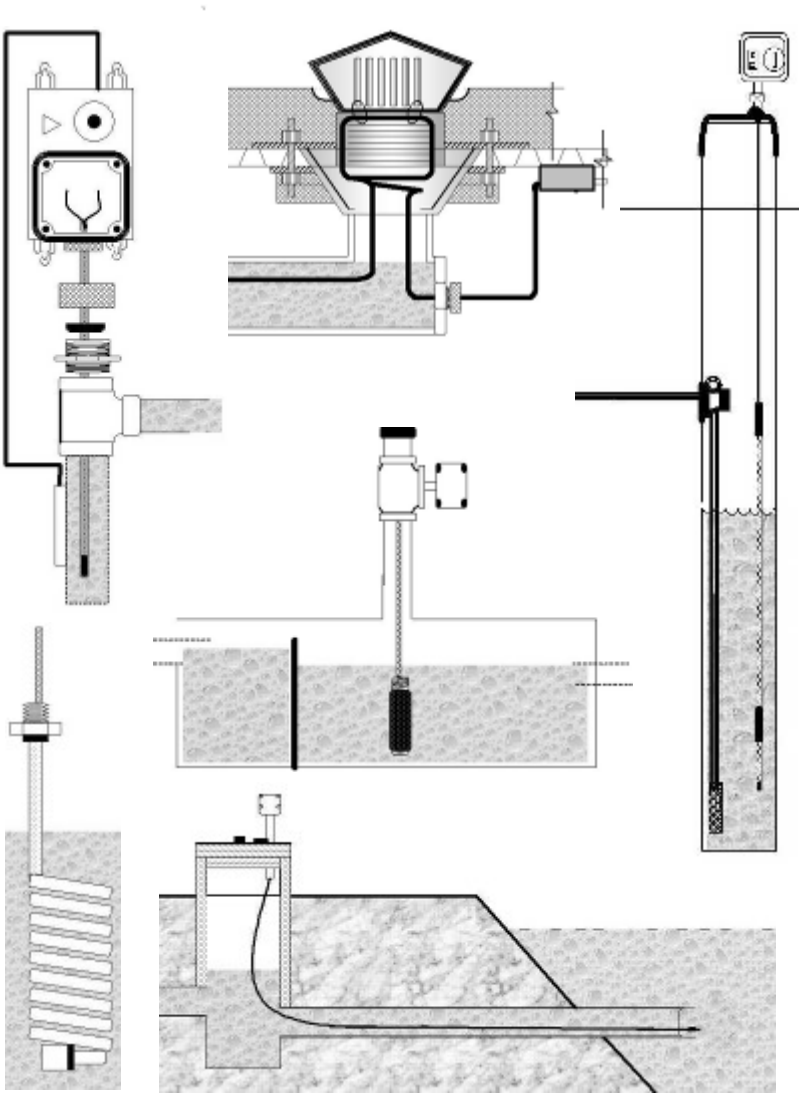
ARCTIC TRACE®

Introduction & Design



Submersible Heat Trace Freeze Protection System

duAlaska Incorporated

Product Information Introduction

As plastic began to emerge as a suitable material to carry water and wastewater, it was discovered that the freeze protection of pipes and vessels could not be done easily using traditional heat cable placed on the pipe or vessel surface. du Alaska decided that if the heat cable itself could be placed inside the pipe in contact with the liquid there would be many advantages.

du Alaska began to introduce heat cables to be used inside pipes or vessels for freeze protection. These cables incorporated a Tefzel jackets, which is a suitable waterproof food grade material. The product was further enhanced with the introduction of parallel resistance heaters, made from power limiting resistance wire. The heat cable was now able to limit its temperature and was suitable for inside the pipe application. Testing confirmed that this new combination of materials offered superior product performance in the area of heat transfer with small or non-existent heat cable in-rush during cold starting. The new materials also extended cable life outlasting other cables 3 to 1 and added greater abrasion resistant quality for all commercial and industrial applications.

The Arctic Trace heat cable system was additionally improved with the introduction of our exclusive heat fused waterproof end cap and butt splice which stopped water infiltration into the cable allowing the heat trace to be placed in pressurized waterlines. The Arctic Trace product in its present form has been used for over 20 years successfully for waterline freeze protection, deep well heat tracing, harbors, agriculture, watering points, roof drains, snow melting systems, sewer outfall lines, food product, and pharmaceutical.

Additional cost savings of Arctic Pipe fabrication is also realized, because no special channel or modified insulation area needs to be added when Arctic Trace heat trace is placed directly inside the pipe in contact with the system water. Retrofit or the replacement of failed heat trace in buried insulated lines now becomes simple and tremendous cost savings are achieved when excavation is not required for replacement of existing heating cables.

Our design also offers cut-to-length cable and completely waterproof field components used in deep well tracing, water tanks, or other applications.

CAUTION

This product must only be installed by qualified personnel, who fully understands electrical equipment placement, and must never under any circumstance be placed in service without the use of an adequate ground fault circuit interrupter to protect personnel from shock or injury.

After this equipment has been placed in service, it must be tested to ensure all wiring and safety devices are working.

All National, State, and Local Electrical Codes must be followed.

U.S. National Electric Code: Allows for internal heating of pipe, vessels or ducts.

Canada - Internal heating of plastic pipes and vessels need to be installed in accordance with the Canadian Electrical Code Part I (CEC Part I) section 62-312 (2)

If this product is not installed properly, fire, death, or injury may result.

