



Instruction Manual
Sanitary Hand Driven High Pressure Pump

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Catalog No. HP-0.5; HP-1.5





1. Open-box Inspection

Check whether there is any packing damage. Refer to the shipping list for the integrity of the product.

2. Product Introduction

2.1 Brief Introduction

The Sanitary Hand Driven High Pressure Pump is an equipment producing high pressure by manual operation, applicable for laboratory preparation for liposome, fat emulsion, nanometer suspensions, micro-emulsion, infusion solutions, cell disruption, juice homogenization, fine chemical engineering and dye etc. The parts contacted with the medium is made of 316L stainless steel or Titanium more resistant to corrosion. The Sanitary Hand Driven High Pressure Pump is qualified for pharmaceutical application and approvable for FDA and GMP. The 30,000 psi model can be used in high pressure homogenizer application, and the 12,000 psi model is suitable for liposome extruding.

Model	Pressure Level	Displacement	Piston Diameter	Stroke
HP-0.5	30,000 psi	0.045 in ³	0.25 inch	0.92 inch
	2,000 bar	0.74 cm ³	6.35 mm	23.4 mm
HP-1.5	12,000 psi	0.10 in ³	0.38 inch	0.92 inch
	800 bar	1.64 cm ³	9.53mm	23.4 mm



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2.2 Specifications


Catalog No.	HP-0.5	HP-1.5
Min. Sample Size	0.6 ml per stroke	1.64 ml per stroke
Flow rate	1~25 ml/min (user dependent)	1~60 ml/min(user dependent)
Temperature Limit	75°C (167°F)	75°C (167°F)
Power Requirements	Hand drive	Hand drive
Dimension	25 cm × 40 cm × 20 cm	25 cm × 40 cm × 20 cm
Inlet type	1/4" HP coupling and Luer	1/4" HP coupling and Luer
Outlet type	1/4" HP coupling and Luer	1/4" HP coupling and Luer
Weight	15 kg (32 lbs)	15 kg (32 lbs)
Cleaning	Flush to clean	Flush to clean
Sterilizing	Whole unit autoclavable	Whole unit autoclavable
Multi-Stages (Adjustable)	1 stage: Max. 10,000 psi; 2 stages: Max. 20,000 psi; 3 stages: Max. 30,000 psi.	1 stage: Max. 4,000 psi; 2 stages: Max. 8,000 psi; 3 stages: Max. 12,000 psi.
Application	Homogenizer InteractionChamber(Microfluidizer) StaticHomogenizingValve(Avestin)	Online Liposome Extruder Gextruder-5ml/min; 50ml/min; 400ml/min; 1500ml/min
Product material	316L stainless steel, Viton and UHPE Titanium (Resistant for strong acid and base)	
Material standard	FDA, GMP	


3. Safety Instruction


The explanations about “Caution”, “Warning” and “Danger”


 **Attention:** Indicate the correct procedures and practices for operation and maintenance, to avoid damage to the equipment or other properties.


 **Warning:** Potential Danger. Correct procedures and practices need to be followed to avoid personal injury.

 **Danger:** The improper handling could cause hazardous condition, such as serious personal injuries, damage to the equipment or even loss of life.


 **Warning:** Please wear suitable protective gear when operating the Sanitary Hand Driven High Pressure Pump.


 **Warning: Do not exceed the rated range.** The exceeding of designed maximum working pressure of hand driven high pressure pump could cause personal injury.


 **Warning: The system working pressure must not exceed the maximum rated pressure of the components.** You can check the pressure situation from the pressure gauge equipped in the system from time to time.


 **Warning: Avoid damage to the hydraulic hose.** Twined hose, knotting, sudden turn and heavy weight on the hose might lead to the


fracture when there is overdraught of the pipeline.

 **Warning: Do not lift Sanitary Hand Driven High Pressure Pump with the hose or other joint parts.** Please use hand or other way to transfer the pump.

 **Attention:** Keep Sanitary Hand Driven High Pressure Pump away from fire and protect it against the high temperature. The overheated temperature could cause damage to the sealing parts and hose. The Sanitary Hand Driven High Pressure Pump can not be used properly when the temperature exceeds 75°C.

 **Danger:** The whole system must not have the structural styles with the friction only generated from close-fitting. It could cause personal injuries by popping when the system pressure is too high.

 **Warning:** Sanitary Hand Driven High Pressure Pump must be maintained by the qualified technicians. The user should be responsible for any improper maintenance.

 **Warning:** Using original parts to replace worn or damaged parts. Replacement with non-original parts will not be warranted.


