



### Pipe Freeze Protection Self-Regulating Heating Cable Application/Specification Guide

#### READ CAREFULLY

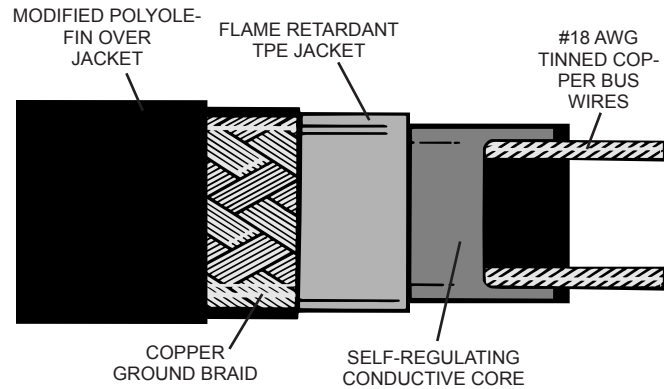
#### PRINCIPLE OF OPERATION

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 (30.48cm). This wattage is specified at a surrounding temperature of 50°F (10°C). 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

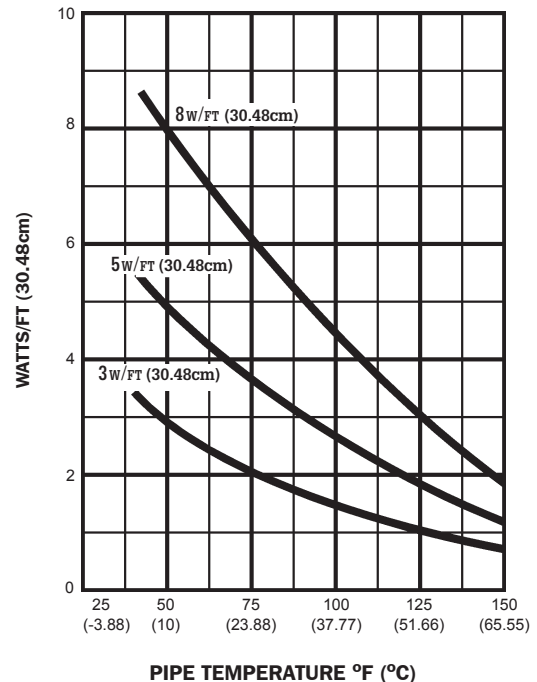
Catalog Number	Service Voltage	Power Rating Watts/Ft (30.48cm) @ 50°F (10°C)	Maximum Length Single Run
SR31J	120	3	221FT (67M)
SR32J	240	3	533FT (163M)
SR51J	120	5	178FT (54M)
SR52J	240	5	458FT (140M)
SR81J	120	8	142FT (43M)
SR82J	240	8	347FT (106M)

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
SR32J	0.58	0.65	0.71	0.81	0.90	1.00	1.34
SR52J	0.70	0.76	0.80	0.88	0.94	1.00	1.20
SR82J	0.80	0.84	0.87	0.92	0.96	1.00	1.12

Nominal Power Output on Metal Pipe



### PERFORMANCE NOTES

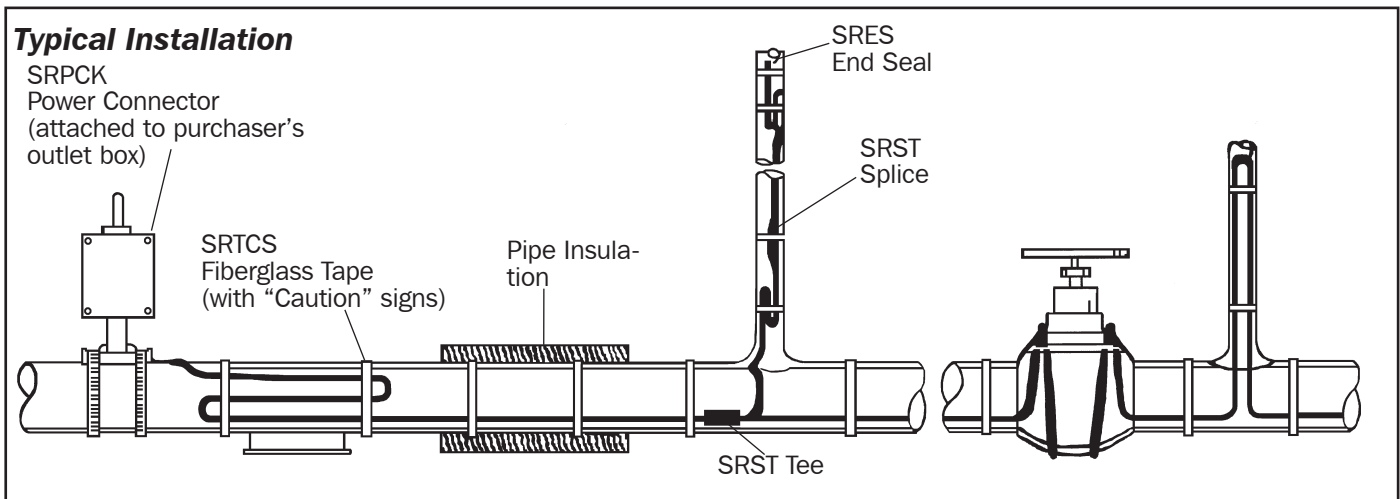
1. Circuit breakers are sized per article 427-4 of NEC and CSA/CEC 62-114.
2. To operate 240 Volt cables at 208, 220 or 277 volts, the cable power is modified by the "Power Rating Multiplier" in the Voltage Adjustment table. The maximum total lengths on a circuit breaker (Circuit Breaker Selection table) and the maximum single run lengths (Performance and Rating Catalog 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/ft (30.48cm) figure for each cable. Then calculate circuit breaker size for the combined loads. These amps/ft (30.48cm) factors include the sizing factor in (1) above.

