

# DSE COMMERCIAL ELECTRIC WATER HEATER

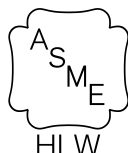
DSE - 5/10/20/30/40/50/65/80/100/120

Heavy duty commercial electrical water heater.



- A.O. Smith's new proprietary electronic water heater control provides precise + or – 1° temperature control that is ideal for industrial and food service applications where exact temperatures are needed.
- The Operating Set Point is adjustable from 90°F/42°C to 190°F/88°C. The factory setting is 120°F/49°C.
- Approved for 180°F/82°C sanitizing applications.
- Animated icons display detailed operational and diagnostic information. Fault or alert messages appear if an operational issue occurs.
- Each element is constantly monitored and current on/off state is displayed, any element failure is reported and its exact location is shown, eliminates a need for field testing of elements.
- Factory standard on board low water cutoff uses a remote electric immersion type probe to prevent energizing of the elements in the event of low water condition and eliminates accidental dry firing.
- Units with multiple element contactors are sequenced on with one-second delay between stages. Prevents high amp electrical loads from hitting the electric system all at once and provides a smoother operating unit. Adjustable modulating mode is optional see options.
- Control system automatically lowers the operating set point by a user defined value during setback periods. Seven-day clock may be programmed for night set back and or weekend shutdown to reduce operating cost and save energy.
- BACnet or Modbus compatible with optional ICC Gateway.
- The DSE models use a unique combination of a conventional sacrificial anode and an adaptive powered anode. The powered anode is self-adjusting to water conditions, does not require maintenance and provides longer-lasting tank protection in hard to reach areas. This multi-anode system provides superior anodic protection to hidden surfaces of the tank not protected in conventional commercial electric water heaters.
- Heavy-duty elements provide excellent protection against oxidation and scaling. Input ranges from 3kW to 90kW available (see accompanying chart). Rugged, industrial grade, elements.
- All models meet or exceed the thermal efficiency and/or standby loss requirements of the U. S. Department of Energy and current edition ASHRAE/IES 90.1.
- A.O. Smith's PermaGlas® coating provides truly superior protection against corrosion and is permanently bonded to all inner tank surfaces at 1600°F.
- ASME tank construction 160 psi working pressure
- Standard voltages 208, 240 and 480 volt single and three phase. All 208 and 240 volt at 24kW and below are supplied phase convertible (single to three and vice versa). 277 volt single phase also available. Consult factory for 120 volt power circuit availability.
- Terminal block. To accept copper or aluminum leads (on units with more than one contactor).
- 120 Volt control circuit powered by fused transformer.
- Magnetic contractors. Heavy-duty UL rated for 100,000 cycles.
- Power circuit fusing (120 amp current draw and above). Meets National Electric Code and UL requirements that water heaters must have internal fusing when current draw exceeds 120 amps.
- Simplified circuitry, color-codes for ease of service
- Hinged control compartment door
- CSA certified and ASME rated T&P relief valve

*For sample specification, please refer to the next page*



## Optional equipment & construction

### Handhole cleanout

### Dial type combination temperature & pressure gauge (Shipped loose)

### Power circuit fusing (less than 120 amps)

- Sub-divides internal circuitry with maximum of 60 amp fuses. Supplied as standard when required by NEC and UL.

### Alarm horn

- Horns may be furnished to warn of any condition in the heater for which sensors have been specified.

