

Cooperative Bulk Handling - Aeration of Stored Grain

HIGHLIGHTS

Aeration fan control based on external temperature and humidity

Data-logging of grain temperature, external temperature, humidity and fan run hours (for last 3 months)

Possible remote access via telephone modem

Soft Starters for all fan motors

Operator-friendly touch screen interface with setpoint entry, historical alarms, trends and system status indication

Fully programmable controller capable of implementing advanced control techniques

1.2m long switchboard

INTRODUCTION

Cooperative Bulk Handling (CBH) is a grower-owned cooperative that is responsible for the centralised storage of grain in WA.

The majority of grain that is produced in Western Australia will be stored for a period of time. During this time, it is of critical importance that the moisture content and temperature of the grain be controlled so as to reduce the risk of spoilage. These conditions can be controlled by a process known as 'Aeration'; i.e. pumping air through the stored grain via fans, ducts and exhaust vents.

SCOPE

Industrial Automation is to design, supply and install the aeration control systems for various existing grain storage locations throughout Western Australia. This includes the supply and design of the control system using a PLC, Operator Interface Panel and motor starting equipment.

It also includes the supply, installation and calibration of the weather station and grain temperature probes.

EQUIPMENT USED

- Sixnet PLC
- 5" monochrome touch screen
- Up to 4 soft starters (7.5kW to 45kW)
- 1.2m long aluminium cubicle
- 1 x Rense Weather Station
- 2 x Grain Temperature
- Probes

END RESULT

The Operator sets the desired setpoints for both temperature and humidity. When the external temperature and humidity readings are both below their respective setpoint values, the aeration fans are operated.

The touch screen Operator Interface provides the Operator with the following functions:

- change the setpoints;
- check current temp/humidity;
- view system alarms;
- check status of fan motors;
- view historical trends;
- configure the control system (password required).

The performance of the aeration control system can be monitored by periodically uploading the data-log file from the Sixnet PLC onto a laptop computer. This file contains the grain temperature, external temperature, humidity and fan run hour readings for the last 3 months.

POSSIBLE EXTENSIONS

The Grain Aeration Control System developed by Industrial Automation is also capable of the following:

- Remote access to the control system via a telephone modem (control system can even notify you of an alarm condition!);
- Implementation of advanced control techniques (using same Sixnet PLC);
- Control of an increased number of fan motors;
- Communications to existing grain temperature monitoring systems/sensors.