



Pump Stations

The Intelligent Use of Water.™

Agenda

- 1. Rain Bird History and Speaker Background**
- 2. Pump Hydraulics and System Design Considerations**
- 3. Pump Station Specifications, Key Features and Options**





BACKGROUND INFORMATION

Speaker

- **Martin Armstrong ASLA**
- **Licensed Landscape Architect CA4607**
- **Licensed C-27 Contractor**
- **CA Rain Bird Pump Products Sales Manager**
- **25 years experience in Landscape & Irrigation**

Rain Bird History

- **1988 – Began manufacturing (Sweden)**
- **1990 – First in Europe with VFD drive**
- **1998 – Began selling pump stations in USA**
- **2004 – Opened manufacturing facility in Tucson Arizona**



Rain Bird Pump Stations Today



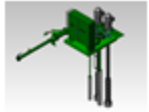
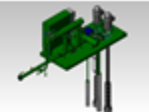
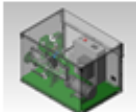
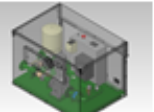
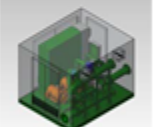
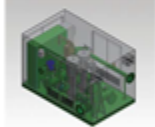
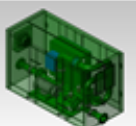
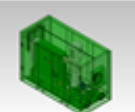
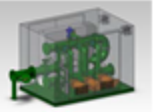
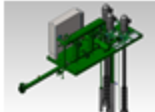
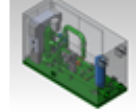

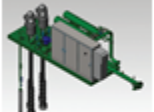

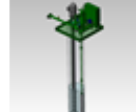
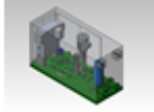
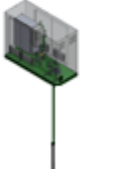

- Rain Bird is the Industry Leader. Rain Bird's quality, performance and range of products is unmatched in the irrigation industry. Only Rain Bird can leverage the technology between Pump Stations and Irrigation Systems. Rain Bird Sales and Services teams are able to support the entire system; from Reservoir-to-Rotor.



