



PVM Series multi-stage vertical
in-line centrifugal pump



Model 282 with two stage turbine

AURORA[®] 280 SERIES ONE AND TWO STAGE TURBINES AND MULTI-STAGE VERTICAL IN-LINE BOILER FEED PUMPS

Also available with multi-stage vertical in-line centrifugal pumps

AURORA® 280 SERIES

One and Two Stage Turbines and Multi-stage Vertical In-line Boiler Feed Pumps

Capacities to 77 G.P.M. (17.5 M³/HR)

Heads to 678 Feet (176 Meters)

Temperatures to 210° F (107° C)

Aurora 280 Boiler Feed Units

Boiler feed requirements call for a system that will provide uninterrupted service for single or multiple boiler installations. Aurora Packaged Systems deliver those values which you need and expect. Quality features include a carbon steel receiver, 3-way valves and pumps, all completely assembled. Duplex, dual and triplex units do not require any additional floor space than a simplex unit requires. In Aurora's design, the pumps, bases and piping are mounted beneath the receiver within the support stand. As your heating system grows, the receiver design will allow you to convert from simplex to duplex, dual or triplex construction. Just add pumps and pipe them up! The following pages explain the reasons why AURORA PUMP is able to offer you a modern, packaged, customer proven, feed system.

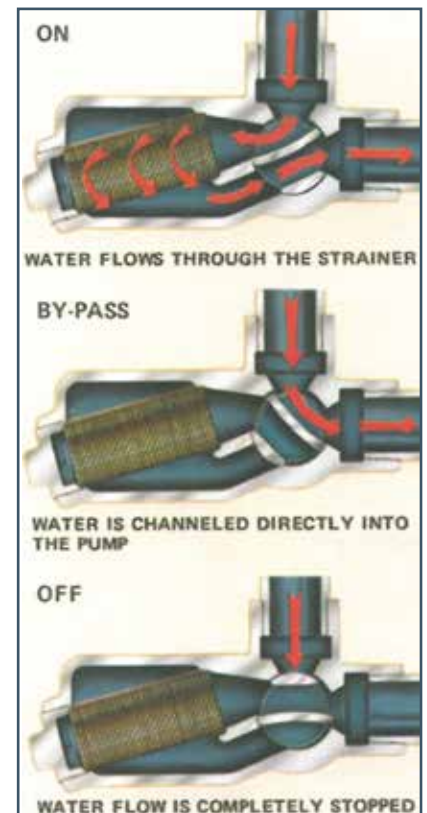
Quick Reference 280 Series Feature Selector

Standard Features

- Quality Aurora Pumps
- V.I.P. pump test
- 3/16" gauge carbon steel receiver with inlet, vent and drain connections
- 3-Way strainer valves with on-off-bypass adjustments
- Piping from receiver to pumps
- Expansion type suction elbows
- Gauge glass assembly
- Mechanical make-up valve)
- Factory assembled
- Coupling guards
- Thermometer

Optional Features

- Pressure Gauges/ A.S.M.E. receivers
- Electrolytic corrosion inhibitors
- Inlet "Y" strainers
- Preheater tube
- Temperature regulator valve
- Make-up feeder valve
- Control panel prewired
- Electric alternator (Duplex)
- Special units
- Galvanized tank



Pump Features

A. Carbon Steel Receiver

is 3/16" thick to ensure long life. Receivers include 2 vents, 2 inlets, drain and connections for additional optional equipment.

B. Brass Float Valve

with simple lever action replaces water lost due to processing, etc.

C. Temperatures to 210°F

water and selected for a minimum capacity of twice the rate of evaporation.

D. Brass Water Level Gauge

glass assembly is furnished complete with shut-off valve and protector rods.

E. Interchangeable Design

provides future system expansion with receiver connections for up to 3 pumps. Just add pumps and pipe them up.

F. 3-Way Valve

provides dependable operation. With a turn of the plug the water flow can be channeled through the strainer, bypassed around the strainer (to allow the strainer to be cleaned) or completely shut off.

G. Completely Assembled Piping

from receiver to pump. Included are expansion type elbows.

H. Accessibility

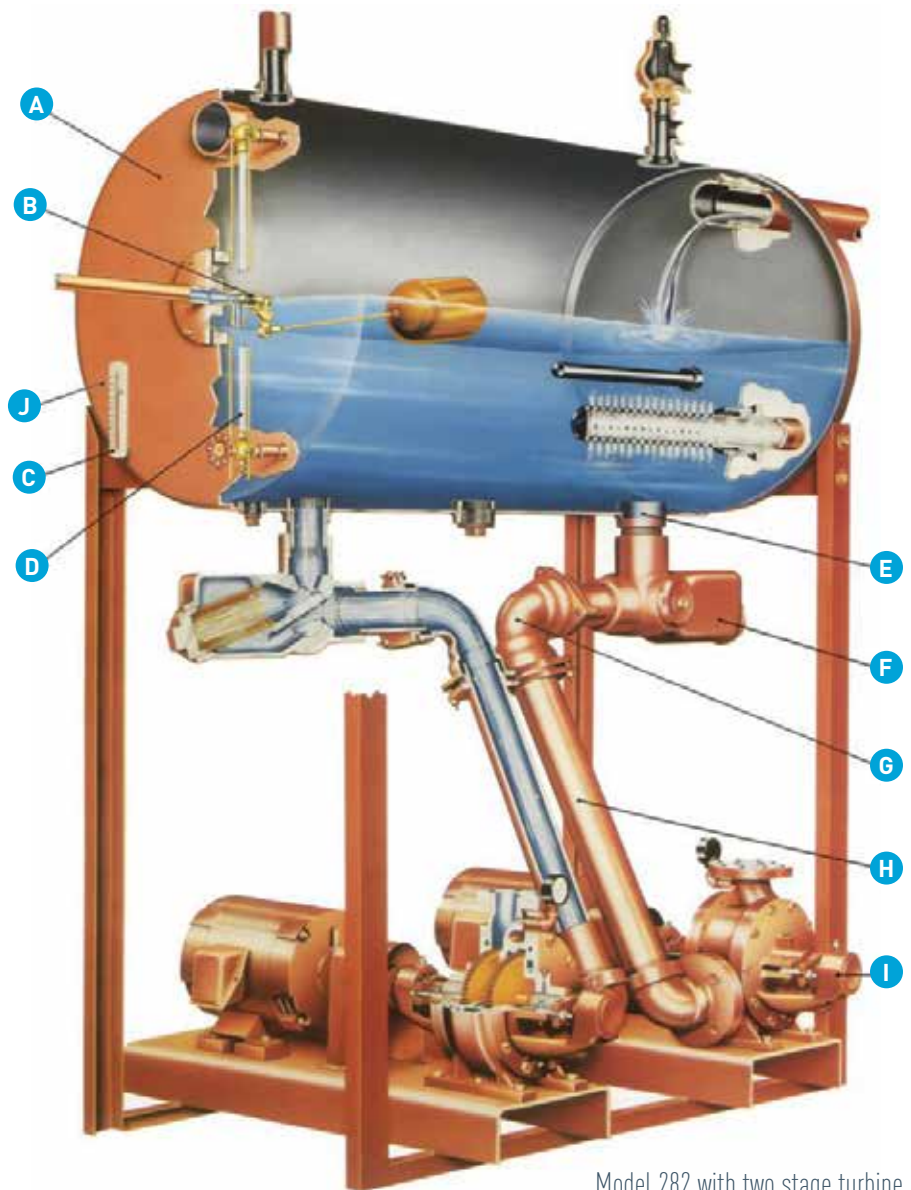
to pump, strainer valve and other components for easier maintenance. All pumps and piping are mounted beneath the receiver within the support stand.