ARCTIC TRACE ®

Type TL series Temperature Limiting

PRODUCT SPECIFICATION SUBMERSIBLE FREEZE PROTECTION SYSTEM

APPLICATION:

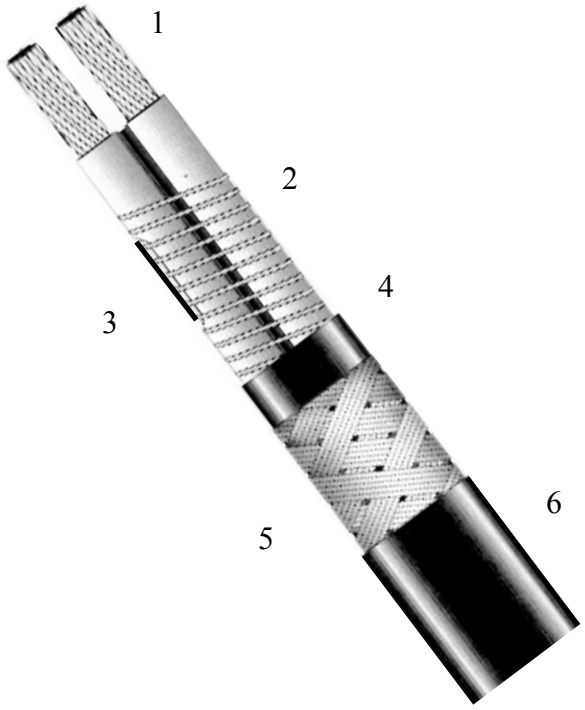
ARCTIC TRACE TL series Temperature Limiting Heating Cable are designed for a wide range of heating application using parallel resistance heating element. Suitable for water freeze protection and process viscosity maintenance. The product is specially designed to be in contact with the process (submersible) or on the outside of the pipe in a conventional heating fashion.

PRODUCT FEATURES:

TL heating cable incorporates a special metal heating element that reduces its resistance as temperature rises giving the cable a temperature limiting quality thus saving energy, protecting plastic pipes, limiting process temperature and allowing the cable to be overlapped during installation. Lowering the cable surface temperature extends cable life. The cable is specifically designed to be submerged in the water or process and is approved for use in contact with potable water.

CONSTRUCTION:

1. Copper bus wire (12 awg)
2. Temperature limiting metal resistance wire
3. Welded heater-bus connection
4. ETFE Fluon® Extruded food grade Insulation
5. (CB) Nickel plated copper braid
   (SS) 316 SS Braid



OPTIONS:

6. (TEZ) TEE over-jacket provides sanitary cover for food application in addition to mechanical and corrosion protection for metal braid

7. (NSF) Certified to NSF/ANSI 61

RATINGS

Maximum maintenance temperature:	300º F (149º C)
Maximum continuous exposure temperature: (de-energized)	300º F (260º C)
Minimum installation temperature:	-60º F (-51º C)
Earth leakage:	1.5 mA per 100 ft. (31mA) @ 240 VAC
Voltage:	120/240 VAC nominal *

* Higher maintenance temperatures and operating voltages up to 480Vac may be possible. Contact du Alaska for design assistance.

ARCTIC TRACE ®

Type TL series Temperature Limiting **TABLE I**

PRODUCT SPECIFICATION SUBMERSIBLE FREEZE PROTECTION SYSTEM

CATALOG NUMBER	Rating W/FT W/M	CIRCUIT LOAD AMP DRAW @ -40			CIRCUIT LENGTH @		CIRCUIT LENGTH WITH END TO END WATT REDUCTION			
@ 120 VAC	W/FT 50F	W/M 50F	AMPS FT	AMPS M	FULL LOAD *		15%		20%	
Z120312CBTL	3	10	.03	.10	450’	120M	500’	150M	590’	177M
Z120512CBTL	5	16	.04	.164	310’	95M	350’	106M	410’	125M
Z120712CBTL	7	23	.06	.33	220’	66M	250’	75M	300’	90M
Z121012CBTL	10	33	.08							
@ 240 VAC										
Z120324CBTL	3	10	.012	.04	480’	121M	600’	181M	875’	266M
Z120524CBTL	5	16	.020	.066	390’	119M	500’	153M	600’	183M
Z120724CBTL	7	23	.029	.095	380’	78M	330’	100M	390’	118M
Z121024CBTL	10	33	.041	.012	370’					

The power output shown apply to standard cable installed on insulated metallic pipe with the service voltage stated.

ALTERNET VOLTAGES
Should Arctic Trace be connected to a less or greater voltage watt per foot output will be reduced or increased

$$\text{ACTUAL WATT PER FOOT OUTPUT} = \left(\frac{\text{CONNECTED VOLTS}}{\text{RATED VOLTS}}\right)^2 \bullet \text{ARCTIC TRACE W/ft}$$

Circuit Breaker should be sized per article 427-4 of the NEC and the use of Ground Fault Equipment is required as stated in N.E.C. Article 427-22.

AMP per FT/M rating is based on –40ºF start up temperature. Increase direct breaker for all cable temperatures>-40º F by 20% to allow for in rush current.

Approval Listings: **Approvals valid only when** used with appropriate heating cable and installation accessories, and installed in accordance with all applicable instructions, codes and regulations

Underwriters Laboratory
Our freeze protection cable has been submitted to and tested by UL and has been recognized by that testing laboratory as a component heating cable to be used in an appropriate freeze protection system.

Hazardous Locations
Class I, Div. 1, Groups C. D; Class II, Div. 1, Groups E, F, G, Class III; Temperature Coded (T6 to T4)
Class I, Div. 2, Groups C, D; Class II, Div 2, Groups F, G; Class III; Temperature Coded (T6 to T4)

C US

Ordinary Locations
Commercial & Industrial UL 515 Type A & D
On metal and nonmetallic pipe and vessels – 3A, 3B, 3C
In metal and nonmetallic pipe and vessels – 4A, 4B, 5A, 5B
wet location industrial

NSF Certified to NSF/ANSI 61

* Full loads are based on 10% power drop when cable is energized on service voltage listed.

