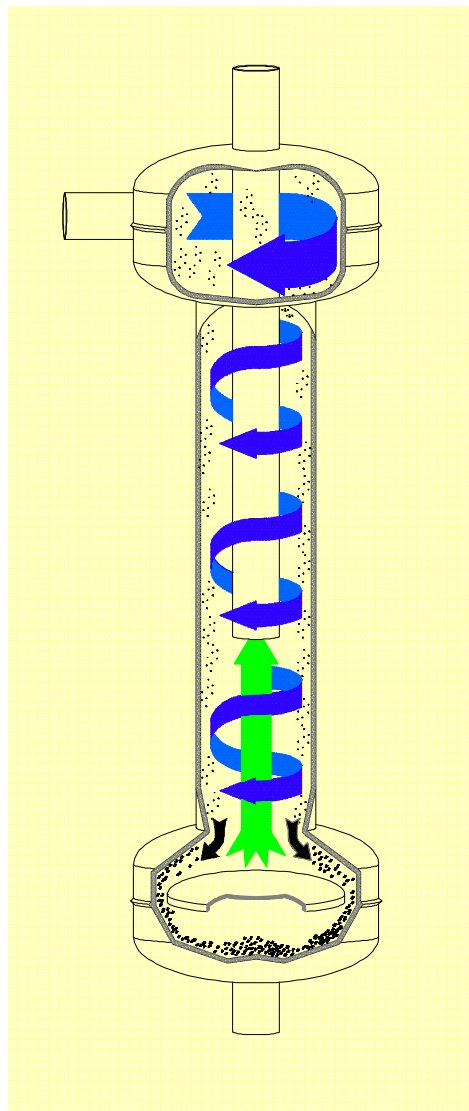


# Balba

## Technologies Limited

*An Introduction to Side Stream Filtration  
And the Balba Viking Product Range*



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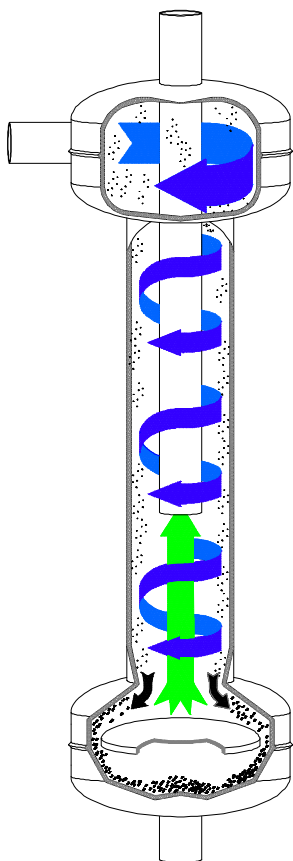
## *Balba Technologies Limited*

## *An Introduction to side stream filtration*

Side stream filtration is frequently used in closed loop systems to remove existing, and prevent future build up of debris and suspended solids. Typically side stream filtration systems are installed on heating and cooling installations, however any looped water system where contamination may exist from installation work, as a result of corrosion or build up of contamination from external sources may benefit. Contamination often builds up over a period of time resulting in reduction of system efficiency and potential damage to seals and failure of control valves and pumps.

The installation of side stream filtration can increase efficiency and life expectancy of your systems and is an economical way of maintaining a clean system where water is circulated as unlike a full flow filtration system only a percentage of the flow is being filtered on each pass.

*Balba Technologies side stream filtration systems utilise our Viking range cyclone separators removing particles from water by centrifugal force. The particles collect at the bottom of the filter until purged. The filter has no moving parts and no backwash requirement. Pumped systems are installed with efficient Lowara vertical multistage inline pumps.*



### *How it Works*

*Liquid enters the unit tangential, which creates a centrifugal flow.*

*The construction inside the upper chamber is designed to accelerate the centrifugal flow.*

*Heavier than water particles are forced to the side of the chamber by the centrifugal force.*

