

Enclosure Thermal Management

Heating Solutions that are simple, compact and lower cost.



INDEECO

an **ASPEQ** company

ENCLOSURE HEATING AND HEATER SELECTION

WHY DO ENCLOSURES NEED HEAT?

Heat is required to raise the temperature of the control panel, for freeze protection, reduce humidity, and prevent damage to the electronic components. As the complexity of electronics increase the temperatures in the panel increase, and it becomes even more critical to safeguard the enclosures. As a result of the higher temperatures, cooling systems are often required in many applications. When you have both the heat build-up and cooling moisture forms which causes the components to fail whether the enclosure is indoors or outdoors, insulated or un-insulated.

MOISTURE AND FAILURE

When moisture is combined with contaminants, such as gas, dirt, water or dust, it may cause atmospheric corrosion, and failure of the components such as relays, transformers, bus bar, and integrated circuit boards. The most dangerous conditions are outdoors with large variation in ambient temperatures. Failure modes include; resistance changes, creepage current, insulation properties being compromised and flash-overs.

ELIMINATE MOISTURE

It is important to keep the relative air humidity below 60% to minimize moisture and corrosion. Should the relative air humidity rise above 65% it greatly increases the opportunity for moisture and corrosion problems to occur. Keeping the enclosure temperature 10°F higher than the ambient air temperature prevents moisture and corrosion in the enclosure. Consistent temperatures assure peak operating conditions. Continual changes in the enclosure temperatures produce condensation and decrease the life expectancy of the components

HEATER LOCATION

Mounting the heaters along with a thermostat near the bottom of the enclosure provides the best performance. Thermostats can be an integral part of the heater or purchased as an accessory item. The controller should be positioned in a neutral location that will provide an average humidity or temperature reading. Placing the thermostat too close to the heater may provide a reading that is influenced by the direct heat off of the heater.

		Temperature Rise from Minimum Expected Ambient Temperature to Desired Enclosure Temperature (°F)													
		20		40		60		80		100		120		140	
Enclosure Surface Area – Square Feet	50	935	402	1800	774	2740	1178	3600	1548	4600	1978	5475	2354	6340	2726
	40	750	323	1430	615	2200	946	2875	1236	3700	1591	4400	1892	5065	2178
	30	560	241	1100	473	1650	710	2175	935	2760	1187	3285	1413	3795	1632
	25	470	202	900	387	1370	589	1800	774	2300	989	2735	1176	3170	1363
	20	375	161	725	312	1100	473	1450	624	1840	791	2200	946	2525	1086
	15	280	120	540	232	820	353	1075	462	1375	591	1650	710	1900	817
	10	185	80	360	155	550	237	725	312	920	396	1100	473	1265	544
	9	165	71	315	135	480	206	635	273	805	346	960	413	1110	477
	7.5	140	60	270	116	410	176	540	232	690	297	825	355	950	409
	6	112	48	216	93	300	129	450	194	550	237	660	284	770	331
	5	95	41	180	77	275	118	365	157	460	198	550	237	635	273
	4	74	32	142	61	216	93	290	125	370	159	440	189	500	215
	3	55	24	110	47	165	71	220	95	275	118	330	142	385	166
	2	37	17	75	32	109	47	145	62	185	80	220	95	250	108
Required wattage – Double above values in areas with extreme wind factors.															
<div style="display: flex; justify-content: center; gap: 20px;"> <div style="border: 1px solid black; width: 20px; height: 10px; background-color: #cccccc;"></div> un-insulated cabinet <div style="border: 1px solid black; width: 20px; height: 10px; background-color: #ffffff;"></div> insulated cabinet </div>															

HX SERIES ENCLOSURE HEATERS

100W - 500W

CORROSION-RESISTANT MOUNTING BRACKET

Offers maximum protection from accidental contact while allowing continuous air circulation

