CAST-X 3000
Circulation Heater

CAST-X 3000 is a very popular heater, with wide use across industrial gas and fluid handling sectors.

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:
  - 1 kW Total to 24.6 kW Total
  - Voltage Range: 208 - 480 V
  - Max Line Current: 35 A per circuit
- Tubing:
  - .750” OD (3/4") (19.1 mm)
  - .065” Wall (1.7 mm)
  - Overall Process Tube Length: 142” (3606 mm) each
  - 316L Stainless Steel (standard)
  - Inconel (optional upgrade)
  - Passivated or Electro-Polished (optional upgrades)
- Max Pressure: 3300 psi (227 bar)
- Enclosures:
  - NEMA 4 (moisture-resistant)
  - NEMA 7 / ATEX (explosion-proof)
- Max Working Temperatures:
  - NEMA 4 (moisture-resistant): 572°F (300°C)
  - NEMA 7 / ATEX (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
  - Process and High-Limit Thermocouples
- Available Accessories:
  - Insulating Jackets
  - Compression Fittings

APPLICATIONS:

- Packaging Sterilization
- Foodservice Pasteurization
- Diesel & Jet Fuel Heating
- Mud Testing Applications (oil exploration)
- Fuel Gas Conditioning (moisture removal)
- Powder Coating Pre-Wash Systems
- Thermal Fluid Heating For Heat Transfer Systems

FEATURES & BENEFITS:

- SS 316L Fluid Path is Separate from Heating Elements
  (allows safe heating of sensitive materials and prevents contamination)
- Compact Design Replaces Larger Heat Exchangers
- Long Heater Life, Due To Cast-In Design
- Clean & Safe (self-draining, non-welded)
- Supports High Flowrate Applications
- Operable in Single-Tube or Dual-Tube Mode
- Dual Tube Mode Can Run in Series or Parallel

