



Cartridge Heat Exchanger

A Heater in a Jacket for heat-on-demand.

A compact heater designed for corrosion resistance and easy maintenance.

Engineered to quickly and safely heat liquids, oils and gases, Heatron's heat exchanger provides faster, more efficient heat transfer.

This compact cartridge design provides higher watt density and dielectric strength compared to tubular versions. Couple this with internal controls for exceptional thermal response, efficiency and precisely applied heat.

Agency Approvals

Heatron offers an extensive UL option list and builds to UL 60601/IEC-60601.

UL E91597 (UL 499)

CSA LR66355-1 (CSA-C22.2)

TUV* EN60335-1/A11 and EN61010-1A2

*This approval gives Heatron the option of CE marking.



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DESIGN GUIDE

Construction Options

Ports located and configured to customer fittings in any location and can be flared to ensure secure clamped connections

Ground wire can be internally connected in heater or a ground lug welded to the heat exchanger

Thermal wells with fittings for mounting thermocouples, thermistors, RTDs or other temperature controlling devices

Mounting pads for disc thermostats or other thermostats welded to the heat exchanger

Mounting brackets designed to customer specifications, including over-the-side design for non-pressurized systems

See Design Guide on back page for common options

Performance Options:

Low leakage current

Dual voltage

Ground wires

Three phase power

Internal thermocouple

Over temperature control

Electropolish or passivation

Special marks

APPLICATIONS

Oil and Gas

Oil heaters

Engine pre-heating

Medical and Life Science

Fluid warming

Laboratory equipment

Industrial

Water, chemical or oil immersion applications

Air and gas systems

Emergency generators



Construction Options

| Sheath | Lead Exit | Lead Wire | Outer Jacket | End Seal | Fittings |
|----------------------|-------------|---------------|----------------------|----------|----------------|
| 304 Stainless Steel | Straight | Fiberglass | SS Braid | Mica | Flange |
| 316L Stainless Steel | Right Angle | Silicone | SS Cable | Epoxy | UL Listed Plug |
| | Elbow | Teflon | Strain Relief Spring | Ceramic | |
| Incoloy | | Straight Pins | Silicone | Silicone | |
| | | | Fiberglass | Teflon | |

Lead Options: Crimped On, Swaged In
Insulation and heater materials available with UL, CSA or Mil Spec recognition.

Design Guide

| Nominal Diameter | Maximum Amps* | Maximum Volts | Maximum Watts** | | | | | Minimum Watts (120V)*** | | |
|------------------|---------------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------|--------|----|
| | | | 120V 1 Phase | 240V 1 Phase | 480V 1 Phase | 240V 3 Phase | 480V 3 Phase | Length | | |
| | | | | | | | | 1" | 1 1/2" | 2" |
| 1/4" | 4.4 | 240 | 525 | 1,050 | | | | 100 | 55 | 40 |
| 3/8" | 7.2 | 480 | 800 | 1,600 | | | | 65 | 35 | 25 |
| 1/2" | 9.7 | 480 | 1,160 | 2,320 | | | | 40 | 25 | 20 |
| 5/8" | 23.0 | 480 | 2,760 | 5,520 | 11,000 | | | 35 | 20 | 15 |
| 3/4" | 23.0 | 480 | 2,760 | 5,520 | 11,000 | 9,550 | 19,100 | 30 | 15 | 10 |

| Nominal Diameter | Maximum Amps* | Maximum Volts | Maximum Watts** | | Minimum Watts (220V)*** | | |
|------------------|---------------|---------------|-----------------|-------|-------------------------|---------|---------|
| | | | 220V | 380V | 25.4 mm | 38.1 mm | 50.8 mm |
| 8.0mm | 4.4 | 240 | 965 | | 340 | 185 | 135 |
| 10.0mm | 7.2 | 480 | 1,580 | | 220 | 120 | 85 |
| 12.5mm | 9.7 | 480 | 2,130 | | 135 | 85 | 70 |
| 16.0mm | 23.0 | 480 | 5,060 | 8,740 | 120 | 70 | 50 |
| 20.0mm | 23.0 | 480 | 5,060 | 8,740 | 100 | 50 | 35 |

* Data determined by current capability or internal parts and lead wire. Consult Heatron for higher AMPS.

** Higher wattages available with design additions. Consult Heatron for higher wattage requirements.

*** Data based on space limits for resistance windings internal to the heater. For minimums at 240 volts, multiply listed wattage by 4. Consult Heatron for lower wattage requirements.

US Size Dimensions

| Diameter | | Length | |
|----------|--------|---------|----------|
| Nominal | Actual | Minimum | Maximum* |
| | Inches | Inches | Inches |
| 1/4" | .245 | 7/8 | 36 |
| 3/8" | .371 | 7/8 | 48 |
| 1/2" | .495 | 7/8 | 60 |
| 5/8" | .621 | 1.0 | 72 |
| 3/4" | .745 | 1.0 | 72 |

* Recommended maximum length; longer lengths available.

Metric Size Dimensions

| Diameter | | Length | |
|----------|--------|---------|----------|
| Nominal | Actual | Minimum | Maximum* |
| | mm | mm | mm |
| 8.0mm | 6.2 | 22.2 | 915 |
| 10.0mm | 9.42 | 22.2 | 1,220 |
| 12.5mm | 12.57 | 22.2 | 1,520 |
| 16.0mm | 15.77 | 25.4 | 1,830 |
| 20.0mm | 18.92 | 25.4 | 1,830 |

US Size Tolerances

| | |
|-------------------|----------------------------------------------------------------------------------|
| Diameter* | ± 0.003 inches |
| Length* | ± 3% |
| Camber | ≤ 6 Inches in length: 0.006 inches > 6 inches in length: 0.02 inches per foot |
| Wattage | +5%, -10% per NEMA Standard |
| Resistance | +10%, -5% per NEMA Standard |
| No Heat | 1/4 inches on disc end Minimum 1/4 inches on lead end |

Metric Size Tolerances

| | |
|-------------------|------------------------------------------------------------|
| Diameter* | ± 0.07 mm |
| Length* | ± 3% |
| Camber | ≤ 150mm length: 0.16mm > 150mm length: 0.25mm per 300mm |
| Wattage | +5%, -10% per NEMA Standard |
| Resistance | +10%, -5% per NEMA Standard |
| No Heat | 6 mm on disc end Minimum 6 mm on lead end |

* Tighter tolerances available.