

## System Specifications Cont'd

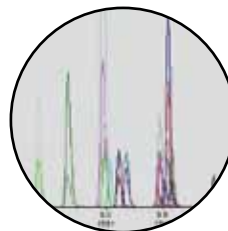
Sample Transfer	
Sample Transfer Precision	< 1% RSD (n=10 @ 6 mL & 8 mL delivery volume measured by weight)
Sample Transfer Accuracy	+/- 2%
Sample Transfer Flowpath	Disposable 1 mL conductive pipette tips. (NOTE: The AutoMate-Q40 only supports pipette tips supplied by Teledyne Tekmar)
Vial Vision (Patent Pending)	The AutoMate-Q40 is equipped with VialVision to determine the amount of solvent that is available for removal from the vial
Vial Vision Accuracy (Patent Pending)	The VialVision™ system is accurate with +/- 20%

System Control	
Instrument Control	TekTouch™ software is installed on the onboard computer
Language	TekTouch™ can easily be translated into any language via text file modification
Method Storage	Infinite method storage including preprogrammed methods
Method Scheduling	Samples can be run from any position in the sample sequence. Samples are parallel processed as defined by the schedule. Up to three standards can be added to any user-specified position.
System History	The system records a complete history of all sample, schedule and method information
Revision Control	The system records and saves changes to methods, schedules and configurations

Mechanism	
Sample Vortexing	Samples are vortexed at 3000 RPM
Sample Vortexing Time	Samples can be vortexed between 0 – 30 minutes
Solid Dispenser Volume	Single dosage volumes variable between a minimum volume of 3.20 cc and a maximum volume of 8.19 cc (with the standard AOAC & EN salt mixture densities this is approximately 4-9 grams). Each sample can receive between 0 to 3 doses.
Solid Dispenser Hopper	The salt dispenser is designed to hold 2 kg of salts as specified in the AOAC Method 2007.01 or EN Method 15622. Salts are stored in the hopper under a dry air blanket to prevent the adsorption of water. (All salts used in the dispenser must be purchased from Teledyne Tekmar.)
Solid Dispense Precision	< 5% RSD (n=20 @ 7.5 g)
Solid Dispense Accuracy	+/- 5%
Sample Shaking	Samples shake at 420 oscillations per minute
Sample Shaking Time	Samples can shake between 0 – 30 minutes
Centrifuge	The four position centrifuge is capable of spinning either two 50 mL or two 15 mL vials. (The centrifuge requires the use of a counterbalance to allow a single sample to be centrifuged.)
Centrifuge Pull	Samples experience a minimum of 1500 Relative Centrifugal Force (RCF)
Centrifuge Time	Samples can be centrifuged between 0 – 60 minutes



Automated



Reproducible



Reliable



*AutoMate-Q40*

# AutoMate™-Q40

## Automated QuEChERS Platform

The AutoMate-Q40 is a revolutionary system specifically designed and optimized to automate the QuEChERS sample preparation workflow.

The system is configured 'out of the box' to conduct two of the most popular QuEChERS sample preparation methods:

- AOAC 2007.01 (Pesticide Residues in Food by Acetonitrile Extraction and Partitioning with Magnesium Sulfate)
- EN 15662.2008 (Foods of Plant Origin—Determination of Pesticide Residues Using GC-MS and/or LC-MS/MS Following Acetonitrile Extraction/Partitioning and Clean-up by Dispersive SPE—QuEChERS Method)

The AutoMate-Q40 incorporates a unique, innovative technology called **VialVision™** (*patent pending*) that is able to reliably identify liquid levels, differentiate between multiple aqueous layers within a vial and then validate their associated volumes.



