Standard Series - S - M - L - XHF

Vane In-Line Variable Area Flowmeters

- Zero straight pipe runs required before or after the meter
- Standard mechanical sensor pointer does not require power
- 10:1 turndown for added measuring flexibility for flow rates of 30 GPM or greater
- Rugged construction
- Multi-directional mounting

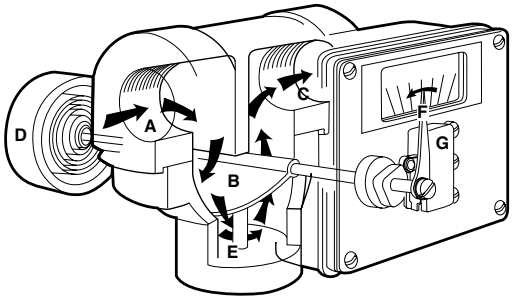
Description

The Standard Series is a range of Vane In-Line Variable Area Flowmeters. It includes the Series SN, SM, SH, SX, MH, MM, MN, MX, LN, LE, and XHF, which are mechanical vane variable area flow meters with visual and electronic output options. It is offered with inscribed scale displays via pointer or numeric digital LCD options. It includes optional mechanical or electronic output options such as 4 mA to 20 mA analog output, and HART® protocol. It is available in pipe sizes 8 mm to 203 mm (1/4 in to 8 in) and flows of 2 LPM to 5600 LPM (0.5 GPM to 1500 GPM) for liquids with viscosity up to 650 centistokes.

All flow meters are individually calibrated for fluids with the viscosity specified at order (up to 3000SSU/650 Centistokes). DwyerOmega also compensate for the fluid's specific gravity. For NIST traceability please consult factory.

Applications

- Cooling water monitoring
- Plastic injection molding coolant control
- Oil measurement
- Lubricant flow control
- Hydraulic flow
- Pump protection
- Hazardous areas



Fluid enters at **A**, passes around the semi-circular vane **B**, exits at outlet **C**. The vane resists the flow because of the spring **D**. The further the vane is pushed the larger the passageway **E** becomes. This minimizes the pressure drop. The vane shaft turns to operate the pointer **F** and remote signal devices such as the switch **G**.

