

**5,200** m³/h Max. Flow Rate **10-500** micron Filtration Degree

**100%** Screen Cleaning Down to **1.6 bar** (26psi) Min. Operating Pressure

Up to **140,000** cm² Filter Area Max. Working **Temp 50°C** 

ENGINEERED FOR BALLAST WATER FILTRATION.





# Our Story

Filtersafe is the only ballast water filtration company that engineered a dedicated seawater filter whose express goal was to make deballasting safer and more efficient for shipowners and the aquatic environment.

Since our beginning in 2004, Filtersafe has grown to be a world leader in seawater filtration, and our filters are installed in over 3,500 ships around the world.



Skid Packages



Installing our patented nozzlex screen cleaning technology

within a BSE Multi-Screen filter











Our BallastSafe filters are modular and can be oriented in any

Filtersafe filter within an FRMA FIRST BWMS installation



# WE LEAD THE MARINE WATER FILTRATION INDUSTRY FILTERING OVER 25% OF GLOBAL BALLAST WATER



# Filtersafe® Advantages for Owners & Operators

- choice and approved by all major class societies + IMO & USCG. That's why we filter over 25% of all ballast water worldwide.
- o SAIL ANYWHERE: We filter the most o LOWER BALLAST TANK MAINTENANCE: Our challenging waters so you can sail anywhere. Our filters won't clog.
- o MODULAR DESIGN: Horizontal and vertical installation options that can be rotated to o **REAL ENERGY SAVINGS:** Lower operating fit your configuration.
- o HIGH FLOW/SMALL FOOTPRINT: Just one unit can filter up to 5,200 m<sup>3</sup>/hr, while taking up minimal space.
- o SUPERIOR PROTECTION: Our first-class filtration protects your system from unplanned maintenance and reduces the amount of secondary treatment required.

- o RELIABLE FILTERS: The dependable filter o GLOBAL PRESENCE: With manufacturing facilities, offices, and support personnel located across the globe, we're there when you need us.
  - **smartweave**™ screen technology ensures minimal sediment intake to the disinfection process and ballast tanks.
  - pressure capability (1.6 bar) means lower ongoing energy costs.











direction to fit any installation.







# OUR TECHNOLOGY

Our automatic screen filters utilize our unique, marketproven, and cutting edge patented technologies smartweave™ filter screens and nozzlex™ proximity suction nozzles ensuring the high performance demands of the market are met.





#### smartweave™



# High Performance Filtration Screens:

- Multi-layered sintered structure
- 2. Enhanced strength & durability
- 3. Available in 904L, SMO254



nozzlex®

High-Efficiency Filter Cleaning System:

- 1. Self balancing cleaning nozzle
- 2. High Efficiency clean
- 3. Zero screen wear + reduced nozzle wear
- 4. Low pressure operation



#### **EVERCLEAR**<sup>TM</sup>

An Unparalleled Automatic Filtration Cycle.

# Flexibility in Design & Installation:

The **BallastSafe Series'** modular design allows for any possible configuration and is particularly helpful in retrofit installations.

The vertical filter configuration operates in the exact same manner as a horizontally positioned unit and to the same performance standard, whilst substantially reducing its area footprint.

# Custom Pressure Vessel Design & Explosion Proof Prepared

Filtersafe offers filters explosion proof prepared (Ex d or Ex ia) for up to Zone O hazardous area installations.

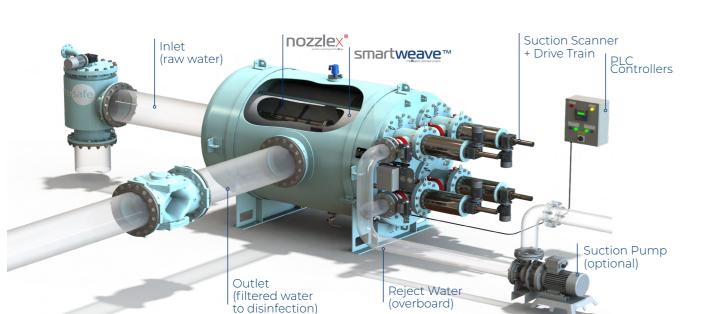
# **turbo<sup>™</sup> & superturbo<sup>™</sup>** for High Sediment Loads

Upgrade your filter's cleaning capacity with *turbo<sup>TM</sup>* or **superturbo<sup>TM</sup>** upgrade packages:

- · Doesn't impact shape or size of filter
- Maximizes cleaning capacity & speed while minimizing footprint
- Tested & Verified by Lloyd's Register and DHI.
- Ideal option for high loads when small footprint is key.

