# 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.

### 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

### 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.

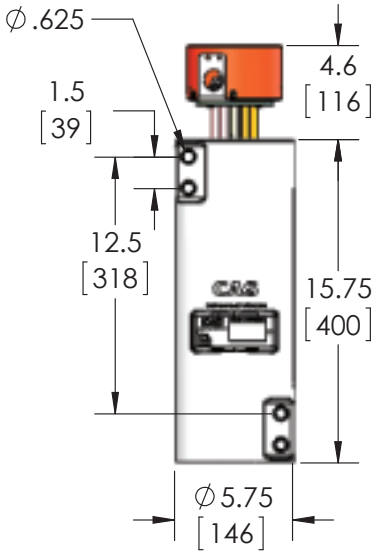
- Sensors:
  - K or J Type Thermocouples Standard
  - Snap-Action High-Limit Thermostat
  - Process and High-Limit Thermocouples
- Available Accessories:
  - Insulating Jackets
  - Compression Fittings

### FEATURES & BENEFITS:

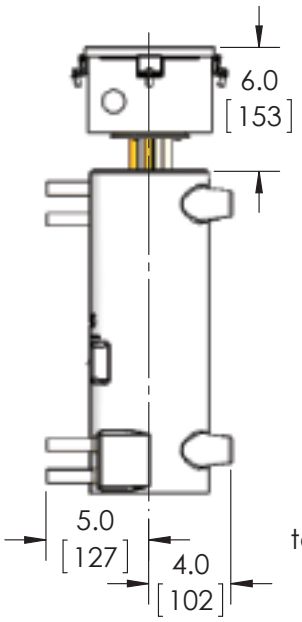
- SS 316L Fluid Path is Separate from Heating Elements
  (allows safe heating of sensitive materials and prevents contamination)
- Very Compact Design: Replaces Much Larger Heaters
- Self-Draining, Low-Maintenance Design
- Non-Welded Body & Cast-In Heaters (for long heater life)
- Wide Application Compatibility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

