



UAM
PILOT PLANT SYSTEM



PHARMAG PILOT PLANT EQUIPMENT

The PHG Pilot Plant System is specifically designed for specialist applications the include new product development, scaling up from test to small batch quantities and the production of speciality materials that are not necessarily manufactured n large quantities. This type of equipment is equally suited to the fine chemical and cosmetic environment as well as the pharmaceutical industry. The PHG range also find broad application in Pharmacy teaching departments (universities) and in the manufacture of low volume, speciality Pharmacist products. The basis of the system is the UAM power plant which employs an industry standardised flange system to connect various interchangeable attachments of different applications. These attachments include mixers, stirrers, granulators, liquid and ointment fillers, and product enhancing tools such as coating pans, pelletizers, and so on. A single punch eccentric and a rotary Karnavati Tablet Press as well as a small scale capsule Filler complete the range. As the UAM has an industry standardised tool attachment flange, you can benefit from the power and stability of the UAM power unit to attach any of your existing tools from other manufacturers such as Erweka. You can also use the PHG range of high quality accessories and tools to attach your existing motor drives by virtue of the same universal flange system. The PHG Pilot Plant System, with UAM power plant and accessories, provides a top quality solution to small batch production at a reasonable price.

Universal Motor Drive UAM



The UAM Motor Drive is the basic power house for all the attachable accessory equipment for Pilot Plant and small batch production, such as Coating Pans, Cube Mixers, Pelletisers, Liquid and Ointment Fillers, etc. It also allows the use of existing equipment and accessories supplied by Erweka.

The flexible design allows the easy, trouble-free changeover of accessories in a fast and efficient manner. The design of the UAM motor drive is such that there is more than enough room to contain the geometry of any accessory and allow all-around access for tool removal.

Naturally, the UAM is equipped with a state of the art drive electronics. The menu driven user screen allows data entry for speed and operating time, as well as the storage of up to 10 different operating procedures. The built-in 700 motor offers a speed range which can be adjusted over the nominal range of 40-400 rpm.

Technical Data

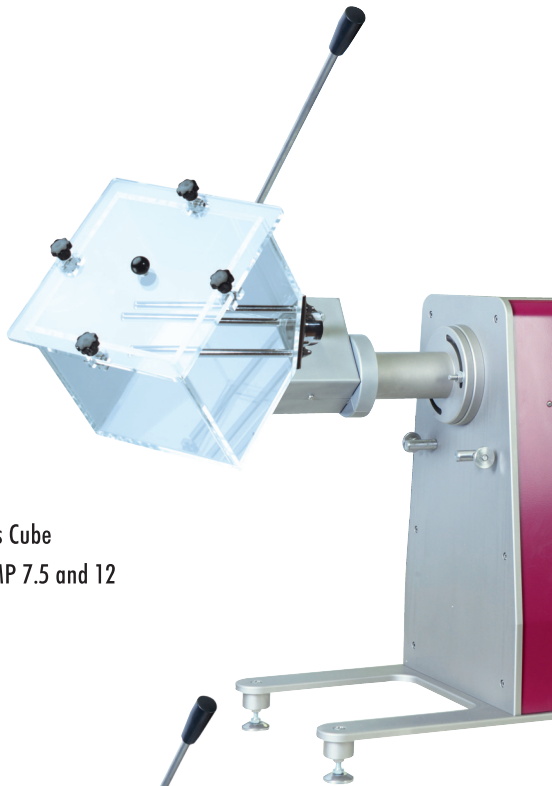
Speed Range:	40 - 400 rpm, continuously adjustable
Gear Ratio:	1 : 3.42
Mains current:	700 W
Mains Voltage:	100 - 240 V - 50/60 cycles.

Universal Gear UGD

The gear is used to allow the adjustment of operating angles from 0 to approximately 180° and reduce the drive speed at a ration of 10 : 1. Several attachments, such as Pelletisers, Mixers, Coating Pans are attached to the UAM motor drive via the UGD gear. The UGD accessory has been so designed that the angle of operating can be accurately set. Unlike some similar devices, the UGD gear drive has been designed so that the operator can always view the on-going process as all accessories are mounted to the front of the drive. This allows easy viewing of the process at any time.