### Cleans While in Operation

- 1. **smartweave™** screen traps organic matter & TSS.
- 2. As sediments are trapped, pressure differential between inlet and outlet will initiate the cleaning process.
- 3. **nozzlex™** scans the entire **smartweave™** screen removing all matter, disposing of the reject water through the flushing chamber.
- 4. Filter returns to it original parameters.



# 90 degrees degrees degrees degrees

TAILORED FILTRATION SOLUTIONS

#### Optional Filter Accessories

turbo™

**super**turbo<sup>TM</sup>









# COMPACT BallastSafe e-SERIES FILTERS

		les /Ocet	50 μm		40 μm		25 μm	
Model		In/Out Connections (Inch)	Max. Flow Rates (m³/hr)	Flushing Flow Rate (m³/hr)	Max. Flow Rates (m³/hr)	Flushing Flow Rate (m³/hr)	Max. Flow Rates (m³/hr)	Flushing Flow Rate (m³/hr)
	Standard		320	11	250	11	150	11
<b>BSE0101</b> (#BS-101E)	turbo™	6''-10''	376	17	300	17	176	16
(#100 1011)	<b>super</b> turbo <sup>™</sup>		427	23	350	23	200	21
	Standard		480	17	375	17	250	16
<b>BSE0151</b> (#BS-151E)	turbo™	8''-12''	565	28	450	28	294	26
(11 00 1012)	<b>super</b> turbo <sup>™</sup>		640	34	525	34	333	32
	Standard		640	23	500	23	335	21
<b>BSE0201</b> (#BS-201E)	turbo™	10''-14''	753	34	600	34	394	32
	<b>super</b> turbo <sup>™</sup>		853	45	700	45	447	42

Note: Maximum flow rates at TSS loading of up to 50PPM as per IMO G8 Guidelines. When unsure of TSS loadings, consult Filtersafe.

**853** m<sup>3</sup>/h Max. Flow Rate Dedicated to BWT Market - 25, 40, 50 micron Filtration Degree

100% Screen Cleaning **1.6 bar** Min. Operating Pressure Up to **20,000** cm<sup>2</sup> screen in a single filter

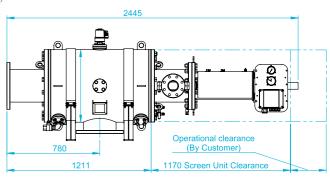
Horizontal & Vertical Configuration

#### COMPACT BallastSafe e-SERIES

Horizontal Configuration Dimensions

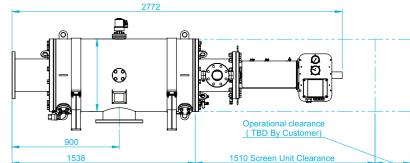
#### BallastSafe 101E (BSE0101/BS-101E)





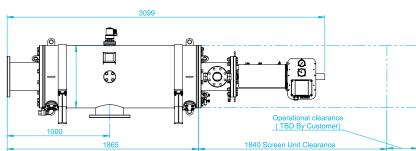
#### BallastSafe 151E (BSE0151/BS-151E)





