20T Electric CIP (Cold Isostatic Pressing) with Protection Cover

CIP-20TA

Operation Manual

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Important Notes

Thank you for purchasing from Materials Technology International Corporation. This manual contains important operation and safety information prepared for those intending on using the equipment. The prospective user is responsible for carefully reading and understanding the contents of this manual prior to operating the equipment.

MTI reserves the right to update or upgrade the product without informing customers of the data change(s) in this manual. Please visit www.mtixtl.com frequently for the latest information and manual.

Warnings

- Never use the isostatic pressing die over 20 T or move it to other pressing machine over 20 T.
- Never let the press hold the target pressure be longer than 8 minutes, the pressure has to be released before the time is up.
- It's normal that the target pressure decreases a little bit during the pressure holding time, so never press the red nor the green button in this period.
- A noise like “ke---ke” is normal and acceptable, when the pressure reaches around 10T,
- Pressure must be completely released first, then make sure the hand wheel and the pressure release valve has been tightened before pressing.
- Never take out the isostatic pressing die with press inside from the protective cover of the pressing machine.
- Lubricate the sliding and moving parts with a right amount of # 30 oil periodically.
- Please always tighten the pressure release valve and retain a little pressure after operation and during storage to avoid air get inside the cylinder and oil channel.

Warranty

MTI Corporation provides one year limited warranty from date that we shipped the goods. If you find any defective part caused by manufacturer please feel free to contact us. We will replace detective part and instruct you how to change the part by yourselves during warranty period. However, MTI Corp is not responsible for any damage or consequence damage caused by misuse. After warranty, MTI will continue to provide technical upport and spare parts at a reasonable cost.

If you have any question, please contact us at info@mtixtl.com or call us at 1-888-5253070. MTI Engineers will instruct you how to use and maintain the machine.

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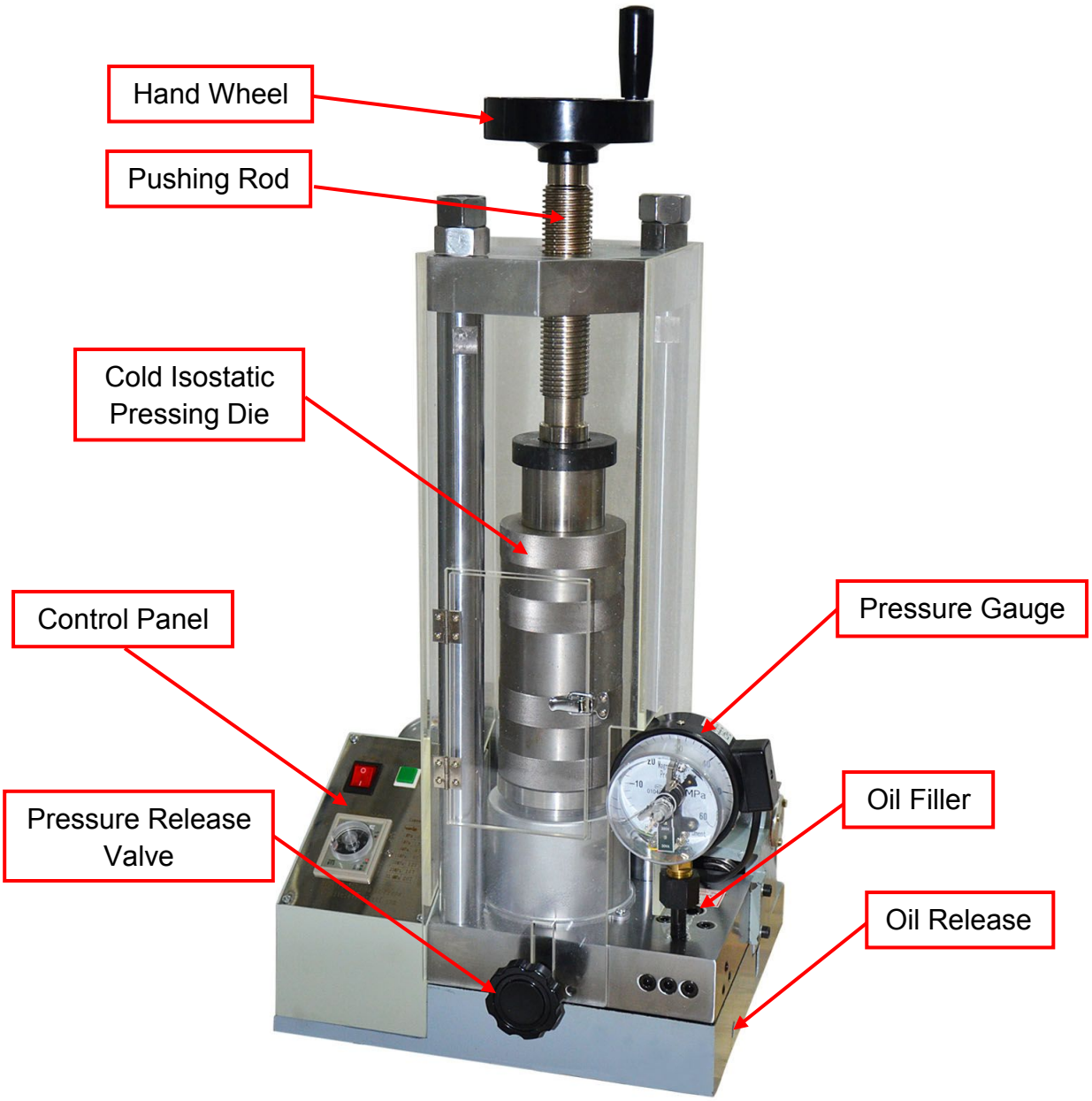
1. Introduction

CIP-20TA is a compact electric cold isostatic presser (CIP). It has a 30mm ID x100mm hydraulic chamber made by ultra strength alloy , which can provide isostatic hydraulic pressure up to 278MPa via a 20T electric hydraulic press. It is excellent CIP for lab material research to prepare high density compound sample easily. CIP-20TA has small footprint and can be placed in glove-box to prepare air-sensitive materials.

