

# New ACQUITY UPLC Sample Organizer Technical Overview



- The new ACQUITY UPLC Sample Organizer has been designed for use with the ACQUITY UPLC H-Class and H-Class Bio systems
  - The X-Shuttle mechanism has been changed to accommodate transfer of plates into a newly designed Rotary Tray for the SM-FTN
- The design is based largely on the current Sample Organizer
- Significant enhancements have been made to the original design
  - To adapt it for use with the SM-FTN
  - To improve functionality and robustness
- Because the new ACQUITY UPLC Sample Organizer is specifically adapted for use with the SM-FTN **it is not compatible** with the original ACQUITY Sample Manager

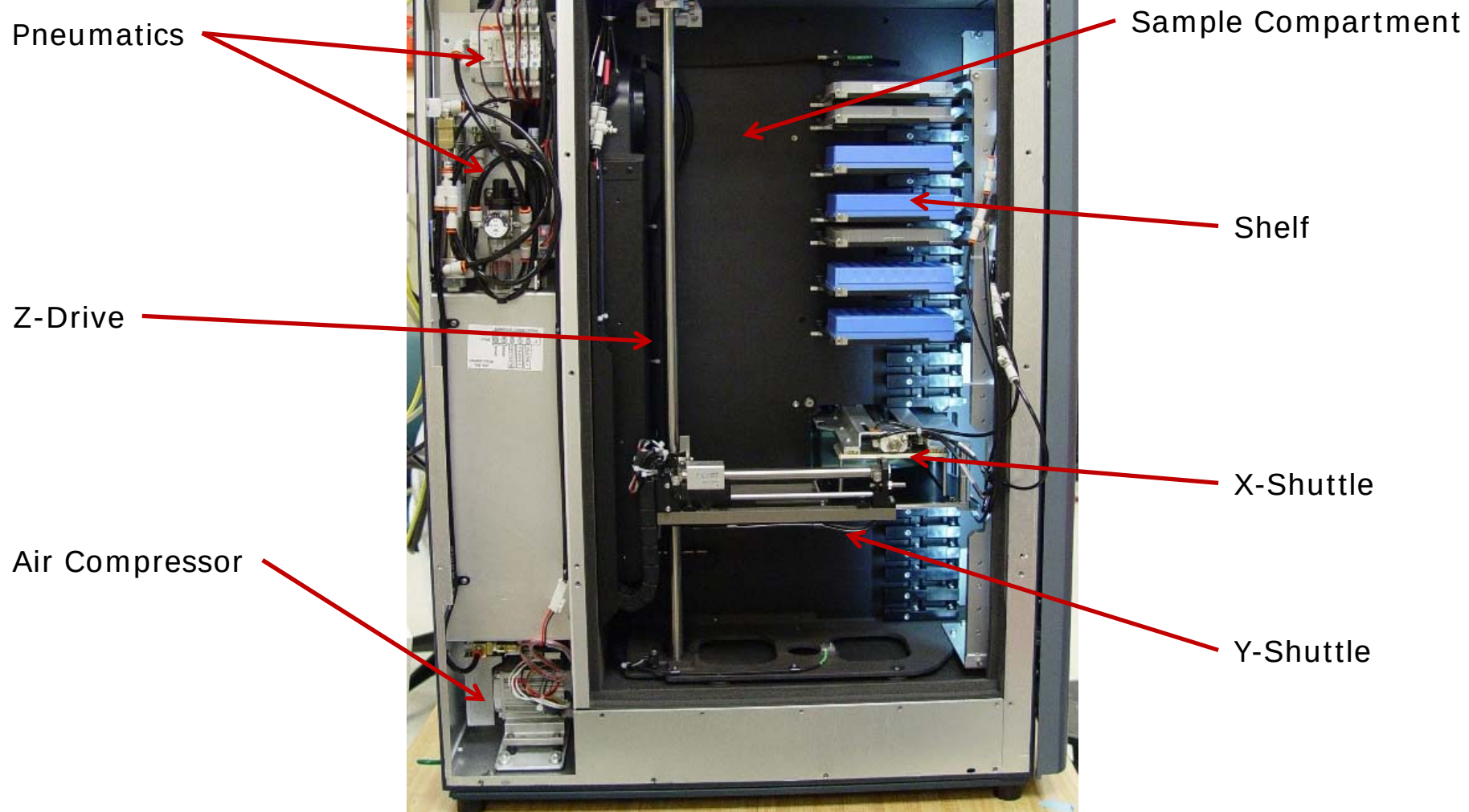
# Objectives of this Presentation

- This presentation will serve as a brief introduction to the new ACQUITY UPLC Sample Organizer.
- Specifically, the following topics will be covered
  - Major functional assemblies
  - New features and functions and how they differ from the current Sample Organizer
  - The adaptations specific to its compatibility with the SM-FTN
  - Brief overview of the startup procedure
- For the complete procedure on how to perform a startup refer to the following (located on the portal):
  - The ACQUITY UPLC Sample Organizer Install Procedure (71502991)
  - The X -Y Hard Stop Calibration video under Video Library

- Shelf capacity up to 7296 samples (depending on chosen plate configuration)
  - Up to 19 microtiter plates
  - 9 intermediate height plates (or 2-mL vial holders
  - 6 deep-well plates (or 4-mL vial holders)
  - or any combination of the above.
- Sample temperature controlled from 4° to 40°C
  - with a range of -2 to +4°C at a setpoint of 4°C
- Firmware Requirements-
  - The Sample Organizer requires updating the SM-FTN firmware and ICS to version 1.49
  - The ICS should be loaded prior to performing the install procedure
  - The respective firmware and ICS will ship with the SO.

