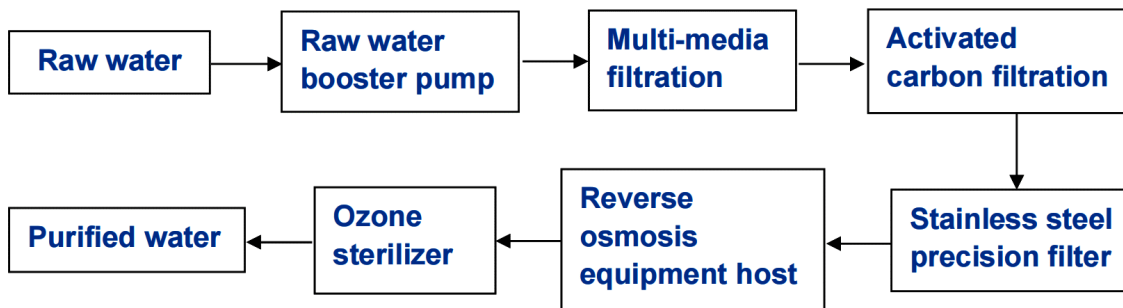


# 18000-20000BPH Drinking Water Production Solution

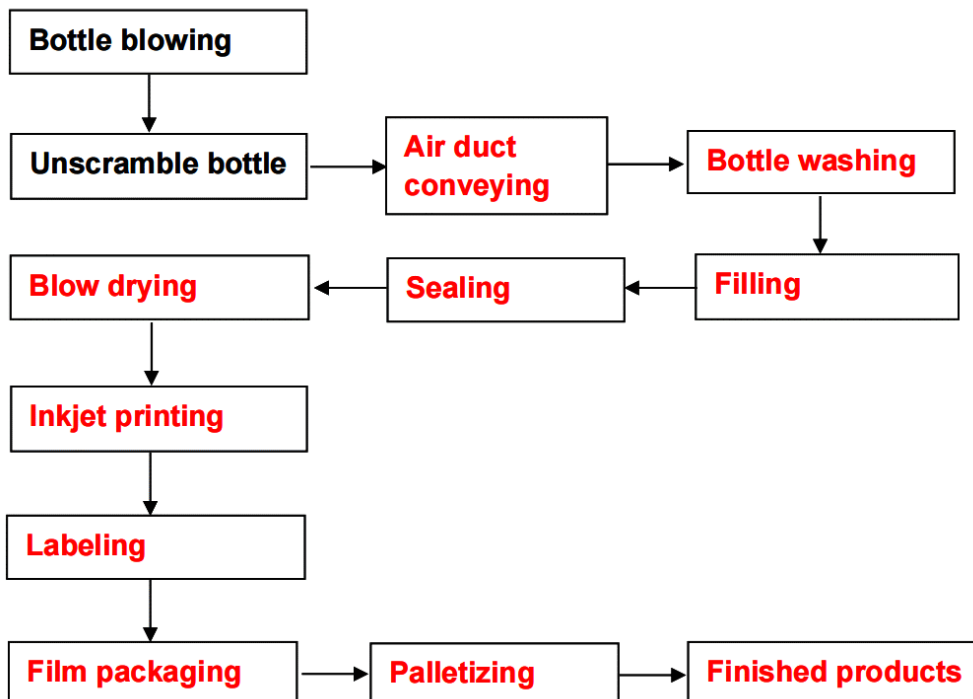
## Detail Introduction :

The 18000-20000BPH Drinking Water Production Solution is composed of water treatment, bottle blowing, filling and packaging process, the full-line process flow is as following:

### Water Treatment Process



### Bottle Blowing, Filling and Packaging Process



Remarks: For the above flow chart, in blue is the water treatment system, in red is the packaging system, in black is the blowing system.

## Part 1. Water treatment system

This system is divided into three parts: pretreatment, reverse osmosis, and sterilization system.

## Pretreatment system

The pretreatment equipment includes raw water pumps, mechanical filters, activated carbon filters, filters and other equipment. Mainly solve the following problems:

- (1) Prevent scaling on the film surface (including  $\text{CaCO}_3$ ,  $\text{CaSO}_4$ ,  $\text{SiO}_2$ ,  $\text{CaF}_2$ , iron, aluminum oxides deposited on the film surface);
- (2) Prevent the contamination of colloidal substances and suspended solid particles;
- (3) Prevent the pollution and blockage of organic matter;
- (4) Prevent microbial contamination;
- (5) Prevent oxidative damage to the membrane by oxidizing substances;
- (6) Ensure the inlet water temperature and keep the water output of the ultrafiltration device stable. ensure the stable operation and service life of the ultrafiltration device.

### 1-1. The raw water tank

The raw water tank is used to store water from the external network for the pretreatment system.



Basic parameters:

Type: Rectangular

Quantity: 1 set

Dimensions: 8000X3000X2000

Weight: 2000KG

Equipment operating conditions:

- (1) Equipment capacity: 48m<sup>3</sup>

(2) Working pressure: atmospheric pressure

(3) Working flow rate:  $\leq 90$  cubic meters/h

(4) Control method: automatic

Equipment body:

(1) Material: stainless steel plate thickness 2MM

(2) Internal parts of the equipment:

(a) Water inlet device type: stainless steel tank,

(b) Water outlet type: stainless steel

(3) The equipment body is equipped with: liquid level display, manhole

### 1-2. Raw water pump

As a pre-treatment water supply power system, we use a high-quality vertical water purification pump produced by South China Pumps.

Model number: TD65-34/2

Power: 5.5KW

Flow range: 40T/H

Head range: 10~40m

Medium acidity and alkalinity: pH4~9

Quantity: 1 unit

### 1-3. Quartz sand filter

As the first stage of preliminary treatment in water treatment, it is suitable to use quartz sand as the filter medium, which is mainly used to filter suspended impurities in the water and clean the water initially.



Model number: JDL-40

Flow rate: 35-40T/h

Dimensions:  $\varnothing 2000 \times 3200$ mm (304 stainless steel plate for barrel body)

Structural composition: water distributor, valve block, pressure gauge and various levels of filter mat  
(high-quality quartz sand 3000kg)

Quantity: 1

Tank material: sus304

Tank thickness: 4MM



#### 1-4. Activated carbon filter

Activated carbon filter mainly exerts the adsorption effect of activated carbon to absorb the peculiar the water, so that the water has a good taste.



Model number: SSJ-4000

Flow rate: 35 40T/h

Dimensions:  $\phi 2000 \times 3200$ mm (304 stainless steel plate for barrel body)

Internal composition: water distributor, pressure gauge and various levels of filter material (high-quality nutshell activated carbon 1500kg,)

Quantity: 1

Tank material: sus304

#### 1-5. Sodium ion filter

As the last process in the preliminary treatment, the sodium ion filter neutralizes the minerals in the based on the principle of anion and cation exchange, thereby reducing the hardness of the water and reaching the standard for drinking healthy water.