I. Pumps

designed for boiler feed applications will handle entrained vapor and air with liquid to eliminate vapor lock.

J. Thermometer

provides readings from 40°F to 260°F.



Model 282 with two stage turbine

ALSO
AVAILABLE WITH
MULTI-STAGE
VERTICAL IN-LINE
CENTRIFUGAL
PUMPS

Features – 280 Optional Equipment

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Optional Boiler Feed System Accessories

A. Make-Up Feeder Valve

a.) Series 21 for 30, 60 & 100 gallon receivers.
b.) Series 25 for 200, 250, 350, 500, 750 and 1,000 gallon receivers.

B. 125# ASME Code Receivers

of equivalent capacity. Manholes 11" x 15" are included in receiver sizes 350 thru 1,000 gallons.

C. Additional Pipe Taps

in receiver.

D. Manhole 11" x 15"

for receiver capacities of 750 and 1,000 gallons.

E. Magnesium Anode

provides electrolytic corrosion protection.

F. Steam Heater Package

consisting of the following:

F1. Relief Valve

F2. Pressure Gauge

F3. Preheater Tube

F4. "Y" Strainer

F5. Temperature Regulating Valve:

a.) Low pressure 25T (5 – 15 psi. steam)

WITHOUT pressure reducing attachment.

b.) High pressure 25PT (50 – 200 psi. steam)

WITH pressure reducing attachment.

NOTE: Item F components can be provided separately.

G. Prewired Control Panel

to all integral hp motors includes external reset buttons and hand-off automatic switches.

See pages 7, 14 and 15 for details.

H. Electric Alternator

mounted and wired on duplex.

I. Mechanical Seals

for turbine pumps. Mechanical seals are standard on multi-stage vertical in-line pumps.

J. Special Pumps

(431B, e.g.)

K. Discharge Pressure Gauges

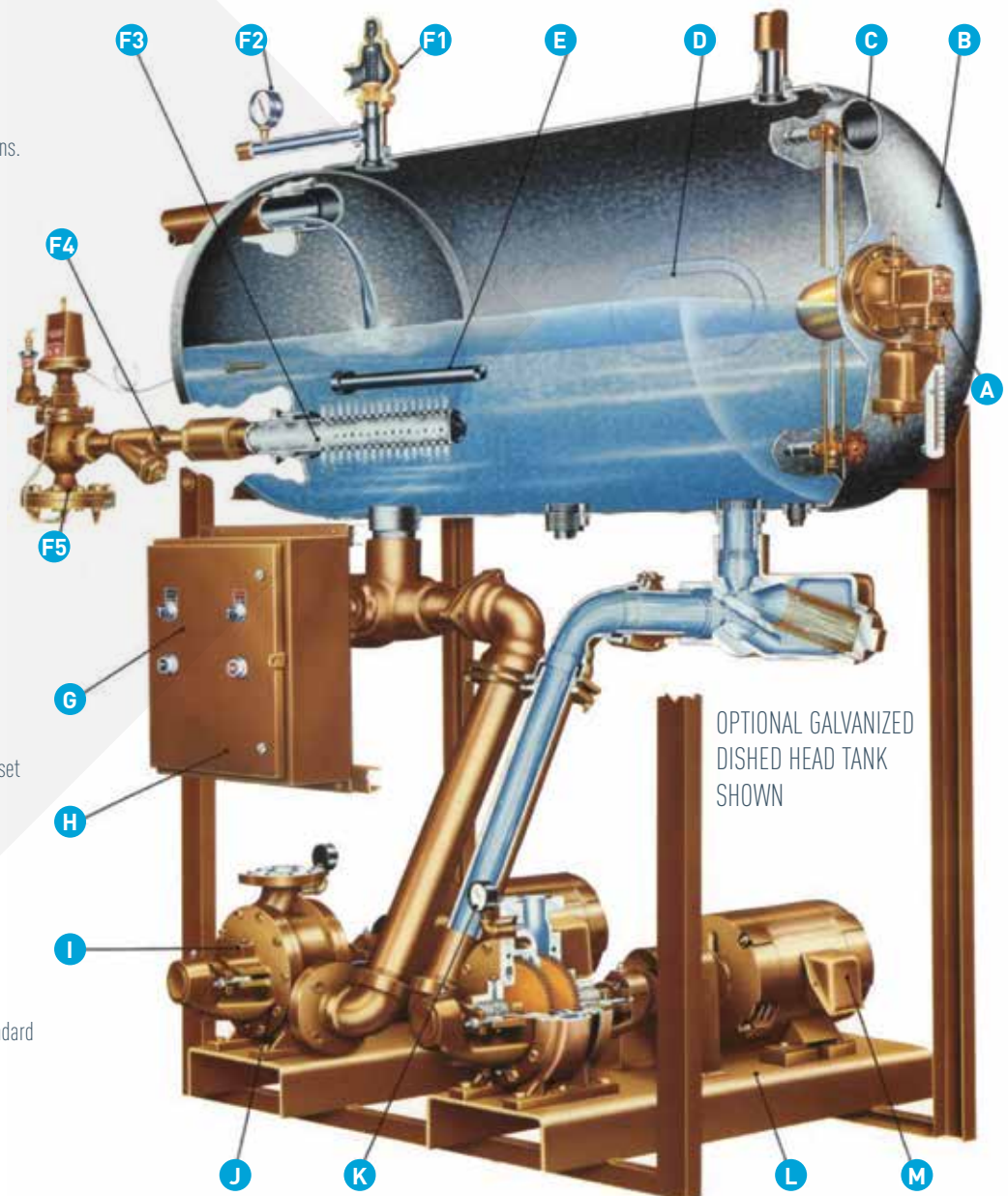
ship loose with multi-stage vertical in-line pumps.

L. Duplex, Dual and Triplex Units

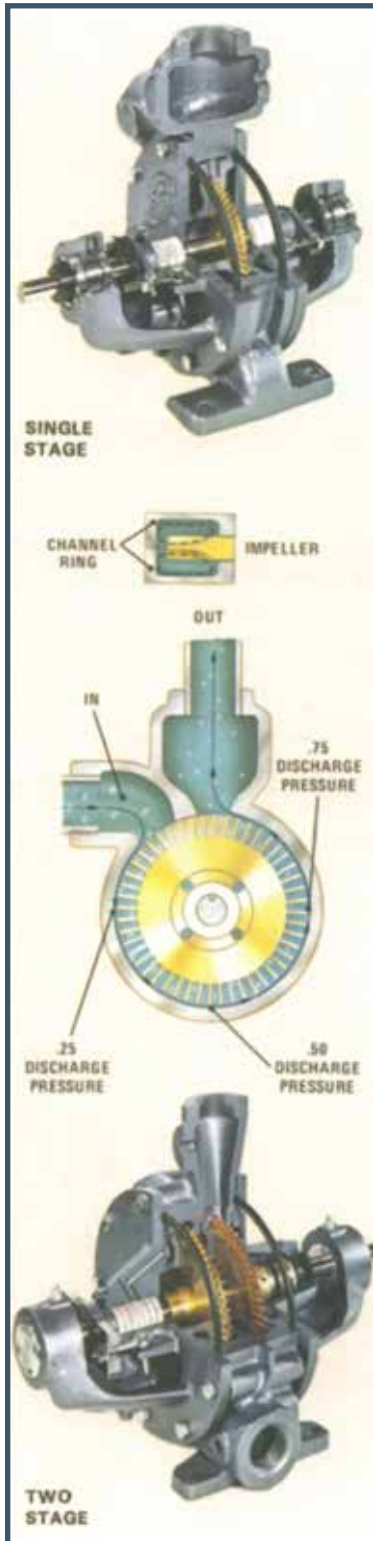
See pages 7, 14 and 15.