*Note- ICOP 1.49 and firmware must not be loaded on a system that does not contain a CPSO. Refer to Release Notes in the portal.*

# Major Functional Assemblies



# Electronics

CPU 2000 PCB

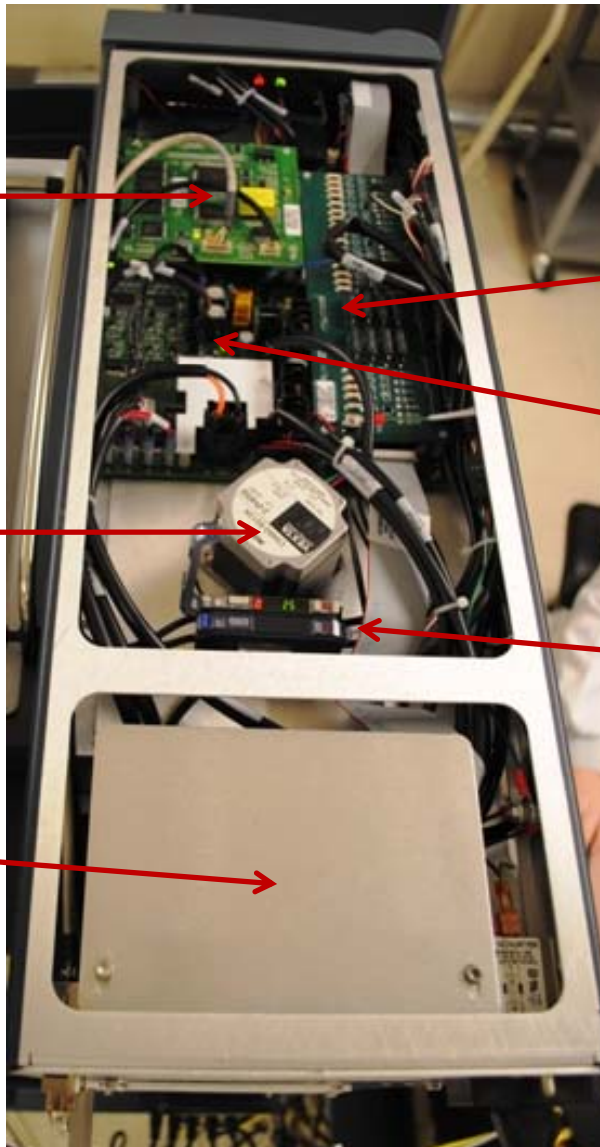
Barrier PCB

Z-Drive Motor

Personality PCB

Power Supply

Amplifier Modules



*Warning- Beware of live AC and DC voltages when troubleshooting and servicing with side or top panels removed. Always remove the power cord from the Sample Organizer before touching any of the electronics.*

# Key Differences

- Door
- X-Shuttle
- Shelf
- Shelf Stability Bracket
- Calibration block

# Sample Organizer Door Enhancements

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- Improved thermal performance
  - Window has been removed
- Improved gasket sealing
- Better door to chassis alignment

# New ACQUITY SM Shelf Design

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Higher shelf clearance to accommodate QSM or BSM without changing the feet.

SM Shelf reinforced to hold more weight



# ACQUITY SM Shelf

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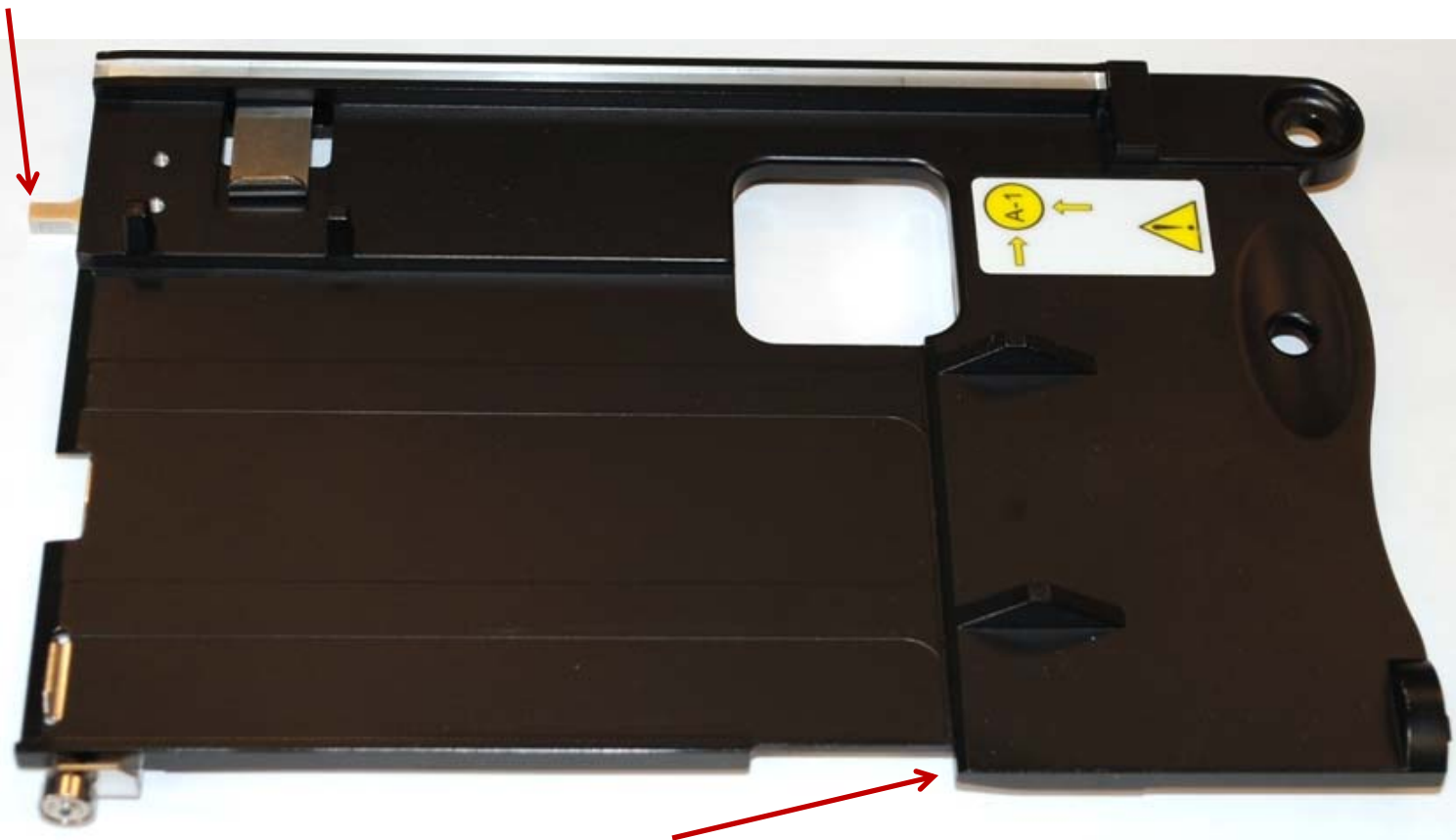


Two Leg Support  
Brackets  
(for better weight  
distribution)

**Warning:** Do not attempt to lift, pull or twist the Sample Organizer by the leg support brackets with the weight of a full ACQUITY stack on it.

