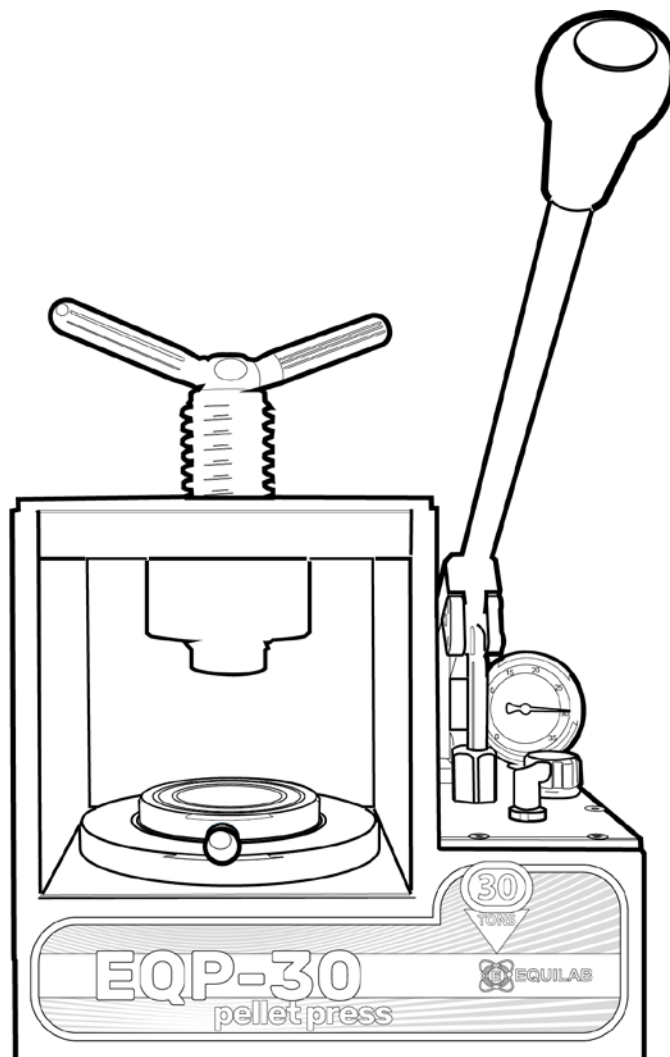


MANUAL HYDRAULIC PELLET PRESS

EQUILAB EQP-30

User Manual



INDEX

Safety measures EQP-30 Manual Hydraulic Pellet Press	5
Generalities	7
Cracks in the pellet	8
Binding agents	9
Technical characteristics	11
Installation	12
Press components	13
Accessories	14
Preparing to work with the press	15
How to use the press	16
Important	20
Removing the piston cover	21
Maintenance / Technical service	23
General disassembly	24
Disassembly of the piston	25
Right hand side disassembly 1	26
Right hand side disassembly 2	27
Pump and closure disassembly	28



MEDIDAS DE SEGURIDAD AL TRABAJAR CON LA PRENSA PELETIZADORA HIDRÁULICA MANUAL EQP-30

- Lea este manual antes de realizar cualquier operación con su prensa.
- La prensa EQP-30 ha sido concebida para elaborar pellets ejerciendo una presión de 30 toneladas. Cada prensa EQP-30 incluye una válvula de seguridad que liberará automáticamente cualquier nivel de presión superior a 34 ó 35 toneladas. Aunque lo intente nunca podrá mantener niveles de presión superiores a 32 toneladas.
- No introduzca manos ni parte alguna de su cuerpo en la zona de trabajo.
- Asegúrese de que la unidad esté correctamente posicionada y centrada antes de iniciar la operación.
- El incumplimiento de estas medidas de seguridad puede ocasionar daños al usuario, la prensa o a alguno de sus componentes.

SAFETY MEASURES FOR THE MANUAL PELLET PRESS EQP-30

- Read this manual before carrying out any operation with your press.
- The EQP-30 press has been designed to produce pellets with a pressure of 30 tons. Each unit of EQP-30 press includes a safety valve that will automatically release any pressure level greater than 34 or 35 tons. Even if you try, you will never be able to hold pressure levels higher than 32 tons.
- Do not put your hands or any other body part in the operations area.
- Make sure that the tool is positioned and centered correctly before starting.
- Failure to comply with these safety measures may cause damage or injury to the user, the press, or some of its components.

The EQP-30 Manual Hydraulic Pellet Press is a unit especially designed to prepare beads/pellets for their subsequent analysis by XRF.

The preparation of pellets is a common technique that enables the user to handle the samples with ease, as well as obtaining repeatable analytical results.

The technique consists in compressing the particles of the powder sample (by itself or with a binding agent) until obtaining a perfectly homogeneous pellet with a flat surface, mechanically robust and without cracks or dust that may be released easily.

There are some points that we must consider when preparing the pellet:

Strength/Pressure

It is actually quite common to confuse STRENGTH with PRESSURE or viceversa, these are related to each other as:

$$\text{Pressure} = \text{Strength} / \text{Surface}$$

The pressure is usually stated in Kg/cm² or in ton/in².

In our case, the pressure (Kg/cm²) supplied by the hydraulic pump will provide a strength of 10, 15 or 20 tons (depending on the model) on the surface of the sample.

If we use the pressure units, the strength applied in the pressing of the pellets will depend on the size of the same, therefore we think that it will be more useful if we explain ourselves with strength units (ton).

To obtain repeatable analytical results, it will be essential that all the samples are prepared and pressed in the same way, and always with the same strength.

Pellets made of the same sample but with different compacting strength, will produce different RX intensities, and therefore, different analytical results.

For this reason, it will be more convenient to use the strength units rather than the pressure ones, and thus avoid mistakes due to the different size of the pellets, especially in tests carried out by different laboratories on the same samples.

Cracks in the pellet

One of the most common issues when preparing the samples are the cracks caused in the pellets after their decompression.

Some of the most common causes of cracks are the following:

1. Compacting Pressure:

The recommended pressure for the majority of samples is 20 ton.

It will be necessary to produce several pellets until finding the adequate pressure for each type of sample.

2. Pressing time:

This is the time we have to keep the sample subject to the selected strength to achieve the complete compacting of the powder particles.

Times between 5 and 10 seconds are generally enough for most of the samples.

3. Milling:

The size of the particles is an important point when preparing a pellet.

In most of the powder samples, we could find particles of very different shapes: oblong, round, etc. We can also find varied hardness.

If the particles are too big, the preparation of the pellet will prove very difficult. It might cause even quite often cracks appearing in the pellet.

We recommend to mill the sample to a analytical grain size of $\leq 200\mu m$.

EQUILAB recommends

EQR-200 Vibratory Disc Mill



Initial sample size: \varnothing 15 mm
Final sample size: \varnothing 50 μm

EQM-402 Ball Mixer Mill



Initial sample size: \varnothing 1,5 mm
Final sample size: \varnothing 10 μm

Binding agents

To obtain beads more easily and with a higher degree of compaction, generally we use binding agents, which makes the manufacture of the pellets more comfortable.

Waxes (stearic acid)

Wax is the most widely used binding agent. It helps to obtain a good result with the majority of the samples.

The wax is mixed with the sample during the milling process, to a percentage of between 5 and 10%.

EQUILAB recommends

EQP-WAX – Wax C for pellets RX – Bottle of 1kg
EQP-CAS – Aluminium cups Ø 40mm x 12 mm – pack of 1000 ud

Boric Acid

It is heat resistant and very abrasive. Used generally with samples that tend to melt during the milling process.

This acid is mixed with the sample during the milling process, to a percentage of between 5 and 10%.

EQUILAB recommends

EQP-BORA – Boric Acid – Bottle of 5 kg

MANUAL

USER GUIDE

This User Guide has been issued to inform the users about all the possibilities available with the **EQP-30** press.

