IMC-700

PRODUCT CATALOG

ENGINE HEATERS • OIL HEATERS • CONTROLS • ACCESSORIES

HOTSTART®
ENGINE HEATING

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HOTflow
BY HOTSTART
HOTSTART
ENGINE HEATING

HOTflow™ Engine Heaters

CTM Series Single Phase

1000-2500 Watts

Meets requirements for installation on any UL 2200 listed generator.

Engine Size CID/Liter	Power Supply Volts	Ø	Hz	Model Number	kW	Amps	Thermostat Range On	Off
CTM w/48" (1.2m) cord and NEMA plug*								
0-500 0-8L	120 240	1 1	60 50/60	CTM10110-N00 CTM10210-N00	1 1	8.8 4.4	100°F (38C) 100°F (38C)	120°F (49C) 120°F (49C)
500-750 8-12L	120 240	1 1	60 50/60	CTM15110-N00 CTM15210-N00	1.5 1.5	13.0 6.5	100°F (38C) 100°F (38C)	120°F (49C) 120°F (49C)
750-1200 12-20L	120 240	1 1	60 50/60	CTM25110-N00 CTM25210-N00	2.5 2.5	21.3 10.7	100°F (38C) 100°F (38C)	120°F (49C) 120°F (49C)
CTM w/9.8' (3m) cord, without plug								
0-500 0-8L	120 240	1 1	60 50/60	CTM10110-A00 CTM10210-A00	1 1	8.8 4.4	100°F (38C) 100°F (38C)	120°F (49C) 120°F (49C)
500-750 8-12L	120 240	1 1	60 50/60	CTM15110-A00 CTM15210-A00	1.5 1.5	13.0 6.5	100°F (38C) 100°F (38C)	120°F (49C) 120°F (49C)
750-1200 12-20L	120 240	1 1	60 50/60	CTM25110-A00 CTM25210-A00	2.5 2.5	21.3 10.7	100°F (38C) 100°F (38C)	120°F (49C) 120°F (49C)
CTM w/9.8' (3m) cord and Schuko plug (Euro)**								
0-500 0-8L	240	1	50/60	CTM10210-E00	1	4.4	100°F (38C)	120°F (49C)
500-750 8-12L	240	1	50/60	CTM15210-E00	1.5	6.5	100°F (38C)	120°F (49C)
750-1200 12-20L	240	1	50/60	CTM25210-E00	2.5	10.7	100°F (38C)	120°F (49C)

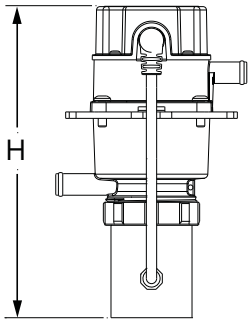
* - UL/C-US listed
** - CE compliant

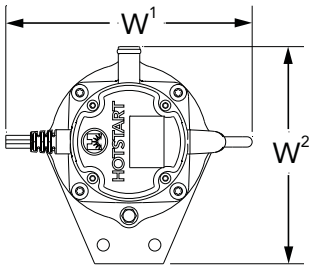
Other voltages available. Consult the factory.

Isolation Mounting Kit (optional)

CTM-IMK

HOTSTART's HOTflow™ engine heater (CTM Series) features an integrated pump that combines the benefits of forced circulation with a compact design that can mount to a variety of small engine applications. Forced circulation of the coolant delivers uniform heating throughout the entire engine, extends element life and offers a significant reduction in electrical consumption.







Height (H)	Width1 (W^1)	Width2 (W^2)	Weight
9.1" 230mm	7.0" 145mm	6.3" 161mm	3.5lbs. 1.6 kg

Engine Size CID/Liter	Power Supply Volts	Ø	Hz	Model Number	kW	Amps	Style	Thermostat Range On	Off
1000 - 2000 15 - 30L	120	1	60	CSM10301-000	3	26.3	A	100°F (38C)	120°F (49C)
	208	1	60	CSM10308-000	3	15.1	A	100°F (38C)	120°F (49C)
	208	3	60	CSM30308-000	3	8.7	B	100°F (38C)	120°F (49C)
	230	1	50	CSM1030J-000	3	13.7	A	100°F (38C)	120°F (49C)
	240	1	60	CSM10302-000	3	13.1	A	100°F (38C)	120°F (49C)
	480	1	60	CSM10304-000	3	7.0	B	100°F (38C)	120°F (49C)
	480	3	60	CSM30304-000	3	4.4	B	100°F (38C)	120°F (49C)
2000 - 3000 25 - 50L	208	1	60	CSM10608-000	6	29.6	A	100°F (38C)	120°F (49C)
	208	3	60	CSM30608-000	6	17.1	B	100°F (38C)	120°F (49C)
	230	1	50	CSM1060J-000	6	26.7	A	100°F (38C)	120°F (49C)
	240	1	60	CSM10602-000	6	25.6	A	100°F (38C)	120°F (49C)
	400	3	50	CSM3060A-000	6	8.9	B	100°F (38C)	120°F (49C)
	440	3	60	CSM3060F-001	6	8.1	B	100°F (38C)	120°F (49C)
	480	1	60	CSM10604-000	6	12.8	B	100°F (38C)	120°F (49C)
	480	3	60	CSM30604-000	6	7.4	B	100°F (38C)	120°F (49C)
	575	3	60	CSM30605-000	6	6.2	B	100°F (38C)	120°F (49C)
3000 - 4500 50 - 75L	208	1	60	CSM10908-000	9	44.0	A	100°F (38C)	120°F (49C)
	208	3	60	CSM30908-000	9	25.4	B	100°F (38C)	120°F (49C)
	230	1	50	CSM1090J-000	9	39.8	A	100°F (38C)	120°F (49C)
	240	1	60	CSM10902-000	9	38.1	A	100°F (38C)	120°F (49C)
	400	3	50	CSM3090A-000	9	13.2	B	100°F (38C)	120°F (49C)
	440	3	60	CSM3090F-001	9	12.2	B	100°F (38C)	120°F (49C)
	480	1	60	CSM10904-000	9	19.1	B	100°F (38C)	120°F (49C)
	480	3	60	CSM30904-000	9	11.0	B	100°F (38C)	120°F (49C)
	575	3	60	CSM30905-000	9	9.2	B	100°F (38C)	120°F (49C)
4500 - 6000 75 - 100L	208	1	60	CSM11208-000	12	58.4	B	100°F (38C)	120°F (49C)
	208	3	60	CSM31208-000	12	33.7	B	100°F (38C)	120°F (49C)
	230	1	50	CSM1120J-000	12	52.8	B	100°F (38C)	120°F (49C)
	240	1	60	CSM11202-000	12	50.6	B	100°F (38C)	120°F (49C)
	400	3	50	CSM3120A-000	12	17.5	B	100°F (38C)	120°F (49C)
	440	3	60	CSM3120F-000	12	15.9	B	100°F (38C)	120°F (49C)
	480	1	60	CSM11204-000	12	25.3	B	100°F (38C)	120°F (49C)
	480	3	60	CSM31204-000	12	14.6	B	100°F (38C)	120°F (49C)
	575	3	60	CSM31205-000	12	12.2	B	100°F (38C)	120°F (49C)

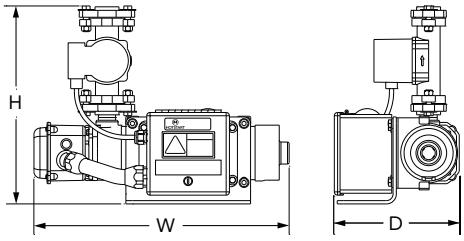
Other voltages available. Consult the factory.



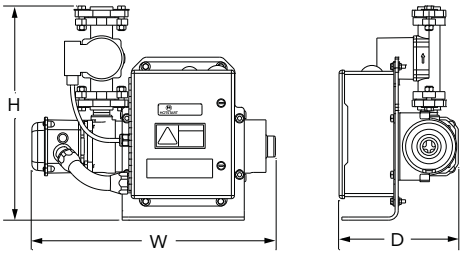
Style A



Style B



Height (H)	Width (W)	Depth (D)	Weight
15.0"	19.4"	9.5"	37 lbs.
383mm	493mm	242mm	16.8 kg



Height (H)	Width (W)	Depth (D)	Weight
17.0"	19.4"	9.5"	54 lbs.
434mm	493mm	242mm	24.5 kg

HOTflow™ Engine Heaters

CSM Series
Single & Three Phase

3000-12000 Watts

Meets requirements for installation on any UL 2200 listed generator.

HOTSTART's HOTflow™ engine heater (CSM Series) features a thermostat, pump and all required controls. Forced circulation of the coolant delivers uniform heating throughout the entire engine, extends element life and offers a significant reduction in electrical consumption.

The HOTflow™ CSM operates automatically when provided contacts are supplied with a 24V DC signal from the engine.

Thermosiphon Engine Heaters

TPS Model Single Phase

500-2000 Watts



Temperature Range ON	Temperature Range OFF	Numerical Code
80°F (27C)	100°F (38C)	8
100°F (38C)	120°F (49C)	10
120°F (49C)	140°F (60C)	12

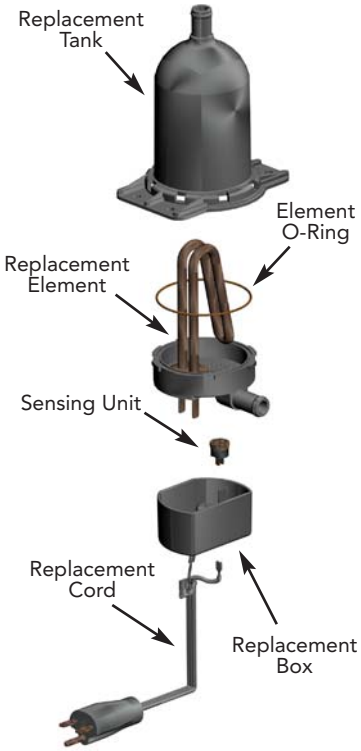
Engine Displacement	Watts	Model Number 120V	Amps	Model Number 240V	Amps	Model Number 277V	Amps
150cid 2.5L	500	TPS051GT8-000 TPS051GT10-000 TPS051GT12-000 —	4.2 4.2 4.2 —	TPS052GT8-000 TPS052GT10-000 TPS052GT10-013* TPS052GT12-000	2.1 2.1 2.1 2.1	TPS057GT10-000	1.8
350cid 5.7L	1000	TPS101GT8-000 TPS101GT10-000 TPS101GT12-000 —	8.4 8.4 8.4 —	TPS102GT8-000 TPS102GT10-000 TPS102GT10-013* TPS102GT12-000	4.2 4.2 4.2 4.2	TPS107GT10-000	3.6
350 - 500cid 5.7 - 8.2L	1500	TPS151GT8-000 TPS151GT10-000 TPS151GT12-000 —	12.5 12.5 12.5 —	TPS152GT8-000 TPS152GT10-000 TPS152GT10-013* TPS152GT12-000	6.3 6.3 6.3 6.3	TPS157GT10-000	5.4
500 - 700cid 8.2 - 11.5L	1800	TPS181GT8-000 TPS181GT10-000 TPS181GT12-000	15 15 15	—	—	—	—
	2000	—	—	TPS202GT8-000 TPS202GT10-000 TPS202GT10-013* TPS202GT12-000	8.3 8.3 8.3 8.3	TPS207GT10-000	7.2

TPS engine preheaters include a fixed setting thermostat. A single or double digit numeral at the end of the model number prefix designates the temperature range. **Example:** TPS101GT**10**-000 (see chart in left column)

* Engine Preheater features 2 meter round cord and Shucko plug - CE compliant

Replacement Parts

For TPS Models



Model Number	Replacement Parts					
	Sensing Unit	Element	Tank	Box	Power Cord	Element O-ring
TPS051GT8-000	LSU-8	REPS051T8	TPS-T	CPS-1	11P48UU	TPS-BOR
TPS051GT10-000	LSU-10	REPS051T10	TPS-T	CPS-1	11P48UU	TPS-BOR
TPS051GT12-000	LSU-12	REPS051T12	TPS-T	CPS-1	11P48UU	TPS-BOR
TPS052GT8-000	LSU-8	REPS052T8	TPS-T	CPS-1	21P48UU	TPS-BOR
TPS052GT10-000	LSU-10	REPS052T10	TPS-T	CPS-1	21P48UU	TPS-BOR
TPS052GT10-013*	LSU-10	REPS052T10	TPS-T	CPS-2	21SCH81UU	TPS-BOR
TPS052GT12-000	LSU-12	REPS052T12	TPS-T	CPS-1	21P48UU	TPS-BOR
TPS057GT10-000	LSU-10	REPS057T10	TPS-T	CPS-1	16H48UU	TPS-BOR
TPS101GT8-000	LSU-8	REPS101T8	TPS-T	CPS-1	11P48UU	TPS-BOR
TPS101GT10-000	LSU-10	REPS101T10	TPS-T	CPS-1	11P48UU	TPS-BOR
TPS101GT12-000	LSU-12	REPS101T12	TPS-T	CPS-1	11P48UU	TPS-BOR
TPS102GT8-000	LSU-8	REPS102T8	TPS-T	CPS-1	21P48UU	TPS-BOR
TPS102GT10-000	LSU-10	REPS102T10	TPS-T	CPS-1	21P48UU	TPS-BOR
TPS102GT10-013*	LSU-10	REPS102T10	TPS-T	CPS-2	21SCH81UU	TPS-BOR
TPS102GT12-000	LSU-12	REPS102T12	TPS-T	CPS-1	21P48UU	TPS-BOR
TPS107GT10-000	LSU-10	REPS107T10	TPS-T	CPS-1	16H48UU	TPS-BOR
TPS151GT8-000	LSU-8	REPS151T8	TPS-T	CPS-1	11P48UU	TPS-BOR
TPS151GT10-000	LSU-10	REPS151T10	TPS-T	CPS-1	11P48UU	TPS-BOR
TPS151GT12-000	LSU-12	REPS151T12	TPS-T	CPS-1	11P48UU	TPS-BOR
TPS152GT8-000	LSU-8	REPS152T8	TPS-T	CPS-1	21P48UU	TPS-BOR
TPS152GT10-000	LSU-10	REPS152T10	TPS-T	CPS-1	21P48UU	TPS-BOR
TPS152GT10-013*	LSU-10	REPS152T10	TPS-T	CPS-2	21SCH81UU	TPS-BOR
TPS152GT12-000	LSU-12	REPS152T12	TPS-T	CPS-1	21P48UU	TPS-BOR
TPS157GT10-000	LSU-10	REPS157T10	TPS-T	CPS-1	16H48UU	TPS-BOR
TPS181GT8-000	LSU-8	REPS181T8	TPS-T	CPS-1	12P16H48UU	TPS-BOR
TPS181GT10-000	LSU-10	REPS181T10	TPS-T	CPS-1	12P16H48UU	TPS-BOR
TPS181GT12-000	LSU-12	REPS181T12	TPS-T	CPS-1	12P16H48UU	TPS-BOR
TPS202GT8-000	LSU-8	REPS202T8	TPS-T	CPS-1	21P48UU	TPS-BOR
TPS202GT10-000	LSU-10	REPS202T10	TPS-T	CPS-1	21P48UU	TPS-BOR
TPS202GT10-013*	LSU-10	REPS202T10	TPS-T	CPS-2	21SCH81UU	TPS-BOR
TPS202GT12-000	LSU-12	REPS202T12	TPS-T	CPS-1	21P48UU	TPS-BOR
TPS207GT10-000	LSU-10	REPS207T10	TPS-T	CPS-1	16H48UU	TPS-BOR

Thermosiphon Engine Heaters

TPS Model w/in-line adjustable and remote thread-in fixed thermostat.

Single Phase

Engine Displacement	Model Number	Volts	Watts	Phase	Amps	Thermostat Range On	Thermostat Range Off
150cid 2.5L	TPS051GT12-001*	120	500	1	4.2	100°F (38C)	120°F (49C)
	TPS051GT12-A00	120	500	1	4.2	ADJUSTABLE	
	TPS052GT12-001*	240	500	1	2.1	100°F (38C)	120°F (49C)
	TPS052GT12-A00	240	500	1	2.1	ADJUSTABLE	
350cid 5.7L	TPS101GT12-001*	120	1000	1	8.4	100°F (38C)	120°F (49C)
	TPS101GT12-A00	120	1000	1	8.4	ADJUSTABLE	
	TPS102GT12-001*	240	1000	1	4.2	100°F (38C)	120°F (49C)
	TPS102GT12-A00	240	1000	1	4.2	ADJUSTABLE	
350 - 500cid 5.7 - 8.2L	TPS151GT12-001*	120	1500	1	12.5	100°F (38C)	120°F (49C)
	TPS151GT12-A00	120	1500	1	12.5	ADJUSTABLE	
	TPS152GT12-001*	240	1500	1	6.3	100°F (38C)	120°F (49C)
	TPS152GT12-A00	240	1500	1	6.3	ADJUSTABLE	
500 - 700cid 8.2 - 11.5L	TPS181GT12-001*	120	1800	1	15	100°F (38C)	120°F (49C)
	TPS181GT12-A00	120	1800	1	15	ADJUSTABLE	
	TPS202GT12-001*	240	2000	1	8.3	100°F (38C)	120°F (49C)
	TPS202GT12-A00	240	2000	1	8.3	ADJUSTABLE	

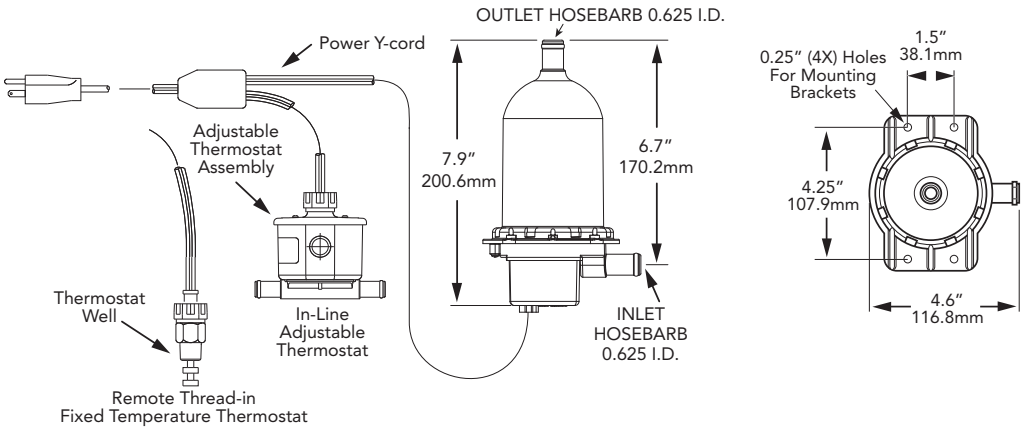
* Remote thread-in fixed temperature thermostat

Adjustable 90-130°F (32-54°C)
On differential – 20°F (-7°C)

Remote Adjustable Thermostat Assembly

Part Number	TFTA-5/8HB

In-line thermostat options:



Replacement Parts

For TPS Model w/in-line adjustable and remote thread-in fixed thermostat.

Single Phase

Model Number	Volts	Watts	Replacement Parts: Sensing Unit	Element	Power Y-cord	Thermostat Well
TPS051GT12-001*	120	500	LSU-10	REPS051T12	TPS-YC1	TW2374-1
TPS051GT12-A00	120	500	RSU90-130	REPS051T12	#	#
TPS052GT12-001*	240	500	LSU-10	REPS052T12	TPS-YC2	TW2374-1
TPS052GT12-A00	240	500	RSU90-130	REPS052T12	#	#
TPS101GT12-001*	120	1000	LSU-10	REPS101T12	TPS-YC1	TW2374-1
TPS101GT12-A00	120	1000	RSU90-130	REPS101T12	#	#
TPS102GT12-001*	240	1000	LSU-10	REPS102T12	TPS-YC2	TW2374-1
TPS102GT12-A00	240	1000	RSU90-130	REPS102T12	#	#
TPS151GT12-001*	120	1500	LSU-10	REPS151T12	TPS-YC1	TW2374-1
TPS151GT12-A00	120	1500	RSU90-130	REPS151T12	#	#
TPS152GT12-001*	240	1500	LSU-10	REPS152T12	TPS-YC2	TW2374-1
TPS152GT12-A00	240	1500	RSU90-130	REPS152T12	#	#
TPS181GT12-001*	120	1800	LSU-10	REPS181T12	12P16H54S54X10UU	TW2374-1
TPS181GT12-A00	120	1800	RSU90-130	REPS181T12	#	#
TPS202GT12-001*	240	2000	LSU-10	REPS202T12	TPS-YC2	TW2374-1
TPS202GT12-A00	240	2000	RSU90-130	REPS202T12	#	#

* Remote thread-in fixed temperature thermostat

Call Factory

Common replacement parts for all TPS engine preheaters:
— Tank
— Box
— Element O-ring

See table on page 6

Thermosiphon Engine Heaters

CB, CL Series Weathertight Single Phase

1500-5000 Watts



CB Model without thermostat



CB Model assembled with thermostat



CL Model without thermostat



CL Model assembled with thermostat

Engine Displacement	Model Number without Thermostat	Model Number with Thermostat see chart 1	Volts	Watts	Phase	Amps
350 - 500cid **5.7 - 8.2L**	CB115100-000 CB115800-000 CB115200-000 CB115700-000 CB115300-000 CB115400-000	CB1151XX-200 CB1158XX-200 CB1152XX-200 CB1157XX-200 CB1153XX-200 CB1154XX-200	120 208 240 277 380 480	1500 1500 1500 1500 1500 1500	1 1 1 1 1 1	12.5 7.2 6.3 5.4 3.9 3.1
500 - 600cid **8.2 - 9.8L**	CB120100-000 CB120800-000 CB120200-000 CB120300-000 CB120400-000	CB1201XX-200 CB1208XX-200 CB1202XX-200 CB1203XX-200 CB1204XX-200	120 208 240 380 480	2000 2000 2000 2000 2000	1 1 1 1 1	16.7 9.6 8.3 5.3 4.2
600 - 800cid **9.8 - 13.1L**	CB125100-000 CB125800-000 CB125200-000 CB125700-000 CB125300-000 CB125400-000	CB1251XX-200 CB1258XX-200 CB1252XX-200 CB1257XX-200 CB1253XX-200 CB1254XX-200	120 208 240 277 380 480	2500 2500 2500 2500 2500 2500	1 1 1 1 1 1	20.8 12.0 10.4 9.0 6.6 5.2
800 - 1000cid **13.1 - 16.4L**	CL130100-100 CL130800-100 CL130200-100 CL130700-100 CL130300-100 CL130400-100	CL1301XX-200 CL1308XX-200 CL1302XX-200 CL1307XX-200 CL1303XX-200 CL1304XX-200	120 208 240 277 380 480	3000 3000 3000 3000 3000 3000	1 1 1 1 1 1	25.0 14.4 12.5 10.8 7.9 6.3
1000 - 1350cid **16.4 - 22.1L**	CL140800-100 CL140200-100 CL140700-100 CL140300-100 CL140400-100	CL1408XX-200 CL1402XX-200 CL1407XX-200 CL1403XX-200 CL1404XX-200	208 240 277 380 480	4000 4000 4000 4000 4000	1 1 1 1 1	19.2 16.7 14.4 10.5 8.3
1350 - 1650cid **22.1 - 27.0L**	CL150800-100 CL150200-100 CL150700-100 CL150300-100 CL150400-100	CL1508XX-200 CL1502XX-200 CL1507XX-200 CL1503XX-200 CL1504XX-200	208 240 277 380 480	5000 5000 5000 5000 5000	1 1 1 1 1	24.0 20.8 18.1 13.2 10.4

CHART 1

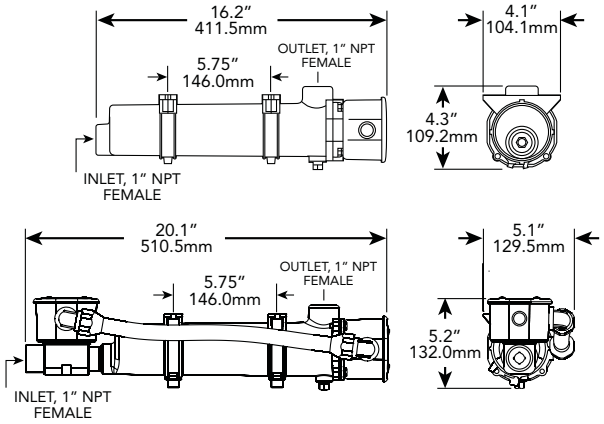
Heaters with Thermostats

To specify temperature range of thermostat, insert numerical code from chart in place of the **XX** in model number.

