Heating Products
General Information and Sizing

General Information
Heating products protect electronic and electrical components from temperature problems that are below acceptable tolerances. There are obvious circumstances when extremely low ambient (outside cabinet) temperatures would require a heater, but there are also less apparent times that a heater should be considered. For example, a system may run all day having its components generate heat, but once the system shuts down for the night, the quick drop in temperature could cause condensation and possibly corrosion - a heater could maintain a safe, constant temperature.

Combined Cooling and Heating
Some components today are sensitive enough that both cooling and heating could be required in the same enclosure. When designing your system, be aware of the need to maintain a relatively constant temperature inside the enclosure as ambient temperatures swing from cool to very hot. Hammond thermostats (one for heaters and one for cooling products) can control both systems automatically.

Heater Sizing Information

P_H = Total power required for this application (W)
P_V = Existing power from components (W)
DT = Temperature differential (Kelvin) ambient to cabinet interior (1°Kelvin = 1°C = 1.8°F)
A = Free-standing cabinet surface area (ft^2)
k = Heat transmission coefficient (W/ft^2 K) convection in quiet air:

Painted steel	approx.	0.51 W/ft^2 K
Aluminum	approx.	1.115 W/ft^2 K
Plastic	approx.	0.325 W/ft^2
Stainless Steel	approx.	.344 W/ft^2

Formula
P_H = (DT x k x A) - P_V
If enclosure located **outside**, use **x2** (DT x k x A)

Sample with solution:
DT = 10K
k = Painted steel = 0.51 W/ft^2
A = 50 ft^2
P_V = 45 W
P_H = (10 x 0.51 x 45) - 50
= 229.5 - 50
= 179.5 W

Recommend: FLHTF200A115

Fan Heater with Thermostat
- Designed to prevent condensation or maintain minimum temperature in enclosures.
- Built in Thermostat. (-18 C to +38 C) (0 F to +100 F)
- Fan Auto/On switch with pilot light for Heat On indication
- 20 CFM airflow
- High temperature safety protection
- Aluminum alloy outer casing
- Connection via terminal block.

Part No.	Watts	Voltage	Hz	Overall Dimensions Height x Width x Depth	Ship Wt. lbs
FLHTF125A115	125 W	120 V	60	5.5" x 4.0" x 5.3"	2.2
FLHTF125A230	105/125 W	220/240 V	50/60	5.5" x 4.0" x 5.3"	2.2
FLHTF200A115	200 W	120 V	60	5.5" x 4.0" x 5.3"	2.2
FLHTF200A230	165/200 W	220/240 V	50/60	5.5" x 4.0" x 5.3"	2.2
FLHTF400A115	400 W	120 V	60	7.5" x 4.0" x 5.3"	3.0
FLHTF400A230	335/400 W	220/240 V	50/60	7.5" x 4.0" x 5.3"	3.0
FLHTF800A115	800 W	120 V	50	7.5" x 4.0" x 5.3"	3.0
FLHTF800A230	670/800 W	220/240 V	50/60	7.5" x 4.0" x 5.3"	3.0

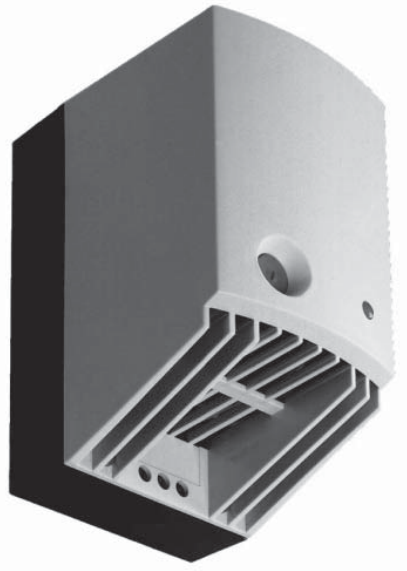
Technical references and CAD downloads available at www.hammondmfg.com
All dimensions in inches unless specified otherwise

Fan Heaters

- For use when larger heating capacities or internal forced air circulation is required.
- Designed to prevent condensation or maintain minimum temperature in enclosures.
- Thermostats are also available.

