APPLICATION FOR HCAI SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0922

HCAI Special Seismic Certification Preapproval (OSP)

Type: [X] New [ ] Renewal

Manufacturer Information

Manufacturer: Water Control Corporation

Manufacturer's Technical Representative: Mike Stimart

Mailing Address: 7150 143rd Ave NW, Ramsey, MN 55303

Telephone: (763) 422-4471 Email: mike.stimart@watercontrolinc.com

Product Information

Product Name: HUF Gen 2 High-Capacity Ultrafiltration Systems

Product Model Number(s): GTE-1 to GTE-4, GTA-2 to GTA-8 (incl. -CEBW), CAF900-125AP

Product Category: Other

Product Sub-Category: High-Capacity Ultrafiltration (HUF) Systems

General Description: Floor mounted High-Capacity Ultrafiltration (HUF) systems for legionella and pathogen control in building water systems, and the associated flow-through expansion tank.

Mounting Description: Base Mounted Rigid

Tested Seismic Enhancements: Seismic enhancements made to the test units and/or modifications required to address anomalies during the tests shall be incorporated into the production units.

Applicant Information

Applicant Company Name: Manwill Engineering LLC

Contact Person: Derek Manwill

Mailing Address: PO Box 1194, Bend, OR 97709

Telephone: (541) 241-2102 Email: derek@manwillse.com

Title: President

REVIEWED FOR CODE COMPLIANCE HCAi OSP-0922 DATE: 11/05/2026 CALIFORNIA BUILDING CODE, 2025

California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)

Company Name: MANWILL ENGINEERING LLC

Name: Derek Manwill California License Number: S6266

Mailing Address: PO Box 1194, Bend, OR 97709

Telephone: (541) 241-2102 Email: derek@manwillse.com

Certification Method

☐ GR-63-Core ☒ ICC-ES AC156 ☐ IEEE 344 ☐ IEEE 693 ☐ NEBS 3

☐ Other (Please Specify):

Testing Laboratory

Company Name: ENVIRONMENTAL TESTING LABORATORIES, INC. (ETL)

Contact Person: Jeremy Lange

Mailing Address: 11034 Indian Trail, Dallas TX 75229-3513

Telephone: (972) 247-9657 Email: jeremy@etldallas.com

REVIEWED FOR CODE COMPLIANCE
HCAi
OSP-0922
BY: Mohammad Karim
DATE: 11/05/2026
CALIFORNIA BUILDING CODE, 2025

Seismic Parameters

Certified Response Spectral Acceleration Factors:(F_p/W_p)

Horizontal	(A Flx-H), g=	3.20	(A Rig-H), g=	2.15
Vertical	(A Flx-V), g=	1.68	(A Rig-V), g=	0.68

S_{DS} (Design spectral response acceleration at short period, g) = 2.50 @ z/h=0; 2.00 @ z/h=1

Hf (Force amplification height factor) = 1 @ z/h = 0; 3.5 @ z/h = 1

Ru (Structure ductility redution factor) = 1 @ z/h = 0; 1.3 @ z/h = 1

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 0 and 1

HCAI Approval (For Office Use Only) - Approval Expires on 11/05/2032

Date: 11/5/2026

Name: Mohammad Karim Title: Supervisor, Health Facilities

Condition of Approval (if applicable):

REVIEWED FOR CODE COMPLIANCE
HCAi
OSP-0922
BY: Mohammad Karim
DATE: 11/05/2026
CALIFORNIA BUILDING CODE, 2025

WATER CONTROL CORPORATION
HUF Gen 2 High-Capacity Ultrafiltration Systems

TABLE 1

	S_{DS} (g)	z/h	H_f/R_μ	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}	I_p
Mounting: Base Mounted Rigid	2.00	1	3.5/1.3	3.20	2.15	1.68	0.68	1.5
	2.50	0	1.0/1.0					

Product Construction: Welded aluminum control skid and filter skids bolted together in a single straight line; ultrafiltration membrane modules; PVC and CPVC process piping.
Options/Subcomponents: CEBW = chemically enhanced backwash (GTA only). Either membrane module may be used on any GTE or GTA model. See Table 3 for the list of allowed subcomponents.
Nomenclature: See Attachment 4 - Nomenclature for model number variants.
Dimensions: Depth is the skid depth; Width is the overall length of the control skid and filter skids in line; Height is the nominal overall height.
Connections: A complete system is one control skid and 1–4 (GTE) or 2–8 (GTA) filter skids bolted together in a single straight line. All external piping and electrical connections, including to the expansion tank, shall be flexible connections.