ARCTIC TRACE ®

Design Considerations

- ARCTIC TRACE THERMAL DESIGN

Step 1 The first design consideration is to determine if inside the pipe or outside the pipe heater cable placement will be used.

A. Heat trace applications that are for long or short runs of buried or insulated liquid filled plastic or metal pipe, drains, watering points, or sewer and water outfall with minimum valve closure, we would suggest the use of TL ETFE coated submersible cable inside the pipes or vessels.

B. Runs of piping with numerous valve, connections, and pumping equipment less then 700' create a challenge for the heat trace installation, for those application we suggest the use of type TL Temperature Limiting applied to the equipment or pipe surface.

Step 2 will be to determine the total watts or the equivalent length of cable for the pipe or tank heat loss based on the temperature to be maintained.

Step 3 will then be to select an available heater cable that will meet or exceed the job requirements.

- DESIGN DEFINITION

Pipe size = inches (nps)
Liquid = water, oil, etc.
Area classification = ordinary, Class 1, division, & ect.
Steam cleaning = high temperature exposure
Voltage = 120 Vac, 240 Vac, ect.
Insulation = type and thickness

Ta = minimum design ambient temperature
Tp = pipe maintenance temperature
ΔT = temperature differential, Tp-Ta.

Heat loss adder for various heat sinks expressed in additional heat cable length.

Total watt requirement for heat trace application.

- **EXAMPLE ON PIPE OR VESSEL SURFACE**

Given: 200' of 2" water filled pipe with 2" thick weather proof fiberglass insulation located above ground with ambient temperature that will drop to –60º F and a maintenance temperature desired at 40º F to prevent freezing. In addition we have 10 each 2" flanges and 20 each 2" pipe supports.

- SOLVE FOR WATTS PER FOOT NEEDED

1. Calculate temperature differential
   Δ T = Tp – Ta
   (Δ T = 100º)
2. Now determine pipe heat loss per foot from Table II. (w/ft = 3.6)
3. Make any necessary pipe heat loss adjustment per foot for insulation correction factor from Table IV. (1 x 3.6 = 3.6 w/ft.)
4. Determine any additional watts required for various heat sinks. Table III

   Surface *cable placement solve for additional cable needed.*

   10 each 2" flange x .3 feet heating cable = 3 feet additional cable required.

   20 each 2" pipe support x 2 feet heating cable = 40 feet additional cable required.

   Inside *the pipe cable placement solve for additional watts required.*

   10 each 2" flanges x .3 feet heating cable = 3 feet additional cable x 3.6 w/ft required = 11 watts required for heat sink of flanges.

   20 each 2" pipe supports x 2 feet heating cable = 40 feet additional cable x 3.6 w/ft required = 144 watts required for heat sink of pipe supports.

REQUIREMENTS FOR INSIDE THE PIPE

Note: For heat trace application inside the pipe all pipe and fitting heat loss should be added to calculate the total watt requirement rather than the total equivalent heater length. Because the liquid inside the pipe will transfer the heat energy more efficiently to the various heat sinks eliminating the need for additional inefficient heater cable placed on the pipe surface at the various heat sinks to maintain the pipe maintenance temperature (Tp). ***Thus creating a dynamic and self balancing heating zone***. All branch circuits extending more than one pipe diameter from this heating zone must be protected as an individual application.

200' of 2" pipe at 3.6 w/ft or (720 watts total).

10 each 2" flanges at 1.1 watts per flange requirement or an additional (11 watts).

20 each 2" pipe supports at 7.2 watts per support requirement or an additional (144 watts).

Total watt required for 200 foot application
(720 + 11 + 144 = 875)

Now select heat cable model available that will meet your watt per foot requirement from heat trace selection. Table I

875 total watts required divided by 200 foot application will require 4.4 watt per foot heater cable selection.

200 total feet Z120512CBTL required for inside pipe application.

REQUIREMENTS FOR OUTSIDE THE PIPE

Note: For heat trace application outside the pipe you must find the equivalent heat trace length for total pipe and fitting adding extra heater cable for various heat sinks like valves, fittings and pipe supports.

200' of 2" pipe at 3.6 w/ft (200 ft total).

10 each 2" flanges add .3 additional feet per flange. (3 ft additional)

20 each 2" pipe supports add 2 additional feet per support (40 ft additional).

Now select heat cable model available that will meet your watt per foot requirement from heat trace selection. Table I

Heat cable required for 200 foot application
(200 + 3 + 40 = 243)

243 total feet Z120512CBTL required for outside pipe application.

- PIPE END VESSEL APPLICATION

It is recognized that heat trace placed inside the pipe in contact with liquid will provide the best heat transfer from heater to liquid and will also eliminate the need for additional heat trace due to poor heat transfer to fittings, flanges, and supports.

Additional cable may be required for application exceeding cable watt output. Additional cable may be added by adding additional cable inside the pipe (more than one heater) or wrapping the cable on the outside of the pipe varying the cable pitch (Chart I).

Another important consideration in the selection of ARCTIC TRACE is the actual application temperature that will avoid damaging plastic pipe or overheating food products (Chart II).

- DEEP WELL TRACING IN PERMAFROST

Contact factory for additional information to heat trace deep wells in permafrost or shallow buried lines. We are pleased to recommend controls and heating cable for this special application.

- ADDITIONAL CODE INFORMATION

Circuit beaker selection should be sized per article 427 -4 of N.E.C. (Table I).

The 1996 National Electrical Code (N.E.C.) requires that ground fault equipment protection be provided for each branch circuit (427-22) on all heating circuits for pipeline and vessel and that a grounded metal cover be included (427-23). The two sections read as follows:

"Article 427-22 Equipment Protection.
Ground fault protection of equipment shall be provided for each branch circuit supplying electric equipment."

