*mar*research

mar 345 dtb

mar dtb

Cryogenic
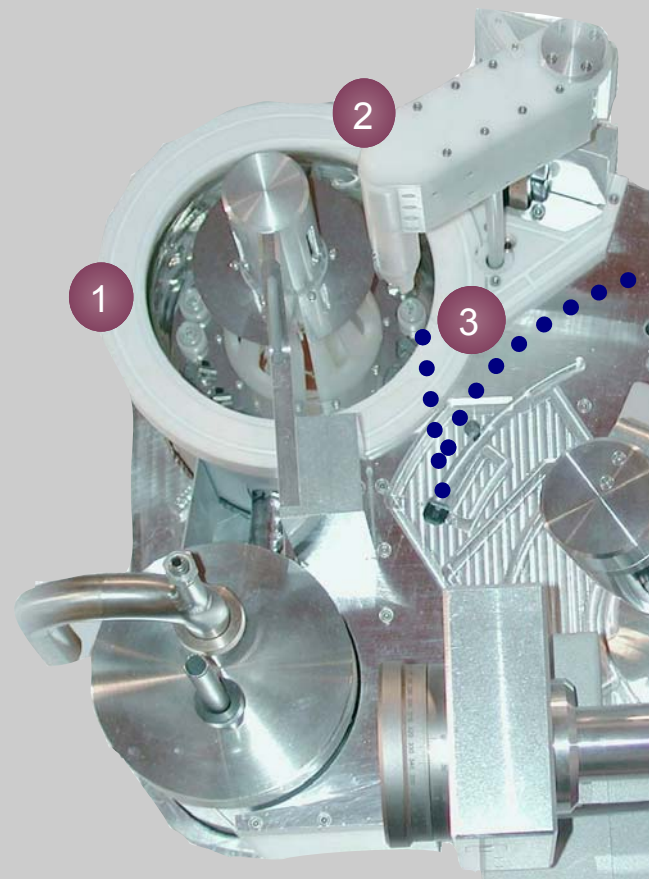# Sample Changer

❶ The vial picker selects a sample from the carousel. Up to 19 vials can be inserted in the carousel. During operation, the carousel can manually be loaded or unloaded.

❷ The vial picker lifts the vial up to be presented to the vial server.

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❼ The vial is opened by a combined rotation and translation of the φ–axis. The empty vial is moved all the way back into the storage dewar.

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❻ The vial server pushes the vial up towards the magnetic base of the goniometer head.
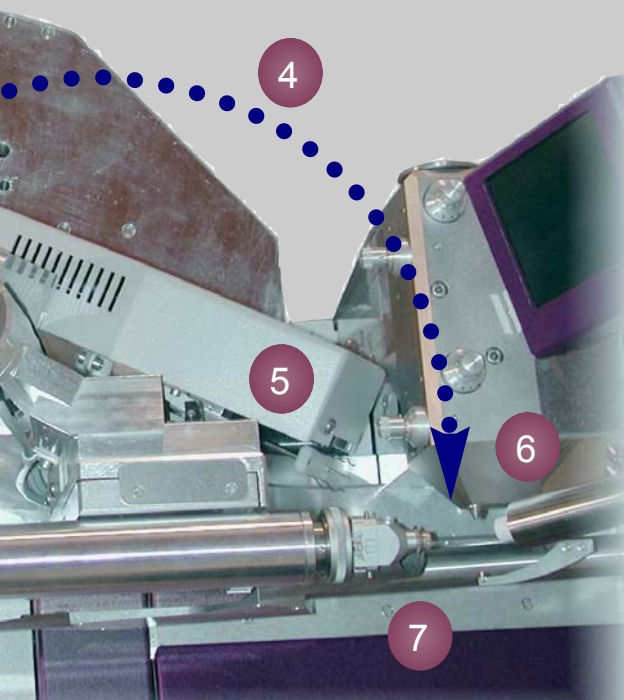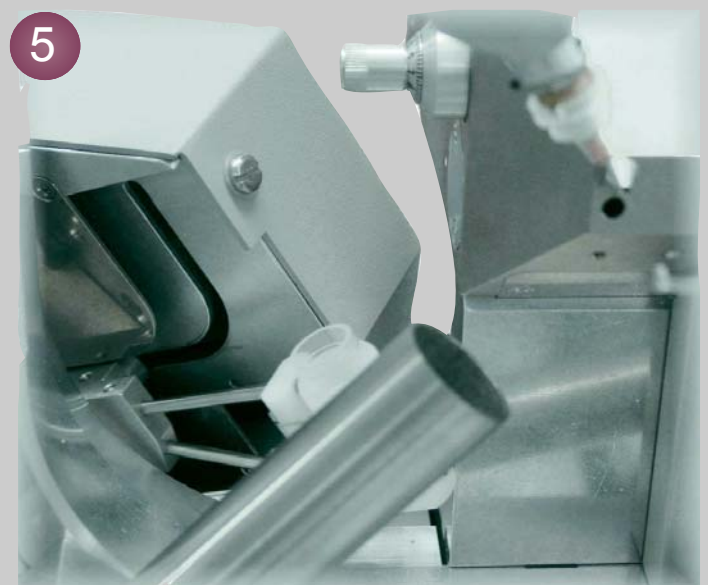

