ALTAIR
EQUIPMENT CO., INC.
335 Constance Drive Warminster, PA. 18974

Spray/Scrubber Type Deaerator
Specifications

The deaerator shall be of the Spray/Scrubber type, designed for oxygen removal of .005 cc/l (7ppb) and complete carbon dioxide removal, when operated at design conditions. The deaerator is to be designed to be operated at an internal steam pressure of 5 psig, with a minimum plant steam supply pressure of 10 psig available.

The deaerator/storage vessel is to be of low overhead horizontal design, and manufactured and stamped in accordance with the ASME Code for unfired pressure vessels, Section VIII, Division 1.

The deaerating element is to be located inside vessel. The deaerating element enclosure is to be manufactured out of 316 S.S.

The steam atomizer shall be easily removable and replaceable to accommodate major changes in plant operating conditions.

The deaerator/storage tank shall be designed that no connections protrude from the top of the tank, allowing for no clearance requirements above the vessel.

The deaerator is to be a two stage design, incorporating a water spray and steam scrubber.
Water entering the deaerator will be sprayed into a steam atmosphere using a spring loaded spray nozzle, capable of providing a large exposed surface area of water to steam. The nozzle shall be designed to have no metal to metal contact, to insure long operating life.
The preheated, and mostly deaerated water is then directed into the second (scrubber) stage, where incoming steam collides at high velocity with the pre-heated water, to completely atomize the water, and complete the removal of any non-condensable gasses remaining in the water.

The fully heated and deaerated water shall then be collected in the lower section of the pressure vessel. The outlet connection of the vessel shall have a vortex breaker capable of preventing feed pump cavation.

Spray/Scrubber Type Deaerator
Design Data

Maximum outlet capacity: 60,000 #/hr

Inlet water temperature: 60 to 180 Deg F

Minimum temperature differential required: 50 Deg F

Minimum steam pressure to deaerator: 10 psig

Minimum deaerator operating pressure: 5 psig

Deaerator/storage vessel design pressure: 30 psig

Deaerator/storage vessel hydro test pressure: 45 psig

Vessel material: Carbon steel

Deaerator element material: 316 S.S.

Exterior painting: one coat shop primer

Pressure indication: one S.S. 4.5" diameter pressure gauge w/ syphon

Temperature indication: one -S.S. 4.5" diameter thermometer w/ S.S. well

Maximum water storage capacity: 473 gallons

Connection type/size:

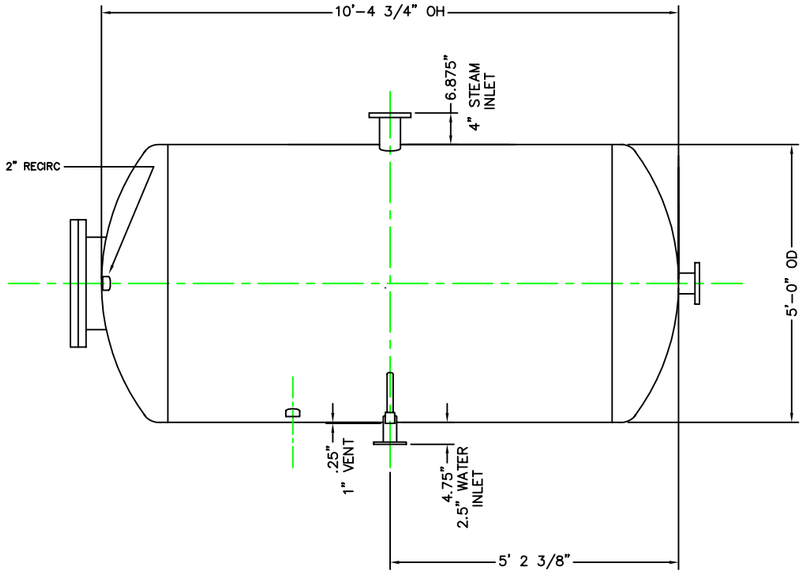
Water inlet: 2 1/2" 150# flanged
Steam inlet: 4" 150# flanged
Vent: 1" coupling
Water outlet: 6" 150# flanged
Over flow: 4" 150#flanged
Level control/indication: Two (2) 2" couplings