M. Special Motor Design

N. Galvanized Inside and Out Receiver



Features – 280 Optional Equipment



Operation – Turbine Pumps

The turbine pump derives its name from the many buckets machined into the periphery of the rotating impeller, which permits development of a relatively high pressure in an efficient and economic manner. More pressure is developed within the turbine pump than with a comparable size centrifugal pump. The pumped liquid is directed by the water passage so that it circulates in and out of the buckets many times on its way from the pump inlet to the pump outlet. Additional energy is added to the liquid each time it passes through the buckets so the numerous passes generate a high discharge pressure. The pressure is developed without pulsations. While close clearances are used within the turbine pumps, there is no metal-to-metal contact. Volatile liquids are handled easily because a turbine pump readily handles vapor and air along with the liquid, thus eliminating the possibility of a vapor lock within the pump. Free-flowing and nonlubrication liquids are handled with a minimum of wear to pump parts because there is no metal-to-metal contact within the pump channel. The illustrations indicate the principle used in the handling of the liquid and developing of pressure in a regenerative turbine pump.

- Double suction minimizes axial thrust.
- Replaceable channel or wearing rings and impellers.
- Opposed discharges to balance radial loads (two stage).
- Interchangeable packing or mechanical seals.
- Large shaft for minimum deflections.
- O-rings prevent case leakage on one/two stage turbine pumps.

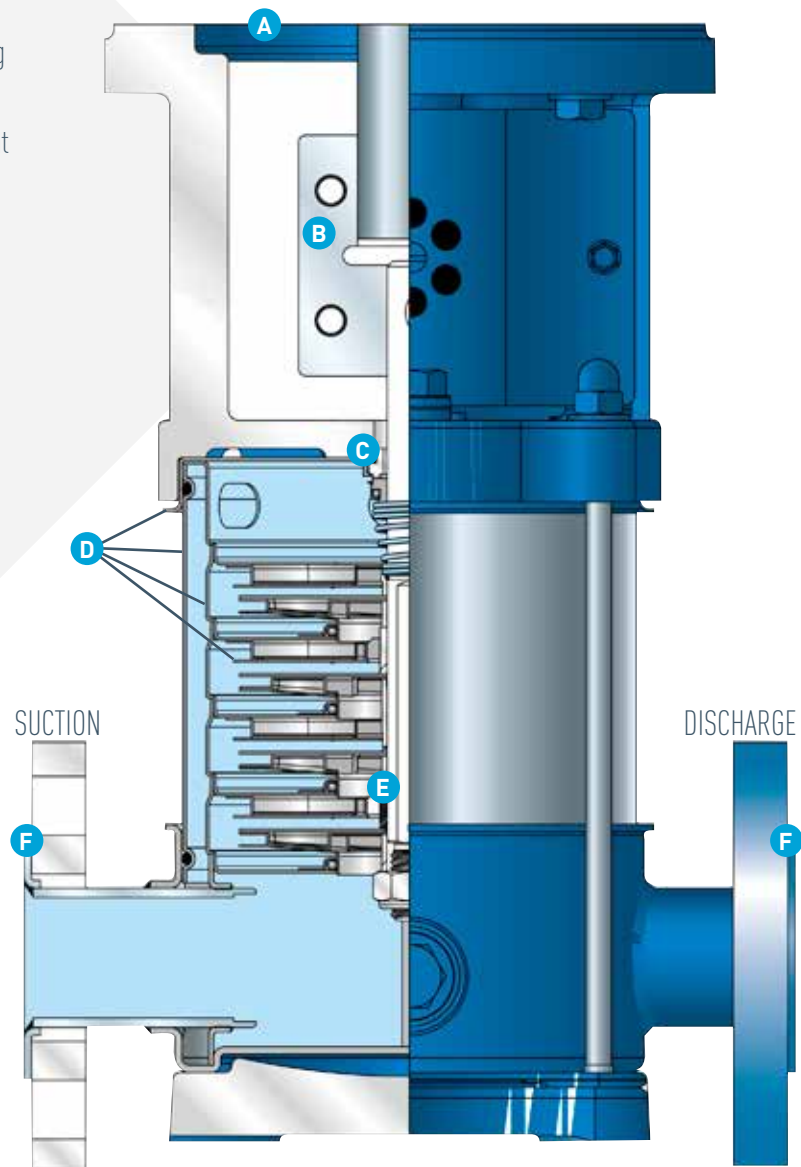
Features – PVM Multi-Stage Vertical In-line Centrifugal Pump

Aurora's line of stainless steel stackable pumps is ideal for high pressure applications that require a minimum amount of floor space. The vertical design is ideal for both new and existing applications. All the pumps' hydraulic components are of 304 stainless steel. All casings are made of 304 stainless steel. The NEMA C motor face and rigid coupling design allows the pump to operate at low noise levels, high efficiency and long working life with minimal maintenance. Mechanical seals of carbon against silicon carbide, interstage pump bushings of tungsten carbide vs. ceramic and O-rings of EPDM allow pumps to operate at temperatures to 250°F.

Benefits

- Floor Saving Design: Small base footprint and in-line construction minimizes space requirements.
- Cost Effective: Stamped stainless steel construction provides big pump performance at a small pump cost.
- Low Operating Cost: High hydraulic efficiency as well as excellent NPSH requirements saves money.
- Easy to Maintain: Design facilitates quick repair time, and in-stock kits for seals and hydraulic components minimize down time.
- Low Noise Level: Superior design limits noise and vibration.

- A.** NEMA C Face Motor Register.
- B.** All Metal Rigid Coupling.
- C.** High Temp/High Pressure Mechanical Seal as standard for low maintenance.
- D.** All Wetted Components of AISI 303/304 Stainless Steel for corrosion resistance.
- E.** Tungsten Carbide vs. Ceramic Bushings for long life at high temperatures.
- F.** Ductile Iron Slip Ring Flanges for easy piping assembly.



Specifications

Simplex – Model 281

Mounting Position "A" for two stage 4RTL, 5RTL, 6RTL and 6RATL 110A turbine pumps.

Mounting Position "C" for single stage 4R, 4RA, 5R and 5RA 110A turbine pumps.

Standard Features: Receiver with make-up valve, sight gauge glass with gauge cock, support legs, 3-way valve, piping, pump, motor, base, coupling, coupling guard and thermometer.

Recommended Options: Pump discharge pressure gauge, magnetic starter and one hand-off-automatic switch mounted and wired.

Duplex – Model 282

Mounting Position "A" and "C" for all pump types. For 110A turbines one pump to be right-handed and one pump to be left-handed.

Standard Features: Receiver with make-up valve, sight gauge glass with gauge cock, support legs, 3-way valves, piping, two pumps (one operational and one standby), motors, bases, couplings, coupling guards and thermometer.

Recommended Options: Pump discharge pressure gauges, NEMA 1 control panel with two starters, hand-off-automatic switch and selector switch, or alternator, mounted and wired.

Dual – Model 282A

Mounting Position "A" and "C" for all pump types. For 110A turbines one pump to be right-handed and one pump to be left-handed.

Standard Features: Receiver with make-up valve, sight gauge glass with gauge cock, support legs, 3-way valves, piping, two pumps (that are operational simultaneously), motors, bases, couplings, coupling guards and thermometer.

