



Zoning Made Easy - "Rules of Thumb"

Flow Rate

$$\frac{\text{Net Btuh Load}}{10,000} = \text{Flow Rate}$$

Maximum Flow Rate

Pipe Size (Copper)	Maximum Flow Rate
1/2"	1 1/2 gpm
3/4"	4 gpm
1"	8 gpm
1 1/4"	14 gpm

Maximum Flow Rate & Heat Carrying Capacity

Pipe Size (Copper)	Maximum Flow Rate	Heat Carrying Capacity
1/2"	1 1/2 gpm	15,000 Btuh
3/4"	4 gpm	40,000 Btuh
1"	8 gpm	80,000 Btuh
1 1/4"	14 gpm	140,000 Btuh

(Based on 20°F temperature drop across the system)

Maximum Length of Fin-Tube Baseboard Loop

Baseboard Size (Copper)	Typical Btuh Per Linear Foot	Maximum Length of Baseboard Loop
1/2"	600	25 feet
3/4"	600	67 feet
1"	770	104 feet
1 1/4"	790	177 feet

(Based on 180°F average water temperature and a 20°F temperature drop across the system)

Total Convectors a Pipe Can Serve

Pipe Size (Copper)	Maximum Btuh Capacity of Pipe	Total Convectors (6"x36"x24" 5,100 Btuh each)
1/2"	15,000	3
3/4"	40,000	8
1"	80,000	16
1 1/4"	140,000	27

(Based on 180°F average water temperature and a 20°F temperature drop across the system)

Shared Piping Size

Pipe Size	Maximum Flow Rate
1/2" copper	1 1/2 gpm
3/4" copper	4 gpm
1" copper	8 gpm
1 1/4" copper	14 gpm
1 1/2" copper	22 gpm
2" copper	45 gpm
1 1/4" iron pipe	17 gpm
1 1/2" iron pipe	25 gpm
2" iron pipe	50 gpm

Zone-Circulator Sizing for Heating Zones*

Zone Supply Pipe Size (Copper)	Bell & Gossett Circulator To Use**
1/2"	Series 100, NRF-9F/LW or ecocirc® 19-16
3/4"	Series 100, NRF-9F/LW or ecocirc 19-16
1"	Series 100, NRF-22 or ecocirc 19-16
1 1/4"***	Series HV or NRF-36

*Based on 180°F average water temperature and a 20°F temperature drop across the system.

**Assumption: Total zone piping 33% more than maximum baseboard radiation.

***You can use a Series 100, NRF-9F/LW, NRF-22 or ecocirc 19-16 on a domestic hot water storage tank with a 1 1/4" boiler supply tapping.)

Pump Head

1. Measure the longest run in feet
2. Add 50% to this.
3. Multiply that by .04 and
4. That's the pump head

Circulator Sizing for Systems with Zone Valves

1. Series 100, NRF-22, NRF-25, or ecocirc 19-16 can be used with:
 - a. Up to three 3/4" heating zones, or
 - b. Two 3/4" heating zones and one 1" zoned domestic water storage tank.
2. Series 100, NRF-22, or NRF-25 can be used with:
 - a. Up to five 3/4" heating zones , or
 - b. Three 3/4" heating zones and one 1" zoned domestic water storage tank.