#### BallastSafe 201E (BSE0201/BS-201E)





## COMPACT BallastSafe e-SERIES

Vertical Configuration Dimensions

# BallastSafe 101E (BSE0101/BS-101E)



# 01/BS-101E) (BSE0151/BS-151E)

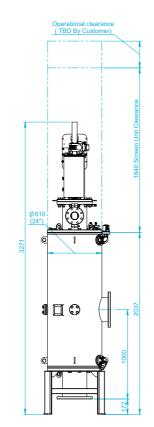


BallastSafe 151E

# Operational clearance (TBD By Customer) Operational Clearance (TBD By Customer)

# BallastSafe 201E (BSE0201/BS-201E)





## TECHNICAL SPECIFICATIONS

		Compact BallastSafe e-Series Models			
		<b>BSE0101</b> (#BS-101E)	<b>BSE0151</b> (#BS-151E)	<b>BSE0201</b> (#BS-201E)	
GENERAL DATA					
Screen Area		10,000 cm²	15,000 cm <sup>2</sup>	20,000 cm <sup>2</sup>	
Screen Type		smartweave	4-layer sintered weaved scr	een fine filter	
In/Out Connections		6''-10''	8''-12''	8''-14''	
Flush Outlet Diame	ter	3"			
Design Pressure		10 bar			
Design Approvals		BV, LR, DNV-GL, ABS, CCS (others available upon request)			
Naintine Company National Company	Standard	2.0 bar @40/50µm - 2.4 bar @25µm			
Minimum Working Pressure	With Flushing Pump	1.6 bar @40/50µm - 2.0 bar @25µm			
Weight (kg, Dry)		490	580	620	
Weight (kg, Wet)		860	1,040	1,180	

#### Global Model Data

CONSTRUCTION & MATERIALS			
Pressure Vessel Housing & Lid	Carbon Steel		
Pressure Vessel Coating	Wet Paint		
Screen Material	904L		
Cleaning Mechanism	316L / POM		
Flush Valve	SS 316/ Marine Bronze		
Seals	Synthetic Rubber		
Internals	SS316/POM/PPH		

CONTROL & ELECT	FRICITY
ΔP Transmitter	Analog
Electric Motor	0.18 kW
Control Voltage	24 DC (pneumatic available upon request)
Rated Operation Voltage	400-480V, 3 Ph @ 50/60Hz
PLC Controller	Unitronics IP55

FLUSHING & DESIGN DA	ATA
Design ΔP Setpoint	0.4 bar
Flush Cycle Duration	45 sec
Design Flush Cycles per Annum	25,000
Design Temperature	4 - 50°C
Filter Orientation	Horizontal & Vertical

ADDITIONAL (	JPGRADES	READILY	AVAILABLE:

Safe Zone, Ex ia prepared, Ex d prepared

turbo<sup>™</sup> superturbo<sup>™</sup>

Additional Equipment & Materials available upon request

# HIGH CAPACITY BallastSafe e-SERIES FILTERS

		In Court	50 μm		40 μm		25 μm	
Model		In/Out Connections (Inch)	Max. Flow Rates (m³/hr)	Flushing Flow Rate (m³/hr)	Max. Flow Rates (m³/hr)	Flushing Flow Rate (m³/hr)	Max. Flow Rates (m³/hr)	Flushing Flow Rate (m³/hr)
	Standard	10''-14''	960	23	750	23	500	21
<b>BSE0300</b> (#BS-300E)	turbo™	30U 36U	1,129	34	900	34	588	32
(#B3 300E)	superturbo™	12''-16''	1,280	45	1,000	45	667	42
	Standard		1,280	28	1,000	28	700	26
<b>BSE0400</b> (#BS-400E)	turbo™	12''-16''	1,506	45	1,200	45	824	42
(1100 1001)	superturbo <sup>™</sup>		1,707	57	1,400	57	933	53
	Standard		1,600	34	1,250	34	875	32
<b>BSE0500</b> (#BS-500E)	turbo™	14''-16''	1,850	57	1,500	57	1,030	53
	superturbo™		2,100	68	1,750	68	1,150	63

 $Note: Maximum\ flow\ rates\ at\ TSS\ loading\ of\ up\ to\ 50PPM\ as\ per\ IMO\ G8\ Guidelines.\ When\ unsure\ of\ TSS\ loadings,\ consult\ Filtersafe.$ 

**2,100** m³/h Max. Flow Rate Dedicated to BWT Market - 25, 40, 50 micron Filtration Degree

100% Screen Cleaning **1.6 bar** Min. Operating Pressure Up to **50,000** cm<sup>2</sup> screen in a single filter

