

# CAST-X 2000

## Circulation Heater

CAST-X 2000 is a very versatile heater, with multiple housing, standoff, control and enclosure options.



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.

### APPLICATIONS:

- Compressor Condensate Evaporation
- Semiconductor Solvent Applications
- DI Water Heating
- Fuel and Oil Pre-Heating
- Nitrogen Gas Heating
- Two-Part Urethane and Foam Systems
- Anodizing / Plating Pre-Wash Applications



### SPECIFICATIONS:

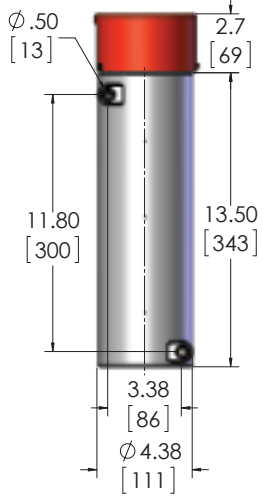
- Power:
    - 1 kW Total to 6 kW Total
    - Voltage Range: 120 - 480 V
    - Max Line Current: 25 A per circuit
  - Tubing:
    - .500" OD (1/2") (12.7 mm)
    - .065" Wall (1.7 mm)
    - Overall Process Tube Length: 150" (3810 mm)
    - 316L Stainless Steel (standard)
    - Inconel (optional upgrade)
    - Passivated or Electro-Polished (optional upgrades)
  - Max Pressure: 4300 psi (295 bar)
  - Enclosures:
    - NEMA 1 (general-purpose/dust-proof)\*
    - NEMA 4 (moisture-resistant)\*
    - NEMA 7 (explosion-proof)
    - Available with Standard or Standoff Design
  - Max Working Temperatures:
    - NEMA 1 (dust-proof/general-purpose): 482°F (250°C) with standoff: 662°F (350°C) with t-stat (w/ or w/o standoff: 250°F (121°C)
    - NEMA 4 (moisture-resistant): 350°F (175°C) with standoff: 662°F (350°C)
    - NEMA 7 (explosion-proof): 482°F (250°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

### FEATURES & BENEFITS:

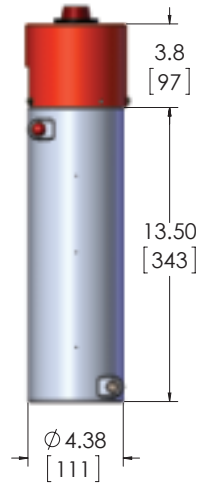
- SS 316L Fluid Path is Separate from Heating Elements (allows safe heating of sensitive materials and prevents contamination)
- Low Ownership Cost: Minimal Maintenance & Downtime
- Self-Draining & Non-Welded (reduces contamination)
- Food, Medical & Semiconductor Application Compatible
- Available with Cost-Effective Over-Temperature Protection
- Compatible with High Pressure Applications
- Standoff Housings Available (for higher temperatures)

# CAST-X 2000 Circulation Heater

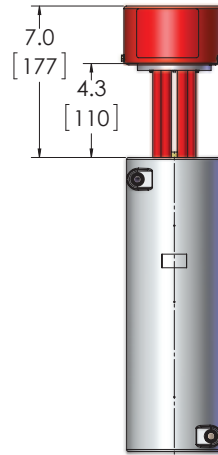
**GENERAL-PURPOSE (NEMA 1) ENCLOSURE**



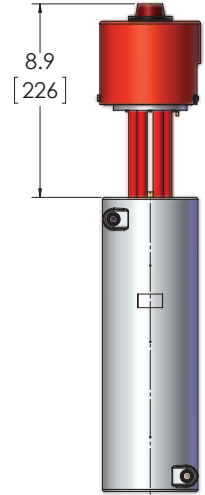
**GENERAL-PURPOSE (NEMA 1) WITH THERMOSTAT**