CAS CAST ALUMINUM Solutions

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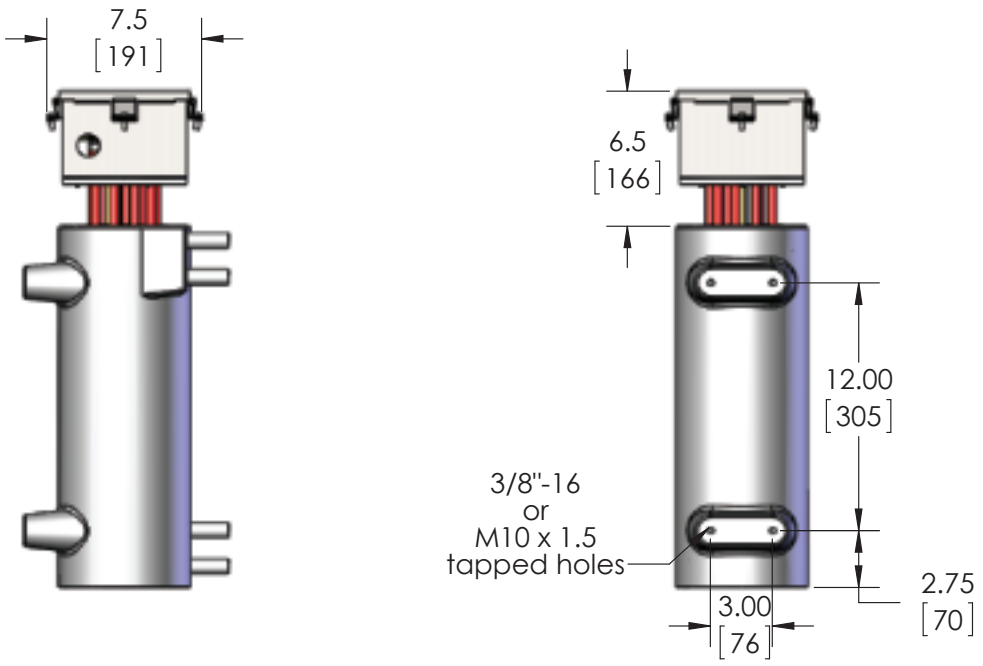
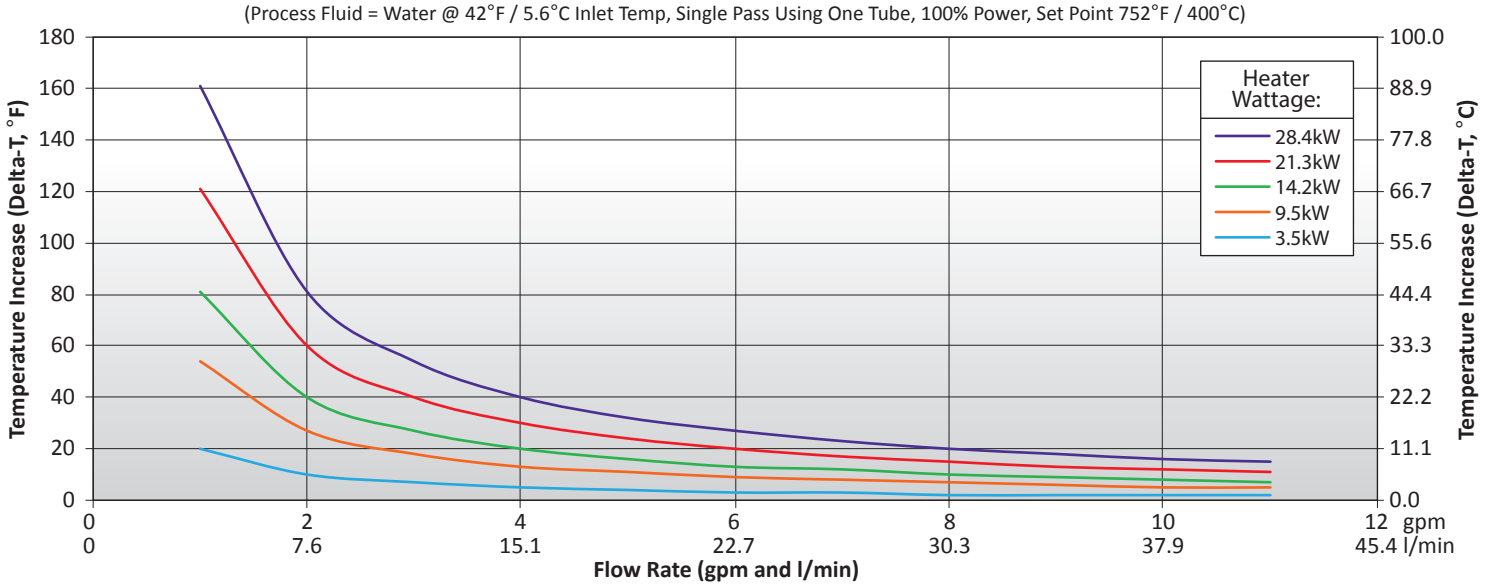
CAST-X 3000 Circulation Heater

