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Grain Prep[®] Auto Delivery System[®]

Reg. U.S. Pat. Off. Nos. 5,194,275; 5,437,882 & 6,192,750 B1

Continuous Flow Design

General Operating Instructions

July, 1997
Rev. 6/07

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Introduction

The Grain Prep Auto Delivery System is a complete moisture process control that monitors grain mass flow rate, moisture content and temperature continuously, on-line as the grain enters the mixing-transfer auger. From these data the Controller calculates the moisture application rate necessary to achieve the target grain moisture content. This calculated rate is continuously compared to the actual rate being applied, as measured by the water flow meter. The Controller adjusts the application rate with the proportional flow control valve to compensate for any variance between the computed and actual rates. This process continuously corrects for changes in grain moisture content, grain mass flow rate and water line pressure. The result is grain ready for processing within 30 minutes having a moisture content within 0.5% of the target.

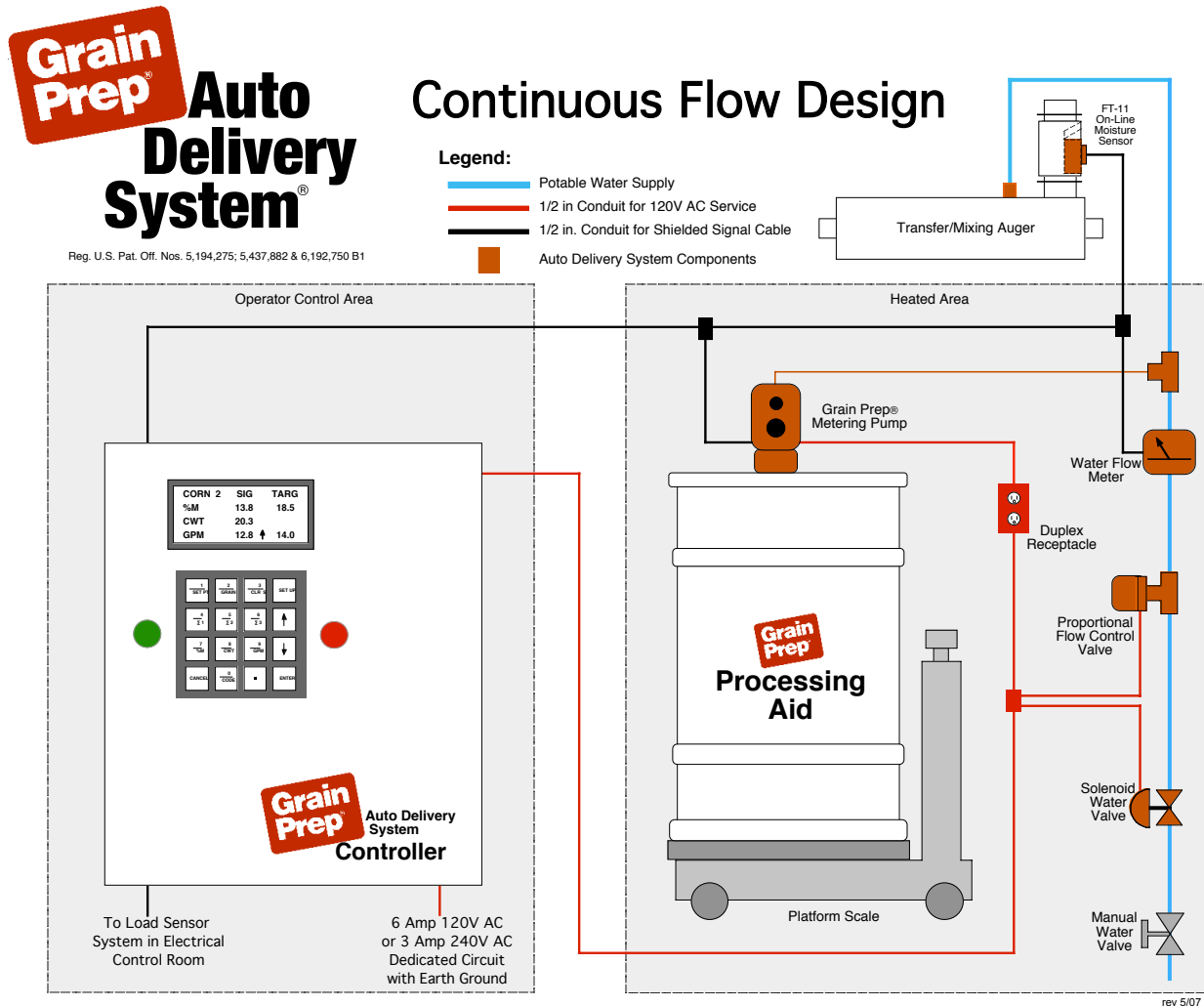


Figure 1: Grain Prep Auto Delivery System Schematic

Grain Prep Auto Delivery System Components

Controller

The patented Grain Prep Auto Delivery System Controller is the "brains" and operator interface of the Grain Prep Auto Delivery System.

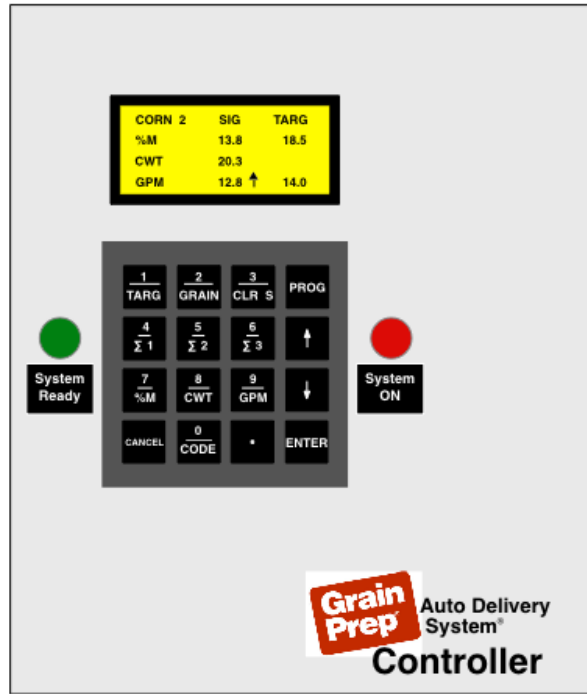


Figure 2: Grain Prep Auto Delivery System Controller

Controller Components

Display Screen

Continuously provides the operator with current processing data.

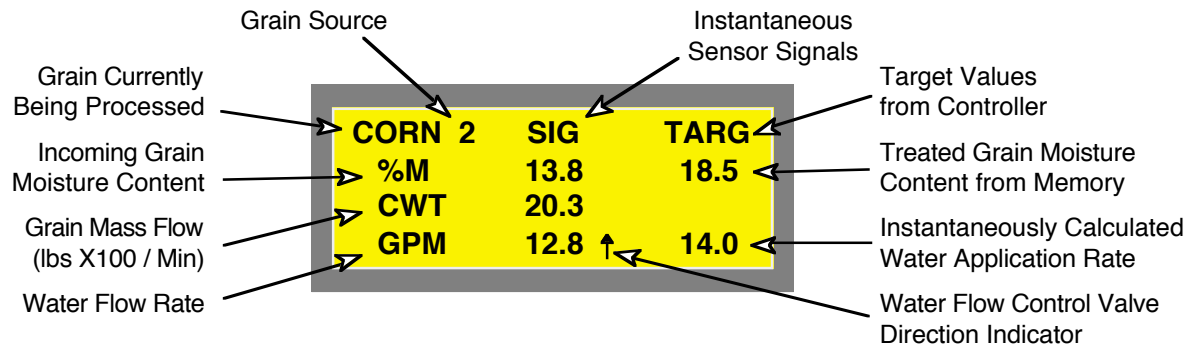


Figure 3: Controller Main Operating Screen

16 Character Key Pad

Allows programming changes and retrieval of processing data.