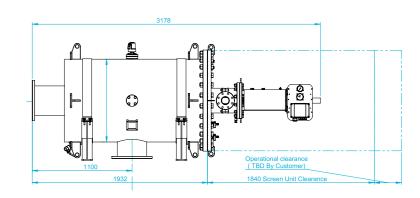
Horizontal & Vertical Configuration

#### HIGH CAPACITY BallastSafe e-SERIES

Horizontal Configuration Dimensions

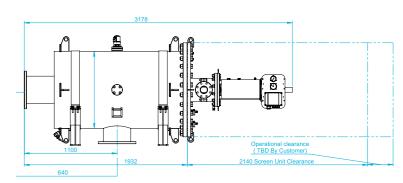
BallastSafe 300E (BSE0300/BS-300E)





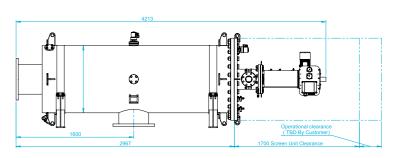
BallastSafe 400E (BSE0400/BS-400E)





BallastSafe 500E (BSE0500/BS-500E)



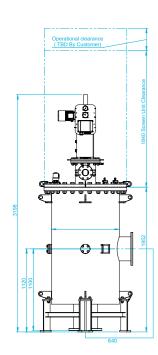


#### HIGH CAPACITY BallastSafe e-SERIES

Vertical Configuration Dimensions

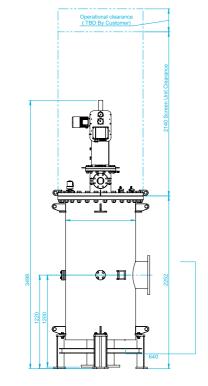
# BallastSafe 300E (BSE0300/BS-300E)





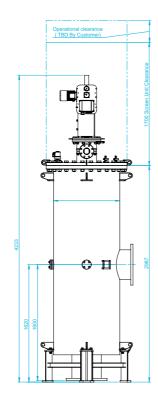
# BallastSafe 400E (BSE0400/BS-400E)





# BallastSafe 500E (BSE0500/BS-500E)





# TECHNICAL SPECIFICATIONS

		High Ca	pacity BallastSafe e-Serie	s Models		
		<b>BSE0300</b> (#BS-300E)	<b>BSE0400</b> (#BS-400E)	<b>BSE0500</b> (#BS-500E)		
GENERAL DATA						
Screen Area		30,000 cm <sup>2</sup>	40,000 cm <sup>2</sup>	50,000 cm <sup>2</sup>		
Screen Type		smartweave	4-layer sintered weaved scr	een fine filter		
In/Out Connections		10" - 16"	12" - 16"	12" - 18"		
Flush Outlet Diame	ter	3"				
Design Pressure		8 bar				
Design Approvals		BV, LR, DNV,	ABS, CCS (others available u	ipon request)		
	Standard	2.0 bar @40/50µm - 2.4 bar @25µm				
Minimum Working Pressure	With Flushing Pump	1.6	bar @40/50µm - 2.0 bar @25	īμm		
Weight (kg, Dry)		1,360	1,440	1,620		
Weight (kg, Wet)		2,560	2,840	1,900		

#### Global Model Data

CONSTRUCTION & MATERIALS			
Pressure Vessel Housing & Lid	Carbon Steel		
Pressure Vessel Coating	Wet Paint		
Screen Material	904L		
Cleaning Mechanism	316L / POM		
Flush Valve	SS 316/ Marine Bronze		
Seals	Synthetic Rubber		
Internals	SS316/POM/PPH		

CONTROL & ELECTRICITY			
ΔP Transmitter	Inlet and Outlet PT Provided		
Electric Motor	0.25 kW		
Control Voltage	24 DC (pneumatic available upon request)		
Rated Operation Voltage	400-480V, 3 Ph @ 50/60Hz		
PLC Controller	Unitronics IP55		

FLUSHING & DESIGN DAT	·A
Design ∆P Setpoint	0.4 bar
Flush Cycle Duration	102 sec
Design Flush Cycles per Annum	25,000
Design Temperature	4 - 50°C
Filter Orientation	Horizontal & Vertical

