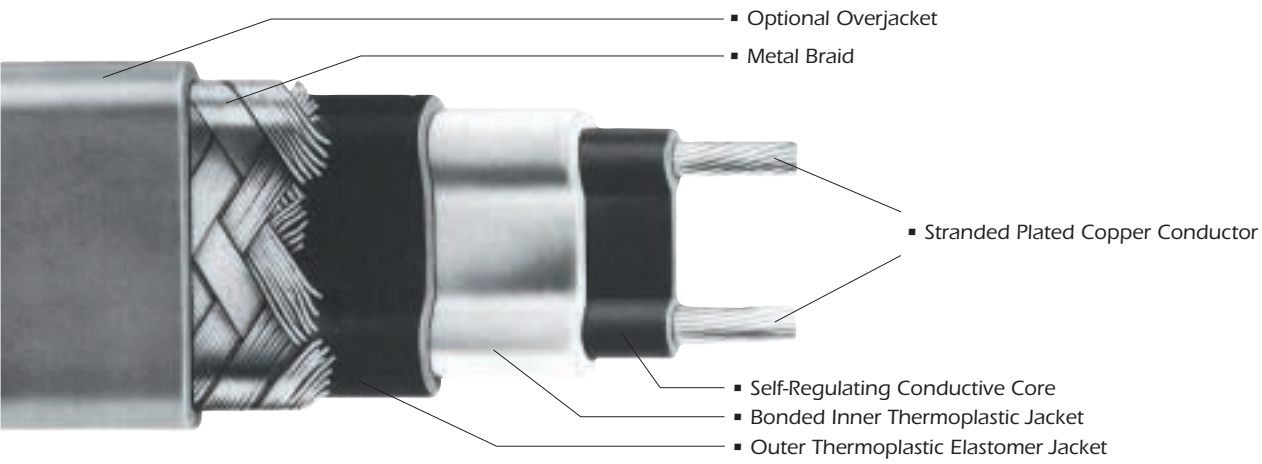
# SERGE BARIL FPS
## SELF-REGULATING HEATER CABLE

## SPECIFICATION/APPLICATION INFORMATION

**3 FPS-1B 3 FPS-2B**
**5 FPS-1B 5 FPS-2B**
**8 FPS-1B 8 FPS-2B**
**10 FPS-1B 10 FPS-2B**




1985-2015 30 YEARS

## Description:

Serge Baril FPS self-regulating heater cable is a parallel circuit electric heater strip. An irradiation cross-linked conductive polymer core material is extruded over the multi-stranded, tin-plated, 16-gauge copper bus wires. The conductive core material increases or decreases its heat output in response to temperature changes. Two jackets provide extra dielectric strength, moisture resistance and protection from impact and abrasion damage. The inner thermoplastic jacket is extruded over and bonded to the core material. A thermoplastic elastomer jacket is then extruded over the inner bonded jacket.

A metal braid is required on all heaters (tinned copper for ordinary or hazardous areas and stainless steel for mechanical abuse situations). An optional overjacket (fluoropolymer or modified polyolefin) can be specified when the heater cable is to be installed in wet or corrosive environments.

## Principle of Operation:

The parallel bus wires apply voltage along the entire length of the heater cable. The conductive core provides an infinite number of parallel conductive paths permitting the cable to be cut to any length in the field with no dead or cold zones developing. The heater cable derives its self-regulating characteristic from the inherent properties of the conductive core material. As the core material temperature increases, the number of conductive paths in the core material decreases, automatically decreasing the heat output. As the temperature decreases, the number of conductive paths increases, causing the heat output to increase. This occurs at every point along the length of the cable, adjusting the power output to the varying conditions along the pipe. The self-regulating effect allows the cable to be overlapped without creating hot spots or burnout. As the cable self-regulates its heat output, it provides for the efficient use of electric power, producing heat only when and where it is needed, and also limiting the maximum sheath temperature.

## Application:

Serge Baril FPS self-regulating heater cable is ideal for use in maintaining fluid flow under low ambient conditions. Freeze protection and low watt density process temperature systems such as product pipelines, fire protection, process water, dust suppression systems, lube oil, hot water and structure anti-icing are typical applications for this product.

For ordinary area installation or for use in dry non-corrosive, hazardous (classified) areas use the basic cable with a tinned copper metal braid.

**Options:** (replace -B by:)

**-SS** A stainless steel metal braid is available for use in dry, corrosive areas where mechanical abuse is a problem. Stainless steel metal braid is not recommended for use as a conductive ground path.

**-BA** A tinned copper metal braid with a modified polyolefin overjacket is available for use when the heater cable is exposed to aqueous solutions of inorganic chemicals (phosphate, dilute acids, chlorides, bases and carbonites). It is also recommended where mechanical abuse is a problem.