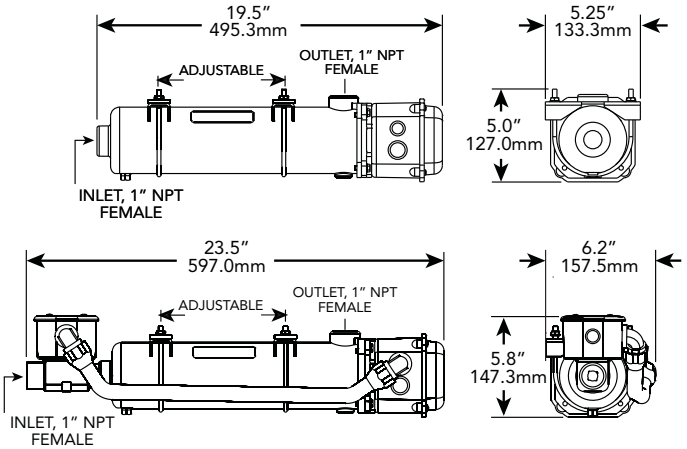
Example:
Desired Temp. Range: 100° - 120°F
Model Number: CB1151**XX**-200
Order as: CB1151**10**-200

Temperature Range		Numerical Code
ON	OFF	
80°F (27C)	100°F (38C)	08
100°F (38C)	120°F (49C)	10
120°F (49C)	140°F (60C)	12
Adjustable 90° - 130°F (32° - 54°C)		A3

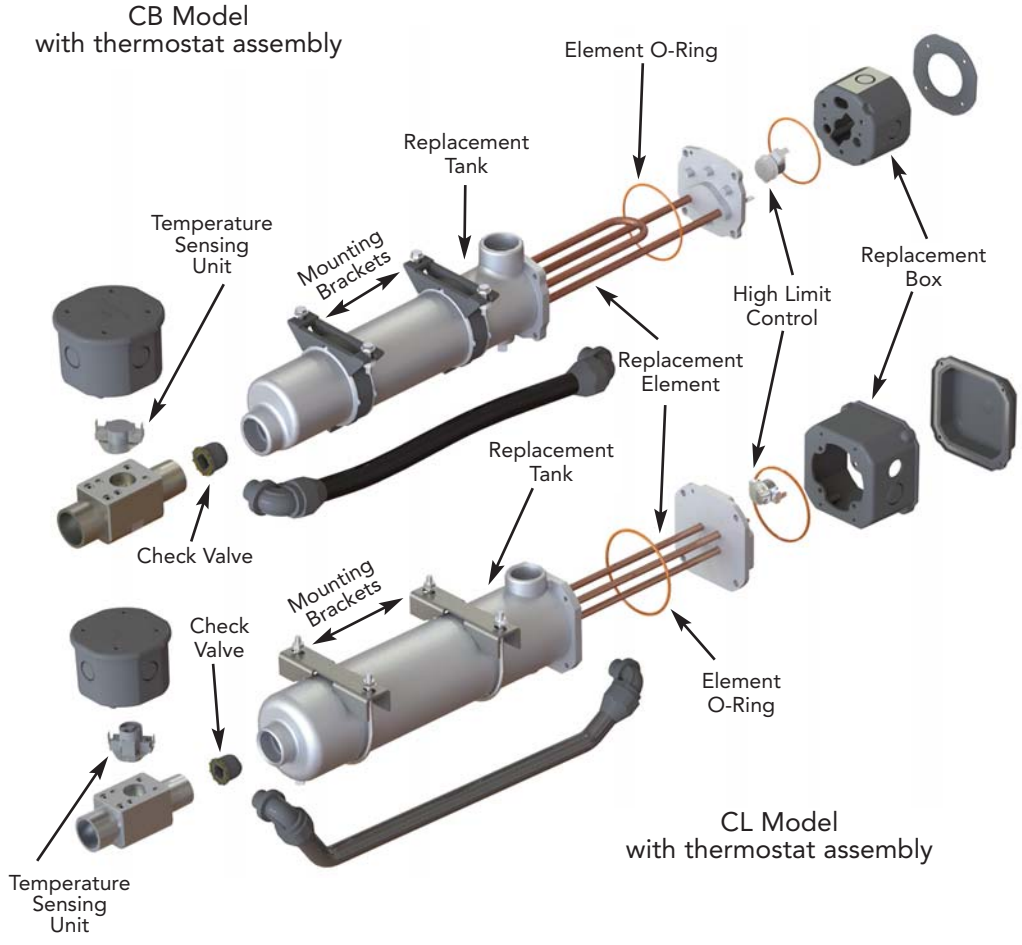
CB Model



CL Model



Model Number without Thermostat	Model Number with Thermostat see chart 2	Replacement Parts				
		Element	Tank	Box	Element O-ring	Mounting Brackets
CB115100-000	CB1151XX-200	RECB1151	RTB	RTBCB	TMM-OR	RTMMB
CB115800-000	CB1158XX-200	RECB1158	RTB	RTBCB	TMM-OR	RTMMB
CB115200-000	CB1152XX-200	RECB1152	RTB	RTBCB	TMM-OR	RTMMB
CB115700-000	CB1157XX-200	RECB1157	RTB	RTBCB	TMM-OR	RTMMB
CB115300-000	CB1153XX-200	RECB1153	RTB	RTBCB	TMM-OR	RTMMB
CB115400-000	CB1154XX-200	RECB1154	RTB	RTBCB	TMM-OR	RTMMB
CB120100-000	CB1201XX-200	RECB1201	RTB	RTBCB	TMM-OR	RTMMB
CB120800-000	CB1208XX-200	RECB1208	RTB	RTBCB	TMM-OR	RTMMB
CB120200-000	CB1202XX-200	RECB1202	RTB	RTBCB	TMM-OR	RTMMB
CB120300-000	CB1203XX-200	RECB1203	RTB	RTBCB	TMM-OR	RTMMB
CB120400-000	CB1204XX-200	RECB1204	RTB	RTBCB	TMM-OR	RTMMB
CB125100-000	CB1251XX-200	RECB1251	RTB	RTBCB	TMM-OR	RTMMB
CB125800-000	CB1258XX-200	RECB1258	RTB	RTBCB	TMM-OR	RTMMB
CB125200-000	CB1252XX-200	RECB1252	RTB	RTBCB	TMM-OR	RTMMB
CB125700-000	CB1257XX-200	RECB1257	RTB	RTBCB	TMM-OR	RTMMB
CB125300-000	CB1253XX-200	RECB1253	RTB	RTBCB	TMM-OR	RTMMB
CB125400-000	CB1254XX-200	RECB1254	RTB	RTBCB	TMM-OR	RTMMB
CL130100-100	CL1301XX-200	RECL1301-100	RTL	RTBCL-100	TML-OR	FK7
CL130800-100	CL1308XX-200	RECL1308-100	RTL	RTBCL-100	TML-OR	FK7
CL130200-100	CL1302XX-200	RECL1302-100	RTL	RTBCL-100	TML-OR	FK7
CL130700-100	CL1307XX-200	RECL1307-100	RTL	RTBCL-100	TML-OR	FK7
CL130300-100	CL1303XX-200	RECL1303-100	RTL	RTBCL-100	TML-OR	FK7
CL130400-100	CL1304XX-200	RECL1304-100	RTL	RTBCL-100	TML-OR	FK7
CL140800-100	CL1408XX-200	RECL1408-100	RTL	RTBCL-100	TML-OR	FK7
CL140200-100	CL1402XX-200	RECL1402-100	RTL	RTBCL-100	TML-OR	FK7
CL140700-100	CL1407XX-200	RECL1407-100	RTL	RTBCL-100	TML-OR	FK7
CL140300-100	CL1403XX-200	RECL1403-100	RTL	RTBCL-100	TML-OR	FK7
CL140400-100	CL1404XX-200	RECL1404-100	RTL	RTBCL-100	TML-OR	FK7
CL150800-100	CL1508XX-200	RECL1508-100	RTL	RTBCL-100	TML-OR	FK7
CL150200-100	CL1502XX-200	RECL1502-100	RTL	RTBCL-100	TML-OR	FK7
CL150700-100	CL1507XX-200	RECL1507-100	RTL	RTBCL-100	TML-OR	FK7
CL150300-100	CL1503XX-200	RECL1503-100	RTL	RTBCL-100	TML-OR	FK7
CL150400-100	CL1504XX-200	RECL1504-100	RTL	RTBCL-100	TML-OR	FK7



Replacement Parts

For thermosiphon engine heaters CB, CL Series

Common Replacement Parts
available on all listed heaters

High Limit Control	Check Valve
HLC-165	RV-M

CHART 2

Heaters with Thermostats

Temperature Range		Sensing Unit
ON	OFF	
80°F (27C)	100°F (38C)	FSU8
100°F (38C)	120°F (49C)	FSU10
120°F (49C)	140°F (60C)	FSU12
Adjustable 90° - 130°F (32°C - 54°C)		FSU90-130

Example:

Model Number: CB1151**10**-200
T-Stat Replacement: FSU10

ADAPTER FITTINGS

For the use of 0.75" or 1" ID heater hose, hose barb adapters are available. See below.

HB-1	1" NPT to 1" hose barb adapter. Installs in 1" NPT female inlet or outlet of the heater.
HB-3/4	1" NPT to 0.75" hose barb adapter. Installs in 1" NPT female inlet or outlet of the heater.

Thermosiphon Engine Heaters

SB, SL Series
With power cord
Weathertight
Single Phase

1500-4000 Watts

Engine Displacement	Model Number without Thermostat	Model Number with Thermostat see chart 1	Volts	Watts	Phase	Amps
350 - 500cid **5.7 - 8.2L**	SB115100-000 SB115800-000 SB115200-000 SB115700-000	SB1151XX-200 SB1158XX-200 SB1152XX-200 SB1157XX-200	120 208 240 277	1500 1500 1500 1500	1 1 1 1	12.5 7.2 6.3 5.4
500 - 600cid **8.2 - 9.8L**	SB120100-000 SB120800-000 SB120200-000	SB1201XX-200 SB1208XX-200 SB1202XX-200	120 208 240	2000 2000 2000	1 1 1	16.7 9.6 8.3
600 - 800cid **9.8 - 13.1L**	SB122100-000 SB125800-000 SB125200-000 SB125700-000	SB1221XX-200 SB1258XX-200 SB1252XX-200 SB1257XX-200	120 208 240 277	2250 2500 2500 2500	1 1 1 1	18.8 12.0 10.4 9.0
800 - 1000cid **13.1 - 16.4L**	SL130800-100 SL130200-100 SL130700-100	SL1308XX-200 SL1302XX-200 SL1307XX-200	208 240 277	3000 3000 3000	1 1 1	14.4 12.5 10.8
1000 - 1350cid **16.4 - 22.1L**	SL140800-100 SL140200-100 SL140700-100	SL1408XX-200 SL1402XX-200 SL1407XX-200	208 240 277	4000 4000 4000	1 1 1	19.2 16.7 14.4

All 208V and 277V models come with cord only - no plug.



SB Model with power cord
no thermostat



SB Model with thermostat
and power cord



SL Model with power cord
no thermostat



SL Model with thermostat
and power cord

CHART 1

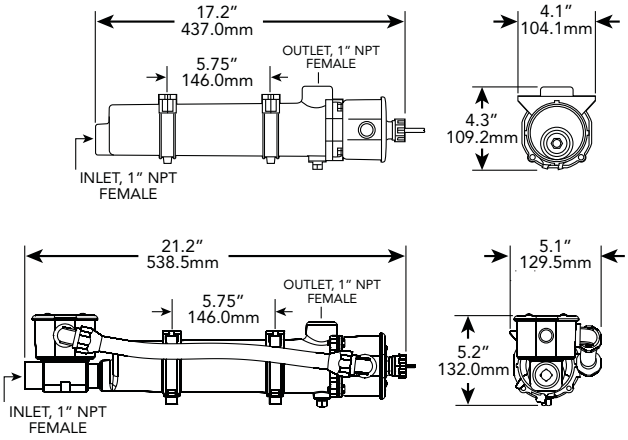
Heaters with Thermostats

To specify temperature range of thermostat, insert numerical code from chart in place of the **XX** in model number.

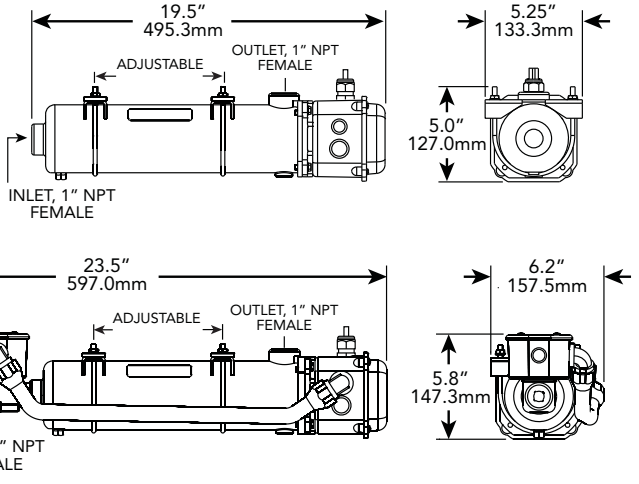
Example:
Desired Temp. Range: 100° - 120°F
Model Number: SB1151**XX**-200
Order as: SB1151**10**-200

Temperature Range ON	Temperature Range OFF	Numerical Code
80°F (27C)	100°F (38C)	08
100°F (38C)	120°F (49C)	10
120°F (49C)	140°F (60C)	12
Adjustable 90° - 130°F (32° - 54°C)		A3

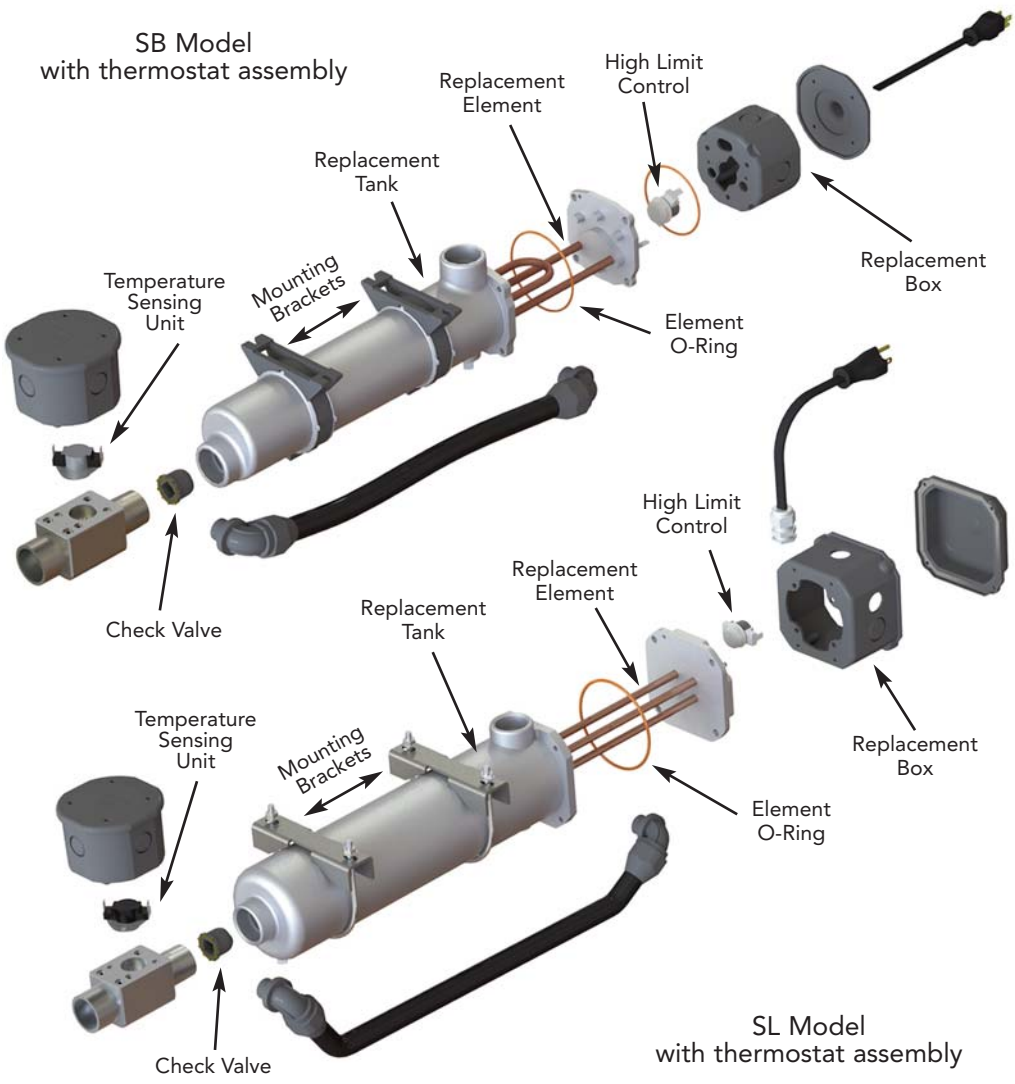
SB Model



SL Model



Model Number without Thermostat	Model Number with Thermostat see chart 2	Replacement Parts					
		Element	Tank	Box	Power Cord	Element O-ring	Mounting Brackets
SB115100-000	SB1151XX-200	RESB1151	RTB	RTBSB	RHB-1-15	TMM-OR	RTMMB
SB115800-000	SB1158XX-200	RESB1158	RTB	RTBSB	RHB-WOP	TMM-OR	RTMMB
SB115200-000	SB1152XX-200	RESB1152	RTB	RTBSB	RHB-2-15	TMM-OR	RTMMB
SB115700-000	SB1157XX-200	RESB1157	RTB	RTBSB	RHB-WOP	TMM-OR	RTMMB
SB120100-000	SB1201XX-200	RESB1201	RTB	RTBSB	RHB-1-20	TMM-OR	RTMMB
SB120800-000	SB1208XX-200	RESB1208	RTB	RTBSB	RHB-WOP	TMM-OR	RTMMB
SB120200-000	SB1202XX-200	RESB1202	RTB	RTBSB	RHB-2-15	TMM-OR	RTMMB
SB122100-000	SB1221XX-200	RESB1221	RTB	RTBSB	RHB-1-20	TMM-OR	RTMMB
SB125800-000	SB1258XX-200	RESB1258	RTB	RTBSB	RHB-WOP	TMM-OR	RTMMB
SB125200-000	SB1252XX-200	RESB1252	RTB	RTBSB	RHB-2-15	TMM-OR	RTMMB
SB125700-000	SB1257XX-200	RESB1257	RTB	RTBSB	RHB-WOP	TMM-OR	RTMMB
SL130800-100	SL1308XX-200	RESL1308-100	RTL	RTBCL-100	RHL-WOP	TML-OR	FK7
SL130200-100	SL1302XX-200	RESL1302-100	RTL	RTBCL-100	RHL-2-15	TML-OR	FK7
SL130700-100	SL1307XX-200	RESL1307-100	RTL	RTBCL-100	RHL-WOP	TML-OR	FK7
SL140800-100	SL1408XX-200	RESL1408-100	RTL	RTBCL-100	RHL-WOP	TML-OR	FK7
SL140200-100	SL1402XX-200	RESL1402-100	RTL	RTBCL-100	RHL-2-20	TML-OR	FK7
SL140700-100	SL1407XX-200	RESL1407-100	RTL	RTBCL-100	RHL-WOP	TML-OR	FK7



Replacement Parts

For thermosiphon engine heaters SB, SL Series

Common Replacement Parts
available on all listed heaters

High Limit Control	Check Valve
HLC-165	RV-M

CHART 2

Heaters with Thermostats

Temperature Range ON	Temperature Range OFF	Sensing Unit
80°F (27C)	100°F (38C)	FSU8
100°F (38C)	120°F (49C)	FSU10
120°F (49C)	140°F (60C)	FSU12
Adjustable 90° - 130°F (32°C - 54°C)		FSU90-130

Example:

Model Number: SB1151**10**-200
T-Stat Replacement: FSU10

ADAPTER FITTINGS

For the use of 0.75" or 1" ID heater hose, hose barb adapters are available. See below.