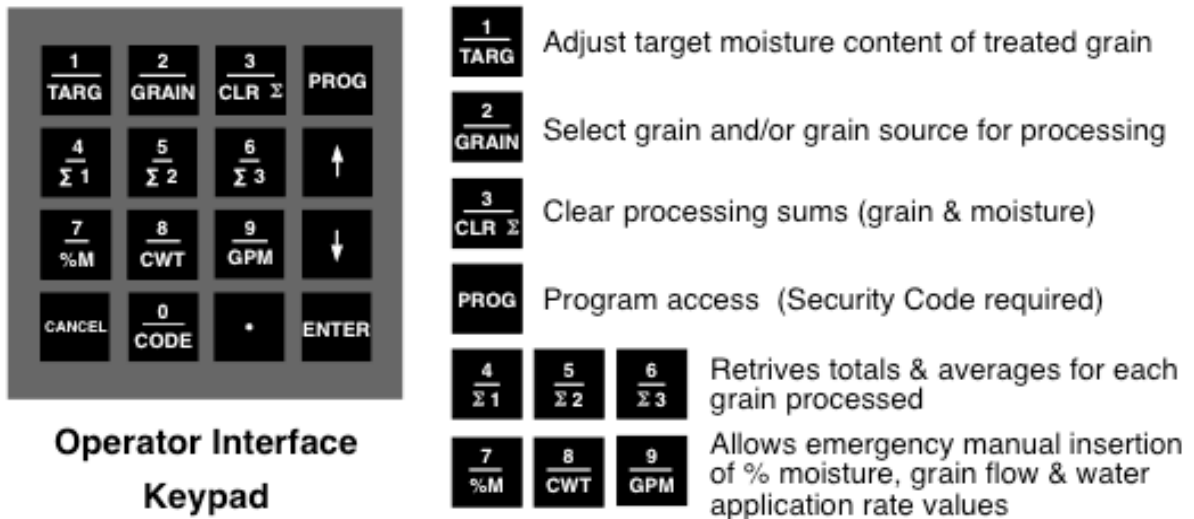


Figure 4: 16 Character Keypad Schematic

Solenoid Water Valve

Provides positive water shut-off.

Proportional Flow Control Valve

Regulates moisture application rate and closes whenever process function is off to provide a positive back-up for the solenoid valve.

Water Flow Meter

Provides accurate water flow measurement for controlling both the proportional flow control valve and the Grain Prep metering pump.

Patented Moisture Sensor

Provides accurate on-line grain moisture assay.

Load Sensor System

Provides a very accurate electronic signal proportional to the mass flow of grain mass flow rate.

Grain Prep Processing Aid

- Enhances feed grain digestibility
- Improves process moisture dispersion and absorption


Grain Prep Auto Delivery System Continuous Flow Design

- Is formulated from ingredients generally regarded as safe (GRAS) for both human and livestock consumption.

Routine Operation of the Grain Prep Auto Delivery System


1. To activate System Controller, press System Ready switch.
 - Electrical power is provided to the Controller and the Auto Delivery System is in standby mode.
 - Any desired Controller program changes may be made in this mode prior to processing grain.
2. Make certain the correct grain, source and target are displayed on the Controller Display Screen
3. To start processing grain, press System ON switch.
 - To manually stop processing, press System ON switch. Usually the Auto Delivery System automatically starts and stops with grain flow, so both the System Ready and System ON switches may be left activated.
 - Program changes, if necessary, may also be made in this mode without disruption to system operation.

To Change Processed Grain Moisture Target:

1. The Controller may be actively processing grain or in the standby mode when the moisture target value is changed.
2. Press  to activate the cursor on the Display Screen.
3. Enter new Target by pressing the appropriate numeric keys.
4. If the entry is correct, press **ENTER**.
5. If an entry error was made, press **CANCEL**, return to the Main Operating Screen and repeat the entry process.

To Select Grain Type and/or Source for Processing:

If the Grain Prep Auto Delivery System is calibrated for more than one grain or grain source:

1. Press  to activate menu screen listing available grain choices.
2. Select desired grain by pressing the corresponding numeric key.
3. A second menu screen will appear showing grain sources.
4. Select the desired source by pressing the corresponding numeric key.
5. The Main Operating Screen will reappear.

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To Retrieve Processing Data:

1. Press one of the following keys $\frac{4}{\Sigma 1}$ $\frac{5}{\Sigma 2}$ $\frac{6}{\Sigma 3}$ corresponding to the grain record desired
2. A data summary will appear on the Display Screen.
3. Press **CANCEL** to return to the Main Operating Screen.

To Clear Processing Data from the Controller Memory:

Press $\frac{3}{\text{CLR } \Sigma}$ to reset memory register to zero.