EASY INSTALLATION

Multiple 3/8" diameter mounting holes

RUGGED 304 SST TUBULAR ELEMENT

SEALED ELEMENT

To prevent moisture absorption

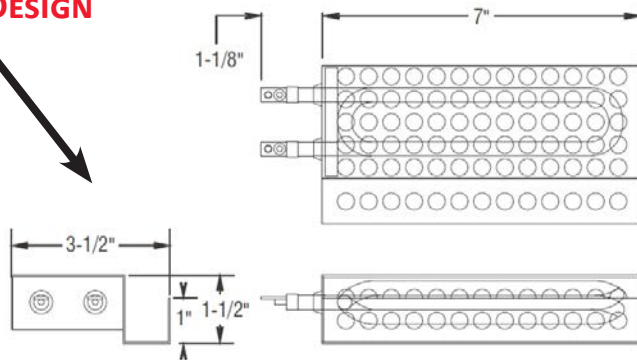
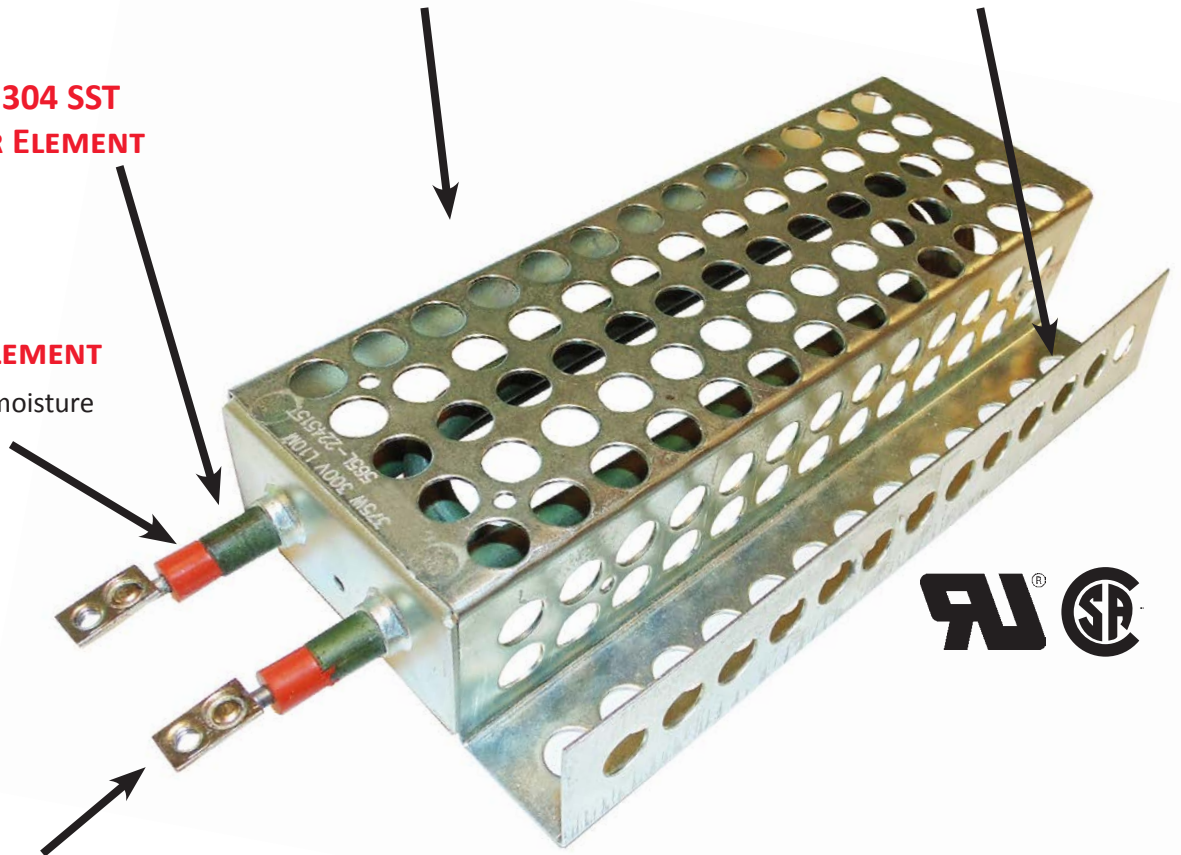
#8-32 SCREW TABS

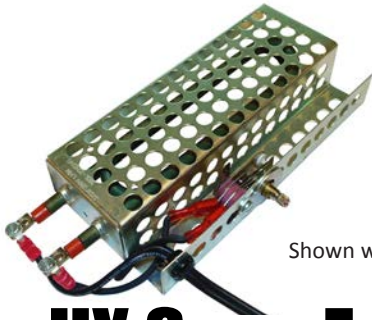
For convenient electrical connections

COMPACT DESIGN

OPTIONAL FEATURES

- Custom wattages/voltages
- Custom dimensions/sizes
- Special moisture resistant vulcanized terminal with lead wire
- Custom mounting brackets and shrouds
- Thermostat
- Terminal shield for touch safe protection