4. Preparation


4.1 Make sure all connectors and hoses are in the right position. The rated pressure class of connectors and hoses should be followed.

4.2 The tightness degree of all thread connections should in moderate, not too loosened or too tight.

4.3 Make sure all pipe fittings are connected properly to the outlet and inlet, which should not exceed the load of Sanitary Hand Driven High Pressure Pump.


4.4 The medium must be compatible with 316L stainless steel. Please refer to the engineering manual or consult with the manufacturer for details. The following is the medium that can be used:

- Distilled Water
 - Petroleum
 - Diester
 - Silicone Oil
 - Surfactants
 - Strong Acids and Base
 - Soluble oil (water-in-oil emulsion)
 - Alcohol
 - Acetone
 - Lipids
 - Other organic solvent
- Strong Acids and Base  **Titanium cylinder needed**

 **Attention:** the large area of corrosion damage of Sanitary Hand Driven High Pressure Pump caused by improper use of medium is not covered in the warranty. **Application with strong acid or base should request for Titanium material.**

5. Installation

Please carefully read chapter 4 before installing Sanitary Hand Driven High Pressure Pump. The majority of faults are caused by improper installation or misuse.

 **Warning:** Fail to follow the chapter 4 might lead to personal injuries or damage to the equipment.

5.1 Fixation of Sanitary Hand Driven High Pressure Pump

Refer to figure 1 for the installation method and size of Sanitary Hand Driven High Pressure Pump

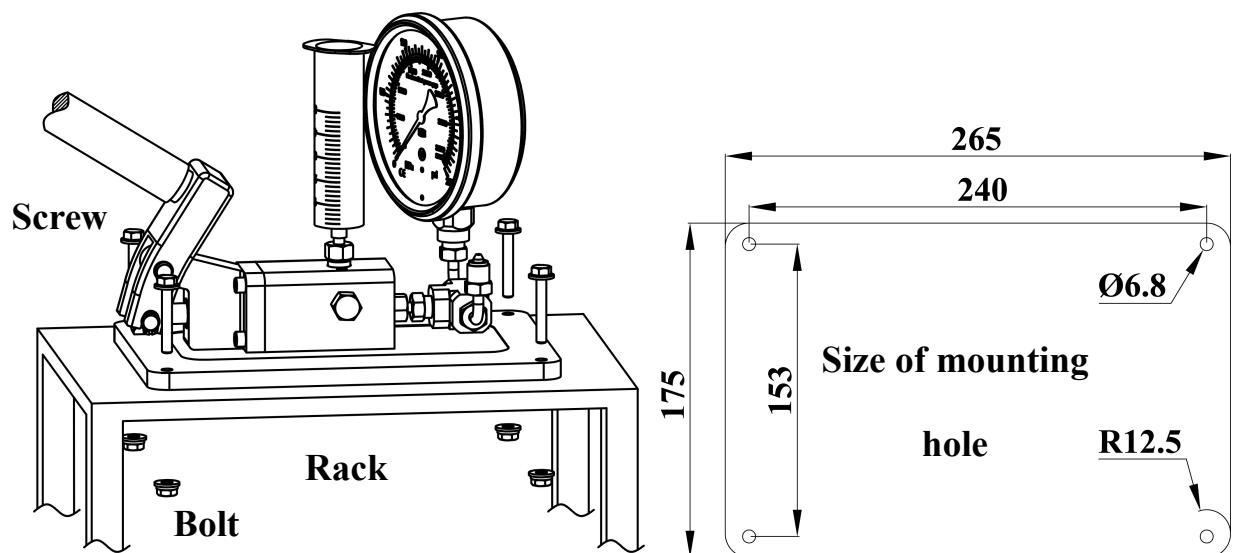



Figure 1

5.2 Assembly of Sanitary Hand Driven High Pressure Pump

Refer to the parts list for detailed exploded drawing of components to assemble each component.

Notes: a. Refer to figure 2 for the pump application after assembly.

b.  **Remain two - three circles of threads on the thread line** and thread mouth where the thread line is applied. Refer to figure 3 for the position.

c. First connect the pump body to HF4-T-junction before installing the outlet check valve. Please pay attention to the installation direction of the check valve.



