



HEAT TRACE DESIGN GUIDE



PIPE HEAT LOSS CALCULATIONS

- 1. Basic Heat Loss:** After determining the difference between the ambient and desired pipe maintenance temperature, T_m , use **Table 1** to figure the basic heat loss for the pipe size and insulation thickness.
- 2. Insulation Adjustment:** Using **Table 2**, find the type of insulation being used and its insulation factor.

- 3. Calculate Q_b :** Multiply the basic heat loss figure from **Table 1** by the adjustment factor from **Table 2** to calculate the estimated heat loss, Q_b , in watts per foot of pipe length.
- 4. Correct for Indoor Location/ Wind Speed:** If location is indoors, multiply Q_b by 0.9. **Table 1** is based on 10% safety factor and 20 mph wind speed; add 5% margin for each 5 mph over 20 mph wind speed.

Table 1 Pipe Heat Loss Q_b in W/ft Based on Temperature Differential and Insulation Thickness

Nominal Pipe Size in. (ID)	Temperature Difference Between Pipe and Ambient															
	Deg°F	40°F	50°F	60°F	70°F	80°F	90°F	100°F	120°F	140°F	160°F	180°F	200°F	220°F	240°F	260°F
1" Insulation Thickness																
1/2"	W/ft	1.4	1.8	2.1	2.5	2.8	3.2	3.5	4.2	5.1	5.9	6.6	7.7	8.5	9.2	10.0
3/4"	W/ft	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.8	5.9	6.7	7.6	8.8	9.7	10.6	11.4
1"	W/ft	1.8	2.3	2.8	3.2	3.7	4.1	4.6	5.5	6.8	7.7	8.7	10.1	11.1	12.1	13.2
1 1/2"	W/ft	2.4	3.1	3.7	4.3	4.9	5.5	6.1	7.3	9.0	10.2	11.5	13.4	14.8	16.1	17.4
2"	W/ft	2.8	3.5	4.1	4.8	5.5	6.2	6.9	8.3	10.1	11.6	13.0	15.2	16.7	18.2	19.7
2 1/2"	W/ft	3.2	4.0	4.8	5.6	6.4	7.2	8.0	9.6	11.8	13.4	15.1	17.6	19.4	21.1	22.9
3"	W/ft	3.7	4.7	5.6	6.5	7.4	8.4	9.3	11.2	13.7	15.6	17.6	20.5	22.5	24.6	26.6
4"	W/ft	4.6	5.8	6.9	8.1	9.2	10.4	11.5	13.8	16.9	19.3	21.7	25.3	27.8	30.4	32.9
6"	W/ft	6.4	8.0	9.6	11.2	12.8	14.4	16.0	19.2	23.5	26.9	30.2	35.2	38.7	42.2	45.8
8"	W/ft	8.1	10.1	12.1	14.1	16.2	18.2	20.2	24.2	29.7	33.9	38.2	44.4	48.9	53.3	57.8
10"	W/ft	9.9	12.4	14.8	17.3	19.8	22.2	24.7	29.6	36.3	41.5	46.7	54.3	59.8	65.2	70.6
12"	W/ft	11.6	14.5	17.4	20.3	23.2	26.1	29.0	34.8	42.6	48.7	54.8	63.8	70.2	76.6	82.9
14"	W/ft	12.6	15.8	19.0	22.1	25.3	28.4	31.6	37.9	46.5	53.1	59.7	69.5	76.5	83.4	90.4
16"	W/ft	14.3	17.9	21.5	25.1	28.7	32.3	35.9	43.0	52.7	60.2	67.8	78.9	86.8	94.6	102.5
18"	W/ft	16.0	20.1	24.1	28.1	32.1	36.1	40.1	48.1	58.9	67.4	75.8	88.2	97.0	105.9	114.7
20"	W/ft	17.7	22.2	26.6	31.0	35.4	39.9	44.3	53.2	65.1	74.4	83.7	97.5	107.2	117.0	126.7
22"	W/ft	19.4	24.3	29.1	34.0	38.8	43.7	48.5	58.2	71.3	81.5	91.7	106.7	117.4	128.0	138.7
24"	W/ft	21.1	26.4	31.6	36.9	42.2	47.4	52.7	63.2	77.5	88.5	99.6	115.9	127.5	139.1	150.7
1.5" Insulation Thickness																
1/2"	W/ft	1.1	1.4	1.7	2.0	2.2	2.5	2.8	3.5	4.1	4.7	5.5	6.2	6.8	7.4	8.0
3/4"	W/ft	1.2	1.6	1.9	2.2	2.5	2.8	3.1	3.9	4.6	5.2	6.1	6.8	7.5	8.2	8.9
1"	W/ft	1.4	1.8	2.2	2.5	2.9	3.2	3.6	4.5	5.3	6.0	7.1	7.9	8.7	9.5	10.3
1 1/2"	W/ft	1.8	2.3	2.8	3.2	3.7	4.1	4.6	5.8	6.8	7.7	9.1	10.1	11.1	12.1	13.2
2"	W/ft	2.1	2.6	3.1	3.6	4.2	4.7	5.2	6.6	7.6	8.7	10.3	11.4	12.6	13.7	14.9
2 1/2"	W/ft	2.4	3.0	3.5	4.1	4.7	5.3	5.9	7.4	8.7	9.9	11.7	13.0	14.3	15.6	16.9
3"	W/ft	2.7	3.4	4.1	4.8	5.4	6.1	6.8	8.6	10.0	11.4	13.5	15.0	16.5	18.0	19.4
4"	W/ft	3.3	4.2	5.0	5.8	6.6	7.5	8.3	10.5	12.2	13.9	16.4	18.3	20.1	21.9	23.7
6"	W/ft	4.5	5.7	6.8	7.9	9.0	10.2	11.3	14.2	16.6	19.0	22.4	24.9	27.3	29.8	32.3
8"	W/ft	5.6	7.1	8.5	9.9	11.3	12.7	14.1	17.8	20.7	23.7	27.9	31.0	34.1	37.2	40.3
10"	W/ft	6.8	8.0	10.3	12.0	13.7	15.4	17.1	21.5	25.1	28.7	33.9	37.6	41.4	45.1	48.9
12"	W/ft	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.2	29.4	33.6	39.6	44.0	48.4	52.8	57.2
14"	W/ft	8.7	10.9	13.0	15.2	17.4	19.5	21.7	27.3	31.9	36.5	43.0	47.7	52.5	57.3	62.1
16"	W/ft	9.8	12.3	14.8	17.2	19.7	22.1	24.6	31.0	36.2	41.3	48.7	54.1	59.5	64.9	70.4
18"	W/ft	11.0	13.7	16.4	19.2	21.9	24.7	27.4	34.5	40.3	46.0	54.3	60.3	66.3	72.3	78.4
20"	W/ft	12.1	15.1	18.1	21.1	24.2	27.2	30.2	38.1	44.4	50.7	59.8	66.4	73.1	79.7	86.4
22"	W/ft	13.2	16.5	19.8	23.1	26.4	29.7	33.0	41.6	48.5	55.4	65.3	72.6	79.9	87.1	94.4
24"	W/ft	14.3	17.9	21.5	25.1	28.6	32.2	35.8	45.1	52.6	60.1	70.9	78.8	86.6	94.5	102.4

