

# FILTER PRESS

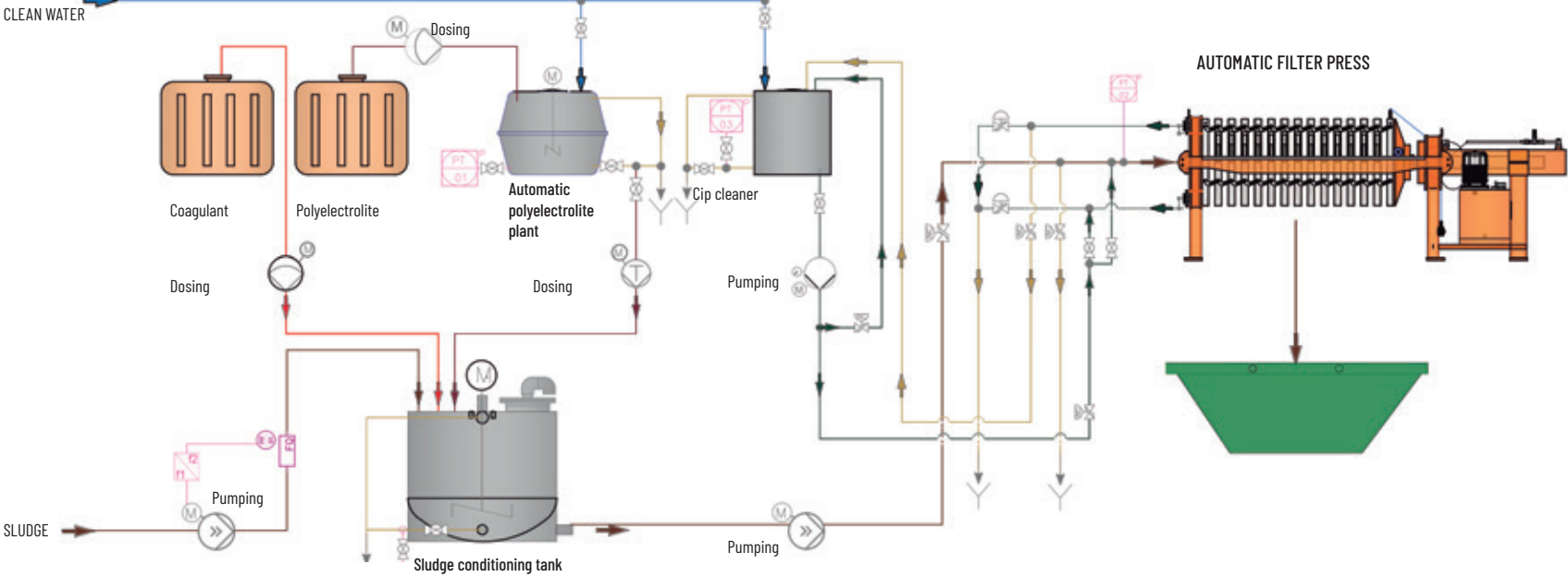
 draco

 draco®

SLUDGE DEWATERING



# Filter press | Process description



**Filtering cycle will start with the filter press closed.**

1. CLOSURE OF FILTER PRESS. The initial phase of the filtering cycle starts with the closure of filter press. Movable plate is triggered by hydraulic system and is moved closing the filter at the pressure needed for the work, which is controlled with a pressure switch positioned in hydraulic circuit.
2. FILLING. Starts the sludge pumping to filter press. Chambers are filled with sludge and starts the formation of cakes. Solid particles are retained on the cloth's surface, while the liquid crosses them and flows out through the draining system of filtering plates. Initial filtering pressure is minimal and raises as the number of retained particles increases.
3. FILTRATION. Maximum filtering pressure is reached and maintained until the sludge pump stops. An appropriate dewatering level for cakes is reached during the initial draining time. Then, the compressed-air valve is opened to clean the central channel and remove the remaining sludge.
4. OPENING OF FILTER PRESS AND CAKES DISCHARGE. After final draining the filtering unit is opened. Shaped cakes now drop as plates are separating. Once the filter is completely opened, the shaker starts to run and it helps to the total discharge of cakes.

