



# Tepid Water Solutions

Tankless Heaters for ANSI Z358.1 Safety Shower and Emergency Eyewash

For detailed specification information on SafeAdvantage products, consult the Eemax Specification Guide.

## Why should you care about providing “tepid water” to your emergency equipment?

1. Approximately 85% of emergency equipment in the US is out of compliance according to equipment manufacturers.
2. As of August 1, 2016, OSHA fines increased 50-80% resulting from worker injuries from non-compliant showers.
3. Emergency equipment is meant to be highly visible and it is often the first stop on an OSHA inspection.

## [Q&A] WHY DOES AN EEMAX TANKLESS HEATER MAKE SENSE?

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| <p>A. What is the tepid water criteria for the ANSI Z358.1 standard?</p> <p>B. Why not simply run piping from existing hot water sources?</p> <p>C. Can I utilize storage tank water heaters?</p> <p>D. Can I tap into existing steam lines with ASSE 1071 thermostatic mixing valves to get tepid water?</p> <p>E. Can I tap into existing hot water systems and use thermostatic mixing valves to get tepid water?</p> <p>F. What are the advantages of electric tankless?</p> <p>G. Do I need a T&amp;P valve, drains, or any mixing valves if I use the Eemax heater?</p> <p>H. If my facility requires multiple showers, can I use an Eemax unit for more than one shower?</p> <p>I. Can the Eemax heater be used for other hot water applications in addition to tepid water?</p> <p>J. Is maintenance required with the heater?</p> <p>K. Can the heater be mounted in corrosive, explosion proof, or outdoor areas?</p> <p>L. Are there any Legionella growth concerns?</p> | <p>A. 23 GPM for at least 15 minutes at 60°-100°F which equals 345 gallons of available tepid water.</p> <p>B. Showers must be available within 10 seconds of the work place so large volumes of hot water must be nearby.</p> <p>C. Tank systems require 150 gallons at 160 degrees. They are 1300 lb and consume energy 24/7. An Eemax tankless heater is suitcase size and only uses energy when tepid water is needed.</p> <p>D. Steam systems may not always be accessible or powered on. Mixing valves are costly, create additional maintenance and extra piping is required.</p> <p>E. The installation of a hot water loop (pipe, pump, hangars, insulation, mixing valve) can be costly, may not have capacity, and create additional maintenance.</p> <p>F. No gas pipe, no vent, wall mountable, energy efficient, and typically lower installed cost vs. other hot water sources.</p> <p>G. Most inspectors recognize that the Eemax EFD model does not require any additional drains or valves.</p> <p>H. Depending on incoming water temperature and the distance between showers, one heater could serve multiple showers.</p> <p>I. Specifying the 140°F model (remove EFD suffix) and pairing it with an ASSE 1071 mixing valve allows the heater to serve multiple needs.</p> <p>J. The heater is designed to be maintenance free.</p> <p>K. The heaters can be built with an array of options depending on exact needs with a 5-15 day lead time and are built in the US.</p> <p>L. Legionella grows between 90-115°F so only hot water storage and recirculating systems are problematic.</p> |
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## STANDBY HEAT LOSSES ASSOCIATED WITH RECIRCULATION AND STORAGE TANKS

Recirculation Loop Heat Loss

	Year 1	Year 2	Year 3	Year 4	Year 5
Loop Length (ft) (includes supply out and loop return)	200	200	200	200	200
Pipe OD (in) (average supply and return pipe diameters)	1.375	1.375	1.375	1.375	1.375
Pipe ID (in) (average supply and return pipe diameters)	1.265	1.265	1.265	1.265	1.265
Insulation Thickness (in)	1	1	1	1	1
Temperature of Hot Water (°F)	140	140	140	140	140
Ambient Air Temperature (°F)	70	70	70	70	70
Thermal Conductivity of Copper Pipe (Btu-ft/hr*ft2*°F)	223	223	223	223	223
Thermal Conductivity of Polyurethane Insulation (W/(m*K))	70	70	70	70	70
Heat Loss Q (kW)	2.84	2.84	2.84	2.84	2.84
Electricity Cost Per kW-hr (\$)	\$0.090	\$0.090	\$0.090	\$0.090	\$0.090
Time (hr/yr)	8760	8760	8760	8760	8760
1/4 Hp Pump Electricity Cost (\$/5 years)	\$315	\$315	\$315	\$315	\$315
Cost to Hold Loop at Temperature for 1 Year	\$2,242	\$2,242	\$2,242	\$2,242	\$2,242
<b>5 Year Heating Losses + Pump Electricity Cost</b>	<b>\$11,208</b>				