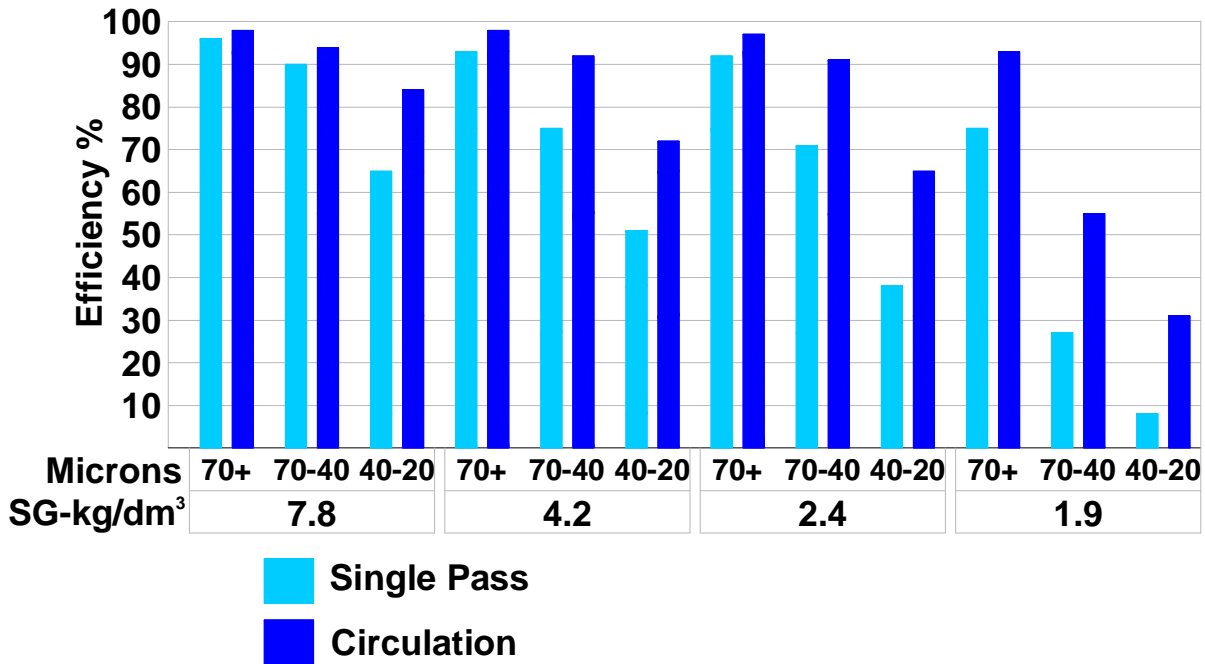
*Solids slowly drop along the sides of the centre tube and collect in the bottom chamber.*

*Solids are then periodically or continuously purged from the collection chamber.*

*The cleaned liquid is drawn up through the vortex and is discharged from the separator through the top outlet.*

When calculating the size of side stream filter required you should take into consideration the total system capacity and the flow rate where know. The age and condition of the system is also a consideration, generally the older the system the higher percentage filtration is recommended. Generally the total system capacity should be filtered at least once every two to four hours with a target of between 2.5% and 10% of flow rate. If the capacity is not known we would recommend side stream filtration of 5% of flow rate for a clean system.

***Cyclone Separation Efficiency - Expected Separation % (fig-1)***



Cyclone separators will only operate efficiently if the flow rate is within specification for the unit size. There are two methods to ensure this, by measuring the pressure drop across the separator or by measuring the flow rate with a flow indicator. We utilise both methods for our skid mounted systems. Flow indicators for sizes up to and including 50mm and pressure gauges for all sizes above 50mm. Flow rate indicators are available for the larger sizes as an option. When supplied pressure gauges are stainless steel, suitable for both cooling water and hot water systems up to 95°C.

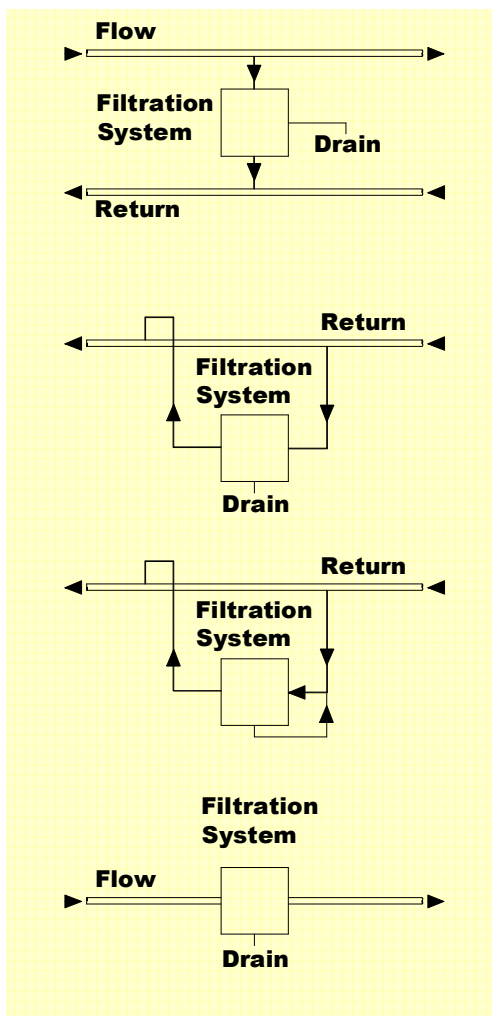
*Protection of equipment helps reduce maintenance costs and prevents loss of production due to breakdown. Whether it is LTHW, chilled water or any closed loop water system, side stream filtration helps keep the system clear of harmful solids.*



## Filtration Systems

Side stream filtration can be installed across the flow and return lines (fig 1) or, alternatively piggybacks on one of the system headers (figs 2 & 3). When installing across the flow and return the system pump is utilised and the following must be considered: -

- The system pump must have the capacity to deal with the additional load created by the filter system.
- With existing heating and cooling systems the balance of the system may be affected causing a loss of efficiency.
- A minimum differential pressure of 1bar will be required between the inlet and outlet headers to allow for the pressure drop across the filter.
- A purge line will be required resulting in periodic loss of water from the system



*Fig 1. Side stream filtration across headers.*

*This method utilises the system pumps and will therefore result in some efficiency loss. Purged water is sent to drain See Viking BVS range page 5.*

