GEO-FLO
Engineered Solutions • Making Geothermal Easier

GEO-FLO PRODUCTS CORP.
905 Williams Park Drive
Bedford, IN 47421 U.S.A.
PH: 812-275-8513
FAX: 812-275-8523
www.geo-flo.com

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Multiple Heat Pump Flow Center Selection Guidelines

Summary:

The availability of variable speed flow centers, along with two-stage and variable speed geothermal heat pumps presents new challenges in selecting the best combination for energy efficiency and cost effectiveness. Geo-Flo has come up with guidelines to help designers choose the best approach for the application.

Two 2-stage geothermal heat pumps:

Best = Single ground loop with variable speed flow center for each heat pump

Next best = NP Dual variable speed flow center or two variable speed pressurized flow centers (one for each heat pump) with check valves on a common loop

Third best = Two constant speed flow centers (one for each heat pump) with check valves on a common loop

Fourth best = One constant speed flow center "shared" via Pump Sharing Relay on a common loop. A variable speed flow center doesn't really make sense in this case because most sharing controls force the variable speed pump to run at the higher of the two flow rates or full flow rate to provide enough flow if either heat pump is running, negating the ability of the variable speed pump to modulate. The exception is the use of a single varaible speed flow center controlled by a Geo-Flo UPC GEO controller, which may be set for two flow rates (one for each heat pump).

Two variable speed geothermal heat pumps:

Best = Single ground loop with variable speed flow center for each heat pump

Next best = NP Dual variable speed flow center or two variable speed pressurized flow centers (one for each heat pump) with check valves on a common loop

Worst (avoid if possible) = constant speed pumping

Three 2-stage or variable speed geothermal heat pumps:

Best = Single ground loop with variable speed flow center for each heat pump, or Magna3 variable speed central pump on a common loop with a zone valve for each heat pump (use a modulating zone valve for variable speed heat pumps or two-stage heat pumps when possible [depending upon available heat pump controls or the use of the UPC GEO controller] to take full advantage of the Magna3 ECM technology)

Next best = Variable speed flow centers (one for each unit) with check valves on a common loop (care must be exercised when using multiple flow centers in parallel to ensure that adequate flow is available when all heat pumps are operating at full load)

Worst (avoid if possible) = constant speed pumping

More than three 2-stage or variable speed geothermal heat pumps:

Best = Magna3 variable speed central pump on a common loop with a zone valve for each heat pump (use a modulating zone valve for variable speed heat pumps or two-stage heat pumps when possible [depending upon available heat pump controls or the use of the UPC GEO controller] to take full advantage of the Magna3 ECM technology)

Next best = A single ground loop with variable speed flow center for each heat pump

Worst (avoid if possible) = constant speed pumping