



Dialog⁺ SW 9.xx

HDF Online

Technical Support International

B. Braun Avitum AG

Service Training Documentation – no update service. This document may not be copied, partly or whole, or made be accessible to third parties without our permission and remains the property of B. Braun Avitum AG with all rights.

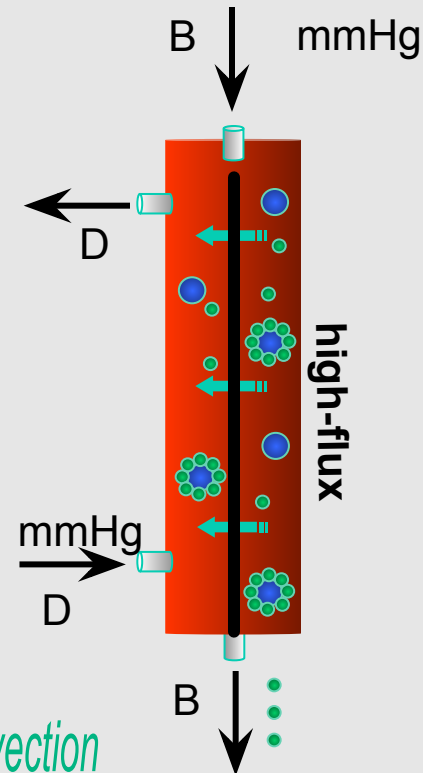
B | BRAUN
SHARING EXPERTISE

What does HDF Online offer?

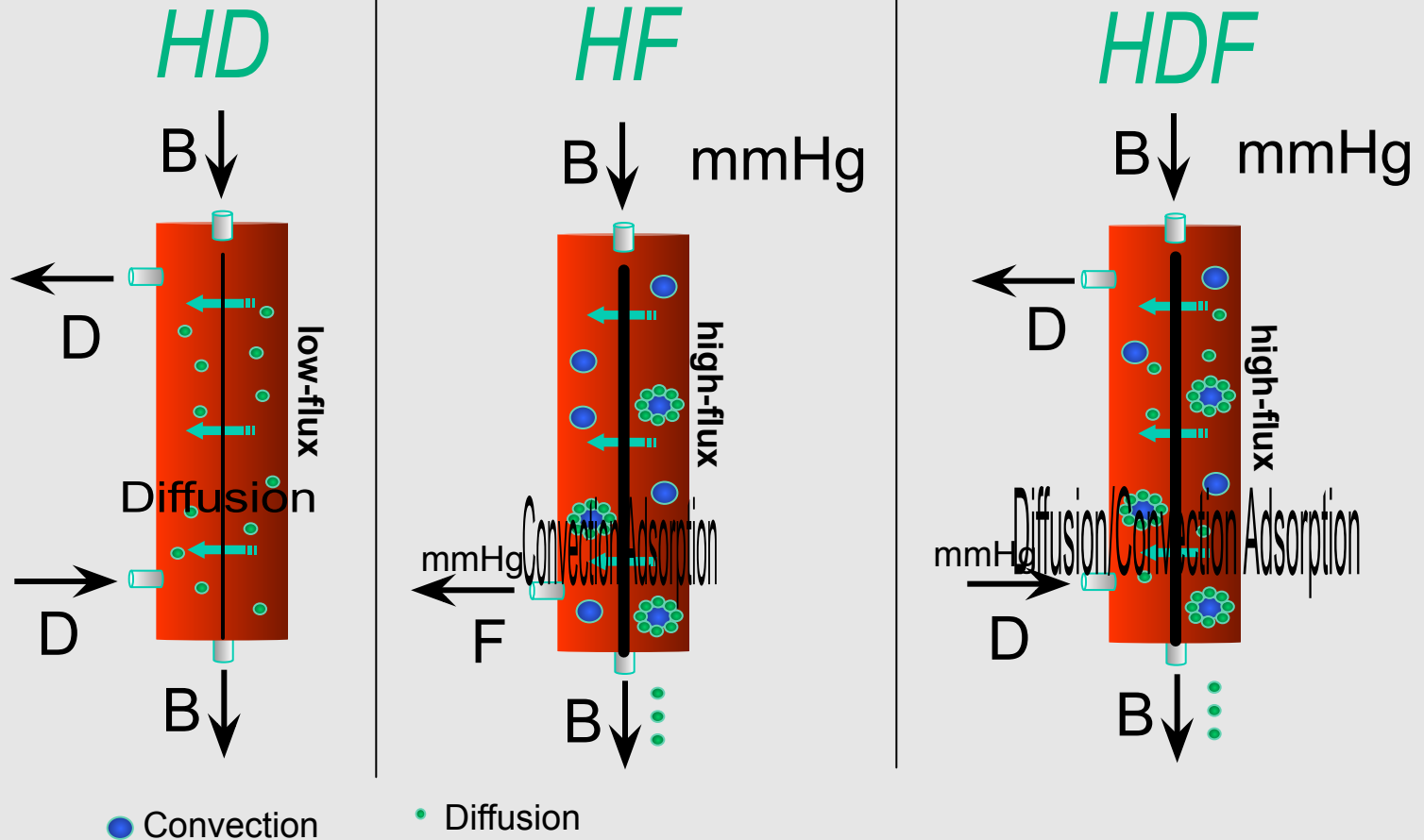
- A safe procedure with a combination of HD and HF.
- High efficiency with diffusion and convection.
- Online production of substitution solution.
- Replacing saline for priming and disconnecting the patient.

Hemodiafiltration

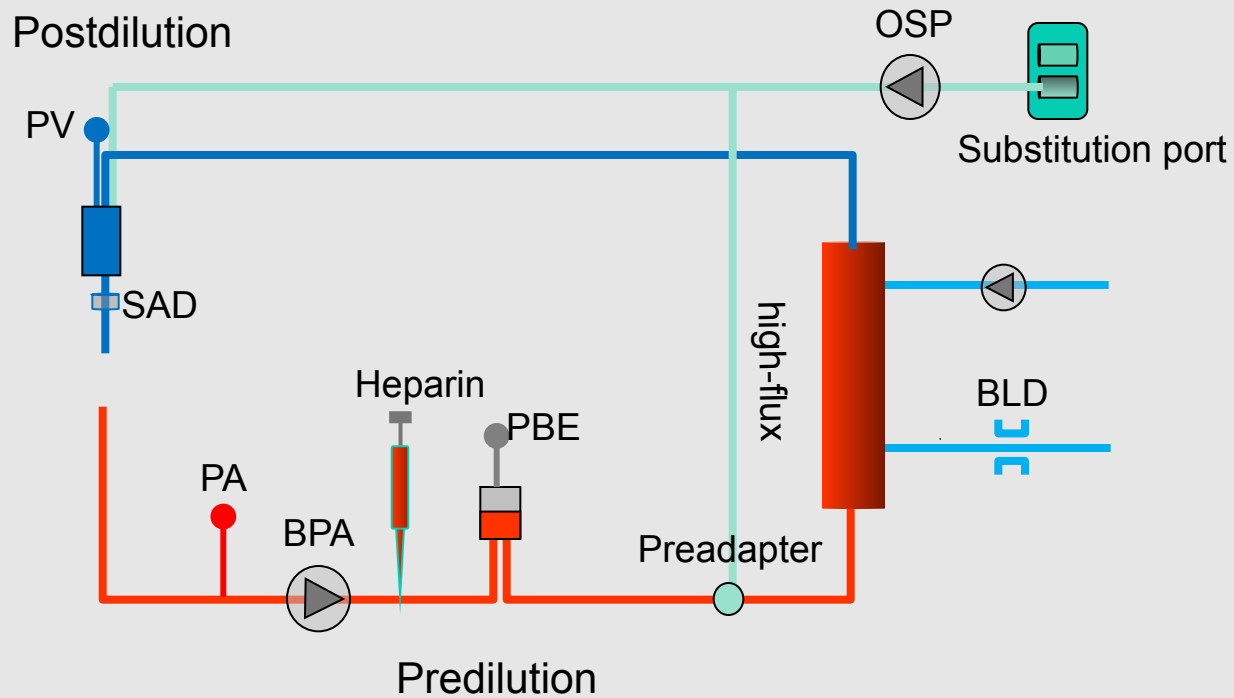
- Combines two dialysis technics, Hemodialysis and Hemofiltration
- High clearance of small molecules through diffusion
- High clearance of middle molecules through convection



Types of Therapies with HDF Online



HDF Online Concept



Microbiological Requirements

	AAMI		Ph. Eur.	
	Bacteria CFU/ml	Pyrogene EU/ml	Bacteria CFU/ml	Pyrogene EU/ml
Permeate	200	5	100	0,25
Dialysing Solution	2000	5	1000 (DafKN)	0,5 (DafKN)
Sterile Solution	10 ⁻⁶	0	0	0,25
Ultrapure Dialysing solution	0,1	0	0	<0,03

AAMI = American Association for the Advancement of Medical Instrumentation

Ph. Eur. = European Pharmacopoe

CFU = Colony Forming Units


EU = Endotoxin Units


HDF Online Icon


HDF Online
Bicarb. Running


Mar 18, 2011 - 08:53 -
CL no conn.
Substitution running


Mode: HDF HF Inf. bolus


Substitution Flow	<input style="width: 80%;" type="text" value="60"/>	[ml/min]	bolus Volume	<input style="width: 80%;" type="text" value="100"/>	[ml]
Substitution Volume	<input style="width: 80%;" type="text" value="14.4"/>	[l]	Total of Inf. volume	<input style="width: 80%;" type="text" value="0"/>	[ml]
Dialysate Flow	<input style="width: 80%;" type="text" value="600"/>	[ml/min]	Connect patient		
Blood Flow	<input style="width: 80%;" type="text" value="250"/>	[ml/min]			
UF/blood Flow ratio	<input style="width: 80%;" type="text" value="27"/>	[%]	Predilution		



Na⁺






MAX
MIN















HELP






Kt/V



HCT


















MIN











B. Braun Avitum AG | DialogP SW9.xx_std_HDF Online_Rev. 1.02_2011-11-21 | Seite 8

HDF-Online Message: “Ratio gross UF rate/blood flow“

The screenshot shows the HDF Online interface for 'Bicarb. Running' mode. The date and time are 'Aug 06, 2011 - 11:51 -'. The status is 'CL no conn.' and 'Substitution running'. The mode is set to 'HDF'. The following parameters are displayed:

Mode:	HDF	HF	Inf. bolus
Substitution Flow	90 [ml/min]	bolus Volume	100 [ml]
Substitution Volume	27.0 [l]	Total of Inf.volume	0 [ml]
Dialysate Flow	600 [ml/min]	Connect patient	
Blood Flow	180 [ml/min]		
UF/blood Flow ratio	54 [%]	Predilution	

A yellow warning bar at the bottom of the interface displays the message: "Ratio gross-UF/bloodflow too low".

- Start therapy in HD Mode
- First reach correct blood flow
- Change to HDF Mode

The screenshot shows the HDF Online interface for 'Bicarb. Running' mode. The date and time are 'Aug 06, 2011 - 12:28 -'. The status is 'CL no conn.' and 'Substitution running'. The mode is set to 'HDF'. The following parameters are displayed:

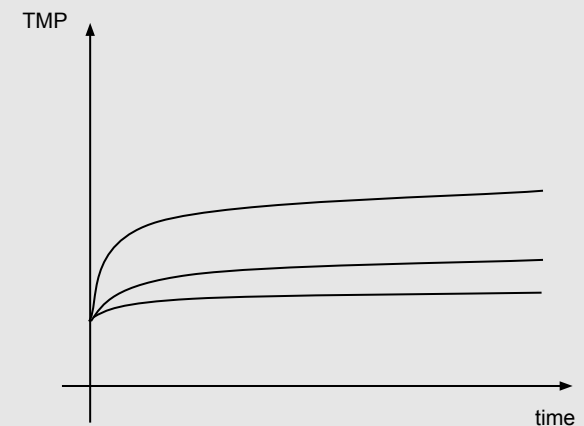
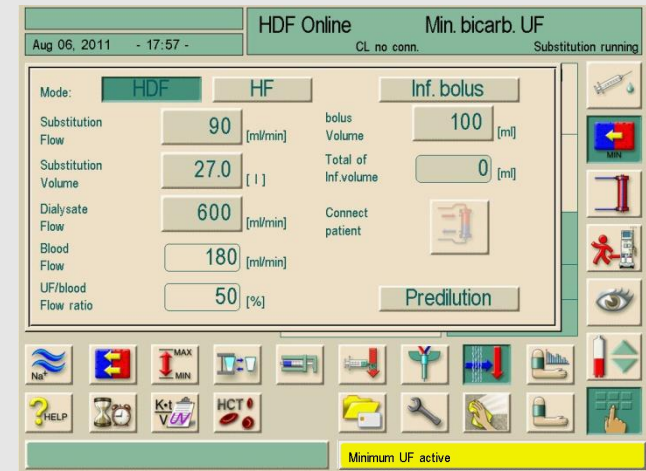
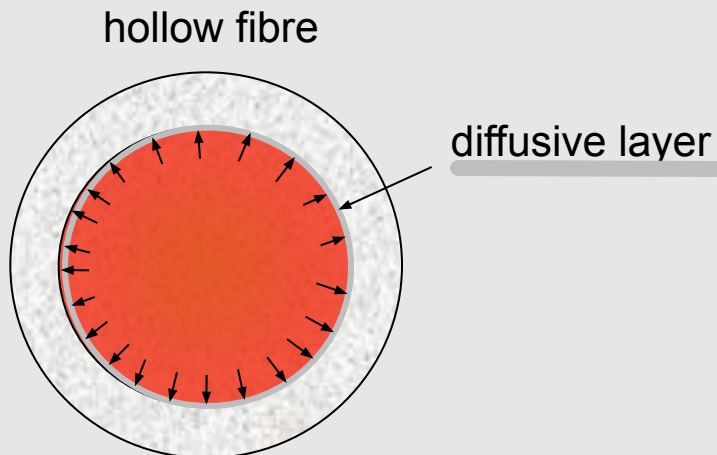
Mode:	HDF	HF	Inf. bolus
Substitution Flow	90 [ml/min]	bolus Volume	100 [ml]
Substitution Volume	27.0 [l]	Total of Inf.volume	0 [ml]
Dialysate Flow	600 [ml/min]	Connect patient	
Blood Flow	350 [ml/min]		
UF/blood Flow ratio	28 [%]	Predilution	

A yellow warning bar at the bottom of the interface displays the message: "Ratio gross-UF/bloodflow too low".

