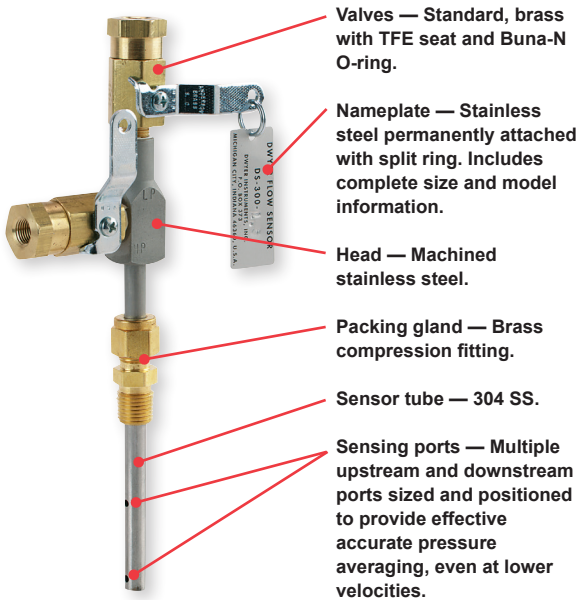
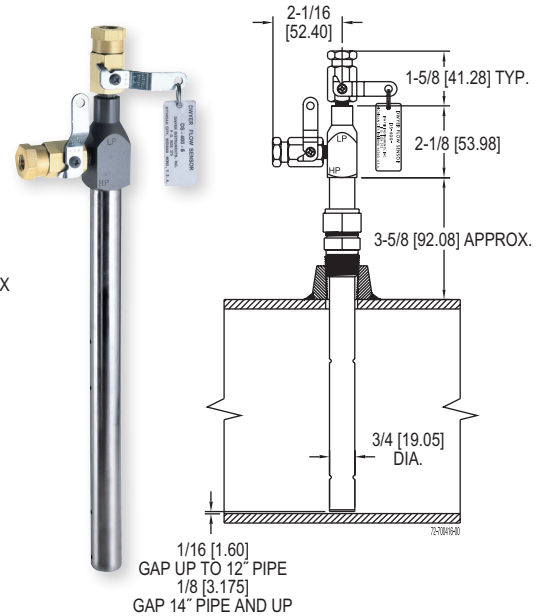
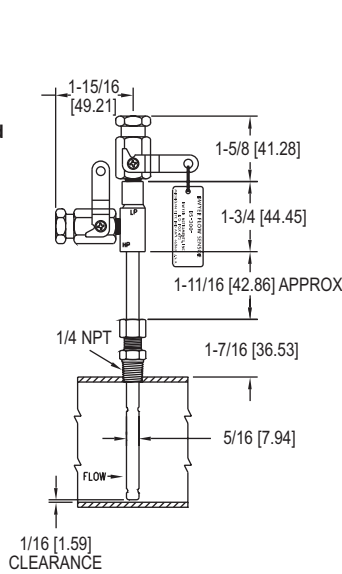


# IN-LINE FLOW SENSORS

Use with the Dwyer® Differential Pressure Gages or Transmitters



Series DS-300



Large 3/4 inch diameter for extra strength in lengths to 24 inches

Series DS-400

The **Series DS In-Line Flow Sensors** are two Series of averaging Pitot tubes for compatible gases and liquids that provide accurate and convenient flow rate sensing, for schedule 40 pipe, when purchased with suitable differential pressure gage with appropriate range. The Series DS-300 Averaging Flow Sensors are designed to be inserted in the pipeline through a compression fitting and available for pipe sizes from 1 to 10" (2.5 to 25.4 cm). Accessories include adapters with 1/4" SAE 45° flared ends compatible with hoses supplied with the Model A-471 Portable Capsuhelic® Gage Kit. The Series DS-400 Averaging Flow Sensors are designed for insertion lengths up to 24" (61 cm) and include a pair of 1/8" NPT x 1/4" SAE 45° flared adapters which are compatible with hoses used in the Model A-471 Portable Capsuhelic® Gage Kit. The supplied solid brass mounting adapter has a 3/4" dia. compression fitting to lock in required insertion length and a 3/4" male NPT thread for mounting in a threaded branch connection (not included).

