



## HIGH VOLUME SAMPLE PREPARATION GRINDING & POLISHING

# VELOX 102





**metken**  
Technology behind Specimen

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Technology behind Specimen

LOX 102

EMERGENCY  
STOP

**FULLY AUTOMATED  
HIGH-VOLUME SAMPLE PREPARATION SYSTEM  
FOR OPERATOR-FREE & NON-STOP SAMPLE PREPARATION**



# VELOX 102



VELOX 102 Fully Automatic Programmable Grinding/Polishing System is developed for operator free sample preparation for high volume sample throughput starting from Planar Grinding to Fine Grinding/Polishing/Fine Polishing/Cleaning and Drying. You only need to place the sample holders in the auto-feed system, select the program number for your specific application and depress the "Start" button. That's it! Your samples will be ready for analysis fully automatically. Possibility to queue up to 6 sample holders during operation for non-stop sample preparation.

## DESIGN

VELOX 102 Automatic programmable grinding and polishing system has a compact design with:

- Planar grinding station
- Fine grinding/polishing station
- Fully automatic sample cleaning and drying station
- Fast automatic grinding/polishing disc replacement system
- Automatic sample holder replacement & feeding system
- Automatic peristaltic dosing unit.

### Planar Grinding Station

The planar grinding station has 4 kW powerful motor with adjustable variable wheel speed from 500 RPM to 1500 RPM with soft start-stop enabling quick planar grinding of the specimen surface. It can accommodate 300 mm diameter flat grinding stones. Automatic dressing unit allows high material removal rate and maximum flatness on the sample.

### Fine Grinding/Polishing Station

The fine grinding/polishing station has 1.1 kW powerful motor with adjustable variable wheel speed from 50 to 600 RPM with soft start-stop. It can accommodate 250 mm grinding/polishing discs. Automatic disc cleaning feature keeps the grinding/polishing discs ready for next use.

### Fully Automatic Sample Cleaning and Drying Station

Fully automatic sample cleaning and drying station is able to make pressurized water cleaning, ethanol cleaning, ultrasonic cleaning and fast drying with filtered air. It can be programmed for each grinding/polishing steps with same or different parameters.

### Automatic Grinding/Polishing Disc Exchange System

Velox 102 has a built in Automatic grinding/polishing disc exchange system which can store up to 10 different grinding/polishing discs. During the cleaning operation, the grinding or polishing discs are exchanged automatically according to the selected preparation recipe. The software automatically informs the operator to replace the disc if one of the disc has reached the end of life cycle.



Automatic Sample Holder Feeding Unit

Automatic Sample Holder Replacement Unit

### Automatic Sample Holder Replacement & Feeding System

Automatic sample holder replacement and feeding system can store and queue up to 6 specimen holder. Each specimen holder can be programmed with same or different grinding/polishing parameters. The sample holder is taken from the rack automatically for grinding/polishing operation. After operation is completed, the sample holder returns back and the next sample holder is taken for operation. No operator intervention is required. During the grinding/polishing operation, the completed sample holders can be taken from the rack and new sample holders can be placed for non-stop grinding/polishing operation for high sample throughput.



### Automatic Head

Servo-motor driven Head proceeds from one step to the next automatically securing the highest level of accuracy and reproducibility. Automatic Head can apply "Central" force adjustable from 30 N to 750 N pneumatically. A built-in encoder allows you to measure the amount of material removed from the surface. The desired grinding depth can be set to grind different type of samples and also for applications that needs special accuracy. The automatic head is equipped with high torque 350 W motor with adjustable variable speed from 50 RPM to 200 RPM with soft start-stop. Clockwise and counterclockwise is possible. It can accommodate Ø160 mm sample holders.