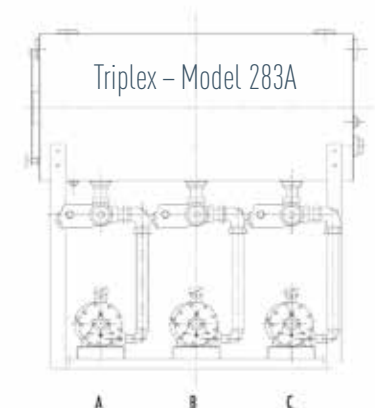
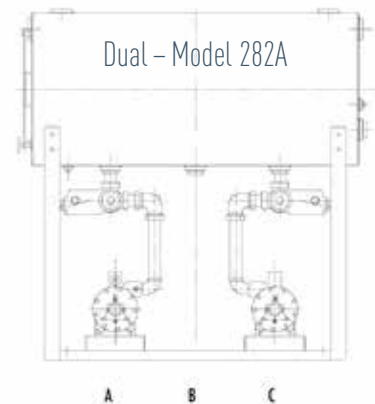
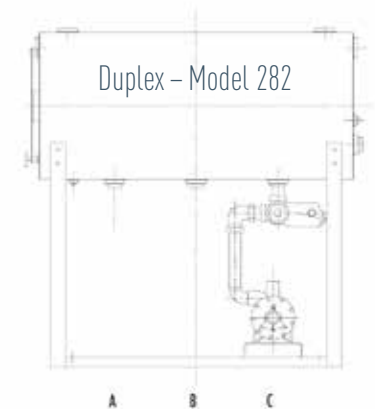
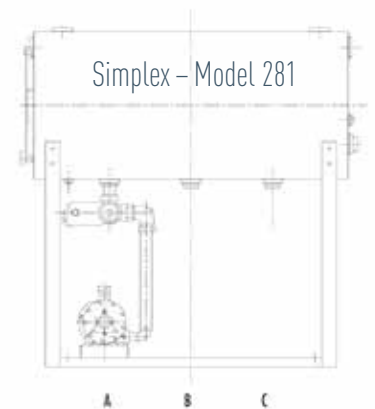
Recommended Options: Pump discharge pressure gauges, NEMA 1 control panel with two starters, hand-off-automatic switch mounted and wired. Two hand-off-automatic switches for two independently operational pumps are provided.

Triplex – Model 283A

Mounting Position "A", "B", & "C" for all pump types.

Standard Features: Receiver with make-up valve, sight gauge glass with gauge cock, support legs, 3-way valves, piping, three pumps (two operational and one standby), motors, bases, couplings, coupling guards and thermometer.

Recommended Options: Pump discharge pressure gauges, NEMA 1 control panel with three starters, two hand-off-automatic switches and two selector switches, which allow the following combinations of pumps to operate: 1 & 2, 1 & 3 or 2 & 3, all mounted and wired.



Pump Selection – 110A

Boiler Size hp	Evap. Rate in GPM	Pump Capacity in Gallons	281 Simplex (Single Boiler – One Pump) 60 Cycle			282 Duplex (Single Boiler – One Standby) 60 Cycle		
			Tank Capacity Gallons	Tank Size Inches	Make-Up Valve Size	Tank Capacity Gallons	Tank Size Inches	Make-up Valve Size
15	1.0	3.9	30	16x37	3/4" NPT	30	16x37	3/4" NPT
20	1.4	4.1	30	16x37	3/4" NPT	30	16x37	3/4" NPT
25	1.7	4.4	30	16x37	3/4" NPT	30	16x37	3/4" NPT
30	2.1	5.0	30	16x37	3/4" NPT	30	16x37	3/4" NPT
40	2.8	6.6	30	16x37	3/4" NPT	30	16x37	3/4" NPT
50	3.5	7.6	60	22x37	3/4" NPT	60	22x37	3/4" NPT
60	4.2	8.5	60	22x37	3/4" NPT	60	22x37	3/4" NPT
70	4.8	10.0	60	22x37	3/4" NPT	60	22x37	3/4" NPT
80	5.5	11.0	100	24x51	3/4" NPT	100	24x51	3/4" NPT
100	6.9	14.0	100	24x51	3/4" NPT	100	24x51	3/4" NPT
125	8.6	17.5	100	24x51	3/4" NPT	100	24x51	3/4" NPT
150	10.7	21.0	200	30x65	1" NPT	200	30x65	1" NPT
200	13.8	28.0	200	30x65	1" NPT	200	30x65	1" NPT
250	17.3	33.0	250	36x60	1" NPT	250	36x60	1" NPT
300	20.7	38.0	350	42x60	1-1/2" NPT	350	42x60	1-1/2" NPT
350	24.2	43.0	350	42x60	1-1/2" NPT	350	42x60	1-1/2" NPT
400	27.6	48.0	350	42x60	1-1/2" NPT	350	42x60	1-1/2" NPT
500	34.5	57.0	500	42x84	1-1/2" NPT	500	42x84	1-1/2" NPT
600	41.5	71.0	500	42x84	1-1/2" NPT	500	42x84	1-1/2" NPT
700	48.3	77.0	750	48x96	1-1/2" NPT	750	48x96	1-1/2" NPT
50	3.5	7.6	60	22x37	3/4" NPT	-	-	-
60	4.2	8.5	60	22x37	3/4" NPT	-	-	-
70	4.8	10.0	60	22x37	3/4" NPT	-	-	-
80	5.5	11.0	100	24x51	3/4" NPT	-	-	-
100	6.9	14.0	100	24x51	3/4" NPT	-	-	-
125	8.6	17.5	100	24x51	3/4" NPT	-	-	-
150	10.7	21.0	200	30x65	1" NPT	-	-	-
200	13.8	28.0	200	30x65	1" NPT	-	-	-
250	17.3	33.0	250	36x60	1" NPT	-	-	-
300	20.7	38.0	350	42x60	1-1/2" NPT	-	-	-
350	24.2	43.0	350	42x60	1-1/2" NPT	-	-	-
400	27.6	48.0	350	42x60	1-1/2" NPT	-	-	-
500	34.5	57.0	500	42x84	1-1/2" NPT	-	-	-

Notes:

1. Table selections are for intermittent operation – If system requires continuous operating pumps, consult factory for pump selection.
2. Apply firing factor to evaporation rate to obtain actual pump capacity required.
3. Model Number Example:
C4-1/3-4 designates C4 pump size with 1/3 hp motor at 4 pole speed.
4 Poles = 1800 RPM motor
6 Poles = 1200 RPM motor
4. For selections not shown, please refer to factory.

