Medica Corporation
EasyRA Service Training

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EasyRA Application Specialist

Reagents-Instructions for use

- **Note: Check the inside of the neck of the wedge for foam after removing the cap and placing the wedge on the analyzer.** If there is foam, remove it with a swab or a disposable pipette before performing the test.

Calcium

- The calibration interval (14 days maximum) is programmed on the RFID chip on the reagent wedge. Recalibration is required whenever there is a new wedge placed on the analyzer, a change in reagent lot number or if a shift in quality control values occurs.

CO2 & ALP

- Keep the reagent tightly closed when not in use. When used in this way, the reagent is stable on-board in the refrigerated reagent area of the Medica EasyRA Chemistry Analyzer for the number of days programmed on the RFID chip on the reagent wedge.

Total Protein

- The reagent is stable on-board in the refrigerated reagent area of the Medica EasyRA Chemistry Analyzer for the number of days programmed on the RFID chip on the reagent wedge if the reagent is recapped and removed at the end of the day and stored overnight at 18º-25oC. Do not use the reagent if it is turbid or cloudy or if it fails to recover known serum control values.

The “Debug Mode”

- When Medica Technical Support says “Yes” or when additional troubleshooting is required.

- Additional info from the Results Menu
  - “Other Tables” (save to file/send to Medica)

- Additional info from the Status Menu
  - “Sample Inventory”

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2/18/2008; 11:13 AM

Setup

System

- Security
- Printing
- LIS
- Operator ID
- Positions for Stat
- Debug Mode
- Auto Run after Inventory

- Cleaning
- Diagnostics
- Maintenance
- Setup
  - System
  - Tests
  - Patients
  - Calibration
  - QC
  - Reagent





2/18/2008; 10:47 AM

Setup

System

- Security
- Printing
- LIS
- Operator ID
- Positions for Stat
- Debug Mode
- Auto Run after Inventory

Disabled	Debug Mode





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2/18/2008; 10:49 AM

Setup

System

Press the Cell To Modify

Disabled	Debug Mode

- Disabled
- Enabled

- Security
- Printing
- LIS
- Operator ID
- Positions for Stat
- Debug Mode
- Auto Run after Inventory





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2/18/2008; 10:50 AM

Setup

System

Press the Cell To Modify

Security	
Printing	
LIS	
Operator ID	
Positions for Stat	
Debug Mode	Enabled
Auto Run after Inventory	

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Se

Sys

- Current Results
- Last Results
- Patient Results
- Calibration Results
- QC Results
- Other Tables

- Security
- Printing
- LIS
- Operator ID
- Positions for Stat
- Debug Mode
- Auto Run after Inventory

Enabled

Debug Mode





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Other Tables

Measurements

Save to File

Dispensed | Measurement

Complete | Worklist Last Results

Remaining | ISE mvs

Worklist Copy | ISE Slope

Ready List | ISE Results

Pending List | Cuvette Abs.

Rerun List | Precision Result

Problem List | Cuvette Edge

Sample Started | System Settings

Progress Table | Config

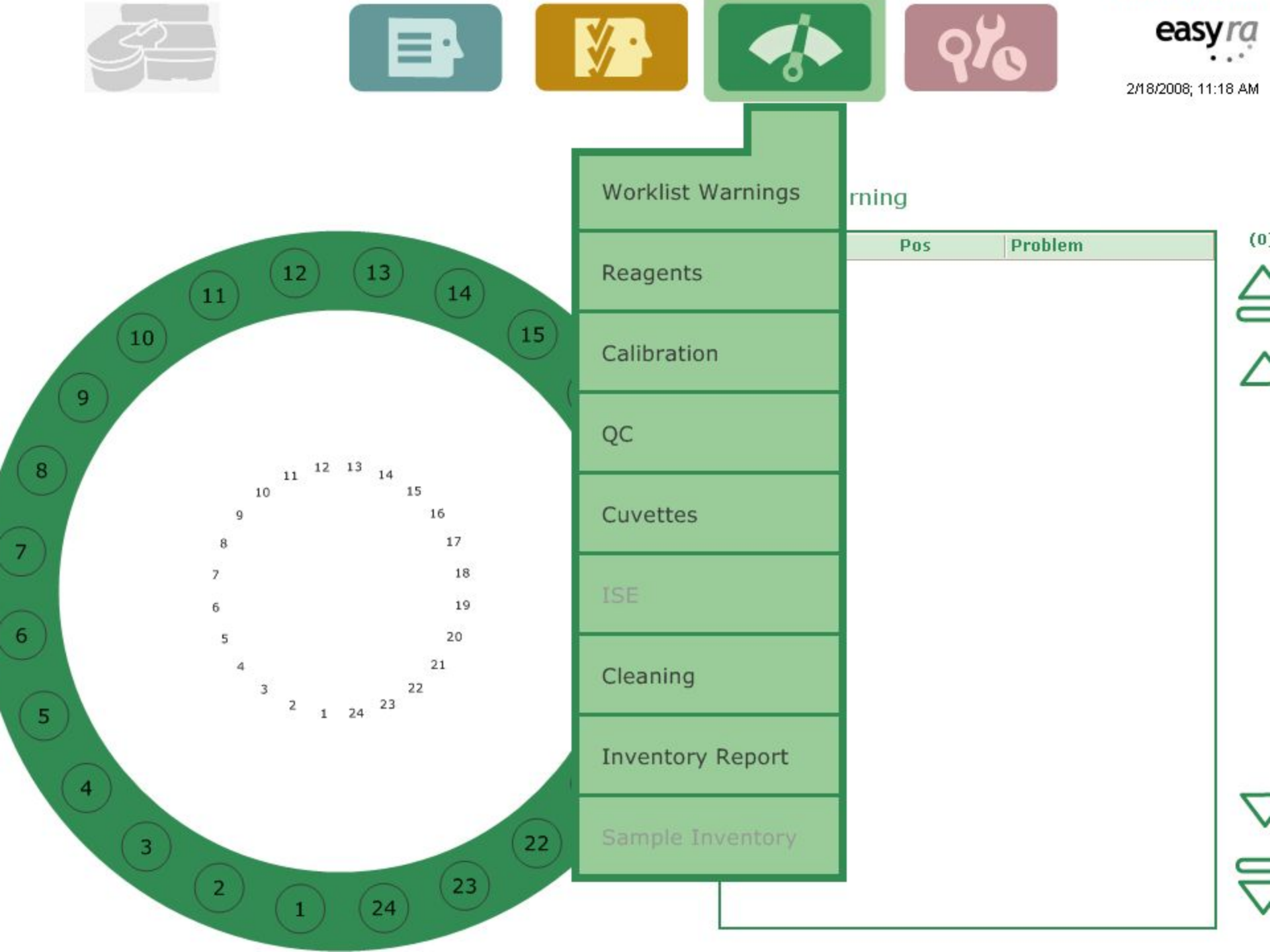
Entry Pos Table | Version

Patient Info | Debug Buffer

Pos	Chem Number	Cuvette	Read Number	Repeats	Filter#	Signal	Reference	Abs	Completion Time

(0)





easyra
2/18/2008; 11:18 AM
Worklist Warnings
rning
Reagents
Calibration
QC
Cuvettes
ISE
Cleaning
Inventory Report
Sample Inventory
Pos
Problem
(0)
1
2
3
4
5
6
7
8
9
10
11
12
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19
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21
22
23
24

System Status

- **Condition of key system components**

1. Reaction Chamber
2. Pre-Heater
3. Reaction Chamber Cover
4. Reagent Chamber Cover
5. Fluidics Drawer
6. Reconnect Port, Reset Hardware, Error Log

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System

System Status

Re-Connect Port | Reset Hardware | Error Log

Component	Sensor Output	Operational Condition	Warning
Reaction Chamber		37C +/- 0.2C	
Reagent Chamber Plate		3C +/- 2C	
Preheater		39.8 +/- 0.4C	
Reaction Chamber Cover		Must be closed for operation	
Reagent Chamber Cover		Must be closed for operation	
Fluidics Drawer		Must be closed for operation	

(6

An error code appears-Now What ???

- Reset Hardware

- Locate the subsystem in question and perform Diagnostic test/s

Investigate the Code – OM 11.2

- A five digit alphanumeric string having the form axxyz
- a - represents a subsystem/location or scheduler software where Easy RA detected the problem
- xx –Represents the position on the Sample Ring/Reagent Tray or Cuvette Carousel
- y&z- Further pinpoints the location and type of problem

Possible Values for Hardware Errors

- a = transfer arm
- r = Reaction Area/Cuvette Wheel
- d = Dilutor Pump
- p = Probe
- s = Sample/Reagent Wheel
- f = Photometer
- i = ISE module
- t = Radio Frequency Tag
- c = Communication Error

Hardware Error Examples (OM sec 11.3)

- a0001- Transfer probe failure to find home.
- Check for object in path of Sample Probe
- Other causes:
- Optical Sensor Failure or Electro/Mechanical failure
- To recover: Go to Diagnostic menu and select Transfer Arm/Probe/Arm positioning, Press Start.

System Error Codes

- P0124 – Empty Sample Cup
  " Check Sample at position 1"

- ID0001- Turned off RA and the UI was running.
  "Serial communication error"
  " Note: Make sure Easy RA is powered on and serial cable is connected. Press <Re-connect Port> under <System Icon> to try again.

System Error Codes

- S0001- S0002 – Sample Wheel Home and Position errors (#1 home, #2 positioning)
- P0214- Cap installed on the Reagent bottle (prompted to check position 2)
- P0125 – No Cup in Sample Position

  “No sample found. Check sample position 1.”

System Error Codes

- P0124 – Empty Sample Cup
  " Check Sample at position 1"

- ID0001- Turned off RA and the UI was running.
  "Serial communication error"
  " Note: Make sure Easy RA is powered on and serial cable is connected. Press <Re-connect Port> under <System Icon> to try again.

Let’s break that code down!

- P2304
  - P=Probe
  - 23=position#
  - 0=R2, 1=R1, 2=Sample, 3=Wash,4=ISE, 5= test/cuvette
  - 4= Bump switch, 5= maximum steps

Running Tests after a System Error

- System beeps to alert you of the error
- Window appears with the code
- You may choose to end the run or continue measuring

Recovering Cancelled Tests

- If you end the run, all tests that are in process are cancelled
- Results are reported prior to the error
- After accepting results, The Easy RA allows you to recover cancelled tests to a new work list!

Legend of Results Flag codes

- To view the legend touch the Flag icon on the results screen.

- 25 possible codes which may appear in the Flag field on the Results screen if an abnormal condition is detected!
- See sect 7.55 Operators manual.





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Results

Current Worklist

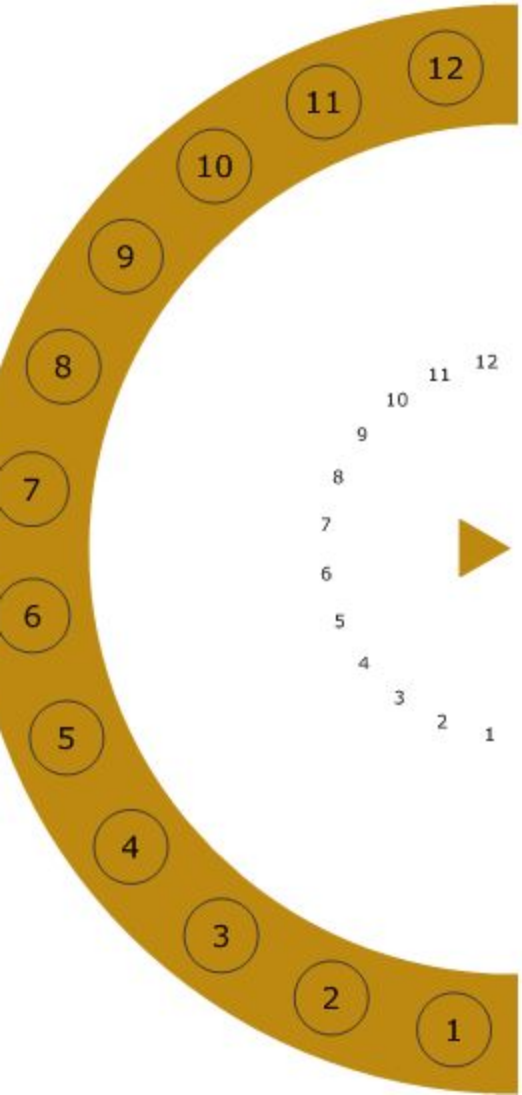


0

(0

Operator ID:

Stat	Pos	Type	Sample ID /Lot	Test	Result	Units	Flags	Rerun	Completion Time	Status







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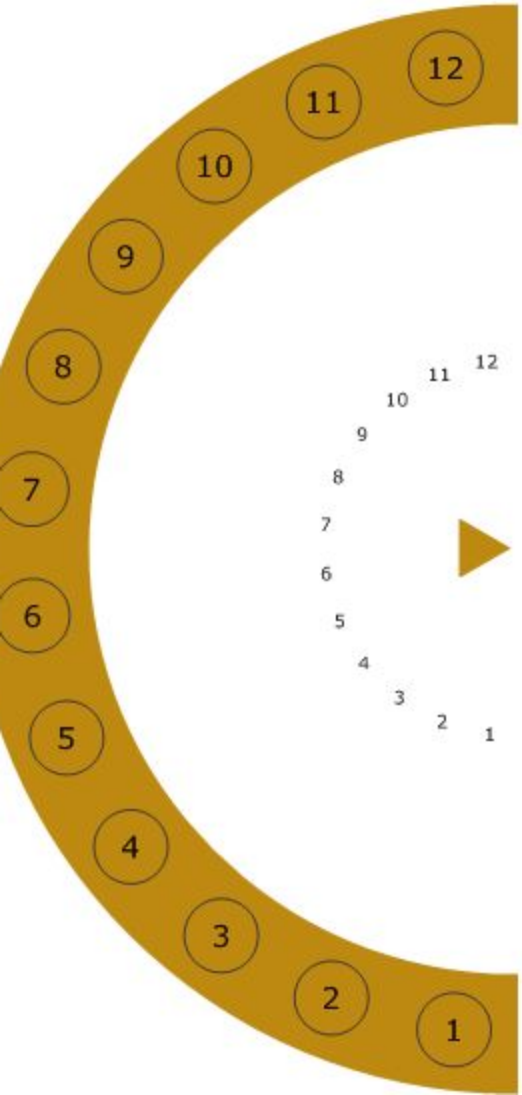
Results

Current Worklist

Operator ID:

Stat	Pos	Type	Sample ID /Lot	Test	Result	Units	Flags	Rerun	Completion Time	Status



Definition of Flags


AA	(ISE) Air in Cal A
AB	(ISE) Air in Cal B
AD	(ISE) Cal A mV Drift
AN	(ISE) Cal A mV Noise
AS	(ISE) Air in Sample
BA	Blank Absorbance
BN	(ISE) Cal B mV Noise
CD	Calibration Deviation
CF	Calibration Factor Range
CR	Outside Critical Range
DS	Slope Drift
EN	End Point Noise
HA	High Absorbance
HN	High Reaction Rate Noise
IE	(ISE)System Error
LH	Linear Range - High
LL	Linear Range - Low
MV	(ISE) Cal A/Cal B Out of mV Range
NF	(ISE) No Fluid Flow
NR	Outside Normal Range
QC	QC Confidence Range
RD	Reaction Direction
RN	Reaction Rate Noise
RR	Outside Rerun Range
SD	Substrate Depletion
SE	System Error or Ended by user
SR	(ISE) Calibration Slope Range

Measurement Problems

- They occur during the measurement phase of the test
- The may affect the resulted presented
- In some cases results are suppressed because they will not represent and accurate assessment of the activity or concentration present.