ADDITIONAL UPGRADES READILY AVAILABLE:
Safe Zone, Ex ia prepared, Ex d prepared
turbo™ superturbo™
Additional Equipment & Materials available upon request

# MULTI BallastSafe e-SERIES FILTERS

		In/Out Connections (Inch)	50 μm		40 µm		25 μm	
Model			Max. Flow Rates (m³/hr)	Flushing Flow Rate* (m³/hr)	Max. Flow Rates (m³/hr)	Flushing Flow Rate* (m³/hr)	Max. Flow Rates (m³/hr)	Flushing Flow Rate* (m³/hr)
	Standard		1,800	68	1,500	68	1,000	63
<b>BSE0603</b> (#BS-603E)	turbo™	16''-18''	2,100	102	1,800	102	1,100	95
(#D3-003E)	superturbo™		2,300	136	2,100	136	1,300	127
	Standard	18''-20''	2,400	91/45	2,000	91/45	1,400	84/42
<b>BSE0804</b> (#BS-804E)	turbo™		2,800	136/68	2,400	136/68	1,600	127/63
	superturbo™		3,000	181/91	2,800	181/91	1,800	169/84
<b>BSE1004</b> (#BS-1004E)	Standard	20''-24''	3,000	113/57	2,500	113/57	1,750	106/53
	turbo™		3,500	181/91	3,000	181/91	2,000	169/84
	superturbo™		3,800	227/113	3,500	227/113	2,200	211/106
<b>BSE1204</b> (#BS-1204E)	Standard	20''-24''	3,600	136/68	3,000	136/68	2,100	127/63
	turbo™		4,200	227/113	3,600	227/113	2,400	211/106
	superturbo™		4,500	272/136	4,200	272/136	2,750	253/127
<b>BSE1406</b> (#BS-1406E)	Standard	20''-24''	4,200	170/85	3,500	170/85	2,394	158/79
	turbo <sup>™</sup>		5,000	272/136	4,200	272/136	2,750	253/127
	superturbo <sup>™</sup>		5,200	340/170	4,900	340/170	3,000	317/158

<sup>\*</sup> Multi filters have 2 Flushing groups: Full Flushing / Half Flushing

Note: Maximum flow rates at TSS loading of up to 50PPM as per IMO G8 Guidelines. When unsure of TSS loadings, consult Filtersafe.

**5,200** m³/h Max. Flow Rate Dedicated to BWT Market - 25, 40, 50 micron Filtration Degree

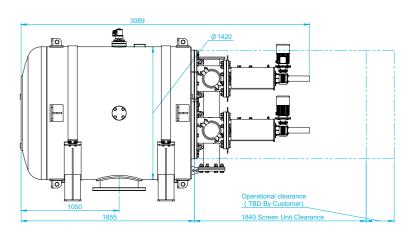
100% Screen Cleaning **1.6 bar** Min. Operating Pressure Up to **140,000** cm<sup>2</sup> screen in a single filter Horizontal & Vertical Configuration

#### MULTI **BallastSafe** e-SERIES

Horizontal Configuration Dimensions

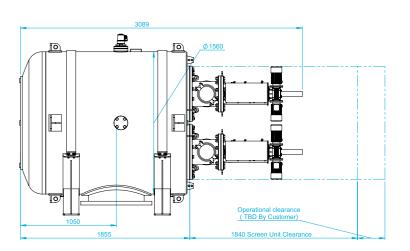
#### BallastSafe 603E (BSE0603/BS-603E)





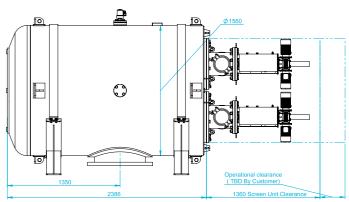
#### BallastSafe 804E (BSE0804/BS-804E)