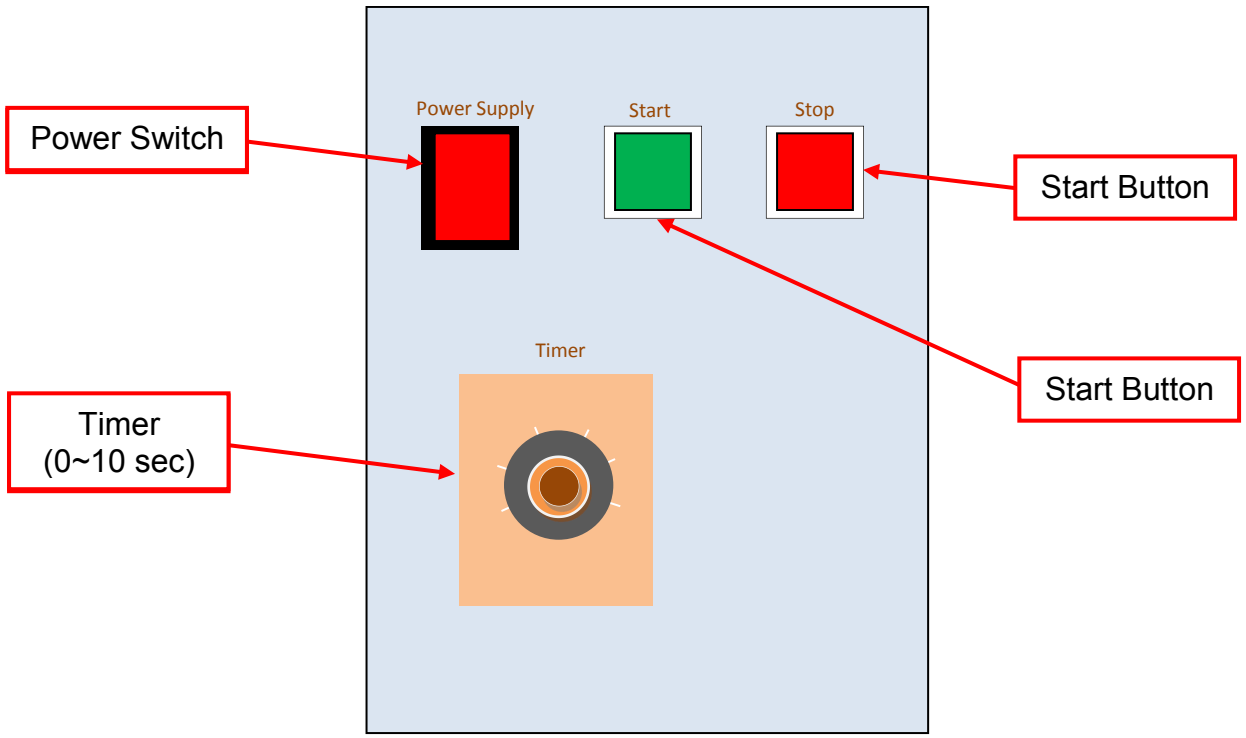
2. Specification

Power	Standard: 208 - 240V AC 50/60Hz (single phase), 180W Optional: 110V-220V transformer (1000W) for using under 110V
Pressure Chamber Size	30mm(ID) x 90mm(H)
Max. Hydraulic Pressure in Chamber	278 MPa (43500 PSI)
Hydraulic Machine	0~20 T(0~33.3 MPa)
Operation Temperature	10~40 °C
Maximum Pressure Holding Time	8 minutes (The time starts from the press reaches the target pressure value and ends by releasing the pressure)
Overall Dimension (including 20T Presser)	440 L x 430W x 560H, mm
Net Weight	100 kg
Warranty	One year