- Suppresses platelet activation
- Lowers protein adsorption
- Reduces hemolysis and clotting

Increase of TMP at start of HDF dialysis

- A high TMP in the beginning of therapy causes proteins to block the pores
- The efficiency of the therapy is reduced
- Blocking of the pores reduces the surface area
- Even in UF Min the machine has a high Ultrafiltration



HDF-Online Message: “Ratio gross UF rate/blood flow“

Example for a patient with 81 kg

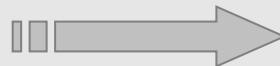
- In postdilution the ratio of total UF/blood flow can be max. 25-30%
- In postdilution 30-40 L substitution volume
total substitution volume 1/3 of patient's body weight
- In predilution 70-100 L substitution volume

Example for post-dilution:

body weight 81 kg
weight loss 3 kg
treatment time 5 h



blood flow 350 ml/min



30% of 81 = 27 l
27 l + 3 l weight loss = 30 l
30 l : 5 h = 6 l/h
6 l/h : 60 min = 100 ml/min

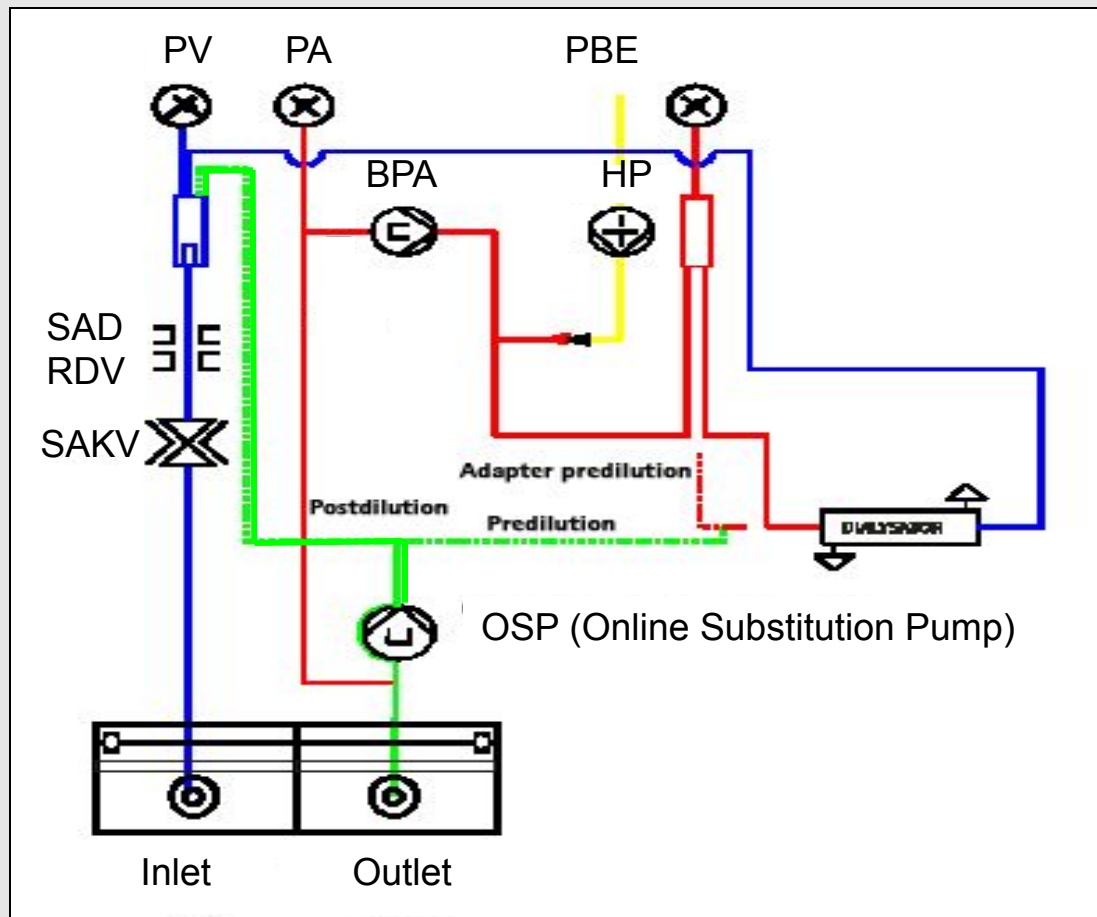
Substitution volume	27 l/h
UF rate	6 l/h (100 ml/min)
nett UF	30 l
total UF	3 l

Hardware Components

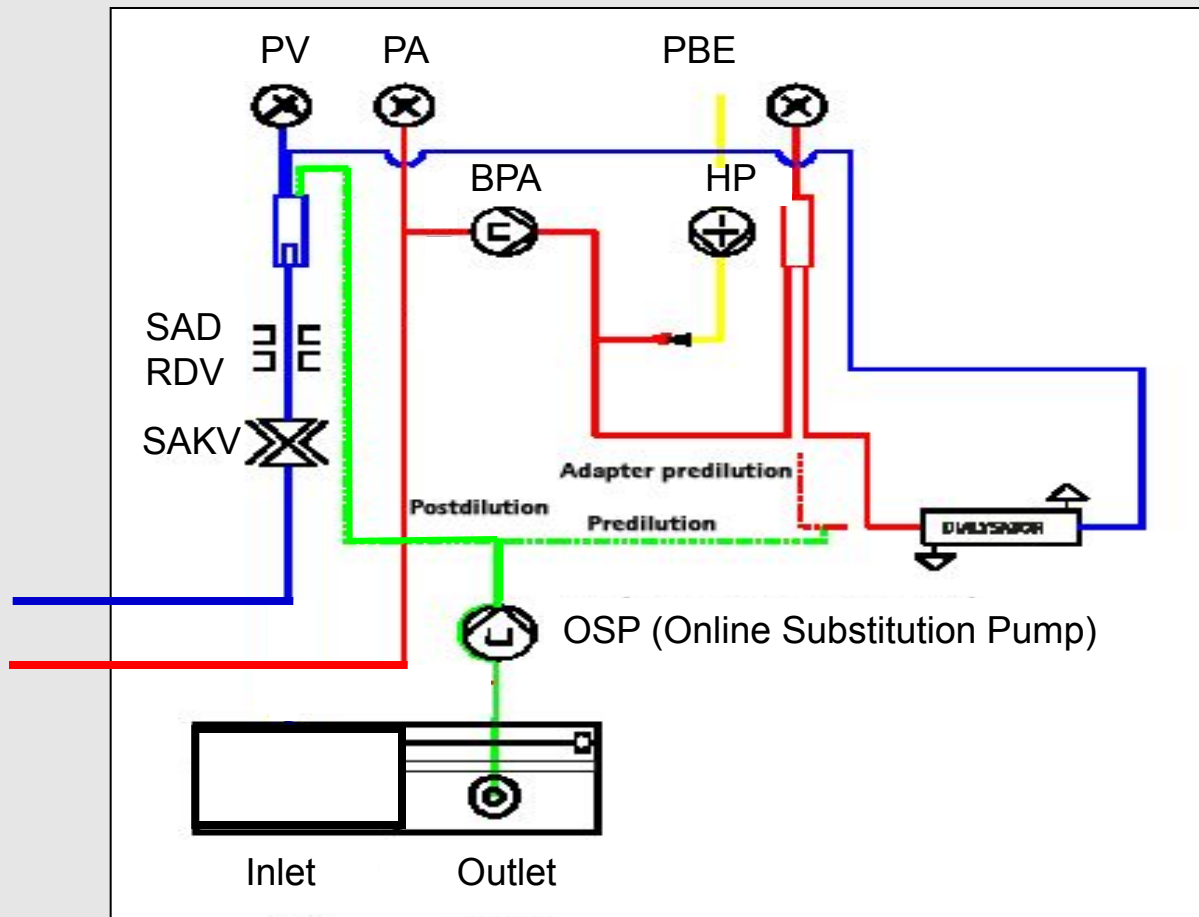
- Substitution ports for infusing of the substitution fluid pre- or postdilution
- Automatic priming of the tubing set with substitution fluid
- 2 DF filters to ensure clean substitution fluid
- replaceable every 150 treatments or 900 hours



