HOW TO CHOOSE THE RIGHT LAB FILTERPRESS FOR YOUR APPLICATION

There are different kind of Lab filterpress model in our range. Each model has his own peculiarity with respect to the other, and in general there's not a univocal answer for your application.

It depends on your expectation on results, budget, batch volume you must filter, available space and kind of application.

For example, if your application is R&D and you have to explore different results by changing filtration parameters using all the available optional and equipment that you can find in an industrial filterpress, our advice is to choose a complete filterpress with all the option installed. In this case I recommend you to choose a TOP version between an electric or pneumatic series.

On the other hand, if your focus is on micro-production, it could be a better idea to switch to a more simple filterpress but considering to install the number of plates suitable for your application, more than the number of plates that are enough only for R&D application. For example, in this case, a simple BASIC filterpress but with 15 installed plates can be a good option.

If your focus is to have a very compact unit that you can easily carry on during travel, you can take a look at our TRAVEL series

This guide will help you to choose the best match for you.

If you want to talk to an expert, remember that you can send an e-mail to our sales department at mailbox:

sales@autemi.com

Or you can talk with us directly through WhatsApp at +39 346 3222007

BRIEF EXPLANATION OF PILOT FILTERPRESS MODELS

First of all, as you certainly already know, every filterpress needs a feeding pump in order to feed the filterpress with the liquid to be filtered inside the filtering plates of the press itself.

This pump is not a common pump, but it needs to reach a pressure of about 15 bar, because the filtration with a filterpress can reach easily 15 bars of working pressure.

In case you need a lower pressure, our pump can be set at a lower value, for example 6 bar.

In our portfolio, we have basically these choices:

1) We can supply filterpress with electric pump / Take a look at **"Electric – Series"** LAB200-CEFS and LAB200-EFS
2) We can supply filterpress with pneumatic pump / Take a look at **"Pneumatic – Series"** LAB200-CPFS and LAB200-PFS
3) We can supply only filterpress without any pump / Take a look at **"Stand-Alone"** Version **LAB200-SA**.In this case the customer must provide the pump and the other equipment
4) We supply a portable version of pilot filterpress; only with compressed air power supply for feeding pump or manual pump: this version can be easily transported / Take a look at **"Travel"** Version LAB200-TRAVEL

Why we offer electric or pneumatic pump, what is the difference?

Basically, there's no such difference;

Some customers prefer a unit that doesn't require any power supply but require only compressed air – that's why we have the pneumatic series.

Some other customers prefer unit with power supply and electric pump, and that's why we offer also electric version.

In general electric version is more like industrial filterpresses, because in real application in 90% of the application an electric pump is installed and the management of the start/stop of the pump is pretty much the same between our electric series of LAB filterpress and industrial filterpress.

On the other hand, pneumatic pump is a pump with an automatic flow rate modulation, which is perfect for filtration: during the beginning of the filtration, when filterpress is empty the flow rate is maximum and step by step, when filterpress is filling up, the flow rate automatically decrease.

Both pneumatic or electric pump can reach the same pressure of 15 bar; of course the pneumatic version is cheaper.

The results in terms of dewatering doesn't change between Electric or Pneumatic; is only a choice of the customer.

In the end, sometimes the customer want to provide itself the pump and the other equipments, so that's why we can supply the stand-alone version LAB200-SA.

What are the other auxiliary equipment?

In a lab-scale filterpress, like in the real applications, there are always other equipment like:

- Slurry tank: the tank from which the pump suction the slurry and feed the filterpress

- Filtrate tank: the tank in which the filtered liquid is collected

- Water pump: the pump which is useful to wash and flush al the piping of the filterpress, in order to clean the equipment in the piping. This pump is also used for washing of the cake

- Compressed air system: this is a system to deliver the compressed air inside the filterpress and in the piping in order to perform special tasks that can improve the efficiency of filtration.

Customer can decide to provide itself this auxiliary equipment, or in some case to use basic filterpress without special tasks

Electric series:

LAB200-CEFS and LAB200-EFS are the electrical versions.

Electric means that the unit has an electrical panel which manage the feeding pump and the tank mixer.

The difference between CEFS and EFS depends on the tanks: CEFS version has got from 2 to 3 tanks, one of them has got the electrical mixer for slurry tank, which is very important for slurries that settle very quickly.

Instead, the EFS has got no tanks at all (in charge to the customer).

Pneumatic series:

LAB200-CPFS and LAB200-PFS are the pneumatic versions.

Pneumatic means that the unit doesn't require any power supply, because compressed air (6 bar) is enough for pilot station functioning, as the feeding pump is pneumatic.

Also in this case, the difference between CPFS and PFS depends on the tanks: CPFS version has got from 2 to 3 tanks (no mixer in this case), instead, the PFS has got no tanks at all.

Then, inside each one of this models (CEFS, EFS, CPFS and PFS),

you can find n°4 different versions, depending on the feature installed and process you can run:

BASIC:

is the simplest version, with only feeding pump

STD:

in this version you can perform **cake blow** and **cake wash** (but washing pump is not supplied and is in charge of the customer), and also **core-blow** and **channel blow**, because a pneumatic low pressure generation system is installed on board.

Cake Blow is useful to reach some more points of dryness in residual cake and in general allows a better detachment of the cake from the clothes (in a lot of applications, but not in everyone).

PLUS:

in this version you can find all the installed features that is available on STD version, but in addition you can also install **membrane plates typology** with **high pressure squeezing system**, that allows you to obtain a dryer cake in order to reduce the residual humidity as much as you can. With this kind of version you can install both standard recessed plates or also membrane plates.

