



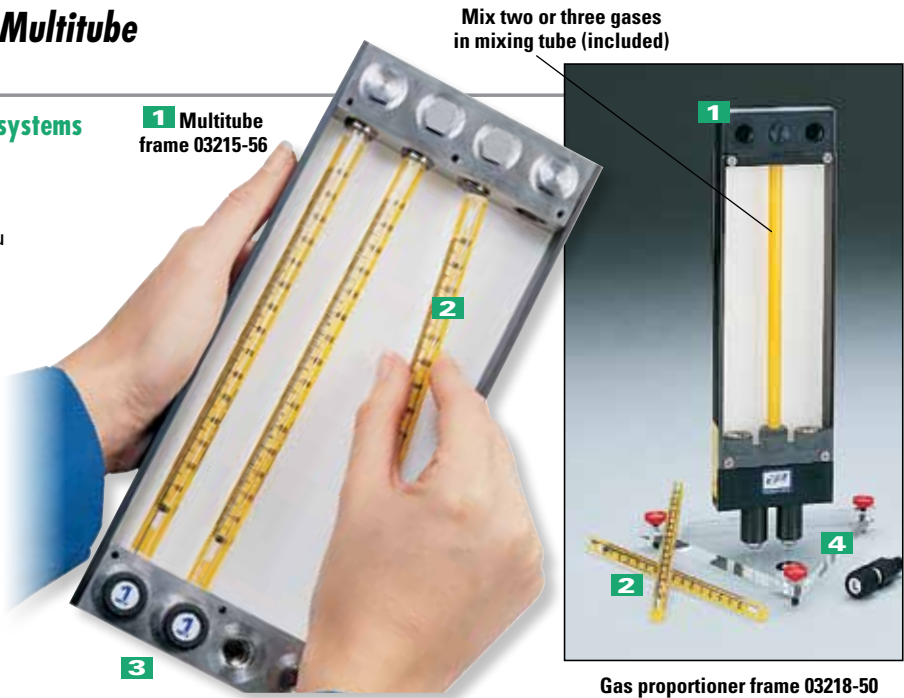
Cole-Parmer Single and Multitube Flowmeter Systems

Create your own multitube or gas proportioner systems for complete flexibility

Design a flow system to meet your multi-channel metering, mixing, or monitoring applications. We offer a variety of frames and flowtubes so that you can create the system to meet your exact needs. If you need assistance in putting together a system, call your local dealer.

REQUIRED SYSTEM Components

- 1 Frame: single or multitube 611
- 2 Flowtube(s) for air, water, and various gases 612-613
- 3 Valve cartridge(s) to control flow rates 613
- 4 Tripod base for your benchtop applications . . . 613



Gas proportioner frame 03218-50 shown with tripod base 03218-58

1 Frames

Choose a frame depending on the flowtube capacity, flow pattern, and wetted parts that you require. For frames with PTFE wetted parts, call your local dealer for information. Single and multitube frames accept both direct-reading and correlated flowtubes; gas proportioner frames accept only correlated flowtubes. All frames include an instruction manual.

Specifications

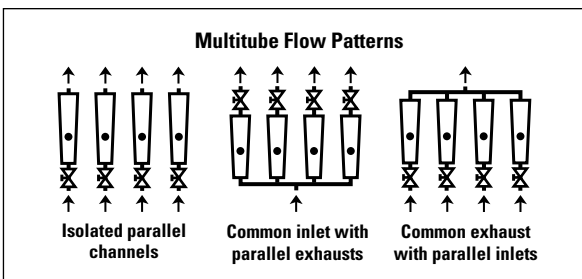
- Minimum flow rate:** approx 10% of max flow rate of flowtube
- Max pressure:** 200 psi (13.7 bar)
- Operating temp:** -15 to 250°F (-26 to 121°C)
- Connections:** 1/8" NPT(F)

ISO9001:2008 CERTIFIED SUPPLIER



Materials of construction

- Side panels: black anodized aluminum
- Front shield: 1/8"-thick polycarbonate
- Back plate: 1/8"-thick acrylic
- O-rings and packing: Buna N for aluminum models, Viton® for 316 SS models



Single-Tube Frames

Choose a frame with valve port if you plan on adding a valve cartridge (page 613) to control flow.