Plexiglas Cube Mixer - CMP 7.5 and CMP 12



Plexiglas Cube Mixer
CMP 7.5 and 12



Stainless Steel Cube Mixer
CM 3.5 and 7.5

The CMP 7.5 and CMP 12 cube mixers use a tumbling motion to produce a homogenous blend of the product. The gentle mixing action suits highly sensitive materials. 3 stainless steel shafts inside the Plexiglas mixing cube assist the mixing action. The CMP mixers are attached to the UGD gear drive to adjust a suitable mixing angle. The stainless steel cube mixers CM 3.5 and 7.5 offer an alternative if Plexiglas cannot be used.

Technical Data

CM 3.5 stainl. steel working volume	approx. 1.5 l
CM/CMP 7.5 Plexiglas and st. steel	approx. 3 l
CMP 12	approx. 5 l

Plexiglas Drum Hoop Blender RM-6



The drum hoop blender is ideal for mixing products such as powders and granules prior to encapsulation or tableting. It can also be used for coating, dyeing or for mixing solid/liquid media and similar duties. The diagonal placement of the drum within the hoop combined with the rotation of the hoop itself produces a uniform three dimensional displacement of the material and hence tumbling mixing action. The mode of operation is extremely simple. The track is attached directly to the UAM Motor Drive. The speed is continually adjustable due to the electronic speed control of the UAM Motor Drive. The Plexiglas drum hoop is carefully placed on the roller tracks. Fill the drum up to approx. 40% of its total height with the material to be blended. The exact level is determined by the particle size of the material to be blended. In the case of liquids, this level can be extended up to approx. 80%. Place the cover on top of the drum hoop and secure with the two clamp catches provided for this purpose.

Technical Data

RM-6 working volume	Solids approx. 2 l, Wet Dispersions approx. 3 l
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Plough Share Mixer - PSM-8

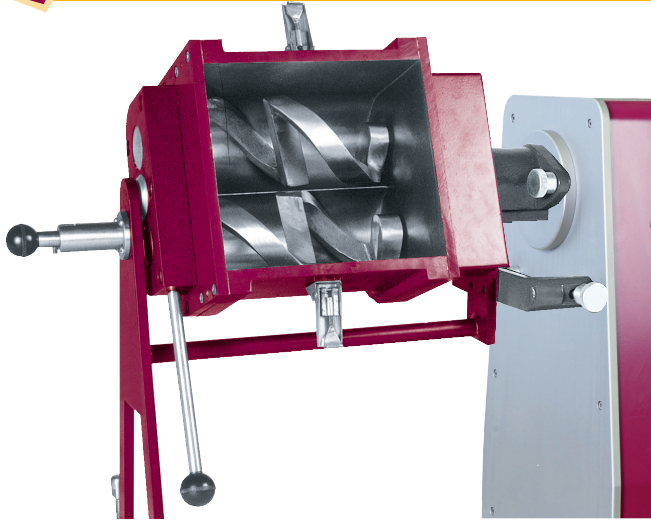


Plough Share Mixers are suitable for mixing powders and granules as well as light pastes and creams. Actually, they are suitable for both dry and wet products. The PSM-8 is based on a proven mixing construction that provides a double mixing action ensuring fast and efficient blending. The constant rotation of the stainless steel blades drives the material to the top of the trough whereupon it tumbles to the base and is once more folded back into the material mass. It's the respective tumbling and folding action which ensures an homogeneous mix. The PSM-8 is directly attached to the UAM Motor Drive which allows you to change speed and test duration to determine the efficiency of the mixing process. The operational capacity of the PSM-8 is about 7 l (product); total trough volume is 12 l.

Technical Data

PSM-8 working volume	approx. 7 l
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Laboratory Kneader - LMZ-5



The Laboratory Kneader type LMZ-5 is operating on the Z-blade principal. It comprises of a mixing trough inside of which two Z-shaped mixing blades rotate towards each other at a different speed. The special shaped blades with differential speed at which they operate cut down substantially the required batch mixing time. The bowl and Z mixing blades are made of stainless steel. The bowl having an acrylic cover which allows visual observation of mixing and above the cover it is having an electro-magnetic safety switch.