#### BallastSafe 1004E (BSE1004/BS-1004E)





turbo™ & superturbo™ upgrades available

#### MULTI **BallastSafe** e-SERIES

Vertical Configuration Dimensions

#### BallastSafe 603E (BSE0603/BS-603E)

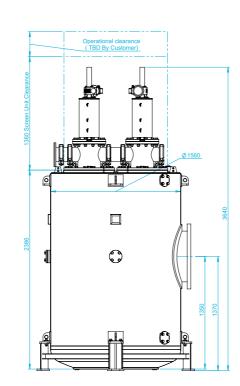


#### BallastSafe 804E (BSE0804/BS-804E)



BallastSafe 1004E (BSE01004/BS-1004E)



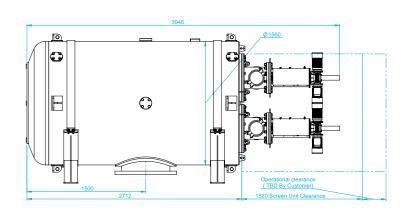


#### MULTI **BallastSafe** e-SERIES

Horizontal Configuration Dimensions

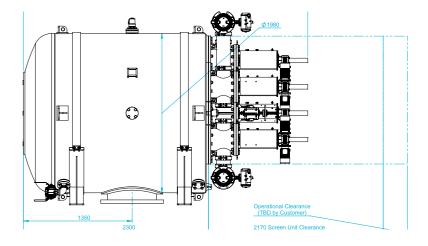
#### **BallastSafe** 1204E (BSE1204/BS-1204E)





BallastSafe 1406E (BSE1406/BS-1406E)





turbo™ & superturbo™ upgrades available

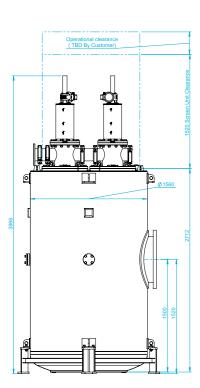
#### MULTI **BallastSafe** e-SERIES

Vertical Configuration Dimensions

## BallastSafe 1204E

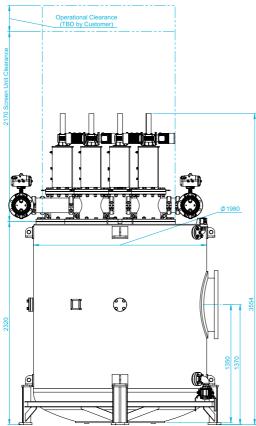
(BSE1204/BS-1204E)





#### BallastSafe 1406E (BSE0804/BS-804E)





# TECHNICAL SPECIFICATIONS

		Multi BallastSafe e-Series Models		
		<b>BSE0603</b> (#BS-603E)	<b>BSE0804</b> (#BS-804E)	<b>BSE1004</b> (#BS-1004E)
GENERAL DATA				
Screen Area		60,000 cm²	80,000 cm <sup>2</sup>	100,000 cm²
Screen Type		smartweave	4-layer sintered weaved scr	een fine filter
In/Out Connections		16" - 18"	16" - 20"	20" - 24"
Flush Outlet Diameter		6"	2 x 6"	2 x 6
Design Pressure			6.9 bar	
Design Approvals		BV, LR, DNV-GL, ABS, CCS (others available upon request)		
Motor Quantity		3	4	4
	Standard	2.0 bar @40/50µm - 2.4 bar @25µm		
Minimum Working Pressure	With Flushing Pump	1.6	bar @40/50µm - 2.0 bar @25	5μm
Weight (kg, Dry)		2,910	3,360	3,680
Weight (kg, Wet)		5,810	6,960	8,280

#### Global Model Data

CONSTRUCTION & MATERIALS			
Pressure Vessel Carbon Steel Housing & Lid			
Pressure Vessel Coating	Wet Paint		
Screen Material	904L		
Cleaning Mechanism	316L/POM		
Flush Valve	SS 316/ Marine Bronze		
Seals	Synthetic Rubber		
Internals	SS316/POM/PPH		

CONTROL & ELECTRICITY		
ΔP Transmitter	Inlet and Outlet PT Provided	
Electric Motor	0.18kW	
Control Voltage	24 DC (pneumatic available upon request)	
Rated Operation Voltage	400-480V, 3 Ph @ 50/60Hz	
PLC Controller	Unitronics IP55	

