PENTAIR



AURORA® CP BOSS
CONSTANT PRESSURE BOOSTER SYSTEMS

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Capacities to 1200 GPM (272.5 M_3/HR)
Pressures to 175 psi (123 M)
Potable Water Application

Constant Pressure Pumping Introduction

CP Boss, Aurora's packaged constant pressure booster systems are designed to meet the ever increasing demand of variable flows in high-rise, commercial, municipal and industrial buildings. These PLC based systems are available in horizontal and vertical configurations. Easy to select and install, pre-engineered duplex and triplex units are available for quick delivery. Each system is performance tested for trouble free operation and ease of installation and start-up.

Feature Selector

Standard Features

- UL labeled pressure sensing control panel
- PLC pump sequence controller
- Duplex or triplex
- Vertical or horizontal configurations
- Cast iron, bronze fitted centrifugal pumps
- High efficiency motors
- Steel manifolds
- Complete factory test
- Pilot operated pressure regulating valves
- Maximum pressure up to 175 psi, maximum flows up to 1200 GPM
- Single source responsibility

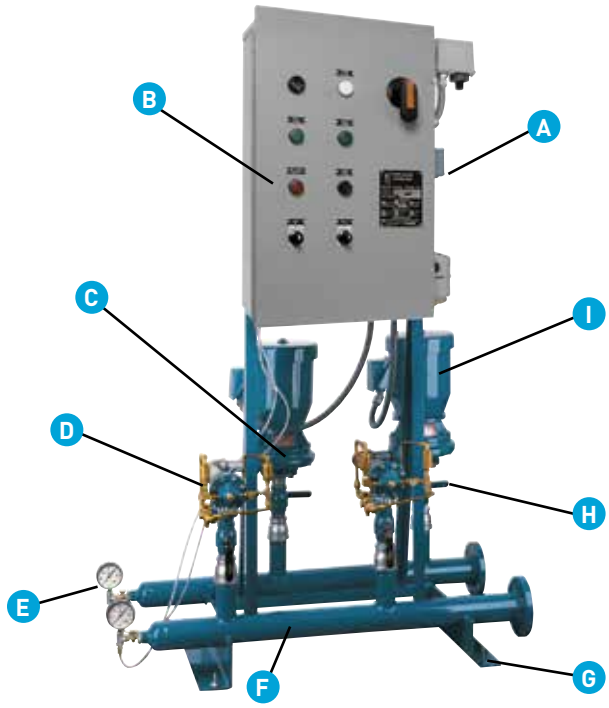
Optional Features

- ASME rated steel bladder tank
- Galvanized, copper or stainless steel headers
- Vertical stackable pumps
- Special control panels



Packaged Constant Pressure Booster Systems described in this bulletin are used in offices and high rise buildings.

Pump Features



A. Completely Assembled

and prewired for easy installation.

B. Pressure Sensing Control Panel

The programmable controller incorporated into the UL listed NEMA 1 Control Panel readily allows for the addition of optional control functions and alarm features.

C. Systems

feature Aurora 340 Series centrifugal end-suction pumps in bronze-fitted construction.

- Bronze shaft sleeve prevents shaft wear and extends the entire length of the seal box. Sleeve and impeller screw are sealed by o-ring gaskets to eliminate corrosion of the shaft by the liquid being pumped.
- Mechanical seal has carbon against a ceramic face for optimum water performance. Long life is also assured with 303 stainless steel metal parts and Buna-N elastomers.
- Back pull-out design simplifies disassembly. Suction and discharge piping is not disturbed and/or misaligned when servicing pumps. Standard motor approved by a joint NEMA and the Hydraulic Institute provides low noise level pump operation. Carbon steel motor shaft is designed for minimum deflection not to exceed .002" at seal faces when at maximum load. Bearings are selected for a long service life under severe operating conditions.
- Dynamically balanced impeller is keyed to the shaft. Quality controlled manufacturing process assures consistently high performance. Enclosed design provides highest efficiency and is vacuum cast. A case wear ring prevents wear on the pump casing and is easily and inexpensively replaced as necessary.

