

Configuring the ACQUITY UPLC System Components

This document outlines recommended configurations for ACQUITY UltraPerformance LC[®] (UPLC) System components.

NOTE: The configuration guide covers UPLC systems only; it does not cover high-performance LC (HPLC) systems configured with the 30-cm Column Heater/Cooler.

NOTE: To be certain you have the latest version of this procedure, please visit the Waters Support Center reference area (via the Portal Knowledge Center).

System components

The ACQUITY UPLC core system consists of the following components (see [Figure 1](#)):

- Binary solvent manager
- Sample manager
- Column heater/high temperature column heater (or optional column manager or column heater/cooler)
- UPLC detector
- Solvent tray
- Sample organizer (optional)

The above components assemble in a single stack, with the optional sample organizer positioned to the left ([Figure 1](#)). Additional components and detectors can require different system configurations that often involve a second instrument stack.

NOTE: Use the flex cart only with the core ACQUITY UPLC system.

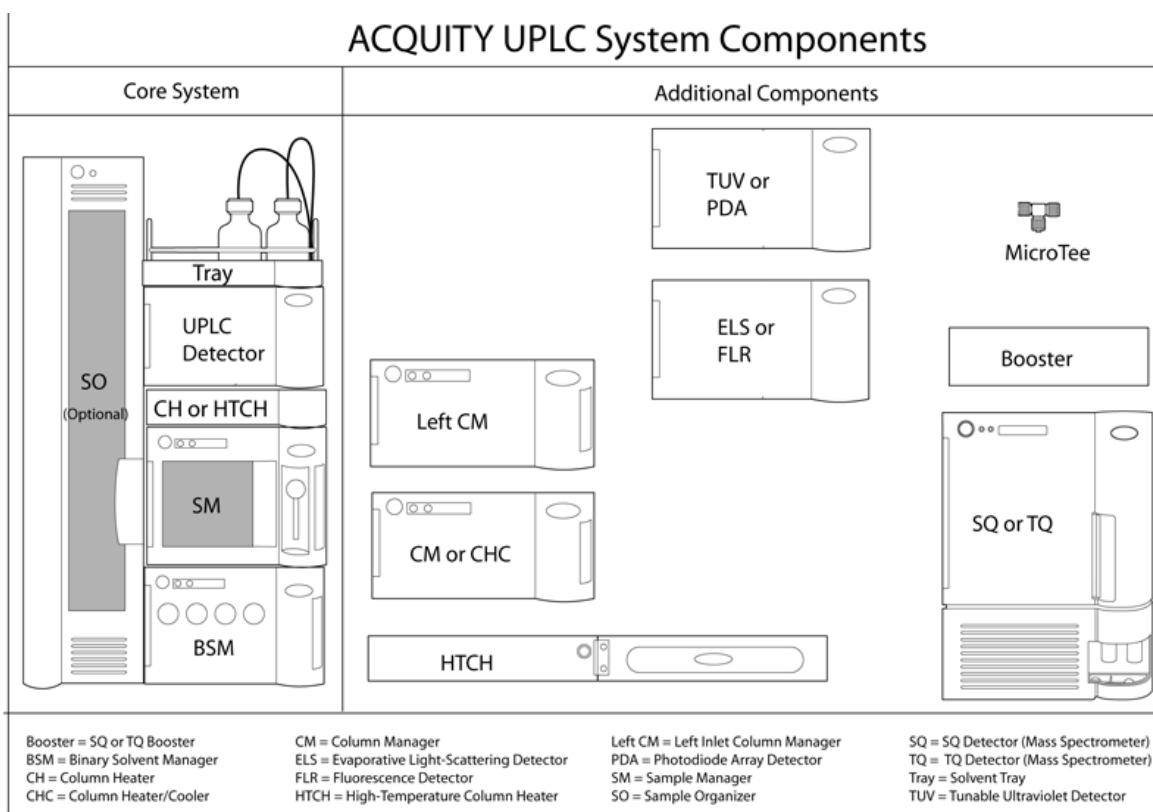


Figure 1 - ACQUITY UPLC System Components

UPLC detectors

The term *UPLC detector* refers to the following instruments:

