	30
Max. Temperature (°C)	200
Heating Jacket	Yes
Accessories	Ball valve, pressure gauge, gas pressure reducer

PVDF NUTSCHE

850228.31



For initial evaluation of the suspension and preliminary selection of the most suitable filter cloth, Nutsche type pressure filters are available.

Material	PVDF
Filter Area (m²)	0.001
Filling Volume (lt)	0.2
Weight (kg)	5
Max. Pressure (barg)	6
Max. Temperature (°C)	80
Heating Jacket	No
Accessories	Ball valve, pressure gauge, gas pressure reducer



STAINLESS STEEL TSD FEED PUMP

850158.04

For optimal feeding of TSD filters, DrM offers air-driven double diaphragm pumps in both stainless steel and PVDF.

Material Body	SS 316L
Material Membrane	PTFE
Max. Feed Flow (lt/min)	18.9
Max. Pressure (barg)	8.5
Lt/Stroke	0.02
Temperature (°C)	-25/+105
Accessories	Pulsation dampener, pressure regulator, mounting platform



PVDF TSD FEED PUMP

850158.31

For optimal feeding of TSD filters, DrM offers air-driven double diaphragm pumps in both stainless steel and PVDF.

Material Body	PVDF
Material Membrane	PTFE
Max. Feed Flow (lt/min)	18.9
Max. Pressure (barg)	8.5
Lt/Stroke	0.02
Temperature (°C)	-25/+105
Accessories	Pulsation dampener, pressure regulator, mounting platform



PERISTALTIC PUMP

Execution	Stand-alone, integrated user panel with display
Product Contact Parts	Santoprene / SEBS
Max. Flow (L / min)	2
Max. Pressure (barg)	7
Max. Temperature (°C)	45
Power Supply (V AC)	100-240
Note	1) Manual, analog and digital input and output functionality 2) Tri clamp or hose barb fittings available 3) Other peristaltic pump types, materials and compliance on request



EXTENSION KIT FOR STAINLESS STEEL TSD FILTER

850157.88

This option allows the installation of a longer TSD candle (212 mm, included in the kit) and doubles the filter area to 0.024 m².

Kit Includes	10 pcs. Various cloths of extended length 1 FKM o-ring gasket 1 Vessel tri clamp 1 FKM profile gasket 1 PTFE profile gasket
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EXTENSION KIT FOR GLASS TSD FILTER

850157.68

This option features a borosilicate glass vessel extension with SS 316L connections, allowing a direct view of the filtration process.

Kit Includes	1 candle extension 1 vessel tri clamp 1 splinter protection 1 FKM profile gasket 1 PTFE profile gasket
Max. Pressure (barg)	6
Max. Temperature (°C)	150
Filling Volume (lt)	1.35
Length / Diameter (mm)	300 / 80
Weight (kg)	~5.6



AUXILIARY KIT FOR STAINLESS STEEL TSD FILTER

850223.00

Kit Includes	Various filter cloths Seal tape (Teflon) Clamps Pincer Gasket O-ring (Silicon/FEP) Various spanners Hexagonal screw wrench
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AUXILIARY KIT FOR PVDF TSD FILTER

850224.00

Kit Includes	Various filter cloths Seal tape (Teflon) Clamp Pincer Screw joint-pneumatic Sealing section TSD PVDF O-ring (Silicon/FEP) Clamping ring Cable tie
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ASSEMBLY SET FOR STAINLESS STEEL TSD FILTER

850222.00

Kit Includes	9 pcs. Screw joints 9 pcs. Support sleeves 10 m of ø 6 x 1 mm PTFE pipe 1 PTFE seal tape roll
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ASSEMBLY SET FOR PVDF TSD FILTER

850221.00

Kit Includes	10 pcs. Screw joints 10 pcs. Support sleeves 10 m of ø 6 x 1 mm PVDF pipe 1 PTFE seal tape roll
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ASSEMBLY SET FOR STAINLESS STEEL NUTSCHE

