

IP-102-WS Water system

SOP

Related Drawing: **IP-102-WS-PID-R01 (Modification 1, 24/06/2025)**

1. Safety & Pre-requisites

- Trained operators only. Follow permit-to-work and LOTO.
- PPE: safety glasses/visor, chemical-resistant gloves, long sleeves, safety boots; add heat PPE for >70°C.
- Emergency shower SS-700-01 operational; test weekly.
- Bunds under chemicals/IBCs empty and intact (110%).
- Utilities available: compressed air 7 bar; process water 5 m³/h @ 1.5 bar.
- E-Stops ES-110-02/03 reset; interlocks functional (filter press plate-pack).

2. Valve Line-up (High-Level)

Service	Tag(s)	Normal for Start	Notes
Process water to system	MV-600-01/03/06	OPEN	Verify PI-600-01/05 within spec
Compressed air to system	MV-701-01/02/03/04/06	OPEN	Membrane squeeze & instruments
Wastewater suction from IBCs	MV-801-01..04	OPEN (as required)	Select active IBC (IBC-801-01/02)
Wastewater discharge to bag filter	MV-801-05..08	OPEN	BF-801-01; ΔP clean ≤50 mbar
Reactor isolation	MV-110-01..06	OPEN	CR-110-01 operation; LSL/LSH ok
Sludge to FP1	MV-600-07/08	OPEN	DP-110-01 → FP-110-01
Sludge to FP2	MV-600-09/12, MV-110-07/08	OPEN (when using FP2)	DP-110-02 → FP-110-02

Hot rinse to FP	MV-600-06/10, MV-702-01/04/05	OPEN (when rinsing)	From CT-702-01 via DP-702-01/CP-702-02
Filtrate to buffer tank	MV-703-01..07	OPEN	To OT-703-01

3. Start-up Procedure

1. Housekeeping & bunds; spill kits ready.
2. Secure hoses/camlocks; rodding point accessible.
3. Fit new 25 µm bag in BF-801-01; record initial ΔP (PI-600-02/03).
4. Confirm CT-130-01 NaOH 32% and CT-102-01 additive levels & labels.
5. Open utilities & filtrate paths; ensure NRV-600-01/702-01/02 seated.
6. Energise CP-01; reset interlocks.
7. Start DP-801-01; set flow using FG-701-01.
8. Start MX-801-01; raise CR-110-01 to operating level (LT-110-01 / LSL/LSH).
9. Start dosing DP-130-01 & PP-102-01 per recipe; confirm TI-110-02 stable.
10. Start DP-110-01 → FP-110-01 (or DP-110-02 → FP-110-02); monitor PI-600-06/07 & PI-110-02.
11. Switch to filtration; send filtrate to OT-703-01 (MV-703-xx; DP-703-01 if used).
12. If hot rinse needed: start DP-702-01 or CP-702-02; open MV-702-xx & MV-600-06/10; verify TI-702-01 & TSAH-702-01.
13. Log pressures/flows/temps every 30 min.

4. Shutdown Procedure

1. Stop dosing; flush lines with water 2–5 min.
2. Stop DP-110-0x; allow press to drain; keep filtrate open until PI stabilises.
3. Stop hot-rinse pumps; close MV-702-xx & MV-600-06/10.
4. Stop DP-801-01; isolate IBC lines.
5. Stop MX-801-01; confirm safe level in CR-110-01; isolate if needed.
6. Close utilities; power down CP-01 at zero pressure.
7. Remove spent bag; housekeeping; complete logbook.

5. Maintenance Schedule

Daily

- Leak/noise/vibration walkdown
- Chemical levels CT-130-01 / CT-102-01
- BF-801-01 ΔP check

- E-Stops & safety shower access

Weekly

- FP plate pack clean & interlock test
- Pump couplings/seals
- Drain air-line filters
- Calibration status check

Monthly

- Calibrate PI/TI; verify LSL/LSH/TSAH
- HW-702-01 & CT-702-01 checks
- NRV seating inspections
- CP-01 electrical terminations

Annual

- Pipework integrity inspection
- Pump overhauls
- Hose/camlock replacement
- SOP review (MOC)

6. Operating Log Template

Date/Time	BF Δ P (mbar)	Press P (bar)	FG Flow (m ³ /h)	TI-702- 01 (°C)	CR Level	Notes	Operator
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Document Control

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Issue	—
Revision	—
Date	—
Approvals	Prepared: __ Checked: __ Approved: Matt Rockey (COO)

7. Recipe Setpoints

Batch	Target pH	Temperature (°C)	NaOH Dose (DP-130-01) L/min	Additive (PP- 102-01) mL/min
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Note: Enter site-specific setpoints. Typical guidance: pH 9–11; 20–30°C unless otherwise specified by process engineering.

8. Valve Line-up by Mode

Tag	Service	Idle	Start	Operate	Clean/Rinse
MV-600-01	Process water header	CLOSE	OPEN	OPEN	OPEN
MV-600-03	Process water to press feed	CLOSE	OPEN	OPEN	OPEN
MV-600-06	Hot rinse header to FP1	CLOSE	CLOSE	CLOSE	OPEN

MV-600-10	Hot rinse header to FP2	CLOSE	CLOSE	CLOSE	OPEN
MV-701-01	Compressed air main	CLOSE	OPEN	OPEN	OPEN
MV-701-02	Compressed air to instruments	CLOSE	OPEN	OPEN	OPEN
MV-801-01	IBC-801-01 suction	CLOSE	OPEN (if in use)	OPERATE (if in use)	CLOSE
MV-801-02	IBC-801-02 suction	CLOSE	OPEN (if in use)	OPERATE (if in use)	CLOSE
MV-801-05	Discharge to bag filter	CLOSE	OPEN	OPEN	OPEN
MV-110-01	Reactor isolation inlet	CLOSE	OPEN	OPEN	CLOSE
MV-110-02	Reactor isolation outlet	CLOSE	OPEN	OPEN	CLOSE
MV-600-07	Sludge to FP-110-01	CLOSE	OPEN	OPEN	CLOSE
MV-600-08	Filtrate from FP-110-01	CLOSE	OPEN	OPEN	OPEN
MV-600-09	Sludge to FP-110-02	CLOSE	OPEN (FP2 use)	OPERATE (FP2)	CLOSE
MV-600-12	Filtrate from FP-110-02	CLOSE	OPEN (FP2 use)	OPERATE (FP2)	OPEN
MV-703-01	Filtrate to OT-703-01	CLOSE	OPEN	OPEN	OPEN

Appendix A – pH Titration Quick Guide

1. Collect representative sample from CR-110-01.
2. Measure initial pH with calibrated meter; rinse electrode.
3. Titrate with NaOH 32% while stirring; record additions.
4. Determine target pH and convert dose to plant setpoint (L/min).
5. Safety: PPE and spill control.

Appendix B – Filter Press Troubleshooting

Symptom	Checks/Actions
Low filtrate flow	Check BF-801-01 ΔP ; verify feed pressure PI-110-02; ensure plates closed.
High cake moisture	Increase cycle; verify membrane squeeze air; check TI-702-01.
Leak at plate pack	Inspect gaskets; verify closing pressure; clean sealing faces.
NRV chatter	Inspect NRV-600-01/702-01/02 for debris & seating.