This technical data will allow the user to get the most from their unit, undertaking reliable and safe pressing procedures, both for the user and the unit.



It is essential to read this Guide before starting to work with the EQP-30 press



Technical characteristics

The **EQP-30** has got the following elements:

- Machined carbon-steel base.
- A gantry: made by two steel walls that fit on the said base, and a spindle.
- An hydraulic circuit.

In order to know the pressure exerted by the press at each given moment, the tool has got an easy to read analog gauge.

Height	410 mm
Width	315 mm
Depth	200 mm
Diameter of the table	95.5 mm
Useful height	96.4 mm
Useful width	178.5 mm
Piston stroke	19.4 mm
Piston diameter	120 mm
Weight	56 kg
Maximum pressure admitted	280 bars (4026 psi) – 32000 kg
Maximum recommended pressure	260 bars (3775 psi) – 30000 kg

On arrival

If the unit must be stored for some time before its installation, please keep it in dry place away from heat sources and areas where it could be battered.

As a first measure, a visual inspection of the packaging must be carried out in order to ensure that the unit has not suffered any damages on transit.

If there was any damage to the packaging, please contact immediately your supplier before unpacking the unit.

If the packaging is fine, please unpack the unit, removing the upper lid of the box and afterwards the side panels.

NOTE:

Please keep the box for some time in case any issue would arise and you would need to return the press to the supplier.

Please check that all the elements are present and that all the requested accessories have been included with the unit.

If the supply is not complete, or there is any faulty item, please contact immediately with the supplier and inform of the issue.



Given that the press weighs 56 kg we recommend that the unit is taken to the place where it will be installed using adequate means.



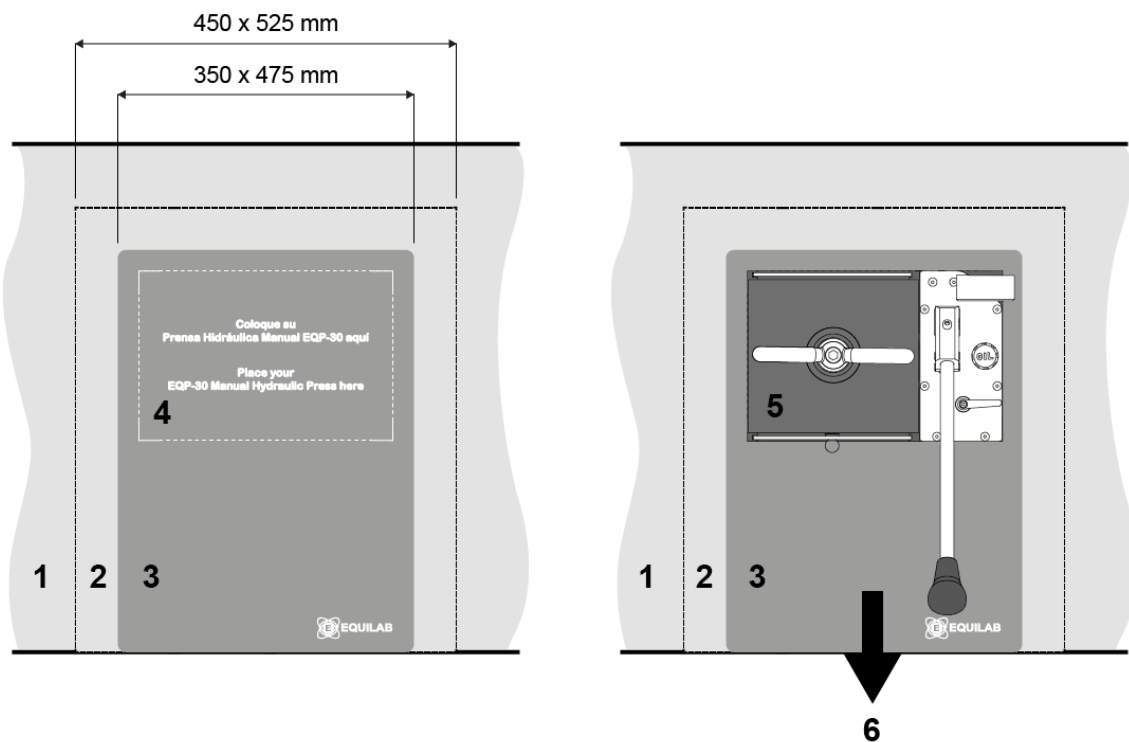
Installation

For a correct installation, the press must be placed on a surface as flat as possible. Do choose a solid and stable surface – please remember that the press weighs 56 kg. It must be installed in a clean and dry area, away from heat sources and passageways.

In order to ensure the stability of the **EQP-30** no legs are attached to the base. A non-slip silicon mat is provided with the unit. This mat will serve as base to the press and also as easy clean working area. Put the mat in the place destined to the press, and follow the instructions written in the mat to place the press on it – please bear in mind that the press is built with very solid materials and weighs 56 kg, you may need some help to lift it and place it in the marked area -.

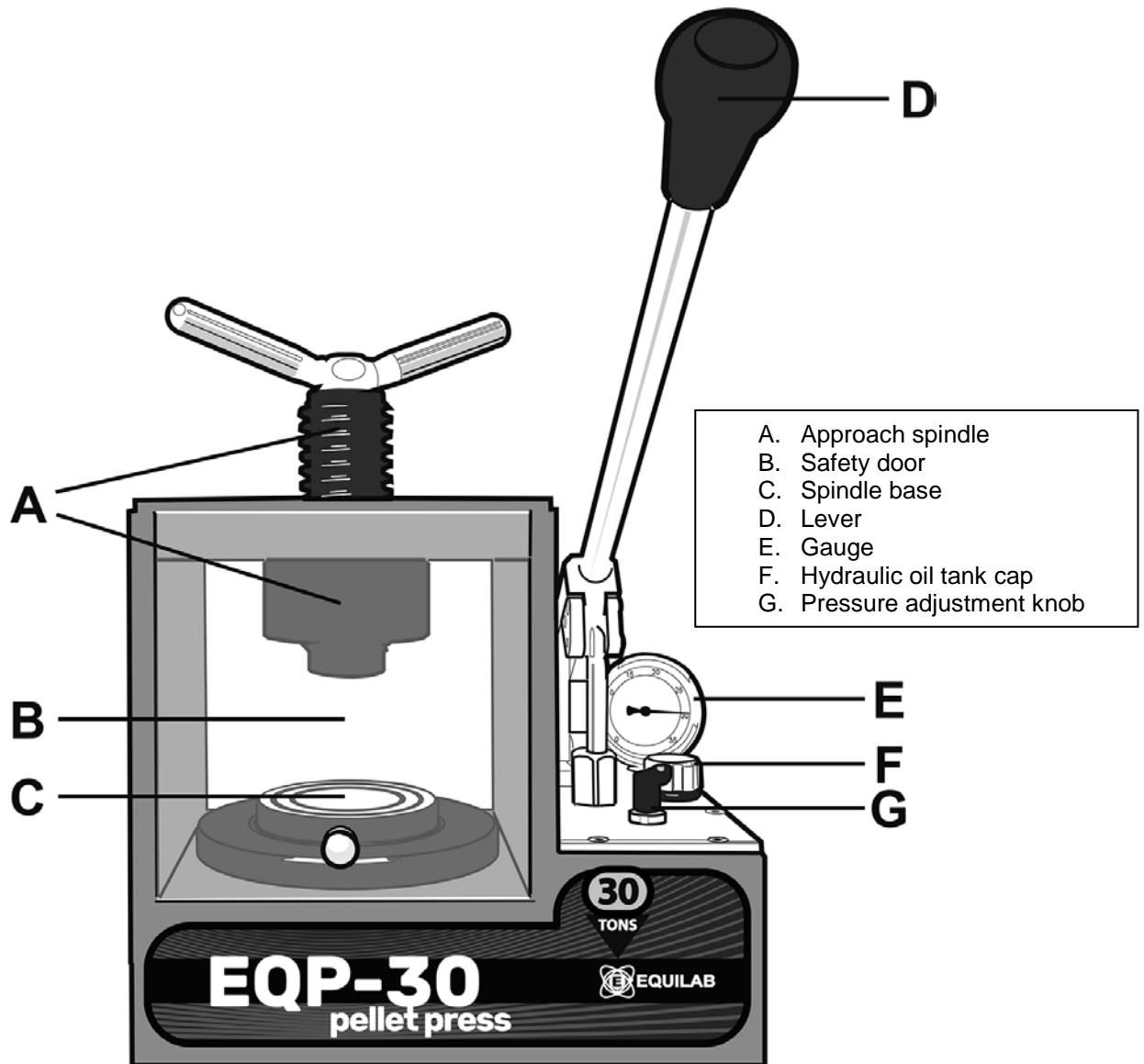
To avoid unnecessary efforts to the user, the press must be placed as close as possible to the processing and sampling table.

