

Advantages

设备优势

1 卓越技术 无菌率高达 99.99%

Advanced Technology Delivers a 99.99% Sterility Assurance

- 根据等效灭菌曲线确定灭菌时间，并加入保险系数
- 更可靠：近千台设备验证，无菌不空谈
- 更彻底：设备完全排空，无残留，灭菌才彻底
- 更高效：升级式螺旋板换热器，热量传输更高效

3 智能控制 设备的最强大脑

Intelligent Control The Brain of Equipment

- 依据蒸汽压力变化智能确定灭菌温度及时间，确保灭菌效果稳定可靠
- 智能处理异常的生产技术指标，保证产品质量
- 空 / 水消、连消、清洗、放空排污等操作自动切换，方便快捷
- 实时显示现场各监测点压力、温度等数据，查询历史灭菌曲线，导出数据报表

不同方式对比表

Data comparison

指标 Indicator	方式 Method	实消 Batch Sterilization	传统连消 Traditional Continuous Sterilization	智能瞬时连消机 Intelligent Instantaneous Sterilizing Equipment
灭菌温度		121°C	127-135°C	138-140°C
灭菌时间		30min	5-10min	50-60s
无菌率		99.99%	N/A	99.99%
无菌稳定性		操作人员水平决定	不同厂家，数据不同	控制单元依据蒸汽压力变化，智能确定灭菌温度和灭菌时间，智能处理异常生产指标，保证灭菌效果稳定
培养基破坏程度		高温时间长 破坏严重	高温时间较长 破坏较严重	高温时间短，基本无破坏
蒸汽用量/100吨物料		20-25t	10t-12t	4t
循环水用量/100吨物料		800t	400t	≈0
操作		劳动强度大 工作时间长	劳动强度较大 工作时间较长	采用自动控制方式，提高工作效率，减少劳动强度
环保		大量高温异味 尾气排出	密闭环境中进行 无高温异味尾气排出	密闭环境中进行，无高温异味尾气排出
泄漏		N/A	板式换热器容易穿孔、漏料 维修难	换热器、维持器采用特殊工艺焊接而成，对板材无损伤，不会造成板材穿孔

2 节能环保 实现提质增效

Energy & Eco-Friendly Enhancing Quality and Efficiency

- 平均 10 个月回收成本
- 实现冷热料热量交换，蒸汽节约 70% 以上
- 换热后物料无需二次降温，循环水节约 90% 以上

4 独具匠心 精准设计每一寸细节

Ingenious Design Precision in Every Detail

- 集成化设计，便于运输安装
- 维持器选择特殊流道尺寸，不结垢
- 喷射器高流速设计，运行更稳定
- 全充氩焊接，机械开孔，无菌更有保障
- 拥有核心专利技术的换热器，采用特殊工艺焊接，杜绝内漏外漏

TIANS Equipment

天俱时装备

天俱时智能装备致力于为生物发酵、合成生物、生物医药、食品健康、生物材料、精细化工等行业客户提供先进的节能环保一站式装备解决方案。

掌握生物发酵、灭菌、节能环保等多项核心技术，拥有数十项节能型连续灭菌系统及废水、废气治理相关专利，建有高标准、自动化的智能装备制造中心，产品远销国内外多个国家及地区，市场占有率稳居前列。

TIANS Equipment is committed to providing advanced energy-saving and environmentally friendly one-stop equipment solutions for customers in industries such as biological fermentation, biosynthetic, biopharmaceutical, food and health, biomaterials, and fine chemicals, etc.

Mastering multiple core technologies such as biological fermentation, sterilization, energy conservation and environmental protection, possessing dozens of energy-saving continuous sterilization systems and related patents for wastewater and waste gas treatment, and establishing a high standard and automated advanced equipment intelligent manufacturing center, our products are exported to multiple countries and regions at home and abroad, with a stable market share among the top.