Model number: NLJ-4000

Flow rate: 35 40T/h

Dimensions:  $\phi 2000 \times 3200$ mm (304 stainless steel plate, thickness 3.0mm)

Internal composition: water distributor, pressure gauge and various levels of filter material (high-quality

resin ion 800kg,)

Quantity: 1

Purpose: reduce water hardness

Tank material: sus304

#### 1-6. Precision filter

Precision filter, mainly based on the principle of microporous filtration, is used to protect reverse osmosis membrane from impurities, also known as security filter.

Model number: JML5000

Flow rate: 35-40T/h

Dimensions:  $\phi 750 \times 1600$ mm (304 stainless steel plate)

Internal composition: microporous membrane, pressure gauge, distribution pad

Function: It is to prevent leakage in the upper filtering process and to infiltrate some particles into the process.

Quantity: 2pcs

#### 1-7. Reverse osmosis host

Reverse osmosis system

This system is equipped with a set of 20m<sup>3</sup>/h reverse osmosis desalination device.

The reverse osmosis device is the most important part of the system. Whether the design is mature and reasonable not only directly determines whether the RO system can meet the design requirements, but also relates to the service life of the RO membrane.

The water treated by the RO device can remove most of the inorganic salts and almost all of the organic matter and microorganisms.

RO device has no phase change in the water quality separation process, high desalination rate, small equipment volume, automatic control operation, strong adaptability, wide application range, no pollution, and other advantages.



The RO device of our company is mainly assembled with imported brand-name components.

(1) RO membrane: Japan Hyde Energy Corporation

(2) High-pressure pump: South China Pump

(3) Automatic flushing device: supporting assembly

#### 1-7-1. High pressure pump

The high-pressure pump is selected from Hangzhou Nanfang Pump Industry Co., Ltd.; the pump is made of high-quality stainless steel, which has the characteristics of small size, high efficiency, and low noise. The high-pressure pump is equipped with a soft-start device and a low-pressure protection device to protect the high-pressure pump from generating strong water flow impact when it starts and stops, and damage the high-pressure pump and the reverse osmosis membrane element.

#### 1-7-2. Reverse osmosis device

The reverse osmosis device is used to remove most of the ions, organic matter, microorganisms and impurities in the incoming water, so that the water quality can be highly purified.

#### (1) System equipment selection

Membrane components are selected from CPA3 (low-pressure polyamide) membrane elements provided by Japan Hyde Energy, which represents the highest level in the world today. The surface layer is made of negatively charged aromatic polyamide composite membrane material, which has good mechanical strength and chemical erosion resistance. The resistance, the module has a larger membrane area, and a relatively large water flux.

The pressure film tube adopts glass fiber reinforced plastic shell, and the inner wall is smooth, not prone to scaling.

bacteria, and anti-corrosion.

## (2) Process design of reverse osmosis device

This system is equipped with a set of reverse osmosis device with a water output of 20m<sup>3</sup>/h. The reverse osmosis device is equipped with 10 3-core pressure membrane tubes and 20 membrane elements with a desalination rate. Under the conditions of water intake of 30-40m<sup>3</sup>/h, operating pressure of 1.5Mpa, recovery rate of 65-75%, the water output of the reverse osmosis device is 20m<sup>3</sup>/h, and the salt rejection is over 97%.

## (3) Auxiliary configuration

The reverse osmosis concentrated water side is equipped with a solenoid valve to perform low-pressure flushing every few hours and during shutdown to flush away the contaminants on the surface of the reverse osmosis membrane and replace the concentrated water in the pressure membrane tube.

The reverse osmosis device is equipped with an on-site instrument panel that directly displays the pressure, concentration, fresh water volume, conductivity and other important parameters of the device's operating conditions.

High and low pressure protection switches are set at the inlet and outlet of the high pressure pump to ensure the safe and reliable operation of the reverse osmosis device.

## 1-7-3. Reverse osmosis cleaning device

No matter how perfect the pretreatment process is, in the long-term operation process, various pollutants in the water will always accumulate on the surface of the reverse osmosis membrane. As a result, the performance of the device (water production and desalination rate) is reduced, and the pressure difference between the inlet and outlet of the module is increased. For this reason, in addition to low-pressure flushing before starting and stopping the device daily, regular chemical cleaning is also required.

The cleaning device configured in this system can chemically clean the reverse osmosis device when the membrane surface of the element is polluted by the feed water. At the same time, in order to prevent the accumulation of membrane surface pollution, the device adopts PLC program control to automatically clean the membrane surface for 2 minutes every few hours, which can effectively prevent membrane surface pollution and extend its chemical cleaning cycle and membrane service life.

## 1-7-4. Antiscalant dosing system

Since the source water contains calcium and magnesium ions, and the desalination rate of reverse osmosis is as high as 97%, the concentrated water side is highly concentrated, which will produce calcium carbonate, magnesium carbonate, magnesium sulfate and other precipitates. The sediment adheres to the surface of the reverse osmosis membrane, which will block the channel of the membrane element, causing the pressure difference to rise, the water flux to drop, and the decline in the salt rejection rate, which affects the normal operation and service life of the reverse osmosis.



Therefore, a scale inhibitor device is installed in front of the reverse osmosis device for protection to scaling on the reverse osmosis concentrated water side.

#### Equipment performance

- (1) Water production: 20m<sup>3</sup>/h (25 )
- (2) Water utilization rate: 75%
- (3) Desalination rate: ≥97%
- (4) Arrangement: 3-20

#### Membrane element

- (1) Type and model: roll-type reverse osmosis membrane element CPA3
- (2) Desalination rate: 99.5%
- (3) Material: TFC
- (4) Total number of membrane elements: 20/set
- (5) Manufacturer: Hydra Energy

#### Pressure vessel

- (1) Quantity: 5 pieces
- (2) Specification: 10"×4500mm
- (3) Shell material: FRP
- (4) Working pressure: 300PSI

#### Valve configuration

- (1) Water production valve Dn12 Pn1.0 (manual diaphragm valve)
- (2) Concentrated water valve Dn100 Pn1.0 (manual ball valve)
- (3) Cleaning valve Dn100 Pn1.0 (manual ball valve)
- (4) Concentrated water discharge valve Dn100 Pn1.6 (solenoid valve)
- (5) Product water discharge valve Dn100 Pn0.6 (solenoid valve)
- (6) High pressure pump outlet valve Dn120 Pn1.6 (stainless steel check valve)

#### Instrument configuration

- (1) Inlet water pressure indication Y80-2.5
- (2) Concentrated water pressure indication Y80-2.5
- (3) Product water flow indicator LZB-180.M
- (4) Concentrated water flow indicator LZB-180.M
- (5) On-line indication of raw water conductivity CM-230
- (6) On-line indication of water conductivity CM-230

#### Device operating conditions:

- (1) Water intake: 60m<sup>3</sup>/h
- (2) Water utilization rate: 75%

(3) Water supply conditions:

(A) Water temperature: 25

(B) Water pressure: 1.2-1.5Mpa

(C) Water supply SDI:  $\leq 4$

(D) Residual chlorine:  $< 0.1 \text{ mg/L}$

## 1-8. Sterilization system

### 1-8-1. Ozone equipment



This equipment consists of an ozone generator, a cooler, an air storage tank, and an oil-free air compressor. According to the need of 3-4 grams of ozone concentration per ton of water, and the utilization rate is 10%, we design the ozone output to 150G per hour, using air source.