- tunable ultraviolet (TUV) detector
- photodiode array (PDA) detector
- evaporative light-scattering (ELS) detector
- fluorescence (FLR) detector
- SQ detector (SQD)
- TQ detector (TQD)

You can include a single UPLC detector (TUV, PDA, ELS, or FLR) in the core system stack or with additional UPLC detectors in a second stack of components. You can also place UPLC detectors on top of an SQD or TQD, with or without the optional booster.

REQUIREMENTS:

- The ELS detector is a destructive detector and must be the last component in a flow path or detector series.

WARNING: TO AVOID EXPOSURE TO SOLVENT VAPORS, PLACE THE ELS DETECTOR IN AN APPROPRIATE POSITION TO ACCOMMODATE ITS EXHAUST REQUIREMENTS. DO NOT ALLOW DETECTOR EXHAUST TO ENTER THE LABORATORY ATMOSPHERE.

- Because the flow cell of the FLR detector is pressure-rated to a maximum of 3447 kPa (34 bar, 500 psi), the FLR detector must be the last component in a flow path or detector series.
- The backpressure on the flow cells of the TUV and PDA detectors must not exceed 6895 kPa (69 bar, 1000 psi).
- Minimize the length of tubing used to connect detector flow cells to minimize dispersion and backpressure between instrument components.
- The mass spectrometer is a destructive detector and must be the last component in a flow path or detector series.
- Minimize the length of tubing used to connect detector flow cells to the inlets of the SQ and TQ detectors. The relatively high backpressure of eluent flow through long lengths of small ID tubing can damage the flow cells.

NOTE: You can use the flex cart to place an ACQUITY UPLC core system near a stationary mass spectrometer.

Recommended configurations

The configuration diagrams in Figures 2 through 5 show the placement Waters recommends for each component of the ACQUITY UPLC system.

On the multiple-detector configuration diagrams, the recommended post-column flow path is also shown. These systems may require a flow splitter (MicroTee), MS booster, or left-inlet column manager.

When to use a MicroTee

Split the eluent flow using a MicroTee when:

1. The system configuration includes two destructive detectors, such as the ELS, TQ detector, or SQ detector.
2. The system configuration includes an FLR detector with a destructive detector.
3. You want to increase MS sensitivity in a system by restricting the flow rate range.

NOTE: Consult the appropriate user documentation for detector flow rate requirements.

Figures 3 through 5 show configurations requiring a MicroTee.

NOTE: For more information on splitting the eluent flow, see:

“Installing the MicroTee” (PN 715001704).

When to use an MS booster

Place an MS booster on top of the MS instrument when the high-temperature column heater (HTCH) swing arm is positioned over the mass spectrometer. The UPLC detector is positioned on top of the MS booster in specified configurations (see Figures 3 and 5).

NOTE: The SQD and TQD boosters have different physical dimensions and are not interchangeable. Be sure to use the booster appropriate for your detector.

When to use a left inlet column manager

Use a left inlet column manager (left CM) for system configurations that require you to:

1. use a column manager and sample organizer
2. minimize downstream tubing runs in order to minimize dispersion ([Figure 6](#))

NOTE: A column manager inlet extension tube kit (PN 205000538) is available for configurations in which extra tubing is needed to reach the sample manager injector. For more information on the extension tube, see:

“Installing the Column Manager Inlet Tube Extension Kit” (PN 715001706)