*Fig 2. Pumped side stream filtration system with purge drain.*

*System is piggybacked on flow or return header with purge to drain and therefore no efficiency loss but some water is lost from the system See Viking VPU-AP range page 6*

*Fig 3. Pumped side stream filtration system with clean water return.*

*System is piggybacked on flow or return line. A second purge filter collects the debris and the cleaned water is returned to the system resulting in no water loss. See Viking VPU-CS Range Page 8.*

*Fig 4. Full flow systems.*

*Generally this type of system is used where the water is not circulated unless contamination is being picked up with each pass, typically in cleaning systems. See Vegetable Cleaning System page 12.*

*All Balba Technologies skid based systems are supplied complete with isolation and set-up valves, flow indicators or pressure gauges, Y strainer to protect the pumps (where fitted) and IP54 steel control panel with auto function(BMS) for remote control on pumped models.*

## Viking BV Range Cyclone Separators

The BV range cyclone separators are available as stand alone units, with auto purge facility or complete with skid base incorporating isolation valves and pressure gauges (BVS).

Designation	Connections	Size Inch	Purge Inch	Capacity M <sup>3</sup> /hr	Overall Height Vertical units (mm)
BV20	BSP	3/4	3/4	1 - 3	600
BV25	BSP	1	1	2 - 7	690
BV32	BSP	1 1/4	1	5 - 10	760
BV40	BSP	1 1/2	1	8 - 18	760
BV50	BSP	2	1	15 - 24	860
BV65	BSP	2 1/2	1	20 - 35	880
BVF80	Flanged	3	1	30 - 60	1040
BVF100	Flanged	4	1	60 - 125	1110
BVF125	Flanged	5	1	110 - 190	1270
BVF150	Flanged	6	1	155 - 260	1640
BVF200	Flanged	8	2	225 - 375	2220
BVF250	Flanged	10	2	350 - 650	2770
BVF300	Flanged	12	2	550 - 1000	4470

**Note:** - Models BV10 -BVF100 are available as vertical units only.

Models BVF125 - BVF300 are generally mounted at an angle of 25° but are also available as horizontal units if required.

When supplied with the auto purge option a 24v electrically actuated valve is fitted to the purge outlet. A 240v IP54 panel is supplied separately. When supplied complete with skid base (BVS models) the panel is wired to the purge valve. As an alternative a pneumatic purge valve can be fitted, the panel will incorporate the pneumatic control and will be connected to the purge valve with nylon tube. Both electrical and pneumatic options are power open power close.

The auto purge control panel incorporates two timers to control time between purges and length of purge. The timers are factory set but can be adjusted to suit site conditions.

The time between purges can be set up to 24hours and the purge time to 1 minute.

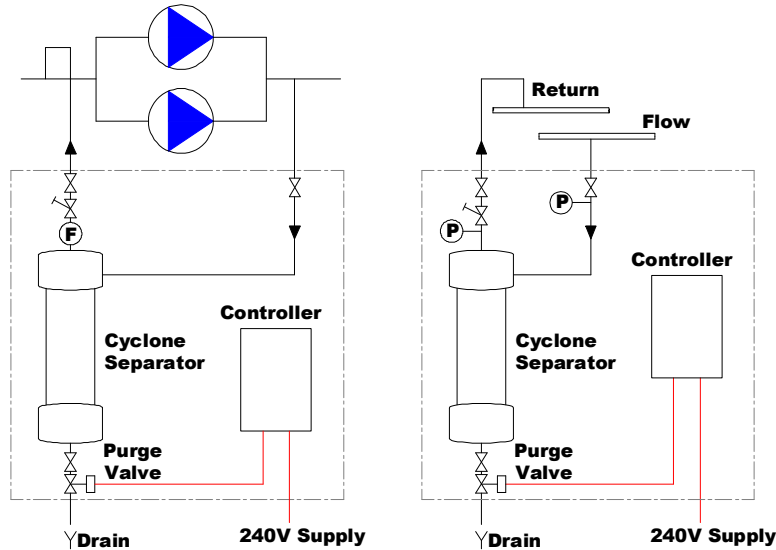
*Illustrated is a BV100 with a pneumatic purge valve during assembly. The pipework fitted is PVC working with ambient temperature water.*

*All units are supplied in carbon steel finished painted blue. Stainless steel is available as a custom manufactured unit. All models are pressure tested for 8 bar working pressure and are supplied with the relevant certification.*



## Viking BVS Range

The Viking BVS range cyclone separators are skid mounted and supplied with auto purge valve fitted to the separator purge discharge and all ancillary equipment including isolation valves, flow indicator or pressure gauges, set-up valve and pipework. The BVS range is available as standard with BV20 - BV80 cyclone separators with capacities as illustrated above.