Shown with optional thermostat

HX SERIES ENCLOSURE HEATERS

						WITH THERMOSTAT 30°F - 150°F		
Watts	Operating Voltage	Max Current	Stocked	Part Number	Price	Stocked	Part Number	Price
100	250	.40 A	Y	HX-565003	\$42.00	N	HX-565003T	\$70.00
100	125	.80 A	Y	HX-565002	\$42.00	Y	HX-565002T	\$70.00
125*	120*	1.04 A	Y	HX-565060**	\$42.00	Y	HX-565060T**	\$70.00
125	240	.52 A	Y	HX-565070	\$42.00	N	HX-565070T	\$70.00
150	120	1.25 A	Y	HX-565071	\$42.00	Y	HX-565071T	\$70.00
150	240	.625 A	Y	HX-565079	\$42.00	N	HX-565079T	\$70.00
250	125	2.0 A	Y	HX-565004	\$42.00	Y	HX-565004T	\$70.00
250	250	1.0 A	Y	HX-565005	\$42.00	Y	HX-565005T	\$70.00
300	125	2.4 A	N	HX-565008	\$42.00	N	HX-565008T	\$70.00
300	250	1.2 A	N	HX-565009	\$42.00	N	HX-565009T	\$70.00
350	125	2.8 A	Y	HX-565006	\$42.00	Y	HX-565006T	\$70.00
350	250	1.4 A	Y	HX-565007	\$42.00	N	HX-565007T	\$70.00
375	125	3.0 A	Y	HX-565011	\$42.00	N	HX-565011T	\$70.00
375	250	1.5 A	Y	HX-565012	\$42.00	N	HX-565012T	\$70.00
500	120	4.17 A	Y	HX-565061**	\$42.00	Y	HX-565061T**	\$70.00
500*	240*	2.08 A	Y	HX-565060**	\$42.00	Y	HX-565060T**	\$70.00

Pricing current through 12/31/2016. Check our website for up-to-date pricing and delivery.
 Stocked items can ship in 24 HRS ARO on orders of 10 or less. Orders exceeding 10 units please contact factory.
 Non-stocked items ship in three (3) weeks ARO.
 Thermostat option adds 1" to the width of the unit.
 * Items are dual rated.
 **CSA Only.

FIELD UPGRADE ENCLOSURE HEATER

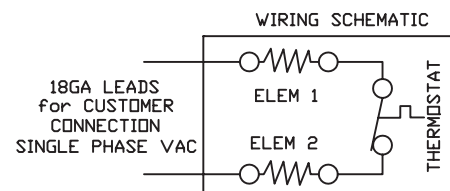
INDEECO Field Upgrade Heating Units offer the same basic design as the INDEECO Enclosure Heater with the benefit of expanded voltage ranges.

Heater can be wired directly to incoming power source, eliminating the need to increase the transformer size to accommodate an enclosure heater.



						WITH THERMOSTAT 30°F - 150°F		
Watts	Operating Voltage	Max Current	Height	Width*	Length	Stocked	Part Number	Price
250	460	.54 A	2.625"	5.250"	10.50"	N	739DR286599	\$250.00
203	415	.49 A						
170	380	.45 A						

* Includes thermostat dial
 22 ga 304 SST shroud
 UL Recognized and CSA Listed Component
 Delivery 4 weeks ARO



COMPARISON OF INDEECO ENCLOSURE HEATERS VERSUS TYPICAL STRIP HEATERS

CONCERN	ENCLOSURE HEATERS	TYPICAL STRIP HEATER
Mounting Options	Enclosure heater is supplied complete with mounting bracket. Bracket allows for installation by any one of numerous pre-punched holes. Heater can be installed horizontally or vertically. Unique design supports the element in a mounting flange allowing for expansion of the element independent of the shroud while allowing continuous circulation of air. Therefore, no stand offs, insulation, or special mounting hardware is required.	Strip heaters are supplied with two mounting slots. This requires specific holes or bolts to install. Due to expansion of the heater the mounting bolts need be left loose to avoid buckling. Also, additional labor and materials are required to provide stand offs and/or insulation to disallow transfer of heat to the surface it is mounted to. All at additional cost.
Element Protection	Enclosure heater provides corrosion resistant shroud which offers maximum protection from accidental contact of heating element.	Strip heaters require additional fabrication installed around the heater (at additional cost) to provide protection from accidental contact of heating element.
Moisture absorption	Enclosure heater uses tubular element sealed at the ends which disallows moisture absorption. This maximizes heater life.	Standard strip heater is generally sheet metal with crimped seams the length of the heater. These seams many times allow for moisture to be absorbed by the hygroscopic insulating material resulting in premature failure. Expansion and contraction during operation exacerbates this problem over the life of the heater.
Heater Size/Shape	The unique design of the enclosure heater featuring a tubular element allows for the same bracket/shield for many different wattages. To increase the wattage the element length is increased and formed to fit within the shroud. The mounting footprint, price for the heater, and installation cost stays consistent.	To increase the wattage on a strip heater the size of the heater must increase to keep the same watt density. The heater must get longer, wider or both. This changes the mounting holes and requires additional fabrication for larger shields to protect the heater. All of this is at additional cost to the user.
Price/Cost	Consistently lower than strip heaters.	Consistently higher than INDEECO Enclosure Heaters. Especially when considering extra added expense in mounting and protecting strip heaters.



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