

DropMaster



Dynamic Contact Angle Meter

Contact Angle, Liquid Surface Tension, Surface Free Energy

■ Product lineup

DMo-901

Fully automated computer-controlled contact angle measuring system with 150x150mm 360° rotation stage

- Computer controlled rotation stage in X, Y and rotation axes.
- Fully automated mapping sequence (droplet generation → droplet deposition → droplet analysis → stage movement) over the full 150x150mm stage area is possible by pre-set coordinates.
- The optional multi dispenser system of up to five liquids allows for one-click fully automated analysis of the surface free energy.
- The optional high capacity dispenser for one liquid allows for fully automated measurement of contact angles for applications with high liquid requirement.



DMo-701

Fully automated computer-controlled contact angle measuring system with 150x150mm stage

- Automated measurement sequence (droplet generation → droplet deposition → droplet analysis → stage movement) in X-axis is possible by pre-set commands.
- The automatic dispenser unit generates droplets with high accuracy and assures precise measurements of advancing and receding angles through its constant volumetric flow rate.
- The optional multi dispenser system of up to five liquids allows for one-click fully automated analysis of the surface free energy.
- The automatic recognition of the droplet deposition after a pre-set time assures reliable results under consistent conditions.



DMo-601

Computer-controlled analysis of static and dynamic contact angles with 150x150mm stage

- Automated measurement sequence (droplet generation → droplet deposition → droplet analysis) is possible by pre-set commands.
- The automatic dispenser unit generates droplets with high accuracy and assures precise measurements of advancing and receding angles through its constant volumetric flow rate.
- The automatic recognition of the droplet deposition after a pre-set time assures reliable results under consistent conditions.
- The manual sample stage can be exactly adjusted to the desired position and the syringe of the dispensing unit can be changed quickly and easily.
- Possibility of later upgrade to DMo-701.



DMo-501

Computer-controlled analysis of static and dynamic contact angles with 150x150mm stage

- The automatic dispenser unit generates droplets with high accuracy and assures precise measurements of advancing and receding angles through its constant volumetric flow rate.
- The automatic recognition of the droplet deposition after a pre-set time assures reliable results under consistent conditions.
- The manual sample stage can be exactly adjusted to the desired position and the syringe of the dispensing unit can be changed quickly and easily.
- Possibility of later upgrade to DMo-601 and DMo-701.



■ Common features for each model

- Fast image capturing system with standard 125 fps at 640x480 resolution USB 3.0 camera, max. 333fps at 640x136 resolution
- Focusing aid with index graph and value displayed in the image screen helps operators to achieve perfect focus
- Movie converter converts data images to MPEG-1 or AVI movie format.
- During analysis of the sessile drop, besides the contact angles, droplet volume, residual droplet volume, sessile drop volume, height and radius of sessile drop are also determined.
- Measured results are displayed in the table of spread sheet like for easy reference and comparison.

■ Sample stage

- All models are equipped with a 150x150mm wide sample stage with a maximum load capacity (temperature chamber + sample) of 1.4kgs.
- Stage travel distance: x-axis 150mm, y-axis 75mm
 - * DMO-901 and DMO-701 are equipped with motorized sample stage
- Possibility to mount temperature control chambers onto the stage
 - * Applicable sample size for temperature control chamber is about 150x75mm

