CAST-X 2500
Circulation Heater

The CAST-X 2500 is our most compact dual-tube model, a powerful and versatile mid-sized heater.

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:
  - 2.5 kW Total to 15 kW Total
  - Voltage Range: 208 - 480V
  - Max Line Current: 30 A per circuit
- Tubing:
  - .625” OD (5/8") (15.9 mm)
  - .065” Wall (1.7 mm)
  - Overall Process Tube Length: 130” (3302 mm) each
  - 316L Stainless Steel (standard)
  - Inconel (optional upgrade)
  - Passivated or Electro-Polished (optional upgrades)
- Max Pressure: 4000 psi (275 bar)
- Enclosures:
  - NEMA 1 (general-purpose/dust-proof)
  - NEMA 4 (moisture-resistant)
  - NEMA 7 (explosion-proof)
  - ATEX (explosion-proof)
- Max Working Temperatures:
  - NEMA 1 (dust-proof/general-purpose): 662°F (350°C)
  - NEMA 4 (moisture-resistant): 572°F (300°C)
  - NEMA 7 (explosion-proof): 482°F (250°C)
  - 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
  - Snap-Action High-Limit Thermostat
  - Process and High-Limit Thermocouples
- Available Accessories:
  - Insulating Jackets
  - Compression Fittings

APPLICATIONS:

- Paint, Solvent & Petrochem Heating
- Glycol & Heat-Transfer System Use
- Food & Beverage Pasteurization
- Industrial Gas Heating & Air Separation
- Steam Generation
- Laboratory & Analytical Applications
- Urethane / Foam System Heating

FEATURES & BENEFITS:

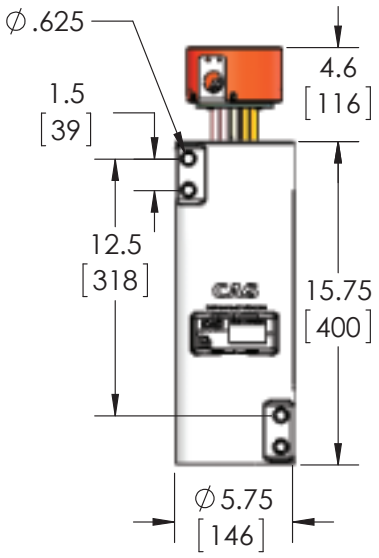
- SS 316L Fluid Path is Separate from Heating Elements
  (allows safe heating of sensitive materials and prevents contamination)
- Very Compact Design: Replaces Much Larger Heaters
- Self-Draining, Low-Maintenance Design
- Non-Welded Body & Cast-In Heaters (for long heater life)
- Wide Application Compatibility (including high pressure)
- Operable in Single-Tube or Dual-Tube Mode
- Dual Tube Mode Can Run in Series or Parallel

CAS CAST ALUMINUM Solutions

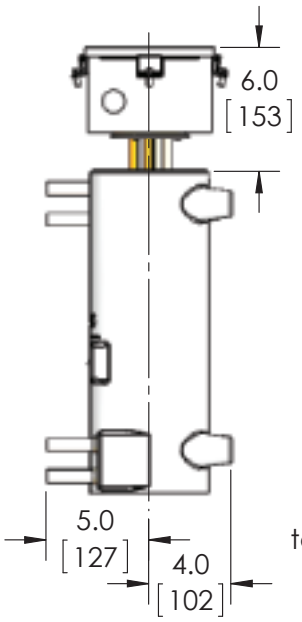
Tel: 630-879-2696 • Sales@CastAluminumSolutions.com • www.CastAluminumSolutions.com • 1310 Kingsland Drive • Batavia, Illinois 60510 USA

