

## Single Use Mixer system Product Specification



### Product

The Disposable Liquid Dispensing System is composed of a stainless steel container and a magnetic stirring motor. It is used together with a disposable stirring bag to realize liquid-liquid mixing or liquid-solid mixing .

### Application

The disposable dosing system can be used for the mixing of liquids in upstream and downstream processes, such as buffer preparation, medium preparation, intermediate product mixing, virus inactivation, semi-finished product preparation and vaccine adjuvant mixing.

### Dosing System Specifications

The single-use dosing system are: 50L , 100L , 200L , 500L , 1000L, 1500L , 2000L and 2500L . Other specifications can be customized.

### Electronic control components

Air switch, CPU , PLC , contactor and power supply are all placed in waterproof electric control cabinet ( IP54 ). Other electrical components, such as equipment power switch, emergency stop switch, and sensor connection ports are all on the equipment. The location of the electrical control cabinet is directly below the IPC/HMI screen.

### Supply voltage

2 20V , 50Hz / 60Hz , or 120V, 50Hz / 60Hz . Power plugs are available in European standard, British standard, American standard and Australian standard (Figure 1. Types of power plugs).



Figure 1. Power Plug Types

### Standard & Coding

- Machinery Directive(MD)2006/42/EC
- Low Voltage Directive (LVD) 2014/35/EU
- EN ISO12100 : 2 010
- EN 60204 - 1:2006 + A1 : 2 009 + AC : 2 010
- CE
- EN ISO 9001

### Compliance

The single-use dispensing systems are CE compliant in European Community countries.

### Tank

The main parts of the liquid distribution system tank, base, and electrical cabinet shell are made of 304 stainless steel. The surface of the equipment is processed by wire drawing, the roughness  $Ra \leq 0.8 \mu m$ , and the corners are smooth and transition to ensure that the equipment is easy to clean.

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## Motor

Adopt Panasonic servo motor ( Figure2. Panasonic servo motor). The motor is fixed at the bottom of the tank. Achievable speed: 0~250 rpm, accuracy: ±5 rpm.



Figure 2. Panasonic Servo Motor

## Control System

Siemens IPC+CPU+PLC is used to control the liquid dispensing system, including:

- CPU processor
- Input and output of digital signals
- Input of analog signal
- Communication port, used to connect the host computer, SACAD system or MES system.

The control system can control all system functions, can fully automatic data collection and storage, with password login management, alarm function, three-level authority and audit trail and other functions, can carry out data storage and PDF export, monitoring system operation, sound and light alarm operation failure.

## Control panel

The control system is operated via an easy-to-use control panel. The user can enter the main page of the control system (Figure 3. The main page of the control system (Siemens IPC)), select each sub-page label on the left, and perform parameter settings, trend graph viewing, data report viewing, alarm parameter

settings, user management settings, and operation. Maintains operations and system settings that block unauthorized access to programs with pre-set access levels.

Control panel size: 12 inches.

