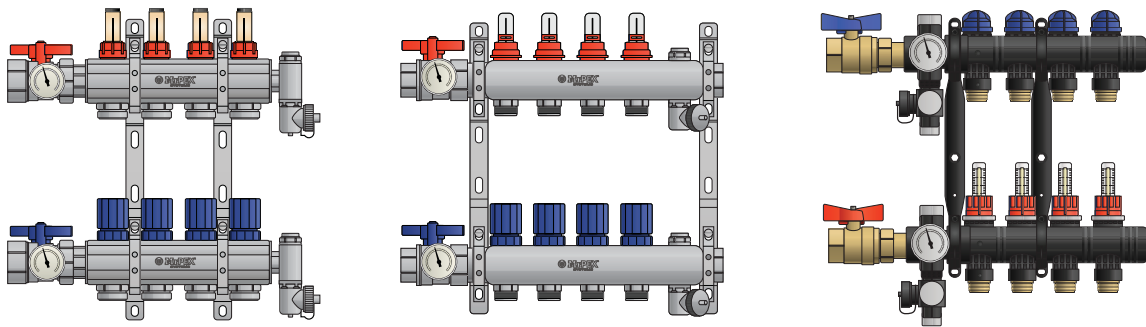


BALANCING THE MANIFOLDS

Balancing the manifold is the key to having the right heat delivered to the correct loop, zone, or room. The manifold is the distribution point where all the loops connect. Depending on design requirements, each loop will cover a specific area, and subsequently, its length and heat demand will be different from that of the other loops on the manifold. To meet the heat demand of a particular loop, first, flow needs to be established, then, the pressure drop of the worst loop so that a pump can be selected. The pump is sized to deliver the correct flow to the manifold. However, that's not the end of it. Water will travel the path of least resistance. A longer loop will have a higher pressure drop compared to a shorter loop, so, given the opportunity, the water will try to go the path of least resistance, through the short loop. This results in too much flow through the short loops (potentially over-heating), and too little flow (never satisfying the thermostat) in the long loops. Balancing takes in account the heat demand (flow) needed and the pressure drop, and diverts the flow to accurately give all the loops their required amount. All MrPEX® Manifolds have loop flow meters available. Use the MrPEX® Design Software to complete the design, each manifold and loop will have a target design flow and pressure drop. The manifold info is used for pump sizing (see Pump Sizing Section) and the loop flow for balancing the loops by dialing in the correct flow on the flow meters.



PROPORTIONAL BALANCING

In areas where all the loops on a manifold are in the same zone/room and have the same heat demand, proportional balancing can be used as long as the valve authority is setup as a straight line curve, meaning 50% open = 50% flow and 100% open = 100% flow. A lot of valves are not calibrated in this manner so please make sure you know. In the case of proportional balancing, we just need to make sure that the water entering the manifold gets distributed evenly across the loops i.e. making the water think all loops are the same length by creating artificial resistance. Our MrPEX 1 1/2" Stainless Steel manifold offers as an example the on/off valve with balancing (part# 3240003). This valve has a straight line balancing valve with 10 turns from closed to open. Here is how you balance with this valve. Let's say we have a manifold with 3 loops, Loop 1 is 350ft, Loop 2 is 300ft, and Loop 3 is 200ft. The longest loop will have the highest restriction for the water, so we leave this wide open at 10 turns. Now, to balance the next loop, you simply take the loop length x 10 / longest loop ($300 \times 10 = 3000 / 350 = 8.6$) = turns from closed to open (8.6). Same thing for the next loop, $200 \times 10 = 2000 / 350 = 5.7$. As you can see, the shorter loop has the least amount of turns open. This is due to the fact that we are creating artificial resistance so that the water thinks all three loops are equal. This eliminates one loop getting too much or too little flow/heat.