

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 contactors. 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

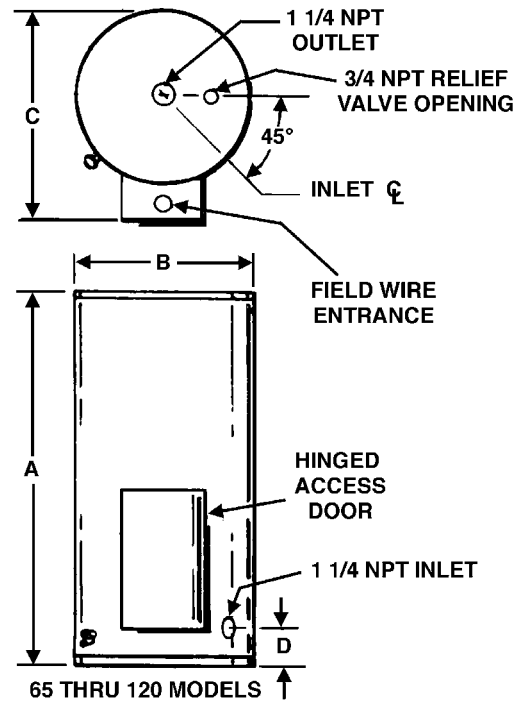
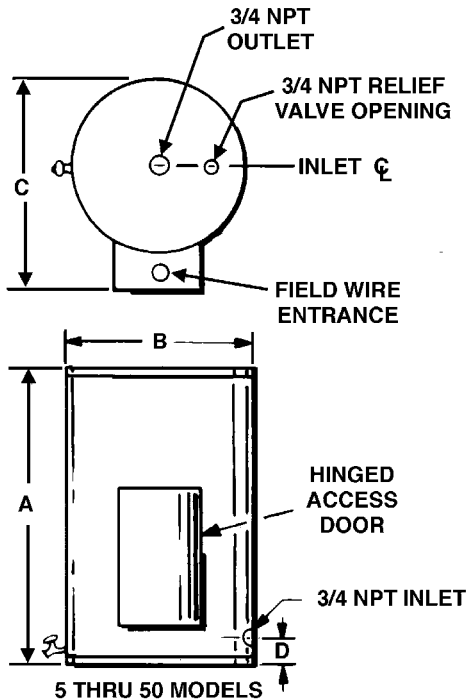
- 380, 415, 575 and 600 volts three-phase available with Y connected elements.

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 units(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 | 40 °F | 50 °F | 60 °F | 70 °F | 80 °F | 90 °F | 100 °F | 110 °F | 120 °F | 130 °F | 140 °F |
| | | 16.7 °C | 22.3 °C | 27.8 °C | 33.4 °C | 38.9 °C | 44.5 °C | 50 °C | 55.6 °C | 61.2 °C | 66.7 °C | 72.3 °C | 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 |

| kW input | No. of elements | Wattage | Full load current in Amperes | | | |
|----------|-----------------|---------|------------------------------|-------|-------------|-------|
| | | | 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 |