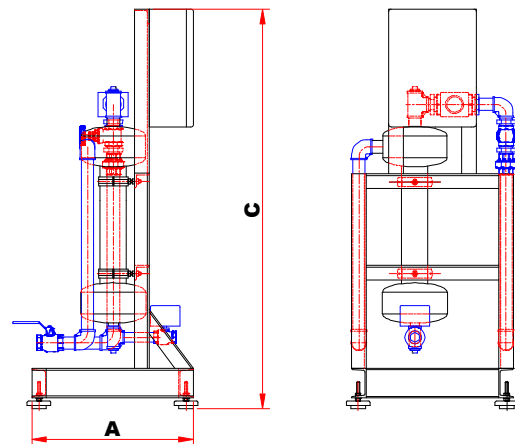
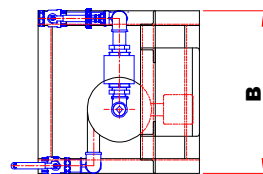
*The LH illustration is of a size BVS-20 - BVS-50 incorporating a flap type flow indicator.*

*The RH illustration is of the BVS-65 and above supplied with pressure gauges.*

*The BVS series require the system pumps to create the pressure required and may be installed across the pumps or across the flow and return headers. Loss of efficiency to the system must be taken into account when installing the BVS range.*

Typical BVS side stream filtration system with cyclone separator incorporating auto purge feature. This system will periodically purge dirty water to drain and is not suitable where water losses are unacceptable, typically where chemicals are used.

Model Number	Dim A	Dim B	Dim C
BVS-20	500	400	1256
BVS-25	500	450	1256
BVS-32	550	550	1356
BVS-40	600	550	1356
BVS-50	650	600	1356
BVS-65	700	600	1436
BVS-80	800	600	1536
BVS-100	1000	775	1692



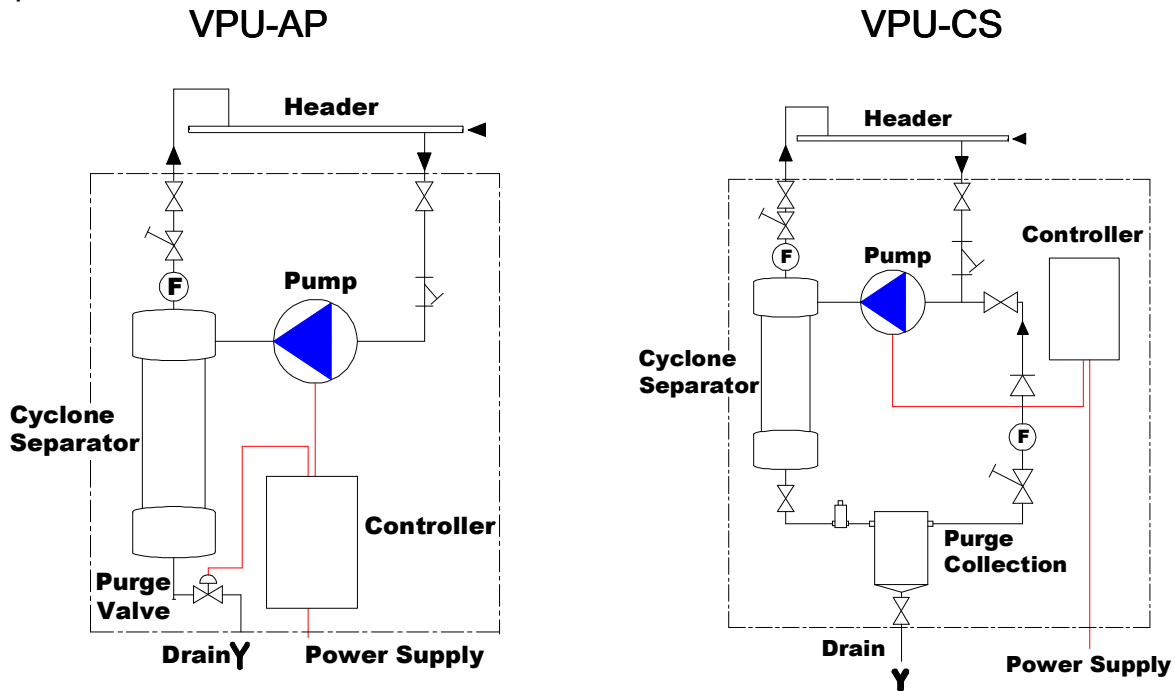
*Skid frames are manufactured in mild steel and finished painted. The frame is supplied with four off adjustable height anti vibration feet.*

*Connections are required to the infeed, discharge and purge lines. A 240VAC supply is required to the control panel.*

*If a pneumatic purge valve is fitted an 80psi pneumatic supply is required to the control panel.*

## Viking Standard Pumped Ranges

Pumped systems are designed for installation across a single header and can be supplied with an auto purge facility (AP) or purge recovery system (CS). The auto purge works on timers and periodically purges collected debris to drain. The timers can be set for period between purges and purge length. The purge recovery system has the advantage of no water loss as the cleaned purge water is returned to the system. The purge recovery utilises a cartridge for dirt collection. A bag filter can be supplied as an option if preferred. Both systems are supplied with BMS interface. The purge recovery system can be supplied with a cartridge full indicator as an option.