# CAST-X 2500 Circulation Heater

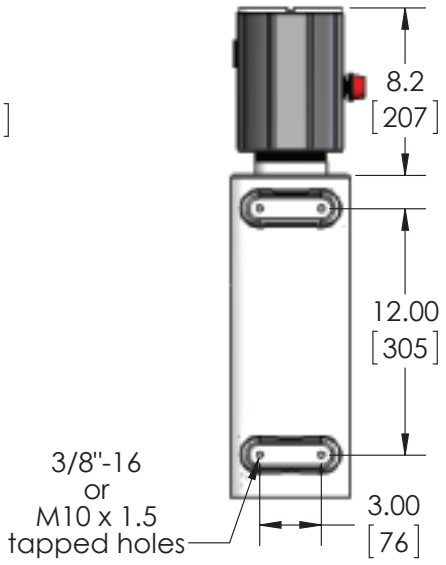
### GENERAL-PURPOSE (NEMA 1) ENCLOSURE



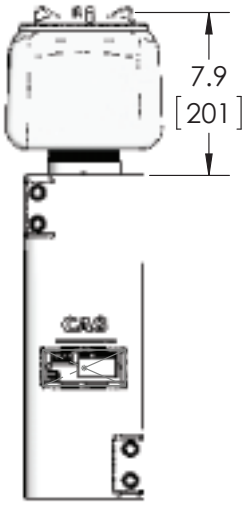

### MOISTURE-RESISTANT (NEMA 4) ENCLOSURE




### EXPLOSION-PROOF (NEMA 7) ENCLOSURE

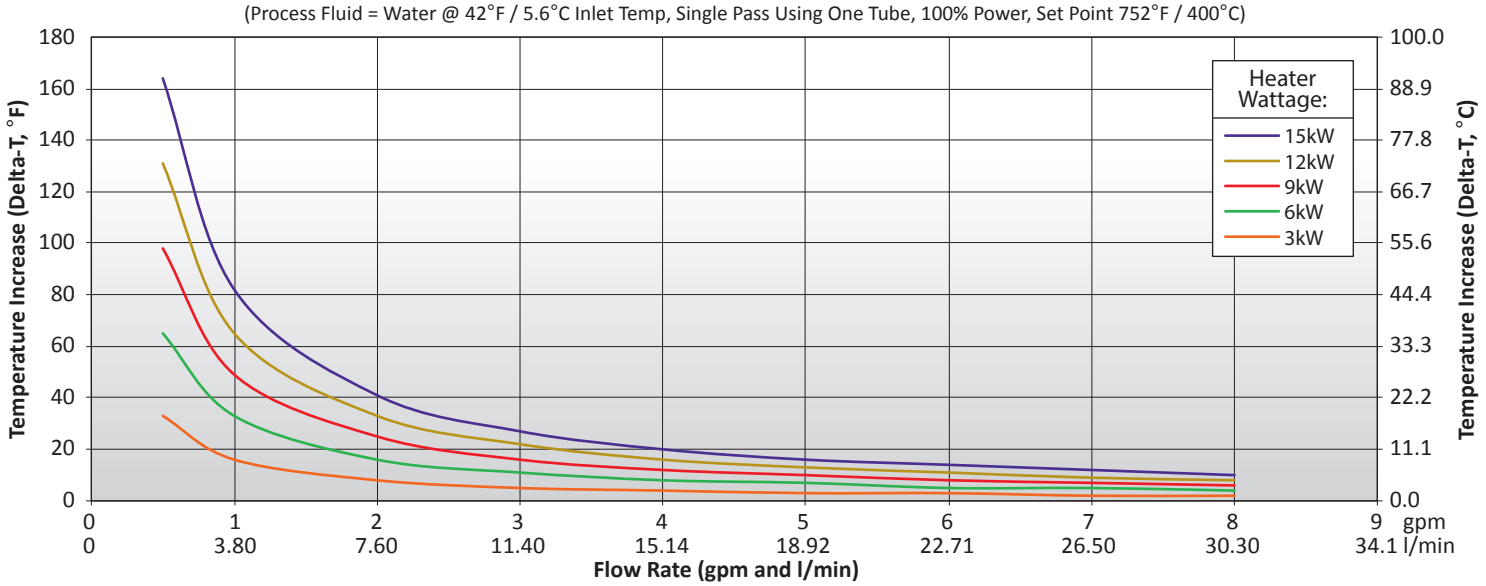



### EXPLOSION-PROOF (ATEX) ENCLOSURE



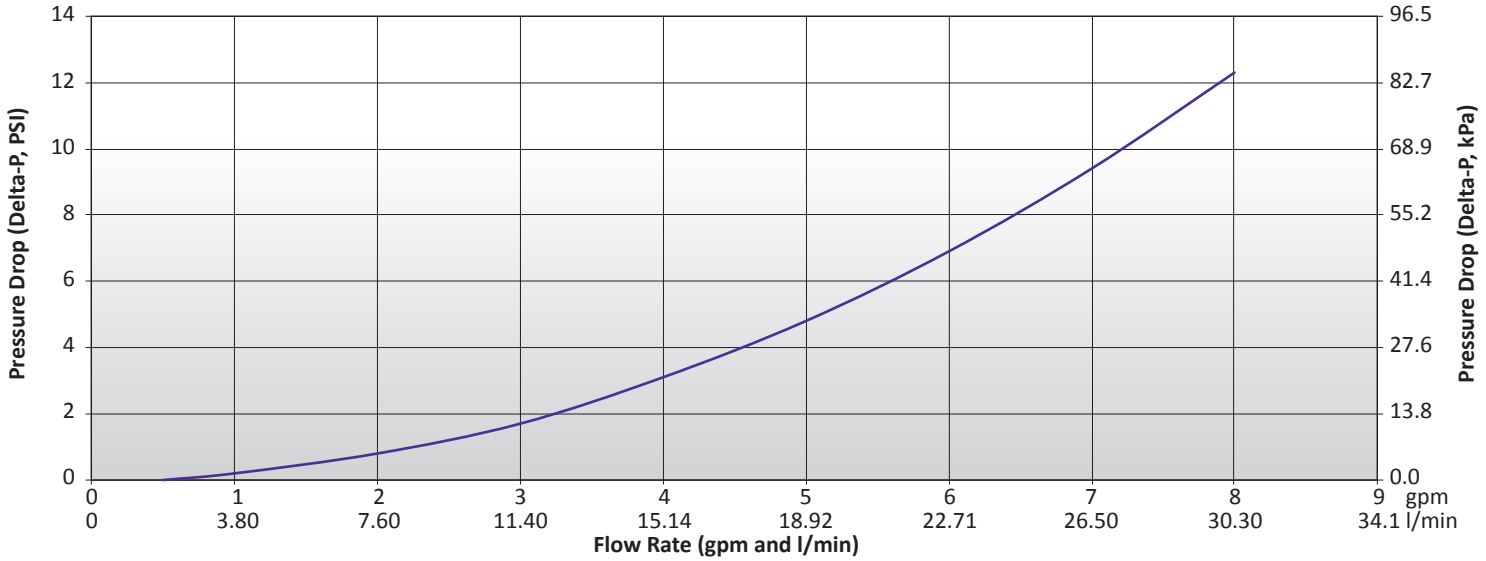

## CAST-X2500 Heating Profile: Delta-T Water

(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)



