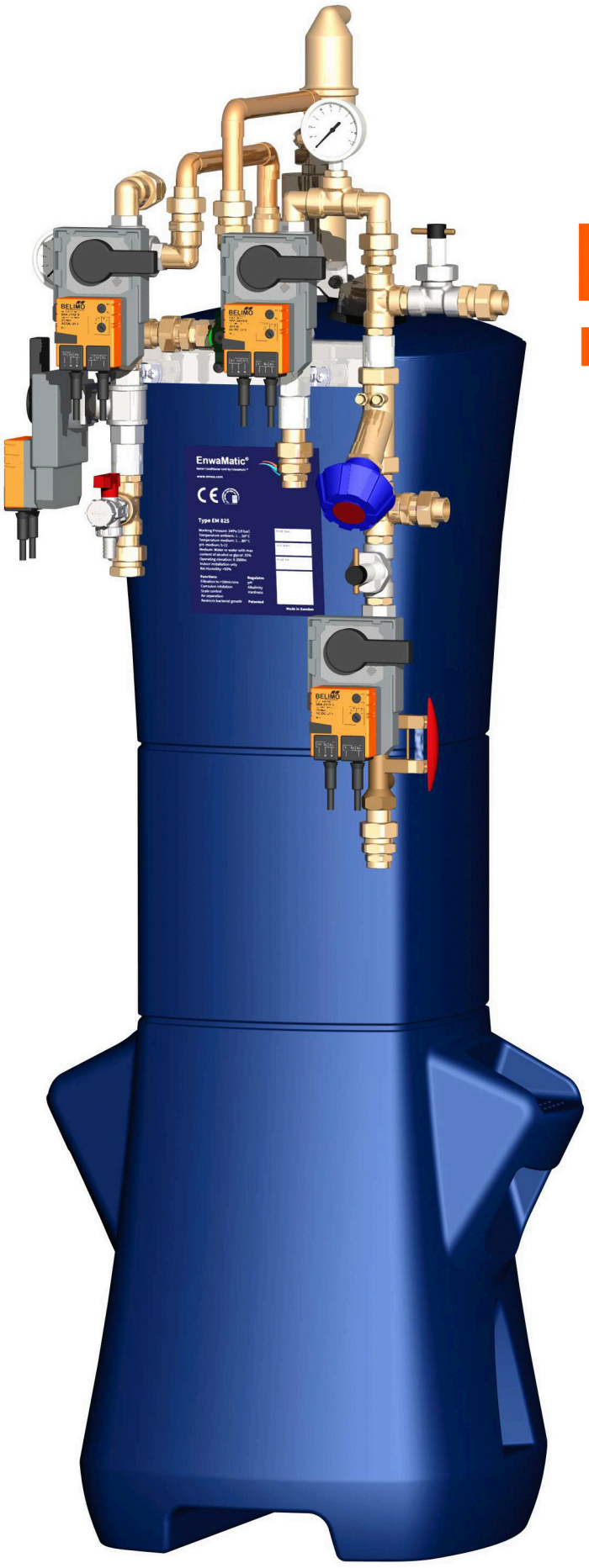
ADVANCED WATER TECHNOLOGY

enwa

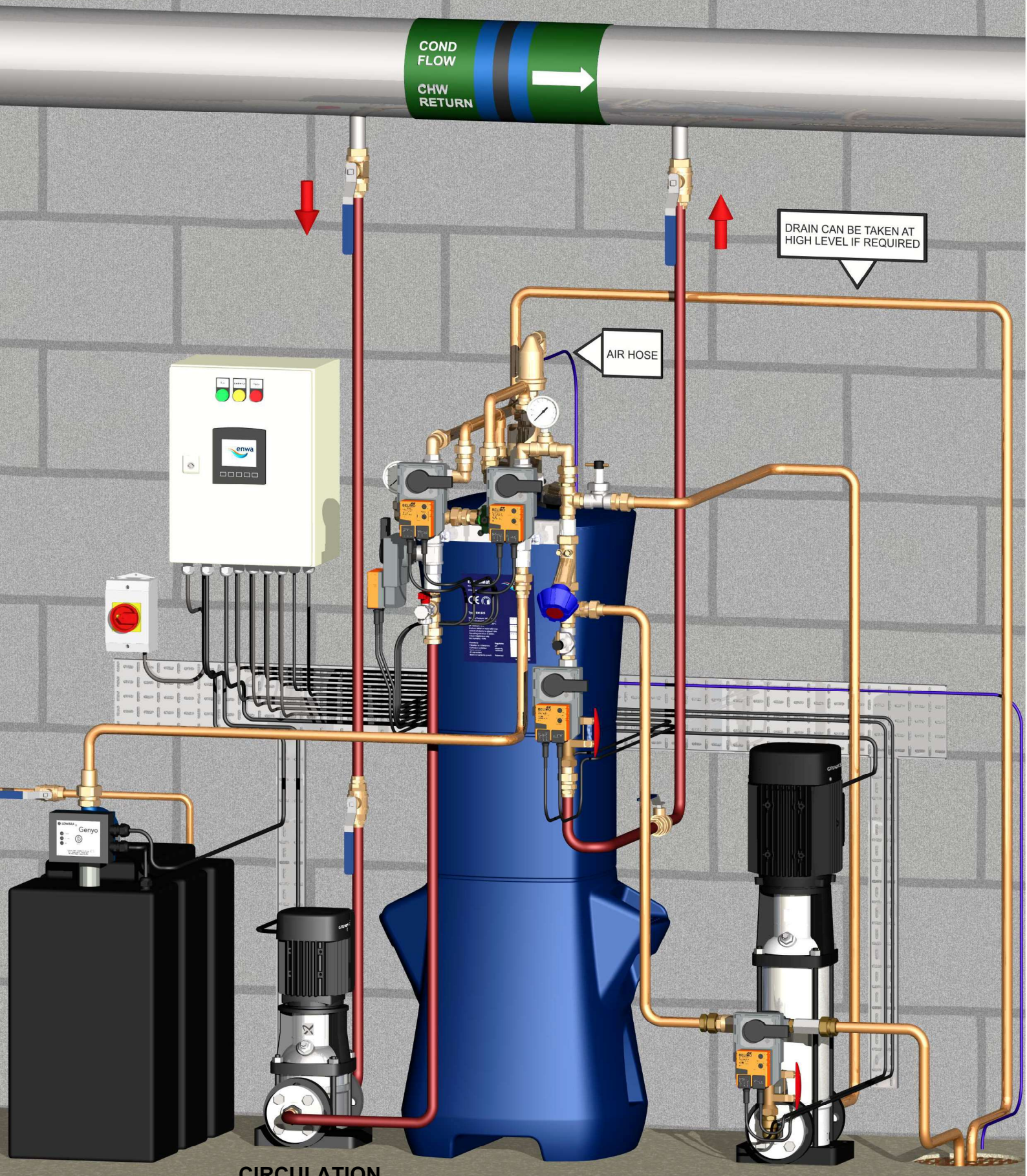
EnwaMatic®

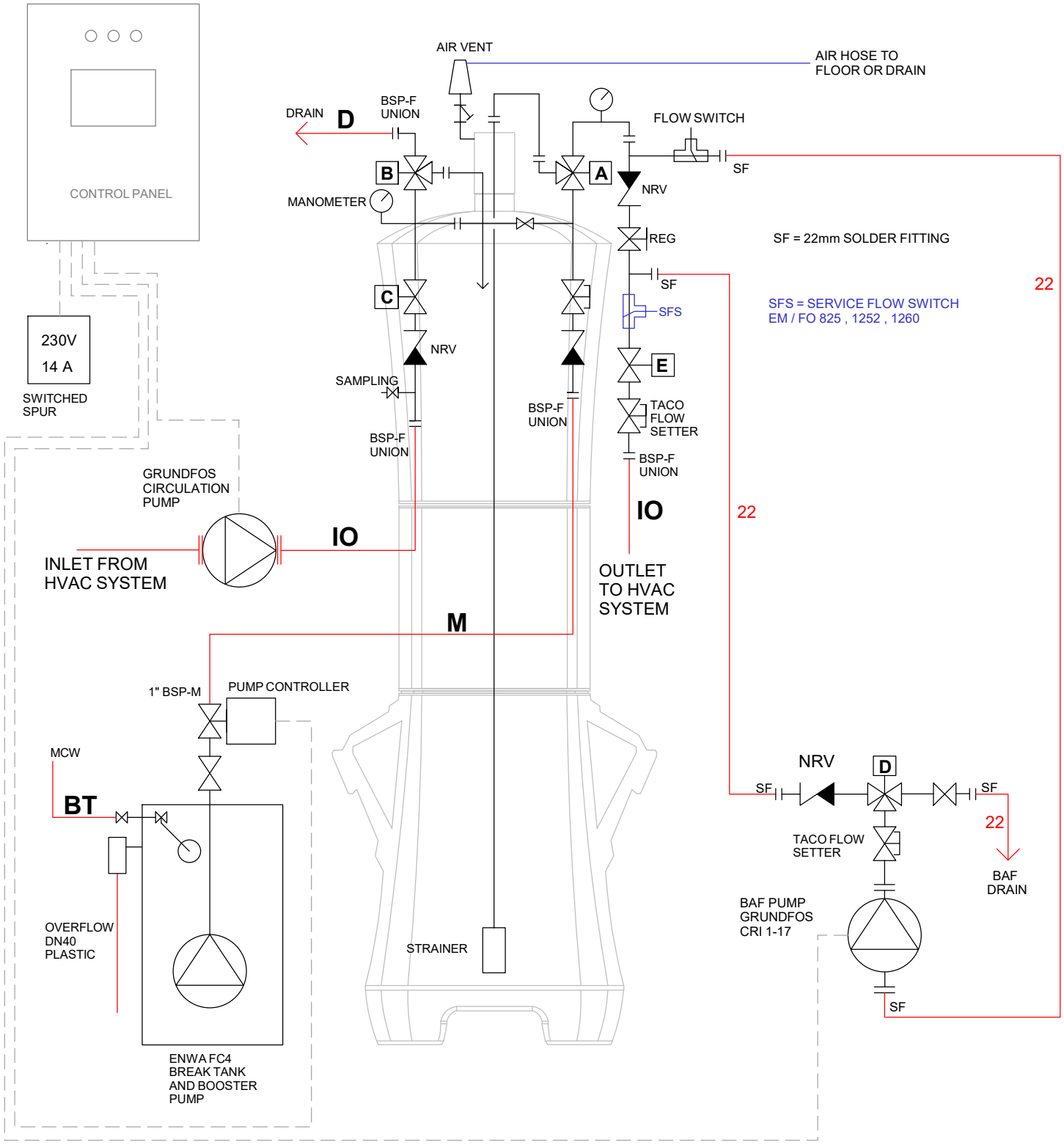
BAF Glycol Retention



ENWA WATER TECHNOLOGY UK 01530 830 354 ukservice@enwa.com www.enwa.co.uk

INSTALLATION OVERVIEW





UNIT	CIRC PUMP	BREAKTANK			IO	M	D	BT	
EM 825	Magna1 25-120	65 L		**DN**	20	20	20	15	PIPEWORK BY INSTALLER
EM 1252	CRI 1-3	65 L		**DN**	20	20	20	15	
EM 1260	CRI 3-5	227 L		**DN**	20	20	20	15	
EM 1665	CRI 5-4	227 L		**DN**	25	25	25	15	230V BY INSTALLER
EM 1672	CRI 5-5	227 L		**DN**	40	25	25	15	

	PROJECT:	TITLE:	DATE:
ADVANCED WATER TECHNOLOGY enwa	**EnwaMatic BAF**	**Installation Schematic**	1.6.20

ADVANCED WATER TECHNOLOGY

EnwaMatic® EM BAF (Backwash Anti-Freeze)

Overview

The EnwaMatic® BAF is a combined side stream filtration and active water treatment process for systems containing glycol or similar additives. A small percentage of the main flow is diverted through the vessel, such that total system volume is turned over twice in a 24 hour period.

The units provide:

- Side-stream filtration to less than 5 microns.
- Elevation and regulation of pH, maintaining a level of 9.0 – 10.5.
- Inhibition of corrosion and removal of dissolved iron levels.
- A stabilising process for the existing glycol content.
- Removal of air through integral air separation device.
- Environmental restriction of bacterial growth.

EnwaMatic internal view

Normal operation:

During normal operation, water enters the top of the vessel, passing through a combined filtration / reaction media bed to a strainer on the outlet pipe.