### Circuit Breaker Selection

Voltage	Cable Power Watts/Ft (30.48cm)	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)	360FT (110M)	540FT (165M)
		0°F (-18°C)	210FT (64M)	280FT (85M)	425FT (130M)

4. The use of ground fault protection equipment for heating cable applications is required by NEC and CSA/CEC.

### 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

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

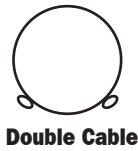
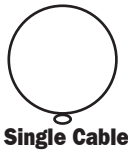
Application Design Conditions	
Maintain Temperature	40°F (4°C)
Insulation Type	Fiberglass
Wind Speed	20 MPH / 32 KPH
Safety Factor	10%
Heater Attachment	GT-6 Fiberglass Tape

- A = SR31J (120V) or SR32J (240 or 277V‡)
- B = SR51J (120V) or SR52J (240 or 277V‡)
- C = SR81J (120V) or SR82J (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” (63.50mm) metal pipe with ½” (12.70mm) insulation to 14°F (-10°C), using 208V supply, use SR52J cable.

- M = Metal Pipe
- P = Plastic pipe

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.



### 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.

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	M	P	M	P	M	P
½ (12.70)	.05 Inch 12.70mm	A	A	A	A	A	B	B	C
¾ (19.05)		A	A	A	B	B	B	B	C
1 (25.40)		A	A	A	B	B	C	B	C
1¼ (31.75)		A	A	A	B	B	C	B	C
1½ (38.10)		A	A	B	C	B	2B	C	2C
2 (50.80)		A	B	B	C	C	2B	C	2C
2½ (63.50)		A	B	B	C	C	2C	2B	2C
3 (76.20)	1 Inch 25.40mm	B	B	B	2B	*	2C	2C	*
4 (101.60)		B	B	C	2C	*	*	2C	*
6 (152.40)		B	2B	2B	*	*	*	*	*
8 (203.20)		A	A	A	A	A	A	A	B
1½ (38.10)		A	A	A	B	A	B	B	C
2 (50.80)		A	A	A	B	B	C	B	C
2½ (63.50)		A	A	A	B	B	C	C	2B
3 (76.20)	A	A	B	C	B	C	C	2B	
4 (101.60)	A	B	B	C	C	2B	C	2C	
6 (152.40)	B	B	C	2B	C	2C	2C	*	
8 (203.20)	B	*	C	2C	2B	*	2C	*	
1½ (38.10)	1.5 Inch 38.10mm	A	A	A	A	A	B	A	B
2 (50.80)		A	A	A	A	A	B	B	C
4 (101.60)		A	A	A	B	B	C	C	2B
6 (152.40)		A	B	B	C	C	2B	C	2C
8 (203.20)	A	*	B	2B	C	2C	2B	*	
2 (50.80)	2 Inch 50.80 mm	A	A	A	A	A	B	A	B
4 (101.60)		A	A	A	B	B	C	B	C
6 (152.40)		A	A	B	C	B	C	C	2B
8 (203.20)		A	*	B	C	C	2B	C	2C
4 (101.60)	3 Inch 76.20mm	A	A	A	A	A	B	A	B
6 (152.40)		A	A	A	A	A	B	B	B
8 (203.20)		A	*	A	*	B	*	B	*

\*Call Easy Heat for appropriate cable selection.

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 (60.96m) 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 (30.48m) each [maximum single run length of 100 ft (30.48m)] instead of one run of 200 ft (60.96m)[maximum single run length of 200 ft.(60.96m)] 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 40°F (4°C). 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 (20.35m) <sup>3</sup>/<sub>4</sub>" (19.05mm) w. fiberglass tape and five "caution" signs for compliance with NEC 427-13.

