

# DIRECT READ VARIABLE AREA FLOW METER

**Ω OMEGA®**

## FLD Series



- ✓ Direct Read variable area flow meter for Air, Water, N<sub>2</sub>, H<sub>2</sub>, CO<sub>2</sub>, Ar, He, and O<sub>2</sub>
- ✓ Rib-Guided or Fluted Metering Tubes Facilitate Stable, Accurate Readings
- ✓ Magnifier Lens in Front Shields to Enhance Reading Resolution
- ✓ Interchangeability of Flow Tubes and Floats
- ✓ Ease of Installation and Exchange of Flow Tube
- ✓ Simple Means of Panel Mounting

Designed for direct read flow rates, the FLD Series variable area flow meter is a precision instrument embodying the inherent simplicity, versatility and economy of the classical variable area flow meter. It is particularly suitable for metering carrier gases in chromatography, indicating and controlling gases in manufacturing processes, liquid and gas measurement in laboratories, pilot plants, flow and level indicating, etc. Shipped completely assembled, flow meters include standard mounting fittings in a choice of materials, side plates, thick protective magnifying front shield and back plate, built-in control valve, and flow tubes. Panel



FLDA3220ST, shown smaller than actual size.

mounting style is convertible to bench mounting through the use of the optional acrylic tripod, FLTR-1. The tripod has a built-in spirit leveler and leveling screws.

Meters come with built-in 6 turn needle valves, high precision metering valves with “non-rising stems” 16 turn, or with no valves. The higher cost of the high resolution valves is justified whenever high sensitivity control and resolution are desirable—particularly in conjunction with metering tubes of very low flow rates. Generally, for gas metering it is recommended that valves are



FLDA3419G, shown smaller than actual size.

positioned at inlets (bottom) for liquids valves may be positioned either at inlets or outlets (top). For vacuum services, valves must be mounted at outlets. If unspecified at the time of ordering, meters will be shipped with valves mounted at the inlets.

Many fittings of various materials and styles are available. Visit us online.



Aluminum Frame Air (65 mm)	316 SS Frame Air (65 mm)	Maximum Flow	Unit
Model No.	Model No.		
FLDA3201C	FLDA3301C	2.2	scfh
FLDA3202G	FLDA3302G	6	scfh-
FLDA3203ST	FLDA3303ST	10	scfh
FLDA3204ST	FLDA3304ST	18	scfh
FLDA3205ST	FLDA3305ST	25	scfh
FLDA3206ST	FLDA3306ST	50	scfh
FLDA3207ST	FLDA3307ST	90	scfh
FLDA3208C	FLDA3308C	150	scfh
FLDA3209C	FLDA3309C	0.6	scfm
FLDA3210G	FLDA3310G	1	L/min
FLDA3211G	FLDA3311G	1.15	L/min
FLDA3212ST	FLDA3312ST	2	L/min
FLDA3213ST	FLDA3313ST	4	L/min
FLDA3214G	FLDA3314G	5	L/min
FLDA3215ST	FLDA3315ST	10	L/min
FLDA3216ST	FLDA3316ST	16	L/min
FLDA3217ST	FLDA3317ST	25	L/min
FLDA3218ST	FLDA3318ST	40	L/min
FLDA3219G	FLDA3319G	7	mL/min
FLDA3220ST	FLDA3320ST	50	mL/min
FLDA3221ST	FLDA3321ST	75	mL/min
FLDA3222G	FLDA3322G	100	mL/min
FLDA3223ST	FLDA3323ST	130	mL/min
FLDA3224C	FLDA3324C	250	mL/min
FLDA3225C	FLDA3325C	500	mL/min
FLDA3226G	FLDA3326G	1000	mL/min