*The AP and CS ranges are available in the following sizes: -*

Model Reference Number	Voltage	Flow Rate M <sup>3</sup> /hr	Feed Connection	Discharge Connection	Purge Connection
VPU-20-240	240	1.0 - 3.0	3/4"	3/4"	3/4"
VPU-20-400	400	1.0 - 3.0	1"	1"	1"
VPU-25-240	240	2.0 - 7.0	1"	1"	1"
VPU-25-400	400	2.0 - 7.0	1"	1"	1"
VPU-32-240	240	5.0 - 10	1 1/4"	1 1/4"	1"
VPU-32-400	400	5.0 - 10	1 1/4"	1 1/4"	1"
VPU-40-240	240	8.0 - 18	1 1/2"	1 1/2"	1"
VPU-40-400	400	8.0 - 18	1 1/2"	1 1/2"	1"
VPU-50-400	400	15 - 24	2"	2"	1"
VPU-65-400	400	20 - 35	2 1/2"	2 1/2"	1"
VPU-80-400	400	40 - 60	3"	3"	1"
VPU-100-400	400	60 - 125	4"	4"	1"

All VPU systems are skid mounted with height adjustable anti vibration feet. The frame is manufactured from carbon steel finished painted. Sizes up to VPU-50 are fitted with a flap type flow indicator to assist with set up during commissioning. VPU-65 and above have pressure gauges installed either side of the separator with the pressure drop set during commissioning.

All systems are supplied with isolation valves to the inlet and discharge, set up valve for commissioning and Y strainer to protect the pump.

## Control System

The IP54 painted steel control panels are mounted on the skid base frame and are electrically connected to the pump and also the purge valve on the AP models. The control panels are supplied with: -

- Door interlocked main incoming power isolator with facility to padlock off.
- Starter and control gear for the pump.
- Auto / Manual switch.
- Push buttons for pump start and stop in manual mode.
- BMS remote start and stop facility for the pump in auto where connected.
- Volt free contacts to allow remote monitoring of the status lamps
- LED indicators for power on, pump running and pump tripped.
- 24Vac control circuit via transformer

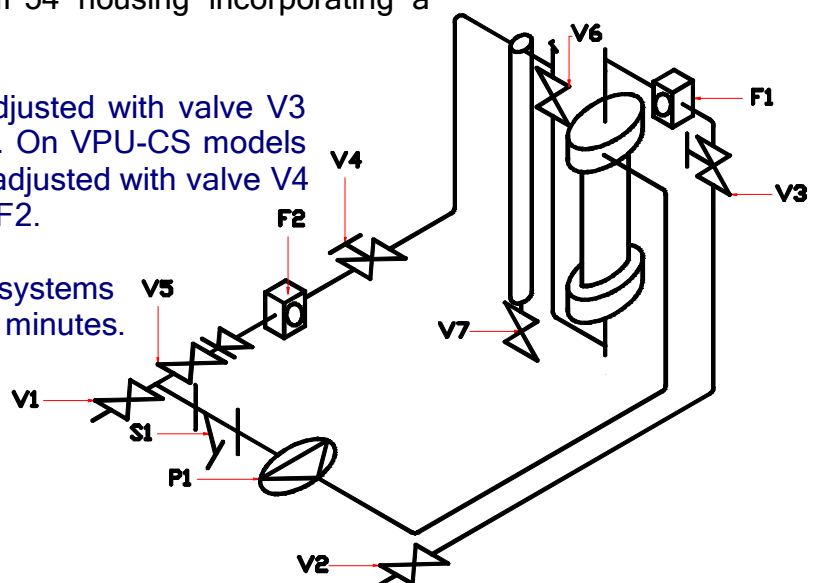
In addition to the above the VPU-AP models also incorporate: -

- Purge switch with manual, auto and off modes. The manual position opens the purge valve and is sprung to off allowing the purge valve to be opened manually as a maintenance function but not left on permanently.
- Adjustable timers for purge valve operation. T1 time between purges. T2 length of purge. These are located inside the panel and are adjusted as a maintenance operation.
- LED indicator for purge activated. Volt free contacts are included for remote monitoring of the valve operation.

The purge valve is fitted with an IP54 housing incorporating a 24Vac valve motor.

The flow through the separator is adjusted with valve V3 and monitored with flow indicator F1. On VPU-CS models (illustrated) the clean water return is adjusted with valve V4 and monitored with the flow indicator F2.

Once the installation is complete the systems can be commissioned in just a few minutes.



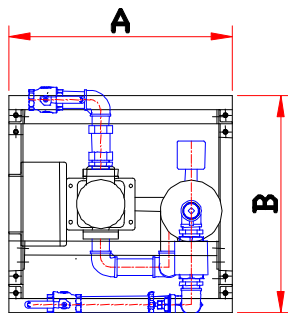
## Viking VPU-AP Range

The VPU-AP range are ideal for installation in systems where small losses of water during purge are acceptable. A drain will be required near to the unit for the purge. Where chemicals are used in the system some will be lost during the purge which once the system has been cleaned should only be required every 24 hours for a period of about 20 seconds.