HB-1	1" NPT to 1" hose barb adapter. Installs in 1" NPT female inlet or outlet of the heater.
HB-3/4	1" NPT to 0.75" hose barb adapter. Installs in 1" NPT female inlet or outlet of the heater.

Thermosiphon Engine Heaters

WL Series Weathertight Three Phase

2500-5000 Watts

CE



WL Model without thermostat



WL Model with thermostat

Engine Displacement	Model Number without Thermostat	Model Number with Thermostat see chart 1	Volts	Watts	Phase	Amps
600 - 800cid **9.8 - 13.1L**	WL325800-000 WL325200-000 WL325A00-000 WL325400-000 WL325500-000	WL3258XX-200 WL3252XX-200 WL325AXX-200 WL3254XX-200 WL3255XX-200	208 240 400 480 575	2500 2500 2500 2500 2500	3 3 3 3 3	6.9 6.0 3.6 3.0 2.5
1000 - 1350cid **16.4 - 22.1L**	WL340800-000 WL340200-000 WL340A00-000 WL340400-000 WL340500-000	WL3408XX-200 WL3402XX-200 WL340AXX-200 WL3404XX-200 WL3405XX-200	208 240 400 480 575	4000 4000 4000 4000 4000	3 3 3 3 3	11.1 9.6 5.8 4.8 4.0
1350 - 1650cid **22.1 - 27.0L**	WL350800-000 WL350200-000 WL350A00-000 WL350400-000 WL350500-000	WL3508XX-200 WL3502XX-200 WL350AXX-200 WL3504XX-200 WL3505XX-200	208 240 400 480 575	5000 5000 5000 5000 5000	3 3 3 3 3	13.9 12.0 7.2 6.0 5.0

CHART 1

Heaters with Thermostats

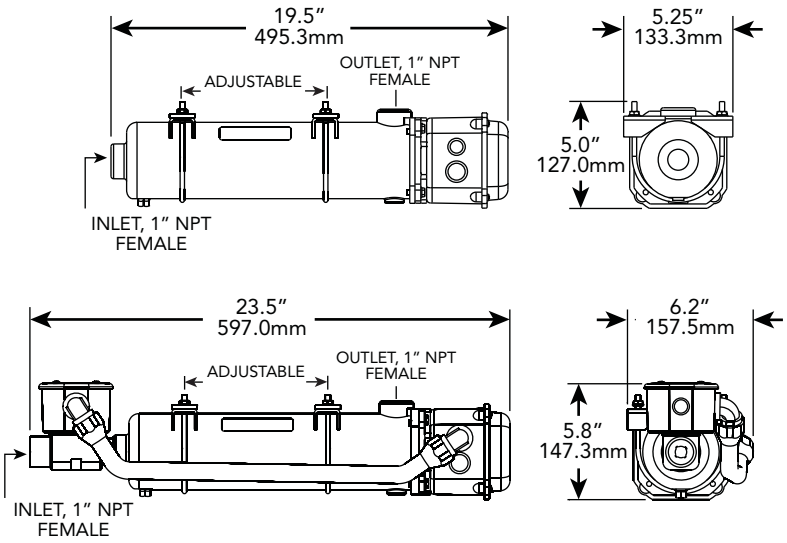
To specify temperature range of thermostat, insert numerical code from chart in place of the **XX** in model number.

Example:
Desired Temp. Range: 100° - 120°F
Model Number: WL3252**XX**-200
Order as: WL3252**10**-200

Temperature Range ON	Temperature Range OFF	Numerical Code
80°F (27C)	100°F (38C)	08
100°F (38C)	120°F (49C)	10
120°F (49C)	140°F (60C)	12
Adjustable 90° - 130°F (32° - 54°C)		A3

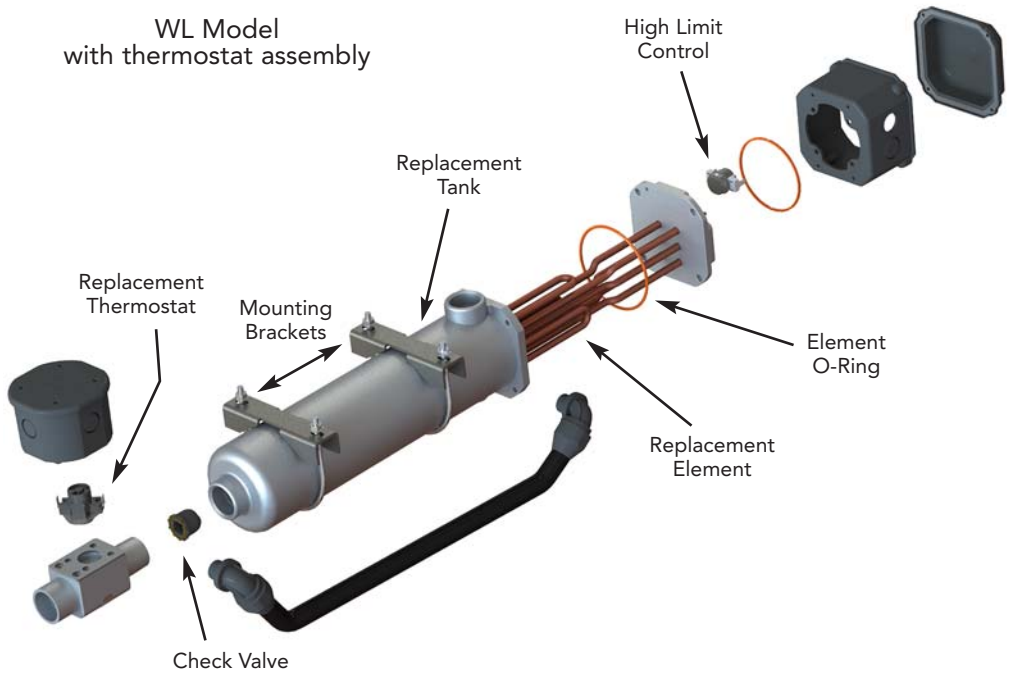
All 3 phase heaters with thermostat must use a control box. See Control Systems page 30.

WL Model



Model Number without Thermostat	Model Number with Thermostat see chart 2	Element Replacement
WL325800-000	WL3258XX-200	REWL3258
WL325200-000	WL3252XX-200	REWL3252
WL325A00-000	WL325AXX-200	REWL325A
WL325400-000	WL3254XX-200	REWL3254
WL325500-000	WL3255XX-200	REWL3255
WL340800-000	WL3408XX-200	REWL3408
WL340200-000	WL3402XX-200	REWL3402
WL340A00-000	WL340AXX-200	REWL340A
WL340400-000	WL3404XX-200	REWL3404
WL340500-000	WL3405XX-200	REWL3405
WL350800-000	WL3508XX-200	REWL3508
WL350200-000	WL3502XX-200	REWL3502
WL350A00-000	WL350AXX-200	REWL350A
WL350400-000	WL3504XX-200	REWL3504
WL350500-000	WL3505XX-200	REWL3505

Common Replacement Parts available for all listed heaters	
Tank	RTL
Element O-ring	TML-OR
High Limit Control	HLC-165
Mounting Brackets	FK7
Check Valve	RV-M



Replacement Parts

For thermosiphon engine heaters WL Series

CHART 2

Heaters with Thermostats

Temperature Range ON	Temperature Range OFF	Sensing Unit
80°F (27C)	100°F (38C)	FSU8
100°F (38C)	120°F (49C)	FSU10
120°F (49C)	140°F (60C)	FSU12
Adjustable 90° - 130°F (32°C - 54°C)		FSU90-130

Example:

Model Number: WL3252**10**-200
T-Stat Replacement: FSU10

ADAPTER FITTINGS

For the use of 0.75" or 1" ID heater hose, hose barb adapters are available. See below.

HB-1	1" NPT to 1" hose barb adapter. Installs in 1" NPT female inlet or outlet of the heater.
HB-3/4	1" NPT to 0.75" hose barb adapter. Installs in 1" NPT female inlet or outlet of the heater.

Thermosiphon Engine Heaters

EE Series Hazardous Location Single Phase

1500-5000 Watts



EE Model without thermostat



EE Model assembled with thermostat

Engine Displacement	Model Number without Thermostat	Model Number with Thermostat see chart 1	Volt	Watt	Phase	Amp
500cid or less **8.2L or less**	EE115100-000 EE115800-000 EE115200-000 EE115700-000 EE115400-000	EE1151XX-000 EE1158XX-000 EE1152XX-000 EE1157XX-000 EE1154XX-000	120 208 240 277 480	1500 1500 1500 1500 1500	1 1 1 1 1	12.5 7.2 6.3 5.4 3.1
500 - 600cid **8.2 - 9.8L**	EE120100-000 EE120800-000 EE120200-000 EE120300-000 EE120400-000 EE120500-000	EE1201XX-000 EE1208XX-000 EE1202XX-000 EE1203XX-000 EE1204XX-000 EE1205XX-000	120 208 240 380 480 575	2000 2000 2000 2000 2000 2000	1 1 1 1 1 1	16.7 9.6 8.3 5.3 4.2 3.5
600 - 800cid **9.8 - 13.1L**	EE125100-000 EE125800-000 EE125200-000 EE125700-000 EE125300-000 EE125400-000	EE1251XX-000 EE1258XX-000 EE1252XX-000 EE1257XX-000 EE1253XX-000 EE1254XX-000	120 208 240 277 380 480	2500 2500 2500 2500 2500 2500	1 1 1 1 1 1	20.8 12.0 10.4 9.2 6.6 5.2
800 - 1000cid **13.1 - 16.4L**	EE130100-000 EE130800-000 EE130200-000 EE130700-000 EE130400-000 EE130500-000	EE1301XX-000 EE1308XX-000 EE1302XX-000 EE1307XX-000 EE1304XX-000 EE1305XX-000	120 208 240 277 480 575	3000 3000 3000 3000 3000 3000	1 1 1 1 1 1	25.0 14.4 12.5 10.8 6.3 5.2
1000 - 1350cid **16.4 - 22.1L**	EE140800-000 EE140200-000 EE140700-000 EE140400-000	EE1408XX-000 EE1402XX-000 EE1407XX-000 EE1404XX-000	208 240 277 480	4000 4000 4000 4000	1 1 1 1	19.2 16.7 14.4 8.3
1350 - 1650cid **22.1 - 27.0L**	EE150800-000 EE150200-000 EE150700-000 EE150400-000 EE150500-000	EE1508XX-000 EE1502XX-000 EE1507XX-000 EE1504XX-000 EE1505XX-000	208 240 277 480 575	5000 5000 5000 5000 5000	1 1 1 1 1	24.0 20.8 18.1 10.4 8.7

CHART 1

Heaters with Thermostats

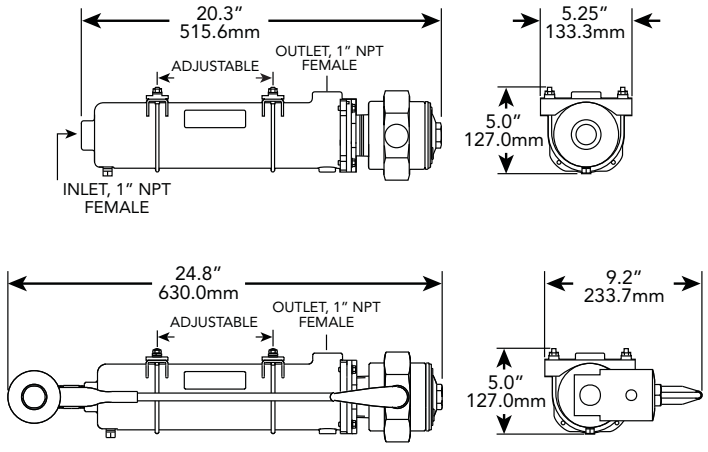
To specify temperature range of thermostat, insert numerical code from chart in place of the **XX** in model number.

Example:
Desired Temp. Range: 100° - 120°F
Model Number: EE1302**XX**-000
Order as: EE1302**10**-000

Temperature Range		Numerical Code
ON	OFF	
80°F (27C)	100°F (38C)	08
100°F (38C)	120°F (49C)	10
120°F (49C)	140°F (60C)	12

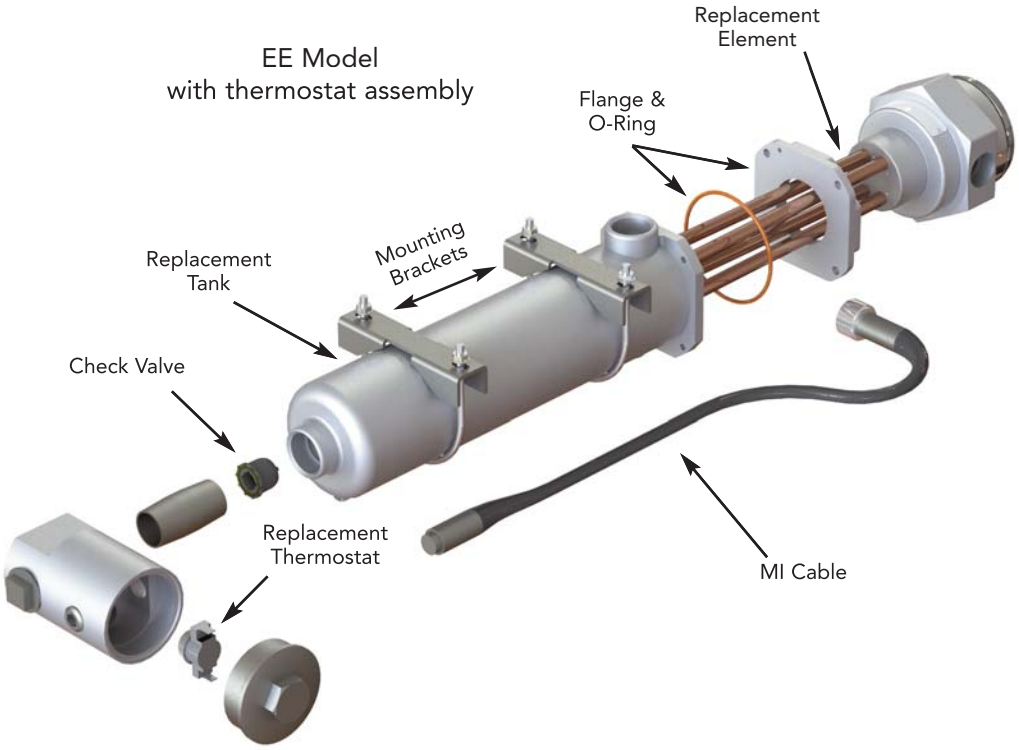
All heaters over 480V with a thermostat must use a control box. See Control Systems page 30.

EE Model



Model Number without Thermostat	Model Number with Thermostat see chart 2	Element Replacement
EE115100-000	EE1151XX-000	REEE1151
EE115800-000	EE1158XX-000	REEE1158
EE115200-000	EE1152XX-000	REEE1152
EE115700-000	EE1157XX-000	REEE1157
EE115400-000	EE1154XX-000	E01541E-50NA-00
EE120100-000	EE1201XX-000	REEE1201
EE120800-000	EE1208XX-000	REEE1208
EE120200-000	EE1202XX-000	REEE1202
EE120300-000	EE1203XX-000	E02031E-50NA-00
EE120400-000	EE1204XX-000	E02041E-50NA-00
EE120500-000	EE1205XX-000	E02051E-50NA-00
EE125100-000	EE1251XX-000	REEE1251
EE125800-000	EE1258XX-000	REEE1258
EE125200-000	EE1252XX-000	REEE1252
EE125700-000	EE1257XX-000	REEE1257
EE125300-000	EE1253XX-000	E02531E-C0NA-00
EE125400-000	EE1254XX-000	E02541E-C0NA-00
EE130100-000	EE1301XX-000	REEE1301
EE130800-000	EE1308XX-000	REEE1308
EE130200-000	EE1302XX-000	REEE1302
EE130700-000	EE1307XX-000	REEE1307
EE130400-000	EE1304XX-000	E03041E-50NA-00
EE130500-000	EE1305XX-000	E03051E-50NA-00
EE140800-000	EE1408XX-000	REEE1408
EE140200-000	EE1402XX-000	REEE1402
EE140700-000	EE1407XX-000	REEE1407
EE140400-000	EE1404XX-000	E04041E-50NA-00
EE150800-000	EE1508XX-000	E05081E-50NA-00
EE150200-000	EE1502XX-000	E05021E-C0NA-00
EE150700-000	EE1507XX-000	E05071E-C0NA-00
EE150400-000	EE1504XX-000	E05041E-C0NA-00
EE150500-000	EE1505XX-000	E05051E-C0NA-00

Common Replacement Parts available for all listed heaters	
MI Cable	PRP104202-024
Tank	RTL
Flange	RF-L
Flange O-ring	TML-OR
Mounting Brackets	FK7
Check Valve	RV-M



Replacement Parts

For thermosiphon engine heaters EE Series

CHART 2

Heaters with Thermostats

Temperature Range ON	Temperature Range OFF	Sensing Unit
80°F (27C)	100°F (38C)	RSU8
100°F (38C)	120°F (49C)	RSU10
120°F (49C)	140°F (60C)	RSU12

Example:

Model Number: EE1302**10**-000
T-Stat Replacement: RSU10

ADAPTER FITTINGS

For the use of 0.75" or 1" ID heater hose, hose barb adapters are available. See below.

HB-1	1" NPT to 1" hose barb adapter. Installs in 1" NPT female inlet or outlet of the heater.
HB-3/4	1" NPT to 0.75" hose barb adapter. Installs in 1" NPT female inlet or outlet of the heater.

Thermosiphon Engine Heaters

EE Series Hazardous Location Three Phase

1500-5000 Watts



EE Model without thermostat



EE Model assembled with thermostat

Engine Displacement	Model Number without Thermostat	Model Number with Thermostat see chart 1	Volt	Watts	Phase	Amp
500cid or less **8.2L or less**	EE315800-000 EE315200-000 EE315400-000	EE3158XX-000 EE3152XX-000 EE3154XX-000	208 240 480	1500 1500 1500	3 3 3	4.2 3.6 1.8
500 - 600cid **8.2 - 9.8L**	EE320800-000 EE320200-000 EE320300-000 EE320400-000 EE320500-000	EE3208XX-000 EE3202XX-000 EE3203XX-000 EE3204XX-000 EE3205XX-000	208 240 380 480 575	2000 2000 2000 2000 2000	3 3 3 3 3	5.6 4.8 3.0 2.4 2.0
600 - 800cid **9.8 - 13.1L**	EE325800-000 EE325200-000 EE325300-000 EE325400-000 EE325500-000	EE3258XX-000 EE3252XX-000 EE3253XX-000 EE3254XX-000 EE3255XX-000	208 240 380 480 575	2500 2500 2500 2500 2500	3 3 3 3 3	6.9 6.0 3.8 3.0 2.5
800 - 1000cid **13.1 - 16.4L**	EE330800-000 EE330200-000 EE330300-000 EE330400-000 EE330500-000	EE3308XX-000 EE3302XX-000 EE3303XX-000 EE3304XX-000 EE3305XX-000	208 240 380 480 575	3000 3000 3000 3000 3000	3 3 3 3 3	8.3 7.2 4.6 3.6 3.0
1000 - 1350cid **16.4 - 22.1L**	EE340800-000 EE340200-000 EE340300-000 EE340400-000 EE340500-000	EE3408XX-000 EE3402XX-000 EE3403XX-000 EE3404XX-000 EE3405XX-000	208 240 380 480 575	4000 4000 4000 4000 4000	3 3 3 3 3	11.1 9.6 6.1 4.8 4.0
1350 - 1650cid **22.1 - 27.0L**	EE350800-000 EE350200-000 EE350300-000 EE350400-000 EE350500-000	EE3508XX-000 EE3502XX-000 EE3503XX-000 EE3504XX-000 EE3505XX-000	208 240 380 480 575	5000 5000 5000 5000 5000	3 3 3 3 3	13.9 12.0 7.6 6.0 5.0

CHART 1

Heaters with Thermostats

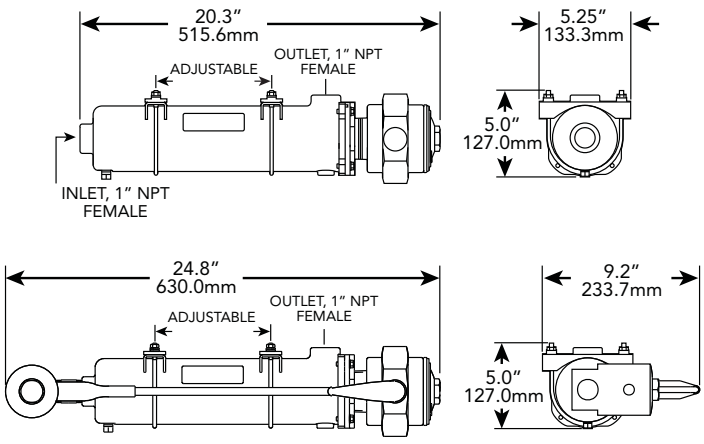
To specify temperature range of thermostat, insert numerical code from chart in place of the **XX** in model number.

Example:
Desired Temp. Range: 100° - 120°F
Model Number: EE3302**XX**-000
Order as: EE3302**10**-000

Temperature Range		Numerical Code
ON	OFF	
80°F (27C)	100°F (38C)	08
100°F (38C)	120°F (49C)	10
120°F (49C)	140°F (60C)	12

All 3 phase heaters with thermostat must use a control box. See Control Systems page 30.

