



HEAT TRACE DESIGN GUIDE

CHROMALOX CABLE SELECTION

1. ELECT HEATING CABLE FAMILY: Based on the maximum maintenance temperature rating, maximum exposure temperature rating, and area classification, select the heating cable family from Table 3. (See Chromalox Heat Trace Cable Product Information Sheets for cable construction options, voltage ratings, and wattage outputs available.)

2. SELECT THERMAL OUTPUT RATING:

- (A) For Metal Pipes – Use Figures 1, 2 or 4
- (B) For Plastic Pipes – Use Figure 3 by finding the intersection of the calculated heat loss, QF, and pipe maintenance temperature, Tm. Select the cable with a thermal output that equals or exceeds QF at Tm.

3. DETERMINE TOTAL CABLE LENGTH: In addition to pipe length, in-line components such as valves, flanges, and pipe supports require additional heat tracing to maintain Tm. See Table 4. Calculate the total cable required by combining the pipe length with additional lengths needed for all other components.

TABLE 3: Heating Cable Families

Heating Cable Family	Area Classification	Pipe Material	Maximum Maintenance Temperature	Maximum Maintenance Temperature (Power Off)	Approvals	
					U.S.	Other
SRL (Self-Regulating Low Temperature)	Ordinary	Plastic/Metal	150°F / 65°C	185°F / 85°C	UL, CSA, FM	GOST, Cenelec, CE, ATEX
	Class I, Div. 2, Gr. B, C, D				CSA, FM, (Gr. A, CSA Only)	GOST, Cenelec, CE, ATEX
	Class II, Div. 2, E, F, G				CSA, FM, (Gr. A, CSA Only)	GOST, Cenelec, CE
	Class III, Div. 2				FM Only	GOST, Cenelec, CE, ATEX
SRM/E (Self-Regulating Medium Temperature)	Ordinary	Metal Only	302°F / 150°C	420°F / 215°C	UL, CSA, FM	GOST, Cenelec, CE, ATEX
	Class I, Div. 2, A, B, C, D				CSA, FM, (Gr. A, CSA Only)	GOST, Cenelec, CE, ATEX
	Class II, Div. 2, Gr. F, G				CSA Only	GOST, Cenelec, CE
SRP (Self-Regulating Medium Temperature)	Ordinary	Metal Only	225°F / 110°C	275°F / 135°C	UL, CSA, FM Pending	GOST, Cenelec, CE, ATEX Pending
	Class I, Div. 2, Gr. B, C, D					
	Class II, Div. 2, Gr. F, G					
	Class III					
HSRL (H-Self-Regulating Low Temperature)	Class I, Div. 1, Gr. B, C, D	Plastic/Metal	150°F / 65°C	185°F / 85°C	CSA, FM	
	Class II, Div. 1, Gr. E, F, G				CSA, FM	
	Class III, Div. 1				CSA, FM	
HSRM (H-Self-Regulating Medium Temperature)	Class I, Div. 1, Gr. B, C, D	Metal Only	302°F / 150°C	420°F / 215°C	CSA, FM	
	Class II, Div. 1, Gr. E, F, G				CSA, FM	
	Class III, Div. 1				CSA, FM	
CMW (Constant Wattage)	Ordinary	Metal Only	Consult Factory	392°F / 200°C	UL, CSA	
	Hazardous Area, Consult Factory					
MI (Mineral Insulated)	Ordinary	Metal Only	Consult Factory	1,100°F / 595°C	CSA, FM	
	Class I, Div. 2, Gr. B, C, D				CSA, FM	
	Class II, Div. 2, E, F, G				CSA, FM	
	Class III				CSA, FM	

TABLE 4: Additional Cable Lengths Required for In-Line Components Based on Pipe IPS (Iron Pipe Size)