Technical Data

LMZ-5 Working Capacity: approx. 3.5 to 4 l

High Speed Powder Mixer - PSM



The PSM mixer operates with plough shape type mixing elements and is designed for dry mixing of powders, granulates and fibre particle containing products. Differences in volume ranging to 1:100.000 can be mixed homogeneously within a few minutes. The drum is unilaterally supported on one side and is tiltable. The mixing drum made of stainless steel has a removable cover through which the material can be fed and discharged. Electro-magnetic cover interlock stops the motor of the UAM drive unit automatically when the cover is removed. The mixing tools as well as the connecting flange of the mixing drum are made of stainless steel and are highly polished. The drum is attached with an adjustable tension ring.

Technical Data

Gross Capacity approx. 5 l
Working Capacity approx. 3 to 4 l

Double Cone Mixer - DCM-6



The DCM-6 Double Cone Mixer is useful for free flowing product or granules. It operates on free flow principal. The mixing is achieved by the cone. The mixing drum made out of stainless steel having capacity of 5 l. The DCM-6 Double Cone Mixer is attached to the UGD Gear Drive.

Technical Data

Gross Capacity approx. 5 l
Working Capacity approx. 3 l

Stainless steel Ball Mill - BM-5



The BM-5 stainless steel Ball Mill can be used for grinding crystalline material, for mixing dry materials and under certain conditions wet materials. The BM-5 Ball Mill consists of three main parts. Drive unit with stand which is directly attached to the UAM Motor Drive, the Ball Mill jar with cover and stainless steel balls. The jar cover is held in place by a knurled screw and support, which forces it against a rubber gasket for airtight seal. The Ball Mill jar top cover and balls are made of stainless steel material. Ball diameter varies between 15 mm to 25 mm. The ball Mill jar rests on two rollers. The speed rotation is controlled by the UGD Gear which is connected to the UAM Motor Drive. The Ball Mill jar and balls may be sterilized in a water bath.

Technical Data

Gross Capacity approx. 5 l
Working Capacity approx. 2 - 2.5 l

Planetary Agitator - POM-5



The POM-5 is an ideal mixer for creams, ointments, pastes, liquids, and wetted powders. It is directly attached to the UAM Motor Drive. The sturdily constructed planetary gear can be equipped with various mixing and kneading attachments, made of stainless steel, each of which is easily interchangeable.

Depending upon type of the material to be processed, a dough arm, a mixing paddle or a wire whip can be supplied as an option. Any material, which sticks to the walls of the kettle, is scraped continuously by the Teflon scraper, which is shaped to fit exactly the kettle wall. Therefore, homogeneous mixing results in the shortest time can be achieved.

Technical Data

Operating Capacity	approx. 5 l
Working Capacity	approx. 3 to 3.5 l

Stainless steel Mini-Ball-Mill - BM-0



The BM-0 stainless steel mini ball mill is suitable for preparing small samples for analysis / for grinding or mixing small quantities of powdery substances. The ball mill is attached to the UGD Gear. The miniature ball mill utilizes 20 mm diameter S.S. balls.

Technical Data

Gross Capacity	approx. 0.5 l
Working Capacity	approx. 0.2 l

V-Blender - YM-4



The YM-4 "V" Blender is a self-contained tumble blender intended for laboratory, pilot-plant and scale-up applications. It is suitable for processing a variety of materials including pharmaceuticals, chemicals, foods, cosmetics, plastics, synthetic fibres. As the "V" shaped blender rotates, the tumbling action brings about mixing of the ingredients. The result is almost a consistent, uniform, predictable blend that can meet the product specification. The "V" blender is offered with a operating capacity of approx. 2.0 kg. The YM-4 is made from 316 stainless steel.