**-BT** A tinned copper metal braid with a fluoropolymer overjacket is available for use when the heater cable is exposed to excessive moisture, organic chemicals, solvents, etc. in hazardous (classified) areas and ordinary areas.

## Performance and Rating Data:

**T-Rating:** Electrical equipment T-Rating codes define the maximum surface temperature that the equipment will reach. It is used in hazardous (classified) area applications. 3,5, and 8 FPS heaters have a T6 rating, 10 FPS has a T5 rating.

**Maximum maintain temperature:** 150°F (65°C)

**Maximum exposure temperature:**
- Energized 150°F (65°C)
- Intermittent power off 185°F (85°C)

**Circuit breaker selection:** The circuit breaker is sized based on the maximum length (feet or meters) of cable that may be connected at the specific start-up temperature. The maximum heater segment is the longest length of heater allowable between the power connection point and the end seal. More than one segment may be connected to a single breaker as long as the maximum heater length per breaker size is not exceeded.

| Heater | Start-Up Temp. | | Max. Length Vs. Circuit Breaker Size | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 120 Volt | | | | | | | | 240 Volt | | | | | | | |
| | | | 15A | | 20A | | 30A | | 40A | | 15A | | 20A | | 30A | | 40A | |
| | °F | °C | ft | m | ft | m | ft | m | ft | m | ft | m | ft | m | ft | m | ft | m |
| **3 FPS** | 50 | 10 | 325 | 99.1 | 433* | 132.0* | 650* | 198.2* | 866* | 264.0* | 650 | 198.2 | 866* | 264.0* | 1300* | 396.3* | 1732* | 528.0* |
| Max. segment | 0 | -18 | 230 | 70.1 | 305 | 93.0 | 460* | 140.2* | 610* | 186.0* | 460 | 140.2 | 620 | 189.0 | 920* | 280.5* | 1240* | 378.0* |
| length | -20 | -29 | 205 | 62.5 | 275 | 83.8 | 410* | 125.0* | 550* | 167.7* | 410 | 125.0 | 550 | 167.7 | 820* | 250.0* | 1100* | 335.4* |
| 120V=325ft / 99.1m | -40 | -40 | 175 | 53.4 | 233 | 71.0 | 350* | 106.7* | 466* | 142.1* | 350 | 106.7 | 466 | 142.1 | 700* | 213.4* | 932* | 284.1* |
| 240V=650ft / 198.2m | | | | | | | | | | | | | | | | | | |
| **5 FPS** | 50 | 10 | 225 | 68.6 | 300* | 91.5* | 460* | 137.2* | 600* | 182.9* | 460 | 137.2 | 600* | 183.9* | 920* | 280.5* | 1200* | 365.9* |
| Max. segment | 0 | -18 | 155 | 47.3 | 206 | 62.8 | 310* | 94.5* | 412* | 125.6* | 310 | 94.5 | 415 | 126.5 | 620* | 189.0* | 830* | 253.0* |
| length | -20 | -29 | 135 | 41.2 | 180 | 54.9 | 270 | 82.3 | 360* | 109.8* | 275 | 83.8 | 370 | 112.8 | 550* | 167.7* | 740* | 225.6* |
| 120V=270ft / 82.3m | -40 | -40 | 122 | 37.2 | 162 | 49.4 | 244 | 74.4 | 324* | 98.8* | 244 | 74.4 | 325 | 99.1 | 488 | 148.8 | 650* | 198.2* |
| 240V=540ft / 164.6m | | | | | | | | | | | | | | | | | | |
| **8 FPS** | 50 | 10 | 145 | 44.2 | 193 | 58.8 | 290* | 88.4* | 386* | 117.7* | 295 | 89.9 | 392 | 119.5 | 590* | 179.9* | 784* | 239.0* |
| Max. segment | 0 | -18 | 102 | 31.1 | 137 | 41.8 | 205 | 62.5 | 274* | 83.5* | 205 | 62.5 | 273 | 83.2 | 410 | 125.0 | 546* | 166.5* |
| length | -20 | -29 | 92 | 28.0 | 123 | 37.5 | 184 | 56.1 | 246* | 75.0* | 184 | 56.1 | 245 | 74.7 | 368 | 112.2 | 490* | 149.4* |
| 120V=210ft / 64m | -40 | -40 | 84 | 25.6 | 111 | 33.8 | 167 | 50.9 | 222* | 67.7* | 168 | 51.2 | 223 | 68.0 | 336 | 102.4 | 446* | 136.0* |
| 240V=420ft / 128m | | | | | | | | | | | | | | | | | | |
| **10 FPS** | 50 | 10 | 120 | 36.6 | 160 | 48.8 | 240* | 73.2* | 320* | 97.6* | 240 | 73.2 | 320 | 97.6 | 480* | 146.3* | 640* | 195.1* |
| Max. segment | 0 | -18 | 89 | 27.1 | 118 | 36.0 | 177 | 54.0 | 236* | 72.0* | 177 | 54.0 | 236 | 72.0 | 354 | 107.9 | 473* | 144.2* |
| length | -20 | -29 | 80 | 24.4 | 107 | 32.6 | 160 | 48.8 | 214* | 65.2* | 160 | 48.8 | 214 | 65.2 | 321 | 97.9 | 428* | 130.5* |
| 120V=180ft / 54.9m | -40 | -40 | 73 | 22.3 | 98 | 29.9 | 147 | 44.8 | 196* | 59.8* | 147 | 44.8 | 195 | 59.5 | 293 | 89.3 | 391* | 119.2* |
| 240V=360ft / 109.8m | | | | | | | | | | | | | | | | | | |