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3 The vial server grabs the vial from the vial picker and moves it out of the storage dewar.

4 The vial server next swings towards the φ–axis. Simultaneously, the φ–axis swings up to 60^0 in χ.

5 The vial server pushes the vial close to the collimator and into the cold stream.

Technical Description

General:

Dedicated and highly optimized hardware for sample exchange
All operations are optimized for highest possible throughput
Sample exchange in approx. 2 minutes
Perfect fit into *desktop beamline*®, compact design

Liquid sample transfer
Quick and precise tranfer of sample from storage system onto goniometer head
Sample stays submerged in liquid nitrogen during entire transfer procedure
Special transfer containers extend time beyond 60 sec. before nitrogen starts boiling

Usage of standard cryo vials
Screw-caps or (optional) magnetic vials

Large allowances for pin size and shape
Length and style of the pin holding the sample may vary

Long term operation
Up to 7 days autonomous operation without user intervention
Low icing rates achieved by special anti-icing mechanisms

Automatic liquid nitrogen refill
Two-chambered dewar allows for smooth refill from supplying dewar during operation

Storage carousel for up to 19 samples
Carousel can easily be loaded or unloaded by hand
Automatic positioning of samples

High speed φ–axis for quick centering
Integrated automatic centering gear (x,y,z)

Automatic crystal finding and centering routines
Automatic interpretation of crystal pictures captured by video camera of *desktop beamline*®
Semi-automatic centering option - manual intervention possible

Seamless integration of sample changer control into data collection software
Sample changing is just one more parameter for data collection
Support of *mar345* image plate and *marCCD* detector
Interface to *automar* data processing for fully automatic selection of suitable crystals

Motors:

Carousel rotation
Stepper motor to rotate carousel and present a vial to the vial picker

Vial picker
Stepper motor to pick a vial out ot the carousel
Stepper motor to lift the vial out of the carousel

Vial server
Stepper motor to swing the vial from the vial picker to the goniometer head
Stepper motor to translate the vial onto the goniometer head

Sample mounting
Stepper motor for φ–axis: opens and closes vials
Stepper motor for φ-swing: moves goniometer head into a suitable mounting position ($\chi=60°$)

Sample centering
Stepper motor to translate the sample on the goniometer head in x-direction
Stepper motor to translate the sample on the goniometer head in y-direction
Stepper motor to translate the sample on the goniometer head in z-direction

Intelligent motor control
All motors are driven by real-time electronics of the *desktop beamline*® and
operated in the same way as all other motors of the *desktop beamline*®