

SRF

Self-Regulating Freeze Protection Heating Cable

- **Self-Regulating, Energy Efficient**
- **Cost Effective for Contractor/Construction Freeze Protection Application**
- **Freeze Protection of Fire Protection Systems**
- **Industrial Grade, 16 AWG Buss Wire**
- **Standard Braid and Optional Overjacket**
- **Circuit Lengths to 460 Feet**
- **3, 5 and 8 Watts per Foot**
- **120, 208-277 Volts Available From Stock**

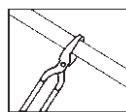
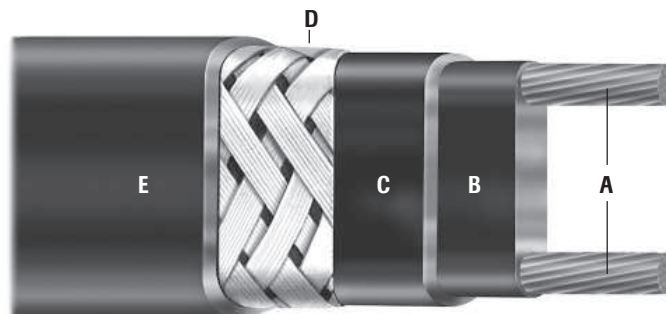


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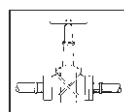


Chromalox®
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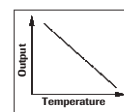
PDS SRF



Cut to Any Length in Field



Can be Single Overlapped



Self Regulating

Description

Chromalox SRF cable is ideal for keeping metal and plastic pipes warm in commercial construction, institutional buildings and some industrial freeze protection applications. SRF cable is constructed of a self-regulating polymer core that varies its output along its entire length, saving energy and eliminating hot spots along the pipe. Parallel construction makes it easier to install than zone or series types of cable since it can be cut to length at any point on the pipe. It can be single overlapped without overheating the cable.

Applications

Commercial Construction

- Cooling Towers
- Chilled Water and Plumbing Pipes
- Sump Discharge Pipes
- Fire Protection System Piping
- Exposed P-traps

Industrial

- Water Treatment Facilities
- Vessel Freeze Protection
- Safety Shower Lines

Construction

Standard

A. Buss Wires

Twin 16 AWG copper buss wires provide good current capability.

B. Matrix

A semiconductive polymer core whose electrical resistance varies with temperature. When process temperature drops, the core's heat output increases; conversely, as process temperature rises, heat output decreases.

C. Jacket

The flame retardant insulation jacket is a thermoplastic rubber material with excellent water resistance. It resists certain mildly corrosive chemicals.

D. Tinned Copper Braid

The braid covering the jacket provides an effective ground path and mechanical protection.

Optional

E. Overjacket

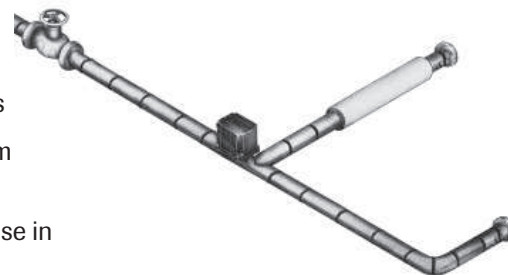
The TPR overcoat protects the braid, and provides resistance to water and certain inorganic chemical solutions.

Approvals

UL Listed for use in ordinary areas

UL Listed for fire protection system piping

FM - Factory Mutual certified for use in ordinary areas



THORNE &
DERRICK
INTERNATIONAL

Thorne & Derrick
+44 (0) 191 490 1547
www.heatingandprocess.com

THORNE &
DERRICK
INTERNATIONAL
+44 (0) 191 410 4292
www.heatingandprocess.com



SRF – Self-Regulating Freeze Protection Heating Cable

Heating Cable Selection Guide

1. Determine Application Data

• Pipe Size/Type • Insulation Thickness • Minimum Ambient Temperature • Operating Voltage

2. Select Cable Rating

Using the selection chart on the following pages and application data from Step 1, above, select the correct cable rating and number of runs needed.