Measurement Problems- OM 11.11

- Chemistries affected
- Abbreviation
- Meaning
- Troubleshooting & Recovery

Measurement Problems/Flags

- Appear in the Results Screen on the left side of the Flags column (with a range error)
- OR they appear in the center of the Flags column
- They can also appear on the ISE Calibration Results screen

Measurement Flags

AS- Air in Sample (ISE"S)

- Short Sample
- Clot in sample

CD- Calibrator Deviation

- CV on triplicates > 5%

CF – Calibration Factor out of range

- Factors found on Assay sheet or from RA
- One chem/ all chems?
- Calibrator/reagent.

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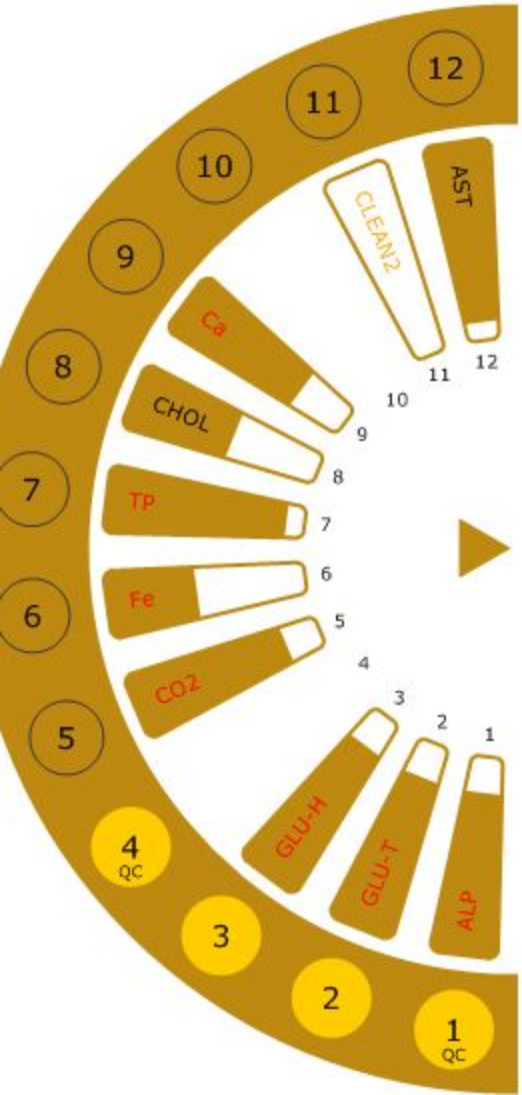
Results

Current Worklist

Operator ID:

Stat	Pos	Type	Sample ID/Lot	Test	Result	Units	Flags	Rerun	Completion Time	Status
☐	1	QC	52870701	LDH	202	U/L		☐	2/19/2008 10:21 AM	Complete
☐	2	Serum	Serum #46	LDH	807	U/L	LR	☑	2/19/2008 10:22 AM	Complete
☐	3	Serum	Serum #46	LDH	807	U/L	LR	☑	2/19/2008 10:22 AM	Complete
☐	4	QC	52880701	LDH	510	U/L		☐	2/19/2008 10:21 AM	Complete



Substrate Depletion Result - Windows Picture and Fax Viewer

UI-80220A/M-80221A

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2/26/2008; 5:48 PM

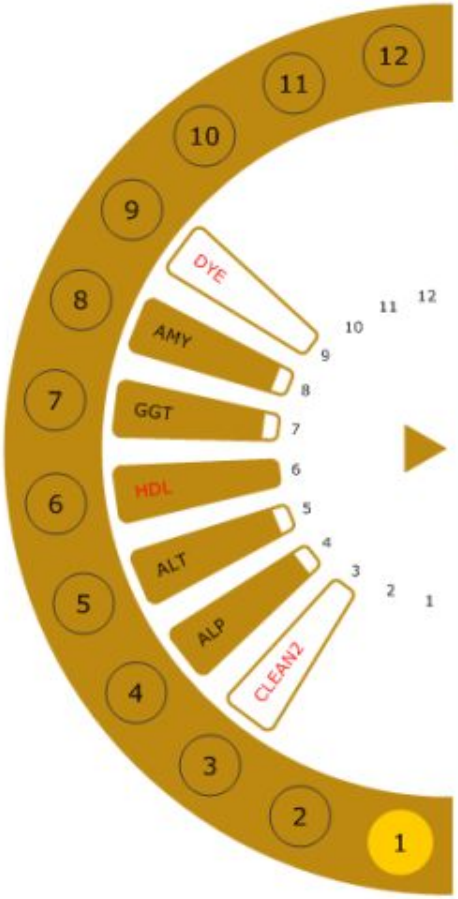
Results

Current Worklist

Operator ID:

Stat	Pos	Type	Sample ID /Lot	Test	Result	Units	Flags	Rerun	Completion Time	Status
☐	1	Serum	222	GGT	—	U/L	SD	☑	2/26/2008 5:48 PM	Complete

(1)



start

3 Microsoft Office O...

Substrate Depletion ...

8:38 AM

Measurement flag- SD (OM Table 11.2)

- Substrate Depletion - Reagent ran out of substrate for enzymes

- To recover: Rerun the test. The Rerun program will automatically reduce the sample volume to either 0.5 or 0.33 of the original sample volume and add to this same Reagent volume. If the SD flag persists after auto dilution, dilute the sample with normal saline, and then rerun the sample.

Range Errors

- **User defined pre-set ranges for:**

1. QC Ranges - error code = QC
2. Normal Ranges - error code = NR
3. Critical Ranges - error code = CR
4. Rerun Ranges – error code = RR

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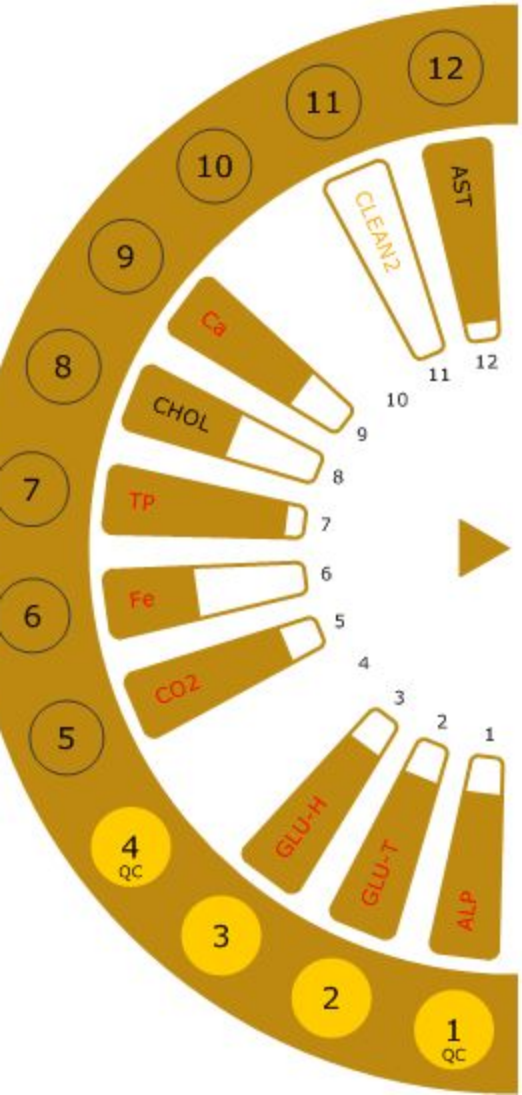
Results

Current Worklist

Operator ID:

Stat	Pos	Type	Sample ID/Lot	Test	Result	Units	Flags	Rerun	Completion Time	Status
☐	1	QC	52870701	LDH	202	U/L		☐	2/19/2008 10:21 AM	Complete
☐	2	Serum	Serum #46	LDH	807	U/L	LR	☑	2/19/2008 10:22 AM	Complete
☐	3	Serum	Serum #46	LDH	807	U/L	LR	☑	2/19/2008 10:22 AM	Complete
☐	4	QC	52880701	LDH	510	U/L		☐	2/19/2008 10:21 AM	Complete



Maintenance OM Section 10

- Daily
- Weekly
- Monthly
- 6 months
- As needed
- EasyRA UI with OM assistance

Diagnostics

- EasyRA UI
- Service software (omit precision dye)
- ECData

Diagnostics in easyra

- Reaction Area
- Transfer Arm/Probe
- Fluidics Drawer/ISE's
- Reagent Sample Area
- Heater Cooler
- Cover/Door Latches
- Precision Test
- Note: These diagnostic tests are in the User Software

Diagnostics – Reaction area

- **Photometer test**

- The voltage output of the Read and Reference photodiodes
- The ratio of the Read and Reference diodes
- The flash to flash precision (N=50) at each wavelength
- **Let's run it now! OM pg 11.31**

Diagnostics – Transfer Arm/Probe

- Arm Positioning
- Probe positioning
- Liquid Level Sensing

- Let's do it now!~ OM 11.36

Diagnostics – Fluidics Drawer

- Dilutor Pump – dilutor pump error or precision test failed/ QC “noisy”
- Waste Pump- Not emptying properly/overflowing
- ISE Sensor System-output of bubble detector with liquid and air, # of pump counts for all three pumps, output of sensors with CalA & B in front
- Let’s do it Now! OM pg 11.46

Diagnostics – Reagent/Sample Area

- Sample Wheel
- Barcode Reader
- RFID Reader
- Let's do it! OM pg 11.55

Precision Test – OM 11.67

- The most important test on the easyra
- An indicator of the performance of the dilutor pump
- Takes 12 minutes, 20 new cuvettes, and a precision dye wedge. Level 1= 16ul/180 and level 2=2ul and 255diluent.
- Should always be performed weekly or when the sample probe, transfer arm, or photometer is replaced!

What if my precision test fails??

- Check dilutor fittings on the right side of the dilutor
- Check for bubbles in the dilutor
- Check/replace probe
- Prime diluent and repeat test

EasyRA Best Practices

- Cals
- Controls
- Water
- Reagents
- Evaporation
- Environmental
- E-mail ECData