850227.00

Kit Includes

- 6 types of filter cloths (5 pcs. of each)
- 1 FKM gasket
- 1 Profile gasket
- 1 O-ring
- 1 Hook key
- 1 Filling T



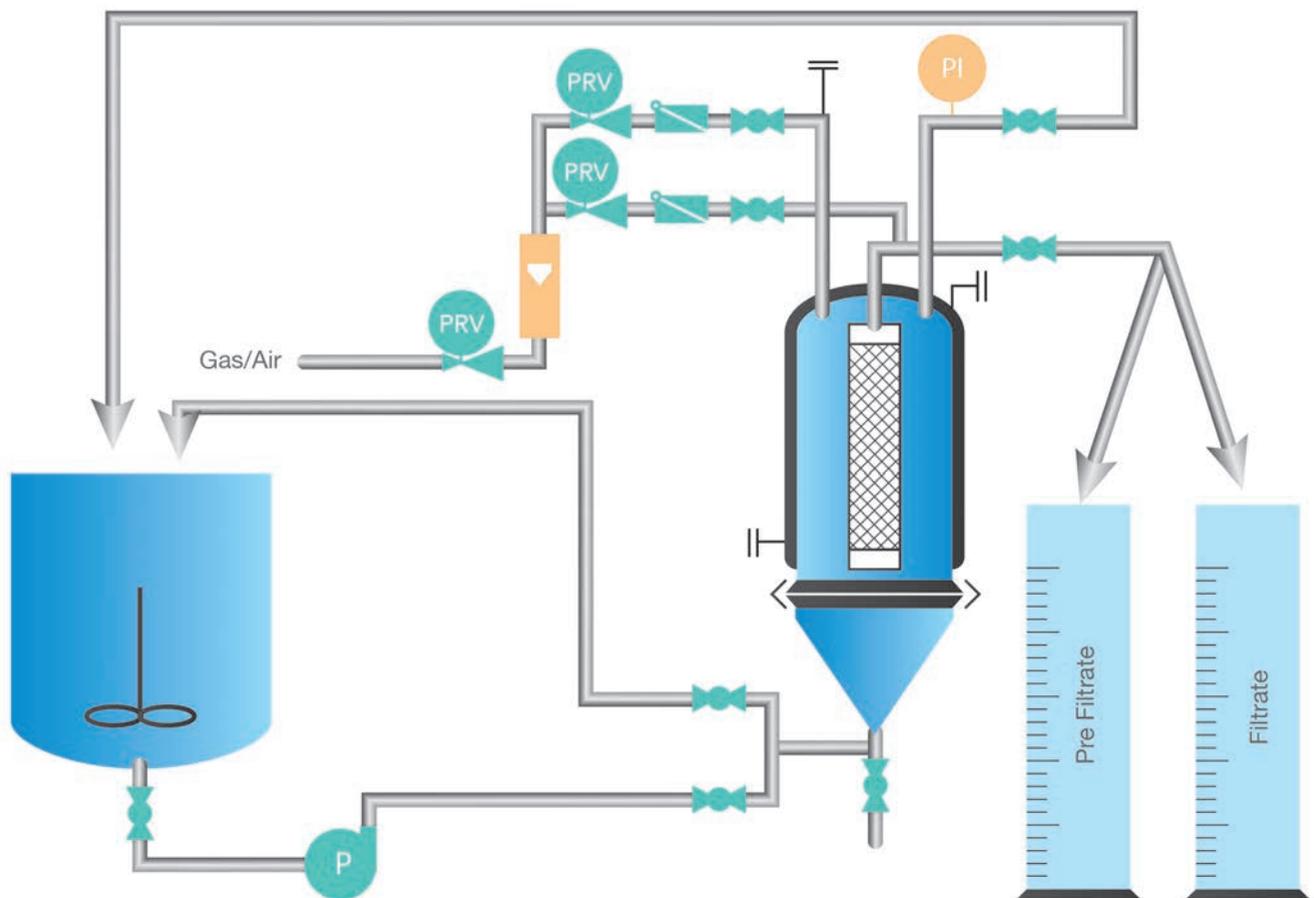