Exception: In industrial establishment where condition of maintenance and supervision ensure that only qualified persons will service the installed system and continue circuit operation is necessary for safe operation of equipment or processes. Alarm indication of ground fault shall be required.

"Article 427-23. Metal covering.
Electric heating equipment shall have a grounded metal covering in accordance with heating wires and cables. Heating wires or cables shall have grounded metal covering over that surrounds the heating element and bus wires, if any, and their electrical insulation."

It is recommended that 5 w/ft cable or less be used for plastic pipe application, and the cable should be placed inside the pipe or in a pipe channel provided by the pipe manufacture.

For application of heat cable that requires more then 5 w/ft outside or inside plastic pipe, factory recommendation must be considered to avoid pipe damage that may occur. Contact du Alaska Incorporated for application review.

Insulation Thickness	Temperature Difference Δ T (ºF)	PIPE HEAT LOSS — TABLE II															
		Pipe Size (Inches)															
		0.5	**0.75**	**1**	**1.25**	**1.5**	**2**	**2.5**	**3**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**
.5”	50	1.9	2.2	2.7	3.2	3.6	4.4	5.1	6.1	7.6	10.9	14.0	17.2	20.3	22.2	25.2	28.2
	100	3.9	4.6	5.5	6.5	7.4	9.0	10.5	12.5	15.7	22.6	28.9	35.6	41.9	45.8	52.0	58..3
	150	6.0	7.1	8.5	10.2	11.4	13.9	16.3	19.4	24.3	35.0	44.8	55.1	64.9	71.0	80.6	90.3
1.0”	50	1.3	1.6	1.7	2.2	2.3	2.7	3.1	3.7	4.5	6.6	8.1	9.9	11.6	12.6	14.3	16.0
	100	2.7	3.3	3.5	4.6	4.7	5.5	6.4	7.6	9.2	13.7	16.8	20.5	24.0	26.2	29.7	33.2
	150	4.2	5.2	5.5	7.1	7.2	8.6	10.0	11.7	14.3	21.3	26.1	31.9	37.3	40.7	46.15	51.6
	200	5.8	7.1	7.5	9.8	10.0	11.8	13.7	16.2	19.7	29.4	36.1	44.1	51.6	56.3	63.8	71.3
	250	7.5	9.2	9.7	12.6	12.9	15.3	17.8	21.1	25.6	38.2	46.8	57.2	67.0	73.1	82.8	92.5
1.5”	50	1.1	1.3	1.4	1.6	1.8	2.1	2.1	2.8	3.3	4.8	5.8	6.8	8.0	9.2	10.4	11.6
	100	2.2	2.6	2.9	3.2	3.7	4.3	4.4	5.7	6.9	9.9	12.0	14.1	16.4	19.1	21.6	24.1
	150	3.2	4.1	4.5	5.0	5.7	6.6	6.8	8.9	10.7	15.4	18.7	22.0	25.6	29.7	33.6	37.4
	200	4.7	5.6	6.2	7.0	7.9	9.1	9.4	12.2	14.9	21.3	25.9	30.4	35.4	41.2	46.5	51.8
	250	6.2	7.3	8.0	9.0	10.2	11.8	12.2	15.9	19.3	27.7	33.6	39.5	46.1	53.5	60.4	67.4
	300	7.7	9.0	10.0	11.2	12.8	14.7	15.2	19.8	24.1	34.6	42.0	49.4	57.5	66.8	75.4	84.1
2.0”	50	0.95	1.1	1.2	1.4	1.4	1.7	1.8	2.3	2.8	3.8	4.7	5.5	6.3	7.2	8.1	9.1
	100	2.0	2.3	2.5	3.0	3.0	3.6	3.8	4.7	5.7	7.8	9.6	11.3	13.1	14.9	16.8	18.7
	150	3.1	3.5	3.9	4.6	4.5	5.6	5.9	7.4	8.9	12.1	15.0	17.6	20.4	23.3	26.2	29.2
	200	4.2	4.9	5.3	6.4	6.3	7.7	8.2	10.2	12.2	16.7	20.7	24.4	28.3	32.2	36.3	40.4
	250	5.5	6.3	6.9	8.3	8.2	10.0	10.6	13.2	15.9	21.7	26.9	31.7	36.8	41.9	47.2	52.5
	300	6.8	7.9	8.6	10.3	10.1	12.5	13.2	16.5	19.8	27.1	33.7	39.6	45.9	52.4	59.0	65.6
2.5”	50	0.83	0.94	1.0	1.3	1.3	1.5	1.6	2.0	2.4	3.2	3.8	4.6	5.3	6.0	6.7	7.5
	100	1.7	2.0	2.2	2.6	2.6	3.2	3.4	4.1	4.9	6.6	7.8	9.6	11.0	12.4	13.9	15.4
	150	2.7	3.0	3.5	4.1	4.1	5.0	5.3	6.4	7.6	10.2	12.1	14.8	17.1	19.3	21.7	24.1
	200	3.7	4.2	4.8	5.7	5.7	6.9	7.3	8.9	10.5	14.2	16.8	20.6	23.8	26.8	30.1	33.3
	250	4.8	5.5	6.3	7.4	7.4	8.9	9.5	11.5	13.7	18.5	21.9	26.8	30.9	34.8	39.1	43.4
	300	6.0	6.8	7.8	9.2	9.2	11.1	11.8	14.4	17.1	23.1	27.4	33.4	38.6	43.5	48.8	54.2
3.0”	50	0.78	0.88	1.0	1.2	1.2	1.4	1.5	1.8	2.1	2.8	3.3	4.0	4.6	5.2	5.8	6.4
	100	1.6	1.8	2.1	2.4	2.4	2.9	3.1	3.7	4.3	5.8	6.9	8.3	9.6	10.6	11.9	13.2
	150	2.5	2.8	3.2	3.7	3.8	4.5	4.8	5.8	6.7	9.1	10.7	12.9	14.9	16.6	18.6	20.6
	200	3.5	3.9	4.5	5.2	5.3	6.2	6.7	8.0	9.3	12.5	14.8	17.9	20.6	23.0	25.8	28.6
	250	4.5	5.1	5.8	6.7	6.8	8.1	8.7	10.3	12.0	16.3	19.3	23.3	26.9	30.0	33.6	37.2
	300	5.7	6.4	7.2	8.4	8.5	10.1	10.8	12.9	15.0	20.3	24.1	29.2	33.6	37.5	42.0	46.5