Argon (65 mm) 316 SS Frame		
Model No.	Maximum Flow	Units
FLDAR3301G	2.5	scfh
FLDAR3302ST	10	scfh
FLDAR3303ST	22	scfh
FLDAR3304G	50	scfh
FLDAR3305S	1000	mL/min
Argon (150 mm) 316 SS Frame		
Model No.	Maximum Flow	Units
FLDAR3501C	2	L/min
FLDAR3502ST	15	L/min
FLDAR3503S	25	L/min
FLDAR3504C	325	mL/min
FLDAR3505G	33	mL/min

Aluminum Frame Air (150 mm)	316 SS Frame Air (150 mm)	Maximum Flow	Unit
Model No.	Model No.		
FLDA3401C	FLDA3501C	2.5	scfh
FLDA3402G	FLDA3502G	5	scfh
FLDA3403G	FLDA3503G	8.25	scfh
FLDA3404ST	FLDA3504ST	10	scfh
FLDA3405ST	FLDA3505ST	16.5	scfh
FLDA3406C	FLDA3506C	23	scfh
FLDA3407G	FLDA3507G	55	scfh
FLDA3408ST	FLDA3508ST	90	scfh
FLDA3409ST	FLDA3509ST	94	scfh
FLDA3410S	FLDA3510S	1	scfm
FLDA3411ST	FLDA3511ST	1.5	scfm
FLDA3412C	FLDA3512C	1.25	L/min
FLDA3413ST	FLDA3513ST	1.8	L/min
FLDA3414G	FLDA3514G	2.5	L/min
FLDA3415G	FLDA3515G	4	L/min
FLDA3416S	FLDA3516S	4.5	L/min
FLDA3417ST	FLDA3517ST	4.8	L/min
FLDA3418S	FLDA3518S	5	L/min
FLDA3419G	FLDA3519G	10	L/min
FLDA3420C	FLDA3520C	10	L/min
FLDA3421ST	FLDA3521ST	17	L/min
FLDA3422G	FLDA3522G	23	L/min
FLDA3425S	FLDA3525S	25	mL/min
FLDA3423ST	FLDA3523ST	42	L/min
FLDA3426S	FLDA3526S	52	mL/min
FLDA3424C	FLDA3524C	60	L/min
FLDA3427C	FLDA3527C	75	mL/min
FLDA3428ST	FLDA3528ST	100	mL/min
FLDA3429C	FLDA3529C	100	mL/min
FLDA3430ST	FLDA3530ST	150	mL/min
FLDA3431ST	FLDA3531ST	200	mL/min
FLDA3432G	FLDA3532G	300	mL/min
FLDA3433S	FLDA3533S	500	mL/min
FLDA3434G	FLDA3534G	800	mL/min

Carbon Dioxide (65 mm) Stainless Steel		
Model No.	Maximum Flow	Units
FLDC3301G	1	L/min
FLDC3302G	6	L/min
FLDC3303ST	10	L/min
FLDC3304ST	35	L/min
FLDC3305ST	20	mL/min
FLDC3306G	55	mL/min
FLDC3307S	200	mL/min
Carbon Dioxide (150 mm) Stainless Steel		
Model No.	Maximum Flow	Units
FLDC3501G	100	mL/min
FLDC3502ST	300	mL/min
FLDC3503S	10	L/min

Ordering Examples: FLDA3212ST, 65 mm variable area flow meter, 6 turn valve, aluminum frame, 316 stainless steel float, range 2 LPM air. FLDC3303ST, 65 mm variable area flow meter, 6 turn valve, 316 stainless steel frame, 316 stainless steel float, range 10 LPM carbon dioxide.

