CAST-X 1000
Circulation Heater

With optional built-in controls, CAST-X 1000 is a straightforward solution, perfect for OEMs and end users.

Designed and manufactured by Cast Aluminum Solutions (CAS), CAST-X Circulation Heaters are engineered using the latest thermal modeling and finite element analysis technology. CAST-X heaters feature low-watt-density heating elements cast into aluminum bodies which also contain the helical-coiled stainless steel flowpath tubes.

The media is sequestered in these tubes, never touching the heating elements: a critical safety benefit, especially when heating explosive or sensitive media. All CAST-X units are capable of heating liquids and gases alike.

CAST-X heaters are self-draining, for safety and cleanliness. With compact, non-welded bodies, plus NEMA & ATEX enclosures, CAST-X units are small-footprint, high-output heaters that meet the needs of high-purity processes, flammable operations, and your most critical heating applications.

SPECIFICATIONS:

- Power:
  - 700 W Total to 3 kW Total
  - Voltage Range: 120 - 480 V
  - Max Line Current: 15 A
- Tubing:
  - .313” OD (5/16") (7.9 mm)
  - .020” Wall (.5 mm)
  - Overall Process Tube Length: 137” (3480 mm)
  - 316L Stainless Steel (standard)
  - Inconel (optional upgrade)
  - Passivated or Electro-Polished (optional upgrades)
- Max Pressure: 2100 psi (144 bar)
- Enclosures:
  - NEMA 1 (general-purpose/dust-proof)
  - NEMA 4 (moisture-resistant)
- Max Working Temperatures:
  - No Enclosure: 662°F (350°C)
  - NEMA 1 (dust-proof/general-purpose): 608°F (320°C)
    with thermostat: 250°F (121°C)
  - NEMA 4 (moisture-resistant): 482°F (250°C)
    with thermostat: 250°F (121°C)

Published temperatures are for housing at 12 o’clock position; higher temps may be possible at 6 o’clock position. See factory for details.

- Sensors:
  - K or J Type Thermocouples Standard
  - Snap-Action High-Limit Thermostat
  - Process and High-Limit Thermocouples
- Available Accessories:
  - Insulating Jacket
  - Compression Fittings

APPLICATIONS:

- Engine Pre-Heating
- Solvent Heating
- Hydrogen Peroxide Vaporization
- Commercial Foodservice Machines
- Air, Co2 and Nitrogen Heating
- Coating & Resin Heating
- Steam Generation

FEATURES & BENEFITS:

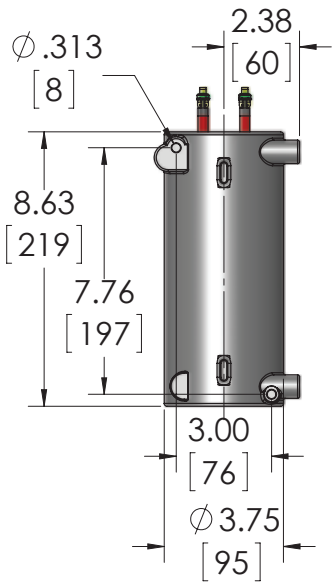
- SS 316L Fluid Path is Separate from Heating Elements
  (allows safe heating of sensitive materials and prevents contamination)
- Compact Footprint Saves Space in Equipment
- Self-Draining, Low-Maintenance Design
- Available With Thermostat, to Simplify Control Wiring
- Robust Cast-In Construction Insures Long Heater Life
- Minimal Leak Potential Due to Non-Welded Design
- Wide Application Compatibility (including high pressure)

CAS CAST ALUMINUM Solutions

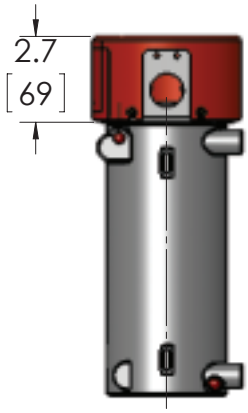
Tel: 630-879-2696 • Sales@CastAluminumSolutions.com • www.CastAluminumSolutions.com • 1310 Kingsland Drive • Batavia, Illinois 60510 USA