Commercial 120 Gallon Electric Tank Storage Loss

	Year 1	Year 2	Year 3	Year 4	Year 5
Tank Energy Factor (EF) Rating	0.86	0.85	0.83	0.82	0.80
Temperature of Hot Water (°F)	140	140	140	140	140
Ambient Air Temperature (°F)	70	70	70	70	70
Heat Loss Through Tank (kW)	0.58	0.59	0.60	0.61	0.62
Electricity Cost Per kW-hr (\$)	\$0.140	\$0.140	\$0.140	\$0.140	\$0.140
Storage Cost of Hot Water (\$/year)	\$717	\$726	\$736	\$745	\$755
<b>5 Year Storage Losses</b>	<b>\$3,679</b>				

**SITE SURVEYS AND DESIGN ASSISTANCE FROM EEMAX AVAILABLE AT NO CHARGE**



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Tankless Heaters for ANSI Z358.1 Safety Shower and Emergency Eyewash

For detailed specification information on SafeAdvantage products, consult the Eemax Specification Guide.

Eyewash and Eye / Face Wash							Temperature Rise (°F)				
Volts	Model	Product Family	kW	Amps	Turn-On (GPM)	Recommended Wire Size (CU)	0.3 GPM	0.75 GPM	1.8 GPM	3.0 GPM	4.0 GPM
120 Single Phase	SPEX2412T EE	LavAdvantage	2.4	20	0.2	14 AWG	55	22	9	-	-
	SPEX3012T EE	LavAdvantage	3.0	25	0.2	12 AWG	60†	27	11	-	-
	SPEX3512T EE	LavAdvantage	3.5	29	0.2	10 AWG	60†	32	13	8	-
240 Single Phase	SPEX35T EE	LavAdvantage	3.5	15	0.2	14 AWG	60†	32	13	8	-
	SPEX48T EE	LavAdvantage	4.8	20	0.2	14 AWG	60†	44	18	11	-
	SPEX55T EE	LavAdvantage	5.5	23	0.2	12 AWG	60†	50	21	13	-
	SPEX65T EE	LavAdvantage	6.5	27	0.2	12 AWG	60†	59	25	15	-
	SPEX75T EE	LavAdvantage	7.5	32	0.2	10 AWG	60†	60†	28	17	-
	SPEX95T EE	LavAdvantage	9.5	40	0.2	8 AWG	60†	60†	36	22	-
	SPEX012240T EE	LavAdvantage	11.5	48	0.2	8 AWG	60†	60†	44	26	-
	EX144T2 EE	Series Two	15.0	64	1.5	10 AWG	-	-	57	34	26
	EX190T2 EE	Series Two	19.0	80	1.5	8 AWG	-	-	60†	43	32
EX023240T2 EE	Series Two	23.0	96	1.5	8 AWG	-	-	60†	52	39	
208 Single Phase	SPEX4208T EE	LavAdvantage	4.1	20	0.2	14 AWG	60†	37	16	9	-
	SPEX8208T EE	LavAdvantage	8.3	40	0.2	8 AWG	60†	60†	31	19	-
	EX1608T2 EE	Series Two	16.6	80	1.5	8 AWG	-	-	60†	38	28
277 Single Phase	SPEX3277T EE	LavAdvantage	3.0	11	0.2	14 AWG	60†	27	11	-	-
	SPEX4277T EE	LavAdvantage	4.1	15	0.2	14 AWG	60†	37	16	9	-
	SPEX60T EE	LavAdvantage	6.0	22	0.2	12 AWG	60†	55	23	14	-
	SPEX80T EE	LavAdvantage	8.0	29	0.2	10 AWG	60†	60†	30	18	-
	SPEX90T EE	LavAdvantage	9.0	33	0.2	10 AWG	60†	60†	34	20	-
	SPEX100T EE	LavAdvantage	10.0	36	0.2	8 AWG	60†	60†	38	23	-
	EX160T2 EE	Series Two	16.0	58	1.5	10 AWG	-	-	60†	36	27
208 Three Phase	EX200T2 EE	Series Two	20.0	72	1.5	8 AWG	-	-	60†	46	34
	EX180T2T EE	Three Phase	18.0	50/phase	0.7	8 AWG	-	60†	60†	41	31
	EX180T3 EE	Three Phase	18.0	50/phase	2.0	8 AWG	-	-	60†	41	31
	EX240T2T EE	Three Phase	24.0	67/phase	0.7	4 AWG	-	60†	60†	55	41
480 Three Phase	EX240T3 EE	Three Phase	24.0	67/phase	2.0	4 AWG	-	-	60†	55	41
	ED020480T3 EE	Three Phase	20.0	24/phase	2.0	10 AWG	-	-	60†	46	34
	ED024480T3 EE	Three Phase	24.0	29/phase	2.0	10 AWG	-	-	60†	55	41
ED032480T3 EE	Three Phase	32.0	38/phase	2.0	8 AWG	-	-	60†	60†	55	

†Temperature electronically limited to factory preset not to exceed temperature. "-" indicates not operable.