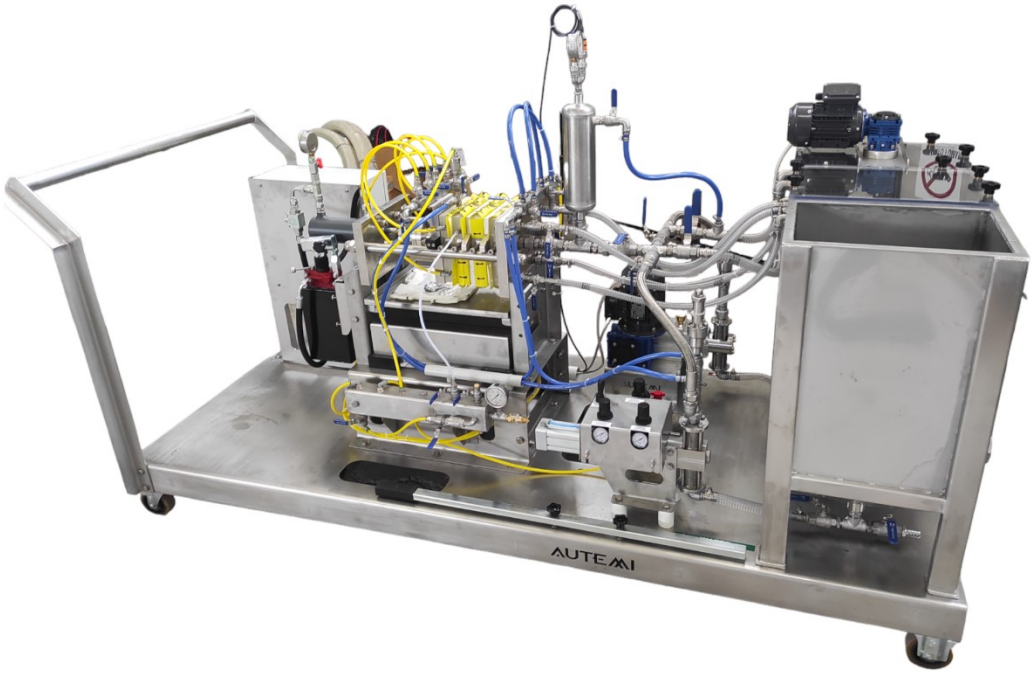
In order to perform membrane squeezing an high pressure generation system is installed on board to allow customer to reach 14 bar of pressure (from 7 bar of net pressure required).

Membrane squeezing filtrations, allow to obtain some benefits and it is used in this cases:

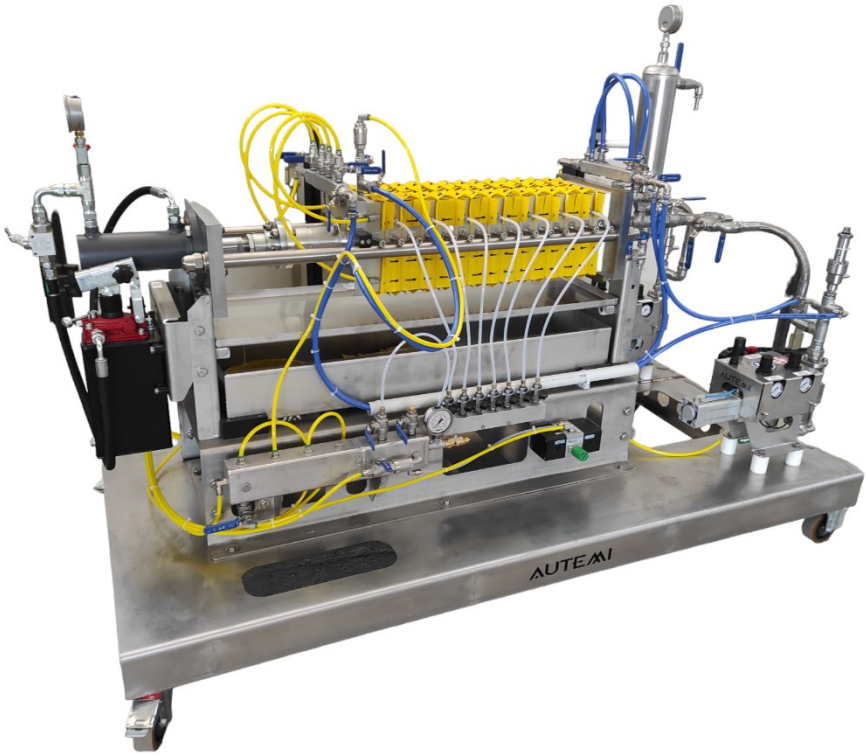
- The dewatered slurry has characteristics that make pressure filtration through a pump only possible up to 6-7 bar. Beyond this limit, the pump is not able to increase the pressure. Therefore, if you want to obtain a cake with a high percentage of dry solids even with these slurry, it is necessary to use squeezing system.
- The noble part of the filtration process is the filtrate and it is necessary to recover as much as possible. For example, this is the case with the filtration of slurry from the processing of sugar beet or sugar cane. In this case, squeezing is combined with washing the cake in such a way as to recover as much sugar as possible.
- The slurry in question is thixotropic and, beyond a certain limit, it is no longer possible to filter it with simple pump pressure, but a mechanical squeezing action is needed to dewater the slurry to the maximum.
- It is desired to dewater the residual cake as much as possible in a shorter cycle time, as the squeezing action is usually much faster than a normal filtration cycle.