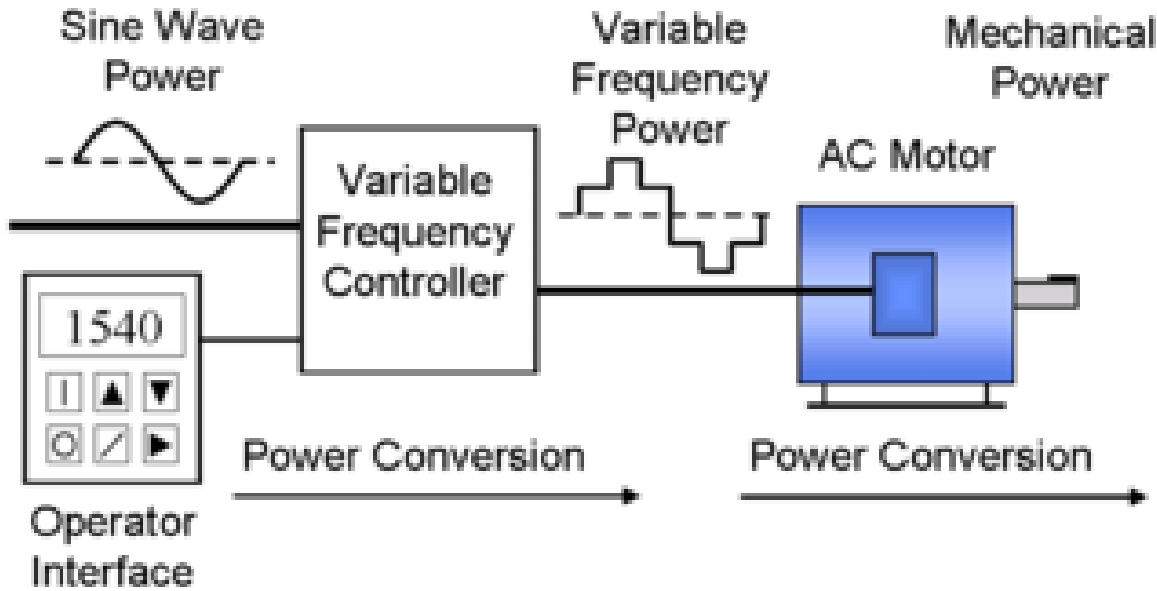
Pump Selection

Site Condition		Pump Category				Notes
		Horizontal End Suction	Vertical Multi-Stage	Vertical Turbine	Vertical Submersible	
Water Source	Pond (with floating intake)	Good Choice	Best Choice	Not Applicable	Not Applicable	If the site has a pond, (without a wet well), a Horizontal End Suction or Vertical Multi-Stage can be selected. Vertical Multi-Stage pumps typically have higher hydraulic efficiency.
	Wet Well	Acceptable for up to 3-5 ft lift	Acceptable for up to 15 ft lift	Best Choice	Acceptable	If the site has a wet well, a Vertical Turbine pump is usually the best choice for maximum hydraulic efficiency and lowest cost of ownership.
	Tank or pressurized pipe (municipal)	Best Choice	Good Choice	Not Applicable	Not Applicable	If there is a pressurized water source, a Horizontal End Suction or Vertical Multi-Stage can be selected.
	Deep Well (up to 350 ft)	Not Applicable	Not Applicable	Not Applicable	Best Choice	For deep wells, Vertical Submersible Pumps are used. Rain Bird can supply complete pump stations for depths up to 40 ft; or pump station (less pumps) for pump depths up to 350 ft
Application	Irrigation	Good Choice	Good Choice	Good Choice	Acceptable	Horizontal End Suction, Vertical Multi-Stage and Vertical Turbine are good choices for most irrigation applications. Vertical Submersible are also used, but have a limited flow range.
	Transfer	Good Choice	Good Choice	Good Choice	Good Choice	Variations of all pump category types can be used for transfer pump applications; consult Rain Bird Pumps Division for specific design characteristics.
	Water Feature	Good Choice	Good Choice	Best Choice	Acceptable	Variations of all pump category types can be used for water feature applications; consult Rain Bird Pumps Division for specific design characteristics.
HP Range	Horsepower	3/4 HP to 60 HP per pump	1 HP to 60 HP per pump	10 HP to 125 HP per pump	2 HP to 20 HP per pump	Horsepower provides pressure and flow; or "Duty Point". Rain Bird pump stations can be designed with multiple pumps with a variety of duty points to meet most site requirements.
Serviceability	Ease of Service	Best Choice	Good Choice	Good Choice	Good Choice	All Rain Bird pump stations are designed with serviceability in mind. Horizontal End Suction types are often considered to be the easiest to service, due to their "on-deck" configuration.

