



Instruction Manual
Hand Driven Ultrahigh Pressure Homogenizer

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Catalog No. HandGenizer





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 hand driven ultrahigh pressure homogenizer is an equipment producing ultrahigh pressure by manual operation, which is a laboratory preparation for liposome, fat emulsion, nanometer suspensions, micro emulsion, infusion solutions, cell disruption, juice homogenization, fine chemical engineering and dye etc. The max. Working pressure is 30,000Psi/2,000Bar. The parts contacted with the medium are made of 316L stainless steel or other materials resistant to corrosion.

2.2 Specifications


Model	Pressure Level	Displacement	Piston Diameter	Stroke
HandGenizer	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


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 hand driven ultrahigh pressure homogenizer.


 **Warning: Do not exceed the rated range.** The designed max. working pressure of hand driven ultrahigh pressure homogenizer is 30,000 psi/2,000 bar, and the exceeding of working pressure could cause personal injury.


 **Warning: the system working pressure must not exceed the max. 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 over draught of the pipeline.

 **Warning: Do not lift hand driven ultrahigh pressure homogenizer with the hose or other joint parts.** Please use hand or other way to transfer the pump.

 **Attention:** keep hand driven ultrahigh pressure homogenizer away from fire and protect it against the high temperature. The overheated temperature could cause damage to the sealing parts and hose. The hand driven ultrahigh pressure homogenizer cannot be used properly when the temperature exceeds 65°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:** hand driven ultrahigh pressure homogenizer 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 loose 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 hand driven ultrahigh pressure homogenizer.


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

 **Attention: the large area of corrosion damage of hand driven ultrahigh pressure homogenizer caused by improper use of medium is not covered in the warranty.**

5. Installation

Please carefully read chapter 4 before installing hand driven ultrahigh pressure homogenizer. 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 Hand Driven Ultrahigh Pressure Homogenizer

Refer to figure 1 for the installation method and size of hand driven ultrahigh pressure homogenizer

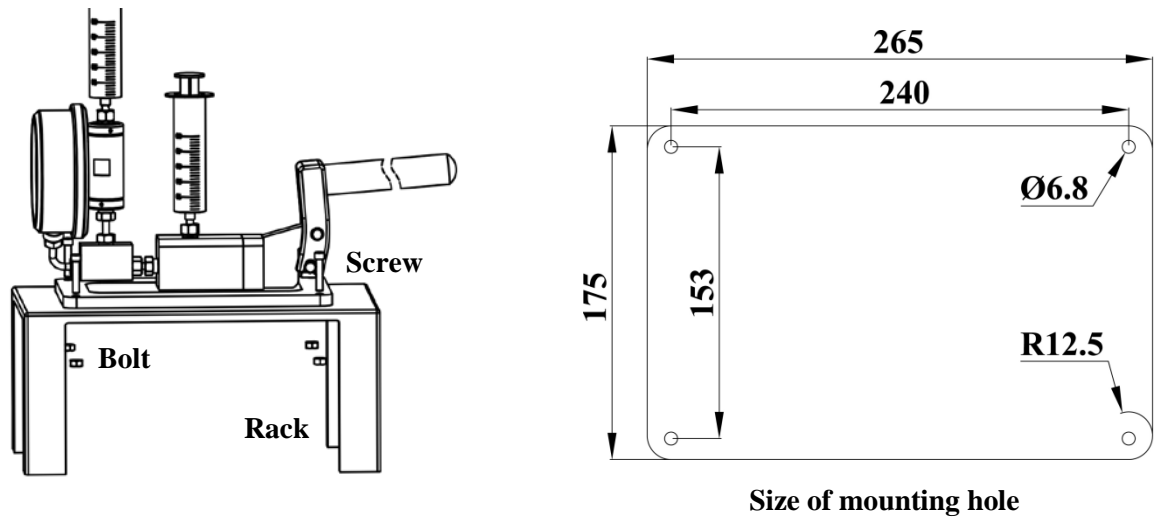


Figure 1

5.2 Assembly of Hand Driven Ultrahigh Pressure Homogenizer

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

Notes: a. Refer to figure 2 for the pump 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.