### North Carolina code - factory installed T&P valve

### Optional international voltages

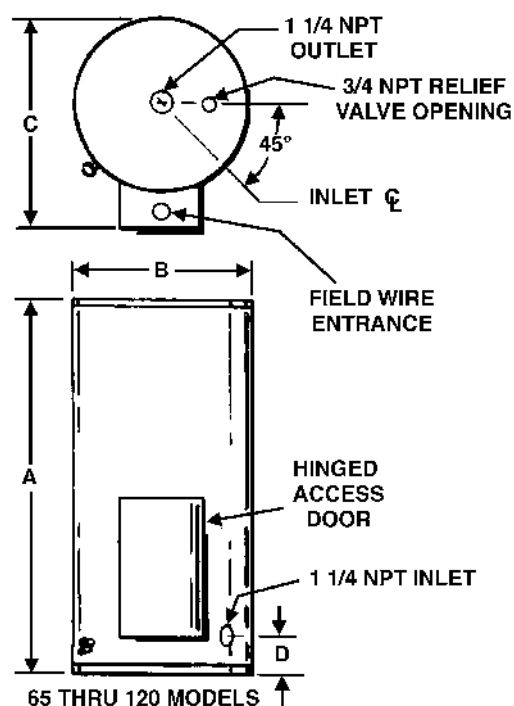
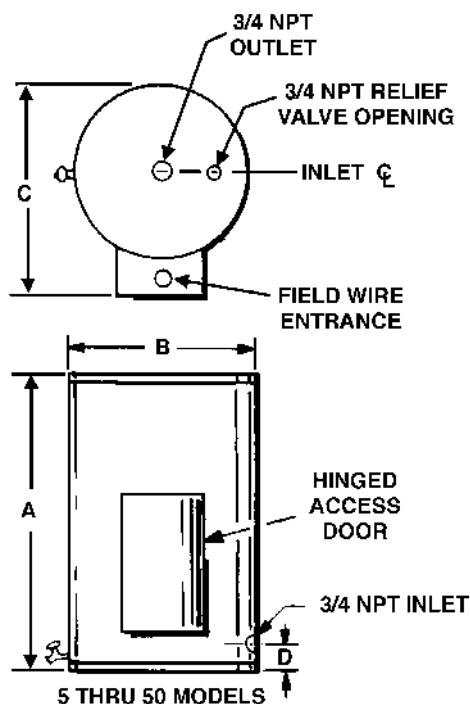
- 380, 415, 575 and 600 volts three-phase available with Y connected elements.

### Modulating control

- The first element on is the first element off.
- Not available on single element, single contactor units.

### SAMPLE SPECIFICATION

The heater shall be a glass-lined Custom Xi™ commercial electric model No. \_\_\_\_\_ with \_\_\_\_\_ gallons storage, as manufactured by A.O. Smith. Heater should be rated at \_\_\_\_\_ kW, \_\_\_\_\_ volts, \_\_\_\_\_ phase, 50/60 cycle AC and constructed in accordance with ASME Code, shall bear appropriate symbol and be listed with the National Board as required. Heater shall be listed with Underwriters' Laboratories and classified to The National Sanitation Foundation Standard No. 5. All internal surfaces of the tank shall be glass-lined with an alkaline borosilicate composition that has been fused-to-steel by firing at a temperature of 1600°F. Tank shall be cathodically protected with a combination of sacrificial and powered anodes. The entire vessel is to be enclosed in a round steel enclosure with baked enamel finish. Water heater shall have an electronic control with large LCD displaying current water heater status; provide real time element status and sensing, low water cutoff and economy mode operation. Shall have 120 volt control circuit transformer, transformer fusing, magnetic contactor(s), element fusing per N.E.C., and commercial grade Incoloy elements. Temperature controls include limiting switch which will require resetting manually in the event the temperature reaches 202°F. Foam insulation shall meet the thermal efficiency and/or standby loss requirements of the U. S. Department of Energy and current edition of ASHRAE/IES 90.1. Heater shall include a CSA Certified and ASME Rated T&P relief valve and a drain valve. Water heater unit(s) shall be compatible with building management systems using Modbus or BACnet with optional ICC interface.



Model number	Gallon capacity		Maximum kW input	Dimensions								Approx. shipping weight	
				A		B		C		D			
	gal.	litre		Inches	mm	Inches	mm	Inches	mm	Inches	mm	lbs	kg
DSE-5A	5	19	3	22	558.8	16	406.4	24	610	4.25	108	82	37.2
DSE-10A	10	38	6	28.13	714.5	18	457.2	26	660	5.25	133.35	116	48.1
DSE-20A	20	76	18	31.75	806.5	22	558.8	28	711	5.75	146.05	145	65.7
DSE-30A	30	114	24	43.25	1098.55	22	558.8	28	711	5.75	146.05	218	98.9
DSE-40A	40	151	36	54.75	1391	22	558.8	28	711	5.75	146.05	245	111.1
DSE-50A	50	189	90	66.19	1681	22	558.8	28	711	5.75	146.05	291	132.0
DSE-65A	65	246	90	57.25	1454	26.5	673.1	32.5	826	11.38	289	344	156.0
DSE-80A	80	303	90	58.13	1477	28	711.2	35	889	12.5	318	406	184.2
DSE-100A	100	379	90	70.25	1784	28	711.2	35	889	12.5	318	419	190.1
DSE-120A	120	450	90	70.25	1784	30.13	765.3	37	939.8	12.5	318	453	205.5