### Automatic Peristaltic Dosing System

VELOX 102 is equipped with automatic peristaltic dosing system with 8 peristaltic pumps [ 6 for diamond suspensions/lubricant and 2 for aluminum oxide suspensions]. The automatic peristaltic dosing system is used in combination to obtain consistent specimens and to save time and consumables. Both diamond suspensions/lubricants and aluminum oxide suspensions can be fed. Dispensing parameters like; frequency, fluid selection etc. are controlled through the LCD screen of the VELOX 102. High quality peristaltic pumps guarantee exactly the same dosing every time. Pre-dosing function lubricates the polishing cloth before each operation to increase the life of polishing cloth and obtain perfectly polished specimen surfaces. The suspensions and lubricants that are remained in the dosing tubes retract back at the end of every step to eliminate the risk of contamination from coarse abrasive on a finer grain size with auto retract function. Automatic Liquid Level Calculation of suspensions and lubricants is also available and can be monitored through the LCD screen of the VELOX 102. The calibration can be carried out when a lubricant or suspension is filled. The operator will be informed to refill the bottle when the suspension/lubricant level is below the critical value. All bottles have a magnetic stirrer inside to prevent sedimentation of suspensions and make more homogenous abrasive distribution inside the suspension.



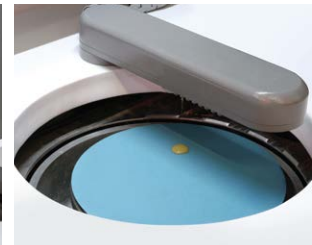
Grinding/Polishing Disc Storage for Automatic Disc Replacement



Automatic Disc Replacement Unit



Automatic Fluid Dispenser



Precise Dosing



Programmable HMI touch screen controls

### User Friendly HMI Touch Screen

VELOX 102 has advanced techniques and software with programmable 9.7" large colored HMI touch screen controls increasing the productivity, sample consistency and operator comfort. It is used to prepare high volumes of metallographic, ceramic and mineralogical specimens with consistent and reproducible quality.

All preparation parameters [Force, Cycle time, Wheel speed and direction, Grinding/Polishing disc, Dispensing frequency, Cleaning drying parameters] can be stored in memory under a specific program number. All the operator needs to do is to call up a specific program and press the "Start" button. That's it! Your samples will be ready for analysis without any operator intervention. A library of 20 different preparation programs with related specimen name or number can be saved with all parameters of each grinding/polishing steps which can be recalled at any time. Upon completion of the cycle, an acoustic signal lets the operator know that the cycle is over and the samples are ready for analysis. When required, it is also possible to intervene in the program and change the parameters without stopping the instrument.





# BENEFITS

- **COMPACT**
- **OPERATOR-FREE**
- **NON-STOP SAMPLE PREPARATION**
- **FAST**
- **PRECISE**
- **REPETABLE RESULTS**
- **COST EFFECTIVE**
- **SAFETY**
- **RELIABILITY**

## The Most Compact Design In It's Class

VELOX 102 consist of many systems inside as below:

- Planar grinding station
- Fine grinding/polishing station
- Automatic sample cleaning and drying station
- Automatic disc replacement system
- Automatic sample holder replacement system
- Automatic peristaltic dosing unit

VELOX 102, which includes all these systems, takes up only 204 cm wide. Thus, it can fit most of the laboratories.

## Fast Sample Preparation

VELOX 102 uses the time with maximum efficiently. Since all sample preparation steps are automatic, there is no waiting time between the preparation steps like manual preparation. As soon as an operation step is completed, the next operation step starts immediately. In addition, the finished sample holder is immediately replaced with the new one for a new sample preparation cycle. The planar grinding station allows very fast material removal from the sample surfaces and provides very planar sample surfaces in a short time. Thus, it saves time on the subsequent fine grinding and polishing steps.

## Cost Effective

VELOX 102 reduces the sample preparation costs significantly comparing with the traditional sample preparation machines. It significantly shortens the sample preparation time and eliminates the need of operator workforce. In addition, automatic peristaltic dosing unit reduces the consumption of polishing suspension during polishing operation. The planar grinding station allows extremely fast material removal with very long grinding stone life, reducing the several subsequent fine grinding steps and time

## Operator-Free Sample Preparation

VELOX 102 can perform all sample preparation steps automatically without need of operator intervention. Thus, operator can be free of time consuming preparation steps, and use his/her time for other activities on the laboratory.