Model Number	Dimensions (in) Depth	Width	Height	Max. Wt. (lb)	Description / Notes	Basis
GTE Series						
GTE-1	23.0	65.0	79.0	625	1 filter, 2-in mains	EXTRAP
GTE-2	23.0	89.0	79.0	1,034	2 filters, 3-in mains	EXTRAP
GTE-2	23.0	89.0	79.0	1,034	As tested: 2 filters, 3-in mains	**UUT 2**
GTE-3	23.0	112.0	79.0	1,450	3 filters, 3-in mains	EXTRAP
GTE-4	23.0	135.0	79.0	1,800	4 filters, 3-in mains	EXTRAP
GTA Series						
GTA-2	37.0	114.0	84.0	1,500	2 filters, 3-in mains	EXTRAP
GTA-2-CEBW	37.0	114.0	84.0	1,713	2 filters, 3-in mains, CEBW	EXTRAP
GTA-2-CEBW	37.0	114.0	84.0	1,713	As tested: 2 filters, 4-in mains, CEBW	**UUT 1**
GTA-3	37.0	142.0	84.0	2,025	3 filters, 3-in mains	EXTRAP
GTA-3-CEBW	37.0	142.0	84.0	2,125	3 filters, 3-in mains, CEBW	EXTRAP
GTA-4	37.0	171.0	84.0	2,525	4 filters, 3-in mains	EXTRAP
GTA-4-CEBW	37.0	171.0	84.0	2,650	4 filters, 3-in mains, CEBW	EXTRAP
GTA-5	37.0	199.0	84.0	3,250	5 filters, 4-in mains	EXTRAP
GTA-5-CEBW	37.0	199.0	84.0	3,425	5 filters, 4-in mains, CEBW	EXTRAP
GTA-6	37.0	228.0	84.0	3,750	6 filters, 4-in mains	EXTRAP
GTA-6-CEBW	37.0	228.0	84.0	3,975	6 filters, 4-in mains, CEBW	EXTRAP
GTA-7	37.0	256.0	84.0	4,325	7 filters, 4-in mains	EXTRAP
GTA-7-CEBW	37.0	256.0	84.0	4,550	7 filters, 4-in mains, CEBW	EXTRAP
GTA-8	37.0	285.0	84.0	4,825	8 filters, 4-in mains	EXTRAP
GTA-8-CEBW	37.0	285.0	84.0	5,100	8 filters, 4-in mains, CEBW	EXTRAP

End of Table 1.

REVIEWED FOR CODE COMPLIANCE HCAi OSP-0922 BY: Mohammad Karim DATE: 11/05/2026 CALIFORNIA BUILDING CODE

WATER CONTROL CORPORATION
HUF Gen 2 High-Capacity Ultrafiltration Systems

TABLE 2

	S_{DS} (g)	z/h	H_f/R_μ	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}	I_p
Mounting: Base Mounted Rigid	2.00	1	3.5/1.3	3.20	2.15	1.68	0.68	1.5
	2.50	0	1.0/1.0					

Product Construction: ASME carbon steel vessel with butyl bladder, 304 stainless steel system connections, and welded anchor clips.
Connections: All piping connections to the tank shall be flexible connections.

Model Number	Dimensions (in) Depth	Width	Height	Max. Wt. (lb)	Description / Notes	Basis
Taco CAF Flow-Through Expansion Tank						
CAF900-125AP	36.0	36.0	80.0	2,010	238-gal, with anchor clips	**UUT 3**

End of Table 2.

REVIEWED FOR CODE COMPLIANCE
HCAi
OSP-0922
BY: Mohammad Karim
DATE: 11/05/2026
CALIFORNIA BUILDING CODE, 2025

WATER CONTROL CORPORATION
HUF Gen 2 High-Capacity Ultrafiltration Systems

TABLE 3

	S_{DS} (g)	z/h	H_f/R_μ	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}	I_p
Mounting: Mounted within component.	2.00	1	3.5/1.3	3.20	2.15	1.68	0.68	1.5
	2.50	0	1.0/1.0					

Construction/Options: Model number uniquely identifies manufacturer, materials, and configuration of subcomponents.