### 1-8-2. Ozone mixing pump

Using a jet to work with a mixing pump can make ozone and water better mix and contact, and achieve the effect of sterilization. Compared with the previous mixing tower, this configuration has lower energy consumption, low station space, and good sterilization effect.

## 1-9. Control link system

System operation control mode: PLC control of the whole machine, one-key automation.

## 1-10. Pure water tank (raw water tank)



Type: horizontal cylinder

With liquid level controller

Quantity: 2 sets

Capacity: 15m<sup>3</sup>

Material: 3MMSU304

## Part 2. Fully Automatic Blow Molding Machine HY6-A

### Overall overview

HY6-A Fully automatic blow molding machine is suitable for producing PET plastic containers and bottle shapes. It is widely used for producing the carbonated bottle, mineral water bottle, pesticide bottle, cosmetics bottle, wide-mouth bottle and hot filling bottle etc.

### Configuration





## Machine Features

1. Reasonable design, full automatic control, save power and labor.
2. Feeding system carries the preforms by robot arms automatically.
3. Infrared oven heater adopts the quartz lamp to heat the PET tube.
4. Fully automatic process with low investment, high efficiency, quick and safe for operation, easy for maintenance.
5. We have perfect service after sales.
6. Adopting high quality components.

## Technical Parameter

Model	HY6-A	
Productivity	Depend on bottle design	5500-6500PCS/H
Product type	Body diameter	90mm
	Height	310mm
	Neck diameter	30mm
Mold	Cavity	6cavities
Main machine power	Electrical source power	380v 3Phase 50HZ
	Rated Power	56kw
	Really use power	18kw
Air source	LP air compressor	2.0m3/min 1.0MPa
	HP air compressor	5.0m3/min 3.0MPa
	Air dryer	5.0m3/min 3.0MPa
Cooling water	Cooling water	15L/min
Size	L*W*H	6800×2060×2200mm
	Weight	5800kg



Auxiliary equipment preform unscrambler	L*W*H	2300×1500×2480mm
	Weight	350kg
Resin available	/	PET

2-1. HP- screw boost air compressor 2-HY-8.0/30



Air compressor	Unit	8.0M <sup>3</sup> /30KG
Volume	M <sup>3</sup>	5.0
Pressure	Kg	30
Speed	r/min	750
Power	KW	55+30
Overall Dimension	mm	3000*1100*1800
Weight	kg	1500

2-2. LP- screw air compressor W-6.0



Air compressor	Unit	6.0M <sup>3</sup> /12KG
Volume	M <sup>3</sup>	6.0
Pressure	Kg	12
Speed	r/min	3000
Power	KW	45
Overall Dimension	mm	1200*1000*1400
Weight	kg	700
Noise	Decibels	65

2-3. Air cooling dryer HY(G)1-15.0/30G



Refrigeration Air Dryer	Unit	15.0M <sup>3</sup> /3.0Mpa
Flow capacity	Nm <sup>3</sup> /min	15.0
W.P	Mpa	3.0
Inlet Temp.		≤80

Dew point		23
Ambient Temp.		≤38
Power supply	V/HZ	220/50
Compressor power	Kw	5.5
Cold Medium	/	R22
Overall Dimension	mm	1400*1000*1180
Weight	Kg	320

2-4. Air Storage Tank 0.6/30



Air storage tank	Unit	0.6M <sup>3</sup> /3.0Mpa	1.0M <sup>3</sup> /1.0Mpa
Volume	M <sup>3</sup>	0.6	1.0
Pressure designed	Mpa	3.3	1.3
Temp. designed		150	150
Work pressure	Mpa	3.0	1.0
Test pressure	Mpa	4.13	1.13
Weight	Kg	505	300
Overall Dimension	mm	Ø660*2116	Ø960*2000

2-5. Water chiller 10HY



Model		10HY
4.4/38	Cooling capacity(Kcal/h)	7580
Compressor		All-closed vorticity
Compressor power (KW)		7.5
Refrigerant		R22
Chilled water pump power(KW)		3
10	Max. flow rate of chilled water(L/min)	55
Flow water inlet and outlet pipe		1 1/2"
Condensing water rate L/min		≥36
Chilled water inlet and outlet pipe		1 1/2"
Exterior dimension	Length(mm)	1550
	Width(mm)	1560
	Height(mm)	870
Water tank capacity	L	58
Weight	Kg	280

Part 3. Air duct conveying path



The air duct conveying path is supported on the ground by a tripod, and the fan is installed on the up of the air duct conveying path. The air inlet of each fan is equipped with an air filter to prevent dust from being blown into the bottle. The bottle is stuck in the bottleneck by the bottle hanging plate in the air conveying path, and is directly sent to the bottle sterilizer by the wind.

#### Main features

1. All parts are made of stainless steel AISI304 except for plastic and nylon parts such as feet and bottle hanging boards.
2. The air inlet of the fan is equipped with an air filter to prevent dust from being blown into the bottle.
3. There is a section of the air duct conveying path at the bottle inlet end with an adjustable joint interface. When changing the bottle shape, it is not necessary to adjust the height of the bottle unscrambler and the entire air duct conveying path. It can be achieved by adjusting the height of the bottle inlet end.
4. There is a jam removal mechanism at the bottle inlet end, which is driven by an air cylinder. When a bottle jam occurs at the bottle inlet end of the air duct conveying path, the mechanism automatically moves the blocked bottle to prevent damage due to squeezing of the bottle.
5. The bottle-stopping cylinder is installed at the bottle-out end, which can be controlled manually or automatically by the photoelectric switch on the air duct conveying path. This mechanism can prevent multiple bottles in the air duct conveying path from entering the three-in-one bottle filling machine.

#### Main technical parameters

Fan model: F-9

Number of fans: 10

Fan power: 1.1KW/set

Length of air duct conveying path: (according to layout drawing)

### Part 4. Three-in-one bottle washing and capping filling machine

PET bottle washing/filling/capping three-in-one machine HYC40-40-12 is an advanced model developed by our company based on the international advanced filling technology and technology.

The bottle conveying of this machine adopts the whole process of bottle-top bottle clamp transmission.