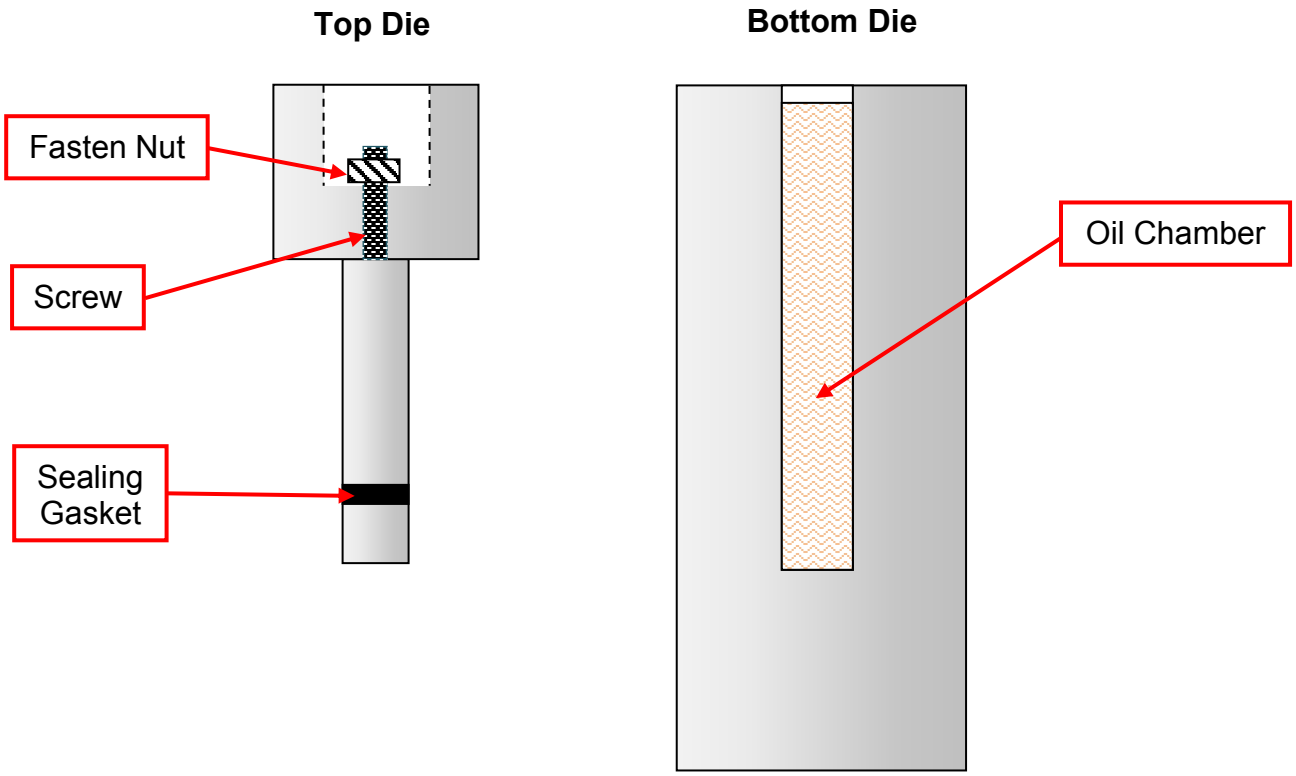
3. Structure


Hand Wheel
Pushing Rod
Cold Isostatic Pressing Die
Control Panel
Pressure Release Valve
Pressure Gauge
Oil Filler
Oil Release