CAST-X 1000 Circulation Heater

NO ENCLOSURE

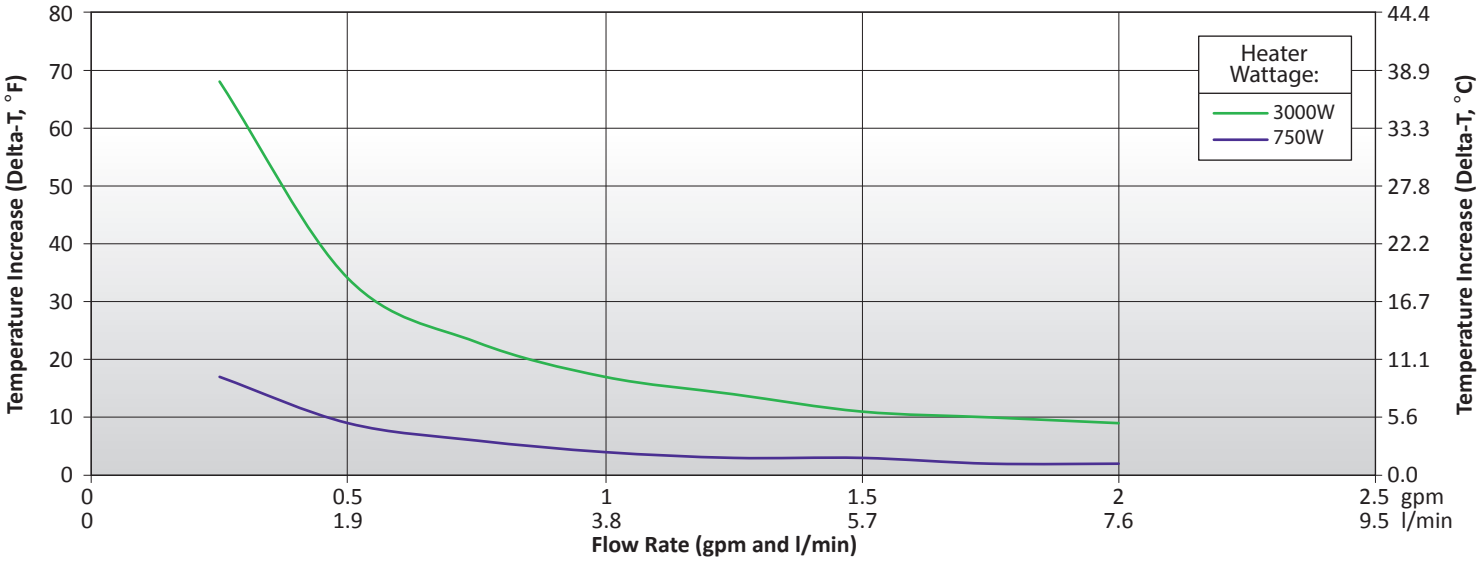


GENERAL-PURPOSE (NEMA 1) NO THERMOSTAT



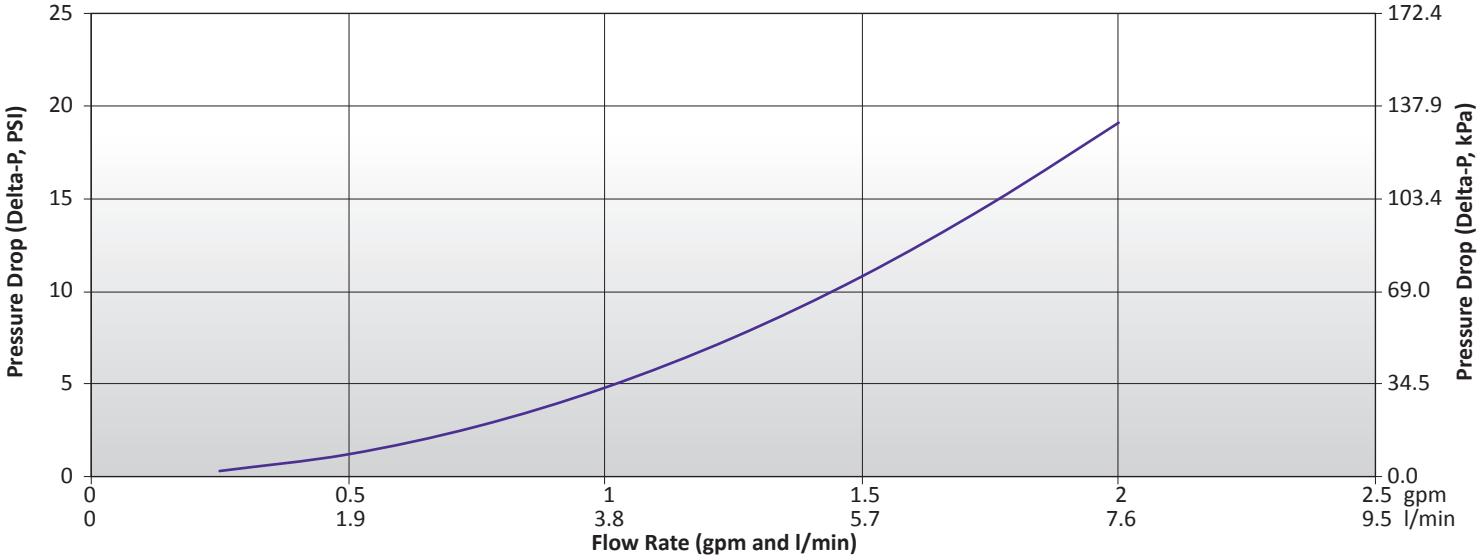
CAST-X 1000 Heating Profile: Delta-T Water

(Process Fluid = Water @ 42°F / 5.6°C Inlet