



## SR\*CB, Braid Only Cable—Dry Locations ONLY Pipe Freeze Protection Self-Regulating Heating Cable Application/Specification Guide

### READ CAREFULLY

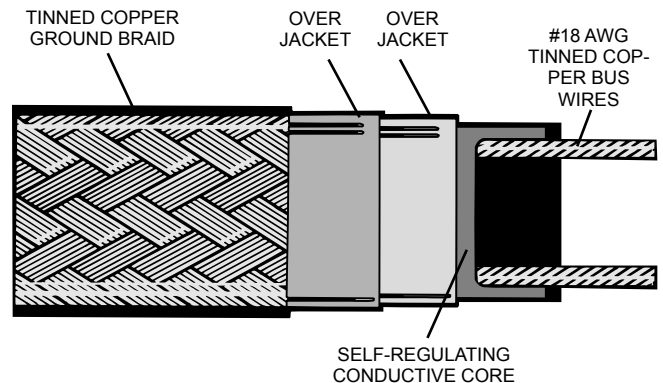
### PRINCIPLE OF OPERATION

SR Trace self-regulating heating cables automatically vary their heat output with changes in surrounding temperature. Since these cables regulate their heat output with temperature, a thermostat may not be necessary for some freeze protection applications. Suitable for use on plastic or metal pipes in ordinary locations.

The Easy Heat SR Trace cable is available with power densities of 3, 5 and 8 watts per foot. This wattage is specified at a surrounding temperature of 50°F. At other temperatures, of course, the cable power output will be considerably different.

Because of the self-regulating feature of this cable, it can be safely wrapped over itself (overlapped), if necessary, when installed on pipes, valves or flanges.

### CONSTRUCTION DETAILS



### PERFORMANCE INFORMATION

#### Performance and Rating Data

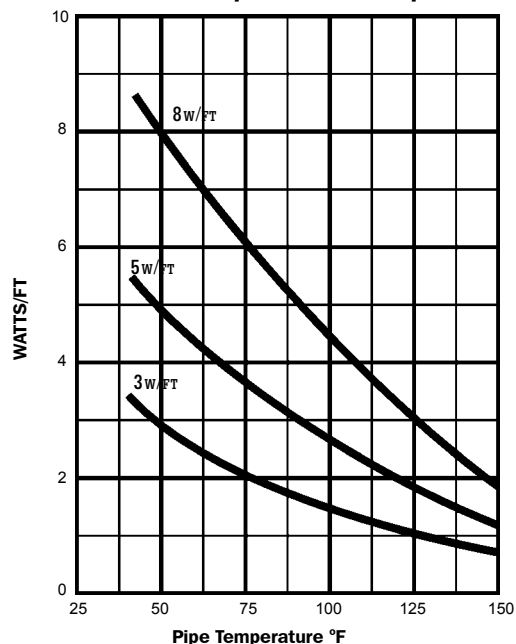
Catalog Number	Service Voltage	Power Rating Watts/Ft @ 50°F (10°C)	Maximum Length Single Run
SR31CB	120	3	221FT (67M)
SR32CB	240	3	533FT (163M)
SR51CB	120	5	178FT (54M)
SR52CB	240	5	458FT (140M)
SR81CB	120	8	142FT (43M)
SR82CB	240	8	347FT (106M)

Maximum maintenance temperature, all cables: 150°F (66°C).  
Maximum intermittent exposure temperature, all cables: 185°F (85°C).