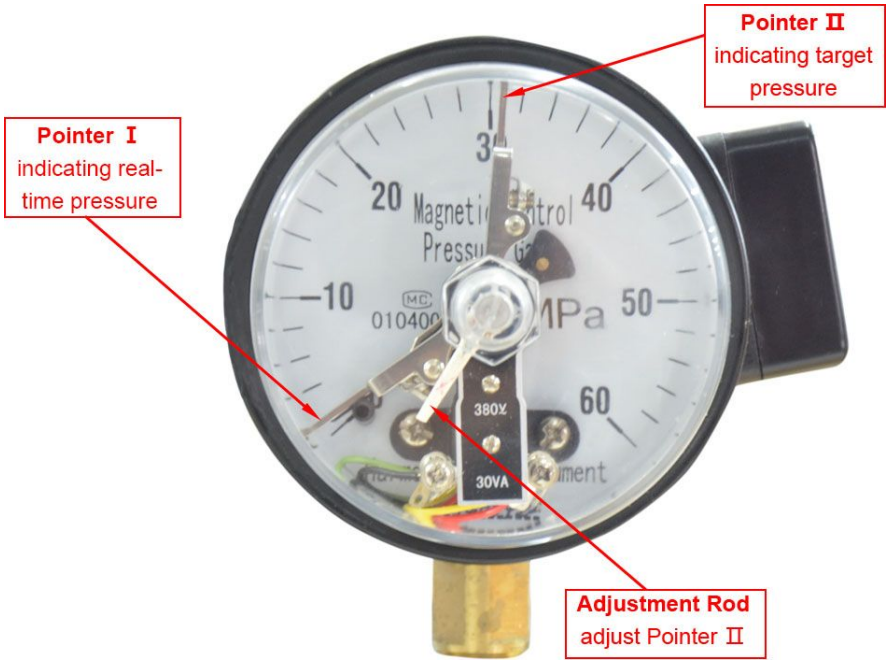
3.1 Control Panel



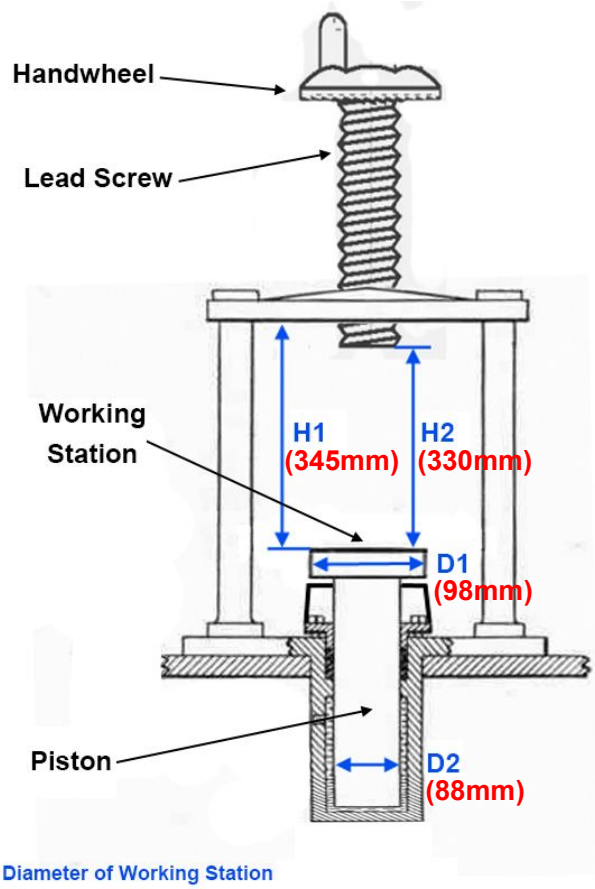
3.2 Cold Isostatic Pressing Die



3.3 Pressure Gauge

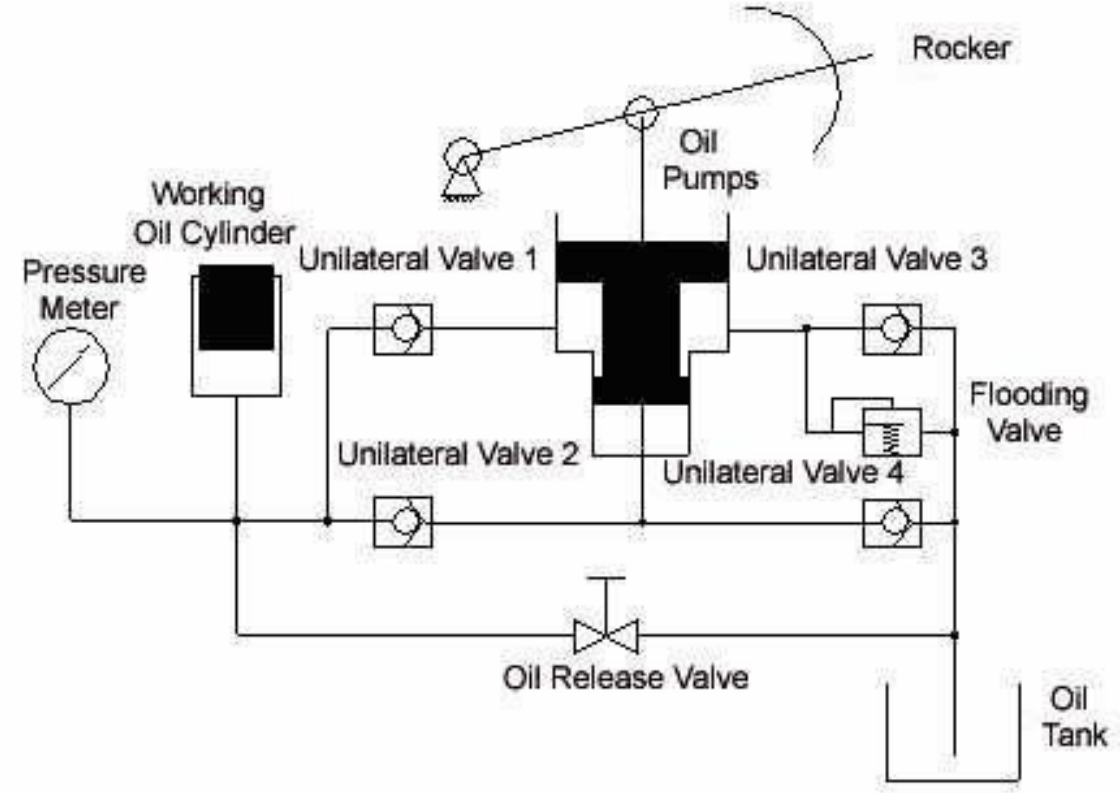


3.4 Dimensions



D1: Diameter of Working Station
D2: Diameter of Piston
H1: Maximum Distance Between Top Supporting Plate and Working Station
H2: Maximum Distance Between Pushing Road and Working Station

4. Hydraulic System Principle



Close the oil release valve and swing rocker. The oil will be absorbed out from oil tank via unilateral 3 and 4, oil pumps and unilateral 1 and 2 into working oil cylinder. The pressured oil will prop up the piston in the working oil cylinder. When the pressure is up to a certain value, the oil in the top oil pump will be flooded out via flooding valve to reduce the working pressure on the rocker. The bottom oil pump will continually pump the pressured oil into the working oil cylinder via the unilateral valves and make the system pressure go up. The pressure can be read out on the pressure meter. Open the oil release valve when the pressure process is done. The oil will be back to oil tank. The working oil cylinder will be back to original position by the spring force.

