

Combi PET Bottling Line  
**PET瓶吹灌旋生产线**



**合肥中辰轻工机械有限公司**  
Hefei Zhongchen Light Industry Machinery Co., Ltd

# 吹灌旋一体机技术

Combi Blower / Filler / Capper



## 从瓶坯到瓶装液态产品的创新包装技术 From preform to filled products

吹灌旋一体机整合吹瓶技术和灌装、拧盖技术，通过在线吹瓶工艺、灌装和拧盖工艺、可靠输送实现生产线能耗降低25%。

Online blowing, filling, capping technology with very stable preforms and bottles transfer and 25% or more line energy saving achieved.



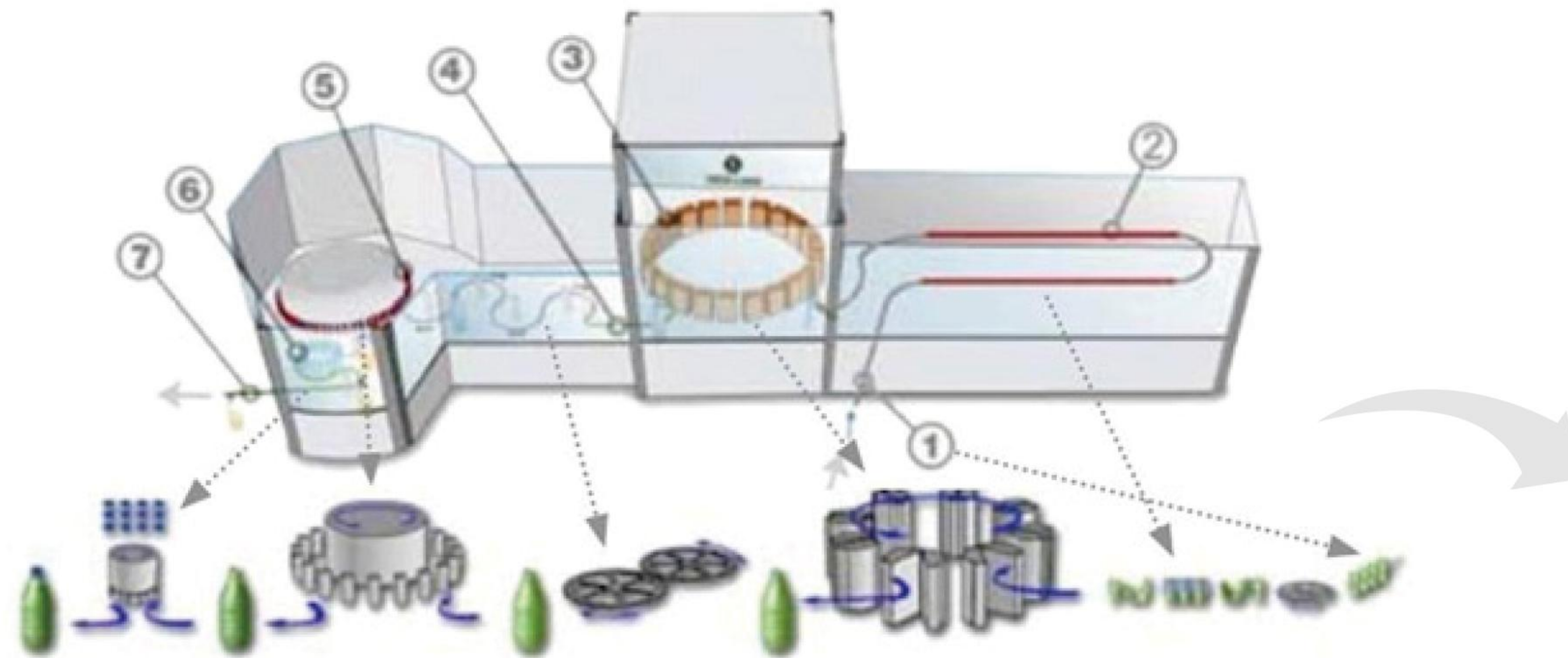
## 吹灌旋一体机的优点 Advantages of Combi-Bloc

- |          |                          |
|----------|--------------------------|
| 更小的占地面积  | Less space               |
| 更高的效益    | Higher earnings          |
| 更少的操作人员  | Less operator            |
| 更可靠的品质保证 | More reliable quality    |
| 更高的生产效率  | Higher efficiency        |
| 更低的能源消耗  | Lower energy consumption |



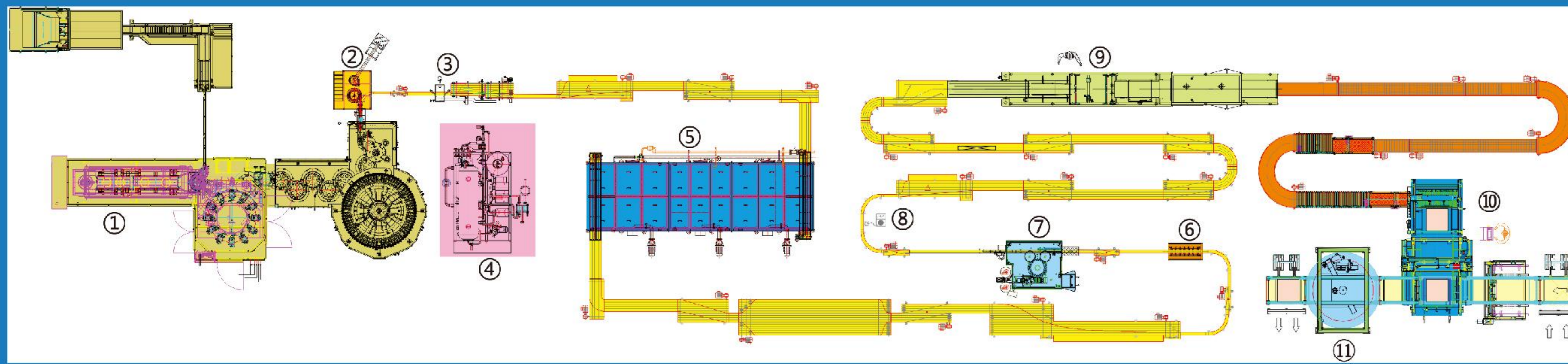
## 吹灌旋流程图 Combi-Bloc Working Process

- |        |                    |
|--------|--------------------|
| 1、瓶坯进  | Preform infeed     |
| 2、瓶坯加热 | Preform heating    |
| 3、吹瓶   | Blowing            |
| 4、星轮传输 | Starwheel transfer |
| 5、灌装   | Filling            |
| 6、旋盖   | Capping            |
| 7、出瓶   | Product discharge  |