MOISTURE-RESISTANT (NEMA 4) ENCLOSURE



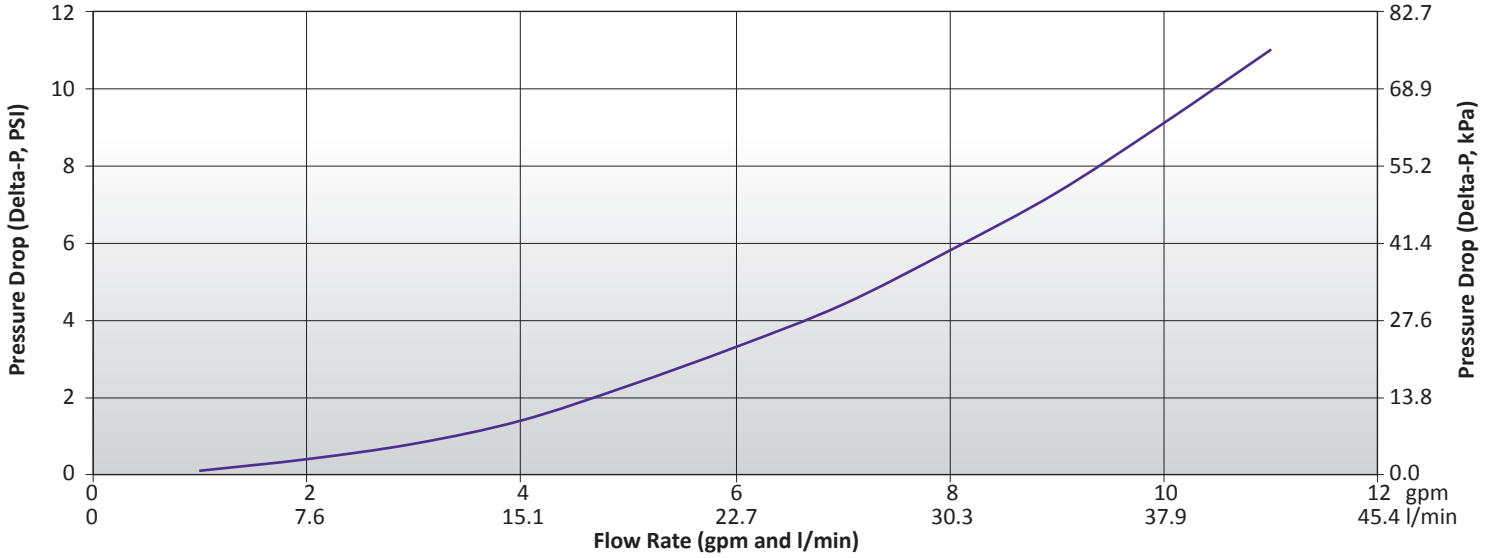
CAST-X 3000 Heating Profile: Delta-T Water