Temp, Single Pass, 100% Power, Set Point 752°F / 400°C)

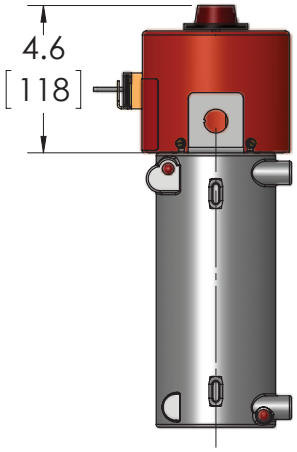


CAST-X 1000 Pressure Drop Profile: Delta-P Water

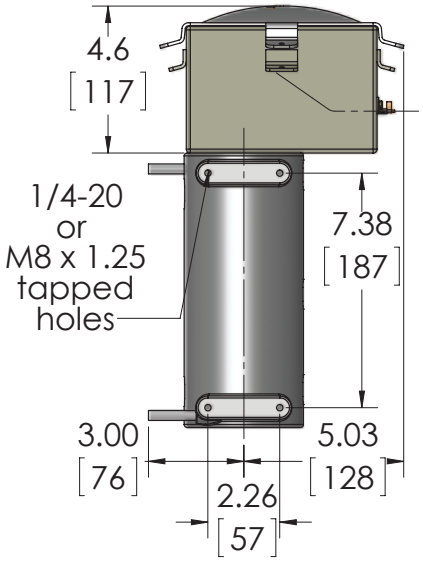
(Process Fluid = Water. Change in Pressure from Inlet to Outlet, Single Pass)