## Precise Sample Surfaces

VELOX 102 has vibration-free robust construction. The automatic head is directly mounted on a strong platform on top of the machine instead of traditional C-Type design. Thus, there is no bending or tilting on the automatic head while force application. The force is transferred perfectly uniform and perpendicular on all samples. In addition that, the planar grinding station provides very flat and planar sample surfaces. This will increase the quality of surface on subsequent fine grinding and polishing steps. Scratch free mirror-like polished surfaces can be obtained on even hard complex materials.

## Safety

VELOX 102 has the highest safety standards. The equipment is provided with safety light curtain allowing easier process monitoring and easier access to the preparation area. It prevents access to moving or rotating parts during operation. When operator fingers, hand and ankles approaches to the operation area, the equipment stops immediately. A stack light is located on the top of the equipment to provide visual and audible indication of machine status.

## Non-Stop Sample Preparation

Operator can feed up to 6 sample holders at the same time to VELOX 102. All sample holders are prepared automatically one by one subsequently. During the operation, the operator can take out the completed sample holders and feed in the new sample holders. Operator can evaluate the prepared sample while Velox 102 is still running.

## Repetable Results

VELOX 102 guarantees repeatable results on prepared samples. Once you determine the correct consumables and correct parameters for your sample, you will obtain the same result everytime. You can download the proven sample preparation recipes from Metkon Website according to material type or you can ask support from Metkon Laboratory according to your specific application.

## Reliability

VELOX 102 is designed for 24/7 operation and low maintenance. All mechanical parts assembled on robust steel construction to eliminate vibration and stretch. Long life reliable mechanical parts, Siemens PLC control unit and modern electronics allow 24/7 operation.

## ACCESSORIES



Enviro recirculating filtering unit

### ENVIRO Recirculating Filtering System

ENVIRO Filter Unit is a closed loop recirculating filter system which can be used for grinding/polishing station of VELOX 102. It has a 20 ltr reservoir capacity with 1 micron filter. It filters and cleans the drain water which comes from grinding/polishing station and pumps it back to grinding/polishing station for cooling. It saves water while grinding. It is optional accessory of VELOX 102 and can be placed inside the cabinet.

### Cooling System for Planar Grinding

A closed loop recirculating cooling unit is optionally available for planar/grinding station of VELOX 102. The grinding stone surface is cooled by a nozzle on the stone cover. This provides an efficient cooling of the sample and prevents the overheating of the surface structure.

### Coolant Level Sensor

Informs operator when coolant level of recirculation cooling tank is insufficient.

### Magnetic Collector Rod

Collects the finest magnetic particles from the cooling liquid and keep it clean.

### 3-Lights Warning Beacon with Audible Signal

Informs operator about machine status from the long distance.



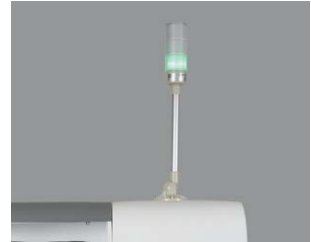
Automatic Dressing Unit



Operator-Free Sample Preparation



Stand For Levomat



3 Lights Signal Beacon



Barcode Scanner

### Barcode Scanner

Optional Barcode Scanner allows easy and quickly loading of correct parameters for different samples. This will eliminate the risk of loading wrong programs due to operator error and increases efficiency. You can simply develop a barcode system for your each specimen on your laboratory to enable fast data entry to eliminate errors. Barcode scanner is very useful while queueing the different sample holders on automatic sample holder replacement & feeding unit.