# PET吹灌旋生产线典型布局

Typical Layout of Combi PET Bottling Line



## 含气线标准布局图

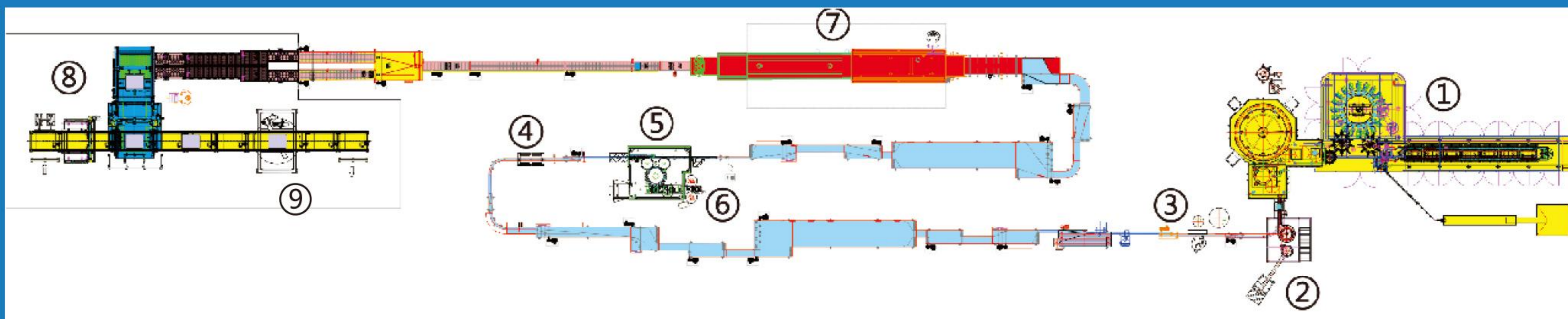
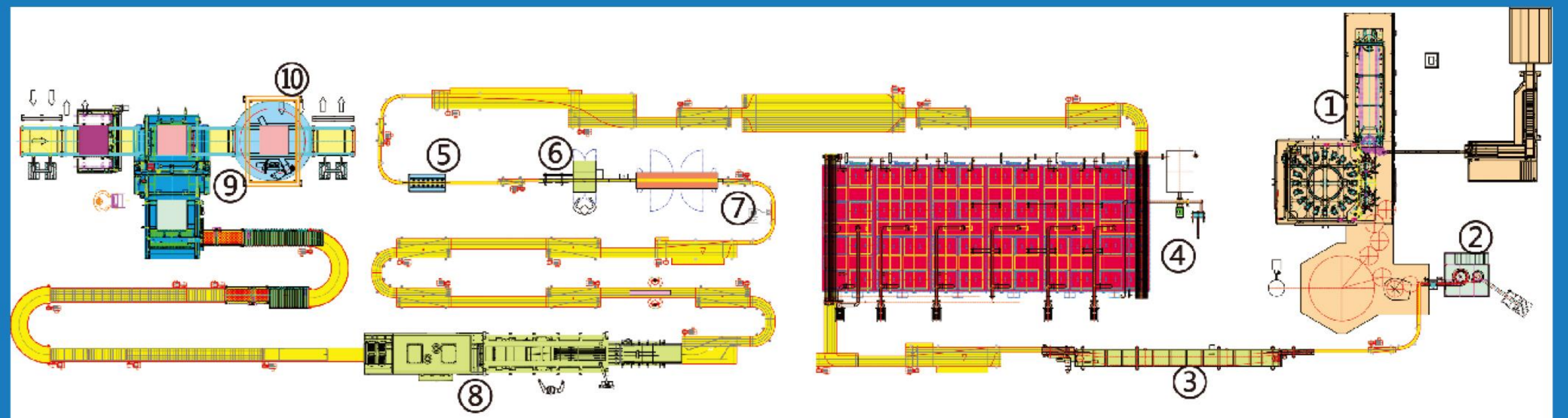
Combi CSD PET Line Typical Layout

- |                                      |                              |
|--------------------------------------|------------------------------|
| 1、吹灌旋一体机 Combi blower/ filler/capper | 2、盖输送清洗机 Cap feeder / washer |
| 3、满瓶检测 FBI                           | 4、混合机 Mixer                  |
| 5、温瓶机 Bottle warmer                  | 6、吹干机 Dryer                  |
| 7、贴标机 Labeler                        | 8、喷码机 Date coder             |
| 9、收缩膜包装机 Shrink packer               | 10、码垛机 Palletizer            |
| 11、缠绕机 Stretch wrapper               |                              |

## 果汁茶等不含气饮料生产线

Combi Fruit Juice / Tea etc PET Line Typical Layout

- |                                     |                              |
|-------------------------------------|------------------------------|
| 1、吹灌旋一体机 Combi blower/filler/capper | 2、盖输送清洗机 Cap feeder / washer |
| 3、倒瓶杀菌机 Cap sterilizer              | 4、冷瓶机 Bottle cooler          |
| 5、吹干机 Dryer                         | 6、套标机 Sleeve labeler         |
| 7、喷码机 Date coder                    | 8、纸箱包装机 Carton packer        |
| 9、码垛机 Palletizer                    | 10、缠绕机 Stretch wrappe        |



