

Product Information

QuickSplit™ Flow Splitters

The *QuickSplit* Flow Splitter is very elegant in its simplicity. Split ratios are created by two or more fluid resistors that form a parallel flow path. *QuickSplit* Flow Splitters are available with a fixed or adjustable split ratio. Interchangeable fluid resistors make it easy to change split ratios quickly, eliminating tedious adjustments to capillary tubing. The technology can be applied to all applications where a controlled, reproducible split ratio is required including LC-MS, flow fractionation, pre/post-column flow splitting mass directed fraction collection, and capillary chromatography.

LC-MS Post Column Flow Splitters



QuickSplit Flow Splitter Features

- Fluid resistor technology eliminates tedious adjustments to capillary tubing for split ratio optimization
- Split ratios are stable and reproducible, and not affected by changes in viscosity or pressure
- Adjustable metering valve enables precise direct control over split ratios
- Easy to use interchangeable fluid resistors make it possible to achieve split ratios from 1:1 to 20:1
- Rugged stainless steel construction allows high pressure operation
- Ultra low dead volume fluidic design
- Applications include LC-MS, pre/post-column flow splitting, and flow fractionation

Fixed Flow Splitters

Unlike conventional splitters that use long lengths of capillary tubing, the *QuickSplit* Fixed Flow Splitter uses two compact fluid resistor elements which are designed as cartridges for easy replacement. The fluid resistors are analogous to resistors used in an electrical circuit. Resistance values (L) are rated in psi/mL/min. Because of the extremely low internal volume of the fluid resistors, the solvent composition in both resistors at any instant in time is the same, and therefore viscosity changes associated with gradient runs do not impact the split ratio.

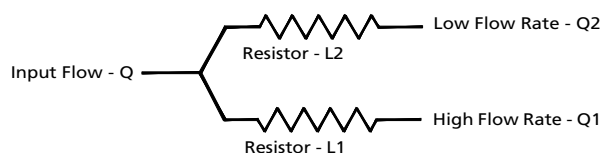
QuickSplit Fixed Flow Splitters provide a fixed split ratio with extremely low dead volume. Delay volume on the low flow rate side is as low as 100 nanoliters depending upon the resistor cartridge selected. The split ratio is not affected by changes in solvent viscosity or pressure, and is extremely stable and reproducible. The interchangeable fluid resistors are available in a wide range of values which make it possible to create split ratios from 1:1 to as high as 20:1.

The flow path of the *QuickSplit* Fixed Flow Splitter contains two fluid resistors that form a parallel flow path. Both low and high flow rate streams pass through fixed resistor cartridges. The ratio of these two resistors creates the split ratio. To understand how the *QuickSplit* Fixed Flow Splitter works it helps to look at a diagram, Figure 1, of the fluid resistors in relation to the flow paths and how a split ratio is calculated.

Since the flow rate is indirectly proportional to resistance, changing the resistance in either flow path results in a change to the split ratio. Changing resistance is accomplished by exchanging the fixed fluid resistor cartridges with a resistor set that has different resistor ratings.

The *QuickSplit* Fixed Flow Splitter is shipped with resistors installed that deliver the nominal stated split ratio. The split ratios have a tolerance range of +/- 10%. Flow rate and viscosity changes will change the backpressure generated by the splitter, but will not affect the actual split ratio. The *QuickSplit* Fixed Flow Splitter is shipped configured for post-column applications.

Figure 1. Schematic Flow Diagram of the QuickSplit Fixed Flow Splitter



L1 = Fixed fluid resistor (resistance value varies depending on cartridge rating)
L2 = Fixed fluid resistor (resistance value varies depending on cartridge rating)
R = Split ratio = Q1/Q2 = Resistance ratio = L2/L1

G004041

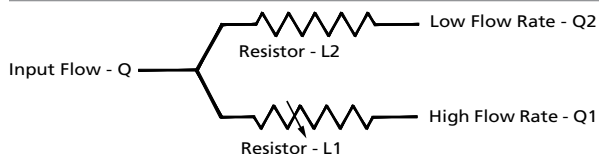
Adjustable Flow Splitters

The *QuickSplit* Adjustable Flow Splitter uses fluid resistors to achieve a wide range of split ratios. The flow path of the *QuickSplit* Adjustable Flow Splitter contains two fluid resistors that form a parallel flow path. The low flow rate stream passes through a fixed resistor cartridge, while the high flow rate stream passes through an adjustable fluid resistor (metering valve). The ratio of these two resistors creates the split flow ratio. The fixed fluid resistor is analogous to a resistor used in an electrical circuit. The compact fluid resistor elements are designed as cartridges for easy replacement with resistance values (L2) rated in psi/mL/min. Because of the extremely low internal volume of the fluid resistors, the solvent composition in both resistors at any instant in time is the same, and therefore viscosity changes associated with gradient runs do not impact the split ratio.

