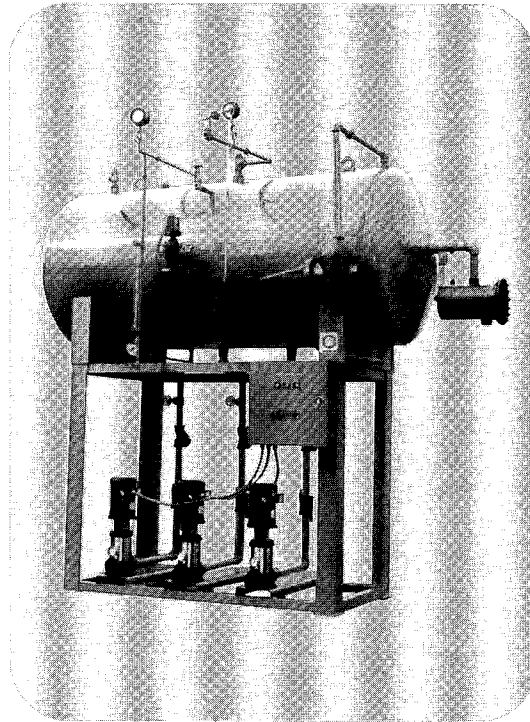




## HORIZONTAL DEAERATOR

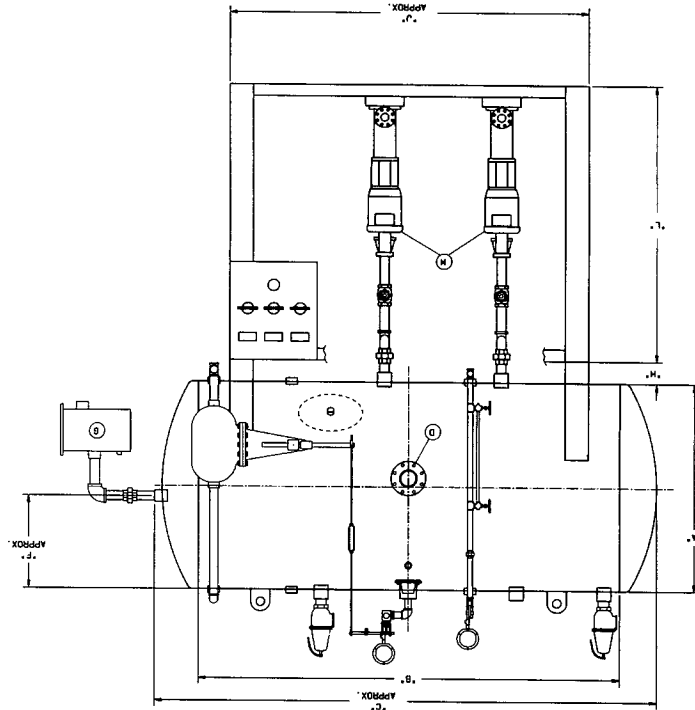
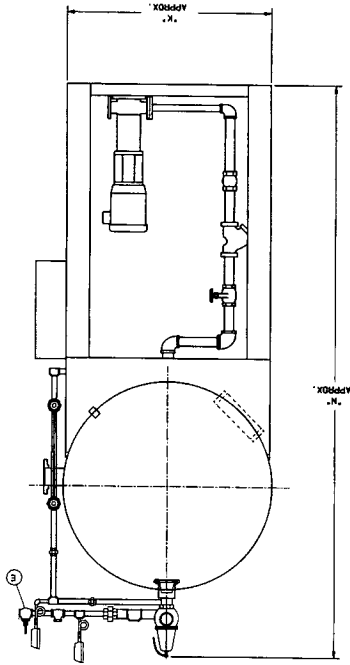