TOP:

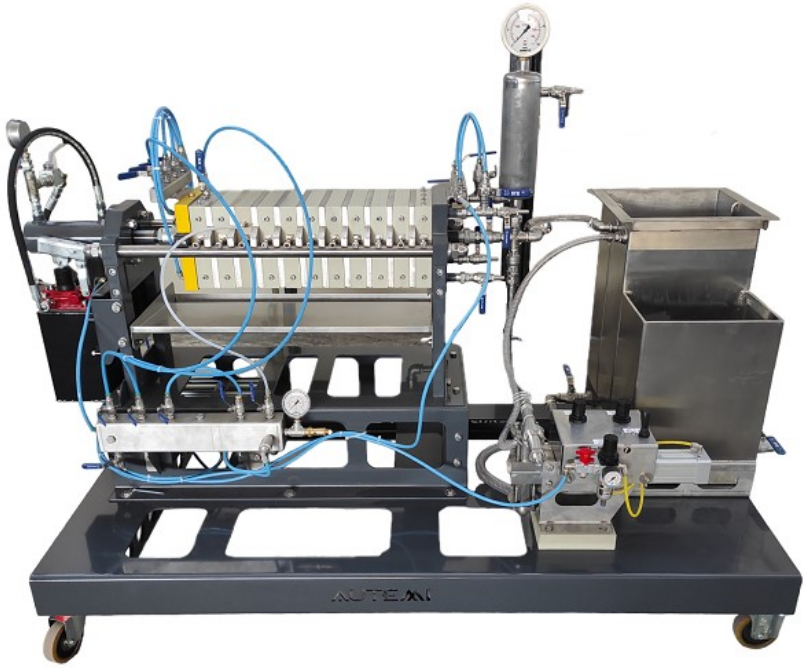
in this version you can find all the installed features that is available on PLUS version, but **in addition, a washing pump is installed**. With the washing pump you can perform cake washing, if you need to wash the cake for your application, and also you can use this pump to flush the piping of the pilot filterpress, if you need to wash the station properly before performing a new filtration cycle with a different slurry or liquid and you want to reduce the contamination between the previous test and the new one.



Picture n°1 - LAB200-CEFS/TOP



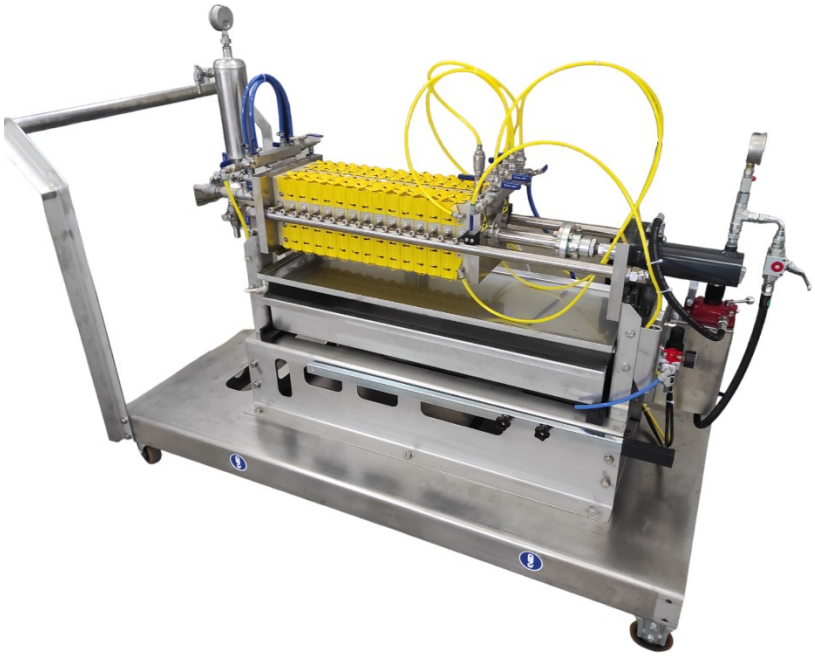
Picture n°2 - LAB200-PFS/TOP



Picture n°3 - LAB200-CPFS/TOP

Finally, the LAB200-SA version is proposed, in Stand-Alone mode: in this version, only the filter press is supplied without any other accessories or auxiliaries (pumps, tanks, air generation systems, etc.).

All the other equipment like pump, tanks, ecc, must be provided by customer.



Picture n°4 - LAB200-PFS/SA

The last pilot filterpress model we have is the LAB200-TRAVEL version.

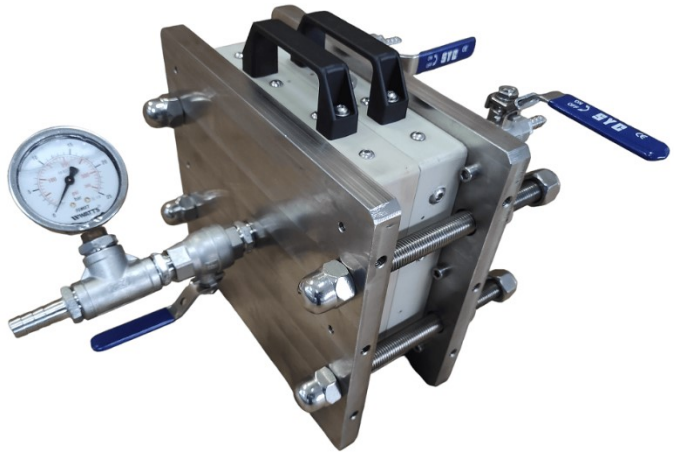
LAB200-TRAVEL means that this series is specifically designed to be manually transported and, because of this, it requires only pneumatic air supply or also in some version a manual pump is installed, in order to have no need of power supply at all.