**GENERAL-PURPOSE (NEMA 1) WITH STANDOFF, NO THERMOSTAT**

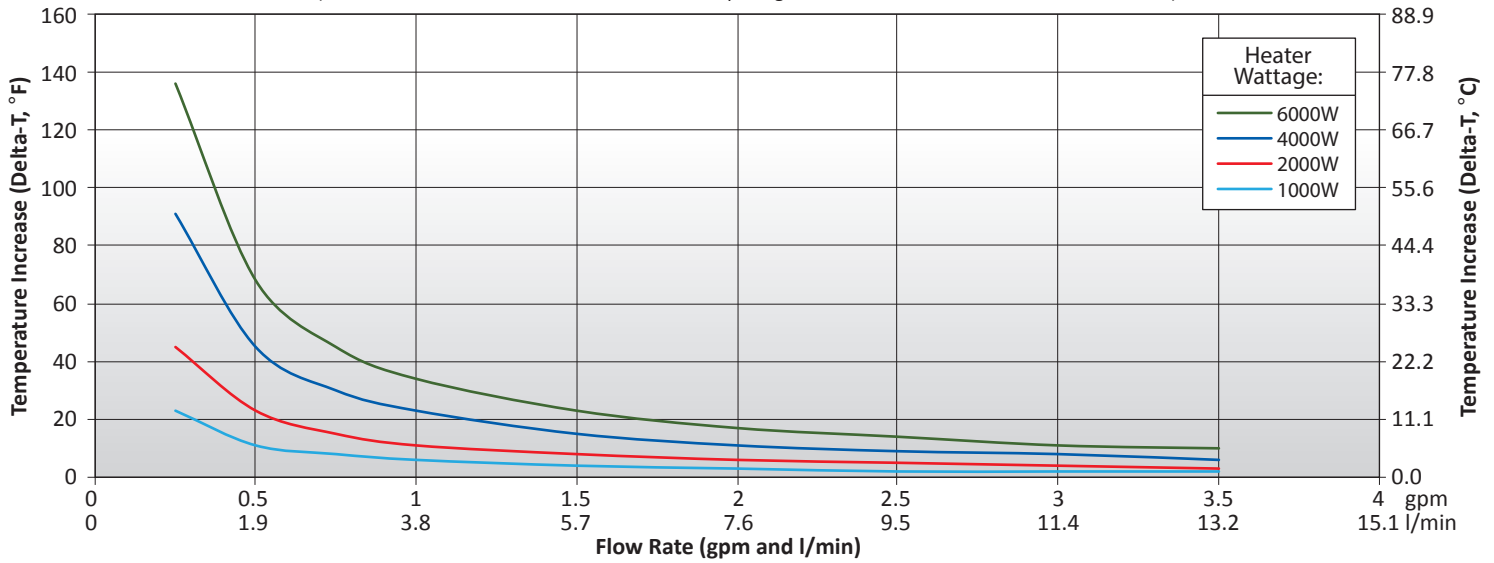


**GENERAL-PURPOSE (NEMA 1) WITH STANDOFF & THERMOSTAT**



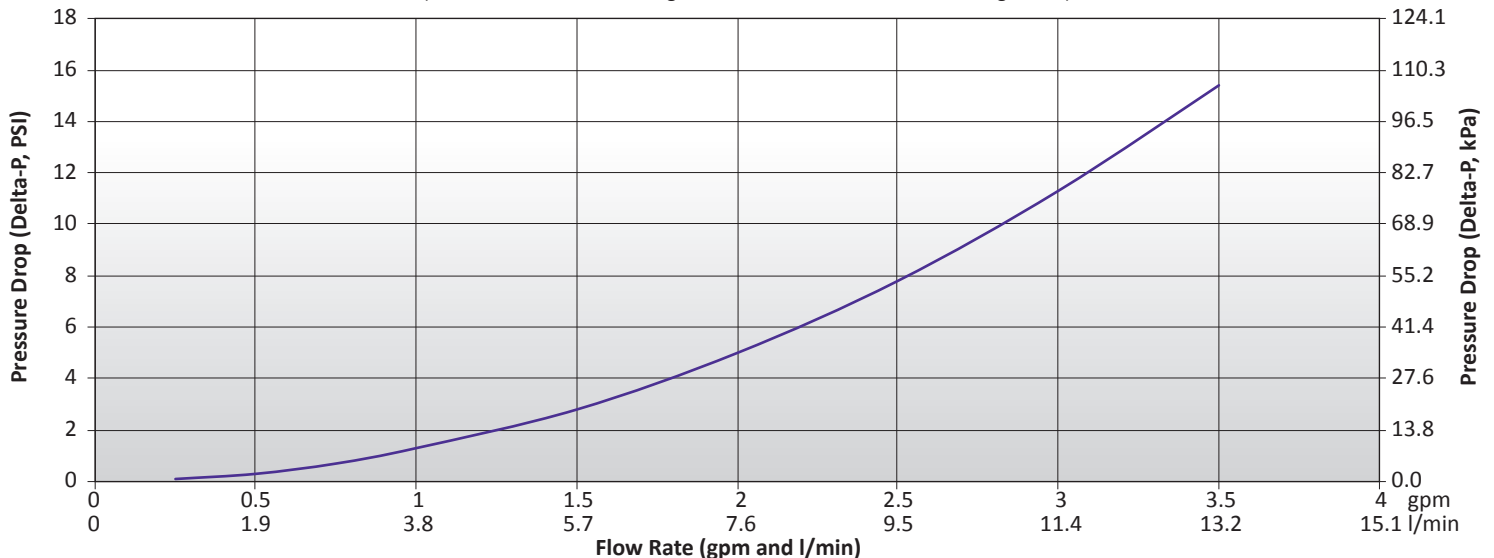
**CAST-X 2000 Heating Profile: Delta-T Water**

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