## SM Shelf- Top View

Shelf Sensor Flag



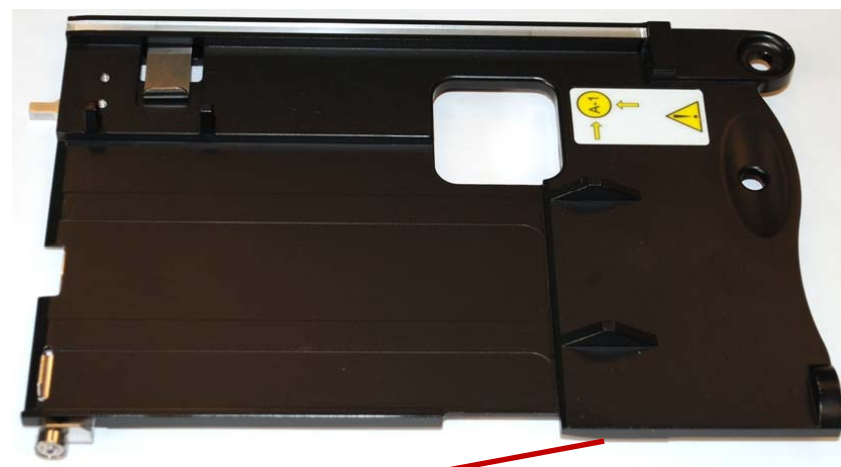
The new shelf is wider at the front end to accommodate its connection to the Shelf Stability Bracket. This will minimize any chance of shelf sag.

*Note: The new shelf is not backward compatible with the old Sample Organizers.*

# Shelf Stability Bracket



Shelf Stability Bracket



New wider Shelf

## SM Shelf- Bottom View

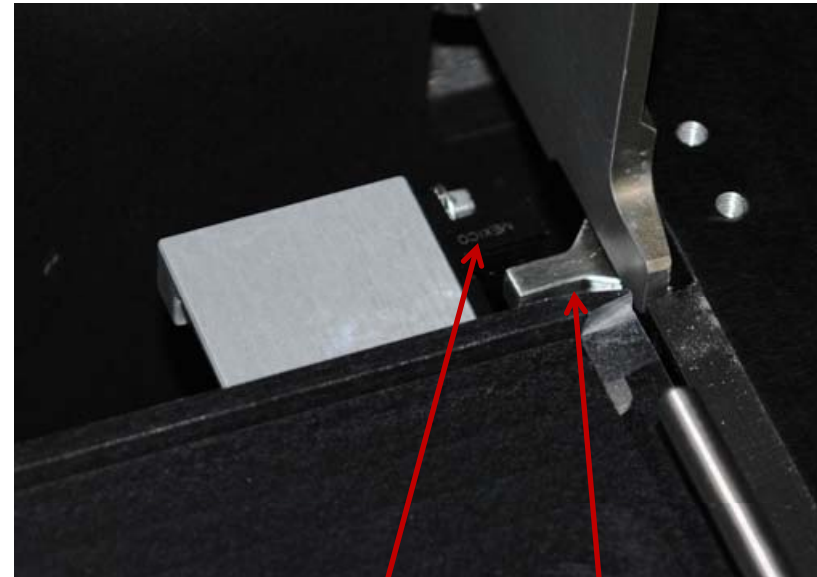
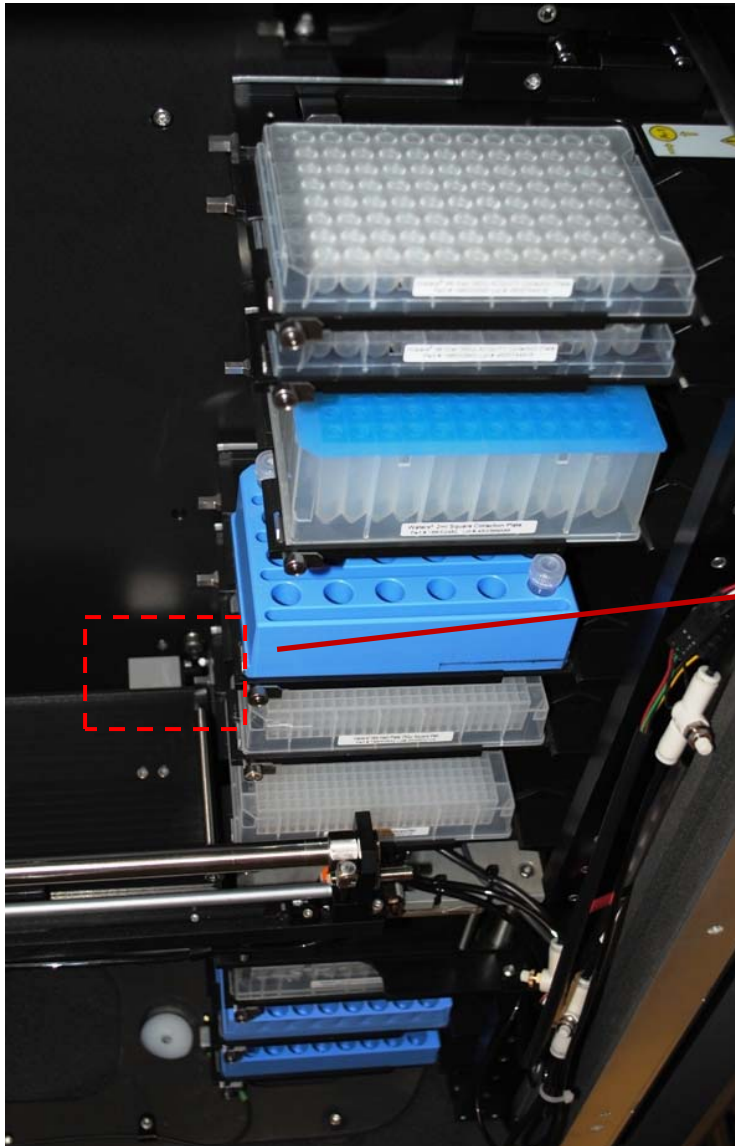


Shelf Sensor Flag

The new shelf sensor flag (along with the shelf sensor) greatly improves the detection of shelves in the new Sample Organizer.