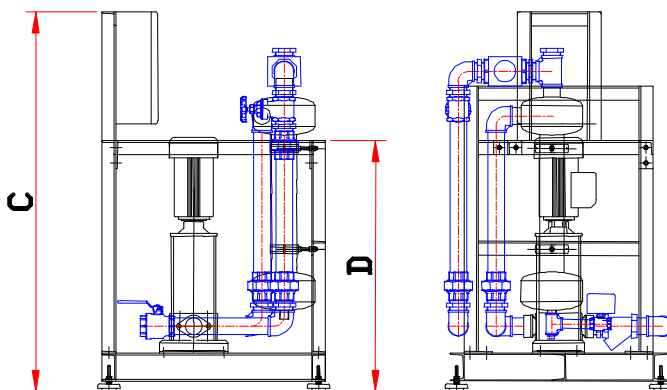
Frames are normally fully welded but are available as a bolted construction, which with pipework unions allows the unit to be broken down to allow installation where access is limited.

*The model pictured is a VPU-32-AP-240  
Supplied with ABS pipework at the customers  
request for installation in a chilled water  
system.*

*The flap flow indicator is clearly visible located  
on the discharge of the cyclone separator.*



Model Number	Dim A	Dim B	Dim C	Dim D
VPU-AP-20	600	560	1356	756
VPU-AP-25	600	620	1356	756
VPU-AP-32	700	710	1456	796
VPU-AP-40	700	750	1456	796
VPU-AP-50	800	775	1456	896
VPU-AP-65	800	970	1636	896
VPU-AP-80	950	1100	1636	1023
VPU-AP-100	1125	1305	1893	1443



*Note: - Dimensions are  
approximate and may change  
dependent on options and pump  
type installed.*

*Flow indicator version illustrated.*

## Viking VPU-CS Range

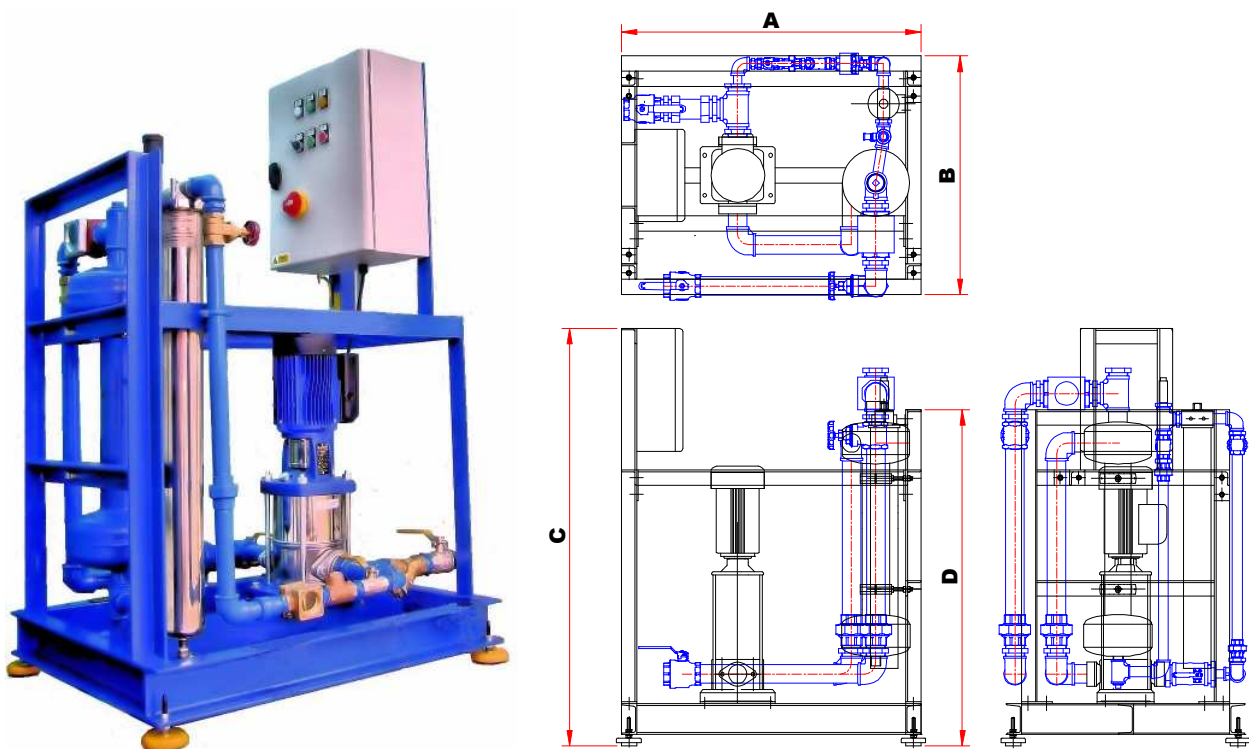
Our most popular model. Unlike the VPU-AP series the purge is a continuous stream reducing the likelihood of blocking in the cyclone separator.

The purge collection cartridge filter (bag filter available as an option) collects the debris from the separator with the cleaned water returned to the system. Isolation valves are installed so that the filter can be removed while the system continues to operate.

A non return valve is installed in the purge line.

A Flow indicator is installed on the purge discharge along with a set-up valve allowing easy commissioning of the purge flow.

The flow indicator also acts as a visual warning if the secondary filter requires changing as the flow rate will reduce as the pressure drop across the filter increases.