Number of flowtubes held	Valve port	Aluminum wetted parts		316 SS wetted parts	
		Cat. no.	Price	Cat. no.	Price
Single-tube frames for 65-mm flowtubes					
One	No	TW-03220-00		TW-03220-40	
	Yes	TW-03220-08		TW-03220-44	
Single-tube frames for 150-mm flowtubes					
One	No	TW-03220-06		TW-03220-42	
	Yes	TW-03220-10		TW-03220-46	

Multitube Frames

These frames have valve ports which accept valve cartridges to control flow. A tripod base is required to use the multitube frame with the common inlet flow pattern; all other multitube frames are designed for panel and tripod mounting.

Number of flowtubes held	Flow pattern	Aluminum wetted parts		316 SS wetted parts	
		Cat. no.	Price	Cat. no.	Price
Multitube frames for 65-mm flowtubes					
Two	Isolated Common	TW-03214-10		TW-03214-16	
		TW-03214-12		TW-03214-18	
Three	Isolated Common	TW-03214-28		TW-03214-34	
		TW-03214-30		TW-03214-36	
Four	Isolated Common	TW-03214-46		TW-03214-52	
		TW-03214-50		TW-03214-56	
Five	Isolated Common	TW-03214-62		TW-03214-66	
		TW-03214-64		TW-03214-68	
Six	Isolated Common	TW-03214-74		TW-03214-78	
		TW-03214-76		TW-03214-80	
Multitube frames for 150-mm flowtubes					
Two	Isolated Common	TW-03215-10		TW-03215-16	
		TW-03215-12		TW-03215-18	
Three	Isolated Common	TW-03215-28		TW-03215-34	
		TW-03215-30		TW-03215-36	
Four	Isolated Common	TW-03215-46		TW-03215-52	
		TW-03215-50		TW-03215-56	
Five	Isolated Common	TW-03215-62		TW-03215-66	
		TW-03215-64		TW-03215-68	
Six	Isolated Common	TW-03215-74		TW-03215-78	
		TW-03215-76		TW-03215-80	

Gas Proportioner Multitube Frames

These multitube frames with valves allow you to increase or decrease gas concentrations accurately at any time during an experiment—blend two or three gases at the exact concentration you require. Frames include a installation tool and mixing tube. **Note:** use only with the 150-mm correlated flowtubes on page 612. Flow tubes come with gas correlation charts.

Number of flowtubes held	Flow pattern	Aluminum wetted parts		316 SS wetted parts	
		Cat. no.	Price	Cat. no.	Price
Gas proportioner frames for 150-mm correlated flowtubes					
Two	—	TW-03218-50		TW-03218-52	
Three	—	TW-03218-54		TW-03218-56	

See next page for more...



Flowmeters

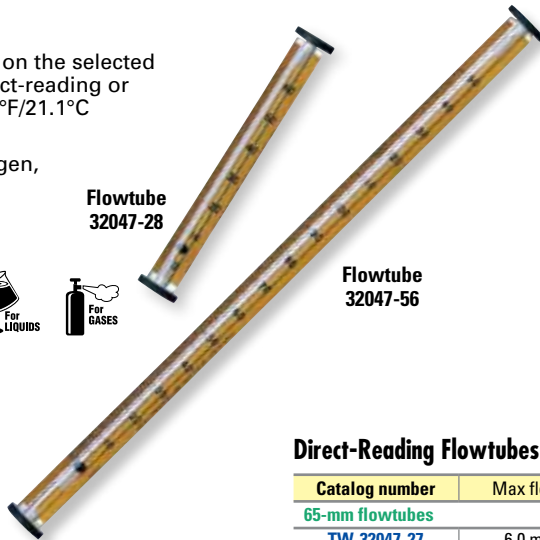
Variable Area, Component Systems

Cole-Parmer Single and Multitube Flowmeter Systems

2A Flowtubes for Air and Water

Choose 65- or 150-mm flowtubes depending on the selected frame size. Flowtubes are calibrated for direct-reading or correlated reading of air or water at STP (70°F/21.1°C and 14.7 psi/1 atm).

Flowtubes for specialty gases—argon, nitrogen, hydrogen, helium, carbon dioxide, and oxygen—are available on page 613.