EE Model



Model Number without Thermostat	Model Number with Thermostat see chart 2	Element Replacement
EE315800-000	EE3158XX-000	E01583E-15NA-00
EE315200-000	EE3152XX-000	E01523E-15NA-00
EE315400-000	EE3154XX-000	E01543E-15NA-00
EE320800-000	EE3208XX-000	E02083E-25NA-00
EE320200-000	EE3202XX-000	E02023E-25NA-00
EE320300-000	EE3203XX-000	E02033E-25NA-00
EE320400-000	EE3204XX-000	E02043E-25NA-00
EE320500-000	EE3205XX-000	E02053E-25NA-00
EE325800-000	EE3258XX-000	E02583E-30NA-00
EE325200-000	EE3252XX-000	E02523E-30NA-00
EE325300-000	EE3253XX-000	E02533E-30NA-00
EE325400-000	EE3254XX-000	E02543E-30NA-00
EE325500-000	EE3255XX-000	E02553E-30NA-00
EE330800-000	EE3308XX-000	E03083E-30NA-00
EE330200-000	EE3302XX-000	E03023E-30NA-00
EE330300-000	EE3303XX-000	E03033E-30NA-00
EE330400-000	EE3304XX-000	E03043E-30NA-00
EE330500-000	EE3305XX-000	E03053E-30NA-00
EE340800-000	EE3408XX-000	E04083E-50NA-00
EE340200-000	EE3402XX-000	E04023E-50NA-00
EE340300-000	EE3403XX-000	E04033E-50NA-00
EE340400-000	EE3404XX-000	E04043E-50NA-00
EE340500-000	EE3405XX-000	E04053E-50NA-00
EE350800-000	EE3508XX-000	E05083E-50NA-00
EE350200-000	EE3502XX-000	E05023E-50NA-00
EE350300-000	EE3503XX-000	E05033E-50NA-00
EE350400-000	EE3504XX-000	E05043E-50NA-00
EE350500-000	EE3505XX-000	E05053E-50NA-00

Common Replacement Parts available for all listed heaters	
MI Cable	PRP104202-024
Tank	RTL
Flange	RF-L
Flange O-ring	TML-OR
Mounting Brackets	FK7
Check Valve	RV-M

Replacement Parts

For thermosiphon engine heaters EE Series

CHART 2

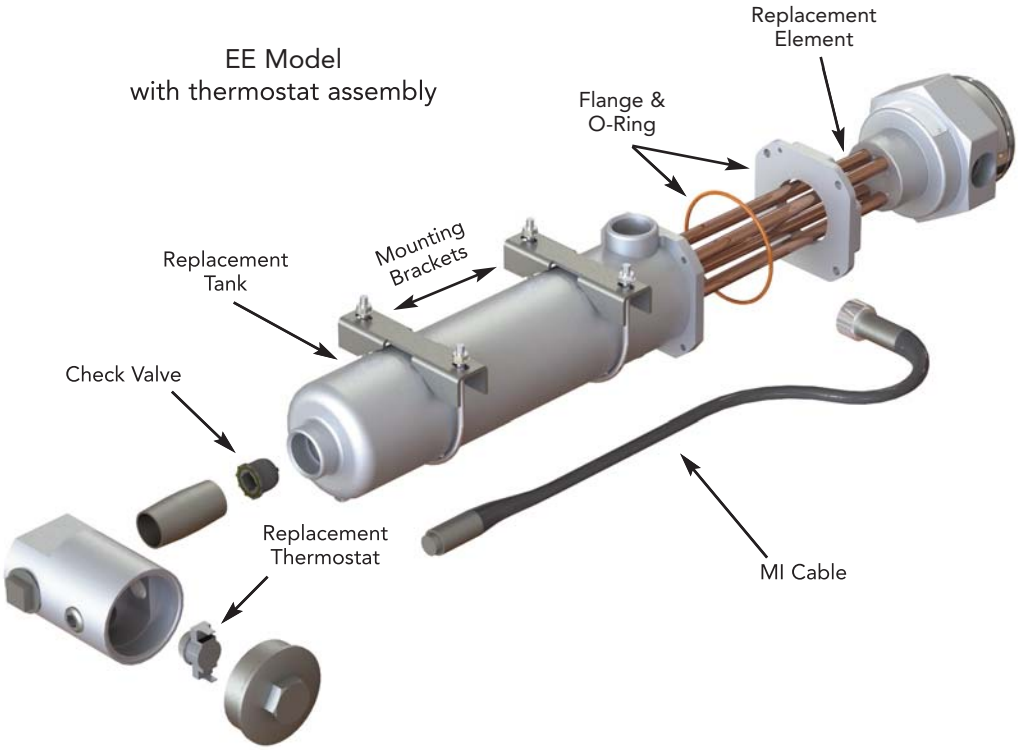
Heaters with Thermostats

Temperature Range ON	Temperature Range OFF	Sensing Unit
80°F (27C)	100°F (38C)	RSU8
100°F (38C)	120°F (49C)	RSU10
120°F (49C)	140°F (60C)	RSU12

Example:

Model Number: EE330210-000
T-Stat Replacement: RSU10

EE Model
with thermostat assembly



ADAPTER FITTINGS

For the use of 0.75" or 1" ID heater hose, hose barb adapters are available. See below.

HB-1	1" NPT to 1" hose barb adapter. Installs in 1" NPT female inlet or outlet of the heater.
HB-3/4	1" NPT to 0.75" hose barb adapter. Installs in 1" NPT female inlet or outlet of the heater.

Installation Instructions for Thermosiphon Engine Heaters

The HOTSTART engine heater operates on the principle of a thermosiphon. As coolant flows into the heater intake opening, it is warmed by the element and begins to rise. The heated coolant exits through the heater outlet opening creating continuous circulation. The heater's thermostat senses the temperature of the coolant and cycles the heater on and off.

For "V" engines larger than eight cylinders or over 1000 CID (15L), HOTSTART recommends using a HOTflow™ heater. Please refer to pages 4-5 for heater selection.

Prior to heater installation, inspect the coolant supply. Contaminated coolant will limit heater performance and cause premature element failure. Check your engine manufacturer's recommendations for the proper coolant. Only de-ionized or distilled water and a low-silicate antifreeze should be used and not exceed a 60% antifreeze to 40% water ratio. The use of hard water or water softened with salts is one of the most common causes of failure to the heating element. A cooling system containing anti-leak additive will also result in element failure.

MOUNTING

Mount the heater in a horizontal position with the outlet neck pointed up. Position the heater outlet directly under the engine port to which coolant returns. Proper positioning of the heater will eliminate horizontal sections or dips in the outlet hose which restricts circulation.

Using supplied hardware, mount heater to the engine frame or skid. (See Figure 2). The heater must be mounted below the lowest level of the engine water jacket to ensure a good gravity flow of coolant to the heater.

DO NOT mount the heater to the engine. Engine vibration can damage the heater and void the warranty.

PLUMBING

Heater Outlet: Install the hose between the outlet of the heater and the coolant return port on the engine. The hose must be routed to ensure a continuous rise from the heater to the engine (See Figure 3).

Heater Inlet: Connect hose from the inlet of the heater to where the coolant will be pulled out of the engine. There must be no high spots in the routing of the hose (See Figure 3).

DO NOT route outlet hose above engine block connection, or loop or kink hoses. This will cause air locks in the hose and block circulation of the coolant by the heater.

Follow the engine manufacturer's specifications for coolant. Refill the cooling system with the outlet hose disconnected to eliminate air pockets in the heater. Connect the hose and start engine. Allow engine to idle until the engine thermostat opens. This will help purge the air out of the heater and plumbing. Once the engine has reached operating temperature, shut off and inspect for leaks and check coolant level. Top off the coolant if necessary.

WIRING

SINGLE PHASE up to 480VAC:
Single phase heaters rated up to 480V may be powered directly without the use of a control relay or contactor.

OVER 480VAC or 3 PHASE:
If the power to the heater is greater than 480V or is 3 phase, the heater thermostats must be used in a control circuit with a contactor for switching the main power to the heating elements. Contact HOTSTART for recommended control boxes.

On standby and automatic start engines, heaters should be de-energized upon engine start-up. The engine heater should not operate during engine operation. See page 30 or consult HOTSTART for recommendations on your specific applications.

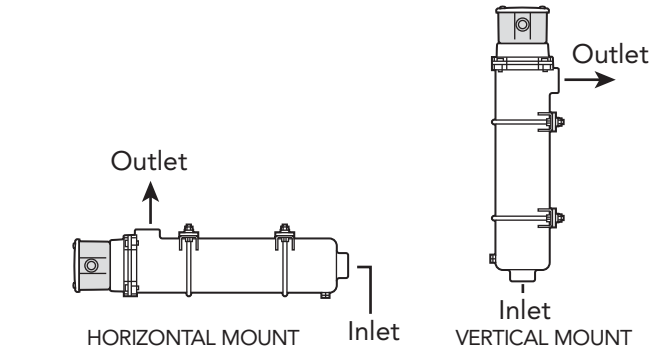


FIGURE 1

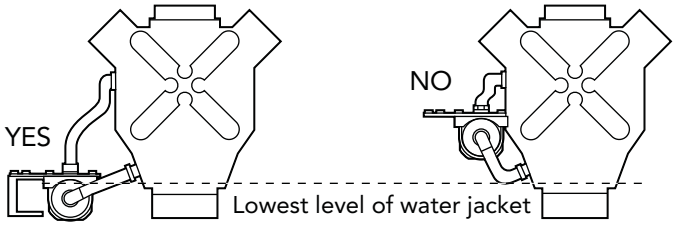


FIGURE 2

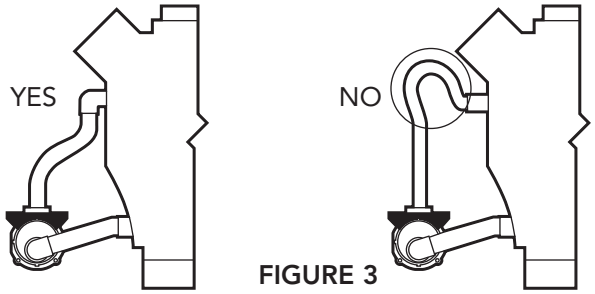


FIGURE 3

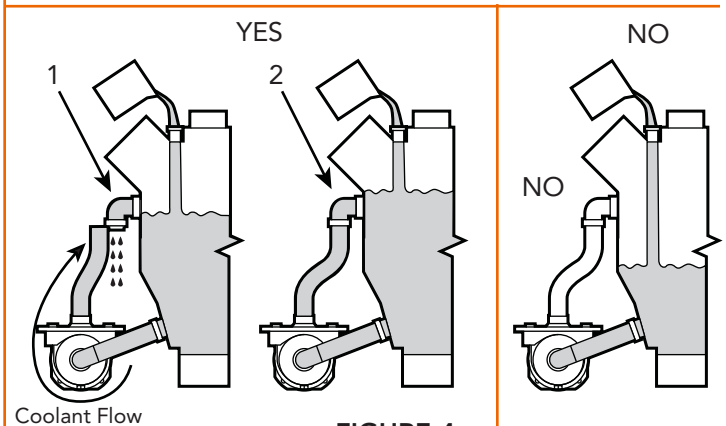


FIGURE 4

To ensure the heater has been installed correctly, the coolant temperature going into the engine should be well below 200°F (93°C). A heater outlet temperature higher than 200°F or an inlet hose that is hotter than the outlet hose indicates limited or no circulation. High outlet temperatures result in decreased heater/hose life and poor engine heating. If equipped with a control thermostat – the heater should cycle on and off a maximum of 4 times per hour.


HOTSTART
WATTS 1600
VOLTS 120
AMPS 12.5
PHASE 1
E01511W-156A-00

Oil Heaters

Oil Heaters up to 277 Vac meet recognized CSA standards for safety or performance.

To specify temperature range of thermostat, insert code from chart in place of the **XX** in model number.

Example:

Desired Temp. Range 80° - 100°F
Model Number: OW2121**XX**-000
Order as: OW2121**08**-000

Temperature Range		Code
ON	OFF	
60°F (16C)	80°F (27C)	06
80°F (27C)	100°F (38C)	08
100°F (38C)	120°F (49C)	10

See p.21 for remote thermostat assembly part numbers.



Oil heater with Y-cord and remote thermostat.

Use a thermostat with all lube oil heaters to protect the oil from overheating. Lube oil heaters must always be installed in the sump with the entire heater submerged below the oil level at all times. See page 21 for remote thermostat part numbers.

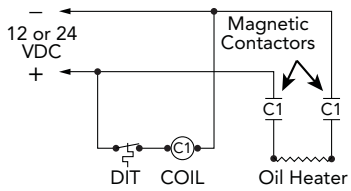
***NOTE:** If heating gear oil (medium weight viscosity), HOTSTART recommends using low watt density heaters

Oil Capacity	Weathertight Heater Only	Weathertight With Thermostat	Hazardous Location Heater Only	Volts	Watts	Amps	Watts/Sq Inch
3/8" N.P.T. THREAD WITH A 2 1/8" (54mm) PROBE LENGTH							
2 qt. (2L) or Less	OW005100-000 OW005200-000	— —	— —	120 240	50 50	.4 .2	20.0 20.0
1/2" N.P.T. THREAD WITH A 4" (101mm) PROBE LENGTH							
2 - 6 qt. 2 - 5.7L	OW212100-000 OW212200-000	OW2121XX-000 OW2122XX-000	OE212100-000 OE212200-000	120 240	125 125	1.0 .5	24.6 24.6
3/4" N.P.T. THREAD WITH A 5" (127mm) PROBE LENGTH							
1 - 5 gal. 3.8 - 19L	OW415100-000 OW415200-000	OW4151XX-000 OW4152XX-000	OE415100-000 OE415200-000	120 240	150 150	1.3 .6	**14.6*** **14.6***
5 - 15 gal. 19 - 57L	OW430100-000 OW430800-000 OW430200-000	OW4301XX-000 OW4308XX-000 OW4302XX-000	OE430100-000 OE430800-000 OE430200-000	120 208 240	300 225 300	2.6 1.1 1.2	29.3 22.0 29.3
1" N.P.T. THREAD WITH A 5 1/4" (133mm) PROBE LENGTH							
1 - 5 gal. 3.8 - 19L	OW615100-000 OW615200-000	OW6151XX-000 OW6152XX-000	OE615100-000 OE615200-000	120 240	150 150	1.3 .6	**10.7*** **10.7***
5 - 15 gal. 19 - 57L	OW630100-000 OW630800-000 OW630200-000 — — —	OW6301XX-000 OW6308XX-000 OW6302XX-000 — — —	OE630100-000 OE630800-000 OE630200-000 OE630700-000 OE630300-000 OE630400-000	120 208 240 277 380 480	300 375 300 265 300 300	2.6 1.8 1.2 1.0 1.0 .6	21.4 28.0 21.4 19.0 21.4 21.4
15 - 30 gal. 57 - 113L	OW650100-000 OW650800-000 OW650200-000 OW650700-000 — — —	OW6501XX-000 OW6508XX-000 OW6502XX-000 OW6507XX-000 — — —	OE650100-000 OE650800-000 OE650200-000 OE650700-000 OE650300-000 OE650400-000 OE650500-000	120 208 240 277 380 480 575	500 450 500 400 500 500 500	4.1 2.2 2.0 1.4 1.3 1.0 0.8	35.7 33.0 35.7 30.0 35.7 35.7 35.7

Weathertight models are furnished with a 4' (1.2m) oil and heat resistant power cord without plug. Hazardous Location models are furnished with 18" (457mm) of lead wire for connection to the power leads in an approved splice box.

DC Oil Heaters 12 V and 24 V

When used with a thermostat control, all DC oil heaters must use a DC relay.



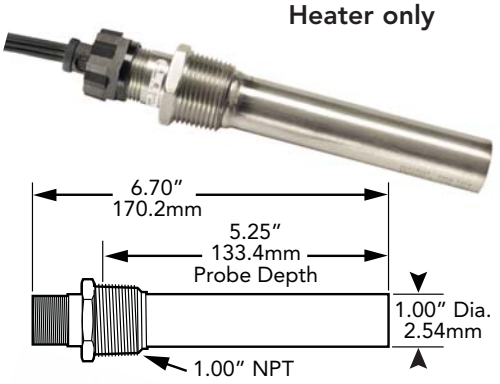
12 Vdc/24 Vdc CONTROL BOXES		
25 Amps Maximum	12V 24V	JBMC330DC-12V JBMC330DC-24V

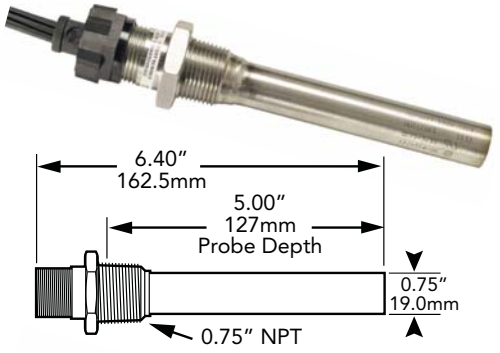
Oil Capacity	Volts	Watts	1/2" NPT with 4" (101mm) Probe Length	3/4" NPT with 4 7/8" (124mm) Probe Length	1" NPT with 5 3/8" (136mm) Probe Length	Amps	Watts Per Square Inch
2 qt. 2.0L or Less	12 24	75 75	OW207900-012 —	OW407900-012 OW407900-024	— —	6.3 3.1	**1/2" — 14.7* WSI** **3/4" — 7.3* WSI**
2-6 qt. 2.0-2.7L	24	125	OW212900-024	—	—	5.2	24.6 WSI
1-5 gal. 3.8-19L	12 24	150 150	— —	OW415900-012 OW415900-024	OW615900-012 OW615900-024	12.5 6.3	**3/4" — 14.6* WSI** **1" — 10.7* WSI**
5-15 gal. 19-57L	12 24	300 300	— —	— OW430900-024	OW630900-012 OW630900-024	25.0 12.5	3/4"— 29.3 WSI 1" — 21.4 WSI
15-30 gal. 57-113L	24	500	—	—	OW650900-024	20.8	35.7 WSI

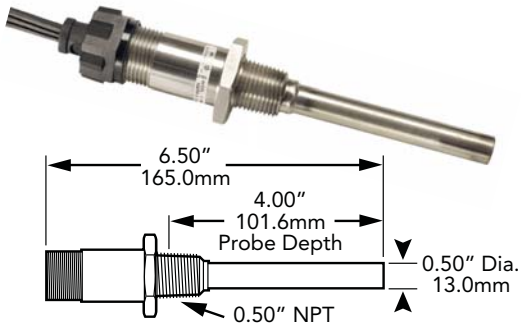
12 Vdc and 24 Vdc oil heaters can be powered directly from the battery, but will drain the battery very rapidly unless charged by an alternator or generator.

Weathertight

Heater only

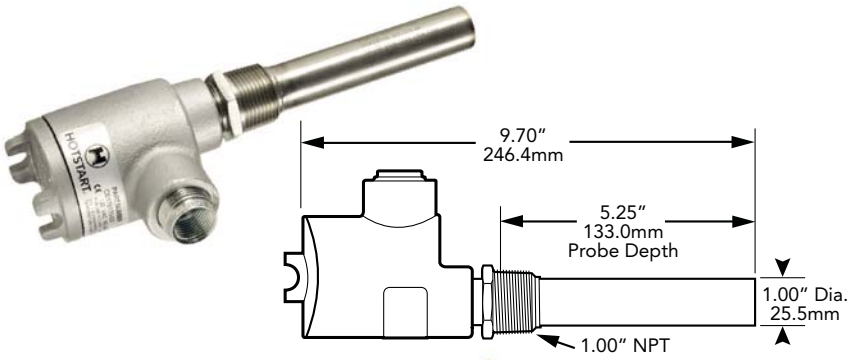


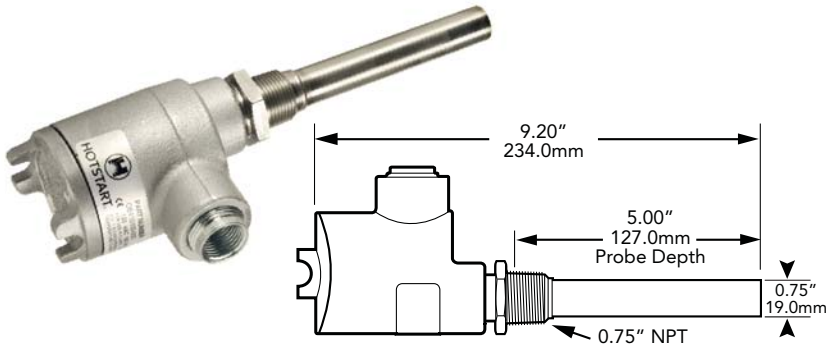


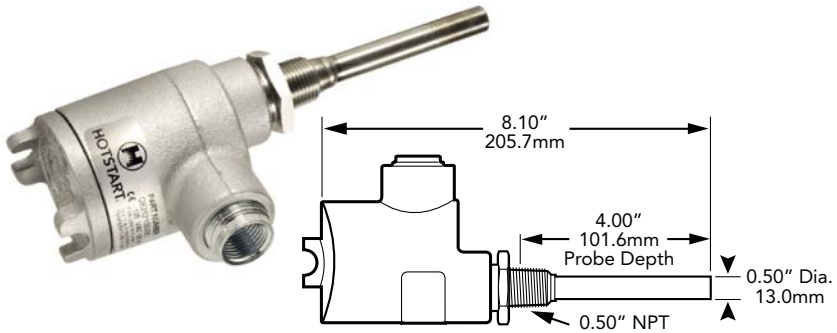


Hazardous Location

Heater only



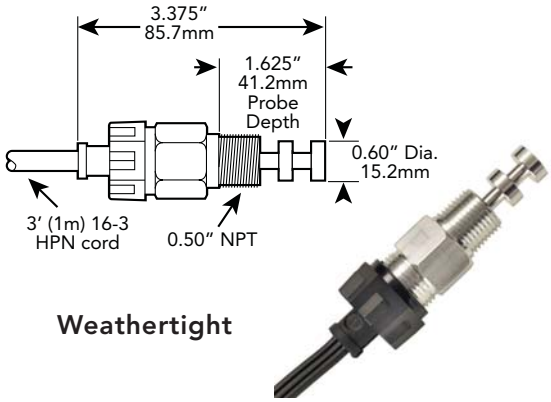




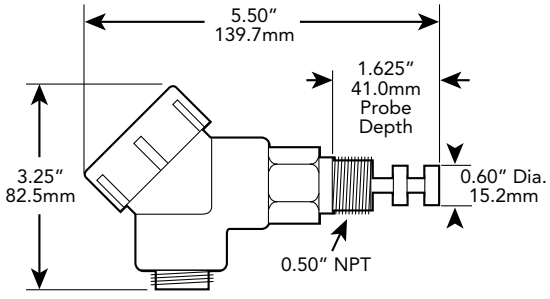
REMOTE THERMOSTATS for OIL HEATERS

Weathertight	Hazardous Location	Temprature Range ON	Temprature Range OFF	Sensing Unit	Thread Size
DIT68	DIT68EP	60°F (16C)	80°F (27C)	LSU-6	0.5" NPT
DIT810	DIT810EP	80°F (27C)	100°F (38C)	LSU-8	0.5" NPT
DIT1012	DIT1012EP	100°F (38C)	120°F (49C)	LSU-10	0.5" NPT
DIT1214	DIT1214EP	120°F (49C)	140°F (60C)	LSU-12	0.5" NPT

Switch Capacity	
120 V - 15amp	
208 V - 10amp	
240 V - 10amp	
277 V - 10amp	
12 Vdc	Pilot Duty Only
24 Vdc	Pilot Duty Only



Weathertight



Hazardous Location



Industrial Immersion Heaters

2" Screw Plug

Available with fixed or adjustable thermostat.



