

# Custom Xi SERIES

## Heavy Duty Electric Water Heaters

**DSE 5 - 120**

**Storage Capacity**  
20 to 450 Litres

**Range of KW Input**  
3 KW to 90 KW Input



Designed for use as a recovery heater having its own storage tank or booster for supplying sanitizing rinse water for dishwashing.

## FEATURES

<b>ADVANCED ELECTRONIC CONTROL</b>	A. O. Smith's new proprietary electronic water heater control provides precise temperature control that is ideal for industrial and food service applications where exact temperatures of hot water are needed.
<b>PLAIN ENGLISH TEXT</b>	Animated icons display detailed operational and diagnostic information. Fault or Alert messages appear if an operational issue occurs.
<b>ELEMENT SENSING</b>	Each element is constantly monitored and current on/off state is displayed, any element failure is reported and its exact location is shown. Eliminates guesswork, makes troubleshooting easy and helps keep the unit operating at maximum performance.
<b>LOW WATER CUT OFF</b>	Factory standard on-board low water cutoff uses a remote electronic immersion type probe to prevent energizing of the elements in the event of low water condition and eliminates accidental dry firing.
<b>SEQUENCING</b>	Heating elements are energized according to adjustable differential set points for each. Helps reduce operating costs during low/moderate loads.
<b>ECONOMY MODE OPERATION</b>	Control system automatically lowers the operating set point by a programmed value during user - defined time periods. Seven-day clock may be programmed for night set back and/or weekend shutdown to reduce operating cost and save energy.

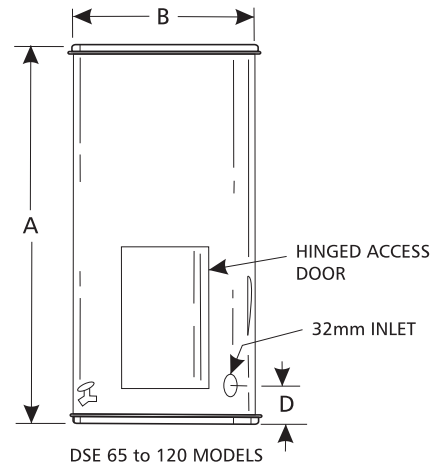
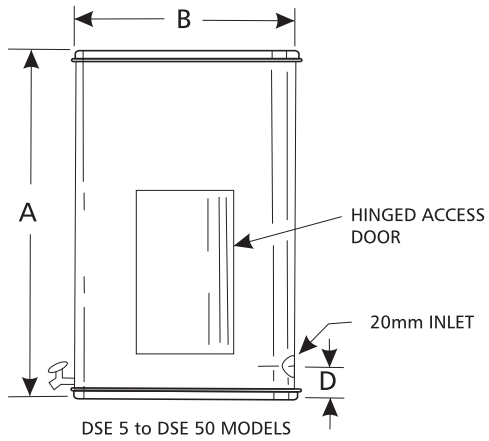
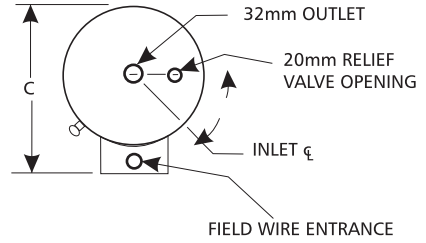
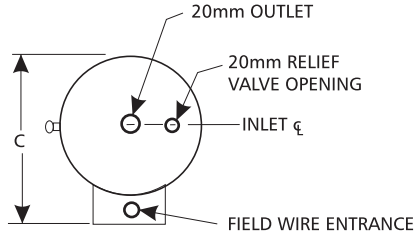
## ADDITIONAL FEATURES