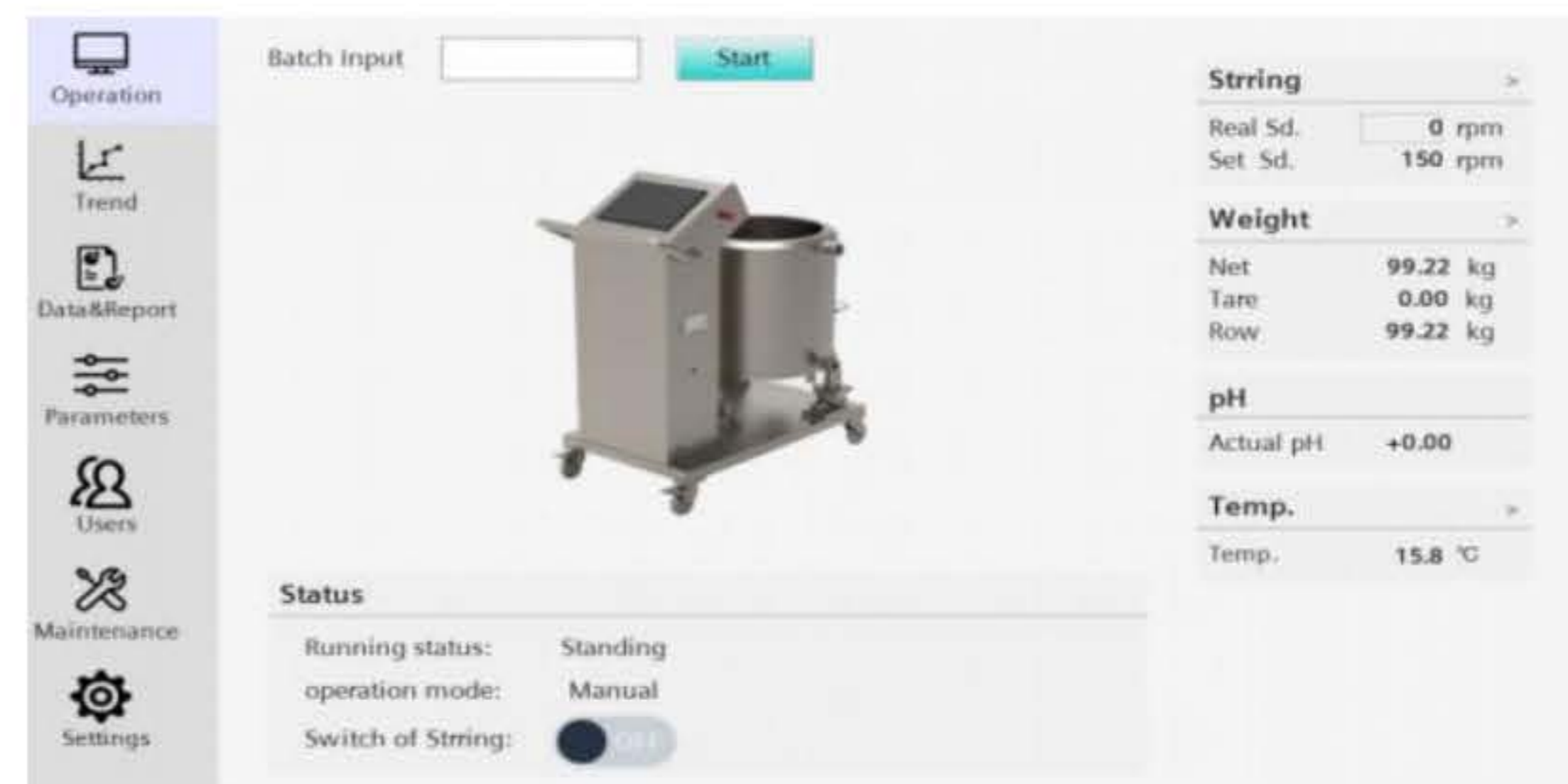


Figure 3. Control system main page (Siemens IPC)

## Call the police

The control system has automatic program detection and process parameter monitoring and alarm functions. When the alarm condition is triggered , the program enters the alarm stage, which will buzzer and suspend the operation of the equipment . The alarm range includes :

- Abnormal monitoring parameters, beyond the safe threshold range (speed, weight, temperature, pH, conductance, DO)
- Power failure
- Sensor connection is abnormal

## Validation Documents

Provide a full set of DQ/FAT/SAT/IQ/OQ verification services (including verification documents).

## Document

The supporting equipment provides the following documents, if you need other documents, please inquire. All documents are available in electronic version (packaged in a USB stick) and paper version.

- Manual

- Verification file package: DQ/FAT/SAT/IQ /OQ verification file
- Quality document
- Electrical drawings
- Equipment mechanical layout