## AutoMate-Q40 Features

- Enable you to achieve improved precision and accuracy for the QuEChERS sample preparation methods being conducted
- Ability to add sample capacity to your lab without adding staff or paying overtime
- Reduce the impact your lab operation currently has on the environment
- Improve workplace safety



## AutoMate-Q40 Process Overview

- Prepared sample trays with required centrifuge tubes are loaded into the AutoMate-Q40
- A method and/or schedule are loaded and started through the TekTouch™ software control
- Sample vial decapped
- Solvent and Standard are added
- Sample recapped and vortexed
- Sample decapped and salt added
- Sample recapped and shaken in the mixer
- Sample centrifuged
- Sample placed in vial vision station for extract volume validation
- Sample extract pipetted into dSPE clean-up vial, if clean-up is desired
- Clean-up vial shaken in mixer
- Clean-up vial centrifuged
- Clean-up vial placed in vial vision station for clean-up extract volume validation
- Clean-up extract pipetted into final extract vial
- Final extract vial returned to sample tray for analysis
- Process complete



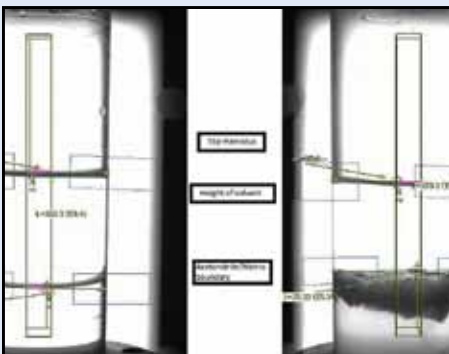
Preparing the Sample



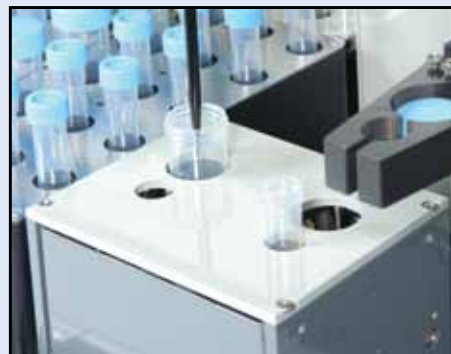
Adding Solvent/Standard



Salt Addition



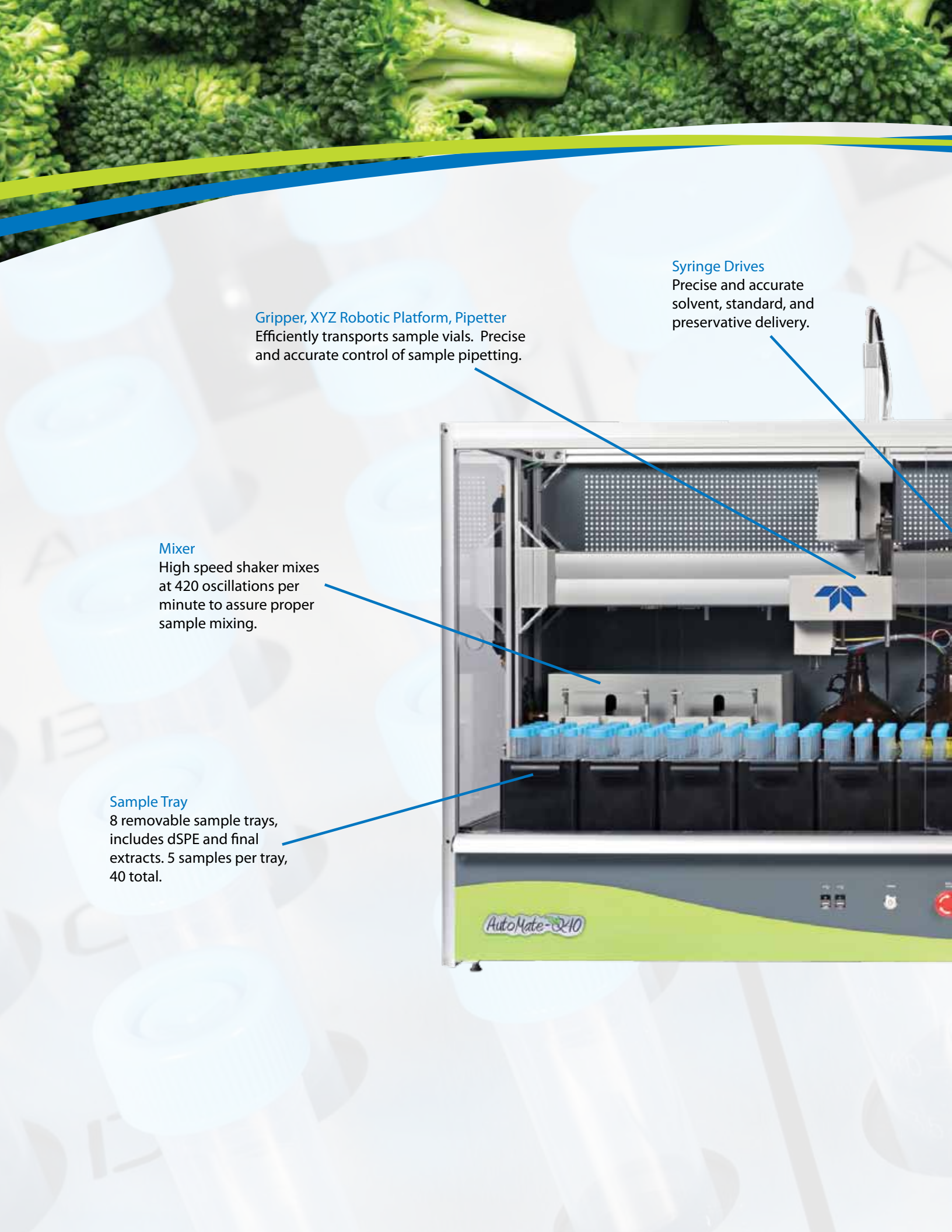
Centrifuge and VialVision™



Pipetting for dSPE Clean-up



Mixing sample and or dSPE



**Gripper, XYZ Robotic Platform, Pipetter**  
Efficiently transports sample vials. Precise and accurate control of sample pipetting.

**Syringe Drives**  
Precise and accurate solvent, standard, and preservative delivery.

**Mixer**  
High speed shaker mixes at 420 oscillations per minute to assure proper sample mixing.

**Sample Tray**  
8 removable sample trays, includes dSPE and final extracts. 5 samples per tray, 40 total.