Plates closing system

In all LAB200 models, the closing system of the plates is made by an hydraulic cylinder which is manually actuated by an hydraulic manual pump. It is very similar to the industrial filterpresses.

Picture n°5 - Hydraulic cylinder with manual pump, lever and oil tank

Instead, in the LAB200-TRAVEL series, the closing of the plate pack is made by screw/unscrew n°4 screws, in order to save space. Of course this action require more time than the hydraulic cylinder system



Picture n°8 - N°4 screws to screw/unscrew for plates opening/closing

LAB200-TRAVEL has mainly 4 models

<u>The 1st version is LAB200-TRAVEL/MINI</u>

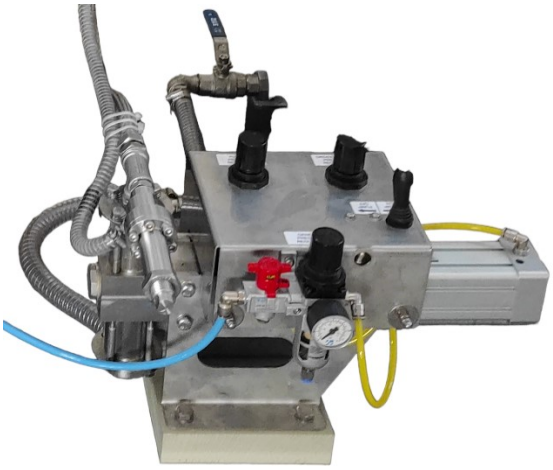
This version is made of only 2 filtering plates (1 filtering chamber only).

It is a very compact portable version.

This is a very basic version and can run only standard filtration, without any other tasks like cake blow, membrane squeezing or cake wash.

This unit can be supplied stand-alone ore can be coupled with feeding pump.

Feeding pump for this filterpress can be pneumatic (model HORUS) or manual (model DEDRA.M)



Picture n°6 - Pneumatic pump / model HORUS

Picture n°7 - Manual pump / model DEDRA.M

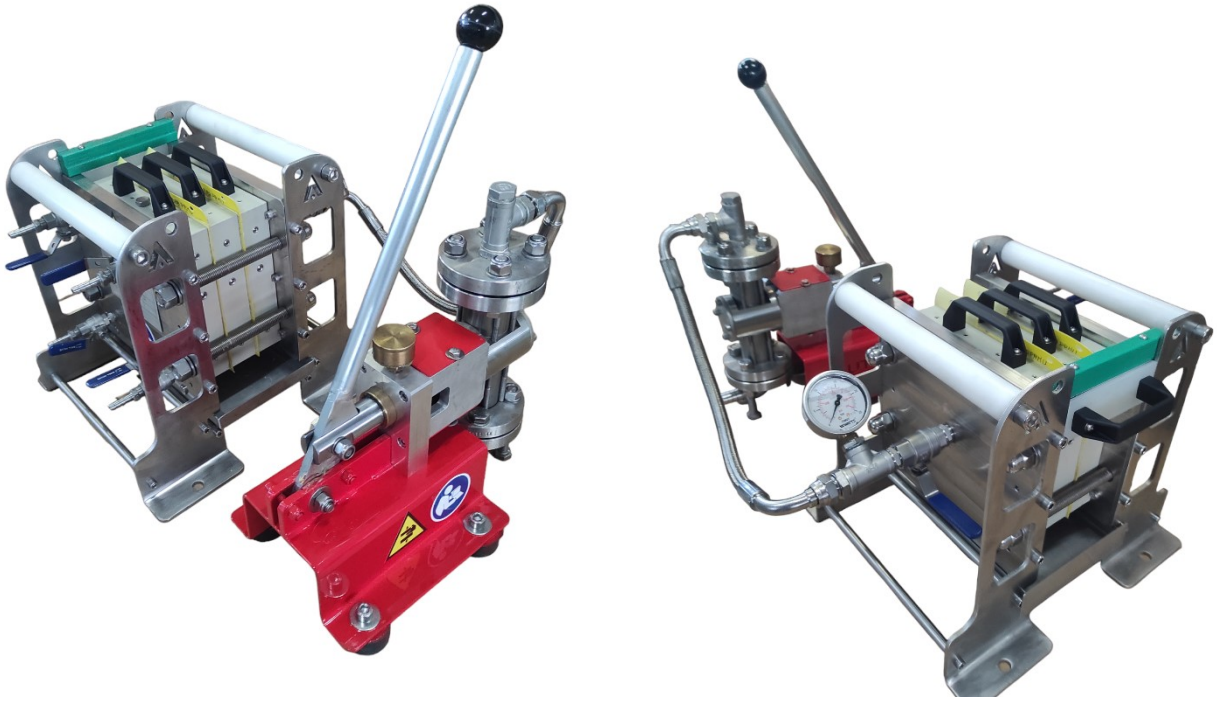
The 2nd version is LAB200-TRAVEL/COMPACT

This version can install from 3 to a maximum of 5 filtering plates.

It is the expanded version of the previous LAB200-TRAVEL/MINI unit with more installed plates.

Also in this case, LAB200-TRAVEL/COMPACT can be supplied stand-alone or coupled with feeding pump (manual or pneumatic), as in the previous version.

Also in this case is possible to run basic filtration: no core blow, no cake blow, no cake wash, no membrane squeezing.