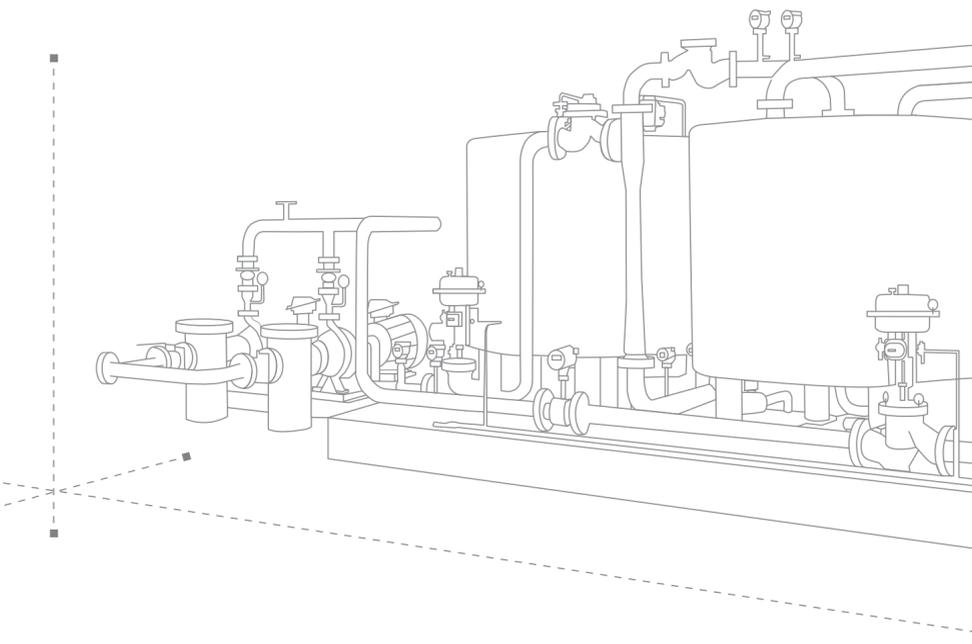
服务行业

TIANS Clients

抗生素 ANTIBIOTIC	氨基酸 AMINO ACID	酶制剂 ENZYME PREPARATION	合成生物 SYNTHETIC BIOLOGY
 科伦集团 齐鲁制药 HISUN 鲁抗 联邦制药 BrightGene 北大医疗 福抗药业	 EPPEN 伊品 阜丰集团 星湖科技 VEGAN YIYANG MYUWAN 牧原 人精晶药业 VITA 鲁肽集团 中德新科	 解益生物 XXTR 康源生物 天润和 Angelcare 绿微康 KDN 新大洋 Bestzyme 瑞源生物	 CATHAY AHB 一号生物 金丹 TOYOU BOTA layn 莱茵生物 博德 东南生物 Levdsynbio

Intelligent Instantaneous Sterilizing Equipment

智能瞬时连消机



无菌 一触即达
ONE-BUTTON STERILIZE

Principle

设备介绍及原理

天俱时智能瞬时连消机是一种采用高温瞬时灭菌，结合高效换热器、新型维持器和喷射器，并通过智能算法运行的灭菌设备。该设备拥有 20 余项核心专利，可实现极致无菌、极致节能、极致效益和极致稳定的“四极”标准，全国销量第一，并荣获“国内领先水平”权威认证，广泛应用于新材料、生物制药、食品饮料等行业的液体物料灭菌及活性物质的灭活。

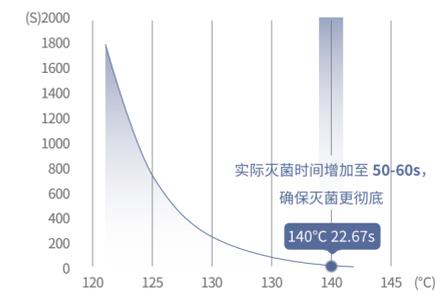
设计原理

根据等效灭菌曲线，常规物料在 121°C，30min 所达到的灭菌效果和138°C，36s 所达到的灭菌效果一致。而消毒过程对物料营养物质的破坏主要由灭菌时间所决定（遇热敏感的物质除外）。

根据高温短时灭菌原理，加入一定保险系数，采用 138-140°C，50-60s，设计出此套新型连消系统。



设备 3D 演示
View 3D Video



TIANS Intelligent Instantaneous Sterilization Equipment works based on high-temperature sterilization technology, integrating high-efficiency heat exchangers, advanced holding tubes, and injectors, all operated through intelligent algorithms. With over 20 core patents, this equipment achieves the "Four Ultimate" standards — Ultimate Sterility, Ultimate Energy Efficiency, Ultimate Economic Benefit, and Ultimate Stability. As the national sales leader and recipient of the authoritative "Domestic Leading Level" certification, it is widely used for liquid material sterilization and inactivation of active substances in industries such as advanced materials, biopharmaceuticals, food and beverages.

Sterilization principle

According to the equivalent sterilization curve, the sterilization effect of conventional materials at 121°C, 30min is the same as that at 138°C, 36s. However, the destruction of nutrients in materials during disinfection is mainly determined by the sterilization time (except for materials that are extremely sensitive to heat).

According to this principle of high temperature and short time sterilization, after adding a certain safety factor, our company has designed this new type of continuous disinfection system by using the sterilization temperature of 138-140°C and the maintenance time of 50-60s.



