

## 2.7 EXPLOSION SUPPRESSION SYSTEM

- Mechanism: gate automatically opens when pressure inside fluid bed chamber arises suddenly (exceeding 2 bars).
  - Anti-explosion gate has vertical design.
  - Additional options.
    - + Fire extinguisher, automatically activated when anti-explosion gate opens suddenly (due to pressure surge exceeding 02 bars) and loss of power.
    - + Machine stops immediately right after anti-explosion gate opens.
- Controlling inlet air temperature.
  - Indicating outlet air temperature.
  - Indicating product temperature.
  - All temperature parameters are set and display on

## 3. MACHINE CONTROL

### 3.1 ELECTRICAL SYSTEM

#### A. Control panel

1. Colour touch screen 10 inch, 65,000 colours.
2. Power switch, fan speed button (Germany).
3. Automatic setup for drying process. With 2 control options:
  - Fully- and semi-automatic.Settings and control parameters include:
  - Inlet air temperature.
  - Outlet air temperature.
  - Product temperature.
  - Drying time.
  - Filter parameters: frequency and duration.
  - Error messages: all errors are displayed on the touch screen.

#### B: Control cabinet

1. Cabinet has anti-dust joint and filter.
2. Automatic programming control: by PLC (Siemens-Germany): 01 set
3. Temperature regulator gauge: 01 item.



FBDG-120 installed at IMEXPHARM



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# FLUID BED DRYER & GRANULATOR

Model: FBDG-120



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# FLUID BED DRYER & GRANULATOR

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## USAGE APPLICATION:

- Fluid-bed drying and granulation

## TECHNICAL FEATURES:

- Designed and manufactured following WHO-GMP standards with innovative design.
- All materials made of SS304; product-contact parts are made of SS316L imported from Europe.
- Particles are granulated uniformly, and dried quickly. Manual mixing is unnecessary.
- Granules combined into uniform, nice pellets.
- Be able to examine particle samples anytime without any disturbance to operation.
- Machine has explosion suppression design.
- Automated control system.
- Module construction, easy assembling and disassembling, and automatic CIP system.

## 1. MAIN BODY

- Dimension: W 2000 x D 2250 x H 3800

### 1.1 Filtering module:

- Materials: SS 304, 04 mm thick, imported from Europe.
- Product observation window: frame made of stainless steel, window made of transparent acrylic sheet.
- Shaking-off-dust filter bag method: by automatic pneumatic cylinder with timing indicator, easy to assemble or disassemble for effective cleaning. Lifting up or lowering down filter bag for replacement by pneumatic cylinder.
- Filter bags: 2 sets. Material is antistatic, explosion-proof polyester fabric, dust-proof, aerated and easy for washing.
- Shaking-off-dust pneumatic cylinder (Festo- Germany).
- Explosion relief vent. .
- CIP system: rotary spray ball.
- Hanger for filter bag sleeves.
- Heat-resistant solid silicon joint.

- External surface finish following Germany technology.
- Inner surface is fully polished to obtain a surface roughness of R.a.0.5

### 1.2 Expansion chamber module:

- Materials: SS 316L, 04 mm thick, Imported from Europe.
- Hinges are mounted to expanded chamber to rotate, lift up or lower down.
- Product area: inside/ outside surface as mirror-polished.
- Observation window: stainless steel frame, the material of window is transparent and heat-resistant acrylic sheet with powder slider. Hinged. Lighting on window for clear observation.
- Heat-resistant, solid silicon joint, designed to facilitate assembly /disassembly when cleaning is needed.
- Lighting lamp inside drying chamber.
- Spray nozzle ports: 3 items. Spray nozzles are from Germany.

### 1.3 Trolley and product container module:

- Container volume: 450 Liters, equivalent to 150Kg per batch
- Material: SS 316L, 04mm thick, imported from Outokompu, Europe.
- Product area: Outside /inside surfaces are all mirror-polished.
- A fine mesh ( SS 316L ). size #110 is mounted at the bottom of container. The container bottom (SS316L) is perforated, easily dismantled for cleaning, attached by heat-resistant silicon joint.
- Observation window: 1 set with transparent glass.
- Trolley: stainless steel, 4 load-supporting wheels
- Sample discharge port: to discharge sample during operation without any disturbance to operation. Made of stainless steel.
- Product's thermal sensor port: 01 item. Easy assembly/disassembly.
- Manual container tilting mechanism: for releasing particles easily after fluid bed.

### 1.4. Container lifting module:

- Materials: SS 304, 12 mm thick.
- Hydraulic cylinder: 02 items (AIRTAC).
- Heat-resistant silicon joint.

### 1.5 Lower compartment module:

- Material: SS 304; 4 mm thick.

- Wastewater discharge port .

### 1.6 Machine frame

- Material: SS 304.
- Cubic shaped.

### 1.7 Open-close valve for inlet air : 01 item.

- Mechanism: Automatic pneumatic system
- Be able to close tightly to prevent cross contamination and protect filter from damage.
- Protect machine from humidity.

### 1.8 Open-close valve for suctioning air: 01 item.

- Mechanism: Automatic pneumatic system.