## CYCLE STAGES | DEWATERING

- 1 Closure of filter press
- 2 Filling
- 3 Filtration
- 4 Opening and cake discharge

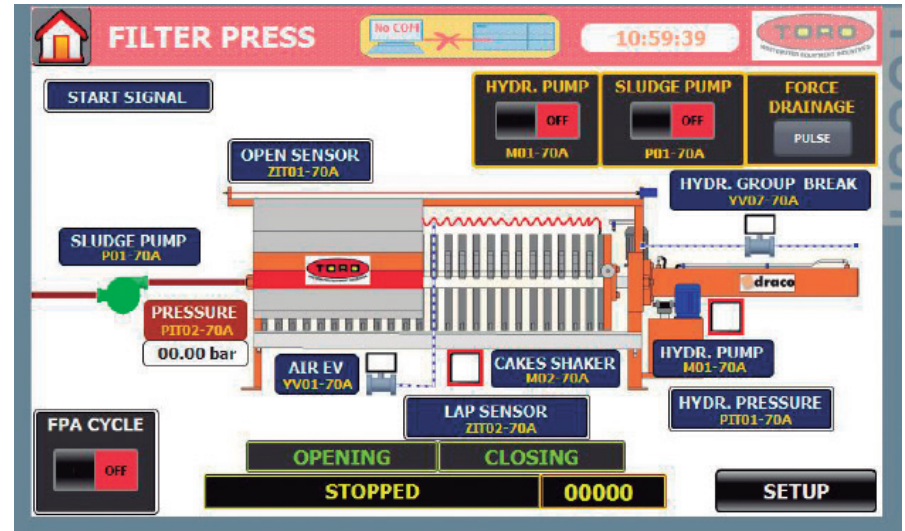
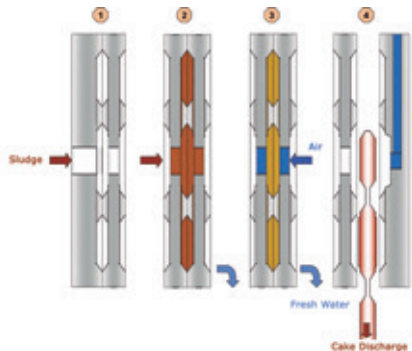
### Pressing cycle time

In each process, the pressing cycle time will depend on several factors, the type of sludge is the main one.

A sludge mostly composed of waste solids (cement plants, quarries, marble plants...) indicates much shorter time for cycles than those needed for carrying out a pressing from food industry sludge.

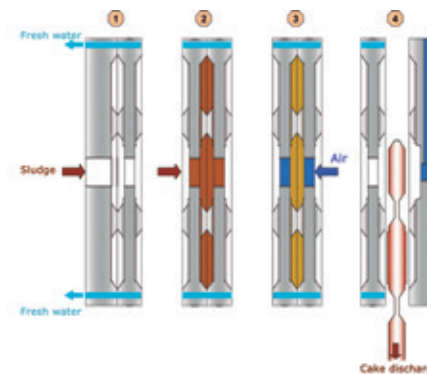
### OPEN EXECUTION

- Cancel option with installation of different taps.
- Enables an easy inspection of the filtrate.
- Enables a quick troubleshooting of the broken/damaged cloth.



### CLOSED EXECUTION

- Suitable to prevent the outside contact of the drained water and thus protect it from any contamination.
- Perfect for working with hazardous products.
- Enables the cleaning of cloths and the blowing of cakes.



# Filter press | Compact equipment

Compact assembly of the Draco® Filter Press, fitted in a 20' DV or 40' DV container subject to the equipment size which contains.