Pressure converter

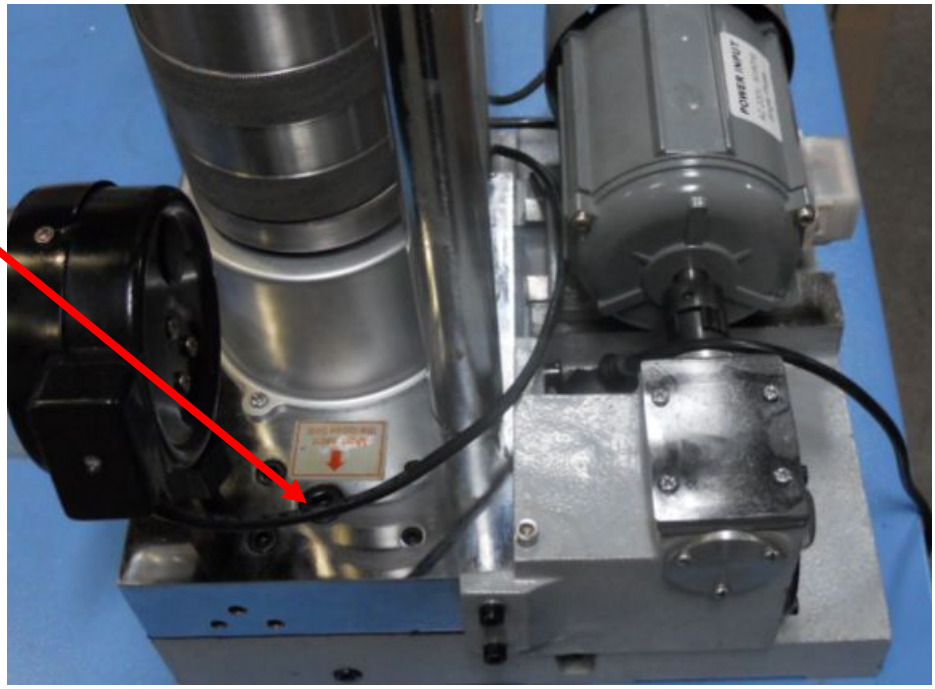
Gauge Display (MPa)	5	10	15	20	25	30	33.4
Cylinder Pressure (T)	3	6	9	12	15	18	20
CIP Die Pressure (MPa)	42	83	125	167	208	250	278

5. Operation

5.1 Before Operation

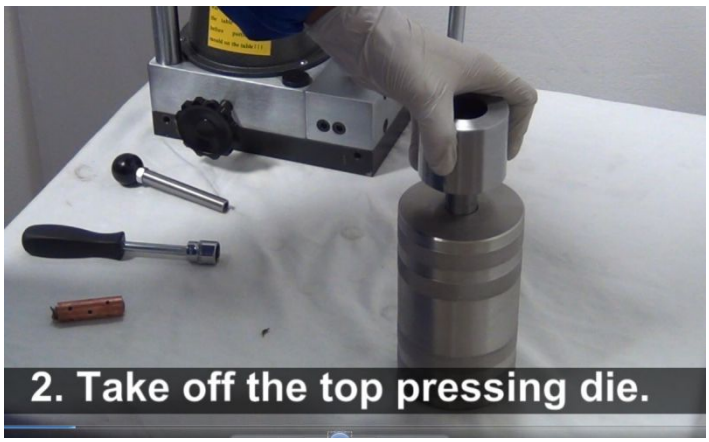
1) Check the voltage of power supply.
2) Check if the power cord is well grounded.
3) Loose the oil filler screw.

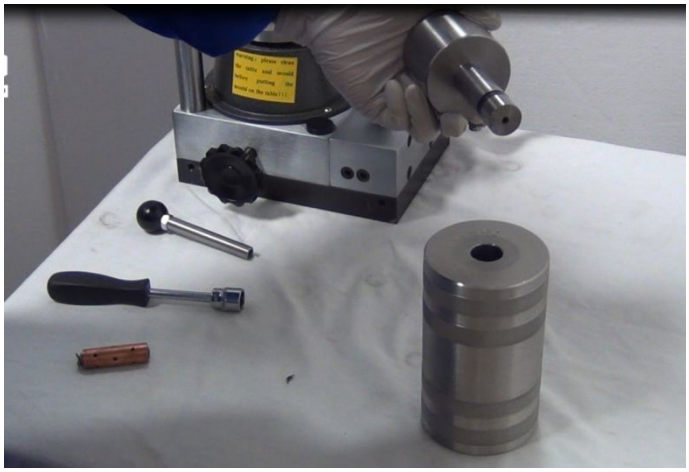
Please turning the screw 1.5 turns counterclockwise to loose the oil filler screw, which keeps the pressure balanced between the oil tank and atmosphere. (No need to completely take it off.)

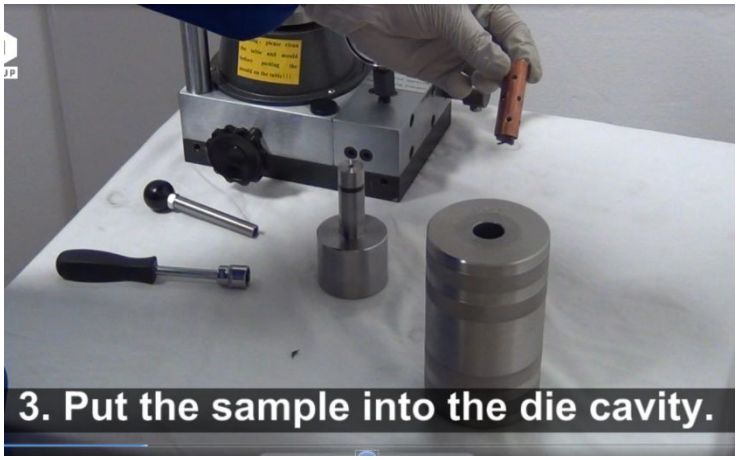


Warning: Please fasten the oil filler screw during the transportation.