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

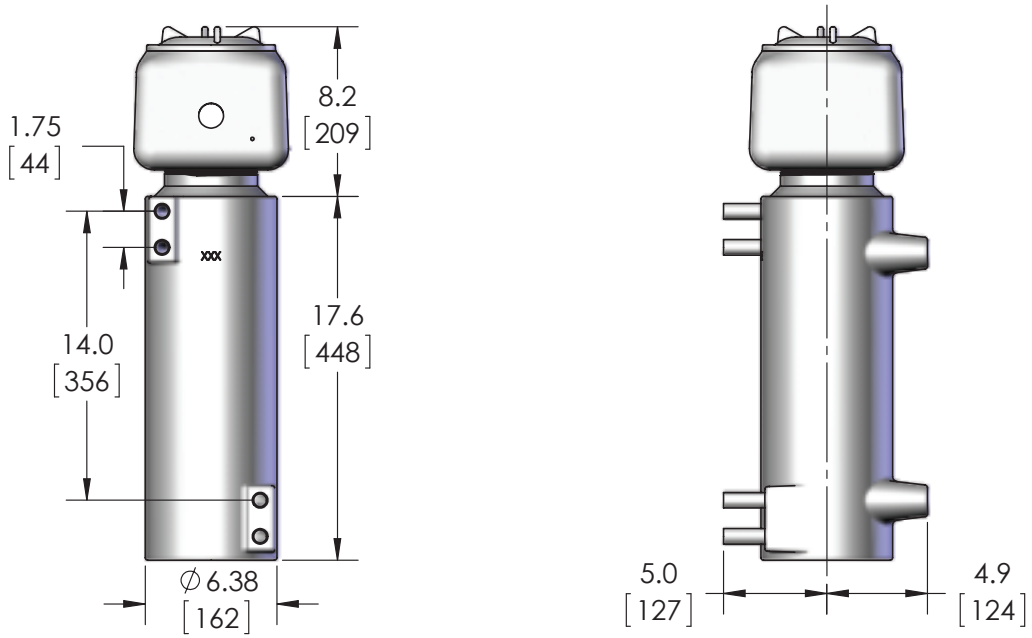


CAST-X 3000 Pressure Drop Profile: Delta-P Water

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

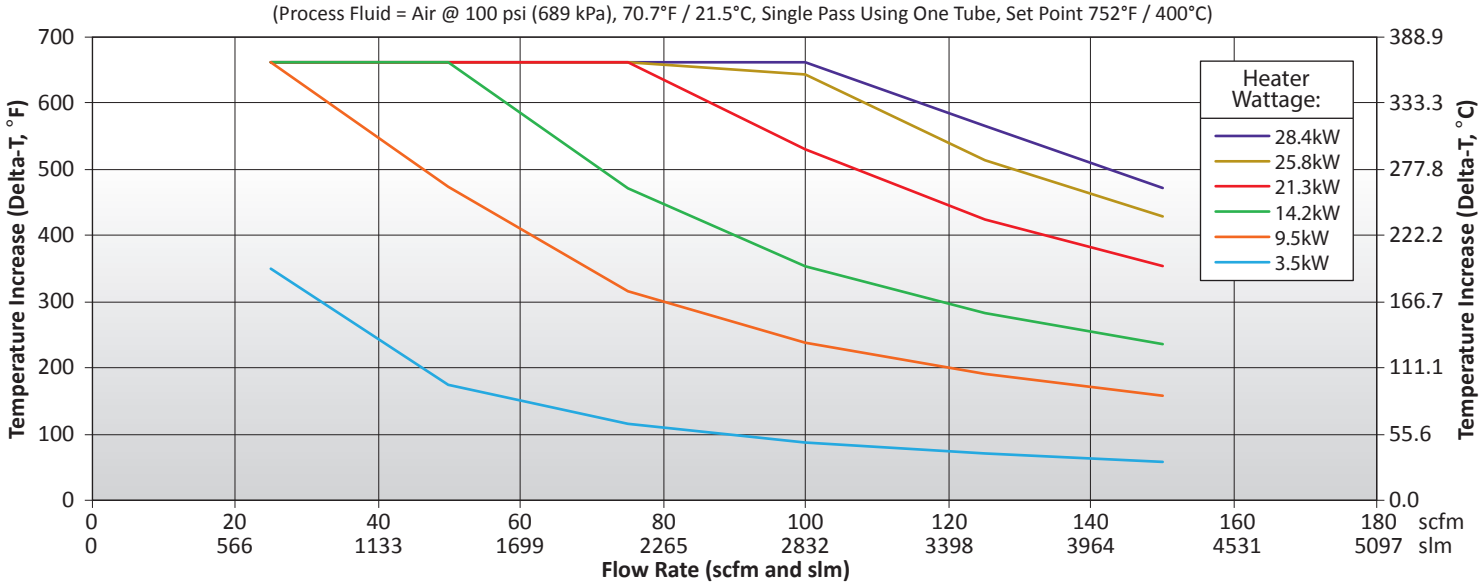


EXPLOSION-PROOF (NEMA 7 / ATEX) ENCLOSURE



CAST-X 3000 Heating Profile: Delta-T Air

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



CAST-X 3000 Heating Profile: Delta-P Air

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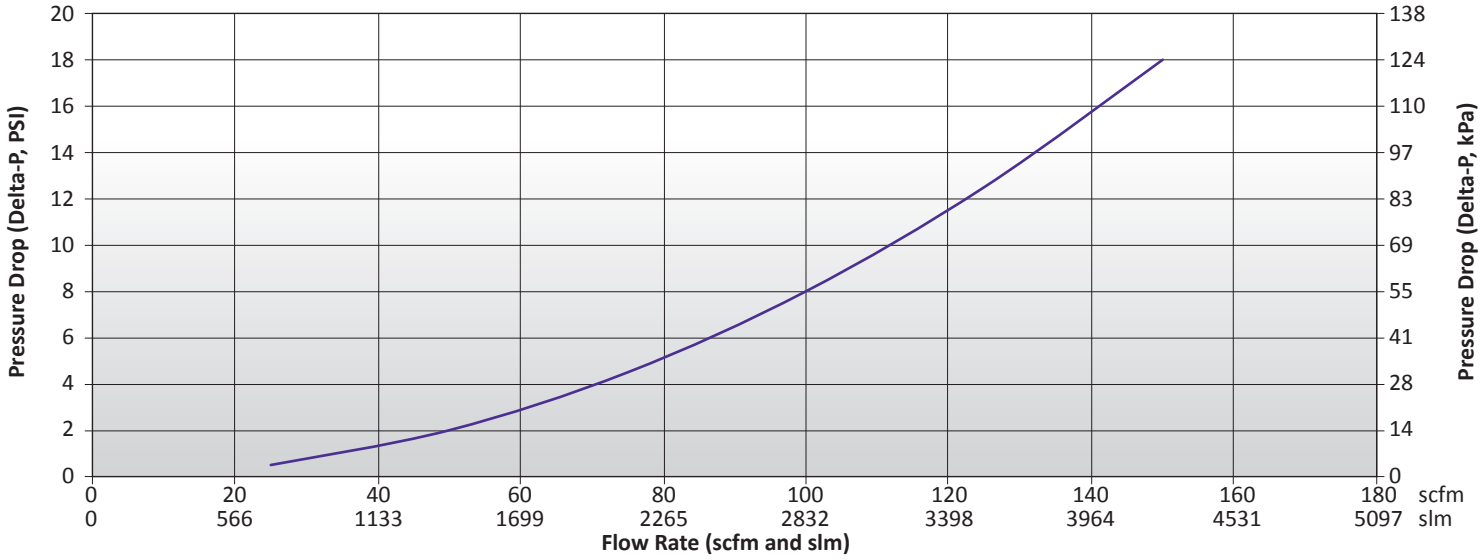