*These lengths exceed the maximum segment length and require more than one segment per breaker.
For longer maximum circuit lengths under specific applications, consult the factory.

**Notes:** 1. Circuit Breakers are sized per article 427-4 of N.E.C.
2. When using 240 volt product at 208, 220, or 277 volts, use the circuit adjustment factors shown in the voltage adjustment table.
3. When using 2 or more heater cables of different wattage ratings in parallel on a single circuit breaker, use the 15A column amperage, divide it by the maximum length to arrive at an amps/foot (amps/meter) figure for each cable. You can then calculate the circuit breaker sizes for these combination loads. These include the N.E.C. sizing factor in Article 427-4.
4. Heater cables with B, SS, BA & BT constructions contain a metal ground shield as required by Article 427-23 of the N.E.C.
5. Heater cables require the use of ground fault interrupter/ground leakage device with a trip setting no greater than 30mA.

**CAUTION:** To minimize the danger of a wet wire fire (arcing fault) if the heating cable is damaged or improperly installed, both the Canadian and the National Electrical Code (NEC 1996) require the use of a ground fault protection device (GFPD) at all times in conjunction with the installation of heat tracers.

# SERGE BARIL FPS
## SELF-REGULATING HEATER CABLE

## SPECIFICATION/APPLICATION INFORMATION

### HEATER SELECTION CATALOG NUMBER

**X** **FPS - X** **XX**

**3** watts/ft at
**5** 50°F (10°C)
**8** on metal pipe
**10**

family of products

**B** ex: 3FPS-1B
**BA** ex: 3FPS-1BA
**BT** ex: 3FPS-1BT
***SS*** ex: 3FPS-1SS

**1** =120 VAC
**2** =208 / 220 / 240 / 277 VAC

### Typical applications

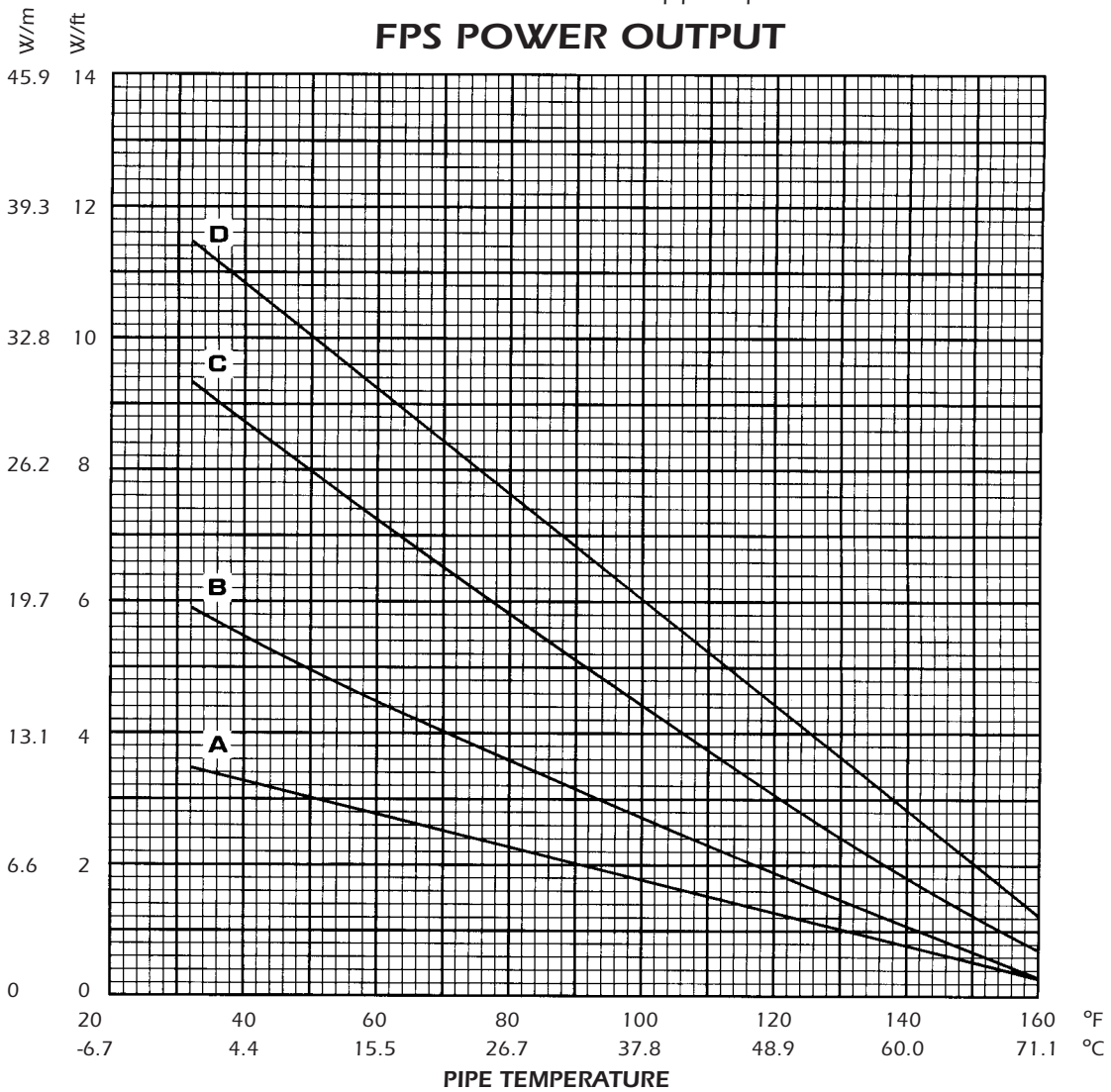
(For other than pipe or vessel tracing, see the appropriate application sheet)