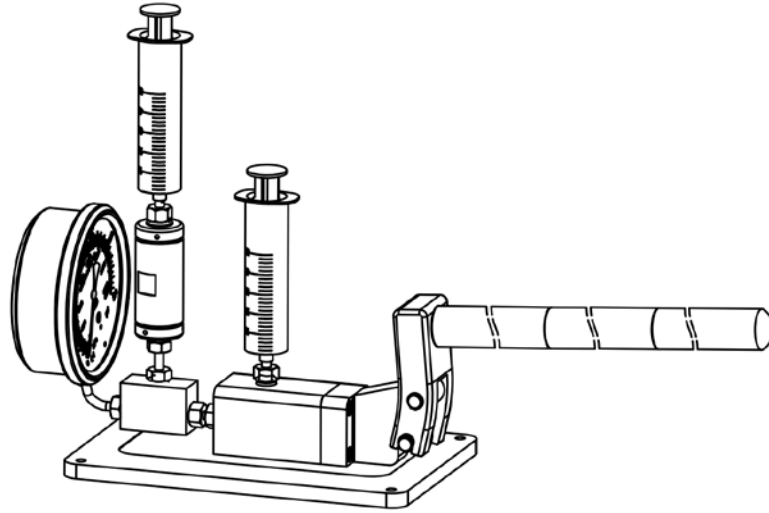


Figure 2

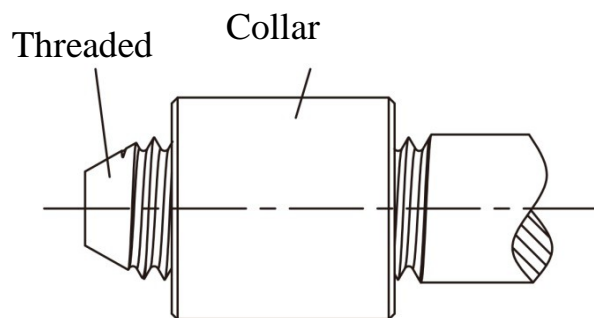


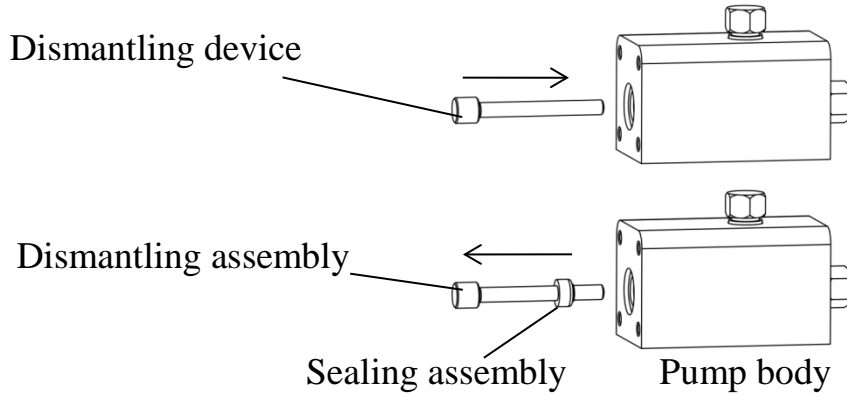
Figure 3

5.3 Dismounting of sealing parts

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

Please refer to the right figure for the dismounting of the sealing parts. First, put the dismantling device into the pump body; second, pull the whole work piece out.

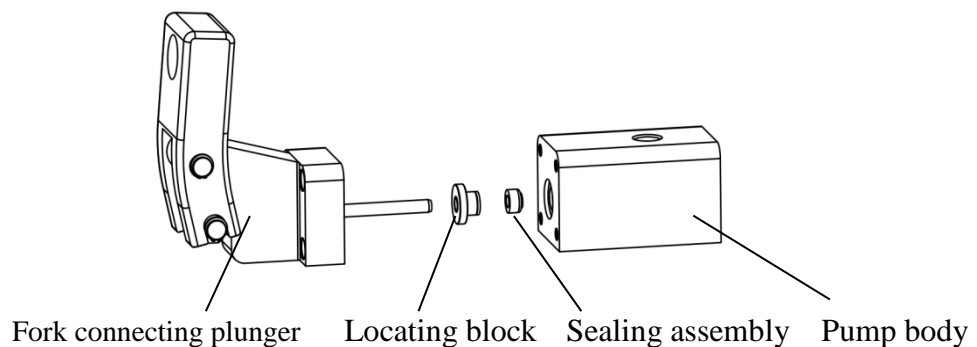
Dismantling of sealing



5.4 Installation of sealing parts

Refer to the right figure 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 locating block into the pump body.

Installation of sealing parts





6. Operation

6.1 Air exhaustion

Once there is air in the system, it is not good for the generation of ultrahigh pressure, so the air needs to be eliminated. The steps are the following:

1. Open the Inlet check valve (turning for about one circle)
2. Operate the reinforcement rod of hand driven ultrahigh pressure homogenizer until the air is fully eliminated.
3. Tighten the Inlet check valve.
4. Check the operation condition of the pump. If the air is not fully eliminated, please repeat the above procedures.

6.2 Operation of Hand Driven Ultrahigh Pressure Homogenizer

Shake the reinforcement rod up and down to operate hand driven ultrahigh pressure homogenizer.

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.

7.4 For high viscous sample, chamber with larger channel and the electric homogenizer such as NanoGenizer and MiniGenizer are recommended.

8. Applications and Tips:

1) Can be used as high pressure pump in sanitary applications such as liposome extruder.

2) Change high pressure gauge with plug for reducing the dead volume.