CAST-X 2500 Circulation Heater

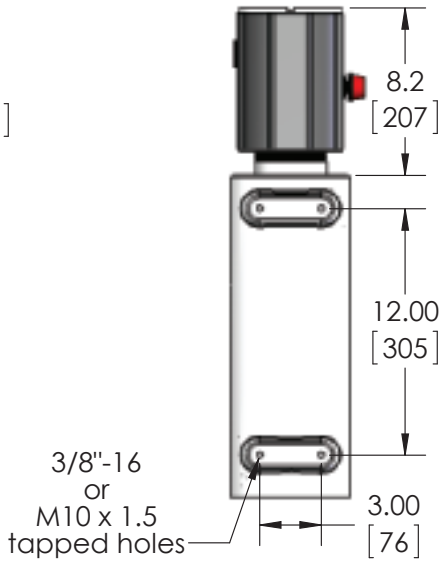
GENERAL-PURPOSE (NEMA 1) ENCLOSURE



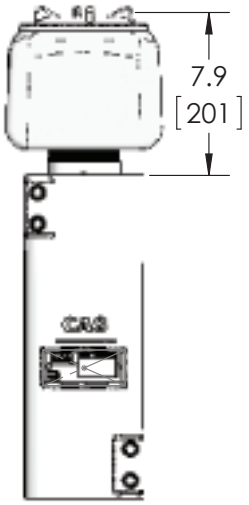
MOISTURE-RESISTANT (NEMA 4) ENCLOSURE



EXPLOSION-PROOF (NEMA 7) ENCLOSURE

