

Loop Name: Default Loop

For:

Pipe Length Details

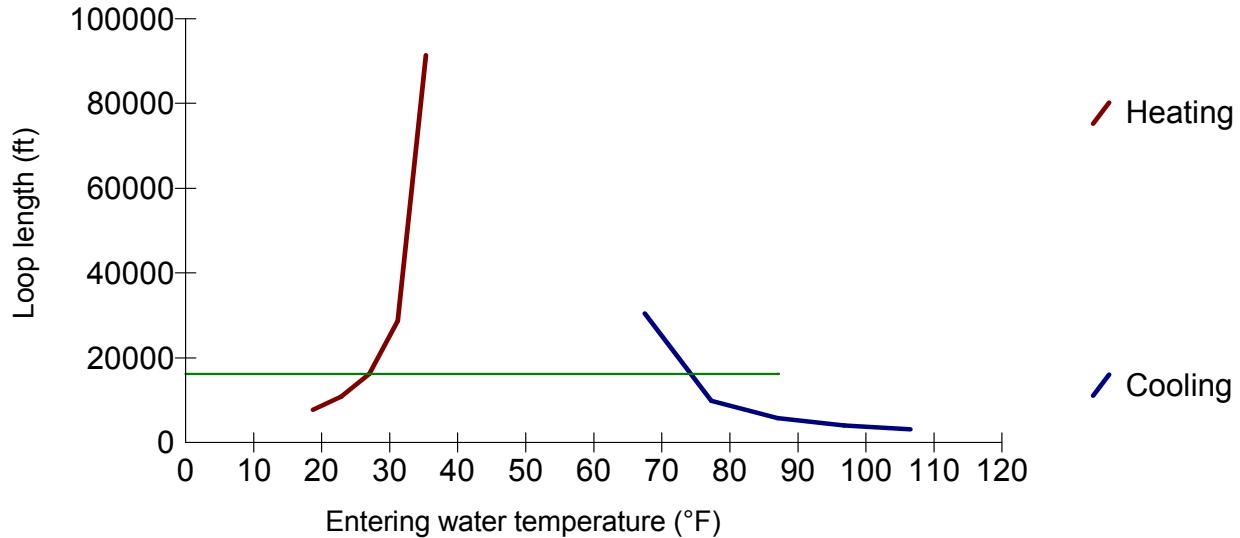
Minimum Reynolds Number:	2500	Soil Type:	Loam
Reynolds Number:	2900	Soil Diffusivity:	0.46 ft ² /day
Pipe Size:	0.75 in	Soil Conductivity:	0.52 Btuh/ft-°F
Pipe ID:	0.86 in	Design Ground Low Temp.:	37 °F
Pipe Type:	PE SDR-11	Design Ground High Temp.:	63 °F
Pipe Thermal Resistance:	0.141 ft-°F/Btuh	Design Heating EWT:	27 °F
		Design Cooling EWT:	87 °F
		Soil Therm. Resistance:	1.500 ft-°F/Btuh

Heating

Cooling

	EWT (°F)	Length (ft)	Capacity (Btuh)	COP	Run Fraction	EWT (°F)	Length (ft)	Capacity (Btuh)	EER	Run Fraction
Design	27	16172	43670	3.58	0.89	87	5741	56000	13.68	0.35
Actual	27	16172	43670	3.58	0.89	71	16172	60721	17.22	0.33

EWT - Loop Length Graph



Loop Name: **Default Loop**

For:

Pump Summary

Water coil head loss: 10.00 ft H2O at 11.00 gpm
Htg EWT (°F): 27 Clg EWT (°F): 87

Section	Pipe Sz (in)	Pipe Type	# Ftgs	Eq Ln (ft)	Pipe Ln (ft)	Total Eq Ln (ft)	Head Loss (ft H2O)
Connection Header	1.00	PE SDR-11	2	3	0	6	0.45
	1.25	PE SDR-11	12	3	0	36	0.91
	0.00		0	0	0	0	0.00
	0.00		0	0	0	0	0.00
Ground Loop	0.75	PE SDR-11	6	3	2695	2713	26.83
Select pump output that is at least:							38.19