# Shelf Position Sensor and Flag

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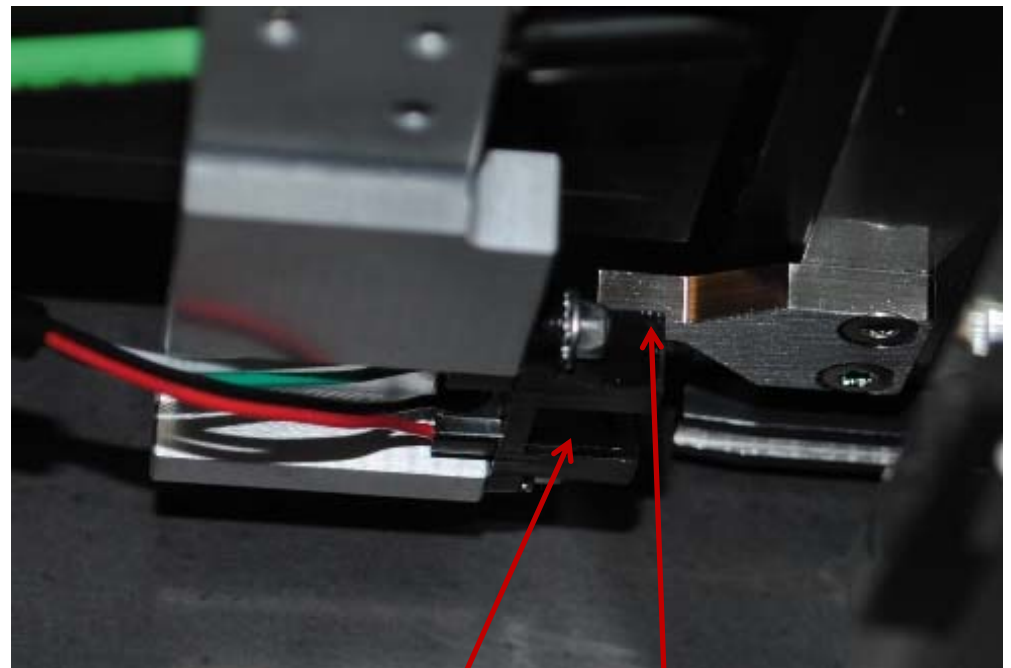
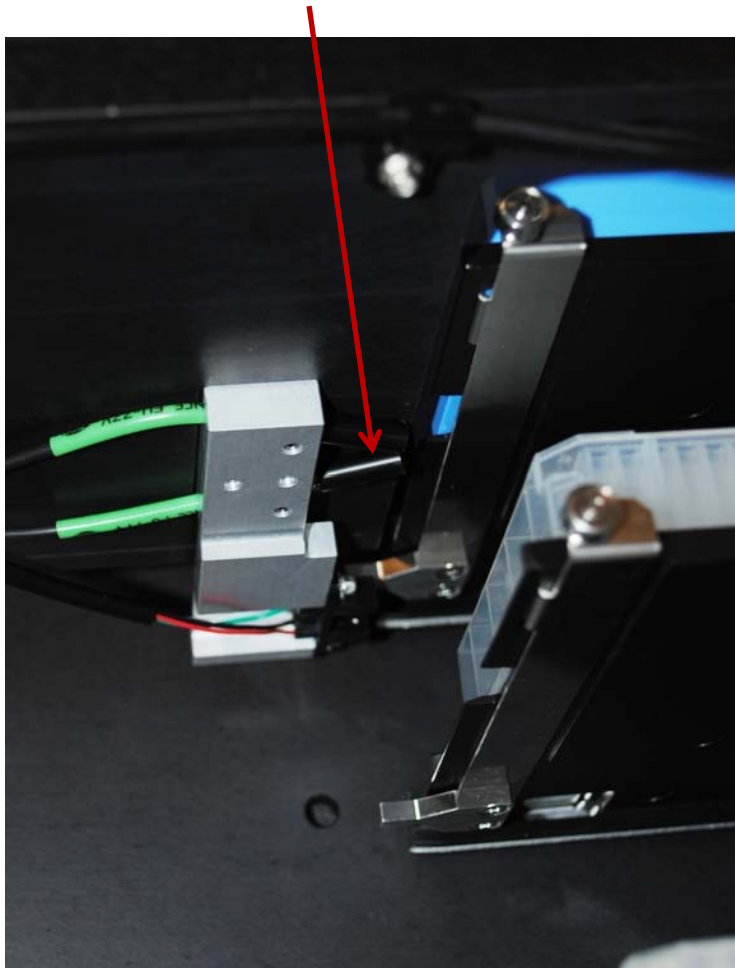


Shelf Sensor and Flag

# Shelf Position Sensor

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Micro-titer Plate Sensor



Shelf Sensor and Flag

# X-Shuttle Assembly

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X-Shuttle Transfer Pneumatics