## ADVANTAGES | DRACO COMPACT UNIT

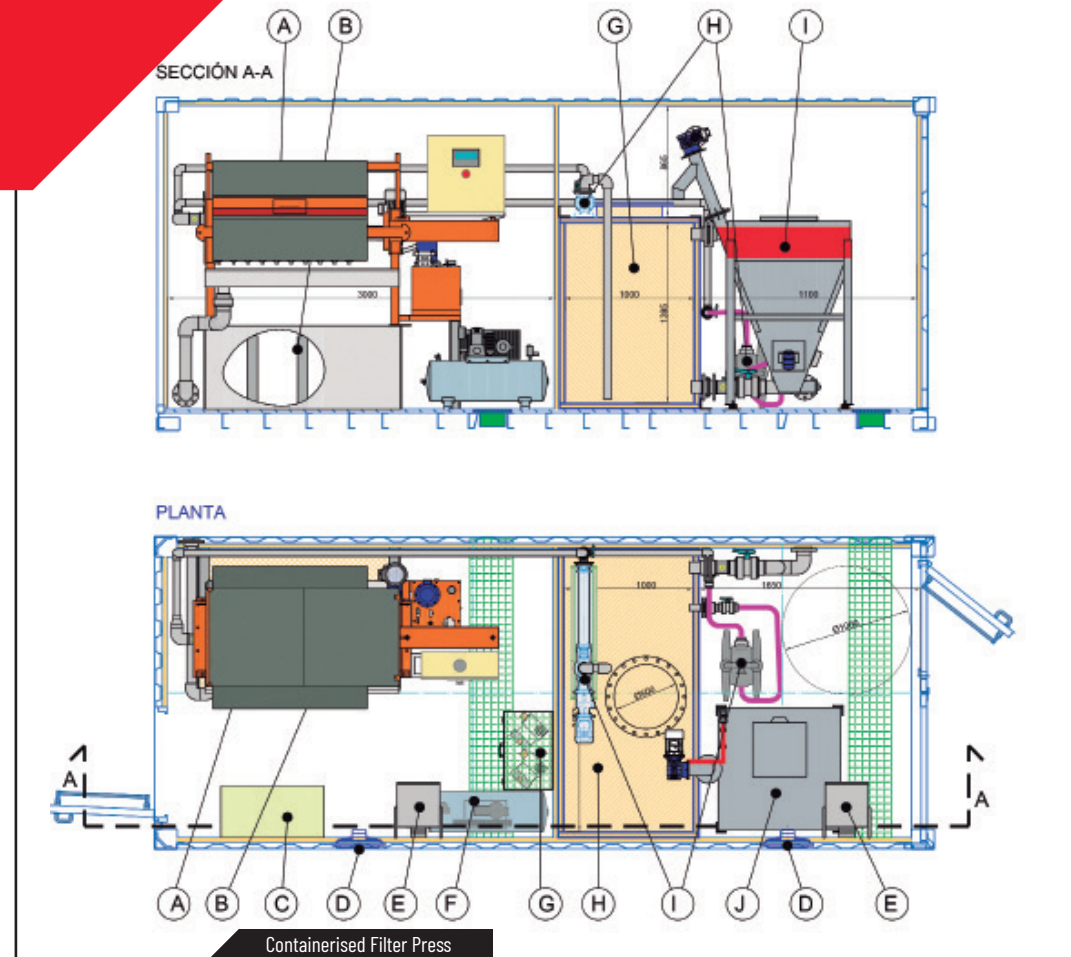
- Rapid installation.
- Easy transportation.
- Minimal footprint required.
- Minimal visual impact.

### Contenerization:

- 20 ft container.
- 40 ft container.
- Insulated containers.

## Draco® TEST EQUIPMENT

Toro Equipment manufactures the Draco® testing/pilot units. These units enable the testing and subsequent analysis for specific applications.



COMPONENTES/COMPONENTS		
MARCA/MARKS	DENOMINACION / DENOMINATION	UDS/QTY
A	FILTRO PRENSA / FILTER PRESS	1
B	FANGOS DESHIDRATADOS / DEWATERED SLUDGE	1
C	CUADRO ELÉCTRICO / ELECTRICAL PANEL	1
D	EXTRACTOR / AIR EXTRACTOR	2
E	AEROTERMO / AIR HEATER	2
F	COMPRESOR / COMPRESSOR	1
G	BOMBAS DOSIFICADORAS / DOSING PUMPS	1
H	TANQUE DE FANGOS / SLUDGE TANK	1
I	BOMBEO DE FANGOS / SLUDGE PUMPING	1
J	TOLVA DE CAL / CAL HOPPER	1

# Advantages and applications | Filter press



## FILTER FABRICS AND PLATES:

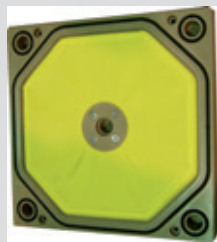
**Filter fabrics and plates:** The filter press have incorporated the filter cloth more appropriated for each application, in order to obtain the maximum performance.