Deg°F		40°F	60°F	70°F	80°F	90°F	100°F	120°F
2" INSULATION THICKNESS								
½"	W/ft	1.0	1.2	1.4	1.7	1.9	2.2	2.4
¾"	W/ft	1.1	1.4	1.6	1.9	2.2	2.4	2.7
1"	W/ft	1.2	1.5	1.8	2.1	2.4	2.7	3.0
1½"	W/ft	1.5	1.9	2.3	2.7	3.0	3.4	3.8
2"	W/ft	1.7	2.2	2.6	3.0	3.4	3.9	4.3
2½"	W/ft	1.9	2.4	2.9	3.4	3.8	4.3	4.8
3"	W/ft	2.2	2.8	3.3	3.9	4.4	5.0	5.5
4"	W/ft	2.6	3.3	4.0	4.6	5.3	5.9	6.6
6"	W/ft	3.6	4.5	5.3	6.2	7.1	8.0	8.9
8"	W/ft	4.4	5.6	6.7	7.8	8.9	10.0	11.1
10"	W/ft	5.3	6.7	8.0	9.3	10.6	12.0	13.3
12"	W/ft	6.2	7.8	9.3	10.9	12.4	14.0	15.5
14"	W/ft	6.7	8.4	10.1	11.8	13.4	15.1	16.8
16"	W/ft	7.6	9.5	11.3	13.2	15.1	17.0	18.9
18"	W/ft	8.4	10.5	12.6	14.7	16.8	18.9	21.0
20"	W/ft	9.2	11.6	13.9	16.2	18.5	20.8	23.1
22"	W/ft	10.1	12.6	15.2	17.7	20.2	22.7	25.3
24"	W/ft	11.0	13.7	16.4	19.2	21.9	24.7	27.4