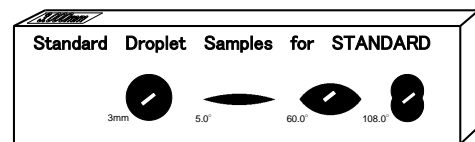


■ Standard components of each model

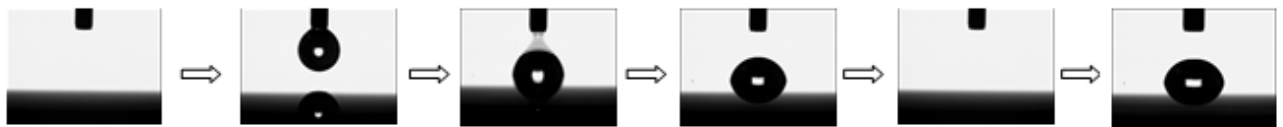
DMo-901	DMo-701	DMo-601	DMo-501	Common accessories for each model
<ul style="list-style-type: none"> • Control box • Motorized camera and dispenser unit (z-axis) and motorized stage in x, y and rotation axis • Automatic single dispenser 	<ul style="list-style-type: none"> • Control box • Motorized camera and dispenser unit (z-axis) and motorized stage in x-axis • Automatic single dispenser 	<ul style="list-style-type: none"> • Control box • Motorized camera and dispenser unit (z-axis) • Automatic single dispenser 	<ul style="list-style-type: none"> • Automatic single dispenser, incl. dispenser controller 	<ul style="list-style-type: none"> • Manual single dispenser • Syringe set 22G (5x each/set) • Teflon coated needles 18G, 22G (2x each) • Standard droplet sample (Standard view)

■ Standard droplet sample

- The standard tool made of glass printed with one circular silhouette for calibration and three droplet silhouettes of 5°, 60° and 108° for inspection
- For use of routine maintenance performed by the user
- Design registered, standard accessory for all models
- A certificate of accuracy for the silhouettes can be obtained optionally



■ Measuring process



DMo-model	Positioning of first measurement point	Generation of droplet	Deposition of droplet (control / recognition)	Analysis of droplet	Positioning of next measurement point	150x150mm full scale continuous measurements
501	▲ by rotary knob	●	▲ / ●	●	▲	▲
601	▲ by rotary knob	●	● / ●	●	▲	▲
701	▲ by command button	●	● / ●	●	●	▲
901	●	●	● / ●	●	●	●

● automatic ▲ manual

■ Specifications

	DMo-901	DMo-701	DMo-601	DMo-501
Camera system	USB 3.0 CCD camera with: 125fps at 640x480 pixels 200fps at 640x278 pixels 333fps at 640x136 pixels			
Optical system	manual focus with 3 step manual zoom field of view: 6.6x4.9mm, 12.0x9.0mm, 17.3x13.0mm ±5%			
Measuring methods	contact angle: sessile drop (static), advancing/receding angle (dynamic) sliding angle (dynamic) ¹⁾ surface/interfacial tension: pendant drop (static and dynamic) surface free energy of solids: sessile drop (static)			
Analysis methods	contact angle: 0/2, tangent, curve fitting (ellipse, circle) surface/interfacial tension: Young-Laplace, ds/de surface free energy of solids: Owens-Wendt, Kaelble-Uy, Kitazaki-Hata, Wu, acid-base, Zisman			
Measuring range	contact angle: 0.01 to 180° surface/interfacial tension: 0.01 to 100mN/m			
Resolution	contact angle: 0.01° surface/interfacial tension: 0.01mN/m			
Accuracy ²⁾	contact angle: 0.2° surface/interfacial tension: 0.2mN/m			
Maximum sample surface area and height (WxDxH)	150x150x16mm	150x150x35mm		
Sample stage operation	automatic motor drive		manual drive	
X-axis	150mm	150mm	150mm	
Y-axis	75mm	75mm (manual)	75mm	
Rotation axis	360°	---	---	
Z-axis operation	16mm	35mm		35mm
camera and dispenser	automatic	automatic		manual
Dimensions (WxDxH) of:				
Main instrument	297x544x305mm			297x544x305mm
Control box	290x240x86mm			260x200x70mm
Approximately weight of:				
Main instrument	10kg	9kg	9kg	8kg
Control box	4kg	4kg	4kg	2kg
Electric power	60W 123VA,			25W 103VA
AC100-240V, 50/60 Hz				

¹⁾ optional

²⁾ Accuracy is the repeatability described in standard deviation of manufacturer's standard

■ Optional accessories and customized solutions

The KYOWA DropMaster series can be easily adapted to meet the customers' requirements for their special applications. A wide range of accessories such as electrical and liquid temperature controlled sample stages and chambers, electrical temperature controlled dispenser, external tilting stage for measurements of roll-off angles, special module for measurements of roll-off speed and acceleration, and more.

Customized solutions, such as special designed sample stages for measurements on cylindrical samples with large diameters or on human arms and legs are also possible.

For detailed information please contact our sales partner or us directly at +81-48-483-2629 or at overseas-sales@face-kyowa.co.jp.

The specifications and designs are subject to change without notice.

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