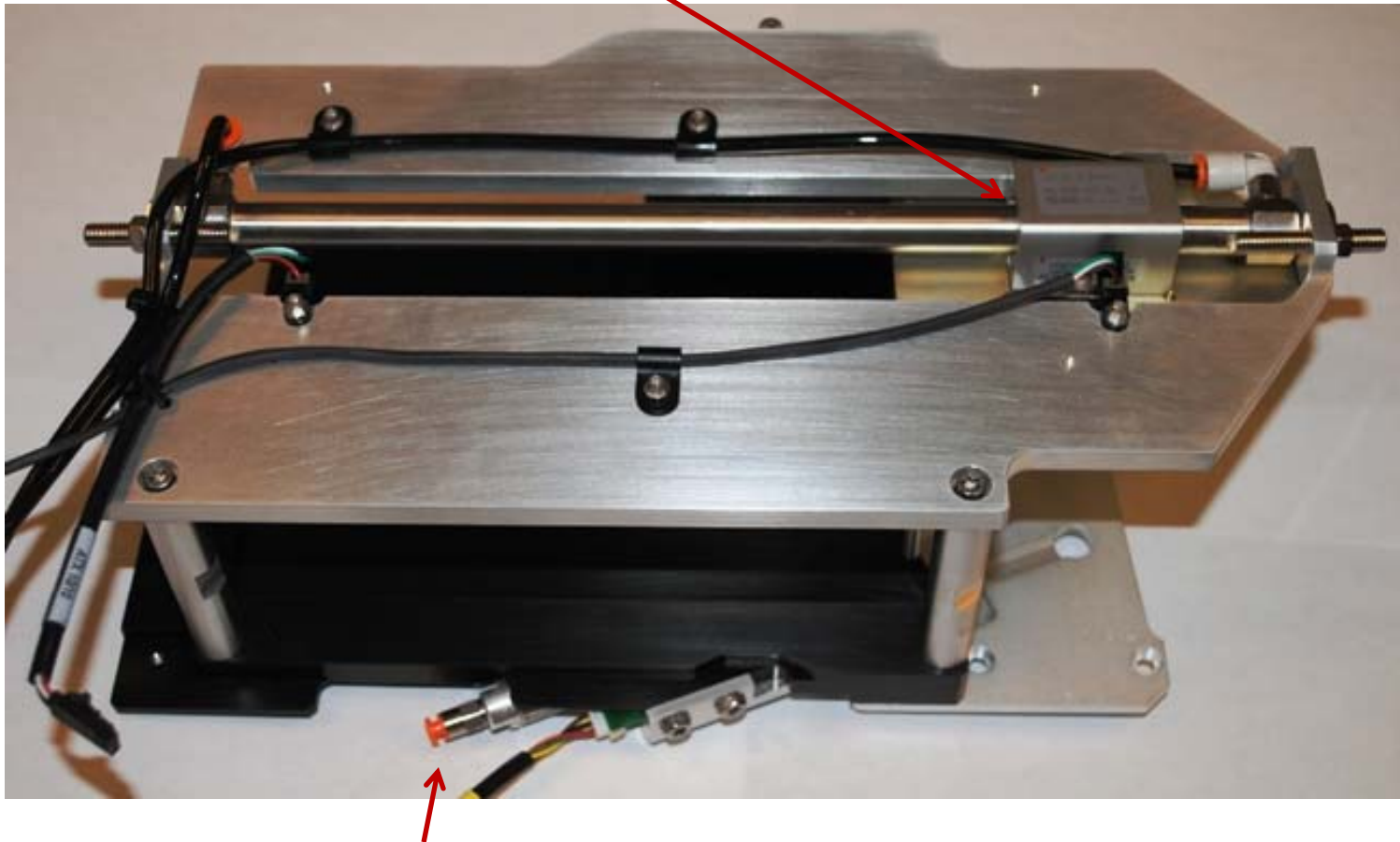
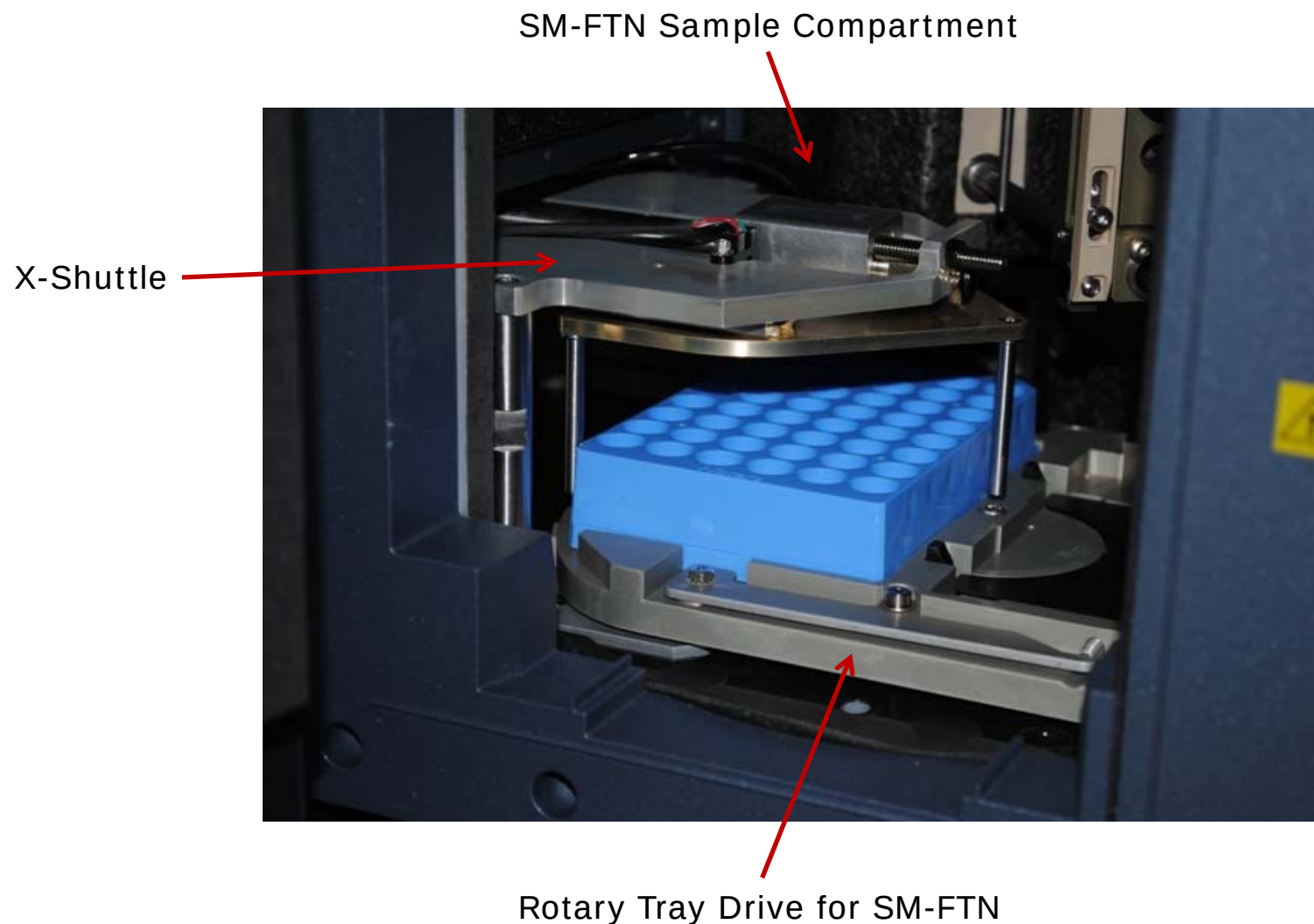