Specifications



Repeatability: ±0.25% full-scale

Minimum flow rate: approx 10% of max flow rate

Materials of construction

Flowtube: heavy-walled borosilicate glass
Float: glass, stainless steel (SS), carbonyl, sapphire, or tantalum

Direct-Reading Flowtubes for Air (Accuracy: ±5%)

Catalog number	Max flow rate	Float	Price
65-mm flowtubes			
TW-32047-00	2.2 scfh	Glass	
TW-32047-01	6.0 scfh	Glass	
TW-32047-02	10 scfh	SS	
TW-32047-04	25 scfh	SS	
TW-32047-08	1.9 scfm	SS	
TW-32047-09	1.0 LPM	Glass	
TW-32047-10	1.15 LPM	Glass	
TW-32047-11	2.0 LPM	SS	
TW-32047-12	4.0 LPM	SS	
TW-32047-13	5.0 LPM	Glass	
TW-32047-14	10 LPM	SS	
TW-32047-15	16 LPM	SS	
TW-32047-16	25 LPM	SS	
TW-32047-17	40 LPM	SS	
TW-32047-18	7 mL/min	Glass	
TW-32047-19	50 mL/min	SS	
TW-32047-20	75 mL/min	SS	
TW-32047-21	100 mL/min	Glass	
TW-32047-22	250 mL/min	Carbonyl	
TW-32047-23	500 mL/min	Carbonyl	
150-mm flowtubes			
TW-32047-50	2.5 scfh	Carbonyl	
TW-32047-51	5 scfh	Glass	
TW-32047-53	10 scfh	SS	
TW-32047-55	23 scfh	Carbonyl	
TW-32047-56	50 scfh	Glass	
TW-32047-57	90 scfh	SS	
TW-32047-60	1.25 LPM	Carbonyl	
TW-32047-61	2.5 LPM	Glass	
TW-32047-62	4.0 LPM	Glass	
TW-32047-63	4.5 LPM	Sapphire	
TW-32047-64	5.0 LPM	Sapphire	
TW-32047-65	10 LPM	Carbonyl	
TW-32047-67	23 LPM	Glass	
TW-32047-68	42 LPM	SS	
TW-32047-69	60 LPM	Carbonyl	
TW-32047-70	25 mL/min	Sapphire	
TW-32047-71	50 mL/min	Sapphire	
TW-32047-72	75 mL/min	Carbonyl	
TW-32047-73	100 mL/min	Sapphire	
TW-32047-74	200 mL/min	SS	
TW-32047-76	500 mL/min	Sapphire	
TW-32047-77	800 mL/min	Glass	

REQUIRED SYSTEM Components

- 1 Frame: single or multitube 611
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Direct-Reading Flowtubes for Water (Accuracy: ±5%)

Catalog number	Max flow rate	Float	Price
65-mm flowtubes			
TW-32047-27	6.0 mL/min	SS	
TW-32047-28	60 mL/min	SS	
TW-32047-29	115 mL/min	SS	
TW-32047-31	250 mL/min	Glass	
TW-32047-32	500 mL/min	Glass	
150-mm flowtubes			
TW-32047-81	1.2 LPM	SS	
TW-32047-82	2.0 LPM	Tantalum	
TW-32047-84	10 mL/min	Sapphire	
TW-32047-86	50 mL/min	Glass	
TW-32047-88	100 mL/min	Glass	
TW-32047-89	200 mL/min	Carbonyl	
TW-32047-90	500 mL/min	SS	

Correlated Flowtubes for Air and Water (Accuracy: ±2%)