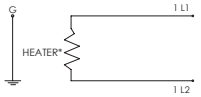
NEMA 1 ENCLOSURE

NEMA 4 ENCLOSURE

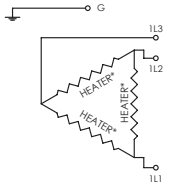
NEMA 7 ENCLOSURE

ATEX ENCLOSURE

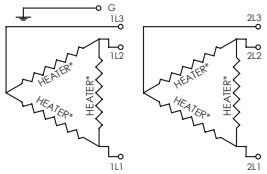
INSULATING JACKET



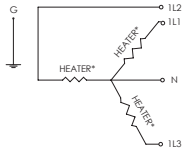

SINGLE PHASE CIRCUIT



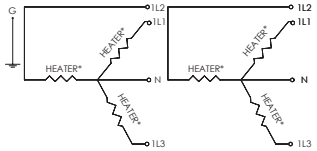

THREE-PHASE DELTA CIRCUIT




TWO THREE-PHASE DELTA CIRCUITS




THREE-PHASE WYE CIRCUIT



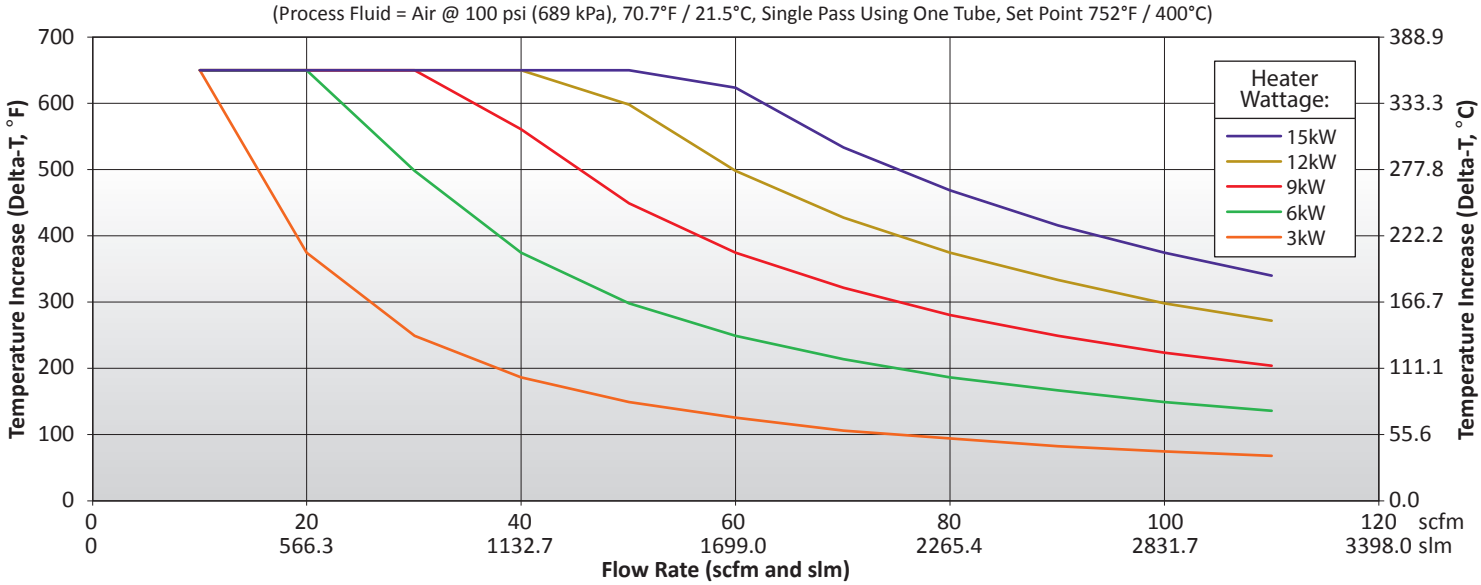

TWO THREE-PHASE WYE CIRCUITS

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).

