

Technical Information

COMPACT

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MODULE OF A COMPACT PRESSING SHOP FOR PRESSING OF VEGETABLE OILS WITH FILTRATION

with the capacity from 6 to 16,8 t of seed per day



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1. Introduction

Farnet Corporation provides development, design, production and sale of complex technological equipment for pressing and processing of vegetable oils and production of feed. It produces a wide range of screw presses for oil seeds, covering a wide range of functions. Parallel lining of presses enables to set the pressing technologies with multiply output of one press.

It is possible to carry out two-level pressing for obtaining higher yield. The usage of produced presses, their modification and various ways of sequencing offer many possibilities for solving particular requirements for pressing from small capacities of special crops up to large pressing shops with the capacity of 1000 tons per day (lined parallel). The total overview is mentioned in the material “**Production of Vegetable Oils**” together with the main advantages and disadvantages.

The conception of the whole technology (shop) including structuring into individual operational sets is described in the material “Plant Design for pressing of vegetable oils”, hereinafter “**Plant Design**”. The “**General Trading Conditions**” are enclosed. We advise to read these materials carefully before you start to read this technical information.

This technical information represents whole solution of smaller capacity of vegetable oils production, which includes following operational sets:

- PS2 – Pressing shop**
- PS3 – Filtration**
- PS4 – Pressing cake storage**
- PS5 – Oil storage**

The module of the compact pressing shop **COMPACT** can be supplied with various types of the pressing technology, namely single-level cold pressing (**CP1**), two-level cold pressing (**CP2**), two-level pressing with extrusion (**EP2**) or one-level pressing with extrusion (**EP1**).

The module of the compact pressing shop can be equipped with one (marked „-1“) or two machine sets (marked „-2“). The total capacity of the pressing shop differs in accordance to this equipment:

Used technology	Capacity - (tons of seed per hour / day / year)		
	rapeseed	sunflower	soya
COMPACT – CP1-1	0,18 / 4,32 / 1425	0,18 / 4,32 / 1425	x
COMPACT – CP1-2	0,36 / 8,64 / 2851	0,36 / 8,64 / 2851	x
COMPACT – CP1-3	0,54 / 12,96 / 4277	0,54 / 12,96 / 4277	x
COMPACT – CP1-4	0,72 / 17,28 / 5702	0,72 / 17,28 / 5702	x
COMPACT – CP2-1	0,3 / 7,2 / 2376	0,3 / 7,2 / 2376	x
COMPACT – CP2-2	0,6 / 14,4 / 4752	0,6 / 14,4 / 4752	x
COMPACT – EP2-1	0,35 / 8,4 / 2772	0,35 / 8,4 / 2772	0.25 / 6 / 1980
COMPACT – EP2-2	0,7 / 16,8 / 5544	0,7 / 16,8 / 5544	0.5 / 12 / 3960
COMPACT – EP1-1	x	x	0.25 / 6 / 1980
COMPACT – EP1-2	x	x	0.5 / 12 / 3960

 Suitable use  Possible use *  Cannot be used

* Variant of EP2 includes presses and extruder(s) equipped with pressing geometry suitable for pressing the rapeseed and sunflower. In addition to that variant it is required to order the Option **Conversion kit for soya pressing**.

Possibility of extension:

The possibility of an extension depends on version of the base oil collection tank.

The standard oil collection tank enables installation of 4 presses of the CP1 technology or 2 pressing units CP2, EP1 or EP2. The short oil collection tank (marked with "S") enables installation of max. 2 presses CP1 or of one pressing units CP2, EP1 or EP2.

Shall the line involve a lower number of pressing units, it is possible to extend the line by another units (up to the full number of units) any time.

The technology of cold-pressing (CP2) can be supplemented with an extruder and thus changed to the technology of two-level pressing with extrusion (EP2).

The technology of one-level pressing with extrusion (EP1) can be supplemented with a pre-press at any time and thus changed to the technology of the two-level pressing with extrusion (EP2). This simple equipment adding is a significant advantage of the COMPACT by changing the production orientation to different crops or different type of seed processing.

2. Range of Solution

This technical information describes the basic supply of the compact pressing shop module and possible choice of the supplementary solutions – OPCE – “Options”. **Battery limits of the delivery** and recapitulation of the offer are defined in the Appendix No.2. Detailed description of the technology is mentioned in Chap.3.2.

Due to different characteristics of the individual oilseeds, especially because of their different content of oil, it is necessary to optimize technology for the specific kind of the oilseed or the group of seeds. During pressing of different oilseed the replacement of some components is required (screws, inserts, weep holes).