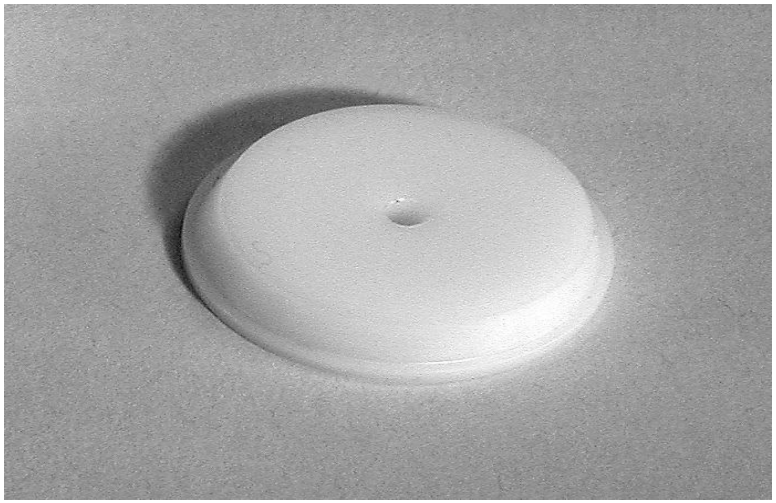
Service Training

Special Tools Required and supplied by Medica

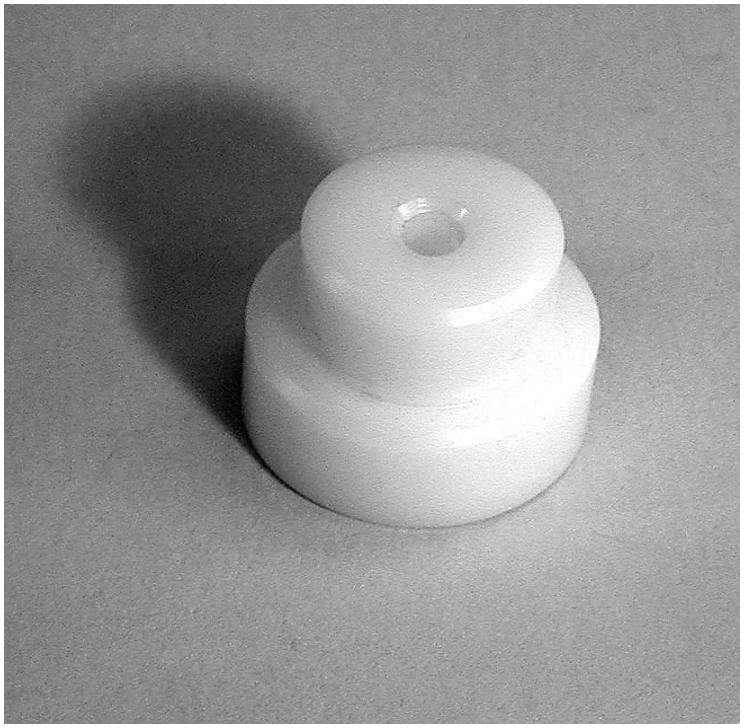
Alignment Cuvette Segment

Photometer/Liquid level sense/temp cal

Wash Cup Alignment Tool



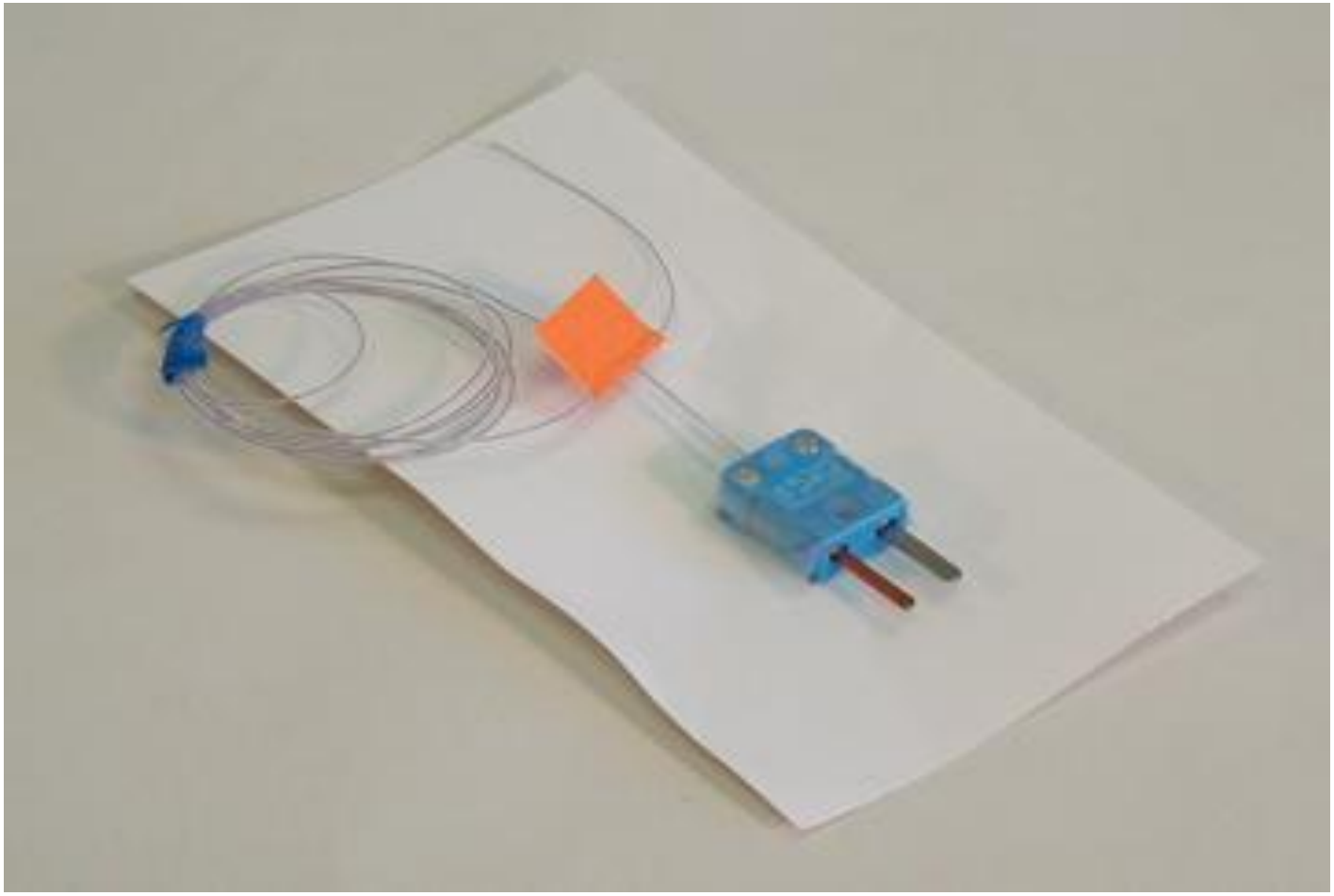
Sample Alignment Tool



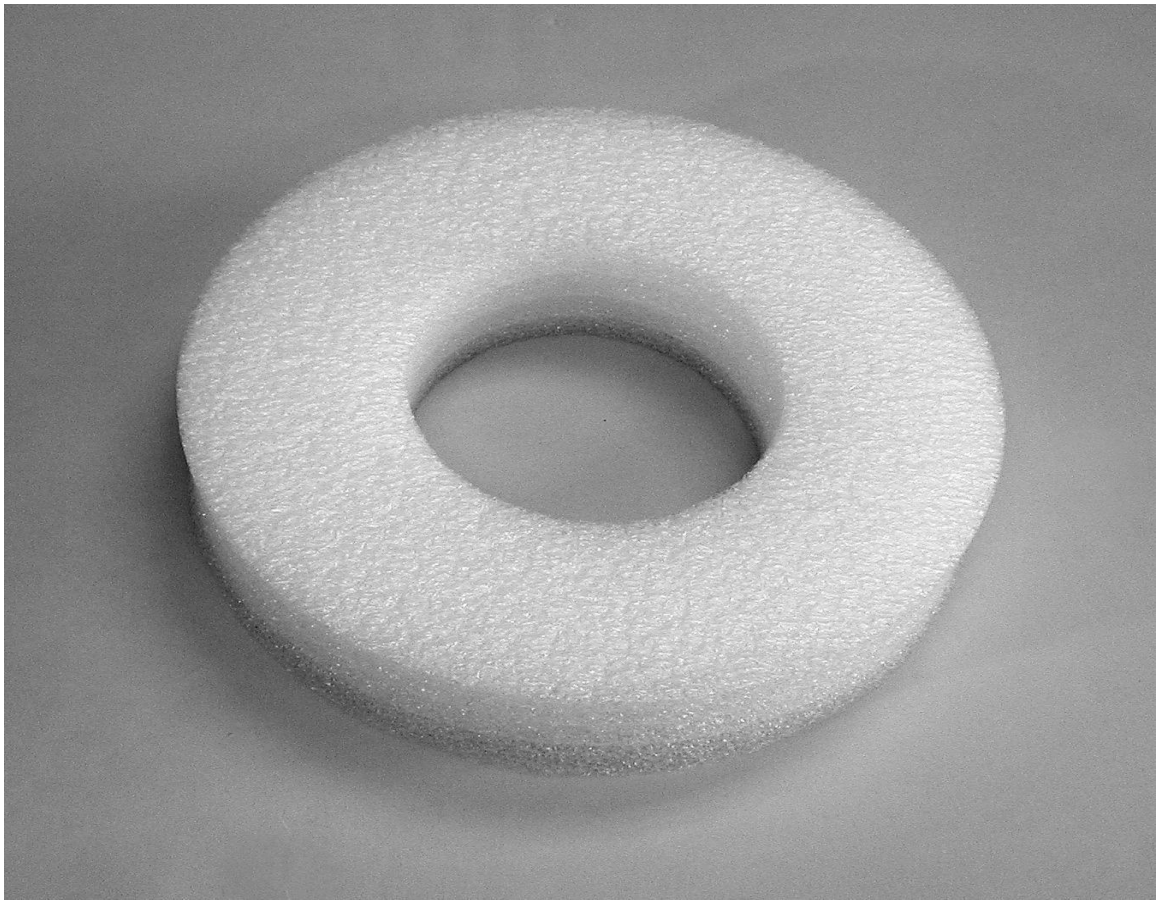
Reagent Wedge Alignment Assembly

Digital Thermometer

Two Thermistors

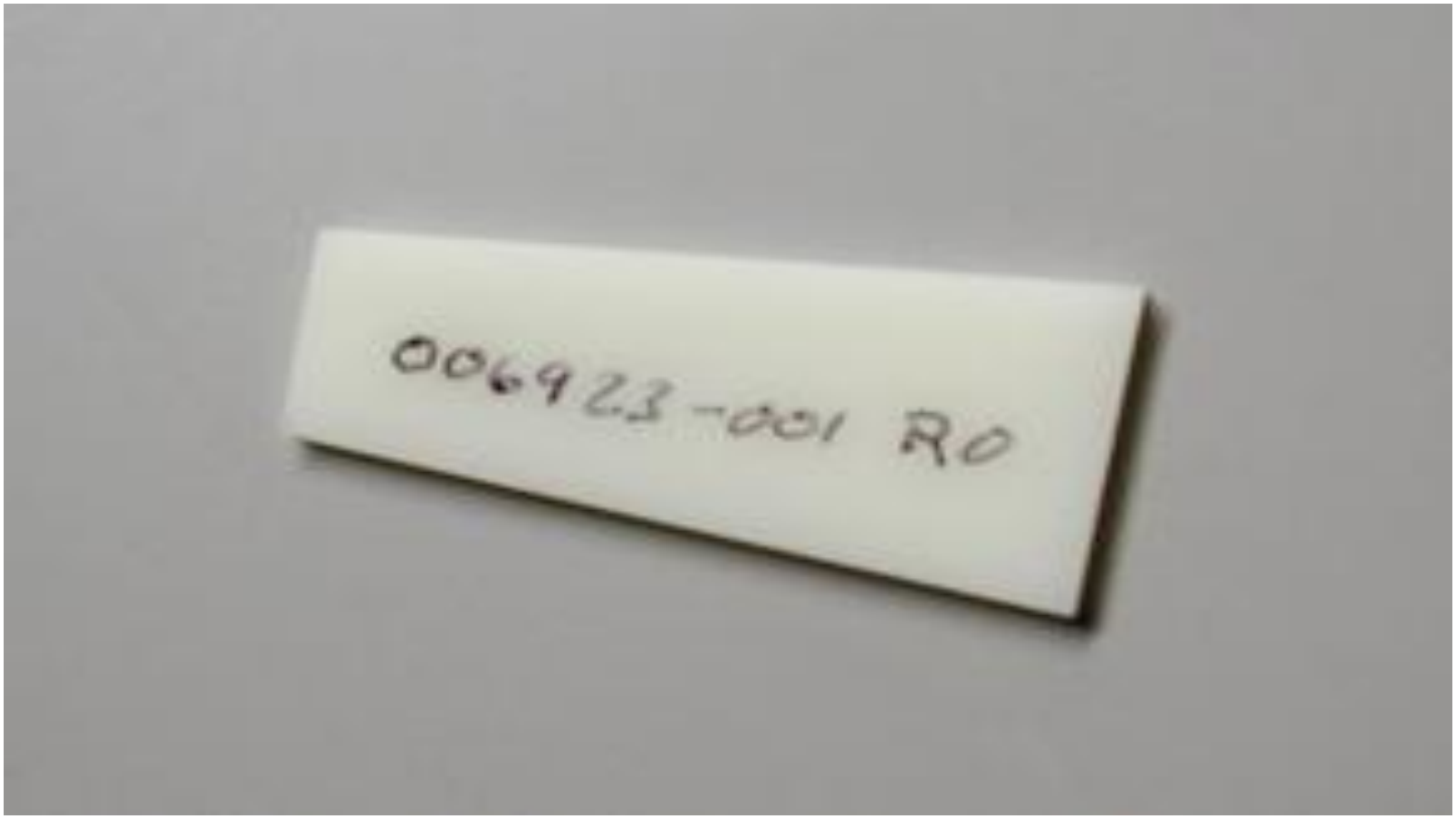


Foam Insulation Ring



RFID Test Fixture/Wedge

Reagent Wedge Base Tool (shim)



Barcode Test Fixture

Adjustment Tool for Inductor Liquid level Sensor

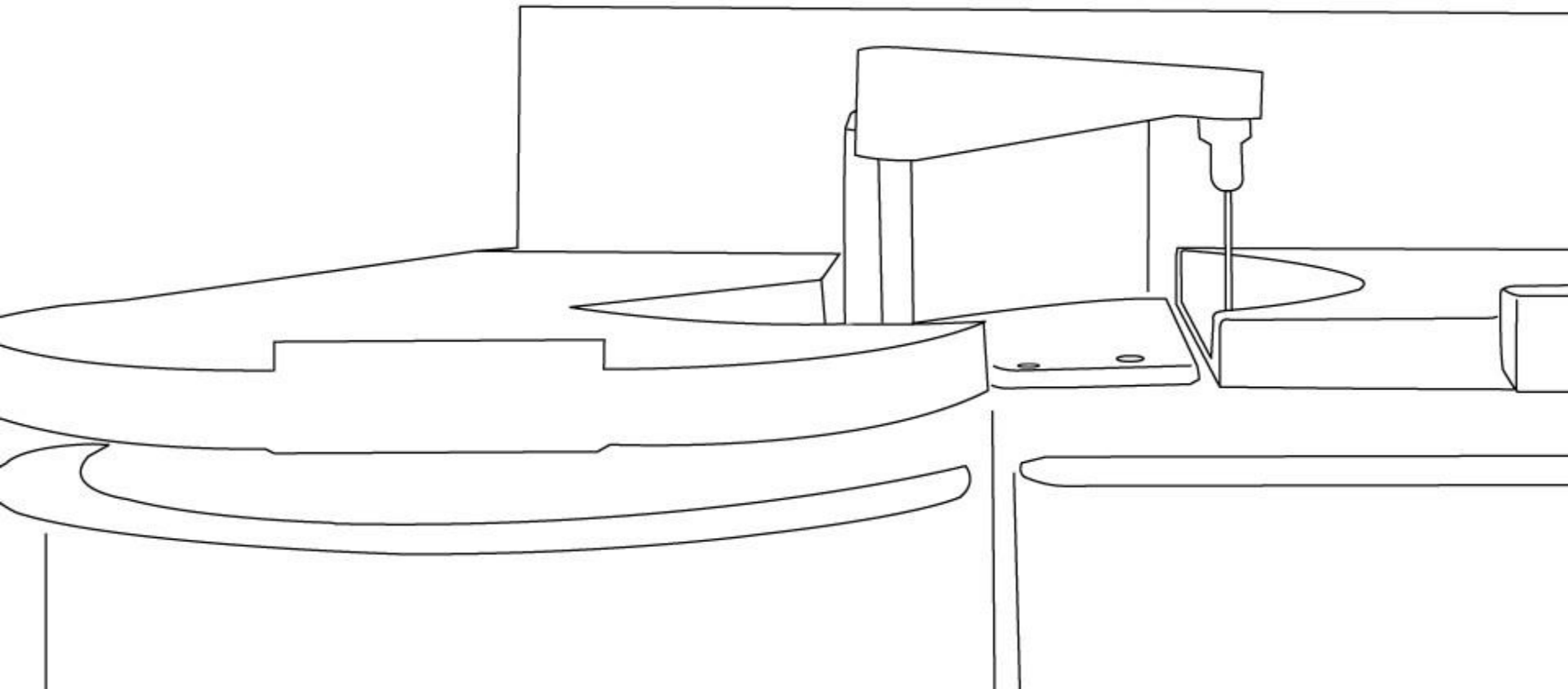
Digital Multimeter with Frequency Counter