#### Main features

1. There is no need to adjust any parts to change the bottle shape, and the bottle shape can be switched only by replacing the bottle output dial. It greatly facilitates the user's use and saves the user's bottle shape switching costs and time.
2. The secondary pollution of the bottle mouth can be avoided.
3. Structural features: The bottle feeding method in which the air conveying channel and the bottle feeding screw work together. Equipped with bottle clamp protection device.

#### Rotary bottle washing system



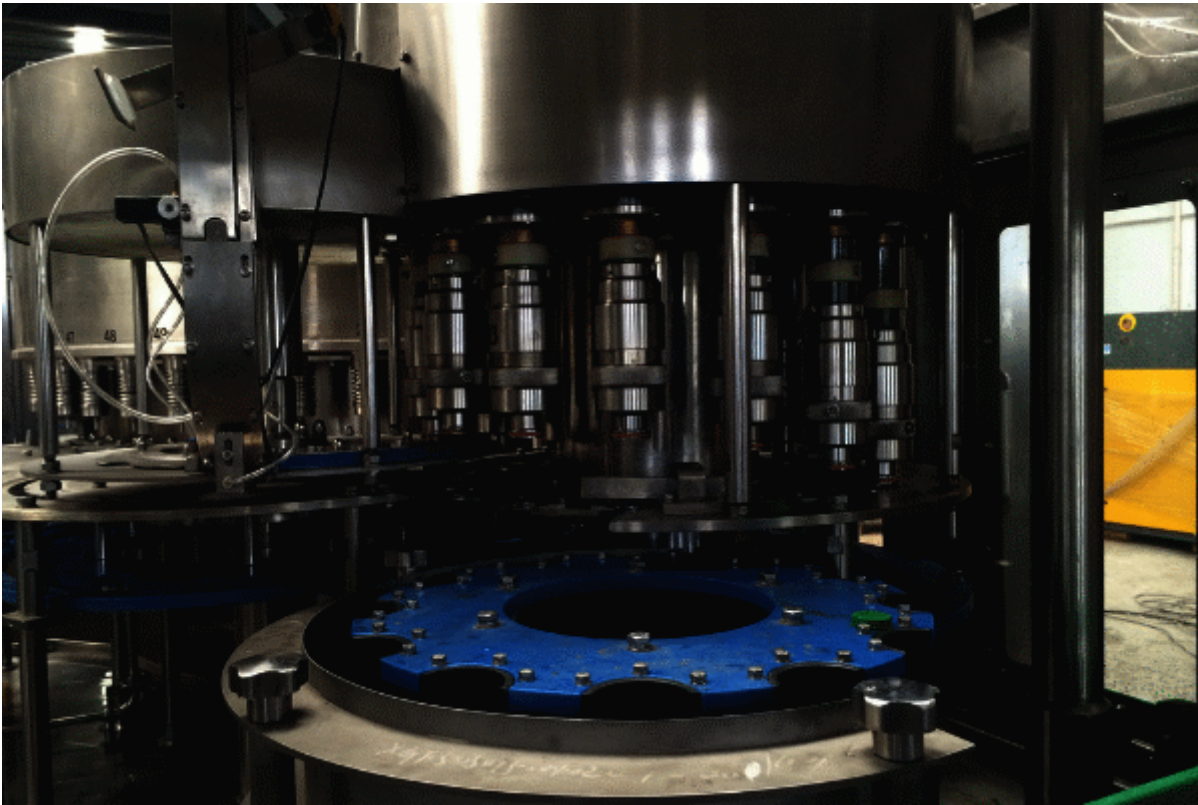
1. The number of rinsing clips is 40, and the water filtration system is rinsed.
  2. The rotating disc is all welded with 304 stainless steel
  3. Large flat toothed bearings, stable and reliable operation
  4. The original flip-type bottle clamp is used to block the bottleneck, avoiding the possible contamination of the threaded part of the bottle mouth by the rubber clamp block on the traditional bottle clamp. The clamp is made of 304 stainless steel, which is hygienic and durable.
  5. The nozzle is a high-efficiency spray nozzle, which can be flushed to any part of the inner wall of the bottle to achieve the best flushing effect and save water for rinsing.
  6. Both the bottle clamp and the sliding sleeve of the lifting mechanism adopt imported corrosion-resistant and maintenance-free bearings.
  7. The power of the bottle washer is transmitted by gears through the transmission system in the frame.
- Rotary filling system





1. The number of filling valves is 40, and the parts in contact with the product are all 304 stainless steel.
2. The gravity filling method has high filling accuracy and stable filling, can accurately control the filling amount, and can avoid material splashing to the maximum extent, which is beneficial to keep the bottle mouth and bottleneck clean.
3. Imported corrosion-resistant and maintenance-free bearings are used in the bottle lifting mechanism, and there is no need to add oil to lubricate, which can avoid polluting the bottle, the material in the bottle, and the filling environment.
4. The rotating discs are all made of stainless steel AISI304. The power of the filling machine is transmitted through gears through a transmission system in the frame. The supporting bearing is a large flat toothed ball bearing, which runs smoothly and reliably. The bearing part is equipped with multiple reliable waterproof structures, such as sealing ring and waterproof ring, which can effectively prevent the water on the table from leaking into the bearing.

Rotary capping system



The capping machine is the single machine with the highest precision among the three-in-one machine, which has a great influence on the reliability of equipment operation and the defective rate of product.

#### Main features

1. A total of 12 capping heads;
2. Adopting international advanced processing and manufacturing technology to make the capping machine run more smoothly, the capping torque is more accurate, the capping effect is more reliable, and the defective rate can be better reduced.
3. The capping machine is equipped with a bottle inlet detection switch, which is interlocked with the cylinder at the connection of the cap drop guide and the cap dial to control the discharge of the cap, so that the cap is stopped when there is no bottle, and the loss of the user's cap is reduced.
4. A set of photoelectric switches are installed on the cap-dropping guide rail. When there is no cap on the cap-dropping guide, it will automatically stop the machine and give an alarm, which can effectively avoid the appearance of uncapped bottles.
5. The anti-rotation knife is made of high-quality materials, with good use effect and long service life.

#### Cap sorting system

1. High-quality motor gearbox, with an electronic capless detection system, which automatically controls the operating speed of the cap feeding machine and the whole machine.
2. The cover bin and compressed air pipeline components are all made of 304 stainless steel, 304 stainless steel lower cover groove, cover bin and lower cover groove, so as to avoid secondary pollution to the cap.
3. With an electronic lidless detection system, it can automatically control the running speed of the lidless detection system.

and the whole machine.

#### Transition pulley system

1. The bottle clamp at the bottle mouth is used to replace the traditional shifting wheel. When changing bottle shape, there is no need to adjust the height of the equipment, and there is no need to replace or adjust any parts. Adapt to thinner and lighter bottle shape and reduce bottle making cost. The chuck plate is made of 304 stainless steel.
2. It is equipped with bottle clamping protection device.

#### Bottle outlet star wheel

1. The bottle bottom conveying mode is adopted, and the bottle bottom supporting plate is a spiral fan curve. When changing the bottle shape, there is no need to adjust the height of the machine and the outlet conveying chain.
2. It is equipped with bottle clamping protection device.