5.2 Cold Isostatic Pressing Die Installation

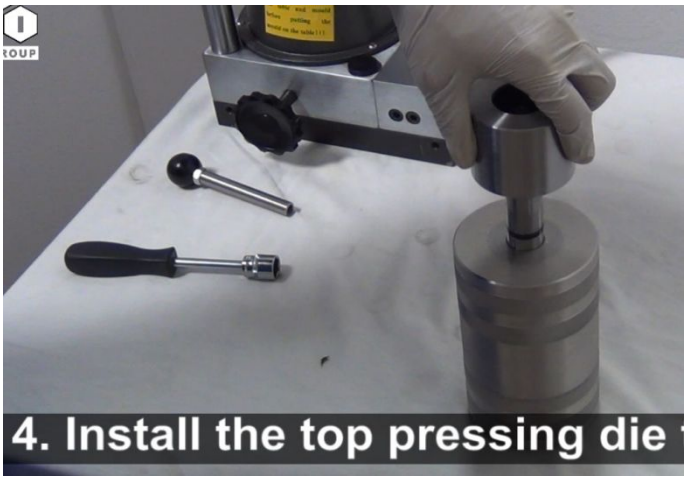






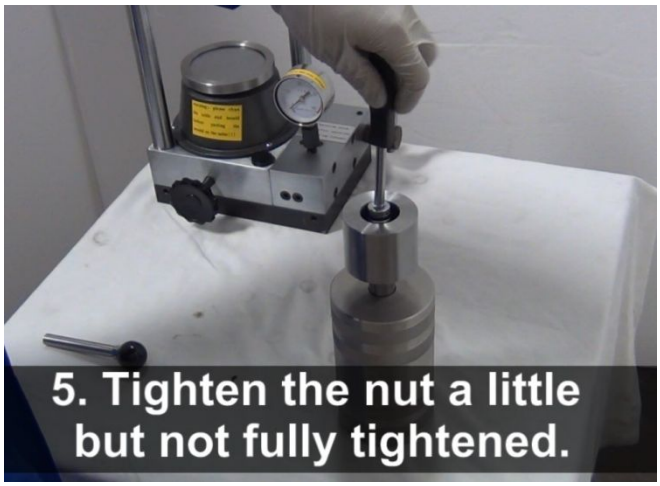
Warning:

You may place your sample (e.g. powder) in a sealed rubber bag or other suitable container for Cold Isostatic Pressing. Please contact your local CIP expert or contact MTI at info@mtixtl.com



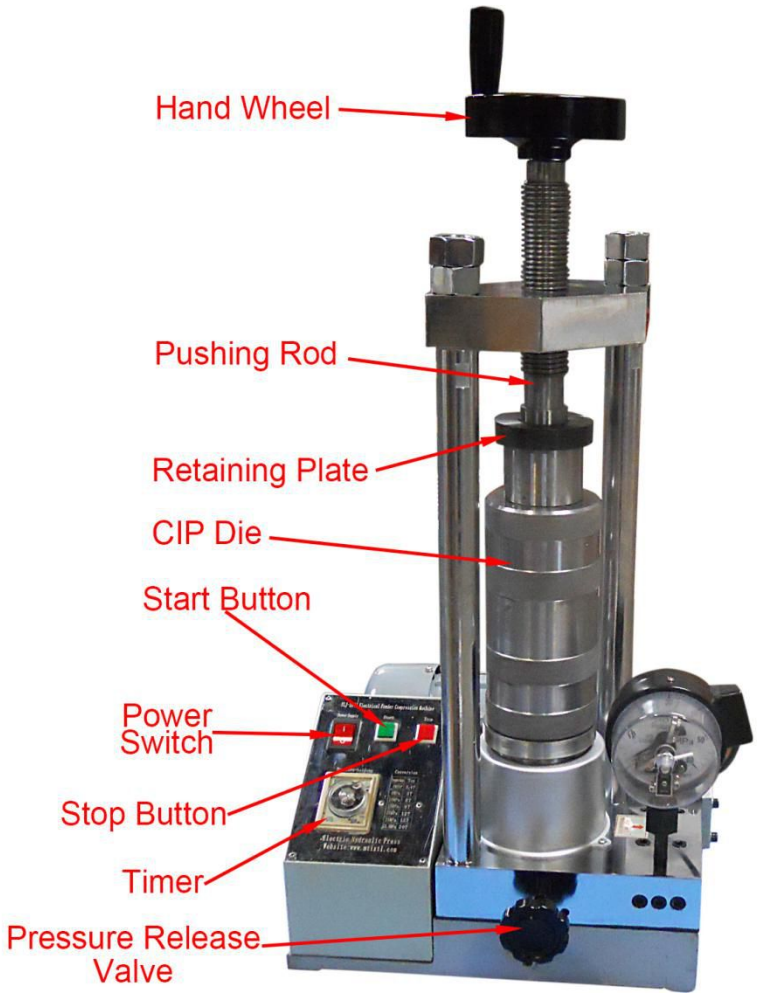
Warning:

- Please check the volume of oil in the Die Cavity (Oil Chamber).
- Fill when it's insufficient. (Hydraulic oil is recommended.)



