



Drive Management

Beckman Environmental Services Co.





VFD Management

Functionality

Ever evolving since the inventor (Kurt Bihler) created the first prototype, its purpose has remained consistent: It's a comprehensive torque control system designed to improve pump motor efficiency. It functions as a program manager for a VFD to make responsive adjustments that will accommodate; fluctuating pressures, multiple pump operation, and ever changing physical dynamics. These adjustments derive from real time motor data monitored by the VFD. Then, predetermined equations instantly modify the power being sent to the pump. By trimming the output power, the pump always operates at its best efficiency.



Features:

- Easy to operate HMI with layered password protection and full system information
- An artificial brain with built in redundancies and SCADA-ready communication features
- Comprehensive control for up to four pumps

Why Use Station Boss?

To extend the life of a pumping system and expand the capabilities.

It starts with an intelligent two way communication with the VFD. This gives the controller an ability to sense and instantly compensate for dynamic physical changes that can negatively affect the pump or its components. By removing these excessive forces from the shaft, bearings and seals, the life of the pump and its components are better preserved and therefore last longer.

Open communication and a mutual desire for a better control system has always been essential in the evolution of Station Boss. Therefore, we make constant efforts to share information and answer all questions whenever the opportunity arises...

Question One

Will it pay for itself and eventually save money? YES! Here is how.

1. Higher hour numbers with less maintenance:

By continually making finite adjustments to the power, the drive can always keep the pump running at its best efficiency. As a result, there is a reduction in excess force on the shaft, bearings and seals. That results in extending the time between maintenance. (Since each system condition is unique, it is impossible to calculate precisely how much) However, it should be reasonable to assume that any system which is constantly trimmed and running at its best efficiency will last longer than one that isn't)

2. Accommodating future system changes at the touch of the screen:

By instantly increasing or decreasing the operative torque percentage on the touch screen, Station Boss gives you the ability to re-scale your pumps and accommodate any new operating point while eliminating the need for extra man hours, pulling the pumps, buying new or changing impellers, system down time, and more.

3. Reduced electrical usage:

When you operate a pump based on its power requirements instead of forcing it to perform within blind parameters, you eliminate all unnecessary power consumption. (In traditional control applications, excess power ends up as heat within the motor as the "speed control" forces it to perform) This savings adds up every month.

4. A flexible system:

Station Boss gives you the ability to balance the workload across multiple pumps to the best of each one's ability. This allows for combinations of different sizes, different brands, and even old pumps working alongside new ones in perfect balance. Such flexibility also enhances the capabilities of down line stations that use the same force main.

Question Two

Who else uses Station Boss and how long have they been using them?

Station Boss is a product sold nationally through EBARA Corporation. For our territory which includes Southern Ohio and Kentucky, there are over 40 units currently in use with more more being specified for station rehabs and new. Our customers include Warren County Ohio since 1999, Clermont County Ohio since 2000, Scioto County Ohio since 2003, Franklin County Ohio since 2005 and Frankfort KY since 2007

Listed below are some unique applications with specific points of interest that we feel, properly highlight some specific benefits of Station Boss.

PROJECT PROFILE ONE

FOOZER ROAD PS - CLERMONT COUNTY WATER RESOURCES 2002

Original design: 720 GPM @ 180' TDH 8006' - 8" PVC force main, "C" factor 120 / Pump selected: Ebara 100DLFU645, 60 HP

Project change: A requirement was added to use a "C" factor of 100 therefore changing the head condition from 180' to 216'

Problem caused by change: Normally at 216' TDH, the 60HP pump wouldn't be capable of this without running in an area that could overload the motor. This TDH would've required an upgrade to a 100 HP pump.

Solution: By using a Station Boss, we were able to "trim" the originally selected 60 HP pump to the system therefore ending the new 100HP requirement. This approach not only offered the lower energy costs associated with smaller pumps, but also saved the county the initial expense of upgrading the pumps, stand by generator, electric service and additional construction cost.

PROJECT PROFILE TWO

INDIAN LOOKOUT PS - CLERMONT COUNTY WATER RESOURCES 2003

Original design: 700 GPM @ 110' TDH / Pumps Originally selected: Ebara 150DLKFU630, 40HP

Project change: The County determined that the pump station was oversized and needed to reduce the flow.

Problem caused by change: The original high flow rate made it impossible to operate a single bar screen at the wastewater plant. They decided to resize the system down to pump 520 GPM @ 103' TDH. This required a revised pump selected which was a 150DLKFU618, 25HP. This was still too much flow to operate a single bar screen.

Solution: It was determined that by installing a Station Boss, they could reduce the flow rate of the 25 HP pumps by an additional 250 GPM from operating the system in PID. This approach allowed them to operate the pumps at a lower flow rate and use a single bar screen while still having the ability to pump the higher flow in the case of an unusual high flow into the station.



PROJECT PROFILE THREE

DUPLEX GRINDER PS WHEELERSBURG, OH - Installed in 2000

In 1999, we were approached by Woolpert Consultants of Ashland, KY with an all too common situation. It involved designing a station that would be required to pump into an existing force main. The difficulty in the design was the difference in head pressure between when the existing station was running and when it was not running.

Original Design: 50 gpm @ 125' tdh with main PS running

Problem and solution summarized

When the main pump station was not operating, the head pressure dropped by about 50'. In order to prevent cavitation and pump overload, the D2L2-jr control system, (early version of Station Boss) was installed in the new station. When the main station was operating, the pumps would operate at full torque & full speed to maintain 50 gpm @ 125' tdh. When the main station was not operating the controller would trim down the power that the drives were giving to the pumps and operate at full torque at a lower speed.

This allowed the new station to be tied into the existing force main with a small grinder pump, therefore saving the owner the cost of purchasing a larger motor which would have been required to maintain a non-overload condition when the main station wasn't operating. This immediately resulted in less electricity use and long term wear & tear savings.

Station Boss can sense a pressure change in the force main from another pump down line regardless of size and instantly adjust its output to allow that other pump to run.

Question Three

How can this system save energy and prolong equipment life?

This system saves energy by:

- A. Trimming all excess power being sent to the pump motor
- B. Eliminating any demand surge
- C. Allowing the use of smaller HP pumps
- D. Always running at best efficiency

This system prolongs equipment life by:

- A. Reducing stresses on shafts, bearings and seals
- B. Eliminating all excess heat in the motor
- C. Providing torque boost at shutoff cushions check valves
- D. Reduces stress at startup while waiting on air valves

More good reasons to include Station Boss

- A. It saves money and frees up resources
- B. Gives equipment more efficiency and longer life
- C. Provides flexibility to fine tune stations instantly
- D. Upgrade the station at the touch of a button

Example:

If you build a new station in an area that will not be developed to its full potential for several years, Station Boss can help. Simply build that station to its full potential and choose a lower operating point on the screen until the time comes when you need more flow.



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design your own
Station Boss

Keep it simple,
or customize it to
your standards...

This is a very
flexible system
that will do what
you need, when
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