D. Pressure Reducing

valves automatically reduce higher inlet pressure to a constant downstream pressure regardless of changing flow rate or inlet pressure. Pilot control settings are readily accessable and are easy to adjust. Return flow is prevented through built in check valves. For some applications where constant discharge pressure is not critical or where suction pressure is relatively constant as with a reservoir, silent check valves may be substituted for pressure reducing valves.

E. Pressure Gauges

are located on suction and discharge manifold.

F. Steel Manifolds

are painted Aurora blue for corrosion resistance and to meet various local codes. Flanged connections provide easy installation. All piping is schedule 40.

G. Welded Groutable Steel Base

provides complete support while still allowing the unit to be readily maneuvered for installation.

H. Full-Port Ball Valves

provided on each pump suction and discharge branch will allow individual pumps to be serviced without interrupted operation.

I. Thermal Relief Valve

is installed in pump casing to prevent overheating and pump failure. The valve will automatically sense the rise in temperature and discharge some of the hot fluid causing the cooler fluid to enter the casing and the valve will then close.

J. Hydropneumatic Pressure Tank

(not illustrated) can be optionally provided to maintain system pressure during periods of low demand. Depending on specific application, the tank can be located adjacent to the system in the equipment room, remotely located, or mounted with the system on the common baseplate.

Pump and System Selection

All packaged booster systems have a desired discharge pressure and a given suction pressure from the city water system, or from a suction tank. Individual pump boost pressure is usually the system boost plus the friction losses within the booster system pipe, fittings, and pressure reducing valves. Individual pump flow is usually two equal sized pumps on a duplex system, and a percentage such as 20% + 40% + 40% = 100% for a triplex system. Determine the system flow and boost as well as individual pump flow and boost.

1) Total system flow in GPM_____

Determine required flow per pump in GPM

(Total system flow ÷ No. of pumps)

P1_____

P1_____

P1_____

2) Determine system manifold size

0 – 250 GPM 3"

0 – 450 GPM 4"

0 – 1200 GPM 6"

3) Determine pump head (TDH)

A: Desired pressure at system discharge manifold _____psig

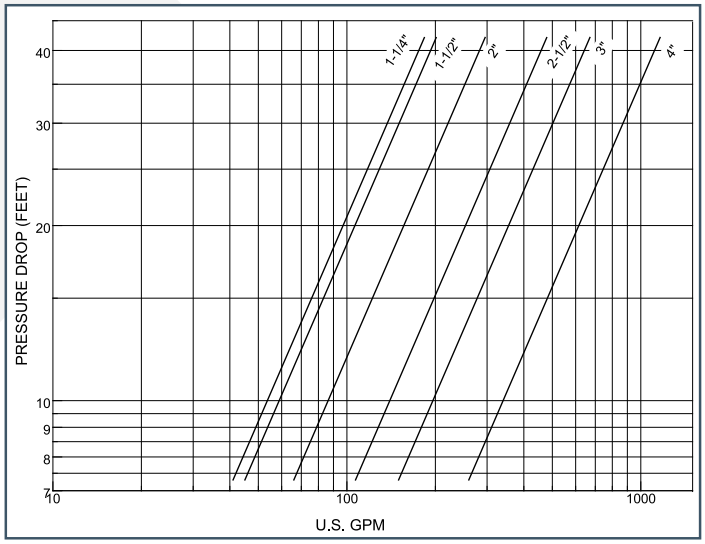
B: Minimum pump suction pressure_____psig (City supply or tank)

Determine PRV size(s)

PUMP FLOW	50 GPM	70 GPM	110 GPM	150 GPM	275 GPM	400 GPM
PRV SIZE	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"

C: Determine Flow Losses based on PRV Size_____Ft.

(See Chart Below)



Calculate Required Pump TDH: [A - B] x 2.31 + C

[(A)____psig -____(B) psig] x 2.31 +____(C) ft. =____ft.