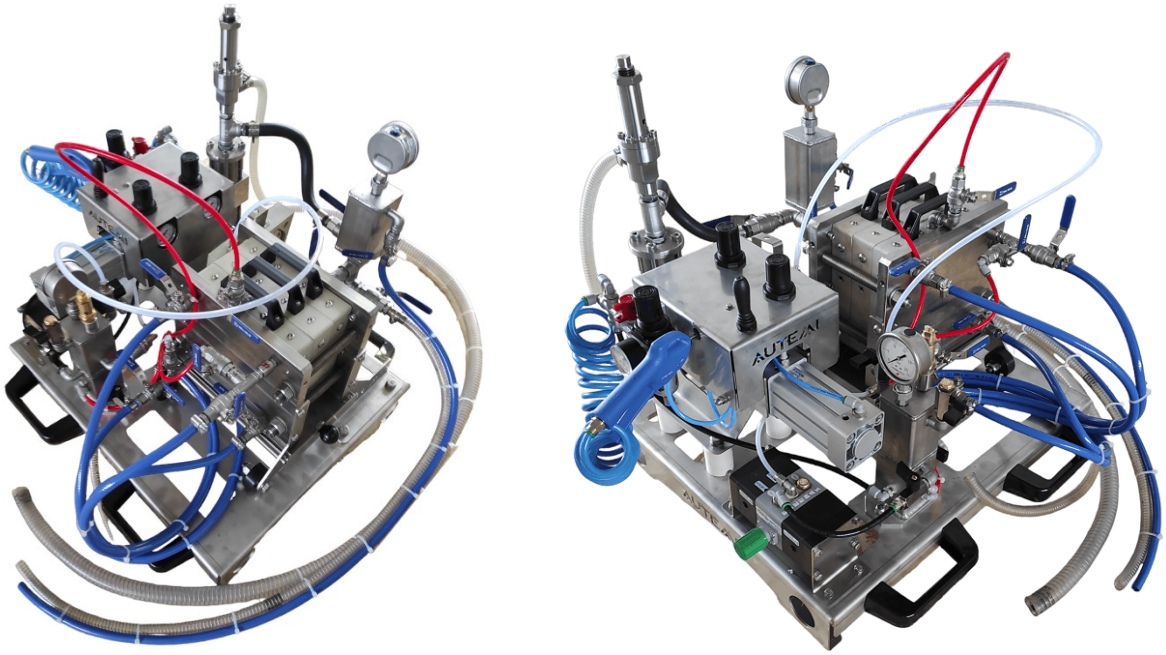
Picture n°8 - LAB200-TRAVEL/COMPACT + Pneumatic manual pump / model DEDRA.M

The 3rd version is LAB200-TRAVEL/FULL

Differently from the previous two models, the LAB200-TRAVEL/FULL is a complete compact filtering station. It's possible to run filtration test with all the most important optional and function we can found also in the industrial machine.

This unit is equipped with a pneumatic piston pump and air distribution system that allows you to run also core-blow, cake-blow and membrane squeezing.

As standard is supplied with 3 recessed filtering plates and 1 membrane squeezing filtering plate. This unit only requires compressed air at 6/7 bar.



Picture n°9 - LAB200-TRAVEL/FULL

The 4th version is LAB200-TRAVEL/OMNIA

The LAB200-TRAVEL/OMNIA represent the most advanced compact station available in our models. All the available technology of filtration available in the market is installed in this small unit.

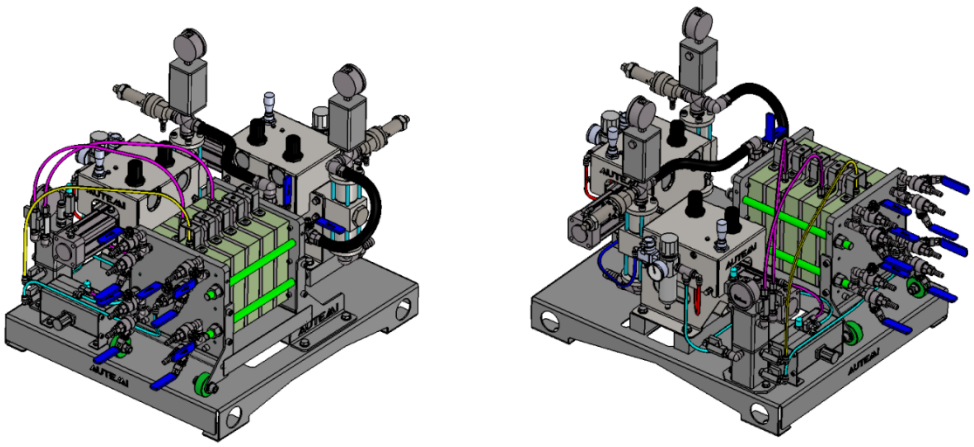
OMNIA version has all the features we can find in the previous model LAB200-TRAVEL/FULL, but in addition, a second piston pneumatic pump is installed.

The second pump can be used for washing of the cake and also piping flushing.

So, basically, with this unit customer can run all the filtration cycles he want.

In his standard version is equipped with 5 standard recessed plates and 2 membrane squeezing plate.

The maximum number of installable plates is 5, so you can run filtration with a complete recessed plate pack or with a membrane squeezing mixed pack.