Duct Tape

Service Software CD

Service Software

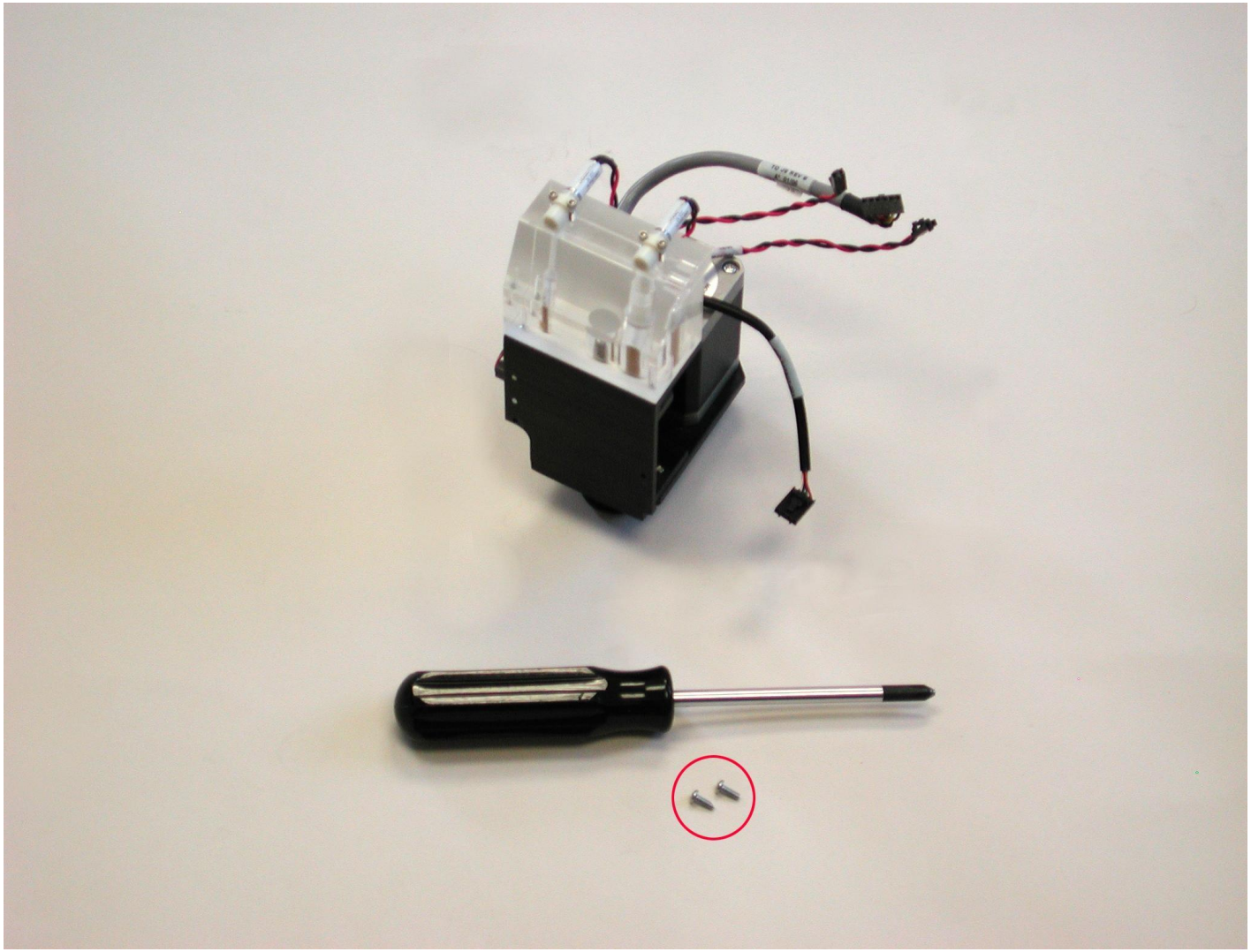
- Fluidics Drawer – ISE's
- Sample/Reagent Area
- Reaction Area
- Photometer
- Mother Board & Daughter Board

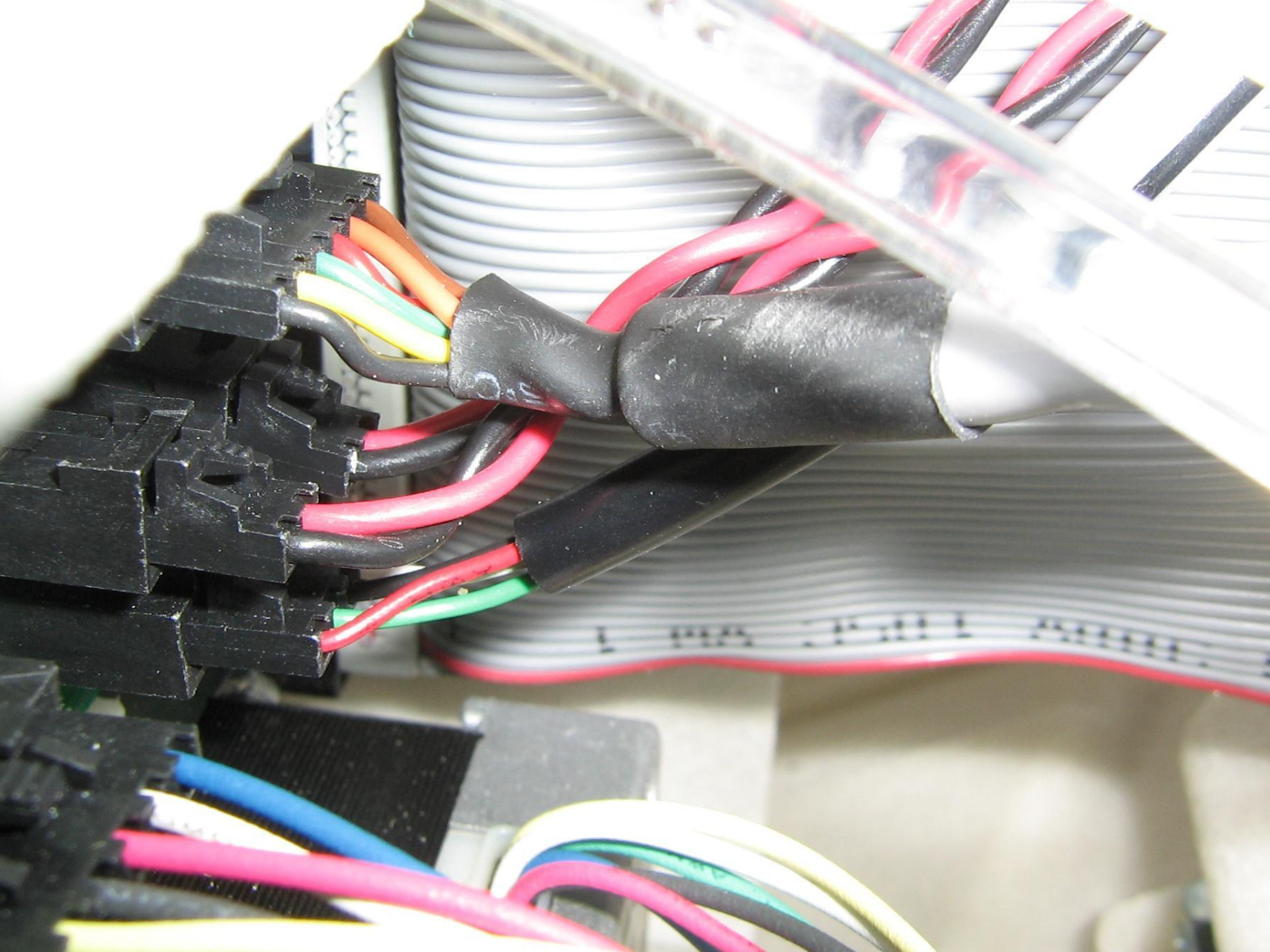


Fluidics Drawer / ISE's

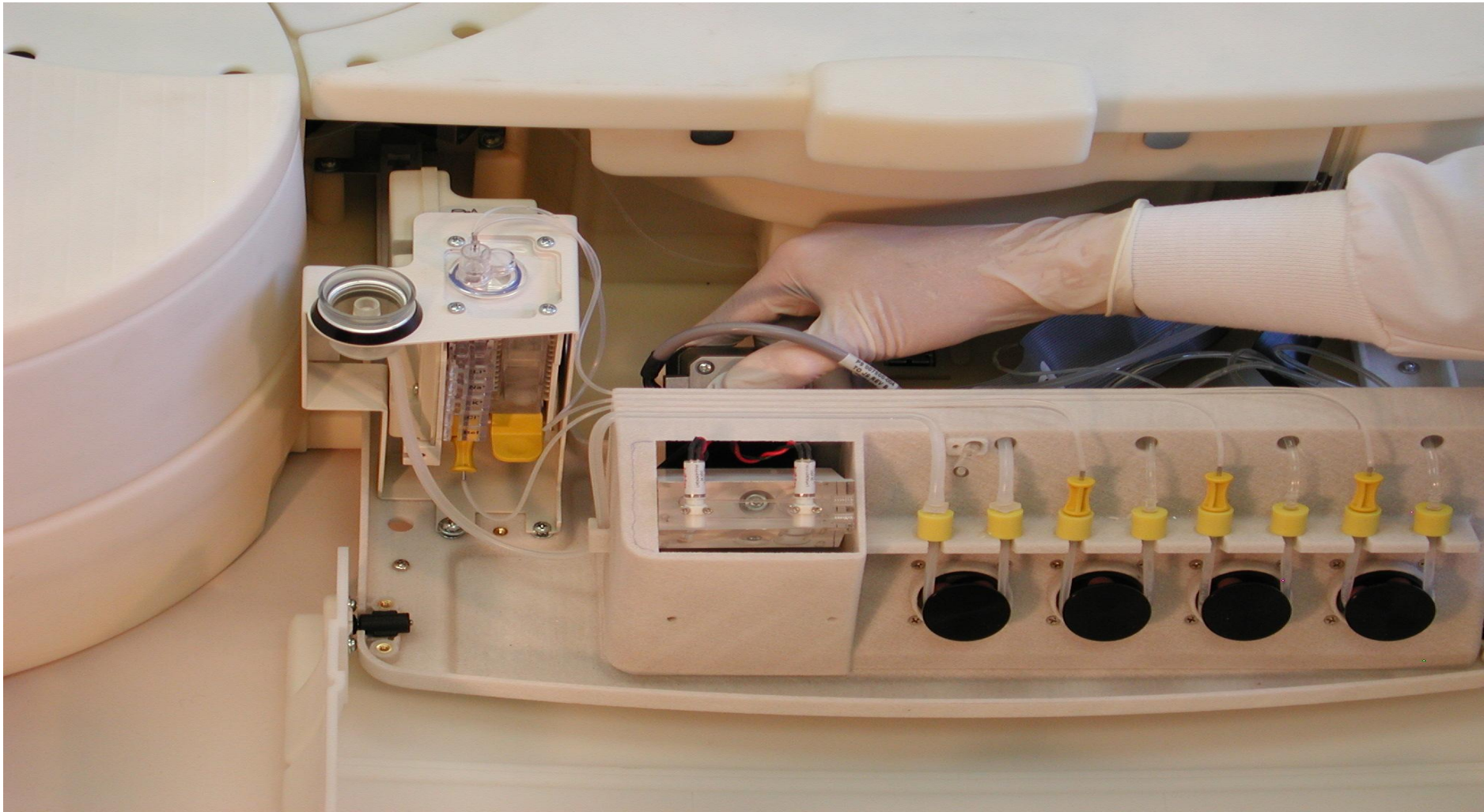
- ISE replacement - OM
- Wash Cup replacement – OM
- ISE Module replacement
- Dilutor Pump replacement
- Peristaltic Pump replacement