Nominal Pipe Size in. (ID)	Temperature Difference Between Pipe and Ambient															
	Deg°F	40°F	50°F	60°F	70°F	80°F	90°F	100°F	120°F	140°F	160°F	180°F	200°F	220°F	240°F	260°F
2" Insulation Thickness																
1/2"	W/ft	1.0	1.2	1.4	1.7	1.9	2.2	2.4	3.0	3.5	4.0	4.8	5.3	5.8	6.3	7.2
3/4"	W/ft	1.1	1.4	1.6	1.9	2.2	2.4	2.7	3.4	4.0	4.5	5.3	5.9	6.5	7.1	8.1
1"	W/ft	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.8	4.4	5.0	5.9	6.6	7.3	7.9	9.0
1 1/2"	W/ft	1.5	1.9	2.3	2.7	3.0	3.4	3.8	4.8	5.6	6.4	7.5	8.4	9.2	10.0	11.4
2"	W/ft	1.7	2.2	2.6	3.0	3.4	3.9	4.3	5.4	6.3	7.2	8.5	9.5	10.4	11.4	12.9
2 1/2"	W/ft	1.9	2.4	2.9	3.4	3.8	4.3	4.8	6.0	7.1	8.1	9.5	10.6	11.6	12.7	14.4
3"	W/ft	2.2	2.8	3.3	3.9	4.4	5.0	5.5	6.9	8.1	9.2	10.9	12.1	13.3	14.5	16.4
4"	W/ft	2.6	3.3	4.0	4.6	5.3	5.9	6.6	8.3	9.7	11.1	13.1	14.5	16.0	17.4	19.7
6"	W/ft	3.6	4.5	5.3	6.2	7.1	8.0	8.9	11.2	13.1	15.0	17.6	19.6	21.5	23.5	26.6
8"	W/ft	4.4	5.6	6.7	7.8	8.9	10.0	11.1	14.0	16.3	18.6	22.0	24.4	26.9	29.3	33.2
10"	W/ft	5.3	6.7	8.0	9.3	10.6	12.0	13.3	16.8	19.6	22.3	26.3	29.3	32.2	35.1	39.8
12"	W/ft	6.2	7.8	9.3	10.9	12.4	14.0	15.5	19.5	22.8	26.0	30.7	34.1	37.5	40.9	46.3
14"	W/ft	6.7	8.4	10.1	11.8	13.4	15.1	16.8	21.2	24.7	28.2	33.3	37.0	40.7	44.4	50.2
16"	W/ft	7.6	9.5	11.3	13.2	15.1	17.0	18.9	23.8	27.8	31.8	37.4	41.6	45.7	49.9	56.5
18"	W/ft	8.4	10.5	12.6	14.7	16.8	18.9	21.0	26.5	30.9	35.3	41.6	46.2	50.8	55.4	62.8
20"	W/ft	9.2	11.6	13.9	16.2	18.5	20.8	23.1	29.1	34.0	38.8	45.7	50.8	55.9	61.0	69.1
22"	W/ft	10.1	12.6	15.2	17.7	20.2	22.7	25.3	31.8	37.1	42.4	50.0	55.6	61.1	66.7	75.5
24"	W/ft	11.0	13.7	16.4	19.2	21.9	24.7	27.4	34.5	40.3	46.0	54.3	60.3	66.3	72.3	81.9
3" Insulation Thickness																
1/2"	W/ft	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.5	2.9	3.4	4.0	4.4	4.8	5.5	6.0
3/4"	W/ft	0.9	1.1	1.3	1.5	1.8	2.0	2.2	2.8	3.2	3.7	4.4	4.8	5.3	6.1	6.6
1"	W/ft	1.0	1.3	1.5	1.8	2.0	2.3	2.5	3.2	3.7	4.2	5.0	5.5	6.1	6.9	7.5
1 1/2"	W/ft	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.8	4.4	5.0	5.9	6.6	7.3	8.3	9.0
2"	W/ft	1.3	1.7	2.0	2.3	2.6	3.0	3.3	4.2	4.9	5.5	6.5	7.3	8.0	9.1	9.9
2 1/2"	W/ft	1.5	1.9	2.2	2.6	3.0	3.3	3.7	4.7	5.4	6.2	7.3	8.1	9.0	10.2	11.1
3"	W/ft	1.7	2.1	2.5	2.9	3.4	3.8	4.2	5.3	6.2	7.1	8.3	9.2	10.2	11.6	12.6
4"	W/ft	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.3	7.4	8.4	9.9	11.0	12.1	13.8	15.0
6"	W/ft	2.6	3.3	3.9	4.6	5.2	5.9	6.5	8.2	9.6	10.9	12.9	14.3	15.7	17.9	19.4
8"	W/ft	3.2	4.0	4.8	5.6	6.4	7.2	8.0	10.1	11.8	13.4	15.8	17.6	19.4	22.1	23.9
10"	W/ft	3.8	4.8	5.7	6.7	7.6	8.6	9.5	12.0	14.0	16.0	18.8	20.9	23.0	26.2	28.4
12"	W/ft	4.4	5.5	6.5	7.6	8.7	9.8	10.9	13.7	16.0	18.3	21.6	24.0	26.4	30.1	32.6
14"	W/ft	4.7	5.9	7.1	8.3	9.4	10.6	11.8	14.9	17.3	19.8	23.4	26.0	28.6	32.6	35.3
16"	W/ft	5.3	6.7	8.0	9.3	10.6	12.0	13.3	16.8	19.6	22.3	26.3	29.3	32.2	36.7	39.8
18"	W/ft	5.9	7.4	8.8	10.3	11.8	13.2	14.7	18.5	21.6	24.7	29.1	32.3	35.6	40.6	44.0
20"	W/ft	6.4	8.1	9.7	11.3	12.9	14.5	16.1	20.3	23.7	27.0	31.9	35.4	39.0	44.4	48.1
22"	W/ft	7.0	8.8	10.5	12.3	14.0	15.8	17.5	22.1	25.7	29.4	34.7	38.5	42.4	48.3	52.3
24"	W/ft	7.6	9.5	11.3	13.2	15.1	17.0	18.9	23.8	27.8	31.8	37.4	41.6	45.7	52.2	56.5

