

# PRODUCT DATA SHEET



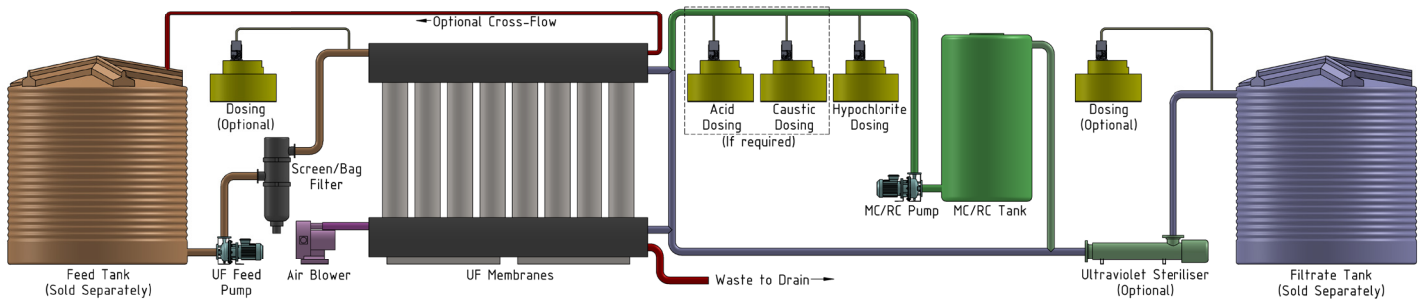
## Ultra Filtration (UF)

water | wastewater | sewage

### OVERVIEW

MAK Water's Ultrafiltration (UF) plants are designed to treat ground water, surface water, tertiary treated effluent, storm water or wastewater with turbidity <300 NTU. The standard treatment process includes pre-screening (bag filter or self-cleaning screen filter), outside-to-inside capillary ultrafiltration modules, automated air scouring and maintenance cleaning (MC) system, as well as a CIP system for periodic recovery cleaning (RC). The UF system can be configured as either: dead-end for lower turbidity applications, or cross-flow for higher turbidity applications.

Additional pre-filtration and post-filtration treatment steps may be added as required to suit feed water conditions and/or treated water quality requirements. The MAK Water UF plants are available as skid mounted or containerised systems.



### STANDARD SPECIFICATIONS

Parameter		Units	UF-0100	UF-0200	UF-0500	UF-1000	UF-2000	UF-3500	UF-5000
Filtrate flow rate (min/max) <sup>1</sup>	Low turbidity feed (<100 NTU)	m <sup>3</sup> /day	54~100	108~200	269~500	538~1,000	1,077~2,000	1,077~3,500	2,692~5,000
	High turbidity feed (<300 NTU)		37~69	74~138	185~346	369~692	738~1,385	1,292~2,423	1,846~3,462
Power consumption <sup>2</sup>	Plant / equipment	kW	1.7	3.5	4.4	8.0	11.5	15.5	22.5
	Air conditioned containers <sup>3</sup>		1.9 per 20' container, 3.8 per 40' container (includes internal lighting)						
Power supply		-	AC 415 V, 3 Phase, 50 Hz						
Recovery rate <sup>1</sup>	Low turbidity feed (<100 NTU)	%	92~98% (dead-end configuration)						
	High turbidity feed (<300 NTU)		88~92% (cross-flow configuration)						
Average gross flux <sup>1</sup>	Low turbidity feed (<100 NTU)	L/m <sup>2</sup> /hr	35~65 (dead-end configuration)						
	High turbidity feed (<300 NTU)		24~45 (cross-flow configuration)						
UF membrane pore size		µm	0.08						
UV dose rate <sup>1</sup>		mJ/cm <sup>2</sup>	Typical >40 @ 90% UVT >20 (flooded suction)						
Pressure	Feed water inlet	kPa	150~200						
	Filtrate discharge		0 (gravity drain)						
	Wastewater discharge		5~30						
Ambient temperature (min/max)	Skid mounted	°C	-5~40						
	Containerised		-15~50						
	Containerised with insulation								

Characteristics		Units	Feed Water		Filtrate
Temperature		°C	5~40		
Turbidity	Dead-end configuration	NTU	<100		<0.2
	Cross-flow configuration		<300 <sup>3</sup>		<0.2
Total suspended solids (TSS)	Dead-end configuration	mg/L	<100		<1
	Cross-flow configuration		<300		<1
Biological oxygen demand (BOD)		mg/L	<20 <sup>3</sup>		-
Chemical oxygen demand (COD)		mg/L	<200 <sup>3</sup>		-
Total organic carbon (TOC)		mg/L	<15 <sup>3</sup>		-
Emulsified oil and grease		mg/L	<2.0 <sup>3</sup>		-
Free oil and grease		mg/L	<0.1 <sup>3</sup>		-
Bacteria removal (UF membrane only)		log	-		≥4 <sup>4</sup>
Virus removal (UF membrane only)		log	-		≥1 <sup>4</sup>