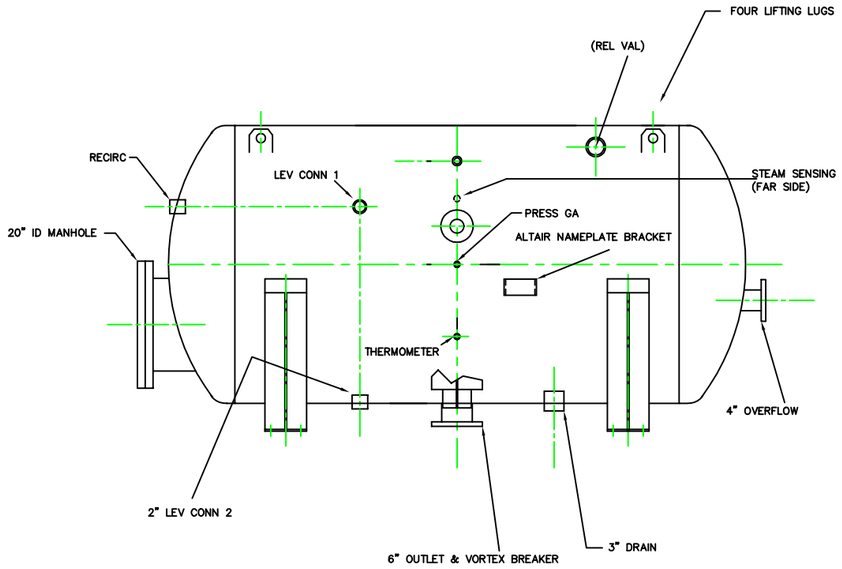
Water Storage

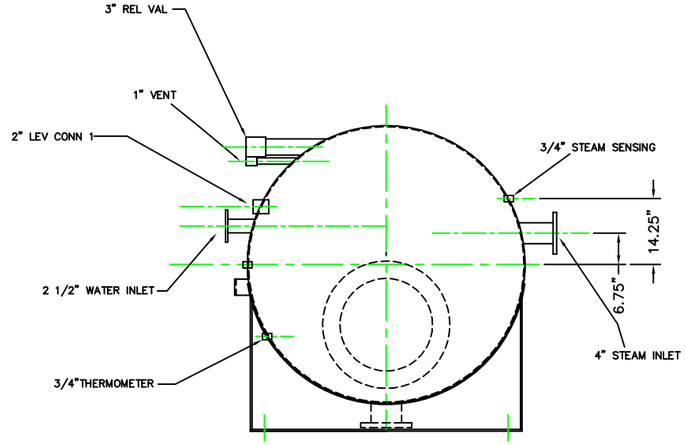
Flow rate	Time
60,000#/hr (120gpm)	4 minutes
40, 000#/hr (80gpm)	6 minutes
20,000#/hr (40gpm)	12 minutes

Steam and Water Requirements

	Oultet Capacity		
	20000#/hr	40000#/hr	60000#/hr
Inlet Water Temp. Deg F	Steam/Water #/hr	Steam/Water #/hr	Steam/Water #/hr
60	3000/17000	6000/34000	9000/51000
120	2000/18000	4000/36000	6000/54000
180	1000/19000	2000/38000	3000/57000







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AH SCRUBBER DEAERATOR ASSEMBLY

ALTAIR EQUIPMENT CO., INC.
•AECO•
WATER TREATMENT TECHNOLOGIES
POWER PLANT SPECIALISTS

DRN ES	DATE 7/27/04	CAD REF.	
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APP RK	DATE 7/29/04		
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