Figure 2.1 Connect with online extruder



Figure 2.2 Connect with homogenize chamber

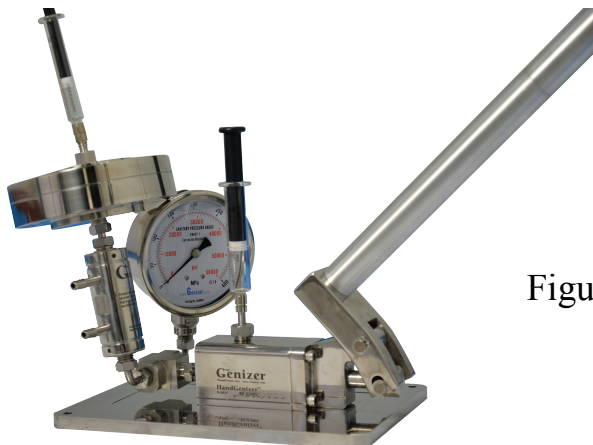


Figure 2.3 Connect with chamber and extruder

Figure 2

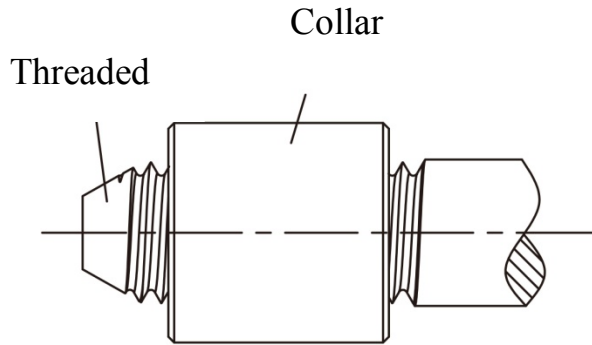
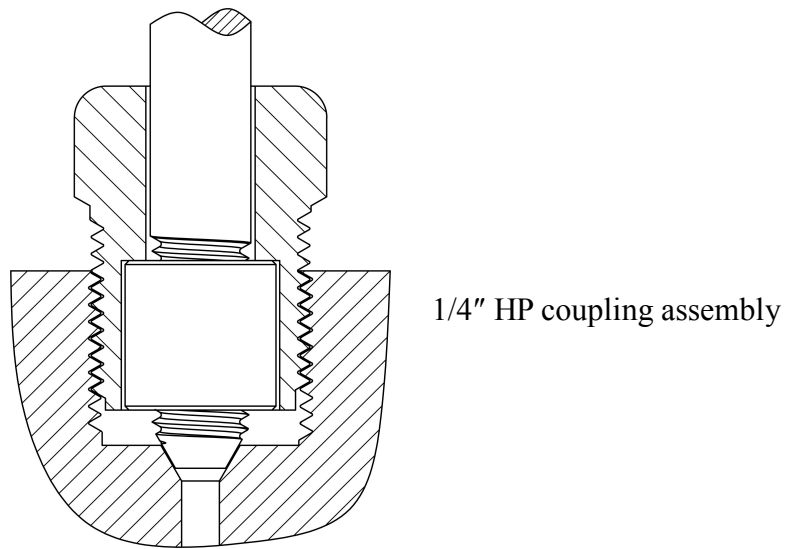
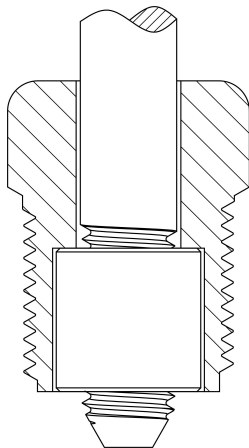


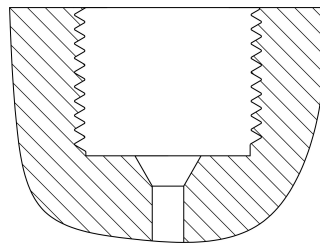
Figure 3



1/4" HP coupling assembly



1/4" HP coupling male



1/4" HP coupling female



Luer

Figure 4

5.3 Dismounting of sealing parts

The sealing parts need to be replaced when they are permanently worn-out. Use circlip pliers and 3/16 internal hexagonal wrench to dismantle the support.

Please refer to the figure 5 for the dismantling of the sealing parts. First, put the dismantling device 1 into the pump body; second, put the dismantling device 2 into the small hole; third, pull the whole work piece out.