PRINCIPLE OF OPERATION:

Materials to be processed are loaded to partially fill the "V" shaped blender. The YM-4 is attached to the UGD Gear and is set in rotation at approximately 25 rpm (nominal). The material falls as the blender turns, ultimately towards the apex and then towards the legs of the "V". The particles of the material move in both vertical and horizontal directions so that complete mixing occurs.

Technical Data

Gross Capacity	approx. 4.5 l
Working Capacity	approx. 2 l

Liquid and Powder Agitator - AT

The AT agitator can mix all types of different viscous liquids. The AT agitator consists of stirring kettle arm and agitating driving unit which is directly attached to the UAM Motor Drive. The kettle and stirring arm are made of stainless steel. The AT agitator is used for stirring, agitating and beating all kinds of liquids, emulsions, suspensions and similar mixtures.



Technical Data

Gross Capacity	approx. 5 l
Working Capacity	approx. 3 to 3.5 l

Stainless Steel Coating Pan - CP-9

The CP-9 stainless steel coating pan is designed to permit the execution of all coating operations. The CP-9 is mounted onto the UGD Gear which allows the user to adjust the Coating Pan to a suitable angle for optimum production. The working speed can be continuously adjusted to adapt the required process. Adjust the UGD Gear for simple, rapid discharging and cleaning. The gear handle can be used to fix an Air-Dryer or an IR Lamp so as to accelerate drying if required. Depending on the adjusted angle of operation, the capacity for coating is about 30% of the pan volume.

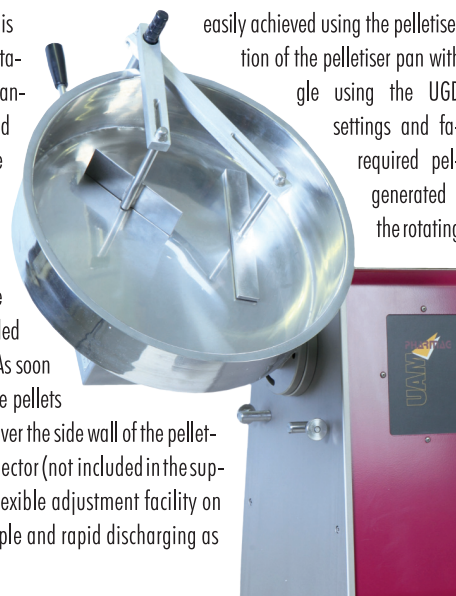


Technical Data

Gross Capacity	approx. 9 l
Working Capacity	approx. 3 l

Stainless Steel Pelletiser - PLT

Manufacturing pellets is easily achieved using the pelletiser PLT. The clockwise rotation of the pelletiser pan with adjustable speed and angle using the UGD Gear, offers optimized facilities to produce the pellets of the required size. The size of the pellets depends on angle, the speed of the pelletiser pan, the amount of liquid added and the type of feed. As soon as the PLT is filled, the pellets will continuously roll over the side wall of the pelletiser into a suitable collector (not included in the supply scope). Use the flexible adjustment facility on the UGD Gear for simple and rapid discharging as well as cleaning.



Technical Data

PLT pan size	approx. 400 mm diam.
Operating Angle	variably by UGD 0-90°

Polishing Drum - PD

The felt-lined drum of the PM Polishing Drum is designed for polishing coated tablets. The covers, which lock quickly into places with three snap closures, as well as the bottom of the drums are lined with felt. All felt parts are easily exchangeable. The cover is fitted with Plexiglas sheet window, which permits the observation of the polishing process. The PM polishing drum is attached to the UGD Gear and so offers to adjust speed and operating angle.