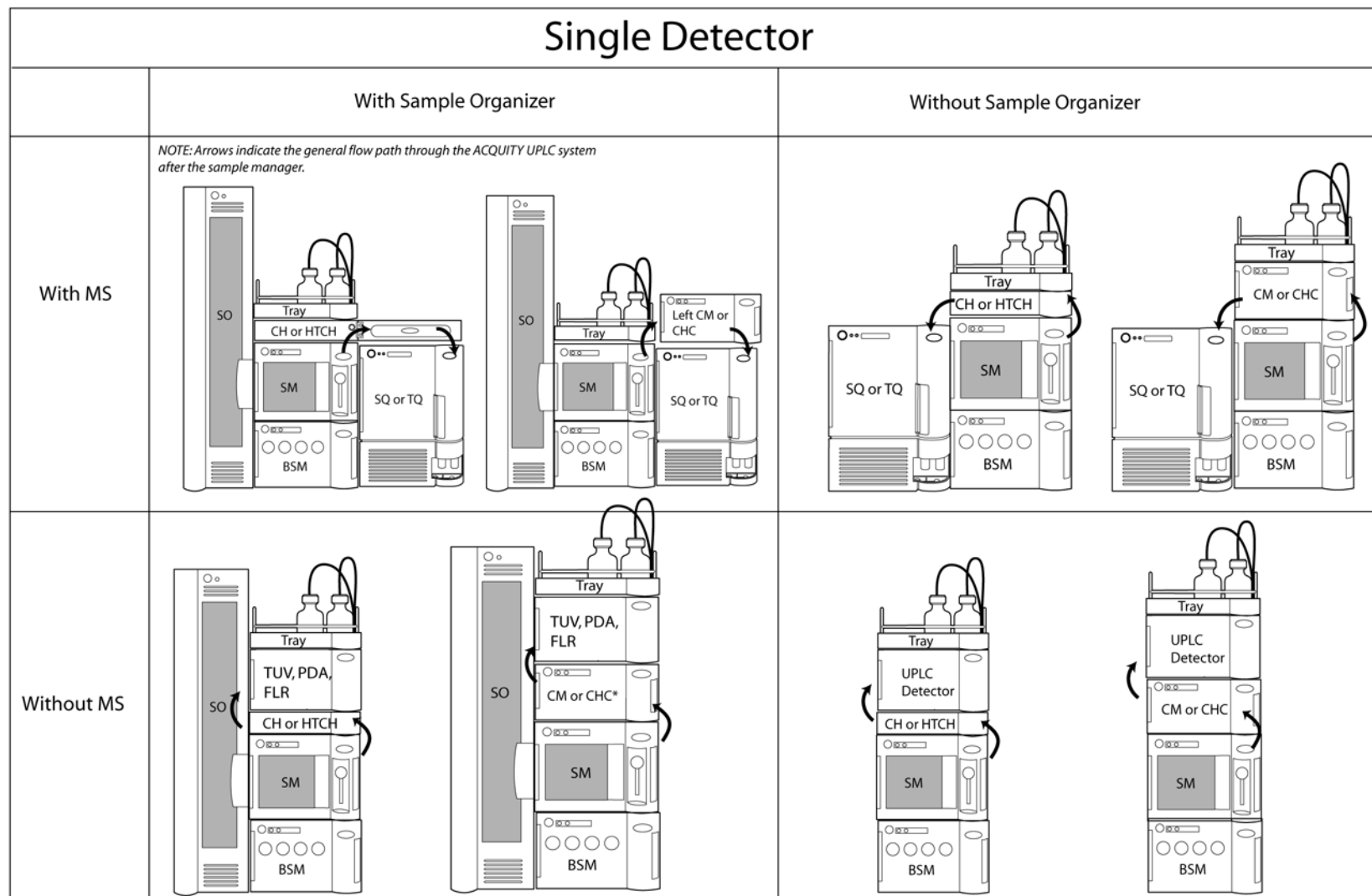


Figure 2 - Recommended Configurations for Single Detector Systems