NOTE: DSE 5A to 50 A not available with G-mark for Gulf countries.

GPH recoveries at list temperature rise													
Standard kW input	BTU/ hour	30 °F 16.7 °C	40 °F 22.3 °C	50 °F 27.8 °C	60 °F 33.4 °C	70 °F 38.9 °C	80 °F 44.5 °C	90 °F 50 °C	100 °F 55.6 °C	110 °F 61.2 °C	120 °F 66.7 °C	130 °F 72.3 °C	140 °F 77.8 °C
3	10,236	42	32	25	21	18	16	14	13	12	11	10	9
		159	121	95	79	68	61	53	49	45	42	38	34
6	20,472	83	63	50	42	36	32	28	25	23	21	20	18
		314	238	189	159	136	121	106	95	87	79	76	68
9	30,708	125	94	75	63	54	47	42	38	34	32	29	27
		473	356	284	238	204	178	159	144	129	121	110	102
12	40,944	166	125	100	83	71	63	56	50	46	42	39	36
		628	473	379	314	269	238	212	189	174	159	148	136
15	51,180	207	156	125	104	89	78	69	63	57	52	48	45
		783	590	473	394	337	295	261	238	216	197	182	170
18	61,416	249	187	150	125	107	94	83	75	68	63	58	54
		942	708	568	473	405	356	314	284	257	238	220	204
24	81,888	332	249	199	166	142	125	111	100	91	83	77	71
		1257	942	753	628	537	473	420	379	344	314	291	269
30	102,360	414	311	249	207	178	156	138	125	113	104	96	89
		1567	1177	942	783	674	590	522	473	428	394	363	337
36	122,832	497	373	299	249	213	187	166	150	136	125	115	107
		1881	1412	1132	942	806	708	628	568	515	473	435	405
45	153,540	621	466	373	311	267	233	207	187	170	156	144	134
		2350	1764	1412	1177	1011	882	783	708	643	590	545	507
54	184,248	746	559	448	373	320	280	249	224	204	187	172	160
		2824	2116	1696	1412	1211	1060	942	848	772	708	651	606
60	204,720	828	621	497	414	355	311	276	249	226	207	192	178
		3134	2350	1881	1567	1344	1177	1045	942	855	783	727	674
75	255,900	1035	777	621	518	444	389	345	311	283	259	239	222
		3917	2941	2350	1961	1681	1472	1306	1177	1071	980	905	840
90	307,080	1242	932	746	621	533	466	414	373	339	311	287	267
		4701	3528	2824	2350	2017	1764	1567	1412	1283	1177	1086	1011

Full load current in Amperes						
kW input	No. of elements	Wattage	Single phase	Three phase		
			240V	380V	400V	415V
3	1	3000	12,5	4,5	4,3	4,2
6	1	6000	25,0	9,1	8,7	8,3
9	1	9000	37,5	13,6	13,0	12,5
12	1	12000	50,0	18,2	17,4	16,7
15	1	15000	62,5	22,7	21,7	20,8
18	1	18000	75,0	27,3	26,1	25,0
24	2	12000	100,0	36,4	34,8	33,3
30	2	15000	125,0	45,5	43,5	41,7
36	2	18000	150,0	54,5	52,2	50,0
45	3	15000	187,5	68,2	65,2	62,5
54	3	15000	225,0	81,8	78,3	75,0
60	4	15000	250,0	90,9	87,0	83,3
75	5	15000	312,5	113,6	108,7	104,2
90	6	15000	375,0	136,4	130,4	125,0