## SPECIFICATIONS

**Standard Accuracy:** ±5% of full scale (FS)

**Repeatability:** ±0.25%

**Useful Flow Range:** 10:1 minimum

**Maximum Operating Pressure:** 200 psig/13.8 bars

**Maximum Operating Temperature:** 121°C (250°F)

**Construction**

**Flow Tubes:** Heavy walled borosilicate glass

**Floats:** Glass, red sapphire, 316 stainless steel, carbonyl and tantalum

**Choice of Mounting Fittings in Contact with Fluids:**

Aluminum, black anodized or 316 stainless steel

**Side Panels:** Aluminum, black anodized

**Front Shield:** Polycarbonate resin with longitudinal magnifier lens for enhanced reading resolution

**Back Plate:** 1/8" thick white acrylics

**O-Rings and Packing:** Buna O-rings in aluminum/brass model. FKM O-rings in stainless steel meters

**Optional:** Perfluoroelastomer and EPR

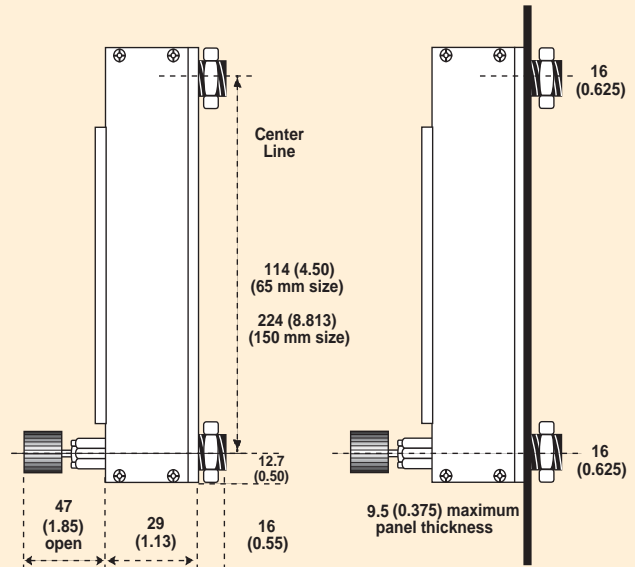
**Connections:** 1/8" NPT female inlet and outlet connections

To Order			
Aluminum Frame Water (65 mm) Model No.	316 SS Frame Water (65 mm) Model No.	Maximum Flow	Units
FLDW3201S	FLDW3301S	1	L/min
FLDW3202ST	FLDW3302ST	1.2	L/min
FLDW3203ST	FLDW3303ST	3	L/hr
FLDW3204G	FLDW3304G	0.5	mL/min
FLDW3205ST	FLDW3305ST	6	mL/min
FLDW3206G	FLDW3306G	25	mL/min
FLDW3207ST	FLDW3307ST	60	mL/min
FLDW3208ST	FLDW3308ST	115	mL/min
FLDW3209ST	FLDW3309ST	150	mL/min
FLDW3210G	FLDW3310G	250	mL/min
FLDW3211G	FLDW3311G	500	mL/min
FLDW3212ST	FLDW3312ST	750	mL/min
Aluminum Frame Water (150 mm) Model No.	316 SS Frame Water (150 mm) Model No.	Maximum Flow	Units
FLDW3401C	FLDW3501C	29	gph
FLDW3402S	FLDW3502S	0.22	gpm
FLDW3403C	FLDW3503C	0.45	gpm
FLDW3404ST	FLDW3504ST	1.2	L/min
FLDW3405T	FLDW3505T	2	L/min
FLDW3406S	FLDW3506S	1	mL/min
FLDW3407S	FLDW3507S	10	mL/min
FLDW3408ST	FLDW3508ST	20	mL/min
FLDW3409G	FLDW3509G	50	mL/min
FLDW3410G	FLDW3510G	60	mL/min
FLDW3411G	FLDW3511G	100	mL/min
FLDW3412C	FLDW3512C	200	mL/min
FLDW3413ST	FLDW3513ST	500	mL/min

**Ordering Examples:** FLDW3401C, 150 mm variable area flow meter, 6 turn valve aluminum frame, carbonyl float, range 29 GPH water.

FLDHE3504G, 150 mm variable area flow meter, 6 turn valve, 316 stainless steel frame, glass float, range 100 ml/min helium.