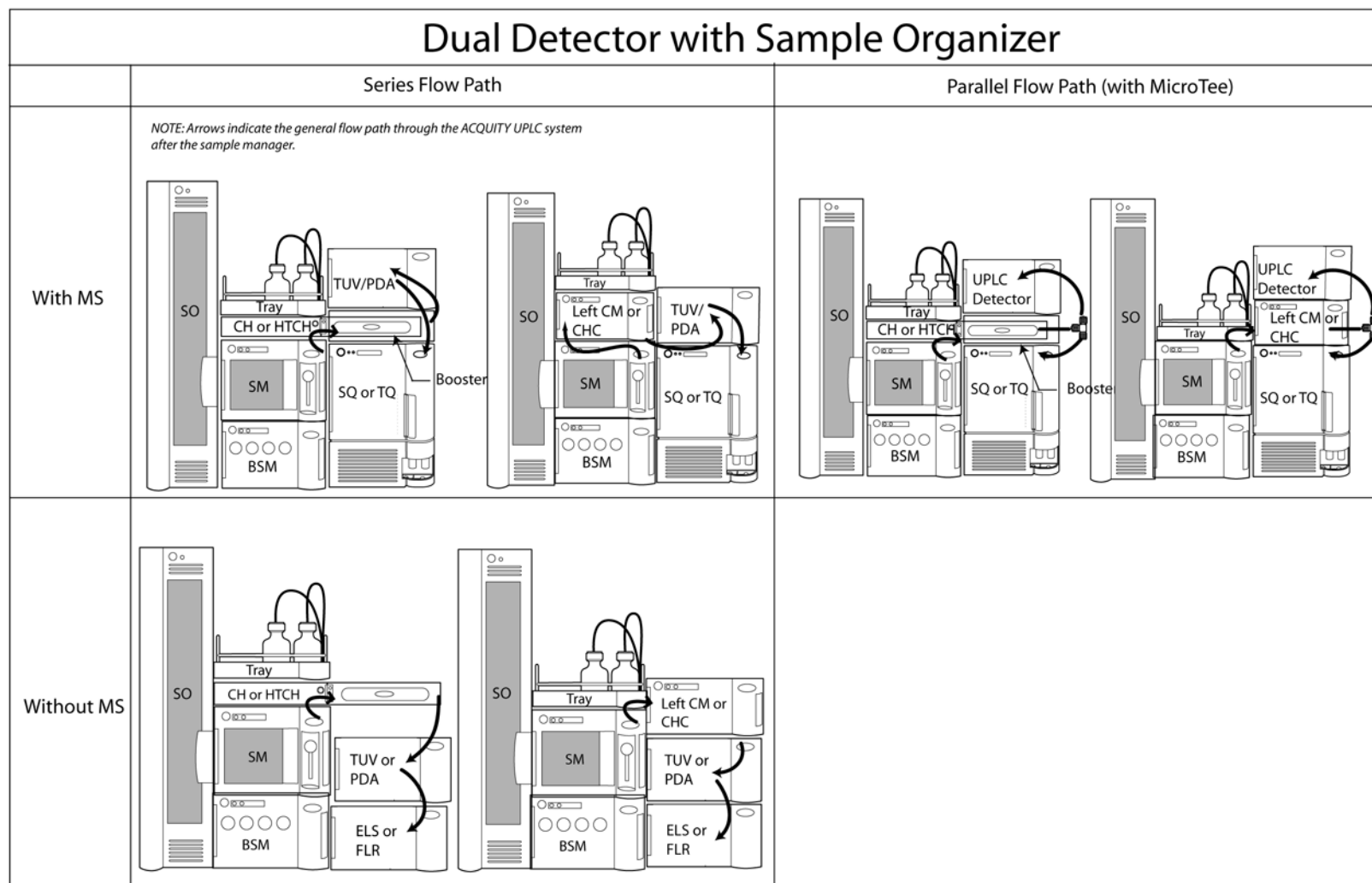


Figure 3 - Recommended Configurations for Dual Detector Systems with Sample Organizer