The offered technological equipment contains:

- Machines and equipment in compliance with the text of this offer (equipment signed as “Options” is not a part of the basic offered price, the price of the “Options” is stated separately)
- Technological wiring
- Accompanying documentation – the manual for using the technology and particular equipment, technological tables and wiring diagrams, documentation of pressure tanks
- EU Declaration of conformity for all equipment used according to the EU rules for delivery in EU and EU directive declaration for the whole delivered technology when the investor ensures the participation with his general project engineer.

Subject of the offered technological equipment does not contain:

- The construction project – we expect co-operation with the investor’s general project engineer
- Any construction works
- Transportation to the realization site
- Supply distribution of the electric energy to the switchboards of the technology
- Compensation of the reactive power (to be solved centrally for the whole shop)
- The source of steam - a boiler room producing the required amount of steam according to the parameter table
- Certification and eventual revisions and approvals outside the EU.
- General fire, electrical, hygienic and other approvals and revisions performed in accordance with

the overall construction

- Assembly
- Chief assembly, putting into operation and staff training

This offer contains only machines and equipment explicitly stated below.

3. Description of the process and technology

3.1. The Principle of the offered technology

The principle of the technologies of pressing CP1, CP2, EP2 and EP1, which are used in the module of the pressing shop COMPACT has been described in detail in the material “**Production of vegetable oils**” and in Technical Information (TI) of the respective technology.

The technology of **cold pressing CP1, CP2** and the technology **two-level pressing with extrusion EP2** can be used for pressing of a wide range of oilseeds, mostly **rapeseed and sunflower**.

The technology of **one-level pressing with extrusion EP1** is specially designed for **soya**. The technology of pre-pressing is not generally used in this technology because of low content of oil, on the other hand it is necessary to include the process of extrusion in order to reduce anti-nutritional substances (mostly urease) in pressing cakes.

The technology of **two-level pressing with extrusion EP2** is not intended directly for soya however it is possible to use it for soya pressing, too, when the material is crushed in the first level of pressing and only a very little amount of oil is pressed.

3.2. Technology description

3.2.1. PS1 – Oilseeds input and storage

Oilseeds input and storage **IS NOT A PART OF THIS OFFER**. It is assumed that oilseeds are stored on the floor in suitable protected storage and manipulated by a front end loader.

3.2.2. PS2 – Pressing Shop

The starting point of the compact pressing shop is an intermediate bin. The operator must keep filling the stock of oilseeds in the intermediate bin; e.g. by the front end loader or by conveyor from the oilseeds storage.

Oilseeds go through the magnetic separator continually to the inclined dosing conveyor controlled with the frequency converter which can change the amount of input seeds fluently. Then seeds continue to the cleaning section (vibration separator) where dust and rough impurities are separated. Oilseeds continue by the heating conveyor, which provides pre-heating of seeds and ensures suitable temperature for pressing even at low surrounding temperature. The conveyor is heated by thermal oil; heating units are integrated inside the conveyor shell.

The heating conveyor carries seeds either into the section of dehulling and partial hull separation (Option) or directly into the pressing section.

For processing of sunflower seed (as well as for soya), it is recommended to use the **OPTION Dehulling and Separation of Hulls 1.15**, possibly together with the **OPTION Granulation of Hulls 1.30** (see standalone Technical Information).

Particular pressing sections differ according to the used technology of pressing and consist of the following machines and devices:

- a) **Technology CP1 (one-level cold pressing):**
Screw press FL200 is used, in the version of full-press.
- b) **Technology CP2 (two-level cold pressing):**
Screw press FL200 is used as a pre-press. Pressing cakes from the pre-press continue by the inclined conveyor into the final press, also the press FL200.
- c) **Technology EP2 (two-level pressing with extrusion):**
Screw press FL200 is used as a pre-press. Pressing cakes from the pre-press fall down into a hopper of the extruder FE250 where extrusion of the material takes place – mechanical kneading and heating up to high temperature under high pressure. The material continues from the extruder by an inclined conveyor into the final press, also the press FL200.
- d) **Technology EP1 (one-level pressing with extrusion):**
Material is transported into the hopper of the extruder FE 250, where extrusion of the material takes place - mechanical kneading and heating up to high temperature by the high pressure. The material continues from the extruder by an inclined conveyor into the final press, also the press FL200.

3.2.3. PS3 – Filtration of oil

Oil from presses flows into a sedimentation tank, which is an integral part of the pressing shop module. The sedimentation tank is equipped with an automatic carriage of solid particles, which are taken out of the tank by blades on a chain conveyor. Solid particles separation takes place on a sieve and then the solid particles are returned into re-pressing.

Oil can be pre-heated in the separation tank by the heating bars to make the filtration easier. This is especially important for filtration of soya and sunflower oil.