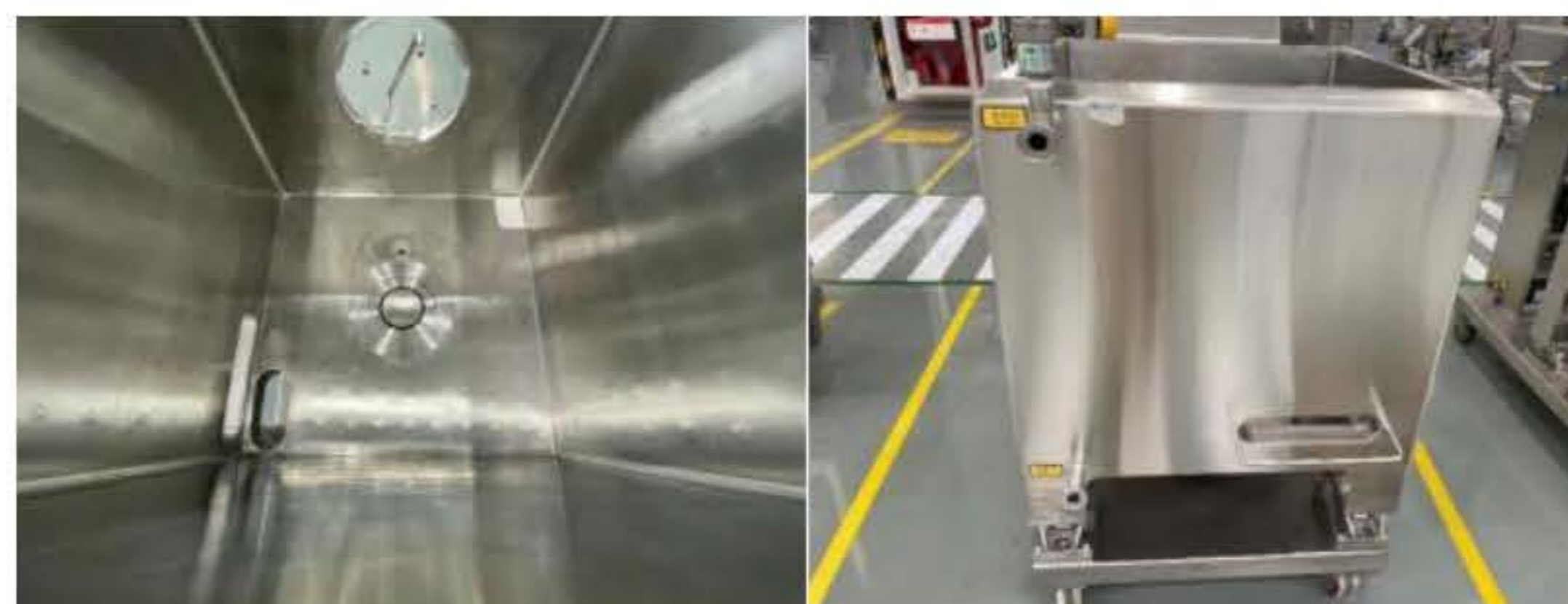


Figure 5. Jacketed

### Dosing bag

The liquid inlet pipeline, feeding port, liquid outlet pipeline, sampling pipeline, sensor placement pipeline, bellows, etc. of the liquid dispensing bag can be flexibly configured to meet various needs. The disposable paddle is welded to the bottom of the dosing bag (Figure 4. Disposable paddle), and the motor and the disposable paddle are connected by strong magnetic coupling, which can achieve high torque and fast mixing.



Figure 4. Disposable paddles

### Transport package

Wooden case

### Feature selection list

#### Tank

The equipment can be equipped with a five-sided horse honeycomb jacket with a 3cm-thick polyurethane insulation layer. It is equipped with a D20 quick interface with its own lock as the water inlet and outlet, and the temperature of the equipment is controlled by TCU. ( Fig. 5. Jacketed tank ).

- Single layer tank (standard)
- Jacketed tank (optional)

#### TCU

The TCU temperature control unit provides high and low temperature circulating liquid for the liquid dispensing system that needs to be cooled or heated, and provides heat source or cold source through external circulation to achieve the temperature required by the process. For jacketed tanks, TCU can be provided for equipment temperature control. Temperature control range: 0 ~ 60 °C, accuracy: ±0.5°C.

- None (standard)
- Lauda TCU (optional)

#### Weighing function

The equipment can be equipped with a Mettler weighing module ( Figure 6. Mettler weighing module ), which can display weighing data in real time, calibrate the weighing module online, and the control system can record and store data automatically. Weighing range: 0~ 1 1 0 % \* FS, weighing accuracy: ± 0.3 % .



Figure 6. Mettler weigh module

- None (standard)
- Mettler weighing module (optional)

**Online pH Monitoring**

The equipment can be equipped with a pH sensor, with automatic temperature compensation function, the pH value can be displayed in real time on the display screen, the sensor can be calibrated online, and the control system can automatically record and store data. pH measurement range: 0~14, accuracy: ±0.05.

- None (standard)
- Mettler pH sensor (optional)
- Hamilton pH sensor (optional)

**Online Conductivity Monitoring**

The equipment is optionally equipped with a conductivity sensor, including automatic temperature compensation, the conductivity value can be displayed on the display screen in real time, the sensor can be calibrated online, and the control system can automatically record and store data. Conductivity measurement range: 0-300mS/cm, accuracy: ±5%.

