

ecosmart
STATION™



We're Opening the Doors
to a New Generation...

The ECO SMART STATION™ will Change the Future of Pump Control Panels...

Revolutionary in design, the new **ECO SMART STATION™** control system provides a safe, simple, energy efficient solution for optimum pump control in municipal lift station applications.

The **ECO SMART STATION™** uses the latest technology in VFD, microprocessor based controller, data storage and communication capabilities available.

This pre-engineered solution is available in 29 models, from 10HP to 100HP.

The **ECO SMART STATION™** is housed in the innovative, multiple compartment **ARC ARMOR™ Enclosure**, reducing the risk of injury resulting from electric shock and exposure to arc flash. The control and power circuitry are isolated in separate compartments, preventing unnecessary operator exposure to high energy circuits and potential arc flash conditions.



Arc Flash

Arc flash in a control panel can occur when there is ample voltage in an electrical system. Resulting from an accelerated fault to ground, it produces an electric arc.

With 5-10 arc flash incidents occurring per day, arc flash is a leading cause of death and burn accidents for maintenance staff when servicing electrical control panels in North America today. Onsite damages caused by an arc flash incident include: OSHA citations or fines, down time, loss of revenue and equipment damage. In worst case scenarios, arc flash may result in long term disability or even death thereby having a significant impact on the liability of the municipality.

All of these arc flash events usually occur in less than 0.2 seconds, and can create:

- Intense heat
- Thermo-acoustic shock wave
- Molten metal
- Hot shrapnel that can pierce a body
- Blinding light
- Toxic smoke
- Contact with energized components

Energy Efficiency

Energy and maintenance expenses for a typical pumping system can add up to be more than 65% of the total life cycle cost. Therefore, energy efficiency is a critical factor when investing in new equipment or simply retrofitting existing control systems. With the **ECO SMART STATION™** control system, up to 30% energy savings is achievable.

How Does the Energy Savings Work?

The Affinity Laws define the relationship between pump speed (n) and power (P), where

$$P2 = P1 (n2 / n1)^3$$

Motor speed (n) in RPM can be controlled with the use of Variable Frequency Drives (VFDs), where

$$n = (120 \times \text{Hz}) / \text{Poles}$$



The graph shown here illustrates how a small reduction in pump speed will result in considerable energy savings.

The **EnergyView™ Controller** with the **kW Logix™ Software** uses an “Efficiency Auto-Tune” algorithm that searches for the pump speed (Hz) that will consume the least amount of energy per gallons of liquid pumped (W/GPM). The flow (GPM) is calculated from the level changes, tank dimensions, fill and discharge times. A flow meter is not needed. The pump motor power (W) is monitored by the VFDs and transmitted to the controller. No power meters are required. The auto-tune program also takes into account the reduction in flow and head characteristics of the pump resulting from speed reductions to determine the Best Efficiency Frequency (BEF)

When the Best Efficiency Frequency (BEF) is found, the pumps will operate at this speed during every cycle. This mode of operation (ECO mode) is very efficient during low and normal in-flow to the station.



ECO (fx) Setup

Cycle Operation or Constant Level Operation?

During high in-flow operation (peak hours), it is more efficient to operate in proportional-integral-derivative control mode (PID mode) than cycling the pump ON and OFF. **kW Logix™ Software** recognizes high in-flow conditions and automatically switches the operation mode from ECO mode to PID mode. During PID operation the pump speed is controlled to match the incoming flow and maintain a constant wet well level. When the in-flow returns to normal, the operation returns to cycle based (ECO mode) of operation automatically.



Controller Overview

The **Energy View™ Controller** is powered by **kW Logix™ Software**. The color touch screen HMI has the ability to provide level control, pump alternation, flow monitoring, data logging, alarm logging, historical trending and comes equipped with a SD memory card for data storage and download. It can connect through multiple communication streams for remote monitoring and control.