## 水线标准布局图

Combi Water PET Line Typical Layout

- |                                     |                            |
|-------------------------------------|----------------------------|
| 1、吹灌旋一体机 Combi blower/filler/capper | 2、盖输送清洗机 Cap feeder/washer |
| 3、满瓶检测 FBI                          | 4、吹干机 Dryer                |
| 5、贴标机 Labeler                       | 6、喷码机 Date coder           |
| 7、收缩膜包装机 Shrink packer              | 8、码垛机 Palletizer           |
| 9、缠绕机 Stretch wrapper               |                            |



## 技术创新 Technical Innovation

- |                    |  |
|--------------------|--|
| 1、优化的凸轮曲线；         | 1. Optimized cam curve;  |
| 2、降低吹瓶噪音，提高稳定性；    | 2. Reduced noise, more stable;   |
| 3、节能减排、环保；         | 3. Energy saving, environment friendly;                                  |
| 4、瓶坯静电除尘、瓶口保护结构优化； | 4. Preform electrostatic dust removal, optimized bottle neck protection; |
| 5、瓶口照相检测；          | 5. Bottle neck camera inspection;  |
| 6、瓶胚翻斗机；           | 6. Preform dumper;   |
| 7、瓶盖静电除尘；          | 7. Cap electrostatic dust removal;                                       |
| 8、伺服电机拉伸；          | 8. Servo motor stretching;   |
| 9、机械方式封瓶口。         | 9. Mechanical bottle mouth sealing.                                      |