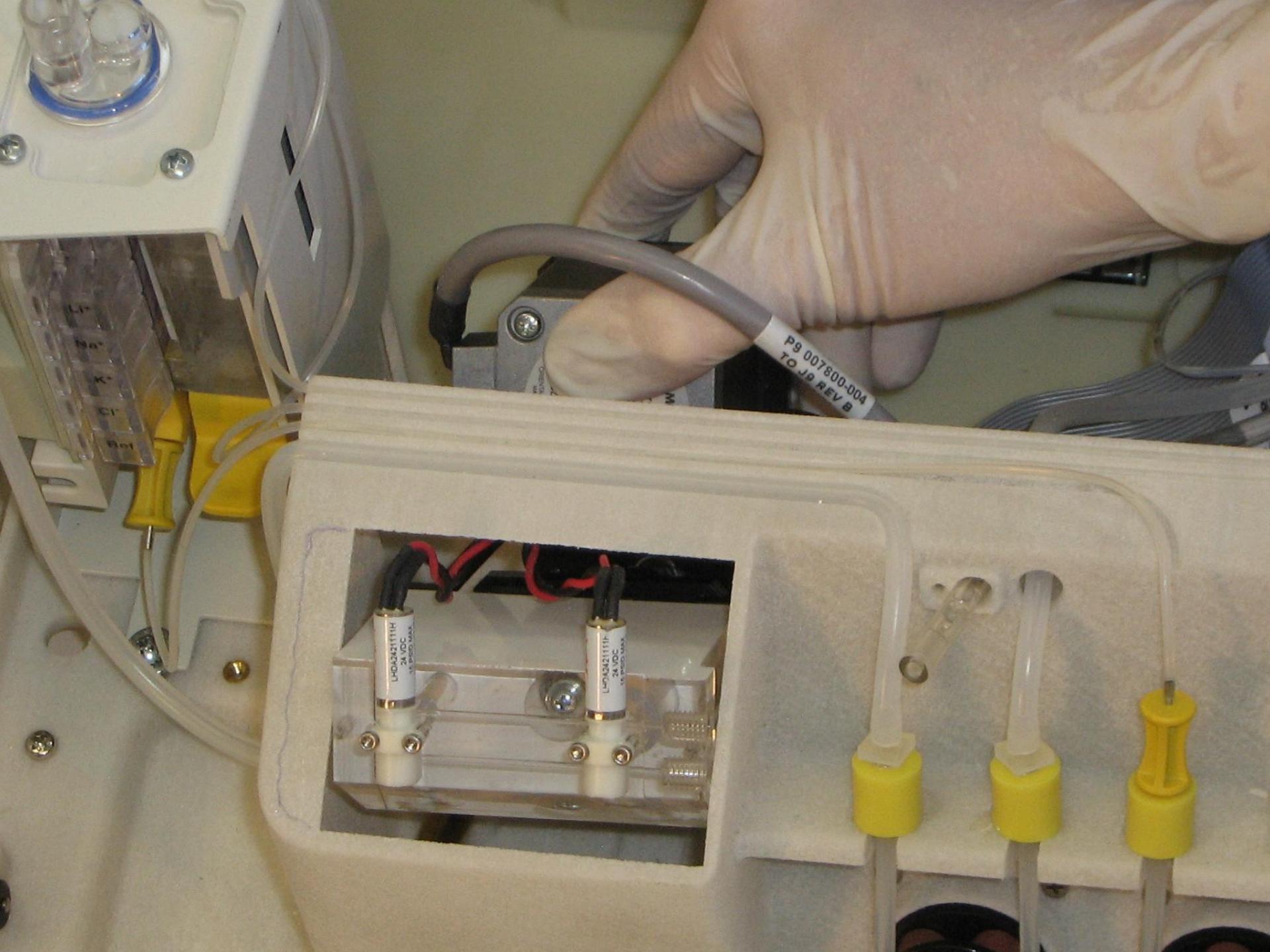
Dilutor Pump Replacement



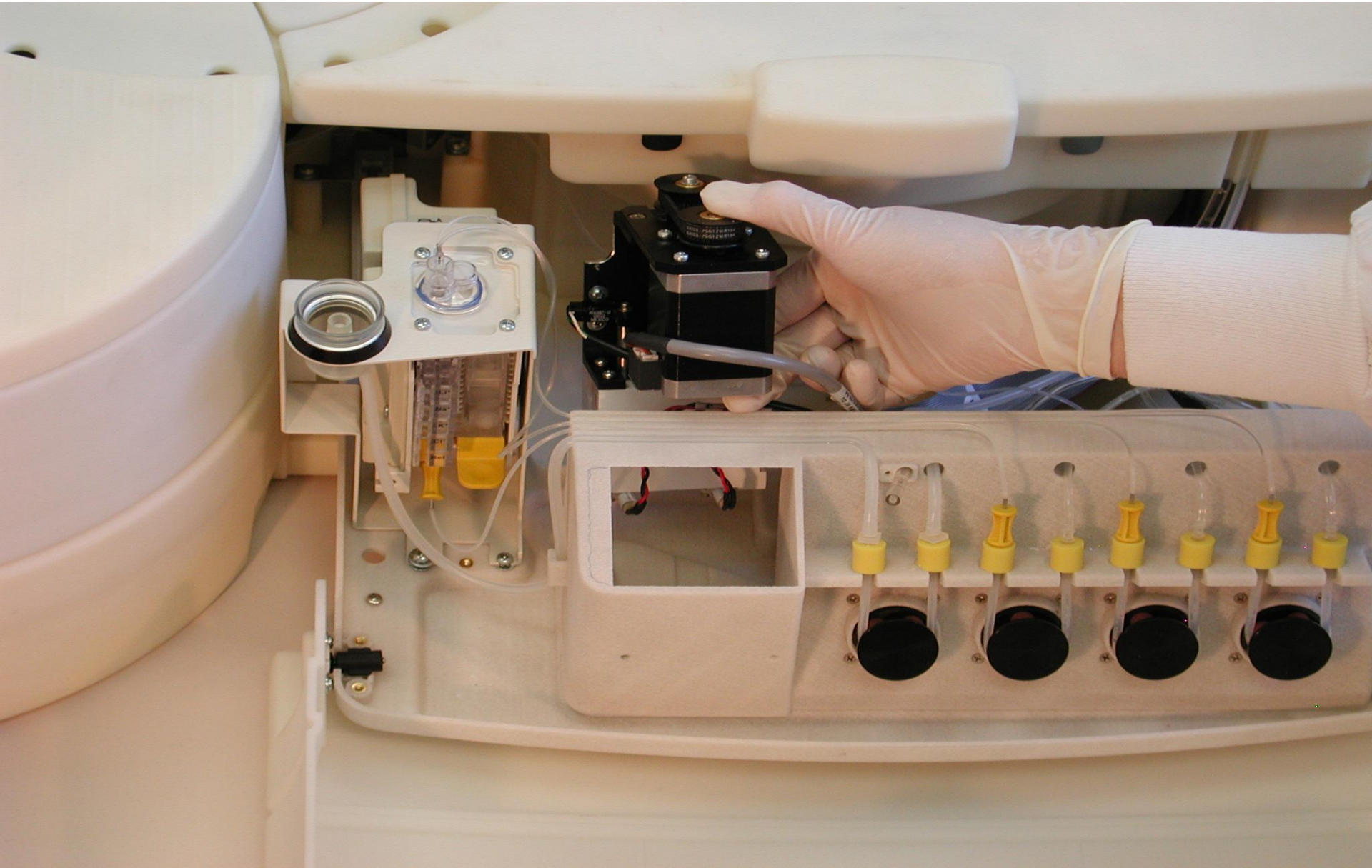


Dilutor Pump removal

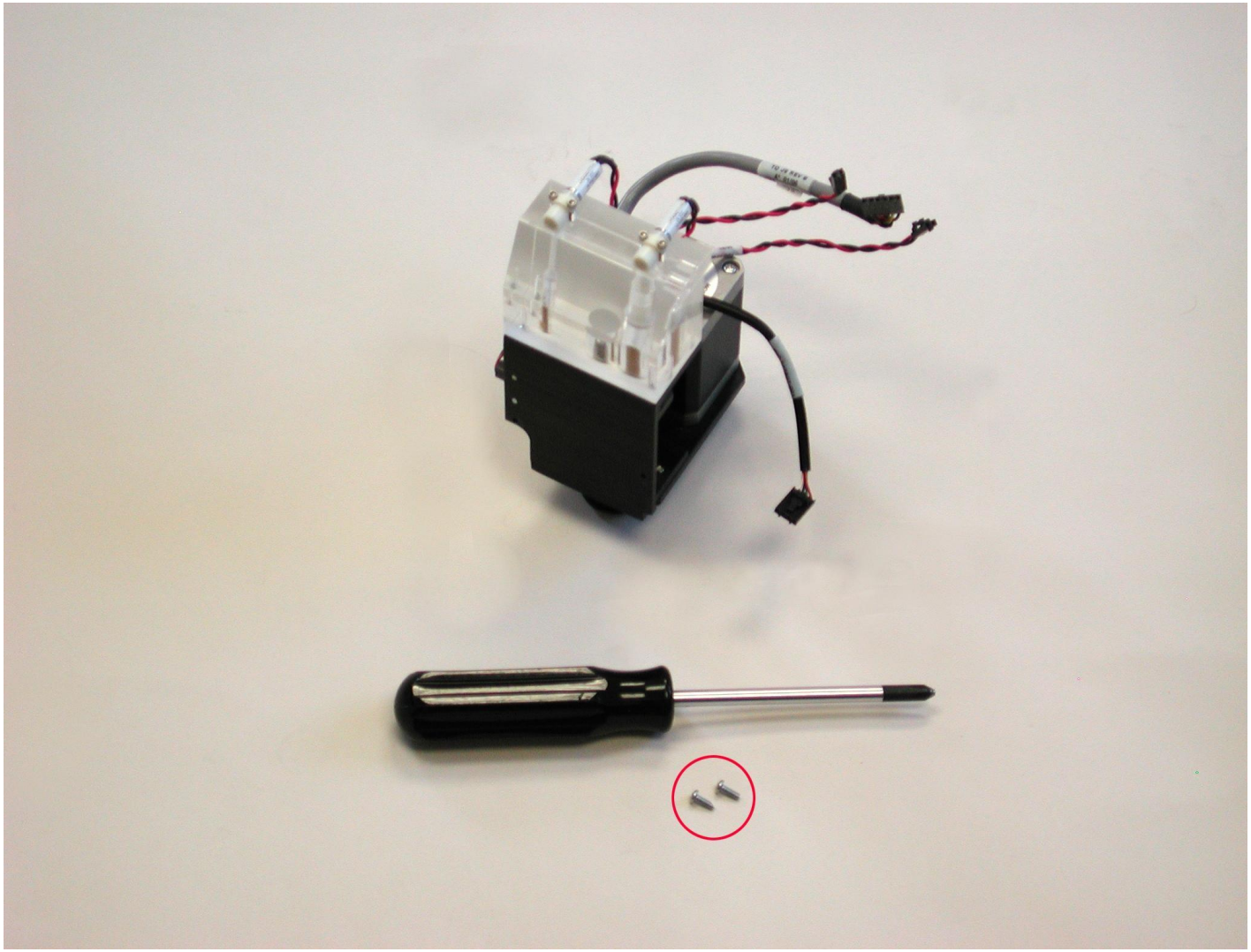


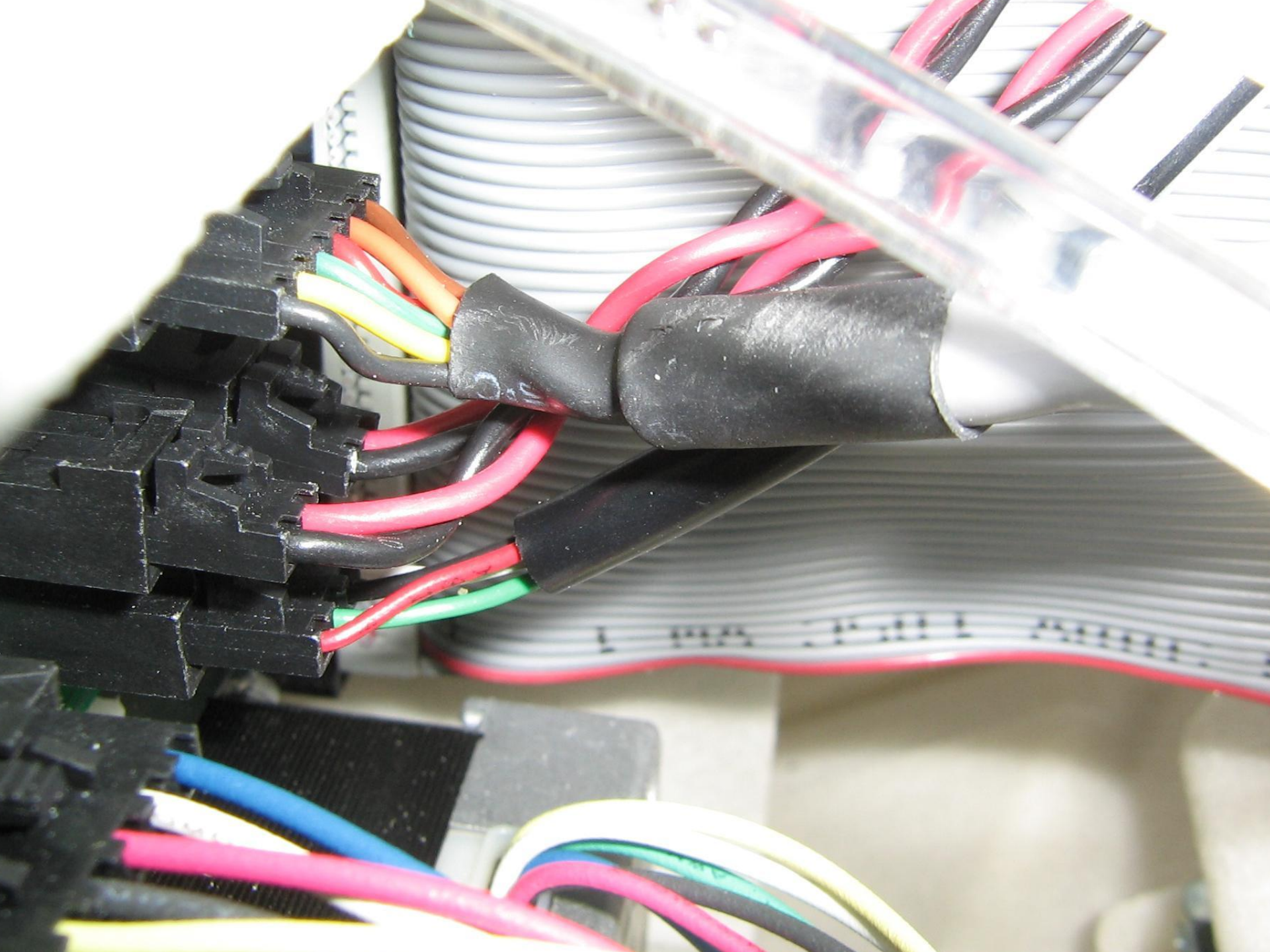

P9 007800-004
TO J9 REV B
LHDA3421111H
24 VDC
LHDA3421111H
24 VDC

Dilutor Pump removal



Dilutor Pump Replacement



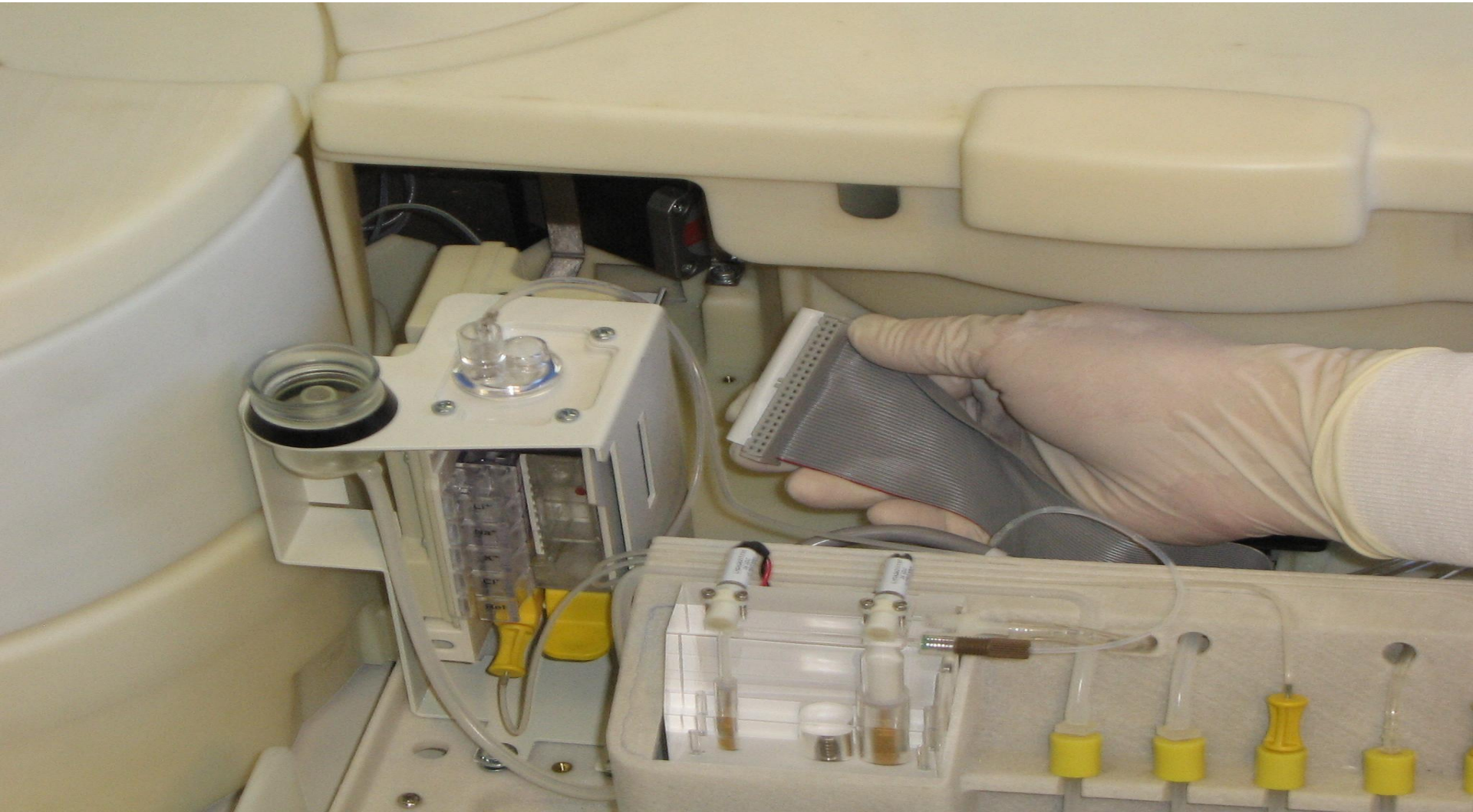


Peri Pump Replacement

