1000W Compact PTC Fan Heaters

Compact Fan Heater

Compact Fan Heater
w/Integrated Thermostat

Applications

These compact fan heaters are designed to prevent condensation and ensure an evenly distributed air temperature in enclosures. The plastic double insulated housing provides protection against contact with current-carrying components. This series is vailable with an optional fixed-point thermostat. These heaters were designed to accommodate DIN rail or panel mounting.

Features

- Compact design
- High heating performance
- Double insulated plastic housing
- Panel or DIN Rail Mount
- Optional integrated fixed thermostat

1000W Compact PTC Fan Heaters Specifications	
Heating Element	PTC resistor - temperature limiting
Overheat Protection	Built-in temperature limiter
Surface Temperature	Max. 176°F [80°C], except upper protective grill at 68°F [20°C] ambient temperature
Air Outlet Temperature	Max 257°F [125°C], 2in [50mm] above grill
Axial Fan, Ball Bearing	Service life 70,000h at 77°F [25°C]
Air Flow, Free Blowing	37 cfm [63 m³/h]
Connection	Male power insert connector according to IEC 320 C18
Housing	Plastic, UL 94V-0, black
Mounting	Clip for 35mm DIN rail, EN 60715 or M5 screws (not included) – tightening torque 2 N·m max.
Mounting Position	Air flow directed up
Recommended Mounting Distance	Sides: 0.79 in [20mm] Bottom/above: 3.94 in [100mm]
Operating / Storage Temperature	-40 to 140°F [-40 to 60°C] / -40 to 158°F [-40 to 70°C]
Protection Class	II (double insulated)
Protection Type	IP20
Approvals	CE, UL Recognized File No. E234324, RoHS 2 compliant

Notes: Connectors and cables for electrical connection are not included with the heater. Connection cables are available as accessories.

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page at www.AutomationDirect.com

1000W Compact PTC Fan Heaters

Part Number DIN Mount	Price	Part Number Panel Mount	Price	Heating Capacity[1]	Operating Voltage	Max. current (inrush)	Integrated Thermostat	Switch-Off Temp[2]	Switch-On Temp[2]	Weight (approx.)
032099-00	$209.00	**032099-01**	$209.00	1000W	100-120V AC 50/60 Hz	18.0 A	NO	–	–	16.5 oz [468g]
032090-00	$209.00	**032090-01**	$209.00		220-240V AC 50/60 Hz	12.0 A		–	–	
032029-00	$235.00	**032029-01**	$235.00		100-120V AC 50/60 Hz	18.0 A	YES	59°F [15°C]	41°F [5°C]	
032020-00	$235.00	**032020-01**	$235.00		220-240V AC 50/60 Hz	12.0 A		59°F [15°C]	41°F [5°C]	

Notes: [1] At 77°F [25°C] ambient temperature
[2] Tolerance of ±9°F [±5K]

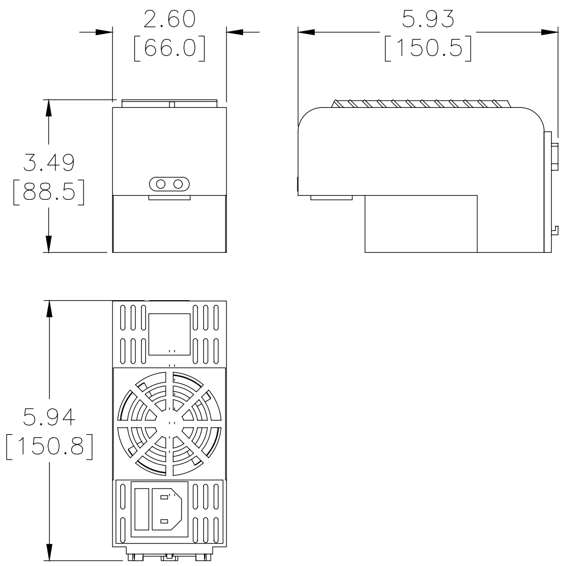
Retaining Clip

Accessories		
Part Number	**Description**	**Price**
244380	2m [6.5 ft] cable for 1000W PTC heater	$10.00
237009	Retaining clip for 244380	$2.25