Pump Selection – 110A

Boiler Size hp	Evap. Rate in GPM	Pump Capacity in Gallons	282A Dual (Two boilers – Two pumps – Large receiver) 60 cycle			283A Triplex (Two boilers – Three pumps – One pump standby) 60 cycle		
			Tank Capacity Gallons	Tank Size Inches	Make-Up Valve Size	Tank Capacity Gallons	Tank Size Inches	Make-up Valve Size
15	1.0	3.9	30	16x37	3/4" NPT	-	-	-
20	1.4	4.1	60	22x37	3/4" NPT	-	-	-
25	1.7	4.4	60	22x37	3/4" NPT	-	-	-
30	2.1	5.0	60	22x37	3/4" NPT	-	-	-
40	2.8	6.6	100	24x51	3/4" NPT	-	-	-
50	3.5	7.6	100	24x51	3/4" NPT	-	-	-
60	4.2	8.5	100	24x51	3/4" NPT	-	-	-
70	4.8	10.0	200	30x65	1" NPT	-	-	-
80	5.5	11.0	200	30x65	1" NPT	-	-	-
100	6.9	14.0	250	36x60	1" NPT	-	-	-
125	8.6	17.5	250	36x60	1" NPT	-	-	-
150	10.7	21.0	350	42x60	1-1/2" NPT	-	-	-
200	13.8	28.0	500	42x84	1-1/2" NPT	-	-	-
250	17.3	33.0	500	42x84	1-1/2" NPT	-	-	-
300	20.7	38.0	750	48x96	1-1/2" NPT	-	-	-
350	24.2	43.0	750	48x96	1-1/2" NPT	-	-	-
400	27.6	48.0	1000	48x120	1-1/2" NPT	-	-	-
500	34.5	57.0	1000	48x120	1-1/2" NPT	-	-	-
600	41.5	71.0	-	-	-	-	-	-
700	48.3	77.0	-	-	-	-	-	-
50	3.5	7.6	-	-	-	350	42x60	1-1/2" NPT
60	4.2	8.5	-	-	-	350	42x60	1-1/2" NPT
70	4.8	10.0	-	-	-	350	42x60	1-1/2" NPT
80	5.5	11.0	-	-	-	350	42x60	1-1/2" NPT
100	6.9	14.0	-	-	-	350	42x60	1-1/2" NPT
125	8.6	17.5	-	-	-	350	42x60	1-1/2" NPT
150	10.7	21.0	-	-	-	350	42x60	1-1/2" NPT
200	13.8	28.0	-	-	-	500	42x84	1-1/2" NPT
250	17.3	33.0	-	-	-	500	42x84	1-1/2" NPT
300	20.7	38.0	-	-	-	750	48x96	1-1/2" NPT
350	24.2	43.0	-	-	-	750	48x96	1-1/2" NPT
400	27.6	48.0	-	-	-	1000	48x120	1-1/2" NPT
500	34.5	57.0	-	-	-	1000	48x120	1-1/2" NPT

Notes:

1. Table selections are for intermittent operation – If system requires continuous operating pumps, consult factory for pump selection.
2. Apply firing factor to evaporation rate to obtain actual pump capacity required.
3. Model Number Example:
C4-1/3-4 designates C4 pump size with 1/3 hp motor at 4 pole speed.
4 Poles = 1800 RPM motor
6 Poles = 1200 RPM motor
4. For selections not shown, please refer to factory.

Pump Selection – 110A

Boiler Size hp	Evap. Rate in GPM	Pump Capacity in Gallons	Boiler Operating Pressure, psi Model Numbers					
			15	100	125	150	200	250
15	1.0	3.9	C4-1/3-4	E4T-1.5-4	E4T-1.5-4	F4T-3-4	D5T-2-4	E5T-3-4
20	1.4	4.1	C4-1/3-4	E4T-1.5-4	E4T-1.5-4	F4T-3-4	D5T-2-4	E5T-3-4
25	1.7	4.4	C4-1/3-4	E4T-1.5-4	F4T-2-4	G4T-3-4	E5T-3-4	G5T-7.5-4
30	2.1	5.0	C4-1/3-4	E4T-1.5-4	F4T-2-4	G4T-3-4	E5T-3-4	G5T-7.5-4
40	2.8	6.6	E4-1/3-4	F4T-2-4	G4T-3-4	G4T-3-4	G5T-5-4	G5T-7.5-4
50	3.5	7.6	E4-1/3-4	F4T-2-4	G4T-3-4	H5-5-4	G5T-5-4	G5T-7.5-4
60	4.2	8.5	E4-1/3-4	G4T-2-4	I4T-3-4	H5-5-4	G5T-5-4	G5T-7.5-4
70	4.8	10.0	G4-1/2-4	G4T-2-4	H5-3-4	H5-5-4	G5T-5-4	H5T-7.5-4
80	5.5	11.0	G4-1/2-4	G5-2-4	H5-3-4	G5T-5-4	G5T-5-4	H5T-7.5-4
100	6.9	14.0	I4-3/4-4	H5-3-4	H5-3-4	H5T-5-4	H5T-5-4	I5T-10-4
125	8.6	17.5	I4-3/4-4	H5-3-4	J5-5-4	K5-7.5-4	I5T-7.5-4	I5T-10-4
150	10.7	21.0	I4-3/4-4	J5-5-4	K5-7.5-4	L5-10-4	D6T-7.5-4	E6T-20-4
200	13.8	28.0	M4-1.5-4	K5-5-4	L5-10-4	D6T-7.5-4	E6T-15-4	G6T-20-4
250	17.3	33.0	M4-1.5-4	L5-7.5-4	E6T-10-4	E6T-10-4	G6T-20-4	-
300	20.7	38.0	M4-1.5-4	L5-7.5-4	E6T-10-4	G6T-15-4	G6T-20-4	-
350	24.2	43.0	P4-1.5-4	G6-10-4	G6T-10-4	G6T-15-4	K6T-25-4	-
400	27.6	48.0	R4-1.5-4	J6-15-4	G6T-15-4	G6T-15-4	K6T-25-4	-
500	34.5	57.0	M5-2-4	G6T-10-4	J6T-20-4	J6T-20-4	-	-
600	41.5	71.0	J6-2-6	J6T-20-4	J6T-20-4	J6T-20-4	-	-
700	48.3	77.0	K6-2-6	K6T-20-4	K6T-20-4	K6T-25-4	-	-
50	3.5	7.6	E4-1/3-4	G4T-2-4	I4T-3-4	H5-5-4	G5T-5-4	H5T-7.5-4
60	4.2	8.5	E4-1/3-4	G4T-2-4	I4T-3-4	H5-5-4	G5T-5-4	H5T-7.5-4
70	4.8	10.0	G4-1/2-4	G5-2-4	H5-3-4	G5T-5-4	G5T-5-4	H5T-7.5-4
80	5.5	11.0	G4-1/2-4	G5-2-4	H5-3-4	G5T-5-4	G5T-5-4	H5T-7.5-4
100	6.9	14.0	I4-3/4-4	G5-2-4	J5-5-4	K5-7.5-4	I5T-7.5-4	I5T-10-4
125	8.6	17.5	I4-3/4-4	G5-2-4	J5-5-4	K5-7.5-4	I5T-7.5-4	I5T-10-4
150	10.7	21.0	I4-3/4-4	J5-5-4	K5-7.5-4	L5-10-4	D6T-7.5-4	E6T-20-4
200	13.8	28.0	M4-1.5-4	K5-5-4	L5-10-4	D6T-7.5-4	E6T-15-4	G6T-20-4
250	17.3	33.0	M4-1.5-4	L5-7.5-4	E6T-10-4	E6T-10-4	G6T-20-4	-
300	20.7	38.0	P4-1.5-4	G6-10-4	G6T-10-4	G6T-15-4	K6T-25-4	-
350	24.2	43.0	P4-1.5-4	G6-10-4	G6T-10-4	G6T-15-4	K6T-25-4	-
400	27.6	48.0	R4-1.5-4	J6-15-4	G6T-15-4	G6T-15-4	K6T-25-4	-
500	34.5	57.0	M5-2-4	G6T-10-4	J6T-20-4	J6T-20-4	-	-

Notes:

1. Table selections are for intermittent operation – If system requires continuous operating pumps, consult factory for pump selection.
2. Apply firing factor to evaporation rate to obtain actual pump capacity required.
3. Model Number Example:
C4-1/3-4 designates C4 pump size with 1/3 hp motor at 4 pole speed.
4 Poles = 1800 RPM motor
6 Poles = 1200 RPM motor
4. For selections not shown, please refer to factory.