Weathertight Model
NEMA 4



Hazardous Location Model
NEMA 4 & 7

Models for larger capacities than shown are available. Call factory.

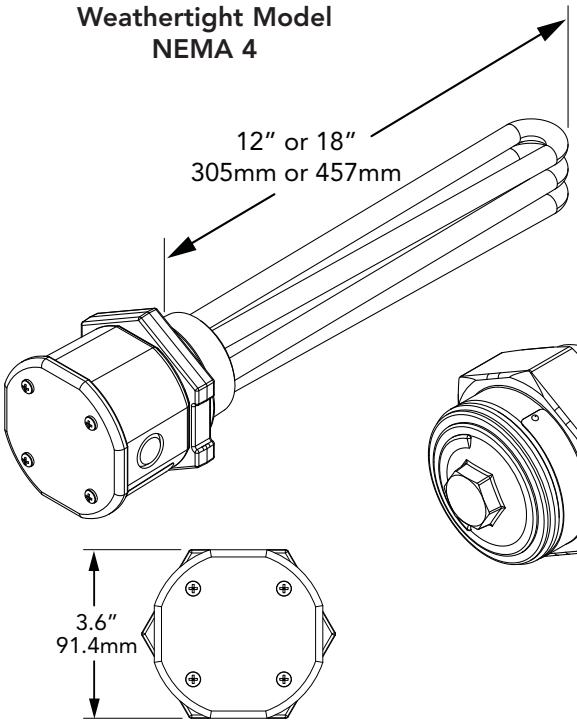
Oil Capacity	HIGH LIMIT THERMOSTAT CONTROL SETTING On 60°F (16C) Off 80°F (27C)	On 80°F (27C) Off 100°F (38C)	On 100°F (38C) Off 120°F (49C)	Volts	Watts	Amps	Watts/ Sq. In.
SINGLE PHASE — 2" N.P.T. WITH A 12" (305mm) PROBE LENGTH							
30 - 45 Gallons 113-170L	E01011W-156A-00	E01011W-158A-00	E01011W-151A-00	120	1000	8.3	17.0
	E01081W-156A-00	E01081W-158A-00	E01081W-151A-00	208	1000	4.8	17.0
	E01021W-156A-00	E01021W-158A-00	E01021W-151A-00	240	1000	4.2	17.0
	E01071W-156A-00	E01071W-158A-00	E01071W-151A-00	277	1000	3.6	17.0
45 - 60 Gallons 170-227L	E01511W-156A-00	E01511W-158A-00	E01511W-151A-00	120	1500	12.5	17.0
	E01581W-156A-00	E01581W-158A-00	E01581W-151A-00	208	1500	7.2	17.0
	E01521W-156A-00	E01521W-158A-00	E01521W-151A-00	240	1500	6.3	17.0
	E01571W-156A-00	E01571W-158A-00	E01571W-151A-00	277	1500	5.4	17.0
THREE PHASE — 2" N.P.T. WITH A 12" (305mm) PROBE LENGTH							
30 - 45 Gallons 113-170L	E01083W-106A-00	E01083W-108A-00	E01083W-101A-00	208	1000	2.8	11.0
	E01023W-106A-00	E01023W-108A-00	E01023W-101A-00	240	1000	2.4	11.0
	E01033W-106A-00	E01033W-108A-00	E01033W-101A-00	380	1000	1.5	11.0
45 - 60 Gallons 170-227L	E01583W-156A-00	E01583W-158A-00	E01583W-151A-00	208	1500	4.2	17.0
	E01523W-156A-00	E01523W-158A-00	E01523W-151A-00	240	1500	3.6	17.0
	E01533W-156A-00	E01533W-158A-00	E01533W-151A-00	380	1500	2.3	17.0
	E01543W-156A-00	E01543W-158A-00	E01543W-151A-00	480	1500	1.8	17.0
SINGLE PHASE — 2" N.P.T. WITH A 18" (457mm) PROBE LENGTH							
60 - 90 Gallons 227-341L	E02011W-156A-00	E02011W-158A-00	E02011W-151A-00	120	2000	16.7	14.0
	E02081W-156A-00	E02081W-158A-00	E02081W-151A-00	208	2000	9.6	14.0
	E02021W-156A-00	E02021W-158A-00	E02021W-151A-00	240	2000	8.4	14.0
	E02071W-156A-00	E02071W-158A-00	E02071W-151A-00	277	2000	7.2	14.0
	E02031W-156A-00	E02031W-158A-00	E02031W-151A-00	380	2000	5.3	14.0
	E02041W-156A-00	E02041W-158A-00	E02041W-151A-00	480	2000	4.2	14.0
THREE PHASE — 2" N.P.T. WITH A 18" (457mm) PROBE LENGTH							
60 - 90 Gallons 227-341L	E02083W-156A-00	E02083W-158A-00	E02083W-151A-00	208	2000	5.6	14.0
	E02023W-156A-00	E02023W-158A-00	E02023W-151A-00	240	2000	4.8	14.0
	E02033W-156A-00	E02033W-158A-00	E02033W-151A-00	380	2000	3.0	14.0
	E02043W-156A-00	E02043W-158A-00	E02043W-151A-00	480	2000	2.4	14.0

Hazardous Location models with thermostat also available.
Substitute the letter **"W"** in part number with the letter **"E"** to specify Hazardous Location models.
Industrial Immersion Heaters are also available for coolants and other process heating. Call factory.

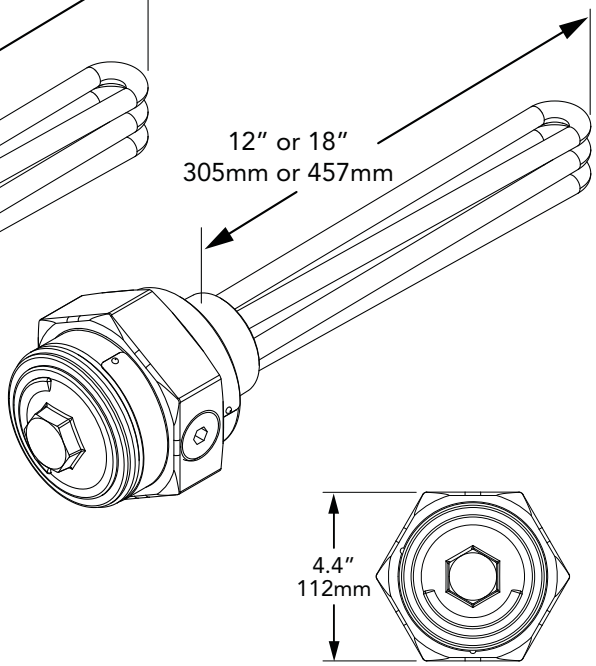
Call HOTSTART for complete model number featuring adjustable thermostat.

HOTSTART immersion heaters include a fixed-setting, built-in thermostat and are available with an adjustable thermostat.

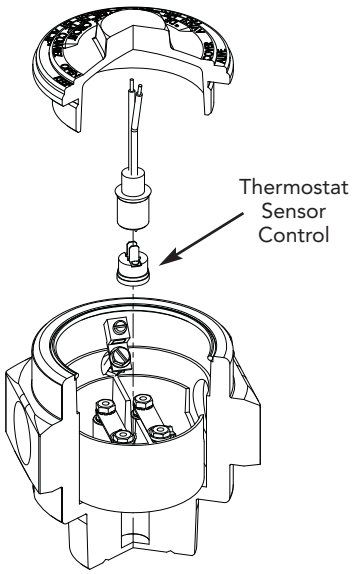
Weathertight Model
NEMA 4



Hazardous Location Model
NEMA 4 & 7



Fixed Thermostat Assembly

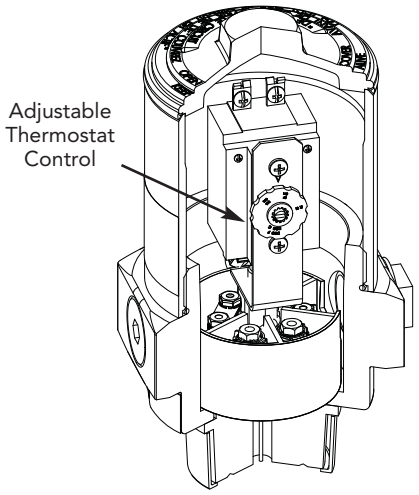


TEMPERATURE RANGE ON	TEMPERATURE RANGE OFF	CONTROL
60°F (16C)	80°F (27C)	HLC-6
80°F (27C)	100°F (38C)	HLC-8
100°F (38C)	120°F (49C)	HLC-10

ELECTRICAL RATING

15 Amps at 120 Vac
10 Amps at 240 Vac
10 Amps at 277 Vac

Adjustable Thermostat Assembly



TEMPERATURE RANGE		CONTROL
OFF	70°F - 210°F (21°-99°C)	AMT70-210

Nominal thermal differential is 8°F (-13°C)

ELECTRICAL RATING

30 Amps at 125 Vac
30 Amps at 240 Vac
30 Amps at 277 Vac
20 Amps at 480 Vac

NOTES:

On applications where level of fluid is subject to change, a liquid level switch mounted a minimum of 3-4" (76-102mm) above element is recommended. **Liquid level switch is not included with heater.**

All 380 Volt and 480 Volt heaters must be used in conjunction with contactor and control transformer.

All three phase models must be used with a contactor. See page 30.

Higher or lower temperature ranges are available. Consult HOTSTART.

V-Clamp Immersion Heaters

Threadless Design

Available with fixed or adjustable thermostat.



Weathertight Model
NEMA 4



Hazardous Location Model
NEMA 4 & 7

Models for larger capacities than shown are available. Call factory.

Oil Capacity	HIGH LIMIT THERMOSTAT CONTROL SETTING On 60°F (16C) Off 80°F (27C)	On 80°F (27C) Off 100°F (38C)	On 100°F (38C) Off 120°F (49C)	Volts	Watts	Amps	Watts/ Sq. In.
SINGLE PHASE — WITH A 12" (305mm) PROBE LENGTH							
30 - 45 Gallons 113-170L	E01011W-156V-00	E01011W-158V-00	E01011W-151V-00	120	1000	8.3	17.0
	E01081W-156V-00	E01081W-158V-00	E01081W-151V-00	208	1000	4.8	17.0
	E01021W-156V-00	E01021W-158V-00	E01021W-151V-00	240	1000	4.2	17.0
	E01071W-156V-00	E01071W-158V-00	E01071W-151V-00	277	1000	3.6	17.0
45 - 60 Gallons 170-227L	E01511W-156V-00	E01511W-158V-00	E01511W-151V-00	120	1500	12.5	17.0
	E01581W-156V-00	E01581W-158V-00	E01581W-151V-00	208	1500	7.2	17.0
	E01521W-156V-00	E01521W-158V-00	E01521W-151V-00	240	1500	6.3	17.0
	E01571W-156V-00	E01571W-158V-00	E01571W-151V-00	277	1500	5.4	17.0
THREE PHASE — WITH A 12" (305mm) PROBE LENGTH							
30 - 45 Gallons 113-170L	E01083W-106V-00	E01083W-108V-00	E01083W-101V-00	208	1000	2.8	11.0
	E01023W-106V-00	E01023W-108V-00	E01023W-101V-00	240	1000	2.4	11.0
	E01033W-106V-00	E01033W-108V-00	E01033W-101V-00	380	1000	1.5	11.0
45 - 60 Gallons 170-227L	E01583W-156V-00	E01583W-158V-00	E01583W-151V-00	208	1500	4.2	17.0
	E01523W-156V-00	E01523W-158V-00	E01523W-151V-00	240	1500	3.6	17.0
	E01533W-156V-00	E01533W-158V-00	E01533W-151V-00	380	1500	2.3	17.0
	E01543W-156V-00	E01543W-158V-00	E01543W-151V-00	480	1500	1.8	17.0
SINGLE PHASE — WITH A 18" (457mm) PROBE LENGTH							
60 - 90 Gallons 227-341L	E02011W-156V-00	E02011W-158V-00	E02011W-151V-00	120	2000	16.7	14.0
	E02081W-156V-00	E02081W-158V-00	E02081W-151V-00	208	2000	9.6	14.0
	E02021W-156V-00	E02021W-158V-00	E02021W-151V-00	240	2000	8.4	14.0
	E02071W-156V-00	E02071W-158V-00	E02071W-151V-00	277	2000	7.2	14.0
	E02031W-156V-00	E02031W-158V-00	E02031W-151V-00	380	2000	5.3	14.0
	E02041W-156V-00	E02041W-158V-00	E02041W-151V-00	480	2000	4.2	14.0
THREE PHASE — WITH A 18" (457mm) PROBE LENGTH							
60 - 90 Gallons 227-341L	E02083W-156V-00	E02083W-158V-00	E02083W-151V-00	208	2000	5.6	14.0
	E02023W-156V-00	E02023W-158V-00	E02023W-151V-00	240	2000	4.8	14.0
	E02033W-156V-00	E02033W-158V-00	E02033W-151V-00	380	2000	3.0	14.0
	E02043W-156V-00	E02043W-158V-00	E02043W-151V-00	480	2000	2.4	14.0

Hazardous Location models with thermostat also available.
Substitute the letter **"W"** in part number with the letter **"E"** to specify Hazardous Location models.
Industrial Immersion Heaters are also available for coolants and other process heating. Call factory.

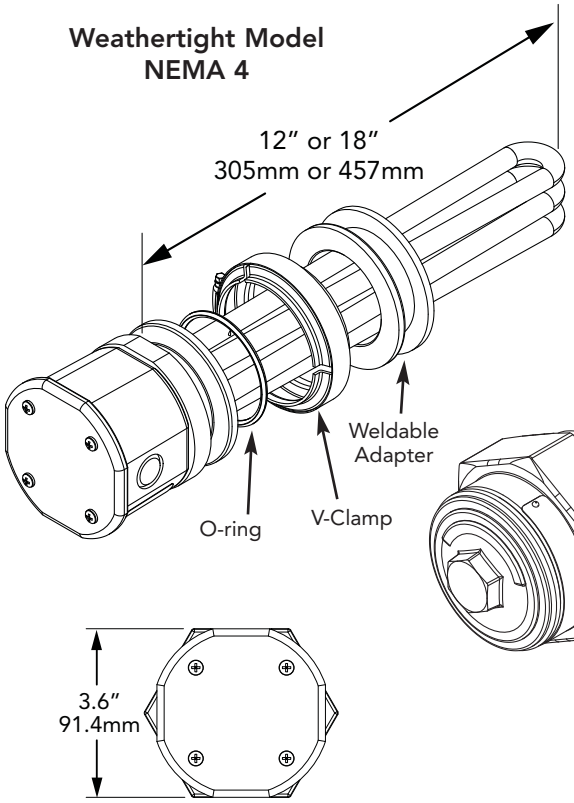
Call HOTSTART for complete model number featuring adjustable thermostat.

V-Clamp Immersion Heaters

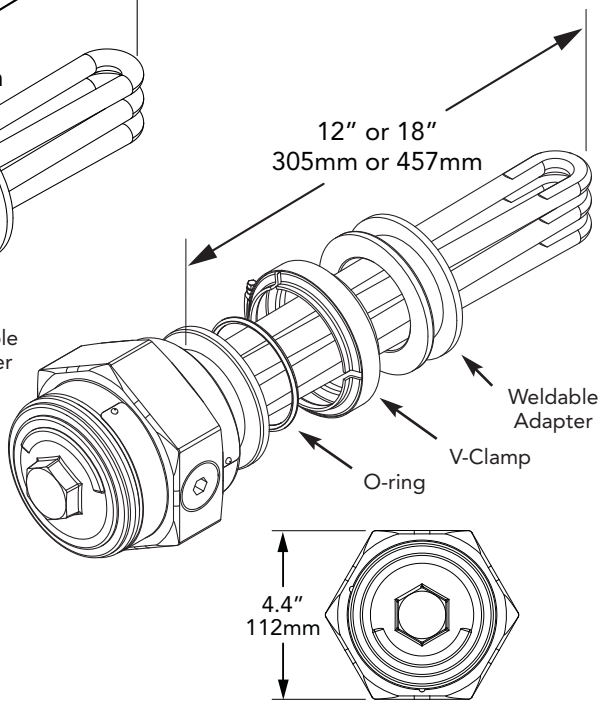
Threadless Design

HOTSTART immersion heaters include a fixed-setting, built-in thermostat and are available with an adjustable thermostat.

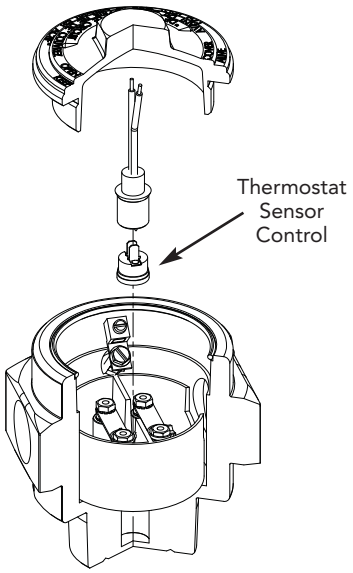
Weathertight Model
NEMA 4



Hazardous Location Model
NEMA 4 & 7



Fixed Thermostat Assembly

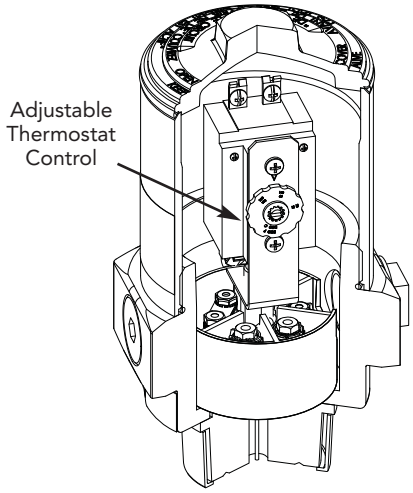


TEMPERATURE RANGE ON	TEMPERATURE RANGE OFF	CONTROL
60°F (16C)	80°F (27C)	HLC-6
80°F (27C)	100°F (38C)	HLC-8
100°F (38C)	120°F (49C)	HLC-10

ELECTRICAL RATING

15 Amps at 120 Vac
10 Amps at 240 Vac
10 Amps at 277 Vac

Adjustable Thermostat Assembly



TEMPERATURE RANGE		CONTROL
OFF	70°F - 210°F (21°-99°C)	AMT70-210

Nominal thermal differential is 8°F (-13°C)

ELECTRICAL RATING

30 Amps at 125 Vac
30 Amps at 240 Vac
30 Amps at 277 Vac
20 Amps at 480 Vac

Element assembly includes **O- Ring** only.

Installation kit sold separately.

V-CLAMP INSTALL KIT

Part Number	Parts Included
VC-SK	Steel weldable adapter V-Clamp O-ring

NOTES:

On applications where level of fluid is subject to change, a liquid level switch mounted a minimum of 3-4" (76-102mm) above element is recommended. **Liquid level switch is not included with heater.**

All 380 Volt and 480 Volt heaters must be used in conjunction with contactor and control transformer.

All three phase heaters must be used with a contactor. See page 30.

Higher or lower temperature ranges are available. Consult HOTSTART.