ASSEMBLY SET FOR PVDF NUTSCHE

850273.00

Kit Includes

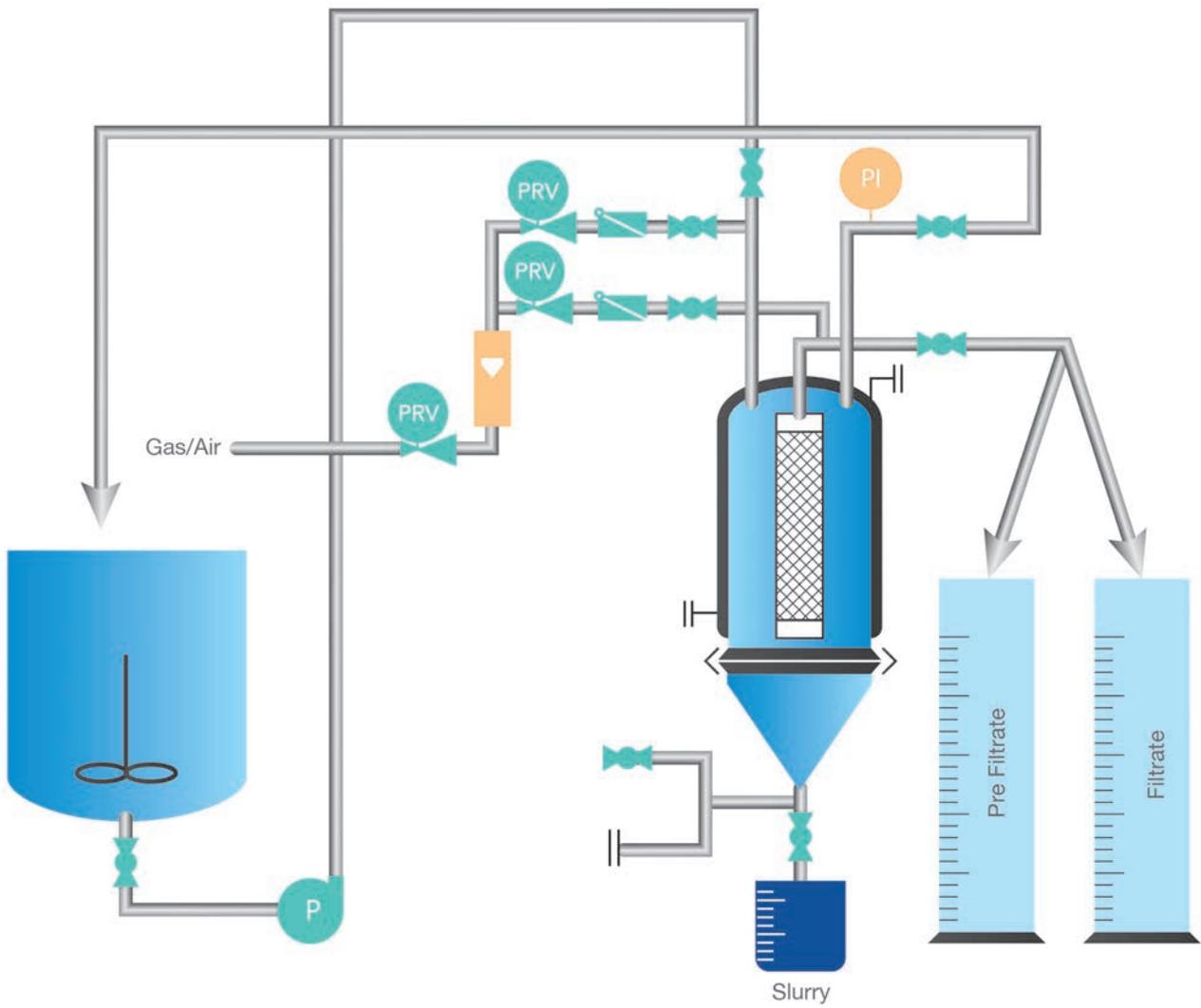
- 6 types of filter cloths (5 pcs. of each)
- 1 FKM gasket
- 2 pcs. O-ring
- 1 Filling T