# SPECIFICATION

ORDER NO	45 09
MODEL NO	VELOX 102
Planar Grinding Station	Standard
Fine Grinding/Polishing Station	Standard
Automatic Sample Cleaning and Drying Station	Standard
Automatic Disc Replacement System	Standard
Automatic Peristaltic Dosing Unit	Standard
Automatic Sample Holder Replacement & Feeding System	Standard
Planar Grinding Motor Power [S1]	4 kW
Grinding Stone Speed	500 - 1500 RPM
Grinding Stone Rotation Direction	CCW
Grinding Stone Diameter	Ø300 mm
Grinding Stone Cleaning & Drying	Automatic
Automatic Dressing System	Standard
Dressing Tip	Diamond
Dressing Depth	10 µm - 100 µm
Dressing Period	20 s - 600 s
Fine Grinding/Polishing Motor Power [S1]	1.1 kW
Grinding/Polishing Disc Speed	50-600 RPM
Grinding/Polishing Disc Rotation Direction	CCW
Grinding/Polishing Disc Diameter	Ø250 mm
Grinding/Polishing Disc Cleaning & Drying	Automatic
Automatic Disc Replacement System	Standard with 10 Discs Capacity
Grinding/Polishing Discs Life Monitor	Standard
Automatic Head Motor Power	350 Watt
Automatic Head Motor Speed	50-200 RPM
Automatic Head Motor Rotation Direction	CW/CCW
Grinding Depth Measurement	Standard
Grinding Depth Range	0 - 5 mm
Sample Holder Type	Central Force
Sample Holder Diameter	Ø160 mm
Central Pressure Force	30 - 750 N
Sample Cleaning	Pressurized Water + Ethanol + Ultrasonic
Sample Drying	Filtered Pressurized Air Drier
Automatic Peristaltic Dosing Unit	Standard with 8 Individual Pumps
Magnetic Stirrers	Standard
HMI Touch Screen	9.7" Colored Touch Screen
Program Memory	20 Programs
Dimensions, WxDxH	2045x902x1690h mm
Weight	750 kgs
Mains	400 V, 3 phase, 50/60 Hz.

\* Other voltages and frequencies available upon request. Please state when ordering. All specifications are subject to change without notice.

45 09

## — VELOX 102

Fully automatic programmable grinding and polishing system Fast, precise and operator-free sample preparation for high-volume sample throughput, with 1 planar grinding station and 1 fine grinding/polishing station, automatic grinding/polishing disc replacement system with 10 discs capacity, automatic sample holder feeding system up to 6 specimen holders capacity, ability to queue sample holders during operation for non-stop sample preparation, fully automatic sample cleaning station with ultrasonic cleaning, water and ethanol, fast automatic sample drying system with filtered air, Independent grinding & polishing station with 1.1 kW powerful motor and planar grinding station with 4 kW powerful motor, Complementary or Contra rotational direction, Soft Start /Stop, Planar grinding stone with 300 mm and grinding/polishing station with 250 mm, variable wheel speed; 500 - 1500 rpm for planar grinding, 50 - 600 rpm for fine grinding and polishing station, programmable sample preparation with colored 9.7" HMI touch screen control, with Siemens PLC control unit, Head movement automatically proceeding from one station to the other with servo driven motor, central force application, with variable specimen holder speed 50-200 rpm, 350 Watt DC motor, controlled material removal with digital setting of grinding depth up to 5 mm, audible warning signal, with holding chuck, Air supply tubes, integrated Automatic Fluid Dispenser for polishing station, with 8 micro peristaltic pumps with magnetic stirrers, 6 for diamond suspensions/lubricant and 2 for alumina suspensions, with automatic liquid level calculation, with pre-dosing function and with automatic retract function at the end of every step to prevent contamination, allowing significant savings and perfect reproducibility. Complete and ready for operation. Without Specimen Holders. 400V, 3-phase, 50Hz.