#### Bottle delivery chain

1. The drive motor adopts frequency conversion speed regulation to keep synchronization with the three-in-one bottler, which can effectively prevent the bottle from overturning.
2. A photoelectric switch is installed on the bottle delivery chain. In case of bottle pouring, the three-in-one filling machine can be controlled to slow down and stop.

#### Frame

1. The frame is welded by high-quality carbon steel, and the surface is treated with rust prevention and spraying, and the surface is covered with 304 stainless steel plate.
2. The transmission system of the three-in-one machine is located under the table top of the frame, consisting of a main motor, and adopts a gear transmission method.
3. The transmission gear adopts a cross arrangement of steel gears and nylon gears.
4. The output shaft of the main motor is equipped with an overload protection mechanism to effectively ensure the safety of the machine.
5. The machine is equipped with a fully automatic centralized lubrication system, which can centrally deliver lubricating oil to the transmission parts of the equipment, which effectively improves the operating life of the equipment and reduces labor.

#### Electronic control system

1. The electric control cabinet is made of 304 stainless steel, and the PLC automatically completes the process control of the three-in-one machine from bottle in to bottle out.
2. Using touch screen operation, production speed, shift output count, fault category, fault occurrence time, etc. are all displayed on the screen. It can also automatically count the time of occurrence of the failure and the type of failure and other information.

#### Main technical parameters

Model: HYC40/40/12  
Production capacity: 18000/20000 bottles/hour (500ml)  
Applicable bottle type: diameter Φ50 Φ92mm; bottle height: 150 310mm;  
Main drive power: 7.5KW;  
Bucket power: 0.37KW;  
Material conveying power: 2.2KW;  
Flushing pump power: 0.75kw  
Filling pump power: 1.1kw  
Working voltage: AC380V  
Control voltage: DC24V  
Water pressure: 0.2-0.25 MPa  
Water consumption: 3.0m3/h  
Compressed air pressure: 0.45 0.7 Mpa  
Filling water consumption: 20 m3/h  
Air consumption: 0.8m3/min  
Dimensions: (L×W×H) 5500×3000×2650 mm  
Weight: 90000KG

Device Configuration

Parts	Brand/Company
Main motor	ABB
Reducer	SEW
Touch visual screen	Siemens
PLC program controller	Siemens
Frequency converter	Siemens
photoelectric switch	TURCK
Proximity switch	TURCK
Contact, circuit breaker	Schneider
Spindle bearing	NTN
Flushing pump	CNP

Part 4. Conveying cap conveyor

HYSG capping machine is a new product developed on the basis of absorbing similar foreign products and combined with many years of production experience of the company. The machine is mainly used to transport bottle cap from the low position to the high position of the capping machine at the high position. The auxiliary equipment of the capping machine is transported by air.

The equipment has the characteristics of simple operation, high production capacity and easy control. It is suitable for conveying plastic cover and aluminum cover.

Main performance parameters

Production capacity: 24000 pcs/hour  
Power: 0.75KW 380V(50HZ)



## Working principle

1. When the photoelectric switch on the hopper of the filling machine detects that the cap is lower than the lower position, the conveying starts, the vibrator on the cap feeding storage box starts to work, the cylinder at the lower end of the storage box opens, and the cap feeding starts.
2. When the photoelectric switch on the hopper of the filling machine detects that the cap is higher than the upper position, the vibrator on the cap feeding device stops, and the cylinder at the lower end of the storage box returns to the initial state (the initial state is that the piston is in the extended state, That is, the blocking state), the blower stops with a delay (the delay is 0-60 seconds, adjustable), and the cap stops.
3. As the cap is gradually used, and when the cap is lowered to the lower position, repeat step 1 again. In this way, the cap conveyor works reciprocatingly.

## Part 5. Bottle cap sterilizer



The bottle cap sorting and sterilizing machine consists of a cover sorting device and a cap sterilizing host. The bottle cap sorting and sterilizing machine is installed outside the filling room. The bottle caps are sent to the cap sorting device by the air feeder and then enter the cover disinfection host after being arranged. They are washed with disinfectant, sterilized water, and dried by sterile air. After that, it is fed into the capping machine through a closed aseptic drop cap rail.

### Main features

1. Efficient centrifugal cap sorting method, less wear on bottle caps.
2. It is equipped with a bottle cap detection mechanism, which is used to automatically control the speed.

stop of the bottle cap elevator.

3. The cap-dropping guide is equipped with a mechanism for preventing the passage of the reverse bottle cap and removing the reverse cap.

4. The bottle cap disinfection machine adopts a reliable spray disinfection method, which can thoroughly disinfect and rinse the inside and outside of the bottle cap to make the bottle cap sterile.

5. The disinfectant storage tank has high and low liquid level detection and automatic disinfectant replenishment functions.

## Part 6. Water blower



### Description

The high-pressure fan is used to blow the air, so that the high-speed flowing air is ejected from a slit to blow away the remaining water droplets on the bottle as much as possible. The slits are arranged obliquely so that all sides of the bottle body can be blown by high-speed air.

The bottle dryer is composed of high-pressure fan, pressure equalizing box, blowing pipe, frame, control device and other components.

Fan power: 5.5X2KW

## Part 7. Laser inkjet printer



The smallest laser printer in the world!

The SmartLase laser printer is very small, with a 10W length of 597 mm, a width of 165 mm, a height of 157 mm, and a weight of only 10 kg. The 30W is 597 mm long, 165 mm wide, 157 mm high, and weighs 12 kg. The whole machine has a compact structure, a small footprint, and flexible installation. The print head can be changed from 0 degrees to 90 degrees at will, which can meet the printing requirements of multiple products and changes.

SmartLase is rich in content and can print text, graphics, barcodes, dates, shifts, serial numbers and other character formats.

The red frame positioning system is convenient for positioning and adjustment during installation and product replacement.

SmartLase laser printers require low laser energy, and only low-energy lasers can be air-cooled. Therefore, there is no need for water cooling systems or external compressed air, and no mechanical arms to transfer materials, which reduces the incidence of mechanical failures.

Main technical parameters

Character format: SL 5x5 SL 7x5 SL 16x10 underline

Character size: 2.0x1.5 mm 2.0x1.5 mm 2.0x1.5 mm 2.0x1.5 mm

Pixel count: 15, 17, 41

Printing area: 0.34 mm<sup>2</sup>, 0.39 mm<sup>2</sup>, 0.93 mm<sup>2</sup>, 1.08 mm<sup>2</sup>

Influence\*1: 100mj/mm<sup>2</sup>

Single character printing time

10w 3.4 μs 3.9 μs 9.3 μs 10.8 μs



Characters/sec 10w 294 256 108 93

Speed 10w products/min 289 253 106 91

The test standard has two lines with a total of 20 characters (10 characters per line). The character size is 2.0x1.5 mm, and there is a space of 0.5 mm between the characters. All modes use a laser aperture of 0.5 mm.