Pump Model:

Number of pumps: 1

Pump Details

Fluid: Propylene glycol Density: 63.34 lb/ft³ Viscosity: 2.360 centipoise

Section	Pipe ID (in)	Reynolds Number	Pipe Length (ft)	Head Loss (ft H2O)	Fluid Vol (gal)	Velocity (fpm)
Connection Header	1.077	13895	6	0.455	0	3.9
	1.358	11020	36	0.909	0	2.4
	0.000	0	0	0.000	0	0.0
	0.000	0	0	0.000	0	0.0
Ground Loop	0.860	2900	2713	26.826	81	1.0
Oversize (10%):					49	
Total Volume (gal):					537	

NOTE: Ground loop parallel branches assumed to be of equal length. All other sections assumed to be connected in series. Pipe lengths are actual lengths. Head Loss calculations are based on parallel loop lengths.

Loop Name: Default Loop

For:

Design Conditions

LOADS	Heating:	78000 Btuh	Cooling:	46000 Btuh
EWT	Min:	27 °F	Max:	87 °F
	Earth Data:	Detroit	Soil:	Loam

Equipment

HEAT PUMP Manufacturer: BARD MANUFACTURING COMPANY
 Trade Name:
 Model: GSVS601-A
 Indoor Coil:
 Supplemental Heat: 34330 Btuh (10.06 kW)

CIRC PUMP The system requires 38 ft H2O at 11.00 gpm
 Use 1 pumps, Model # Series: 1 Parallel: 0

Loop

PIPE Loop type: Slinky Edge Total pipe length: 16172 ft
 6 trenches, 242 ft each, total trench length: 1454 ft
 Pitch = 12 in, depth = 6.6 ft, # of parallel loops = 6

Section	Pipe length	Pipe size and type
Connection	0 ft	1.00 in PE SDR-11
Header	0 ft	1.25 in PE SDR-11
	0 ft	0.00 in
	0 ft	0.00 in
	2695 ft	0.75 in PE SDR-11
Ground Loop		

TRENCHES 3 in wide 6.6 ft deep 10.0 ft separation

ANTI-FREEZE Type: Propylene glycol 15 %, freeze point: 23 °F
 Coolant 81 gal + water 456 gal = 537 gal

Loop Name: **Default Loop**

For:

Weather City: Port Huron
 Bin Data City: Mt Clemens/Selfridge ANGB, MI
 Earth Temp. City: Detroit

Winter Extreme Temperature: -13 °F Mean Earth Temperature: 50 °F
 Summer Extreme Temperature: 97 °F Annual Temperature Swing: 25 °F
 Mean Air Temperature: 48 °F Minimum Temperature Day: 39

Manufacturer:	BARD MANUFACTURING COMPANY	Load (Btuh):	Heating 78000	Cooling 46000
Trade Name:		EAT (°F):	70	80/67
Model:	GSVS601-A	EWT (°F):	27	71
Indoor Coil:		Capacity (Btuh):	43670	60721
		COP/EER:	3.58	17.22
		Input (kW):	3.58	3.53

Loop Type:	Slinky Edge	Coolant:	Propylene glycol
Configuration:	13 # trenches: 6	Concentration:	15 %
Depth: 5.00 ft, Pitch: 12.00 in		Water Volume (gal):	456
6 trenches, 242 ft length each		Coolant Volume (gal):	81
Soil Type:	Loam	Freezing Temp (°F):	23
Pipe:	PE SDR-11 0.75 in		

Heating	Design EWT (°F):	27	Pipe Length (ft):	16172
	Pipe Length (ft):	16172	Trench Length, (ft):	1454
Cooling	Design EWT (°F):	87	Flow (gpm):	11.00
	Pipe Length (ft):	5741	Minimum Head (ft H2O):	38

Bold/italic values have been manually overridden