Flow Sheet FUNDABAC®



Typical process flow diagram of a FUNDABAC® TSD Filter for dry cake discharge.

Flow Sheet CONTIBAC®



Typical process flow diagram of a CONTIBAC® TSD Filter for slurry cake discharge.

Lab Mixing Unit

The FUNDAMIX®, also known as Vibromixer, is a sophisticated mixing device where a plate with conical bores oscillates resulting in the liquid being pumped through the plate holes following the Bernoulli effect. No rotating parts (so low maintenance costs and lower risk of contamination) and low shear forces with a high mixing effect are among the key advantages of the system.

Lab scale tests can be meant to investigate a few basic parameters (homogenization efficiency, possibility to achieve a shear-free mixing, capability of suspending settling or floating solids, etc.) or can simulate a whole process (crystallization, fermentation, heat transfer, pH control).

DrM can provide laboratory sets and accessories for special applications or complete customized systems based on the exact client's requirements.



FUNDAMIX® LAB SET

The FUNDAMIX® lab set is an excellent tool for a simple assessment to see the performances of this mixing device. The lab set includes mixing plates in different sizes as well as various membrane seals. The set can be installed on a simple glass container or on an existing lab reactor. Additionally, it also includes a controller to adjust the mixing amplitude.

FUNDAMIX®	Size 1
Mixing Volume (lt)	1-10
Pressure	Atmospheric
Voltage (V), Frequency (Hz)	110-220, 50-60
Mixing Plates Diameter (mm)	23, 45, 54, 65
Mixing Plates Material	SS 316L
Shaft Length (mm)	400
Amplitude Controller	AC 1-3
Note	For special cases, disk in PVDF or PEEK can be provided

FUNDAMIX® GLASS / STAINLESS STEEL REACTOR

For testing bio/chemical applications and mixing efficiency in real process conditions. This system is also suitable for testing sterile processes.



Reactor Volume (lt)	0.5 - 5
Reactor Material	Glass, SS 316L
FUNDAMIX®	Size 1
Membrane Sealing Unit (barg, °C)	0-5, 150
Voltage (V), Frequency (Hz)	110-220, 50-60
Mixing Plates Diameter (mm)	45
Mixing Plates Material	SS 316L
Process Connections	On request
Amplitude Controller	ESR 2000
Note	Complete with operating manual, material certificates, FDA certificates. The system can be tailor made on request



PLASTIC MIXER

When the process medium is not compatible with Stainless Steel, mixing plate and shaft are available in PP, PVDF or other materials upon request.

Diameter (mm)	80
Temperature (°C)	130



AMPLITUDE CONTROLLER AC1-3

881085.00

The amplitude controller is the simplest system for adjusting the vibration amplitude. A potentiometer with graduated scale 1-10 allows variation of the mixing amplitude from 0 to a maximum of 3 mm.

Voltage (V)	110/230
Frequency (Hz)	50/60
Note	0-10 graduated scale to adjust the amplitude



MEMBRANE SEALING UNIT

881160.00 / 881150.00

With mixing systems operating under pressure (max. 5 barg) or full vacuum, a specifically designed membrane sealing unit is flanged onto the vessel to provide a tight seal. The membrane is pre compressed by a spring system so that the force applied by the spring equals the pressure inside the vessel during the operation. As a result, the membrane is not exposed to any stress and a long operating life is assured.