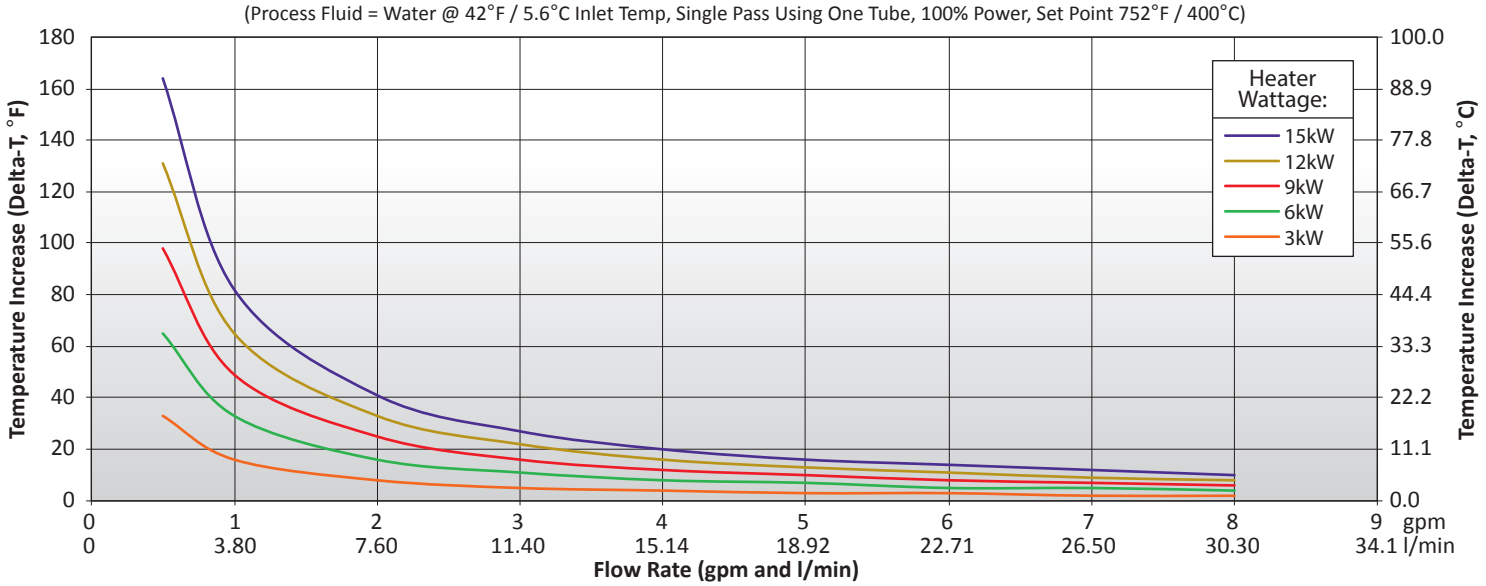


EXPLOSION-PROOF (ATEX) ENCLOSURE



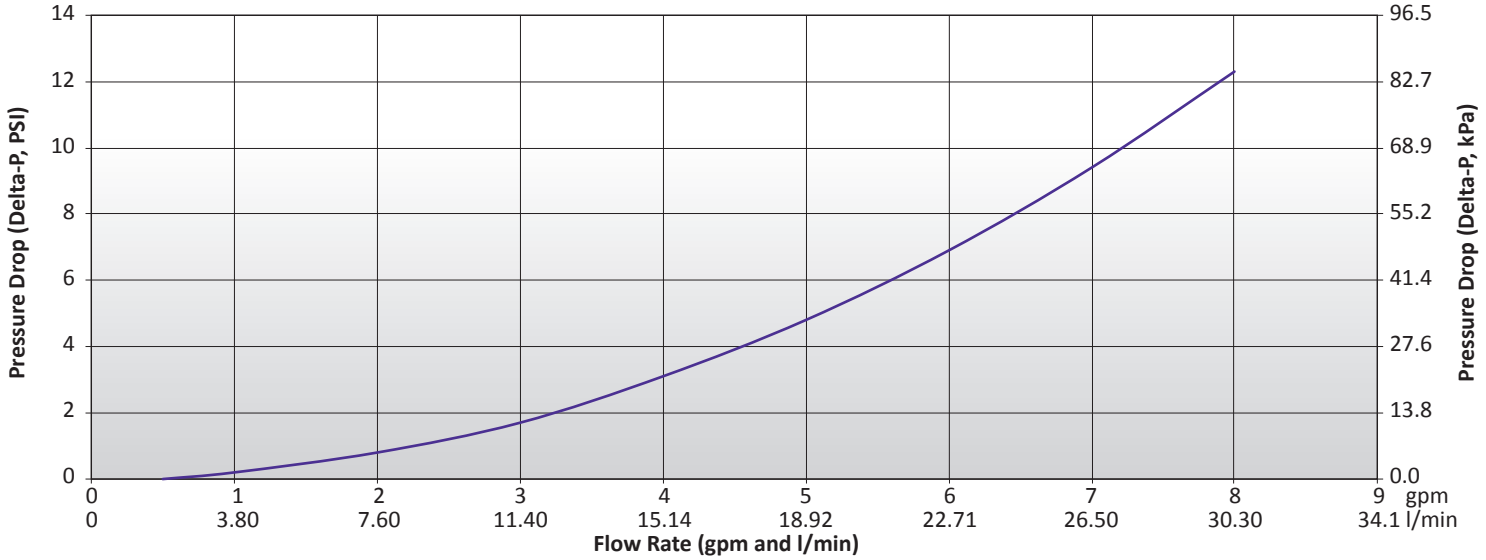
CAST-X2500 Heating Profile: Delta-T Water

(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 2500 Pressure Drop Profile: Delta-P Water