AutoMate-X10



**VialVision™**  
Patent pending extract  
volume validation.

**Centrifuge**  
1500 RCF indexing centrifuge with  
“out of balance” safety control.

**Sample Shuttle, Capping Station**  
Controls vial capping and de-capping.  
Collection point for solvent, standard,  
preservative, and salt addition.

**Solid Dispenser**  
Salt dispensing, 2 kg  
reservoir delivers exact  
user defined doses.

**Vortexer (not shown)**  
Vortexes at 3,000 rpm for  
complete blending of  
standards and solvent.

**TekTouch User Interface**  
System control. Create, save, and  
edit methods and schedules. Stores  
entire sample history.

*From Homogenate to Final Extract...*

## TekTouch™ User Interface

The TekTouch user interface employs a capacitive touch screen monitor for all instrument operation. The system software was written with single touch operation in mind. Large and clearly visible fonts allow for easy navigation through the user intuitive menus. Methods and schedules can be created, edited, and built, simply by pressing a button. All system diagnostics and configurations, as well as sample logs are readily accessible from the touch screen. Full customization is possible for any of the required variables. Additionally, wizards are built in for help with salt weight and solvent volume calibration to assure proper sample integrity protocols.

## TekTouch Default Methods

The AutoMate-Q40 was designed to optimize and automate the QuEChERS extraction method for the determination of pesticide residues in agricultural commodities. For this reason, the TekTouch software has been preloaded with two default methods: the AOAC 2007.01 method and the EN 15662.2008 method. The parameters for both methods, as they are programmed into TekTouch, are displayed in the tables below.