### Filter fabrics types:

- Standard fabrics.
- Non-drip fabrics.
- Fabrics for sealed plates.
- Special fabrics for aggregate treatment.
- Fabrics for other specific treatments.



Special fabrics for aggregate treatment



Fabrics for sealed plates



Non-drip fabrics

### WASTEWATER

- Draco® Filter Press achieves more dryness, reducing the managing cost of produced sludge.
- Sludge easy to carry. Problems like the overflow of liquids in containers are avoided.
- Stackable sludge once dewatered. The high dryness degree improves handling, composting and management of sludge.
- 24 hours of full reliability. Unassisted operation due to shaking system of cakes.
- Low water consumption in the process.
- Minimum maintenance costs.
- No need for lubrication.
- Cycles operation 100% automated.
- Accurate control of actual sludge output.
- Enclosures which facilitates more hygienic environments than rotating systems. Sludge only contacts with air at the time of opening.
- Possibility of filter the sludge directly from biological reactor, without thickeners.

### WASTEWATER FOR REUSE

- Filtration below 10 $\mu$ .
- Guaranteed flow in cycles greater than 24 hours.
- Low investment and high reliability.

### STONE, AGGREGATES, TUNNEL BORING MACHINES

- Filter press of high draining capacity.
- Fast cycles.
- Strong operation.

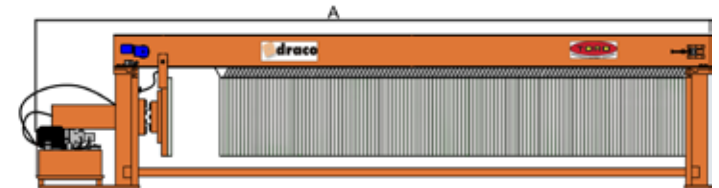
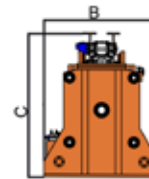
### ANTIBIOTICS, FOOD AND BEVERAGE INDUSTRY, CHEMICAL PRODUCTS

- Closed construction. Material does not contact with the frame.
- Frame of stainless steel or GFRP infused with isophthalic resin or highly structural and corrosion resistant vinylester.
- Special filtering plates.

# Filter press | Technical Specifications

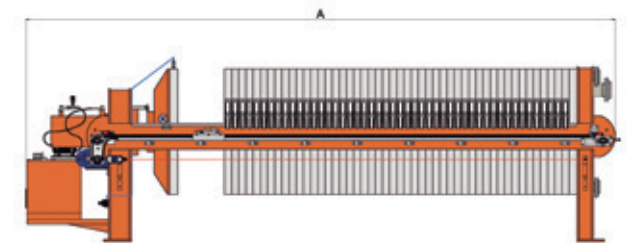
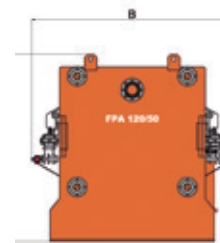
## FILTER PRESS SUPERIOR DRAGGING

Model	Maximum N° of plates	Maximum length	Maximum width	Maximum height	Maximum filter surface	Maximum filtered volume
		mm (A)	mm (B)	mm (C)	(m <sup>2</sup> )	(l)
FPA-AR 1000	125	11.000	1.400	2.100	215	3.220
Pump type: Cylinder of 23 cm <sup>3</sup>		Tank Volume (l): 150 Power: 7,5 Kw				
FPA-AR 1200	125	12.400	1.900	2.400	310	4.445
Pump type: Cylinder of 23 cm <sup>3</sup>		Tank Volume (l): 150 Power: 7,5 Kw				
Frame: Material ST-37/AISI-304, finish: Epoxy Paint.						
Operation: Automatic.						
Ral 2011						