Model Number	Dim A	Dim B	Dim C	Dim D
VPU-CS-20	900	625	1356	1096
VPU-CS-25	900	675	1356	1096
VPU-CS-32	900	710	1456	1096
VPU-CS-40	900	750	1456	1096
VPU-CS-50	975	775	1456	1096
VPU-CS-65	1060	935	1536	1136
VPU-CS-80	1200	935	1643	1293
VPU-CS-100	1125	1305	1893	1443

*Note: - Dimensions are approximate and may change dependent on options and pump type installed*

*Flow indicator version illustrated.*

## Viking MVPU-CS Range

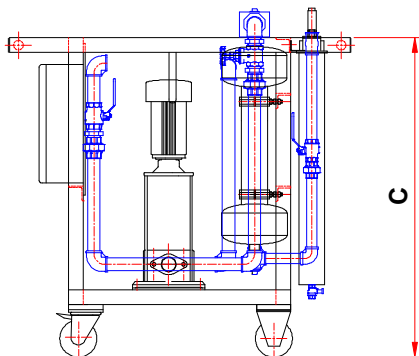
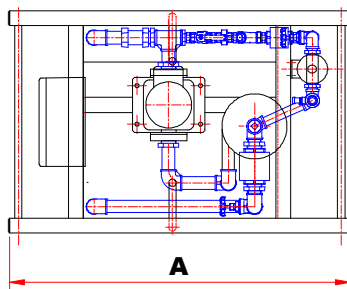
We listened to our customers when they said they wanted a mobile side stream filtration system that was not just a standard unit with wheels. Based on the VPU-CS range the MVPU series is custom designed to suit requirements of a mobile system with features including: -

- Purpose built support frame with four off wheels, two off fixed and two off swivel and break. Handles are fitted at each end to allow for lifting the units over bund walls or other small obstructions.
- The systems are usually supplied with hoses to suit customer requirements. Hoses are fitted with isolation valves to reduce water spillage when disconnecting. There is provision for hose storage on the unit during transport.
- A flying lead with either a 240v or 415v plug is included.
- Additional drain points are included so that the system may be emptied when not in use.

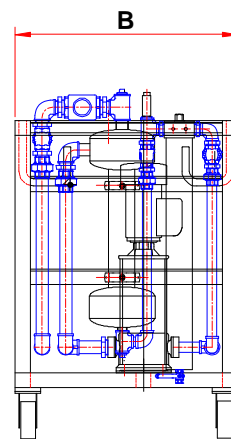
**Note: BMS interface is not included in the MVPU range**

*The picture is of an MVPU-20-CS. The hoses are heavy duty with a working pressure of 10 bar and temperature rating of 100°Centigrade. The hoses are stored in the main frame on purpose made hooks.*

*The frame is manufactured in box section and angle and finished with two part epoxy paint. The control panel is mounted on the frame below one of the handles*



Model Number	Dim A	Dim B	Dim C
MVPU-CS-20	1120	750	1077
MVPU-CS-25	1120	750	1077
MVPU-CS-32	1150	750	1077
MVPU-CS-40	1150	750	1077
MVPU-CS-50	1250	800	1077



**Nylon strips can be fitted to the base of the frame to allow a single operator to lift and slide the unit over low bund walls.**

## ***Custom Design and Build***

In addition to supplying our standard Viking product ranges Balba Technologies will design and manufacture systems to suit your individual needs. If you require additional or alternative filtration types, your system requires temperature or pressure ratings outside of our standard range or you wish to incorporate other functions on the skid base we will endeavour to help. Once we have established the system needs we can quickly produce a proposal and quotation.

Examples of bespoke systems include the following: -



***Mobile system designed for a cleaning both complete systems and sections during outages. The cartridge filter will remove particles down to 5µ. Two balance valves and a bypass system on the pump allow the flow through the filter to be controlled while the main flow continues at a higher rate helping to move sludge in the section being cleaned.***



***Custom built systems during manufacture. Both based on our CS range the unit on the left incorporates duty and standby pump and is designed for continuous filtration of a heating system***

***The system on the right was designed to operate with a high back pressure and was supplied with a high pressure pump. Both systems are designed to operate at 12 bar and 110°Centigrade Provision was included for the installation of a second 5 micron filter at a later date.***



## *Other Products and Services*

With many years experience working in the commercial and industrial sectors we understand the effect water impurities have on the life and reliability of key equipment and the cost incurred with the sudden loss of essential services. Our mission is to assist you in keeping your water clean and where possible recycle and reuse this essential commodity.

In all instances we apply proven technology to meet our customer's requirements and can supply stand alone plant or fully integrated systems utilising our wide range of standard products.



## *Water Softeners*

Balba Technologies supply water softeners to commerce and industry including: -

- *Supply and installation at a chemical processing company to eliminate clouding in final product*
- *New build barracks installation to protect the heating system and prevent scale build up*
- *Installation in a hotel to stop scale build up on bathroom taps and showers reducing cleaning costs*
- *Installation in a Boiler House to prevent scaling*



## *Bore Water Treatment Using Media Filtration Technology*

Removal of pesticides from bore hole water in food processing facility to upgrade the water for use in the manufacturing process and significantly reduce costs.