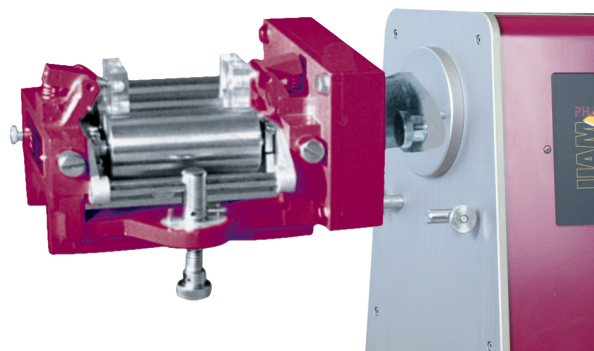


Technical Data

Gross Capacity	approx. 2 l
Working Capacity	approx. 1 l

Triple Roller Ointment Mill - TRM-S

The TRM-S Triple Roller Mill is used in the preparation of ointments, salves, pastes, doughs and similar products. The hourly production is from 2 Kg. to 12 Kg. depending upon the consistency of the material. The rolling action is produced by three hard stainless steel rollers, which are 110 mm long, and 50 mm diameter. The two outer rollers are spring supported to eliminate the possibility of damage to the rollers or to the operating mechanism. Space between rollers is regulated by turning one thumbscrew. The roller mill is directly attached to the UAM Motor Drive.



Technical Data

Working Capacity	approx. 12 Kg. / hr.
Roller Size	110 mm long - 50 mm diameter

Homogenizer - HMG

The Homogenizer HMG is used for the preparation of oil-in-water and water-in-oil construction in quantity up to approximately 30 Kg. per hour. A piston pump produces homogenization. Materials may be fed to the pump either from a hopper, having a capacity of 1.5 litre, or a screw nozzle may be attached with a suction filter, which sucks the premixed materials from a storage container. Homogenization takes place by the forward and backward movements of the piston. A vacuum is created during the backstroke of the piston, which sucks the liquid back. During the forward movement of the piston, the liquid is pushed against the tip of the nozzle. Adjustment of the nozzle determines the fineness of the homogenization. The Homogeniser HMG is equipped with a graduated scale. Hopper, piston and nozzle are made of stainless steel. The homogeniser is directly attached to the UAM Motor Drive.

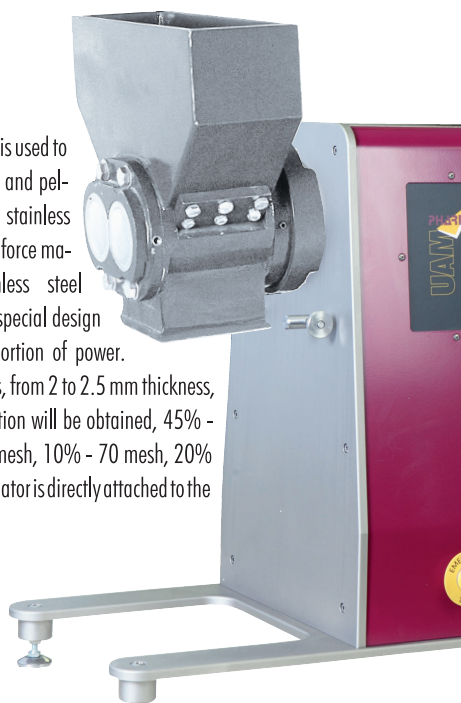


Technical Data

Gross Capacity	approx. 1.5 l
Working Capacity	approx 15 l/hr

Dry Granulator - DG

The Dry Granulator DG is used to granulate tablet slugs and pellets. Two power drive stainless steel rollers with teeth force material against stainless steel breaking combs. The special design results in a low proportion of power. When using hard slugs, from 2 to 2.5 mm thickness, the following granulation will be obtained, 45% - 16 mesh, 25% - 24 mesh, 10% - 70 mesh, 20% powder. The dry granulator is directly attached to the UAM Motor Drive



Technical Data

Working Capacity	approx. 1.5 Kg/h
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Wet Granulator - WG-30