Indivdual Pump Duty Points:

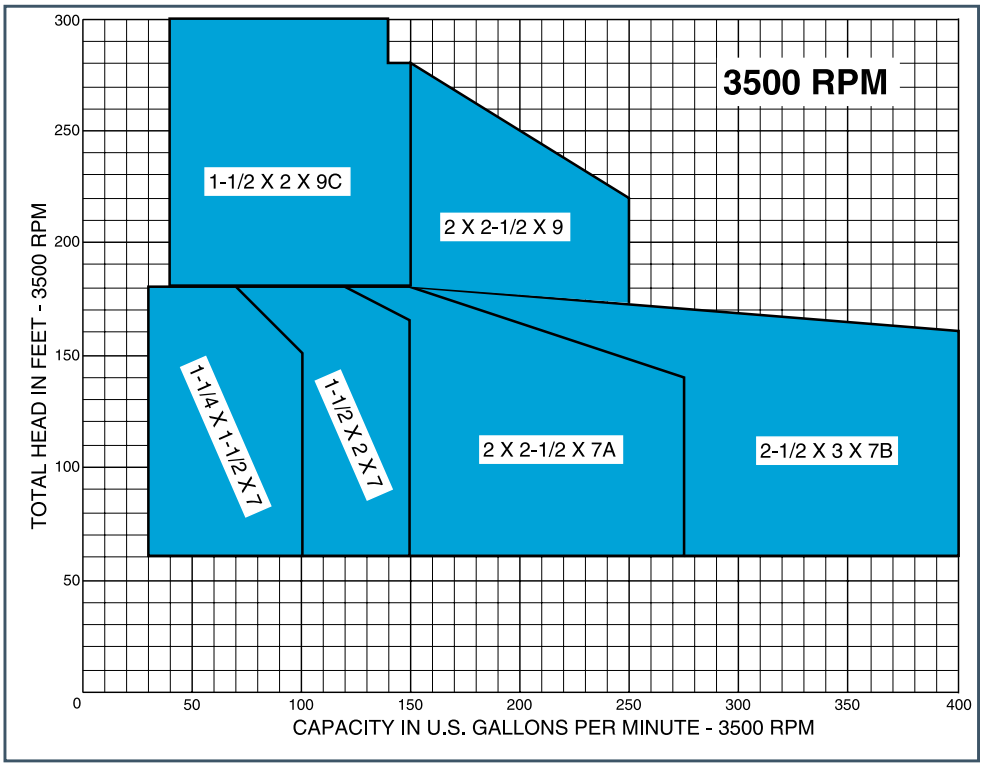
P1 _____GPM @_____ft. TDH

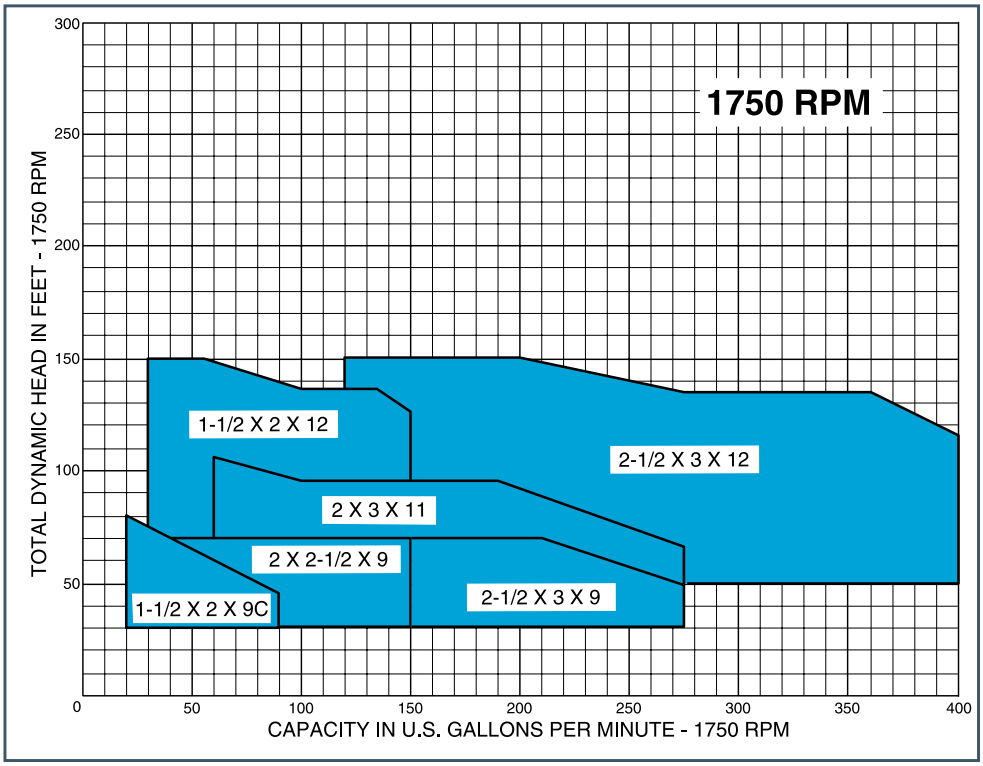
P2 _____GPM @_____ft. TDH

P3 _____GPM @_____ft. TDH

4) Select required pumps and motors using Aurora H2Optimize or the current Aurora Pump catalog