<b>POWERED ANODE</b>	The DSE models use a unique combination of a conventional magnesium anode and a European style power anode. The powered anode is self-adjusting to water conditions, does not require maintenance or inspection, 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 convention commercial electric water heaters.
<b>INCOLOY IMMERSION HEATERS</b>	Heavy-duty medium watt density elements have incoloy sheathing and prewired leads: provides excellent protection against oxidation and scaling. Input ranges from 3kW to 90kW available (see accompanying chart).
<b>HEAVY FOAM INSULATED</b>	All models meet or exceed the standby loss requirements of ASHRAE 90.1b-1992 and ASHRAE/IESNA 90.1-2004.
<b>GLASS-LINED TANK</b>	A. O. Smith's PermaGlass® coating provides truly superior protection against corrosion and is bonded to all inner tank surfaces at 870°C.
<b>ASME TANK CONSTRUCTION</b>	8.6 Bar working pressure (246 to 455 litres), 10.3 Bar working pressure (19 to 190 litres).
<b>THREE YEAR LIMITED WARRANTY</b>	For complete warranty information consult written warranty or contact A. O. Smith.
<b>STANDARD VOLTAGES</b>	220, 240 and 415 volt single and three phase. Single phase 220 and 240 are convertible to three phase. All 220 and 240 volt at 24kW and below are supplied phase convertible (single to three and vice versa). Consult factory for 120 volt power circuit availability. Also available in international voltages.
<b>TERMINAL BLOCK</b>	To accept copper or aluminum leads (on units with more than one contactor).
<b>120 VOLT CONTROL CIRCUIT</b>	120 volt control circuit powered by fused transformer.
<b>MAGNETIC CONTACTORS</b>	Heavy-duty UL rated for 100,000 cycles.
<b>POWER CIRCUIT FUSING (120AMP CURRENT DRAW AND ABOVE)</b>	Meets UL requirements that water heaters must have internal fusing when current draw exceeds 120 amps.

- Simplified circuitry, color-coded for ease of service
- Brass drain valve
- Hinged control compartment door
- ASME T & P relief valve.

**ASME**





DSE							
Models	Liters	Maximum kW Input	All Dimensions in mm				Approximate Shipping Wt.
			A	B	C	D	Kg.
DSE-5	20	3	520	415	572	133	37.2
DSE-10	38	6	667	476	635	133	48.1
DSE-20	76	18	692	520	673	146	59
DSE-30	114	24	908	520	673	146	68
DSE-40	151	36	1162	520	673	146	86.2
DSE-50	189	90	1391	520	673	146	100.2
DSE-65	246	90	1283	673	850	178	121.1
DSE-80	303	90	1251	711	889	178	129.3
DSE-100	379	90	1480	711	889	178	160.6
DSE-120	450	90	1607	762	940	190	190.5

## RECOVERY RATE IN LITRES PER HOUR FOR TEMPERATURE RISE IN °C

Standard kW Input	17°C	22°C	28°C	33°C	39°C	45°C	50°C	56°C	61°C	67°C	72°C	78°C
3	155	117	91	76	64	57	49	45	42	38	38	34
6	310	235	185	155	132	117	102	95	83	79	72	68
9	466	348	280	235	201	174	155	140	129	117	106	98
12	621	466	371	310	265	231	208	185	170	155	144	132
15	776	583	466	386	333	291	257	231	212	193	178	167
18	931	697	560	466	397	348	310	280	254	235	216	201
24	1,242	931	746	621	530	466	413	371	341	310	288	265
30	1,552	1,166	931	776	666	583	519	466	424	390	360	333
36	1,862	1,397	1,117	931	799	697	621	560	507	466	428	397
45	2,328	1,745	1,397	1,162	996	871	776	697	636	583	538	500
54	2,794	2,097	1,677	1,359	1,196	1,049	931	837	761	700	644	598
60	3,100	2,328	1,862	1,552	1,329	1,162	1,033	931	844	776	715	666
75	3,880	2,907	2,328	1,938	1,662	1,454	1,291	1,162	1,056	969	893	829
90	4,652	3,490	2,794	2,328	1,995	1,745	1,552	1,397	1,268	1,162	1,075	996

