

## MADDEN HV SERIES BLOWDOWN HEAT RECOVERY SYSTEM SHOWN (LEFT SIDE)

Operates at same pressure as the D/A tank.

MADDEN'S SIMPLE BUT EXTREMELY RELIABLE SS FLOAT AND DRAIN ASSEMBLY. RARELY FAILS AND USUALLY LASTS 10+ YEARS BEFORE IT MAY NEED TO BE REPAIRED.

ENSURES UPPER FLASH VESSEL STAYS UNDER PRESSURE; AS WELL AS ENSURING ONLY FLASH STEAM LEAVES TO THE D/A OUT OF THE VENT, AND REMAINING CONDENSATE THEN DRAINS THROUGH THE VERTICAL COIL HEAT EXCHANGER.

MADDEN'S VERTICAL TYPE, 304SS HEAT EXCHANGER ASSEMBLY. ENSURES DIRTY BLOWDOWN CONDENSATE WILL ALWAYS GRAVITY DRAIN EVEN WHEN NOT OPERATING UNDER PRESSURE. NO SCALE OR SOLIDS BUILD UP BECAUSE OF THIS AND BECAUSE OF THE SHELL SIDE ALWAYS REMAINING FULL OF MAKEUP WATER.

BLOWDOWN WATER THAT REMAINS AFTER FLASH, PASSES THROUGH COIL AND OUT TO DRAIN

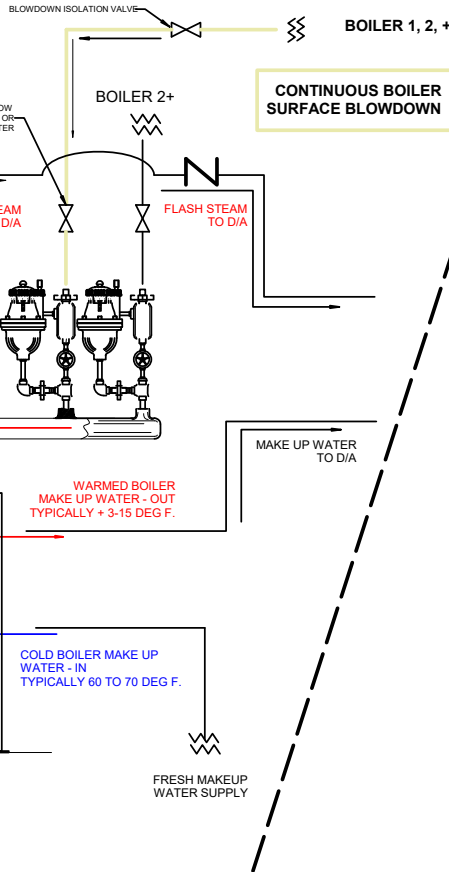
< 140 deg F. Typically closer to 100-120 deg F

FRESH MAKEUP WATER SUPPLY

WARMED BOILER MAKE UP WATER - OUT TYPICALLY + 3-15 DEG F.

COLD BOILER MAKE UP WATER - IN TYPICALLY 60 TO 70 DEG F.