Main Screen

Features:

- 6 inch, color touch screen
 - LED backlit, sunlight readable
 - Intuitive menu navigation
 - Simple setup and operation
 - Battery back up
 - Continuous level monitoring
 - Flow monitoring (with or without a flow meter)
 - Power monitoring
 - Motor current monitoring
 - Pump speed control
 - Pump efficiency monitoring (W/GPM)
 - Pump efficiency Auto-Tuning (lowest W/GPM)
 - Automatically switches to PID mode during high in-flow
 - Automatic alternation
 - Multiple password protection
 - Pump low efficiency alarm
 - Pump over temperature and seal fail monitoring
 - Pump dry run protection
 - Data logging on SD memory card
- * **kW Logix™** is patent pending



Level Setup



Live Trends

Simple

The HMI display is very simple to use, intuitive and easy to read in various weather and light conditions, including direct sunlight.

Communication Options:

- I-LINK® Web based monitoring system
- Dial up modem (Sixnet)
- Protocol converter Red Lion model DSPLE
- Auto dialer
- GSM/GPRS cellular modem communication, includes:
 - SMS messaging
 - Remote access

Cost Effective

The **ECO SMART STATION™** is designed to offer a superior solution at a competitive price. Many government agencies and utilities offer rebate programs to promote energy efficient solutions such as the **ECO SMART STATION™**. Rebates are in addition to the energy savings resulting directly from using an energy efficient solution such as the **ECO SMART STATION™**.

Pre-Engineered

With the pre-engineered **ECO SMART STATION™** electrical schematics, mechanical drawings, bill of materials, component cut sheets, specifications, operation manuals and installation manuals are made available by your Control Solutions Provider.



Flow Setup



Sensor Setup



The **ECO SMART STATION™** is housed in the innovative, multiple compartment **ARC ARMOR™ Enclosure**, reducing the risk of injury resulting from electric shock and exposure to arc flash.

Zone 1 - Service Compartment

Danger Zone: This zone contains the most dangerous arc flash potential and risk of electrical shock. Workers may require Personal Protective Equipment (PPE) when entering. “Lockout/Tagout” is supported.

Zone 2 - MCC Compartment

Danger Zone: When Zone 1 is energized, workers cannot gain access to Zone 2. Thereby, reducing accidental exposure to arc flash. There is visual indication when power is present in Zone 1. “Tagout/Lockout” is also supported.

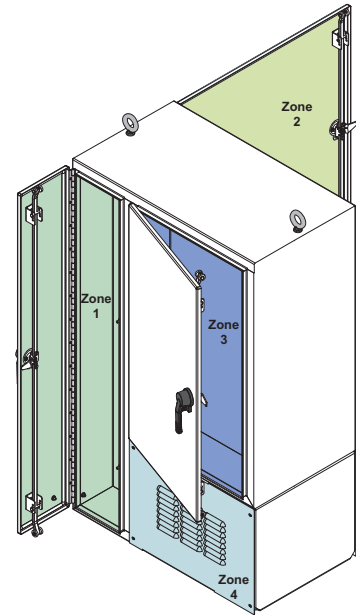
Zone 3 - Controls Compartment

Operator Safety Zone: Contains only low circuits (120VAC or lower only). Therefore, minimal PPE is required.

Zone 4 - Skirt Compartment

Gas Isolation Zone: Provides gas isolation from wet well in wastewater lift station applications.

For more information on the **ARC ARMOR™ Enclosure**, visit www.ArcArmorEnclosure.com.