Pump Selection – PVM

Boiler Size hp	Evap. Rate in GPM	Pump Capacity in Gallons Boiler Operation Pressure (psi)							281 Simplex (Single Boiler – One Pump) 60 Cycle			282 Duplex (Single Boiler – One Standby) 60 Cycle		
		15	100	125	150	175	200	250	Tank Capacity Gallons	Tank Size Inches	Make-Up Valve Size	Tank Capacity Gallons	Tank Size Inches	Make-up Valve Size
15	1.0	2.0	4.1	4.3	4.6	4.8	5.0	5.5	30	16 x 37	3/4" NPT	30	16 x 37	3/4" NPT
20	1.4	2.4	4.5	4.7	5.0	5.2	5.4	5.9	30	16 x 37	3/4" NPT	30	16 x 37	3/4" NPT
25	1.7	2.8	4.9	5.1	5.4	5.6	5.8	6.3	30	16 x 37	3/4" NPT	30	16 x 37	3/4" NPT
30	2.1	3.2	5.3	5.5	5.8	6.0	6.2	6.7	30	16 x 37	3/4" NPT	30	16 x 37	3/4" NPT
40	2.8	4.0	6.1	6.3	6.6	6.8	7.0	7.4	30	16 x 37	3/4" NPT	30	16 x 37	3/4" NPT
50	3.5	4.8	6.8	7.1	7.4	7.6	7.8	8.2	60	22 x 37	3/4" NPT	60	22 x 37	3/4" NPT
60	4.2	5.6	7.6	7.9	8.2	8.4	8.6	9.0	60	22 x 37	3/4" NPT	60	22 x 37	3/4" NPT
70	4.8	6.4	8.4	8.7	9.0	9.2	9.4	12.9	60	22 x 37	3/4" NPT	100	24 x 51	3/4" NPT
80	5.5	7.2	9.2	9.5	9.8	10.0	10.2	13.7	100	24 x 51	3/4" NPT	100	24 x 51	3/4" NPT
100	6.9	8.7	10.8	11.1	11.3	11.6	11.8	15.3	100	24 x 51	3/4" NPT	100	24 x 51	3/4" NPT
125	8.6	10.7	12.8	13.1	13.3	13.6	13.8	15.7	100	24 x 51	3/4" NPT	100	24 x 51	3/4" NPT
150	10.7	12.7	14.4	15.1	15.3	15.5	15.8	17.7	200	30 x 65	1" NPT	200	30 x 65	1" NPT
200	13.8	16.7	18.8	19.0	19.3	19.5	19.7	21.7	200	30 x 65	1" NPT	200	30 x 65	1" NPT
250	17.3	20.6	22.7	23.0	23.2	23.5	23.7	27.2	250	36 x 60	1" NPT	250	36 x 60	1" NPT
300	20.7	24.6	26.7	27.0	27.2	27.4	30.5	31.1	350	42 x 60	1-1/2" NPT	350	42 x 60	1-1/2" NPT
350	24.2	30.8	32.9	3.4	33.8	34.2	34.5	33.6	350	42 x 60	1-1/2" NPT	350	42 x 60	1-1/2" NPT
400	27.6	34.8	36.9	37.4	37.8	38.1	38.0	34.7	350	42 x 60	1-1/2" NPT	350	42 x 60	1-1/2" NPT
500	34.5	42.7	44.8	45.3	45.7	46.1	46.4	57.5	500	42 x 84	1-1/2" NPT	500	42 x 84	1-1/2" NPT
600	41.5	50.7	52.8	53.2	53.6	63.2	64.0	65.4	500	42 x 84	1-1/2" NPT	500	42 x 84	1-1/2" NPT
700	48.3	58.6	60.7	61.2	61.6	71.1	71.9	73.3	750	48 x 96	1-1/2" NPT	750	48 x 96	1-1/2" NPT

Notes:

1. Table selections are for intermittent operation – If system requires continuous operating pumps, consult factory for pump selection.
2. Apply firing factor to evaporation rate to obtain actual pump capacity required.
3. Model Number Example:
391-3 / .75 designates 391-3 pump size with .75 hp. motor.
All pumps are 2 poles or 3600 RPM motor.
4. For selections not shown, please refer to factory.

Pump Selection – PVM

Boiler Size hp	Evap. Rate in GPM	Pump Capacity in Gallons Boiler Operation Pressure (psi)							282A Dual (Two boilers – Two pumps – Large receiver) 60 cycle			283A Triplex (Two boilers – Three pumps – One pump standby) 60 cycle		
		15	100	125	150	175	200	250	Tank Capacity Gallons	Tank Size Inches	Make-Up Valve Size	Tank Capacity Gallons	Tank Size Inches	Make-up Valve Size
15	1.0	2.0	4.1	4.3	4.6	4.8	5.0	5.5	30	16x37	3/4" NPT	-	-	-
20	1.4	2.4	4.5	4.7	5.0	5.2	5.4	5.9	60	22x37	3/4" NPT	-	-	-
25	1.7	2.8	4.9	5.1	5.4	5.6	5.8	6.3	60	22x37	3/4" NPT	-	-	-
30	2.1	3.2	5.3	5.5	5.8	6.0	6.2	6.7	60	22x37	3/4" NPT	-	-	-
40	2.8	4.0	6.1	6.3	6.6	6.8	7.0	7.4	100	24x51	3/4" NPT	-	-	-
50	3.5	4.8	6.8	7.1	7.4	7.6	7.8	8.2	100	24x51	3/4" NPT	350	42x60	1-1/2" NPT
60	4.2	5.6	7.6	7.9	8.2	8.4	8.6	9.0	100	24x51	3/4" NPT	350	42x60	1-1/2" NPT
70	4.8	6.4	8.4	8.7	9.0	9.2	9.4	12.9	200	30x65	1" NPT	350	42x60	1-1/2" NPT
80	5.5	7.2	9.2	9.5	9.8	10.0	10.2	13.7	200	30x65	1" NPT	350	42x60	1-1/2" NPT
100	6.9	8.7	10.8	11.1	11.3	11.6	11.8	15.3	250	36x60	1" NPT	350	42x60	1-1/2" NPT
125	8.6	10.7	12.8	13.1	13.3	13.6	13.8	15.7	250	36x60	1" NPT	350	42x60	1-1/2" NPT
150	10.7	12.7	14.4	15.1	15.3	15.5	15.8	17.7	350	42x60	1-1/2" NPT	350	42x60	1-1/2" NPT
200	13.8	16.7	18.8	19.0	19.3	19.5	19.7	21.7	500	42x84	1-1/2" NPT	500	42x84	1-1/2" NPT
250	17.3	20.6	22.7	23.0	23.2	23.5	23.7	27.2	500	42x84	1-1/2" NPT	500	42x84	1-1/2" NPT
300	20.7	24.6	26.7	27.0	27.2	27.4	30.5	31.1	750	48x96	1-1/2" NPT	750	48x96	1-1/2" NPT
350	24.2	30.8	32.9	3.4	33.8	34.2	34.5	33.6	750	48x96	1-1/2" NPT	750	48x96	1-1/2" NPT
400	27.6	34.8	36.9	37.4	37.8	38.1	38.0	34.7	1000	48x120	1-1/2" NPT	1000	48x120	1-1/2" NPT
500	34.5	42.7	44.8	45.3	45.7	46.1	46.4	57.5	1000	48x120	1-1/2" NPT	1000	48x120	1-1/2" NPT
600	41.5	50.7	52.8	53.2	53.6	63.2	64.0	65.4	-	-	-	-	-	-
700	48.3	58.6	60.7	61.2	61.6	71.1	71.9	73.3	-	-	-	-	-	-

Notes:

1. Table selections are for intermittent operation – If system requires continuous operating pumps consult factory for pump selection.
2. Apply firing factor to evaporation rate to obtain actual pump capacity required.
3. Model Number Example:
391-3 / .75 designates 391-3 pump size with .75 hp motor.
All pumps are 2 poles or 3600 RPM motor.
4. For selections not shown, please refer to factory.

