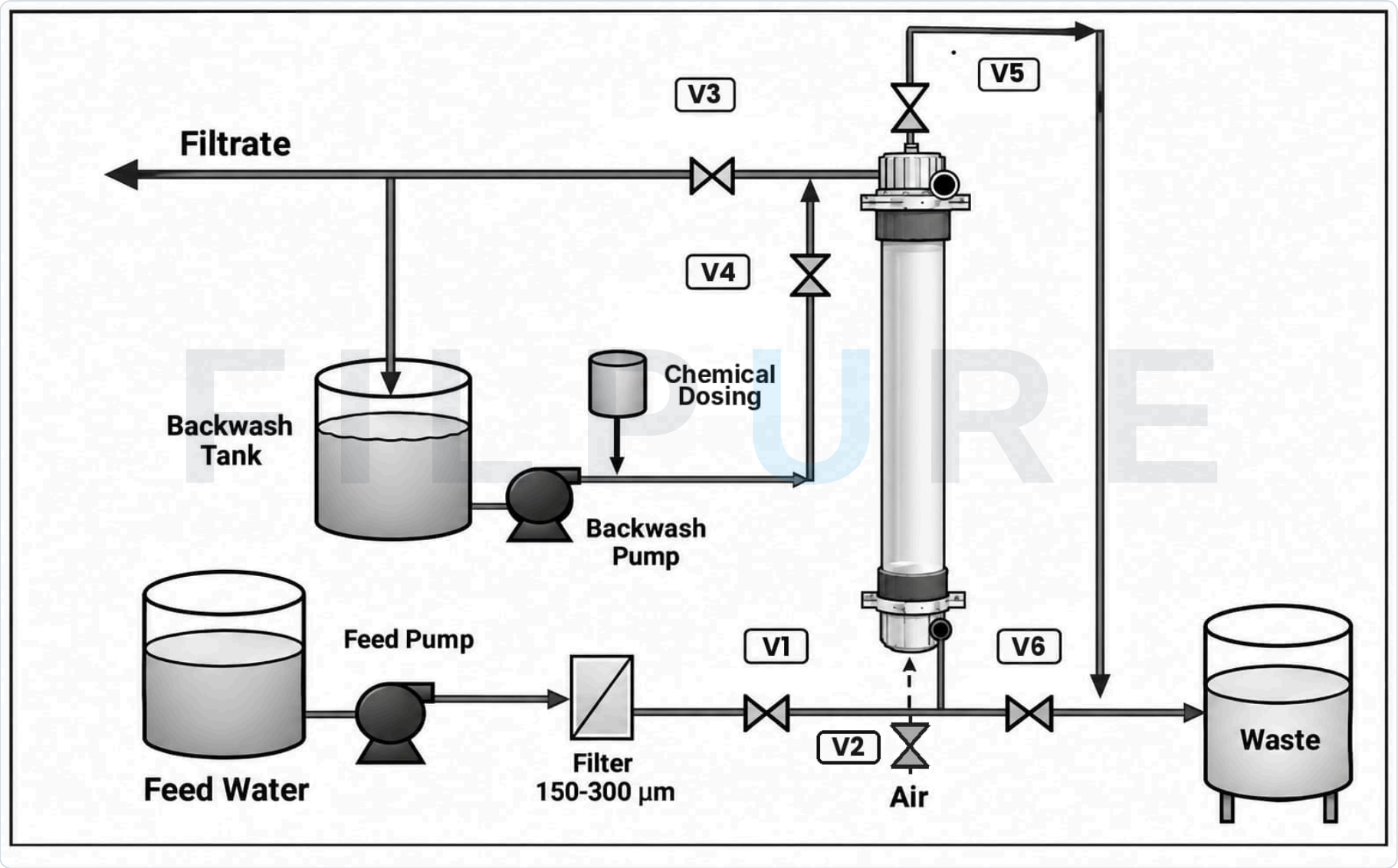
Process Flow Diagram

Ultrafiltration unit · feed, backwash, chemical dosing and waste paths



Valves V1 to V6 are referenced in the valve sequence on the next page.

FILPURE®
OUTSIDE IN SERIES

Valve Sequence of Operation

Service cycle and maintenance chemical cleaning

ON Valve open ON Pump running / dosing OFF Closed or not running Times in seconds unless shown otherwise

#	STEP	TIME (S)	VALVES						PUMPS		CHEMICAL DOSING	
			V1	V2	V3	V4	V5	V6	UF Feed Pump	UF Backwash Pump	Sodium Hypo	Acid
SERVICE CYCLE												
1	Forward flush	15	ON	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
2	Service	1800	ON	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
3	Air cleaning	45	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
4	Water drain	30	OFF	ON	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
5	Forward flush, air assisted	30	ON	ON	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
Repeat steps 1 to 5												
MAINTENANCE CHEMICAL CLEANING												
6	Air cleaning	45	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
7	Water drain	30	OFF	ON	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
8	Forward flush, air assisted	30	ON	ON	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
9	Forward flush	15	ON	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
10	Chemical injection	300 to 600	OFF	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF
11	Soaking	150 to 300	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
12	Chemical injection with air	150 to 300	OFF	ON	OFF	ON	ON	OFF	OFF	ON	ON	OFF
13	Chemical reject drain	30 to 60	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
14	Chemical rinse	300 to 600	OFF	OFF	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
15	Forward flush	15	ON	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
16	Chemical injection	300 to 600	OFF	OFF	OFF	ON	ON	OFF	OFF	ON	OFF	ON
17	Soaking	150 to 300	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
18	Chemical injection with air	150 to 300	OFF	ON	OFF	ON	ON	OFF	OFF	ON	OFF	ON
19	Chemical reject drain	30 to 60	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
20	Chemical rinse	300 to 600	OFF	OFF	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
Restart from steps 1 to 5												

NOTES

1) All times and flow rates are estimated and adjustable during start-up, depending on required flux.
2) ON = valve open or pump running / dosing; OFF = valve closed or pump not running.
3) Cleaning and chemical cleaning frequency is adjustable depending on feed condition.
4) Chemical cleaning is envisaged once in 24 hours or a rise in TMP of more than 25% of the original value, whichever is earlier.
5) Sodium hypochlorite injection should typically be performed after every six (6) service cycles, if there is no presence of free chlorine in the feed water.
6) The timings for the above steps are effective timing after valve opening.
7) During chemical cleaning, 200 mg/l (as chlorine) in the form of sodium hypochlorite shall be injected.
8) During chemical cleaning, HCl shall be injected to maintain a pH of around 2 in the backwash waste water.

UF Plant Photographs (1 of 3)

Outside In Series · ultrafiltration plants



UF Plant Photographs (2 of 3)

Outside In Series · ultrafiltration plants



UF Plant Photographs (3 of 3)

Outside In Series · ultrafiltration plants