Picture n°10 - LAB200-TRAVEL/OMNIA

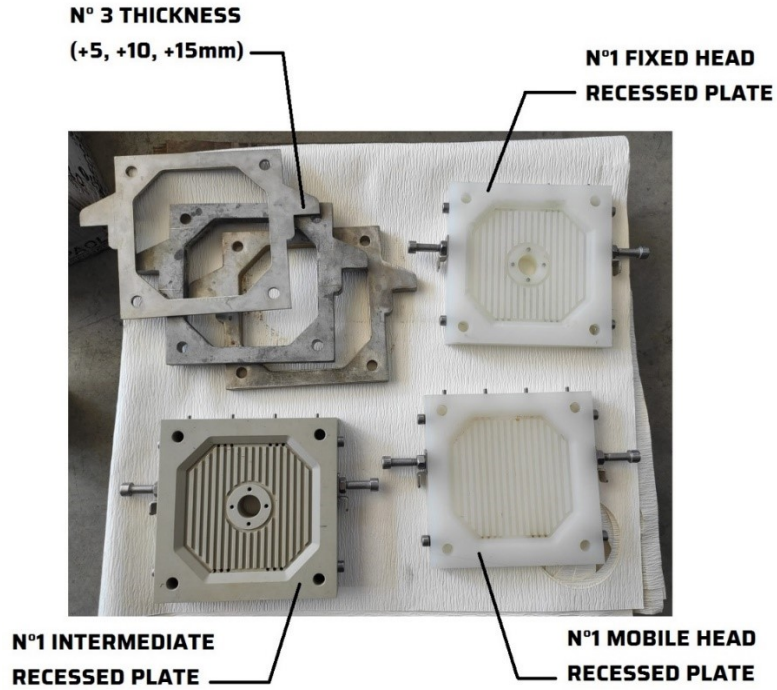
Plates

All LAB200 filter press models can mount from 2 to 15 filter plates.

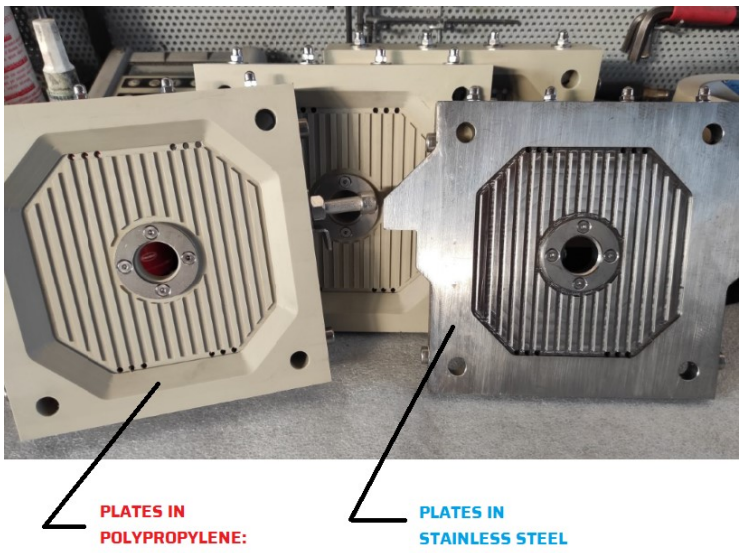
As our standard, n° 3 filter plates are supplied, but clearly up to 15 installed plates can be configured.

Only the LAB200-TRAVEL series has the limitation to 5 maximum filter plates that can be installed, due to space constraints

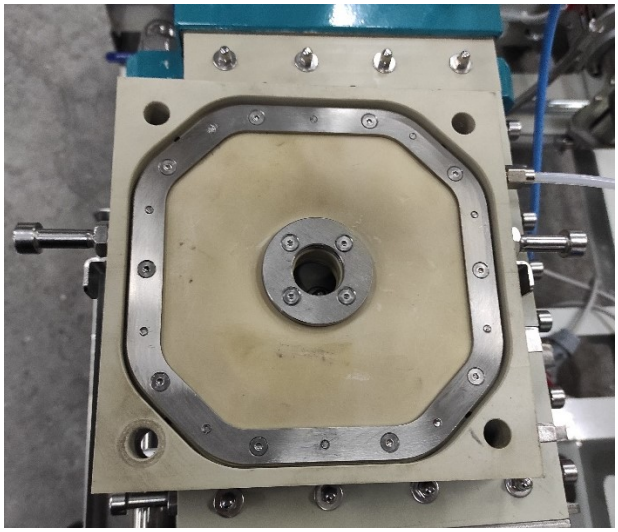
Standard plate material is Polypropylene; but for some special application also Stainless Steel AISI 316 can be supplied.



Picture n°11 - Plates in polypropylene and spacers (thickness)



Picture n°12 - Plates in polypropylene and in Stainless Steel



Picture n°13 - Intermediate Membrane plate (squeezing system)

<u>High temperature version and special version</u>

In this application it is possible, for example, to build tanks with the presence of a thermoresistance which has the task of heating the product. In order to keep the product at the required temperature, the tanks are insulated internally with rock wool or polyurethane foam.

In addition, there are applications in which it is necessary to carry out not a real filtration but a polishing process using filtration aids such as diatomaceous earth.

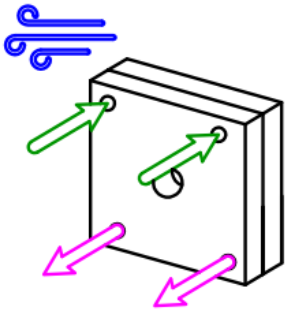
It is possible to install several tanks with appropriate exclusion and recirculation valves to test exactly this type of process.

For example, in the pictures below there are 3 separate tanks (a tank containing the product to be filtered, a tank for preparing the precoat and a tank for discharging the filtered product).

The operator will perform manually what normally in polishing plants can be done automatically or by turbidity analysis or simply by measuring the process time.