Filter media: A light, granular silicate based material that traps fine particles during downward flow. Reversing the flow during backwashing lifts and fluidises the media, allowing the collected debris to be washed to drain.

Reaction media: A calcite / dolomite blend containing alkaline materials. This media dissolves until an equilibrium pH is established (9.0 – 10.5). The process is self-regulating and will always strive to maintain this level, even where system water exchange occurs.

pH elevation accomplishes a number of tasks:

- Passivation (corrosion inhibition) of internal metal surfaces
- Precipitates dissolved iron from solution
- Counteracts the acidic nature of glycol products
- Stabilises the glycol content
- Reduces bacterial growth

Base layers: A gravel bed to prevent downward migration of reaction media. A final layer of glass beads to maintain free water flow around the strainer.

Water exits the vessel via the central pipe, returning to the system via the flow regulator.

The 'Service Flow Switch' on the unit outlet will generate an alarm if flow is lost.

Air separation:

The EnwaMatic unit will collect and expel any excess air entering the sidestream flow. In addition, air will be expelled and drawn in during the backwash process.

To prevent discharge of water / glycol vapour to air, the air eliminator is supplied with 6mm air hose. This can be piped to floor or drain, or piped into the breaktank via a M16 cable gland.

Automated backwash:

To remove collected debris and maintain a fluid media bed, the units will backwash at regular intervals.

Backwashing is a reversal of the direction of flow, created by operation of the 3 way valves (A&B). The unit is isolated from the main system during this process, and backwashing is carried out using mains water (MCW).

The units have a pressure independent flow regulator on the MCW inlet, to ensure excessive flow rates cannot lift filter media into the backwash output. Additional regulation is provided on the breaktank outlet.

The units will backwash for 5-10 minutes. Observation of the flow to drain will show a transition from clear, to orange / brown and back to clear. The removed debris will be predominantly fine iron oxides, and does not present a discharge or drainage issue.

Backwash flow rate: 35 - 45 l/min

The backwash interval is set by calendar date and time.

The default settings will backwash on the 1st and 15th of the month. This will be reviewed at commissioning and an appropriate regime for the water quality selected.

Default time: 01.00 am.

BAF (Backwash Anti-Freeze): Glycol recovery system

Isolation of the vessel and backwashing with MCW reduces any loss of system water and is suitable for the majority of closed systems. However, the volume of water trapped within the vessel at the start of the process is discharged to drain, which is not suitable where glycol is present.

The BAF system prevents this loss by transferring the vessel contents into the main system before backwashing commences. This temporary storage uses the system's expansion capacity, so consideration should be given to the available volume of expansion vessels.

To prevent the creation of a ‘dead leg’ in the BAF assembly during normal operation and to provide priming for the pump, a proportion of the service flow is diverted through the BAF pump.

EnwaMatic® EM BAF

BAF automated backwash sequence

1) Backwashing activated by date / time, or manual activation (PLC 'BACKWASH')
2) Unit isolation Valve C closes. Green light on panel goes out.
3) BAF pump starts – pumping the vessel contents into the glycol system.
   Flow rate regulated to allow the expansion system to respond gradually.
   Small increase is system pressure during transfer of vessel contents.
4) Valve B opens to drain, to allow more air flow into the vessel during pump out.
5) BAF pump continues until air reaches the BAF flow switch. Vessel empty.
6) Valve A moves to backwash position. Outlet Valve E closes.
7) Orange light on panel.
8) Backwash commences. Duration: 5 - 10 minutes.
9) Valve B returns to service position, bringing the vessel to fill water pressure.
10) Valve D moves to BAF drain position.
11) Valve A returns to service position.
.
12) BAF pump starts – transferring the vessel contents to drain.
13) Valve B opens to drain, allowing more air flow into the vessel.
14) BAF pumps continues until air reaches the BAF flow switch. Vessel empty.
15) Valve B returns to service position.
.
16) Valve D moves to service position.
17) Valve C opens partially, allowing a slow refill of the vessel from the glycol circuit.
    System pressure / expansion volume returns to original levels.
18) A time delay allows all air to be expelled and the vessel to reach system pressure.
19) Outlet Valve E opens.
20) Unit returns to service.