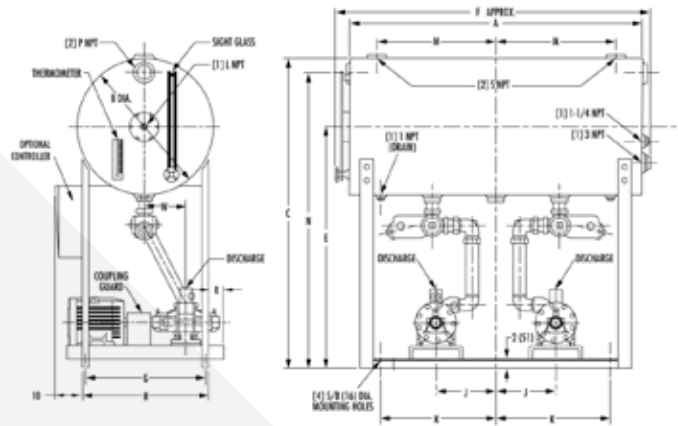
Pump Selection – PVM

Boiler Size hp	Evap. Rate in GPM	Pump Capacity in Gallons Boiler Operation Pressure (psi)							Boiler Operating Pressure, psi Model Numbers						
		15	100	125	150	175	200	250	15	100	125	150	175	200	250
15	1.0	2.0	4.1	4.3	4.6	4.8	5.0	5.5	391-3/.75	391-8/2	391-9/2	391-11/3	391-13/3	391-15/5	391-18/5
20	1.4	2.4	4.5	4.7	5.0	5.2	5.4	5.9	391-3/.75	391-8/2	391-9/2	391-11/3	391-13/3	391-15/5	391-18/5
25	1.7	2.8	4.9	5.1	5.4	5.6	5.8	6.3	391-3/.75	391-8/2	391-10/3	391-11/3	391-13/3	391-15/5	391-18/5
30	2.1	3.2	5.3	5.5	5.8	6.0	6.2	6.7	391-3/.75	391-8/2	391-10/3	391-11/3	391-13/3	391-15/5	391-18/5
40	2.8	4.0	6.1	6.3	6.6	6.8	7.0	7.4	391-3/.75	391-8/2	391-10/3	391-11/3	391-13/3	391-15/5	391-18/5
50	3.5	4.8	6.8	7.1	7.4	7.6	7.8	8.2	391-3/.75	391-8/2	391-10/3	391-13/3	391-13/3	391-15/5	391-18/5
60	4.2	5.6	7.6	7.9	8.2	8.4	8.6	9.0	391-3/.75	391-9/2	391-10/3	391-13/3	391-15/5	391-15/5	391-18/5
70	4.8	6.4	8.4	8.7	9.0	9.2	9.4	12.9	391-3/.75	391-9/2	391-11/3	391-13/3	391-15/5	391-16/5	393-14/15
80	5.5	7.2	9.2	9.5	9.8	10.0	10.2	13.7	391-3/.75	391-9/2	391-11/3	391-13/3	391-15/5	391-16/5	393-14/15
100	6.9	8.7	10.8	11.1	11.3	11.6	11.8	15.3	391-3/.75	391-10/3	391-13/3	391-13/3	391-15/5	392-15/5	393-14/15
125	8.6	10.7	12.8	13.1	13.3	13.6	13.8	15.7	391-3/.75	392-8/3	392-10/5	391-11/5	392-13/5	392-15/5	393-14/15
150	10.7	12.7	14.4	15.1	15.3	15.5	15.8	17.7	392-3/1	392-9/3	392-10/5	392-11/5	392-13/5	392-15/5	393-14/15
200	13.8	16.7	18.8	19.0	19.3	19.5	19.7	21.7	392-3/1	392-9/3	392-11/5	392-13/5	392-13/5	392-15/5	393-14/15
250	17.3	20.6	22.7	23.0	23.2	23.5	23.7	27.2	392-3/1	392-9/3	392-11/5	392-13/5	392-15/5	392-16/7.5	393-14/15
300	20.7	24.6	26.7	27.0	27.2	27.4	30.5	31.1	392-4/1.5	392-10/5	392-13/5	392-15/5	392-16/7.5	393-15/10	393-14/15
350	24.2	30.8	32.9	3.4	33.8	34.2	34.5	33.6	393-3/3	393-7/7.5	393-8/7.5	393-10/7.5	393-12/10	393-12/10	393-14/15
400	27.6	34.8	36.9	37.4	37.8	38.1	38.0	34.7	393-3/3	393-7/7.5	393-10/7.5	393-10/7.5	393-12/10	393-12/10	394-12/25
500	34.5	42.7	44.8	45.3	45.7	46.1	46.4	57.5	393-3/3	393-8/7.5	393-10/7.5	393-12/10	393-12/10	393-15/15	394-12/25
600	41.5	50.7	52.8	53.2	53.6	63.2	64.0	65.4	393-3/3	393-10/7.5	393-10/7.5	393-12/10	394-9/20	393-14/15	394-12/25
700	48.3	58.6	60.7	61.2	61.6	71.1	71.9	73.3	393-3/3	393-10/7.5	393-12/10	393-14/15	394-9/20	394-10/2	394-12/25

Notes:

1. Table selections are for intermittent operation – If system requires continuous operating pumps, consult factory for pump selection.
2. Apply firing factor to evaporation rate to obtain actual pump capacity required.
3. Model Number Example:
391-3 / .75 designates 391-3 pump size with .75 hp motor.
All pumps are 2 poles or 3600 RPM motor.
4. For selections not shown, please refer to factory.

Dimensional Data



110A Turbine Pumps

Receiver Capacity Gallons	3-Way Valve Size	A	B	C	E	F	G	H	J	K	L	M	N	P	S	R
30	1-1/4	37	16	42.19	34	44	14.25	15.75	9	15.5	3/4	14.5	40	2	2	7.81
60	1-1/4	37	22	49.69	38.5	44	20.38	21.88	9	15.5	3/4	15	47	2	2	4.75
100	1-1/4	51	24	59.69	47.5	58	21.25	22.75	11	21	3/4	20.5	57	2	3	4.31
200	2*	65	30	77.19	62	72	26.25	27.75	17	25.5	1	26.5	74	3	3	10.81
250	2*	60	36	80.19	62	67	28.38	29.88	17	25.5	1	26.5	77	3	3	9.81
350	3**	60	42	80.19	59	67	36.75	38.25	17	25.5	1-1/2	26.5	76	3	3	5.63
500	3	84	42	80.19	59	91	37.38	38.88	17	28.5	1-1/2	38.5	76	3	3	10.5
750	3	96	48	88.19	64	103	45.5	47	17	35.5	1-1/2	40	85	3	3	1.25
1000	3	120	48	88.19	64	127	45.5	47	17	47.5	1-1/2	52	85	3	3	1.25

* 3" with pump sizes D6T and E6T.