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



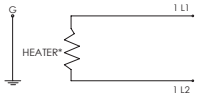
NEMA 1 ENCLOSURE

NEMA 4 ENCLOSURE

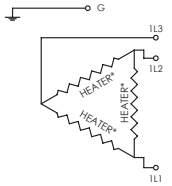
NEMA 7 ENCLOSURE

ATEX ENCLOSURE

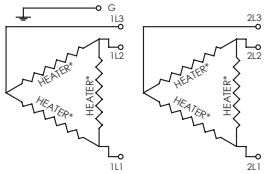
INSULATING JACKET



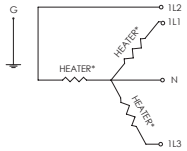
SINGLE PHASE CIRCUIT



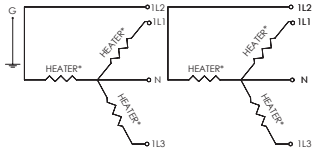
THREE-PHASE DELTA CIRCUIT



TWO THREE-PHASE DELTA CIRCUITS



THREE-PHASE WYE CIRCUIT



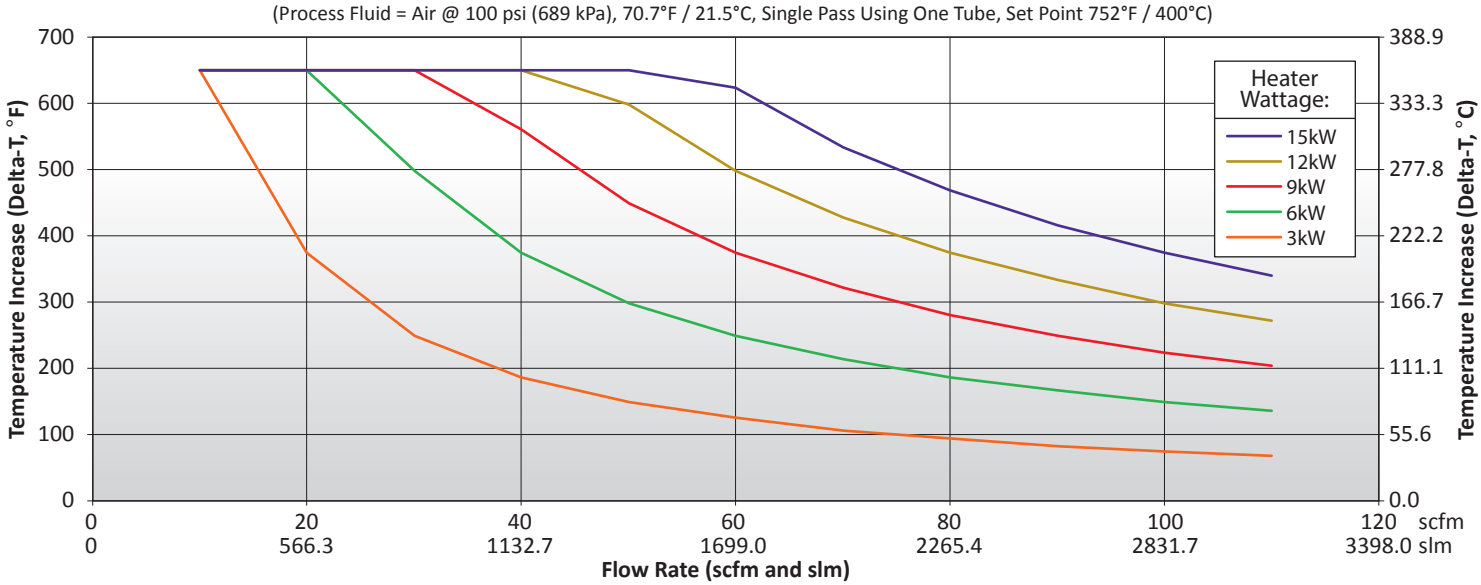
TWO THREE-PHASE WYE CIRCUITS

CAST-X 2500 Available Circuit Types

The CAST-X 2500 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).

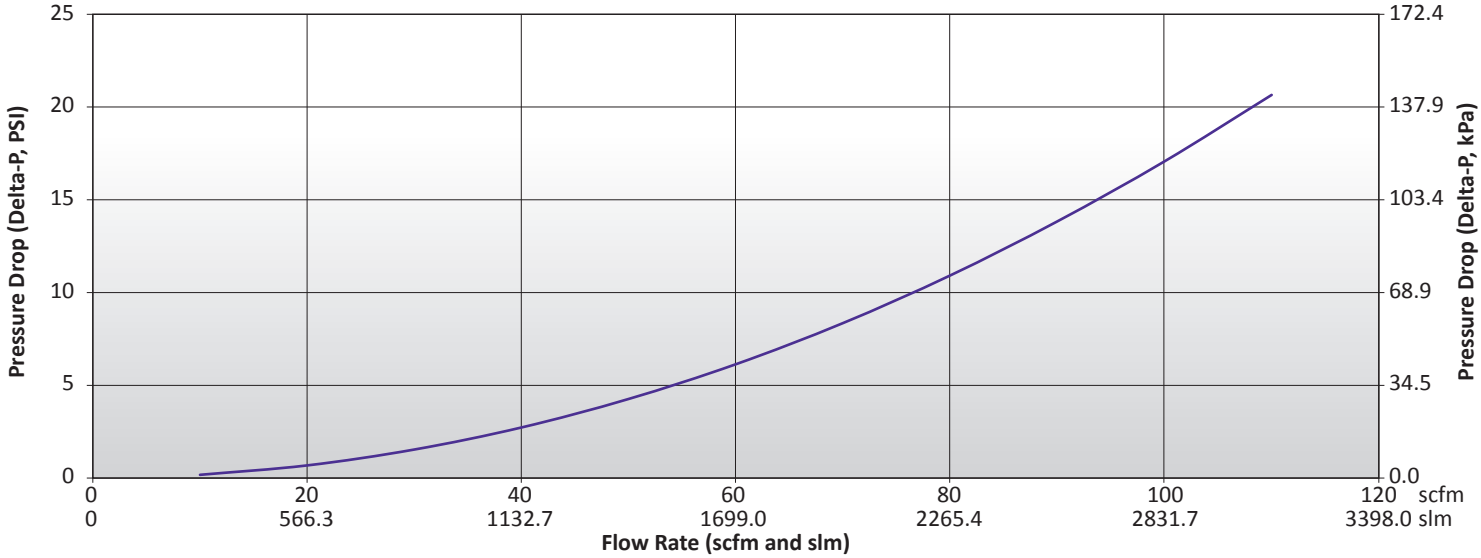
CAST-X 2500 Heating Profile: Delta-T Air