CAST-X 3000 Circulation Heater

Engineering Expertise • Speed to Market • Operational Excellence

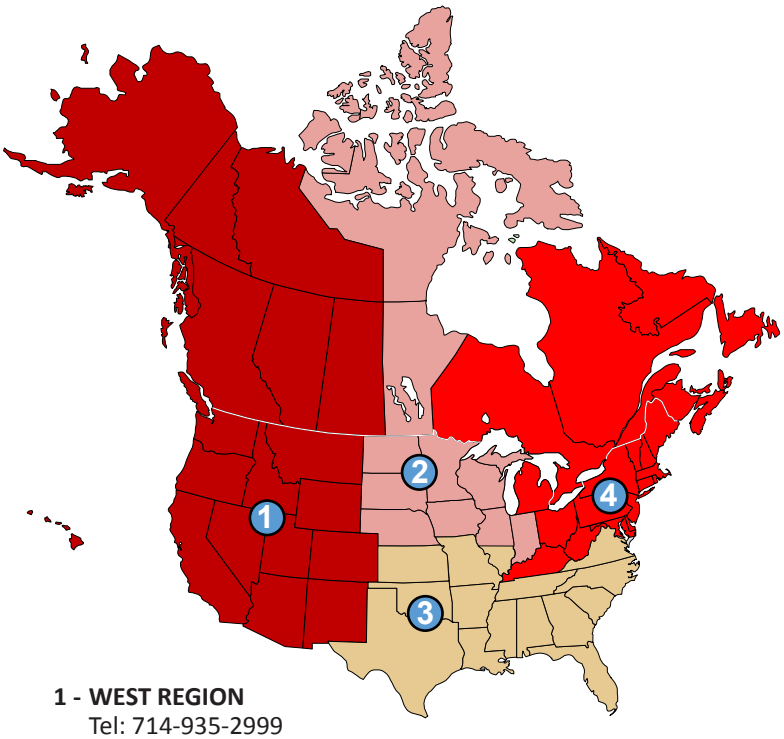
Cast Aluminum Solutions (CAS) manufactures the CAST-X line of circulation heaters, plus a broad range of heating, cooling, and non-thermal components. We are relied upon by OEMs and end-users alike throughout the semiconductor, medical device, aerospace, industrial gas, fluid-handling, food equipment,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

