

Service Bulletin 082
September 25, 2014

Floor Cooling Updates

The floor cooling operation has been updated to simplify it and meet end users' expectations to change the floor cooling set point. The floor cooling change requires that a thermostat with heating and cooling capability be installed in each floor cooling zone. The floor cooling operation has been removed from heat-only thermostats.

When designing floor cooling systems, it is important to understand that a floor cooling system has limited cooling capacity and should be paired together with an air cooling system. The floor cooling system reduces part of the sensible cooling load, while the air cooling equipment cools the latent and remaining sensible cooling loads.

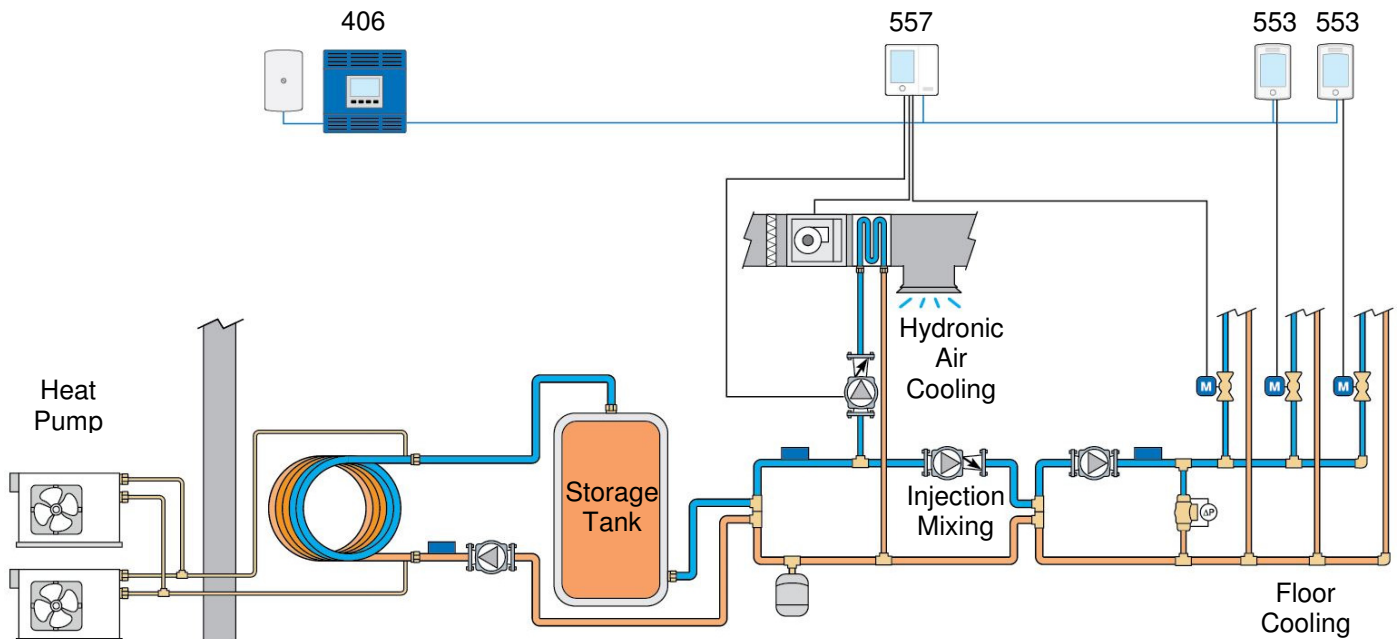
| Product | Changes | Effective |
|-------------------------------|---|---------------------|
| Thermostat 527, 528, 529, 530 | No changes, not recommended for floor cooling | Not applicable |
| Thermostat 537, 538, 540 | No changes, not recommended for floor cooling | Not applicable |
| Thermostat 552 | Floor cooling option removed | Lot 17218 or higher |
| Thermostat 553 | Floor cooling updated | Lot 17184 or higher |
| Thermostat 557 | Floor cooling updated | Lot 17178 or higher |

Floor Cooling Operation

The new floor cooling operates when the following conditions have been met:

1. A Thermostat 553 or 557 has been installed.
2. The Thermostat 553 or 557 is connected to a House Control 406. The 406 is able to provide both hot and chilled water to the system.
3. The thermostat's floor cooling setting is set to ON.
4. The thermostat and 406 is in warm weather shut down (WWSD).
5. The thermostat heat emitter is set to either high or low mass hydronic radiant floor (HRF1 or HRF2).
6. The thermostat turns on floor cooling at 1.0°F (0.5°C) below the set cool setpoint setting.
7. The air and/or floor temperature is above 64°F (18.0°C).
8. The tN4 House Control 406 is in mode auto or mode cool. In mode auto, there cannot be any heat calls for 2 hours.
9. Chilled water is 2°F (1°C) above the dew point. This prevents condensation on floors and equipment.

Floor Cooling Application Example



A hydronic heat pump provides both heating and cooling to a system. A storage tank acts as a buffer and reduces short cycling on the heat pump compressor. There are three floor heating and cooling zones. There is also a hydronic chilled water fan coil unit that provides air cooling and dehumidification for the entire building.

The Thermostats 553 and 557 measure both air temperature and relative humidity in each of the zones. The relative humidity measurement allows the tN2 House Control 406 to calculate the highest dew point temperature for all zones.

The thermostats turn on the floor cooling system when the room air temperature is 1 °F below the Set Cool set point. The 406 operates the heat pump to chill the storage tank and operates the variable speed injection mixing to ensure the water supplied to the floor cooling zones is 2 °F above the dew point temperature. This ensures that there is no condensation on the floor or on any floor cooling equipment. The air cooling system is operated when the room air temperature exceeds the Set Cool set point and can also provide dehumidification should the relative humidity exceed a maximum RH set point.