



A-T Controls, Inc.

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Boiler Blowdown and Makeup

Boiler blowdown is a term that describes water that is purged to prevent contaminants like scale and solids from building up in a boiler. These contaminants build up over time, which reduces the efficiency of the boiler and can prevent the boiler from operating properly. Makeup water is the water added to replenish the boiler system after the blowdown is purged. Makeup water is usually preheated in a heat exchanger prior to entering the make up tank to 175-190°F. This helps the water to blend with the hot returning condensate in the make up tank without flashing. Flashing is the sudden, violent change of liquid water to water vapor because of a pressure drop. Flashing could cause water hammer and potential damage to the level control system and piping.

Blowdown Valve/ Automated Assembly Characteristics

A ball valve used in boiler blowdown in an automated system should be a three-piece design that allows serviceable seat exchange should damage occur from scale or severe flashing across the valve. A vented, upstream ball is required to prevent flashing. Flashing damages the downstream seat in most cases, which causes deformation in the seat face as the ball opens. The seats shall be a carbon filled (CTFE) or stainless steel filled PTFE (50/50 STFE) rated for higher temperatures with a ridge the design to prevent deformation in extreme conditions. Stainless steel materials of construction (CF8M, CF3M, and 316SST) are recommended to eliminate rust.

The actuation package should be installed with a mounting kit or direct mount stem extension for proper heat dissipation. This helps to preserve the soft seals in a pneumatic actuation package and reduces the possibility of overheating for an electric actuation package. The stem extension also allows for insulation around the valve. A pneumatic actuation package is usually the best option, providing a quick cycle time

that gives a proper blowdown of scale and dirt from the tubes and system. High temperature solenoids and limit switches should be considered as the proximity to the boiler creates a high temperature environment. Cycle time under start up or full load and duty cycle must be considered when choosing an electric actuator for coil tube boilers. Control span must be given time for a full stroke to occur. If this is not set properly, the actuator will never fully stroke causing thermal protector failure in a short period of time.

The choice of a well-designed valve with a live loaded stem with correct seats and gaskets make an automated ball valve a cost-effective package, which can also be repaired in the field.

Makeup Valve/Automated Assembly Characteristics

A similar design of blowdown valves (vented ball, stainless steel materials of construction, CTFE or 50/50 STFE seats, stem extension or mounting kit, three-piece design) is also recommended for makeup water valves and valve packages. A ball valve with V-port ball design is preferred for makeup valves because it allows for more control of the addition of the make up water to the boiler system.

Electric actuation assemblies should consider cycle time and duty cycle in conjunction with the boiler control under full load to achieve a proper level in the tank based on demand. Pneumatic actuation is often considered best for this application because constant modulation is common on start up and full load, fast reaction time, and long cycle life.

Please consult A-T Controls for material selection for your boiler application. These parameters are guidelines, and customers are responsible for materials of construction, preparation of the valves for service, and lubricants being compatible with their boiler application.



Manual and Automated Quarter Turn Valves
Complete Valve and Damper Automation





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Valve Packages (*Others Available*)

Series 88- Sizes ¼"-4", ISO 5211 mounting, Threaded, Socket Weld or Butt Weld, Anti-Static Device
2000/1500/1000 WOG (by size)
Literature Download & [Web Content](#)

V Series Control Port- Sizes ½"-4" (up to 6" with FVD9), 3-piece design (V7, V8) or 150#/300# flanged (V9 and FVD9), ISO 5211 mounting, 30°, 60°, and 90° "V" notch design standard (other designs available on request)
Literature Download & [Web Content](#)

Series 55- Sizes ¼"-4", ISO 5211 mounting, Threaded, Socket Weld or Butt Weld three-piece design, 1000/800 WOG (by size)
Literature Download & [Web Content](#)



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