Model Number	Dimensions (in) Depth	Width	Height	Max. Wt. (lb)	Description / Notes	Basis
Type: Ultrafiltration Membrane Module - Mfr: Veolia						
ZW700B-10060	13.0	13.0	66.2	69	182 lb wet	**UUT 2**
Type: Ultrafiltration Membrane Module - Mfr: DuPont						
IN-0068	11.6	11.6	66.1	95	208 lb wet	**UUT 1**
Type: Enclosure - Mfr: nVent						
LHC234616	6.1	18.1	9.1	14	GTA remote panel	**UUT 1**
CSD302010	10.0	20.0	30.0	46	GTE main panel	**UUT 2**
CSD302410	10.0	24.0	30.0	53	GTA main panel	**UUT 1**
Type: Compressed Air Filter - Mfr: Compressed Air USA						
MCF35-38-HE	3.0	3.2	9.2	2.4		**UUT 1,2**
Type: Air Compressor - Mfr: Gast						
87R647-PS101-N470X	5.1	9.5	7.9	19		**UUT 1,2**
Type: Flow Meter - Mfr: GF Signet						
3-2581-PT02-102	9.4	5.5	9.8	8.1	2 in	EXTRAP
3-2581-PT03-102	10.8	8.6	12.9	13	3 in	**UUT 2**
3-2581-PT04-102	10.9	9.0	12.9	14	4 in	**UUT 1**
Type: Motorized Ball Valve - Mfr: U.S. Solid						
USS-MSV00025	3.2	3.2	4.0	<1		**UUT 1**
Type: Electric Valve Actuator - Mfr: Valworx						
561851C	4.7	6.2	6.4	5.5		**UUT 1,2**
Type: I/O Module - Mfr: Horner						
HE959CNX116	3.0	0.8	4.9	0.2	CsCAN base	**UUT 1,2**
HE959CNX100	3.0	0.8	4.9	0.2	CsCAN base; remote	**UUT 1**
HE959ADC270	3.0	0.8	4.9	0.2	Analog input	**UUT 1,2**
HE959DAC107	3.0	0.8	4.9	0.2	Analog output	**UUT 1,2**
HE959DQM606	3.0	0.8	4.9	0.2	Digital output	**UUT 1**
Type: PLC / Operator Interface - Mfr: Horner						
HE-XPLWE4	3.0	7.3	5.7	3.9		**UUT 1,2**
Type: DC UPS - Mfr: Mean Well						
DUPS20	4.5	1.6	4.9	0.7		**UUT 1,2**
Type: Battery - Mfr: Power-Sonic						
PS-1227-F1	2.2	3.1	4.1	2.4		**UUT 1,2**
Type: Power Supply - Mfr: Mean Well						
XDR-480-24	4.9	1.9	4.9	2.4		**UUT 1,2**
Type: Relay - Mfr: Phoenix Contact						
2966171	3.7	0.2	3.2	0.1	PLC-RSC; 1 pole	**UUT 1,2**
2903334	3.0	0.6	3.8	0.1	RIF-1; 2 pole	**UUT 1,2**
2903311	3.0	1.2	3.8	0.2	RIF-2; 120 VAC	**UUT 1,2**
Type: Solid-State Contactor - Mfr: Phoenix Contact						
1032919	4.1	0.7	4.3	0.6		**UUT 1,2**

Table 3 continues on the next page.

ICC-ES OSP-0922 REVIEWED BY: Mohammad Karim DATE: 11/05/2026 REVIEWED FOR CODE COMPLIANCE CALIFORNIA BUILDING CODE 2025

WATER CONTROL CORPORATION
HUF Gen 2 High-Capacity Ultrafiltration Systems

TABLE 3 (continued)