(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 2500 Heating Profile: Delta-P 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 2500 Circulation Heater

BX25-**AAA-BB-CDDEF**

- AAA = VOLTS, POWER, CIRCUIT TYPE
- BB = ENCLOSURES & THERMOSTAT
- C = HIGH LIMIT SWITCH
- D = THERMOCOUPLES
- E = TUBING
- F = MACHINING

Building a CAST-X 2500 Part Number

Use the graphs on the following pages to build each section of the CAST-X 2500. After assigning numbers for each section A to F, you will have a complete part number, ready to quote.

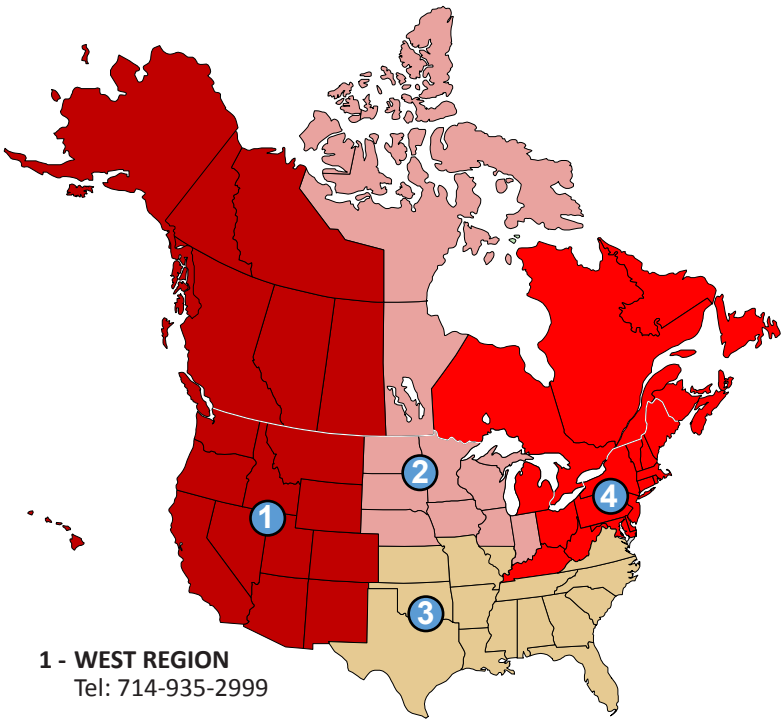
For assistance, contact CAS directly.

Cast Aluminum Solutions (CAS) manufactures CAST-X 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.