Zone 3: Inner Door of Controls Compartment



Zone 1: Service Entrance Compartment



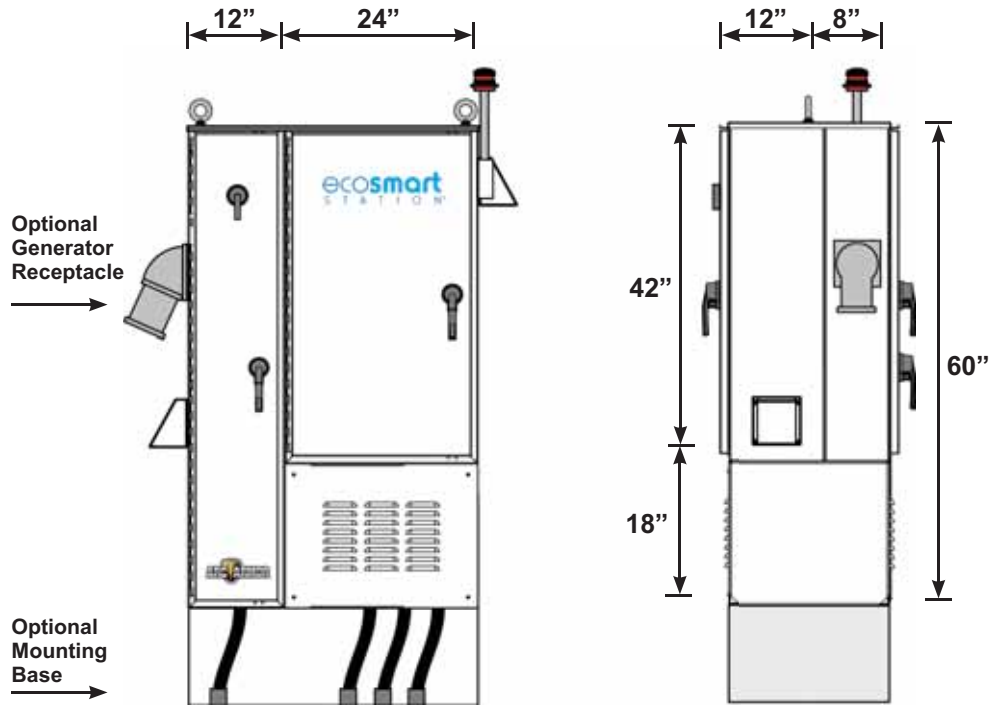
Zone 2: MCC Compartment



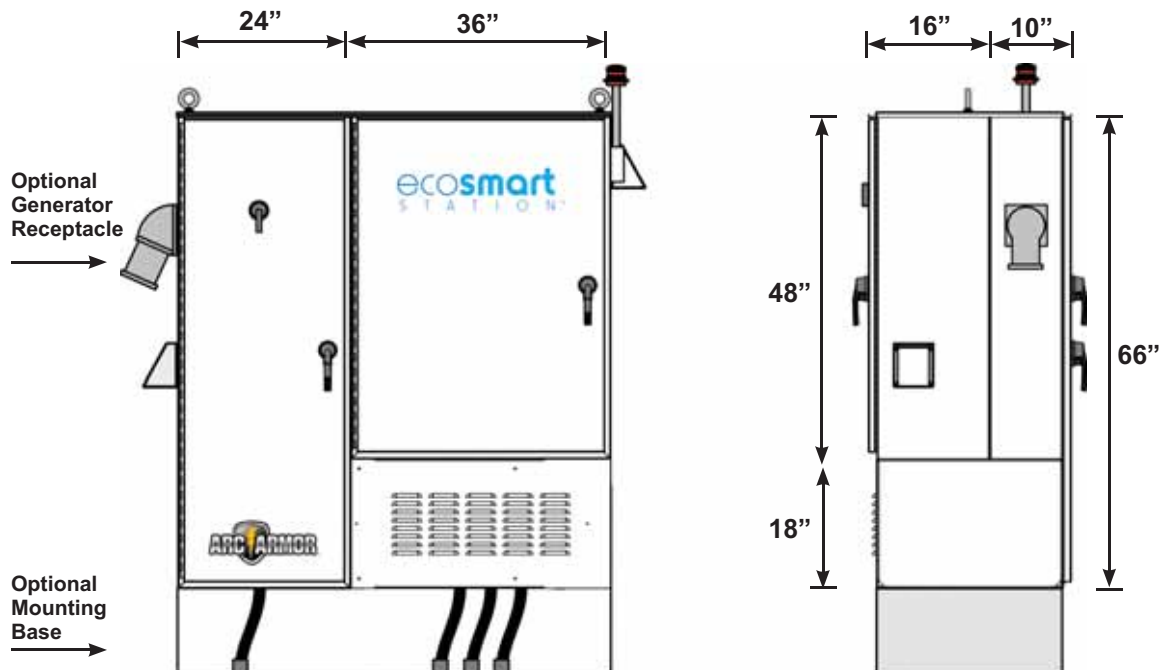
Zone 3: Controls Compartment

ECO SMART STATION™ Enclosure Overview

Size 1 Overall Dimensions: 60"H x 36"W x 20"D



Size 2 Overall Dimensions: 66"H x 60"W x 26"D



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Control
Works, inc.

1179 US Highway 50
Milford, OH 45150
Phone: 513-831-9959
Fax: 513-831-3549
www.controlworksinc.com

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