Plate Latch Pneumatic Actuator

# X-Shuttle Assembly Installed



# Rotary Tray Drive for Sample Organizer

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X-Shuttle

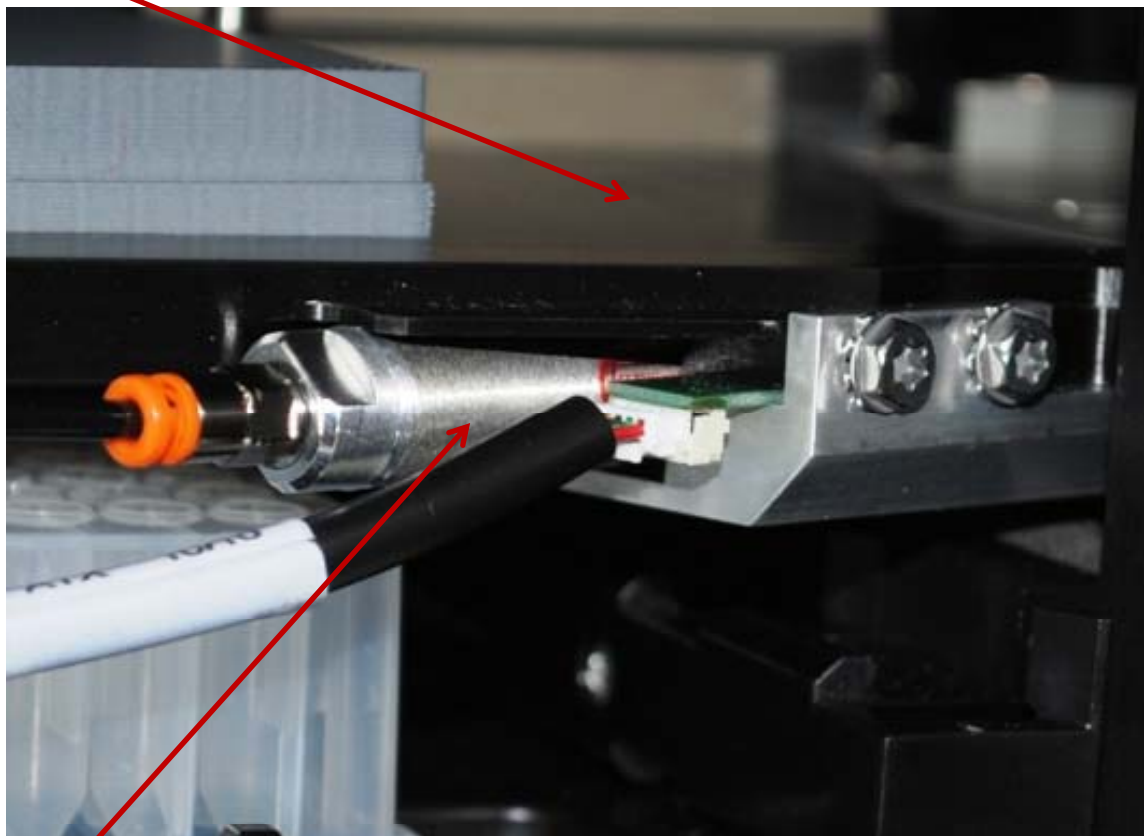
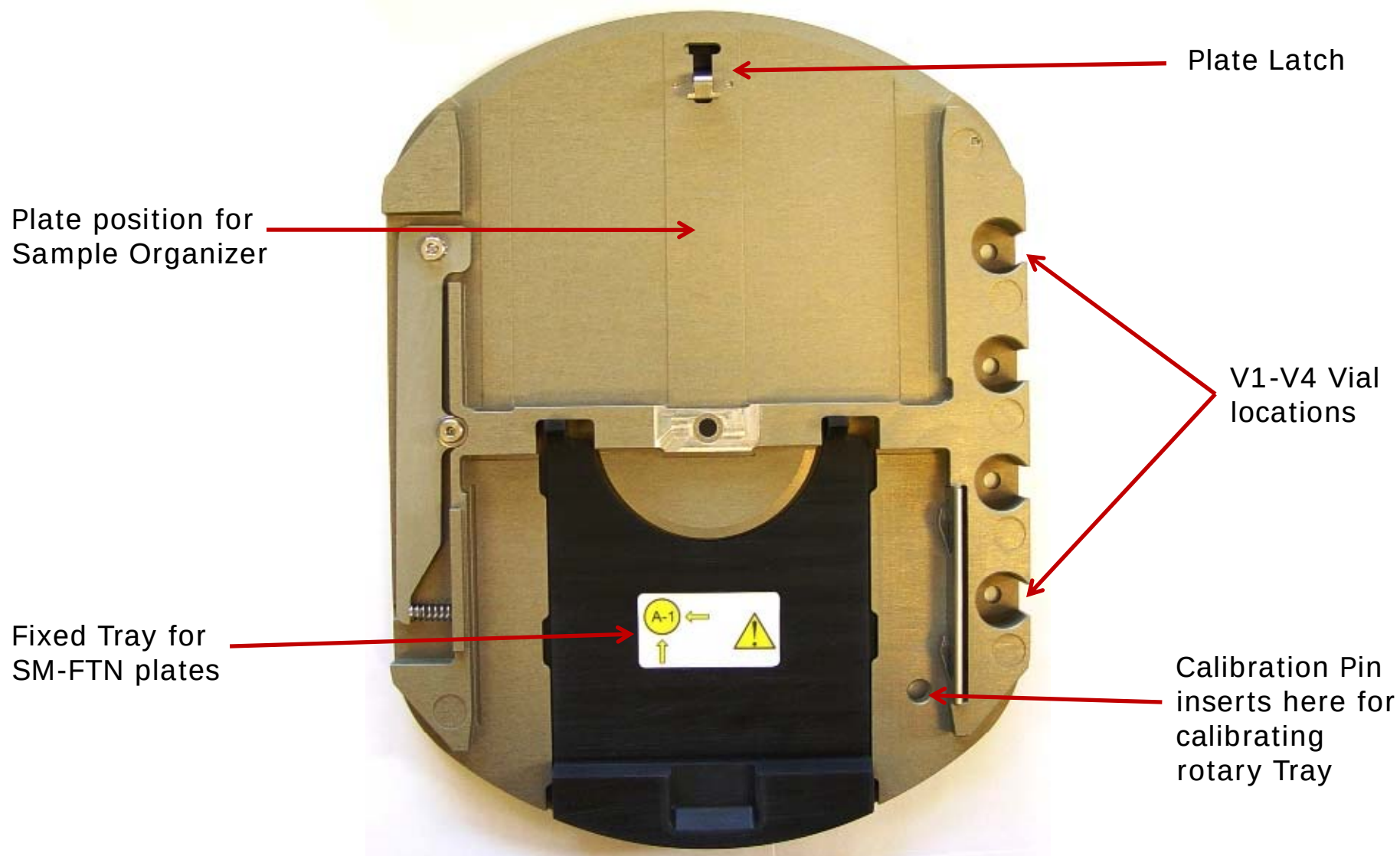