#### Voltage Adjustment Table

Cable	Power Rating Multiplier						
	190 VAC	200 VAC	208 VAC	220 VAC	230 VAC	240 VAC	277 VAC
SR32CB	0.58	0.65	0.71	0.81	0.90	1.00	1.34
SR52CB	0.70	0.76	0.80	0.88	0.94	1.00	1.20
SR82CB	0.80	0.84	0.87	0.92	0.96	1.00	1.12

Nominal Power Output on Metal Pipe



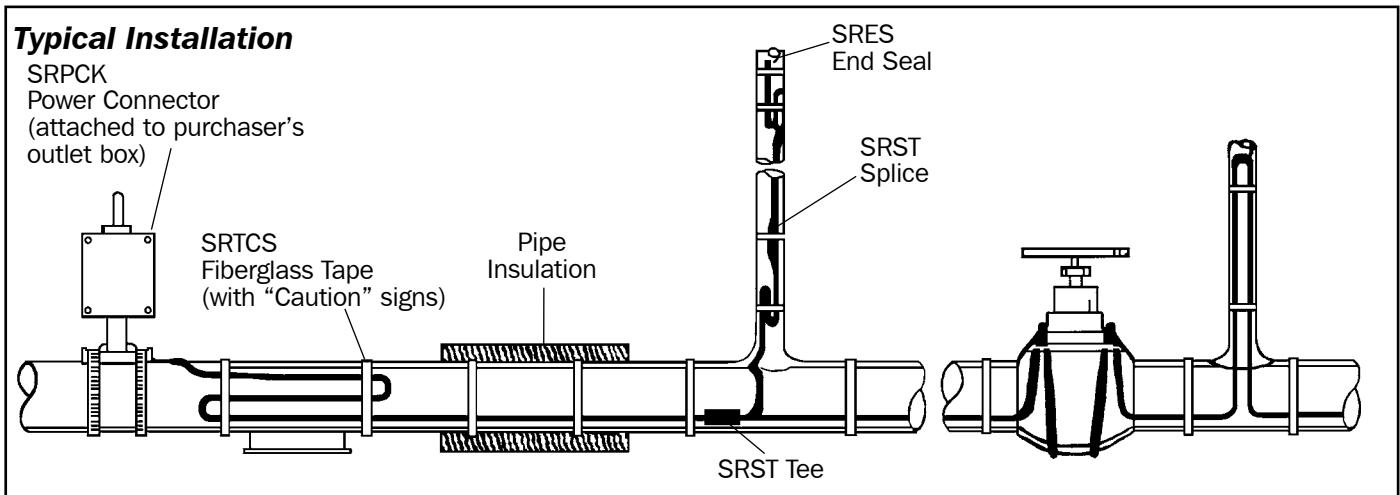
## PERFORMANCE NOTES

1. Circuit breakers are sized per article 427-4 of NEC and CSA/CEC 62-114.
2. To operate 240 Volt cables at 208, 220 or 277 volts, the cable power is modified by the "Power Rating Multiplier" in the Voltage Adjustment table. The maximum total lengths on a circuit breaker (Circuit Breaker Selection table) and the maximum single run lengths (Performance and Rating Cata table) do not change.
3. When using two (2) or more heating cables of different wattage ratings in parallel on a single circuit breaker, use the 15A column amperage of 15 amps, divide it by the maximum footage to arrive at an amps/foot figure for each cable. Then calculate circuit breaker size for the combined loads. These amps/foot factors include the sizing factor in (1) above.
4. The use of ground fault protection equipment for heating cable applications is required by NEC and CSA/CEC.

## Circuit Breaker Selection

Voltage	Cable Power Watts/Ft	Min. Start-up Temperature	Max. Total Cable Length vs. Circuit Breaker Rating		
			15A	20A	30A
120	3	40°F (4°C)	270FT (82M)	360FT (110M)	540FT (165M)
		0°F (-18°C)	210FT (64M)	280FT (85M)	420FT (128M)
	5	40°F (4°C)	195FT (59M)	255FT (78M)	385FT (117M)
	8	40°F (4°C)	135FT (41M)	180FT (55M)	270FT (82M)
		0°F (-18°C)	105FT (32M)	140FT (43M)	210FT (64M)
208/ 240/ 277	3	40°F (4°C)	540FT (165M)	720FT (220M)	1080FT (329M)
		0°F (-18°C)	420FT (128M)	555FT (169M)	835FT (255M)
	5	40°F (4°C)	385FT (117M)	515FT (157M)	770FT (235M)
	8	40°F (4°C)	310FT (95M)	415FT (127M)	620FT (189M)
		0°F (-18°C)	270FT (82M)	110FT (34M)	540FT (165M)
		0°F (-18°C)	210FT (64M)	85FT (26M)	425FT (130M)