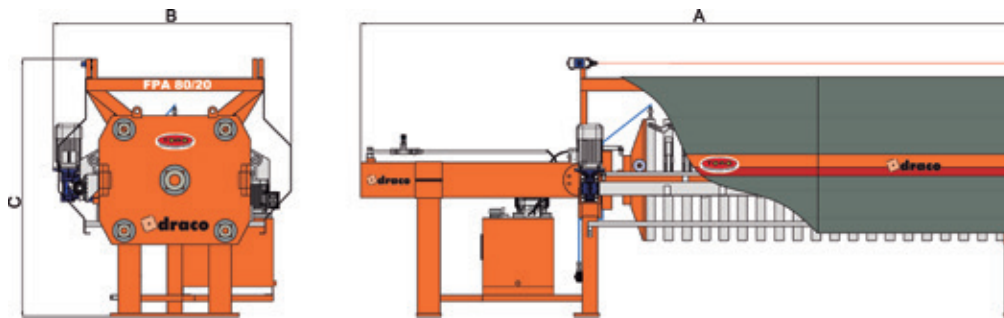


## FILTER PRESS LATERAL DRAGGING

Model	N° of plates	N° of chambers	Length	Width	Height	Weight empty	Weight loaded	Total filter area	FP total cake volume	Plates and fabric size
	ud.	ud.	mm (A)	mm (B)	mm (C)	(Kg)	(Kg)	(m <sup>2</sup> )	(l)	mm
FPA AL 120/40	40	39	5.020	1.935	1.790	7.800	9.420	92	1.247	1.200
FPA AL 120/50	50	49	5.710	1.935	1.790	8.400	10.438	115,60	1.567	1.200
FPA AL 120/60	60	59	6.400	1.935	1.790	9.000	11.450	139,2	1.886	1.200
Pump type: Cylinder of 25 cm <sup>3</sup>		Tank volume (l): 100 Power: 4Kw								
Frame: Material ST-37/AISI-304, Finish: Epoxy paint.										
Operation: Automatic.										
Ral 2011.										



## AUTOMATIC FILTER PRESS



### NOTE

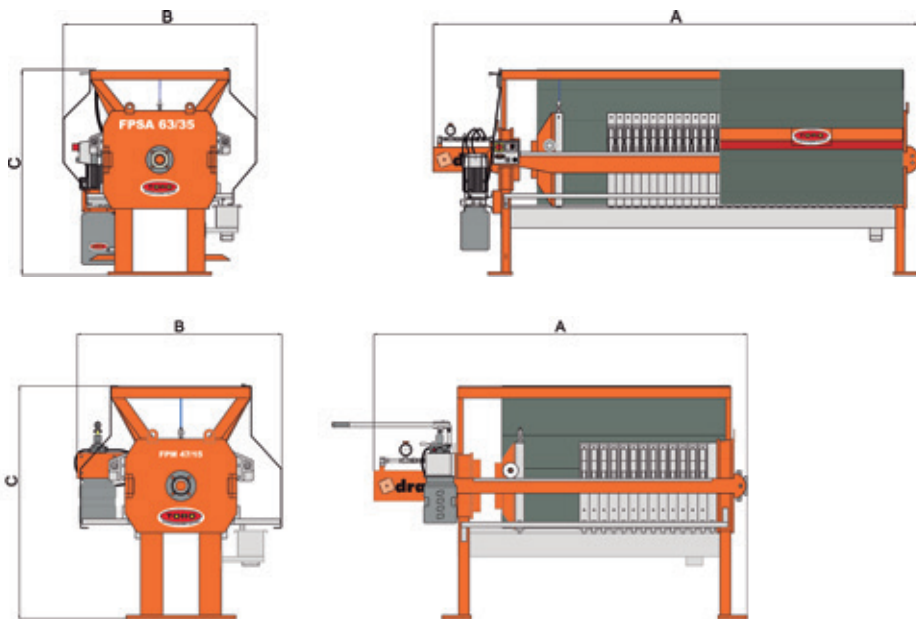
- (1) The FPA is supplied with:
  - Side protection plates.
  - Filtered water collection channel and handles.
  - Compressed air socket.
  - Equipped with cake-blowing circuit.
  - Emergency stop cable.
  - Hydraulic oil included.
- (2) Compressor not included.
- (3) The dimensions and specifications may vary slightly due to the normal development of products by the engineering department or Toro Equipment SL. When ordering request the specifications sheet at [www.toroequipment.com](http://www.toroequipment.com)