Example: *Pipe Size / Type:* 6" Metal
 Insulation: 1"
 Minimum Ambient Temperature: -10° F
 Operating Voltage: 120 Volts

From the chart for 6" metal pipe, 2 Runs of SRF5 (SRF5 x 2) are needed.

To specify 120 volts, add "-1C" to the cable model number (SRF5-1C); to specify 208-277 volts add "-2C" to the cable model number. If protection against abrasion or inorganic chemical corrosion is required, specify "-1CR" for 120 volt TPR overcoat option or "-2CR" for 208-277 volt TPR overcoat option.

3. Calculate Heating Cable Quantity

The total amount of heating cable is determined by adding the total footage of pipe to be traced and an allowance for the components such as flanges, valves, pipe supports, then multiplying by the total number of runs determined in Step 2 (above).

(Total Feet of Traced Pipe + Cable Allowance for Components) x # of Runs = Total Cable Length

Component Cable Allowances

Component	Cable Allowance (Ft.)		# of Components
Flange Pair	1.5	x	_____
Pipe Support	2.0	x	_____
Butterfly Valve	2.5	x	_____
Ball Valve	2.7	x	_____
Globe Valve	4.0	x	_____
Gate Valve	5.0	x	_____

Example: *Pipe:* 150 feet
 Valves: 1 globe valve
 Pipe Supports: 2
 Flanges: 2

$$\begin{aligned} \text{Total Cable Length} &= [150 + (1 \times 4.0) + (2 \times 2.0) + (2 \times 1.5)] \times 2 \text{ Runs} \\ &= 161 \text{ feet} \times 2 \text{ Runs} \\ &= 322 \text{ feet} \end{aligned}$$

4. Determine Circuits/Circuit Protection

Circuit protection depends on the breaker size being used and the start-up temperature. The National Electric Code (NEC 1999) requires the use of ground fault protection breakers for heating cable. The following chart shows the maximum circuit length for a given breaker rating. To determine the number of circuits required for each pipe, divide the total cable (circuit) length found in Step 3 by the maximum circuit length found in the chart. Round up to the next higher number.

$$\text{Number of Circuits} = \frac{\text{Heater Length}}{\text{Maximum Circuit Length}}$$

Self-Regulating Freeze Protection Heating Cable – SRF

4. Determine Circuits/Circuit Protection

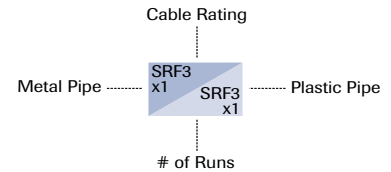
Cable Rating	Circuit Breaker	Maximum Circuit Lengths (Ft.)					
		40° F Start-Up			0° F Start-Up		
		20 Amp	30 Amp	40 Amp	20 Amp	30 Amp	40 Amp
SRF3-1C		350	360	N/R	270	360	N/R
SRF3-2C		660	N/R	N/R	555	660	N/R
SRF5-1C		230	270	N/R	180	270	N/R
SRF5-2C		450	540	N/R	360	540	N/R
SRF8-1C		180	215	N/R	145	215	N/R
SRF8-2C		330	420	420	265	395	420

N/R = Not Required. Maximum circuit length has been reached in a smaller breaker size.

Example: Using 20 Amp circuit breakers, how many circuits are needed for the 322 foot circuit shown in Step 3 in a 40°F start-up environment?
From the chart. SRF5-1C maximum circuit length is 180 feet.
Number of circuits = $\frac{322 \text{ feet}}{180 \text{ feet}}$
= 2 Circuits

SRF Cable Selection Chart

- Selections suitable for 120V and 208-277V applications.
- Design based on straight runs of cable or pipe. Spiralling is not required.
- Heat loss is based on 40°F maintenance temperature and fiberglass insulation K = 0.25 at 50°F
- Non-metallic pipe heat losses are based on using AT-1 aluminum tape for improving heat transfer. Be sure to use “-CR” designation for a ground path for non-metallic pipe applications.
- Only 3 W/Ft. rating is UL Listed for non-metallic pipe applications.