Now the CIP die is completely installed. You may place the die on the working stage of the hydraulic press.

5.3 Pressing Operation



1) Place the CIP die on the working stage. (Make sure it is located in the center of the stage.)
2) Put the retaining plate on the top of the CIP die.
3) Turn the hand wheel clockwise until the pushing rod touches the retaining plate.
4) Install the protective cover.
5) Fasten the pressure release valve.
6) Set the target pressing pressure in the pressure gauge. (The max. pressure is 33.3 MPa)
7) Set up the pressure holding time by adjusting the timer, the machine will retain the pressure after it reaches your target pressure. (The max. pressure holding time is 8 min.)
8) Press the “Power” switch. The machine is on.
9) Press the “Start” button. The motor starts to work and the pressure of the gauge increases to the set value. (Press “Stop” button any time if you want to terminate the process.)
10) When the holding time is up. Please press the “Stop” button and “Power” button to turn the machine off.

Warning: After press the “Stop” button, Never press the “start” button to reincrease the pressure without completely releasing the pressure of the machine.

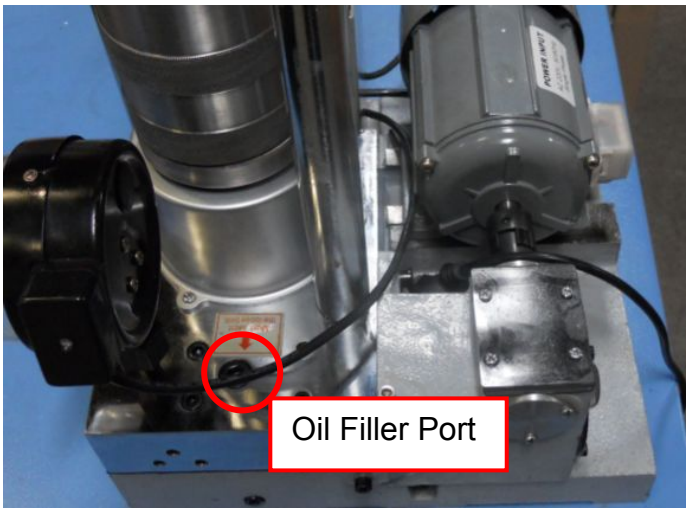
11) Loose the pressure release valve and the pressure will be released quickly.
12) Turn the hand wheel counterclockwise to detach the pushing rod and the retaining plate.
13) Please keep the CIP die staying on the working stage for another 10 minutes and then take it out of the stage.

Warning: Never take the die out of the stage immediately if the pressure is still kept inside the die.

14) Loose the top CIP pressure die nut.
15) Take off the top CIP pressure die.
16) Take out your sample.

6. Maintenance and Troubleshooting

➢ **How to add the hydraulic oil?** (Frequent operations of the machine may result in the phenomenon that the level of the hydraulic oil is lower than the required level, which causes no pressurization.)



a. Remove the screw of the oil release port.
b. Insert a probe from the hole of the oil-filling part to determine the depth of the oil (no less than 1 cm).
c. It is recommended to fill the oil until 3~4.5 cm in the oil pool.

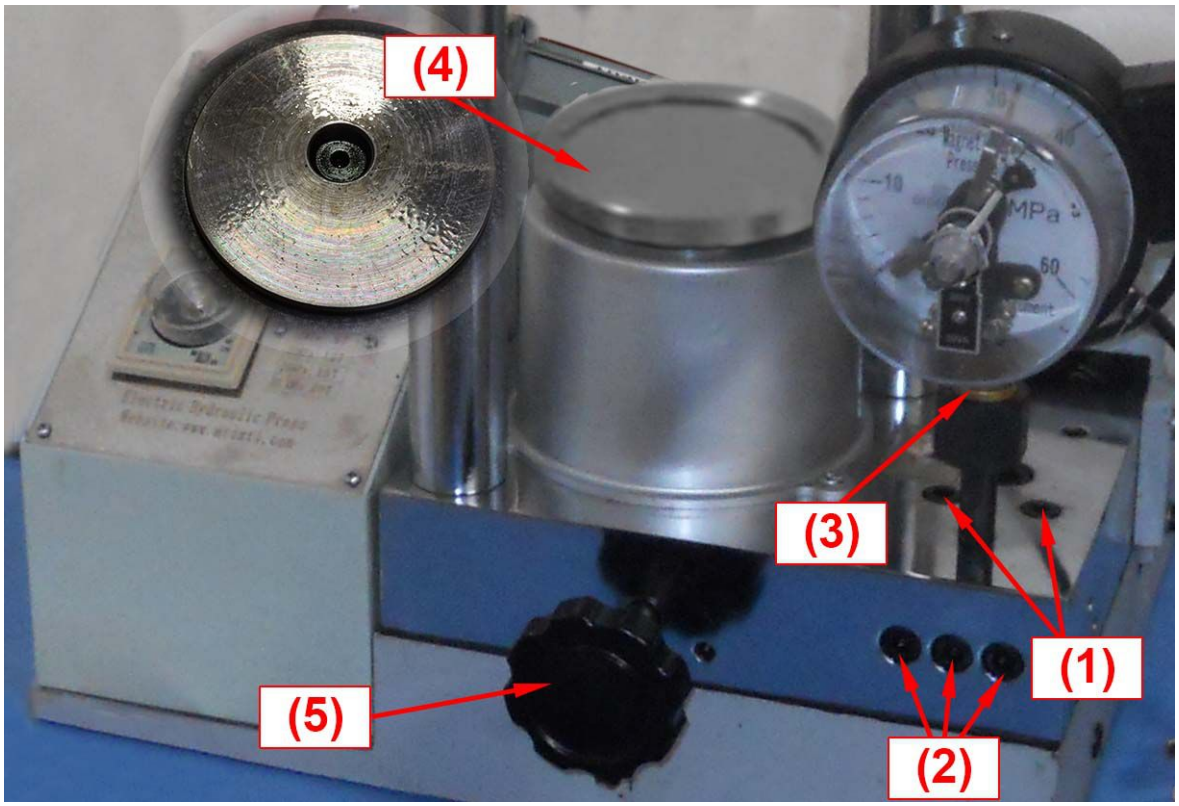
➢ **How to change the hydraulic oil?** (After a long time operation, you may need to change the hydraulic oil.)

