

Monday, June 28th, 2021

Boiler Safety: CSD-1 Emergency Shut-off Switches

Monday Morning Minutes | by Norm Hall, June 28th, 2021

The **ASME CSD-1 Controls and Safety Devices for Automatically Fired Boilers** is a standard for many State codes including Michigan and Ohio. This standard exists for the protection of people and property. Part of CSD-1 requires a disconnect switch at all entrance doors to a room containing the boilers. This disconnect is commonly called a “mushroom”.

How should this mushroom be wired?

The Emergency Shut-Off Switch Requirement

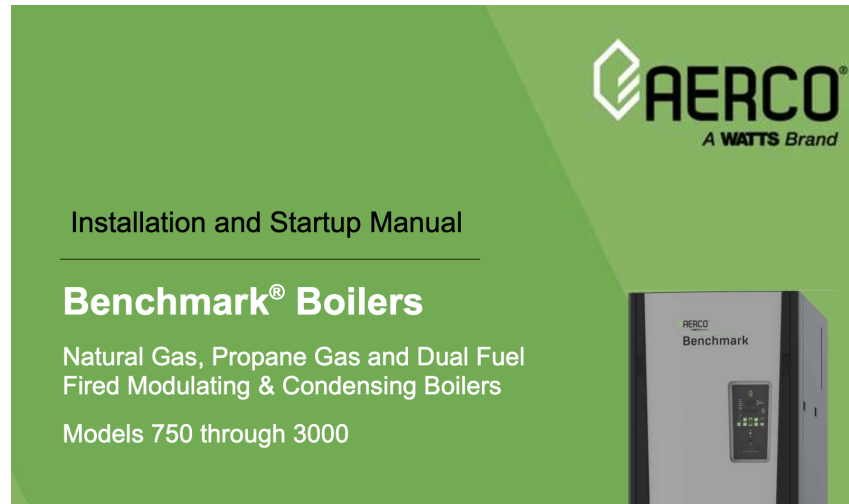
State and local codes are based on various versions or updates of the ASME CSD-1 standard. Please review the actual wording of the codes in your area. The version I am referring to has the following wording taken from a portion of the Electrical Requirements: General, section CE-110.

“.....A manually operated emergency shutdown switch or circuit breaker shall be located just outside the boiler room door and marked for easy identification. Consideration should be given to the type and location of the switch to safeguard against tampering. If the boiler room door is on the building exterior, the switch should be located just inside the door. If there is more than one door to the boiler room, there should be a switch located at each door.

Activation of the emergency shutdown switch or circuit breaker shall immediately shut off the fuel or energy supply. ...”

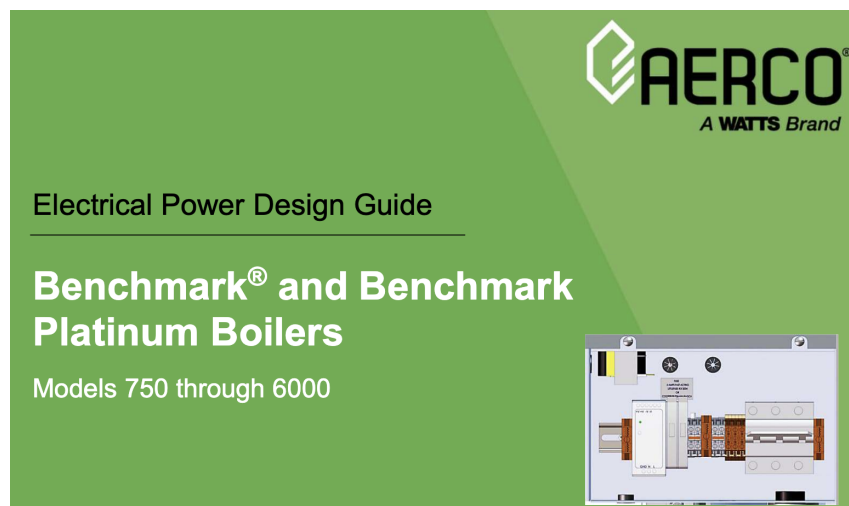
There is much more to the section of the code. This blog centers on the portion shown above.

Shutting Down the Fuel Supply vs. Shutting Off the Boilers



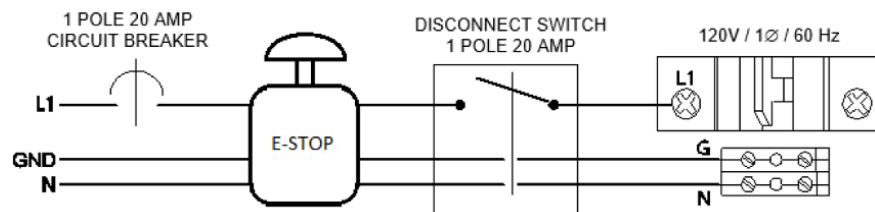
There is a big difference between shutting down the boiler compared with disabling the boilers. Many boilers have an enable/disable switch for the boiler. [The AERCO Benchmark installation and operation manuals](#) refer to these as the “Remote Interlock Circuits”. They exist for the control system to enable or disable the boiler based on some external requirement such as, for example, having the pump on and operating prior to boiler startup. These contacts will stop the control of the boiler. They do NOT stop the power source and should never be used as a means to achieve the CSD-1 emergency shut-off.

Emergency Shut Down of the Fuel Supply

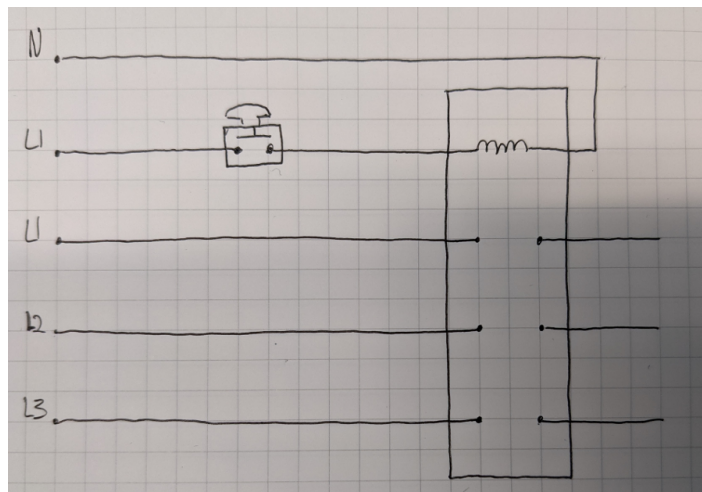


The ASME CSD-1 standard requires that the fuel supply be shut off. For that to happen, the emergency switch can completely shut down the power to the boiler. This is important in case the boilers are set on manual for service or an issue arises in the control circuits. Aerco offers a handy [Electrical Power Design Guide](#) to assist you when you are specifying an Aerco Platinum or Benchmark hydronic boiler system. Other brands may or may not offer the same assistance.

Here is an example, taken from page 7, of the wiring for the Aerco boilers requiring 120/60/1 power. It is important to check local codes to determine if the shutdown is required for individual boilers or the complete plant.



If the power is three-phase to the Benchmark or Platinum boiler, here is a sketch of one way to achieve the power shutdown.



Safety is an extremely important part of the design of a boiler system. Engineers understand and demand safety. This R. L. Deppmann Monday Morning Minute was written to help you make a better decision when wiring the boiler plant.