Each block specifies cable rating and # of runs for metal pipe (dark) and plastic pipe (light).

0.50" Pipe

Insulation Thickness (In.)	Minimum Ambient Temperature				
	0°	-10°	-20°	-30°	-40°
0.5	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF5 x1 SRF5 x1	SRF5 x1 SRF5 x1
1.0	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1
1.5	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1
2.0	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1
3.0	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1

1.00" Pipe

Insulation Thickness (In.)	Minimum Ambient Temperature				
	0°	-10°	-20°	-30°	-40°
0.5	SRF3 x1 SRF5 x1	SRF5 x1 SRF5 x1	SRF5 x1 SRF5 x1	SRF5 x1 SRF8 x1	SRF8 x1 SRF8 x1
1.0	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF5 x1 SRF5 x1	SRF5 x1 SRF5 x1
1.5	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF5 x1
2.0	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1
3.0	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1

0.75" Pipe

Insulation Thickness (In.)	Minimum Ambient Temperature				
	0°	-10°	-20°	-30°	-40°
0.5	SRF3 x1 SRF3 x1	SRF3 x1 SRF5 x1	SRF5 x1 SRF5 x1	SRF5 x1 SRF5 x1	SRF5 x1 SRF5 x1
1.0	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF5 x1
1.5	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1
2.0	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1
3.0	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1

1.25" Pipe

Insulation Thickness (In.)	Minimum Ambient Temperature				
	0°	-10°	-20°	-30°	-40°
0.5	SRF5 x1 SRF5 x1	SRF5 x1 SRF5 x1	SRF5 x1 SRF8 x1	SRF8 x1 SRF8 x1	SRF8 x1 SRF8 x1
1.0	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF5 x1 SRF5 x1	SRF5 x1 SRF5 x1	SRF5 x1 SRF5 x1
1.5	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF5 x1	SRF5 x1 SRF5 x1
2.0	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1
3.0	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1	SRF3 x1 SRF3 x1

SRF – Self-Regulating Freeze Protection Heating Cable

SRF Cable Selection Chart

1.50" Pipe

	0°	Minimum Ambient Temperature -10°	-20°	-30°	-40°
0.5	SRF5 x1	SRF5 x1	SRF8 x1	SRF8 x1	SRF8 x1
1.0	SRF3 x1	SRF3 x1	SRF5 x1	SRF5 x1	SRF5 x1
1.5	SRF3 x1	SRF3 x1	SRF3 x1	SRF5 x1	SRF5 x1
2.0	SRF3 x1	SRF3 x1	SRF3 x1	SRF3 x1	SRF5 x1
3.0	SRF3 x1	SRF3 x1	SRF3 x1	SRF3 x1	SRF3 x1

3.50" Pipe

	0°	Minimum Ambient Temperature -10°	-20°	-30°	-40°
0.5	SRF8 x1	SRF5 x2	SRF8 x2	SRF8 x2	SRF8 x3
1.0	SRF5 x1	SRF8 x1	SRF8 x1	SRF8 x1	SRF5 x2
1.5	SRF5 x1	SRF5 x1	SRF5 x1	SRF8 x1	SRF8 x1
2.0	SRF3 x1	SRF5 x1	SRF5 x1	SRF5 x1	SRF5 x1
3.0	SRF3 x1	SRF3 x1	SRF3 x1	SRF5 x1	SRF5 x1

2.00" Pipe

	0°	Minimum Ambient Temperature -10°	-20°	-30°	-40°
0.5	SRF5 x1	SRF8 x1	SRF8 x1	SRF8 x1	SRF5 x2
1.0	SRF3 x1	SRF5 x1	SRF5 x1	SRF5 x1	SRF8 x1
1.5	SRF3 x1	SRF3 x1	SRF5 x1	SRF5 x1	SRF5 x1
2.0	SRF3 x1	SRF3 x1	SRF3 x1	SRF5 x1	SRF5 x1
3.0	SRF3 x1	SRF3 x1	SRF3 x1	SRF3 x1	SRF5 x1