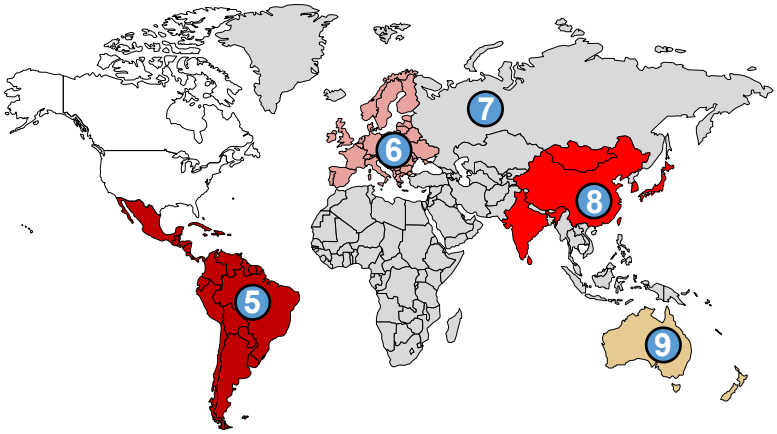
2 - MIDWEST REGION
Chicago Tel: 847-458-1500
Minneapolis Tel: 952-892-9222

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



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6 - EUROPE

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Spain
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Korea
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BX17E6G **AAAA-BBB-D**

BASE CIRCULATION HEATER
HEATER POWER
ENCLOSURES & SENSORS
METRIC MOUNTINGS

Electropolished Flow-Tubes = Add "**EP**" to end of Part Number
Passivated Flow-Tubes = Add "**P**" to end of Part Number
For both, add "**EP-P**"

Building a CAST-X 3000 Part Number

Use the graphs below to build your CAST-X 3000.
Assigning numbers for sections AAAA and BBB.
If you need metric mountings, assign "M" to section C.
If metric mounts are not required, leave sec. C 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"	**Circuit Type**	**Volts (V)**	**Watts (kW)**	**Amps (A)** (per circuit)
300A	Two Three-Phase Delta Circuits	480	24.6	14.8
		440	20.6	13.6
		415	18.4	12.8
		400	17.1	12.3
		380	15.4	11.7
		240	6.1	7.4
		230	5.6	7.1
		220	5.1	6.8
		208	4.6	6.4
300B	One Three-Phase Delta Circuit	480	12.3	14.8
		440	10.3	13.6
		415	9.2	12.8
		400	8.5	12.3
		380	7.7	11.7
		240	3.0	7.4
		230	2.8	7.1
		220	2.5	6.8
		208	2.3	6.4
300C	One Three-Phase Wye (Parallel) Circuit	575	11.8	11.9
		480	8.2	9.9
		440	6.9	9.1
		415	6.1	8.6
		400	5.7	8.2
		380	5.1	7.8
		240	2.0	5.0
		230	1.9	4.7
		220	1.7	4.5
		208	1.5	4.3
300D	One Three-Phase Delta (Series) Circuit	480	6.2	7.4
		440	5.2	6.8
		415	4.6	6.4
		400	4.3	6.3
		380	3.8	5.9
		240	1.5	3.7
		230	1.4	3.6
		220	1.3	3.4
		208	1.1	3.2
300E	One Single Phase Circuit	480	4.1	8.5
		440	3.4	7.8
		415	3.0	7.4
		400	2.8	7.1
		380	2.6	6.8
		240	1.0	4.3
		230	0.9	4.1
		220	0.8	3.9
		208	0.7	3.7