## APPLICATION



### STEP 1. PLANNING

Determine the following information to enable proper selection of heating cable:

- Pipe diameter
- Pipe length
- Pipe material
- Minimum ambient temperature
- Type of insulation
- Thickness of insulation
- Number of flanges, pipe supports, shoes, etc.
- Power supply voltage
- Number of valves

### STEP 2. CABLE SELECTION

Using the information from Step 1, select the appropriate heater cable type and number required from Table 1, page 3.

### STEP 3. DETERMINE CABLE LENGTH

$$\text{Length required} = \text{Number required} \times \text{pipe length} + 4 \times \text{Number of valves} + 2 \times \text{Number of flanges/ supports, etc.}$$

Insulation = Fiberglass (0.6 lbs/cu. ft.)

- A = SR31CB (120V) or SR32CB (240 or 277V‡)
- B = SR51CB (120V) or SR52CB (240 or 277V‡)
- C = SR81CB (120V) or SR82CB (240 or 277V‡)

‡ for operation at 208 Volts, use the cable recommended for the next colder Minimum Ambient Temperature. For example, to protect a 2½" metal pipe with ½" insulation to 14°F, using 208V supply, use SR52CB cable.

- M = Metal Pipe
- P = Plastic pipe
- PT = Plastic pipe with aluminum tape covering cable

Run the cable straight along the bottom of the pipe. If two cables are required, attach them at the 4 and 8 o'clock positions.

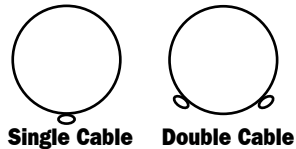


Table 1—Pipe Freeze Protection Quick Selection Guide

Pipe Diameter (inch/mm)	Insulation Thickness (inch/mm)	Minimum Ambient Temperature											
		14°F/10°C			-4°F/-20°C			-22°F/-30°C			-40°F/-40°C		
		M	P	PT	M	P	PT	M	P	PT	M	P	PT
½ 12 ¾ 18 1 25 1¼ 30 1½ 38 2 50 2½ 62 3 75 4 100 6 150	0.5 inch 12 mm	A	A	A	A	A	A	A	B	A	A	B	A
		A	A	A	A	A	A	A	B	A	B	B	B
		A	A	A	A	B	A	B	B	B	B	B	B
		A	A	A	B	B	B	B	C	B	B	C	B
		A	B	A	B	B	B	B	C	B	C	2B	C
		A	B	A	B	C	B	C	2B	C	C	2B	C
		B	B	B	C	2B	C	2B	2C	2B	2B	3B	2C
1½ 38 2 50 2½ 62 3 75 4 100 6 150 8 200	1 inch 25 mm	A	A	A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A	B	A
		A	A	A	A	A	A	B	B	B	B	B	B
		A	A	A	A	B	A	B	B	B	B	C	B
		A	A	A	A	B	B	B	B	B	B	C	B
		A	B	A	B	B	B	C	B	C	C	2B	C
		B	B	B	B	C	B	C	2B	C	2B	2C	2B
1½ 38 2 50 4 100 6 150 8 200	1.5 inch 38 mm	A	A	A	A	A	A	A	A	A	A	B	A
		A	A	A	A	A	A	A	B	A	A	B	A
		A	A	A	A	B	A	B	B	B	B	C	B
		A	B	A	B	B	B	B	C	B	C	2B	C
		A	*	*	B	*	*	B	*	*	C	*	*
		A	*	*	B	*	*	B	*	*	C	*	*
		A	*	*	B	*	*	B	*	*	C	*	*
2 50 4 100 6 150 8 200	2 inch 50 mm	A	A	A	A	A	A	A	A	A	A	B	A
		A	A	A	A	A	A	A	B	B	B	B	B
		A	A	A	A	B	B	B	B	B	B	C	B
		A	*	*	B	*	*	B	*	*	C	*	*
4 100 6 150 8 200	3 inch 75 mm	A	A	A	A	A	A	A	B	A	A	B	A
		A	A	A	A	A	A	A	B	B	B	B	B
		A	*	*	A	*	*	B	*	*	B	*	*