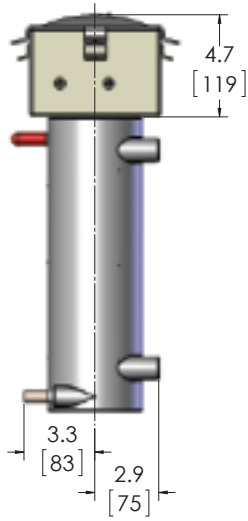


**CAST-X 2000 Pressure Drop Profile: Delta-P Water**

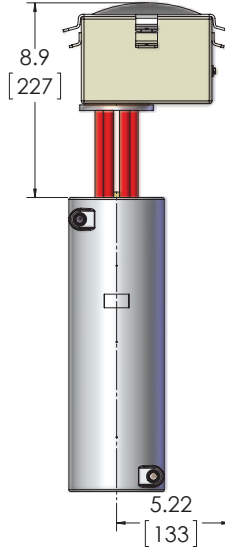
(Process Fluid = Water. Change in Pressure from Inlet to Outlet, Single Pass)



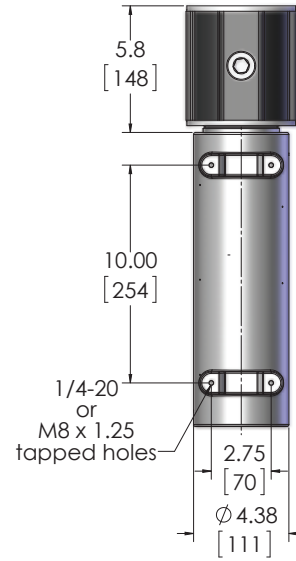
**MOISTURE-RESISTANT (NEMA 4)  
WITH OR WITHOUT THERMOSTAT**