- Removes oxygen to a minimum of .005 cc/liter.
- Removes carbon dioxide to 0.
- Heats boiler feedwater to 227°F.
- 50 psig ASME, Section VIII Code.
- Model Range: 15,000 #/hour through 125,000 #/hour.
- Water storage to overflow: 10.6 minutes standard.
- Operating range: 3 - 15 psig standard.
- Complete system including: vessel, pumps, controls, stand, trim and control panel.
- Atomizing/spray-type Deaerator.
- Weight-loaded atomizing valve.
- Factory piped pump recirculation is standard.
- Vessel unbolts from stand with 4 bolts; conveniently-located suction piping unions for ease of jobsite re-assembly.
- Can be custom configured to meet customer requirements.
- Factory insulation and jacketing available.
- Available as standard over/under configuration.



All Dimensions are approximate. All dimensions subject to change without notice. Actual dimensions per submittal.  
Trim sized for 100% make-up. Actual trim will be adjusted per order submittal.

Standard Multi-Stage Vertical Centrifugal Pumps															M - Pumps
Determined by Specific Pump Requirements															L - Stand Height
K15S	K18S	K21S	K24S	K28S	K30S	K35S	K40S	K50S	K60S	K70S	K80S	K100S	K125S	K15000	43
18000	21000	24000	28000	30000	35000	40000	50000	60000	70000	80000	100000	125000	15000	90	
435	522	609	696	812	870	1014	1159	1449	1739	2029	2319	2899	3623	129	
317	381	444	509	594	634	740	846	1057	1269	1480	1692	2115	2643	129	
10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	90	
48	48	48	48	54	54	60	60	66	66	78	78	78	84	129	
48	48	48	48	54	54	60	60	66	66	78	78	78	84	129	
4	4	4	4	4	4	6	6	6	6	6	6	6	8	151	
4	4	4	4	4	4	6	6	6	6	6	6	6	8	151	
3/4	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	2	2	112	
25	25	25	25	25	25	32	32	32	32	37	37	37	37	112	
25	25	25	25	25	25	32	32	32	32	37	37	37	37	151	
2	2	2	2	2	2	2	2	3	3	3	3	4	4	151	
6	6	6	6	6	6	6	6	6	6	6	6	6	6	151	
76	90	103	120	92	100	113	127	143	143	98	114	144	143	151	
43	43	43	43	48	48	54	54	60	60	70	70	70	75	151	





## STANDARD EQUIPMENT

### CLASSIC VII DEAERATOR SYSTEMS

#### HORIZONTAL

#### Vessel Assemblies

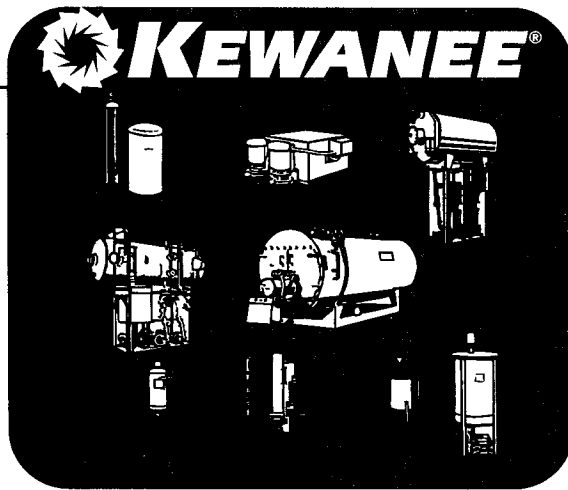
1. Horizontal 50 psig ASME Section VIII Code Vessel with 5/16" shell and 5/16" head (15,000 - 40,000 #/hour) or 3/8" head (50,000 - 125,000 #/hour) with saddles. Vessel sized for 10.6 minutes storage to overflow. Designed for .005 cc/liter deaeration.
2. Stainless steel spray valve.
3. Weight loaded atomizing valve.
4. Manual vent gate valve with drilled orifice.
5. Vacuum breaker.
6. 12" x 16" manway.
7. Water inlet valve sized for 100% make-up at 40 psig minimum, 85 psig maximum water pressure (Fisher #171L is standard).
8. Make-up check valve.
9. Water inlet pressure gauge.
10. External float (Warren #377).
11. Overflow trap sized to pass the deaerator capacity with a 5 psig differential (Warren #313 shipped loose).
12. Steam pressure reducing valve (Spirax-Sarco #25P shipped loose).
13. Pressure relief valve(s) to relieve the full capacity of the Pressure Reducing Valve (PRV).
14. Drain valve.
15. Gauge glass with cocks.
16. Panel mounted steam section thermometer.
17. Panel mounted water section thermometer.
18. Steam section pressure gauge.