a. Remove the screws of the oil release port and oil filling port to release oil
b. Fasten the screw of the oil release and refill the new hydraulic oil in oil filler port.
c. Get rid of the residual gas in the machine according to the below steps.

➢ **How to deal with a loosened nut?**

a. Loosen the M20 nut in the upper metal board.
b. Tighten the two columns with a wrench.
c. Tighten the fixative nuts above the columns.

➢ **How to get rid of the residual gas of the hydraulic press machine.** (The machine may not rise pressure or maintain the target pressure with the residual gas in it.)



1) To get rid of the residual gas in Region 1.

a. Loosen the two screws of the Region 1 to be connected to atmosphere. (No need to completely take it off.)

b. Start the machine as usual steps. (Please refer to the section "**5.3 Pressing Operation**".)

c. Tighten the two screws of the Region 1, when the hydraulic oil spill over them, just a little.

d. Stop the machine and loose the pressure release valve. (Please refer to the section "**5.3 Pressing Operation**".)

2) To get rid of the residual gas in Region 2.

The same as "1)".

3) To get rid of the residual gas in Region 3.

The same as "1)".

4) To get rid of the residual gas in Region 4.

a. Remove the bottom plate of Region 4 and you can see the screw below it.

b. Loosen the screw.

c. Start the machine as usual steps. (Please refer to the section "**5.3 Pressing Operation**".)

d. Tighten the screw, when the hydraulic oil spill over it, just a little.

e. Stop the machine and loose the pressure release valve. (Please refer to the section "**5.3 Pressing Operation**".)

5) To get rid of the residual gas in Region 5.

a. Rotate the machine 90 degrees to make the pressure release valve be the top of it.

b. Loose the pressure release valve.

c. Start the machine as usual steps. (Please refer to the section "**5.3 Pressing Operation**".)

d. Tighten the pressure release valve, when the hydraulic oil spill over it, just a little.

e. Stop the machine and loose the pressure release valve. (Please refer to the section "**5.3 Pressing Operation**".)

Notice:

① When the machine have not been used for a long time, you can completely get rid of the residual gas referring to the above steps. And even repeating the above steps are necessary if the machine has too much residual gas.

② If the machine is used frequently, firstly you can operate according Step " 5) " and repeat it for several times to get rid of the residual gas in the pressure release valve. If the machine still has the residual gas, you can get rid of the residual gas in other regions as the above steps.

➢ **How to get rid of the foreign body of the hydraulic press machine.** (The machine may not rise pressure or maintain the target pressure with the foreign body in it.)

1) To get rid of the foreign bodies in the Region 1.

a. Loosen and remove the two screws of Region 1, and clean them.

b. Remove the spring and ball with a magnet iron stick, and clean them.

c. Absorb the two holes of the Region 1 with a magnet repeatedly to get rid of the foreign bodies inside.

d. Start the machine as usual steps. (Please refer to the section "**5.3 Pressing Operation**")

e. Stop the machine and loose the pressure release valve, when the hydraulic oil spill over the two holes of Region 1, just a little.
f. Repeat Step “d” and “e” for several times until the foreign bodies are completely removed.
g. Assemble the clean spring, ball and screws according to the previous procedures.
h. Get rid of the residual gas in Region 1 according to the above steps.

2) To get rid of the foreign bodies in Region 2.

The same as “1)”.

3) To get rid of the foreign bodies in Region 3.

The same as “1)”.

4) To get rid of the foreign bodies in Region 4.

a. Remove the bottom plate of Region 4 and you can see the screw below it.
b. The following operations are same as “1)”.

5) To get rid of the foreign bodies in Region 5.

a. Rotate the machine 90 degrees to make the release valve be the top of it.
b. Loose and remove the pressure release valve and the red-copper airtight gasket, and clean them.
c. The following operations are same as “1)”.

Notice:

When the pressure of the machine reduces dramatically after reaching the target pressure, the foreign bodies most likely exist in the pressure release valve. Firstly you can get rid of the foreign bodies in the pressure release valve according to the Step “5)”. If the machine still can not rise pressure or maintain the target pressure, you can get rid of the foreign bodies in other regions according to the above steps.

If any questions please contact us 1-510-525-3070 or email info@mtixtl.com, we will help you out within 24 hours.