1 - WEST REGION
Tel: 714-935-2999

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

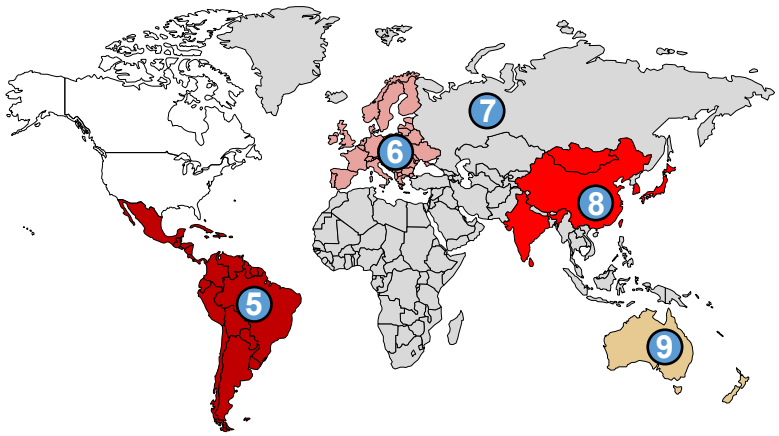
3 - SOUTH REGION
Tel: 678-951-8120

4 - NORTHEAST REGION
Tel: 513-398-5500

ENERGY PROCESS DIVISION
Tel: 866-948-1708

SEMICONDUCTOR DIVISION
Tel: 408-754-3370

CAS CAST ALUMINUM Solutions



5 - MEXICO, CENTRAL and SOUTH AMERICA
Tel: +52 442-256-2200

6 - EUROPE
France
Tel: +33 (0) 1-41-32-79-70

Germany
Tel: +49 7253-9400-0

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

"AAA" section

The first step in building a CAST-X 2500 part number is determining the volt, watt and circuit configuration.

Select the "AAA" number (far left column) that best matches your specifications.

Need Help with Part Numbers ?

Contact CAS Directly:
Tel: 630-879-2696 (USA)
Toll-Free: 888-367-3992
Sales@CastAluminumSolutions.com

CAS representatives are available to walk you through the process.

VOLTAGE, POWER, CIRCUIT TYPE				
Volts refers to line volts (V_L). Amps refers to line current (I_L).				
Designation "AAA"	**Circuit Type**	**Volts (V)**	**Watts (kW)**	**Amps (A) (per circuit)**
012	THREE-PHASE WYE	480	N/A	
		415	14.8	20.7
		400	13.8	19.9
		380	12.4	18.9
		240	5.0	12.0
		208	3.7	10.4
021	THREE-PHASE DELTA	480	15.0	18.0
		415	11.2	15.6
		400	10.4	15.0
		380	9.4	14.3
		240	3.7	9.0
		208	2.8	7.8
022	THREE-PHASE WYE	480	5.0	6.0
		415	3.7	5.2
		400	3.4	5.0
		380	3.1	4.8
023	SINGLE PHASE	480	N/A	
		415	11.2	27.0
		400	10.4	26.0
		380	9.4	24.7
		240	3.7	15.6
		208	2.8	13.5
031	THREE-PHASE DELTA	380V TO 480V NOT AVAILABLE		
		240	7.2	17.3
		208	5.4	15.0
032	THREE-PHASE WYE	480	9.6	11.6
		415	7.2	10.0
		400	6.7	9.6
		380	6.0	9.1
		240	2.4	5.8
033	SINGLE PHASE	380V TO 480V NOT AVAILABLE		
		240	7.2	30.0
		208	5.4	26.0
041	THREE-PHASE DELTA	380V TO 480V NOT AVAILABLE		
		240	10.7	25.7
		208	8.0	22.2
042	THREE-PHASE WYE	480	14.2	17.1
		415	10.6	14.8
		400	9.9	14.3
		380	8.9	13.5
		240	3.6	8.6
		208	2.7	7.4
051	THREE-PHASE DELTA	480	N/A	
		415	12.0	16.6
		400	11.1	16.0
		380	10.0	15.2
		240	4.0	9.6
		208	3	8.3
052	THREE-PHASE WYE	480	5.3	6.4
		415	4.0	5.6
		400	3.7	5.4
		380	3.3	5.1
053	SINGLE PHASE	480	N/A	
		415	12.0	28.8
		400	11.1	27.8
		380	10.0	26.4
		240	4.0	16.7
		208	3.0	14.4
061	THREE-PHASE DELTA	480	4.0	4.8
		415	3.0	4.2
		400	2.8	4.0
		380	2.5	3.8
063	SINGLE PHASE	480	4.0	8.3
		415	3.0	7.2
		400	2.8	6.9
		380	2.5	6.6

