

## Boil-Over Protection

Its 10:00 am and you're in the walk-in weighing hops. You've had a good morning. You got in early and started your mash almost immediately and your lauter ran perfectly. You started your boil about 15 minutes earlier than normal and it looks like its going to be a short(ish) day. As you leave the walk-in, though, you hear the unmistakable sound of a boil-over.

Wort is rocketing out of the kettle door and cascading onto the brewhouse floor. Maybe you can fight your way to the kettle steam controls by playing fireman with the brewhouse water hose. Maybe your system is set up so you can turn off your steam or burner without going near the kettle door. Maybe, if you're lucky, you didn't just dump a major portion of your morning's work down the drain. And maybe, if you're lucky, you don't have a giant mess to clean up. Maybe.

It could have been a lot worse. Depending on your system, this could have been a serious safety risk. We all know that a boil over at the wrong time can cause serious injury. Imagine a boil-over while you're back is turned to the kettle, while the door is closed and you're about to add hops or while you're under the kettle switching valves or hoses. Hot wort blasting out of the kettle at any of these times could land you in the hospital.

We all know this. We all know the monetary cost of wort down the drain. We all know the labor cost and unfortunately, some of us will experience the personal cost of a serious burn. We tell ourselves that we are careful enough that it won't happen to us. But why take the risk? It doesn't have to happen. Boil-overs are completely preventable.

Any system can be modified to add boil-over protection. It's as simple as adding a level switch into the kettle and wiring it to either your burner control or a steam solenoid. For most systems, a capacitive level switch with an integrated probe can be installed into the top of the kettle with the probe hanging down to a height about halfway between the height of the normal boil and the height of the kettle manway. Here, the probe is out of the boiling liquid and any foam topping and only is touched by foam when the foam pile covers the wort and rises toward the door. Once the probe is touched by foam, the switch turns off either the steam solenoid or the burner control. The heat is turned off and the boil-over subsides. The switch resets once the probe is no longer touching the foam pile and turns the heat back on.

Now, obviously, relying on the switch to regulate your boil is not recommended. Heating to boil-over, then cooling, then heating to boil-over repeatedly will not provide the kind of boil profile a brewer wants. You still need to set your heat level properly. However, the switch can provide safety for the times you don't get it quite right.

Modifying your system to add boil-over protection is simple and only requires one or two items, depending upon your kettle heating configuration. For direct fire systems only a level switch is needed. It can be added to your kettle and wired directly to your burner control system. For steam heated systems, an additional steam control solenoid or motorized control valve, sized for your steam requirements, is needed in the steam supply piping to the kettle. For multi-jacketed vessels, this should be placed on the main tank supply upstream of any jacket branches.

The level switch is the main component of this modification. I have used the Proximity CLS2 from Dwyer controls for this application with great success, but other manufacturers offer comparable units. Normally, a welded sanitary tri-clover fitting is added to the top of the kettle and the switch is mounted on it with the probe passing through the fitting into the tank. The unit requires a 12-240V AC/DC electric supply and provides a relay output that can be wired to your burner control or a steam control valve. Operating times for the switch can be set to eliminate nuisance tripping with the steam control valve or burner control set to turn off in 10 seconds or less. Each system varies slightly but the overall installation is quite simple.

That's it. One switch and one valve and it can save your life, or at least, a good portion of your next batch of beer. So feel free to go weigh some hops. The level switch can watch your boil.

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