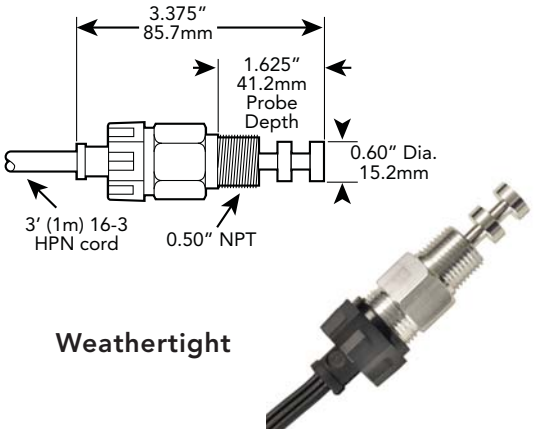

HOTSTART
JUNCTION BOX
PN: JBC11-100
WARNING
HAZARDOUS
VOLTAGE.
Disconnect power
before servicing.
HOTSTART
JUNCTION BOX
PN: PDB-000
DATE CODE: 04 13

Remote Thermostats for Weathertight and Hazardous Location Oil Heaters (see p.20 for model numbers)

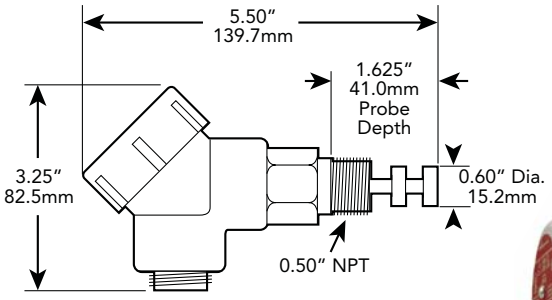
REMOTE THERMOSTATS for OIL HEATERS

Weathertight	Hazardous Location	Temprature Range ON	Temprature Range OFF	Sensing Unit	Thread Size
DIT68	DIT68EP	60°F (16C)	80°F (27C)	LSU-6	.5" NPT
DIT810	DIT810EP	80°F (27C)	100°F (38C)	LSU-8	.5" NPT
DIT1012	DIT1012EP	100°F (38C)	120°F (49C)	LSU-10	.5" NPT
DIT1214	DIT1214EP	120°F (49C)	140°F (60C)	LSU-12	.5" NPT

Switch Capacity
120 V - 15amp
208 V - 10amp
240 V - 10amp
277 V - 10amp
12 Vdc } Pilot Duty Only
24 Vdc } Pilot Duty Only



Weathertight



Hazardous Location

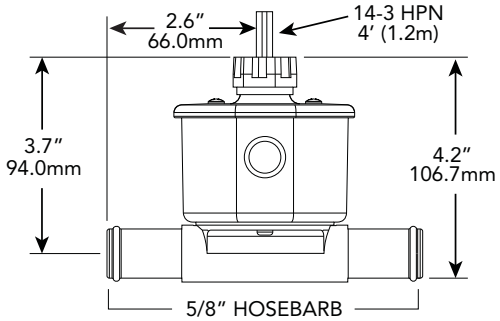


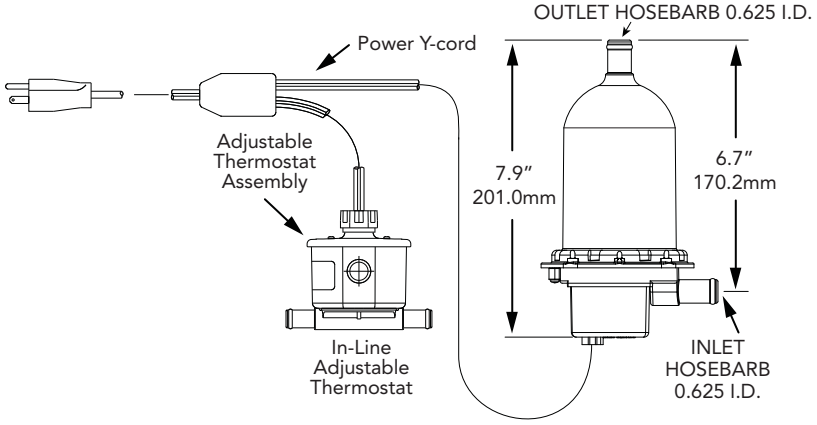
Remote Adjustable Thermostat for TPS Thermosiphon Engine Heater (see p.7 for model numbers)

5/8" HB x 5/8" HB

Part Number	Adjustable Range Temperature Setting	Sensing Unit
TFTA-5/8HB	Adjustable 90-130°F (32-54°C)	FSU90-130

Part number does not include "Y" cord

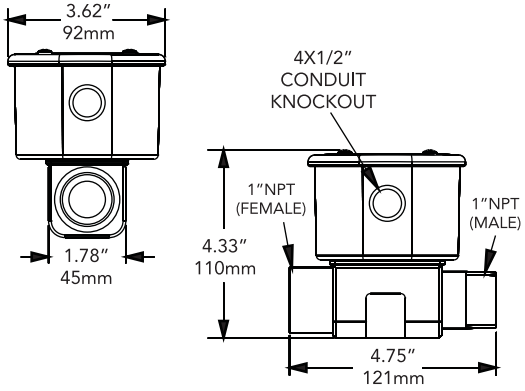






When using a thermostat above rated capacity or on 3 phase applications, select the proper control box with transformer and contactor as shown on page 30.

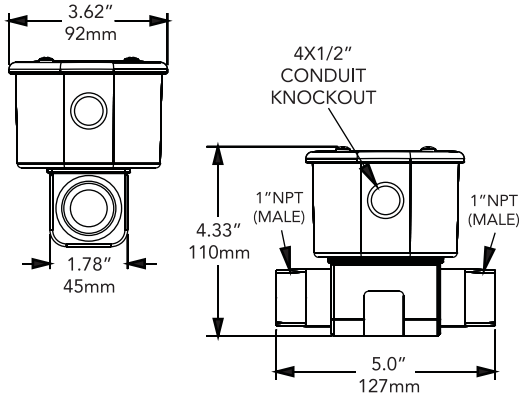




1"NPT female x 1"NPT male
CONDUIT TYPE ENCLOSURE

Part Number	Temperature Setting		Maximum Capacity Ratings		
	On	Off	120/240V	277V	480V
TFTC8-200	80°F (27C)	100°F (38C)	25amp	22amp	22amp
TFTC10-200	100°F (38C)	120°F (49C)	25amp	22amp	22amp
TFTC12-200	120°F (49C)	140°F (60C)	25amp	22amp	22amp
TFTCA-200	Adjustable 90-130°F (32-54°C)		25amp	22amp	22amp

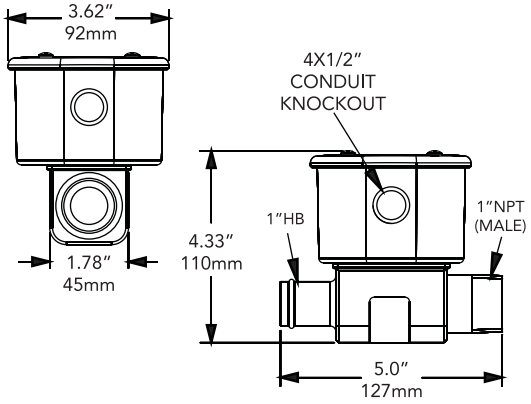




1"NPT male x 1"NPT male
CONDUIT TYPE ENCLOSURE

Part Number	Temperature Setting		Maximum Capacity Ratings		
	On	Off	120/240V	277V	480V
TFTC8-220	80°F (27C)	100°F (38C)	25amp	22amp	22amp
TFTC10-220	100°F (38C)	120°F (49C)	25amp	22amp	22amp
TFTC12-220	120°F (49C)	140°F (60C)	25amp	22amp	22amp
TFTCA-220	Adjustable 90-130°F (32-54°C)		25amp	22amp	22amp

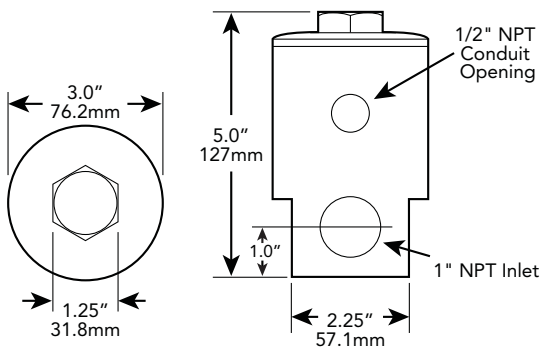




1" hose barb x 1"NPT male
CONDUIT TYPE ENCLOSURE

Part Number	Temperature Setting		Maximum Capacity Ratings		
	On	Off	120/240V	277V	480V
TFTC8-240	80°F (27C)	100°F (38C)	25amp	22amp	22amp
TFTC10-240	100°F (38C)	120°F (49C)	25amp	22amp	22amp
TFTC12-240	120°F (49C)	140°F (60C)	25amp	22amp	22amp
TFTCA-240	Adjustable 90-130°F (32-54°C)		25amp	22amp	22amp



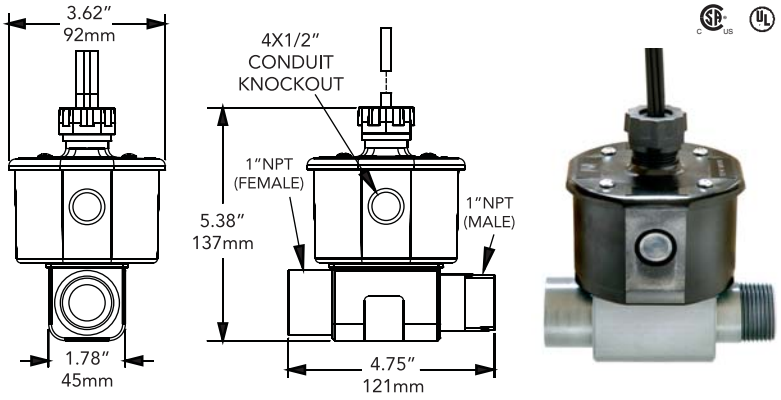


HAZARDOUS LOCATION
CONDUIT TYPE ENCLOSURE

Part Number	Temperature Setting		Maximum Capacity Ratings		
	On	Off	120/240V	277V	480V
TFT8ER	80°F (27C)	100°F (38C)	25amp	22amp	22amp
TFT10ER	100°F (38C)	120°F (49C)	25amp	22amp	22amp
TFT12ER	120°F (49C)	140°F (60C)	25amp	22amp	22amp

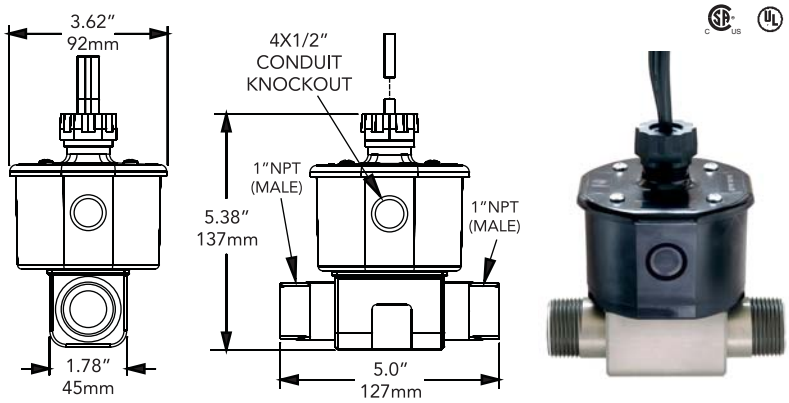
1"NPT female x 1"NPT male
CORD CONNECTED

Part Number	Temperature Setting		Maximum Capacity Ratings		
	On	Off	120/240V	277V	480V
TFT8-200	80°F (27C)	100°F (38C)	25amp	22amp	22amp
TFT10-200	100°F (38C)	120°F (49C)	25amp	22amp	22amp
TFT12-200	120°F (49C)	140°F (60C)	25amp	22amp	22amp
TFTA-200	Adjustable 90-130°F (32-54°C)		25amp	22amp	22amp



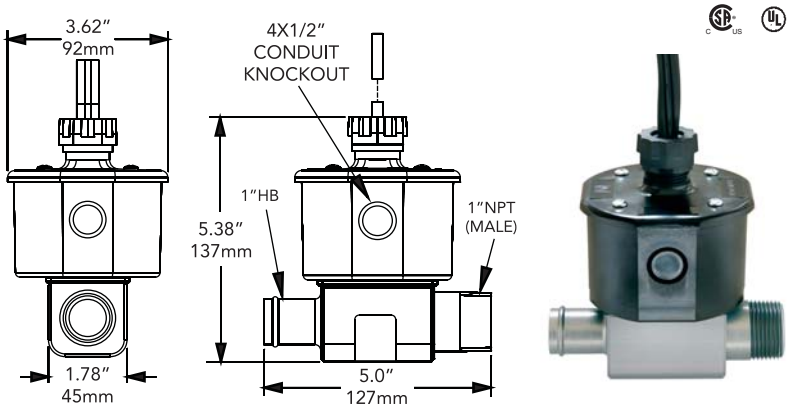
1"NPT male x 1"NPT male
CORD CONNECTED

Part Number	Temperature Setting		Maximum Capacity Ratings		
	On	Off	120/240V	277V	480V
TFT8-220	80°F (27C)	100°F (38C)	25amp	22amp	22amp
TFT10-220	100°F (38C)	120°F (49C)	25amp	22amp	22amp
TFT12-220	120°F (49C)	140°F (60C)	25amp	22amp	22amp
TFTA-220	Adjustable 90-130°F (32-54°C)		25amp	22amp	22amp



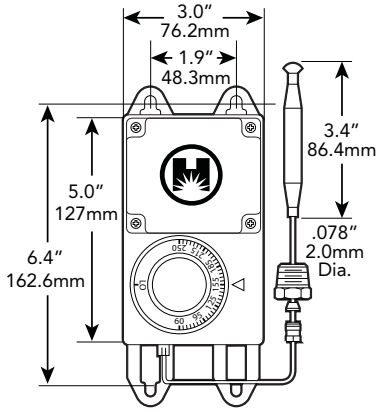
1" hose barb x 1"NPT male
CORD CONNECTED

Part Number	Temperature Setting		Maximum Capacity Ratings		
	On	Off	120/240V	277V	480V
TFT8-240	80°F (27C)	100°F (38C)	25amp	22amp	22amp
TFT10-240	100°F (38C)	120°F (49C)	25amp	22amp	22amp
TFT12-240	120°F (49C)	140°F (60C)	25amp	22amp	22amp
TFTA-240	Adjustable 90-130°F (32-54°C)		25amp	22amp	22amp



REMOTE ADJUSTABLE
With 5' (1.5m) Capillary Probe

Part Number	Adjustable Range Temperature Setting	Maximum Capacity Ratings		
		120/208/240V	277V	480V
AT6525	65 - 250°F (18 - 121°C) (Open or Off Setting) Differential 7°F (-14°C) (Close or On Setting)	25amp	22amp	5amp
ATW Aluminum Well for AT6525	 0.5" NPT			





Control systems allow for quick electrical installation of all HOTSTART engine heaters. They are designed as a time and labor saving component. Control systems are especially useful on installations that require two coolant heaters or combinations of a coolant heater and oil heater/hydraulic heater etc.

All control boxes on this page are NEMA 4, 12 & IP66.

CONTROL SYSTEMS

CONTROL SYSTEMS featuring AUTOMATIC SHUTDOWN DEVICES
With 24 Vdc Relay

Amps	Volts	1 Heater, 1 Thermostat per application	2 Heaters, 2 Thermostats per application
30A Max	120	JBC11-100	JBC21-100
30A Max	208	JBC18-100	JBC28-100
30A Max	240	JBC12-100	JBC22-100
30A Max	400	JBC1A-100	JBC2A-100
30A Max	480	JBC14-100	JBC24-100
30A Max	575	JBC15-100	JBC25-100



Model JBC14-100

See wiring schematic page 31



Model JBC24-100

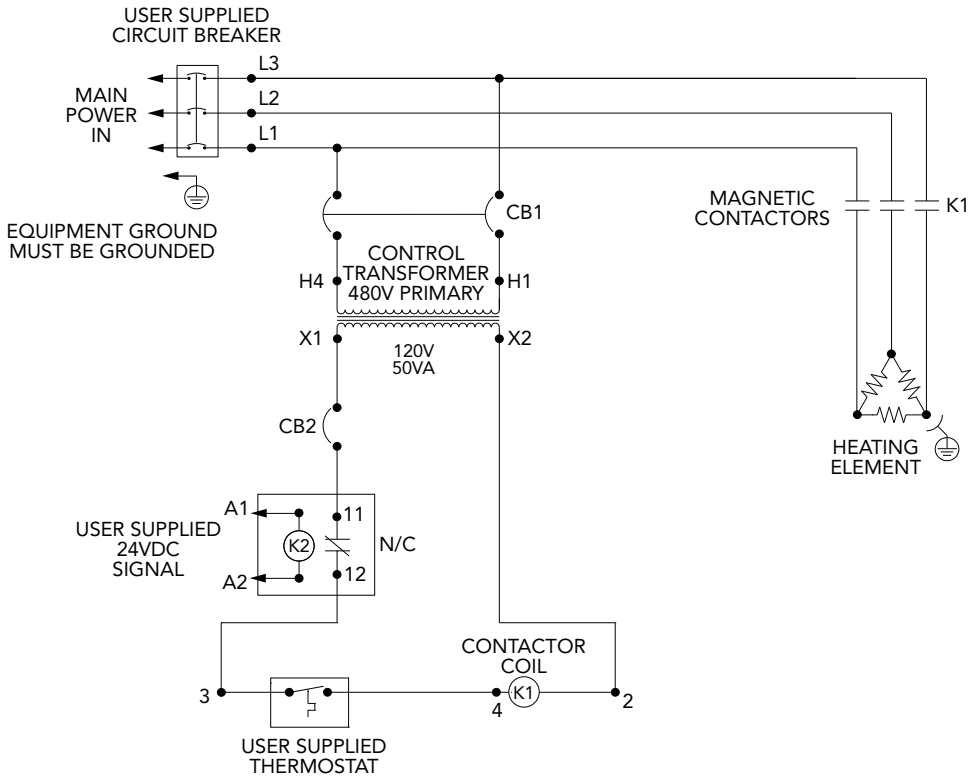
See wiring schematic page 31

All HOTSTART heaters with thermostat, operating on three phase current (at any voltage), require the use of a control system with a 3-pole contactor. All HOTSTART heaters with thermostat, operating over 480 volt (single or three phase) require a control system to reduce the primary voltage to 120 volts for the control circuit. For increased thermostat life, use a control system on all heaters above 277 volts either single or three phase.

All control boxes can be used with either single or three phase heaters.
Control boxes are available in Hazardous Location models - contact factory for part number.

For heater protection and power savings, HOTSTART recommends de-energizing the heater when engine is running. Control boxes are supplied with a 24 volt relay to de-energize the heater upon engine start-up.

Wiring Schematic for JBC14-100

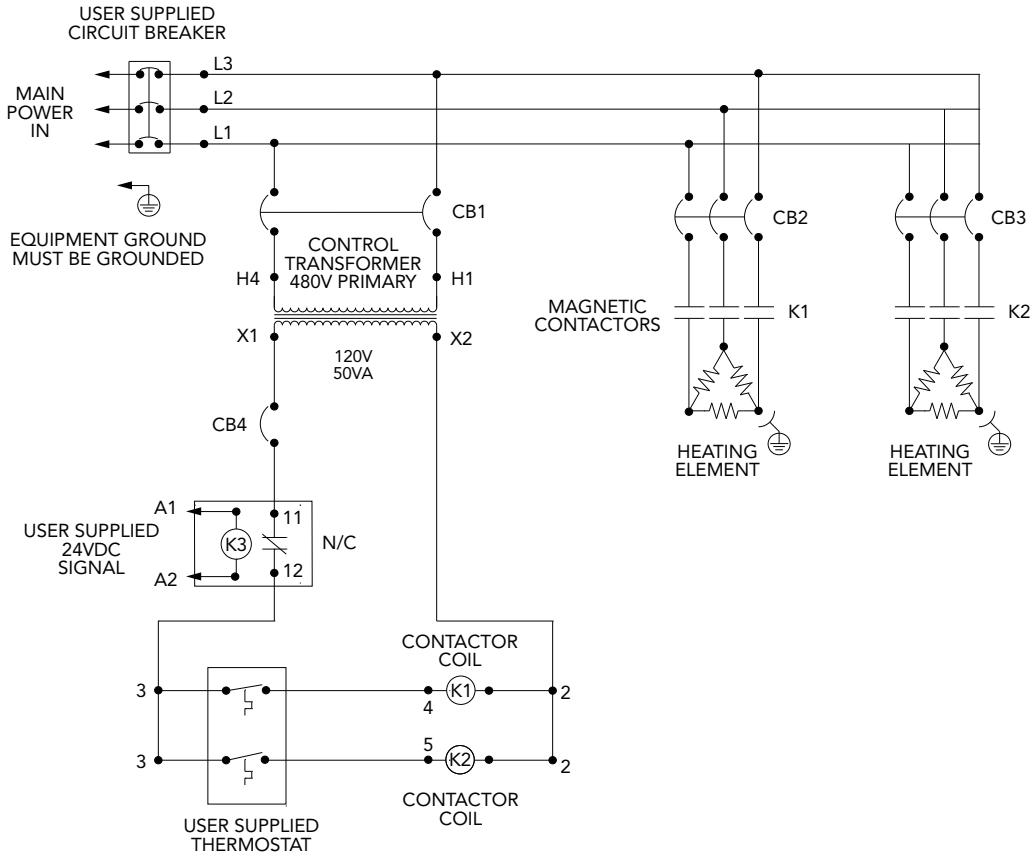


To control one 480 Volt heater at maximum 30 amps on manual start engine.



Model JBC14-100

Wiring Schematic for JBC24-100



To control two 480 Volt heaters at maximum 30 amps on automatic start engines.



Model JBC24-100

POWER DISTRIBUTION BOX

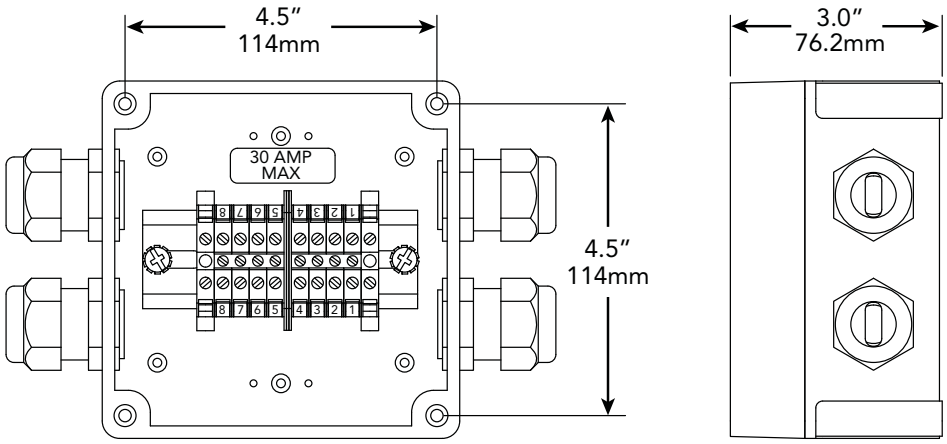
Use to simplify wiring on equipment when a variety of heaters and controls are required. All models have ten, 25 Amp terminal blocks. Power Distribution Boxes are rated NEMA 4 and IP66/67

PDB-000



Part Number	Number of Openings
PDB-000	8*

*Box comes assembled with 4 strain relief connectors. For additional connectors, order part# A6553-2.



A6553-2



OIL PRESSURE SWITCH

For automatic cut-off of heaters when engine starts.

Maximum Current Capacity:
120 V/208 V/240 V/277 V — 25 Amps
380 V/480 V/575 V — 15 Amps
Two pole single throw.

To prevent overheating of the heating element on standby equipment and automatic start engines, HOTSTART recommends turning the coolant heater off when the engine is running. A pressure switch that senses engine oil pressure is utilized to shut the heater off on increase of oil pressure and to turn the heater on when engine oil pressure drops.