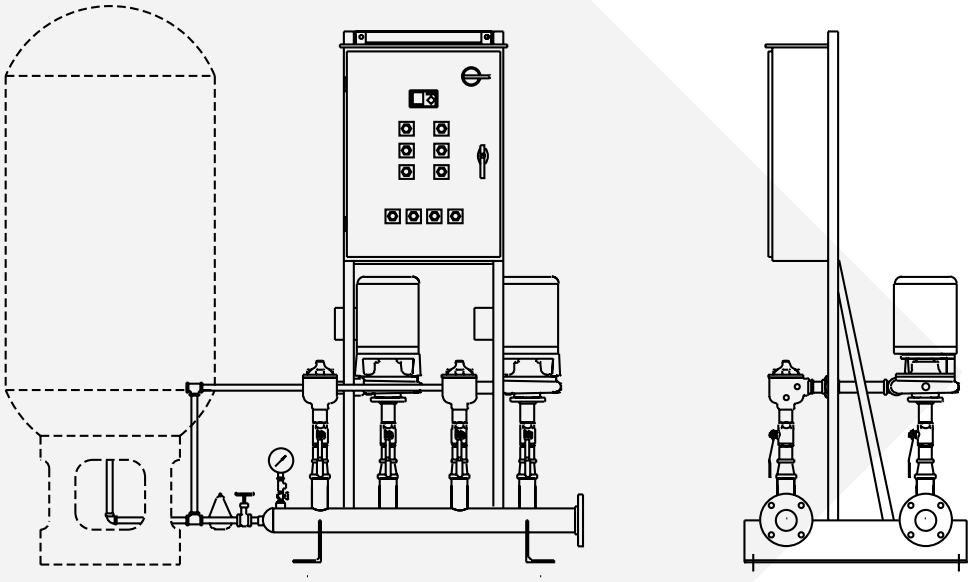
Performance Data



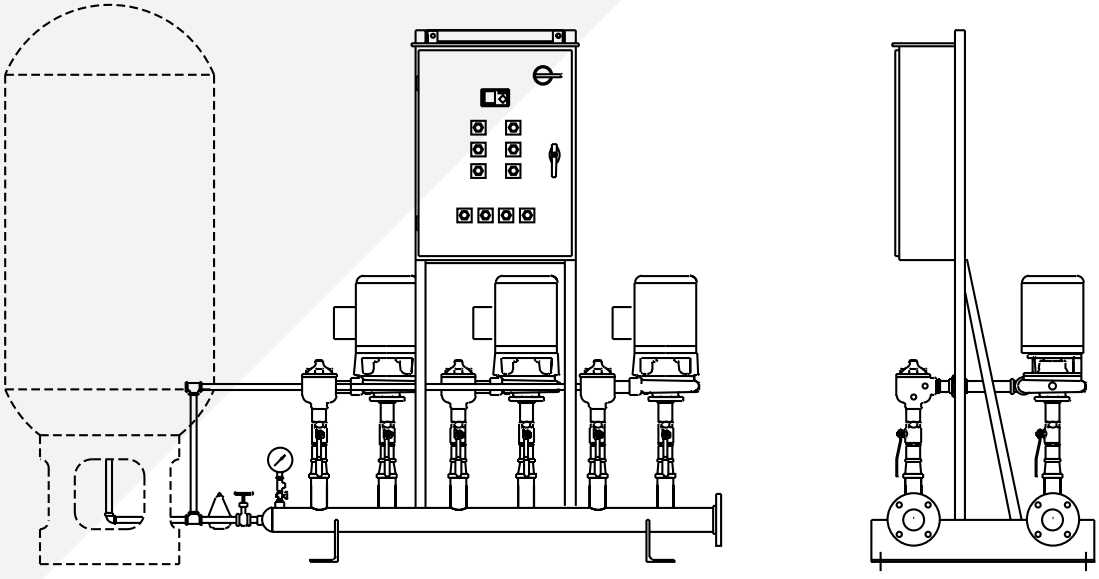


Model Diagrams

VERTICAL DUPLEX

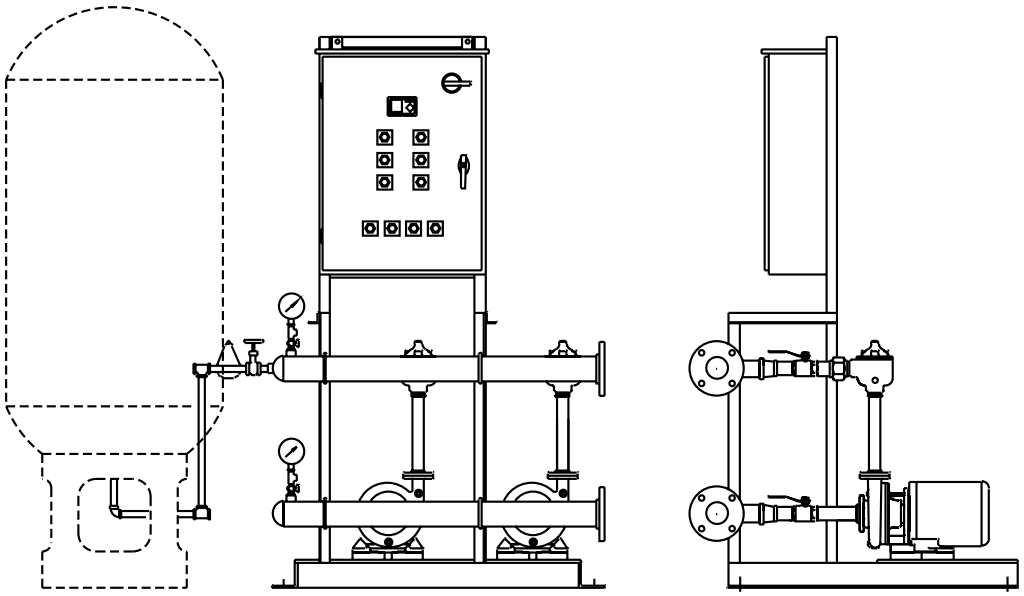


VERTICAL TRIPLEX

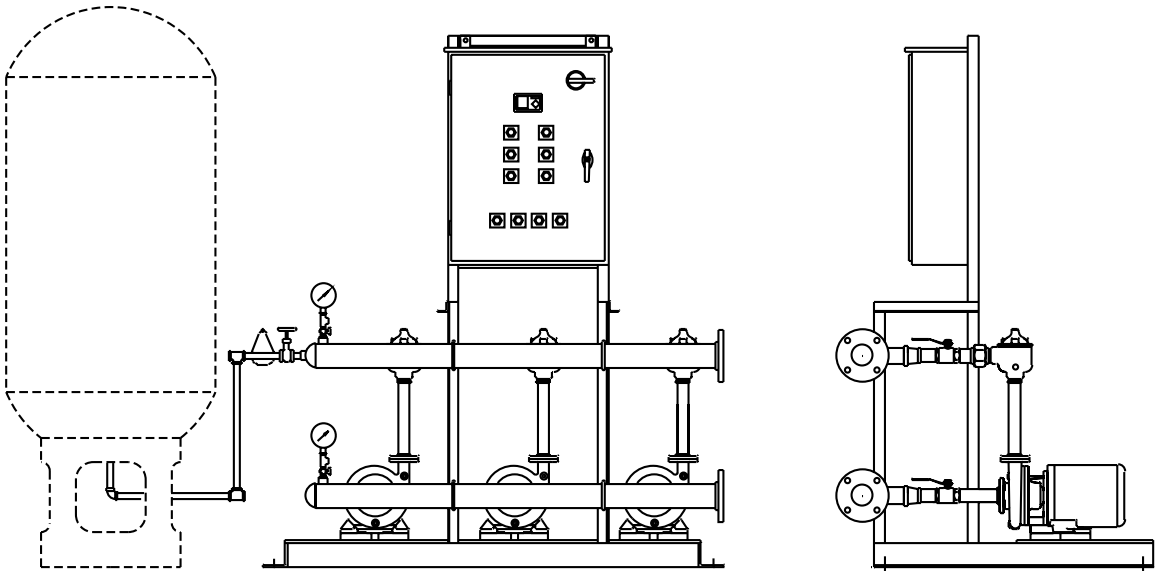


Model Diagrams

HORIZONTAL DUPLEX



HORIZONTAL TRIPLEX



Engineering Specifications

The contractor shall furnish and install an Aurora variable flow (duplex or triplex) constant pressure booster system as manufactured by Aurora Pump. The unit shall have a total system capacity of___GPM at a discharge head of___feet when supplied with a working suction head of___feet. Each pump shall be sized as indicated for a % of the total flow.

Duplex System	PumpP1 =.....GPM.....%System
	PumpP2 =.....GPM.....%System
Triplex System	PumpP1 =.....GPM.....%System
	PumpP2 =.....GPM.....%System
	PumpP3 =.....GPM.....%System

Piping and Valves

Each system shall be skid mounted, completely assembled and wired on a groutable steel base ready for installation. All piping shall be schedule 40 steel pipe. Each system shall include suction and discharge ball valves for each pump suction and discharge, combination pressure regulating/non-slam check valves for each pump, flanged