Rain Bird Pump Product Line

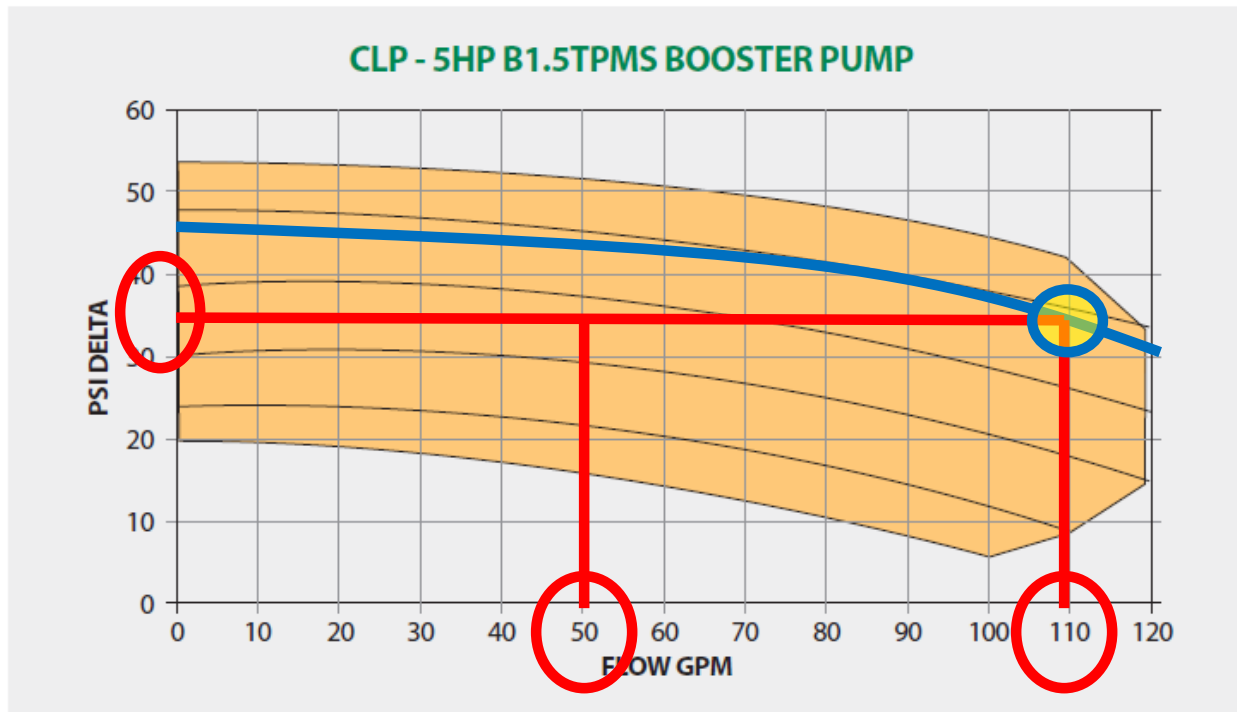
<p>LC Series</p> <ul style="list-style-type: none"> One horizontal end suction pump ¾, 1, 1 ½, 2 or 3 HP motor Up to 60 psi (4.1 bar) Up to 115 gpm (7.2 lpa, 26.1 m³/h) Powder coated steel enclosure Suction lift or boost applications 	<p>CLP Series</p> <ul style="list-style-type: none"> One horizontal end suction pump 3 HP motor with VFD Suction-Lift model <ul style="list-style-type: none"> Up to 60 psi (4.1 bar) Up to 140 gpm (9.8 lpa, 31.8 m³/h) Boost model <ul style="list-style-type: none"> Up to 55 psi boost (3.7 bar) Up to 120 gpm (7.6 lpa, 27.2 m³/h) Aluminum enclosure 	<p>VT2 – Compact Deck</p> <ul style="list-style-type: none"> 15 to 100 HP motors with VFD or VFM option Up to 145 psi (10.0 bar) Up to 1600 gpm (101 lpa, 365 m³/h) 3.7" monochrome or 6.4" color touch-panel display 	<p>VT2 – Large Deck</p> <ul style="list-style-type: none"> Large Deck to accommodate optional integrated filtration 15 to 100 HP motors with VFD or VFM option Up to 145 psi (10.0 bar) Up to 1600 gpm (101 lpa, 365 m³/h) 3.7" monochrome or 6.4" color touch-panel display 
<p>HES1 – LP Series</p> <ul style="list-style-type: none"> One horizontal end suction pump 3 to 10 HP motor with VFD Up to 95 psi (6.6 bar) Up to 200 gpm (12.6 lpa, 45.4 m³/h) Aluminum enclosure 3.7" monochrome or 6.4" color touch-panel display 	<p>VM1 – LP Series</p> <ul style="list-style-type: none"> One vertical multistage pump 1 to 2 HP motor with VFD Up to 50 psi (3.5 bar) Up to 120 gpm (7.6 lpa, 27.3 m³/h) Aluminum enclosure 3.7" monochrome or 6.4" color touch-panel display 	<p>HES2</p> <ul style="list-style-type: none"> Two horizontal end suction pumps 20 to 60 HP motor with VFD or VFM option Up to 124 psi (8.6 bar) Up to 1200 gpm (76 lpa, 273 m³/h) Aluminum enclosure 3.7" monochrome or 6.4" color touch-panel display 	<p>VM2</p> <ul style="list-style-type: none"> Two vertical multi-stage pumps 25 to 60 HP motor with VFD or VFM option Up to 130 psi (9.3 bar) Up to 1000 gpm (101 lpa, 365 m³/h) Aluminum enclosure 3.7" monochrome or 6.4" color touch-panel display 
