



Industry Notification - Food and Beverage Industry

Delta Intelligent Facility Process Cooling Water Control Solution for Beverage Factory

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Introduction

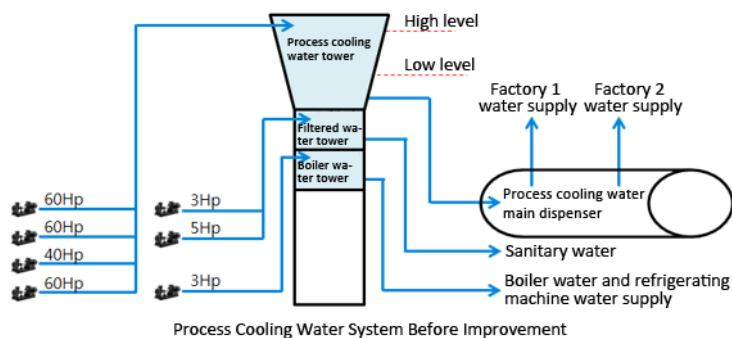
Function

Before improvement, the water supply pressure and flow of the boiler and filtered water for the beverage production line and factory area were controlled via a water tower with a height of 20M, utilizing high/low water level of the water tower to start/stop the lift pump in order to keep the water pressure stable.

After improvement, with intelligent variable-frequency control, the system provides more accurate constant pressure control solution with less footprint.

Application

The constant pressure water supply solution for process cooling water can be widely used in food processing and chemical fiber industry.



Process

Description

With the same fluid, pipe size and switch state, the flow rate remains unchanged under the same outlet water pressure.

Therefore, after switching from water tower to direct water supply, it delivers the same flow rate in the field pipeline as long as the water supply pressure remains the same.

This solution features the mid-range PLC AH500 to control 3 sets of variable-frequency water supply systems, and sets the manual/automatic mode and parallel standalone mode over the central monitoring system (DIAView).