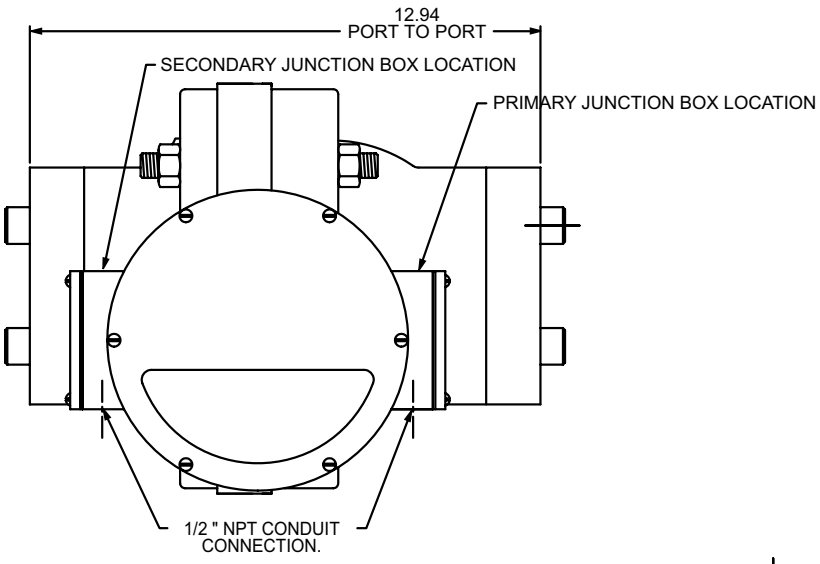
Specifications

Service	Compatible liquids.
Range	See flow rate chart.
Display	Standard analog scale and pointer display with optional numeric digital LCD (model selectable).
Wetted Materials	Flow body: Aluminum, brass or 316 SS; 316L SS; Seal: Buna-N or Viton®.
Accuracy	(model selectable) M-L-XHF Series +/- 5 % of full scale S series
Repeatability	1 % of reading.
Temperature Limits	93 °C (200 °F) or HT option 205 °C (400 °F); Transmitters HT 150 °C (300 °F); Ambient temperature: 65 °C (150 °F) to 41 °C (105 °F).
Pressure Limits	SX-P & MX-P: 13.8 bar (200 psi) SX-V: 6.9 bar (100 psi) SN-MN-LN-XHF: 20.7 bar (300 psi) SM-MM-LE: 34.5 bar (500 psi) SH-MH: 137.9 bar (2000 psi)
Pressure Drop	S Series: 2.2 psid average up to 8 GPM; M series: 3.8 GPM max till 80 GPM L series: 3.8 GPM max till 300 GPM & XHF up to 800 GPM
Response Time	250 ms.
Power Requirements	Standard: None; 4 mA to 20 mA analog output or HART® protocol: 10 Vdc to 30 Vdc, 0.25 A @ 24 Vdc; Intrinsically safe transmitter*: 10 Vdc to 24 Vdc, 0.25 A @ 24 Vdc.
Output	4 mA to 20 mA (model selectable).
Deadband	Alarm output: 2.5 % FS for up to 1/2 in; 5 % FS for larger than 1/2 in.

Viscosity	650 centistokes max.
Enclosure Rating	Type 12 (IP52), Type 4 (IP66) or Type 4X (IP65) (model selectable).
Process Connection	Female NPT, SAE, BSPT, BSPP or ANSI RF flanges (model selectable).
Electrical Connection	3/4 in NPT for A, L, Z and T-box enclosures; 1/2 in NPT for R-box enclosure.
Weight	1.8 kg to 68 kg (4 lb to 150 lb) (model dependent).
Installation Orientation	In-line and in any position.
Straight Pipe Run	Zero straight pipe runs before or after, meter required.
Switch Output Compliance	General purpose or rated for hazardous locations (all classes, groups and divisions) (model selectable).
Compliance	CE, ETL.
*Only when used with intrinsically safe barrier.	