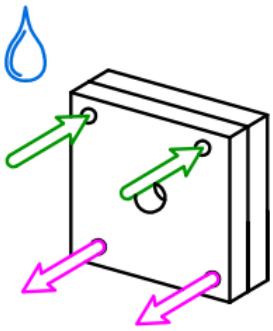
Picture n°14 - Thermal insulated tanks for high temperature application

PROCESS FEATURES AVAILABLE IN LAB200 SERIES - BRIEF EXPLANATION



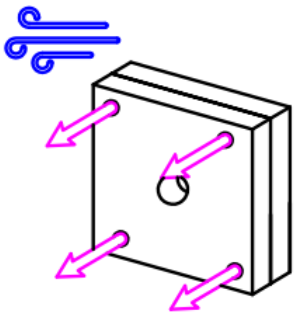
CAKE BLOW:

Cake blow option consist in a blowing of the cake after that the filtration is done and the dewatered cake is already formed in the filtration chamber, but has not been discharge yet.
By blowing compressed air inside the cake, is generally possible to obtain some more percentage of dry solid content in the residual cake and is possible to help the detachment of the cake from the cloth. This help to maintain the cloth clean also.



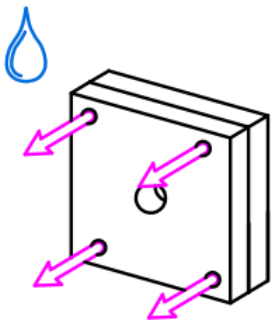
CAKE WASH:

Is the same of the cake blow, but instead of blowing air in the cake, some water (or other liquid sometimes) is forced through the cake.
This function is used for some process motivation, for example if users want to reduce salinity of the cake by washing the cake itself; or can be used to recover some impurities from the cake by washing with other liquids.



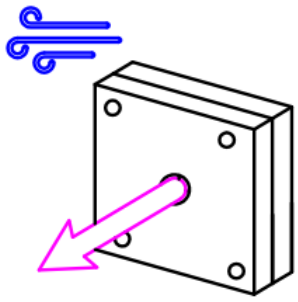
CHANNEL BLOW:

Channel blow is a feature that is mainly used for cleaning of the filtrate channel.
Sometimes, especially when the filterpress is used for different products, you need to properly clean the filtrate outlet channel with compressed air before start the filtration with a different product.



CHANNEL WASH:

Channel wash is the same feature of the channel blow, but water is used instead of using compressed air.
This allow a deeper cleaning of the filtrate holes.

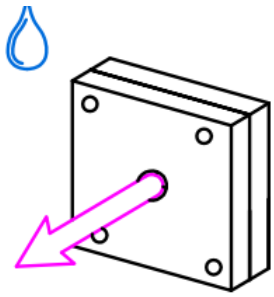


CORE BLOW:

Core Blow is a feature that is used to clean the feeding hole of the filterpress by blowing the channel with compressed air.

It's very important that the feeding hole remains well cleaned after the filtration, to allow a proper filtration in the subsequent filtering cycles and to allow a better formation of the exhaust cakes.

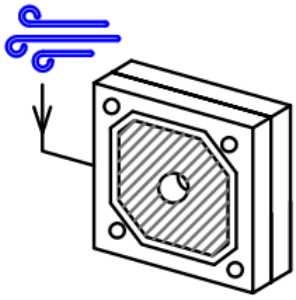
This important features allows you to avoid clogging of the slurry in the feeding hole



CORE WASH:

Core Wash is the same kind of features of the Core Blow, but water is used instead of blowing compressed air.

This system allows a deeper cleaning of the feeding hole and is used especially when the filtration runs with very heavy slurries with high settling problems.



MEMBRANE SQUEEZING:

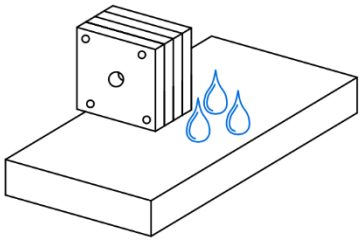
Membrane squeezing is a system that allows users to achieve some more dry solid percentage points in the output exhaust cake.

The membrane squeezing filtering plates has an internal membrane that can be inflated with compressed air.

After the classic filtration, by using this kind of plates, is possible to mechanically squeeze the exhaust cake which is in the filtering chamber by inflating the membrane blowing it with compressed air.

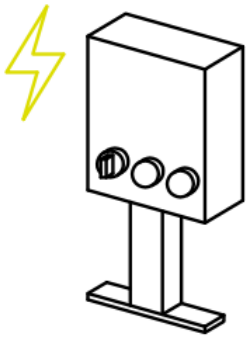
Normally the squeezing pressure is around 12 bar; to run this you need an high pressure generation system in the filterpress.

EQUIPMENT INSTALLABLE IN LAB200 SERIES - BRIEF EXPLANATION



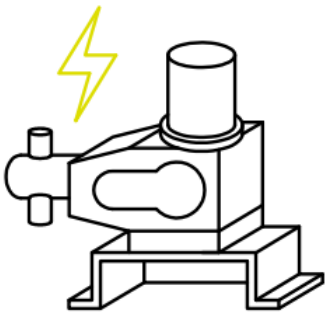
DRIP TRAY:

During the filtration, a bit of filtrate dripping from the lower part of the plates of the filterpress is normal.
This device allows you to recover all the dripping in a proper tray keeping the filterpress and the test area clean.



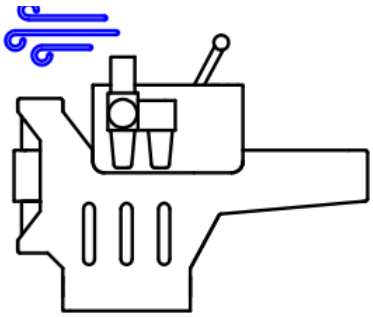
ELECTRIC PANEL:

This is the electric panel which is used to run and manage the electric feeding pump and also the electric mixer.
In general this equipment control all the electric devices installed in the filterpress station.
If the lab station is pneumatic, there's no need to install this device.