Model Number	Dimensions (in)			Max. Wt. (lb)	Description / Notes	Basis
	Depth	Width	Height			
Type: Circuit Breaker (SU201M) - Mfr: ABB						
SU201M-K4	2.7	0.7	4.4	0.3	4 A	**UUT 1,2**
SU201M-K6	2.7	0.7	4.4	0.3	6 A	**UUT 1,2**
SU201M-K8	2.7	0.7	4.4	0.3	8 A	**UUT 1,2**
SU201M-K10	2.7	0.7	4.4	0.3	10 A	**UUT 1**
SU201M-K15	2.7	0.7	4.4	0.3	15 A	**UUT 1,2**
SU201M-K20	2.7	0.7	4.4	0.3	20 A	**UUT 1,2**
SU201M-K25	2.7	0.7	4.4	0.3	25 A	**UUT 1**
Type: Power Distribution Block - Mfr: nVent						
569020	1.8	1.1	3.0	0.3	UDJ-125 A	**UUT 1,2**
Type: Surge Protective Device - Mfr: Citel						
32273255	2.6	1.4	3.5	<1	DS72US-120S/G	**UUT 1,2**
Type: Network Switch - Mfr: Phoenix Contact						
1085254	3.3	0.9	4.6	0.3		**UUT 1,2**
Type: Gateway - Mfr: Control Solutions						
BB3-7301	2.4	2.8	3.9	<1		**UUT 1,2**
Type: Bluetooth Module - Mfr: Halogen						
BT-SB-E	2.3	5.8	3.6	1.0		**UUT 1,2**

End of Table 3 - Subcomponents.

REVIEWED FOR CODE COMPLIANCE
HCAi
OSP-0922
BY: Mohammad Karim
DATE: 11/05/2026
CALIFORNIA BUILDING CODE, 2025

UUT 1

Manufacturer: Water Control Corporation
Model number: GTA-2-CEBW
Unit function: Ultrafiltration System
Serial number: 26CP-1054



Dimensions (in)			Weight	Res. Freq. (Hz)		
Depth	Width	Height	(lb)	F-B	S-S	V
37.0	114.0	84.0	1,713	4.5	9.0	24.5

Code & criteria: 2025 CBC, ICC-ES AC156-24 (2nd Edition)
Test laboratory: Environmental Testing Laboratory
Report: 26062TR1.0 (dated 10-13-26), tested on 8-11-26

S_{DS} (g)	z/h	H_f/R_μ	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
2.00	1	3.5/1.3	3.20	2.15	1.68	0.68
2.50	0	1.0/1.0				

Importance Factor, I_p = 1.5: Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.

Mounting: Rigid base mounted to fixture using (8) 1/2 in diameter Grade 5 bolts.

Construction: Welded aluminum framing. Ultrafiltration membrane modules with PVC and CPVC process piping.

Subcomponents: DuPont - Ultrafiltration Membrane Module (IN-0068), nVent - Enclosure (LHC234616, CSD302410), Compressed Air USA - Compressed Air Filter (MCF35-38-HE), Gast - Air Compressor (87R647-PS101-N470X), GF Signet - Flow Meter (3-2581-PT04-102), U.S. Solid - Motorized Ball Valve (USS-MSV00025), Valworx - Electric Valve Actuator (561851C), Horner - I/O Module (HE959CNX116, HE959CNX100, HE959ADC270, HE959DAC107, HE959DQM606), Horner - PLC / Operator Interface (HE-XPLWE4), Mean Well - DC UPS (DUPS20), Power-Sonic - Battery (PS-1227-F1), Mean Well - Power Supply (XDR-480-24), Phoenix Contact - Relay (2966171, 2903334, 2903311), Phoenix Contact - Solid-State Contactor (1032919), ABB - Circuit Breaker (SU201M) (SU201M-K4, SU201M-K6, SU201M-K8, SU201M-K10, SU201M-K15, SU201M-K20, SU201M-K25), nVent - Power Distribution Block (569020), Citel - Surge Protective Device (32273255), Phoenix Contact - Network Switch (1085254), Control Solutions - Gateway (BB3-7301), Halogen - Bluetooth Module (BT-SB-E)

Testing notes: N/A

HCAi REVIEWED FOR CODE COMPLIANCE OSP-0922 2025 CALIFORNIA BUILDING CODE

UUT 2

Manufacturer: Water Control Corporation
Model number: GTE-2
Unit function: Ultrafiltration System
Serial number: 26CP-1053



Dimensions (in)			Weight	Res. Freq. (Hz)		
Depth	Width	Height	(lb)	F-B	S-S	V
23.0	89.0	79.0	1,034	5.0	9.1	23.5

Code & criteria: 2025 CBC, ICC-ES AC156-24 (2nd Edition)
Test laboratory: Environmental Testing Laboratory
Report: 26062TR1.0 (dated 10-13-26), tested on 8-11-26

S_{DS} (g)	z/h	H_f/R_μ	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
2.00	1	3.5/1.3	3.20	2.15	1.68	0.68
2.50	0	1.0/1.0				

Importance Factor, I_p = 1.5: Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.