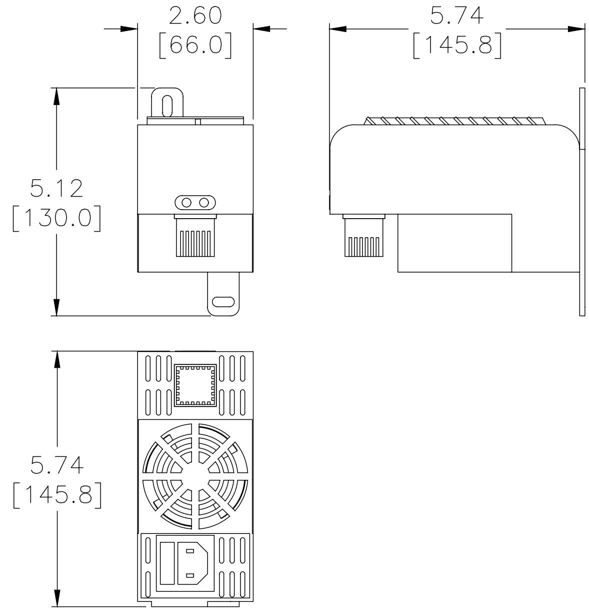
1000W Compact PTC Fan Heaters

Dimensions: Inches [mm]

Compact PTC Fan Heaters



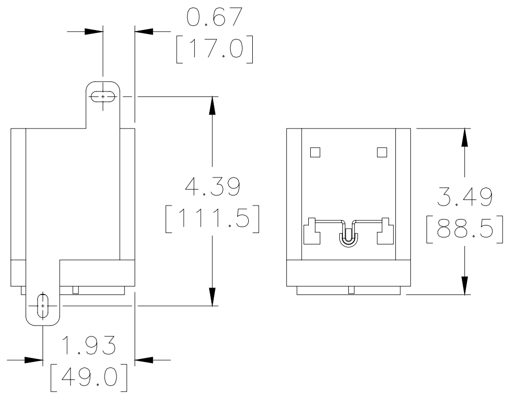
Fan Heaters with Integrated Thermostat



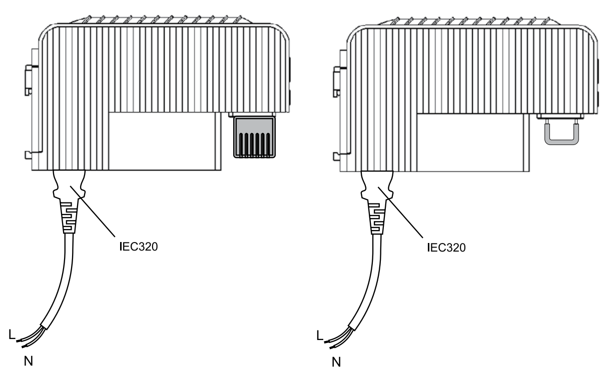
Please see our website www.AutomationDirect.com for complete engineering drawings.

View: back side

Panel Mount **DIN Rail Mount**



Wiring Diagram



Note: When wiring 230 volt units for North American installations "L" (line) and "N" (neutral) will be used as "L1" (line1) "L2" (line2) respectively with no neutral connection.

Enclosure Heating and Heater Selection

Why Heat an Enclosure?

Today's miniaturization of enclosure components results in high packing densities, which in turn results in higher temperatures within the enclosure. These high temperatures are harmful to electronic components. In response, cooling systems have become standard in many applications. However, just as critical and widely underestimated, are failures caused by the formation of moisture.

Under certain climatic conditions, moisture can build up not only in outdoor or poorly insulated enclosures, but also in highly protected and well-sealed enclosures.

Moisture and Failure

Moisture, especially when combined with aggressive gases and dust, causes atmospheric corrosion and can result in the failure of components such as circuit breakers, busbars, relays, integrated circuit boards and transformers. The greatest danger lies in conditions where electronic equipment is exposed to relatively high air humidity or extreme variations in temperature, such as day-and-night operation or outdoor installation. Failure of components in such cases is usually caused by changing contact resistances, flashovers, creepage currents or reduced insulation properties.