### Accessories for VELOX 102

GR 0803

#### — Starter Working Kit

Including the following standard set of accessories & consumables:

- PVC Carrier for Grinding & Polishing Discs, 10 pcs.
- Special Magnetic Foil (2 pcs), 250 mm dia.
- PGS-M Planar Grinding Stone, 120 grit, 300 mm dia.
- Magneto grinding disc 54 mic., 250 mm dia.
- Magneto grinding disc 18 mic., 250 mm dia.
- An assortment of 5 polishing cloths, 250 mm dia.
- Diamond suspensions 1 l of each of 6 µ, 3 µ, 1 µ and lubricant

GR 0018  
YM 8813

#### — Recirculation Cooling Tank, 60 l, for VELOX 102

— Fine filter sheets for recirculation cooling tank (GR 0018/0019/1675/1945/1988), 10 pcs

GR 1559

#### — Coolant level sensor for recirculation cooling tank

— Informs operator when coolant level is insufficient.

GR 1540

#### — Magnetic collector rod for recirculation cooling tank

31 20

— Additional PVC Carriers for Grinding & Polishing Discs, 5 pcs

GR 0140

— 3-lights warning beacon with audible signal (To be ordered simultaneously together with the machine order)

GR 0665

— Barcode Scanner for easy loading correct programs for different samples

YM 10781-00

— Diamond Tip for Dressing Unit, FORCIPLAN 352/VELOX 102

GR 0780

— Stand for LEVOMAT with storage for sample holders and consumables

GR 0440

— Air filtering and lubricating unit

GR 1397-00

— Water Filtering and Pressure Regulator System for city water inlet. Keeps the water pressure at the appropriate level and protects from sudden pressure spikes. Filtering out impurities in the water and prevents calcification.

YM 3824-00

— Spare Silphos Cartridge Filter

(for Water Filtering and Pressure Regulator System (GR 1397-00))

GR 2223

### Spare Part Kit for VELOX 102

— Recommended Set of Spare Parts, VELOX 102

47 91

### Specimen Holders for Central Force Application

47 92

— Clamp type specimen holder, Ø160 mm, 10 specimens with Ø25 mm.

47 93

— Clamp type specimen holder, Ø160 mm, 8 specimens with Ø30 mm.

47 94

— Clamp type specimen holder, Ø160 mm, 6 specimens with Ø40 mm.

47 95

— Clamp type specimen holder, Ø160 mm, 4 specimens with Ø50 mm.

47 96

— Clamp type specimen holder, Ø160 mm, 10 specimens with Ø1"

47 97

— Clamp type specimen holder, Ø160 mm, 8 specimens with Ø1 1/4"

47 98

— Clamp type specimen holder, Ø160 mm, 6 specimens with Ø1 1/2"

47 99

— Clamp type specimen holder, Ø160 mm, 4 specimens with Ø2"

47 73

— Teardrop specimen holder, Ø160 mm, 6 specimens with 10 - 42 mm diameter

47 74

— Teardrop specimen holder, Ø160 mm, 4 specimens with 10 - 52 mm diameter

47 45

— Clamp type specimen holder, Ø160 mm, 3 rectangular specimens with 40 x 70 mm.

47 77

— Universal specimen holder for large and irregular shaped specimens, Ø160 mm with 6 clamping fixture

45 60

### Accessories for Specimen Loading

— LEVOMAT

— Specimen Loading Fixture, to level the specimens within the central force specimen holders, without specimen loading plate.

45 50

### Specimen Loading Plates

— Specimen Loading Plate Ø160 mm

GR 0865

### ENVIRO Recirculating Filtering System

— ENVIRO Recirculating Filtering System, Closed loop 1 micron filtering system with 20 ltr. recirculating water tank, suitable to operate with line water on 80 micron filter as well. Requires 4 bar compressed air.

YM 6214-00

— Ready for operation with all Melkon Grinder/Polishers Filter, 10 inches 1 Micron

GR 1996

### Spare Part Kit for ENVIRO

— Recommended Set of Spare Parts, ENVIRO