### Dimensions: mm (inch) Panel Mount Installation



Dimensions show flowmeter side view. Face width (not shown) is 32 mm (1.25"). Use center line dimensions for drilling panel.

Drill two 15 mm (0.59") holes to fit inlet and outlet. Maximum panel thickness is 9.5 mm (0.375"). Use the 2 retaining nuts supplied to secure flowmeter.

Helium (65 mm) 316 SS Frame		
Model No.	Maximum Flow	Units
FLDHE3301S	65	mL/min
FLDHE3302G	120	mL/min
Helium (150 mm) 316 SS Frame		
Model No.	Maximum Flow	Units
FLDHE3501S	1.25	scfh
FLDHE3502C	5	L/min
FLDHE3503ST	40	L/min
FLDHE3504G	100	mL/min
FLDHE3505C	500	mL/min
FLDHE3506G	1500	mL/min
Hydrogen (65 mm) 316 SS Frame		
Model No.	Maximum Flow	Units
FLDH3301C	1.5	L/min
FLDH3302G	3.5	L/min
FLDH3303G	6	L/min
FLDH3304ST	42	L/min
FLDH3305G	35	mL/min
FLDH3306ST	100	mL/min
FLDH3307S	150	mL/min
FLDH3308G	600	mL/min
Hydrogen (150 mm) 316 SS Frame		
Model No.	Maximum Flow	Units
FLDH3501S	225	scfh
FLDH3502G	100	mL/min



FLDA3419G,  
shown smaller  
than actual size.

## To Order

### Nitrogen (65 mm) 316 SS Frame

Model No.	Maximum Flow	Units
FLDN3301ST	12	L/min
FLDN3302G	6	mL/min
FLDN3303ST	50	mL/min
FLDN3304S	60	mL/min
FLDN3305G	120	mL/min
FLDN3306S	200	mL/min

### Nitrogen (150 mm) 316 SS Frame

Model No.	Maximum Flow	Units
FLDN3501ST	1.6	scfm
FLDN3502G	2	L/min
FLDN3503G	100	mL/min
FLDN3504C	200	mL/min
FLDN3505C	300	mL/min
FLDN3506S	500	mL/min

### Oxygen (65 mm) 316 SS Frame

Model No.	Maximum Flow	Units
FLDO3301G	1	L/min
FLDO3302ST	4	L/min
FLDO3303ST	8	L/min
FLDO3304ST	15	L/min
FLDO3305G	50	mL/min
FLDO3306ST	300	mL/min
FLDO3307ST	500	mL/min

### Oxygen (150 mm) 316 SS Frame

Model No.	Maximum Flow	Units
FLDO3501S	1	L/min
FLDO3502S	5	L/min
FLDO3503C	10	L/min
FLDO3504ST	16.50	L/min
FLDO3505C	58	L/min
FLDO3506ST	250	mL/min
FLDO3507S	400	mL/min

## Accessories

Model No.	Description
FLTR-1	Tripod for one variable area flow meter
FLTR-2	Tripod for two variable area flow meter
FLTR-3	Tripod for three variable area flow meter

Comes complete with operator's manual.

"G" suffix denotes glass float, "ST" suffix denotes 316SS float, "C" suffix denotes carbonyl float and "SA" denotes red sapphire float.

For units without valve, add suffix "-NV" to model number and subtract cost for aluminum; subtract cost for for 316SS.

For oxygen cleaning add "-02CLEAN" to model number for additional cost.

**Note:** Minimum flow rate is 10% of the maximum rate shown.

For 16 turn, high resolution non-rising stem valve for 150 mm variable area flow meter, add suffix "-HRV" to model number for additional cost.

NIST traceable calibration not available.

**Ordering Examples:** FLDN3501ST, 150 mm variable area flow meter, 6 turn valve stainless steel unit, with 316SS float, range of 1.6 scfm nitrogen.

FLDO3501S, 150 mm variable area flow meter, 6 turn valve stainless steel unit with sapphire float range of 1 LPM oxygen.