

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 a 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)

"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!

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TOTAL CONVECTORS A PIPE CAN SERVE

Pipe Size (Copper)	Maximum Btuh Capacity of Pipe	Total Convectors (6" x 36" x 24" 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	Max. Flow Rate	Pipe Size	Max. Flow Rate
1/2" copper	1 1/2 gpm	2" copper	45 gpm
3/4" copper	4 gpm	1 1/4" iron pipe	17 gpm
1" copper	8 gpm	1 1/2" iron pipe	25 gpm
1 1/4" copper	14 gpm	2" iron pipe	50 gpm
1 1/2" copper	22 gpm		

ZONE-CIRCULATOR SIZING FOR HEATING ZONES

Zone Supply Pipe Size (Copper)

1/2"
3/4"
1"
1 1/4"

Bell & Gossett Circulator to Use

NRF-22, NRF-33 or Series 100
NRF-22, NRF-33 or Series 100
NRF-22, NRF-33 or Series 100
Series HV or NRF-33

CIRCULATOR SIZING FOR SYSTEMS WITH ZONE VALVES

1. An NRF-22 or Series 100 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. An NRF-33 or Series 100 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.

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