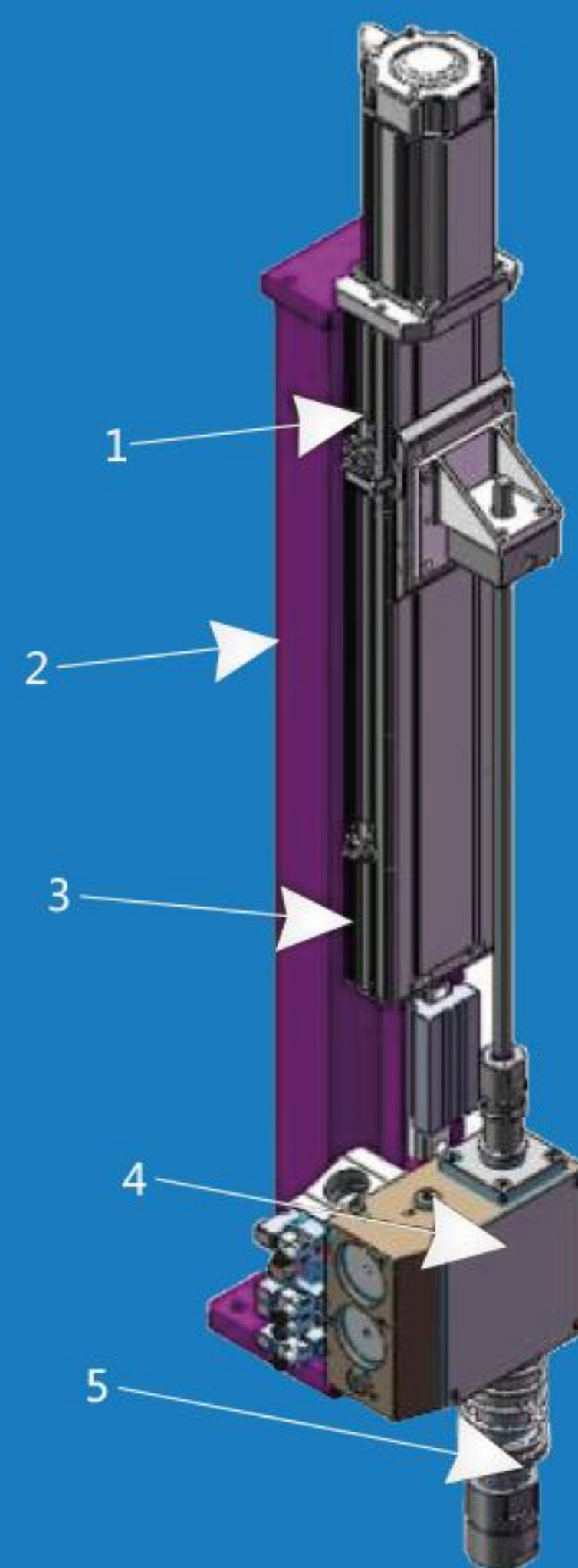


## 吹瓶伺服拉伸 Servo-motor Stretching

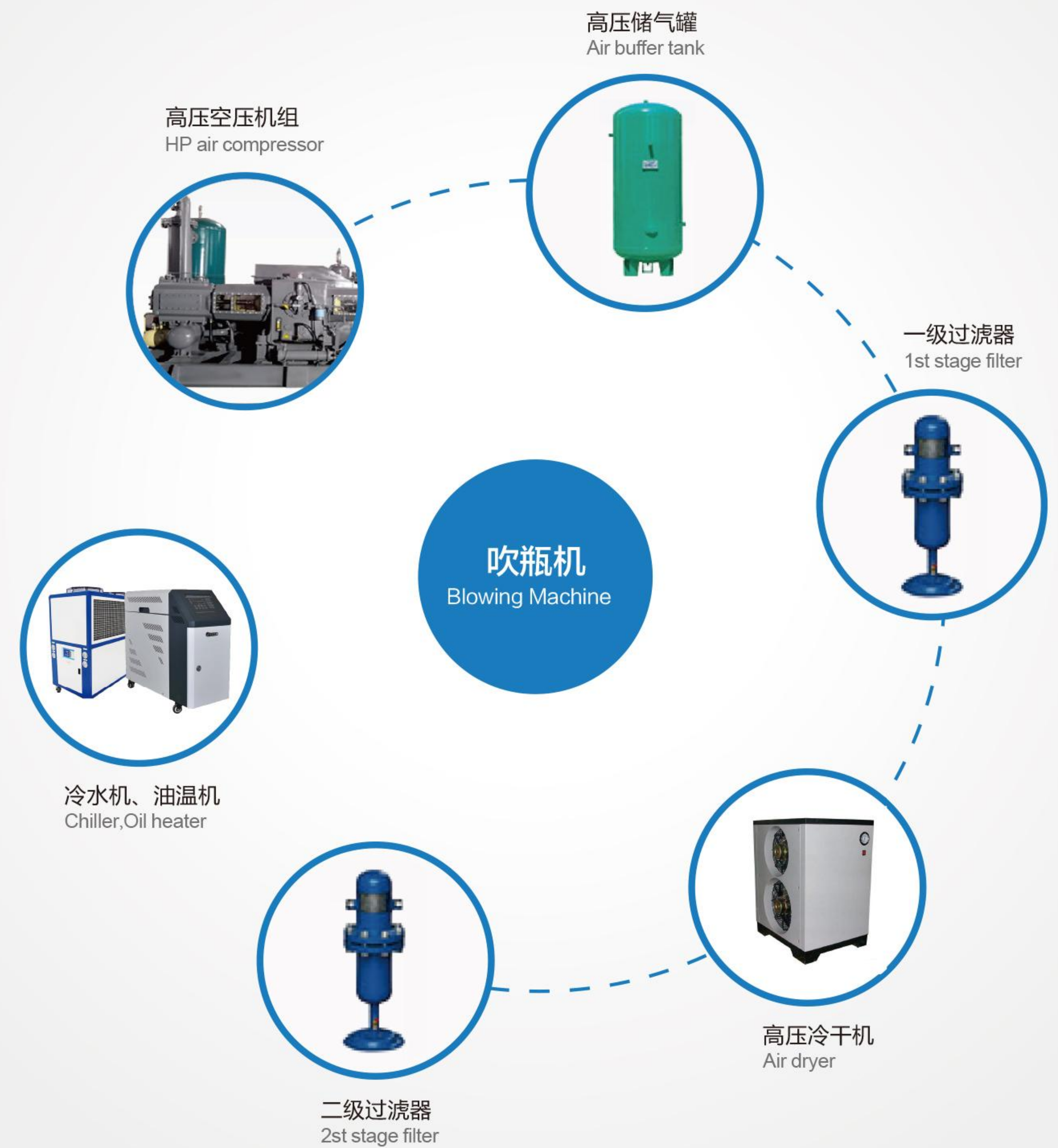


- 1、高转速、大扭矩伺服电机
- 2、电缸安装座
- 3、电缸
- 4、拉伸杆
- 5、机械封口缸及高压阀组

1. High revolving speed, and high torque servo-motor
2. Installation base for electrohydraulic servo cylinder
3. Electrohydraulic servo cylinder assembly
4. Stretch rod