FIG. 1: SRL & HSRL – Thermal Output Ratings on Insulated Metal Pipe

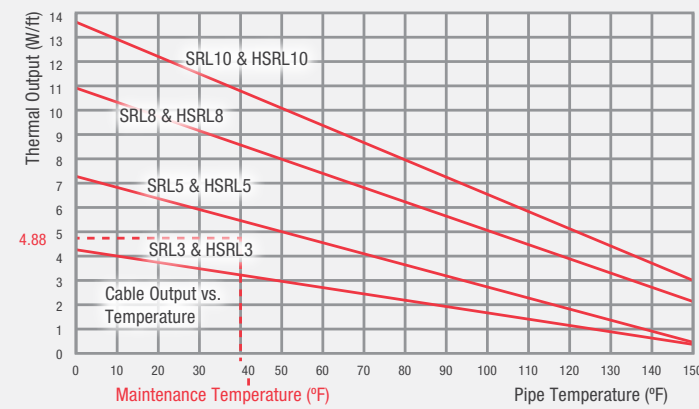


FIG. 2: SRM/E & HSRM – Thermal Output Ratings on Insulated Metal Pipe

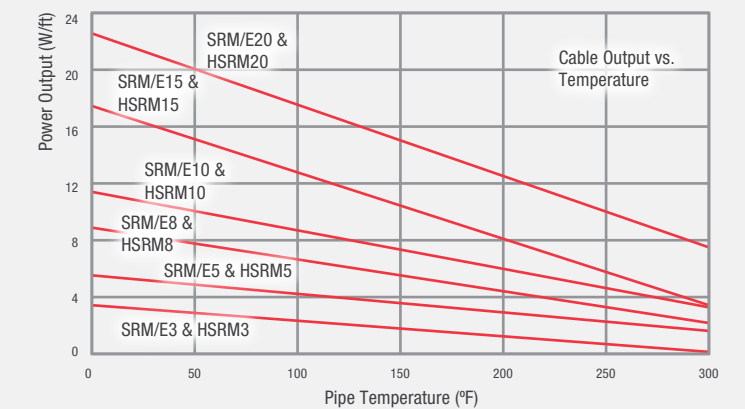


FIG. 3: SRL & HSRL – Thermal Output Ratings on Plastic Pipe w/ Aluminum Tape

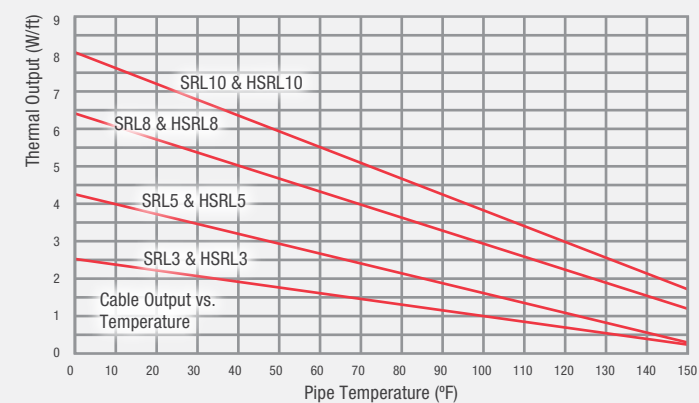
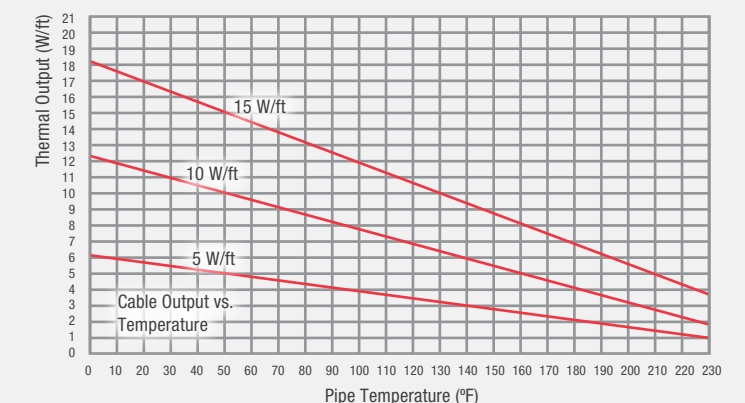


FIG. 4: SRP – Thermal Output Ratings on Insulated Metal Pipes

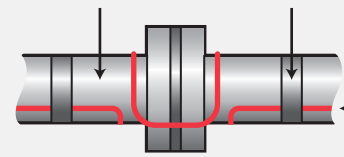


ELECTRIC HEAT TRACE QUICK INSTALL GUIDE

Quick Install Guide is a specification tool only. Always refer to proper installation instructions when installing heat trace cable.