4.00" Pipe

	0°	Minimum Ambient Temperature -10°	-20°	-30°	-40°
0.5	SRF5 x2	SRF8 x2	SRF8 x2	SRF8 x2	SRF8 x3
1.0	SRF5 x1	SRF8 x1	SRF8 x1	SRF8 x1	SRF5 x2
1.5	SRF5 x1	SRF5 x1	SRF8 x1	SRF8 x1	SRF8 x1
2.0	SRF3 x1	SRF5 x1	SRF5 x1	SRF5 x1	SRF8 x1
3.0	SRF3 x1	SRF3 x1	SRF5 x1	SRF5 x1	SRF5 x1

2.50" Pipe

	0°	Minimum Ambient Temperature -10°	-20°	-30°	-40°
0.5	SRF8 x1	SRF8 x1	SRF5 x2	SRF8 x2	SRF8 x2
1.0	SRF5 x1	SRF5 x1	SRF5 x1	SRF8 x1	SRF8 x1
1.5	SRF3 x1	SRF5 x1	SRF5 x1	SRF5 x1	SRF8 x1
2.0	SRF3 x1	SRF3 x1	SRF5 x1	SRF5 x1	SRF5 x1
3.0	SRF3 x1	SRF3 x1	SRF3 x1	SRF3 x1	SRF5 x1

5.00" Pipe

	0°	Minimum Ambient Temperature -10°	-20°	-30°	-40°
0.5	SRF8 x2	SRF8 x2	SRF8 x3	SRF8 x3	SRF8 x3
1.0	SRF8 x1	SRF8 x1	SRF5 x2	SRF5 x2	SRF8 x2
1.5	SRF5 x1	SRF5 x1	SRF8 x1	SRF8 x1	SRF8 x1
2.0	SRF5 x1	SRF5 x1	SRF5 x1	SRF8 x1	SRF8 x1
3.0	SRF3 x1	SRF5 x1	SRF5 x1	SRF5 x1	SRF5 x1

3.00" Pipe

	0°	Minimum Ambient Temperature -10°	-20°	-30°	-40°
0.5	SRF8 x1	SRF5 x2	SRF5 x2	SRF8 x2	SRF8 x2
1.0	SRF5 x1	SRF5 x1	SRF8 x1	SRF8 x1	SRF8 x1
1.5	SRF3 x1	SRF5 x1	SRF5 x1	SRF5 x1	SRF8 x1
2.0	SRF3 x1	SRF3 x1	SRF5 x1	SRF5 x1	SRF5 x1
3.0	SRF3 x1	SRF3 x1	SRF3 x1	SRF5 x1	SRF5 x1

6.00" Pipe

	0°	Minimum Ambient Temperature -10°	-20°	-30°	-40°
0.5	SRF8 x2	SRF8 x2	SRF8 x3	SRF8 x3	SRF8 x4
1.0	SRF8 x1	SRF5 x2	SRF5 x2	SRF8 x2	SRF8 x2
1.5	SRF5 x1	SRF8 x1	SRF8 x1	SRF8 x1	SRF5 x2
2.0	SRF5 x1	SRF5 x1	SRF8 x1	SRF8 x1	SRF8 x1
3.0	SRF3 x1	SRF5 x1	SRF5 x1	SRF5 x1	SRF8 x1

Self-Regulating Freeze Protection Heating Cable – SRF

SRF Cable Selection Chart

8.00" Pipe

	0°	Minimum Ambient Temperature -10°	-20°	-30°	-40°
Insulation Thickness (In.)					
1.0	SRF5 x2	SRF8 x2	SRF8 x2	SRF8 x2	SRF8 x3
1.5	SRF8 x1	SRF8 x1	SRF5 x2	SRF8 x2	SRF8 x2
2.0	SRF5 x1	SRF8 x1	SRF8 x1	SRF8 x1	SRF5 x2
3.0	SRF5 x1	SRF5 x1	SRF8 x1	SRF8 x1	SRF8 x1