Plate Latch  
Pneumatic Actuator

# Rotary Tray Drive for Sample Organizer

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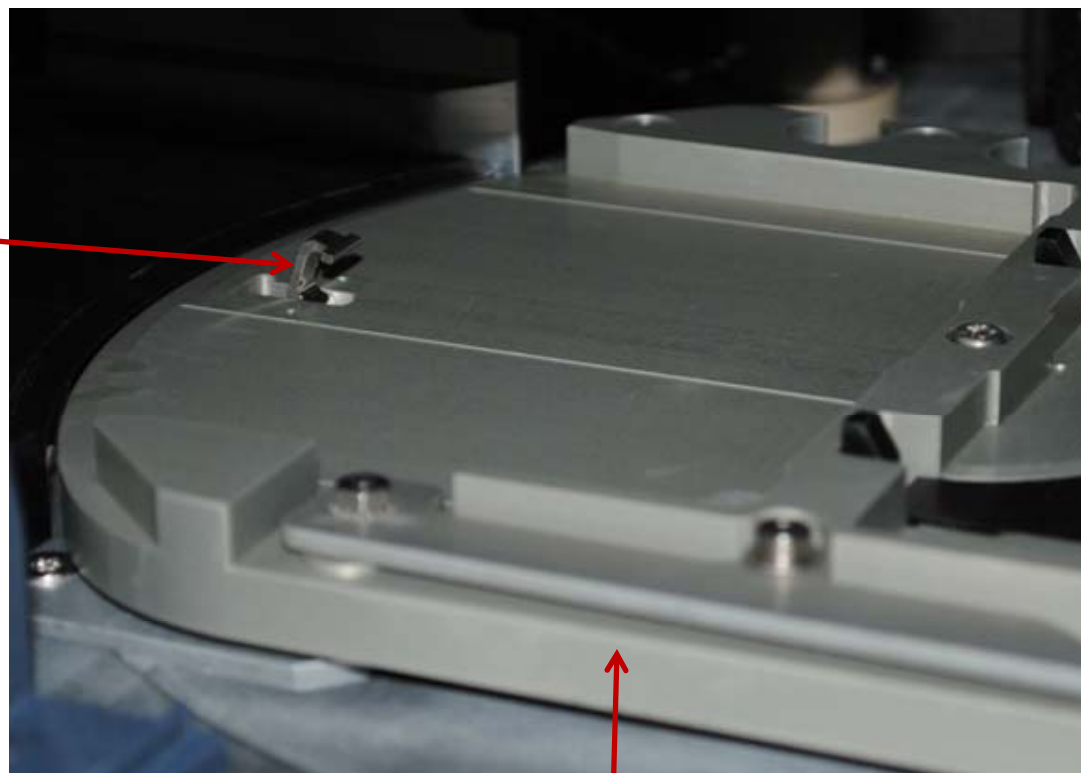


# Rotary Tray Drive for Sample Organizer

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## Plate Latch-

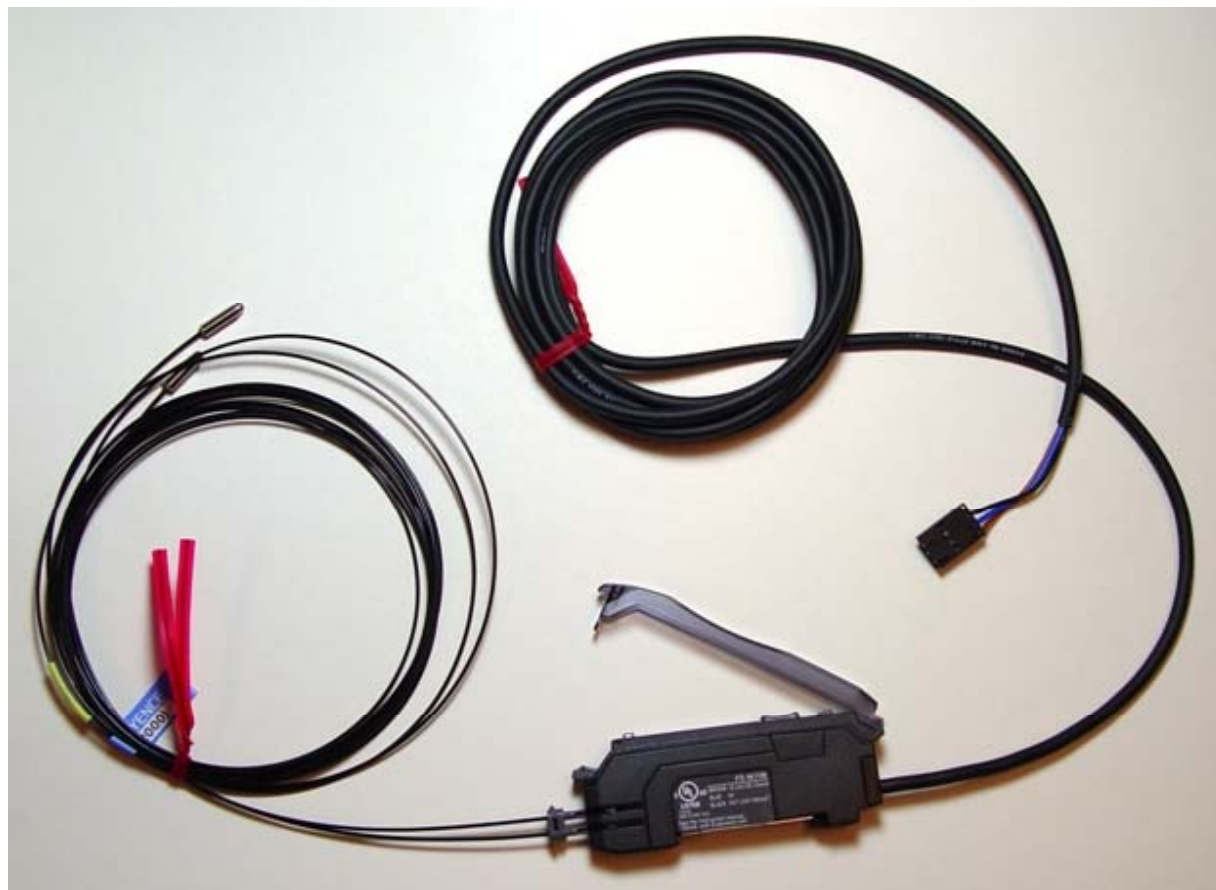
Adjust Plate latch  
time to approximately  
1 sec ( 3/4 counter  
clockwise on  
pneumatic hose)



Rotary Tray Drive for Sample Organizer

# IGUS Cable and Amplifier Module

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A new IGUS cable going to and from the Micro-titer Plate Sensor has been added to the Sample Organizer. The thin ID of the fiber optic cable gives the IGUS cable increased flexibility but has necessitated a different amplifier module than the previous Sample Organizer.