AOAC Method 2007.01	
Extraction Salts	
	Weight (g)
AOAC Method	7.5
Extraction Solvents	
	Volume (mL)
1% Hac in MeCN	15.0
Solvent 2	0.0
Water	0.0
Extraction Mix/Vortex	
	Duration (min)
50 mL Sample Mix	1.0
15 mL dSPE Mix	0.5
Sample Vortex Before Extraction Salts	0.0
Centrifuge	
	Duration (min)
50 mL Sample Centrifuge Time	1.0
15 mL dSPE Centrifuge Time	1.0
Extract Volumes	
	Volume (mL)
dSPE Volume	8.0
Final Extract Volume	4.0

EN Method 15662.2008	
Extraction Salts	
	Weight (g)
EN Method	6.5
Extraction Solvents	
	Volume (mL)
Acetonitrile	10.0
Solvent 2	0.0
Water	0.0
Extraction Mix/Vortex	
	Duration (min)
50 mL Sample Mix	1.0
15 mL dSPE Mix	0.5
Sample Vortex Before Extraction Salts	1.0
Centrifuge	
	Duration (min)
50 mL Sample Centrifuge Time	5.0
15 mL dSPE Centrifuge Time	5.0
Extract Volumes	
	Volume (mL)
dSPE Volume	6.0
Final Extract Volume	5.0



Home Screen



Method Editor



Schedule Builder



Status Screen



## System Specifications

Automation	
Sample Types	QuEChERS extractions for pesticide residue samples according to either AOAC Method 2007.01 or EN Method 15622.2008
Sample Capacity	Automation of up to 40 QuEChERS samples
Sample Vials	The AutoMate-Q40 only supports 50 mL polypropylene conical centrifuge tubes purchased from Teledyne Tekmar
Extract Cleanup Vials	The AutoMate-Q40 only supports 15 mL polypropylene conical centrifuge tubes purchased from Teledyne Tekmar
Final Extract Vials	The AutoMate-Q40 only supports 15 mL polypropylene conical centrifuge tubes purchased from Teledyne Tekmar
Vial Transport Device	X, Y, Z robotic arm including vial gripping assembly
Vial Transport Device Positioning	X, Y, Z robotic arm is accurate to within +/- 1 mm

General Specifications	
Dimensions	44" H x 64" W x 27" D (111.76 cm x 162.56 cm x 68.58 cm)
Power Requirements	575 Watts, 100/115 VAC, 50/60 Hz, 5 Amps 575 Watts, 230 VAC, 50/60 Hz, 2.5 Amps
Environmental Specifications	Operating temperature: 10 ° to 30 °C; storage temperature: - 20 ° to 60 °C; relative humidity: 10% to 90%
Corrosion Resistance	The side panels, back panel and deck are corrosion resistant
Certifications	CE

Standard Injection	
Standard Injection System	Up to 3 standard injection vessels utilizing a 9-port valve and 250 µL syringe drive
Capacity	Each standard vessel can be individually dosed in increments of 25 µL up to 250 µL per vessel
Precision	< 5% RSD measured by weight (n=10)
Accuracy	+/- 10%
Consumption	25 µL per 25 µL injection
Standard Vessels	Three 15 mL standard vessels, UV-protected for added standard stability
Preservative	The third internal standard vessel can be configured for preservative dosing to the final extract vial in 25 mL increments up to 250 mL

Solvent Delivery	
Solvent Delivery	Up to 3 solvents can be employed utilizing a 9-port valve and 27 mL syringe drive. The solvent tray can accommodate two 4 L jugs, or up to three 1 L jugs and a 1 L waste jug.
Solvent Delivery Volume	Solvents can be delivered in 0.1 mL increment volumes between 0 mL to 25 mL
Solvent Delivery Precision	< 1% RSD (n=25 @ 10 mL delivery volume measured by weight)
Solvent Delivery Accuracy	+/- 2%
Solvent & Standards Flowpath	1/8" & 1/16" (0.3175 cm & 0.15875 cm) Teflon™ tubing for solvent and standard delivery

Pneumatic Specifications	
Pneumatic Pathway	1/4" & 1/8" (0.635 cm & 0.3175 cm) Polyurethane
Air Supply	House Air or Compressor; Incoming Pressure: 100-125 psi, (125 psi max)



***From Homogenate to Final Extract...***