Correct installation of the EQP-30 press (top view):



- 1 – Work table.
- 2 – Minimum working space recommended.
- 3 – **EQP-30 Press non-slip mat.**
- 4 – Space reserved to place the **EQP-30 Press**.
- 5 – **EQP-30 Press** (top view).
- 6 – Border of the table and location of the user.

Press components

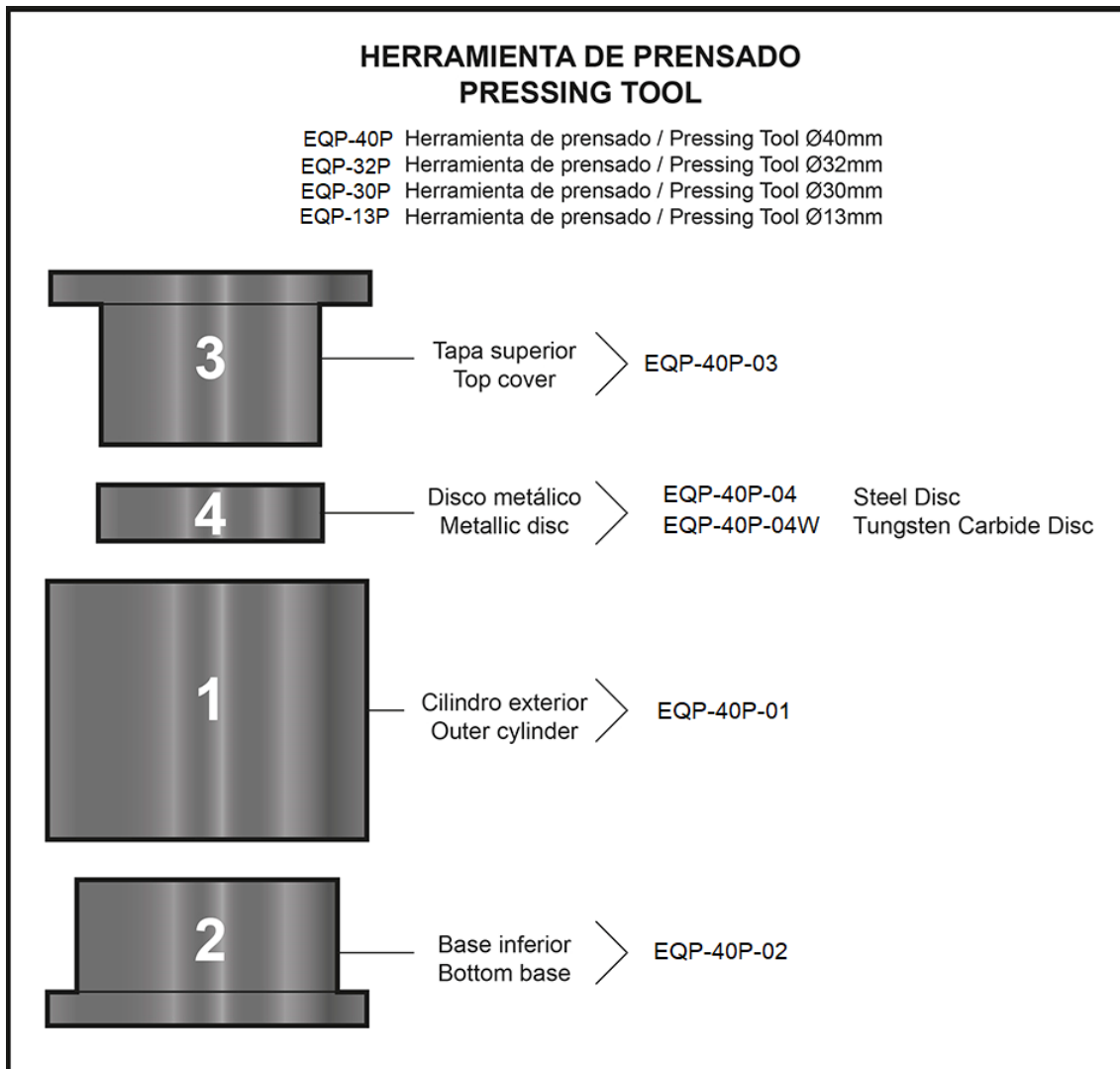


Accessories

This is a very versatile press as it can prepare pellets/tablets of different diameters just by changing the pressing tool – also called pellet die -.

Although the most common pellet/tablet diameters are 40 and 32 mm, Equilab also offers pressing tools for other diameters.

We also have got steel ring pressing tools. This tool is generally chosen to include it in automated processes.



Preparing the press for working

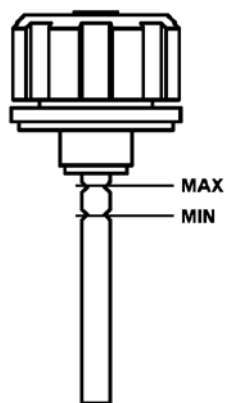
Hydraulic oil tank cap



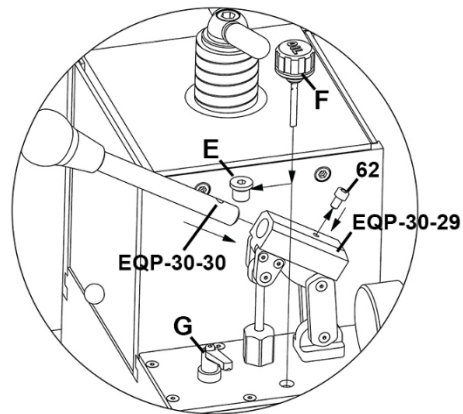
To avoid possible oil leaks during transportation, The EQP-30 Manual Hydraulic Pellet Press is supplied with a 1/4" cap (EQP-30-57). **As told previously, the only purpose of this cap is to avoid oil leaks during transportation and must be replaced before starting to use the press.**

Once the press is received, the packaging has been visually checked, and confirmed that all the requested accessories have also arrived, the press is ready to be installed. The process is the following:

- Place the non-slip mat (EQP-30-56) in the place where the press will be installed.
- The mat has got some safety markings within which the press is to be placed. These marks have been especially designed to avoid the unintentional overturning of the press in case an excessive pressure is applied on the lever. This rule must always be respected. Please place the press inside the marked area.
- Afterwards, remove the cap located opposite the gauge (E) and replace it by the air breather cap with the rod (F) (see picture 1).



Picture 1



- To release the pressure of the press turn the Pressure Knob (G) anticlockwise. This lever has got a double action system, please try by pulling it upwards: this way you can change the initial starting position of the turn, making it easier.
- Installing the lever: remove the upper screw (62) from the Upper Lever Holder (EQP-30-29). Insert the lever taking care to make coincide the holes in the lever (EQP-30-30) and in the holder (EQP-30-29). Screw the lever to fix it.