Pipe heat loss is shown in watts per foot.
Heat loss calculations are from ANSI/IEEE 515-1989, Equation 1, with the following provisions:

- Pipes insulated with glass fiber in accordance with ASTM C547; and insulation size is the same as the pipe.
- Pipes located outdoors in a 0º F ambient with a 25 mph wind; alternate minimum ambience will slightly affect heat losses due to different “mean insulation temperatures” impacting the insulation thermal conductivity.
- A 10% safety factor has been included. For alternate design safety factors, divide the value by 1.10 and multiply by desired safety factor (i.e. 1.25 X for 25%).

HEAT LOSS ADDER FOR SURFACE HEAT TRACE INSTALLATIONS

Additional Heater Feet for Various Heat Sinks TABLE III

Pipe Size	Standard Flange	Blind Flange	Pipe Support (1)	Screwed or Welded Valve	Flanged Valve	Butterfly Valve
.50	.3	.5	1.0	1.0	1.0	1.0
.75	.3	.5	1.5	1.0	1.5	1.0
1.00	.3	.5	1.5	1.0	2.0	1.0
1.50	.3	.5	1.5	1.5	2.5	1.5
2.00	.3	.5	2.0	2.0	2.5	2.0
3.00	.5	.75	2.0	2.5	3.0	2.5
4.00	.5	.75	2.5	3.0	4.0	3.0
6.00	.75	1.0	2.5	3.5	5.0	3.5
8.00	.75	1.0	2.5	4.0	7.0	4.0
10.00	.75	1.0	3.0	5.0	8.0	4.5
12.00	.75	1.0	3.0	6.0	9.0	5.0

Nominal pipe length in feet. Adders are for various inline pipe fittings to compensate for greater areas of heat loss.
NOTE: Values above are based on area average of various fittings available, and the assumption that fitting insulation will be equivalent to pipe insulation. The nominal length of heat trace to be applied to a particular fitting would be the values shown in this chart plus the flange -to-flange length of the fitting.

INSULATION CORRECTION FACTORS[1] TABLE IV

Preformed Pipe Insulation[2]	Insulation Factor (I_{cf})	Insulation "k factor" (Conductivity) (Ftu • in/hr • ºF) @ 50º F
Urethane Foam	0.66	0.165
Polyisocyanurate	0.72	0.180
Fiberglass	1.00	0.250
Mineral Wool	1.20	0.300
Calcium Silicate	1.50	0.375
Cellular Glass	1.60	0.400
Expanded Silica	1.88	0.470

Notes: 1. Rigid insulation materials should be oversized to accommodate heat trace if placed on pipe surface. This would require calculating heat loss for the next larger size pipe before applying the insulation correction factor.

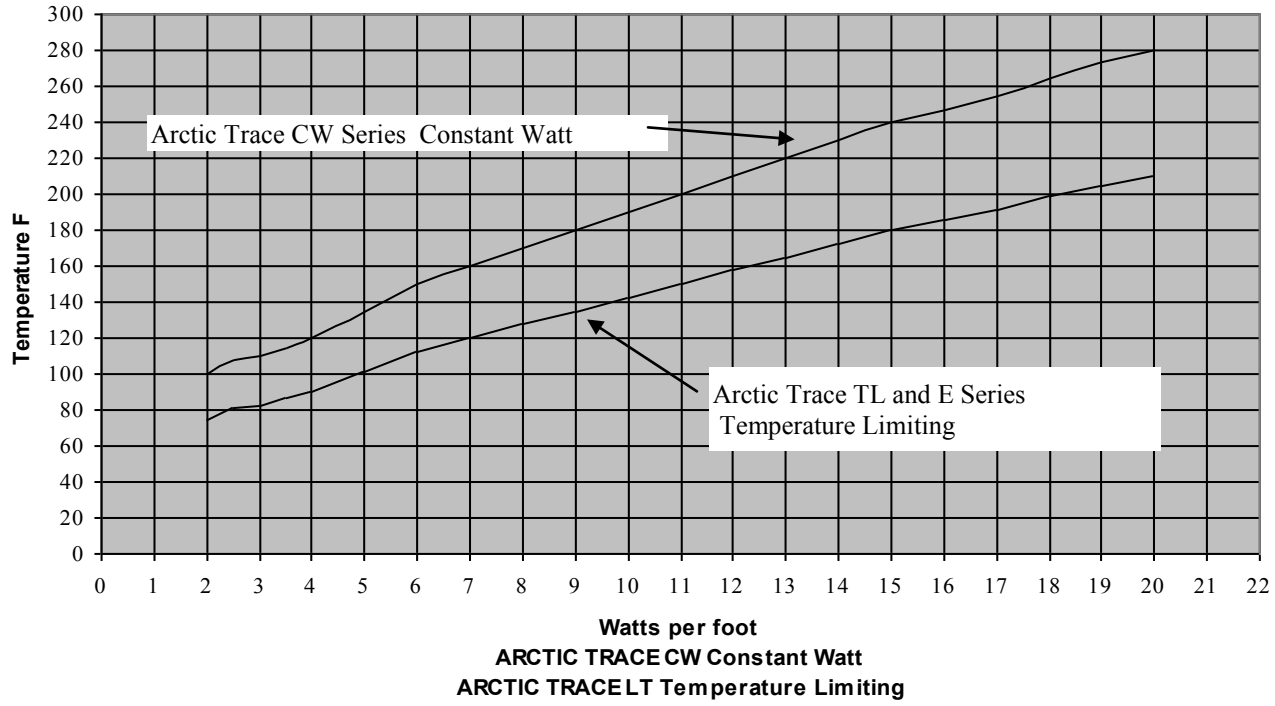
2. Values are based on IEEE 515.1-1995 standard.