300F	One Three-Phase Wye Circuit	575	5.9	5.9
		480	4.1	4.9
		415	3.0	4.3
		400	2.8	4.1
		380	2.6	3.9
		240	1.0	2.5
		230	0.9	2.4
		220	0.8	2.3
		208	0.7	2.1
300G	Two Three-Phase Delta Circuits	380	15.4 Same as 300A	11.7
300H	One Three-Phase Delta Circuit	380	7.7 Same as 300B	11.7
300J	One Three-Phase Wye (Parallel) Circuit	380	5.1 Same as 300C	7.8
300K	One Three-Phase Delta (Series) Circuit	380	3.8 Same as 300D	5.9
300L	One Single Phase Circuit	380	2.6 Same as 300E	6.8
300M	One Three-Phase Wye Circuit	380	2.6 Same as 300F	3.9
300N	Two Three-Phase Delta Circuits	240	27.0	32.5
		230	24.8	31.2
		220	22.7	29.8
		208	20.3	28.2
300P	One Three-Phase Delta Circuit	240	13.5	32.5
		230	12.4	31.2
		220	11.3	29.8
		208	10.1	28.2
300Q	One Three-Phase Wye (Parallel) Circuit	415	27.0	37.6
		400	25.0	36.2
		380	22.6	34.4
		240	9.0	21.7
		230	8.3	20.8
		220	7.6	19.9
		208	6.8	18.8
300R	One Three-Phase Delta (Series) Circuit	480	27.0	32.5
		415	20.2	28.1
		400	18.7	27.1
		380	16.9	25.7
		240	6.8	16.3
		230	6.2	15.6
		220	5.7	14.9
		208	5.1	14.1
300S	One Single Phase Circuit	240	4.5	18.8
		230	4.1	18.0
		220	3.8	17.2
		208	3.4	16.3
300T	One Three-Phase Wye Circuit	415	13.5	18.8
		400	12.5	18.1
		380	11.3	17.2
		240	4.5	10.9
		230	4.1	10.4
		220	3.8	10.0
		208	3.4	9.4
300U	Two Three-Phase Delta Circuits	208	20.3 Same as 300N	28.2
300V	One Three-Phase Delta Circuit	208	10.1 Same as 300P	28.2
300W	One Three-Phase Wye (Parallel) Circuit	208	6.8 Same as 300Q	18.8
300X	One Three-Phase Delta (Series) Circuit	208	5.1 Same as 300R	14.1
300Y	One Single Phase Circuit	208	3.4 Same as 300S	16.3
300Z	One Three-Phase Wye Circuit	208	3.4 Same as 300T	9.4

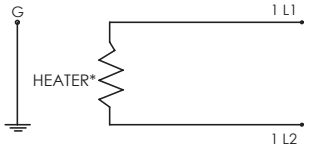
ENCLOSURES AND TEMPERATURE SENSORS			
All thermocouples are ungrounded, for optimal performance			
Section "BBB"	**Description**	**No. of Sensors**	**Enclosure**
W00	No Sensor	0	NEMA 4
W0J	J-Type Thermocouple in Thermowell	1	NEMA 4
W0K	K-Type Thermocouple in Thermowell	1	NEMA 4
W0R	RTD, Single, 3 Wire, 100 Ohms	1	NEMA 4
WJJ	J-Type Thermocouples in Thermowells	2	NEMA 4
WKK	K-Type Thermocouples in Thermowells	2	NEMA 4
WRR	RTDs, Each is 3 Wire, 100 Ohms	2	NEMA 4
E00	No Sensor	0	NEMA 7 / ATEX
E0J	J-Type Thermocouple in Thermowell	1	NEMA 7 / ATEX
E0K	K-Type Thermocouple in Thermowell	1	NEMA 7 / ATEX
E0R	RTD, Single, 3 Wire, 100 Ohms	1	NEMA 7 / ATEX
EJJ	J-Type Thermocouples in Thermowells	2	NEMA 7 / ATEX
EKK	K-Type Thermocouples in Thermowells	2	NEMA 7 / ATEX
ERR	RTDs, Each is 3 Wire, 100 Ohms	2	NEMA 7 / ATEX