Then the oil from the separating tank is pumped by an integrated pump into a manual desk filter, which secures filtration of remains of solid particles and thin particles.

3.2.4. PS4 – Store of press cakes

Press-cakes from the final press are taken by horizontal trough conveyor out of the pressing shop. Inclined conveyor with the supportive construction is a part of a delivery. It serves for taking the press cakes to PS4 – **Store of press cakes** and at the same time it creates the dividing wall.

3.2.5. PS5 – Store of oil

The filtered oil is pumped into the oil storing tanks (Option). Plastic tanks of volume 1m³ or 7m³ are optionally delivered for oil storing. We always advise to use two pieces of these tanks at least so that you always have sufficient space for solving the oil logistics.

It is possible to deliver a dispensing oil pump (Option) optionally, which is used for pumping the filtered oil from the storage tanks (Option) into the transport ways of the customer, into the transport containers or into a tank truck. A part of the pump is the working area with manual valve for the eventual bottling into PET bottles or cans.

3.3. Control and process visualization

For the compact pressing shop COMPACT, two versions of the control systems are available – CLASSIC or CLEVER.

Version CLASSIC:

This version includes complete wiring for drive and control all equipment based on the classical elements (contactors and relays). Filling of pre-presses, maximal temperature of extruders and maximal level of oil in the tank are controlled by the sensors to provide automatic stopping of dosing of material into pressing section if any system failure sets in. Control is performed by buttons on the switch board, which is an integral part of the pressing module. Dosing of material (line capacity) can be regulated by setting the rotation speed of the feed conveyor. Furthermore, the system of control includes control of heating

elements, heated conveyor and sedimentation tank together with the possibility of setting the temperature and automatic control of maximal temperature.

This version does not include control by PLC computer or visualization.

Version CLEVER:

In case of the version CLEVER, the switchbox is be fitted with the Touch panel and PLC (programmable logic controller). This version secures precise controlling of the line, there is no need for multiple push-buttons on the control panel and the technology is to be controlled directly from the touch panel. Another advantage of this version is the FIC control system, data logging, variability for future expansion, etc.

For description of the FIC control system please see standalone Technical Informaiton.

The version CLEVER can be further expanded with utilization of the OPTION “PC Visualization”, which comprises also the remote control, or using the OPTION “Remote Access”.

3.4. Auxiliary equipment

The module of the compact pressing shop does not require any auxiliary equipment.

4. OPCE - Options

It is possible to add these **Options (recapitulation):**

<p>1.15 Dehulling and hull separation (for sunflower /soya) It removes a part of hulls prior to the pressing. This decreases the content of fibre in pressing cakes and they become more valuable feed. We like to send you separate Technical information and following offer for the technology of dehulling.</p>
<p>1.30 Granulation of hulls (for sunflower /soya) It follows-up the OPTION Dehulling and hull separation. The technology of granulation (pelleting) of hulls serves for processing of sunflower hulls into the form of granules (pellets), which are more suitable for handling, storing and subsequent utilization. Granulation considerably decreases volume of the hulls and thus the requirements for storage dimensions. This technology is closer described in the standalone Technical Information (TI GS).</p>
<p>2.20 Water dosing into the extruder (for technologies EP1, EP2) Option includes a frequency controlled dosing pump and injection nozzles for water dosing into the entry part of the extruder. This is useful if the input seeds are over-dried and their minimum moisture is not corresponding to the table A – Input parameters (chapter 5.1.).</p>
<p>2.20.2.3 Active breaker at the output of extruder This Option is required for processing those oilseeds which create a cohesive mass, for example sunflower. Active breaker breaks up the output material into smaller parts and therefore allows their passage through other transport ways. It is not necessary for processing of rapeseed and soya. OPTION is mounted at the output of the extruder.</p>
<p>5.10.1.1 Oil storage 1m³ It contains 1m³-IBC-container which serves as a simple oil storage. We advise to use at least 2 pcs of containers.</p>
<p>5.10.1.2 Oil storage 7m³ It contains a plastic 7m³-container which serves as a simple oil storage. We advise to use at least 2 pcs of containers.</p>
<p>5.10.2 Dispensing oil pump It serves for pumping the oil from storing tanks into transport containers or tank truck. A part of the pump is a working space with manual valve for bottling the oil into PET bottles or cans.</p>

2.20.9 Conversion kit for soya pressing

This OPTION is defined for COMPACT in a variant EP2 (originally intended for rapeseed or sunflower) which is supposed to be used alternatively for soya processing. The OPTION includes working screws, inserts of the extruder in the implementation of soya extrusion. Further it includes a conveyer(s), which serves as a bypass of pre-press(es).

2.40a PC Visualization + Remote Access

This OPTION can be used only in case that the technology is equipped with the control system in the version CLEVER (PLC-based control system).