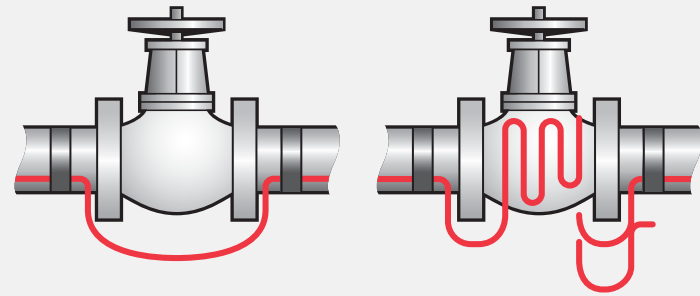
METAL PIPE INSTALLATION

Metallic Pipe Fiberglass Tape FT-3



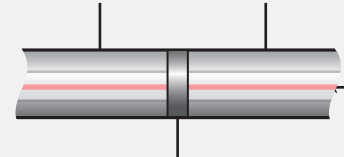
Self Regulating Heating Cable

- Low Temperature SRL, HSRL, SRF
- Medium Temperature SRM/E, SRP, HSRM



PLASTIC PIPE INSTALLATION

Plastic Pipe Aluminum Tape AL-1



Self Regulating Heating Cable

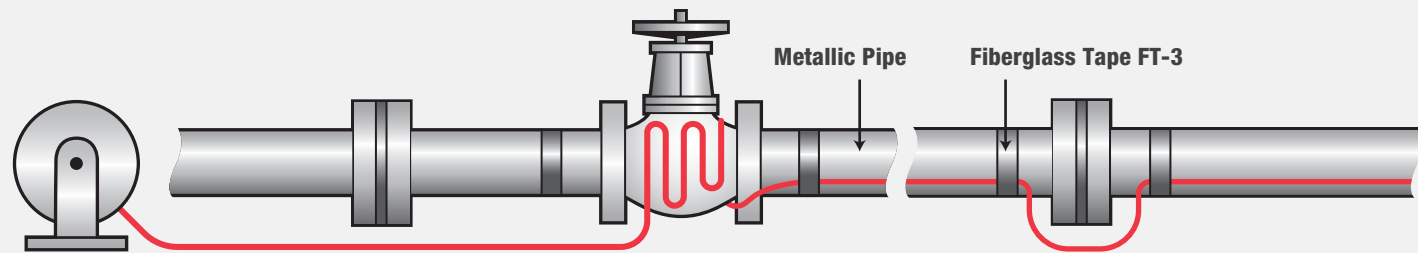
- Low Temperature SRL, HSRL, SRF

Note: Aluminum tape must be used under/over heating cable to spread heat transfer.

Fiberglass Tape FT-3

Installation Tips

- Temporary position cable on pipe and equipment to ensure proper distribution
- Leave a loop of cable at heat sinks such as valves, pipe supports, and flange sets. Use FT-3 fiberglass tape to secure cable to pipe at 18 in. / 445 mm (nom) intervals using recommended method.
- Always observe minimum bend radius.



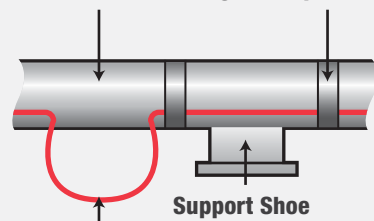
Step 1
Start tracing at the end of the pipe and work your way back to spool.

Step 2
Leave a loop of cable at heat sinks such as valves, pipe supports and flange sets. Use FT-3 fiberglass tape to secure cable to pipe at 18 in. / 455 mm intervals.

POWER CONNECTION BOX (UPC)

Step 1

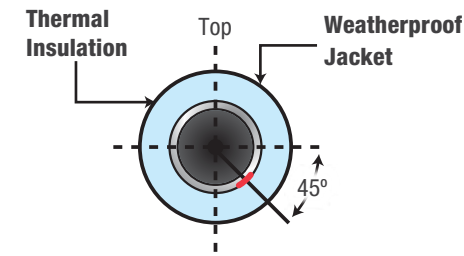
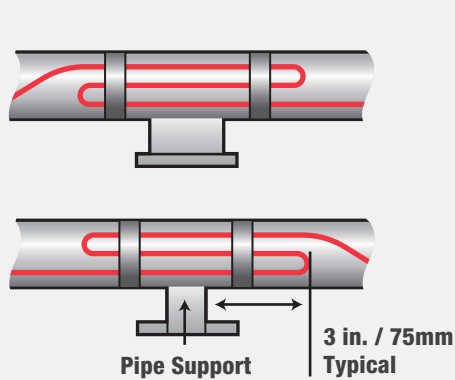
Metallic Pipe Fiberglass Tape FT-3



Self Regulating Heating Cable

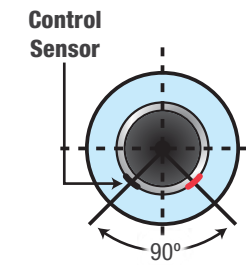
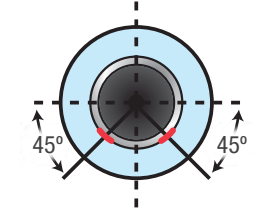
- Low Temperature SRL, HSRL, SRF
- Medium Temperature SRM/E, SRP, HSRM

Step 2



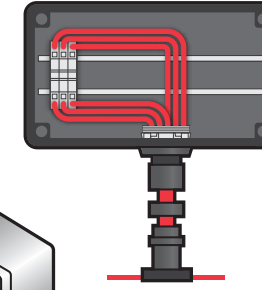
Cable located at nominal 45° below horizontal centerline on either side.

Cable located at nominal 45° below horizontal centerline.



For multiple heaters place control sensor 90° from nearest heater or centered between equally spaced heaters.