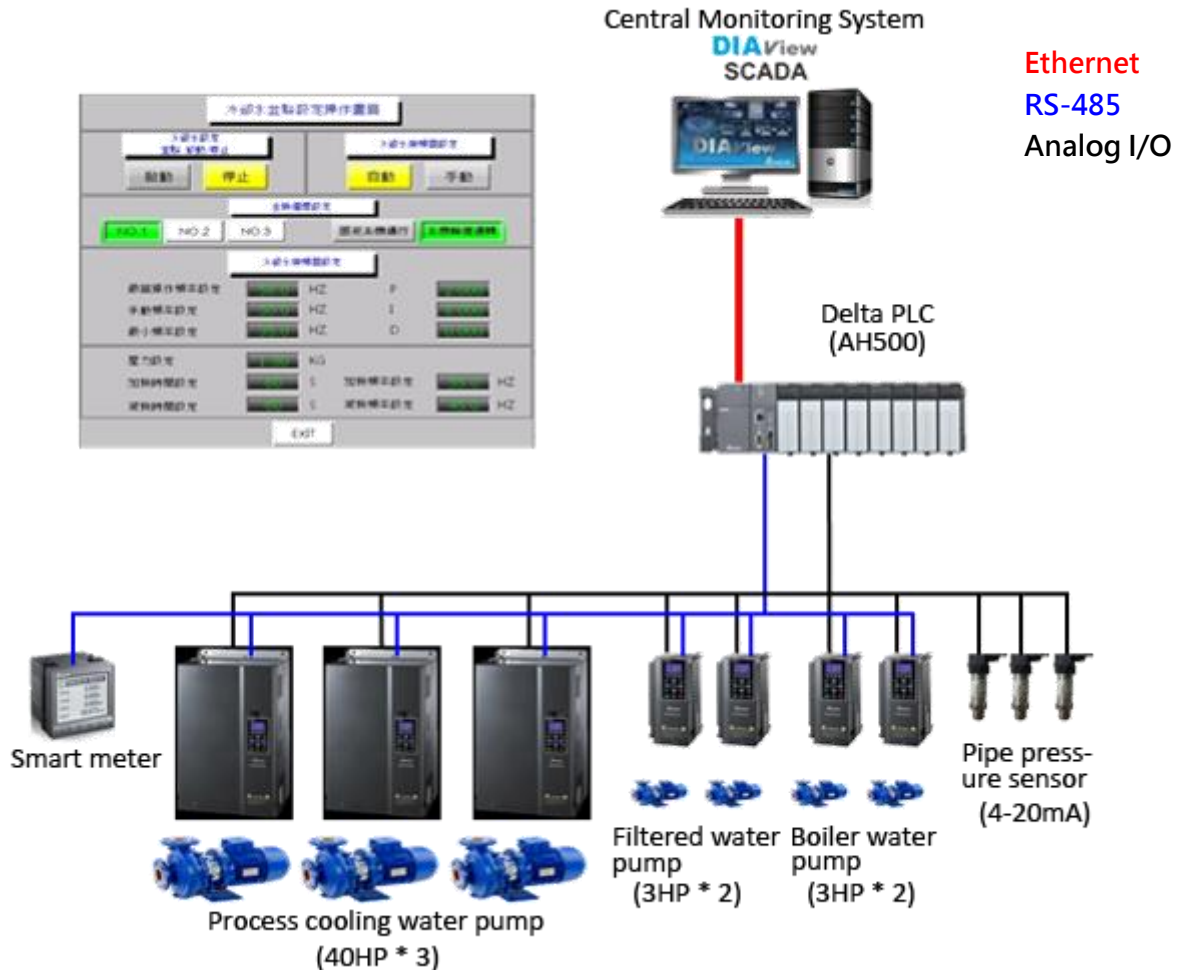
Control Instructions

Automatic mode: Execute the constant pressure control program in automatic mode. Select the parallel mode to automatically increase/decrease the number of water pumps, and feed back 4~20mA pressure signal to the PLC via the outlet pressure sensor for cooling water. The PID performs calculation and sends the output frequency signal to the motor drive as the constant pressure output. Increase the number of paralleled variable-frequency water pumps via loading conditions if the pressure is insufficient even under full load.

Manual mode: The operator sets the operation frequency on the HMI directly without performing constant pressure control.

Constant pressure water supply system	Water supply by water tower	Traditional direct water supply	Variable-frequency direct water supply
Pump start/stop basis	Water level of water tower	Outlet water pressure	Outlet water pressure
Sensing element	Liquid level sensor	Mechanical pressure sensor	Electronics pressure sensor
Precision	Good	Medium	Excellent
Pump operation mode	0/100%	0/100%	0/50~100%
Pressure change	Good	Medium	Excellent

Delta Total Solution



Equipment List

Name	Function	Model	Quantity
Industrial HMI software	Process, boiler and filter water supply monitoring	DIAV-xxxxx0000B	1
High-performance mid-range PLC	Constant pressure control and parallel control for process cooling water	AHCPU500-EN (32DI,32DO,8AI,8AO)	1
Vector control drive	Pump motor control for process cooling water, boiler water and filtered water	C2000	7
Multi-function integrated meter	Electric metering for process cooling water pump	DPM-C530A	1

Features and Advantages

Further Upgrade of Device Architecture

- Intelligent, precise and instant control architecture for higher process water supply stability and less equipment footprint.
- Integrated communication among the drive, controller and HMI software for visualized operation.

Flexible Extension

- The PLC supports different communication protocols including Modbus TCP, EtherNet/IP, Modbus RS485, etc., for quick extension and integration with peripheral devices in the future.
- The HMI supports OPC communication protocol (OPC Server/OPC Client), allowing future data integration and data analysis with energy management systems.

Complete and Professional Solution from Delta

- Comprehensive consideration for both the system and control, offering different operation modes.
- Modular programming is used for system setup. Users can program function blocks for different processes or actions separately, for easy read/write and maintenance.
- Delta IA solution is highly integrated, offering high precision, stability, synchronization and flexibility.



• Solution Contact

TEL : +61 3 9543 3720

E-Mail : info.au@deltaww.com