**MOISTURE-RESISTANT (NEMA 4) WITH  
STANDOFF, WITH OR W/O THERMOSTAT**

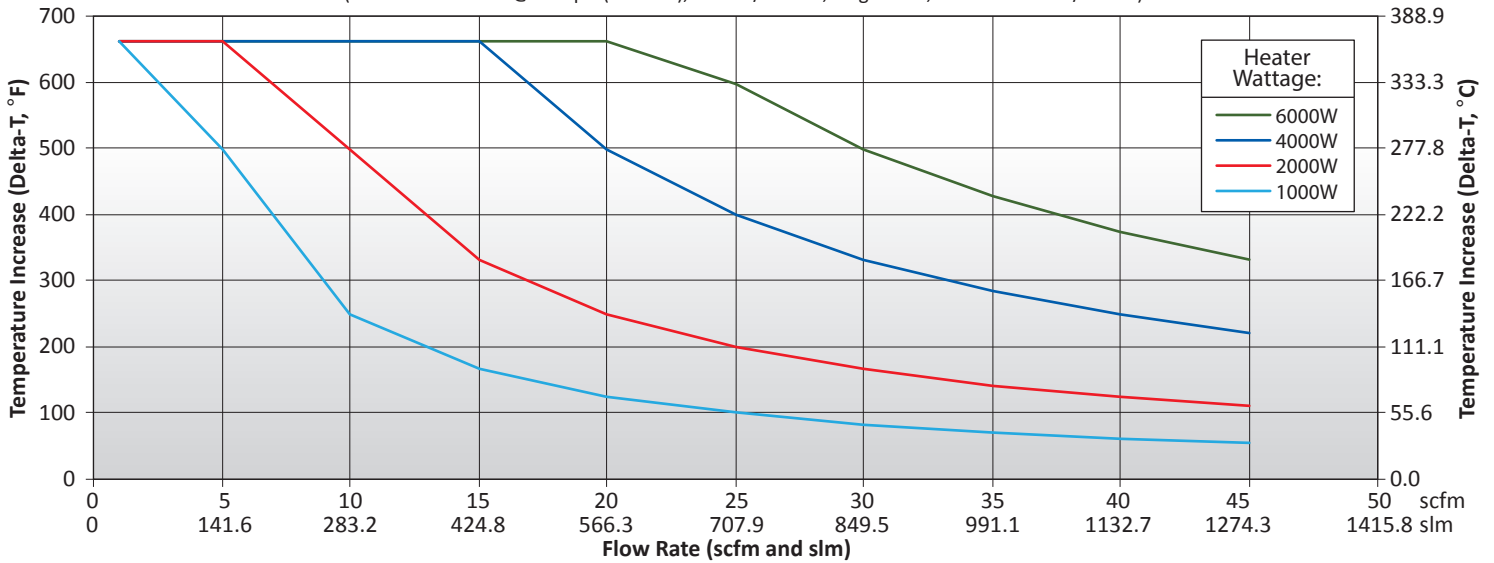


**EXPLOSION-PROOF (NEMA 7)**



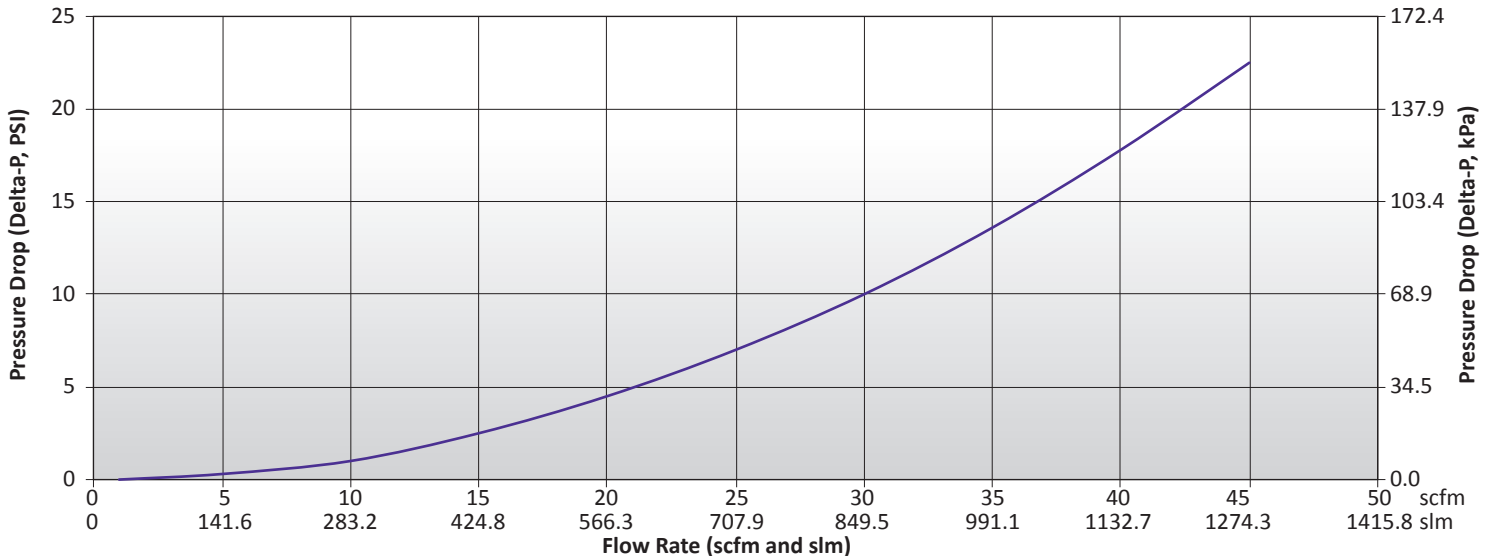
**CAST-X 2000 Heating Profile: Delta-T Air**