FLUSHING & DESIGN [	DATA
Design ΔP Setpoint	0.4 bar
Flush Cycle Duration	54 sec
Design Flush Cycles per Annum	25,000
Design Temperature	4 - 50°C
Filter Orientation	Horizontal & Vertical

ADDITIONAL UPGRADES READILY AVAILABLE:			
Safe Zone, Ex ia prepared, Ex d prepared			
turbo™ superturbo™			
Additional Equipment & Materials available upon request			

# TECHNICAL SPECIFICATIONS

		Multi BallastSafe e-Series Models		
		<b>BSE1204</b> (#BS-1204E)	<b>BSE1406</b> (#BS-1406E)	
GENERAL DATA				
Screen Area		120,000 cm <sup>2</sup>	140,000 cm²	
Screen Type		smartweave 4-layers	sintered weaved screen fine filter	
In/Out Connections		20" - 24"	20" - 24"	
Flush Outlet Diame	ter	2 x 6"	2 x 6"	
Design Pressure		6.9 bar		
Design Approvals		BV, LR, DNV-GL, ABS, CCS (others available upon request)		
Motor Quantity		4	6	
	Standard	2.0 bar @40/50µm - 2.4 bar @25µm		
Minimum Working Pressure	With Flushing Pump	1.6 bar @40/50µm - 2.0 bar @25µm		
Weight (kg, Dry)		3,830	5,260	
Weight (kg, Wet)		9,030	12,360	

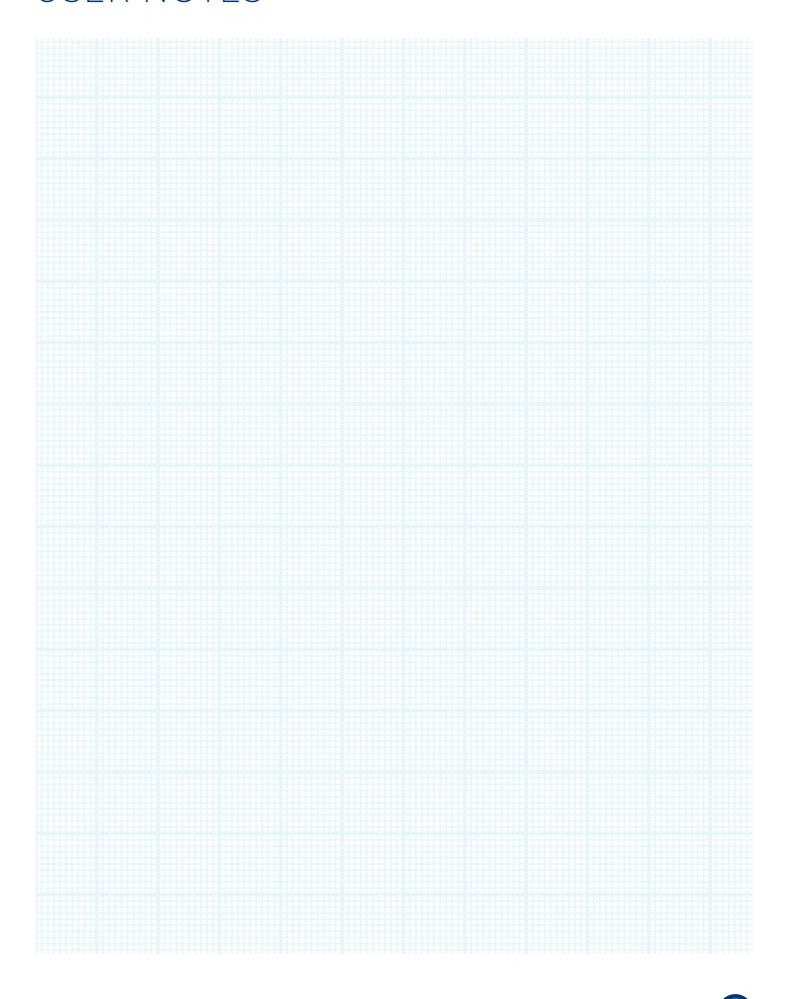
#### Global Model Data

CONSTRUCTION & MATERIALS		
Pressure Vessel Housing & Lid	Carbon Steel	
Pressure Vessel Coating	Wet Paint	
Screen Material	904L	
Cleaning Mechanism	316L / POM	
Flush Valve	SS 316/ Marine Bronze	
Seals	Synthetic Rubber	
Internals	SS316/POM/PPH	
	*	