**Heater with copper braid** (non-corrosive areas)
- Pipe freeze protection
- Tank freeze protection
- Maintain temperature on product pipelines
- Sprinkler freeze protection
- Hot water systems

**Heater with copper braid and polyolefin overjacket**
- Same as with copper braid

**Heater with copper braid and fluoropolymer overjacket** (corrosive areas)
- Same as with copper braid plus
- Drains, roofs & gutters
- Comfort and space heating
- Inside pipe for potable water

## FPS POWER OUTPUT




**A** 3FPS **B** 5FPS **C** 8FPS **D** 10FPS

## Voltage Adjustment:

*Use of these products at other than rated voltages requires minor adjustments in power and maximum circuit lengths.*

| | ADJUSTMENT MULTIPLIER | | | | | | Absolute max. segment length* | |
|---|---|---|---|---|---|---|---|---|
| | 208 VAC | | 220 VAC | | 277 VAC | | | |
| Product | Power | Length | Power | Length | Power | Length | ft | m |
| 3FPS-2 | .85 | .98 | .91 | .99 | 1.13 | 1.05 | 650 | 198.2 |
| 5FPS-2 | .87 | .98 | .92 | .97 | 1.09 | 1.06 | 540 | 164.6 |
| 8FPS-2 | .88 | .94 | .93 | .95 | 1.08 | 1.08 | 420 | 128.0 |
| 10FPS-2 | .89 | .94 | .94 | .95 | 1.05 | 1.07 | 360 | 109.8 |

*For longer maximum circuit lengths under specific applications, consult the factory.

## Approvals:

**FM**

**Ordinary Locations**
(with -B, -SS, -BT or -BA options)

**Hazardous (Classified) Locations**
(with -B, -BT or -BA options)
Class 1;Division 2;Groups B,C,D
Class II; Division 2; Group G;
Class III; Division 2
( C2D1 - option) Class II; Division I; Groups E,F,G
Class I; Zone 1; Groupe IIC

**CSA**

**Ordinary Locations**
(with -B, -BT or -BA options)

**Hazardous (Classified) Locations**
(with -B, -BT or -BA options)
Class I; Division 2;
Groups B,C,D Class II;
Division 2; Groups E,F,G
Class III; Division 2
(with -BT option)
Class I; Division 1;
Groups B,C,and D

**UL**

**Ordinary Locations**
(with -B , -BT or -BA options)

**Hazardous (Classified) Locations**
(with -B , -BT or -BA options)
Class I; Division 2;
Groups A,B,C,D Class II;
Division 2; Groups F,G
Class I; Zone 2 Group IIC
(D1-option) Class I; Division 1;
Groups B,C,D
Class II, Division 1;
Groups E,F,G
Class III

## Accessories

- Connection Kits for Power Connection, Tee Splice, Splice and End Seal (PST, AL-PST, SS-PST, HA Series)
- Thermostatic Controls (Ambient, or Line Sensing)
- Junction Boxes, Tapes and Warning Signs
- Custom Control Monitoring and Power Panels

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