** 2" with pump sizes J5, K5 and L5.

Materials of Construction

Receiver Assembly

Part	Material
Receiver	3/16" CARBON STEEL
3-Way Valve Body	Cast Iron ASTM A48-64
3-Way Valve Strainer	Brass
Float Valve	Brass ASTM B-36
Gauge Glass Fitting	Brass ASTM B-36
Base and Supports	Commercial Steel

Limitations

Maximum Internal	Maximum Discharge Pressure	Maximum Temp. Limit on Pump Suction	Make-up Valve**
5 psig Short Surges Only*	250 psig	210°F	3/4" NPT 22.5 GPM
			1" NPT 45 GPM
			1-1/2" NPT 87 GPM

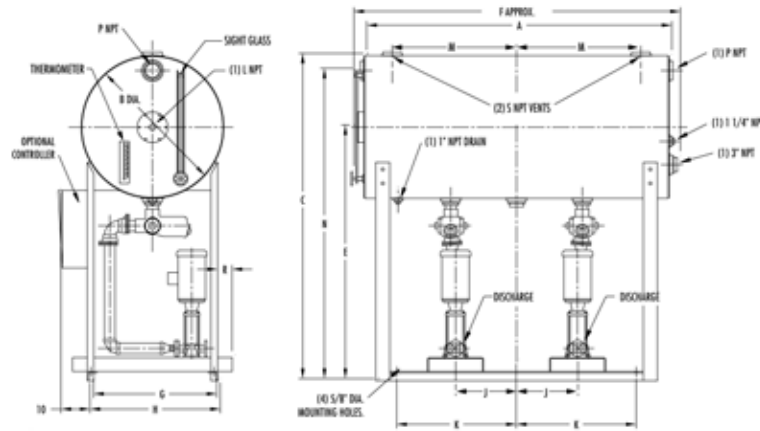
* This is a vented system and pressure ratings are for short surges only.

**Make-up valve limitation based on 40 psi utility water pressure.

Notes:

1. Dimensions and weights are approximate.
2. All dimensions are in inches and may vary ± .50".
3. Optional controller may be mounted on end of unit if space deems it to be necessary.
4. Not for construction purposes unless certified.

Dimensional Data



PVM Multi-stage Vertical In-line Pumps

Receiver Capacity Gallons	3-Way Valve Size	A	B	C	E	F	G	H	J	K	L	M	N	P	S	R
30	1-1/4	37	16	69.19	61	44	14.25	15.75	9	15.5	3/4	14.5	67	2	2	.13
60	1-1/4	37	22	76.69	65.5	44	20.38	21.88	9	15.5	3/4	15	74	2	2	1.06
100	3	51	24	86.69	74.5	58	21.25	22.75	11	21	3/4	20.5	84	2	3	2.06
200	3	65	30	101.19	86	72	26.25	27.75	17	25.5	1	26.5	98	3	3	1.13
250	3	60	36	104.19*	86	67	28.38	29.88	17	25.5	1	26.5	101	3	3	.06
350	3	60	42	116.19*	95	67	36.75	38.25	17	25.5	1-1/2	26.5	112	3	3	.38
500	3	84	42	116.19*	95	91	37.38	38.88	17	28.5	1-1/2	38.5	112	3	3	.06
750	3	96	48	124.19*	100	103	45.5	47	17	35.5	1-1/2	40	121	3	3	.5
1000	3	120	48	124.19*	100	127	45.5	47	17	47.5	1-1/2	52	121	3	3	.5

* "C" DIMENSIONS OVER 103 WILL REQUIRE SPECIAL SHIPPING ARRANGEMENTS.

Materials of Construction	
110A Turbine Pumps	
Pump Part	Material
Casing	Cast Iron ASTM A48-64
Covers	Cast Iron ASTM A48-64
Channel Rings	Cast Iron ASTM A48-56
Impeller	Bronze ASTM B62-63
Shaft	Stainless Steel AISI-416
Center Spacer	Cast Iron ASTM A48-56
Packing	Interwoven, T.F.E. Impregnated Acrylic Die Molded, Diagonally Cut
Mechanical Seals	Optionally Available

Materials of Construction	
PVM Multi-stage Vertical In-line Centrifugal Pumps	
Pump Part	Material
Upper Casing	Stainless Steel AISI 304 Wetted and ASTM 48 Class 35
Lower Casing	Stainless Steel AISI 304 Wetted with Iron Flange Rings
Diffusers	Stainless Steel AISI 304
Impeller	Stainless Steel AISI 304
Shaft	Stainless Steel AISI 303
Pump Sleeve	Stainless Steel AISI 304
Pump Bushings	Tungsten Carbide vs. Aluminum Oxide Ceramic
O-rings	EPDM
Mechanical Seal	Carbon vs. Silicon Carbide Faces with EPDM Elastomers & AISI 316 SS metals

Notes:

1. Dimensions and weights are approximate.
2. All dimensions are in inches and may vary ± .50".
3. Optional controller may be mounted on end of unit if space deems it to be necessary.
4. Not for construction purposes unless certified.

Engineering Specifications

Furnish and install as shown on the plans, one Aurora Pump Model Number ____ (Simplex) (Duplex) (Dual) (Triplex) packaged Boiler Feed System consisting of ____ gallon receiver of carbon steel with flat heads (turbine pump(s), (multi-stage vertical in-line centrifugal pump(s), ____ horsepower, ____ R.P.M. motor(s), 3-way strainer valve(s), steel base and supports, and all necessary suction piping factory installed. The system shall be suitable for returning ____ G.P.M. at a pressure of ____ psi for 210°F water to supply a ____ hp boiler.

Turbine Pumps:

Each pump shall be the APCO bronze fitted turbine type. The pump casing(s) shall be vertically split. The pump covers shall be of the removable channel ring design to permit replacement of the channels only and shall incorporate the bearing arms and stuffing boxes for (packing) (mechanical seals). The pump(s) shall be flexibly coupled to the motor(s).

Multi-stage Vertical In-line Centrifugal Pumps:

Each pump shall be in Multi-Stage Vertical In-Line Centrifugal Pump. Each pump shall be constructed with 304 stainless steel impellers and diffusers, a high temperature mechanical seal with carbon vs. silicon carbide, EPDM elastomers through out, tungsten carbide against ceramic pump bushings and a cast iron motor bracket. Flanges will be ductile or cast iron in slip ring (and isolated for liquid).

Turbine or Multi-stage Vertical In-line Centrifugal Pumps:

The pump(s) shall be mounted within the support stand on a common steel base. Coupling guard(s) will be provided. Suction piping between the receiver and pump(s) shall be factory

assembled with expansion type elbows to relieve pipe strain and vibration and 3-way strainer valve(s) with removable brass strainer. The strainer valve plug must be so designed that by turning the plug the liquid flow may be channeled in two directions – through the strainer housing or bypass around the strainer directly into the pump – or be completely shut off. The receiver shall contain all necessary openings for float operated automatic make-up water feeder, water level sight glass with shut-off valves, thermometer, and in simplex units, a plugged suction opening for a future pump shall be provided, to easily convert a simplex unit to a duplex or dual unit. The receiver shall be 3/16" carbon steel and shall be mounted on structural steel legs attached to the pump base. Threaded inlets shall be provided at the top of both tank heads. Two vents shall be provided and also a 1" drain. Motors shall be open drip-proof for (230/460 volt, 3 phase) (115/230 volt, 1 phase) 60 Hertz current, built in a standard NEMA frame.

Optional:

Magnetic starters with overload and under voltage protection shall be mounted and wired to the pump motors (3 phase, 1/3 hp motors or less). On Simplex units, the starters shall be in a general purpose enclosure. On Duplex, Dual and Triplex units, magnetic starters shall be panel mounted in a NEMA 1 enclosure. Reset buttons shall be provided outside the box. On Duplex and Triplex units, transfer switches to provide standby pump operations shall be mounted and wired in the panel. The transfer switch is not required on Dual units. An alternator (will) (will not) be provided on Duplex models in lieu of a selector switch.



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