Model	Nº of plates	Nº of chambers	Length	Width	Height	Weight empty	Weight loaded	Total filter area	FP total cake volume	Plates and fabric size
	ud.	ud.	mm (A)	mm (B)	mm (C)	(Kg)	(Kg)	(m²)	(l)	mm
FPA 47/	5	4	1.455	1.167	1.396	660	688	1,5	21	470
	10	9	2.330	1.167	1.396	800	860	3,3	47	470
	15	14	3.170	1.167	1.396	940	1.035	5,2	73	470
	20	19	4.030	1.167	1.396	1.100	1.230	7,0	98	470
	25	24	4.910	1.167	1.396	1.260	1.420	8,9	124	470
	30	29	5.775	1.167	1.396	1.410	1.605	10,7	150	470
Pump flow (l/m): 6,8 Tank volume (l): 30 Power: 3 Kw Calculated for cake thickness: 32 mm										
FPA 63/	10	9	2.415	1.350	1.508	1.380	1.490	5,9	85	630
	15	14	3.270	1.350	1.508	1.500	1.670	9,1	132	630
	20	19	4.145	1.350	1.508	1.620	1.850	12,4	179	630
	25	24	5.030	1.350	1.508	1.780	2.080	15,6	226	630
	30	29	6.200	1.350	1.508	1.900	2.250	18,9	273	630
Pump flow (l/m): 12+4 Tank volume (l): 55 Power: 2,2 Kw Calculated for cake thickness: 32 mm										
FPA 80/	15	14	3.565	1.585	1.700	2.500	2.790	15,3	224	800
	20	19	4.475	1.585	1.700	2.730	3.125	20,7	305	800
	25	24	5.535	1.585	1.700	2.970	3.470	26,2	385	800
	30	29	6.295	1.585	1.700	3.100	705	31,6	465	800
Pump flow (l/m): 28+4,5 Tank volume (l): 75 Power: 4 Kw Calculated for cake thickness: 32 mm										
FPA 100/	20	19	5.165	1.780	1.950	6.000	6.630	33	485	1.000
	25	24	5.485	1.780	1.950	6.400	7.195	42	612	1.000
	30	29	5.805	1.780	1.950	6.800	7.762	50,8	740	1.000
Pump flow (l/m): 33+5 Tank volume (l): 100 Power: 4 Kw Calculated for cake thickness: 32 mm										
FPA 120/	20	19	5.380	2.010	2.135	6.550	7.375	48	635	1.200
	25	24	5.725	2.010	2.135	7.200	8.240	61	802	1.200
	30	29	6.070	2.010	2.135	7.850	9.110	73	969	1.200
	35	34	6.415	2.010	2.135	8.500	9.977	86	1.136	1.200
Pump flow (l/m): 33+5 Tank volume (l): 100 Power: 4 Kw Calculated for cake thickness: 32 mm										
FPA 150/	20	19	5.156	2.300	1.800	7.150	8.505	73,9	1.042	1.500
	25	24	6.141	2.300	1.800	7.800	9.512	93,4	1.317	1.500
	30	29	7.126	2.300	1.800	8.450	10.519	112,8	1.591	1.500
	35	34	8.011	2.300	1.800	9.100	11.525	132,3	1.865	1.500
Pump flow (l/m): 33+5 Tank volume (l): 150 Power: 4 Kw Calculated for cake thickness 32 mm										

Frame: Material ST-37/AISI-304, Finish: Epoxy paint.  
 Model FPA 47 lateral shafts in GRP Operation: Automatic.  
 Working Pressure: 8 Bares.  
 Ral 2011.

# Filter press | Technical Specifications

## SEMI AUTOMATIC & MANUAL FILTER PRESS



### NOTE

(1) The FPA is supplied with:

- Side protection plates.
- Filtered water collection channel and handles.
- Compressed air socket.
- Equipped with cake-blowing circuit.
- Hydraulic oil included.

(2) Compressor no incluido.