The OPTION consists of a standalone computer with the respective SW for visualization and control of the process. We recommend to place this computer in a dedicated control room. The computer serves for visualization of various operational states and the whole technology can be controlled from it.

The OPTION includes also the **function of REMOTE ACCESS**, which – after connection to the Internet – enables to supervise and control the technology from a remote workplace. This function can be also utilized for the purposes of Farnet service support and to secure operative help and support to the user in case of emergency operation states of the technology.

2.40b Remote Access

This option secures the function of REMOTE ACCESS (see above), but without the visualization computer.

This OPTION is recommended in cases, when it is not possible or suitable to have a dedicated control room close to the pressing shop.

The OPTION Includes a minicomputer installed inside the switchboard, together with the respective SW, without any monitor or keyboard.

All of these Options are delivered including the electrical wiring necessary for their function and its connections into the system of operation, visualization and control.

Option prices specified in the price offer are only valid if the options are ordered with the technology at the same time. Costs for additional supplies are usually much higher and must be calculated according to the particular situation.

5. Equipment Parameters

The basic parameters of the output, quality, space and energy requirements are mentioned in the table in Enclosure no. 1 - Parameters. They are indicative data for the standard verified solutions and some of them can be adjusted according to specific requirements of a particular investment intention. It is necessary to start up the technology (several weeks) and to stabilize the operation to achieve the performance and quality parameters.

The decisive parameters are the capacity of technology (the quantity of oilseeds processed per unit of time) and the quantity of pressed oil. There are many inconsistencies and mistakes in the definition and understanding of these parameters, especially in the practical setting. Because of it these parameters are clarified in the material **“Production of vegetable oils”** elaborately.

5.1. Parameters of the input oilseeds

It is necessary to pay close attention to the quality of oil seeds to ensure effective pressing. The decisive parameters affected the pressing process are listed below:

Biological Ripeness and Drying Care - these parameters are very difficult to evaluate in practice and no single methodology has been set. It is necessary to avoid following:

- Burnt oilseeds (odour, dark colour, hard)
- Typical light-colour indicating unripeness
- Moldy oilseeds and affected in other ways
- Damaged oilseeds – according to most standards the limit for **damaged seeds is max 2%** (the oxidation of oil in oilseed starts in the damaged oilseeds and this causes deterioration of the oil quality)

Impurities - The upper limit is **max. 2% of impurities**. The technology is equipped with cleaning of seeds at the input. This serves as a protection of the technology and it does not substitute the quality after-harvest cleaning.

Moisture - of the input seeds is very important parameter for the technology of pressing. If the moisture of the seeds would be above the limit recommended for storing – see the following Table A – there is a danger that the seeds will be damaged by storing (moulds etc.) and at the same time the extrusion output would decrease because it would be necessary to heat up too big amount of water (water has big measuring thermal capacity). This would decrease the performance of the complete technology.

If the moisture would be too low, the process of extrusion (for the technologies EP1 and EP2) will become unstable and the output expansion will not be sufficiently intensive.

The common storing moisture for rape and sunflower is about 6-7% and this moisture gets into pressing cakes from the first level and their moisture is commonly higher than 8% and the technology works out without problems.

If it is assumed to process seeds with the moisture lower than 5%, we recommend using the Option **“Dosing water into the extruder”**.

Temperature of the input oilseed influences the yield of oil in the first level of pressing and also the input temperature into the extruder. **The module of the compact pressing shop is equipped with heating up the seeds at the input by the heated conveyor, which decreases the influence of the input temperature of the seed.**

Oiliness - (oil content in the seed) is the key parameter for determining the yield of oil (how much oil will be pressed). There are parameters for standard seeds of many kinds in the following Table A. The technology is optimized for these seeds' parameters. It means that for meeting the requirements of output parameters of technology, mentioned in the chapter 5.2., it is required to keep the parameters of seeds at the input. If the real oiliness is lower but in the range of effective pressability according to the Table A, the technology will press the oil. The parameter “maximal residual fat in pressing cakes” will be kept, however the yield will be lower.

If the oiliness is higher than stated medium, the yield will rise, but the parameter “maximal residual fat in pressing cakes” (see the Table B) can slightly worsen (big amount of oil does not manage to flow away from the press) This quality worsening should not be higher than 0,2% of the increase of the residual fat in pressing cakes per every 1% of higher content of fat in the oilseed above the medium limit stated in the following Table A.