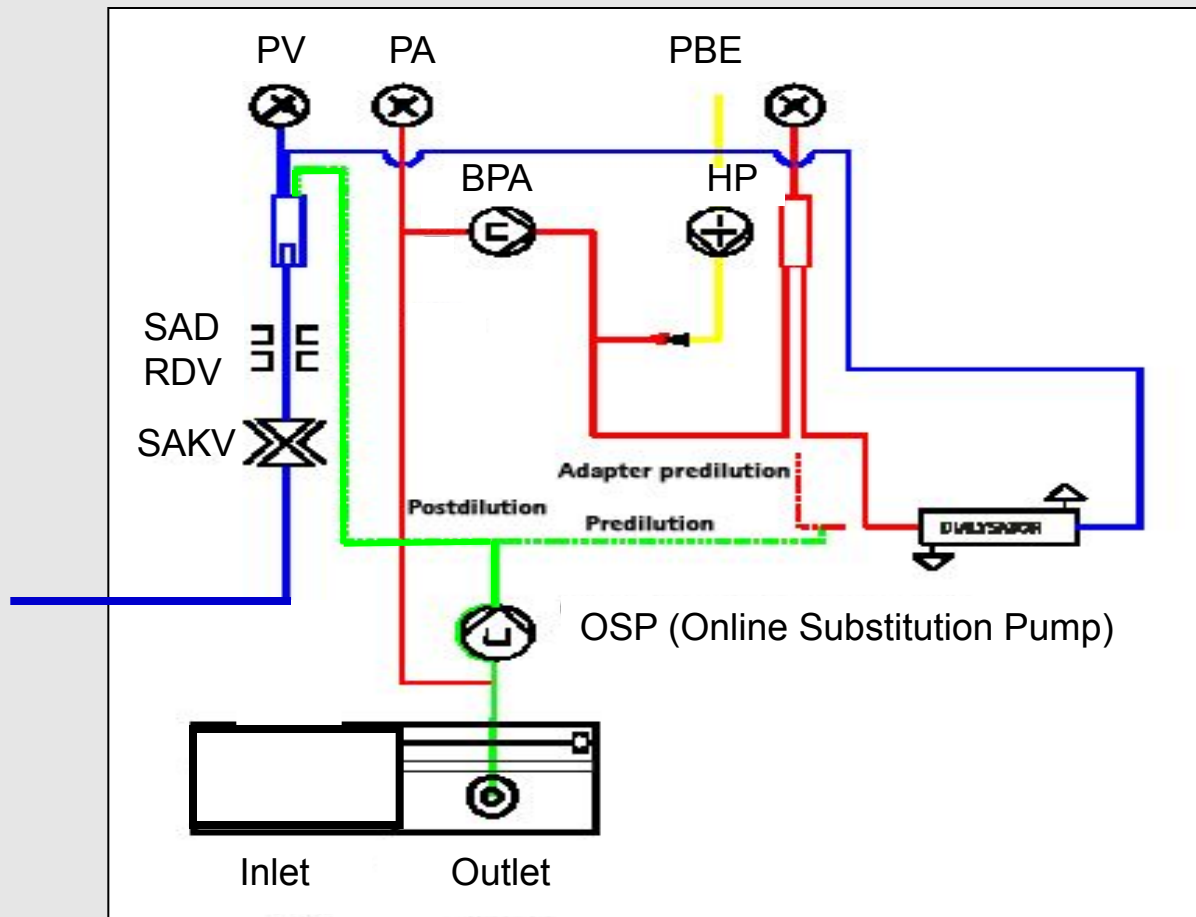
HDF Online – Blood Side Preparation



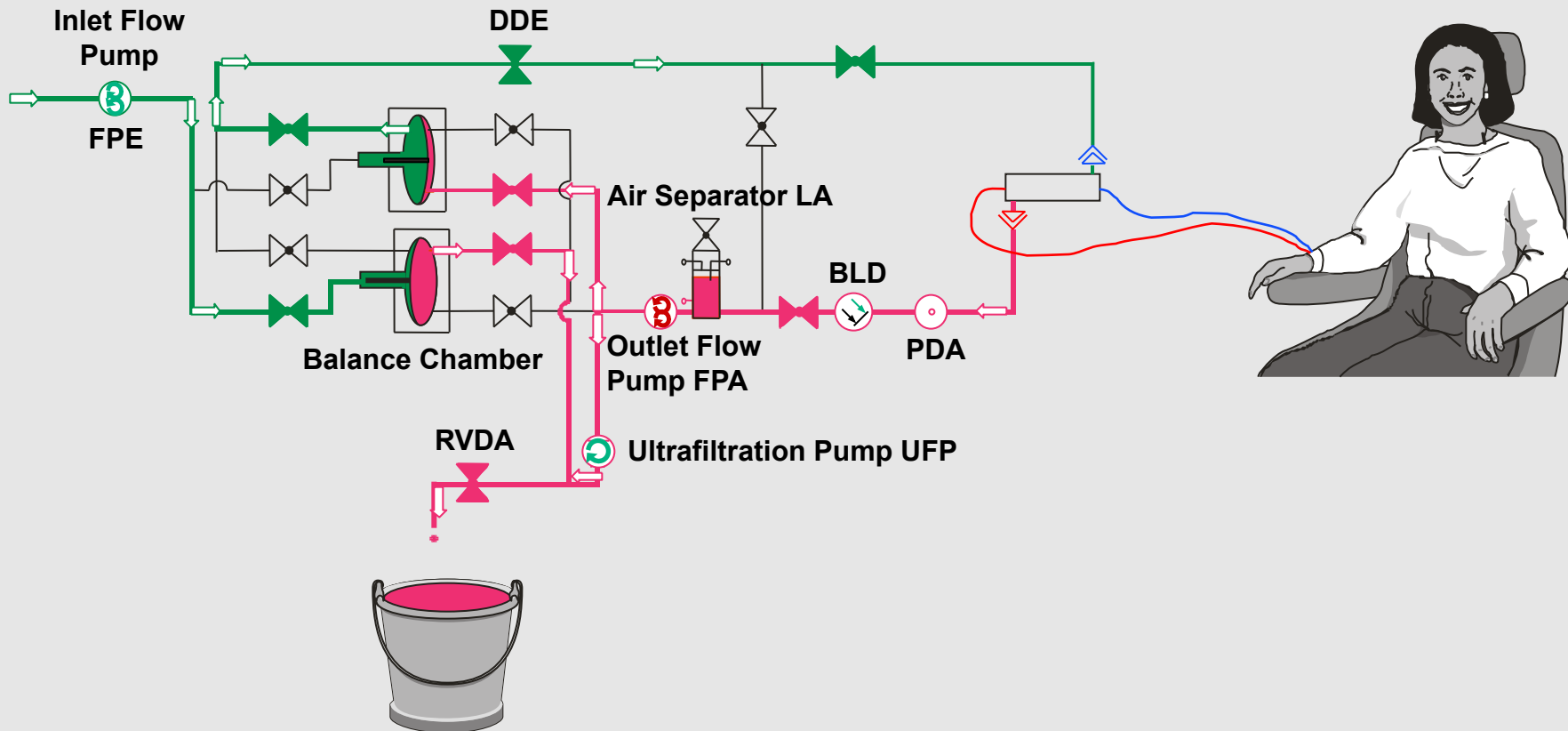
HDF Online Therapy



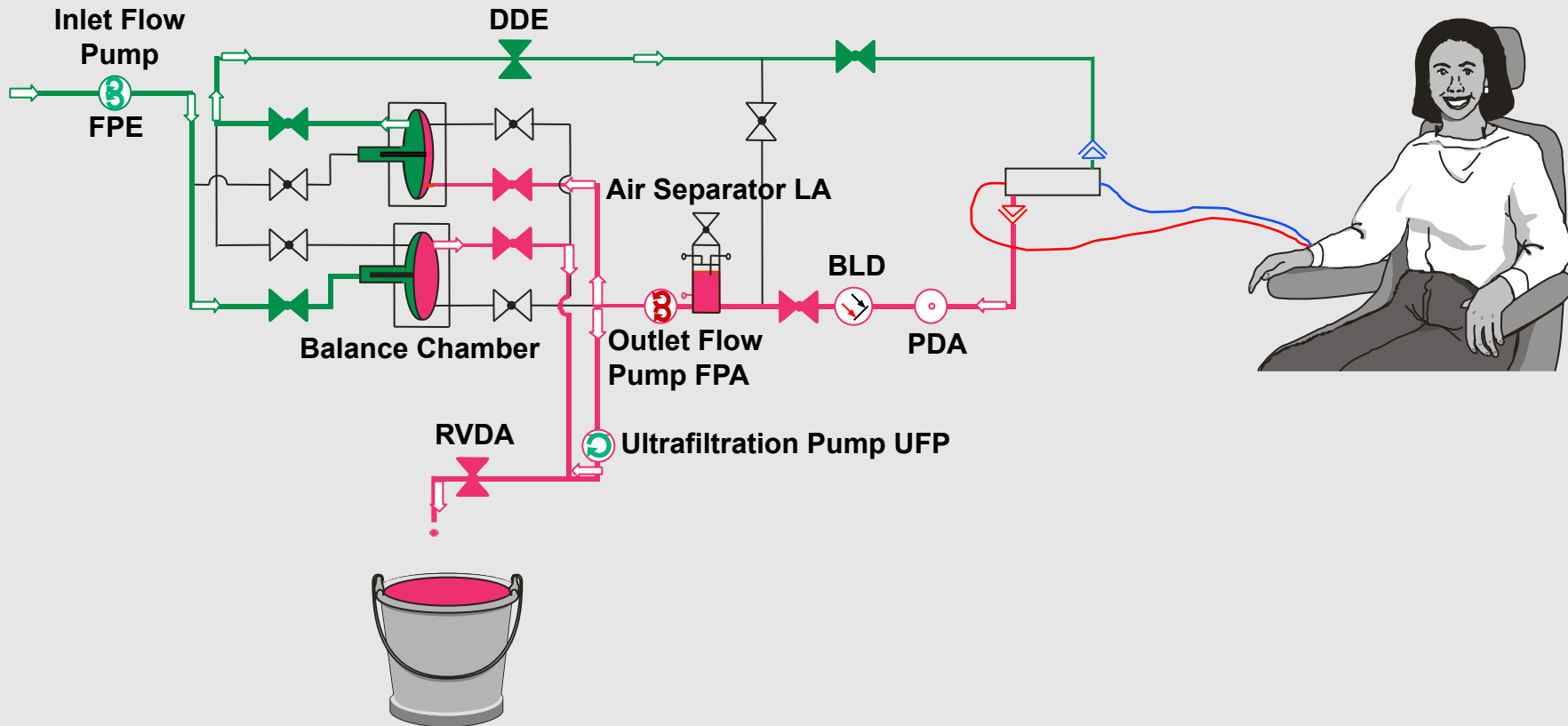
HDF Online Reinfusion



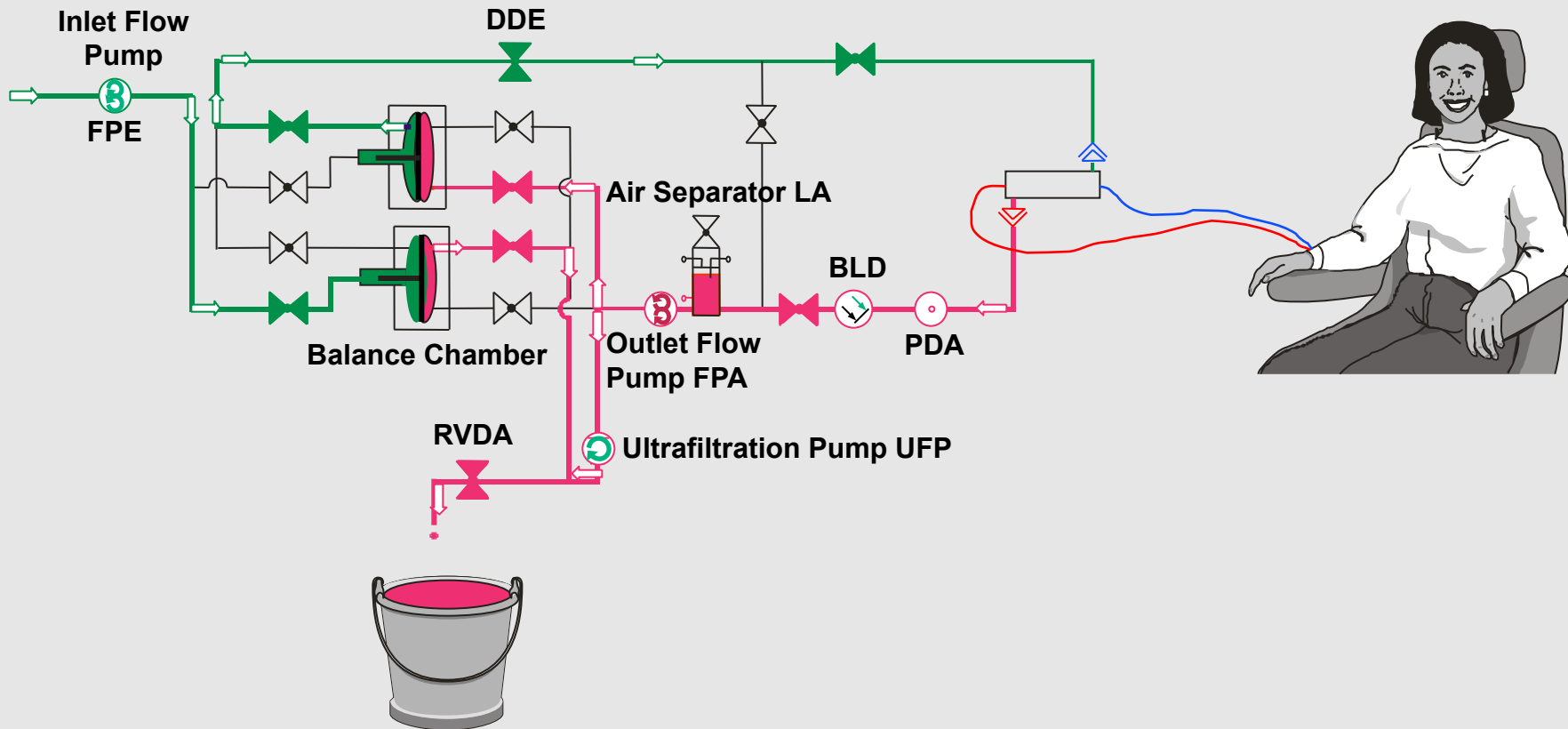
Balance Chamber Principle Phase 1



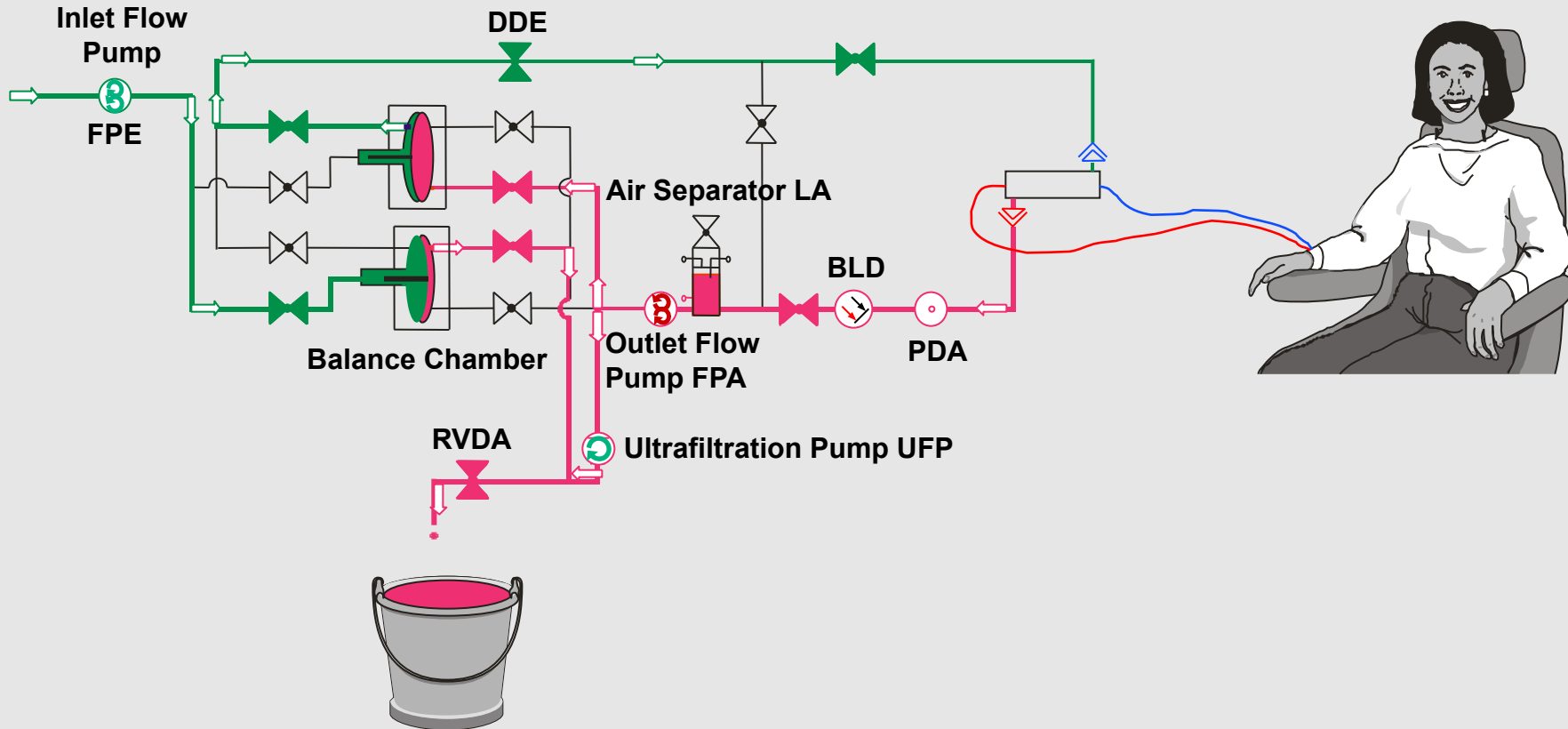
Balance Chamber Principle Phase 1