Eliminate Moisture

Moisture and corrosion will remain low if relative air humidity stays below 60%. However, relative humidity above 65% will significantly increase moisture and corrosion problems. This can be prevented by keeping the environment inside an enclosure at a temperature as little as 9°F (5°C) higher than that of the ambient air. Constant temperatures are a necessity to guarantee optimal operating conditions. Continuous temperature changes not only create condensation but they reduce the life expectancy of electronic components significantly. Electronic components can be protected by cooling during the day and heating at night.

Thermal Management

Modern enclosure heaters are designed to protect against condensation. They heat the air inside enclosures, preventing water vapor from condensing on components while providing the greatest possible air circulation and low energy consumption.

Other heating element technology improvements include:

- Longer operating life
- Greater energy efficiencies
- Quick wiring options
- Easier mounting
- Fan heaters should be considered for larger enclosures to ensure that the entire enclosure is heated uniformly

Heater Location

Ideally, most heaters will perform optimally when mounted near the bottom of an enclosure and used in conjunction with a control device, thermostat, and/or hygrostat. The control device may be a separate device, or it may be integral to the heater. With the controller located in an area of the cabinet that is representative of the average temperature or humidity requirement, the heater should then be placed in a position near the bottom of the enclosure. If a separate control device is used, the heater should not be located directly beneath the controller to ensure that the controller is not influenced by direct heat from the heater.

Heater Calculation

Follow Steps 1-5 to determine the heating requirement of an enclosure (US units - left column, metric - right)

STEP 1: Determine the Surface Area (A) of your enclosure which is exposed to open air.

Enclosure Dimensions:

height = ________feet ________meters

width = ________feet ________meters

depth = ________feet ________meters

Choose Mounting Option from next page, and calculate the surface area as indicated

A = ________ ft^2 or ________ m^2

STEP 2: Choose the Heat Transmission Coefficient (k) for your enclosure's material of construction.

painted steel =	0.511 W/(ft²•K)	5.5 W/(m²•K)
stainless steel =	0.344 W/(ft²•K)	3.7 W/(m²•K)
aluminum =	1.115 W/(ft²•K)	12 W/(m²•K)
plastic or insulated stainless =	0.325 W/(ft²•K)	3.5 W/(m²•K)

k = _______W/(ft²•K) or ________ W/(m²•K)

STEP 3: Determine the Temperature Differential (ΔT).

A. Desired enclosure interior temp. = ____°F ____°C

B. Lowest ambient (outside) temp. = ____°F ____°C

Subtract B from A = Temp. diff. (ΔT) = ____°F ____°C

For these calculations, ΔT must be in degrees Kelvin (K). Therefore, divide ΔT (°F) by 1.8. ΔT = ________ K

STEP 4: Determine Heating Power (P_V), if any (generated from existing components, i.e. transformer).

P_V = ________ W or ________ W

STEP 5: Calculate the Required Heating Power (P_H) for your enclosure based on the above values.

If enclosure is located inside:

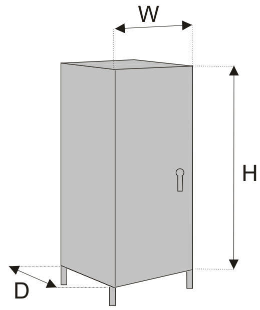
$P_H = (A \times k \times \Delta T) - P_V$ = __________ W

If enclosure is located outside:

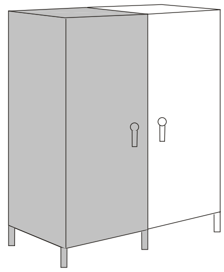
$P_H = 2 \times (A \times k \times \Delta T) - P_V$ = __________ W