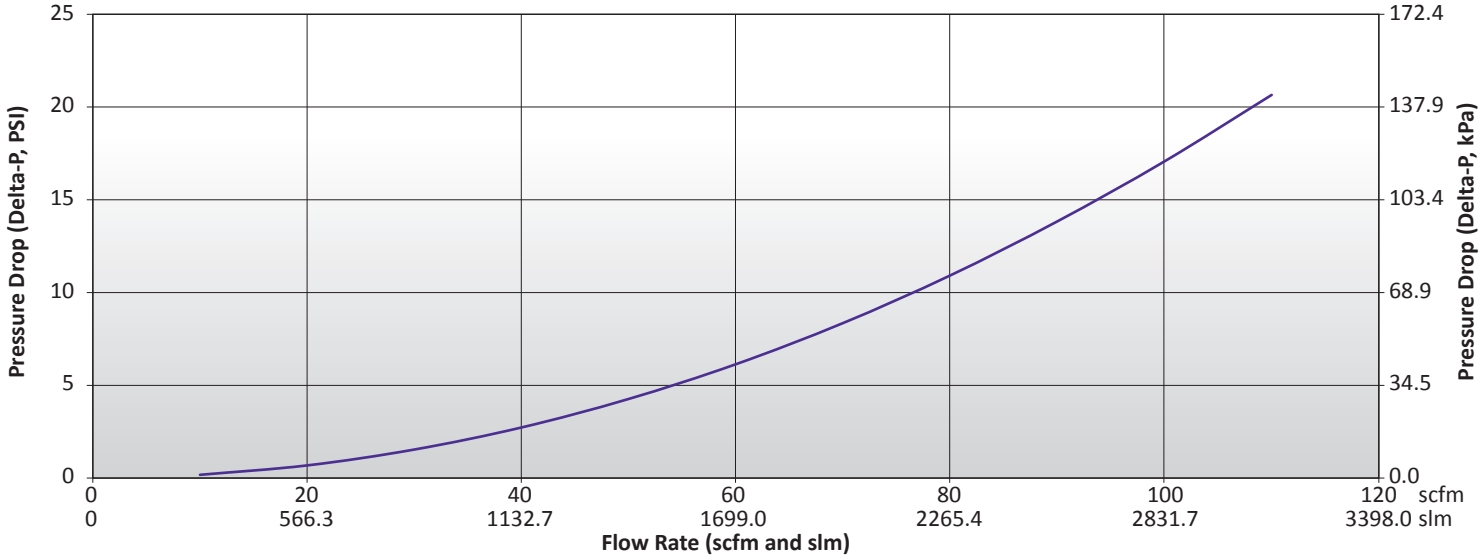
**CAST-X 2500 Heating Profile: Delta-T Air**

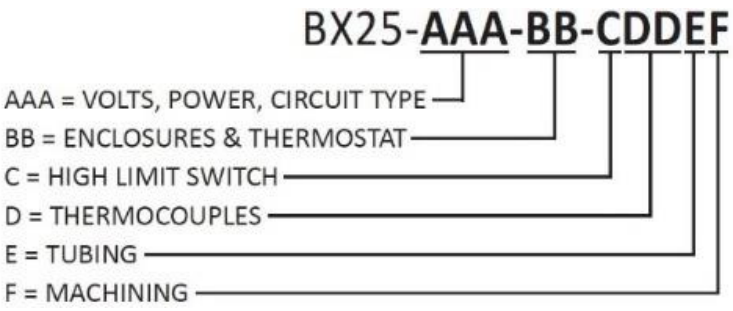
(Process Fluid = Air @ 100 psi (689 kPa), 70.7°F / 21.5°C, Single Pass Using One Tube, Set Point 752°F / 400°C)