5. Mechanical bottle neck seal & high pressure valve assembly



## 吹瓶机辅助设备 Accessories to Blowing Machine





### 技术创新 Technical Innovation

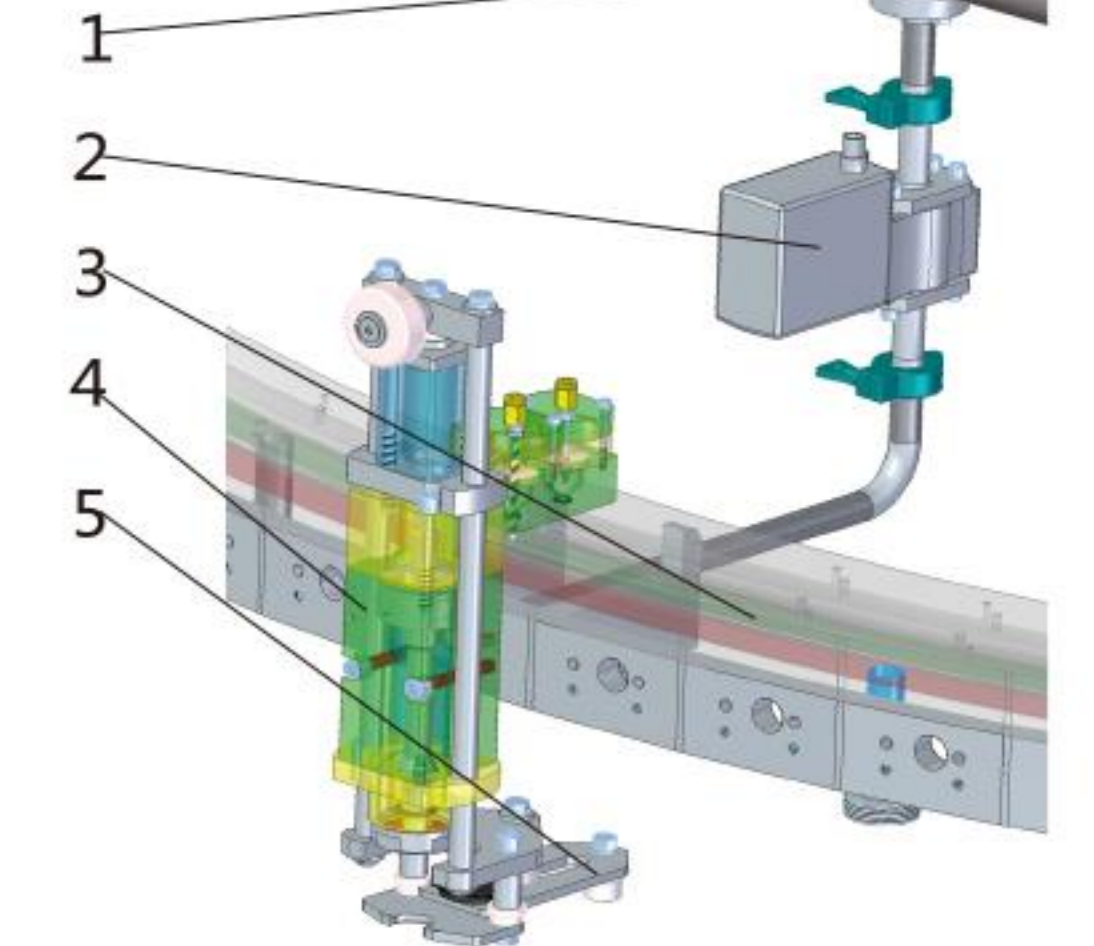
- 1、流量计或机械式电子阀灌装；
- 2、管式环缸，无死角，更易清洗；
- 3、自动CIP清洗杯，利于操作维护；
- 4、提高灌注温度，实现12~15℃以上灌装，节省混合机制冷消耗；
- 5、流量计精确计量灌注量，灌注精度比传统机械阀提高约5~6倍；
- 6、流量计灌装技术实现快速转产，无须更换回气管。