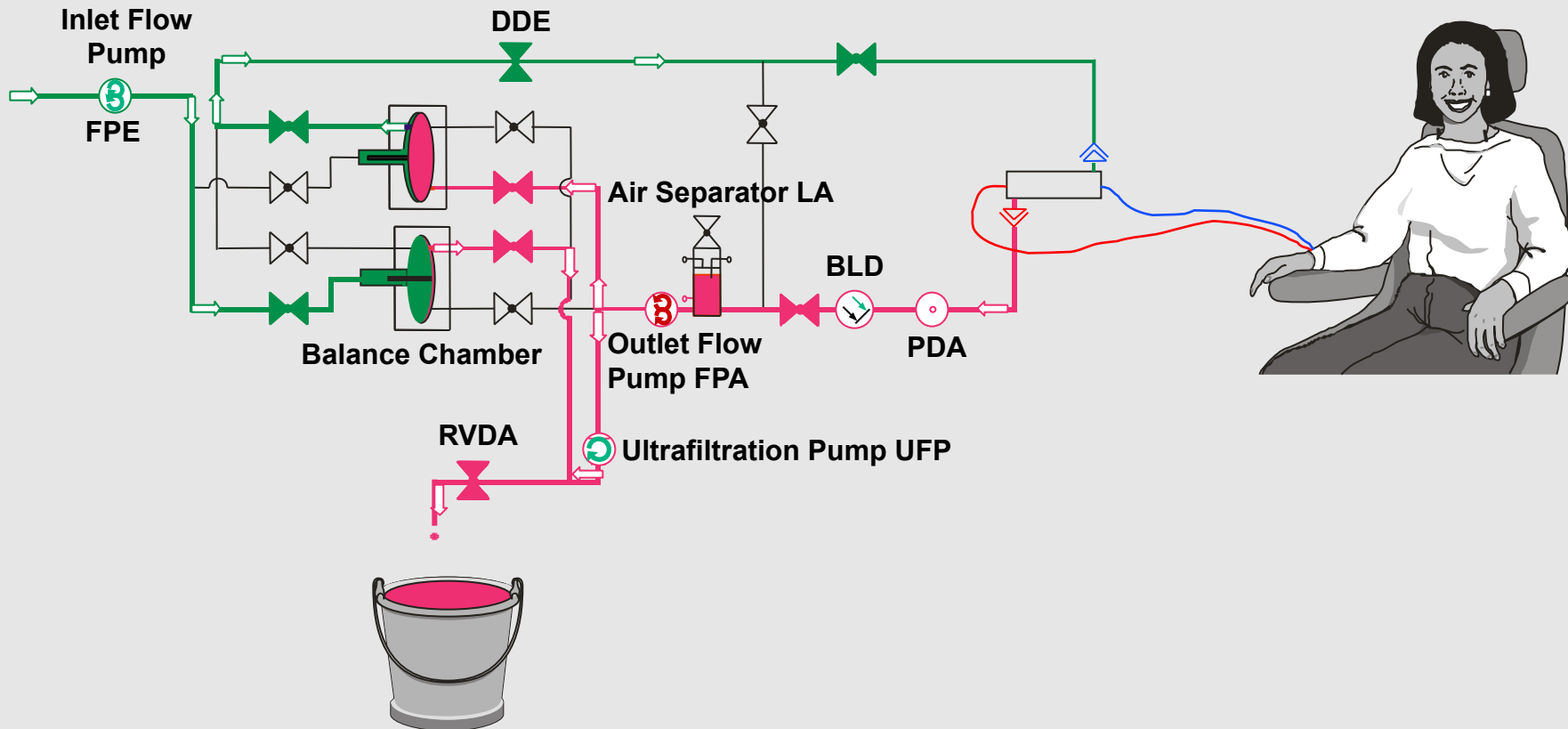
Balance Chamber Principle Phase 1



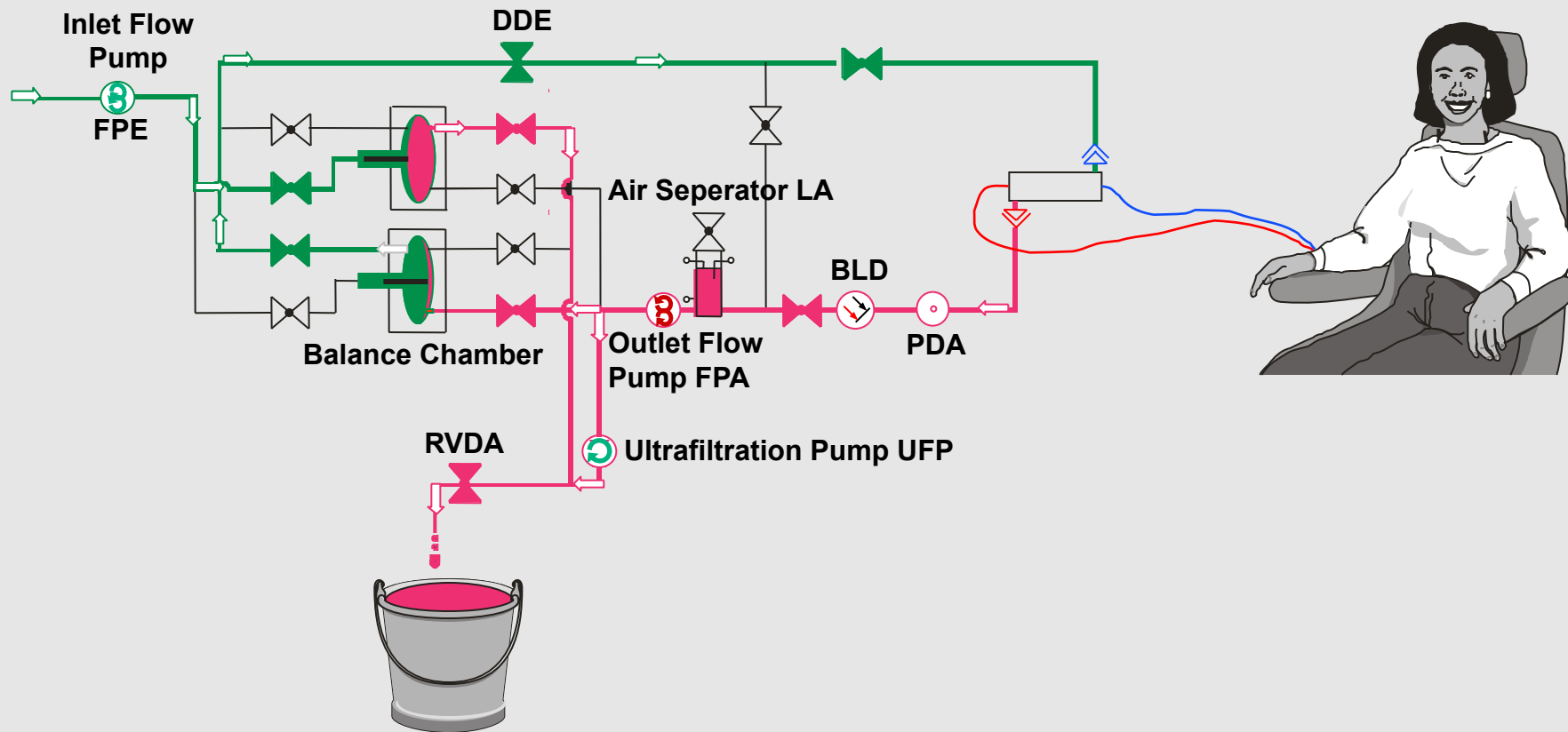
Balance Chamber Principle Phase 1



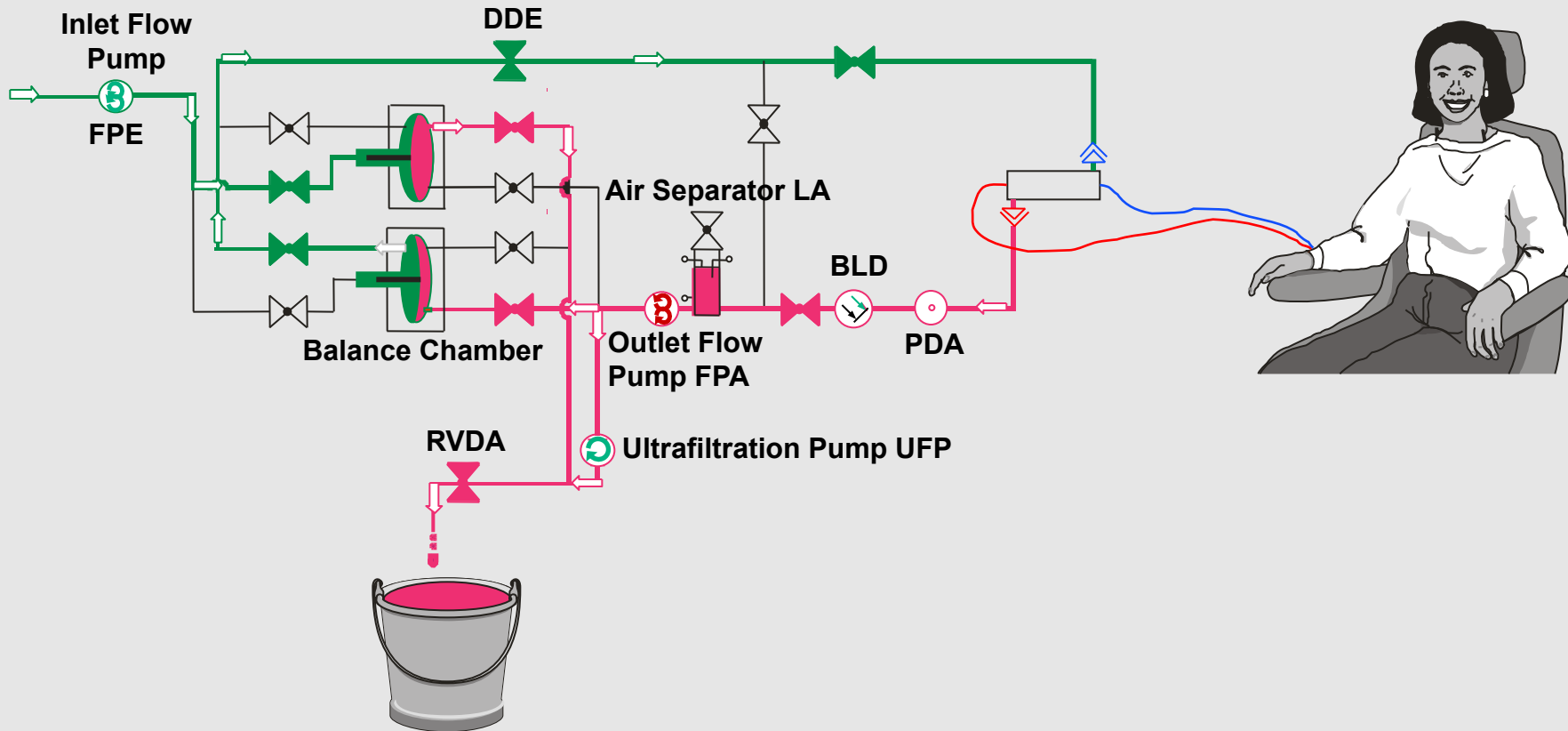
Balance Chamber Principle Phase 1



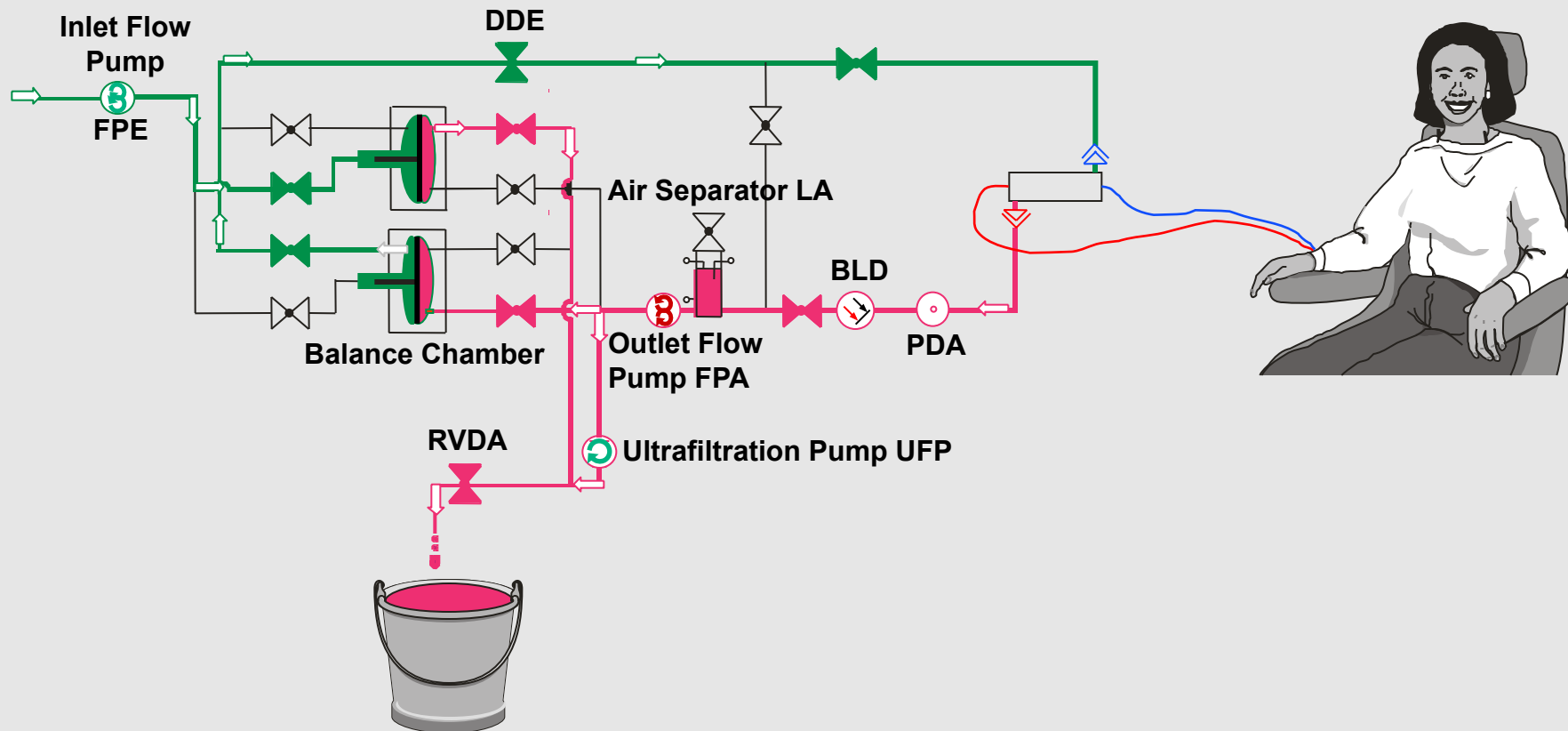
Balance Chamber Principle Phase 2



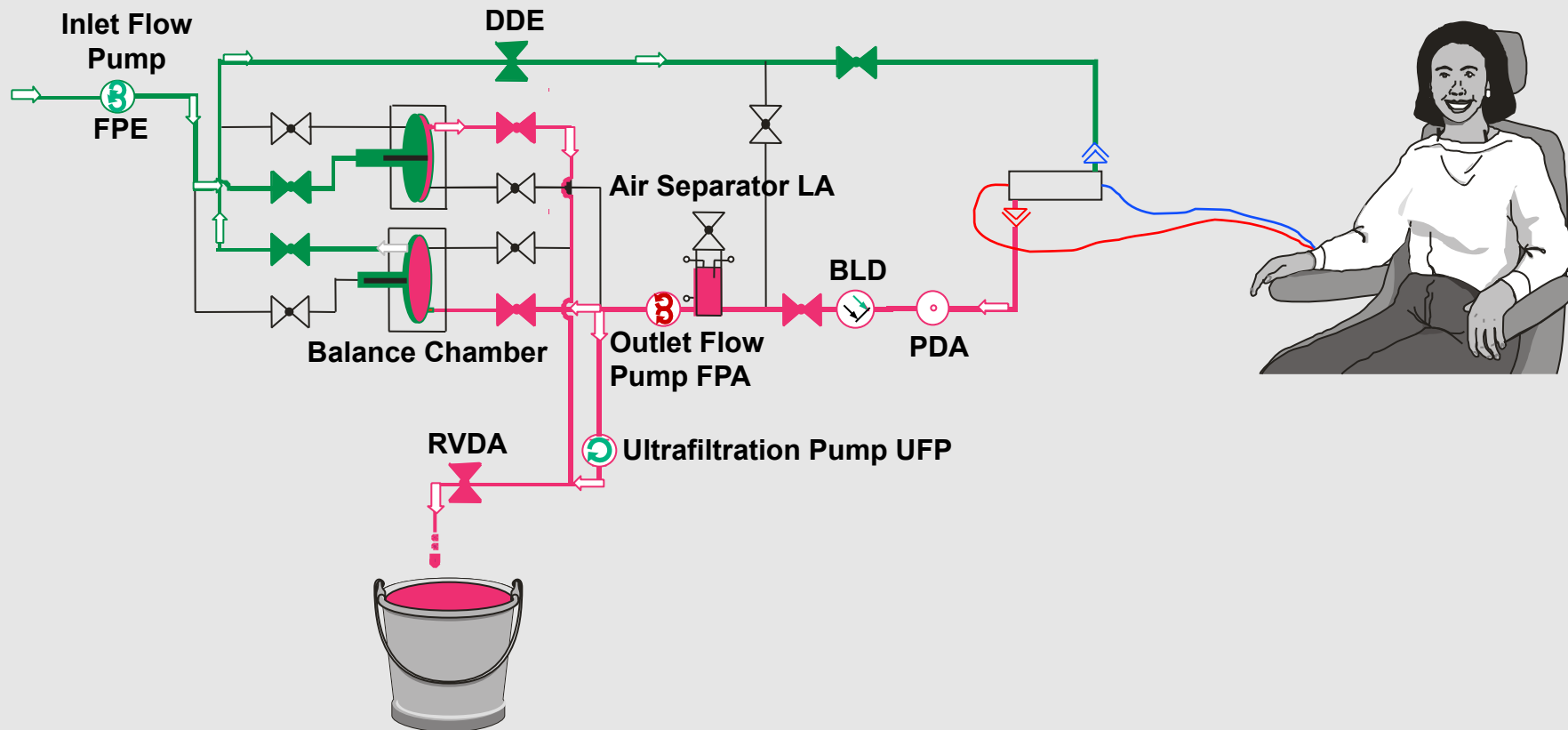
Balance Chamber Principle Phase 2