The Wet Granulator WG-30 is designed for the production of granulates in various sizes from moistened powders. It can also be used to reduce slugs as required in the double compression method for tablet production or for re-processing of rejected tablets. Its attached to the UAM Motor Drive by means of four knurled screws. The unit operates on the oscillating rotor principle compressing the granules through a stainless steel sieve of a predetermined size. The pre-formed granules are normally collected in trays prior to removal for drying. The high quality stainless steel rotor measures 1500 mm in length by 75 mm outer diameter, it has 6 blades and may be readily removed for cleaning using the two hand wheels provided for this purpose. It has an oscillating angle of 90°. Throughput of the WG-30 is about 25-30 kg/h. The WG-30 is supplied with two sieves as standard, 1.0 mm mesh and 1.6 mm mesh width respectively. Other sieves are available on request. For wet granulation, larger mesh sieves tend to be used. The smaller sizes are more suitable for dry sieving. The following mesh sizes are available: 0.315 - 0.63 - 0.8 - 1.0 - 1.25 - 1.6 - 2.0 - 3.15 mm mesh width. The sieves are readily interchangeable. Two hand grips are provided to allow the operator to apply equal tension to all parts of the sieve when bringing it into contact with the rotor.

Technical Data

Working Capacity	approx. 25-30 kg/h
Available Sieve Sizes	0.315 - 0.63 - 0.8 - 1.0 - 1.25 - 1.6 - 2.0 - 3.15 mm mesh width
Rotor Size	150 x 75 mm - 6 blades

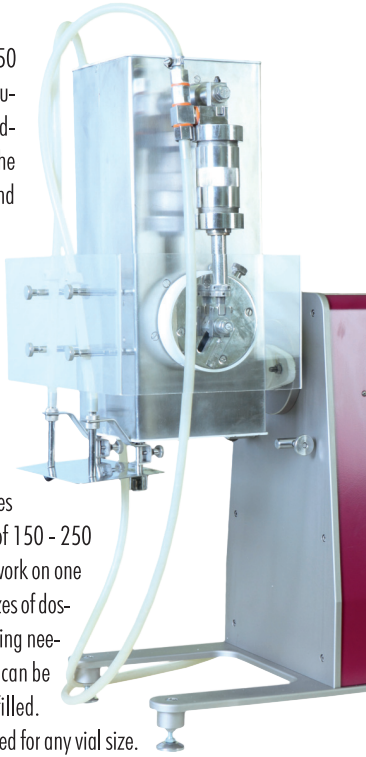
Liquid Dosing Instrument - LF-150

Some of the advantages of the LF-150 Liquid Dosing Instrument are, accurate dosing, drip free filling, easy adjustment, fast disassembly of the pump and valves for cleaning and sterilizing and really space saving design as a table top machine. The Liquid Filler LF-150 fills and dispenses all liquids with two pumps and valves made of stainless steel each of them ranging from 25 - 150 ml.

If volume of less than 25 ml. have to be filled, smaller pumps and valves must be used. If filling quantities of 150 - 250 ml. are required, both pumps can work on one common filling needle. Different sizes of dosing pumps can be supplied. The filling needles are made of stainless steel and can be supplied for any container to be filled.

The vial holder can easily be adjusted for any vial size.

The Liquid Dosing Instrument LF-150 is directly attached to the UAM Motor Drive. To ease operation a Foot Pedal can be supplied to start and stop the filling action.