1. Mechanical or volumetric electronic filling valve;
2. Tubular type filling bowl no dead angle, easy to clean;
3. Automatic CIP, easy for operation and maintenance;
4. Raise filling temperature above 12~15°C for energy saving;
5. Volumetric valve leads to high filling precision, 5~6 times higher than mechanical valve;
6. Volumetric valve filling can realize fast changeover, no vent tubes.

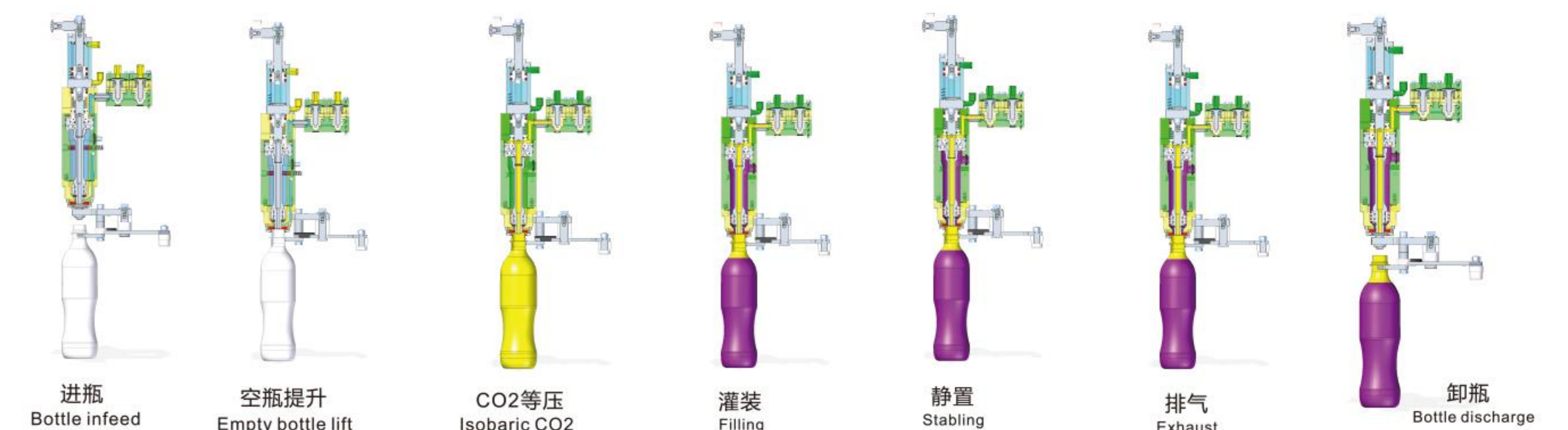


灌装系统主要结构 Filling system Main Structure

1. 环形灌装缸
2. 电磁流量计
3. 气室圈
4. 灌装阀
5. 自动CIP杯

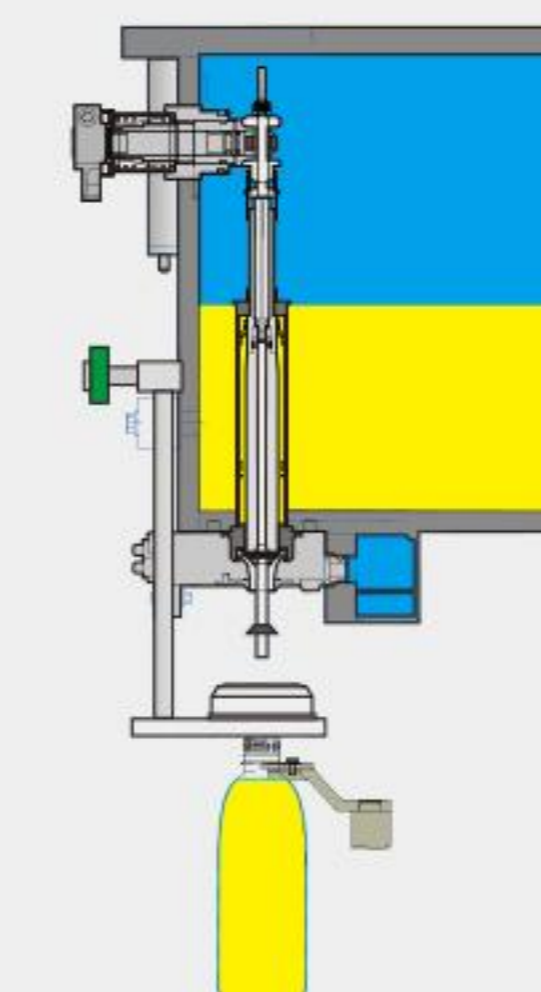


灌装过程及原理 Filling process and principle

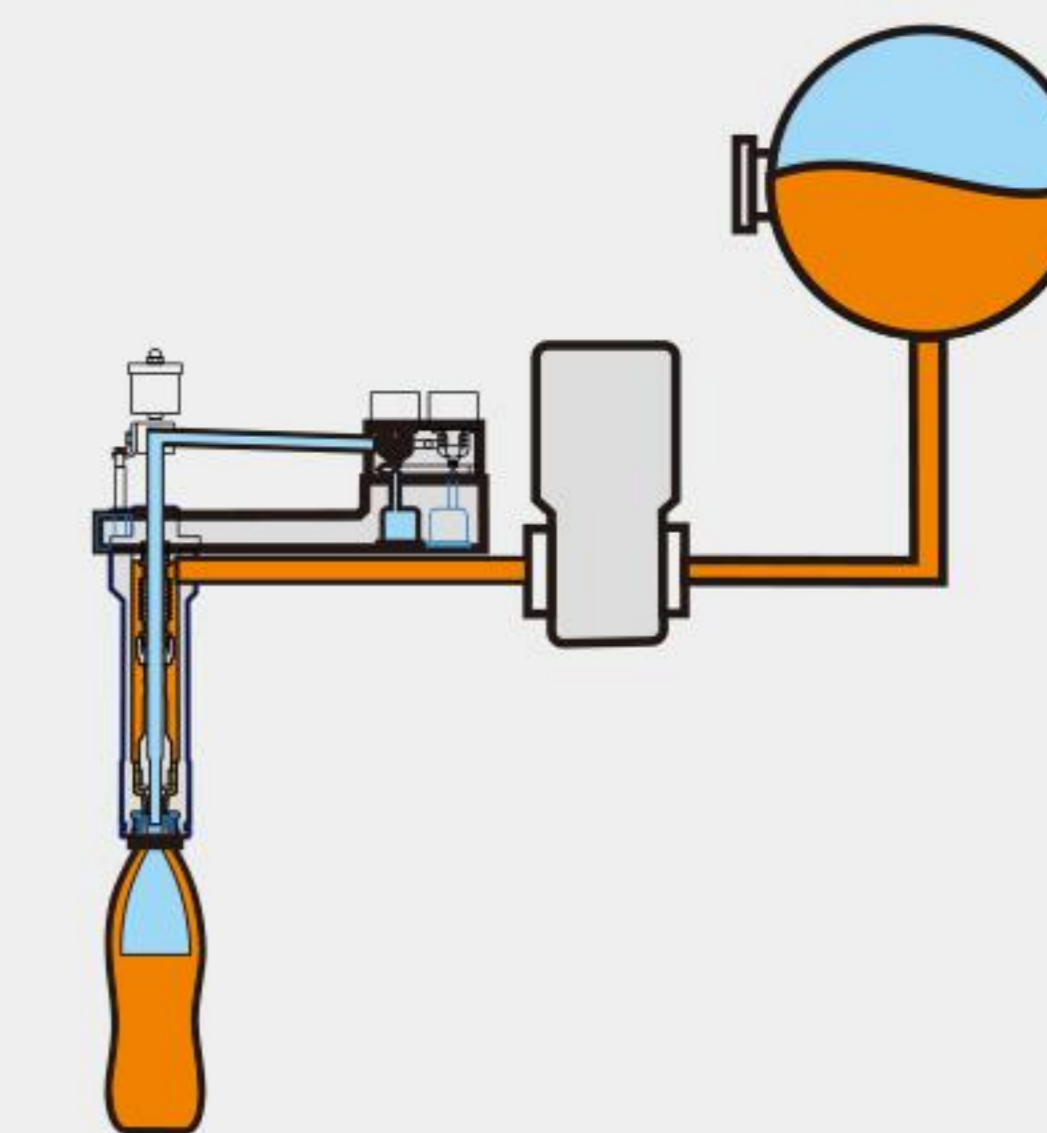


PET含气瓶吹灌旋设备 Soft drinks combi-bloc machine models selection					
机型型号 Machine model	吹瓶腔数 No. of blower cavity	灌装头数 No. of filling valve	旋盖头数 No. of capping head	产量BPH(0.5L) Capacity BPH (0.5L)	灌装阀节距 Filling valve pitch
QC063208	6	32	8	10000	40π
QC084010	8	40	10	15000	36π
QC105010	10	50	10	18000	36π
QC126012	12	60	12	21000	36π
QCE126012	12	60	12	20000	36π
QC146015	14	60	15	24000	40π
QCE148015	14	80	15	24000	36π
QCE168015	16	80	15	27000	36π
QCE189018	18	90	18	30000	40π
QCE2010820	20	108	20	36000	36π