* 数据来源：弗若斯特沙利文。设计时间：2024年。

Classification & Composition

设备类型及构造

■ 智能瞬时连消机分类方式 Classification method of intelligent instantaneous sterilizing equipment

根据加热方式不同分类 Classification according to different heating methods

- 直接加热
Direct heating
- 间接加热
Indirect heating

根据消毒方式不同分类 Classification according to different disinfection methods

- 蒸汽消毒 (空消)
Steam disinfection (steam disinfection)
- 过热水消毒 (水消)
Superheated water disinfection (water disinfection)

■ 智能瞬时连消机分为 4 个系列 Intelligent instantaneous sterilizing equipment is divided into 4 series

I 型智能瞬时连消机 - 直接加热空消智能瞬时连消机

II 型智能瞬时连消机 - 直接加热水消智能瞬时连消机

III 型智能瞬时连消机 - 间接加热空消智能瞬时连消机

IV 型智能瞬时连消机 - 间接加热水消智能瞬时连消机

Type I intelligent instantaneous sterilizing equipment - direct heating and steam disinfection

Type II intelligent instantaneous sterilizing equipment - direct heating and water disinfection

Type III intelligent instantaneous sterilizing equipment - indirect heating and steam disinfection

Type IV intelligent instantaneous sterilizing equipment - indirect heating and water disinfection



维持器 Maintainer

选择特殊流道尺寸，在线清洗，结构紧凑，无存料死角，阻力小，不结垢、无焦化物、无物料黏结。

Special runner size is selected, on-line cleaning is carried out, the structure is compact, no dead corners of materials exist, the resistance is small, no scaling, no coking matter and no material adhesion are realized.

喷射器 Ejector

充分利用蒸汽汽化潜热，结构紧凑，阻力小，无震动；

特殊流道尺寸、高流速设计及合适的清洗方案避免物料本身颗粒物长期运行造成物料残存。

特殊构造保证加热均匀，避免物料局部温度过高产生焦化而结垢。

Make full use of latent heat of vaporization of steam, with compact structure, small resistance and no vibration.

Special flow channel size, high flow rate design and appropriate cleaning scheme can prevent the material from remaining due to the long-term operation of particles in the material.



换热器 Heat Exchanger

采用整张板材卷制而成，中间无焊缝，全部自动焊接，对板材无损伤，不会造成板材穿孔，不会内漏。

换热器两端封条打坡口，保证焊透，减小应力。焊接时由里及外释放应力；焊接完成后，经过振动处理释放应力，避免外漏。

It is rolled from the whole plate, with no welding seam in the middle, and all automatic welding has no damage to the plate, and will not cause perforation or internal leakage of the plate.

自控系统 Automatic Control

采用西门子 S7-1200PLC 控制系统，配备触摸屏以便于现场控制，智能系统可多点采样设备的温度、压力、流量值、采样周期 100ms。系统对所有温度、压力、流量信号进行判断并采取相应措施，对于高风险报警，强制中断流程，切换为安全模式。系统支持 OPC/SQL 标准数据库，可提供 OPC、DP、MODBUS 接口，可作为 SERVER 端，也可作为 CLIENT 端。必要时提供协议等参数，可以接入发酵车间主 DCS 控制系统进行控制。

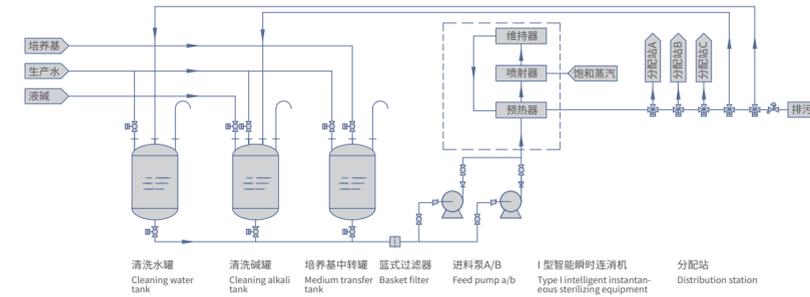
Siemens S7-1200PLC control system is adopted and touch screen is equipped to facilitate on-site control. The intelligent system can multi-point sample the temperature, pressure and flow value of equipment with a sampling period of 100 ms. The system judges all temperature, pressure and flow signals and takes corresponding measures. For high-risk alarm, the system forcibly interrupts the process and switches to the safety mode. The system supports OPC/SQL standard database, can provide OPC, DP, MODBUS interface, can be used as SERVER end, or as CLIENT end. Necessary protocols and parameters are provided when necessary, which can be connected to the main DCS control system of the fermentation workshop for control.