Table A - Input parameters

Oilseeds	Max. moisture for storing	Medium moisture recommended	Oiliness medium at medium moisture	Oiliness Range of effective pressability
Rape	8 %	6.5 %	42 %	38 - 44 %
Sunflower	8 %	6.5 %	43 %	40 - 48 %
Soya	12 %	10 %	19 %	17 - 22 %

It is also possible to press oilseeds with oiliness out of the range of effective pressing mentioned in this table, however, the parameters can worsen and problems with solid particles and with the stability of the process can set in.

5.2. Output parameters after pressing

Capacity of the technology is rated as a throughput of oilseed at the entry to the technology. In case that the OPTION Dehulling and separation of hulls is used, it is understood as the throughput before the dehulling.

For sunflower, capacity of a technology is rated for using the OPTION Dehulling and separation of hulls.

For dehulled sunflower seed, the capacity must be derated by 10-15%.

If the OPTION Returning of filtration cake (a part of PS3) is used, capacity of the technology will be slightly decreased (depending on the quantity of filtration cakes to be returned for re-processing, practically no more than by 8%).

Table B – Output parameters

a) For the technology CP1

Oilseeds	Residual fat in pressing cakes in moisture 10 %	Residual fat in dry mass %	Yield (at average oiliness of seeds) %	Remainder of oil in pressing cakes in % (oiliness - yield)
Rapeseed	11 - 13 %	12,22 – 14,44	34,83 - 33,31	7,17 – 8,69
Sunflower	11 - 13 %	12,22 – 14,44	35,97 – 34,47	7,03 – 8,53
Soya	Not suitable for cold pressing			

b) For the technology CP2

Oilseeds	Residual fat in pressing cakes in moisture 10 %	Residual fat in dry mass %	Yield (at average oiliness of seeds) %	Remainder of oil in pressing cakes in % (oiliness - yield)
Rapeseed	10 - 12 %	11.1 – 13.3	34.08 – 35.56	6.44 – 7.92
Sunflower	10 - 12 %	11.1 – 13.3	35.23 – 36.69	6.31 – 7.77
Soya	Not suitable for cold pressing			

c) For the technology EP2

Oilseeds	Residual fat in pressing cakes in moisture 10 %	Residual fat in dry mass %	Yield (at average oiliness of seeds) %	Remainder of oil in pressing cakes in % (oiliness - yield)
Rapeseed	7 - 9 %	8.82 – 11.03	35.61 – 37.02	4.98 – 6.39
Sunflower	7 - 9 %	8.82 – 11.03	36.74 – 38.11	4.89 – 6.26
Soya	6 – 8 %	6.62 – 8.82	12.13 – 13.97	5.03 – 6.87

d) For the technology EP1

Oilseeds	Residual fat in pressing cakes in moisture 10 %	Residual fat in dry mass %	Yield (at average oiliness of seeds) %	Remainder of oil in pressing cakes in % (oiliness - yield)
Rapeseed	Rapeseed is not suitable for one-level pressing with extrusion			
Sunflower	Sunflower is not suitable for one-level pressing with extrusion			
Soya	6 – 8 %	6.62 – 8.82	12.13 – 13.97	5.03 – 6.87

If requested, we will be pleased to send you the information explaining the terms above.

Evaluations have often been mistaken by confusing parameters “**Residual fat in pressing cakes**” (as a percentage of oil from the weight of the pressing cakes) and the parameter “**Remainder of oil in pressing cakes**” (calculated as oiliness minus the yield, which is in fact the volume of oil in pressing cakes but related not to the weight of pressing cakes but to the weight of the incoming oilseed!)

For clarity, see Enclosure No. 6 - Material balance, where all these parameters are stated.

6. Requirements for Installation and Operation of the Technology

The customer has to ensure below stated conditions for installation and operation of the technology.

6.1. Premises for installation

It is necessary to provide thermally insulated building with minimum dimension stated in the table in Enclosure no.1. – Parameters. The module of the compact pressing shop will be placed directly on the flat even floor of the building. No other supplementary constructions or other special building preparation are needed.

Temperature in the place of installation must not drop below -20°C for stored or non-working equipment, otherwise irreversible damage to the control panels will occur.

At start-up and operation of the technology, minimal ambient temperature of 0°C and maximal of 35°C must be ensured.

Air humidity must be within 10-90%, non-condensing, both for storage and for start-up and operation.

6.2. Energy

Electrical energy – technological device uses voltage system 3+PEN/3 + N + PE, AC 50Hz, 3 x 400 / 230 V. The installed electric input is presented for each capacity in the table in the Enclosure No.1. – Parameters, where the estimated concurrence is stated.

6.3. Operational media

It is necessary to have a source of drinking water if the Option “Dosing water into the extruder” will be used.

6.4. Laboratory

In order to operate the technology, it is necessary to regularly find out the parameters and to check the settings in accordance with the results.

The laboratory is not a part of the delivery.