### LIMITED WARRANTY AND LIABILITY

Easy Heat warrants that if there are any defects in material or workmanship in any heating cable or accessory during the first year after the date of purchase. We will provide new products to replace any defective items, or we will refund the purchase price paid for the accessory or cable, not including any labor or other installation costs. As an alternate, we may elect to repair the cable or accessory at our factory with all shipping and other removal costs borne by the purchaser.

We further warrant that any services performed for the Buyer hereunder will be performed in a good and skillful manner, based on our understanding of pertinent technical data as of the date of performance of such services. Easy Heat's sole responsibility and liability in the event of any defect, error, omission, or failure in the services rendered hereunder shall be to provide corrected services of the type provided for herein, designed to correct such defect, error, omissions, or failure, and in no event shall the Easy Heat's liability with respect to such warranty exceed the amount received by it from the Buyer on account of such services.

Our obligation to provide corrected services, new products, refund the purchase price, or perform the repair described above is conditioned upon (a) the installation of the accessory or cable conforming to the specifications set forth in our installation instructions and (b) the accessory or cable not having been damaged by mechanical or electrical activities unrelated to the operation of the accessory or cable.

**A refund of your purchase price, provision of replacement products, repair of the accessory or cable or provision of corrected services as described above, shall be your sole and exclusive remedy for a breach of this warranty. THESE ARE THE SOLE AND EXCLUSIVE WARRANTIES GIVEN BY EASY HEAT WITH RESPECT TO THE GOODS AND SERVICES AND ARE IN LIEU OF AND EXCLUDE ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ARISING BY OPERATION OF LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHETHER OR NOT THE PURPOSE OR USE HAS BEEN DISCLOSED TO EASY HEAT IN SPECIFICATIONS, DRAWINGS OR OTHERWISE, AND WHETHER OR NOT EASY HEAT'S PRODUCTS ARE SPECIFICALLY DESIGNED AND/OR MANUFACTURED BY EASY HEAT FOR YOUR USE OR PURPOSE.**

This warranty does not extend to any losses or damages due to misuse, accident, abuse, neglect, normal wear and tear, negligence, unauthorized modification or alteration, use beyond rate capacity, or improper installation, maintenance or application. To the extent that you or your agents have supplied specifications, information, representation of operating conditions or other data to Easy Heat in the selection or design of the Goods and the preparation of Easy Heat's quotation, and in the event that actual operating conditions or other conditions differ from those represented by you, any warranties or other provisions contained herein which are affected by such conditions shall be null and void.

If within thirty (30) days after your discovery of any warranty defects within the warranty period, you notify Easy Heat thereof in writing, Easy Heat shall, at its option, repair, correct or replace F.O.B. point of manufacture, or refund the purchase price for that portion of the Goods found by Easy Heat to be defective. Failure by you to give such written notice within the applicable time period shall be deemed an absolute and unconditional waiver of your claim for such defects. Goods repaired or replaced during the warranty period shall be covered by the foregoing warranty for the remainder of the original warranty period or ninety (90) days from the date of shipment of the repaired or replaced goods, whichever is longer.

**This limited warranty does not cover any costs relating to the repair or replacement of any accessory or cable at the installation site.** Our accessories and cables are not easily accessible. A failed accessory or cable usually cannot be easily repaired. Replacement of a failed accessory or cable will require that the materials under which it is installed be removed to permit replacement of the accessory or cable. **We will not reimburse any costs relating to the repair or replacement of any accessory or cable at the installation site.**

**IN NO EVENT, REGARDLESS OF THE FORM OF THE CLAIM OR CAUSE OF ACTION (WHETHER BASED IN CONTRACT, INFRINGEMENT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE), SHALL EASY HEAT'S LIABILITY TO YOU AND/OR YOUR CUSTOMERS EXCEED THE PRICE PAID BY YOU FOR THE SPECIFIC GOODS PROVIDED BY EASY HEAT GIVING RISE TO THE CLAIM OR CAUSE OF ACTION. YOU AGREE THAT WE SHALL NOT BE LIABLE TO YOU OR YOUR CUSTOMERS FOR ANY INCIDENTAL, SPECIAL OR CONSEQUENTIAL OR PUNITIVE DAMAGES. No agent, employee or representative of ours has authority to bind us to any affirmation, representation or warranty concerning the goods sold unless such affirmation, representation or warranty is specifically incorporated by written agreement.**

To obtain new products, arrange repair of existing product, or a refund under this warranty, please contact Easy Heat with a description of the defect and proof of purchase at the address noted herein.

ATTN: WARRANTY DEPARTMENT:

In US - EasyHeat Inc; 2 Connecticut South Drive, East Granby, CT 06026  
In CANADA - EasyHeat Ltd; 99 Union Street, Elmira, ON N3B 3L7