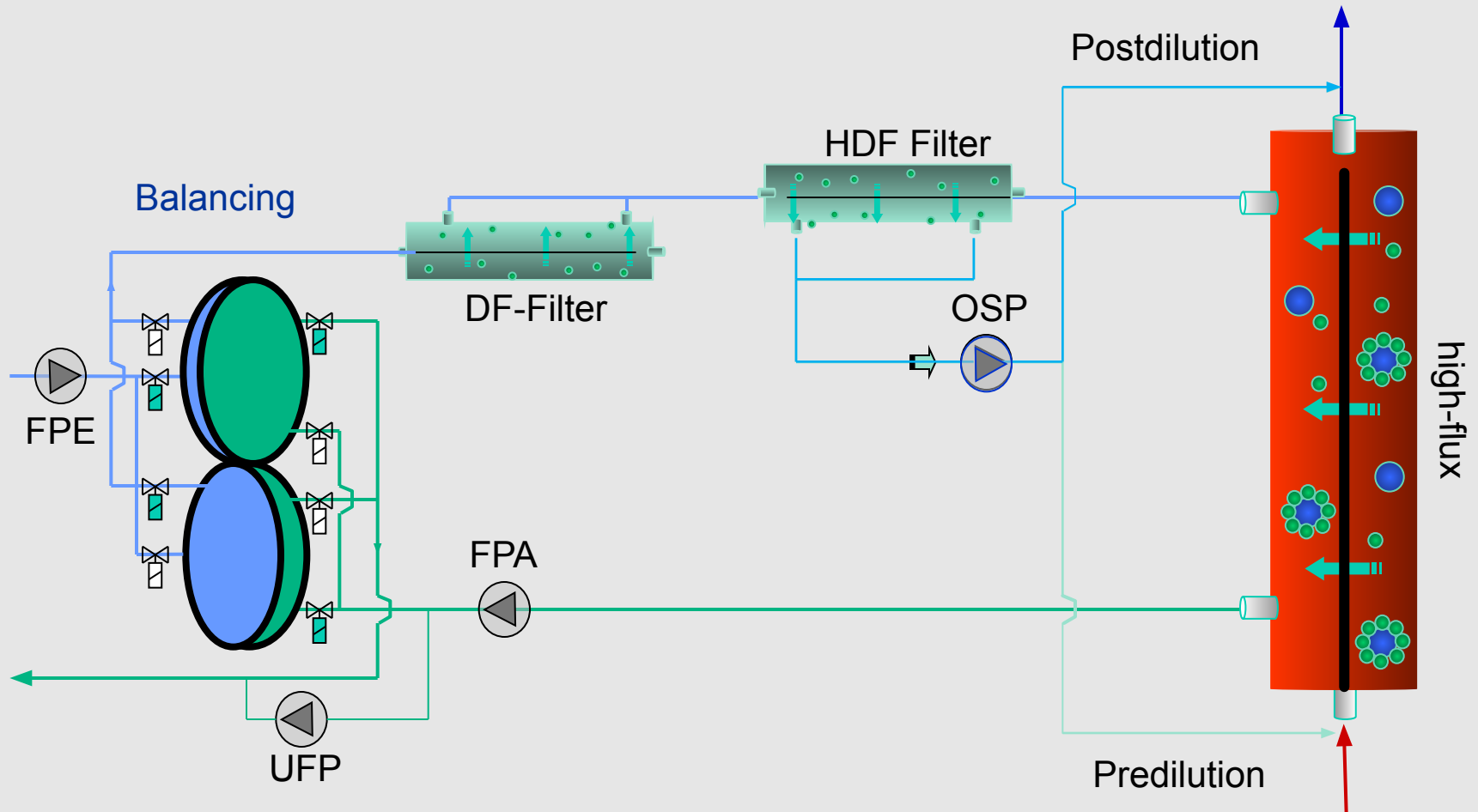
Balance Chamber Principle Phase 2



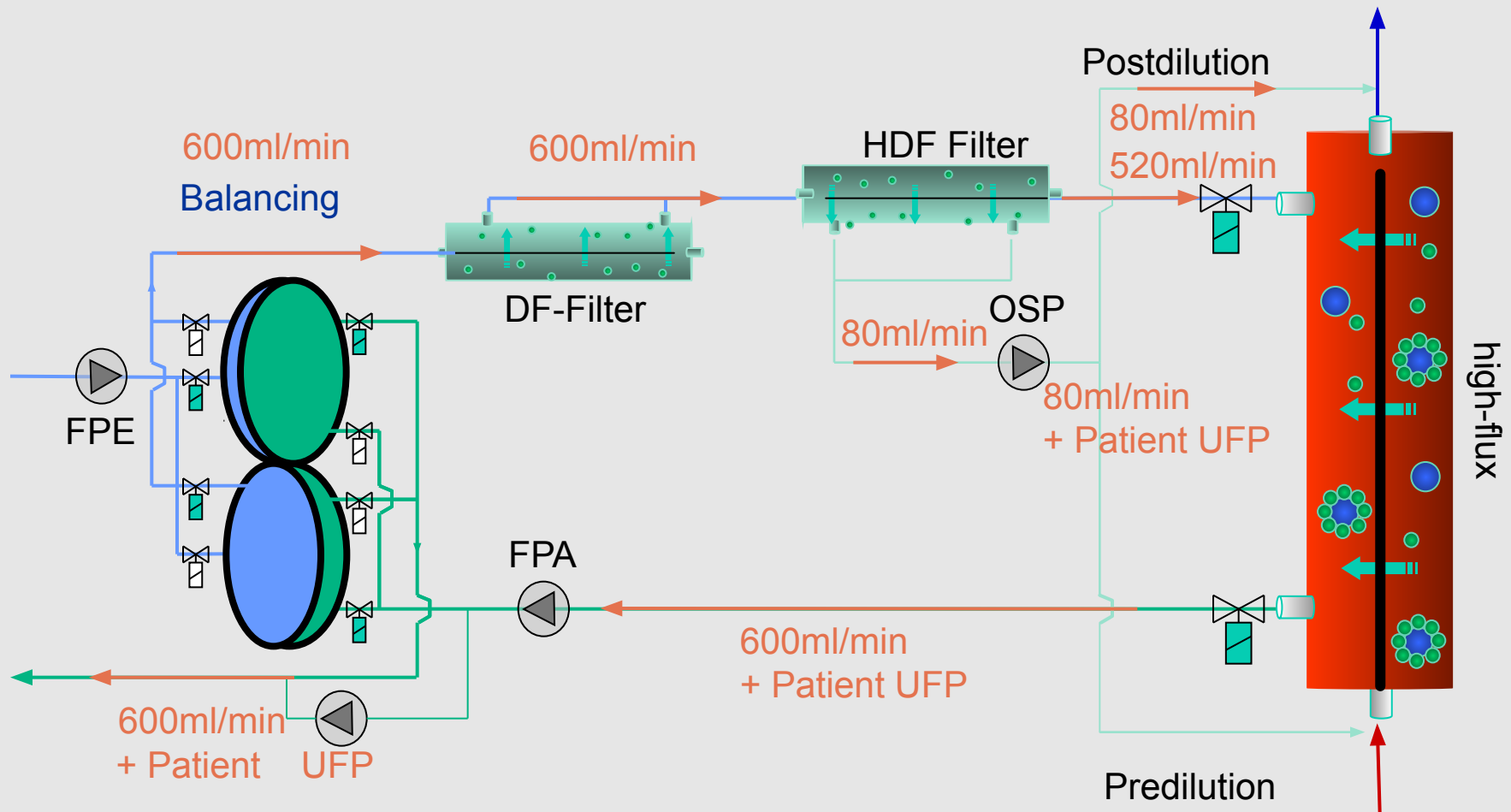
Balance Chamber Principle Phase 2



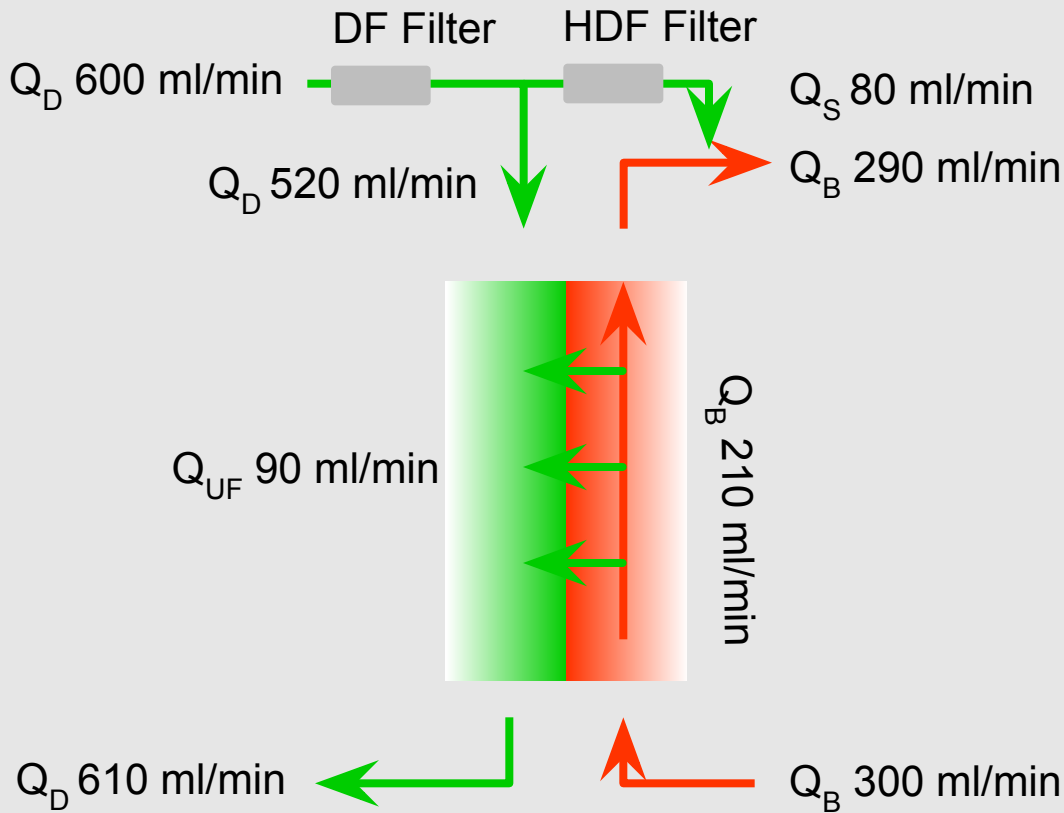
Producing Substitution Fluid



HDF Online Balancing Chamber



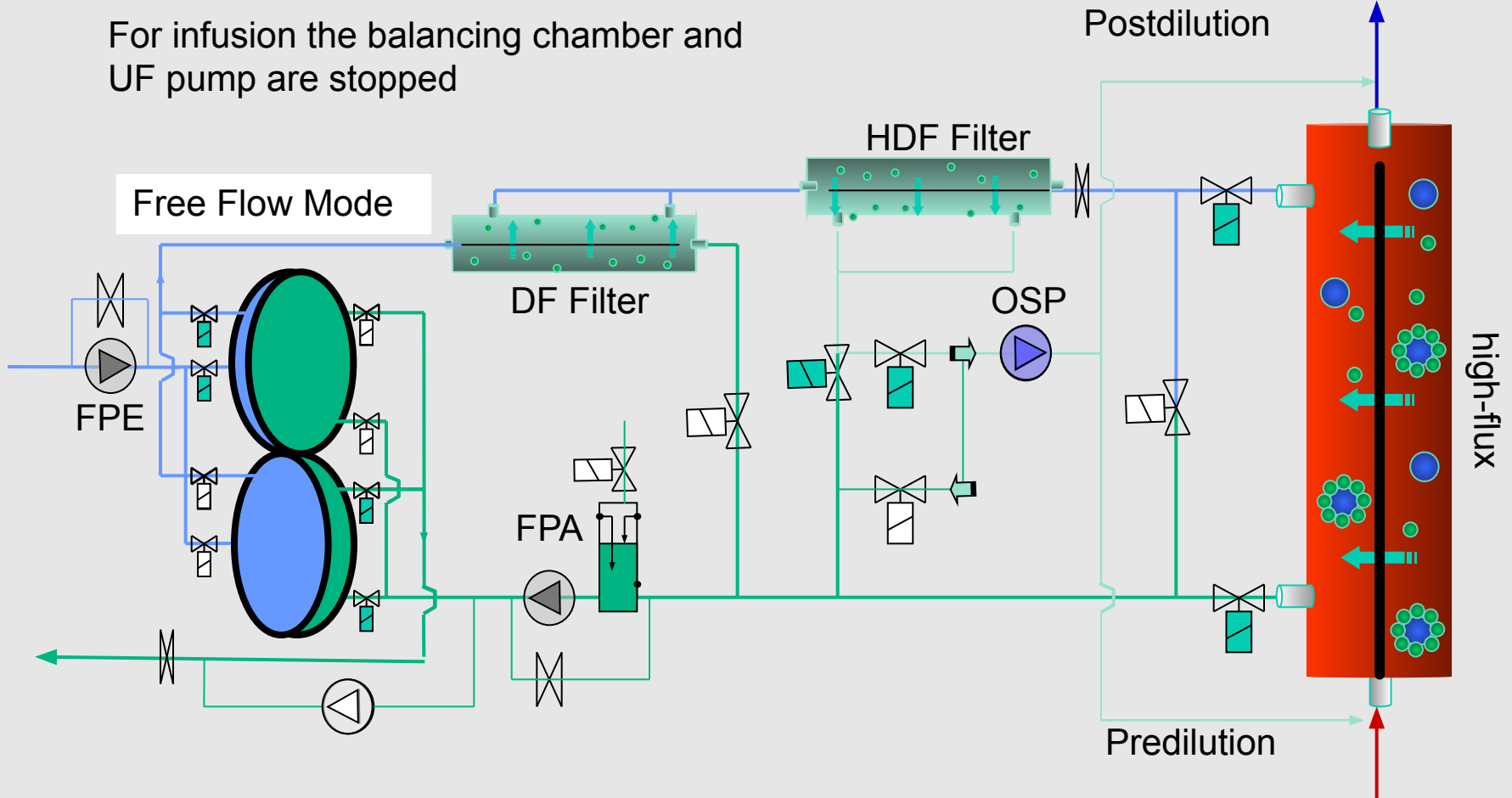
HDF Online – Dialysate Distribution in the Filter