#### Pump Assembly Selections

1. A pump assembly includes: pump, open drip-proof motor, baseplate, recirculating/vent piping, discharge pressure gauge, discharge companion flange, complete set of suction piping including gate valve, "Y" strainer and expansion coupling.
2. Grundfos vertical multi-stage centrifugal pumps are provided as standard.
3. All selections assume that the boiler safety valves are set at 10% above the operating pressure shown.
4. Due to the characteristics of centrifugal pumps, it is recommended that the exact system pressure losses be determined. Since actual system pressure conditions are usually unknown, pump selections shown with accompanying stand heights are for quotation and preliminary engineering purposes only. Pump selections, price and stand heights are subject to adjustment based on final system configuration.

March, 1997





# HOW TO SPECIFY

## Classic VII Boiler Room Systems **HORIZONTAL DEAERATOR**

15,000 #/HOUR THROUGH  
125,000 #/HOUR

### GENERAL SPECIFICATIONS

**Horizontal, pressurized (5 PSIG nominal operating pressure), .005 cc/liter deaeration, 50 PSIG ASME Section VIII Code, atomizing/spray type Deaerator.**

The Contractor shall furnish and install, as specified in the plans, and in accordance with the manufacturer's instructions \_\_\_\_\_ (number of units) Kewanee Classic VII, horizontal, pressurized (5 PSIG — 227° F nominal operating pressure and temperature — 3 to 15 PSIG standard operating range), atomizing/spray type deaerator, with weight - loaded atomizing valve and spring loaded spray valve. The system will be designed to operate with a minimum of 50° F temperature differential between the deaerator nominal operating temperature and the average mix temperature of the water to the spray head, designed and trimmed for 100% \_\_\_\_\_ (other %) make-up at 57 \_\_\_\_\_ (other temperature) degrees F and 0% \_\_\_\_\_ (other %) return at \_\_\_\_\_ degrees F and capable of reducing Oxygen content to no greater than .005 cc/liter.

#K- \_\_\_\_\_ (15, 18, 21, 24, 28, 30, 35, 40, 50, 60, 70, 80, 100, 125 thousand #/hour capacity) -S- \_\_\_\_\_ (steam supply pressure) - \_\_\_\_\_ (number of pumps) - \_\_\_\_\_ (317, 381, 444, 509, 634, 740, 846, 1057, 1269, 1480, 1692, 2115, 2643 gallons of tank capacity to overflow ) - \_\_\_\_\_

(pump model no.) - \_\_\_\_\_ (pump motor horsepower) - \_\_\_\_\_ (stand height) - \_\_\_\_\_ (voltage) with a nominal capacity of \_\_\_\_\_ (15,000-18,000-21,000-24,000-28,000-30,000-35,000-40,000-50,000-60,000-70,000-80,000-100,000-125,000) #/hour.

The vessel portion of the Deaerator System will consist of a 50 PSIG (including corrosion allowance) with 5/16" shell, 5/16" heads (15,000 - 40,000 #/hour), 3/8" heads (50,000 - 125,000 #/hour) ASME Section VIII Code certified and stamped horizontal vessel assembly with a capacity to contain a minimum of 10.6 minutes \_\_\_\_\_ (other minutes) / \_\_\_\_\_ (gallons of deaerated water storage to overflow), based upon \_\_\_\_\_ boiler horsepower, a spring-loaded spray valve in conjunction with a weight-loaded atomizing valve and stainless steel vent condensing chamber. All components that come into contact with undeaerated water will be of non-corrosive materials, including factory piped stainless steel pipe between the spray valve and condensate return entry point.