The SmartLase laser printer has a low cost of use, no maintenance, and a design service life of more than 10 years. The whole machine is guaranteed for one year. As the main product, the 10W laser tube is guaranteed for three years (30W laser tube is guaranteed for one year). The energy consumption is small, and the power consumption is only 225W, which greatly reduces the operating cost. (30W is 600W, 10W can save more than half of power loss)

Smartlase is safe and reliable, with a mean time between failures of 28000 hours, which reduces cost and has the best cost performance.

No matter how many words or characters there are in the content, the laser tube only switches once when printing a group of content, which greatly reduces the frequency of laser tube switching and effectively improves the service life of the laser tube.

## Part 8. Non pressure conveying buffer system







#### Technical requirements

Pressureless conveying is composed of a three-stage differential conveyor chain with multiple rows of conveyors and unequal speeds. It is driven by three variable-frequency speed-regulating motors. It is equipped with photoelectric detection of full bottles, accumulated bottles and bottle supply number per unit time. According to the speed pulse signal, the speed of the conveyor chain is changed by PLC automatic synchronization tracking to ensure continuous and non-squeezing bottle supply. This section is also equipped with a bottle inverting and discharging device.

#### Technical parameters

Nominal conveying capacity: 15000----30000 bottles/hour

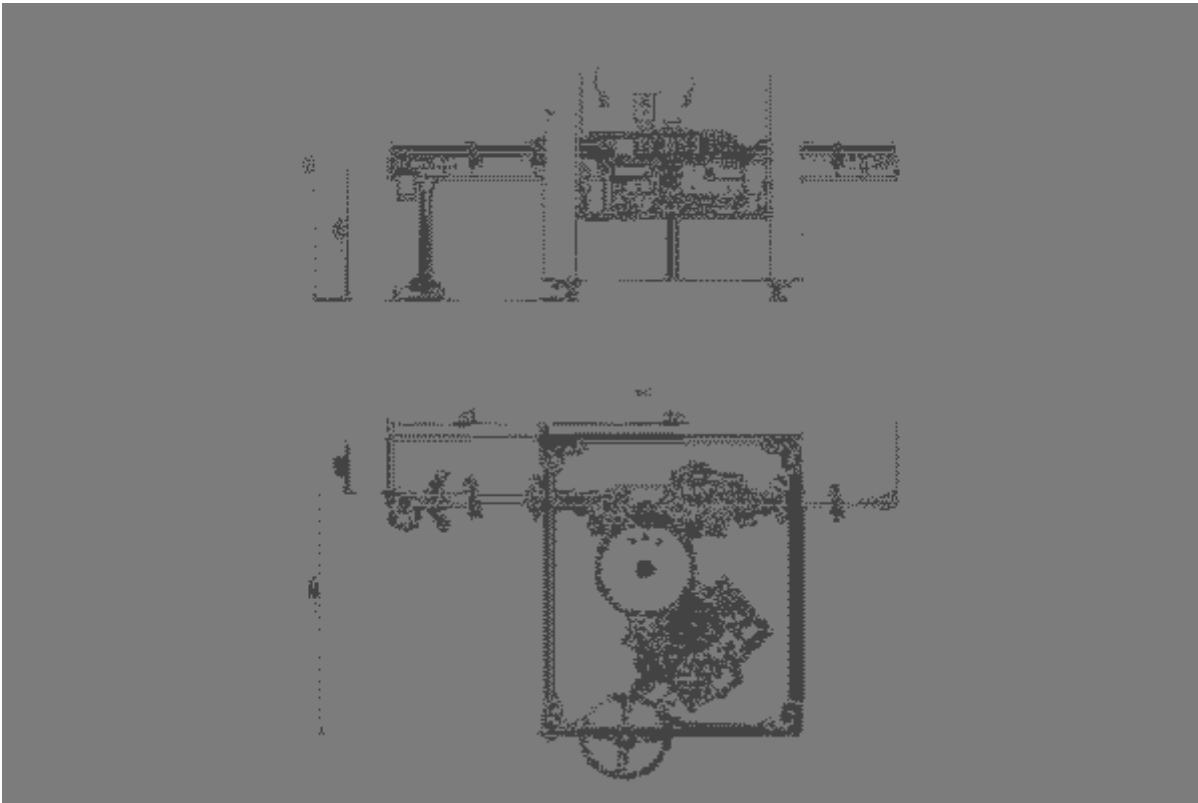
Conveying speed: 8----80m/min

Motor power: 0.75----1.1KW

Installed capacity: It depends on the layout

### Part 9. Automatic labeling machine

Rotary hot melt adhesive OPP labeling machine (round bottle) HY-OPP0406



### Working principle

This hot melt adhesive OPP labeling machine is a new type of rotary, continuous operation labeling machine. The equipment can automatically adjust the in and out transmission of the container. The container coming from the conveyor belt is separated by the separation screw according to the spacing of the star wheel. After a certain distance, the imported star wheel transfers the container to the container turntable. At this time, the container is fixed by the bottle pressing mechanism and the mold seat of the container, the container can rotate at a certain speed; the product is mechanically pre-positioned during the rotation of the product and Position and label according to the trajectory of the mechanism.

When the container reaches the detection position of the electric eye, the computer host controls the label delivery system to send the label. When a label delivery action is completed, the high-speed cutter cuts the label. Due to the adoption of Sanyo's small inertia high-speed servo motor, the accuracy and stability of high-speed label feeding and label cutting are ensured.

The cut labels are sent to the gluing system; in this part, the system coats the first and the tail edges of the label with glue. This gluing method minimizes the consumption of hot melt adhesive.

When the glued label is transferred to the labeling position, the label can be accurately and effectively adhered to the container. Since the container is in a rotating state during the transfer process of the label, the label can be affixed to the container smoothly and tightly. The adhesive strip at the end of the sizing process forms a good label lap seal, completing a labeling process.

**The whole process is: Bottle feeding → Pre-positioning → Cutting label → Gluing label → Supporting label → Pressing → Completed**

Main composition of the hot melt adhesive labeling machine

A: Host

Sanyo Servo System

Japan Sanyo Servo Drive System

Taiwan WEINVIEW 7-inch color screen man-machine interface

Japan SUNX high-speed high-resolution color label sensor

Japan SUNX high-speed high-resolution gluing and missing-sticking detection sensor

Japan SUNX product detection photoelectric switch

KYENES (CKD) pressure sensor

B: Mechanical part

Conveying mechanism: 750W TRANSTECNO AC motor (with TRANSTECNO reducer), frequency converter speed regulation;

Conveyor belt: industrial nylon chain plate conveyor belt

Host conveying mechanism: 1500W TRANSTECNO AC motor (with TRANSTECNO reducer)

Bottle-separating mechanism: Industrial screw-type bottle-separating mechanism

Bottle feeding mechanism: Cooperate with screw-type bottle separating mechanism and star wheel positioning feeding mechanism to ensure the accuracy and stability of feeding

Positioning mechanism: mechanical pre-positioning; use cam mechanism track to flatten bottle position and labeling

Labeling mechanism: Rotating turntable drives the bottle to perform labeling during rotation

Label delivery mechanism: High-speed servo OPP label film delivery system (high-speed servo motor)

Pressing mechanism: professional arc brush assembly

Bottle guide mechanism: profile guide rail with dual coordinate adjustment

Glue supply system: dedicated hot melt glue supply system (using German Siemens control system) to ensure the accuracy and uniformity of glue application

Machine alarming and protection function

Safety protection:

The protection door will be closed when the equipment is running to prevent injury to the operator.