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



**CAST-X 2000 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 2000 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.

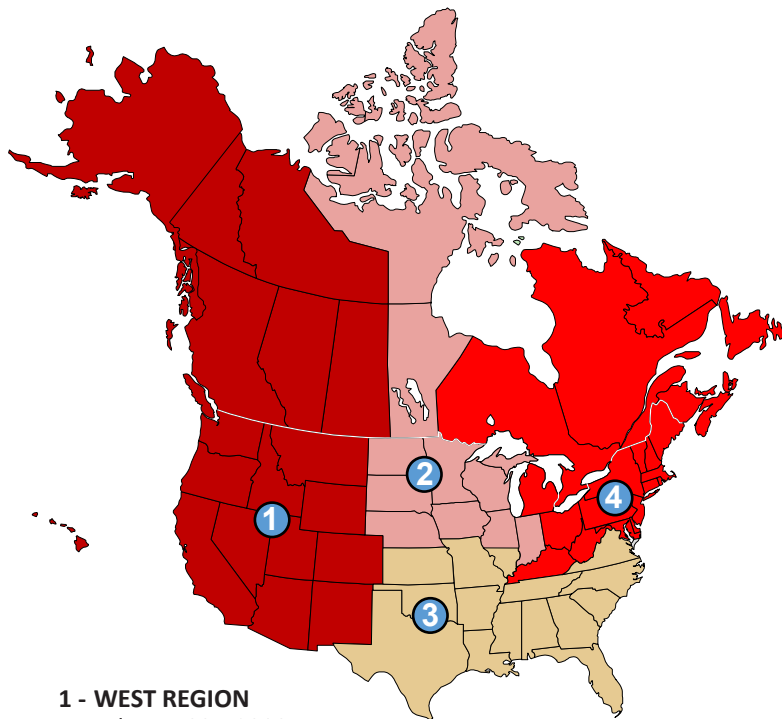
Our multi-discipline team of engineers and technicians works closely with customers to develop practical solutions to complex process challenges. We utilize industry standard applications such as Finite Element Analysis (FEA), SolidWorks® 3-D CAD technology, and a range of structural analysis & thermal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



**1 - WEST REGION**  
Tel: 714-935-2999

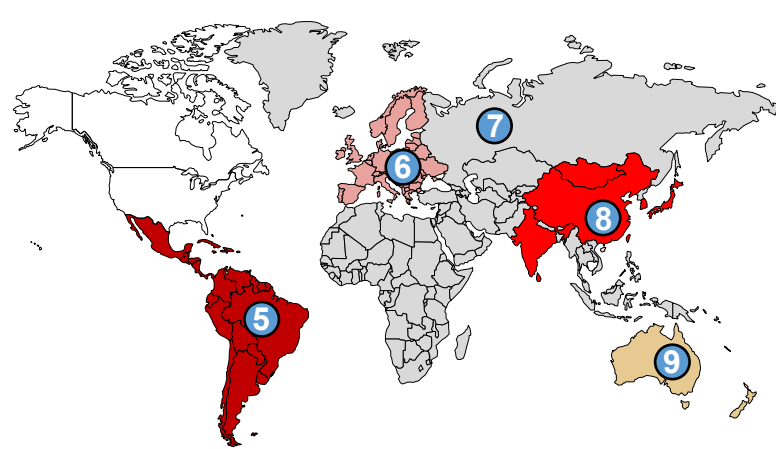
**2 - MIDWEST REGION**  
Chicago Tel: 847-458-1500  
Minneapolis Tel: 952-892-9222