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CHROMALOX CABLE SELECTION

- 1. Select 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, Q_f , and pipe maintenance temperature, T_m . Select the cable with a thermal output that equals or exceeds Q_f at T_m .

- 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 T_m . See **Table 4**. Calculate the total cable length required by combining the pipe length with the additional lengths needed for all the other components.

Table 3 Heating Cable Families

Heating Cable Family	Area Classification	Pipe Material	Maximum Maintenance Temperature	Maximum Exposure 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, Gr. E, F, G				CSA, FM, (Gr. E, 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, Gr. 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, ATEX
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					
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	
CWM (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, Gr. E, F, G				CSA, FM	
	Class III				CSA, FM	

NOTE: It is the responsibility of the facility manager or engineer to determine the classification of an area where heat trace will be installed. The factory can help determine a suitable cable based on the information provided.

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

Piping Size	Gate Valve	Globe Valve	Ball Valve	Butterfly Valve	Shoe Support	Hanger Support	Sleeper Support	Flange Pair
	ft							
1/2 in.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.30
3/4 in.	1.50	1.00	1.00	1.00	1.50	1.00	1.00	0.30
1 in.	2.00	1.00	1.00	1.00	1.50	1.00	1.00	0.30
1 1/2 in.	2.50	1.50	1.50	1.50	2.00	2.00	2.00	0.30
2 in.	2.50	2.00	2.00	2.00	2.00	2.00	2.00	0.30
2 1/2 in.	2.50	2.00	2.00	2.00	2.00	2.00	2.00	0.30
3 in.	3.00	2.50	2.50	2.50	2.00	2.00	2.00	0.50
4 in.	4.00	3.00	3.00	3.00	2.50	2.50	2.50	0.50
6 in.	5.00	3.50	3.50	3.50	2.50	2.50	2.50	0.80
8 in.	7.00	4.00	4.00	4.00	2.50	2.50	2.50	0.80
10 in.	8.00	4.50	4.50	4.50	3.00	3.00	3.00	0.80
12 in.	9.00	5.00	5.00	5.00	3.00	3.00	3.00	0.80
14 in.	10.00	5.50	5.50	5.50	3.00	3.00	3.00	1.00
16 in.	11.00	6.00	6.00	6.00	3.50	3.50	3.50	1.00
18 in.	12.00	7.00	7.00	7.00	3.50	3.50	3.50	1.00
20 in.	13.00	7.50	7.50	7.50	3.50	3.50	3.50	1.00
22 in.	13.00	7.50	7.50	7.50	3.50	3.50	3.50	1.00
24 in.	15.00	8.00	8.00	8.00	4.00	4.00	4.00	1.00