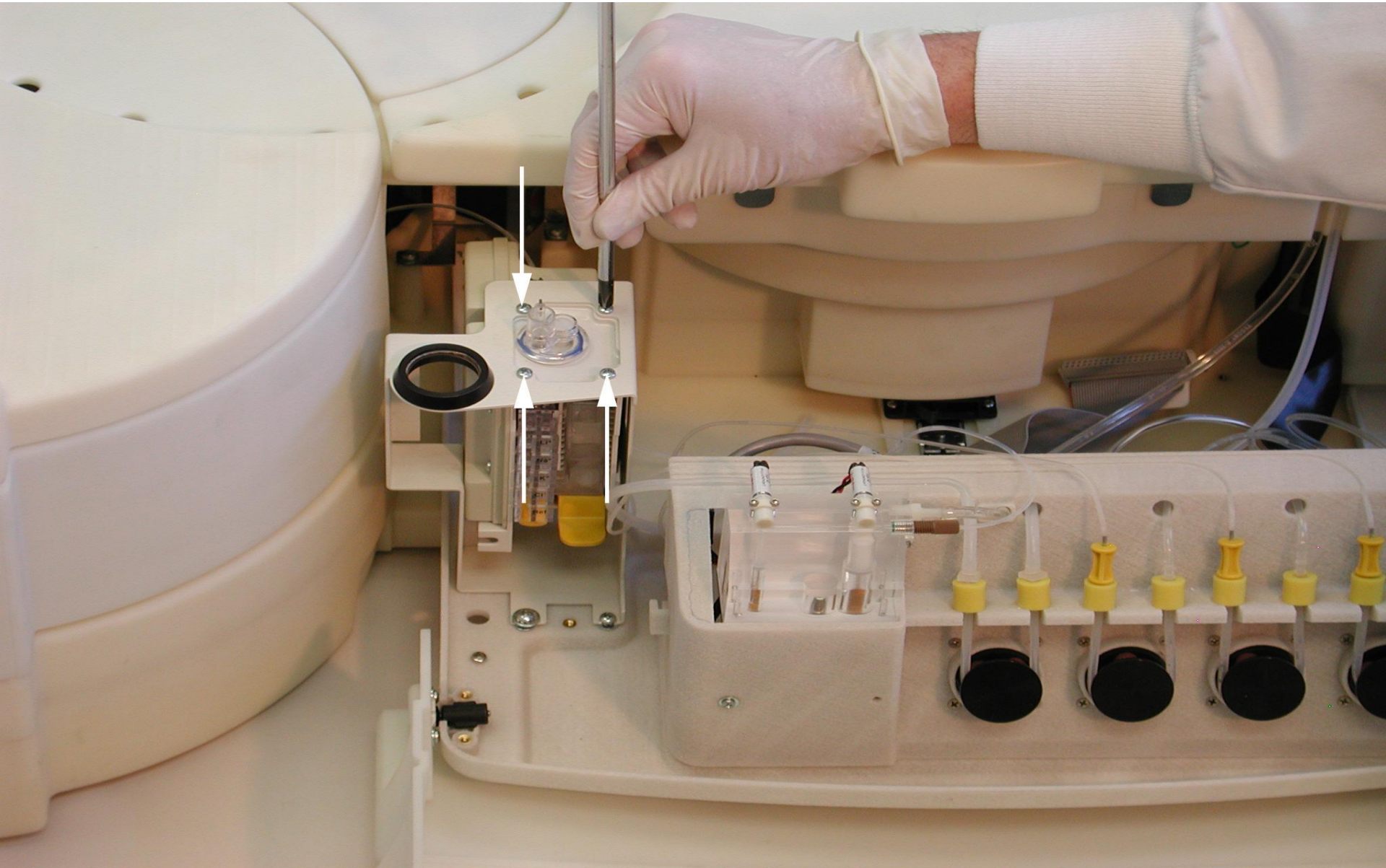
Peri Pump Replacement ISE Module pg29

ISE Module Replacement

ISE Module Interface Cable Removal



ISE Fluidics Drawer

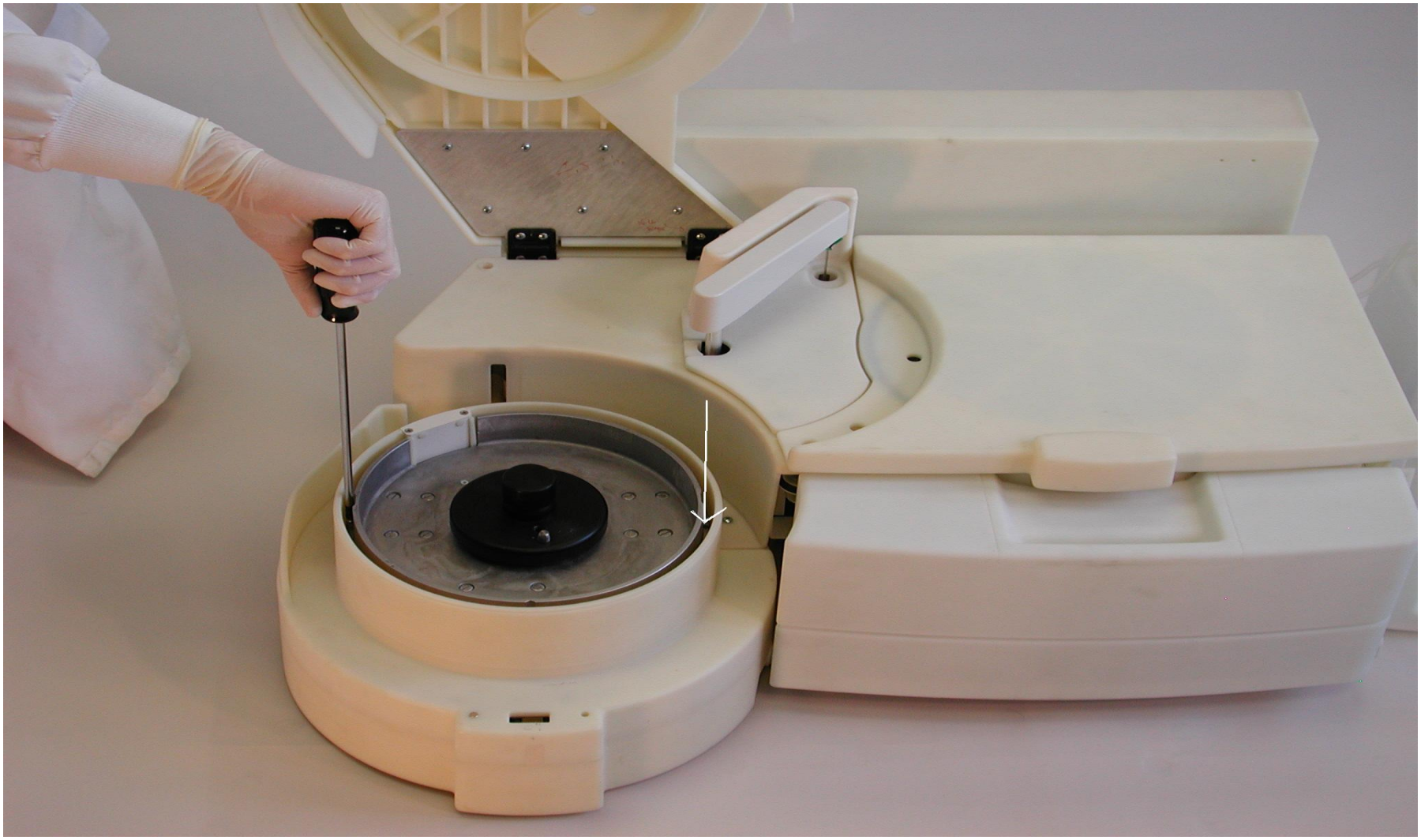


Sample Reagent Area

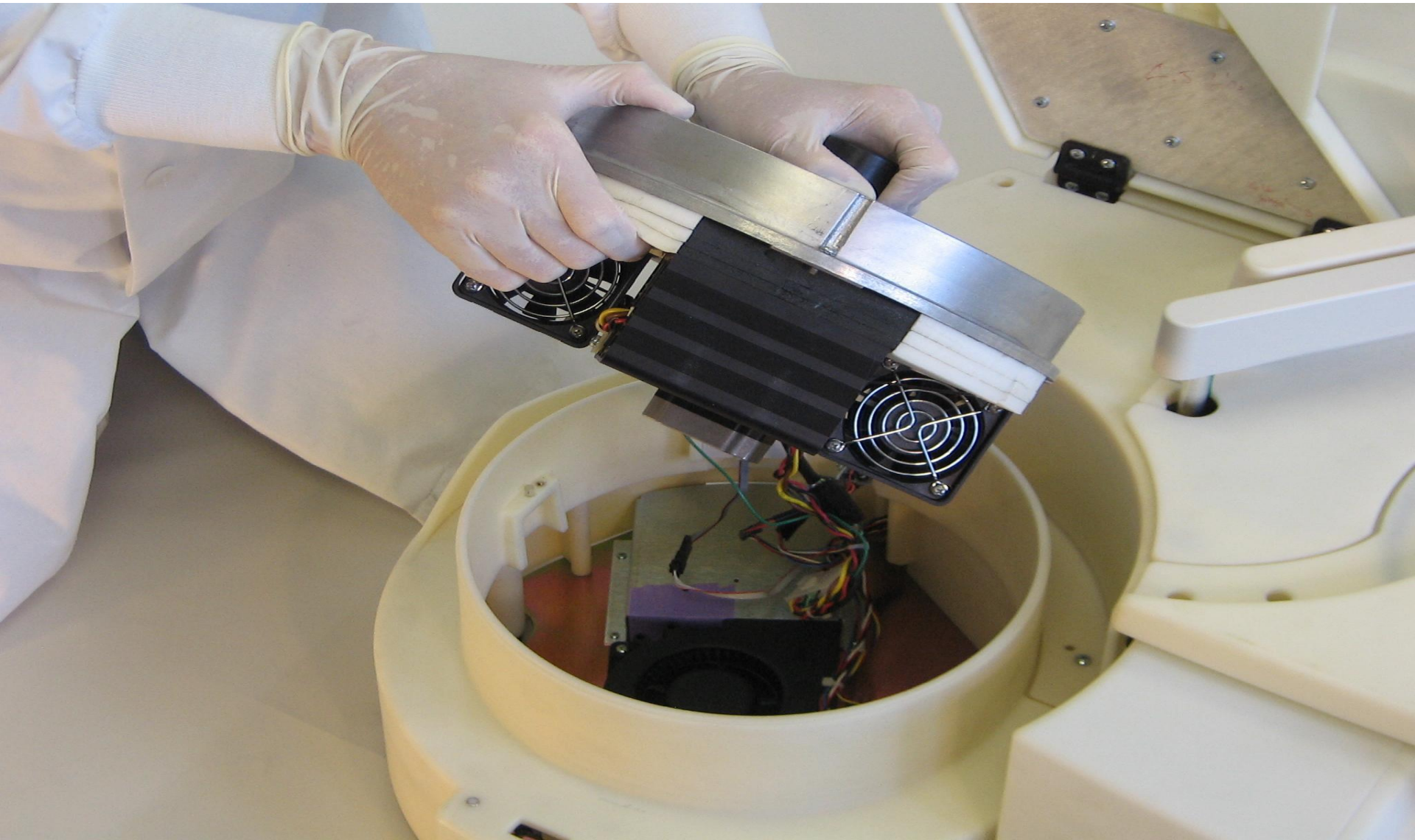
- Sample/Reagent Drive Assembly
- Fan Assembly (below coolers)
- RFID Reader
- ISE Fan Assembly
- Barcode Reader
- Transfer Arm Assembly