**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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**6 - EUROPE**  
**France**  
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**Germany**  
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**Italy**  
Tel: +39 02-458-8841

**Spain**  
Tel: +34 91-675-1292

**United Kingdom**  
Tel: +44 115-964-0777

**7 - RUSSIA, AFRICA & MIDDLE-EAST**  
Tel: +1 630-879-2696

**8 - ASIA**  
**China**  
Tel: +86 21-3532-8532

**Japan**  
Tel: +81 3-3518-6630

**Korea**  
Tel: +82 2-2169-2600

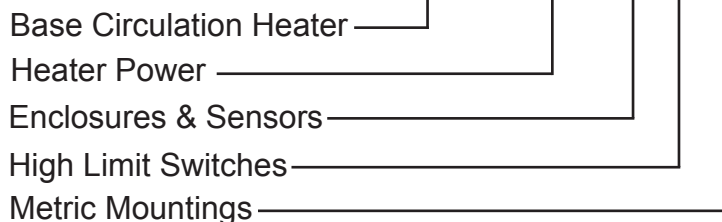
**Taiwan**  
Tel: +866 7-288-5168

**India**  
Tel: +91 40-666-12700

**9 - AUSTRALIA & NZ**  
Tel: +61 3-9335-6449



**BX13J4G AAAA-BBCC-D**



Building a CAST-X 2000 Part Number

Use the graphs below to build your CAST-X 2000. 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 - STANDARD DESIGNS**

*The CAST-X 2000 is available with both standard or standoff designs  
 Volts refers to line volts (V<sub>L</sub>). Amps refers to line current (I<sub>L</sub>).*

Section "AAAA"	Volts (V)	Watts (kW)	Circuit Type (all are single circuit)	Amps (A)
300A	480	6	THREE PHASE DELTA	7.2
300B	480	2	THREE PHASE WYE	2.4
300C	480	6	SINGLE PHASE	12.5
300D	480	4	SINGLE PHASE	8.3
300E	480	2	SINGLE PHASE	4.2
300F	240	6	THREE PHASE DELTA	14.4
300G	240	2	THREE PHASE WYE	4.8
300H	240	6	SINGLE PHASE	25
300J	240	4	SINGLE PHASE	16.7
300K	240	2	SINGLE PHASE	8.3
300L	240	1.5	SINGLE PHASE	6.6
300M	240	1	SINGLE PHASE	4.4
300Q	208	4.5	THREE PHASE DELTA	12.5
300R	208	1.5	THREE PHASE WYE	4.2
300S	208	4.5	SINGLE PHASE	22.8
300T	208	3	SINGLE PHASE	15.2
300U	208	1.5	SINGLE PHASE	7.2
300N	120	1.5	SINGLE PHASE	13.2
300P	120	1	SINGLE PHASE	8.8

**VOLTAGE, POWER, CIRCUIT TYPE - STANDOFF DESIGNS**

*The CAST-X 2000 is available with both standard or standoff designs  
 Volts refers to line volts (V<sub>L</sub>). Amps refers to line current (I<sub>L</sub>).*

Section "AAAA"	Volts (V)	Watts (kW)	Circuit Type (all are single circuit)	Amps (A)
30SA	480	6	THREE PHASE DELTA	7.2
30SB	480	2	THREE PHASE WYE	2.4
30SC	480	6	SINGLE PHASE	12.5
30SD	480	4	SINGLE PHASE	8.3
30SE	480	2	SINGLE PHASE	4.2
30SF	240	6	THREE PHASE DELTA	14.4
30SG	240	2	THREE PHASE WYE	4.8
30SH	240	6	SINGLE PHASE	25
30SJ	240	4	SINGLE PHASE	16.7
30SK	240	2	SINGLE PHASE	8.3
30SL	240	1.5	SINGLE PHASE	6.6
30SM	240	1	SINGLE PHASE	4.4
30SQ	208	4.5	THREE PHASE DELTA	12.5
30SR	208	1.5	THREE PHASE WYE	4.2
30SS	208	4.5	SINGLE PHASE	22.8
30ST	208	3	SINGLE PHASE	15.2
30SU	208	1.5	SINGLE PHASE	7.2
30SN	120	1.5	SINGLE PHASE	13.2
30SP	120	1	SINGLE PHASE	8.8