NEMA 1

Part Number	Enclosure Type
PS252	Dry Locations
PS252R	Dry Locations (Reverse Action)
PS252WT	Wet Locations
PS252EP	Hazardous Locations


HOTSTART
ENGINE HEATING
CAUTION
DO NOT SET BATTERY
ON CORD CONNECTIONS
HOTSTART

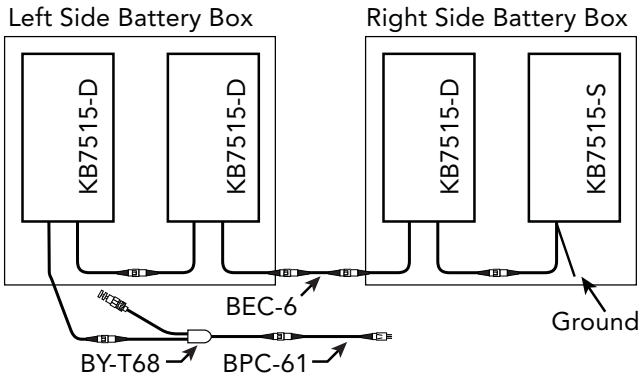
Battery Heating Pads



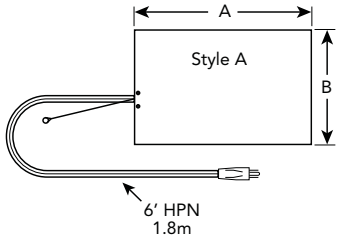
Battery heater not recommended for nickel cadmium batteries. When batteries are placed in an insulated battery box, a thermostat is recommended to sense battery box temperature to prevent overheating the battery.

Model Number	Volts	Watts	Amps	Nominal Dimensions A	Nominal Dimensions B	Battery Size	Style
KB5015	120	50	.42	12.75" (32.4cm)	8.25" (21.0cm)	4D	A
KB5015-S	120	50	.42	12.75" (32.4cm)	8.25" (21.0cm)	4D	B
KB5015-D	120	50	.42	12.75" (32.4cm)	8.25" (21.0cm)	4D	C
KB7515	120	75	.63	19.5" (49.5cm)	10.5" (26.7cm)	8D	A
KB7515-S	120	75	.63	19.5" (49.5cm)	10.5" (26.7cm)	8D	B
KB7515-D	120	75	.63	19.5" (49.5cm)	10.5" (26.7cm)	8D	C
KB7523	240	75	.31	19.5" (49.5cm)	10.5" (26.7cm)	8D	A
KB7523-S	240	75	.31	19.5" (49.5cm)	10.5" (26.7cm)	8D	B
KB7523-D	240	75	.31	19.5" (49.5cm)	10.5" (26.7cm)	8D	C

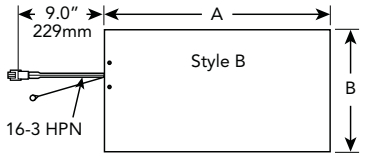
Typical Connection - 2 Batteries on Each Side of Vehicle

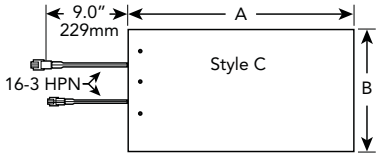


Standard Pad for Single Battery



Special Pads for Multiple Batteries





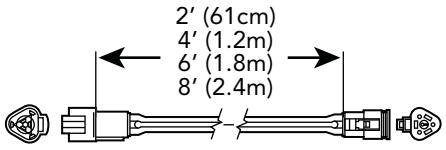
Accessories For Multiple Battery Heating

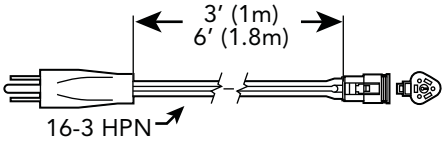
EXTENSION CORDS

Part Number	Length
BEC-2	2' (61cm)
BEC-4	4' (1.2m)
BEC-6	6' (1.8m)
BEC-8	8' (2.4m)

POWER SUPPLY CORDS

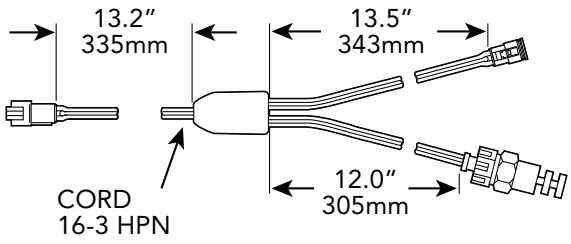
Part Number	Length	Volts
BPC-31	3' (1m)	120
BPC-32	3' (1m)	240
BPC-61	6' (1.8m)	120
BPC-62	6' (1.8m)	240





THERMOSTAT & "Y" CORD ASSEMBLY

Part Number	Temperature Control On	Temperature Control Off
BY-T68	60°F (16°C)	80°F (27°C)



Battery Thermal Wrap



BATTERY THERMAL WRAP — NO THERMOSTAT

Model Number	Volts	Watts	Length
KBW5015-000	120	50	28" (71.0cm)
KBW8015-000	120	80	36" (91.5cm)
KBW16015-000	120	160	72" (183.0cm)

Prolong the life of your battery with HOTSTART thermal battery wraps with or without thermostat.

- Durable, fire-retardant vinyl cover that resists oils and acids.
- All standard battery pads and battery wraps come with 6' (1.8m) grounded cord and plug.
- Fast, easy installation.
- Boosts battery cranking power as much as 75%.

BATTERY THERMAL WRAP — WITH THERMOSTAT

Thermostat range: 65°F - 80°F (18°C - 27°C)

Model Number	Volts	Watts	Length
KBW5015T-000 KBW5024T-000	120 240	50 50	26" (66.0cm) 26" (66.0cm)
KBW8015T-000 KBW8024T-000	120 240	80 80	44" (112.0cm) 44" (112.0cm)
KBW10015T-000 KBW10024T-000	120 240	100 100	56" (142.0cm) 56" (142.0cm)

Thermostatically controlled battery thermal wraps provide optimum heating regardless of ambient temperature.

- At 80°F (27°C), the battery will achieve maximum cold cranking amps.
- Battery is constantly maintained at 80°F (27°C).
- Provides greater heat rise than plates or pads.
- Thermostat will eliminate battery damage caused by overheating and acid spill.

Silicone Pad Heaters



Not for use on batteries.

Flexible, Versatile and Easy to Install.

HOTSTART adhesive pad heaters can be used on oil pans, hydraulic reservoirs, engine blocks, hydraulic cylinders and diesel fuel tanks.

- Easy peel and stick application.
- Etched foil heating element for optimal heat transfer and long life.
- Durable silicone/fiberglass cover resists abrasion.
- 120 V models are assembled with a standard 6' (1.8m) HPN cord and plug. 240 V models include 6' (1.8m) HPN cord without plug.

Model Number	Dimensions	Volts	Watts
AF10015 AF10024	4" x 5" (102mm x 127mm)	120 240	100 100
AF15015 AF15024	4" x 5" (102mm x 127mm))	120 240	150 150
AF25015 AF25024	5" x 6" (127mm x 152mm)	120 240	250 250
AF40015 AF40024	6" x 8" (152mm x 203mm)	120 240	400 400

Application Guidline	100 Watt	150 Watt	250 Watt	400 Watt
Engine oil pan	2 - 5 quarts 1.9 - 4.7L	5 - 8 quarts 4.7 - 7.5L	2 - 5 gallons 7.5 - 19.0L	5 - 8 gallons 19.0 - 30.3L
Diesel Tank	5 - 7 gallons 19.0 - 26.5L	7 - 10 gallons 26.5 - 38.0L	10 - 20 gallons 38.0 - 75.7L	20 - 30 gallons 75.7 - 113.5L
Hydraulic Tank	1 - 5 gallons 4.0 - 19.0L	5 - 10 gallons 19.0 - 38.0L	10 - 20 gallons 38.0 - 75.7L	20 - 30 gallons 75.7 - 113.5L
Water Tank	up - 2 gallons up - 7.5L	2 - 4 gallons 7.5 - 15.0L	4 - 7 gallons 15.0 - 26.5L	7 - 10 gallons 26.5 - 38.0L

CAUTION: Do not use pads with higher than recommended wattage for specific oil capacities. For use on metal surfaces only.



In-block Heaters

In-block heaters are complete with 2-wire w/ground 6' (1.8m) HPN cord and plug.
For cord replacements or "Y" Thermocord energy saver, please reference page 48.

Engine Model	Part Number 120V	Part Number 240V	Watts	Application Information	Heat Shield Required	Photo
Allis Chalmers						
670T & I 685T & I 6138LT, T & I 25000 (844 CID)	AC-101 CATV-151	AC-102 CATV-152	1000 1500	Replaces 1" thread-in plug on the oil cooler at rear of the engine on right side. Not all of the engines have this opening.		
Case/IH – Agricultural						
ALL 4 CYL 390 ALL 6 CYL 590	CUB-751FP CUB-101FP CUB-151FP	CUB-752FP CUB-102FP CUB-152FP	750 1000 1500	Inserts in any of the core plugs on right side of engine.		
ALL 6 CYL 830	CUC-151FP	CUC-152FP	1500	Inserts in the core plug at right rear of engine block.		
Caterpillar						
C-10 C-12	TF121-000	TF122-000	1250	Replaces the threaded plug in the oil cooler bonnet on the right side of engine.	YES	
C-9 Non ACERT C-15 Non ACERT C-16 Non ACERT	CATV-151	CATV-152	1500	C-9: Replaces 1" NPT plug in the right rear of engine block. C-15, C-16: Replaces the threaded plug in the back of the oil cooler.		
C7 ACERT 3126	FP101-001 FP151-001	FP102-001 FP152-001	1000 1500	Replaces the 44mm core plug on right side of engine just below the turbo charger.	YES	
C7 ACERT rear port	TL101-000	TL102-000	1000	Replaces the threaded 1-1/16" (1.0625") plug in the rear of engine block.		
C9 ACERT	CATV-151	CATV-152	1500	Replace 1" NPT plug in the right rear of engine block.		
C11 ACERT C13 ACERT	TF151-008	TF152-008	1500	Replace any 1-5/16" (1.3125") plug in the rear of the oil cooler on right side of engine.	Check Exhaust Routing	
C15 ACERT w/o breaksaver	TF151-009	TF152-009	1500	Replace 1-3/16" (1.1875") plug in rear of oil cooler on right side of engine.		
C15 ACERT with breaksaver	TF151-008	TF152-008	1500	Replace any 1-5/16" (1.3125") plug in the oil cooler on right side of engine.		
C9 2007 ACERT C13 2007 ACERT C15 2007 ACERT	TF151-012	TF152-012	1500	Replace any 1-3/16" (1.1875") plug in rear of oil cooler on right side of engine.		
1674	CATB-151	CATB-152	1500	Replace the 1-1/2" (1.5") plug on right side of engine.		
1693 & D343	CATC-151	CATC-152	1500	Replaces the water jacket access plate on left side of engine.		
1693T & 1693TA	CATC-151-S	CATC-152-S	1500	Replaces the water jacket access plate on left side of engine.		
3013 1.5L 3014 2.0L	FP531-003	FP532-003	530	Replaces 40mm core plug on the front left side of engine.		

In-block heaters are complete with 2-wire w/ground 6' (1.8m) HPN cord and plug.
For cord replacements or "Y" Thermocord energy saver, please reference page 48.

Engine Model	Part Number 120V	Part Number 240V	Watts	Application Information	Heat Shield Required	Photo
Caterpillar — Continued						
3024 2.22L	FP531-003	FP532-003	530	Replaces 40mm core plug on the front left side of the engine.		
3034 2.95L	FP531-001	FP532-001	530	Replaces 50mm core plug located at rear of head.		
3044 3.3L	PF531-001	PF532-001	530	Replaces the plate in oil cooler case on left side of engine.		
3046 5.0L	PF531-000	PF532-000	530	Replaces 35mm core plug located at rear of engine, left side.		
3054 3.99L 3054B 4.23L	PER-751FP PER-101FP	PER-752FP PER-102FP	750 1000	Mounts in the 1-1/4" (1.25") core plug opening on left side of engine.		
3054C	PER-751FP	PER-752FP	750	Mounts in 1-1/4" (1.25") core plug at right rear of engine with element oriented in the 12 O'clock position.		
3056 6.0L	PER-151FP	PER-152FP	1500	Mounts in the 1-1/2" (1.5") core plug on right side of engine.		
3114 3116	FP101-001 FP151-001	FP102-001 FP152-001	1000 1500	Replaces the 44mm core plug on right side of engine just below the turbocharger.	YES	
3176 10.3L through 1995	DD8L-101 CAT-12015 TF151-001	DD8L-102 CAT-12023 TF152-001	1000 1250 1500	Replaces the 3/4" (0.75") threaded plug on the right side of engine just below the head.		
3176 10.3L 1996 and later	TF121-000	TF122-000	1250	Replaces the 1" threaded plug in the oil cooler bonnet on right side of engine.	YES	
3196 12.0L	TF121-000	TF122-000	1250	Replaces the 1" threaded plug in oil cooler bonnet on right side of engine.	YES	
3204 all 1100 series	CATX-751 CATX-101	CATX-752 CATX-102	750 1000	Replaces 44mm core plug on right rear side of engine.		
3208 — 2 heaters with a single cord	CATX-2-751-Y	CATX-2-752-Y	1500 total	Use on industrial engines when clear access is available. Replaces any core plug - one on each side of engine.		
3208 Recommended aftermarket installation	JD3/4-101IN JD1-101IN JD3/4-151IN JD1-151IN	JD3/4-102IN JD1-102IN JD3/4-152IN JD1-152IN	1000 1000 1500 1500	Replaces any of the 3/4" (0.75") or 1" plugs on the water transfer casting (right front of engine). 3/4" use JD3/4 — 1" use JD1		
3304 3306	DD8L-101 CAT-12015 TF151-001	DD8L-102 CAT-12023 TF152-001	1000 1250 1500	Replaces the 3/4" (0.75") plug on left side of engine.		
3406C/E 14.6L	AC-101 CATV-151	AC-102 CATV-152	1000 1500	Replaces 1" threaded plug in the rear of the oil cooler bonnet on right side of engine.		

In-block Heaters

In-block heaters are complete with 2-wire w/ground 6' (1.8m) HPN cord and plug.
For cord replacements or "Y" Thermocord energy saver, please reference page 48.

Engine Model	Part Number 120V	Part Number 240V	Watts	Application Information	Heat Shield Required	Photo
Caterpillar — Continued						
3406 & 3408 except 1998 ADEM 2	AC-101 CATV-151	AC-102 CATV-152	1000 1500	Replaces 1" threaded plug in the rear of the oil cooler bonnet on right side of engine.		
3406E 1998 ADEM 2 engines only	TF151-002	TF152-002	1500	Replaces the 1" threaded plug that points downward on the top of the rear of the oil cooler bonnet.	YES	
3406E ADEM 3 and ADEM 2000 engines	AC-101 CATV-151	AC-102 CATV-152	1000 1500	Replaces 1" threaded plug in the rear of the oil cooler bonnet on right side of engine.		
3456 15.8L	AC-101 CATV-151	AC-102 CATV-152	1000 1500	Replaces 1" threaded plug in the rear of the oil cooler bonnet on right side of engine.		
Cummins						
6 Cylinder Engines: H, NT, NH, N Family 743 CID, 855 CID, 927 CID, "N14"						
1. Cummins engines are often referred to by their horsepower rating "i.e. 350 Cummins"						
2. Cummins engines are often referred to as Big Cam, Big Cam2, 3, 4, full flow cooling, etc.						
All refer to engines of 855 CID Size – listed below						
Group I						
Flat plate design	CUN-151B	CUN-152B	1500	6 bolt flat plate on the right side of the engine. May use either the forward or rear opening depending on clearance.		
Flat plate design when the 1/2" NPT opening is used	CUN-151BH	CUN-152BH	1500			
Group II						
When an external oil cooler is used..		**Note:** When a 4 bolt flat plate element design is encountered, remove the next two bolts on the casting, remove the whole casting, and replace the casting and element with either CNT-151B/CNT-152B OR CNT151B90/CNT152B90				
When connection is 1 1/2" rubber hose Engines produced Aug. 1975 thru June 1982	CNT-151B-90	CNT-152B-90	1500	6 bolt, flat plate design with an elbow that will rotate 360 degrees to connect with any hose or casting.		
Uses an "O" ring for the 1 1/4" water tube connection Engines produced prior to August '75	CNT-151B	CNT-152B	1500	6 bolt, flat plate design with an elbow that will rotate 360 degrees to connect with any hose or casting.		
Group III						
For industrial engines with hole pattern reversed	CUN-151BREV	CUN-152BREV	1500	Six bolt flat plate on the right side of engine block.		
Group IV						
1998 and later N14 Industrial	PF151-002	PF152-002	1500	Six bolt flat plate on the right side of engine block.		

In-block heaters are complete with 2-wire w/ground 6' (1.8m) HPN cord and plug.
For cord replacements or "Y" Thermocord energy saver, please reference page 48.

Engine Model	Part Number 120V	Part Number 240V	Watts	Application Information	Heat Shield Required	Photo
Cummins — Continued						
Cummins A 4 cyl & 6 cyl	CUA-101F	CUA-102F	1000	Inserts in any of the core plugs on right side of engine. Element points down.		
ISC/QSC 8.3L ISL/QSL 9.0L	DD8L-101 TF751-002	DD8L-102 TF752-002	1000 750	Replaces 3/4" (0.75") NPT plug in right front side of engine.		
L10, M11 ISM 2007	CUL-151	CUL-152	1500	Inserts in the forward opening of the heater casting on the right rear of engine block.		
QSB 3.9L, 5.9L ISB 5.9	TF751-002	TF752-002	750	Replaces 3/4" (0.75") NPT plug in the front of the oil cooler casting.		
ISM/QSM 11.0L Flat Plate Design	PF151-003	PF152-003	1500	Right rear. Replaces plate.		
ISX, QSX Signature 600 Pre 2007	PF151-004	PF152-004	1500	Mounts in the oval shaped plate on the right side of engine block.		
4BT 3.9L	CUB-751FP CUB-101FP	CUB-752FP CUB-102FP	750 1000	Replaces 57.8mm core plug on right side of engine.	Check Exhaust Routing	
6BT 5.9L	CUB-751FP CUB-101FP CUB-151FP	CUB-752FP CUB-102FP CUB-152FP	750 1000 1500	Replaces 57.8mm core plug on right side of engine.	Check Exhaust Routing	
6CT 8.3L	CUC-151FP	CUC-152FP	1500	Replaces 57.8mm core plug on right rear side of engine.		
Detroit Diesel						
SERIES 10 4 cylinder Phaser engines	PER-751FP PER-101FP	PER-752FP PER-102FP	750 1000	Mounts in the 1-1/4" (1.25") core plug opening on either side of engine.		
SERIES 10 6 cylinder Phaser engines	PER-151FP	PER-152FP	1500	Mounts in the 1-1/4" (1.25") core plug on right side of engine.		
SERIES 30	DD8L-101 TF751-002	DD8L-102 TF752-002	1000 750	Mounts in the 3/4" (0.75") NPT opening in engine block.		
SERIES 40 all versions	PER-751FP INTA-121 FR151-001	PER-752FP INTA-122 FR152-001	750 1250 1500	Mounts in the core plug opening on right side of engine.		

In-block Heaters

In-block heaters are complete with 2-wire w/ground 6' (1.8m) HPN cord and plug.
For cord replacements or "Y" Thermocord energy saver, please reference page 48.

Engine Model	Part Number 120V	Part Number 240V	Watts	Application Information	Heat Shield Required	Photo
Detroit Diesel – continued						
SERIES 50 SERIES 60 Pre 2007	AC-101 CATV-151	AC-102 CATV-152	1000 1500	Mounts in the 1" NPT opening in either water pick up pipe (up to 1991) or in the 1" NPT opening on the oil cooler housing after 1991.	Yes on 1991 and later	
SERIES 55	PF151-000	PF152-000	1500	Mounts in the triangle plate on the side of engine block.		
3-53, 4-53, 3-71, 4-71 with water cooled air compressor	DD-751-S	DD-752-S	750	Mounts in the oval shaped plate on engine block. Check clearance.		
3-53, 4-53, 3-71, 4-71 without water cooled air compressor	DD-751	DD-752	750	Mounts in the oval shaped plate on engine block. Check clearance.		
6-71 with water cooled air compressor	DD-151-S	DD-152-S	1500	Mounts in the oval shaped plate on engine block. Check clearance.		
6-71 without water cooled air compressor	DD-151	DD-152	1500	Mounts in the oval shaped plate on engine block. Check clearance.		
8.2 L V-8 Diesel	DD8L-101 TF751-002	DD8L-102 TF752-002	1000 750	Threads into the 3/4" (0.75") NPT opening on engine block.		
6V-53 with water cooled air compressor	DD6V-751-S	DD6V-752-S	750	Mounts in the oval shaped plate on engine block. Check clearance.		
6V-53 without water cooled air compressor	DD6V-751	DD6V-752	750	Mounts in the oval shaped plate on engine block. Check clearance.		
6V71 & 8V71 Alternate location	AC-101 CATV-151	AC-102 CATV-152	1000 1500	Threads into 1" NPT plug in the front face of engine block.		
6V-71 & 8V-71 6V-92 & 8V-92 except GMC General models	DDV-151B	DDV-152B	1500	Mounts in the square plate on engine block.		
6V92 & 8V92 alternate location - threads into oil cooler	DD8L-101 TF751-002	DD8L-102 TF752-002	1000 750	Threads into the 3/4" (0.75") NPT opening in the oil cooler housing. Note - not all engines have this opening.		
Deutz						
BF4L913 BF6L913 F3L912 F3L913 F6L913 1011 SERIES oil cooled engines	OLT221515 and A22M48M (adapter)	n/a	150	Use adapter kit to mount the 22mm heater in the 48mm opening.		

In-block heaters are complete with 2-wire w/ground 6' (1.8m) HPN cord and plug.
For cord replacements or "Y" Thermocord energy saver, please reference page 48.