SPIRAL PITCH FACTOR CHART I

ipe Size IPS	Feet of Cable per Foot of Pipe							
	1.1	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**1.7**	**1.8**
1	9	6	5	4	4	3	3	3
1 ¼	11	8	6	5	5	4	4	3
1½	13	9	7	6	5	5	4	4
2	16	11	9	7	6	6	5	5
2½	20	14	11	9	8	7	6	6
3	24	17	13	11	10	9	8	7
4	31	21	17	14	13	11	10	9
6	45	31	25	21	18	17	15	14
8	59	41	32	27	24	22	20	18
10	74	51	41	34	30	27	25	23

Example: For 2" pipe, with 1.3 feet of Heat Cable per foot of pipe, Pitch = 9 inches.

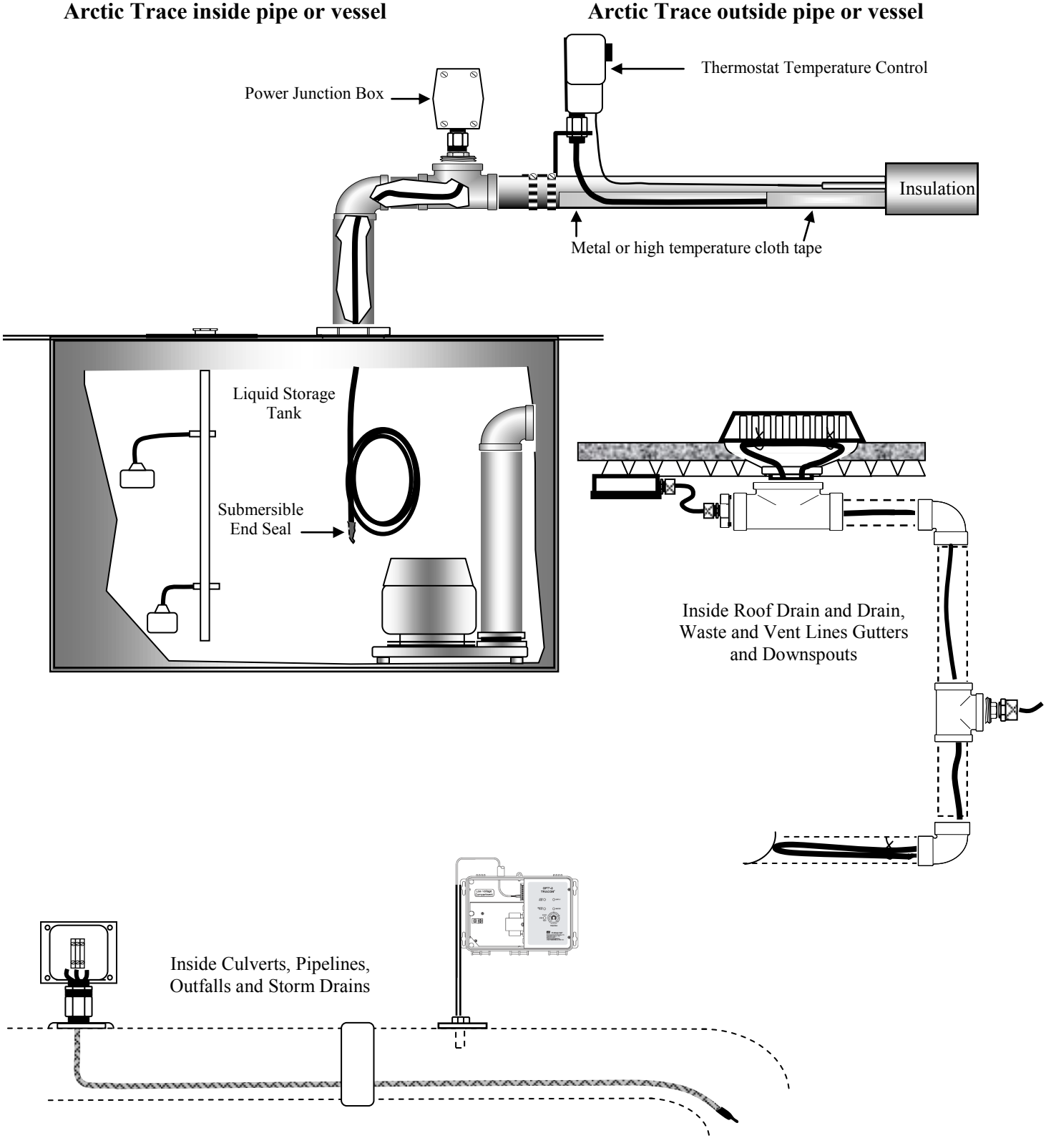
SURFACE TEMPERATURE VS. INPUT POWER IN OPEN AIR CHART II