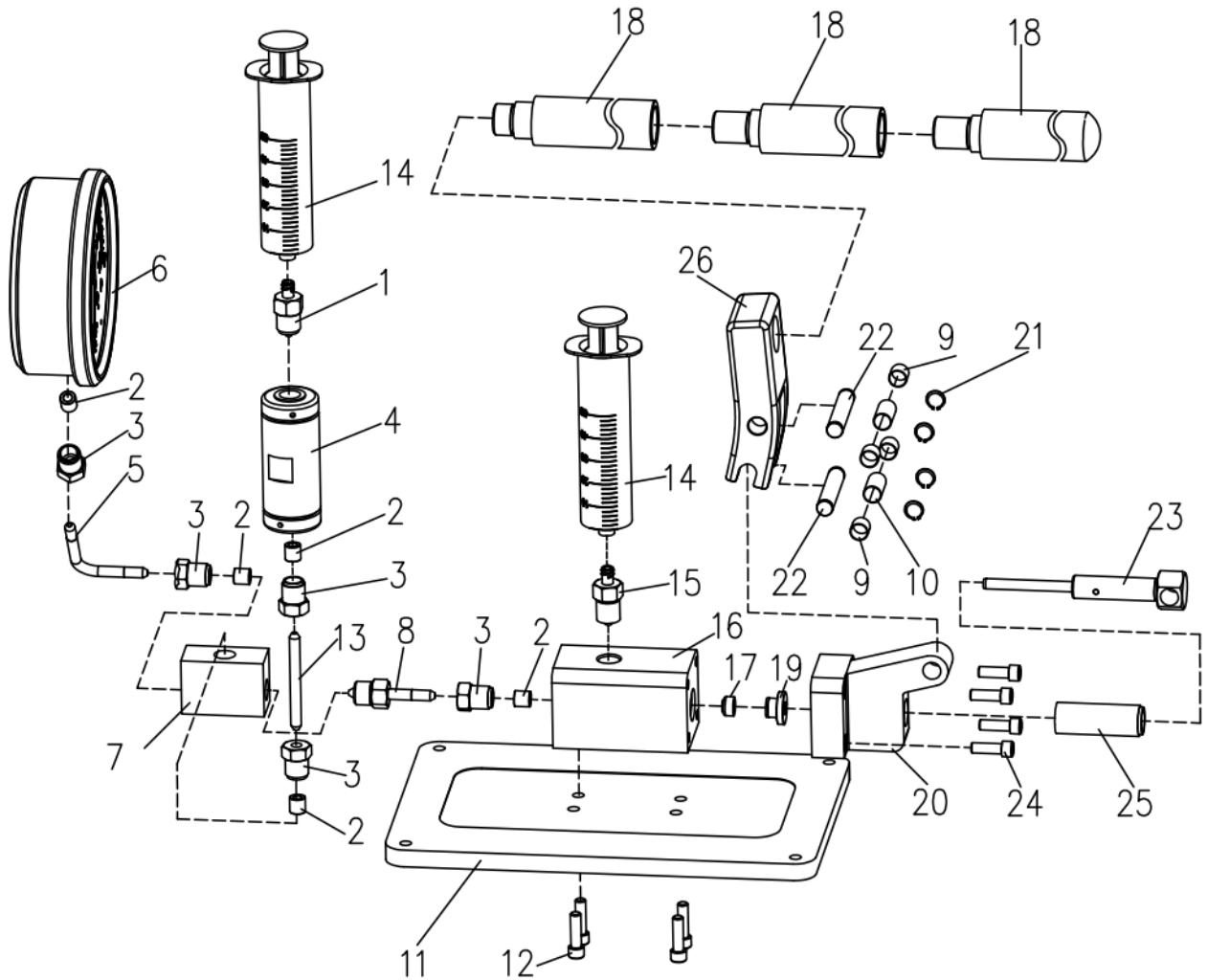
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3) Applications of liposome preparation, cell disruption of Soft

Mammalian Cells, Organelles and Mitochondria, Sperm, Nematodes, E.coli.

Use for quick formulation prescreening of fat emulsion ahead of the high pressure homogenizer driven by electricity. Can't be used as the complete substitute for the electric high pressure homogenizer.

4) Assay Standards: Pump the pure water to the pressure of 20,000psi and above.



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	1	HF4-bent pipe
6	G-YLB-35000	1	Pressure gauge-G35000
7	G-60-23HF4.1	1	HF4-Tee joint-1
8	G-CV-O-00	1	Outlet check valve
9	G-SCR	4	Side copper ring
10	G-HS-005	2	Middle copper ring
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 check valve
16	G-HS-001	1	Pump body
17	G-HSC-6.35-00	1	6.35 Sealing assembly
18	G-HS-007	3	Reinforcement rod
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	PEEK sleeve
26	G-HS-003	1	Fork

Accessories: a kit of dismantling tool, a kit of 6.35 sealing group.

Remark: 1. Small chamber (4) can be replaced by other models.

2. Syringe cylinder can be replaced by other cylinder in other format.

Note: 1. The specification, structure and parameter may be modified without notification. 2. The Dimensions, structure and parameter should be subject to the final product.