16.00" Pipe

	0°	Minimum Ambient Temperature -10°	-20°	-30°	-40°
Insulation Thickness (In.)					
1.0	SRF8 x2	SRF8 x3	SRF8 x3	SRF8 x4	SRF8 x4
1.5	SRF8 x2	SRF8 x2	SRF8 x3	SRF8 x3	SRF8 x3
2.0	SRF5 x2	SRF8 x2	SRF8 x2	SRF8 x2	SRF8 x3
3.0	SRF8 x1	SRF8 x1	SRF5 x2	SRF8 x2	SRF8 x2

10.00" Pipe

	0°	Minimum Ambient Temperature -10°	-20°	-30°	-40°
Insulation Thickness (In.)					
1.0	SRF8 x2	SRF8 x2	SRF8 x2	SRF8 x3	SRF8 x3
1.5	SRF8 x1	SRF5 x2	SRF8 x2	SRF8 x2	SRF8 x2
2.0	SRF8 x1	SRF8 x1	SRF5 x2	SRF8 x2	SRF8 x2
3.0	SRF5 x1	SRF5 x1	SRF8 x1	SRF8 x1	SRF8 x2

18.00" Pipe

	0°	Minimum Ambient Temperature -10°	-20°	-30°	-40°
Insulation Thickness (In.)					
1.0	SRF8 x3	SRF8 x3	SRF8 x4	SRF8 x4	SRF8 x4
1.5	SRF8 x2	SRF8 x2	SRF8 x3	SRF8 x3	SRF8 x3
2.0	SRF5 x2	SRF8 x2	SRF8 x2	SRF8 x3	SRF8 x3
3.0	SRF8 x1	SRF5 x2	SRF8 x2	SRF8 x2	SRF8 x2

12.00" Pipe

	0°	Minimum Ambient Temperature -10°	-20°	-30°	-40°
Insulation Thickness (In.)					
1.0	SRF8 x2	SRF8 x2	SRF8 x3	SRF8 x3	SRF8 x4
1.5	SRF5 x2	SRF8 x2	SRF8 x2	SRF8 x2	SRF8 x3
2.0	SRF8 x1	SRF5 x2	SRF5 x2	SRF8 x2	SRF8 x2
3.0	SRF5 x1	SRF8 x1	SRF8 x1	SRF8 x1	SRF5 x2

20.00" Pipe

	0°	Minimum Ambient Temperature -10°	-20°	-30°	-40°
Insulation Thickness (In.)					
1.0	SRF8 x3	SRF8 x4	SRF8 x4	SRF8 x4	SRF8 x4
1.5	SRF8 x2	SRF8 x3	SRF8 x3	SRF8 x4	SRF8 x4
2.0	SRF8 x2	SRF8 x2	SRF8 x2	SRF8 x3	SRF8 x3
3.0	SRF8 x1	SRF5 x2	SRF8 x2	SRF8 x2	SRF8 x2

14.00" Pipe

	0°	Minimum Ambient Temperature -10°	-20°	-30°	-40°
Insulation Thickness (In.)					
1.0	SRF8 x2	SRF8 x3	SRF8 x3	SRF8 x4	SRF8 x4
1.5	SRF5 x2	SRF8 x2	SRF8 x2	SRF8 x3	SRF8 x3
2.0	SRF8 x1	SRF5 x2	SRF8 x2	SRF8 x2	SRF8 x3
3.0	SRF8 x1	SRF8 x1	SRF8 x1	SRF5 x2	SRF8 x2