ARCTIC TRACE ®

Design Considerations Inside Pipe or Vessel

Refer To Arctic Trace Application Section for More Detail

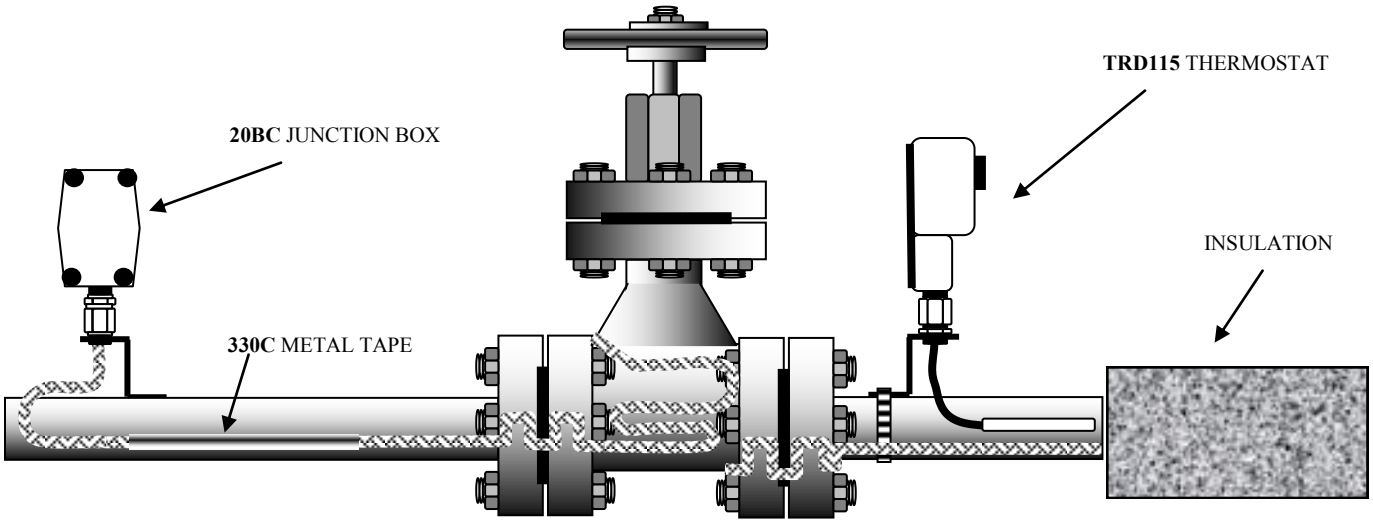


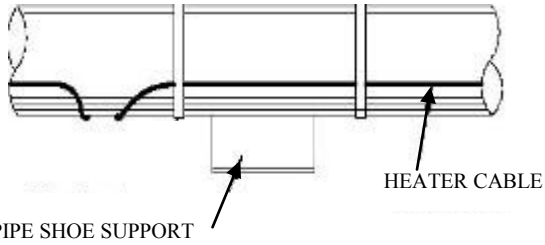
Submersible Heat Trace System

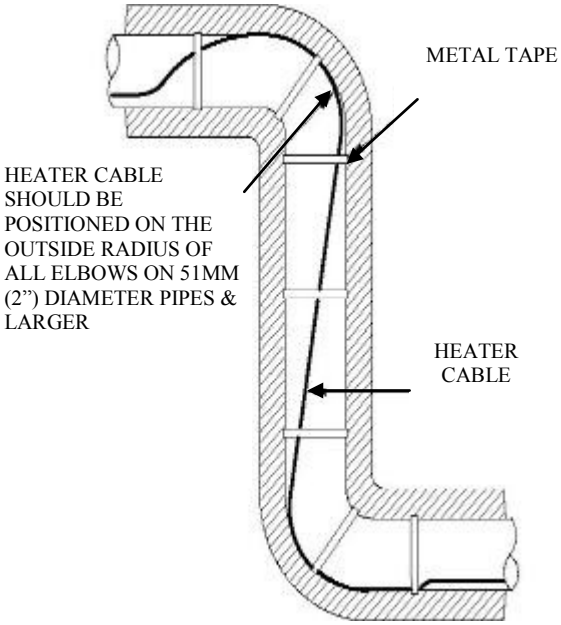
ARCTIC TRACE ®

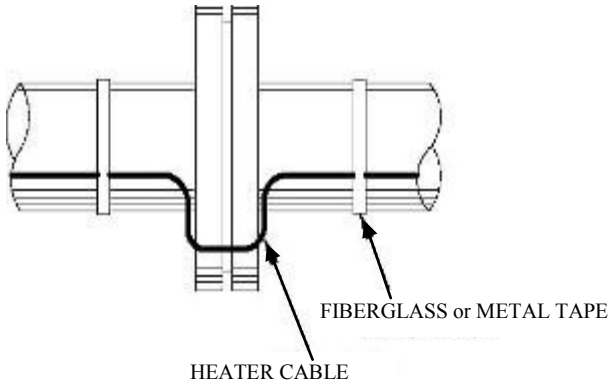
Design Considerations Outside Pipe or Vessel

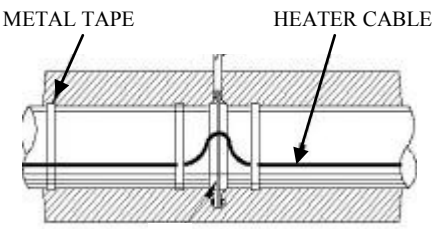
Refer To Arctic Trace Application Section for More Detail