传统机械阀 (含气)  
Traditional mechanical valve



流量计定容阀 (含气)  
Volumetric electronic valve

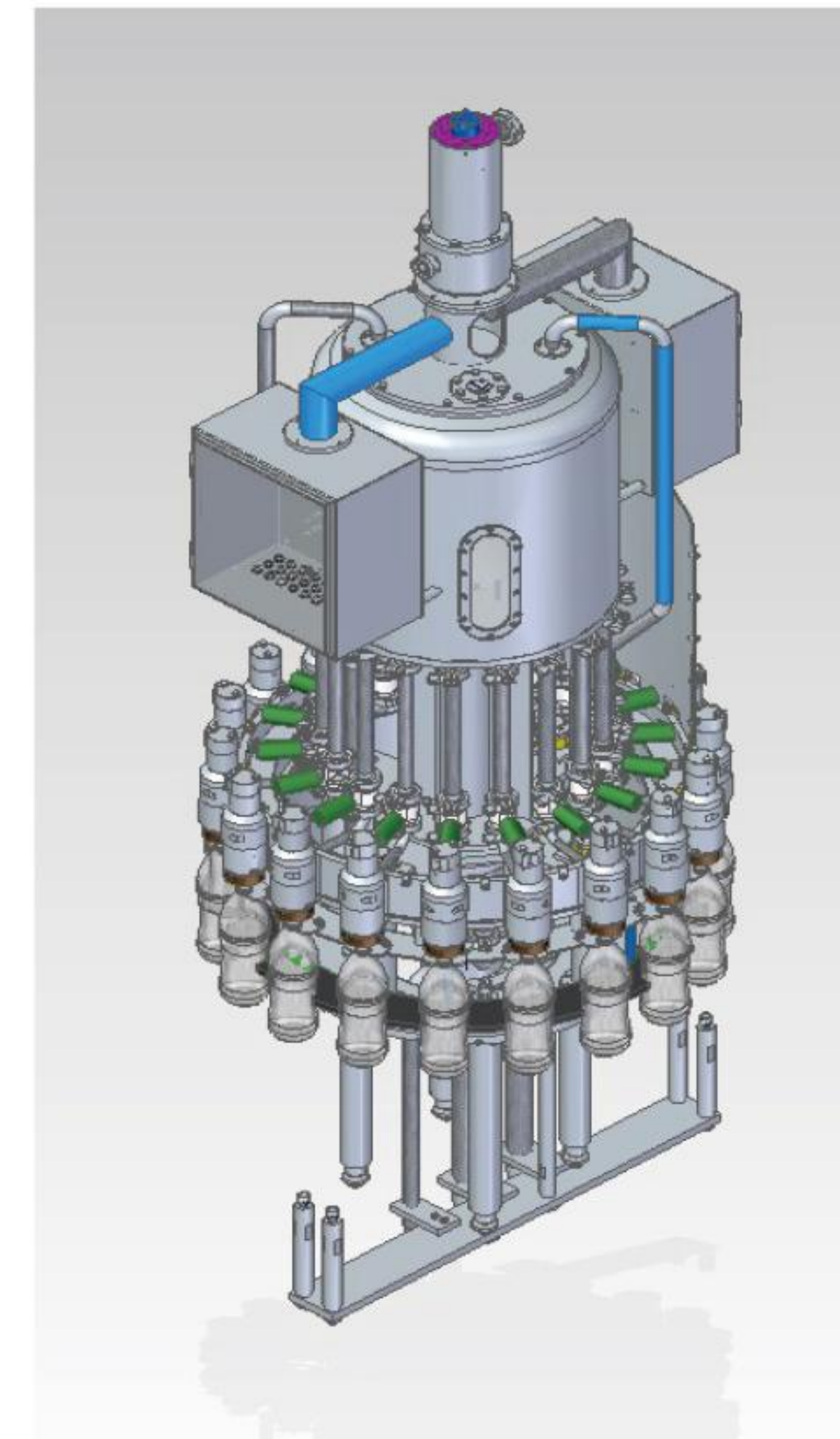




## 灌装机 Filler

- 1、采用涡轮流量计灌装、精度高；
- 2、可不停机在线调整灌装容量；
- 3、具有先快后慢的双速灌装功能，根据不同容量的瓶型设定不同快慢灌装时间；
- 4、非接触式灌装，无提升气缸，利于维护并降低设备重量；
- 5、CIP清洗杯，自动CIP清洗；
- 6、有瓶信号自动检测，无瓶不灌装；
- 7、物料接触件全不锈钢卫生型设计、设备上部可水冲洗。

1. Flow meter filling with high efficiency;
2. On-line adjusting filling volume;
3. Fast filling and slow filling adopted, filling time adjustable for different bottle size;
4. Non-contact filling without lift cylinder, easy for maintenance;
5. Automatic CIP after install dummy cups;
6. No bottle no filling;
7. Stainless steel for product contact parts, washable structure.



PET水瓶吹灌旋设备 Water combi-bloc machine models selection

机型型号 Machine model	吹瓶腔数 No. of blower cavity	灌装头数 No. of filling valve	旋盖头数 No. of capping head	产量BPH(1.5L/1L/0.5L) Capacity BPH (1.5L/1L/0.5L)	灌装阀节距 Filling valve pitch
SCE061806	6	18	6	5500/8000/12000	53π
SCE082408	8	24	8	7000/10000/16000	40π
SCE103210	10	32	10	9000/13500/20000	40π
SCE104010	10	40	10	12000/18000/20000	32π
SCE124015	12	40	15	12000/15000/24000	36π
SCE144515	14	45	15	13000/20000/28000	40π
SCE165015	16	50	15	15000/21000/30000	36π
SCE186020	18	60	20	20000/24000/30000	36π



## 旋盖机 Capper

- 1、全不锈钢设计、内置弹簧旋盖头、可冲洗；
- 2、适用1881或者1810等国际通用盖型；
- 3、更低的高歪盖率；
- 4、凸轮导轨及轴承食品级润滑；
- 5、采用差速旋盖设计，28口和38口快速转换；
- 6、每个旋盖头可配置伺服电机，伺服旋盖（选配）；
- 7、瀑布式理盖输盖机（选配）；
- 8、盖消毒及消毒液制备系统（选配）。

1. Full stainless steel structure, spring inside, washable;
2. Suitable for 1881 or 1810 international standard caps etc;
3. Lower rate of excessive height and slant closure;
4. Food grade lubrication for cam guide and bearing;
5. Differential capping technology, fast changeover between 28mm and 38mm caps;
6. Each capping head with servo motor (Option);
7. Waterfall cap sorting and feeding (Option);
8. Cap sterilizing and disinfectant preparation system (Option).