Figure 1 SRL & HSRL – Thermal Output Ratings on Insulated Metal Pipe

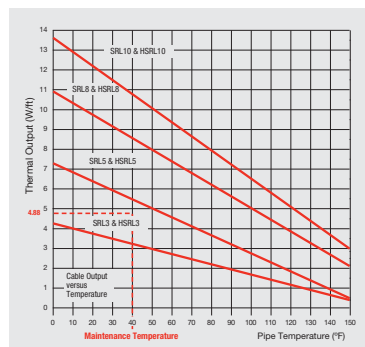


Figure 2 SRM/E & HSRM – Thermal Output Ratings on Insulated Metal Pipe

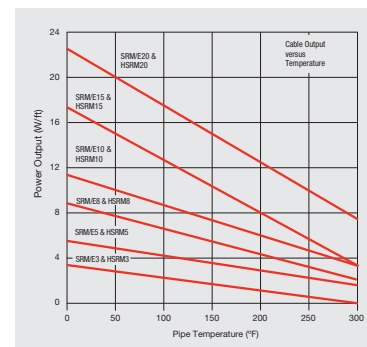


Figure 3 SRL & HSRL – Thermal Output Ratings on Plastic Pipe with Aluminum Tape

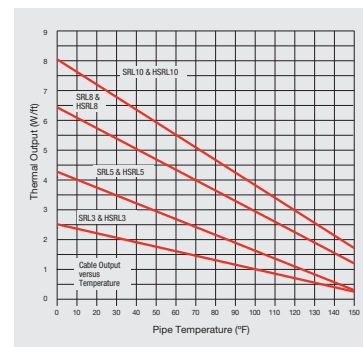
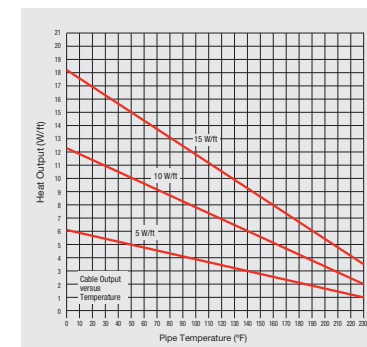