Figured at 1 KW=860 Kcal

## STANDARD KW INPUTS

Standard Kw Ratings	Immersion Heaters***		Number Of 50A Contactors		Full Load Current In Amperes		
	No. Of Heaters	Wattage	240V	480V	Single Phase	Three Phase	
					220V	240V	415V
3	1	3,000			13.6	12.5	4.1
6	1	6,000			27.2	25	8.3
9	1	9,000	1		37.5	12.5	
12	1	12,000		1	54.5	50	16.6
15	1	15,000			68.1	62.5	20.8
18	*1	18,000			81.8	75	25.0
24	2	12,000	2		100	33.3	
30	2	15,000			136.3	125	41.7
36	*2	18,000	3		150	50.0	
45	3	15,000		2	204.5	187.5	62.5
54	3	18,000			N/A	225	75.0
60**	4	15,000	4		250	83.4	
75**	5	15,000	5	3	N/A	N/A	104.2
90**	5	18,000			N/A	N/A	125.1

\*\* Available on 189 Litres models or larger.

\*\*\* Each immersion heater contains three electric elements.

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## OPTIONAL EQUIPMENT & CONSTRUCTION

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<b>GOLDENROD ELEMENTS</b>	All DSE models are available with the patented Goldenrod 24K gold plated element. Goldenrod elements provide long-life and five times the scaling resistance of standard Incoloy elements. Goldenrod elements carry a three-year warranty against failure due to scale. [Goldenrod Elements not available with 220V & 415V]
<b>STAINLESS STEEL TANK</b>	Available for deionized water. Add a D to the end of the model prefix for use with deionized water. For example a DSE5 would become a DSED5.
<b>10.34 OR 11 BAR WORKING PRESSURE</b>	Available when required. Must be specified at time of order.
<b>HANDHOLE CLEANOUT</b>	100 mm x 150 mm size.
<b>COMBINATION TEMPERATURE /PRESSURE GAUGE</b>	Dial type combination gauge (shipped loose).

## CONTROL OPTIONS

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<b>OVERRIDE SWITCHES</b>	A simple form of load control allows all or part of unit input to be controlled manually. Up to one override switch per contactor is available.
<b>INDICATING/PILOT LIGHTS</b>	For indicating element operation and/or switch closure. Up to one indicating light available for each switch and/or contactor is available.
<b>MODULATING CONTROL</b>	The first element on is the first element off. Not available on single element, single contactor units.
<b>PRESSURE LIMIT SWITCHES</b>	Both high and low pressure limit switches available.
<b>POWER CIRCUIT FUSING</b>	Sub-divides internal circuitry with maximum of 60 amp fuses. Supplied as standard when required by NEC and UL.
<b>ALARM HORN</b>	Horns may be furnished to warn of any condition in the heater for which sensors have been specified.
<b>OPTIONAL INTERNATIONAL VOLTAGES</b>	380, 575 and 600 volts three-phase available with Y connected elements.

## MANIFOLD KITS

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- Two Heaters – 9003429205
- Three Heaters – 9003430205
- Four Heaters – 9003431205

**SUGGESTED SPECIFICATION**

The heater shall be a glass-lined Custom Xi commercial electric model No. \_\_\_\_\_ as manufactured by A. O. Smith Corporation. Heater should be rated at \_\_\_\_\_ kW, \_\_\_\_\_ volts, \_\_\_\_\_ phase, 50 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 approved 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 870°C. Tank shall be cathodically protected with 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 house 120 volt control circuit transformer, transformer fusing, magnetic contactor(s), element fusing per N.E.C., and commercial grade incoloy sheathed flange mounted elements with prewired terminal leads. Temperature controls include limiting switch which will require resetting manually in the event the temperature reaches 88°C. Foam insulation shall exceed latest requirements of ASHRAE 90.1b-1992 and ASHRAE/IESNA 90.1-2004 for heat loss efficiency. Heater shall include ASME T & P relief valve and drain valve. Water heater should incorporate the iCOMM™ system for remote monitoring, leak detection and fault alert.

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