GENERAL-PURPOSE (NEMA 1) WITH THERMOSTAT

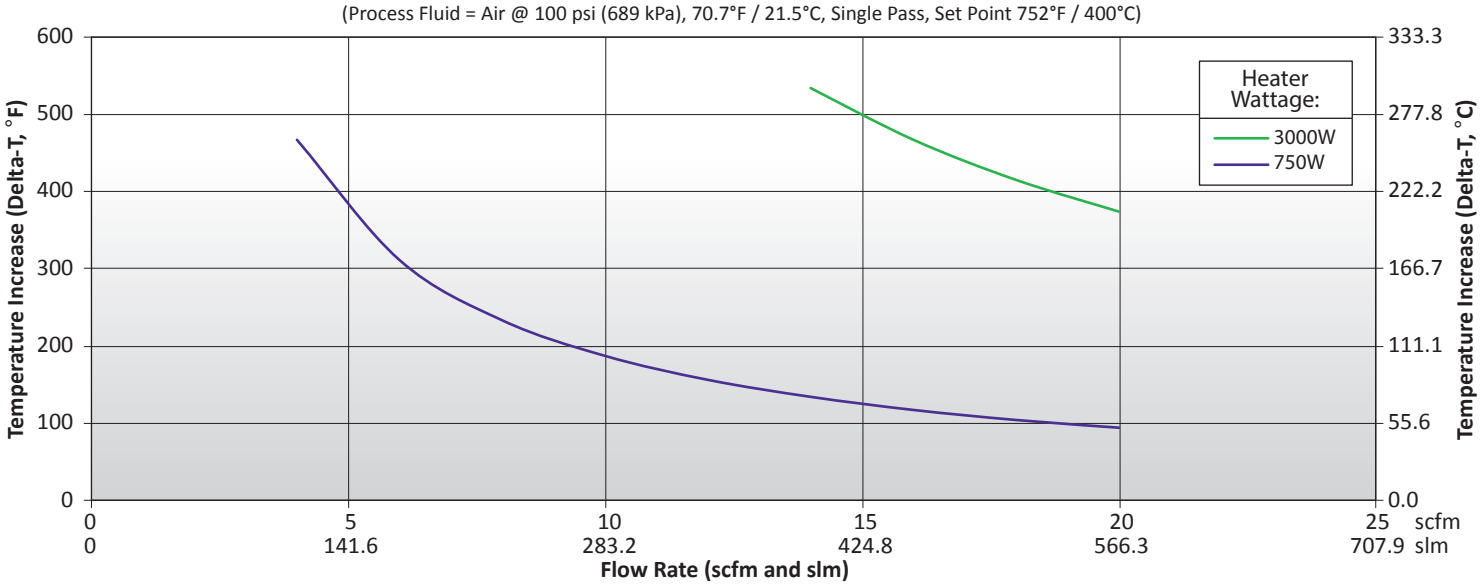


MOISTURE-RESISTANT (NEMA 4) WITH OR WITHOUT THERMOSTAT



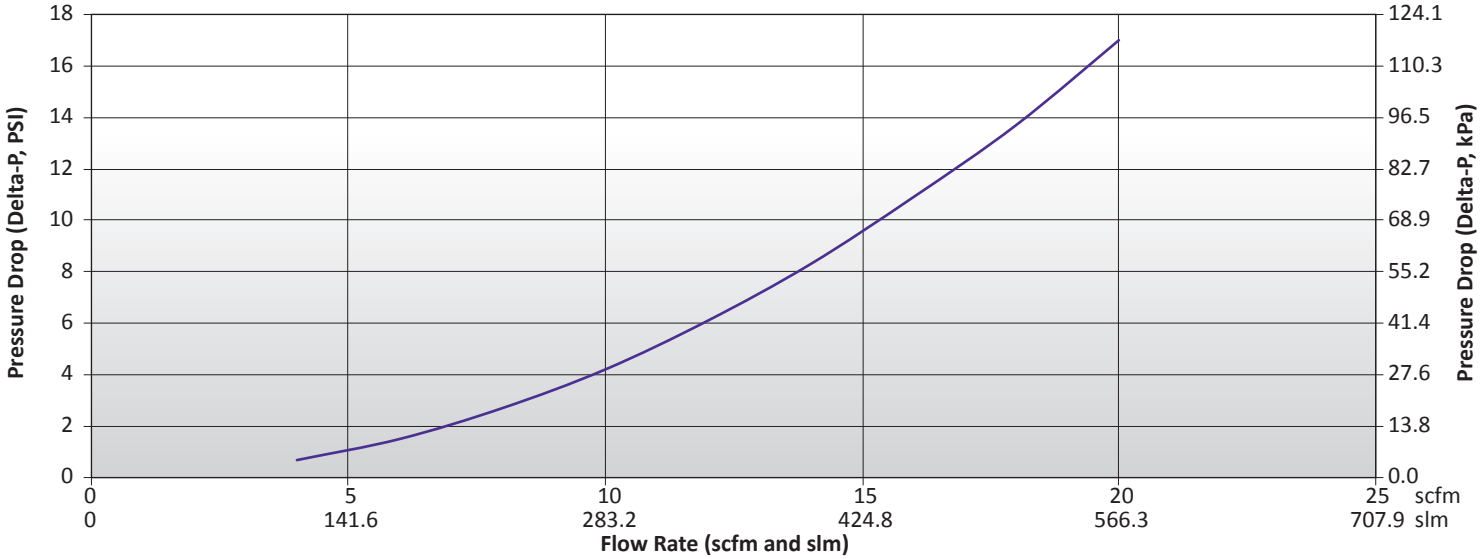
CAST-X 1000 Heating Profile: Delta-T Air