Figure 4 SRP – Thermal Output Ratings on Insulated Metal Pipe



CONTROL SYSTEMS

<p>IntelliTrace</p>  <ul style="list-style-type: none"> • Up to 72 Loops at 40 A/circuit • Full monitoring, powerful sensor mapping, Modbus RS485 or Ethernet communications & supervisory control • Extremely intuitive programming via large touch screen HMI, ordinary or hazardous (Division 2) areas 	<p>WeatherTrace</p>  <ul style="list-style-type: none"> • Up to 40 loops • Pre-wired and assembled monitoring and distribution (saves time on installation) • Includes the Sentinel monitoring system 	<p>ITC Controller</p>  <ul style="list-style-type: none"> • 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 	<p>Combination Single Point Temperature Controls & Power Connection Boxes</p> <table border="1"> <tr> <td data-bbox="1009 247 1297 679"> <p>UAS Ambient-Sensing</p>  <ul style="list-style-type: none"> • 0° to 225°F / 0° to 107°C temperature rating • 120 to 480 Vac, 22 A switching capability • Freeze protection applications </td> <td data-bbox="1297 247 1586 679"> <p>UBC Line-Sensing</p>  <ul style="list-style-type: none"> • 0° to 400°F / 0° to 205°C set points • 120 to 480 Vac, 22 A switching capability • Freeze protection