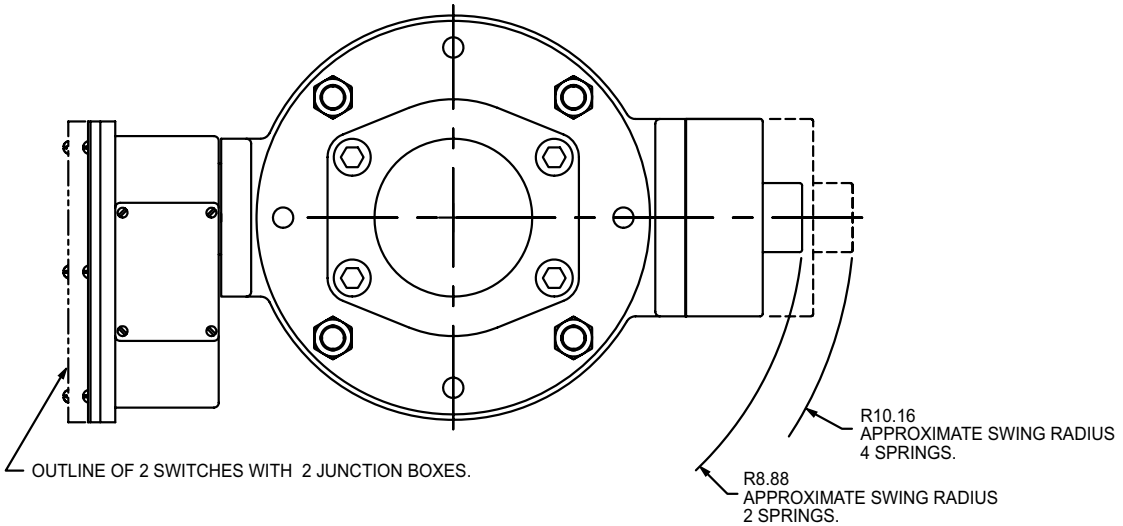
Dimensions and Wiring Diagram

"L" Models

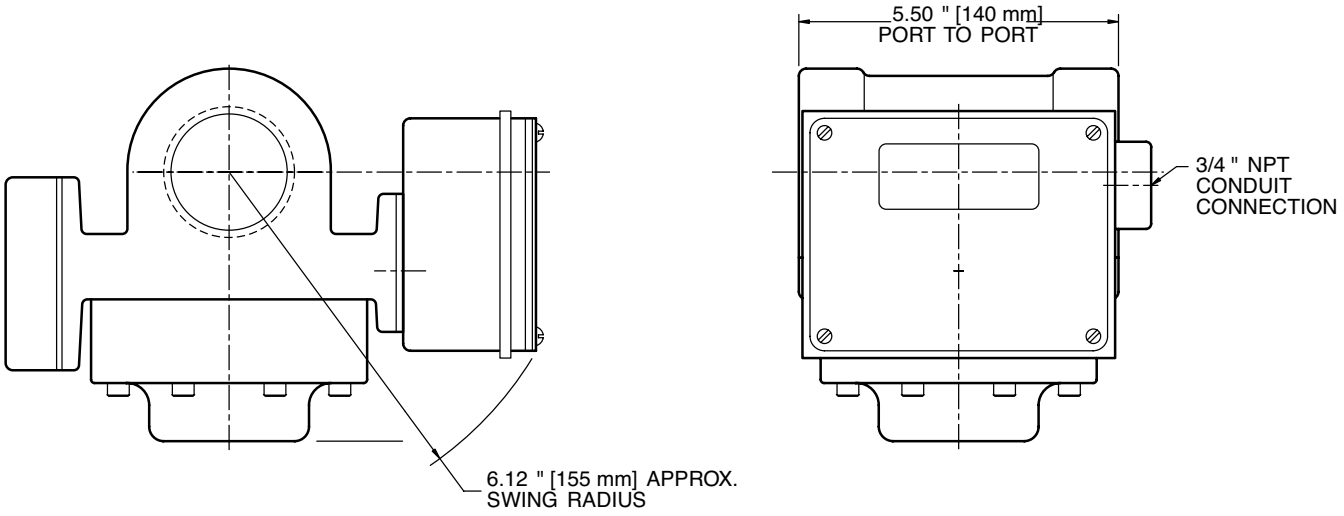


Round Enclosure Junction Box Options

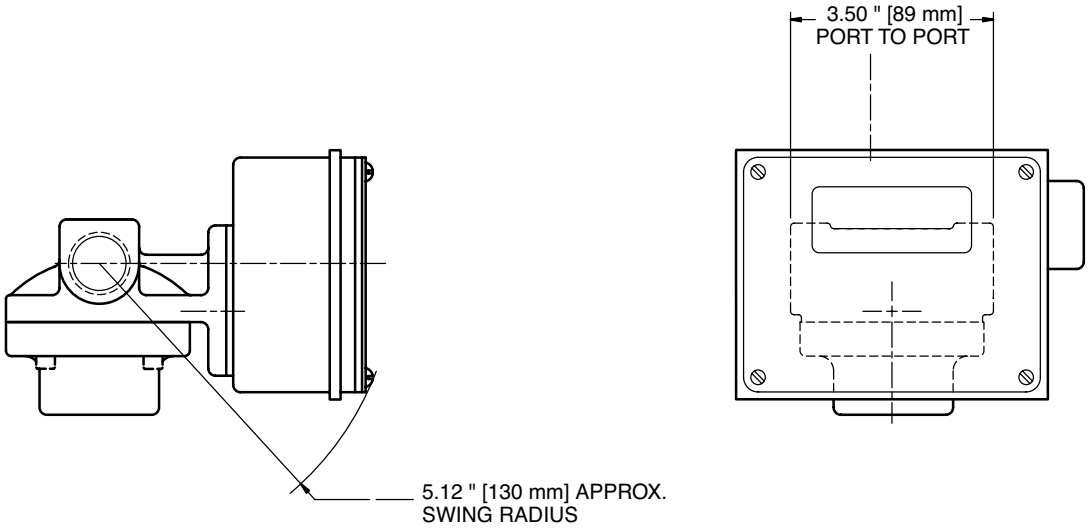
No Junction Box	Pointer only, no electrical components.
1 Junction Box Primary Location	One type of electrical item Only - 1 or 2 Switches or Transmitter, but NOT both.
2 Junction Boxes	Transmitter AND 1 or 2 Switches.