(Process Fluid = Air @ 100 psi (689 kPa), 70.7°F / 21.5°C, Single Pass, Set Point 752°F / 400°C)



CAST-X 1000 Heating Profile: Delta-P Air

(Process Fluid = Air @ 100 psi (689 kPa), 70.7°F / 21.5°C, Single Pass, Set Point 752°F / 400°C)



CAST-X 1000 Circulation Heater

Engineering Expertise • Speed to Market • Operational Excellence

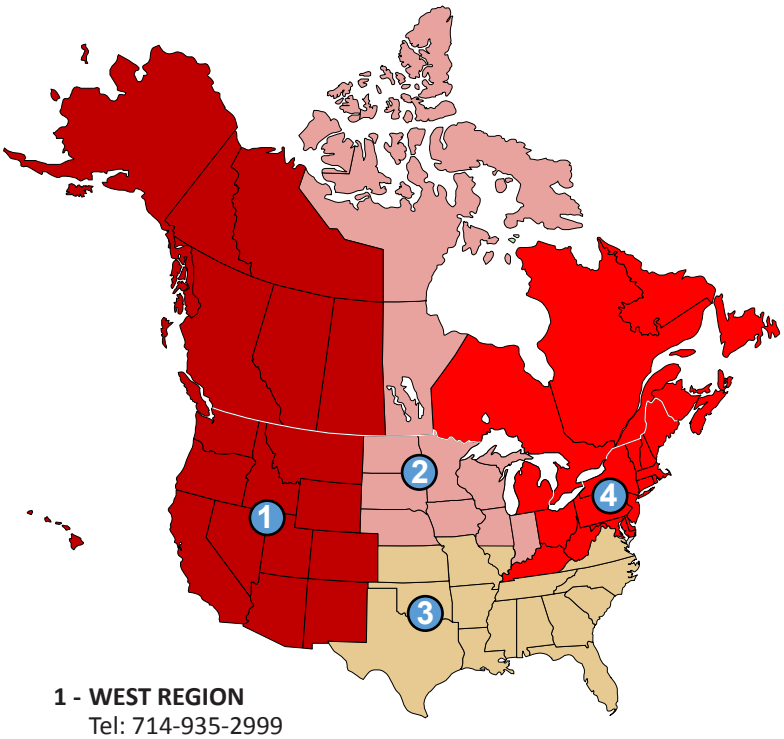
Cast Aluminum Solutions (CAS) manufactures the CAST-X line of circulation heaters, plus a broad range of heating, cooling, and non-thermal components. We are relied upon by OEMs and end-users alike throughout the semiconductor, medical device, aerospace, industrial gas, fluid-handling, food equipment, and energy markets.