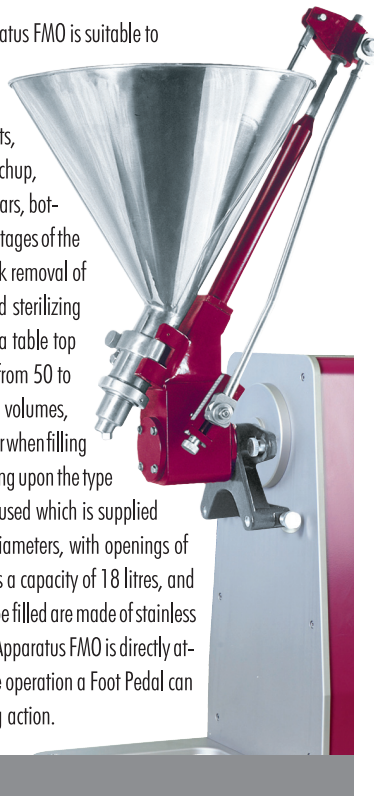


Technical Data

Capacity *approx. 1000 – 2000 fills/hr (max)*

Ointment Dosing and Filling Apparatus - FMO

The Ointment Dosing and Filling Apparatus FMO is suitable to fill drip free and dose accurately, ointments, creams, pharmaceutical and cosmetic emulsions, toothpaste, oil paints, liquids, detergents, jam, mustard, ketchup, honey and similar products into tubes, jars, bottles, plastic containers, etc. Other advantages of the FMO are the easy adjustment, the quick removal of the pump and hopper for cleaning and sterilizing and the really space saving design as a table top machine. The FMO has a filling range from 50 to 200 ml. In order to obtain exact filling volumes, cylinder and piston must be changed over when filling smaller quantities than 50 ml. Depending upon the type of product, an exchangeable nozzle is used which is supplied with the apparatus in three different diameters, with openings of 2mm, 4mm and 8mm. The hopper has a capacity of 18 litres, and all parts in contact with the material to be filled are made of stainless steel. The Ointment Dosing and Filling Apparatus FMO is directly attached to the UAM Motor Drive. To ease operation a Foot Pedal can be supplied to start and stop the filling action.



Technical Data

Capacity *approx. 1000 – 1200 fills/hr (max)*

Suppository and Lipstick Moulding Apparatus - PFM-L



The Suppository and Lipstick Moulding Apparatus PFM-L is used for moulding suppositories, lipsticks and similar products. The PFM-L permits melting, agitation and mixing during the filling operation. The stainless steel kettle and the agitator are heated by a glycerine bath and 1000 watt heating element. A thermostat permits the adjustment of the temperature of the kettle contents from 20° to 100°C by 1° graduations.

The sled, below the filling nozzle, holds any type of mould. It is adjustable in all directions and controlled by a hand wheel. The working capacity of the kettle is approx. 3.5 litres. The heating jacket requires 2.75 Kg. of glycerine. The production varies with material, moulds etc., but production rates up to about 4000 suppositories per hour are possible. The Suppository and Lipstick Moulding Apparatus PFM-L is directly attached to the UAM Motor Drive. To ease operation a Foot Pedal can be supplied to start and stop the filling action.

Technical Data

Gross Capacity *approx. 5 l*
Working Capacity *approx. 3 to 3.5 l*

Single Punch Tablet Press - Riva Minipress



This Tablet Press was developed for the use in R&D and Galenical Departments.

The main body of the table top Riva Minipress consists of a solid frame with stainless steel shrouding. The compression compartment is easily accessible and closed by means of detachable transparent acrylic panel, equipped with safety switches. All components of the press which are in contact with the product are made of stainless steel (AISI 316) or hard chrome plated. The press is designed to conform to most stringent GMP requirements. Removable components are equipped with quick release clamps for fast disassembly and cleaning.

The compression system consists of a plunger actuated by a crankshaft, the die table, the holding device for the upper and lower punches as well as the ejection rod, which is moved by a cam disk, are also mounted on the crankshaft. The gravity fill shoe carries out its oscillating movement, actuated again by the central crankshaft. It is connected to the hopper by a flexible tube. This pressure system is designed to take up to 60 KN. The pressure builds up according to the filling level of the die. This filling volume can be adjusted by turning a sprocket on the lower central shaft of the punch holder. The thickness of the tablets is adjusted by adjusting the penetration of the upper punch via the plunger on the crankshaft. The accuracy of tablet weight depends on the number of cycles, as well as the size of the tablet. These parameters have to be manually optimised.

The Riva Minipress is equipped with

- > Gravity fill shoe
- > Upper and lower punch holder
- > Electrical control buttons incl. key switch and emergency stop
- > Manual lubrication
- > Standard electrical circuitry with contactors
- > Drive by means of a frequency modulated AC motor with smooth start characteristics

Technical Data

Number of compression stations	1
Max. compression force	60 KN
Filling depth	18 mm
Max. tablet diameter	24 mm
Penetration of upper punch	0 - 8 mm
Type of Tooling	Riva
Output rate	up to 6000 tablets/h
Power requirement	approx. 1.0 KW
Power supply	115 or 230V, 1 Ph, 50 or 60Hz (with neutral)
Dimensions	845 x 662 x 340 mm
Net weight	approx. 160 kg

The Riva Minipress is used as a table top machine, the table is not included in the standard supply scope. To supply correct tooling for single, double or triple punches drawings are required.