Insulation Cap & Ring

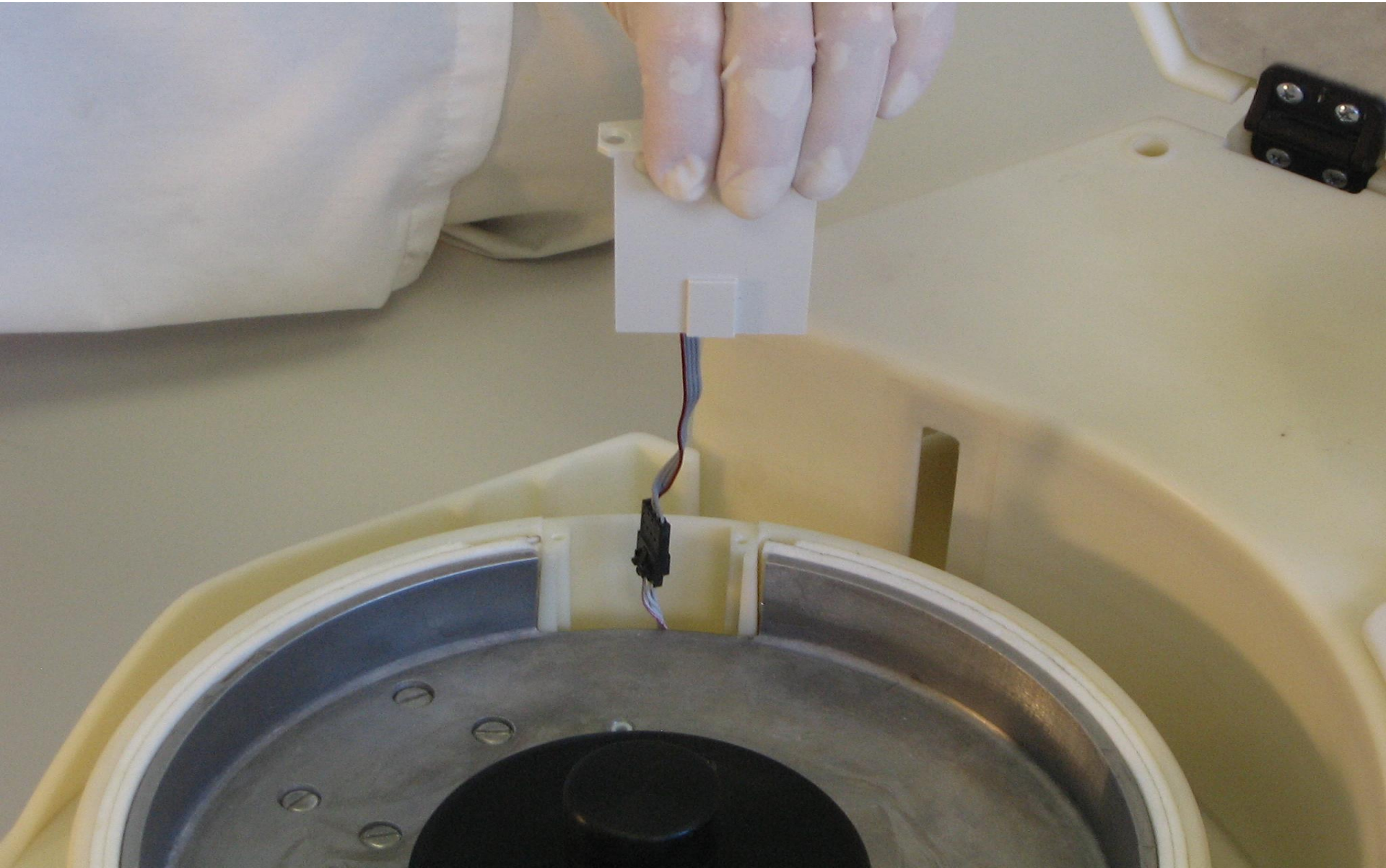
Sample Reagent Drive Assembly



S/R Drive Assembly Removal Service Manual



RFID Reader replacement



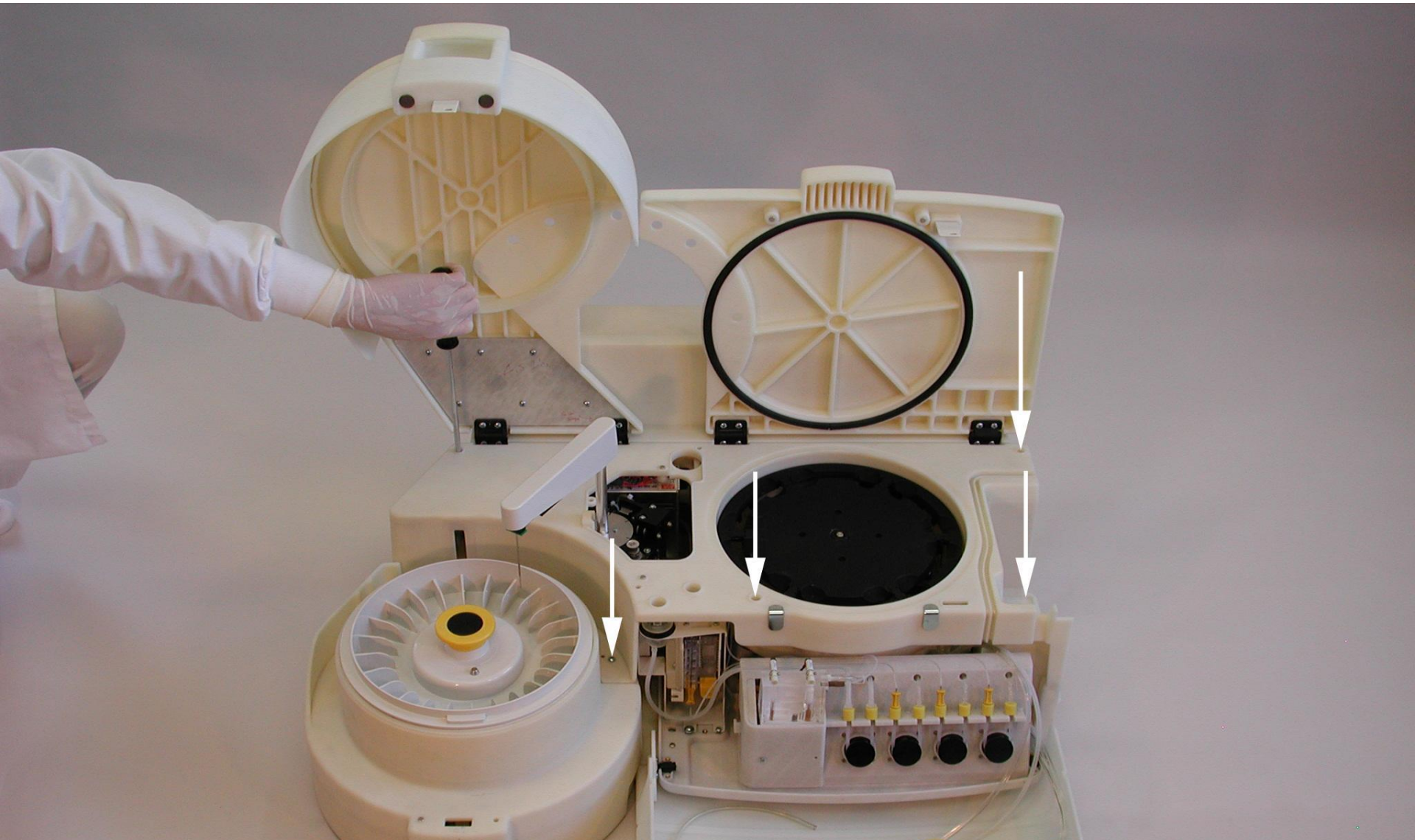
Sample Reagent Area

- ISE Fan Assembly
- Barcode Reader
- Transfer Arm Assembly
- NOTE! Remove Mid chassis cover and Parking Cover to Replace the above assemblies. See Service manual!

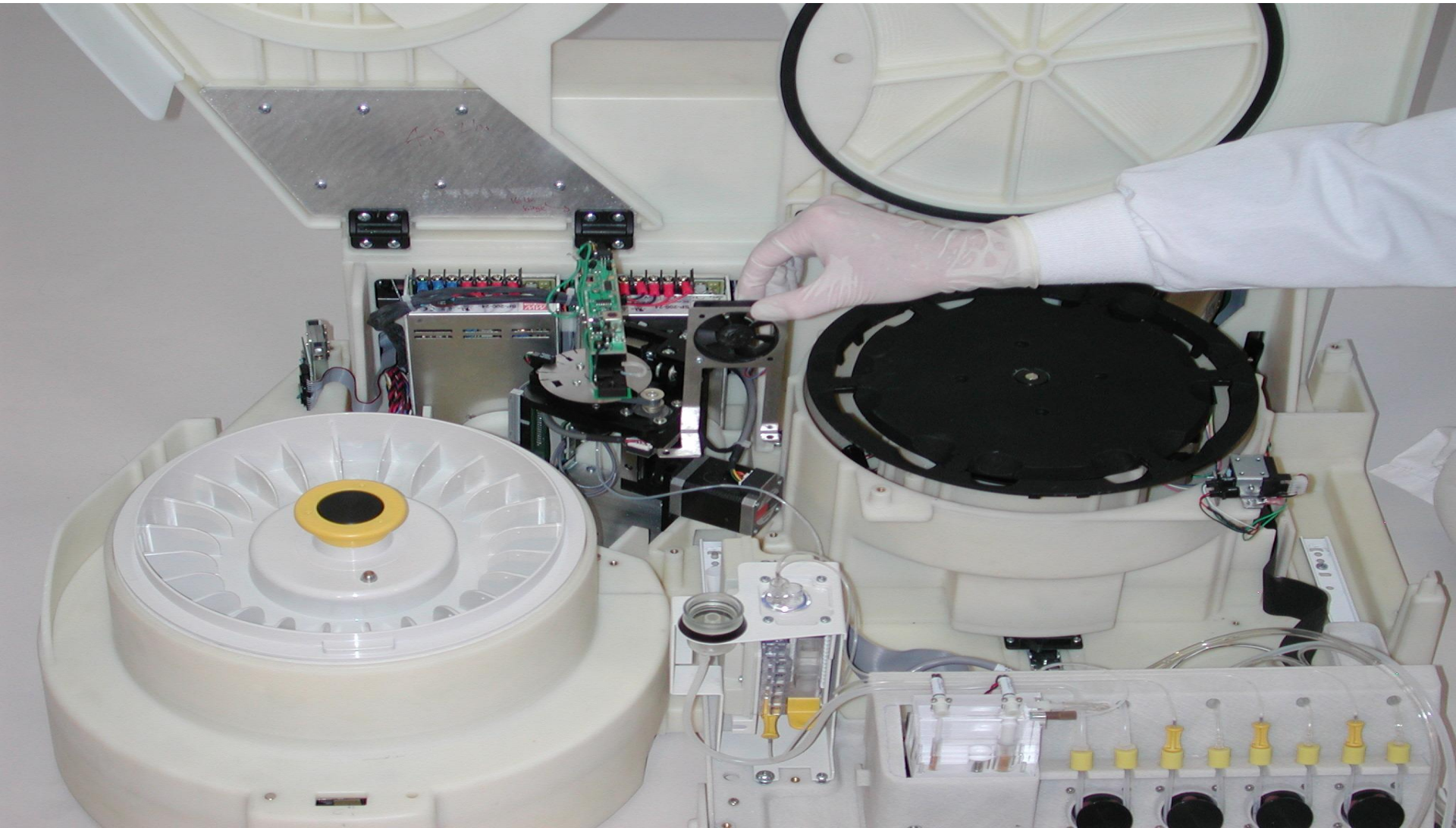
Removing the Mid Chassis & Parking Cover allows you to…….

1. Remove/replace the ISE fan assembly
2. Remove/replace the Barcode Reader assembly
3. Remove/replace the the Transfer arm assembly

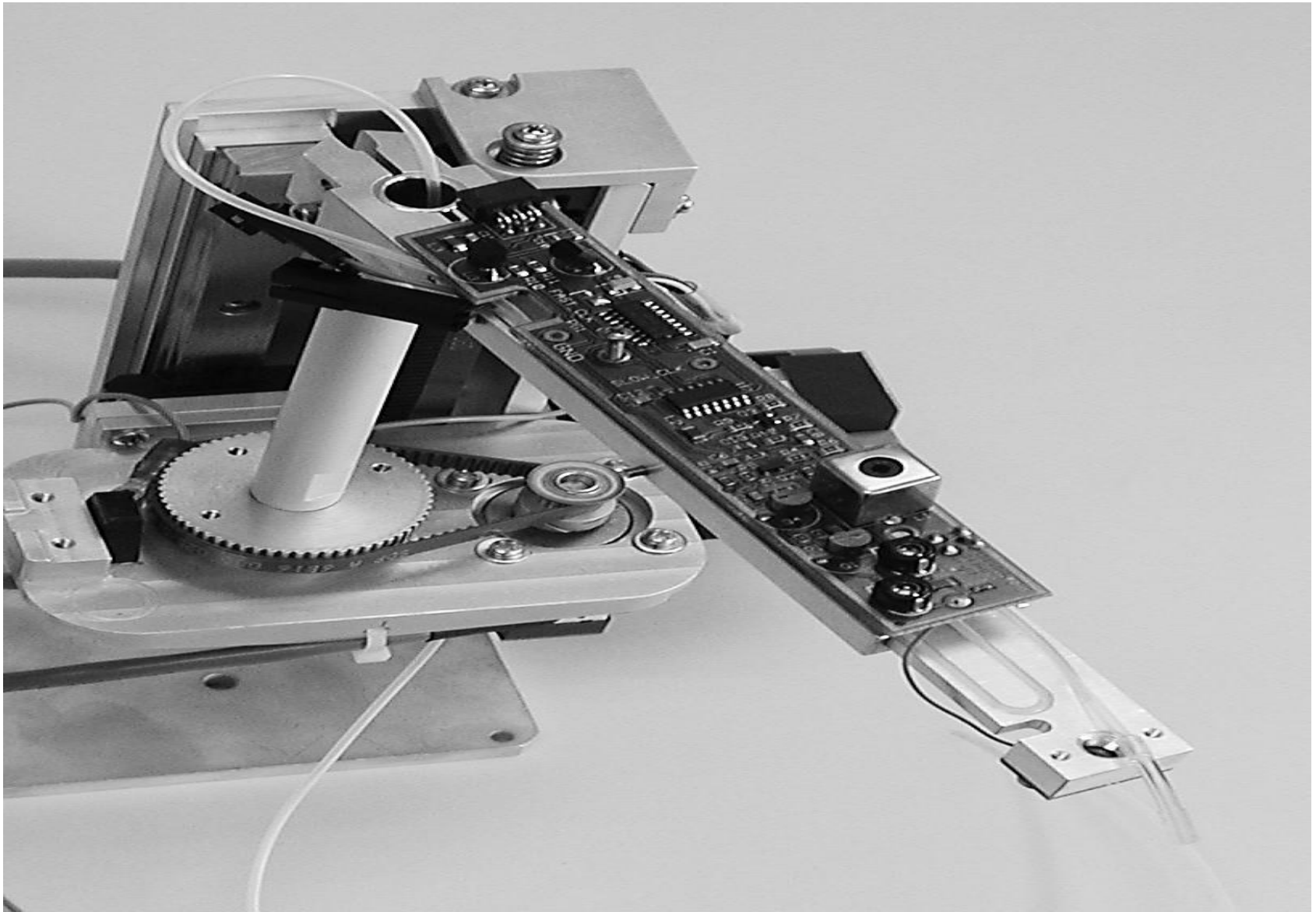
Mid Chassis/Park Cover Removal



ISE Fan



Transfer Arm Assembly



After replacing the Transfer Arm Assembly you must…….