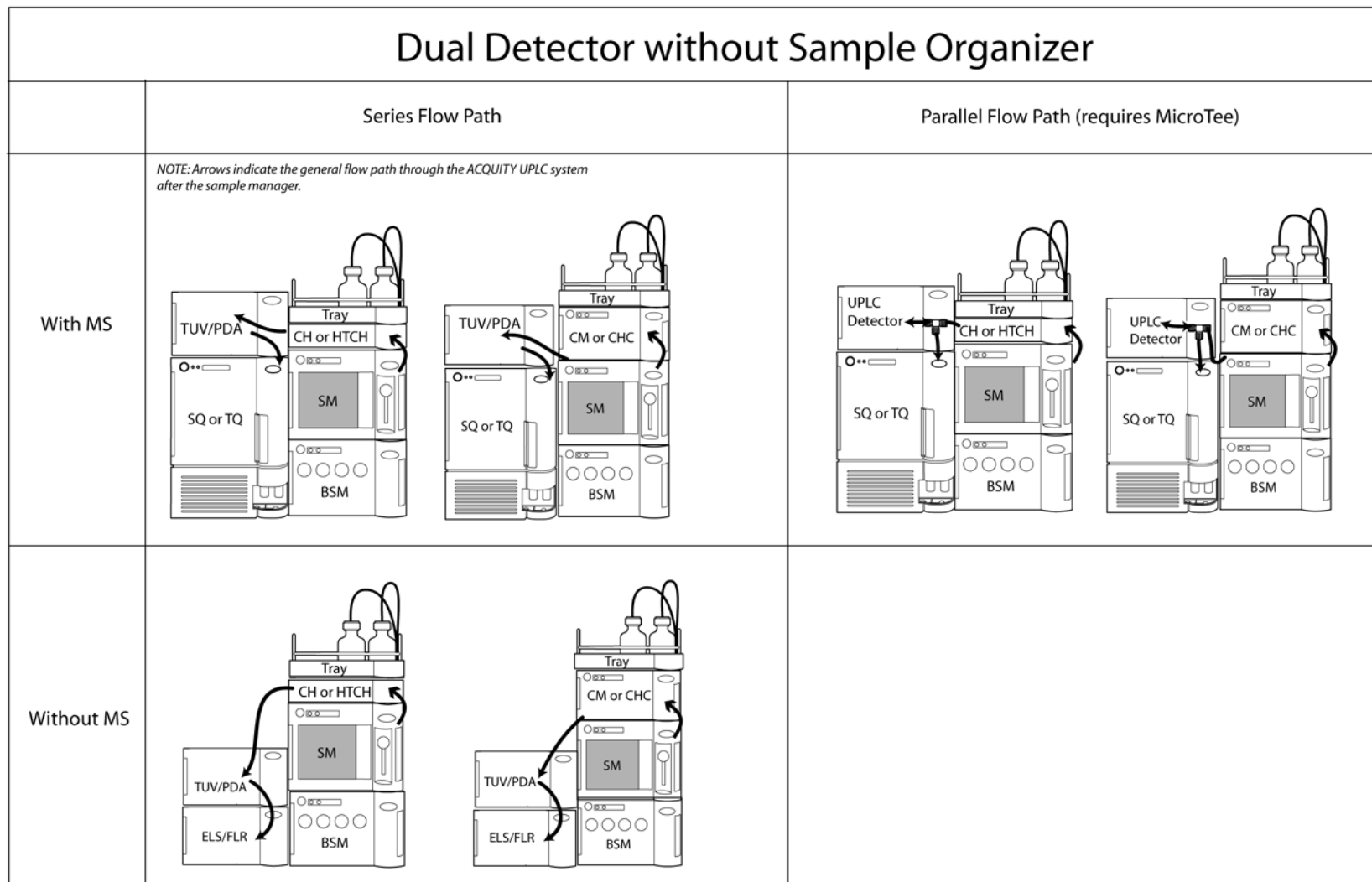


Figure 4 - Recommended Configurations for Dual Detector Systems without Sample Organizer