applications </td> <td data-bbox="1586 247 1874 679"> <p>DTS-HAZ Digital ThermoStat / Power Connection Line- or Ambient-Sensing</p>  <ul style="list-style-type: none"> • 30 A/120 to 277 Vac, SSR control, large LED display • Programmable with soft start, alarm contact, Class I, Division 2 & ATEX • Applications: freeze protection/process temperature maintenance </td> </tr> </table>			<p>UAS Ambient-Sensing</p>  <ul style="list-style-type: none"> • 0° to 225°F / 0° to 107°C temperature rating • 120 to 480 Vac, 22 A switching capability • Freeze protection applications 	<p>UBC Line-Sensing</p>  <ul style="list-style-type: none"> • 0° to 400°F / 0° to 205°C set points • 120 to 480 Vac, 22 A switching capability • Freeze protection applications 	<p>DTS-HAZ Digital ThermoStat / Power Connection Line- or Ambient-Sensing</p>  <ul style="list-style-type: none"> • 30 A/120 to 277 Vac, SSR control, large LED display • Programmable with soft start, alarm contact, Class I, Division 2 & ATEX • Applications: freeze protection/process temperature maintenance
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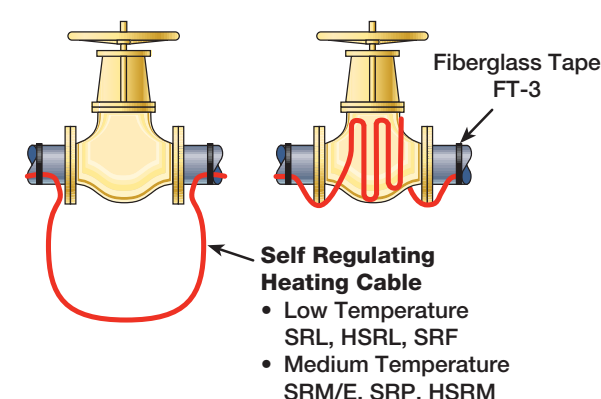
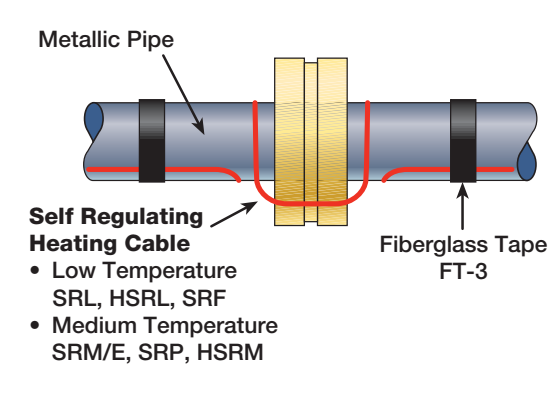
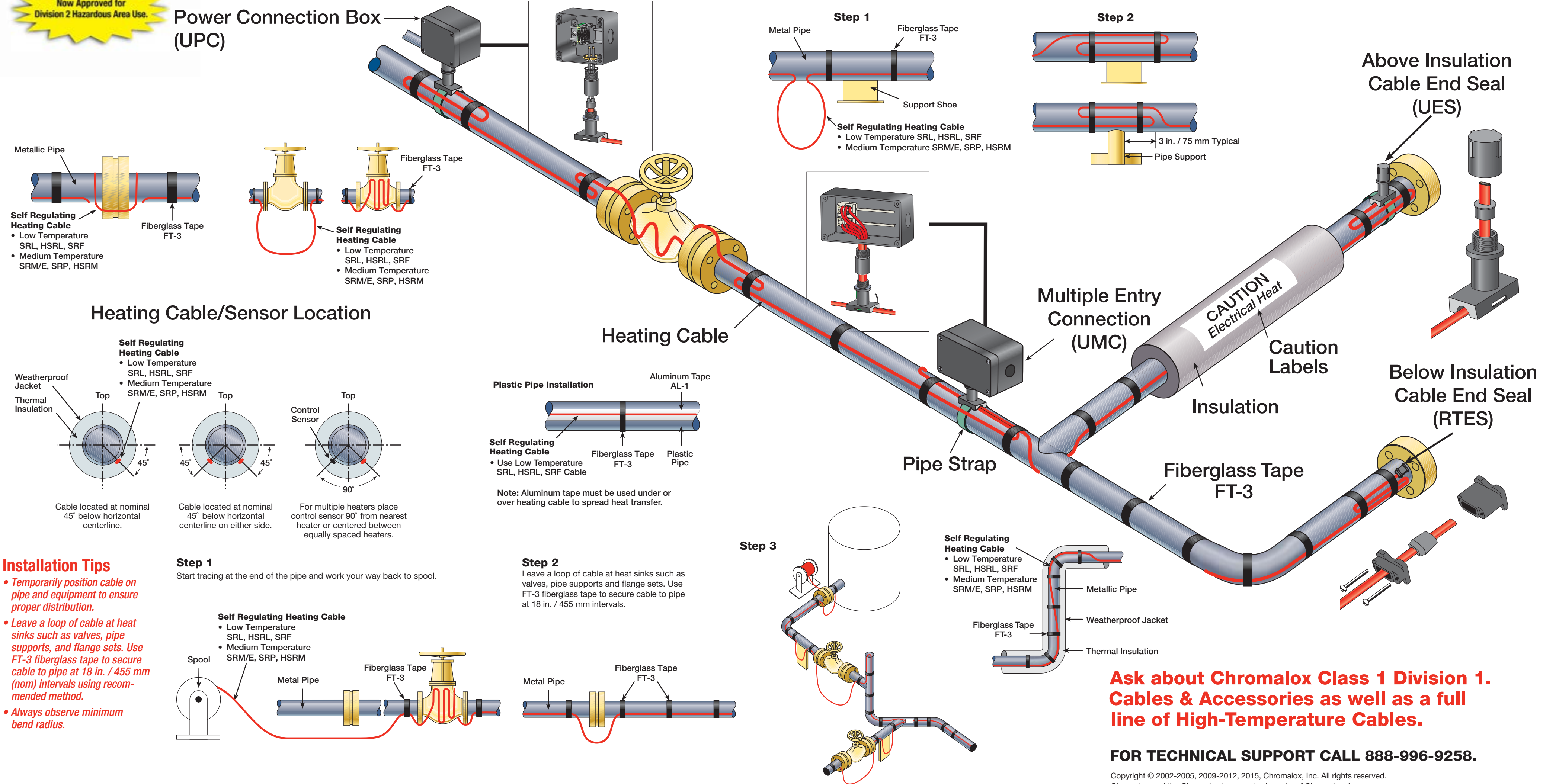