Hydraulic oil measure

Before starting to work, it is important to check the measure of the oil in the tank.

This is made as follows:

- 1°. First release the pressure turning the Pressure Knob (G) anticlockwise.
 - 2°. Place a pressing tool between the Approximation Spindle (A) and the Spindle Base (C); turning the Pressure Knob clockwise we will push the piston down to its lowest position.
 - 3°. Push down the lever (D).
 - 4°. Unscrew the air breather cap (F) and clean the measuring rod.
 - 5°. Screw back the cap (F) firmly with the rod now clean.
 - 6°. Unscrew again the cap to check the oil level. If it is between the minimum and maximum levels, we can place it again and start working.
- If the oil level is over the maximum, it is necessary to remove some oil, whether with a pipette or opening the screw (EQP-30-51) located under the oil tank, taking care to put some recipient below to collect the excess oil.

If on the contrary the level is under the minimum recommended, add oil using the device provided. Check the oil level again if you have had to decrease or increase the same.

How to use the press

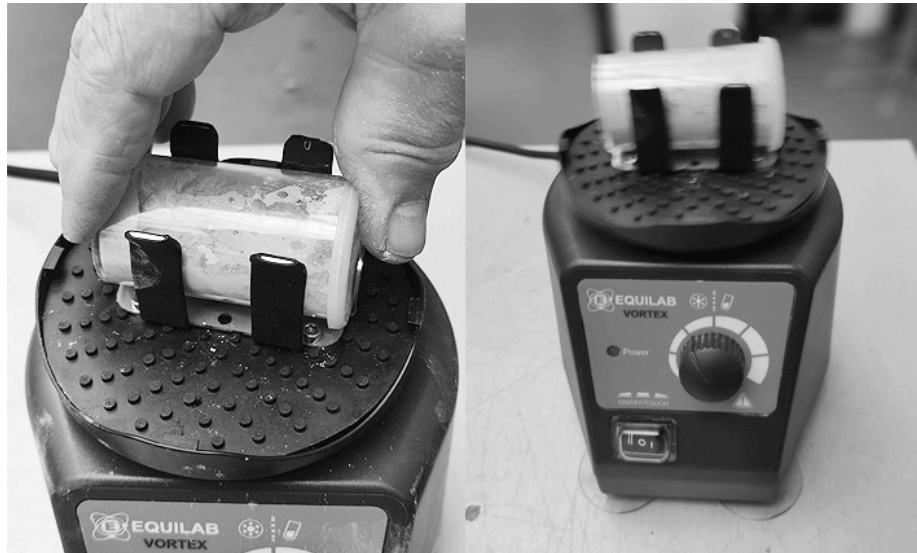
1. Mix the sample with the binding agent. The recommended method is to use a Vortex stirrer to homogenize sample and binding agent quickly, comfortably, effectively, and in a repeatable manner.
The vortex Equilab is the most appropriate to help you prepare samples for pressing, as it includes a holder for accessories especially designed to mix and homogenize samples.



2. Mix the sample with the binding agent in the vessel provided with the **Vortex EQUILAB EQ-VO**. Then place within the steel balls also supplied.





3. Cover the vessel and insert it in the special holder the EQUILAB Vortex has got. Press the tilt selector switch to position 2 and set the appropriate speed – the unit offers a range from 0 to 3000rpm -, keep the sample stirring for 30 to 60 seconds. Your sample is now correctly mixed and homogenized.



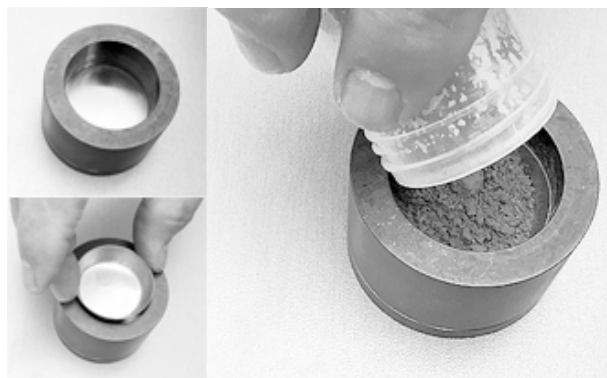
EQUILAB recommends

**Vortex Stirrer
EQ-VO**



To mix and homogenize solid and liquid samples quickly and comfortably.

4. Once the sample is homogenized, remove the top cover of the pressing tool and place an empty aluminium cup. When the cup is in place, put the mixture in.



- Place the metallic disc (coin) directly over the sample. Then put in the top cover in the cylinder.



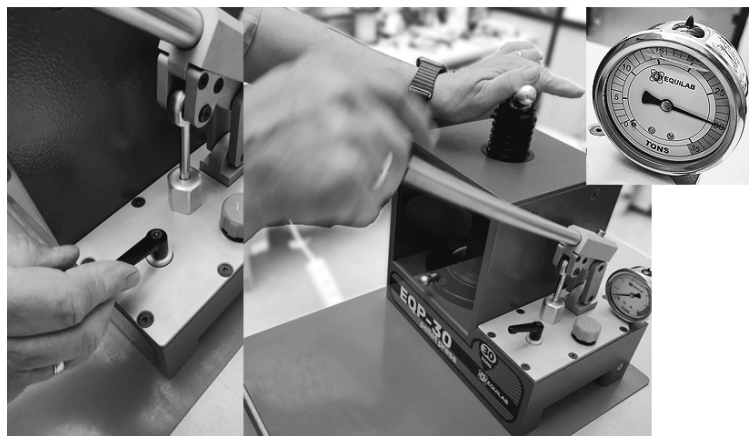
- With the pressure knob (G) completely open (two turns) place the pressing tool in the base of the spindle (C) taking care to put the tool in the centre: you can use the concentric rings engraved in the base. Move the spindle (A) to touch the tool and then continue pressing until the base (C) reaches its lowest level before undertaking the pressing process.



UNDERTAKING THE PRESSING PROCESS WITHOUT HAVING BROUGHT DOWN THE PISTON MAY DAMAGE THE UNIT.



- Close the pressure knob (G) and start manual pumping. Do control with the manometer the applied pressure (maximum recommended 30 tons). Keep the chosen pressure for at least two minutes to ensure a good compaction of the pellet.



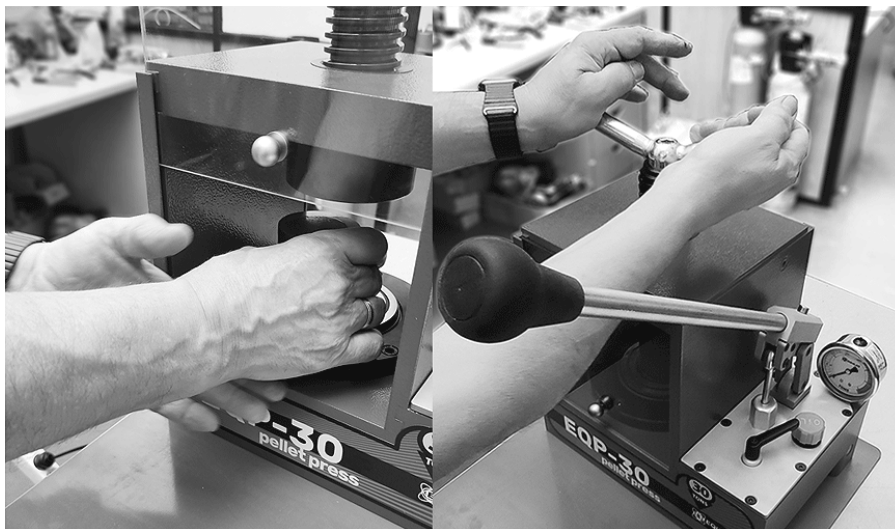


THE EQUILAB EQP-30 MANUAL HYDRAULIC PELLET PRESS INCLUDES AN AUTOMATIC EXCESS PRESSURE RELEASE SYSTEM, WHICH WILL START AUTOMATICALLY WHEN REACHING 32/33 TONS. THAT WAY THE UNIT WILL NEVER REACH NOR MAINTAIN PRESSURE ABOVE THESE VALUES (32/33 TONS)

8. To ensure an optimum quality of the pellet, please proceed as follows: first ease the pressure knob (G), and hoist up the spindle (A) to be able to remove the pressing tool. At this moment, please only remove the bottom part of the pressing tool.