Engine Model	Part Number 120V	Part Number 240V	Watts	Application Information	Heat Shield Required	Photo
Deutz – continued						
1012 — 4 & 6 cyl 1013 — 4 cyl	PF751-000 PF121-001	PF752-000 PF122-001	750 1250	Mounts in the oval shaped plate opening on the oil cooler casting.		
1013 6 cyl	PF121-001 PF751-000	PF122-001 PF752-000	1250 750	Mounts in the oval shaped plate opening on the top of the oil cooler.		
1015 6 & 8 cyl	TL151-004	TL152-004	1500	Replaces 30mm plug in water elbow on front of engine.		
2012 — 4 & 6 cyl without electric fuel injection	PF751-002	PF752-002	750	Replace oval shaped plate on the top of the oil cooler.		
Ford						
7.3L V-8 diesels from 1994 on	TF751-002 DD8L-101	TF752-002 DD8L-102	750 1000	Mounts in the 3/4" (0.75") NPT plug in the engine's block.		
Hino						
3.8L, 5.8L, 6.0L, 6.4L, 6.7L, H06C-T, H07C-B, W04C-T, W06E	DD8L-101 TF751-002	DD8L-102 TF752-002	1000 750	Threads into 3/4" (0.75") NPT opening in engine block.	YES	
Isuzu						
4BD1 6HE1 6BD1 6SA1 6BG1	TF401-001	NONE	400	Replaces 1" NPT plug on left rear of engine.		
Iveco						
NEF 4cyl NEF 6 cyl	PF751-001	PF752-001	750	Mount in front opening on right side of engine block.		
John Deere						
With 3/4" plug in the back of the block	JD3/4-101IN JD3/4-151IN	JD3/4-102IN JD3/4-152IN	1000 1500	3/4" (0.75") NPT opening in the rear face of engine block.	Check Exhaust Routing	
With 1" plug in the back of the block	JD1-101IN JD1-151IN	JD1-102IN JD1-152IN	1000 1500	1" NPT opening in the rear face of engine block.		
With 1-5/8" opening on the side of the water jacket	JDS-101 JDS-151	JDS-102 JDS-152	1000 1500	1-5/8" (1.625") threaded opening on the side of the block in the water distribution channel.		

In-block Heaters

In-block heaters are complete with 2-wire w/ground 6' (1.8m) HPN cord and plug.
For cord replacements or "Y" Thermocord energy saver, please reference page 48.

Engine Model	Part Number 120V	Part Number 240V	Watts	Application Information	Heat Shield Required	Photo
John Deere – continued						
6105 (10.5L) 6125 (12.5L)	AC-101 CATV-151	AC-102 CATV-152	1000 1500	1" NPT opening in the oil cooler casting.		
Komatsu						
L10 (10L) M11(11L)	CUL-151	CUL-152	1500	Inserts in the forward opening of the heater casting on the right rear of engine block.		
SA6D125	MA-151	MA-152	1500	Threads into the core plug opening in engine block.		
Kubota						
B, L, M Series D905 V1205 D1005 V1305 D1105 V1505 D3000B V4000B D3200B V4300B DH905 VH1205 DH1005 VH1305	TF401-001	NONE	400	Replaces 1" NPT plug on left front of engine.		
Mack						
Mid liner E3 MS200 & MS250	MAM-101	MAM-102	1000	Mounts in rear face of block.		
Mid liner E5 MS300	MAM-151	MAM-152	1500	Mounts in the oil cooler bonnet.		
E6 engines "smooth bore" 1981 and later	MASB-151	MASB-152	1500	Replaces 1-3/4" (1.75") core plug on side of engine.		
E6 engines threaded core plug opening Pre-1981 END 465, 711, EN438, 504, 707, 673, 675, 676 (1957 through 1981)	MA-151	MA-152	1500	Mounts in any threaded core plug opening.		
E7 Engines Except E-Tech water pump mount	PF151-001 PF101-000	PF152-001 PF102-000	1500 1000	Mounts in the plate in either the front or rear face of the block in the water jacket passage. For 2002 engine – mounts in rear face of block.		
E9, ENDT865, 866 and 1000 series V8 engines Use two heaters	DD8L-101	DD8L-102	2000 total	Threads into the 3/4" (0.75") NPT opening on each side of engine block.		

In-block heaters are complete with 2-wire w/ground 6' (1.8m) HPN cord and plug.
For cord replacements or "Y" Thermocord energy saver, please reference page 48.

Engine Model	Part Number 120V	Part Number 240V	Watts	Application Information	Heat Shield Required	Photo
MAN						
D2840 D2842 D2848	PF121-003	PF122-003	1250	Replace oval shaped plate in lower water pipe on right side of engine.		
D2866 D2876	PF151-006	PF152-006	1500	Replace 3 bolt plate on left side of engine. May require adapter if 3 bolt opening is not available on engine. Consult customer service.		
Massey Ferguson						
3 cylinder 4 cylinder 6 cylinder	PER-751FP PER-101FP	PER-752FP PER-102FP	750 1000	Mounts in any of the 1-1/4" (1.25") core plug openings in the engine.	YES	
Mercedes Benz						
MBE904 MBE906 MBE924 MBE925	PF101-001	PF102-001	1000	Replaces 60mm core plug on right rear of engine.		
Navistar/International						
V800 (796 CID)	AC-101 CATV-151	AC-102 CATV-152	1000 1500	Threads into a 1" NPT opening in the oil cooler bonnet.		
INLINE 6 CYLINDER — all series — 312, 360, 414, 436, 466 & 530	INTA-121 INTA-101	INTA-122 INTA-102	1250 1000	Replaces third or fourth core plug on left side of engine. Element should point toward 1 O'clock position.		
7.3L & T444 1994 and later	TF751-002 DD8L-101	TF752-002 DD8L-102	750 1000	Mounts in the 3/4" (0.75") NPT plug in the engine's block.		
9.0L — V8 diesel	INT9-101F	INT9-102F	1000	Mounts in a core plug.		
Oliver						
ALL EXCEPT 1265, 1365 & 1900	TF751-002 DD8L-101	TF752-002 DD8L-102	750 1000	Threads into a 3/4" (0.75") NPT opening in the block.		
Onan — See Cummins "A" Series						
Perkins						
3.152 4.236 6.354	PER-751FP PER-101FP	PER-752FP PER-102FP	750 1000	Mounts in the 1-1/4" (1.25") core plug opening on right side of engine.		
103.15 104.22 404.22	FP531-003	FP532-003	530	Replaces core plug on left front of engine.		

In-block Heaters

In-block heaters are complete with 2-wire w/ground 6' (1.8m) HPN cord and plug.
For cord replacements or "Y" Thermocord energy saver, please reference page 48.

Engine Model	Part Number 120V	Part Number 240V	Watts	Application Information	Heat Shield Required	Photo
Perkins – continued						
700 Series 704.30	FP531-001	FP532-001	530	Replaces 50mm core plug located at rear of head.		
800 Series	PF531-001	PF532-001	530	Mounts in oval shaped plate on the left front of the block.		
1004 (right side)	FR751-002 FR101-000 PER-151FP	FR752-002 FR102-000 PER-152FP	750 1000 1500	Mounts in the 1-1/2" (1.5") core plug opening on right side of engine.		
1004 (left side)	PER-751FP PER-101FP	PER-752FP PER-102FP	750 1000	Mounts in the 1-1/4" (1.25") core plug opening on left side of engine.		
1006 (6 Cyl) A & B	PER-151FP	PER-152FP	1500	Mounts in the 1-1/2" (1.5") core plug on right side of engine.		
1103C	FR531-000-WOC	FR532-000-WOC	530	Replaces 1-1/4" (1.25") core plug on right rear of engine. Element should point towards 1 O'clock position.		
1104 (4 Cyl) C & D	PER-751FP PER-101FP	PER-752FP PER-102FP	750 1000	Mounts in 1-1/4" (1.25") core plug opening on right side of engine.		
Volvo						
D9	PF151-007	PF152-007	1500	Replaces oval shaped plate on right side of engine.		
D12C Prior to Serial #250502	PF151-005	PF152-005	1500	Replaces oval shaped plate on right side of engine.	YES	
D12C After Serial #250502	PF121-002	PF122-002	1250	Replaces oval shaped plate on right side of engine.	YES	
TD60, TD61, TD70, TD71, TD100, TD101, VE10, TD120, TD121	VT6-101	VT6-102	1000	Mounts into threaded opening on left side of engine.		
Yanmar						
3T72HLE 4TN82E D4T YYDXL4.41	TF401-001	NONE	400	1" NPT No replacement cord available.		

NOTE: The only replacement part for in-block heaters is the power cord. Please see the power cord section on page 48 for the proper replacement cord set.

For thermostat control of in-block heaters, see page 48. The energy saver Thermocord is available in various temperature ranges.

Supplemental heat for engines using in-block heaters can be achieved by the installation of lube-oil heaters in the oil pan. Reference pages 20 and 21 of this catalog or consult factory.

Instructions for:
In-block heaters
Please refer to specific instructions that accompany heater.

THREADED PLUG TYPE HEATERS



A. Drain the cooling system.

B. Remove the recommended core plug. (See instructions with heater)

C. Apply teflon tape to pipe threads or grease to O-ring.

D. Thread heater into engine.

Please follow these steps to ensure proper operation of your HOTSTART in-block heater.

1. Align cord with pins on the heater and press the cord into the heater. Place clamp around cord & heater. DO NOT PLUG IN HEATER YET!
2. Route the cord, keeping away from hot or moving surfaces.
3. Re-fill the cooling system. Run engine until engine thermostat opens and continue running for another 20 minutes to eliminate air.
4. Stop engine and let cool. Check for leaks. Check coolant level.
5. Plug heater into power supply and test for proper operation. Block should feel warm near heater.

PLATE TYPE HEATERS



A. Drain the cooling system.

B. Remove the recommended plate. (See instructions with heater)

C. Clean the gasket area.

D. Apply gasket sealant to plate and engine surfaces.

E. Insert heater into engine. Tighten bolts.

Please follow these steps to ensure proper operation of your HOTSTART in-block heater.

1. Align cord with pins on the heater and press the cord into the heater. Place clamp around cord & heater. DO NOT PLUG IN HEATER YET!
2. Route the cord, keeping away from hot or moving surfaces.
3. Re-fill the cooling system. Run engine until engine thermostat opens and continue running for another 20 minutes to eliminate air.
4. Stop engine and let cool. Check for leaks. Check coolant level.
5. Plug heater into power supply and test for proper operation. Block should feel warm near heater.

FREEZE (CORE) PLUG TYPE HEATERS



A. Drain the cooling system.

B. Remove the recommended core plug. (See instructions with heater)

C. Clean, smooth and dry core plug opening.

D. If retaining ring style, apply a light coat of grease to the O-ring and core plug opening. If press-in style, apply a light coat of high-temperature, high-strength retaining compound (Loctite 640 recommended).

E. Insert heater into engine and position properly. Push the heater into the engine by hand, then tap in using a suitable tool until flange is even with engine block.

Please follow these steps to ensure proper operation of your HOTSTART in-block heater.

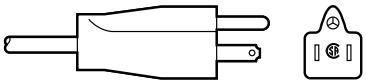
1. Align cord with pins on the heater and press the cord into the heater. Place clamp around cord & heater. DO NOT PLUG IN HEATER YET!
2. Route the cord, keeping away from hot or moving surfaces.
3. Re-fill the cooling system. Run engine until engine thermostat opens and continue running for another 20 minutes to eliminate air.
4. Stop engine and let cool. Check for leaks. Check coolant level.
5. Plug heater into power supply and test for proper operation. Block should feel warm near heater.

Replacement Cords & Thermostats

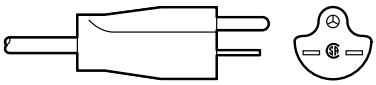
For use with In-block Heaters

Cord Length	Plug Style	120 Volt	240 Volt
6′ 1.8m	1	IM6-1IN	IM6-2IN
11′ 3.4m	1	IM11-1IN	IM11-2IN
16′ 4.8m	1	IM16-1IN	IM16-2IN
Cord Length	**Plug Style**	**120 Volt**	**240 Volt**
6′ 1.8m	2	11PR72T	21PR72T
11′ 3.4m	2	11PR132T	21PR132T
16′ 4.8m	2	11PR192T	21PR192T

STYLE 1



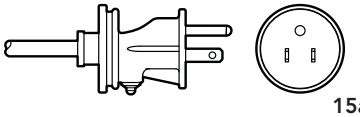
15amp, 120V



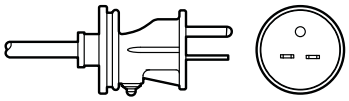
15amp, 240V

Fits most competitor's applications.

STYLE 2



15amp, 120V



15amp, 240V

Heat Shield

HS1



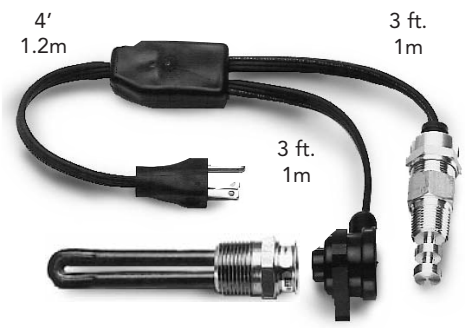
Use when exhaust manifold or turbo come close to heater termination.



NOTE: When ordering in-block heater **and** thermocord, place suffix **–WOC** (which stands for **without cord**) after the heater model number to save cost as the standard 6′ (1.8m) heater cord is replaced by the Thermocord harness.

Thermocord for In-block Heaters

Part No.	Volts	Thread Size	Temp Range
A-2822-ØB	120	0.5"	100-120°F (38-49C)
A-2822-ØC	120	0.5"	120-140°F (49-60C)
A-2822-ØH	240	0.5"	100-120°F (38-49C)
A-2822-ØI	240	0.5"	120-140°F (49-60C)
A-2822-ØM	120	0.5"	80-100°F (27-38C)
A-2822-ØP	240	0.5"	80-100°F (27-38C)



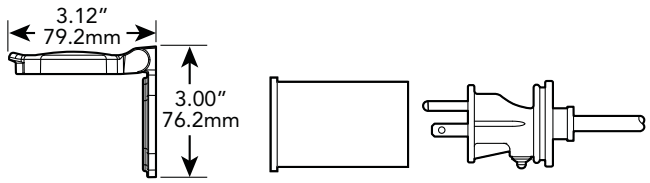
Heater shown for illustration purposes only.

Flush Mount Kits for In-block Heaters

Model Number 120 Volt	Model Number 240 Volt	Cord Length	Plug Style
IM6-1IN-FM	IM6-2IN-FM	6′ (1.8m)	2
IM11-1IN-FM	IM11-2IN-FM	11′ (3.4m)	2
IM16-1IN-FM	IM16-2IN-FM	16′ (4.8m)	2

Kits include: 11PR- style cord (shown on page 48), recessed male receptacle and hinged flip cover.



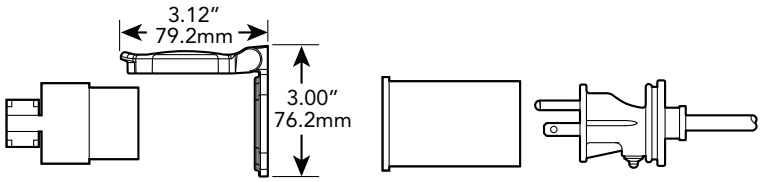


Flush Mount Kits for Thermosiphon Engine Heaters

Model Number	Volts	Amps	For Heater with Wattage of:
FM15120	120	15	500 to 1800
FM15240	240	15	500 to 3000
FM20120	120	20	2000 to 2250

Kits include: Recessed male receptacle with 6′ (1.8m) cord (no female connectors), hinged flip cover and female connector.

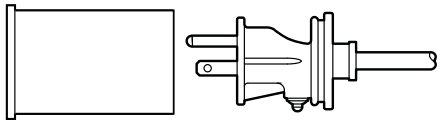




Other Accessories

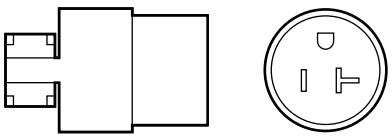
Recessed Male Receptacle – with 6′ (1.8m) cord (no female connectors)

Model Number	Volts	Amps
RM5-15	120	15
RM6-15	240	15
RM5-2Ø	120	20
RM6-2Ø	240	20



Female Connector - for extension cords

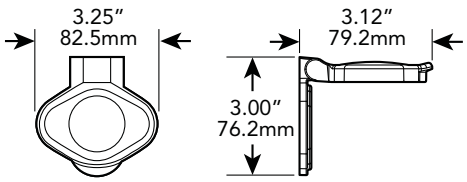
Model Number	Volts	Amps
FM1G2ØA	120	15/20
FM2G2ØA	240	15/20



Hinged Cover

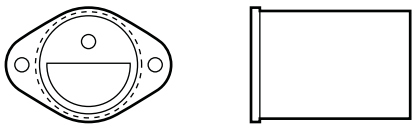
Model Number	Description
*FC-KH	Black/Kim Logo
FC-KH-C	Chrome/Kim Logo

*Standard with kit



Plug Housing

Model Number
A-2223-PH



Specifying an Engine Heater

1. Determine the best type of heater to be used for the application.
   - In-block or Thermosiphon Engine Heater?
   - Weathertight model for all indoor or outdoor applications (hospital, communications building, shopping mall, pump station, off-road equipment).
   - Hazardous Location model (off-shore platform, oil rig, gas compression station).

2. Determine engine size.
   - Cubic inch or litre displacement.

3. Determine wattage required by using this general formula:
   - 3 watts x cubic inch displacement = watts required.
     Example: Engine is 855 C.I.D. — 855 x 3 = 2565. Requirement is 2500 watt heater.
   - This formula is a very good rule of thumb to use down to 0°F (-18 °C) ambient temperature. This formula will generally hold engine temperature at approximately 100°F (38 °C) above ambient.
   - Engines over 1250 CID (20L) and "V" engines require forced circulation preheatering systems (CTM, CSM models — see pages 4-5).

4. Now that you have the required wattage, you need to determine:
   - Voltage available that will power the heater (120, 208, 277, 240, 380, 480).
   - Is the power source Single Phase or Three Phase?

5. For thermostat selection, determine the desired engine temperature to be maintained.
   - 100°F (38 °C) to 120°F (49 °C) applies 95% of the time. However, specifications vary with respect to the user and a higher or lower range may be required.

You now have the specifications needed to select the required engine preheater from the many products listed in this catalog. For other technical information and installation tips, see pages 18 and 47. If you have other questions or need additional assistance, please contact our customer service department.

Conversion Factors

Litres x 1.0567 = Quarts
Quarts x 0.94635 = Litres
Litres x 0.26417 = Gallons
Gallons x 3.7854 = Litres

Cubic Inches - Litres Conversion Chart

Cubic Inches	Litres	Cubic Inches	Litres	Cubic Inches	Litres
150	2.46	1600	26.22	3050	49.98
200	3.28	1650	27.04	3100	50.80
250	4.10	1700	27.86	3150	51.62
300	4.92	1750	28.68	3200	52.44
350	5.74	1800	29.50	3250	53.26
400	6.55	1850	30.32	3300	54.08
450	7.37	1900	31.13	3350	54.90
500	8.19	1950	31.95	3400	55.71
550	9.01	2000	32.77	3450	56.53
600	9.83	2050	33.59	3500	57.35
650	10.65	2100	34.41	3550	58.17
700	11.47	2150	35.23	3600	58.99
750	12.29	2200	36.05	3650	59.81
800	13.11	2250	36.87	3700	60.63
850	13.93	2300	37.69	3750	61.45
900	14.75	2350	38.51	3800	62.27
950	15.57	2400	39.33	3850	63.09
1000	16.39	2450	40.15	3900	63.91
1050	17.21	2500	40.97	3950	64.73
1100	18.03	2550	41.79	4000	65.55
1150	18.84	2600	42.61	4050	66.37
1200	19.66	2650	43.42	4100	67.19
1250	20.48	2700	44.24	4150	68.00
1300	21.30	2750	45.06	4200	68.82
1350	22.12	2800	45.88	4250	69.64
1400	22.94	2850	46.70	4300	70.46
1450	23.76	2900	47.52	4350	71.28
1500	24.58	2950	48.34	4400	72.10
1550	25.40	3000	49.16	4450	72.92

Cubic Inches x 0.01639 = Liters
Liters x 61.024 = Cubic Inches

Temperature

Fahrenheit	Celsius
-40° F	-40° C
-30° F	-34° C
-20° F	-29° C
-10° F	-23° C
0° F	-18° C
10° F	-12° C
20° F	- 7° C
30° F	- 1° C
40°F	4.5°C
50°F	10.0°C
60°F	15.5°C
70°F	21.0°C
80°F	27.0°C
90°F	32.0°C
100°F	38.0°C
110°F	43.0°C
120°F	49.0°C
130°F	54.0°C
140°F	60.0°C
150°F	65.5°C
160°F	71.0°C
170°F	77.0°C
180°F	82.0°C
190°F	88.0°C
200°F	93.0°C
210°F	99.0°C

C x 1.8 + 32 = °F
(F - 32) x 0.55 = °C

Forced Circulation Heating Systems

HOTSTART forced circulation preheating systems are ideal for engines ranging in size from 10L to the largest displacement currently in production. These systems are designed specifically for installation on a generator, compressor package, marine engine or locomotive. HOTSTART offers forced circulation heating systems for coolant heating, lube oil heating and diesel fuel heating. Combination systems are also available that heat and circulate coolant and oil in one pre-assembled unit. Complete with all necessary components and controls, these automated systems are available in various wattage, voltage and phase combinations to accommodate most large industrial preheating needs.

For additional information regarding HOTSTART's forced circulation heating systems, please visit www.hotstart.com or contact HOTSTART and have all your questions answered by one of our engine heating product specialists.

CMM/CLM Models



Coolant-only Heating Systems

Voltage Range: 230-690V
Heat Power: 6 - 144kW

CLA/CLE Models



Coolant heating systems are designed to heat and circulate coolant throughout the engine's cooling system to efficiently maintain an engine at optimum starting temperatures. Maintaining jacket water temperatures ensures easy starting, reduces harmful emissions at start-up and allows engines to go to full power without needless idling.

OSM Model



Oil-only Heating Systems

Voltage Range: 120-690V
Heat Power: 1 - 12kW

OLA/OLE Models



Oil heating systems provide uniform heating to the oil throughout the engine oil sump and external piping, enhancing engine or compressor availability and decreasing wear and tear from cold startups.

Coolant and Oil Heating Systems
OCLA/OCLE Models



Voltage Range: 230V, 400V
Heat Power: Oil - 2.5-12kW
Heat Power: Coolant - 6-36kW

Auxiliary Power Unit for Locomotive Engines



The HOTSTART APU allows an idling locomotive to be shutdown in cold weather at any location. This self-contained system runs off the locomotive's fuel supply and will maintain water temperature at 100°F (38°C) above ambient.