

Don Johns Engineering Control System – An Alternative Solution Batching Application Using Load Cells

Here is an example of how Don Johns Engineering (DJE) provided a customer with a highly accurate solution to their batching needs.

The application required adding a small amount of additive (around 300 lbs) into an already-filled storage tank containing their main product (around 100,000 lbs). Historically, the customer had been filling a small bucket with the additive (by weight) and then hand-carrying the bucket to the top of the outside storage tank and dumping in the additive. Obviously, the accuracy and safety requirements drove the customer to look for an alternate (and more automated) solution.

The customer required the additive batching to be very accurate (to 0.1 lbs), very repeatable, verifiable, and fast.

Don Johns Engineering came up with a solution which utilized a Tension Hopper Weighing System with “S” type Load Cells. The weighing system was supplied with an ISO Certified 50 lbs test weight, allowing customer to verify scale accuracy prior to each batch (an important requirement for their batch records).

This custom control system was mounted on a metal skid, giving it portability. The skid contained the Weighing System (weigh hopper on load cells), the DJE Control Panel, two pumps and an automated 2-stage electric valve. The Batching valve and pump were controlled by the Weigh Controller, delivering a preset (adjustable) amount of additive from a large tote into the Weigh Hopper. The speed of the Batching pump was adjustable, using a Variable Frequency Drive (VFD).

Installed in the Weigh Hopper was a single-point Ultrasonic Level switch, tied into the Weigh Controller as a safety High level shutdown, to prevent overflow of additive.

After the additive is batched into the Weigh Hopper, it is pumped out of the Weigh Hopper using the Transfer pump and transferred into the outside large storage tanks. In order to make sure that all of the additive from the Weigh Hopper was pumped into the storage tank, such that none was left in the piping between the Weigh Hopper and storage tank, the main product from the storage tank is then re-circulated to flush the entire line from the Weigh Hoppe back out to the storage tank, using the same Transfer pump on the DJE skid.



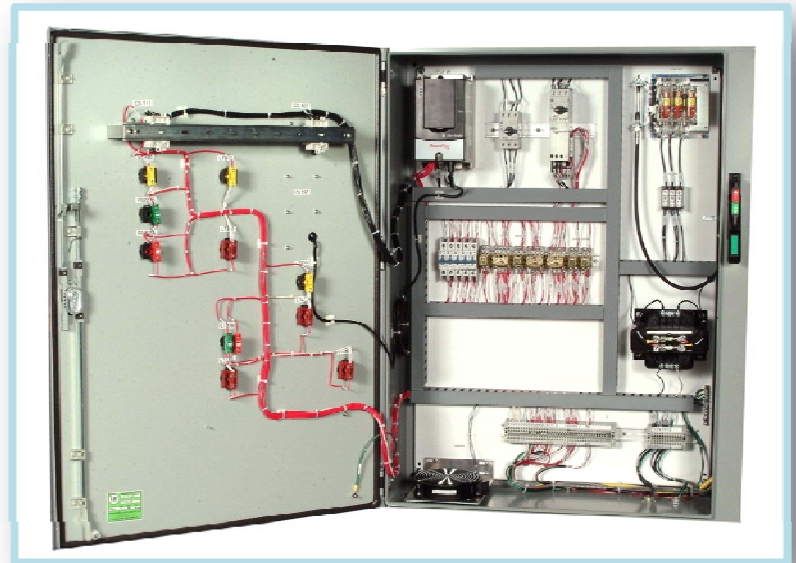
***Skid-Mounted Don Johns Engr Control System –
accurate, repeatable, and easy-to-use!***

As with all DJE systems, the customer was provided with electrical schematics and documentation for their electricians to install the new system. After installation, the customer was also provided with start-up assistance, testing and training to ensure the customer received the highly accurate, highly repeatable and easy-to-use Control System that they had envisioned and purchased!

Process Description

The basic principle of batching the additive is:

- Enter in the speed of the Pulsafeeder batching pump using the door-mount Allen-Bradley Powerflex VFD Display panel
- Enter in the desired amount of additive into the Fairbanks/GSE Weigh Controller and start the batch
- The RCS 2-stage batching valve opens and the batching pump runs at preset speed. The Weigh Controller delivers the required amount.
- The Flowline Ultrasonic Level Switch in the Weigh Hopper shuts down the system if the level were to ever reach the tip of the sensor towards the top of the Weigh Hopper.
- Once the batch is complete, the Operator runs the Pulsafeeder Transfer pump to move the weighed amount of additive into the Main Product storage tank.



What the Don Johns Engineering Solution gives you

- **Portable Skid-Mounted Equipment**, with the mechanical expertise to design and fabricate to the degree of precision required for sensitive equipment such as Load Cell system
- **CAD Drawings**, including electrical schematics and field wiring diagrams
- **Electrical Control Panel**, keeping in mind electrical codes and ease-of-wiring for field wiring
- **Easy-to-Understand Operator Interface**, such as on the Weigh Controller and VFD keypad, to give access to users to monitor and control the process. Descriptive alarms to assist troubleshooting.
- **Start-Up Services** (after installation and wiring is completed by customer) to ensure a successful deployment of the system.

... A Solution aimed to meet and exceed Customer's expectations!