Catalog number	Max flow rate			Float	Price
	Air	Air (50 psi)	Water		
65-mm flowtubes					
TW-03219-50	5.8 mL/min	—	0.065 mL/min	Glass	
TW-03219-51	16.7 mL/min	—	0.283 mL/min	SS	
TW-03219-52	48.7 mL/min	—	0.55 mL/min	Glass	
TW-03219-53	145 mL/min	—	2.38 mL/min	SS	
TW-03219-54	202.1 mL/min	—	2.6 mL/min	Glass	
TW-03219-55	522 mL/min	—	12 mL/min	SS	
TW-03219-56	1249 mL/min	—	27 mL/min	Glass	
TW-03219-58	2040 mL/min	—	39.7 mL/min	Glass	
TW-03219-57	2520 mL/min	—	70.7 mL/min	SS	
TW-03219-59	3990 mL/min	—	108.3 mL/min	SS	
TW-03219-60	6318 mL/min	—	147 mL/min	Glass	
TW-03219-62	23,169 mL/min	—	522 mL/min	Glass	
TW-03219-66	58,500 mL/min	—	1866 mL/min	Carbonyl	
150-mm flowtubes					
TW-03219-70	18.9 mL/min	83 mL/min	0.19 mL/min	Glass	
TW-03217-05	49.1 mL/min	191.6 mL/min	0.49 mL/min	Glass	
TW-03217-07	60.6 mL/min	242 mL/min	0.945 mL/min	SS	
TW-03217-09	92 mL/min	324 mL/min	0.85 mL/min	Glass	
TW-03217-11	137 mL/min	460 mL/min	2.34 mL/min	SS	
TW-03217-15	264 mL/min	825 mL/min	4.74 mL/min	SS	
TW-03217-13	374 mL/min	1086 mL/min	5.5 mL/min	Glass	
TW-03217-17	814 mL/min	2024 mL/min	20.4 mL/min	SS	
TW-03217-21	2313 mL/min	5528 mL/min	53.5 mL/min	Glass	
TW-03217-19	4562 mL/min	10,813 mL/min	130.4 mL/min	SS	
TW-03217-29	8678 mL/min	19,767 mL/min	210 mL/min	Glass	
TW-03217-23	16,737 mL/min	38,995 mL/min	506 mL/min	SS	
TW-03217-33	22,536 mL/min	49,374 mL/min	541 mL/min	Glass	
TW-03219-72	41,512 mL/min	89,880 mL/min	1288 mL/min	SS	
TW-03219-74	59,494 mL/min	123,846 mL/min	1881 mL/min	Carbonyl	

[TW-17080-00](#) NIST-traceable calibration with data for air/gas flowmeter
[TW-17080-12](#) NIST-traceable calibration with data for liquid flowmeter

See previous page for frames...



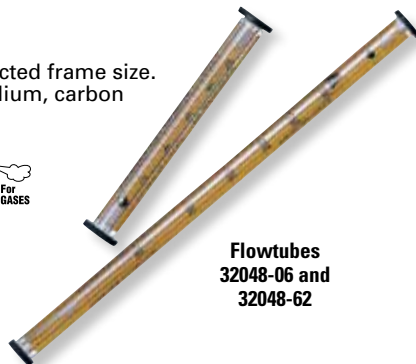
2B Direct Reading Flowtubes for Specialty Gases

Choose 65- or 150-mm flowtubes, depending on the selected frame size. Flowtubes read directly in argon, nitrogen, hydrogen, helium, carbon dioxide, or oxygen at STP (70°F/21°C and 14.7 psi/1 atm).

Specifications

Accuracy: ±5% full-scale
Repeatability: ±0.25% full-scale
Minimum flow rate: approx 10% of maximum flow rate

Materials of construction
Flowtube: heavy-walled borosilicate glass
Float: glass, stainless steel (SS), carbonyl, or sapphire



Flowtubes
32048-06 and
32048-62

Direct-Reading, Carbon Dioxide

Cat. no.	Max flow rate	Float	Price
65-mm flowtubes			
TW-32048-04	1.0 LPM	Glass	
TW-32048-05	6.0 LPM	Glass	
TW-32048-06	10 LPM	SS	
TW-32048-07	20 mL/min	SS	
TW-32048-08	55 mL/min	Glass	
TW-32048-09	220 mL/min	Sapphire	

Direct-Reading, Nitrogen

Cat. no.	Max flow rate	Float	Price
65-mm flowtubes			
TW-32048-20	12 LPM	SS	
TW-32048-21	6 mL/min	Glass	
TW-32048-22	50 mL/min	SS	
TW-32048-23	60 mL/min	Sapphire	
TW-32048-24	120 mL/min	Glass	
TW-32048-25	200 mL/min	Sapphire	
150-mm flowtubes			
TW-32048-58	1.6 scfm	SS	
TW-32048-59	2.0 LPM	Glass	
TW-32048-60	100 mL/min	Glass	
TW-32048-61	200 mL/min	Carbonyl	
TW-32048-62	300 mL/min	Carbonyl	
TW-32048-63	500 mL/min	Sapphire	