9. When you have removed the bottom part of the pressing tool, place it again in the base (C), but this time the other way around, that is, with the open part upwards, adjust again the pressure knob (G) and lower the spindle (A) until the bottom part of the pressing tool pushes the pellet upwards. In the case when we could not remove the pellet only by turning the spindle (A), make a second press cycle and pump pressure again until the bottom part of the tool moves the pellet to the upper part.



10. When the pellet has been pushed to the top part of the pressing tool, ease again the pressure knob (G), and move the approximation spindle upwards (A), until we can remove the tool. Now you can remove the pellet. The unit is now ready to undertake a new pressing cycle.



Each 50 bars (725 psi) a pressure of 5.650 kg is applied. Thus, for 100 bars (1450 psi) you may obtain 11.300 kg; for 200 bars (2900 psi), 22.600 kg; up to a maximum of 265 bars (3843psi) equal to 30.000 kg. It is not recommended to use the press up to its maximum as the gauge could suffer mechanical alterations, as well as lower the useful life of the other elements of the press.

The maximum recommended pressure is 30 tons, please remember that this press includes an automatic excess pressure release system that shall release automatically any pressure going above 32 ó 33 tons.

If necessary, please use only EXTRA hydraulic oil (SAE 10). On no account other liquids are to be used

Important

Any manipulation of this press must be carried out by Equilab staff. Failure to comply with this norm will result in the warranty being cancelled.

All the assembly and disassembly operations must be undertaken with utmost care, to avoid damages to the press or its elements.

A big leak of oil between the plunger of the pump (EQP-30-26) and the nut (EQP-30-41) when the lower plate goes down to rest position, is an obvious signal of too much oil. In this case please unscrew the oil filling screw (F) and remove the excess oil until the level is between the Max. and Min. marks (Picture 1).

If when pushing/pumping on the lever (D) you notice that the press is not building up pressure, this may indicate that the level of hydraulic oil is low. We recommend that you check the oil level.

Removing the piston cover

If it would be proven necessary to remove the piston following instructions from Equilab, you will need two Allen keys for M8 and M10.

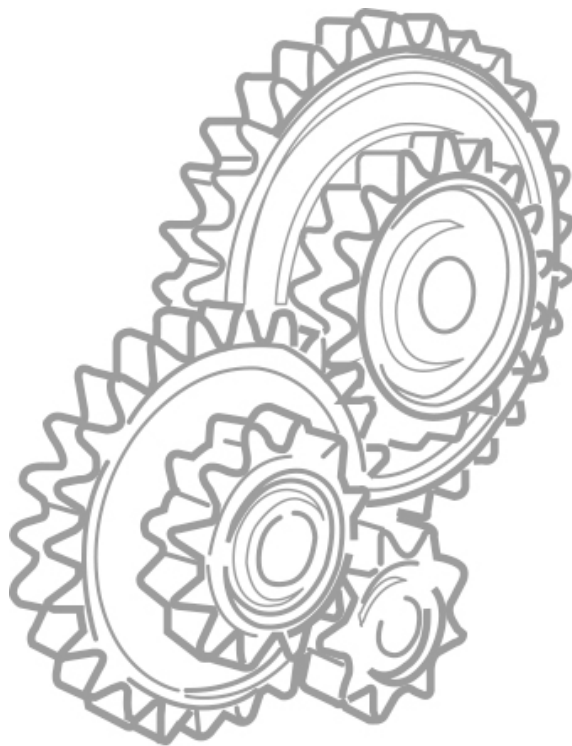
The procedure is the following:

- Remove the 6 screws M8 (64) from the cover of the cylinder (EQP-30-03), then we shall screw in three M10 screws in the threaded hole, helping the cover to come out easily.
- Lastly, to remove the plunger, close the pressure knob (G) and push the lever as many times as necessary until the piston goes up and it is easy to take out – it may happen that you need to pour in extra oil for this process to work -.