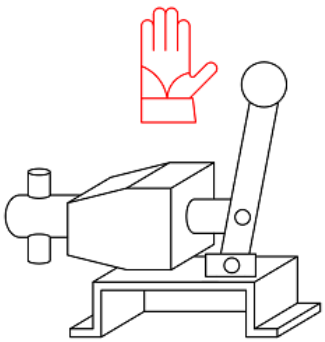
ELECTRIC PISTON PUMP:

This is the slurry feeding pump which is used in case of electric filterpress (EFS / CEFS).
Is a high pressure pump - single effect and piston type.
Max pressure of work of the pump is 15 bar.
When using this pump is necessary to install the electric panel also.



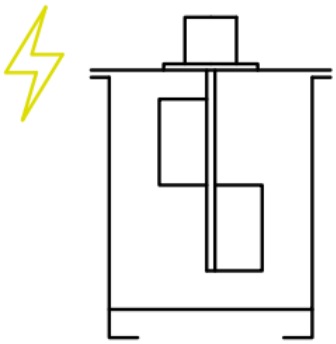
PNEUMATIC PISTON PUMP

This is the slurry feeding pump which is used in case of pneumatic filterpress (PFS / CPFS).
Is a high pressure pump - single effect and piston type.
Max pressure of work of the pump is 15 bar.
This kind of pump is used also for washing of the cake and flushing of all the piping



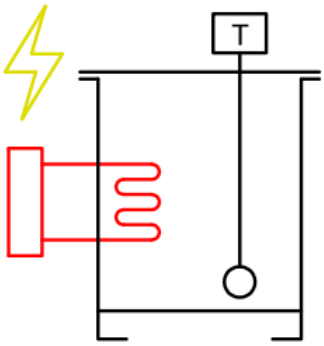
MANUAL PISTON PUMP:

This kind of pump is a single effect piston pump with manual actuation.
Is able to reach 15 bar of max pressure.
Considering his nature of manual pump, can be used only with the model LAB200-TRAVEL/MINI



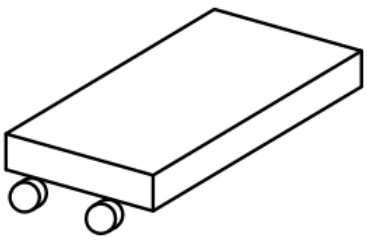
TANK:

Several kind of tanks are available in LAB200 series.
We can provide tanks for slurry, tank for filtrate and tank for washing water.
In electric kind of LAB200 (EFS / CEFS) the tank is equipped with electric mixer also (and electric panel is required)



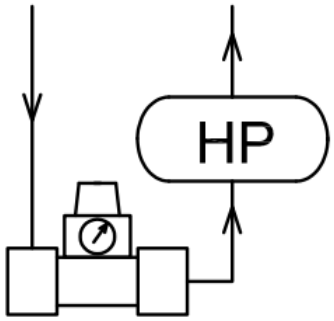
HEATED TANK:

When slurry needs to be kept at high temperature, we can supply heated tank with electric heater and external thermal insulation.
This allows you to run filtration in temperature.
Of course electric panel is required.



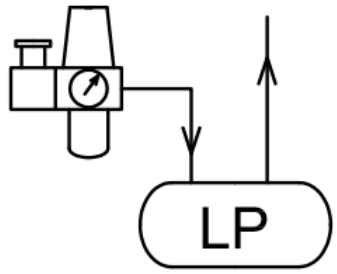
SKID WITH WHEELS:

This item can be installed under the filterpress and allows you to easily move filterpress inside your test area. For example, if you need to was the filterpress, you can easily move all the station in a dedicated area or wherever you want.
Of course this item is used to fix all the equipment necessary for the pilot station to work (filterpress, pump, tank, ecc..)



HIGH PRESSURE GENERATION SYSTEM

This system is necessary to prepare high pressure at 12 bar or 15 bar value for membrane squeezing system.
To properly work, membrane must be inflated at 12/15 bar of pressure and to do this, you need an equipment capable to generate high pressure for this kind of application



LOW PRESSURE DISTRIBUTION SYSTEM

When you need to use all the low pressure process features, like core-blow, cake-blow and channel blow, you need a distribution system of the pressure to the filterpress.
You also need this equipment when using a pneumatic pump.
Low pressure distribution and regulation system allows you to set the pressure level for this devices.

CHECK-LIST FOR REQUEST OF TECHNICAL QUOTATION

Company Details	
Company Name	
Company State	
Company Adress	
Name / Surname of contact person	
Phone number of contact person	
E-mail of contact person:	
Job-Title	

General Data	
What's the main usage of pilot filterpress?	☐ External Research and Development dept. ☐ Company Internal Laboratory ☐ Micro-Production
What's the volume of your average filtration batch?	_____ _____
What's the kind of product/products you would like to process with filterpress?	_____ _____ _____ _____
Have you ever used a filterpress before?	☐ Yes ☐ No
What's the temperature of your product to be filtered?	_____ _____
What's the main chemical composition of your product to be filtered? And pH value?	_____ _____ _____ _____ pH _____
What's the dry solid content value in your product to be filtered?	☐ _____ g/liter ☐ _____ %
Do you recover liquid or solid?	☐ We recover solid and discard liquid ☐ We recover liquid and discard solid ☐ We recover both
Other Information you would like to add: please write here on the right your comments	_____ _____ _____ _____ _____ _____