Due to the rugged design, the split ratio repeatability is +/- 1% of setting, and unlike alternative splitter valves or tees, will not be affected by actions that affect input flow such as turning the pump off and on, or pressure spikes. Because the *QuickSplit* Adjustable Flow Splitter incorporates a metering valve, split ratios can be changed frequently with flow changes that are stable and reproducible. The *QuickSplit* Adjustable Flow Splitter will create split ratios that are not affected by changes in solvent viscosity or pressure and provides direct real time control over split ratio optimization.

To understand how the *QuickSplit* Adjustable Flow Splitter works it helps to look at a diagram, Figure 2, of the fluid resistors in relation to the flow paths and how a split ratio is calculated.

Figure 2. Schematic Flow Diagram of the *QuickSplit* Adjustable Flow Splitter



L1 = Adjustable fluid resistor (metering value)

L2 = Fixed fluid resistor (resistance value varies depending on cartridge rating)

R = Split ratio = $Q1/Q2$ = Resistance ratio = $L2/L1$

G004042

Since the flow rate is indirectly proportional to resistance, changing the resistance in either flow path results in a change to the split ratio. Changing resistance is accomplished by adjusting the metering valve on the high flow rate channel or exchanging the fixed fluid resistor cartridge in the low flow rate channel with a resistor cartridge which has a different resistance rating. Adjusting the metering valve is analogous to changing the capillary tubing length or diameter on conventional tee type flow splitters.

The *QuickSplit* Adjustable Flow Splitter has a convenient mounting bracket and hand adjustment knob to control the split ratio. A calibrated indicator rod tracks the split ratio setting and each splitter is shipped with calibration data. Split ratios are not affected by changes in solvent viscosities or pressure, which makes this product suitable for gradient applications as well as isocratic. The *QuickSplit* Adjustable Flow Splitter is shipped configured for post-column applications.

Flow Splitter Mounting Bracket



Ordering Information

Description	Cat. No.
HPLC Post Column Flow Splitters - Fixed	
Split Ratio = 20:1	56624-U
Split Ratio = 10:1	56625-U
Split Ratio = 5:1	56626-U
Split Ratio = 3:1	56627-U
HPLC Post Column Flow Splitter - Adjustable	
Split Ratio = 1:1 to 20:1	56629-U
HPLC Post Column Resistor Sets - Binary	
Split Ratio = 20:1	56631-U
Split Ratio = 10:1	56632-U
Split Ratio = 5:1	56633-U
Split Ratio = 3:1	56634-U
Accessories	
Mounting Bracket for HPLC Post Column Flow Splitters - Fixed	56630-U

Trademarks

QuickSplit — Analytical Scientific Instruments

World Headquarters

3050 Spruce St., St. Louis, MO 63103
(314) 771-5765
sigma-aldrich.com

Order/Customer Service (800) 325-3010 • Fax (800) 325-5052

Technical Service (800) 325-5832 • sigma-aldrich.com/techservice

Development/Bulk Manufacturing Inquiries **SAFC**® (800) 244-1173

*Accelerating Customers'
Success through Innovation and
Leadership in Life Science,
High Technology and Service*

©2009 Sigma-Aldrich Co. All rights reserved. SIGMA, SAFC, SAFC®, SIGMA-ALDRICH, ALDRICH, FLUKA, and SUPELCO are trademarks belonging to Sigma-Aldrich Co. and its affiliate Sigma-Aldrich Biotechnology, L.P. Sigma brand products are sold through Sigma-Aldrich, Inc. Sigma-Aldrich, Inc. warrants that its products conform to the information contained in this and other Sigma-Aldrich publications. Purchaser must determine the suitability of the product(s) for their particular use. Additional terms and conditions may apply. Please see reverse side of the invoice or packing slip.

JT1
T407094A