Part No.	Watts	Surface Temperature	Starting Current	Dimensions L x W x D	Ship Wt. lbs
SHGL04600	250 W	167°F	2.2 A	7.00 x 3.15 x 3.15	2
SHGL04601	400 W	167°F	3.5 A	9.76 x 3.15 x 3.15	3

Operating Voltage:	AC 110-120 V, 50/60 Hz
Circulation Power:	20 CFM Free Blowing
Axial Fan:	Ball bearing
Durability:	30,000 hrs. at 68°F ambient temperature
Heating Element:	Resistance heating element with temperature limiter
Heating Body:	Extruded aluminum, black anodized
Connection:	3 pole terminal for 12 AWG
Mounting:	Easily installed by clip mounting on 35 mm DIN rails (included)
Protection Class:	1 (tested for grounding at 1250 V)
Protection:	IP20
Approval:	UL Recognized Component, cUL Recognized Component, CE



High Wattage Fan Heater

- For large heating capacity requirements.
- Maintains minimum operating temperatures in enclosures.
- Helps prevent failures to components caused by condensation and corrosion.
- Built-in thermostat and control light.
- Heating power adjusts to ambient temperature.
- Heat exits top of fan heater. (add 2" clearance for heat sensitive parts)

Part No.	Watts	Inrush Current (Amps)	Volts	Temperature Maximum with Fan	Ship Wt. lbs
SCR027009	550 W	11 A	AC 120	250°F/120°C	2
SCR027009230	550 W	13 A	AC 230	250°F/120°C	2
SCR027019	650 W	12 A	AC 120	320°F/160°C	2.4

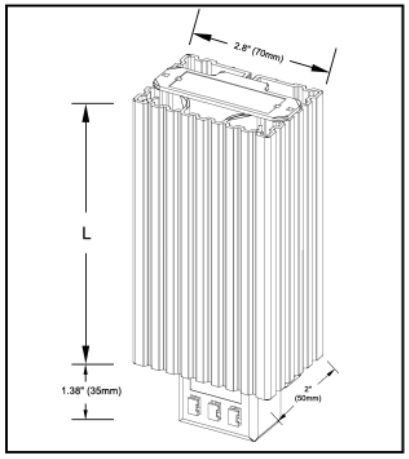
Air Flow:	20 CFM (550W), 26 CFM (650W)
Thermostat Range:	32 - 140 degrees Fahrenheit
Heating Element:	PTC - Semiconductor/resistor
Housing:	Plastic, rated UL94-VO
Connection:	3 pole terminal, AWG 14 max (2.5 mm^2)
Mounting:	Clip for 35mm DIN rail
Protection Class:	II (Double Insulated)
Protection Type:	IP20
Approval:	UL Recognized Component, cUL Recognized Component, CE

Technical references and CAD downloads available at www.hammondmfg.com

All dimensions in inches unless specified otherwise

Canada: 519.822.2960 or 905.456.3770 USA: 716.630.7030

Heating Products



Heaters

- Designed to provide enclosed electronic, pneumatic, hydraulic and mechanical equipment with protection from low temperatures, condensation and corrosion.
- The PTC (Positive Temperature Coefficient) heater unit maintains a stable temperature environment within enclosures, allowing critical components to perform with consistent reliability for longer periods.
- Heating power adjusts to ambient temperature
- Push connectors for quick and easy wiring

Part No.	Watts[1]	Max. Current[2]	L (in.)	Max Surface Temperature	Ship Wt lbs
SHG14000	15 W	1.5 A	2.56	131°F/55°C	1
SHG14001	30 W	3.0 A	2.56	131°F/55°C	1
SHG14003	45 W	3.5 A	2.56	121°F/105°C	1
SHG14005	60 W	2.5 A	5.51	121°F/105°C	1
SHG14006	75 W	4.0 A	5.51	148°F/120°C	1
SHG14007	100 W	4.5 A	5.51	266°F/130°C	2
SHG14008	150 W	8.0 A	8.46	302°F/150°C	2

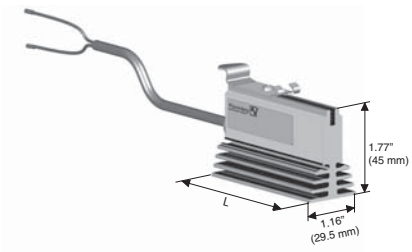
[1] At 68°F (20°C) ambient temperature. [2] Inrush current