The customer is to ensure continuous operation of his laboratory or to arrange cooperation with an external laboratory.

Requirements for the laboratory and laboratory tests:

Pressing:

- Measuring of moisture level and oiliness in the entering oilseed, pressing cakes (possibly also in hulls);
The most suitable are analytical instruments with short time of processing the results within about 30 minutes, with a possibility of verification by means of classical methods of extraction and drying within approx. 24 hrs.

For the OPTION Dehulling:

- Fibre content in the pressing cakes – with evaluation within approx. 24 hrs.
- Fat content in the hulls – with evaluation within approx. 24 hrs.

Degumming:

- Phosphorus content in oil - the most suitable are analytical instruments with short time of processing the results within about 30 minutes, with a possibility of verification by means of classical methods

7. Operation and maintenance

The operation of the whole device is controlled by the operator by the controlling elements on the switchboard.

The status and important process parameters are displayed by warning lights.

The device is equipped with a button of the emergency stop – CENTRAL STOP, which will immediately stop all the equipment.

The operation of the whole device is not demanding, however, permanent control by the operator is necessary. Estimated number of the operators is mentioned in the Enclosure No.1 – Parameters.

The technology is designed for continuous operation with permanent control by the operator. The technology requires trial operation and running-in (see the General Trading Conditions).

The technology of pressing and extrusion is based on creating pressure by mechanical friction in the inner parts of the press (screws, lamellas, chambers), therefore wear and tear arises. It is necessary to allow for carrying out regular cleaning and we recommend shutdown and complete cleaning of the technology at least each 6 months.

We use the highest quality materials and procedures for production of screws, still it is necessary to replace the worn out screws and inserts of presses and extruders (similar by discs of hullers if used). The working life of screws depends significantly on the processed raw material and its purity (Beware of abrasive dust and sand).

We advise to study all obtained Farnet documents completing the above mentioned information, especially all enclosures, the documents “Plant Design“ and “Production of Vegetable Oils“.

Thank you for your interest in our products.

Team of specialists, Farnet Corporation

Enclosures:

1. Parameters of technological equipment
2. Limits definition
3. Technological layout PS2
4. Layout plan
5. -
6. Material balance (electronically separated file)
7. Specification for processing the price offer (electronically separated file)
8. General trading conditions Farnet (electronically separated file)

Enclosure no. 1: Parameters of the technological equipment COMPACT – CP1 / CP2 / EP2 / EP1