Electric Heat Trace Quick Install Guide

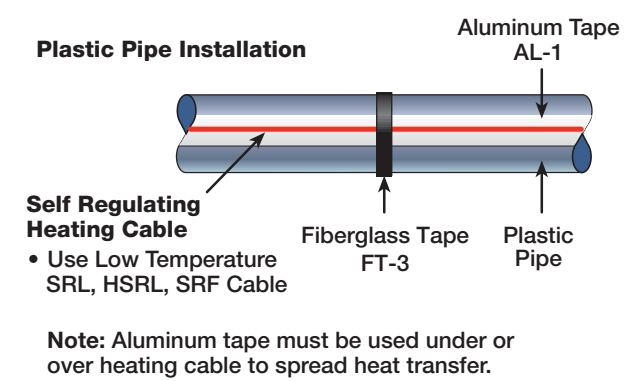
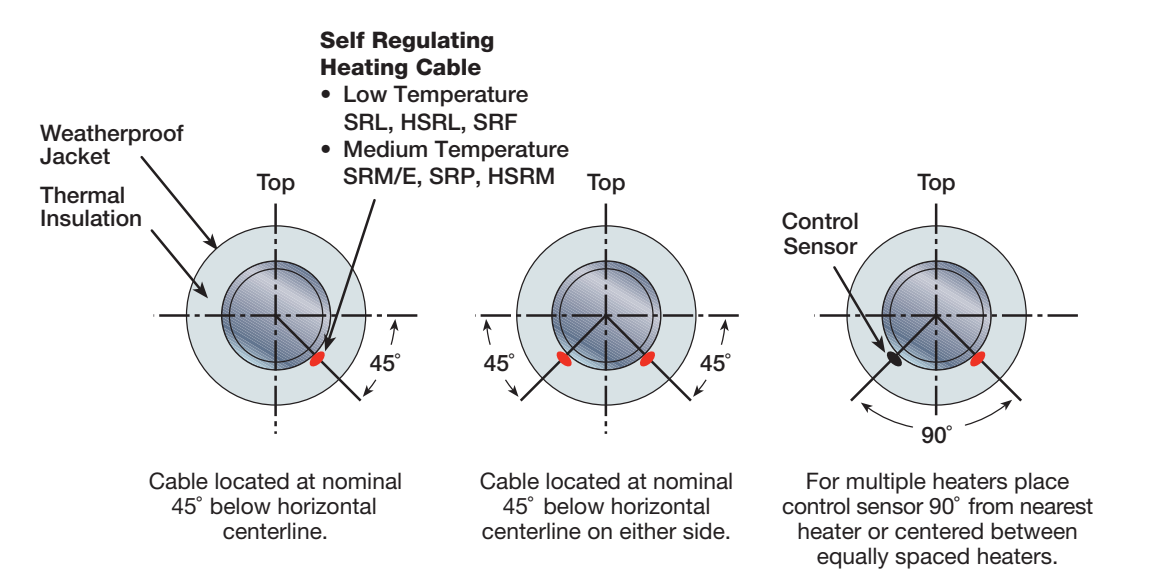
Quick Install Guide is a specification tool only. Always refer to proper installation instructions when installing heat trace cable.

Now Approved for Division 2 Hazardous Area Use.

Power Connection Box (UPC)



Heating Cable/Sensor Location

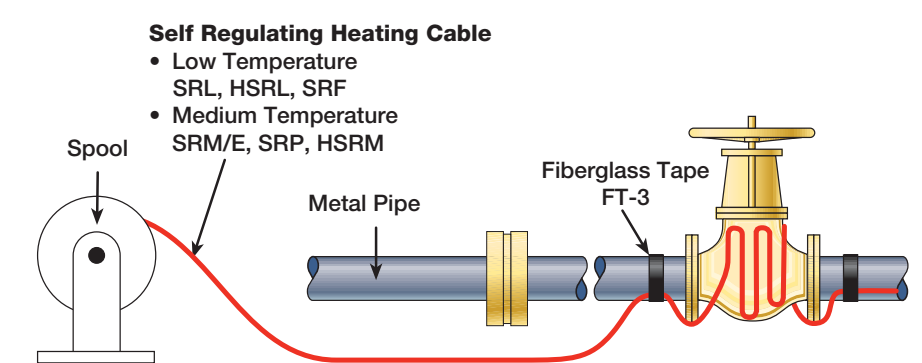


Installation Tips

- Temporarily 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. / 455 mm (nom) intervals using recommended method.
- Always observe minimum bend radius.