CONTINUOUS BOILER SURFACE BLOWDOWN



## TYPICAL COMPETITOR ASSEMBLY DESIGN SHOWN (RIGHT SIDE)

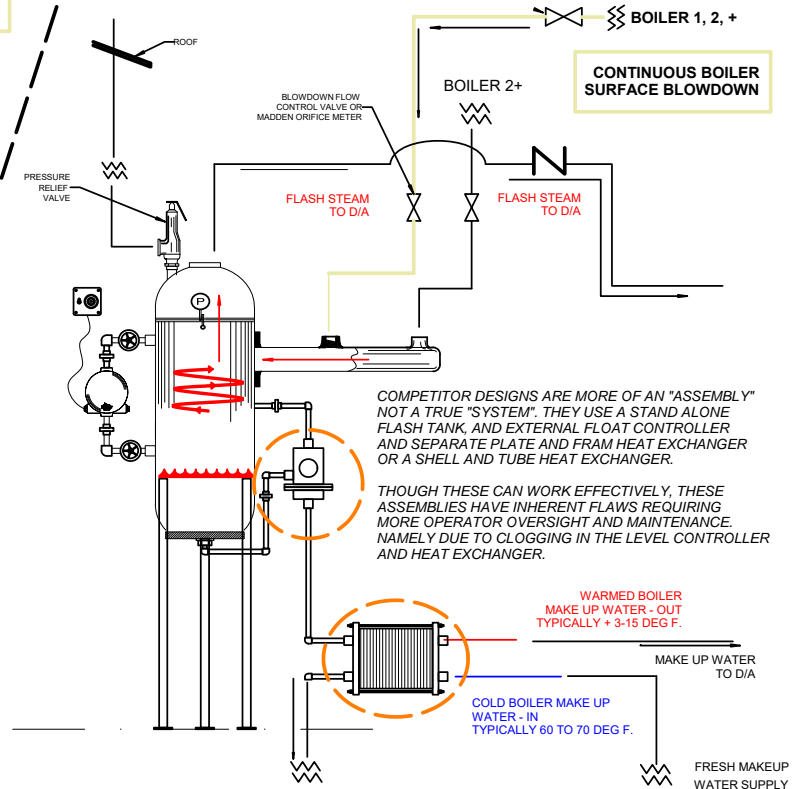
COMPETITOR DESIGNS ARE MORE OF AN "ASSEMBLY" NOT A TRUE "SYSTEM". THEY USE A STAND ALONE FLASH TANK, AND EXTERNAL FLOAT CONTROLLER AND SEPARATE PLATE AND FRAME HEAT EXCHANGER OR A SHELL AND TUBE HEAT EXCHANGER.

THOUGH THESE CAN WORK EFFECTIVELY, THESE ASSEMBLIES HAVE INHERENT FLAWS REQUIRING MORE OPERATOR OVERSIGHT AND MAINTENANCE. NAMELY DUE TO CLOGGING IN THE LEVEL CONTROLLER AND HEAT EXCHANGER.

WARMED BOILER MAKE UP WATER - OUT TYPICALLY + 3-15 DEG F.

COLD BOILER MAKE UP WATER - IN TYPICALLY 60 TO 70 DEG F.

CONTINUOUS BOILER SURFACE BLOWDOWN



### CONTINUOUS SURFACE BLOWDOWN RECOVERY SYSTEMS BY MADDEN:

- Madden is a smaller, family owned manufacturer serving a niche market in boiler blowdown equipment. Our company is truly dedicated to being the number one solution for boiler blowdown systems, and in particular, surface blowdown heat recovery systems.
- The Madden vertical heat recovery unit is a true "system". Its design is entirely dedicated to being an operator friendly and durable design. Most systems last 15+ years before requiring any type of maintenance or replacement of the heat exchanger or level controller.
- The key benefit Madden heat recovery systems provide is in our vertical 304SS coil type heat exchanger and rugged level control and drain valve. This equipment ensures you will see no solids buildup. Madden systems are self-flushing, designed to use gravity flow to continuously clean itself. They operate without becoming clogged or fouled with solids contained in the dirty blowdown water.
- Madden also takes price in backing our heat recovery equipment with excellent customer service. We are happy to customize these designs to better fit the clients needs as well as provide supporting information like a performance and savings estimate.
- These systems typically pay for themselves in less than one year.

### COMMON COMPETITOR HEAT RECOVERY DESIGN "ASSEMBLIES":

- Most of our competitors "assemble" their systems. We say "assemble" because most buy out each piece and put it all together to work as an assembly.
- This brings about inherent issues. Namely with clogging and general operator oversight required. One must continuously check to be sure the external float trap is not clogged and float is actuating, as well as ensure there isn't clogging in the heat exchanger.
- The heat exchangers used are typically plate and frame or shell and u-tube bundle type. Never vertical and self draining.
- It is also important to note, none of our competitors on the market currently have pre-designed heat recovery systems capable of handling continuous blowdown flow rates over 15,000 PPH. For large industrial boiler rooms, this won't cut it. Madden HC horizontal heat recovery systems can handle up to 50,000 PPH of continuous boiler blowdown.