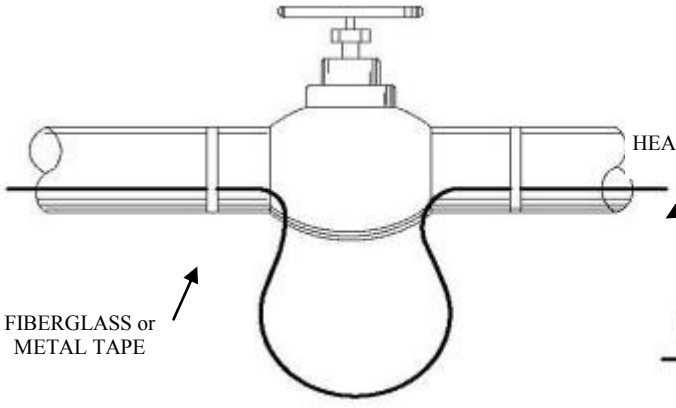


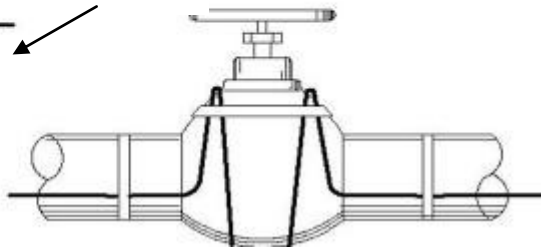












ARCTIC TRACE ®

Snow and Ice Melting System

Refer To Arctic Trace Application Section for More Detail

Arctic Trace Snow and Ice Melting System is designed for direct burial in concrete or asphalt.

Arctic Trace is a rugged and reliable electric radiant heating system. Ideally suited for critical access applications and utilizes a rugged construction to electrically generate heat.

Over 2,000 square feet (186 square meters) can be protected from a single power point. Each system is simple to design for stairs and complex layouts. Constructed for long-term operation. Preparation of cable for connection to power is easy with standard kits which require no special tools.

ASHRAE Recommended loads

Class I—Residential Walks & Driveways	36 watts sq/ft
Class II—Commercial sidewalks and Driveways, hospital steps	40 watts sq/ft
Class III—Toll Plazas, bridges, aprons and airport areas	55 watts sq/ft

Step-by-step guides allow user to select products, lay out circuits and install a complete system.

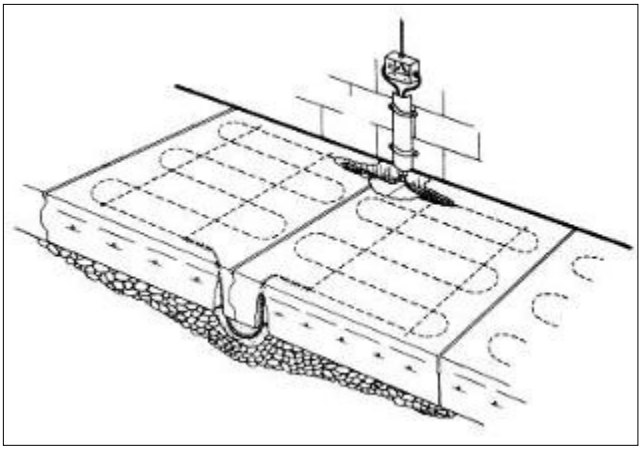
Installation—The installation of our radiant snow melting systems is fairly easy compared to other radiant heating systems. Any electrician would not have any trouble installing the system. Any contractor could install the system, and then have an electrician hook up the power to the system.

A minimum of 1" HDPE foam insulation should be used to insulate the slab from the ground below.

Technical support is available 5 days a week, and the installation manual and system diagrams are available.

Arctic Trace is spaced at 6" across the area to be heated. For a new pour concrete application, the Arctic Trace is secured to the re-mesh, and raised, if necessary, to be within 2" of the surface. When retrofitting Arctic Trace into concrete or asphalt, 1/4" wide grooves are saw cut into the existing surface 1" deep. The Arctic Trace is then laid in the grooves, after which backerod is used to fill in the space between the Arctic Trace and the surface. The surface is then sealed with Sikaflex on concrete, and with Dow 888 on asphalt.

Product choice—The Arctic Trace heating cables with an output of 20 W/ft, 240vac. **Model Z120524CBTL** can be used for all snow melting applications Asphalt or Concert.



Accessories and Optional Equipment

Part #

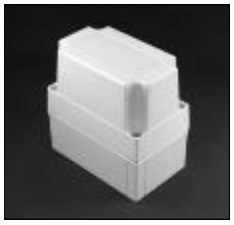
105A Low Temperature Vinyl shrink Butt Splice with solderless connectors and heat shrink

206C 1/2" MNPT Water Proof Strain Relief / Pressure Connector

207C 1/2"X1/2" MNPT Water Proof Strain Relief Pressure Connector

208C NEMA 4X Power Connection Junction Box with DIN Terminals Single Gang

209C NEMA 4X Power Connection Junction Box with DIN Terminals Double Gang



305C Water Proof End Seal

330C 150'x2" Metal Heat Transfer Tape

38036 500VDC Insulation Tester Megohmmeter

Part #

907 1100F Heat Gun with end cap adapter120VAC,

C14880
15 Amp GFCI Protected
15' Plug and Cord Set
120VAC

PGF1221BN114A
20 AMP GFCI Protected
15' Plug and Cord Set
240 VAC

C33120SP
20 Amp 120 volt,
Universal Power
connection kit with
switch, pilot light and
GFCI 4 each 1/2" hubs

SST-2 120/208/240/277VAC
30 AM Freeze Protection
Digital Thermostat,
Status Indicators,
temperature Sensor,
30 mA GFEP NEMA 4X
Enclosure

TRD115
120/240 VAC General
Purpose Adjustable
Thermostat, 5' Capillary,
NEMA 4X Enclosure

Automatic Ice and Snow Melting Controls
Snow, Ice, Roof, Gutter, Pavement, Concrete
Sensors and Controls

du Alaska Incorporated

6706 Greenwood Street
Anchorage, AK 99518

Phone: (907) 522-3004
Fax: (907) 349-1023

E-mail: dualaska@alaska.net