# Calibration Block

The Calibration Block is included in the startup kit and is used to verify the X and Y hard stops.



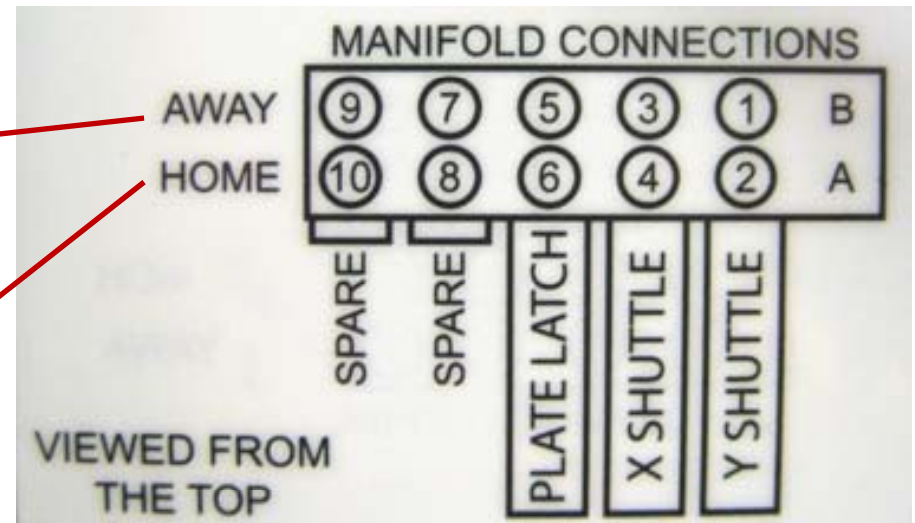
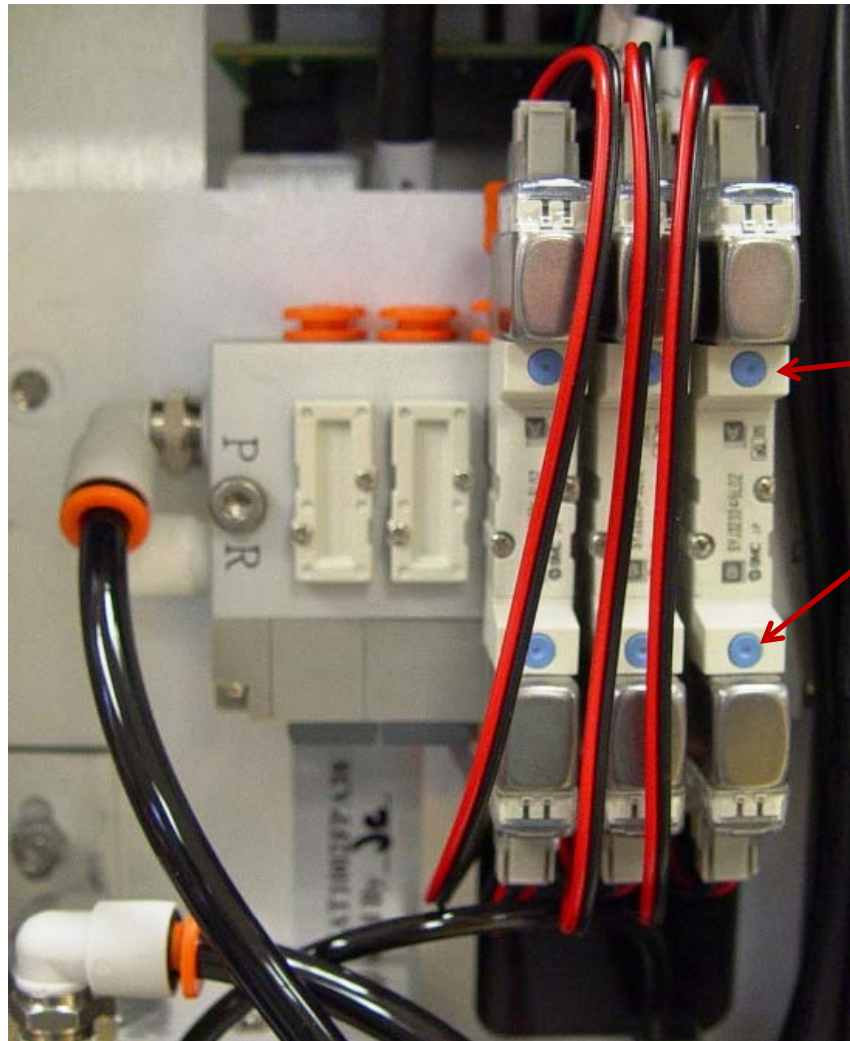
Y-Hard Stop Location

X-Hard Stop Location

Front

# Pneumatic Manifold Controls

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# Startup Procedure

- It is quite important to follow the Sample Organizer Install Guide step by step for installations as there are many differences versus the old Sample Organizer
  - Major steps are detailed on the next slide
- Tools Required
  - Calibration block and X mechanism wall adjustment tool (from hardware shelf startup kit)
  - 1/4" and 5/16" open-ended wrenches
  - T10 and T20 Torx drivers
  - 90 degree T20 Torx driver
  - 2 mm, 3 mm and 4 mm Allen wrenches
  - Medium-sized Phillips head screwdriver
  - Medium-sized flat blade screwdriver
  - Magnet

# Startup Procedure- Major Steps

- De-stacking the H-Class Components
- Unpacking the unit
- Attaching the outboard leg and sample manager shelf
- Docking and securing the SM-FTN to the Sample Organizer
- Installation of the SO specific Rotary Tray in the SM-FTN
  - Note: You must recalibrate new rotary carrousel immediately after replacement step
- Installing the X-axis transfer shuttle (XTS)
- XTS Pre-alignment
- Making Electrical and pneumatic connections
- Configuring the sample organizer
- Verifying/adjusting the of hard stops using the calibration block
- Verifying Proper Operation

Please refer to the ACQUITY UPLC Sample Organizer Assembly and Install Procedure (71502991)

- Once a Year
  - Inspect Rails (Clean if needed)
  - Adjust and test function as needed
    - Speed, air pressure, hard stops
- Every Two Years
  - Same as above plus
  - Change IGUS cable
  - Adjust and test function as needed
- Replace as required
  - Filter Cartridge