Mounting: Rigid base mounted to fixture using (8) 1/2 in diameter Grade 5 bolts.

Construction: Welded aluminum framing. Ultrafiltration membrane modules with PVC and CPVC process piping.

Subcomponents: Veolia - Ultrafiltration Membrane Module (ZW700B-10060), nVent - Enclosure (CSD302010), Compressed Air USA - Compressed Air Filter (MCF35-38-HE), Gast - Air Compressor (87R647-PS101-N470X), GF Signet - Flow Meter (3-2581-PT03-102), Valworx - Electric Valve Actuator (561851C), Horner - I/O Module (HE959CNX116, HE959ADC270, HE959DAC107), Horner - PLC / Operator Interface (HE-XPLWE4), Mean Well - DC UPS (DUPS20), Power-Sonic - Battery (PS-1227-F1), Mean Well - Power Supply (XDR-480-24), Phoenix Contact - Relay (2966171, 2903334, 2903311), Phoenix Contact - Solid-State Contactor (1032919), ABB - Circuit Breaker (SU201M) (SU201M-K4, SU201M-K6, SU201M-K8, SU201M-K15, SU201M-K20), nVent - Power Distribution Block (569020), Citel - Surge Protective Device (32273255), Phoenix Contact - Network Switch (1085254), Control Solutions - Gateway (BB3-7301), Halogen - Bluetooth Module (BT-SB-E)

Testing notes: N/A

REVIEWED FOR CODE COMPLIANCE HCAi OSP-0922 DSA APPROVED DATE: 11/05/2026 CALIFORNIA BUILDING CODE, 2025

UUT 3

Manufacturer: Taco Comfort Solutions
Model number: CAF900-125AP
Unit function: Expansion Tank
Serial number: 546751

Dimensions (in)			Weight	Res. Freq. (Hz)		
Depth	Width	Height	(lb)	F-B	S-S	V
36.0	36.0	80.0	2,010	19.5	22.2	>33.3

Code & criteria: 2025 CBC, ICC-ES AC156-24 (2nd Edition)
Test laboratory: Environmental Testing Laboratory
Report: 26062TR1.0 (dated 10-13-26), tested on 8-11-26

S_{DS} (g)	z/h	H_f/R_μ	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
2.00	1	3.5/1.3	3.20	2.15	1.68	0.68
2.50	0	1.0/1.0				

Importance Factor, I_p = 1.5: Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.



Mounting: Rigid base mounted to fixture using (4) 5/8 in diameter Grade 5 bolts.

Construction: ASME carbon steel vessel with butyl bladder, 304 stainless steel system connections, and welded anchor clips.

Subcomponents: None.

Testing notes: Tank was filled with 1,300-lb of water weight during testing.

REVIEWED FOR CODE COMPLIANCE
HCAi
OSP-0922
BY: Mohammad Karim
DATE: 11/05/2026
CALIFORNIA BUILDING CODE, 2025

WATER CONTROL CORPORATION
HUF Gen 2 High-Capacity Ultrafiltration Systems

HUF GEN 2 HIGH-CAPACITY ULTRAFILTRATION SYSTEMS

Digit:	1	2	3	4	5	6	7	8	9	10
Sample:	**G**	**T**	**A**	**-**	**8**	**-**	**C**	**E**	**B**	**W**

Digit	Digit Description	Codes	Definitions
1-2	Product Family	GT	HUF Gen 2 High-Capacity Ultrafiltration System
3	Series	E	Basic series (central valving, GTE main control panel)
		A	Advanced series (per-filter valving, GTA main control panel, remote panels)
5	Number of Filters	1-4	Basic (E) series
		2-8	Advanced (A) series
7-10	Option	(blank)	Standard
		CEBW	Chemically Enhanced Backwash (Advanced series only)

FOR REFERENCE ONLY