24.00" Pipe

	0°	Minimum Ambient Temperature -10°	-20°	-30°	-40°
Insulation Thickness (In.)					
1.0	SRF8 x3	SRF8 x4	SRF8 x4	SRF8 x4	SRF8 x4
1.5	SRF8 x2	SRF8 x3	SRF8 x3	SRF8 x4	SRF8 x4
2.0	SRF8 x2	SRF8 x2	SRF8 x3	SRF8 x3	SRF8 x3
3.0	SRF5 x2	SRF8 x2	SRF8 x2	SRF8 x2	SRF8 x3

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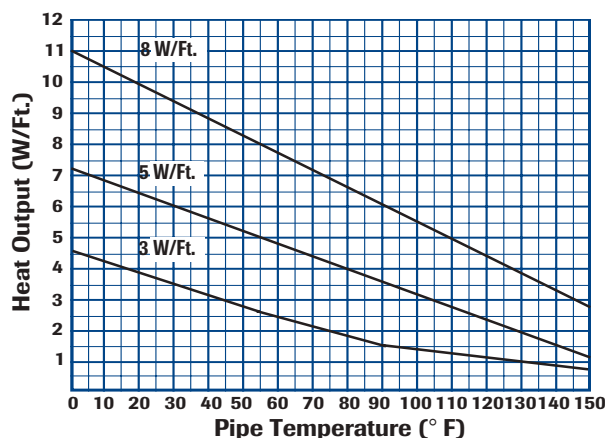
Specifications

Cable Ratings

Model Number	Output @ 50°F (W/Ft.)	Voltage (Vac)	Maximum Circuit Length* (Ft.)
SRF3-1	3	120	360
SRF3-2	3	208-277	660
SRF5-1	5	120	270
SRF5-2	5	208-277	540
SRF8-1	8	120	215
SRF8-2	8	208-277	420

*See chart on page 3 for maximum circuit lengths by start-up temperature and circuit breaker size.

SRF Cable Output vs. Pipe Temperature



Ordering Information

Output at Rated Voltage (50° F)

(W/Ft.)	Voltage	Model Number	PCN	Wt.(Lbs.) 1000'
3	120	SRF3-1C	386943	53
3	208-277	SRF3-2C	386951	53
5	120	SRF5-1C	386960	53
5	208-277	SRF5-2C	386978	53
8	120	SRF8-1C	386986	53
8	208-277	SRF8-2C	386994	53
With Optional Overjacket:				
3	120	SRF3-1CR	386100	64
3	208-277	SRF3-2CR	386118	64
5	120	SRF5-1CR	386142	64
5	208-277	SRF5-2CR	386150	64
8	120	SRF8-1CR	386062	64
8	208-277	SRF8-2CR	386070	64

Accessories

Chromalox has a complete line of accessories specifically designed for use with SRF cable. Use only Chromalox accessories to ensure the performance of the heat trace system.

	Model	Description
Thermostat	RTAS*	DL Series air-sensing thermostat with microswitch for local control of circuit.
	RTBC*	DL Series pipewall-sensing thermostat with Microswitch®.
Power Connection	RT-JBC-1**	Power termination kit for entry into JBLT box for one circuit.
Junction Box	JBLT**	Junction box.
Splice & Tee Kit	RT-RST**	Includes materials for 5 splices and/or tees.
End Seal Fitting	RT-RES**	Includes materials for 5 end seals.
Pipe Straps	PS-1, PS-3, PS-10**	Pipe straps to affix RT-JBC-1 and RTAS kits to pipes.
Fiberglass Tape	FT-2**	Tape to affix cable to pipe, 66' x 1/2" roll, install on 12" centers.
Aluminum Tape	AT-1**	Tape to aid heat transfer on plastic pipes, 180 foot roll. Apply over cable along entire length of circuit.
Caution Labels	CL-1**	"Electrical Heat Tracing" caution labels, 5 per package. Install every 10 feet.
Control Panels		Contact your Chromalox representative for Control Panel information.

*For PCN's, refer to DL Series connection system accessories product data sheet.

**For PCN's refer to EL Series connection system accessories product data sheet.

PJ317-4

PDS SRF

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