MULTIPLE ENTRY CONNECTION (UMC)



ABOVE INSULATION CABLE END SEAL (UES)

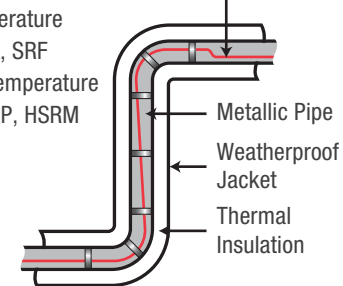
Insulation

Caution Labels

PIPE STRAP

Self Regulating Heating Cable

- Low Temperature SRL, HSRL, SRF
- Medium Temperature SRM/E, SRP, HSRM



Fiberglass Tape FT-3

Ask about Chromalox Class 1 Division 1. Cables & Accessories as well as a full line of High-Temperature Cables.

FOR TECHNICAL SUPPORT CALL 888-996-9258.

Copyright © 2024, Chromalox Inc. All rights reserved. Chromalox and the Chromalox logo are trademarks of Chromalox, Inc.

INSTALLATION TIPS

- Do not twist buss wires together at end of circuit
- Insulate all conductive parts
- Seal all electrical connections against moisture
- Seal ends of exposed cable during installation
- Do not expose cables to temperatures above their maximum ratings
- Install cable with aluminum tape for use on plastic pipes
- Locate ambient temperature sensors in coldest expected area
- Locate pipe temperature
- Use sufficient cable to trace additional heat sinks
- Install cable so that valves can be removed without removing cable



SRL CABLE

- 150°F / 65°C Maximum Maintenance
- 185°F / 85°C Maximum Exposure
- 3 to 10 W/ft / 10 to 33 W/m
- 16 AWG with Optional TPE or Fluoropolymer Jacket



SRL CABLE

- 302°F / 150°C Maximum Maintenance
- 420°F / 215°C Maximum Exposure
- 5 to 20 W/ft / 16 to 66 W/m
- 16 AWG with Optional Fluoropolymer Jacket

IMPORTANT SAFEGUARDS

Mechanical Inspections

- Inspect all insulation and weatherproofing
- Inspect all junction box, connection box, and sensor connections
- Verify all circuits have been properly grounded
- Verify all circuits are connected in proper panel locations
- Verify proper circuit breakers are in place (always use 30 mA trip GFI-type breakers)
- Verify all circuit lengths are within manufacturer's specified limits
- Verify all proper safety warnings are in place
- Verify all end seal, splice/tee locations are marked on lagging

Electrical Tests

- Insulation Resistance (Megger)
 - Before tracing pipes
 - After installing terminations
 - Before insulating pipes
 - After insulating pipes
 - Before energizing system
- Circuit Voltage
- Initial Current
 - Note ambient temp / pipe temp
- Stabilized Current (15 minutes of operation)
 - Note ambient temp / pipe temp
- Always use ground fault circuit breakers (30 mA trip level)

Tools Needed

- Circuit Voltage
- Wire Cutters/Strippers
- Megger
- Phillips Head Screwdriver
- Standard Screwdriver
- Voltmeter
- Utility Knife
- Hammer

HEAT TRACE CONTROLS



IntelliTrace

- Up to 72 Loops at 0 A/circuit
- Full monitoring, powerful sensor mapping, Modbus RS485 or Ethernet communication & supervisory control
- Extremely intuitive programming via large touch screen HMI, ordinary or hazardous (Divisions 2) areas



WeatherTrace

- Up to 40 loops
- Pre-wired and assembled monitoring and distribution (saves time on installation)
- Includes the sentinel monitoring system



ITC Controller

- 1 or 2 circuits, 40 A/circuit, SSR control
- Full monitoring, RS485 or Ethernet communications up to 2 RTD inputs/circuit, soft start, alarms
- Bright display & easy to program, only 8x10x8 in. /203x254x203 mm, Division 2 hazardous area



DTS-HAZ Digital ThermoStat

- 30 A/120 to 277 Vac, SSR control, large LED display
- Programming w/ soft start, alarm contact, Class 1, Division 2 & ATEX
- Applications: freeze protection process temperature maintenance



SCAN THE QR CODE TO EXPLORE OUR WORLDWIDE LOCATIONS AND FIND YOUR LOCAL SPECIALIST:

www.chromalox.com | sales@chromalox.com