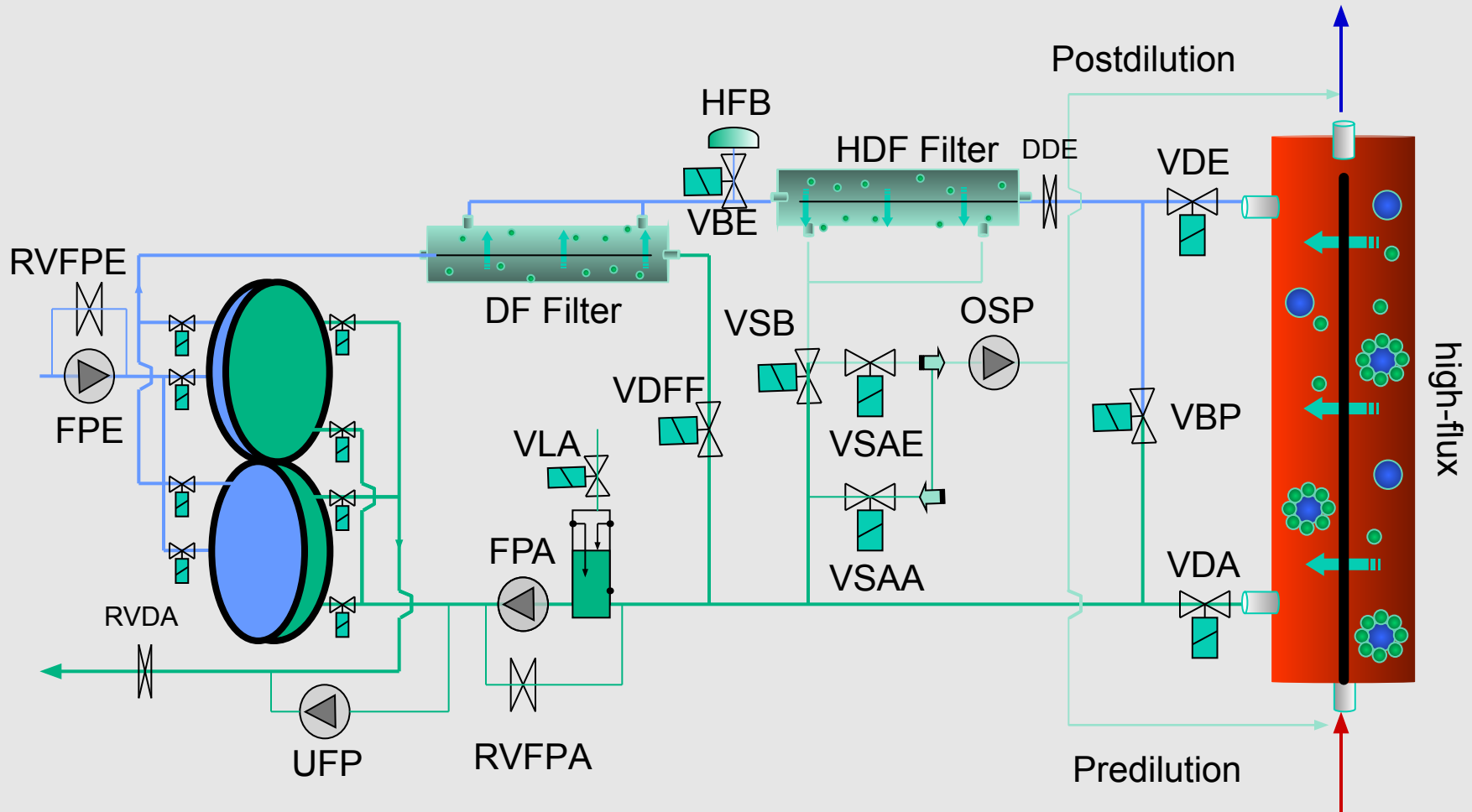
Infusion Bolus – Patient Connection and Disconnection



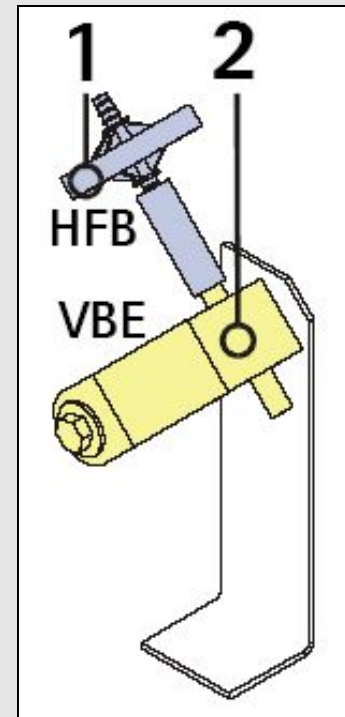
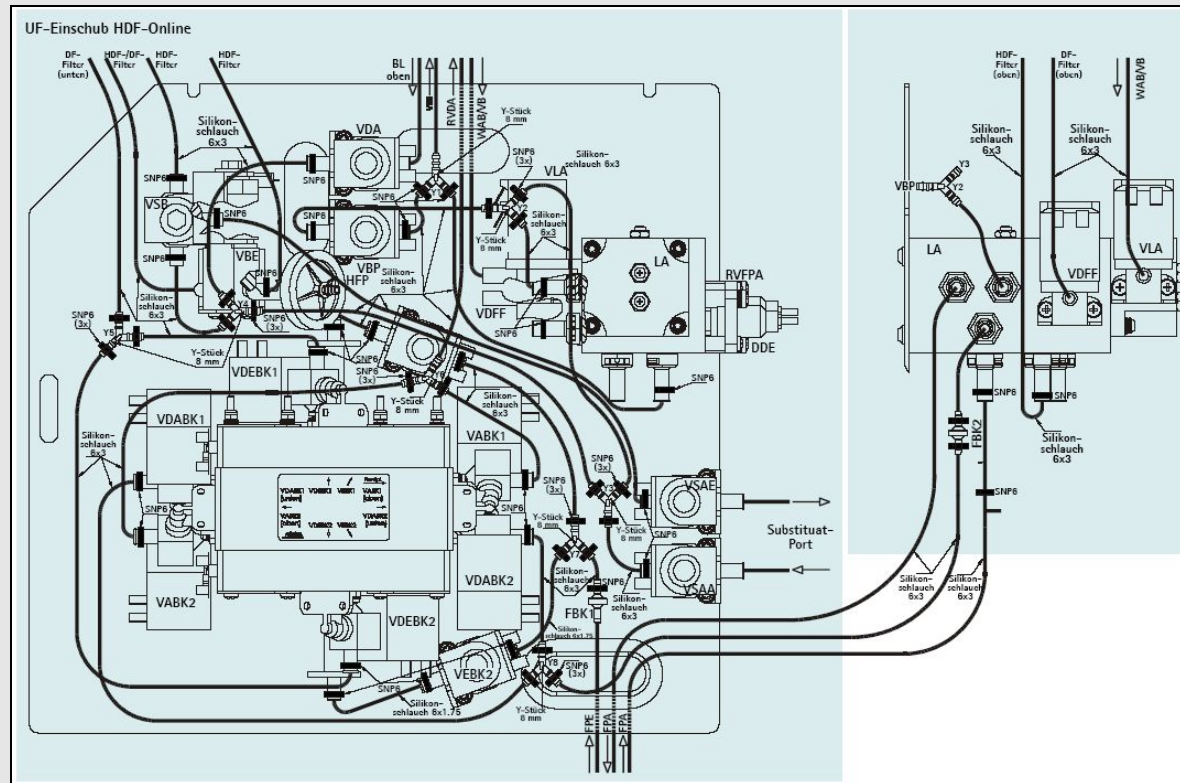
For infusion the balancing chamber and UF pump are stopped



HDF Online – Hydraulics

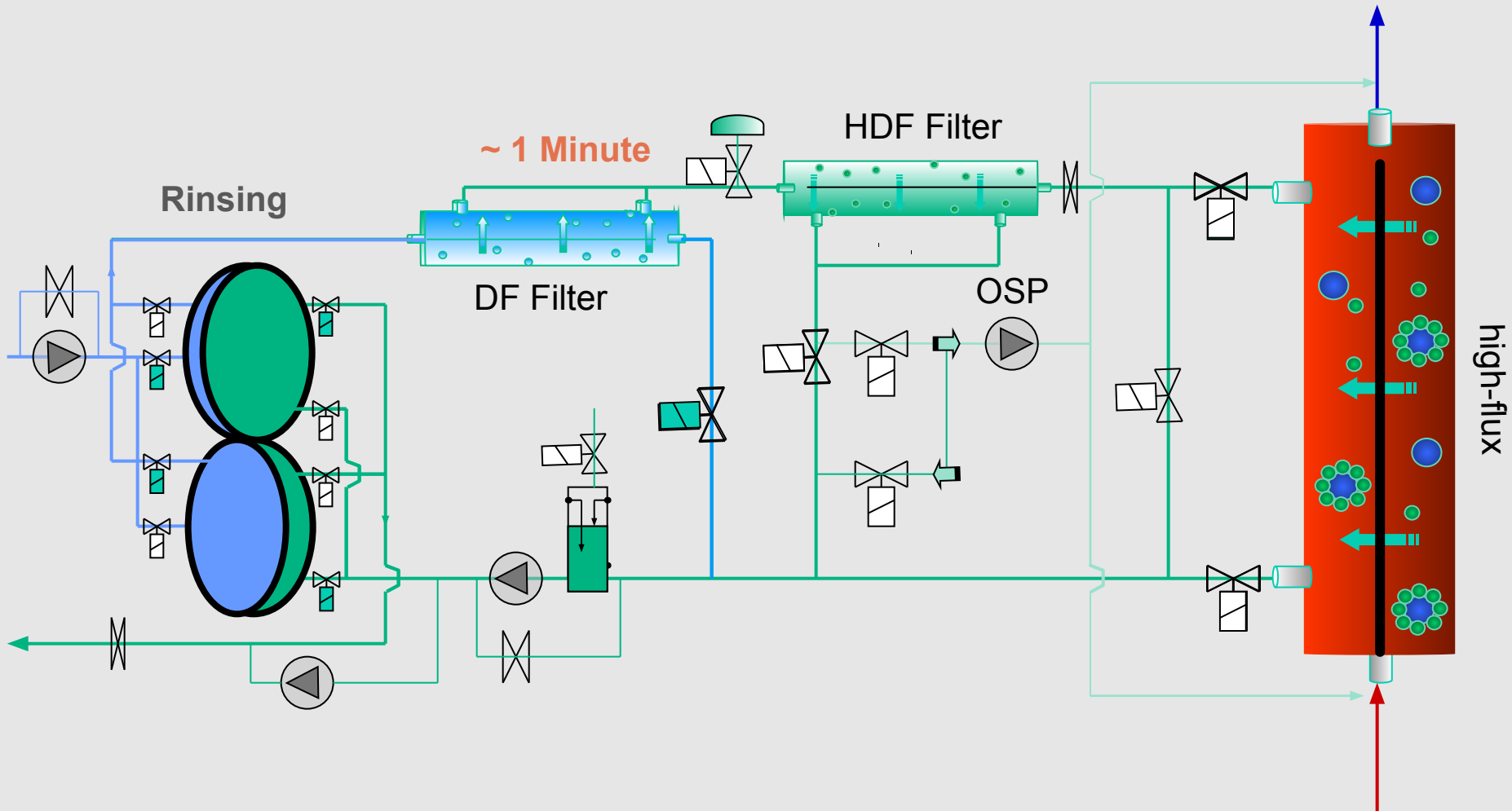


HDF Online – Hydraulics

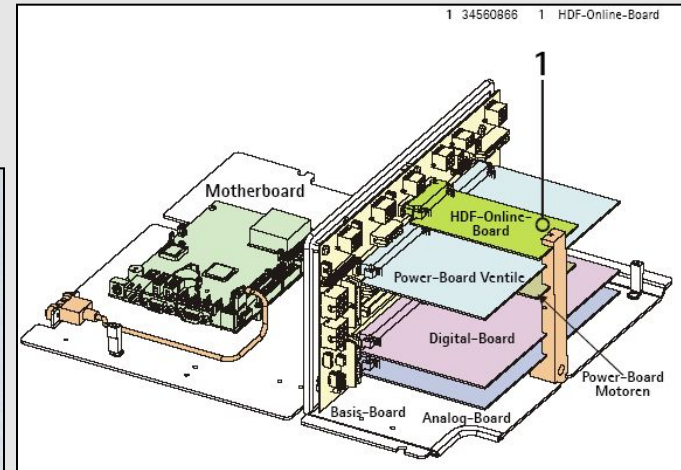
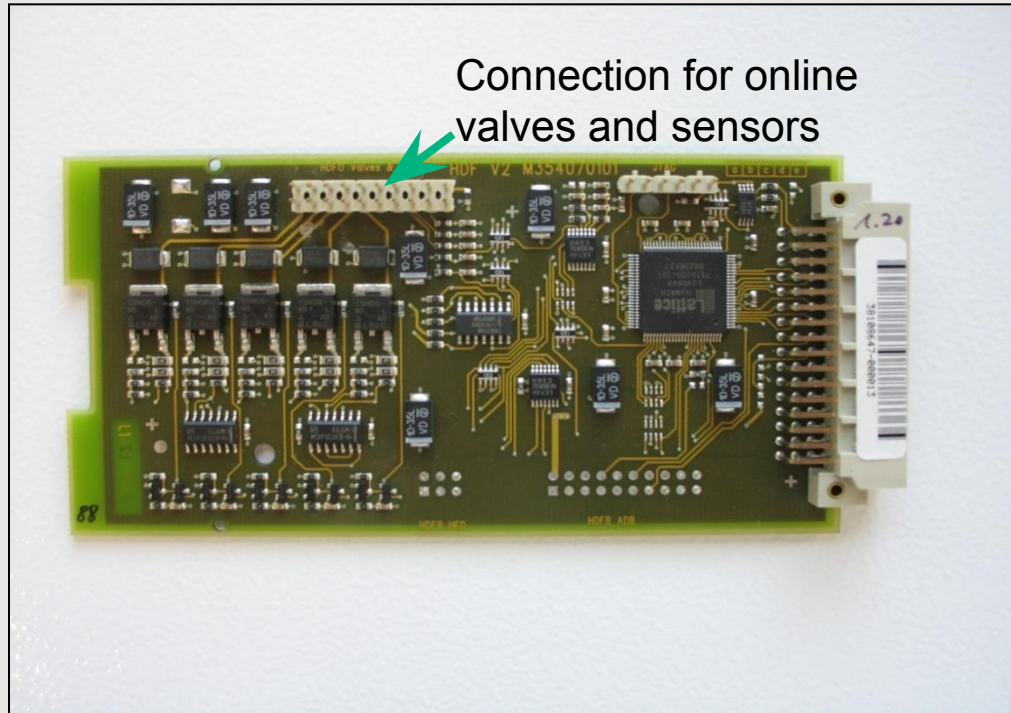