<p>HES1 – D Series</p> <ul style="list-style-type: none"> One horizontal end suction pump 3 to 20 HP motor with VFD Up to 130 psi (9.0 bar) Up to 350 gpm (22.1 lpa, 79.5 m³/h) Powder-coated steel enclosure 3.7" monochrome or 6.4" color touch-panel display 	<p>VM1 – D Series</p> <ul style="list-style-type: none"> One vertical multistage pump 3 to 15 HP motor with VFD Up to 120 psi (8.3 bar) Up to 200 gpm (12.6 lpa, 45.4 m³/h) Powder-coated steel enclosure 3.7" monochrome or 6.4" color touch-panel display 	<p>HES3</p> <ul style="list-style-type: none"> Large deck to accommodate optional integrated filtration 20 to 60 HP motor with VFD or VFM option Up to 120 psi (8.3 bar) Up to 1600 gpm (114 lpa, 409 m³/h) 5.4" Color touch-panel display 	<p>VT3 – Large Deck</p> <ul style="list-style-type: none"> Large Deck to accommodate optional integrated filtration 15 to 100 HP motor with VFD or VFM option Up to 145 psi (10.0 bar) Up to 2400 gpm (151 lpa, 345 m³/h) 5.4" Color touch-panel display 
<p>HES1 – M Series</p> <ul style="list-style-type: none"> One horizontal end suction pump 20 to 50 HP motor with VFD Up to 120 psi (8.3 bar) Up to 600 gpm (37.9 lpa, 136 m³/h) Aluminum enclosure 3.7" monochrome or 6.4" color touch-panel display 	<p>VM1 – Enhanced</p> <ul style="list-style-type: none"> One vertical multistage pump 3 to 50 HP motor with VFD Up to 150 psi (10.3 bar) Up to 500 gpm (31.5 lpa, 114 m³/h) Aluminum enclosure - Compact Size 3.7" monochrome or 6.4" color touch-panel display 	<p>VT4-Large</p> <ul style="list-style-type: none"> Large deck to accommodate optional integrated filtration 15 to 100 HP motor with VFD or VFM option Up to 140 psi (9.7 bar) Up to 3200 gpm (202 lpa, 727 m³/h) 5.4" Color touch-panel display 	<p>Panel Only</p> <ul style="list-style-type: none"> Controls 1-6 pumps, up to 100 HP each VFD or VFM Flow meter and pressure transducer included 3.7" monochrome, 6.4" color or 5.4" color touch-panel display 
<p>VT1 – Compact Deck</p> <ul style="list-style-type: none"> 40 to 75 HP motor with VFD Up to 145 psi (10.0 bar) Up to 800 gpm (50.5 lpa, 182 m³/h) 6.4" or 5.4" color touch-panel display 	<p>VM1 – M Series</p> <ul style="list-style-type: none"> One vertical multistage pump 15 to 60 HP motor with VFD Up to 155 psi (10.7 bar) Up to 500 gpm (31.5 lpa, 114 m³/h) Aluminum enclosure 3.7" monochrome or 6.4" color touch-panel display 	<p>S1</p> <ul style="list-style-type: none"> One submersible pump in an aluminum enclosure 20 to 60 HP motor with VFD Up to 124 psi (8.6 bar) Up to 600 gpm (38 lpa, 136 m³/h) 3.7" monochrome or 6.4" color touch-panel display 	<p>S2</p> <ul style="list-style-type: none"> Two submersible pumps in an aluminum enclosure 20 to 60 HP motor with VFD or VFM Up to 124 psi (8.6 bar) Up to 1200 gpm (76 lpa, 273 m³/h) 6.4" or 5.4" color touch-panel display 