The vessel assembly will also include a standard support saddle and a 12" X 16" code manway. An externally removable spray valve assembly is available as an option. The vessel assembly will include

complete, properly sized, factory trim including: a manual vent valve (with orifice), vacuum breaker, a Fisher #171L water inlet valve sized for 100% make-up at 40 PSIG minimum, 85 PSIG maximum water pressure, controlled by an external Warren #377 float cage, a make-up check valve, a water inlet pressure gauge, a Warren #313 overflow trap sized to pass the Deaerator capacity with a 5 PSIG differential, panel mounted steam and water section thermometers, a Spirax-Sarco #25P cast iron pressure reducing valve (shipped loose) sized for 100% (other %), make-up at 57 \_\_\_\_\_ (other temperature) degrees F pressure relief valve(s) sized to relieve the full capacity of the pressure reducing valve, a steam section pressure gauge, gauge glass with cocks, equalizing piping and blowdown valves, drain valves and all necessary and extra openings as may be required.

The vessel assembly may also include the optional (hi-low alarm system consisting of (2) McDonnell Miller #63Bs mounted in an equalizing line and appropriate controls), optional (3-valve by-passes around both the make-up valve and the PRV) and the optional (factory installed 2" insulation and 22 gauge prime cold rolled steel jacket).

The pump assembly portion of the Deaerator System will include \_\_\_\_\_ (number of units ) Grundfos Series "C" vertical, multi-stage, centrifugal pumps with stainless steel impellers and tungsten carbide seals, close-coupled to 3450 RPM, ODP 208-230/460 volt, 3 phase, 60 hertz motors.

When modulating feedwater valves and appropriate modulating controls are present on the boiler(s), the pump(s) will be designed to be continuous run and the flow rate sized for the full steaming rate of the boiler plus recirculation plus a small safety factor at the boiler operating pressure plus the pressure drop across the modulating feedwater valve. The standard design pressure drop will be 13 PSIG for electric modulating feedwater valves.

On-off pumps will be sized for approximately two times the full steaming rate of the boiler at the boiler operating pressure plus 5 PSIG. Boiler safety relief valves will be set to satisfy code based on actual boiler operating pressure and pump discharge pressure curves. (Per Code, each boiler feedwater pump shall be capable of supplying water to the boiler at a pressure of 3% higher than the highest setting of any safety valve on the boiler.) Pump configuration will be one pump for each boiler with one manual changeover back-up pump. Both the configurations for continuous run and on-off Grundfos pumps will include factory piped recirculation/vent piping.

Design criteria for each of the pump assemblies will be: \_\_\_\_\_ GPM at \_\_\_\_\_ PSIG at \_\_\_\_\_ Ft. NPSHr.

Each pump assembly will include pump and ODP motor mounted and wired on a baseplate, factory piped recirculation piping, discharge pressure gauge, discharge companion flange, complete factory piped suction piping including a gate valve, "Y" strainer and dresser coupling. Discharge piping is available as an option. Pumps will be removable from the system without disturbing the suction or the discharge piping.

The stand assembly portion of the Deaerator System will consist of a stand constructed from 6" structural steel angle of a height to satisfy the pump NPSHr plus a 2' safety factor. To satisfy the above pump NPSHr a \_\_\_\_\_ Ft. stand will be supplied. Vessel assembly will be removed from the stand assembly for shipment.

The control panel portion of the Deaerator System will consist of a NEMA 12 enclosure with magnetic starters with three phase protection, H-O-A switches, running lights, fuse blocks and control circuit transformer. Circuit breaker(s) and disconnect(s) are available as an option. All components will be UL approved.