1. **Perform an Alignment**
2. **Perform Liquid Level Sense Calibration**
3. **Perform Liquid Level Sense Diagnostics**
4. **Perform a Z Axis Calibration**
5. **Perform a Pre-heater Calibration**
6. **Perform a Precision Dye Test**
7. **Let's get started!**

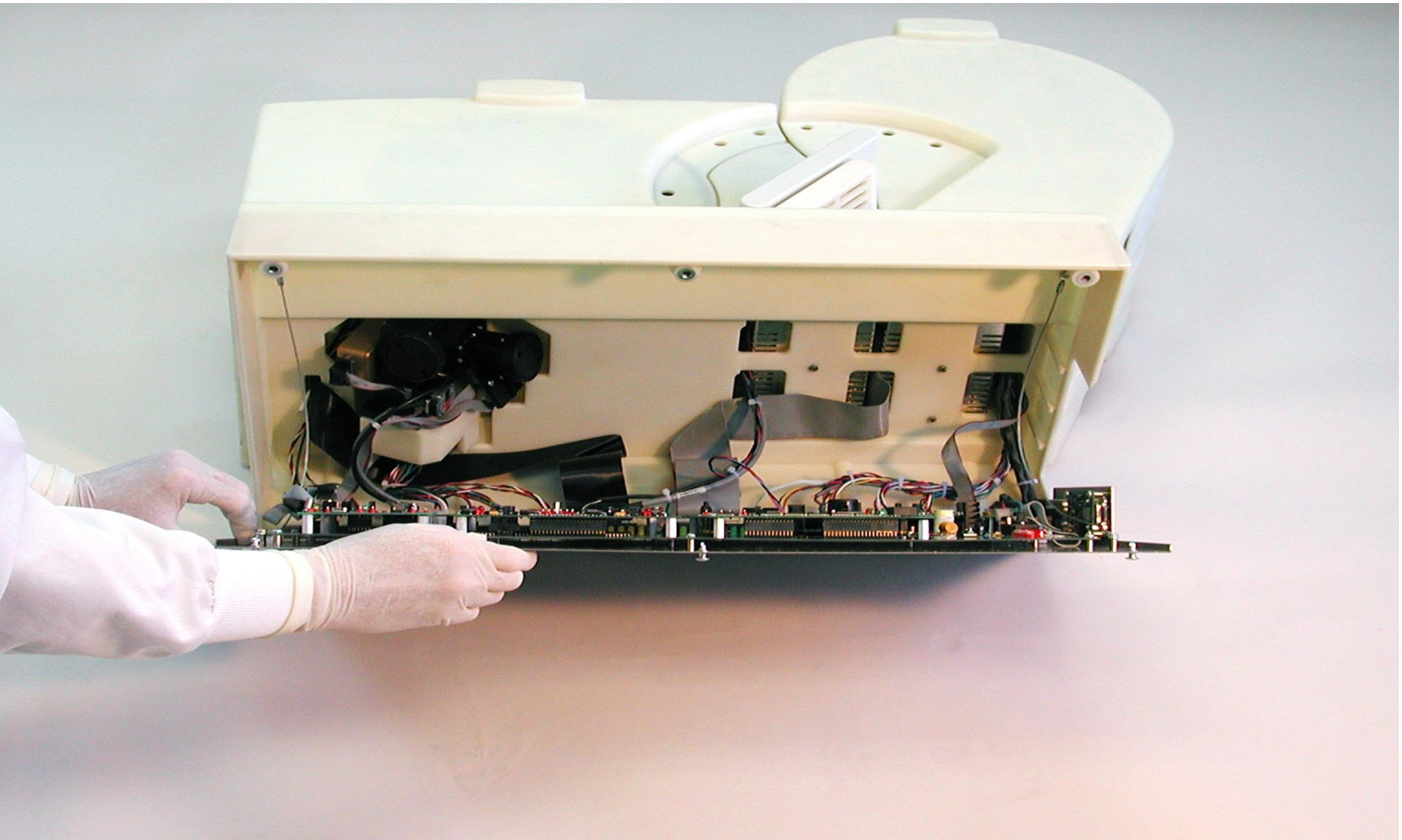
Reaction Area – Service Manual

- Reaction Area Drive Assembly
- Reaction Area Fan/Heater Assembly
- Reaction Area Thermistor

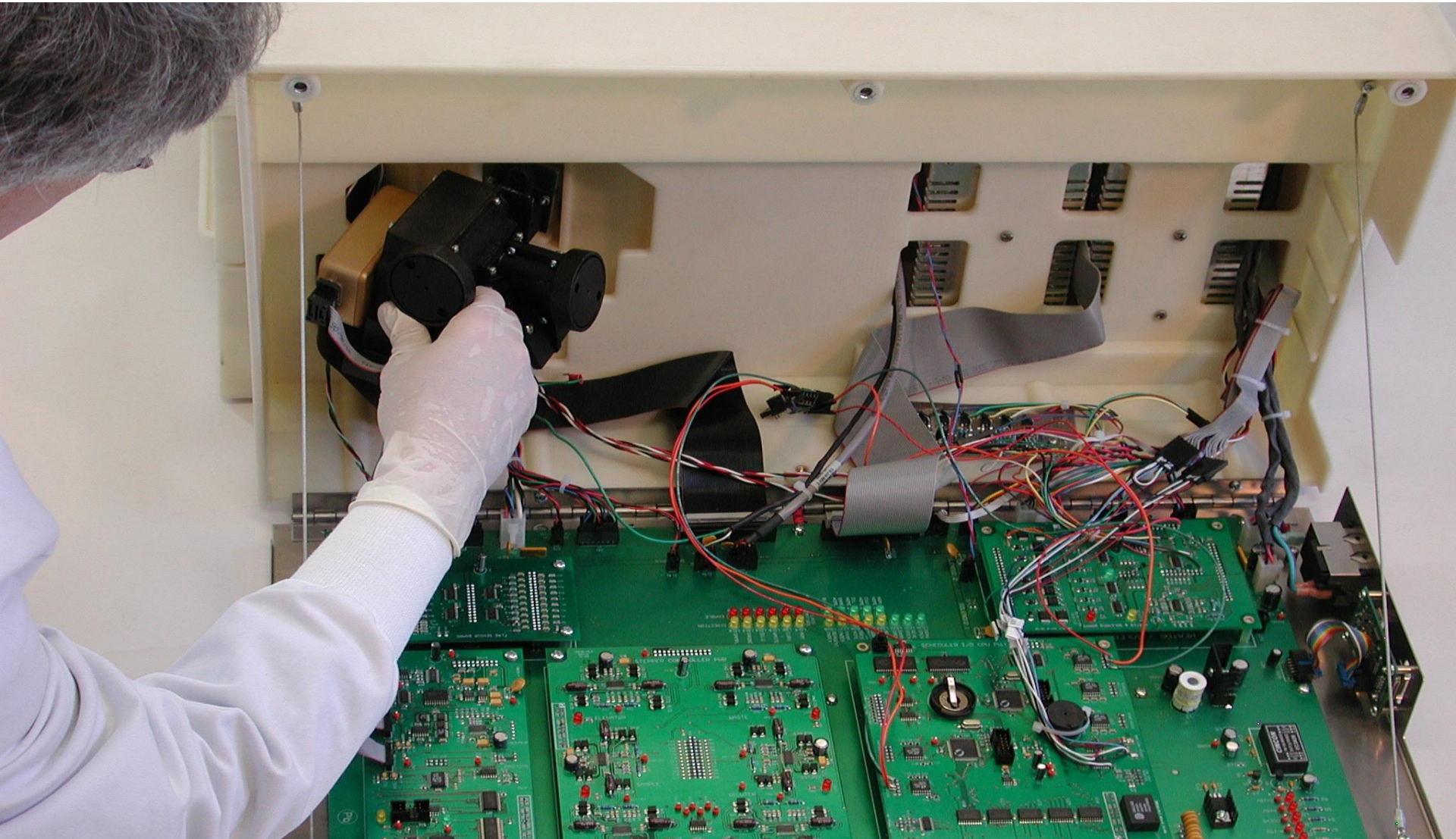
After Replacing the Fan and or Thermistor You must……

- Perform a Temperature calibration of the Reaction Area
- **Let's get started!**

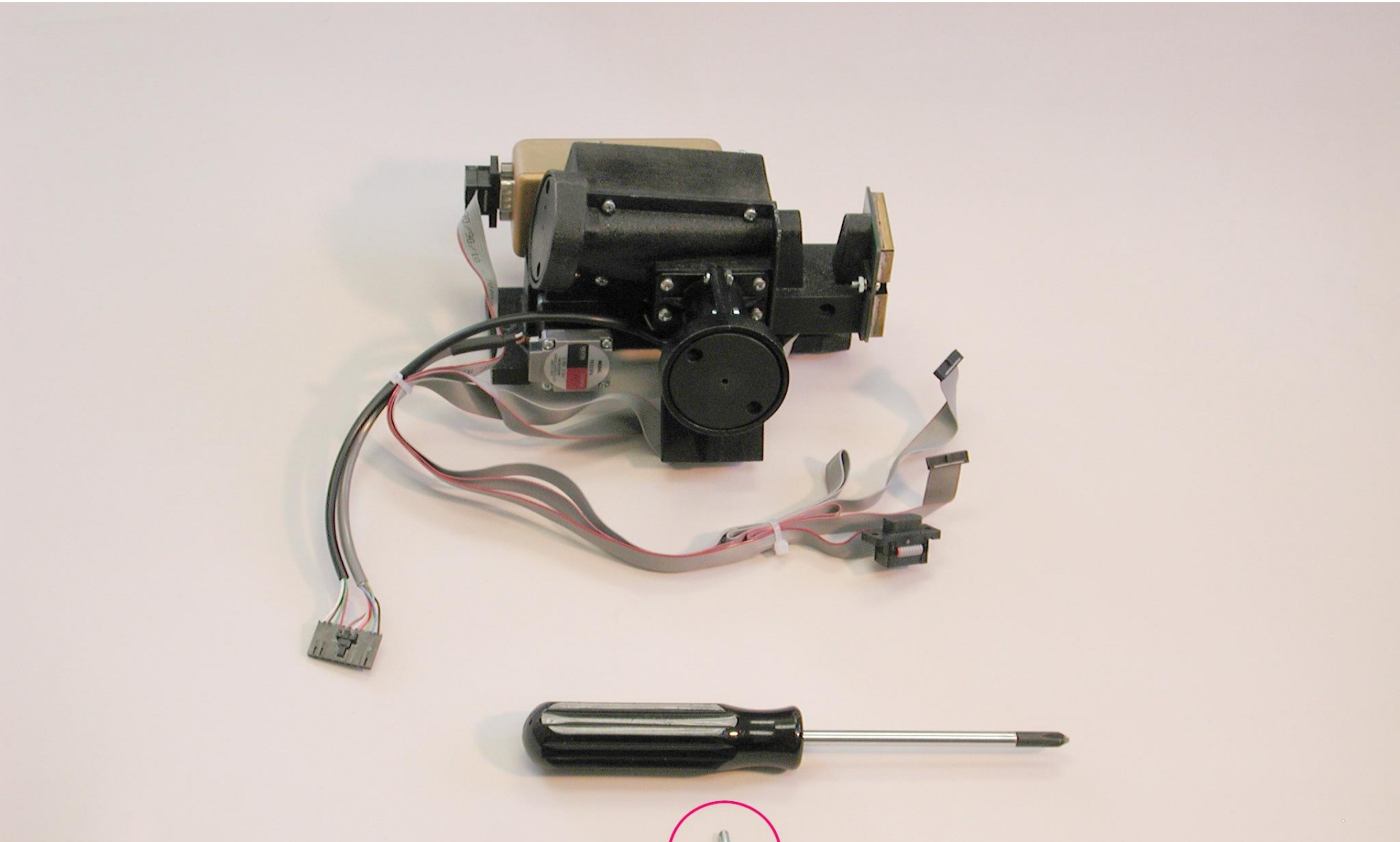
Photometer Replacement



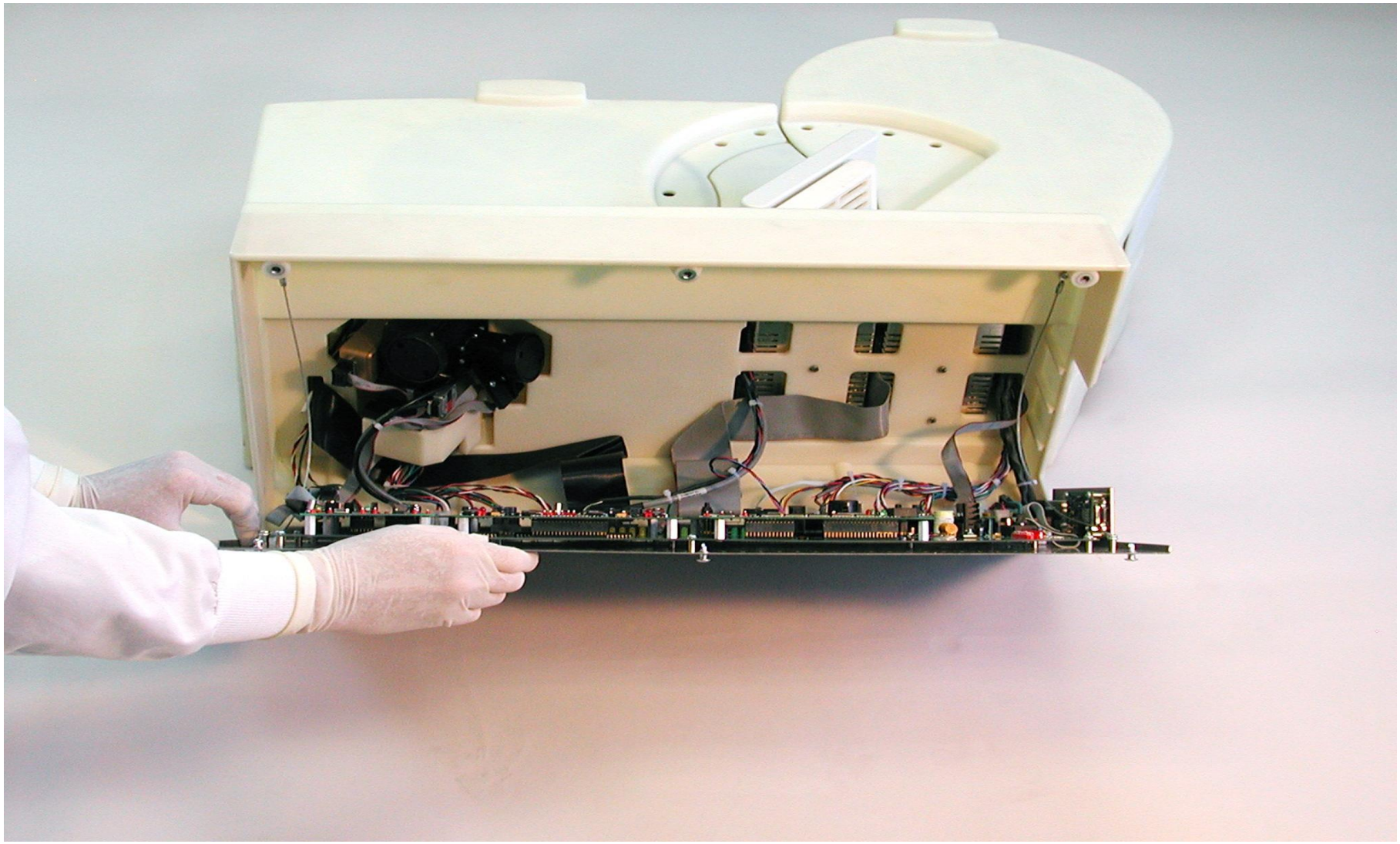
Photometer – Service Manual



Photometer – Service Manual



Check Voltages on PCB's



Mother/Daughter PCB's