## FEATURES/BENEFITS

- Multiple sensing point measurement and built-in averaging capability eliminates the need for "traversing" the flowing stream with single point velocity pressure measurement saving time
- Extremely reliable, proven technology, Pitot tubes, have been used in flow measurement for years
- All models include convenient and quick-acting quarter-turn ball valves to isolate the sensor for zeroing with 1/8" female NPT valve assembly process connections.
- Furnished with instrument shut-off valves on both pressure connections with 1/8" female NPT connections rated at 200 psig (13.7 bar) and 200°F (93.3°C)
- Where valves are not required, they can be omitted at reduced cost
- The Series DS-400 Averaging Flow Sensors are quality constructed from extra strong 3/4" dia. stainless steel to resist increased forces encountered at higher flow rates with both air and water
- Economical flow indication when used with appropriate differential pressure gage
- Rugged construction yields, non-clogging, stable design

## SPECIFICATIONS

- Service:** Compatible gases or liquids.
- Wetted Materials:** Sensor tube: 304 SS; Compression fitting: brass.
- Temperature Limit:** 200°F (93.3°C).
- Pressure Limit:** 200 psig (13.78 bar) at 200°F (93.3°C).
- Pipe Sizes:** DS-300: 1 to 10" (2.5 to 25.4 cm); DS-400: 6 to 24" (15.2 to 61 cm).
- Process Connections:** DS-300: 1/4" male NPT compression fitting included; DS-400: 3/4" male NPT compression fitting included.
- Piping Connections:** DS-300: 1/8" female NPT; optional 1/8" female NPT x 1/4" SAE 45 flared adapter sold separately; DS-400: 1/8" female NPT with 1/8" female NPT x 1/4" SAE 45 flared adapters include.
- Weights:** Consult factory.

## APPLICATIONS

- Remediation
- Natural, flare, flue, stack gas
- Boiler feedwater
- Cooling water
- Superheated, saturated, or geothermal steam
- Combustion or compressed air
- Oil flow monitoring



# IN-LINE FLOW SENSORS

Use with the Dwyer® Differential Pressure Gages or Transmitters

### HOW TO ORDER

Merely determine the pipe size into which the flow sensor will be mounted and designate the size as a suffix to Model DS-300. For example, a flow sensor to be mounted in a 2" pipe would be a Model No. DS-300-2".

For non-critical water and air flow monitoring applications, the chart below can be utilized for ordering a stock Capsuhelic® differential pressure gage for use with the DS-300 flow sensor. Simply locate the maximum flow rate for the media being measured under the appropriate pipe size and read the Capsuhelic® gage range in inches of water column to the left. The DS-300 sensor is supplied with installation and operating instructions, Bulletin F-50. It also includes complete flow conversion information for the three media conditions shown in the chart below. This information enables the user to create a complete differential pressure to flow rate conversion table for the sensor and differential pressure gage employed. Both the Dwyer® Capsuhelic® gage and flow sensor feature excellent repeatability so, once the desired flow rate is determined, deviation from that flow in quantitative measure can be easily determined. You may wish to order the adjustable signal flag option for the Capsuhelic® gage to provide an easily identified reference point for the proper flow.

Capsuhelic® gages with special ranges and/or direct reading scales in appropriate flow units are available on special order for more critical applications. Customer supplied data for the full-scale flow (quantity and units) is required along with the differential pressure reading at that full flow figure. Prior to ordering a special Capsuhelic® differential pressure gage for flow read-out, we recommend you request Bulletin F-50 to obtain complete data on converting flow rates of various media to the sensor differential pressure output. With this bulletin and after making a few simple calculations, the exact range gage required can easily be determined.

