

PILOT PLANT

FREEZE DRYER BFD-20 SERIES



The BFD-20 pilot plant freeze dryer is specifically designed to satisfy commercial small-scale production in non-aseptic environment. Typical applications including bio-pharma, nutrition, chemicals, cosmetics and high added value products. Vekuma's BFD-20 pilot production freeze dryer has similar technical features as commercial larger ones, which means it helps your technology transfer easily.

Technical Specifications

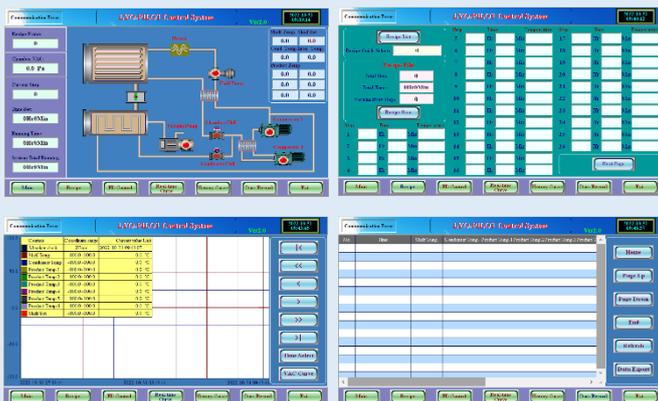
| | |
|-----------------------|------------------------|
| Install Size | W/1350*D/2000*H/2350mm |
| Weight | 1400Kgs |
| Power Install | 13Kwh |
| Voltage | 380V/50Hz/3P |
| No. of Shelves (Max.) | 7+1 |
| Shelf Area (Max.) | 2.8m ² |
| Shelf Clearance | 52~144mm |
| Shelf Dimension | W/510*D/810*T/16mm |
| Condenser Volume | 88L |
| Condenser Performance | 30Kgs/24Hrs |
| Condenser Capacity | 45Kgs |
| System Final Vacuum | 0.01mBar |

Performance Specifications

| | |
|-------------------------------------|-----------------|
| Shelf Temperature Control Range | -50C ~ +70C |
| Lowest Shelf Temperature | -55C |
| Shelf Temperature Control Accuracy | <+/-1C |
| Shelf Temperature Uniformity | <+/-1C |
| Shelf Cooling Rate +20C to -40C | <60Min |
| Shelf Heating Rate | >1C/Min |
| Lowest Condenser Temperature | -85C |
| Condenser Cooling Rate +20C to -40C | <10Min |
| Condenser Defrost Time | <60Min |
| System Final Vacuum | <0.01mBar |
| Vacuumize To 1 mBar | <30Min |
| Leak Rate | <0.05mBar L/Sec |

Standard Features

- S/S304 drying chamber, interior polish Ra<0.6um.
- Acrylic drying chamber door, lubricate free gasket.
- S/S304 shelves, flatness <0.5mm/m.
- Shelves upper and bottom polish Ra<0.4um.
- S/S304 ice condenser, interior polish Ra<0.6um.
- S/S304 condenser coils, surface polish Ra<0.4um.
- Acrylic condenser door, lubricate free gasket.
- Condenser auto defrost.
- 2-stage oil sealed rotary vacuum pump, velocity 32m³.
- 4HP + 4HP cascade refrigeration system, air cooled ^[1].
- 2x1500w fluid heating bar.
- Industrial grade, PLC and user-friendly touch screen HMI based control system. LYO-PILOT interface, which has the function of:
 - Alive display main components working status and key parameters.
 - Freeze drying recipes management system.
 - Real-time freeze drying curve and historical trend review.
 - Drying data-logging and export to USB memory.
 - Automatic and semi-automatic work mode.
 - Users and authorizations.
 - Alarms.
 - Interlocking system to avoid hardware damage due to mis-operate.
 - Vacuum pump will not active if condenser higher than -45C.
 - Vacuum pump auto shut down if chamber pressure not reduce.
 - All air and water isolate valves automatic close to protect raw product once power outage.
 - Drying data and recipes in HMI will not lose once power outage.
 - Freeze drying will continue after power restoration ^[2].
 - System always executes the latest modified drying steps, even if the freeze drying is in process.
 - Shelf temperature not reach set, system will not move to next step although the set time has been reached.



Processing Capacity

| BFD-20S | | Vials Load | | | | |
|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|--|
| Shelves No. | 3 | 4 | 5 | 6 | 7 | |
| Vials Size | | | | | | |
| 2R/4R Dia.16 | 4650 | 6200 | 7750 | 9300 | 10850 | |
| 6R/8R Dia.22 | 2376 | 3168 | 3960 | 4752 | | |
| 10R/15R Dia.24 | 1980 | 2640 | 3300 | | | |
| Shelf Area | 1.2m ² | 1.6m ² | 2.0m ² | 2.4m ² | 2.8m ² | |
| Shelf Clearance | 144mm | 104mm | 80mm | 64mm | 52mm | |

| BFD-20 | | Bulk Fill | | | | |
|----------------|-------------------|-------------------|-------------------|-------------------|-------------------|--|
| Shelves No. | 3 | 4 | 5 | 6 | 7 | |
| Thick In Trays | | | | | | |
| 10mm | 12L | 16L | 20L | 24L | 29L | |
| 15mm | 18L | 24L | 30L | 36L | | |
| 20mm | 24L | 32L | 40L | | | |
| Shelf Area | 1.2m ² | 1.6m ² | 2.0m ² | 2.4m ² | 2.8m ² | |



Accessories and Options

| Name | Part No. | Description |
|----------------------------|----------|--|
| S/S316L Material | | Drying chamber, shelves, trays, condenser & coils. |
| S/S Door | | Drying chamber and condenser door. |
| Inert Gas Backfill Port | | |
| VHP Port | | |
| Side Mounted Flask Rack | | 6 ports manifolds |
| Dry Vacuum Pump | | Scroll type, oil free pump. |
| Vacuum Break Filter | | 0.22um. |
| Auto Vacuum Break Valve | | |
| Capacitive Vacuum Gauge | | |
| Condenser Isolate Valve | | |
| Auto Condenser Drain Valve | | |
| Pneumatic Operated Valves | | All air and water isolate valves open/close by compressed air. |
| Eutectic Point Detector | | |
| PC Control | | |
| Water Cooled Compressor | | |

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