

## INTRODUCTION OF AUTOMATIC CONTROL 啤酒设备自动控制简介

### 自動控制系统 Automatic control system

#### 设备构成

本系统由计算机工控机、组太软件、PLC、变频器、液位、温度、压力传感器及控制元器件等组成。

#### 控制原理

根据啤酒发酵工艺要求，设计以计算机工控机、组太软件、PLC为核心的啤酒发酵控制系统。对啤酒发酵温度(升温、控温、降温)、液位、压力、进出料泵运行等进行控制。主要实现数据采集、自动控制和联锁等功能。具有简单可靠、容易实现、静态性能好等优点。

#### 技术说明

- ◆本系统可以根据啤酒生产需要，对糖化系统、发酵系统的进出物料及工艺水罐输送泵、液位、温度、压力等工况进行全面的检测、显示和操作控制。
- ◆本系统采用计算机、显示器或触摸屏，采用欧姆龙等国际品牌的传感、检测及控制元器件。
- ◆本系统对生产中的液位、温度、压力均采用计算机工控机、组太软件、PLC等系统实现自动控制或半自动控制。
- ◆本系统设计先进合理、加工精致，外观美观，便于操作和维修保养。

#### Structure of equipment

The system is composed by industrial personal computer, configuration Software, PLC, frequency converter, liquid level and temperature and pressure sensor, and control element.

#### Control principle

The beer fermentation control system is designed with core units of computer controlled system, configuration software, and PLC according to requirements of beer fermentation process. The system offers control on the temperature of beer fermentation (temperature rising, temperature control and temperature lowering), liquid level, pressure and feed-in and feed-out pump aiming at to achieve functions like data collection, automatic control and interlock. The control system is featured by strengths of simple reliability, easy achievement and static performance. The system can provide full-automatic and semiautomatic control service according to requirements of client's order.

#### Technical Specification

- ◆The system can conduct all-round inspection, display and operation control for in and out of material of saccharification system and fermentation system, as well as work condition of delivery pump, liquid level, temperature and pressure of the process according to requirements of beer production.
- ◆The system uses computer, display or touch screen, sensor, inspection and control elements of internal brand such as Omron.
- ◆The system is equipped with industrial computer, configuration software and PLC to achieve the automatic control or semiautomatic control of liquid level, temperature and pressure during production.
- ◆The system is featured by advanced and reasonable design, delicate process, nice appearance and durable service which are convenient for operation and repair as well as maintenance.



## EQUIPMENT INTRODUCTION OF PROCESS WATER TANK, WINE PUMP AND CLEANING SYSTEM 工艺水罐及酒泵、清洗车设备

#### 设备构成

本系列由软水罐、热水罐、冷媒罐、移动泵车、CIP清洗车等组成。

#### 生产能力

满足每日生产50L、100L、200L、300L、500L、800L、1000L啤酒酿造所需要的酿造用水、热水、冷媒的贮存，以及对物料的泵送、CIP清洗等生产工艺需要，也可根据客户订单指定配套设备供货。

#### 技术说明

##### 工艺水罐系列

根据啤酒生产需要，与动力系统设备配套的有软水罐、热水罐、冷媒罐等系列罐。

- ◆本系列罐可以满足软水贮存、热水加热与贮存、冷媒贮存与循环等需要。
- ◆全部采用优质不锈钢材料制造，符合国际国内食品安全卫生标准。
- ◆热水罐与冷媒罐均采用保温层，保温层厚度60mm以上，保温层密度符合相关标准。
- ◆本系列罐液位、温度等均采用计算机工控机、组太软件、PLC系统实现自动控制或半自动控制。
- ◆软水、热水、冷媒进出均采用管道固定式连接，清洗方式采用移动式CIP清洗车及软管连接实行自循环清洗。
- ◆设备设计合理、加工精致，外观美观，经久耐用，便于操作和维修保养。

##### 移动泵车

- ◆根据啤酒吧各发酵罐、贮酒罐、清酒罐的特点，对各罐之间的物料输送采用移动泵车的形式。
- ◆移动泵车采用优质不锈钢泵体，卫生级离心泵，满足啤酒卫生标准要求。
- ◆移动泵的选型，流量为1~5t/h,扬程为10~30m。
- ◆本移动泵的控制可根据客户要求，纳入控制系统实行自动操作或采用手动操作。

##### 清洗车

- ◆根据啤酒吧设备的特点，对各罐的清洗采用CIP清洗车进行移动式单元清洗，即将本清洗车与各自单元罐连接，使其形成自循环对各罐进行CIP清洗。
- ◆CIP清洗车由1台卫生泵和2只酸碱容器罐组成。
- ◆移动泵车采用优质不锈钢泵体，卫生级离心泵，酸碱罐全部采用优质不锈钢制造，满足啤酒卫生标准要求。
- ◆清洗泵的选型，流量为3~10t/h,扬程为20~50m。
- ◆本清洗车的控制可根据客户要求，纳入控制系统实行自动操作或采用手动操作。

#### Structure of equipment

This series is composed by soft water tank, hot water tank, refrigerant tank, movable pump truck and CIP cleaning tanker.

#### Productive capacity

It can meet the requirements of brewing water, hot water and refrigerant storage, pumping of material and CIP cleaning required by beer brewing for 50L, 100L, 200L, 300L, 500L, 800L and 1000L every day.

#### Technical Specification

##### Process water tank series

- A series of tanks such as soft water tank, hot water tank and refrigerant tank equipped for power system according to requirement of beer production.
- ◆This series tank can meet the requirements of soft water storage, hot water heating and storage, refrigerant storage and cycle.
- ◆All equipments are made by stainless steel with good quality which can meet the international and national food hygiene and safety standards.
- ◆Hot water tank and cooling material tank are insulation type,Thickness of insulating layer is more than 60mm whose intensity can meet related standard.
- ◆The system uses industrial personal computer, configuration software and PLC to achieve the automatic control or semiautomatic control of liquid level and temperature of this series tanks.
- ◆In and out pipes of soft water, hot water and refrigerant adopt fixed connection, and the cleaning is to use CIP cleaning tanker and hose connection to achieve self-circulation cleaning.
- ◆The Equipment has reasonable design, delicate process, nice appearance and durable service which are convenient for operation and repair as well as maintenance.

##### Mobile pump

- ◆Products conveying among all tanks is achieved by mobile pump according to characteristics of fermentation tank, beer storage tank and bright beer tank in beer bar.
- ◆Mobile pump uses high quality stainless steel pump body and centrifugal sanitary pump which meets the requirement of beer hygienic standard.
- ◆Type selection of mobile pump shall meet the requirement that the capacity is 1~5t/h and the head is 10~30m.
- ◆Control of mobile pump can be put into control system to achieve automatic operation or manual operation according to client's requirement.

##### CIP cleaning tank

- ◆It uses CIP cleaning tank to achieve movable unit cleaning for cleaning of all tanks according to characteristics of equipments in beer bar, that is, connect the cleaning tanker with every unit tank so that it can form self-circulation to take CIP cleaning for it.
- CIP cleaning tanker is composed by 1 sanitary pump and 2 acid and alkaline tanks.
- CIP cleaning tanker is made of high quality stainless steel pump body and centrifugal sanitary pump, and acid/alkaline tanks are made of high quality stainless steel which meets the requirement of beer hygienic standard.
- Type selection of cleaning pump shall meet the requirement that the capacity is 3~10t/h, and the head is 20~50m.
- Control of cleaning pump can be put into control system to achieve automatic operation or manual operation according to client's requirement.