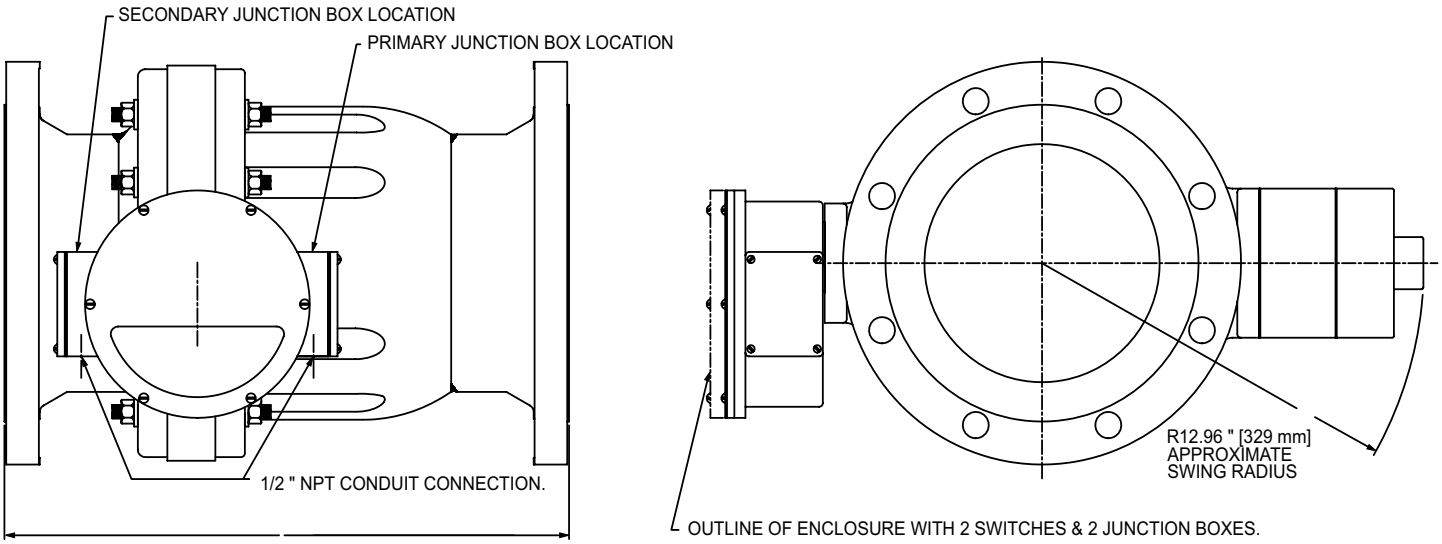
"M" Models



"S" Models



"XHF" Models



Ordering Guide

Use the **bold** characters from the chart below to construct a product code. Note: This specification sheet is intended to show all options available, please reference the configurator and DwyerOmega applications team for compatibility.

An example product code 'SN-DIB30LM-2-1C1-AX0NR' is outlined and explained over the next three pages.

SN	-D	I	B	30LM		-2	-1	C	1.00		-A

Series
SN: Small Vane Normal Pressure (300 psi)
SM: Small Vane Medium Pressure (500 psi)
SH: Small Vane High Pressure (2000 psi)
SX: Small Vane Low Pressure (100 psi to 200 psi)
MN: Medium Vane Normal Pressure (300 psi)
MM: Medium Vane Medium Pressure (500 psi)
MH: Medium Vane High Pressure (2000 psi)
MX: Medium Vane Low Pressure (200 psi)
LN: Large Vane Normal Pressure (300 psi)
LE: Large Vane High Pressure (1000 psi)
XHF: Extra Large Vane Normal Pressure (300 psi)

Housing Material
-A: Aluminum with Nylon Flow Chamber
-B: Brass with Nylon Flow Chamber
-D: Aluminum
-F: Brass
-I: 316 Stainless Steel
-M: Carbon Steel
-V: PVC
-P: Polysulfone

Internal Moving Parts
I: 316 Stainless Steel
T: Titanium

Seal Material
B: Buna N
F: Fluorocarbon FKM
K: Kalrez and Fluorocarbon FKM

Max Flow Rate Liquids
XGH: 30 GPH to 1200 GPH
XGM: 0.5 GPM to 1500 GPM
XGLM: Gallons/Liters per minute scale
XLH: 100 LPM to 4000 LPM
XLM: 2 LPM to 5000 LPM
XCMH: 0.1 CMH to 340 CMH