(3) Las dimensiones y especificaciones técnicas pueden variar ligeramente debido al normal desarrollo de los productos por parte del equipo técnico o de Toro Equipment S.L. Al realizar su pedido solicite plano de especificaciones en [www.toroequipment.com](http://www.toroequipment.com)

Model	Nº of plates	Nº of chambers	Length	Width	Height	Weight empty	Weight loaded	Total filter area	FP total cake volume	Plates and fabric size
	ud.	ud.	mm (A)	mm (B)	mm (C)	(Kg)	(Kg)	(m²)	(l)	mm
FPSA 47/	5	4	1.495	1.100	1.270	580	610	1,5	21	470
	10	9	1.765	1.100	1.270	620	680	3,3	47	470
	15	14	2.035	1.100	1.270	660	755	5,2	73	470
	20	19	2.305	1.100	1.270	710	837	7	98	470
	25	24	2.575	1.100	1.270	760	920	8,9	124	470
	30	29	2.845	1.100	1.270	810	1005	10,7	150	470
	35	34	3.115	1.100	1.270	860	1089	12,5	176	470
	40	39	3.385	1.100	1.270	910	1172	14,4	202	470
	45	44	3.655	1.100	1.270	960	1256	16,3	228	470
	50	49	3.925	1.100	1.270	1.010	1340	18	254	470
	55	54	4.195	1.100	1.270	1.060	1425	20	280	470
60	59	4.465	1.100	1.270	1.110	1507	21,8	306	470	

Pump flow (l/m): 2,5 Tank volume (l): 8 Calculated for cake thickness: 32 mm

FPSA 63/	10	9	1.865	1.308	1.385	1.050	1.160	5,9	85	630
	15	14	2.150	1.308	1.385	1.115	1.285	9,1	132	630
	20	19	2.435	1.308	1.385	1.200	1.430	12,4	179	630
	25	24	2.720	1.308	1.385	1.270	1.565	15,6	226	630
	30	29	3.005	1.308	1.385	1.350	1.705	18,9	273	630
	35	34	3.290	1.308	1.385	1.420	1.837	22,1	321	630
	40	39	3.575	1.308	1.385	1.490	1.968	25,4	368	630
	45	44	3.860	1.308	1.385	1.560	2.100	28,6	415	630
	50	49	4.145	1.308	1.385	1.630	2.230	31,9	462	630
	55	54	4.430	1.308	1.385	1.700	2.360	35,1	509	630
	60	59	4.715	1.308	1.385	1.770	2.490	38,4	556	630

Pump flow (l/m): 2,5 Tank volume (l): 8 Calculated for cake thickness: 32 mm

FPSA 80/	15	14	2.410	1.585	1.575	1.910	2.200	15,3	224	800
	20	19	2.720	1.585	1.575	2.080	2.475	20,7	305	800
	35	34	3.750	1.585	1.575	2.250	2.750	26,2	385	800
	30	29	3.340	1.585	1.575	2.420	3.025	31,6	465	800
	35	34	3.750	1.585	1.575	2.590	3.300	37,1	545	800
	40	39	4.060	1.585	1.575	2.760	3.572	42,5	625	800
	45	44	4.370	1.585	1.575	2.930	3.846	48,0	705	800
	50	49	4.680	1.585	1.575	3.100	4.120	53,4	785	800
	55	54	4.990	1.585	1.575	3.270	4.395	58,4	866	800
	60	59	5.300	1.585	1.575	3.440	4.670	64,3	946	800

Pump flow (l/m): 2,5 Tank volume (l): 15 Calculated for cake thickness: 32 mm

Frame: Material ST-37/AISI-304, Finish: Epoxy paint.

FPSA y FPM 47 model lateral shafts in GRP

Operacion: Joystick.

working Pressure: 8

Bares.Ral 2011.