TECHNOLOGY		CP1				CP2		EP2		EP1	
Main used equipment	Unit	CP1-1 (FL200)	CP1-2 (FL200)	CP1-3 (FL200)	CP1-4 (FL200)	CP2-1 (FL-FL)	CP2-2 (FL-FL)	EP2-1 (FL-FE-FL)	EP2-2 (FL-FE-FL)	EP1-1 (FE-FL)	EP1-2 (FE-FL)
Presses FL200 – pre-press	Piece	1	2	3	4	1	2	1	2	-	-
Extruder FE 250	Piece	-	-	-	-	-	-	1	2	1	2
Presses FL200 – final press	Piece	-	-	-	-	1	2	1	2	1	2
Intermediate bin with a conveyor above the presses, cleaning and heating up		1	1	1	1	1	1	1	1	1	1
Requirements for installation PS2	Unit	CP1-1 (FL200)	CP1-2 (FL200)	CP1-3 (FL200)	CP1-4 (FL200)	CP2-1 (FL-FL)	CP2-2 (FL-FL)	EP2-1 (FL-FE-FL)	EP2-2 (FL-FE-FL)	EP1-1 (FE-FL)	EP1-2 (FE-FL)
- minimal height of ceiling (without Options/ including dehulling)	m	4,5 / 5	4,5 / 5	4,5 / 5	4,5 / 5	4,5 / 5	4,5 / 5	4,5 / 5	4,5 / 5	4,5 / 5	4,5 / 5
- area (without Options / with Options)	m ²	65 / 136	65 / 136	65 / 136	65 / 136	65 / 136	65 / 136	65 / 136	65 / 136	65 / 136	65 / 136
- electric installed load (usage 0.8)	kW	24 / 53	35 / 64	46 / 75	57 / 86	43 / 72	73 / 102	64 / 93	117 / 146	49 / 78	88 / 117
+ heating (electrically heated conveyor)	kW	11	11	11	11	11	11	11	11	11	11
- operational staff per shift	workers**	1	1	1	1	1	1	1	1	1	1
- Transport in container possible – type		ANO – 40'	ANO – 40'	ANO – 40'	ANO – 40'	ANO – 40'	ANO – 40'	ANO – 40'	ANO – 40'	ANO – 40'	ANO – 40'
-Number of trucks of the basic delivery	Piece	1	1	1	1	1	1	1	1	1	1
-Volume of the intermediate bin	m ³	7,4	7,4	7,4	7,4	7,4	7,4	7,4	7,4	7,4	7,4
Delivery date FCA	Month	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4
Parameters of the technology	Unit	CP1-1 (FL200)	CP1-2 (FL200)	CP1-3 (FL200)	CP1-4 (FL200)	CP2-1 (FL-FL)	CP2-2 (FL-FL)	EP2-1 (FL-FE-FL)	EP2-2 (FL-FE-FL)	EP1-1 (FE-FL)	EP1-2 (FE-FL)
Rape 42% / 6,5%	t/hour- t/day t/year	0,18 – 4,32 1425	0,36 – 8,64 2851	0,54 – 12,96 4277	0,72 – 17,28 5702	0,3 – 7,2 2 376	0,6 – 14,4 4 752	0,35 – 8,4 2 772	0,7 – 16,8 5 544	-	-
-production of oil	t/hour- t/day t/year	0,06 – 1,45 478	0,12 – 2,9 956	0,18 – 4,35 1435	0,24 – 5,8 1913	0,103 – 2,47 817	0,206 – 4,95 1 635	0,126 – 3,02 998	0,252 – 6,05 1 996	-	-
-production of pressing cakes (moisture 10%) (u neloupané slunečnice)	t/hour- t/day t/year	0,11 – 2,81 925	0,23 – 5,61 1851	0,35 – 8,42 2777	0,46 – 11,2 3702	0,19 – 4,6 1 520	0,38 – 9,2 3 041	0,22 – 5,3 1 755	0,44 – 10,63 3 509	-	-
Sunflower 43% / 6,5%***	t/hour- t/day t/year	0,18 – 4,32 1425	0,36 – 8,64 2851	0,54 – 12,96 4277	0,72 – 17,28 5702	0,3 – 7,2 2 376	0,6 – 14,4 4 752	0,35 – 8,4 2 772	0,7 – 16,8 5 548	-	-
-production of oil	t/hour- t/day t/year	0,065 – 1,57 518	0,13 – 3,14 1036	0,196 – 4,71 1555	0,26 – 6,28 2073	0,11 – 2,65 874	0,22 – 5,3 1 748	0,138 – 3,32 1094	0,273 – 6,57 2 167	-	-
- production of pressing cakes (moisture 10%)	t/hour- t/day t/year	0,075 – 1,82 601	0,15 – 3,64 1202	0,23 – 5,47 1804	0,30 – 7,29 2405	0,11 – 2,62 865	0,22 – 5,2 1 730	0,2 – 4,94 1 631	0,42 – 9,9 3 263	-	-
Soya 19% / 10%	t/hour- t/day t/year	-	-	-	-	-	-	0,25 – 6,0 1 980	0,5 – 12,0 3 960	0,25 – 6,0 1 980	0,5 – 12,0 3 960
-production of oil	t/hour- t/day t/year	-	-	-	-	-	-	0,033 -0,78 258	0,066 – 1,56 517	0,033 -0,78 258	0,066 – 1,56 517
-production of pressing cakes (moisture 10%)	t/hour- t/day t/year	-	-	-	-	-	-	0,217 – 5,2 1 722	0,435 – 10,4 3 443	0,217 – 5,2 1 722	0,435 – 10,4 3 443

* The figure shows the oiliness / moisture of treated seed. The annual capacity is calculated for 330 days of operation.

** The number of workers is indicative and depends on local conditions. The employee performs supervision and occasional intervention and in most cases serves other parts of the technology PS1 – Seed storage, PS3 Filtration, PS4 Transport Ways of Pressing Cakes and the Storage of pressing cakes.

For security reasons; we recommend the presence of at least two employees per shift. It is therefore appropriate to build a common control room for all the technologies.