Lack of label alarm:

set the alarm to remind the operator to prepare to replace the label when the label will be used up.

Bottle shortage alarm:

when there is a bottle shortage, the equipment will stop and alarm; when there is a bottle, it will automatically resume production, which is convenient for on-line production.

Missing labeling alarm:

It is conducive to the control of labeling quality.

Air pressure detection:

When the air pressure does not meet the production requirements of the equipment, the equipment will shut down to prevent the production of defective products.

Vacuum detection:

When the vacuum does not meet the production requirements of the equipment, the equipment will shut down to prevent the occurrence of defective products.

Temperature detection:

When the temperature of the hot melt adhesive does not meet the production requirements of the equipment, the equipment will be shut down to prevent defective products

Equipment technical parameters

Three-phase 380V 50 Hz 8000W

Labeling machine equipment length: 3000mm (labeling machine conveyor belt length: 3000mm; can be adjusted according to the actual size of the customer's production line)

Labeling machine host size: 3000mm (length) X 2500mm (width) X 2100mm (height)

Conveyor belt surface height: 1250±30mm (can be adjusted according to the actual size of the customer's production line)

Conveyor line speed: 30m/min (conveyor line speed can be adjusted according to actual production conditions)

Speed adjustment method: stepless speed regulation

The maximum speed of the label: the maximum speed of the label is 150 m/min

Maximum labeling speed: 350 round bottles per minute (production speed can be adjusted according to actual conditions)

Posting accuracy: ±1mm

Labeling accuracy: ±1mm

Product size: Customer provides bottle sample (empty bottle or label after filling)

Maximum label width (height): 200mm (standard width, the width can be increased according to the product size)

Maximum label length: 500mm

Maximum outer diameter of label: 600 mm

Paper core diameter: 152mm

Labeling glue: hot melt glue, only apply glue on both ends of the label

Gluing temperature: 120 160

Label type: OPP film label, paper-plastic composite film label, paper label

Labeling station: 16 stations per week for round bottle hot melt adhesive labeling machine

Number of labeling molds: According to the bottle specifications provided



Labeling product type: round bottle

Machine weight: about 2500 Kg

## Part 10. Fully automatic PE film packaging machine

Heat shrinkable film packaging machine HY30



Main components of equipment

### 1. External bottle conveying belt:

Ensure continuous supply of bottles. It relies on a motor to drive S900 space net chain to transmit bottles. The motor is controlled by frequency conversion.

### 2. Bottles feeding:

The bottle feeding part controls the bottle feeding through photoelectric control.

### 3. Bottles separating:

The bottles separating action is completed according to the arrangement format required by the user. The movement of the bottles separating part is driven by two synchronous motors. The bottles passing through this area are divided into bottle groups after detection.

### 4. Bottles separating plate:

The operator can easily adjust the distance between the bottle dividing plates to ensure that the bottles can run freely.

### 5. Bottle driving:

Push the bottle group packed by the paper pad evenly to the film winding area and drive it with a servo motor.

### 6. Film winding combination:

The heat shrinkable film is wound on the bottle group as required and driven by a servo motor.

### 7. External conveyor:

Feed the wound bottle group into the oven (thermal fluidity tunnel).

### 8. Film tensioning device:

The combination can keep the film in a constant tension state and prevent the damaged film from entering the winding area. It is adjusted by air pressure.

#### 9. Film output combination:

Each time the correct film length is cut, the bottle group is synchronously wound and controlled by a synchronous motor.

#### 10. Automatic packaging combination:

After the semi-finished product is transported to this area, the signal prompts that the film is automatically cut after being wound. The operation of this combination is composed of a synchronous motor and a synchronous belt.

#### 11. Sensor:

Control the bottle.

#### 12. Photoelectric probe:

Control the bottle to enter the bottle separation channel as required.

#### 13. Manual film loading:

When a roll of film is about to be used up, manually connect the film to the old film and continue using.

#### 14. Film roller:

Maintain a continuous film supply; use air pressure to make the film in a relaxed state, which is conducive to winding.

#### 15. Oven:

Oven drive mechanism: Send the packaged products into the hot air duct of the oven.

Oven construction: Electric heating pipes are installed on both sides of the oven.

There are 2 motors on the top to drive the fan, so that the airflow is heated first and then blown onto the packaging bottle as required.

Oven outlet: Here, the packaged products have left the oven to be cooled and then sent to the outside machine.

Cooling fan: Cool the product just coming out of the oven.

Oven Motor: Drive the product into the oven. Driven by a frequency conversion motor.

#### Equipment performance parameters

1. Equipment production capacity: 30 bags/min (2\*3) bottles/bag

2. Packaging form: heat shrinkable film

3. Applicable bottle type:

(1) PET bottle 2000ml; (2) Bottle height H70-360mm (Note: The positive or negative error of the diameter of each bottle type is 2 mm, otherwise it will be calculated according to another bottle type)

4. Applicable Packaging products:

Length 200-530mm

Width 110-350mm

Height 70-360mm

## 5. Film:

Material: PE

Thickness: 30-100um

Maximum film roll diameter: 500mm

Diameter of film reel core: 76mm

Tensile strength: longitudinal and transverse conform to GB13022 standard

Heat shrinkage rate: longitudinal and transverse conform to GB/T13519-92 standard

Shrinkage ratio: Longitudinal and horizontal conform to GB/T13519-92 standard

Breaking strength: longitudinal and transverse conform to GB13022 standard

Thickness deviation: in line with GB6672 standard

Other parameters of the equipment

Model size:

The bottle feeding belt is 4000mm long and 538mm wide

Dimensions 11700\*1450\*2500 (length\*width\*height mm)

Total power of equipment: 65KW

Main power supply: Three-phase AC 380V±5% 50HZ

Control power supply: 24V DC

Compressed air :

(a) Pressure: 0.4-0.6MPa

(b) Air consumption: 100L/MIN

Equipment weight: 5.6T

Basic equipment configuration:

This machine adopts PROFACE touch screen; the module adopts Siemens S7-300 PLC system control.