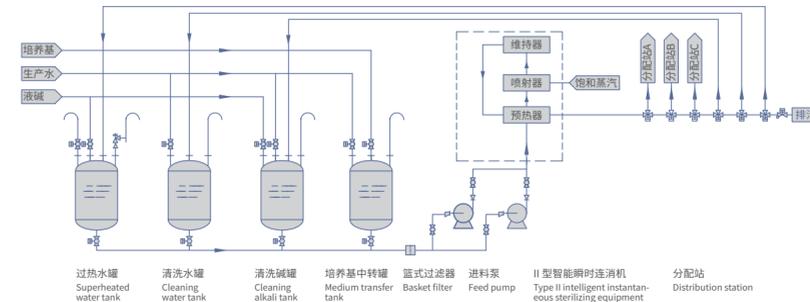
Process

工艺流程

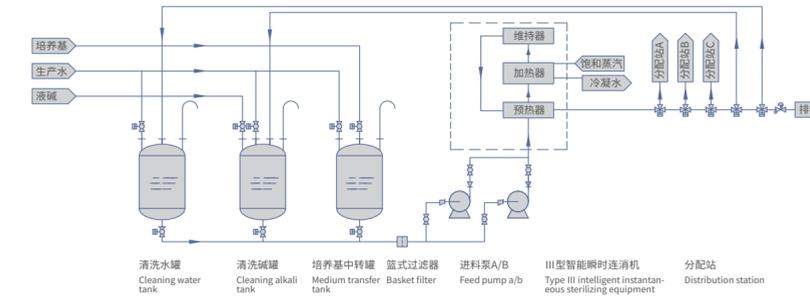
■ I 型智能瞬时连消机 - 直接加热空消智能瞬时连消机 Type I intelligent instantaneous sterilizing equipment



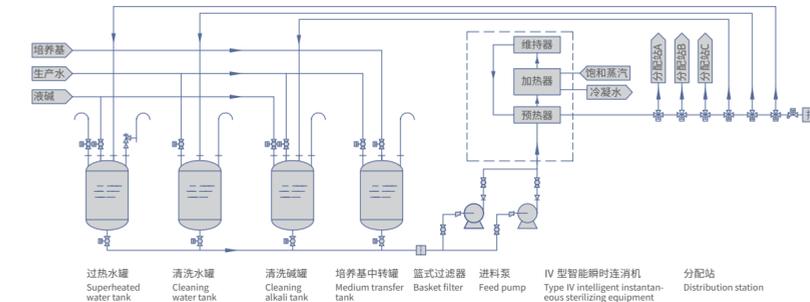
■ II 型智能瞬时连消机 - 直接加热水消智能瞬时连消机 Type II intelligent instantaneous sterilizing equipment



■ III 型智能瞬时连消机 - 间接加热空消智能瞬时连消机 Type III intelligent instantaneous sterilizing equipment



■ IV 型智能瞬时连消机 - 间接加热水消智能瞬时连消机 Type IV intelligent instantaneous sterilizing equipment



序号 No.	流量 (m³/h) Flow (m³/h)	进出口管径 (DN) Inlet and outlet pipe diameter (DN)	机组尺寸(长×宽×高 mm) Unit size (length × wide × height mm)	机组净重 (kg) Unit net weight (kg)	运行重量 (kg) Operating weight (kg)
1	3	32	3500×1700×2100	2500	2800
2	6	40	4000×2000×2100	3500	3900
3	10	50	4800×2100×2200	5000	5600
4	15	65	5100×2200×2200	5800	6800
5	30	80	5300×2500×3000	7800	9500
6	40	100	6200×2800×3000	12000	15000
7	50	100	6500×3000×3000	14000	17600
8	80	125	8500×3000×3000	24000	32500
9	100	150	9000×3000×3000	28000	40000

序号 No.	流量 (m³/h) Flow (m³/h)	进出口管径 (DN) Inlet and outlet pipe diameter (DN)	机组尺寸(长×宽×高 mm) Unit size (length × wide × height mm)	机组净重 (kg) Unit net weight (kg)	运行重量 (kg) Operating weight (kg)
1	3	32	5000×1700×2100	2700	3000
2	6	40	5500×2000×2100	3800	4200
3	10	50	6600×2100×2200	5500	6100
4	15	65	7000×2200×2200	6600	7600
5	30	80	7400×2500×3000	9400	11100
6	40	100	8500×2800×3000	14100	17100
7	50	100	8800×3000×3000	16600	20200
8	80	125	10800×3000×3000	28200	36700
9	100	150	11400×3000×3000	33200	45200