Options	1) Vacuum 2) Pressure (max. 5 barg)
Material	SS 316L electropolished, membrane in PTFE



FREQUENCY CONVERTER

880131.00 / 880131.10

When it comes to systems equipped with a membrane sealing unit (see above), a simple Amplitude Controller is not suitable. The sealing unit generates frictional forces which need to be compensated in order to produce a proper oscillation. To achieve this, a frequency converter needs to be installed.

Voltage (V)	110/230
Frequency (Hz)	50/60

Lab Single-Use Systems

Laboratory Single-Use Filtration and Mixing Systems are essential for the evaluation and development of industrial performances. During selection, sizing and validation, small-scale trials are performed to understand the equipment properties and determine process data for further scale-up and development. Scale-up criteria such as principles of operation, designs and choice of materials are considered throughout all our Single-Use products.

GENERAL SINGLE-USE FILTER	
Includes	1 SU Filter bag 1 Housing 2 pcs. tri clamp 2 pcs. tri clamp gasket
Bag material	Polyethylene, multi-layer bag film with gas barrier
Material housing	Polysulfone / 316L
Connector type	Hose barb, tri clamp, sterile/aseptic, luer, others on request
Sterilisation	Pre sterilized by gamma irradiation on request
Heating jacket	On request
Note	1) Other materials, sizes and capacities on request 2) Instrumentation and control unit on request 3) Gasket material: silicone (others on request) 4) Basic port configuration: 1/4" hose barb



TSD SU MINI 0.6dm ²	
Filter area (m ²)	0.006
Max cake thk. (mm)	6
Max cake volume per cycle (lt)	0.036
Design cake volume per filter bag (lt)	0.42
Filter bag volume (lt)	0.55
Batch size (lt)	
FUNDABAC® SU	≤ 5
(CONTIBAC® SU)	(≤ 5)



TSD SU 4.8dm ²		890100.00
Filter area (m ²)	0.048	
Max cake thk. (mm)	6	
Max cake volume per cycle (lt)	0.29	
Design cake volume per filter bag (lt)	1.4	
Filter bag volume (lt)	2	
Batch size (lt)		
FUNDABAC® SU	≤ 15	
(CONTIBAC® SU)	(≤ 40)	



FUNDAMIX® SINGLE-USE MIXER 1L

Includes	1 SU Mixing bag 1 Housing 1 Drive unit & controller 1 Stand & shaft
Max. Temperature (°C)	50
Max. Pressure (barg)	5
Bag Volume (lt)	1
Plate dia. (mm)	65
Bag Material	Polyethylene, multi-layer bag film with gas barrier
Housing Material	Polysulfone / 316L
Connector Type	Hose barb, tri clamp, sterile/aseptic, luer
Sterilisation	Pre sterilized by Gamma Irradiation on request
Heating Jacket	On request
Note	1) Other materials, sizes and volumes on request 2) Instrumentation and sampling on request 3) Gasket material: silicone (others on request) 4) Basic port configuration: 1/4" hose barb



FUNDAMIX® SINGLE-USE MIXER 10L

Includes	1 SU Mixing bag 1 Housing 1 Drive unit & controller 1 Stand & shaft
Max. Temperature (°C)	50
Max. Pressure (barg)	5
Bag Volume (lt)	10
Plate dia. (mm)	65
Bag Material	Polyethylene, multi-layer bag film with gas barrier
Housing Material	Polysulfone / 316L
Connector Type	Hose barb, tri clamp, sterile/aseptic, luer
Sterilisation	Pre sterilized by Gamma Irradiation on request
Heating Jacket	On request
Note	1) Other materials, sizes and volumes on request 2) Instrumentation and sampling on request 3) Gasket material: silicone (others on request) 4) Basic port configuration: 1/4" hose barb