Manual Hydraulic Pellet Press

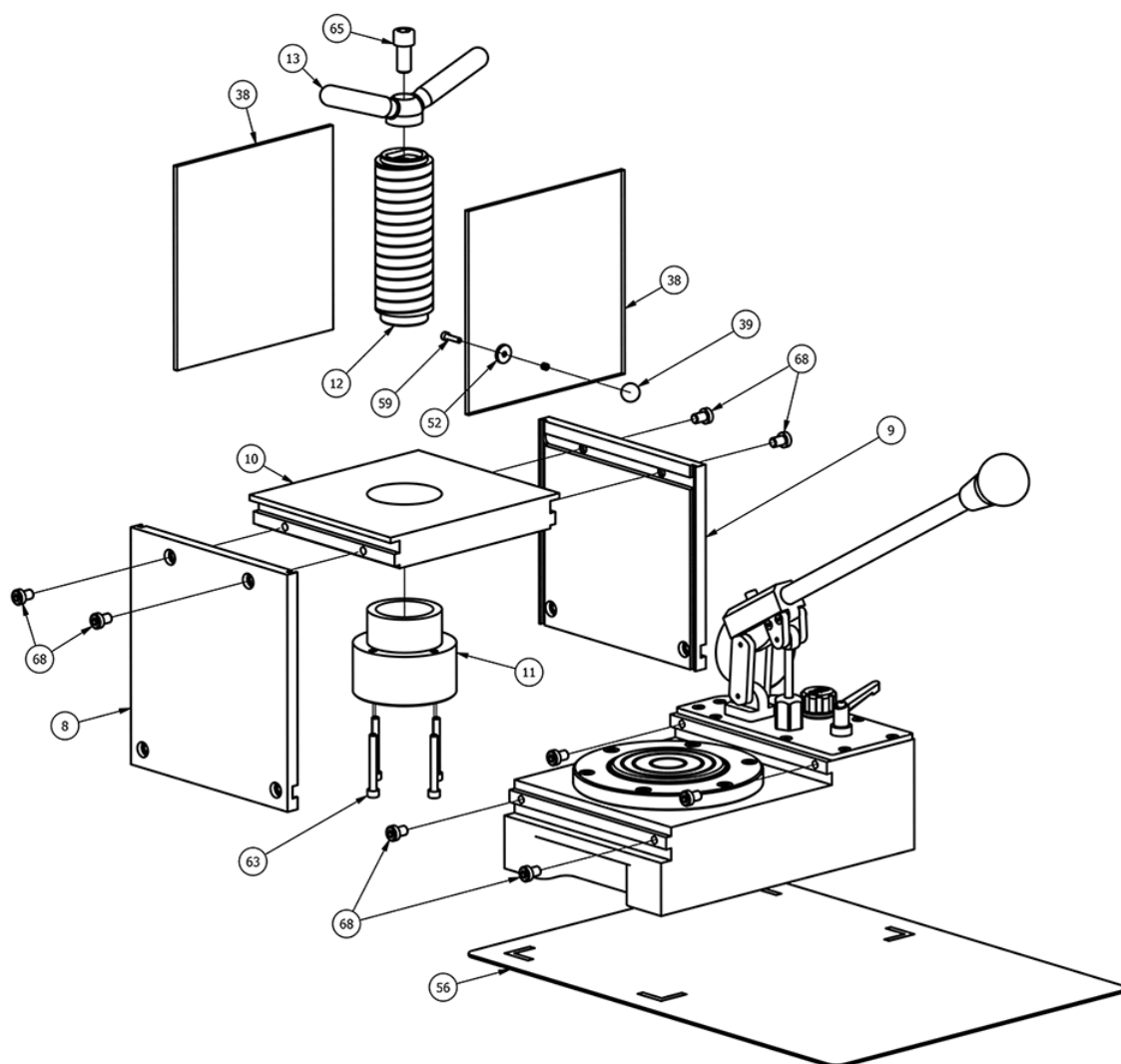
EQP-30

- **Components**
- **After sales technical support**



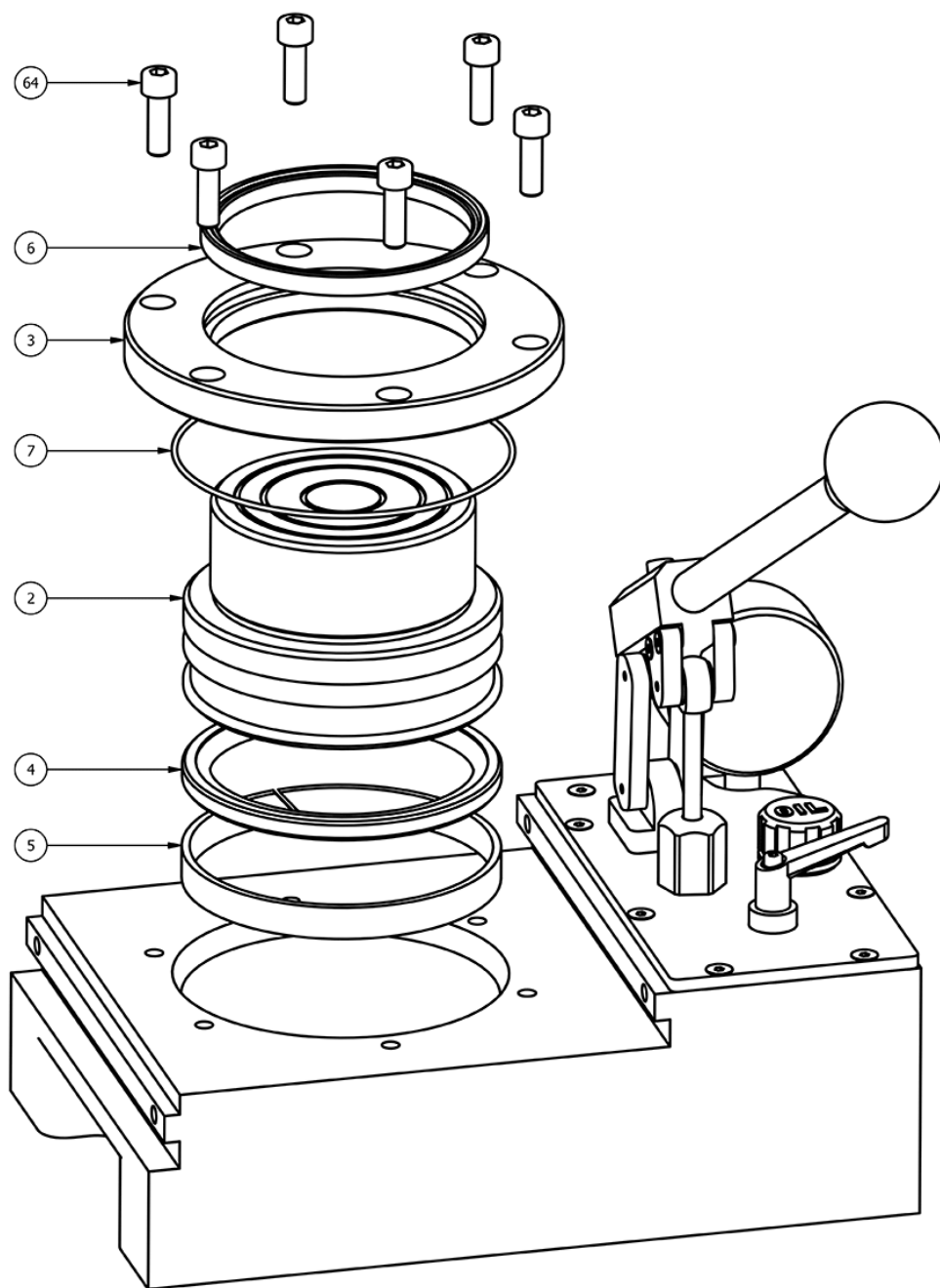
EQP-30 Manual Hydraulic Pellet Press

I. General disassembly



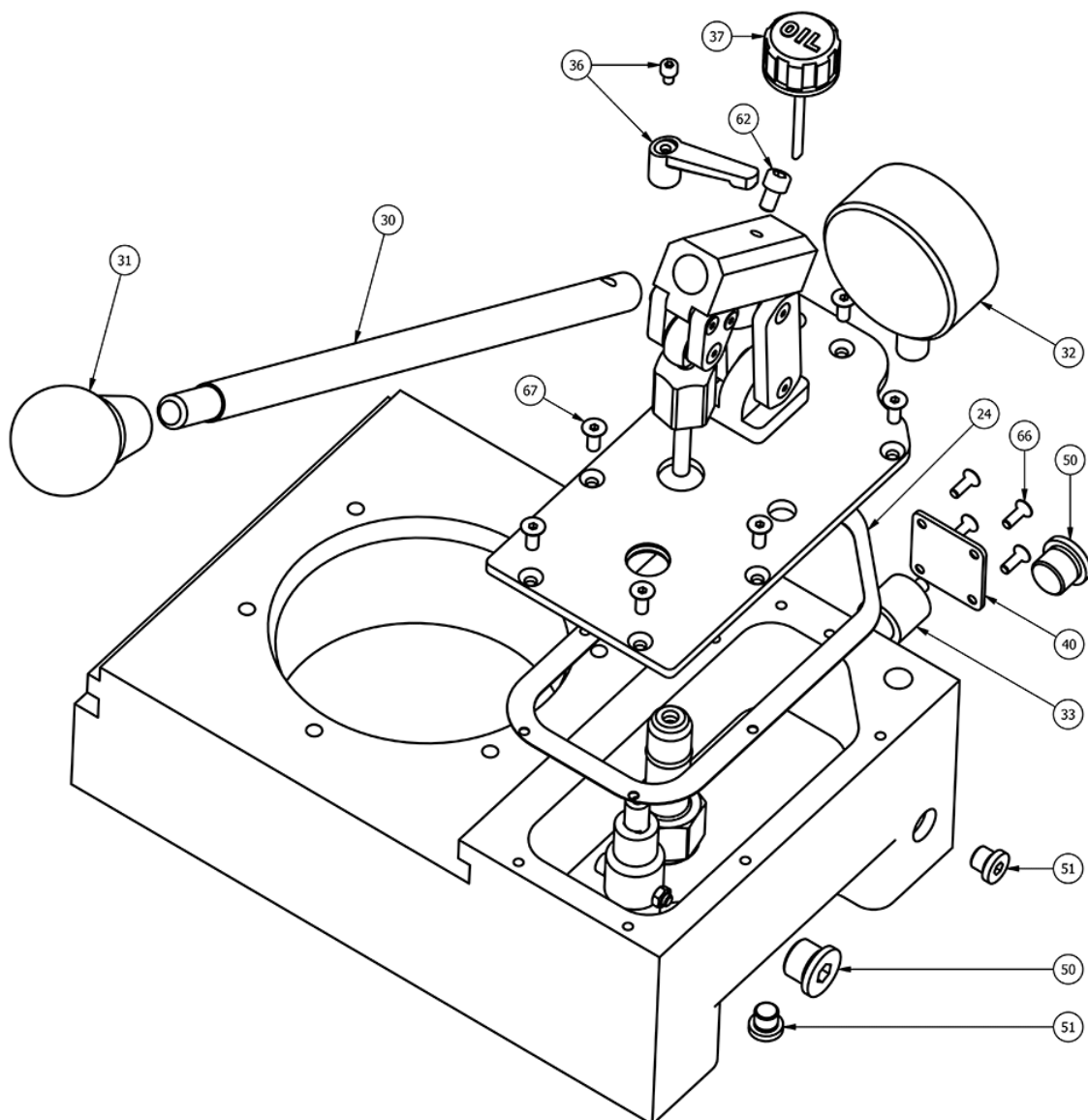
Nº	Referencia	Descripción	Nº	Referencia	Descripción
8	EQP-30-08	Lateral Izquierdo / Left Wall	39	EQP-30-39	Pomo Protector / Protector Knob
9	EQP-30-09	Lateral Derecho / Right Wall	52	EQP-30-52	Arandela Avellanada / Flat Washer
10	EQP-30-10	Base superior / Upper Base	56	EQP-30-56	Alfombrilla Antideslizante / Anti-slip mat
11	EQP-30-11	Tuerca trapezoidal / Trapezoidal Nut	63	DIN 912 – M6 x 50	Tornillo Allen / Allen Bolt – M6x50
12	EQP-30-12	Husillo trapezoidal / Trapezoidal Spindle	65	DIN 912 – M12 x 25	Tornillo Allen / Allen Bolt – M12x25
13	EQP-30-13	Manilla Husillo / Spindle Handle	68	DIN 6912 – M8 x 12	Tornillo Allen Bajo / Low Allen Bolt – M8x12
38	EQP-30-38	Policarbonato protector / Protective Polycarbonate			