CONTROL & ELECTRICITY			
ΔP Transmitter	Inlet and Outlet PT Provided		
Electric Motor	0.18kW		
Control Voltage	24 DC (pneumatic available upon request)		
Rated Operation Voltage	400-480V, 3 Ph @ 50/60Hz		
PLC Controller	Unitronics IP55		

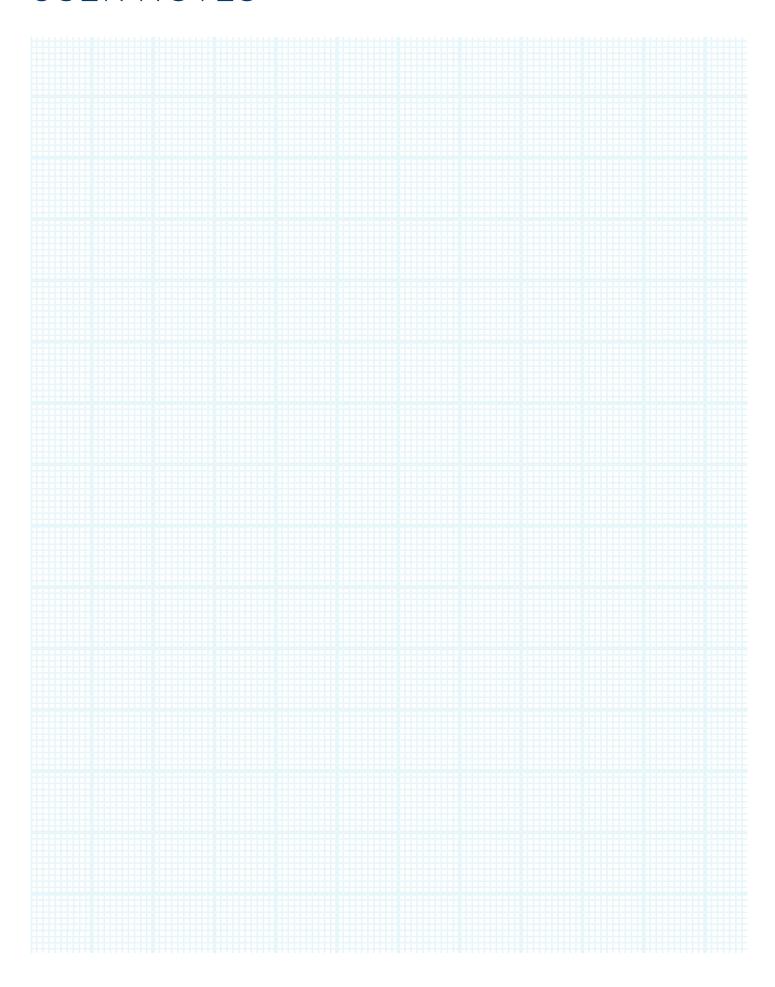
FLUSHING & DESIGN DATA			
Design ΔP Setpoint	0.4 bar		
Flush Cycle Duration	54 sec		
Design Flush Cycles per Annum	25,000		
Design Temperature	4 - 50°C		
Filter Orientation	Horizontal & Vertical		

# USER NOTES





# USER NOTES







OUR HEADQUARTERS

Our flagship factory. The 4,000 m² building contains our regional sales offices, R&D facilities and manufacturing and assembly plant. The facility is capable of handling very large volumes of production with an incredibly fast lead time.

sales@filtersafe.net

#### **ASIA**

#### HONG KONG

Our Hong Kong manufacturing and assembly plant produces our entire line of products to the region, and is supported by a world-class steel fabrication facility.

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