Eye / Face Wash and Drench Shower							Temperature Rise (°F)				
Volts	Model	NEMA 4 Cabinet Suffix	kW	Amps	Turn-On (GPM)	Recommended Wire Size (CU)	4.0 GPM	20.0 GPM	23.0 GPM	26.0 GPM	30.0 GPM
208 Three Phase	AP032208 EE	N4, N4X	32	89/phase	1.0	3 AWG	55	11	10	8	7
	AP036208 EE	N4, N4X	36	100/phase	1.0	3 AWG	60†	12	11	9	8
	AP041208 EFD	N4, N4X	41	113/phase	1.0	2 AWG	60†	14	12	11	9
	AP054208 EFD	N4, N4X	54	150/phase	1.5	1/0 AWG	60†	18	16	14	12
	AP064208 EFD	N4, N4X	64	178/phase	2.5	3/0 AWG	60†	22	19	17	15
480 Three Phase	AP036480 EE	N4, N4X	36	43/phase	1.0	8 AWG	60†	12	11	9	8
	AP039480 EE	N4, N4X	39	47/phase	1.0	8 AWG	60†	13	12	10	9
	AP048480 EFD	N4, N4X	48	58/phase	1.0	6 AWG	60†	16	14	13	11
	AP054480 EFD	N4, N4X	54	65/phase	1.5	6 AWG	60†	18	16	14	12
	AP063480 EFD	N4, N4X	63	76/phase	2.5	4 AWG	60†	22	19	17	14
	AP072480 EFD	N4, N4X	72	87/phase	2.5	3 AWG	60†	25	21	19	16
	AP096480 EFD	N4, N4X	96	116/phase	2.5	1 AWG	60†	33	29	25	22
	AP108480 EFD	N4, N4X	108	130/phase	2.5	1 AWG	60†	37	32	28	25
	AP126480 EFD	N4, N4X	126	151/phase	2.5	2/0 AWG	60†	43	37	33	29
	AP144480 EFD	N4, N4X	144	173/phase	2.5	2/0 AWG	60†	49	43	38	33
600 Three Phase	AP061600 EFD	N4, N4X	61	59/phase	2.5	6 AWG	60†	21	18	16	14
	AP071600 EFD	N4, N4X	71	68/phase	2.5	4 AWG	60†	24	21	19	16
	AP102600 EFD	N4, N4X	102	98/phase	2.5	3 AWG	60†	35	30	27	23
	AP130600 EFD	N4, N4X	130	125/phase	2.5	1 AWG	60†	44	39	34	30
	AP150600 EFD	N4, N4X	150	144/phase	2.5	1/0 AWG	60†	51	45	39	34

†Temperature electronically limited to factory preset not to exceed temperature.

## Suffix Definitions

- EE** **Emergency Eyewash.** Shipped with maximum outlet temperature 90°F. Conforms to ANSI Z358.1.1 tepid water without additional mixing valve.
- EFD** **Emergency Eye, Face & Drench.** Shipped with maximum outlet temperature 90°F. Conforms to ANSI Z358.1.1 tepid water without additional mixing valve.

## NEMA 4 Cabinet Options

- N4** Waterproof powder coated steel
- N4X** Waterproof corrosion resistant 304 stainless steel
- N4X6** Waterproof corrosion resistant 316 stainless steel

## NEMA 4 Cabinet Option Accessories

- FP** Freeze protection (-30°F)
- EDS** Non-fused disconnect
- FDS** Fused disconnect
- EP** Explosion proof (C1D2 compliant)
- GFCI** True RMS GFCI with digital display and reset
- SK** 24" legs for free standing applications
- RD** Remote display
- SB** Siren and beacon
- DC** Dry contact
- ES** Emergency stop - push button

**Eemax recommends the use of a NEMA 4 Cabinet for safety applications.** For additional SafeAdvantage specifications, view the Eemax specification guide.

Heaters with 90°F maximum output should not feed a thermostatic mixing valve. If a TMV is required, order the heater capable of 140°F output.