MODEL CHART			
Model	Description	Model	Description
DS-300-1"	1" pipe size	DS-400-6"	6" pipe size
DS-300-1-1/4"	1-1/4" pipe size	DS-400-8"	8" pipe size
DS-300-1-1/2"	1-1/2" pipe size	DS-400-10"	10" pipe size
DS-300-2"	2" pipe size	DS-400-12"	12" pipe size
DS-300-2-1/2"	2-1/2" pipe size	DS-400-14"	14" pipe size
DS-300-3"	3" pipe size	DS-400-16"	16" pipe size
DS-300-4"	4" pipe size	DS-400-18"	18" pipe size
DS-300-6"	6" pipe size	DS-400-20"	20" pipe size
DS-300-8"	8" pipe size	DS-400-24"	24" pipe size
DS-300-10"	10" pipe size		

OPTIONS	
To order add suffix:	Description
-LV	DS-300 or DS-400 less valves



-LV option

RANGE CHART		Full Range Flows by Pipe Size (Approximate)									
Gage Range (in w.c.)	Media @ 70°F	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"	10"
		2	Water (GPM)	4.8	8.3	11.5	20.5	30	49	86	205
2	Air @ 14.7 PSIA (SCFM)	19.0	33.0	42.0	65.0	113	183	330	760	1340	2130
2	Air @ 100 PSIG (SCFM)	50.0	90.5	120.0	210.0	325	510	920	2050	3600	6000
5	Water (GPM)	7.7	14.0	18.0	34.0	47	78	138	320	560	890
5	Air @ 14.7 PSIA (SCFM)	30.0	51.0	66.0	118.0	178	289	510	1200	2150	3400
5	Air @ 100 PSIG (SCFM)	83.0	142.0	190.0	340.0	610	820	1600	3300	5700	10000
10	Water (GPM)	11.0	19.0	25.5	45.5	67	110	195	450	800	1260
10	Air @ 14.7 PSIA (SCFM)	41.0	72.0	93.0	163.0	250	410	725	1690	3040	4860
10	Air @ 100 PSIG (SCFM)	120.0	205.0	275.0	470.0	740	1100	2000	4600	8100	15000
25	Water (GPM)	18.0	32.0	40.5	72.0	108	173	310	720	1250	2000
25	Air @ 14.7 PSIA (SCFM)	63.0	112.0	155.0	255.0	390	640	1130	2630	4860	7700
25	Air @ 100 PSIG (SCFM)	185.0	325.0	430.0	760.0	1200	1800	3300	7200	13000	22000
50	Water (GPM)	25.0	44.0	57.5	100.0	152	247	435	1000	1800	
50	Air @ 14.7 PSIA (SCFM)	90.0	161.0	205.0	360.0	560	900	1600	3700	6400	
50	Air @ 100 PSIG (SCFM)	260.0	460.0	620.0	1050.0	1700	2600	4600	10000	18500	
100	Water (GPM)	36.5	62.0	82.0	142.0	220	350	620	1500		
100	Air @ 14.7 PSIA (SCFM)	135.0	230.0	300.0	505.0	800	1290	2290	5000		
100	Air @ 100 PSIG (SCFM)	370.0	660.0	870.0	1500.0	2300	3600	6500	15000		

ACCESSORIES	
Model	Description
A-160	Threaded branch connection, 3/8" NPT, forged steel, 3000 psi
A-161	Brass bushing, 1/4" x 3/8"
A-471	Portable kit. For portable operation, the A-471 Capsuhelic® portable gage kit is available complete with tough polypropylene carrying case, mounting bracket, 3-way manifold valve, two 10' high pressure hoses, and all necessary fittings. ①
631B	Capsuhelic® wet/wet differential pressure transmitter. Low pressure transmitter for use with DS-300/400 flow sensors. Use Series 631B Capsuhelic® wet/wet differential pressure transmitter.



Capsuhelic® gage shown installed in A-471 portable kit



Series 631B



① See page 31 (Series 4000)