Automatic Filter Press in (Refinery-Portugal)



FPA Draco® 120/80



Contenerized Filter Press



FPA Draco® 100/60

# Filter press | Optional extras

## EQUIPMENT

● Standard equipment ● Optional equipment

BODY	FPA	PFSA	FPM
S235JR Material	●	●	●
Connection flanges ISO/ANSI	●	●	●
GRP Protective covers PRFV	●	●	●
Lifting eye bolts	●	●	●
Anchor support	●	●	●
Painting RAL 2011	●	●	●
Clean water collection spillway	●	●	●
Pressure air connection	●	●	●
DOCUMENTATION	FPA	PFSA	FPM
Operating manual in specific language	●	●	●
Identification plate	●	●	●
Documentation in ISO regulations	●	●	●
CERTIFICATES	FPA	PFSA	FPM
CE certificate	●	●	●
Factory test certificate	●	●	●
Quality certificate	●	●	●
Sealing certificate	●	●	●
Certificate of materials	●	●	●
Welding certification	●	●	●
Hydraulic group certificate	●	●	●

● Standard equipment ● Optional equipment

DISTRIBUTION PANEL	FPA	PFSA	FPM
Distribution panel	●	●	—
Scroll screen 6"	●	—	—
Emergency stop	●	—	—
Piston proximity sensor	●	—	—
ACTIVATION	FPA	PFSA	FPM
Multi-voltage motor	●	●	—
ATEX motor	●	●	—
NEMA, CSA...motor	●	●	—
OTHERS	FPA	PFSA	FPM
Washing system	●	●	●
Conveyor belt	●	●	—
Sludge conditioning tank TAF	●	●	●
Lime hopper TDC	●	●	●
Dryp tray	●	—	—
Cakes shacker	●	—	—
PACKAGING:	FPA	PFSA	FPM
Packaging	●	●	●
Packing in wooden box	●	●	●
Lifting structure	●	●	●
Contenerization	●	●	●



Distribution panel



Maniflow in GRP



Scada



Mobile filter press FPA 120/115



Protective wooden crate

## How to determine the size of the Filter Press you need?

### Design details:

- Sludge volume per day.
- Kg of dry matter.
- Nº of working hours per day.



The following is an example of pressing without lime knowing that the dryness obtained is 30%.

**Input data: Sludge volume 7m<sup>3</sup>/day, at 6% dryness**

In order to obtain kg of dry matter, we have to multiply the volume by dryness. **The result is 420-kg of dry matter. Dryness of output cake should be 30%.**

**Therefore, we get 1.4 m<sup>3</sup>/day of cakes at 30% = 1,400 l/day.**

**If we want to perform 4 pressing cycles per day: 1,400/4 = 355 l/cycle (look for this data in the chart).**

**In this case, the Filter Press to be selected would be an FPA 80/25.**

Model	Nº of plates	Nº of chamber	Length mm (A)	Width mm (B)	Height mm (C)	Weight empty (Kg)	Weight loaded (Kg)	Total filter area (m <sup>2</sup> )		FP total cake volume (l)		Plates and fabrics size (mm)
								Open.Exec	Closed-Exec	Open.Exec	Closed-Exec	
<b>FPA 80/</b>	15	14	3.565	1.585	1.700	2.500	2.790	15,3	14,1	224	202	800
	20	19	4.475	1.585	1.700	2.730	3.125	20,7	19,2	305	274	800
	25	24	5.535	1.585	1.700	2.970	3.470	26,2	24,2	385	346	800
	30	29	6.295	1.585	1.700	3.100	705	31,6	29,3	465	418	800



Factory Villavaquerín - Valladolid

## WORLD LEADERS

- Algeria
- Argentina
- Australia
- Austria
- Belgium
- Brazil
- Bulgaria
- Canada
- Chile
- China
- Colombia
- Costa Rica
- Croatia
- Dominican Republic
- Ecuador
- Egypt
- Estonia
- Finland
- France
- Germany
- Greece
- Guatemala
- Holland
- Hungary
- Indonesia
- Iran
- Ireland
- Israel
- Italy
- Japan
- Jordan
- Latvia
- Lebanon
- Lithuania
- Luxembourg
- Malaysia
- Mexico
- Montenegro
- Morocco
- Netherlands
- Nicaragua
- Pakistan
- Panama
- Peru
- Philippines
- Poland
- Portugal
- Qatar
- Romania
- Russia
- Saudi Arabia
- Serbia
- Seychelles
- Singapore
- Slovenia
- South Africa
- Spain
- Switzerland
- Thailand
- Trinidad and Tobago
- Tunisia
- Turkey
- UK
- Ukraine
- United Arab Emirates
- United States of America
- Uruguay
- Vietnam

**FOUNDED**  
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### FACTORY AND Y OFFICES

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Filter Press