<sup>1</sup> Values dependent on water quality and may differ between applications, <sup>2</sup> Based on standard equipment supply, <sup>3</sup> Higher values can be treated; consult MAK Water, <sup>4</sup> Additional log credits are available with UV and chlorination; consult MAK Water

# STANDARD INCLUSIONS + OPTIONS

√ = Standard Supply, o = Optional Supply, - = Not Applicable

Equipment		UF-0100	UF-0200	UF-0500	UF-1000	UF-2000	UF-3500	UF-5000
Skid mounted plant / equipment		√	√	√	√	√	√	√
UF feed pump		√	√	√	√	√	√	√
UF modules		√	√	√	√	√	√	√
Pre-screen	Bag filter or equivalent	√	√	√	-	-	-	-
	Self-cleaning screen filter	o	o	o	√	√	√	√
UF membrane cleaning system	MC/RC tank	√	√	√	√	√	√	√
	MC/RC pump	√	√	√	√	√	√	√
	Air scour blower <sup>1</sup>	o	o	o	o	o	o	o
	Hypochlorite dosing system	√	√	√	√	√	√	√
	Acid dosing system	o	o	o	o	o	o	o
	Caustic dosing system	o	o	o	o	o	o	o
UV steriliser (non-validated <sup>*2</sup> )		o	o	o	o	o	o	o
Feed and/or treated water chemical dosing systems(s)		o	o	o	o	o	o	o
Actuated valves	Electrically actuated	√	√	√	o	-	-	-
	Pneumatic air actuated	-	-	-	√	√	√	√
Air compressor with refrigeration dryer		-	-	-	√	√	√	√
uPVC / HDPE inlet and outlet pipework / manifolds, manual isolation and sampling valves		√	√	√	√	√	√	√
Containerised with A/C, overhead lighting & GPOs for maintenance	Standard supply	o	o	o	o	o	o	o
	With non-slip floor coating	o	o	o	o	o	o	o
	With non-slip floor coating and insulation	o	o	o	o	o	o	o
PLC control system with touch screen HMI		√	√	√	√	√	√	√
Instrumentation	Standard package	√	√	√	√	√	√	√
	Premium package with ClearAccess™ remote monitoring	o	o	o	o	o	o	o
<b>Instrumentation &amp; Controls</b>		<b>Standard Package</b>			<b>Premium Package</b>			
Feed & treated water tank float level switches			√				-	
Feed & treated water tank float level transmitters			-				√	
Chemical dosing & MC/RC tank float level switches			√				√	
Pressure switches (air scour and MC/RC pump)			√				√	
Pressure gauges			√				-	
Pressure indicating transmitters (UF feed and filtrate)			-				√	
Filtrate flow gauge (rotameter)			√ (≤UF-0500 only)				-	
Magnetic flow transmitter (treated water and cross flow recycle)			√ (>UF-0500 only)				√	
pH transmitter (with feed or filtrate acid or caustic dosing)			√				√	
Filtrate turbidity analyser (treated water)			-				√	
UV intensity sensor/monitor (with UV steriliser)			-				√	
ClearAccess™ remote monitoring & control capabilities			-				√	

<sup>1</sup> Client to provide suitable compressed air supply if air scour blower is excluded, <sup>\*2</sup> Validated systems available on request

## MODEL SELECTION

- 100** Capacity - 100 m<sup>3</sup>/day (max)
- 200** Capacity - 200 m<sup>3</sup>/day (max)
- 500** Capacity - 500 m<sup>3</sup>/day (max)
- 1000** Capacity - 1,000 m<sup>3</sup>/day (max)
- 2500** Capacity - 2,000 m<sup>3</sup>/day (max)
- 3500** Capacity - 3,500 m<sup>3</sup>/day (max)
- 5000** Capacity - 5,000 m<sup>3</sup>/day (max)
- XXXX** Capacity - specify m<sup>3</sup>/day (max)
- XX** Assembly - skid mounted
- CX** Assembly - containerised - standard
- CF** Assembly - containerised - with floor coatings
- CP** Assembly - containerised - with floor coatings & insulation
- B** Pre-screen – bag filter
- A** Pre-screen – self-cleaning screen filter
- X** Pre-filtration chemical dosing – without
- C** Pre-filtration chemical dosing – with (specify)
- D** Membrane configuration – dead end
- R** Membrane configuration – cross flow
- S** Membrane MC/RC – hypochlorite dosing
- D** Membrane MC/RC – hypochlorite + acid or caustic dosing
- T** Membrane MC/RC – hypochlorite + acid + caustic dosing
- X** Auto membrane integrity testing – without
- I** Auto membrane integrity testing – with
- X** Air scour blower – without (client to supply compressed air)
- L** Air scour blower – with
- X** UV steriliser – without
- U** UV steriliser – with
- X** Post-filtration chemical dosing – without
- C** Post-filtration chemical dosing – with (specify)
- X** Standard instrument package
- P** Premium instrumentation package
- C** Custom instrumentation (specify)
- X** Specifications – standard
- C** Specifications – custom



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SAL-PDS-029 | APR-2026