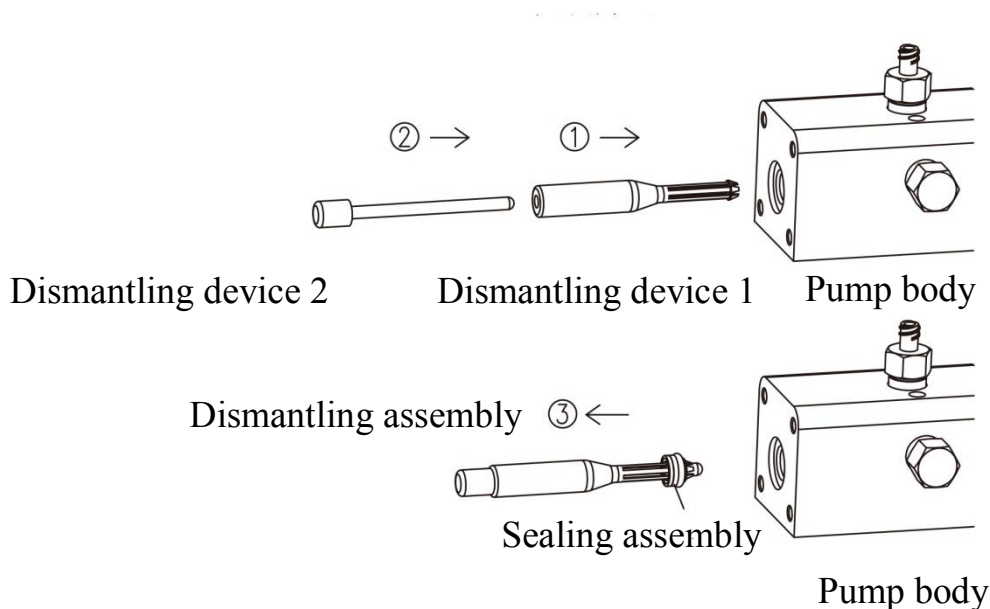


Figure 5 Dismantling of sealing parts

5.4 Installation of sealing parts

Refer to the figure 6 for the installation chart. Put the pressing block and sealing part assembly onto the installation tools. Then use palm to slightly push sealing parts and pressing block into the pump body.

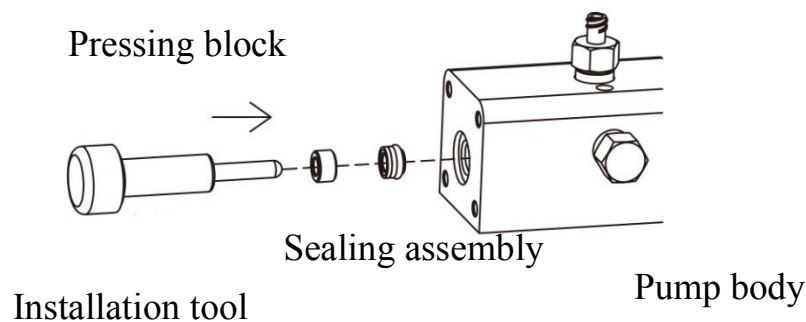


Figure 6 Installation of sealing parts

6. Operation

6.1 Air exhaustion

Once there is air in the system, it will compromise the generation of ultrahigh pressure, so the air needs to be eliminated. The steps are as the following:

1. Open the unloading valve (turning for about one circle)
2. Operate the reinforcement rod of Sanitary Hand Driven High Pressure Pump until the air is fully eliminated.
3. Tighten the unloading valve.



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4. Check the operation condition of the pump. If the air is not fully eliminated, please repeat the above procedures.

6.2 Operation of Sanitary Hand Driven High Pressure Pump

Press the reinforcement rod down and raise it up to operate Sanitary Hand Driven High Pressure Pump.