SINGLE-USE BACK-FLUSH TANK

Includes	1 SU Back-flush bag 1 Housing 1 Tri clamp 1 Tri clamp gasket
Bag Volume (lt)	1
Note	Other specification based on FUNDABAC® Single-Use Filter



SU VALVE		896200.00
Type	Pinch, non-invasive	
Model	SU Valve	
Actuation	Electrical	
Actuation Time	Opening: 3 sec Closing: 3 sec	
Power Consumption	Idle position (closed or open): 0.1W During opening and closing (3 sec.): 5W	
Power Supply	24 VDC / 12 VDC	
Signal Input	OFF Position: 0VDC ON Position: 12...24VDC	
Material	316L / Polyethylene	
Max. Working Pressure (barg)	4	
Max. Working Temperature	80 °C	
Hose size	OD 6.35 - 25.4 mm OD 1/4" - 1"	
Electrical Connection	Power, 12VDC: 2 wires Signal, 24VDC: 2 wires	
Note	1) User interface via PLC or DCS	



FUNDASTEP CONTROLLER		895100.00 / 895200.00
Size (mm)	1) 400 x 300 x 200 2) 600 x 300 x 200	
Stainless steel cabinet with TP includes	1 PLC 3 Power supplies 6 SU pinch valves 3 Solenoid valves (3/2-way) 2 Air filter regulator 1 Emergency Stop	
Options	Max. 3 Pressure sensors 1 Flow sensor	
Power Supply	100...230 VAC (12/24 VDC)	
Power Supply Connector	IEC 60320 C13 IEC 320 C13	
Electrical Connector	Circular connectors with protective cap	
Pneumatic Connector	4 Push-in connector for tubing diam. 6 mm	
Touch Panel Operating Modes:	1) Fully automatic loop filtration: The filtration cycle restarts automatically after reaching the end of the sequence 2) Automatic single pass filtration: The filtration cycle stops after reaching the end of the filtration 3) Step-by-step: The operator steps through the sequence manually 4) Manual: The operator opens and closes each individual valve from the touch screen	
Note	1) Steps can be added/removed by the operator as required	



PERISTALTIC PUMP

Execution	Stand-alone, integrated user panel with display
Product Contact Parts	Santoprene / SEBS
Max. Flow (lt / min)	2
Max. Pressure (barg)	7
Max. Temperature (°C)	45
Power Supply (V AC)	100-240
Note	1) Manual, analog and digital input and output functionality 2) Tri clamp or hose barb fittings available 3) Other peristaltic pump types, materials and compliance on request



CENTRIFUGAL PUMP

896500.00

Execution	Stand-alone, integrated user panel with display
Product Contact Parts	Polypropylene
Max. Flow (lt / min)	17
Max. Pressure (barg)	2
Max. Temperature (°C)	60
Power Supply (V DC)	24
Note	1) Manual and analog input 2) Tri clamp or hose barb fittings available 3) Wet material can be delivered pre sterilized by gamma irradiation 4) Wet material FDA, USP Class VI, BSE/TSE/ animal free 5) Other centrifugal pump configuration and materials available on request



AIR COMPRESSOR

896700.00

Execution	Stand-alone
Max. Flow (lt / min)	37
Max. Pressure (barg)	8
Tank Volume (lt)	3.5
Power Supply (V AC)	100-240
Noise Level (dB)	30-40
Note	1) Lubricated 2) Pressure reducing valve and pressure gauges available 3) Quick pneumatic coupling connection 4) Other compressor types and oil-free on request



ASSEMBLY SET PROCESS

Set Includes	3 m reinforced tubing, 1/4", OD 16 mm, silicone 10 pcs. Hose barb/tri clamp adapter, 1/4" HB/25 mm TC 10 pcs. tri clamp silicone gasket 5 pcs. Clamp, quick-connect, TC 25 mm 2 pcs. Hose barb Y-connector, 1/4" 5 pcs. Manual valve, process, 1/8"- 3/4" OD tube
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