ENCLOSURE AND THERMOSTAT		
The first digit corresponds to the following: 1. Standoff mounting required 2. Pipe nipple mounting required		
Designation "BB"	**Thermostat**	**Enclosure**
11	NO THERMOSTAT	NEMA 1
12	NO THERMOSTAT	NEMA 4
21	NO THERMOSTAT	NEMA 7
22	32° - 250°F (0° - 121°C) THERMOSTAT	NEMA 7
23	0° - 100°F (-17° - 38°C) THERMOSTAT	NEMA 7
24	NO THERMOSTAT	ATEX
25	DOUBLE POLE SINGLE THROW (DPST) THERMOSTAT	ATEX

SNAP ACTION HIGH LIMITS SWITCHES	
Only heaters with NEMA 7 or ATEX enclosures can accommodate high limit switches: NEMA 1 & 4 cannot.	
Designation "C"	**Switch**
0	NONE
1	AUTO RESET, 200°F (93°C)
2	AUTO RESET, 250°F (121°C)
3	AUTO RESET, 425°F (218°C)
4	AUTO RESET, 500°F (260°C)
5	MANUAL RESET, 260°F (126°C)
6	MANUAL RESET, 185°F (85°C)
7	MANUAL RESET, 150°F (65°C)
8	MANUAL RESET, 260°F (126°C) WITH TEFLON LEADS

"BB" to "F"
Sections

After selecting your AAA number, use the charts on this page to select your BB, C, D, E and F designations.

(always selecting your number from the far left column)

THERMOCOUPLES	
All thermocouples are ungrounded, for optimal performance	
Designation "DD"	**Description**
0	NONE
1	SINGLE J-TYPE THERMOCOUPLE IN THERMOWELL
2	DUAL J-TYPE THERMOCOUPLES IN THERMOWELL
3	SINGLE K-TYPE THERMOCOUPLE IN THERMOWELL
4	DUAL K-TYPE THERMOCOUPLES IN THERMOWELL

NOTE: The part number has two "D" designations because the unit has two thermowells.
Always put the lowest designation number first in the part number to avoid duplicate configurations.
e.g. BX25-xxx-xx-x 1 2 x instead of BX25-xxx-xx-x 2 1 x

TUBING		
Option 1 is the standard option (dual 316L SS)		
Designation "E"	**Tube Description**	**Number of Tubes**
1	5/8" (15.9 mm) OD X .065" (1.65 mm) WALL, 316L SS SEAMLESS (STANDARD OPTION)	2
2	5/8" (15.9 mm) OD X .065" (1.65 mm) WALL, 316L SS SEAMLESS, ELECTROPOLISHED	2
3	5/8" (15.9 mm) OD X .065" (1.65 mm) WALL, 316L SS SEAMLESS, PASSIVATED	2
4	5/8" (15.9 mm) OD X .065" (1.65 mm) WALL, 316L SS SEAMLESS	1
5	5/8" (15.9 mm) OD X .065" (1.65 mm) WALL, 316L SS SEAMLESS, ELECTROPOLISHED	1
6	5/8" (15.9 mm) OD X .065" (1.65 mm) WALL, 316L S.S. SEAMLESS, PASSIVATED	1

MACHINING	
Designation "F"	**Mounting Hole Description**
1	STANDARD 3/8"-16 MOUNTING HOLES
2	STANDARD M10 X 1.5 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	
SPECIAL ALLOY TUBES	SPECIAL HIGH-LIMIT SWITCHES OR RTDs
THICK WALL TUBES	NPT FITTINGS

ACCESSORIES	
Part Number	**Description**
274-55-6-8	TUBE UNION COMPRESSION FITTING (5/8" / .625 INCH) / PAIR (SHIPPED LOOSE)
307-0-22-1	INSULATING JACKET: TEMP. LIMIT: 986°F / 530°C

Need 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.

Contact CAS Directly:
Main Tel: 630-879-2696
Toll-Free: 888-367-3992
Sales@CastAluminumSolutions.com
www.CastAluminumSolutions.com

CAS CAST ALUMINUM Solutions