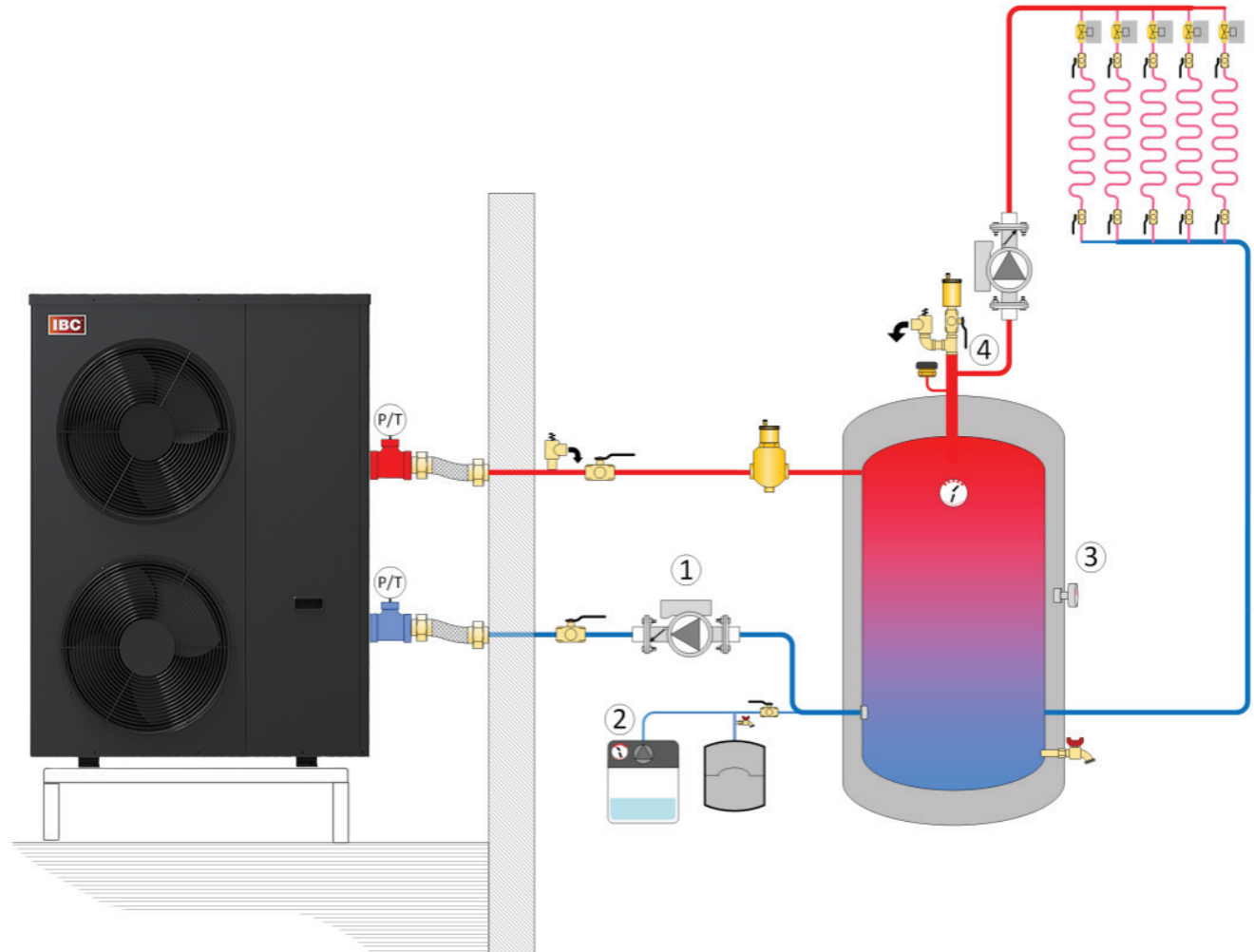


Buffer Tank Piping

Buffer Tank Piping

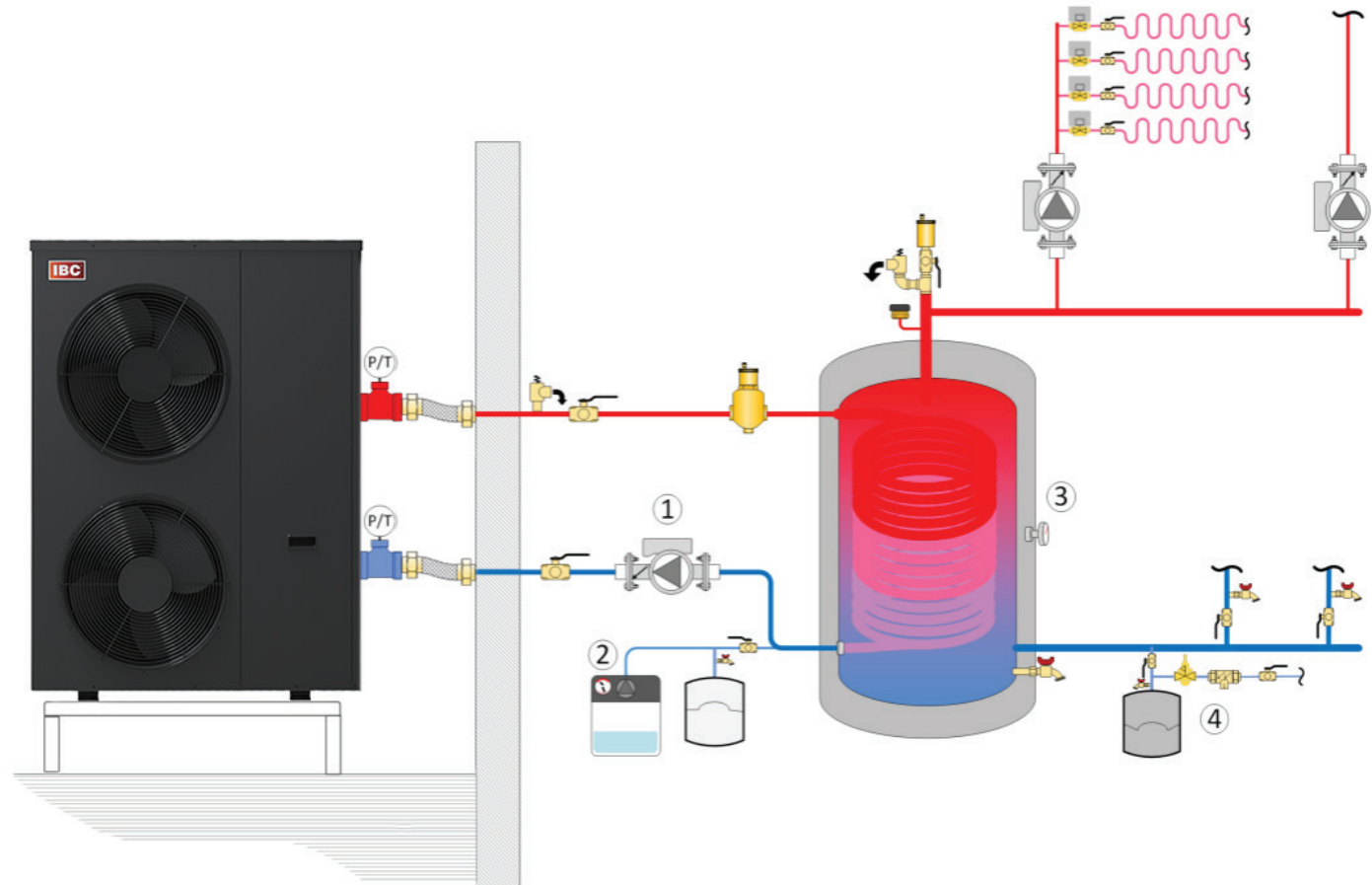
- 1 Hydronic heat pump circulator with integral check valve
- 2 Glycol fill tank: 25%-50% propylene glycol throughout system. Alternatively, a flat plate heat exchanger or heat pump indirect tank can isolate glycol from distribution water.
- 3 Buffer tank
- 4 Buffer tank hydraulically separates HPX™ from load piping; load pump(s) sized for head loss of building side of tank only. Buffer tank needs vacuum breaker for cooling mode.