Balba Technologies supplied: -

- Full process design
- Supply of all new equipment
- Modification to existing Iron removal system
- Mechanical & electrical installation
- PLC control system
- Commissioning and training
- Service, spares and consumables

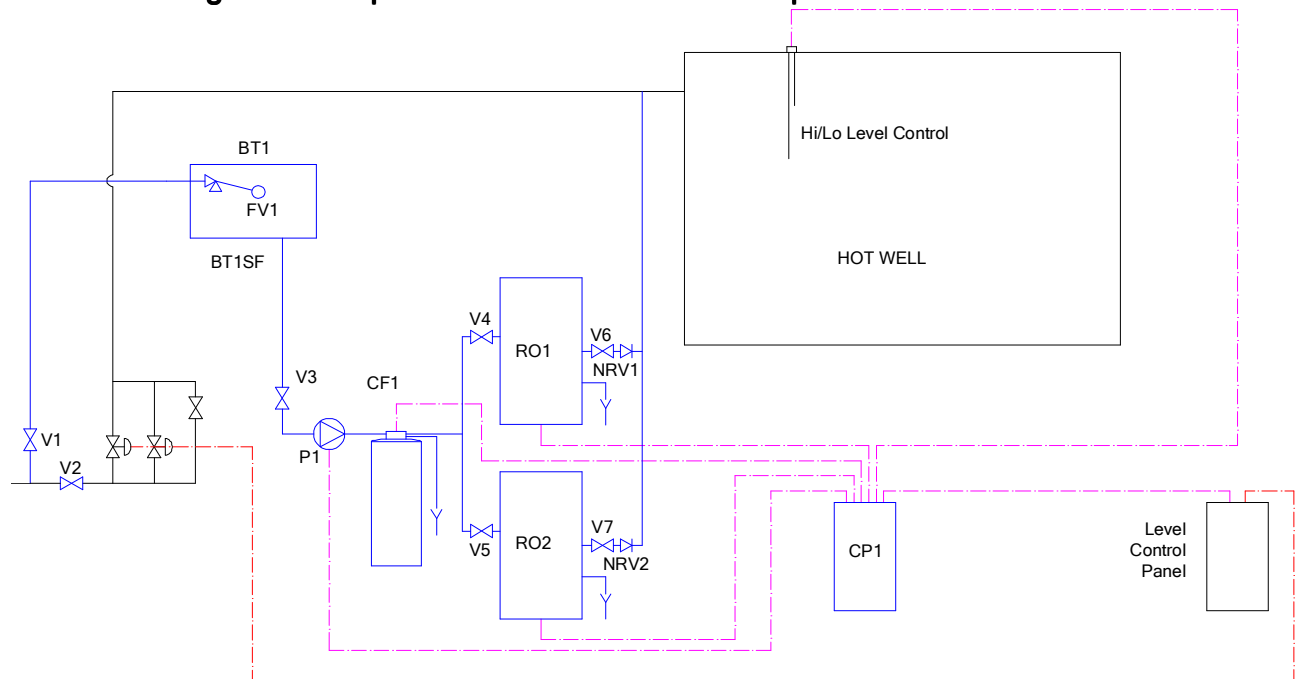


## *Reverse Osmosis*

Recent project included working with an associate company to carry out the design, procurement and site management for a boiler RO project.

The dual RO system was designed to function as duty/standby during Normal production and as a twin system during peak production.

A bypass was incorporated to allow the hot well to be filled during installation and commissioning and for rapid fill of the hot well when required.



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## *Vegetable Wash Water*

Continuous removal of sand from onion cleaning water to prevent clogging of spray bars and build up of silt in water storage tank utilising cyclone separation technology.

- Balba Technologies provided full design manufacture, procurement, installation and commissioning
- Equipment supply included new stainless steel dewatering screen, two new tanks, pumps, control system and all ABS pipework
- Auto purge to filter system based on 1tonne bag. Bag changed by fork truck as required.
- Purged water pumped to buffer tank and returned to system
- Twin pumps operated on level control to allow for variations in the system flow rate



## *Mud Recovery*

The previous system relied on tankers removing sludge from the site for disposal at high cost. The new system removed the mud from the water. The water could then be reused and the mud returned to the land reducing disposal costs

- New wash water tank
- Continuous treatment stream
- Polymer/ flocculent dosing
- Filter Press
- Mud recovered & returned to land
  
- Design and supply of new wash tank.
- Supply and installation of filter press.
- PLC control system.
- Electrical & mechanical installation.
- Commissioning and training



## Storage and Containment

Balba Technologies act as an agent for a UK based company specialising in the design and manufacture of spill containment and storage solutions for commerce and industry. A wide range of pallets are available for the storage of IBCs and chemical drums as well as racking storage units and spill trays. Included in the range are storage cabinets and trolleys and Universal Beam protection. Below is a small sample of what's available.



*IBC and drum storage units are available in a range of sizes to suit any application including rain water protection accessories as illustrated. The bunds are designed to suit standard drum and IBC capacities and are suitable for a wide range of chemical storage.*



For more details of our storage and containment range and beam protection see our website at [www.balbatech.com](http://www.balbatech.com) or contact the office on 08452 603080