**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)

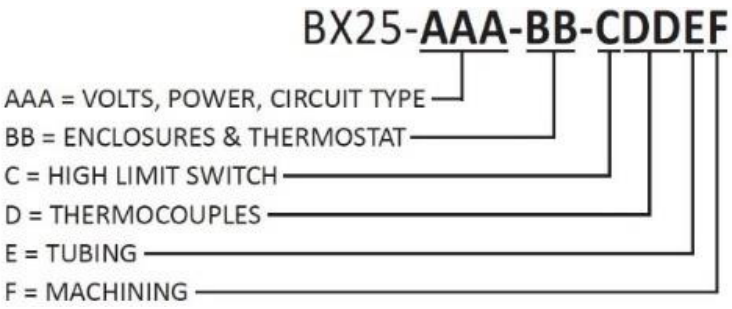





"AAA" Section

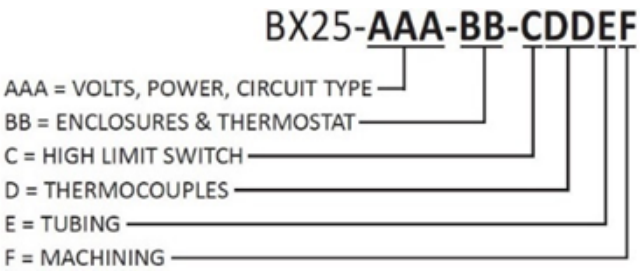
The first step in building a CAST-X 2500 part number is determining the volt, watt and circuit configuration. Select the "AAA" number (far left column) that best matches your specifications.

| VOLTAGE, POWER, CIRCUIT TYPE | | | | |
|---|---|---|---|---|
| Volts refers to line volts ($V_L$). Amps refers to line current ($I_L$). | | | | |
| **Section "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 | 575 | 7.2 | 7.2 |
| | | 480 | 5.0 | 6.0 |
| | | 415 | 3.7 | 5.2 |
| | | 400 | 3.4 | 5.0 |
| | | 380 | 3.1 | 4.8 |
| | | 240 | 1.2 | 3.0 |
| | | 230 | 1.1 | 2.9 |
| | | 220 | 1.0 | 2.0 |
| | | 208 | 0.9 | 2.6 |
| 023 | SINGLE PHASE | 415 | 11.2 | 27.0 |
| | | 400 | 10.4 | 26.0 |
| | | 380 | 9.4 | 24.7 |
| | | 240 | 3.7 | 15.6 |
| | | 230 | 3.4 | 15.0 |
| | | 208 | 2.8 | 13.5 |
| 031 | THREE-PHASE DELTA | 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 | 240 | 7.2 | 30.0 |
| | | 230 | 6.6 | 28.8 |
| | | 208 | 5.4 | 26.0 |
| 041 | THREE-PHASE DELTA | 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 |




| Section "AAA" | Circuit Type | Volts (V) | Watts (kW) | Amps (A) (per circuit) |
|---|---|---|---|---|
| 051 | THREE-PHASE DELTA | 415 | 12.0 | 16.6 |
| | | 400 | 11.1 | 16.0 |
| | | 380 | 10.0 | 15.2 |
| | | 240 | 4.0 | 9.6 |
| | | 208 | 3.0 | 8.3 |
| 052 | THREE-PHASE WYE | 575 | 7.6 | 7.7 |
| | | 480 | 5.3 | 6.4 |
| | | 415 | 4.0 | 5.6 |
| | | 400 | 3.7 | 5.4 |
| | | 380 | 3.3 | 5.1 |
| | | 240 | 1.3 | 3.2 |
| | | 230 | 1.2 | 3.1 |
| | | 220 | 1.1 | 2.9 |
| | | 208 | 1.0 | 2.8 |
| 053 | SINGLE PHASE | 415 | 12.0 | 28.8 |
| | | 400 | 11.1 | 27.8 |
| | | 380 | 10.0 | 26.4 |
| | | 347 | 8.3 | 24.1 |
| | | 240 | 4.0 | 16.7 |
| | | 230 | 3.6 | 16.0 |
| | | 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 |
| | | 240 | 1.0 | 2.4 |
| | | 230 | 0.9 | 2.3 |
| | | 220 | 0.8 | 2.2 |
| | | 208 | 0.7 | 2.1 |
| 063 | SINGLE PHASE | 480 | 4.0 | 8.3 |
| | | 415 | 3.0 | 7.2 |
| | | 400 | 2.8 | 6.9 |
| | | 380 | 2.5 | 6.6 |
| | | 347 | 2.1 | 6.0 |
| | | 240 | 1.0 | 4.2 |
| | | 230 | 0.9 | 4.0 |
| | | 220 | 0.8 | 3.8 |
| | | 208 | 0.7 | 3.6 |

| 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.<br>Always put the lowest designation number first in the part number to avoid duplicate configurations.<br>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 STS 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 STS Directly:
Main Tel: 704-399-4248
Sales@sethermal.com
www.sethermal.com