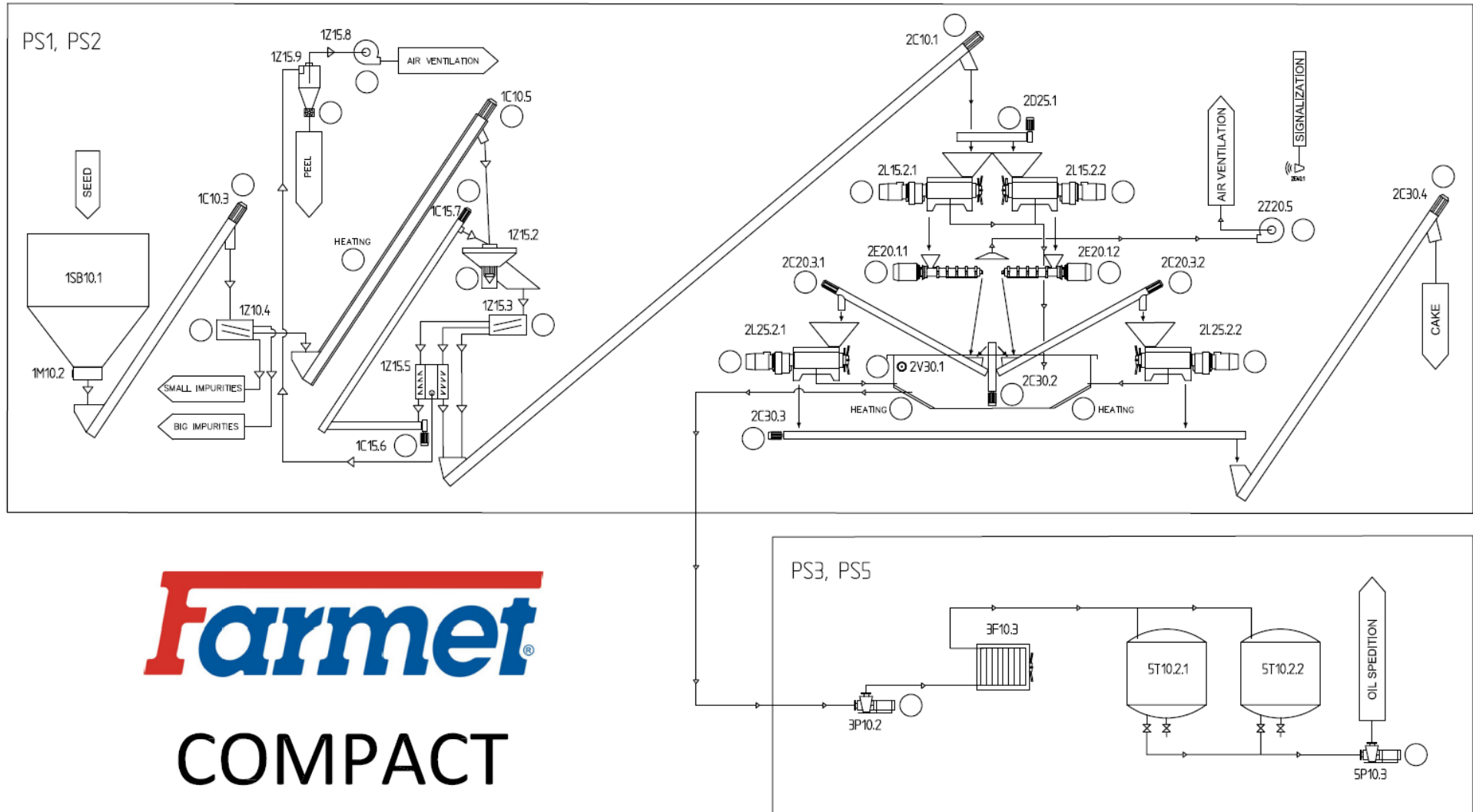
*** For sunflower, capacity is rated with the OPTION Dehulling and separation of hulls. In case of unhulled sunflower, capacity of the technology is to be derated by 10-15%

Enclosure no.2: Battery Limits of the Delivery

Dimensions, parameters and properties in the limit points and their exact placement will be specified in the project documentation.

	Battery limits – definition of Farmet delivery
Entry limit of raw material	Oilseeds from PS1 – Input intermediate bin of oilseeds. Customer provides filling of this bin. The intermediate bin must be continuously filled up.
Output limit of products	Pressing cakes: Output conveyor of pressing cakes including the separating wall of the Pressing cake storage. Oil – A part of the delivery is an oil pump in the press module tank and manual filter. In case of choosing the “Option” Oil Storage, plastic containers of the stated volume are a part of the order. In case of choosing the “Option” Output pump of oil, then the oil pump is a part of the order.
Limits of energy connection	Electrical energy – customer provides main input to terminals in the switch box, set 3+PEN/3+PE+N, AC 50Hz, 400/230V, compensation of any idle current.
Limits of media connection	Other media are not required.
Limits of air-conditioning system	Farmet provides only local aspiration from places of evaporation. Aspiration has its output into the pressing cakes as standard. Air-conditioning of the building is not a part of this offer.
Limits of solution of measurement and regulation system	Farmet provides equipment, measuring and regulation of the delivered technology.
Limits of solution of subsidiary constructions and technological stores	All subsidiary steel constructions for installation of the technology are included.

Enclosure no.3: Technological Layout COMPACT EP2-2, including options



Farmet
COMPACT

Enclosure no. 4: Dispositional Layout, Basic Dimensions COMPACT EP2-1, including Options