METRIC MOUNTING HOLES	
Place an "M" in section C if metric mounting holes are required. If standard Imperial mounting holes are desired, section C can be left blank.	
Section "C"	**Metric Mounting Holes**
M	M10 x 1.5 Metric Tapped Mounting Holes

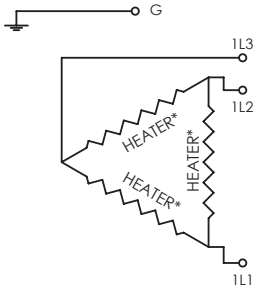
VALUE ADDED OPTIONS FOR FLOW-TUBES	
If you need electropolished or passivated flow-tubes, add these letters to the end of your part number. *For both, indicate "EP-P"* *These prices are in addition to the cost of the tubes, listed in above part number tables.*	
PN Adder	**Additional Service**
P	Passivation - Single Tube: To Clean Flow-Tube ID (Diluted Nitric Acid Flush)
P	Passivation - Dual Tube: To Clean Flow-Tube ID (Diluted Nitric Acid Flush)
EP	Electropolished Tube ID - Single Tube: Ra: 10 Micro-Inches (.254 Micro-Meters)
EP	Electropolished Tube ID - Dual Tube: Ra: 10 Micro-Inches (.254 Micro-Meters)

ACCESSORIES	
These PNs are totally separate from the PNs for the heater	
Part Number	**Component**
274-55-6-7	Compression Fittings (High Pressure), Pair (Shipped Loose)
307-0-16-1	Insulation Jacket, Maximum Temperature 986°F (530°C)

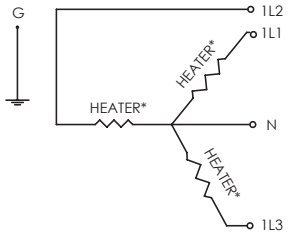
ACCESSORIES	
These PNs are totally separate from the PNs for the heater	
Part Number	**Component**
274-55-6-7	COMPRESSION FITTINGS (HIGH PRESSURE) / PAIR (SHIPPED LOOSE)
307-0-16-1	INSULATION JACKET, MAXIMUM TEMPERATURE 986°F (530°C)



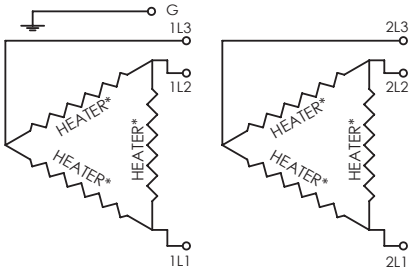
SINGLE PHASE CIRCUIT



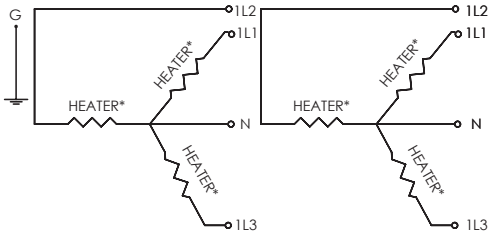
THREE-PHASE DELTA CIRCUIT



THREE-PHASE WYE CIRCUIT



TWO THREE-PHASE DELTA CIRCUITS



TWO THREE-PHASE WYE CIRCUITS

CAST-X 3000 Available Circuit Types

The CAST-X 3000 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 (if applicable).

NEMA 4 ENCLOSURE

NEMA 7 / ATEX ENCLOSURE

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.

CAS CAST ALUMINUM Solutions

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