Welcome to WMS Hydronics 101
Part 2 The Basics

What will be covered

The Math
Circulator Zoning
Zoning with Zone valves
Expansion Tanks and Glycol
Picking and placing the circulator
System water quality

Where is the Magic ?

It is in the Math

Universal Hydronics Formula

GPM = BTUH ÷ °ΔT x 500

Pick your pipe size by GPM Required

Pick your Circulator by GPM and Pressure Drop

There is no Magic!!

Expansion Tank Sizing

Determining system volume

Water is being heated from 70° F to 180° F

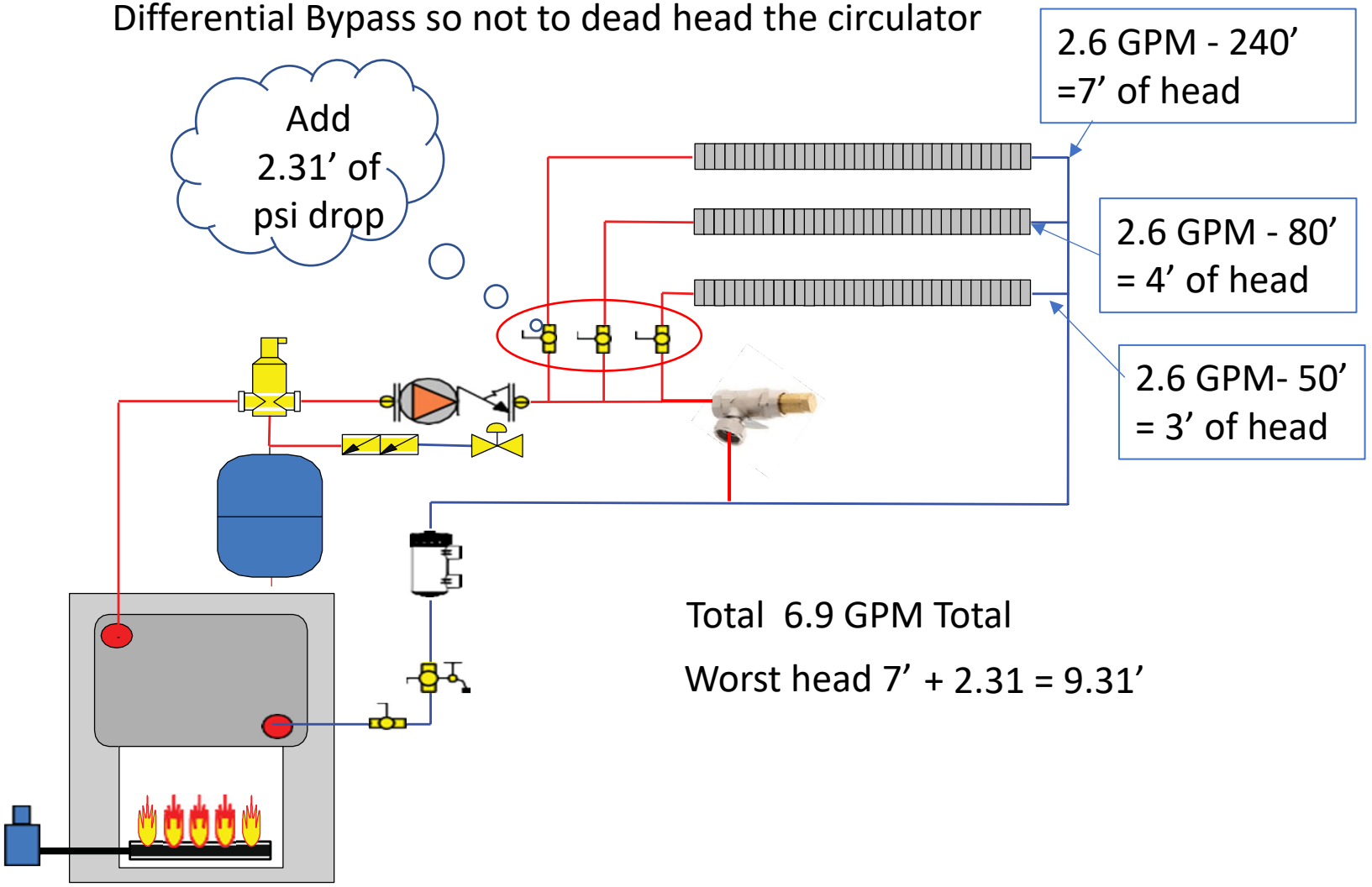
Quick Sizing Chart

Boiler Output Net BTU/H	Finned Tube Baseboard	Convectors or Unit Heaters	Cast Iron Radiators	Cast Iron Baseboard
	Suggested Selection			
20,000	ETX-15	ETX-15	ETX-15	ETX-15
30,000	ETX-15	ETX-15	ETX-15	ETX-15
40,000	ETX-15	ETX-30	ETX-30	ETX-30
50,000	ETX-15	ETX-30	ETX-30	ETX-30
60,000	ETX-30	ETX-30	ETX-60	ETX-60
70,000	ETX-30	ETX-30	ETX-60	ETX-60
80,000	ETX-30	ETX-30	ETX-60	ETX-60
90,000	ETX-30	ETX-30	ETX-60	ETX-60
100,000	ETX-30	ETX-60	ETX-60	ETX-60
125,000	ETX-30	ETX-60	ETX-60	ETX-90
150,000	ETX-30	ETX-60	ETX-90	ETX-90
175,000	ETX-60	ETX-60	ETX-90	ETX-90
200,000	ETX-60	ETX-60	ETX-90	ETX-90
250,000	ETSX-30	ETSX-30	ETSX-40	ETSX-30
300,000	ETSX-30	ETSX-40	ETSX-40	ETSX-30
350,000	ETSX-30	ETSX-40	ETSX-60	ETSX-30
400,000	ETSX-30	ETSX-60	ETSX-90	ETSX-40
500,000	ETSX-40	ETSX-60	ETSX-90	ETSX-40
600,000	ETSX-40	ETSX-90	ETSX-90	ETSX-60
700,000	ETSX-60	ETSX-90	ETSX-90	ETSX-60
800,000	ETSX-60	ETSX-110	ETSX-110	ETSX-90
900,000	ETSX-60	ETSX-110	ETSX-110	ETSX-90
1,000,000	ETSX-90	ETSX-110	ETSX-110	ETSX-90
1,200,000	ETSX-90	ETSX-110	ETSX-160	ETSX-90
1,400,000	ETSX-110	ETSX-160	ETSX-160	ETSX-110
1,500,000	ETSX-110	ETSX-160	ETSX-110 (2)	ETSX-110

Note: These recommendations are based on the average water volume of typical closed systems.
Fill pressure 12psi (83 kPa), relief valve set pressure of 30psi (207 kPa) and system temperature of 200F (93°C)

Hydronics 101 Part 2

When Using Zone Valves it is recommended to use a Differential Bypass so not to dead head the circulator



Total 6.9 GPM Total

Worst head 7' + 2.31 = 9.31'

Hydronics 101 Part 2

Cleaning up the System