Glycol Isolation With Indirect Water Heater

Glycol Isolation with Indirect Water Heater

- 1 Hydronic heat pump circulator with integral check valve
- 2 Glycol fill tank
- 3 Extended-coil indirect water heater for glycol isolation. NOTE extra surface area of specialty heat pump indirect tank for efficient heat transfer: domestic model of indirect tank would likely cause short-cycling. Buffer tank needs vacuum breaker for cooling mode.
- 4 Fill valve and expansion tank to maintain system pressure

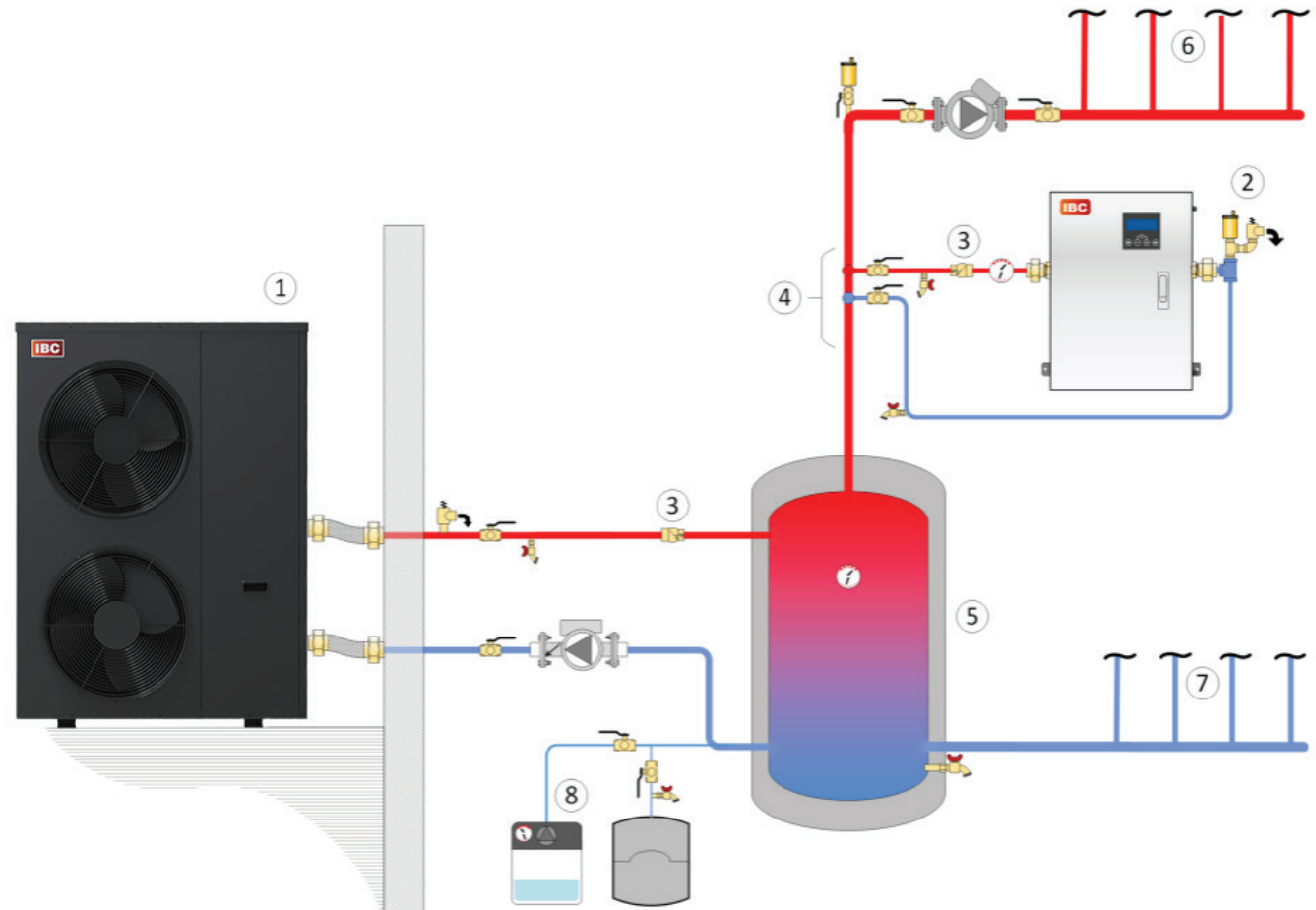


Multiple Heat Sources With Buffer Tank

IBC[®]

Multiple Heat Sources with Buffer Tank

- | | |
|---|--|
| 1 | Hydronic heat pump circulator with integral check valve |
| 2 | High-efficiency hydronic gas boiler or electric boiler staged (by IBC Sky 35 Controller) to supplement heat pump below system balance point. |
| 3 | Check valves |
| 4 | Closely-spaced tees: Max. four pipe diameters apart; Min. eight pipe diameters straight piping upstream and four downstream |
| 5 | Buffer tank. Buffer tank needs vacuum breaker for cooling mode. |
| 6 | Supply to heating system |
| 7 | Return from heating system |
| 8 | Glycol fill tank |



HPX[™]