### 1.9 Granulating system

- Top spraying mechanism, including:
- Spray nozzle: 1 item (Germany): single-handle attached to fluid bed chamber.
- Peristaltic pump, model 5320S (England), to supply the accurate amount of materials to the spray gun.
- Silicon band (Watson Marley, England).
- Solution tank, SS 316L, 80 liters with agitator impeller operated by pneumatic motor - air rotary motor with dust-free gasket and explosion-proof: 1item, Taiyo-Japan.

## 2. ADD-ON SECTION:

### 2.1 INLET AIR PROCESSING & HEAT SUPPLY:

- Inlet air processing qualifies WHO-GMP standards. The filters can be assembled-dissambled easily for replacement or cleaning. Knobs on doors for easy open and close. Air flow is calculated according to user's requirement.
- 1. Dimensions: L 3500 x W 1200 x H 1450.
- 2. Frame: Ss304.
- 3. Covering material: All SS 304.
- 4. Air filter through 4 levels.
- Insects preventing filter: SS 304, fine mesh of 0.1 mm hole size.
- Pre-filter: Filter G4 (efficiency >90%) Size : 592 x 592 x

- 50mm (2 sets) .

- Fine filter: bag filter F8 (efficiency >95%) Size : 592 x 592 x 500mm (2 sets).
- Final filter: Hepa Eu13 filter (efficiency >99.997%) installed behind a resistor array, heat resistant 250oC.
- Differential pressure gauge for checking Hepa filter conditions.

- 5. Heat supply: 2 types.

- 5.1 Stainless steel resistor: using SS304 heat radiator. Capacity: 54 KW.

- 5.2 Steam: heat exchanger at 150,000 Kcal/hour.

### 2.2 SUCTION FAN : 1 item

- Type: high-voltage fan, with curving blades, dynamically balanced by computer achieving very low noise.
- Fan surface is electrostatic painted for rustlessness and fire protection.
- Motor ABB, 25HP, 2900 rpm, 3-phase/380v-50Hz.
- Vibration absorbers are mounted with the base frame of the fan.

### 2.3. DUST FILTER SYSTEM:

1. All made from anti-rust painted steel sheet.
2. Dust collection mechanism: dry.
3. Efficient dedusting through F8 filter.
4. Knobs on door for easy open and close.
5. Tightly attached by silicon joint.

### 2.4 SILENCER : 01 item

### 2.5 DUCT SYSTEM:

- Material: SS 304, clean and easy for hygiene cleaning.
- Diameters of inlet/outlet air duct: 300 mm.

### 2.6 CIP SYSTEM:

- 01 HP Pump. Stainless steel pump head.
- Rotating washing nozzle mounted on top of machine.
- Water supply valve: RO (1 pc). Pneumatic solenoid blowing off water inside pipe.
- Wastewater discharge valve (01 pc).
- Automatic cleaning process: operator can program the timing of cleaning process.

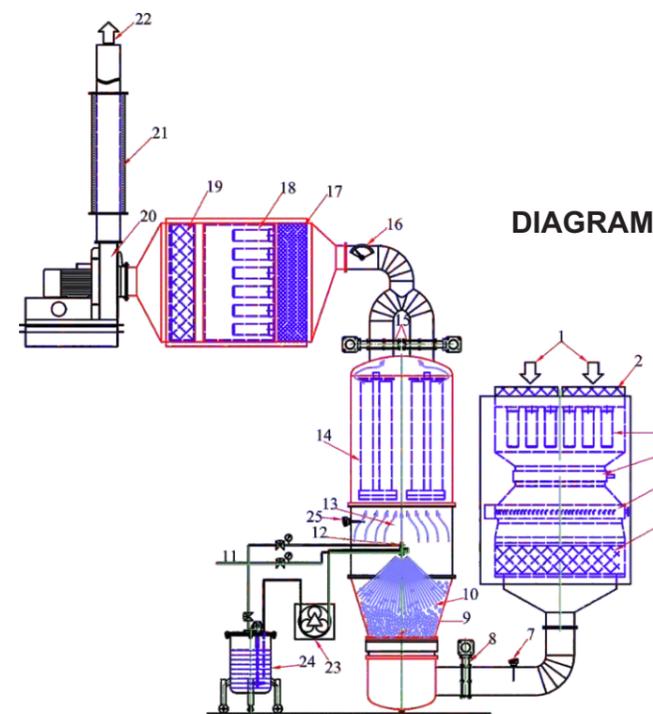


DIAGRAM OF WORKING PRINCIPLE

1. Inlet air
2. Pre-filter G4
3. Bag filters F8
4. Dehumidifier cooling system
5. Heat resistor
6. Hepa filter
7. Inlet air temperature gauge
8. Inlet air valve
9. Air dispenser plate
10. Product container
11. Pneumatic supply
12. Spray nozzle
13. Expansion chamber
14. Exhaust air filter bag
15. Exhaust air valve
16. Air flow regulating valve
17. Pre-filter G4
18. Bag filter F8
19. Hepa filter
20. Suction fan
21. Silencer
22. Outlet of clean exhaust air
23. Peristaltic pumps
24. Stirring tank
25. Thermal sensor