Enclosure Mounting Types and Surface Area Calculations

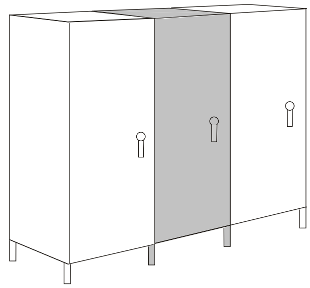
1. Free-Standing



**Area (A) = 1.8 (H x W)
+ 1.8 (H x D) + 1.8 (W x D)**

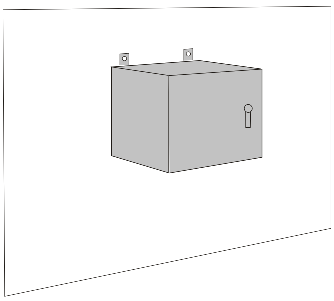


**Area (A) = 1.8 (H x W)
+ 1.4 (H x D) + 1.8 (W x D)**

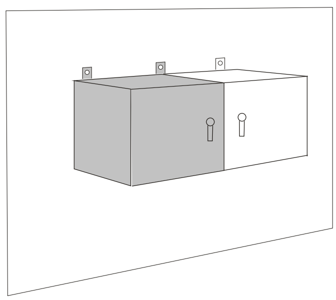


**Area (A) = 1.8 (H x W)
+ (H x D) + 1.8 (W x D)**

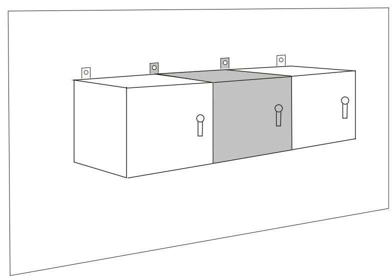
2. Wall-Mounted



**Area (A) = 1.4 (H x W)
+ 1.8 (H x D) + 1.8 (W x D)**

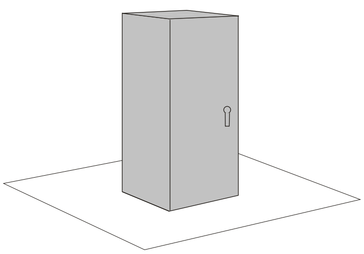


**Area (A) = 1.4 (H x W)
+ 1.4 (H x D) + 1.8 (W x D)**

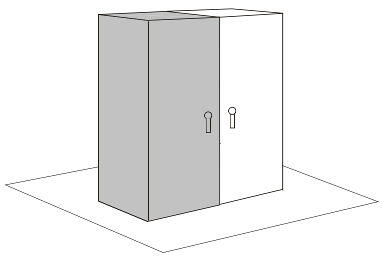


**Area (A) = 1.4 (H x W)
+ (H x D) + 1.8 (W x D)**

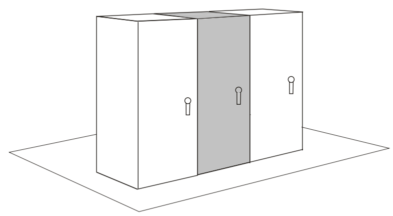
3. Ground



**Area (A) = 1.8 (H x W)
+ 1.8 (H x D) + 1.4 (W x D)**

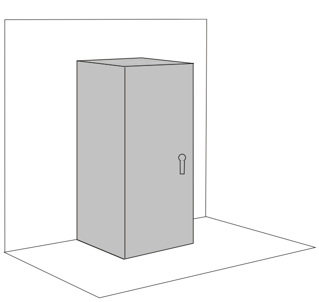


**Area (A) = 1.8 (H x W)
+ 1.4 (H x D) + 1.4 (W x D)**

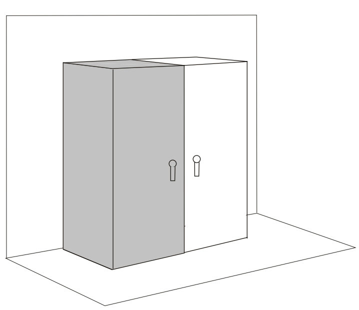


**Area (A) = 1.8 (H x W)
+ (H x D) + 1.4 (W x D)**

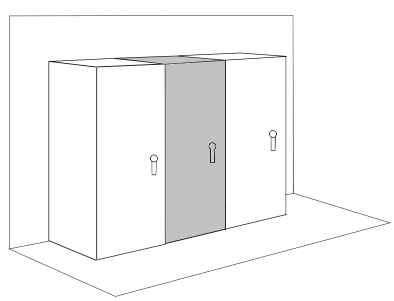
4. Ground and Wall



**Area (A) = 1.4 (H x W)
+ 1.8 (H x D) + 1.4 (W x D)**



**Area (A) = 1.4 (H x W)
+ 1.4 (H x D) + 1.4 (W x D)**



**Area (A) = 1.4 (H x W)
+ (H x D) + 1.4 (W x D)**