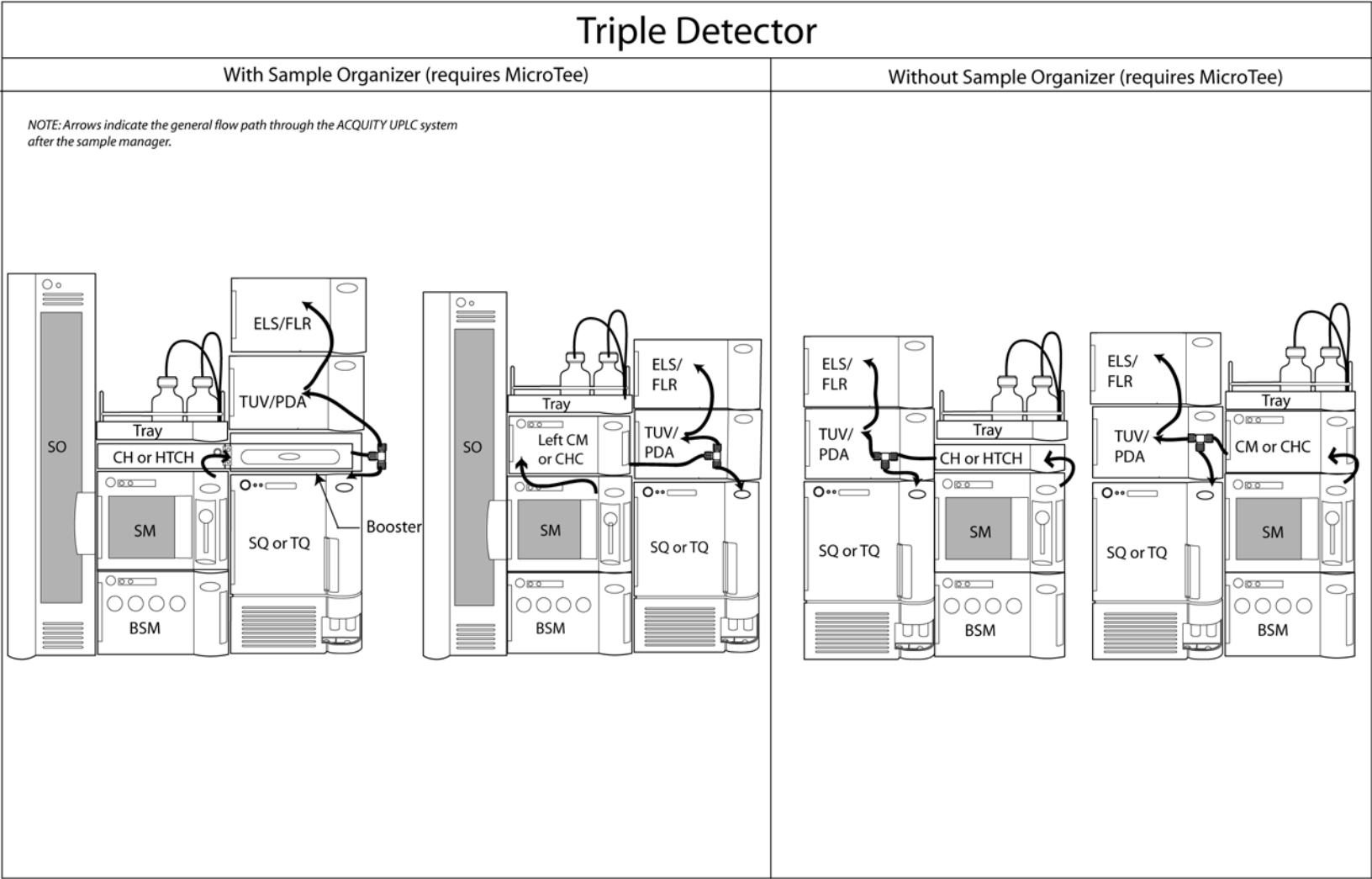


Figure 5 - Recommended Configurations for Triple Detector Systems