## 技术创新 Technical Innovation

- 1、可采用热灌装或中温、无菌灌装技术，确保产品的饮用安全；
- 2、热灌装时停机有回流，保持阀头温度；
- 3、回流量按照客户要求可调，控制在5~15%；
- 4、灌装阀设计可为机械阀带回流，也可升级为电子气动阀或流量计阀、流道结构简洁、易清洗；
- 5、CIP设计无任何卫生死角，有正洗和逆洗，确保清洗效果；
- 6、带5x5x5mm以上尺寸的果肉颗粒可以采用二次灌装设计；
- 7、可选配顶罩加HEPA过滤器或抽风系统，保证灌装区域洁净。

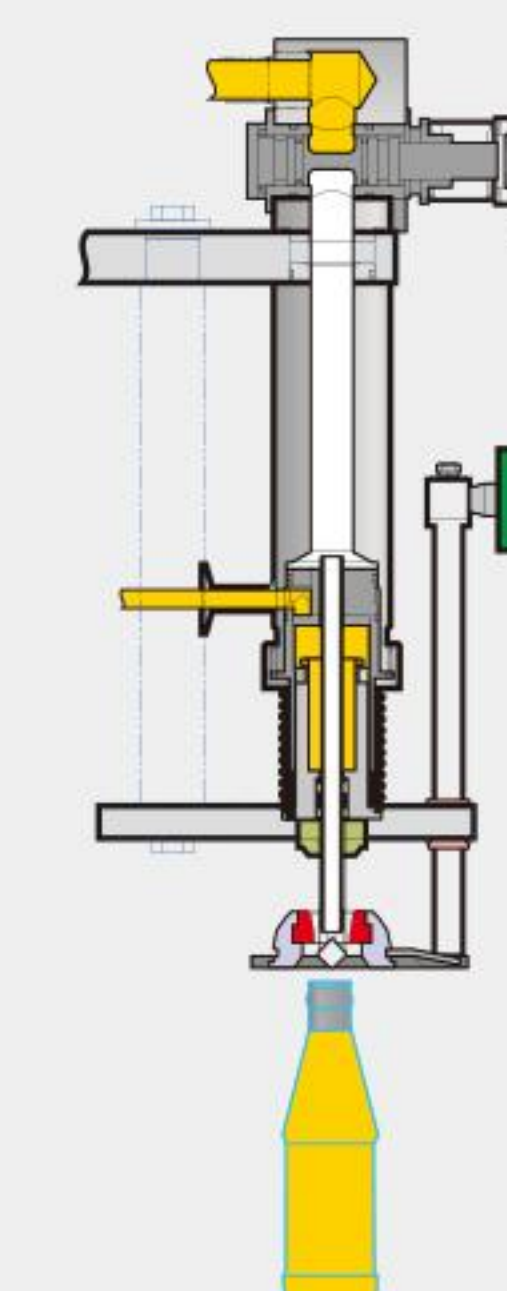
1. Hot filling or aseptic filling technology available;
2. For hot fill, product return during machine stop to keep valve body temperature;
3. Product return volume adjustable as per request, e.g. 5~15%;
4. Filling valve design could be mechanical valve with product return, or upgraded to be electro-pneumatic valve or flow meter valve, simple flow structure, easy for CIP, no leakage;
5. Advanced CIP structure design no dead angle, downstream and upstream clean available;
6. Two steps filling in case fruit pulp size bigger than 5x5x5mm;
7. Enclosed structure with HEPA filter or exhaust system to guarantee clean filling area (Option).



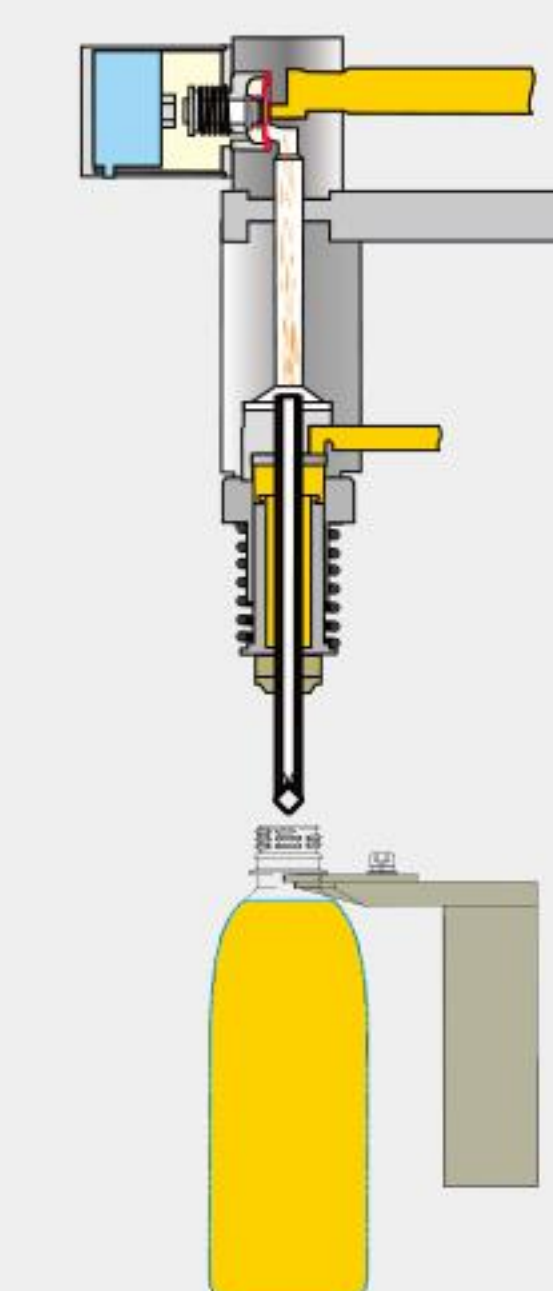
PET热灌装吹灌旋设备 Fruit juice / tea etc combi-bloc machine models selection

机型型号 Machine model	吹瓶腔数 No. of blower cavity	灌装头数 No. of filling valve	旋盖头数 No. of capping head	产量BPH(0.5L) Capacity BPH (0.5L)	灌装阀节距 Filling valve pitch
RC062408	6	24	8	8000	40π
RC083208	8	32	8	10000	40π
RC103208	10	32	8	12000	40π
RC124010	12	40	10	15000	36π
RC145010	14	50	10	18000	36π
RC166012	16	60	12	20000	36π
RC206416	20	64	16	24000	37π

传统机械阀拨叉（热）  
Mechanical valve (hot fill)



电子气动阀（原理）  
Electro Pneumatic valve





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