connections for easy installation and pipe supports for the upper manifold. Suction and discharge pressure gauges shall be provided. Gauges shall have 3-1/2" faces with large scale numerals and individual air bleed type valves.

Pumps

The pumps shall be Aurora horizontal or vertical close-coupled end suction centrifugal pumps with back pullout design. The pump shall be constructed of cast iron casing, bronze dynamically balanced impeller, bronze shaft sleeves, and bronze case wear rings. Shaft sealing shall be accomplished by means of a stainless steel mechanical seal.

Motors

The motors shall be NEMA type JM, closed coupled, ___hp, 3 phase, 60 hertz, ___volt, ODP, high-efficiency. Motors shall be selected so that they do not exceed their nameplate hp rating through their entire range of operation.

Control Panel-Pressure Sensing

Each system shall have a mounted and wired UL Listed NEMA I control panel with individual magnetic motor starters, ambient compensated overload relays on each phase, individual motor fuseblocks with fuses, main circuit disconnect switch with door interlock, 110 volt control transformer with primary and secondary fuses. The panel shall be suitable for the horsepower and voltage of the motors. The control panel will incorporate a programmable logic controller with pressure-sensing logic and have the following features:

- On and off delays factory set to system operating characteristics to prevent short cycling of pumps.
- Individual pump run lights and selector switches
- Failure logic and indicating light to activate second pump if lead pump malfunctions.
- Automatic Lead/Lag pump alternation
- Low suction pressure shutdown with alarm light, horn and reset button.

Testing

The entire system shall be tested at the factory to assure proper sequencing to meet the design flows and pressure; and the system components shall be adjusted at the factory.

Services

The pump manufacturer shall assume unit responsibility and shall provide a factory trained engineer to supervise initial start-up to insure proper operation and to instruct the operating personnel in the operation and maintenance of the system.

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Because we are continuously improving our products and services, Pentair reserves the right to change specifications without prior notice.
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