Our multi-discipline team of engineers and technicians works closely with customers to develop practical solutions to complex process challenges. We utilize industry standard applications such as Finite Element Analysis (FEA), SolidWorks® 3-D CAD technology, and a range of structural analysis & thermal modeling tools.

CAS is an ISO 9001 Certified company with a fully-equipped R&D facility. Testing capabilities include X-Ray, ultrasound, helium leak, and infra-red technology, plus the latest coordinate measuring machines (CMM). Our in-house casting facility utilizes a permanent mold low-pressure casting process which reliably produces low-porosity, high-quality aluminum products. We offer an array of precision CNC machining options, finishing options such as electroless nickel plating, Teflon® coatings, clear-coat and hard-coat anodizing, plus high-value-added testing and inspection services.

Headquartered in Batavia, Illinois (just outside Chicago) we serve customers worldwide.
See the below map to locate a Sales Engineer, or contact CAS directly. We look forward to working with you.

With offices worldwide, the CAS Team of knowledgeable and experienced representatives is ready to assist with your project.



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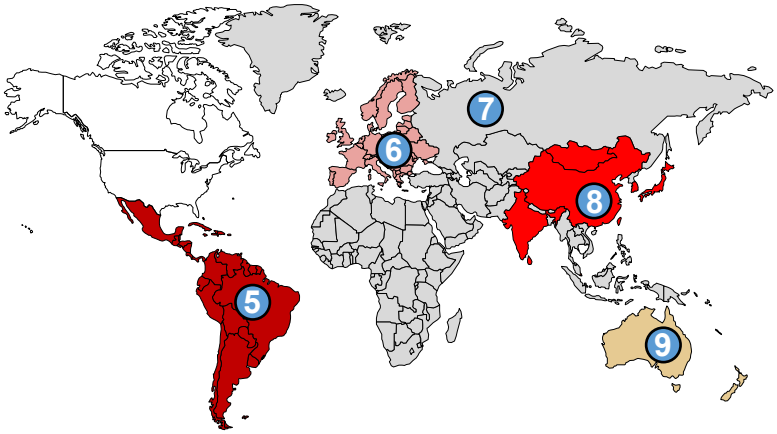
2 - MIDWEST REGION
Chicago Tel: 847-458-1500
Minneapolis Tel: 952-892-9222

3 - SOUTH REGION
Tel: 678-951-8120

4 - NORTHEAST REGION
Tel: 513-398-5500

ENERGY PROCESS DIVISION
Tel: 866-948-1708

SEMICONDUCTOR DIVISION
Tel: 408-754-3370



5 - MEXICO, CENTRAL and SOUTH AMERICA
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United Kingdom
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Korea
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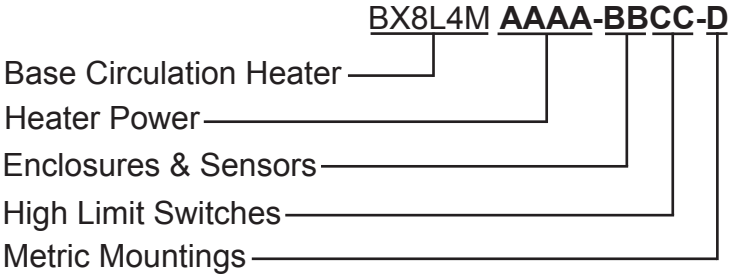


Building a CAST-X 1000 Part Number

Use the graphs below to build your CAST-X 1000. Assigning numbers for sections AAAA, BB and CC.

If you need metric mountings, assign "M" to section D. If metric mounts are not required, leave section D blank.

For assistance, contact CAS directly.

