QuickSplit Adjustable Makeup-Flow Splitter

Methods for Setting Low Split Flow

Figure 1: (left) *QuickSplit* Adjustable Makeup-Flow Splitters (right) Split flow indicator rod scale on rear panel

Figure 2: *QuickSplit* Adjustable Makeup-Flow Splitters

Adjusting the Split Ratio

Split ratios are increased by turning the adjustment knob (Figure 2) clockwise and decreased by turning the adjustment knob counterclockwise. The split ratio range can be changed by exchanging the replaceable resistor cartridge.

Setting the Split Ratio

Listed below are several options for setting the split ratio of an adjustable splitter. Choose the method that best suits your purposes.

Routine split ratio setting

Each flow splitter is shipped with a Manufacturing Test Log unique to that splitter. If you require a replacement copy, contact ASI and provide the splitter part number and serial number. Refer to Figure 3 for a sample copy.

Set the inlet flow and the restrictor rod setting to the value listed on Manufacturing Test Log. The metering rod scale projects from the rear of the bracket (Figure 1, right photo).

Note: Once it's set, the split ratio will remain constant regardless of changes to inlet flow rate or solvent viscosity. Regarding gradients with different viscosity mobile phases, the low split flow will remain constant for Post-column applications. Accuracy is ± 10% of the listed value, on account of system-to-system variability.

High accuracy split ratios

Adjust the splitter to generate the back pressure corresponding to the desired test log low split flow. Low split flow can be set with a precision of ±2% by means of this procedure. Even higher accuracy can be achieved using the following methods:

Set splitter by means of the previous procedure. Set the low split flow to desired accuracy by making successive fine adjustments while determining flow rate by measuring volume and time with a graduated cylinder and stop watch. Note down the system back pressure! Use the results to create a low split flow - back pressure table for the system and each column. System back pressure is proportional to column back pressure and splitter back pressure:

$$\textit{System BP} = \textit{column BP} + \textit{splitter BP}$$

Figure 3

S/N: 00000

Manufacturing test log for 690-POCS-CS

Customer: ASI
Ship date = M/D/Y
Leak check at inlet at 4000 psi pass
Leak check at outlet at 4000 psi pass
Solvent = Water
Input flow rate = 20.00 ml/min
Split Ratio Range = 25:1 to 700:1

Restrictor rod setting	Capillary flow, ml/min	Split ratio	Back Pressure, PSI
0.5	0.027	739.741	49
1	0.054	369.37	78
1.5	0.095	209.526	130
2	0.142	139.845	193
2.5	0.179	110.732	241
3	0.217	91.1659	291
3.5	0.253	78.0514	337
4	0.265	74.4717	354
4.5	0.282	69.922	376
5	0.315	62.4921	417
5.5	0.349	56.3066	460
6	0.401	48.8753	527
6.5	0.448	43.6429	587
7	0.475	41.1053	621
7.5	0.529	36.8072	690
8	0.569	34.1494	740
8.5	0.639	30.2989	828
9	0.696	27.7356	901
9.5	0.787	24.413	1016

Low Flow Resistor = 17" of 75uM I.D. capillary @ 1326 psi/(ml/min)
Delay Coil= 12 ft. of 0.03" I.D. Teflon tubing.

Note: The above data is for zero back pressure downstream from flow splitter. Back pressure generated by splitter will vary depending on solvent viscosity, but split ratio will not be affected.

Adjust Back Pressure

Use pressure drop across the flow splitter and Ohms Law.

$$P = L \times Q2 \times V$$

***Q2*: Desired split flow, mL/min.**
***P*: Pressure drop across splitter, PSI**
***L*: Fluid resistor value PSI/mL/min. (from calibration sheet)**
***V*: Viscosity in centipoise**