\* Call Easy Heat for appropriate cable selection.

### STEP 4. POWER SUPPLY REQUIREMENTS

The nature of self regulating cable is that it consumes less power as it gets warmer. This is a major feature of this type of cable, as it applies more heat to colder areas of a pipe (where it is needed) than to warmer areas (where it is not needed). However, this same phenomenon also results in the cable drawing more current when power is first applied to it (cable is cold), and this requires careful selection of breaker sizing to ensure cold start-ups don't trip the breaker. Hence, the total length of heater cable connected to a breaker must be limited to ensure the selected breaker does not trip on cold start-ups.

The total length of heating cable installed on any circuit must not exceed the "Maximum Total Length" associated with the circuit breaker supplying the circuit. If total length of heater cable required does exceed that allowed for the circuit breaker supplying the circuit, either a larger circuit breaker (and associated wiring) must be used, or multiple circuit breakers (and associated wiring) must be installed.

From the Circuit Breaker Selection table, determine the number of circuits and circuit breaker size required to supply the heating cables.

## STEP 5. CABLE ROUTING

Due to the parallel design of this cable, power is carried down the cable by bus wires. Since current is flowing through these bus wires, there will be some voltage drop along the bus wires. It is important to limit this voltage drop to ensure that the power dissipated by the cable does not fall below that required to keep the pipe from freezing. Hence, the total length of cable in a single run must be limited to ensure that the power dissipation at the tail end of the cable is adequate.

From the piping arrangement, determine the length of the longest single run of cable. If this value exceeds the “Maximum Single Run Length” in the “Performance and Rating Data” table, then the cable routing, or type of cable selected, must be altered. For example, it may be possible to change the location of the power supply; if a 200 ft pipe is being protected, the power supply location could be placed in the center of the pipe length, thereby resulting in two runs of 100 ft each (maximum single run length of 100 ft) instead of one run of 200 ft (maximum single run length of 200 ft.) Also, 240 Volt cables allow longer single runs than 120 Volt cables.

## STEP 6. CABLE CONTROL

It is recommended that heating cables for freeze protection be controlled by a thermostat to minimize energy consumption. Control options are as follows:

**T4XA** Ambient sensing thermostat—energizes cables when ambient temperature falls below setting. Setting adjustable from 15 to 140°F (-9.4 to 60°C). NEMA 4X enclosure.

**C4XC** Line sensing thermostat—energizes cables when line (pipe) temperature falls below 40F (4C). NEMA 4X enclosure.

## STEP 7. CABLE CONNECTIONS

Using kits available from Easy Heat, the following cable connections are possible:

- SRP** CSA Certified Power/Splice Connection Kit. Provides heat shrink tubing based power connection of one or two cables within customer supplied junction box. Also provides heat shrinkable end seals. Can also be used for heating cable to heating cable splice using a customer supplied junction box.
- SRST** UL Listed and CSA Certified In-line Splice Connection Kit. Provides heat shrink tubing based in-line splice connection of two or three heating cables. Junction box is not required. Each kit performs two sets of splices.
- SRES** UL Listed and CSA Certified End Seal Kit. Provides materials necessary to perform a moisture proof end seal of the heating cable circuit. Each kit contains 5 end seals.
- SRTCS** 66 feet 3/4" w. fiberglass tape and five “caution” signs for compliance with NEC 427-13.