Operating Voltage:	AC 110 - 250 V
Heating Element:	PTC resistor, self regulating
Heating Body:	Anodized extruded aluminum
Connection:	Push-type terminals for stranded and solid wire 3 x AWG 20 AWG 16 (0.5 - 1.5 mm²)
Mounting:	Easily installed by clip mounting on 35 mm DIN rails (included)
Protection Class:	I, test voltage 1600 V
Protection:	IP20
Approval:	UL Recognized Component, cUL Recognized Component, CE

Mini Radiant Heaters

- Designed for use in small enclosure housing or for heating of isolated spots in sensitive areas
- Heating power adjusts to ambient temperature
- Compact design

Part No.	Watts	Max. Current	L (in.)	Ship Wt lbs
SHGM1410	10	1	1.97	0.5
SHGM1420	20	1.1	2.95	0.5
SHGM1430	30	1.2	2.95	0.5



Operating Voltage:	110-250 AC 50/60 Hz
Heating Element:	Resistor, self regulating
Heating Body:	Aluminum, black anodised
Max surface temperature:	10w @ 203°F/95°C 20w @239°F/115°C 30w @284°F/140°C
Connection:	Connecting cable 11.8"
Mounting:	Din rail 35mm profile
Protection class:	IP20
Approval:	UL Recognized Component, cUL Recognized Componet, CE

Technical references and CAD downloads available at www.hammondmfg.com

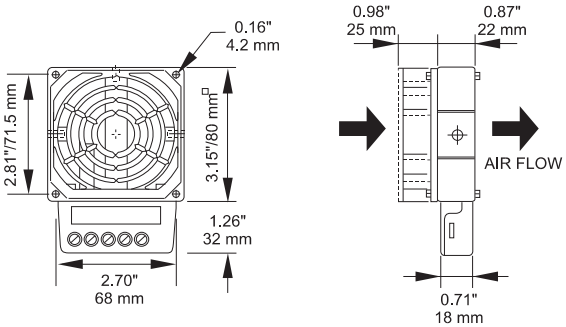
All dimensions in inches unless specified otherwise

Control Panel Heater

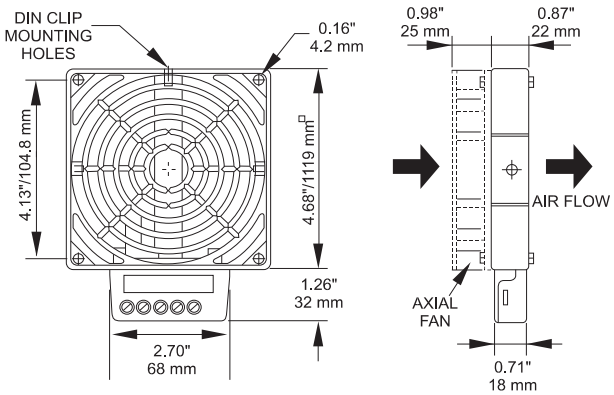
- When larger heating capacities or internal forced air circulation is required and space is limited.
- Compact design to prevent condensation or maintain minimum temperature in enclosures.
- Fan is included.
- Thermostats available

Part No.	Watts	Operating Current (Amps)	Volts	Temperature Maximum with Fan	Ship Wt. lbs
SHV031029	100 W	0.89	AC 120	250°F/120°C	1
SHV031039	150 W	1.30	AC 120	320°F/160°C	1
SHV031139	200 W	1.79	AC 120	250°F/120°C	2
SHV031149	300 W	2.62	AC 120	320°F/160°C	2
SHV031159	400 W	3.45	AC 120	360°F/180°C	2

Operating Voltage:	AC 110 -120 V 50/60 Hz
Air Flow:	20 CFM (100W, 150W heaters), 63 CFM (200W, 300W, 400W heaters)
Axial Fan:	Ball bearing
Durability:	50,000 hrs. at 77°F ambient temperature
Heating Element:	Cartridge heater
Heating Body:	Die cast aluminum
Connection:	5 pole terminal for 14 AWG (maximum)
G/L1/N1:	Heater
L2/N2:	Fan
Mounting:	Easily installed by clip mounting on 35 mm DIN rails (included)
Protection class:	1 (tested for grounding at 1500 V)
Protection:	IP20
Approval:	UL Recognized Component, cUL Recognized Component,CE



100 W, 150 W Heaters



200 W, 300 W, 400 W Heaters

Technical references and CAD downloads available at www.hammondmfg.com

All dimensions in inches unless specified otherwise