II. Piston disassembly



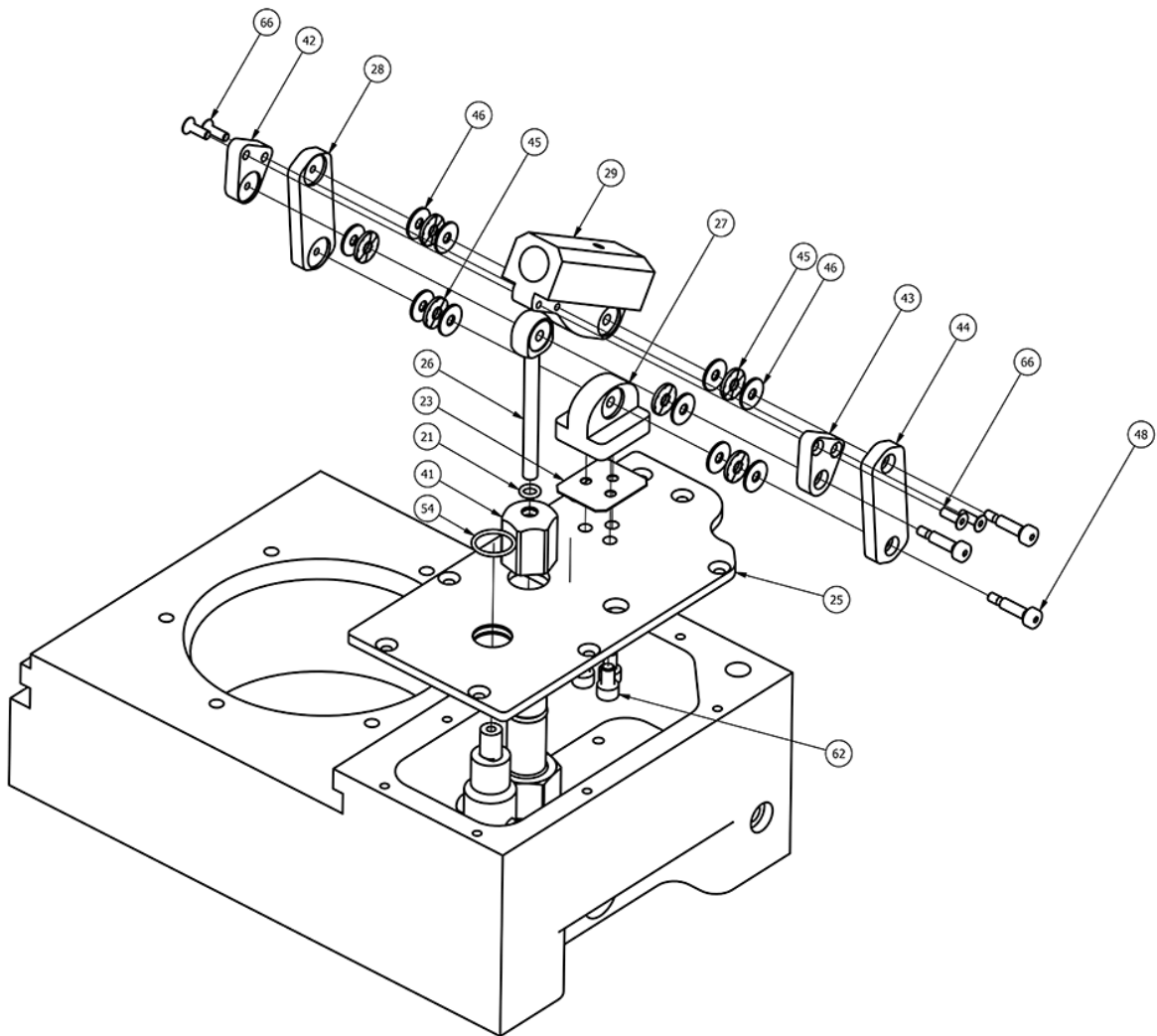
Nº	Referencia	Descripción	Nº	Referencia	Descripción
2	EQP-30-02	Piston 120mm	6	EQP-30-06	Rascador Pistón / Piston Wiper
3	EQP-30-03	Tapa Cilindro / Cylinder Lid	7	EQP-30-07	Tórica Tapa Cilindro / Cylinder Lid o'ring
4	EQP-30-04	Junta Pistón / Piston Gasket	64	DIN 912 – M8 x 20	Tronillo Allen / Allen Bolt – M8x20
5	EQP-30-05	Guía Pistón / Piston Guide Ring			