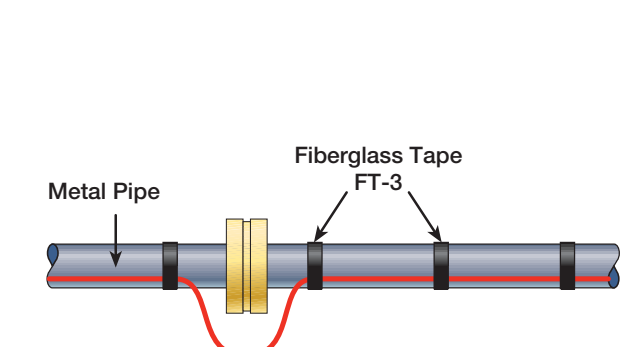
Step 1

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

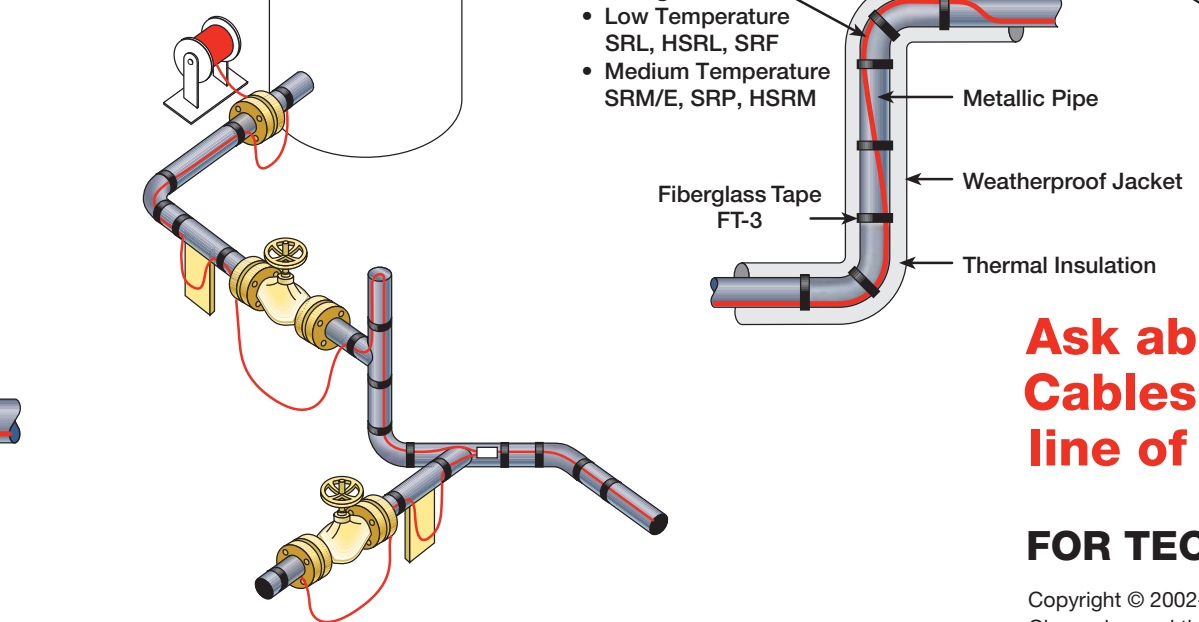


Step 2

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.



Step 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.

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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 sensors at lowest expected line 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



SRP Cable

- 225°F / 110°C Maintenance Temperature
- 275°F / 135°C Maximum Exposure Temperature
- 5 to 15 W/ft / 16 to 49 W/m
- 16 AWG with Optional Fluoropolymer Jacket



SRM 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 Inspection

- 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 and pipe temp
- Stabilized Current (15 minutes of operation)
 - ✓ Note ambient temp and pipe temp
- Always use ground fault circuit breakers (30 mA trip level)

Tools Needed

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



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