The main drive adopts 7 SEW servo motor controllers and reducers imported from the original German factory, with stepless speed regulation and automatic error correction functions.

Schneider low pressure control system, German FESTO pneumatic control system, SICK photoelectric control system, etc.

Imported aluminum and 304 stainless steel, INTRALOX polymer self-lubricating low-wear chain belt, DZ adjuster, Habers conveyor belt, centralized lubrication control, etc.

Equipment technical characteristics

1. Patented bottle feeding system:

It can adopt a variety of product arrangements and combinations. It is convenient to change the bottle arrangement and change the arrangement and combination without adding additional accessories. The low-impact feeding separation system is suitable for beer bottles and soft PET bottles. And other fragile container packaging.

## 2. Advanced configuration, safe and reliable:

The main drive of this machine adopts 7 SEW servo controllers imported from the original German factory, servo motors, FESTO air control system, SICK photoelectric control and Siemens S7-300 module integrated control, etc. All configurations are made in Germany to ensure low failure and high efficiency of equipment operation.

## 3. Unique film unwinding and shearing device:

The patented design of film constant tension conveying can adjust the length of the film simply and conveniently. The film does not fuse, but only overlaps at the bottom of the package, which can make the product packaging display effect better.

## 4. High production efficiency:

The double film rolls can replace the film, and the film change time only takes one minute. When the film is used up, it will stop automatically and continue to move in a straight line during operation. The speed is adjustable, continuously variable, and the production efficiency is extremely high.

## 5. Excellent selection of materials and durability:

This machine uses a large number of imported aluminum and stainless steel materials that can be heat-treated in the body and transmission parts. Its service life is several times that of domestic materials. The selection of bottle conveyor belts is in the world's leading technology. The polymer self-lubricating low-friction chain belts and sprockets of American Intralox are equipped with centralized lubrication devices, which are durable. Customers who choose our products will have very few spare parts replacement in the future operation process. Reduced production costs.

## 6. Easy to change varieties and adjustments:

The machine is designed to take into account the various needs of customers to change varieties during production. All adjustment points of the machine are installed with the adjuster, scale and variety specification table of the German UNIT company. The operator only needs to adjust according to the setting value when changing the variety, which greatly saves time and is convenient and quick.

## 7. High-quality electrostatic spray treatment:

This machine uses imported equipment for electrostatic spray treatment, and the cost is 4-5 times that of paint treatment. However, the processed equipment has a beautiful outer case and high suction power.

## 8. Humanized cabinet design:

In order to minimize the occupation of the customer's site and use the equipment safely, the electrical control cabinet is designed to be installed on the top of the machine to make the entire equipment more compact.

## 9. Technology-leading heat shrinkable channel:

The heat shrinkable channel is equipped with electric heating elements on both sides, and the conveyor belt is conveyed by a stainless steel mesh chain with a roller chain, which eliminates the problem of deviation of the equipment network chain during long-term operation. All are equipped with safety fences to ensure



safety of operators, and are equipped with centralized lubrication, which has good thermal insulation and has no impact on the surrounding environment.

#### 10. Reasonable structure, easy operation and maintenance:

This machine is composed of reasonable mechanical structure, reliable pneumatic device and advanced automatic control technology, with high configuration level, closed operation, conforming to industrial regulations, solid structure, convenient operation and maintenance.

### Part 11. Gantry palletizing machine

#### Description

The palletizer puts the finished carton on the pallet or pallet (wood, plastic) according to a certain arrangement for automatic stacking, which can be stacked in multiple layers and then output, which is convenient for the forklift to transport the stacked products to the warehouse for storage.

This equipment adopts PLC+touch screen control to realize intelligent operation management, simple and easy to master. Can greatly reduce labor and labor intensity.

Designed with the concept of high speed, stability and space saving. Using separate stripping, faster and space-saving. One machine has multiple functions and can be adjusted quickly, so there is no need to worry about replacing stacked products. Scope of application: corrugated boxes, plastic boxes.



#### Main features

1. Use man-machine interface operation to realize man-machine dialogue, which can display product speed, failure reason and location, and has a high degree of automation. PLC can be used to program the sorting and stacking layers, pallet supply and discharge of cartons.

- 2. The equipment guardrail is equipped with photoelectric sensor for entering and exiting. When the opened, the machine stops working to protect the operator.
- 3. The stacking method is convenient and simple to adjust, and can be operated on the touch screen.
- 4. The stacking is stable and efficient, which can greatly save manpower.
- 5. Low noise, the noise is below 75DB, in line with international standards.
- 6. Several stacking methods can be completed without replacing stacking parts.
- 7. Low-position stacking type, international advanced design concept, more advanced and reasonable structure, lighter and more stable movement, and less power consumption.
- 8. Using FESTO cylinder, reliable quality and performance, can meet high-strength, long-term work
- 9. The palletizing method can be carried out on the man-machine interface, which is easy to adjust. A of palletizing methods can be completed without changing parts.
- 10. The electrical components are all European brands, with stable performance and high efficiency, greatly saves manpower.
- 11. The carton supply system is controlled by a brake motor to ensure that the carton is transported according to the preset position.
- 12. Meets food hygiene requirements: oil-free pneumatic components are used, and 60% of the mov adopt a humanized design that does not need to be lubricated for life, which reduces a lot of use cos users.

Equipment composition

- 1. Separation belt conveying, steering and aligning device
- 2. Lifting and palletizing device
- 3. Pallet stacking and automatic pallet supply device
- 4. Stack output device
- 5. Safety protection device

Main technical parameters

Machine model	HY-MDDZ40
Palletizing capacity	40 cartons/min
Mode of operation	Human-machine interface touch screen
Maximum load per layer	150KG
Maximum load per pallet	1500KG
Maximum stacking height	1800MM (other heights can be customized separately)
Maximum size of pallet	1300*1100MM (other sizes can be customized)
Motor power/power	AC3-phase380V10KW50HZ
Air consumption	110L/MIN (Air consumption: 5-6KG/ CM2)
Equipment weight	2000KG

Process flow

This machine ca

the functions of

automatic feedi

separation, auto

steering, autom

alignment, auto

lifting of the

arrangement la

automatic supply of pallets, and automatic palletizing.

During production, the cartons are conveyed by the conveyor belt. When passing through the steering the cartons are turned as necessary according to the counting program to automatically align the row. When the alignment of one layer is completed, the layer pushing device will push the alignment layer into the storage platform. After that, the alignment layer rises with the reservoir platform to a specific stacking position, and the alignment layer is released to realize a layer of stacking. After the first layer is stacked, the reservoir platform returns to its original state, and the second layer stacking operation is repeated. After palletizing is completed, the entire pallet is automatically output.

Main electrical configuration

Item	Part Name	Origin/Brand
1	Gear motor	SEW
2	Pneumatic components	FESTO
3	PLC	Siemens
4	Low-voltage appliances	Siemens
5	Sensor	SICK or Schneider
6	Inverter	Siemens