6.3 Circulating system

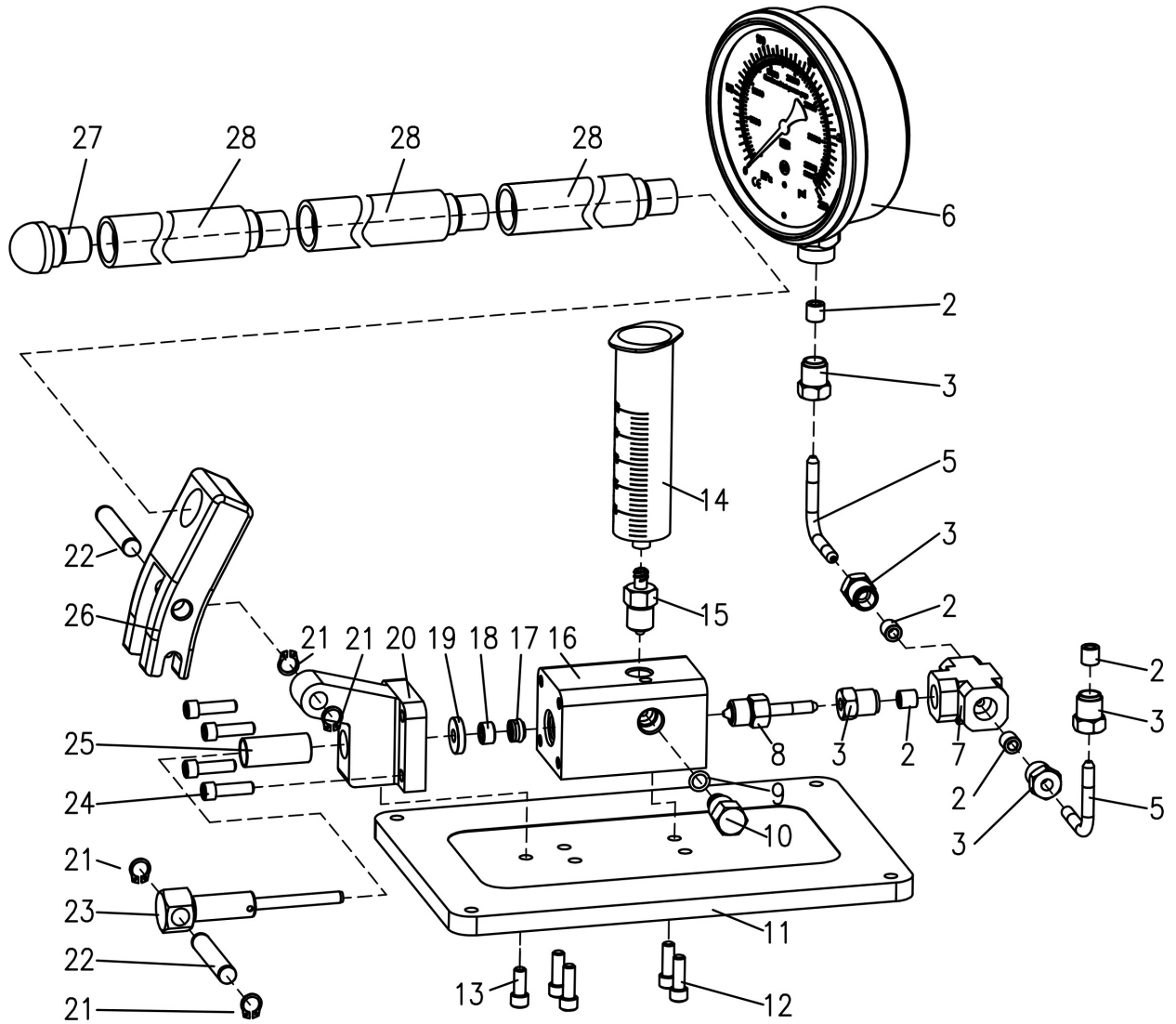
Connect one hose to the needle cylinder by the outlet luer connector for the backflow once the system medium needs a cycle operation.

7. Trouble Shootings

7.1 When the pump is leaking, please re-assemble, and inspect if all O-rings are in good condition and installed correctly. Check if the fasteners are loose.

7.2 If the chamber is blocked, please reverse the chamber direction for unblocking it.

7.3 The channel of chamber in Handgenizer is smaller than the electric homogenizer, please pre-treat the sample carefully for prevent the blockage of the chamber.



Detailed Exploded Drawing of Components



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Spare Parts List			
Seq.	Component NO.	Quantity	Component Name
1	G-60-LR4	1	Outlet Luer connector
2	G-60-2H4	5	HF4-Thread line
3	G-60-2HM4	5	HF4-Screw
4	G-XXYQ-00	1	Small chamber
5	G-HM4-W-120	2	HF4-bent pipe
6	G-YLB-35000	1	Pressure gauge-35000
7	G-60-23HF4.1	1	HF4-Tee joint-1
8	G-CV-O-00	1	Outlet one-way valve
9	GB1235-76	1	O Ring 11x1.9
10	G-HS-005	1	Unloading valve
11	G-HS-004	1	Bottom plate
12	ANSI 18.3	4	1/4"-20 Length 5/8"
13	ANSI 18.3	1	1/4"-20 Length 3/8"
14	LKZSQ-50	1	Syringe cylinder
15	G-CV-I-00	1	Inlet One-way valve
16	G-HS-001	1	Pump body
17	G-HSC-6.35-00	1	6.35 Sealing assembly
18	G-HS-010	1	Pressing block
19	G-HS-009	1	Locating block
20	G-HS-002	1	Support
21	GB/T 894. 1 86	4	Circlip 10
22	G-HS-006	2	Fork pin
23	G-HS-008	1	Pull rod
24	ANSI 18.3	4	1/4"-20 Length 3/4"
25	G-LGTT-14	1	Metal bush
26	G-HS-003	1	Fork
27	G-HS-007	1*	Plug of Reinforcement rod
28	G-HS-008	3	Reinforcement rod

Accessories: a kit of dismantling tool, a kit of sealing group.