1 Hydrophobe filter with adapter
2 Valve 3/2 way

HDF Online – Rinsing after a DF Problem



HDF Online – Electronics



Tests in TSM

DIALOG TSM MODE

Aug 24, 2011 - 09 36 -

LL Manual Test

Test 1.25 HDF-Online Valves and Coupling Detectors

	VBE	VDF	VSB	VSAE	VSAA	Detector	Actual Status
Actual Status Supervisor						PSAUSS	OPEN
						PSABFS	OPEN
Desired Setting						FEDFFS	OPEN
Common Setting						FEHDFS	OPEN

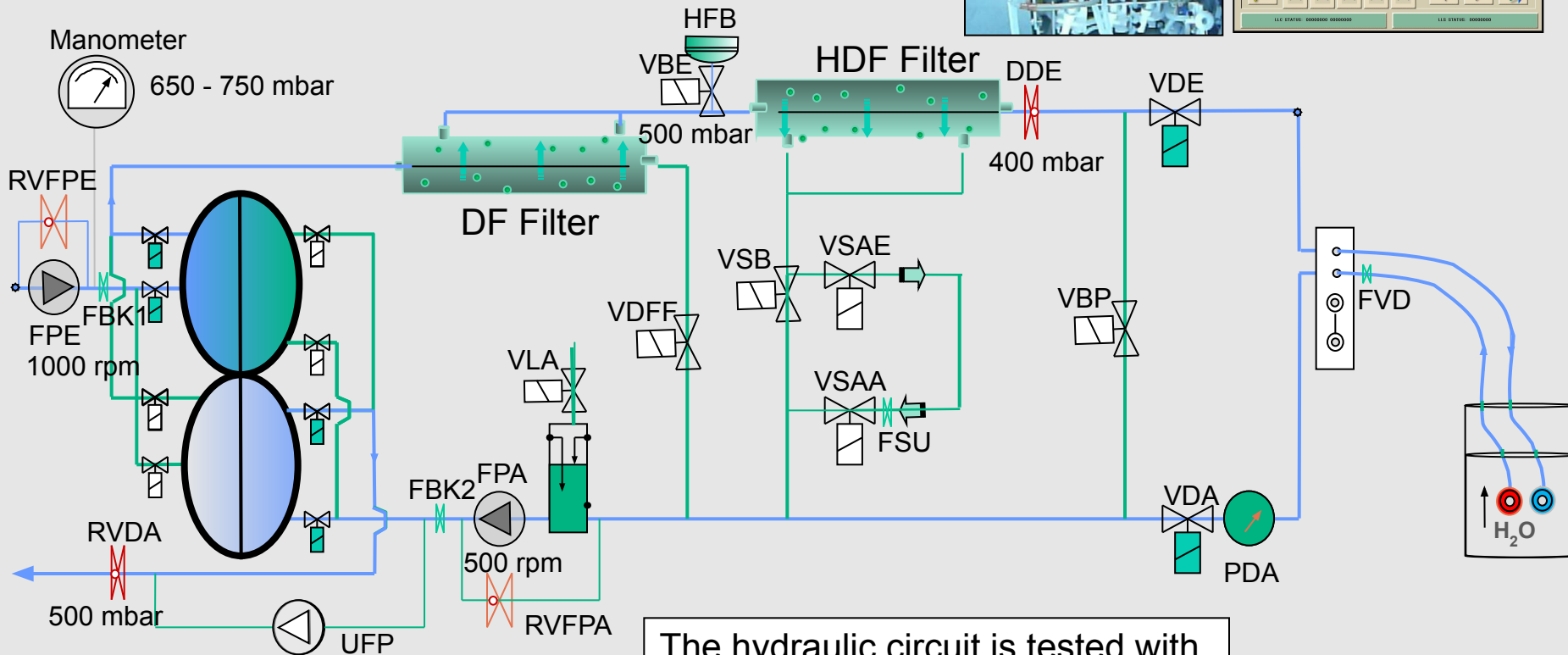
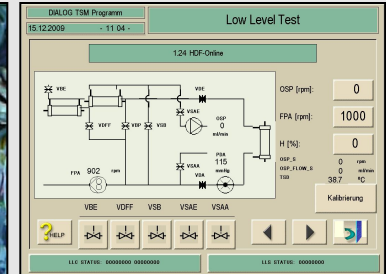
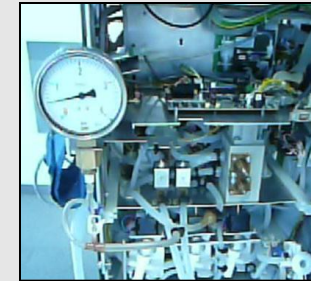
? HELP

LLC STATUS: 00000000 00000000

LLS STATUS: 00000000

HDF Online – Filter Testing

DF, HDF Filter Tests

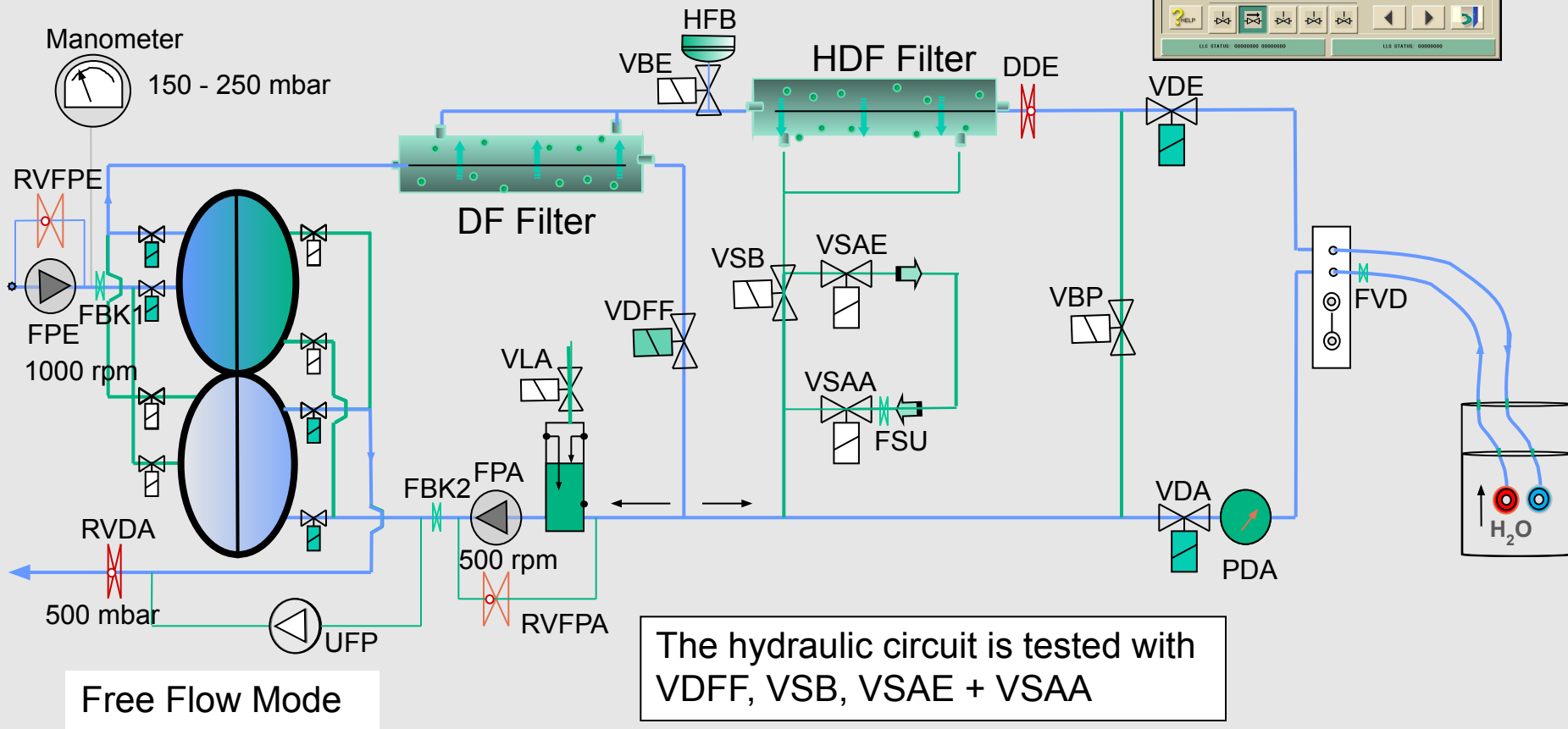


Free Flow Mode

The hydraulic circuit is tested with VDF, VSB, VSAE + VSAA

HDF Online – Filter Test

Air is flushed from the DF-Filter

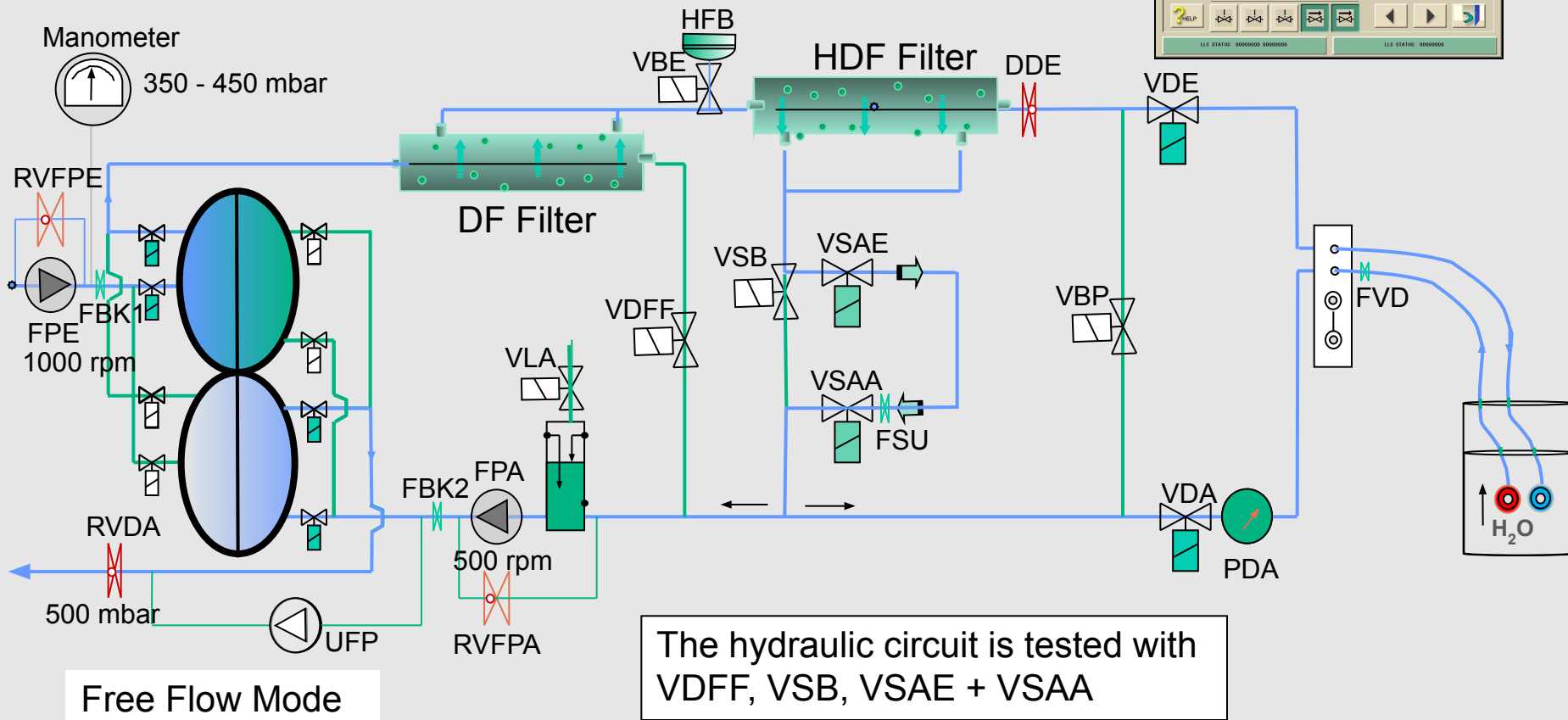


Free Flow Mode

The hydraulic circuit is tested with VDF, VSB, VSAE + VSAA

HDF Online – Filter Tests

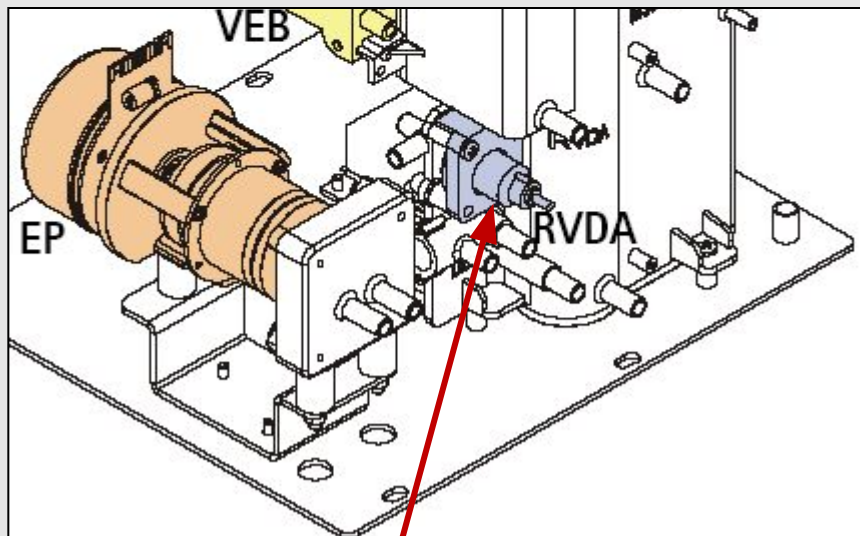
DF, HDF Filter and Port Tests



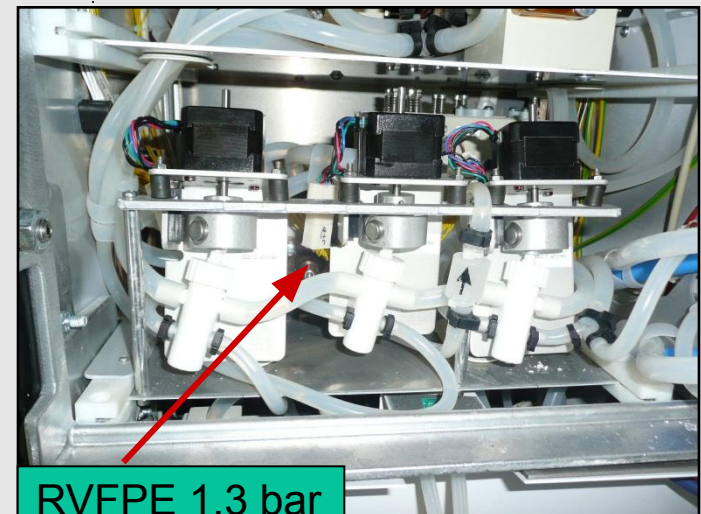
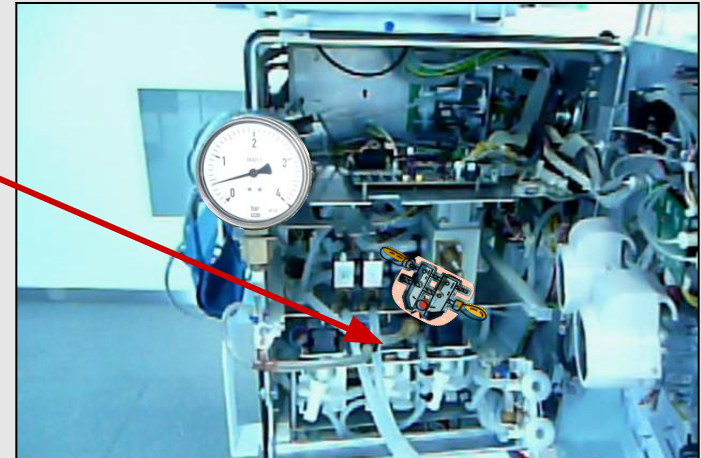
Calibration RVDA and RVFPE