Rotary Tablet Press - Mini Press II

The table top Mini Press II is an ideal machine for Research and Development as well as small batch production. This sturdy single sided rotary tablet press is designed with GMP considerations. The machine settings and adjustments are performed by hand-wheels which are at the side of the Mini Press. The Mini Press is equipped with a built-in frequency modulated AC motor. The main compression force can be adjusted up to 40 KN, while the pre-compression force will be max. 20KN. A rotary force feeder with adjustable speed as well as a pre-compression station using rollers (up to 0.5 tons) are included as standard. Instrumentation for measuring compression and ejection force and special software for analysis is available as an option.

The Mini Press II is available in 3 versions:

1. Mini Press IIB (Standard Version B Tooling, 10 position)
2. Mini Press IID (Standard Version D Tooling, 8 position)
3. Mini Press IIS (Sense Force Instrumentation)

Standard Features are:

- > In Built Pre-Compression Feature
- > Adaptability to both gravity feeder and force feeder
- > ELNP - Turret and Cam Tracks to give protection against wear and tear
- > Interlocking at Upper and Lower Guards ensures protection against hazards
- > All controls for setting tablet parameters are on the dash board.
- > SS 316 Contact parts
- > 1 set of regular shaped Punches and Dies as per your drawing



Technical Data

Tooling Type B - No. of Stations:	10
Tooling Type D - No. of Stations:	8
Max. Output (Tab/h):	27600
Max. Pressure:	60 KN
Max. Pre-Compression:	20 KN
Max. Tab. Diameter:	15 mm
Max. Depth of Filling:	16.5 mm
Main Motor Drive:	ACVF
Force Feeder Drive:	ACVF

Optional Features:

- > Anti Vibration Pads
- > SS 304/316 L Turret
- > Fully Automatic Version including Force Monitoring (Mini Press IIS)

The Mini Press II is used as a table top machine, the table is not included in the standard supply scope. To supply correct tooling for single, double or triple punches drawings are required.

Fully Automated Capsule Filling Machine - Mini Cap



The Mini Cap is designed for R&D and small scale manufacturing. It is an ideal machine for a correct scale up process compared to the use of manual capsulation equipment. The Mini Cap is probably the only machine available which would change the way most researchers do their Hard Gelatin/Veg. Starch Capsulation Research. It is an automatic Bench-top Capsule Filling Machine for Powder and Pellet Filling. The machine has been designed to fill gelatine capsules and is incorporated with PLC controls, designed as per GMP and CE standards. The Mini Cap is a basic machine for R & D Laboratories, F & D Scientists, and Process Development Laboratories.

Thanks to its compact size and its design it is easy to install the machine on any work bench. The work cycle is totally automatic and is controlled by Programmable Logic Control (PLC).

Some Features of the Mini Cap

- > Mini Compact Size
- > Human Touch Free Capsulation
- > Maximum Output of 3000 Capsules/hr
- > Auto Rejection of un-opened Capsules
- > Fully Automated Capsulation Work Cycle
- > Change Over Time 50 Minutes
- > All Contact Parts of SS 316
- > CE Compliance

Technical Data

Output	Maximum 3000 Capsules / Hour
Capsule Sizes	00 – 0 – 1 – 2 – 3 – 4
Electric Voltage	230 V; Single Phase; 50/60 Hz
AC Motor Rating	90 W; 1400 RPM; 230 V; 3 Phase (Gear Box Ratio 30:1)
Rated Power	0.75 KW (Including the Vacuum Pump)
Vacuum Pump	Capacity 6 m ³ /Hour (VTE – 6)
Aspirating Vacuum Pump	Capacity 90 m ³ /Hour (Delta P. 120 Mbar)
Air Compressor	Capacity 50 Lit/Min (Working Pressure 1.5 Bar)





Technical innovations
for small scale
fine chemical production
Made in Germany

PRODUCTION EQUIPMENT

PHARMAG

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& GERÄTEBAU GMBH

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