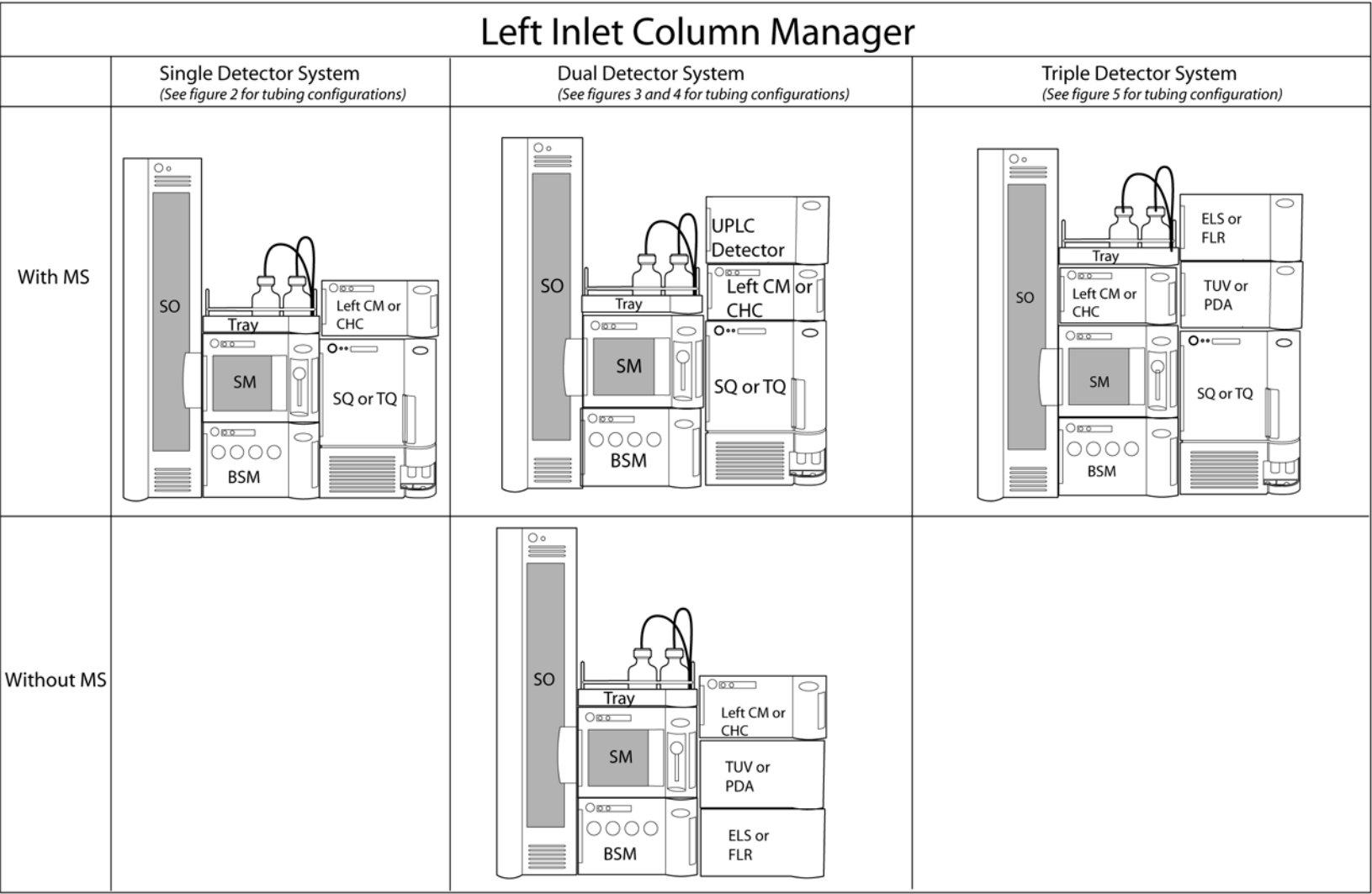


Figure 6 - Recommended Configurations for Systems with Left Column Manager