Direct-Reading, Hydrogen

Cat. no.	Max flow rate	Float	Price
65-mm flowtubes			
TW-32048-12	1.5 LPM	Carbonyl	
TW-32048-13	3.5 LPM	Glass	
TW-32048-14	6.0 LPM	Glass	
TW-32048-15	42 LPM	SS	
TW-32048-16	35 mL/min	Glass	
TW-32048-17	100 mL/min	SS	
TW-32048-18	150 mL/min	Sapphire	
TW-32048-19	600 mL/min	Glass	

Direct-Reading, Helium

Cat. no.	Max flow rate	Float	Price
65-mm flowtubes			
TW-32048-10	65 mL/min	Sapphire	
TW-32048-11	120 mL/min	Glass	
150-mm flowtubes			
TW-32048-53	5.0 LPM	Carbonyl	
TW-32048-54	40 LPM	SS	
TW-32048-55	100 mL/min	Sapphire	
TW-32048-56	500 mL/min	Carbonyl	
TW-32048-57	1500 mL/min	Glass	

REQUIRED SYSTEM Components

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- 4 Tripod base for your benchtop applications 613



Direct-Reading, Argon

Cat. no.	Max flow rate	Float	Price
65-mm flowtubes			
TW-32048-00	2.5 scfh	Glass	
TW-32048-01	10 scfh	SS	
TW-32048-02	22 scfh	SS	
TW-32048-03	50 scfh	Glass	
150-mm flowtubes			
TW-32048-50	15 LPM	SS	
TW-32048-51	33 mL/min	SS	

Direct-Reading, Oxygen

Cat. no.	Max flow rate	Float	Price
65-mm flowtubes			
TW-32048-26	1.0 LPM	Glass	
TW-32048-27	4.0 LPM	SS	
TW-32048-28	8.0 LPM	SS	
TW-32048-29	15 LPM	SS	
TW-32048-30	50 mL/min	Glass	
TW-32048-31	300 mL/min	SS	
TW-32048-32	500 mL/min	SS	
150-mm flowtubes			
TW-32048-64	5.0 LPM	Sapphire	
TW-32048-65	16.5 LPM	SS	
TW-32048-66	58 LPM	Carbonyl	
TW-32048-67	250 mL/min	SS	
TW-32048-68	400 mL/min	Sapphire	

3 Valve Cartridges

Use these metering needle valve cartridges to control flow rate. Simply insert into the valve port on the flowmeter frame. Select a valve cartridge compatible with your frame material: aluminum or stainless steel (SS). Choose a high-resolution metering valve cartridge for greater precision of flow rate.



Specifications

Materials of Construction

Frame	Aluminum	316 SS
Standard		
Body	Aluminum	316 SS
Needle	316 SS	
Orifice	PTFE	
O-rings	Buna N	Viton®
High-resolution		
Body	Brass	316 SS
Needle	316 SS	
Orifice	PTFE	
O-rings	Buna N	Viton

Flow ranges (mL/min) [†]		Aluminum frame		316 SS frame	
For air and gases	For water	Catalog number	Price	Catalog number	Price
Standard valve cartridges, 10 turn					
5000 to 20,000	0 to 350	TW-03217-92		TW-03217-82	
20,000 to 60,000	0 to 1200	TW-03217-88		TW-03217-84	
60,001	0 to 3500	TW-03217-96		TW-03217-86	
High-resolution valve cartridges, 16 turn					
0 to 200	0 to 6	TW-03218-72		TW-03218-74	
201 to 1000	3.1 to 30	TW-03218-61		TW-03218-67	
1001 to 2500	30 to 70	TW-03218-62		TW-03218-68	
2501 to 6200	71 to 200	TW-03218-63		TW-03218-69	
≥ 6201	≥ 650	TW-03218-64		TW-03218-70	

[†]If your flowtube is in units other than mL/min, convert them to mL/min and choose a valve within that flow range. See pages 2013-2016 for conversion factors.

4 Tripod Bases

Use base for benchtop applications. Three leveling screws and spirit level are built into a clear acrylic base.

Note: a tripod base is required to use the multitube frame with the common inlet flow pattern; all other multitube frames are designed for panel and tripod mounting.



Tripod base 03226-50

Catalog number	Use with	Price
For multitube frames		
TW-03226-50	2-, 4-, or 6-tube models; or isolated models	
TW-03226-40	3- or 5-tube models; or common inlet models	
For gas proportioner frames		
TW-03218-58	Models 03218-50, -52	
TW-03218-59	Models 03218-54, -56	