- None (standard)
- Mettler conductivity sensor (optional)
- Hamilton conductivity sensor (optional)

**Online DO monitoring**

The equipment is optionally equipped with a conductivity sensor, including automatic temperature compensation, the conductivity value can be displayed on the display screen in

real time, the sensor can be calibrated online, and the control system can automatically record and store data. Measuring range: 0~100%\*Sat (Mettler)/0~300%\*Sat (Hamilton), accuracy: ± 1%+6 ppm (Mettler) or ± 1% (Hamilton).

- None (standard)
- Hamilton (optional)
- Mettler (optional)

**Online temperature monitoring**

Optional temperature sensor, the temperature value can be displayed in real time on the display screen , and the control system can automatically record and store data. Temperature measurement range: 0~60°C, accuracy: ±0.5°C.

- None (standard)
- End face temperature probe (optional)
- Needle temperature probe (optional)

**Print online**

The device can be equipped with an online miniature non-thermal printer (Figure 8. Miniature printer and print content), which can print monitoring data such as weight, temperature, and pH in real time.



Figure 8. Micro printer and print content

## Control System

In addition to Siemens IPC+CPU+PLC, the control system can also provide the choice of MCGS HMI+Siemens CPU+Siemens PLC. The control system also has three-level authority, password login management, audit trail and other functions.

- Siemens IPC+CPU+PLC (standard)
- MCGS HMI+Siemens CPU+Siemens PLC (optional)

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## Equipment Size

For specific dimensions and design details, please refer to the corresponding mechanical layout drawing. The appearance of the equipment is as follows:

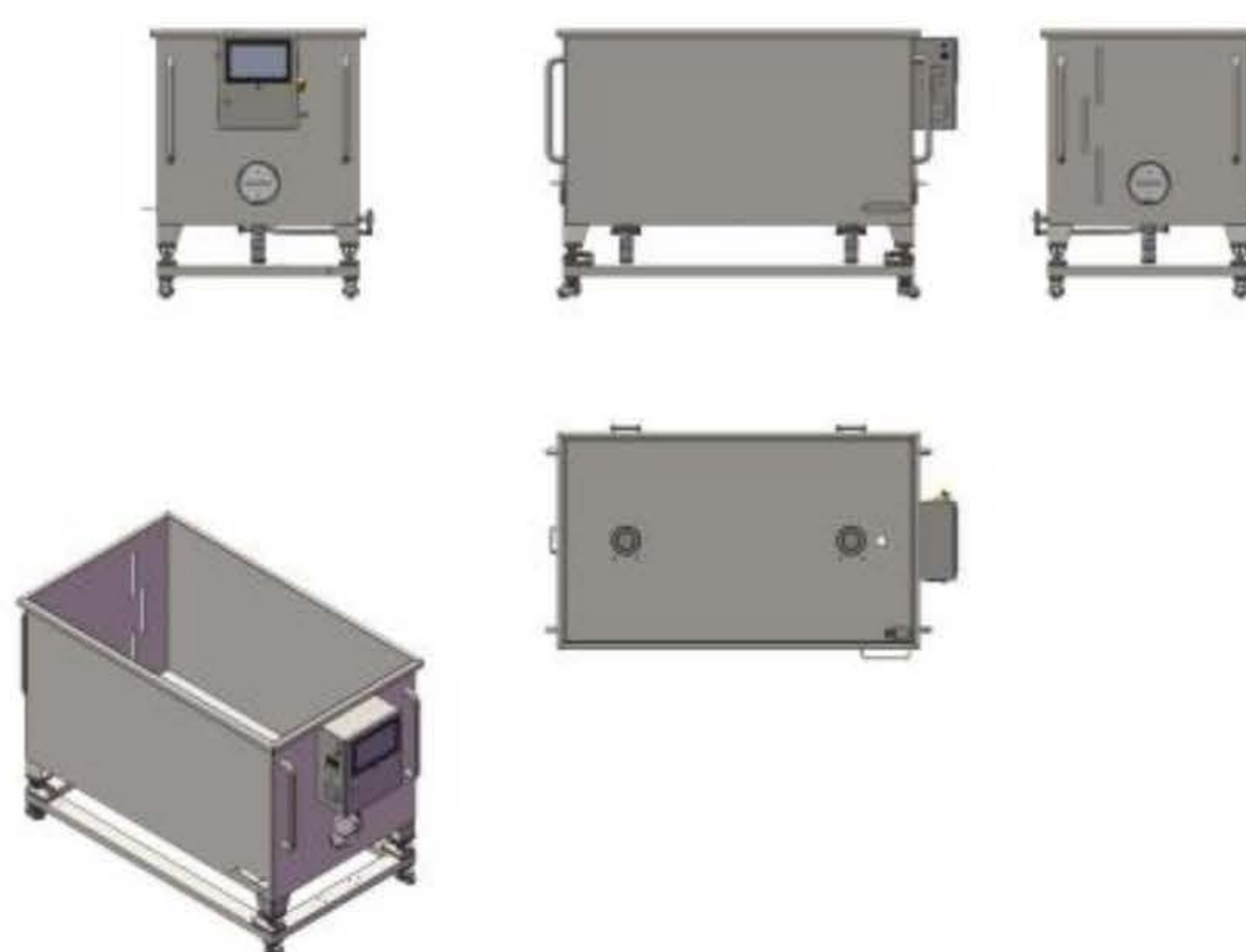
Below 500L



500L~1500L



2000L and 2500L



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## Equipment basic parameter table

### Without Jacket

Volume (L)	50	100	200	500	1000	1500	2000	2500
Device Dimensions (D*W*H, mm)	1152* 572* 1238	1157* 608* 1238	1364* 743* 1238	1213* 929* 1380	1432* 1144* 1565	1727* 1234* 1605	2490* 1359* 1483	2490* 1359* 1633
Equipment no-load mass (kg)	140	160	220	288	390	430	955	1020
Tank internal dimensions (L*W*H, mm)	400* 400* 370	500* 500* 450	635* 635* 635	835* 835* 835	1040* 1040* 1020	1340* 1150* 1100	2100* 1200* 940	2100* 1200* 1100
Tank volume (L)	59	112	256	582	1103	1695	2368	2770
material	304 stainless steel, Ra≤0.8um							
Plate thickness (mm)	Wall Thickness: 4 Bottom plate thickness: 4			Wall Thickness: 6 Bottom plate thickness: 6			Wall Thickness: 10 Bottom plate thickness: 10	

### With Jacket

Volume (L)	50	100	200	500	1000	1500	2000	2500
Device Dimensions (D*W*H, mm)	1170* 570* 1238	1220* 610* 1238	1468* 740* 1238	1305* 979* 1413	1508* 1184* 1553	1820* 1294* 1605	2580* 1490* 1488	2580* 1409* 1635
Equipment no-load mass (kg)	175	220	275	415	560	725	1213	1310
Tank internal dimensions (D*W*H, mm)	400* 400* 370	500* 500* 450	635* 635* 635	835* 835* 835	1040* 1040* 1020	1340* 1150* 1100	2100* 1200* 940	2100* 1200* 1100
Tank volume (L)	59	112	256	582	1103	1695	2368	2770
material	304 stainless steel, Ra≤0.8um							
Plate thickness (mm)	Wall Thickness: 4 Bottom plate thickness: 4 Jacket outer plate thickness: 3			Wall Thickness: 6 Bottom plate thickness: 6 Jacket outer plate thickness: 4			Wall Thickness: 10 Bottom plate thickness: 10 Jacket outer plate thickness: 6	

### Utilities Data Sheet

describe	supply	Motor Power
power connection	<input type="checkbox"/> 220V, 2 phase 50Hz <input type="checkbox"/> 220V, 2 phase 60Hz <input type="checkbox"/> 120V , 2 phase 50Hz <input type="checkbox"/> 120V , 2 phase 60Hz	<ul style="list-style-type: none"> <li>● 750w (below 2000L)</li> <li>● 1500W (2000L and above)</li> </ul>

### TCU parameter recommendation

Jacketed Tank Volume (L)	50	100	200	500	1000	2000	2500
Heating power kW	2.2	1.5	4.5	4.5	7.5	16	16
Simulated heating rate °C/h	24.0	9.0	15.0	6.0	6.0	6.8	5.4
Cooling power kW	2.0	3.0	5.0	7.0	10.0	13	19.0
Simulated cooling rate °C/h	18.0	18.0	16.8	9.0	8.4	6.0	7.2
Pump speed (L/min)	28	37	37	37	37	60	60
Tank volume (L)	8-15	20-33	20-33	48-64	48-64	9.7-22.5	9.7-22.5
Remarks :  The above values are for reference, the specific heating and cooling rate depends on the specific performance of the TCU.							