III. Right hand side dissassembly 1



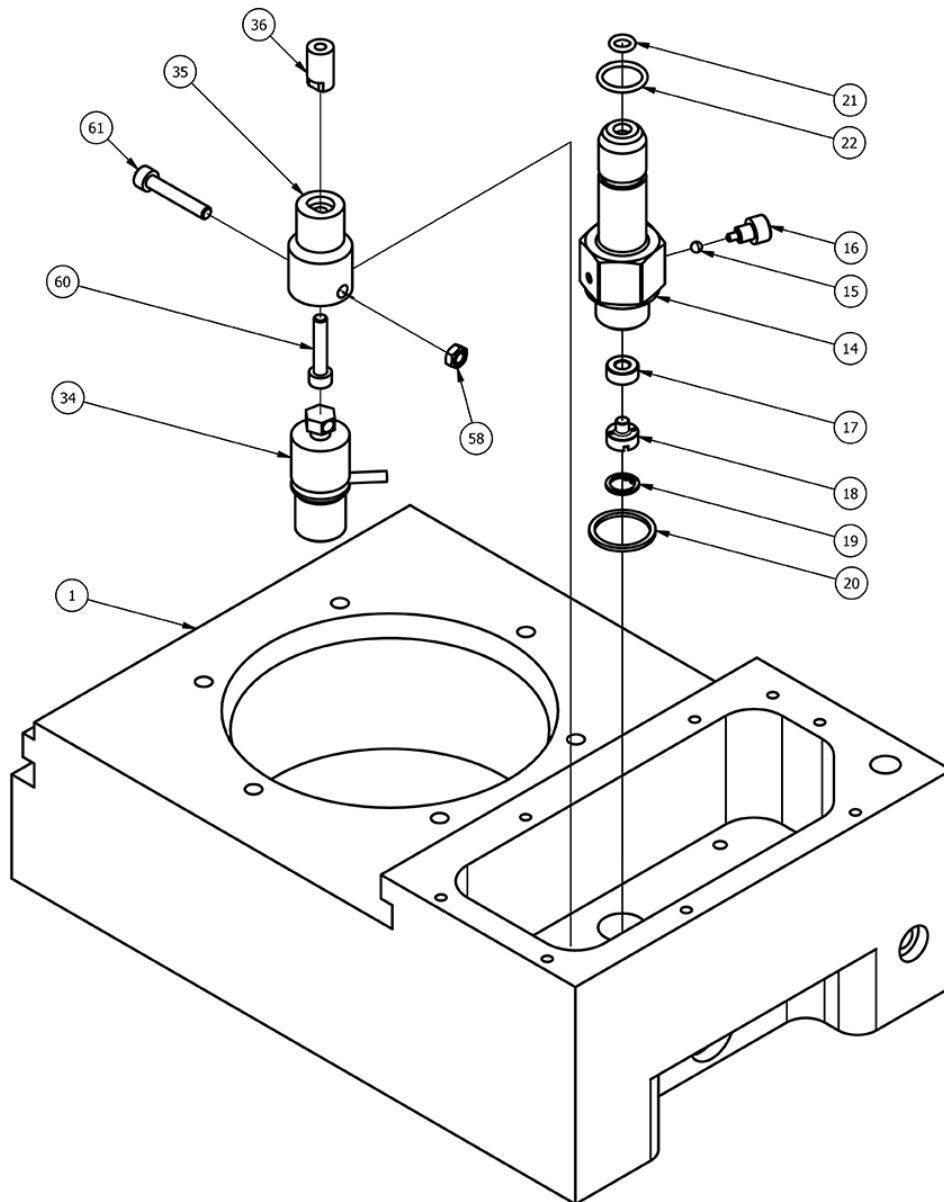
Nº	Referencia	Descripción	Nº	Referencia	Descripción
24	EQP-30-24	Junta Tapa Depósito / Tank Lid Gasket	37	EQP-30-37	Tapón aireador Depósito / Tank Breather Plug
30	EQP-30-30	Palanca Prensa / Press Lever	50	EQP-30-50	Tapón 3/8" / Plug 3/8"
31	EQP-30-31	Empuñadura Palanca / Lever Handle	51	EQP-30-51	Tapón 1/8" / Plug 1/8"
32	EQP-30-32	Manómetro / Tonnage Gauge	62	DIN 912 – M6 x 10	Tornillo Allen / Allen Bolt – M6x10
33	EQP-30-33	Válvula Limitadora de Presión / Pressure Limiting Valve	66	DIN 7991 – M4 x 12	Tornillo Avellanado / Countersunk Bolt – M4x12
36	EQP-30-36	Manilla Cierre Presión / Pressure Locking Handle	67	DIN 7991 – M5 x 12	Tornillo Avellanado / Countersunk Bolt – M5x12

IV. Right hand side dissassembly 2



Nº	Referencia	Descripción	Nº	Referencia	Descripción
21	EQP-30-21	Tórica Interior Bomba / Pump Inner O'ring	43	EQP-30-43	Unión Pistón-Palanca Derecha / Right Piston – Lever Joint
23	EQP-30-23	Junta Soporte Palanca / Level Support Gasket	44	EQP-30-44	Biela Derecha / Right Connecting Rod
25	EQP-30-25	Tapa Depósito Aceite / Oil Tank Lid	45	EQP-30-45	Rodamiento axial / Axial Bearing
26	EQP-30-26	Pistón Bomba Manual / Hand Pump Piston	46	EQP-30-46	Arandela Plana / Flat Washer
27	EQP-30-27	Soporte Palanca / Level Support	48	EQP-30-48	Tornillo Pasador / Shoulder Screw
28	EQP-30-28L	Biela Izquierda / Left Connecting Rod	54	EQP-30-54	Tórica / O'ring 18,77 x 1,77mm
29	EQP-30-29	Soporte Palanca Superior / Upper Lever Support	62	DIN 912 – M6 x 10	Tornillo Allen / Allen Bolt – M6x10
41	EQP-30-41	Tuerca Bomba / Pump Nut	66	DIN 7991 – M4 x 12	Tornillo Avellanado / Countersunk Bolt – M4x12
42	EQP-30-42L	Unión Pistón-Palanca Izquierda / Left Piston – Lever Joint			

I. Pump and closure disassembly



Nº	Referencia	Descripción	Nº	Referencia	Descripción
1	EQP-30-01	Base Prensa / Press Base	21	EQP-30-21	Tórica Interior Bomba / Pump Inner O'ring
14	EQP-30-14	Cuerpo Bomba Manual / Hand Pump Body	22	EQP-30-22	Tórica Exterior Bomba / Pump Outer O'ring
15	EQP-30-15	Bola Válvula Llenado / Filling Valve Ball	34	EQP-30-34	Válvula Sellado / Locking Valve
16	EQP-30-16	Tornillo Válvula Llenado / Filling Valve Screw	35	EQP-30-35	Unión Manilla-Cierre / Handle-Lock Joint
17	EQP-30-17	Junta Labio Válvula Presión / Pressure Valve Lip Seal	36	EQP-30-36	Manilla Cierre Presión / Pressure Locking Handle
18	EQP-30-18	Pistón Válvula Presión / Pressure Valve Piston	60	DIN 912 – M5 x 25	Tornillo Allen / Allen Bolt - M5x25
19	EQP-30-19	Seeger 12mm	61	DIN 912 – M5 x 30	Tornillo Allen / Allen Bolt - M5x30
20	EQP-30-20	Arandela Cobre Bomba / Pump Copper Washer			



Equilab, S.A.

Avda. Camino de lo Cortao Nº21, Nave 6 - 28703 (Madrid)

Tlf.: +34 91 661 00 22 // 49 37

Fax : +34 91 661 81 46

Email: equilab@equilab.es

CE CONFORMITY CERTIFICATE

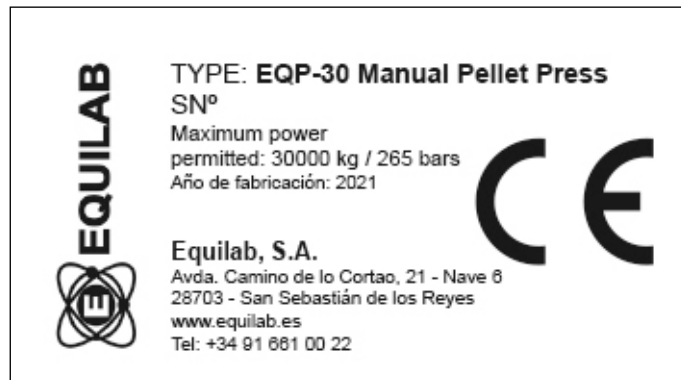
Equilab S.A.

CERTIFIES

That the **EQUILAB** press, model **EQP-30** with **serial number 008/21** has been built in compliance with the following EU directives:

- **2006/42/CE Safety of Machines**

This conformity is reflected in each unit by the following distinctive:



In Madrid, on the 20th of January, 2022

Signed:

Pedro Vellosillo
Managing Director



Equilab, S.A.

Avda. Camino de lo Cortao, 21 – Nave 6
28703 – San Sebastián de los Reyes – MADRID – SPAIN
Tel: +34 91 661 00 22 / Fax: +34 91 661 81 46
www.equilab.es / equilab@equilab.es / info@equilab.es