**ENCLOSURES AND SENSORS**

*All thermocouples are ungrounded, for optimal performance*

Section "BB"	Description	Thermocouple Qty.	Enclosure
S2	30 TO 250°F [-1 TO 121°C] SINGLE POLE THERMOSTAT	0	NEMA 1
S5	60 TO 250°F [16 TO 121°C] DOUBLE POLE THERMOSTAT	0	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	0	NEMA 4
W5	60 TO 250°F [16 TO 121°C] DOUBLE POLE THERMOSTAT	0	NEMA 4
WJ	J-TYPE THERMOCOUPLE IN THERMOWELL	1	NEMA 4
WK	K-TYPE THERMOCOUPLE IN THERMOWELL	1	NEMA 4
E0	NO SENSOR	0	NEMA 7
E1	50 TO 250°F [10 TO 121°C] SINGLE POLE THERMOSTAT	0	NEMA 7
EJ	J-TYPE THERMOCOUPLE IN THERMOWELL	1	NEMA 7
EK	K-TYPE THERMOCOUPLE IN THERMOWELL	1	NEMA 7

## SNAP ACTION HIGH LIMITS SWITCHES

*Not available with standoff designs*

Section "CC"	Switch
00	NONE
01	MANUAL RESET, 260°F (127°C)
02	AUTOMATIC RESET, 500°F (260°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

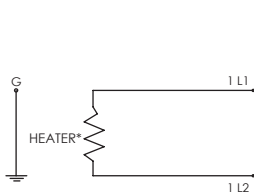
*CAS offers several options for special tubes, sensors, and finishes.  
For these options, please call a CAS Representative for a quote.*

Options	
INCONEL, MONEL OR HASTELLOY TUBES	SPECIAL HIGH-LIMIT SWITCHES OR RTDs
ELECTRO-POLISHED OR PASSIVATED TUBES	NPT FITTINGS
THICK WALL TUBES	DUAL TUBE DESIGNS

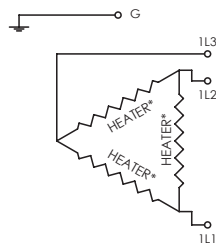
## ACCESSORIES

*These PNs are totally separate from the PNs for the heater*

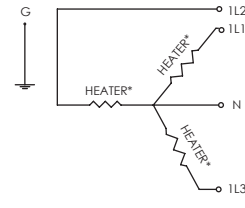
Part Number	Component
274-55-6-5	COMPRESSION FITTINGS (HIGH PRESSURE) / PAIR (SHIPPED LOOSE)
307-0-11-1	INSULATION JACKET, MAXIMUM TEMPERATURE 400°F (204°C)
307-0-21-1	INSULATION JACKET, MAXIMUM TEMPERATURE 1112°F (600°C)



SINGLE PHASE CIRCUIT



THREE-PHASE DELTA CIRCUIT



THREE-PHASE WYE CIRCUIT

### CAST-X 2000 Available Circuit Types

The CAST-X 2000 is manufactured with these types of circuit configurations.

\*Wiring schematic only shows heater elements. Refer to I&M Manual for further details on wiring of snap-action switches and thermostats (if applicable).



NEMA 1 ENCLOSURE WITH THERMOSTAT



NEMA 4 WITH THERMOSTAT INSIDE ENCLOSURE



NEMA 7 ENCLOSURE WITH THERMOSTAT



NEMA 7 ENCLOSURE NO THERMOSTAT

### Need Help with Part Numbers or Engineering Calculations?

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.

**Contact CAS Directly:**

Main Tel: 630-879-2696

Toll-Free: 888-367-3992

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