VOLTAGE, POWER, CIRCUIT TYPE				
Volts refers to line volts (V_L). Amps refers to line current (I_L).				
Section "AAAA"	**Volts (V)**	**Watts (W)**	**Circuit Type** (all are single circuit)	**Amps (A)**
200A	240	3000	SINGLE PHASE	12.5
200D	240	750	SINGLE PHASE	3.1
200B	480	3000	SINGLE PHASE	6.3
200C	120	750	SINGLE PHASE	6.3

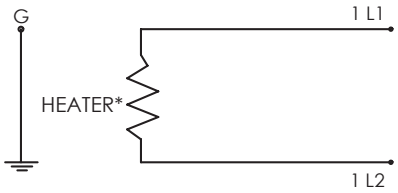
ENCLOSURES AND SENSORS			
All thermocouples are ungrounded, for optimal performance			
Section "BB"	**Description**	**Thermocouple Qty.**	**Enclosure**
00	NO SENSOR	0	NO ENCLOSURE
S2	30 TO 250°F (-1 TO 121°C) SINGLE POLE THERMOSTAT	1	NEMA 1
SJ	J-TYPE THERMOCOUPLE IN THERMOWELL	1	NEMA 1
SK	K-TYPE THERMOCOUPLE IN THERMOWELL	1	NEMA 1
W0	NO SENSOR	0	NEMA 4
W2	30 TO 250°F (-1 TO 121°C) SINGLE POLE THERMOSTAT	1	NEMA 4
WJ	J-TYPE THERMOCOUPLE IN THERMOWELL	1	NEMA 4
WK	K-TYPE THERMOCOUPLE IN THERMOWELL	1	NEMA 4

SNAP ACTION HIGH LIMITS SWITCHES	
Pilot duty only	
Section "CC"	**Switch**
00	NONE
01	MANUAL RESET, 260°F (127°C)

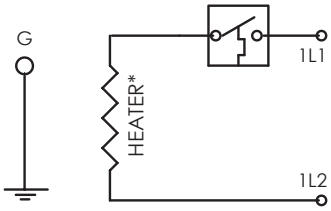
METRIC MOUNTING HOLES	
Place an "M" in section D if metric mounting holes are required.	
If standard Imperial mounting holes are desired, section D can be left blank	
Section "D"	**Metric Mounting Holes**
M	M8 X 1.25 METRIC TAPPED MOUNTING HOLES

CUSTOM DESIGNS & COMPONENTS	
CAS offers several options for special tubes, sensors, and finishes.	
For these options, please call a CAS Representative for a quote.	
Options	
INCONEL, MONEL OR HASTELLOY TUBES	RTDS (RESISTANCE TEMPERATURE DETECTORS)
ELECTRO-POLISHED OR PASSIVATED TUBES	SPECIAL HIGH-LIMIT SWITCHES
THICK WALL TUBES	NPT FITTINGS

ACCESSORIES	
These PNs are totally separate from the PNs for the heater	
Part Number	**Component**
274-55-6-4	COMPRESSION FITTINGS (HIGH PRESSURE) / PAIR (SHIPPED LOOSE)
307-0-2-1	INSULATION JACKET, MAXIMUM TEMPERATURE 400°F (204°C)
307-0-20-1	INSULATION JACKET, MAXIMUM TEMPERATURE 986°F (530°C)



SINGLE PHASE CIRCUIT



SINGLE PHASE CIRCUIT
WITH SWITCH

CAST-X 1000 Available Circuit Types

The CAST-X 1000 is manufactured with a single heating element, and is offered with or without a thermostat.

Refer to I&M Manual for further details on wiring of snap-action switches and thermostats (if applicable).

NO ENCLOSURE
OPTION

NEMA 1 ENCLOSURE
WITH THERMOSTAT

NEMA 4 ENCLOSURE, WITH
THERMOSTAT INSIDE ENCLOSURE

Need Help with Part Numbers or Engineering Calculations?

One of the key advantages of working with CAS is the accessibility of our team and ability to offer assistance. The CAS Team is ready and available to help you work through part number configurations, provide engineering advice, and ensure customers purchase the heater most appropriate for their particular application.

CAS Engineers are accustomed to working closely with customers to generate accurate calculations and models. We have a range of powerful tools at our disposal, including Finite Element Analysis (FEA) software, 3-D CAD applications, and infra-red thermal testing.

Our mission is developing solutions, from concept to reality. So feel free to contact the CAS Team directly:

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