Variable Frequency Drive - VAF



VFD Performance

Variable Frequency Drive. VFD technology allows this pump to operate throughout a wide flow range.



System Discharge Pressure = Incoming Pressure + Pressure gain from pump.

BENEFITS OF VFD CONTROL

- **30% to 50% Energy Savings Over Constant Speed System.**

Hydraulic Institute claims 97% of a pump cost over a 20 year life is energy + maintenance. Only 3% represents initial purchase cost.

- **Slower Pump Start Up**

Reduced current inrush

Reduced pressure spikes – water-hammer

- **Constant Pressure During Changing Flow Conditions**

- **Allows intelligent pump feedback (high and low pressure shut down, loss of prime shut down)**

- **Less Overall System Maintenance**

Warranty

- Read and understand the terms
 - First year
 - Beyond first year
- ASP Support
- Technical Support



Rain Bird Pump Station Professional Customer Satisfaction Policy Terms and Conditions

Rain Bird guarantees that its pump station will be free of manufacturer defects for one year from date of authorized start-up but not beyond sixteen months from date of invoice.

Start-up by other than Rain Bird Authorized personnel will void these terms and conditions.

Provided that all installation, start-up and operation responsibilities have been properly executed, Rain Bird will replace or repair, at Rain Bird's option, any part found to be defective under normal recommended use during this period. Repairs performed at Rain Bird's expense must be authorized by Rain Bird prior to repairs being performed. Upon request, Rain Bird shall provide advice on trouble-shooting a defect during the effective period of this Customer Satisfaction Policy. However, no service, replacement or repair under this Customer Satisfaction Policy will be rendered while the customer is in default of any payments due to Rain Bird.

Rain Bird will not accept responsibility for costs associated with the removal, replacement, or repair of equipment in difficult-to-access locations. Difficult-to-access locations include (but are not limited to) locations where any of the following are required:

- 1) Cranes larger than 15 tons
- 2) Divers
- 3) Barges
- 4) Helicopters
- 5) Dredging
- 6) Any other unusual means or requirements

Such extraordinary cost shall be the responsibility of the customer, regardless of the reason requiring removal of the equipment from service.

The terms and conditions of this Customer Satisfaction Policy do not cover damage caused by or resulting from the following:

- 1) Misapplication, abuse, or failure to conduct routine maintenance (to include winterization / winter lay-up procedures).
- 2) Pumping of liquids other than fresh water as defined by the U.S. Environmental Protection Agency, unless the pump station is specifically designed to do so.
- 3) Use of free chlorine or other strong biocides.
- 4) Exposure to electrolysis, erosion, or abrasion.
- 5) Presence of destructive gases or chemicals.
- 6) Over voltage or low voltage.
- 7) Electrical phase loss or reversal.
- 8) Exposure to incoming power lacking circuit breaker or fused protection.
- 9) Using the control panel as a service disconnect.
- 10) Lightning or other Act of Nature.
- 11) Failure of pump packing seal (unless the failure occurs on initial start-up).

The foregoing terms and conditions constitute Rain Bird's entire Customer Satisfaction Policy. Rain Bird does not offer any other or additional warranty, with respect to the pumping system or its components. Rain Bird makes no implied warranty, with respect to fitness for a particular purpose or merchantability of the pumping system or its components. Components manufactured by others (as noted on the Pump Station Quotation) are covered solely by and to the extent of the warranty, if any, offered by the manufacturer. Rain Bird shall not be liable to the customer or any other person or entity for any liability, loss, or damage caused or alleged to be caused, directly or indirectly, by the pump system. Rain Bird shall not be responsible for incidental, consequential, collateral or indirect damages or loss of profit or damages related to the customer's business operations, nor for those caused by Acts of Nature. In no case and under no circumstances shall Rain Bird's liability exceed the Rain Bird Corp's net sale price of the pump system. Laws concerning customer warranties and disclaimers vary from state to state, and therefore some of the foregoing limitations may not apply to you.

Qualified Service Provider





Questions ?

Thank You

The Intelligent Use of Water.™