Measuring point for both calibrations:
flow 500ml/min and temperature 37 °C

1. without clamp for RVDA adjustment
2. with clamp the tube next to the FBK2 for RVFPE adjustment



RVDA 500 mbar

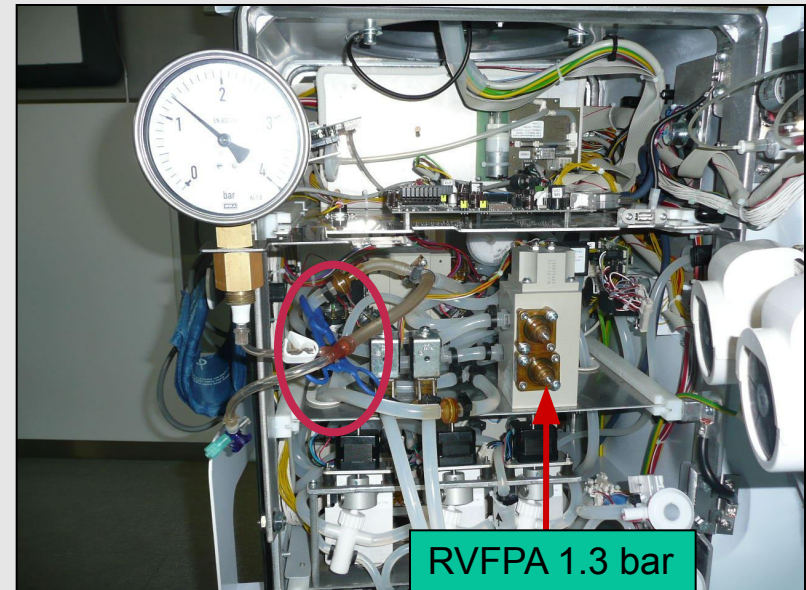
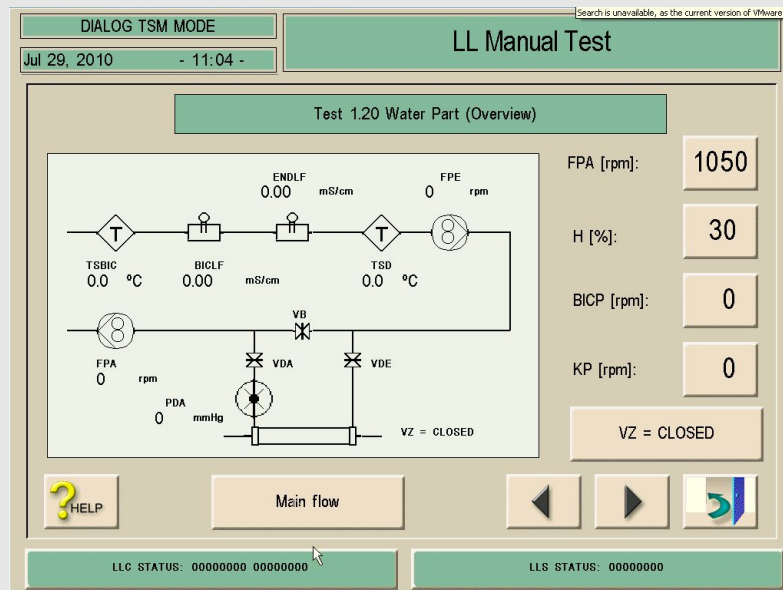


RVFPE 1.3 bar

Calibration of RVFPA

During the calibration pay attention to the following:

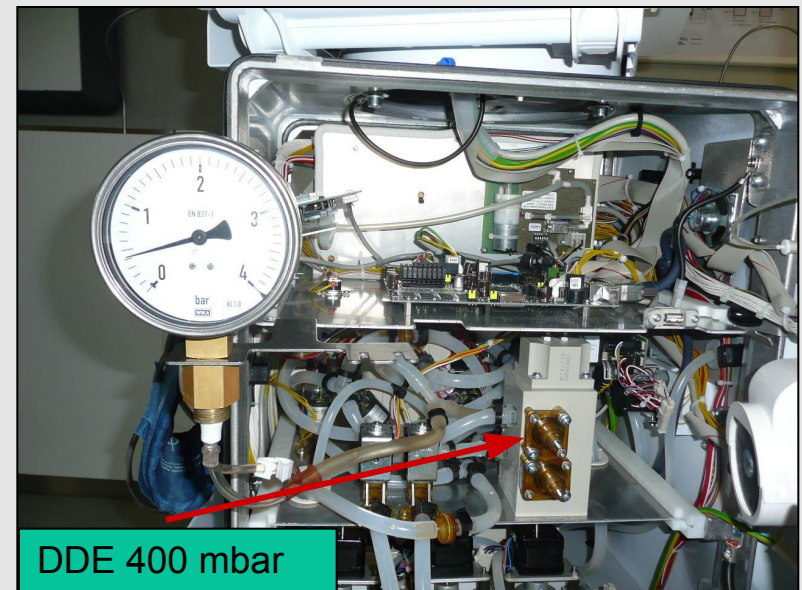
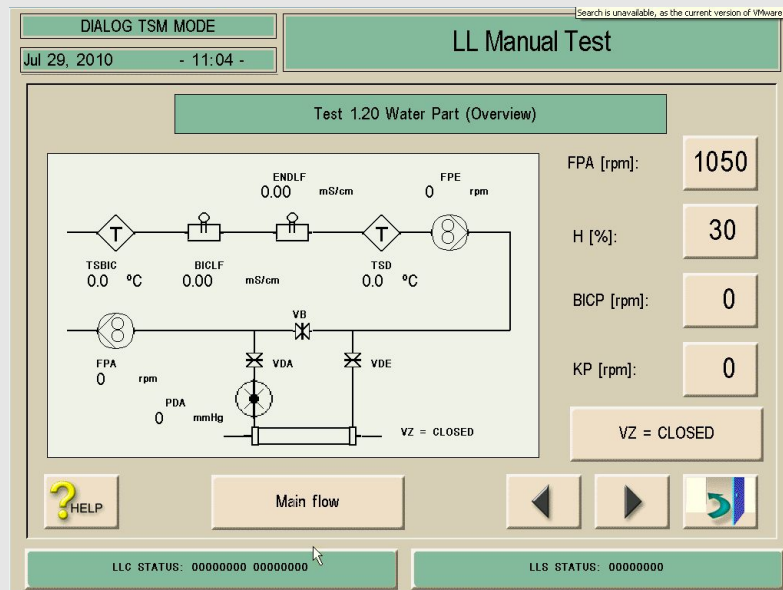
1. Both dialyser couplings should be in a water filled container
2. The DF filters must be decalcified and free of air
3. Low level test 1.20 Settings: flow 500ml/min, temperature 37 °C
4. Clamp the tube next to the FBK2



Calibration of DDE

During the calibration pay attention to the following:

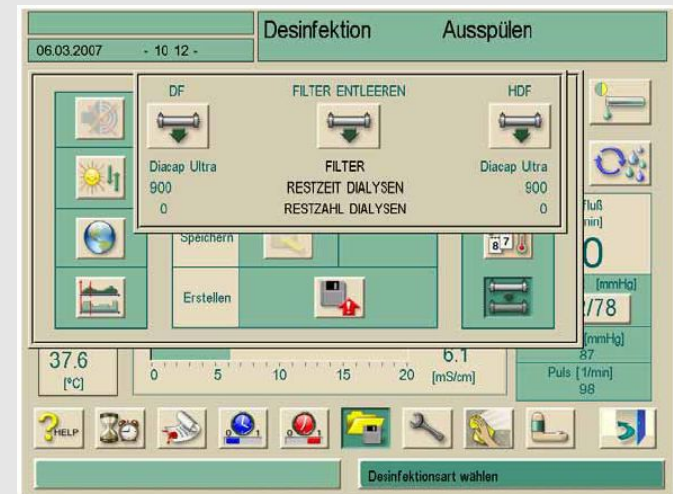
1. Both dialyser couplings should be in a water filled container
2. The DF filters must be decalcified and free of air
3. Low level test 1.20 Settings: flow 500ml/min, temperature 37 °C



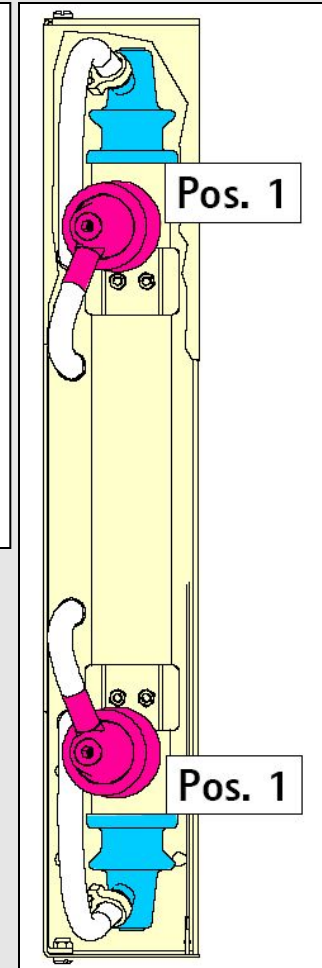
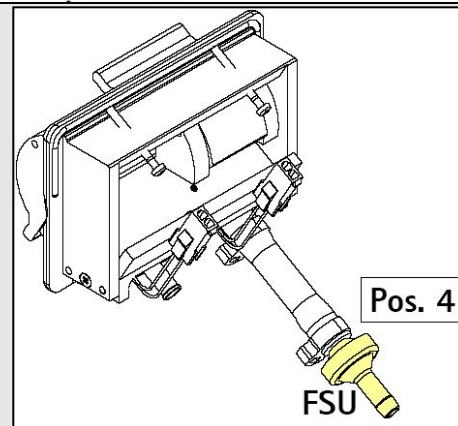
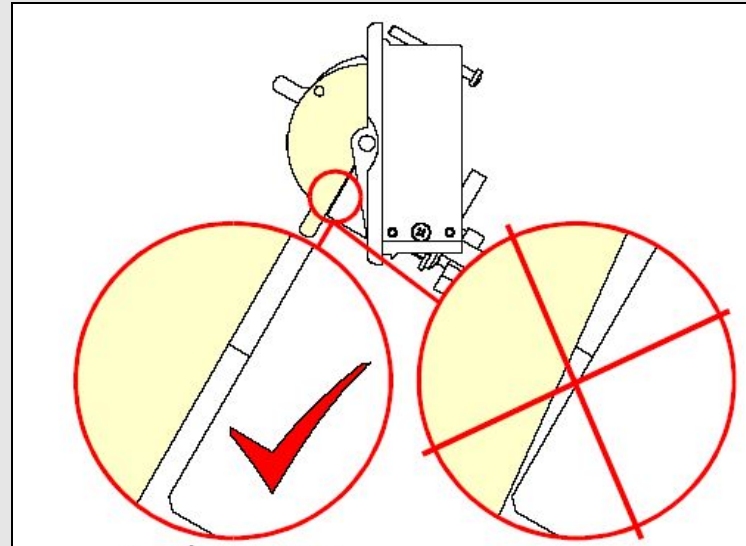
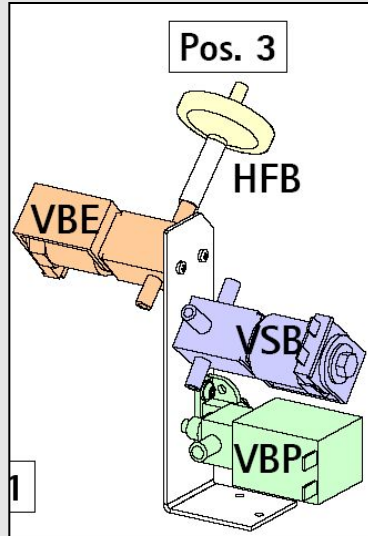
Change after 150 Treatments or 900 Hours

Follow the correct procedure

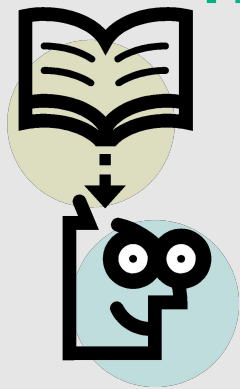
1. Chemical disinfection with Tiutol[®] KF with the old filter
2. Empty the filter
3. Test for residual disinfectant
4. Change the filter
5. Reset the counter
6. Fill in the rinsing mode for 5 minutes
7. Citric heat disinfection



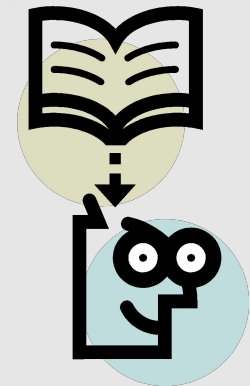
Maintenance Kit



Thank you very much for your attention.



In case of any further questions,
please do not hesitate to ask me.



It is a pleasure for me to answer you!