Hand Operated Globe Valve
BLANK: No Valve
V: Brass Valve

Process Connection Threaded
2: 1/4 in (6.35 mm) NPT Female
3: 3/8 in (9.53 mm) NPT Female
4: 1/2 in (12.70 mm) NPT Female
6: 3/4 in (19.05 mm) NPT Female
8: 1 in (25.40 mm) NPT Female
10: 1-1/4 in (XX mm) NPT Female
12: 1-1/2 in (38.10 mm) NPT Female
16: 2 in (XX mm) NPT Female
4T: 1/4 in (6.35 mm) SAE
6T: 3/8 in (9.53 mm) SAE
8T: 1/2 in (12.70 mm) SAE
10T: 5/8 in (15.88 mm) SAE
12T: 3/4 in (19.05 mm) SAE
16T: 1 in (25.40 mm) SAE
20T: 1-1/4 in (XX mm) SAE
24T: 1-1/2 in (38.10 mm) SAE
4BP: 1/4 in (6.35 mm) BSPP
6BP: 3/8 in (9.53 mm) BSPP
8BP: 1/2 in (12.70 mm) BSPP
12BP: 3/4 in (19.05 mm) BSPP
16BP: 1 in (25.40 mm) BSPP
20BP: 1-1/4 in (XX mm) BSPP
24BP: 1-1/2 in (38.10 mm) BSPP
32BP: 2 in (XX mm) BSPP
4BT: 1/2 in (12.70 mm) BSPT
6BT: 3/4 in (19.05 mm) BSPT
8BT: 1/2 in (12.70 mm) BSPT
12BT: 3/4 in (19.05 mm) BSPT
16BT: 1 in (25.40 mm) BSPT
20BT: 1-1/4 in (XX mm) BSPT
24BT: 1-1/2 in (38.10 mm) BSPT
32BP: 2 in (XX mm) BSPT
2MP: 1/4 in (6.35 mm) Plastic Male
4MP: 1/2 in (12.7 mm) Plastic Male
6MP: 3/4 in (19.0 mm) Plastic Male
8MP: 1 in (25.4 mm) Plastic Male
2FP: 1/4 in (6.35 mm) Plastic Female
4FP: 1/2 in (12.7 mm) Plastic Female
6FP: 3/4 in (19.0 mm) Plastic Female
4FS: 1/2 in (12.7 mm) 316SS Female
6FS: 3/4 in (19.0 mm) 316SS Female
8I: 1 in (25.4 mm) 316 SS Female Adapter
12I: 1-1/2 in (38.1 mm) 316 SS Female Adapter
8P: 1 in (25.4 mm) Polysulfone NPT Female Adapter
12P: 1-1/2 in (38.1 mm) Polysulfone NPT Female Adapter

Flanged
Flanged options available with the selection of Attachment, Material, Class, and Style. Refer to configuration for options.
Code example: SN-DIB30LM- [12 (flanged) FW (Attachment) CS (material) 150 (class) RF (style)] -1C1-A

SN	-D	I	B	30LM		-2	-1	C	1.00		-A	X0	N	R		

Fluid Characteristics
XXX: Custom Viscosity SSU (V); Centistokes (CS) Centipoise (C)
32: 32 Saybolt Seconds Universal (SSU V) (Water)
1: 1 (Water) Centipoise (C)

Viscosity Units
V: SSU
C: Centipoise
CS: Centistokes

Specific Gravity
0.9
1.00: 1.00 (Water)
XXX: Custom Specific Gravity

Single / Dual
BLANK: Single Viscosity
/XXXXX: Dual Viscosity ie: 40/400V

Control Box
A: Analog Flow Rate Display in Polysulfone Box (A Box)
L: Analog Flow Rate Display in Aluminum Box (L Box)
Z: Analog Flow Rate Display in 316 SS Box (Z Box)
TX: Analog Flow Rate Display with 4 mA to 20 mA Transmitter (T Box) intrinsically safe with approved barriers - (only true for TX0 and RX0)
TXL: Digital LCD Flow Rate Display with 4 mA to 20 mA Transmitter (T Box) with open collector alarms
TH: Analog Flow Rate Display, HART & 4 mA to 20 mA Transmitter (T Box)
R: Greater resolution Analog flow rate display (R Box)
RX: Greater resolution Analog flow rate display with 4 mA to 20 mA Transmitter (R Box) intrinsically safe with approved barriers - (only true for TX0 and RX0)
RH: Greater resolution Analog flow rate display, HART & 4 mA to 20 mA Transmitter output (R Box)

Readout
X0: 4 mA to 20 mA transmitter (intrinsically safe with approved barriers)
- Only available for Control box A-Z
- Ax0, ZX0, TX0, TXL0, and RX0 are the only configurations that are intrinsically safe with approved barriers

H0: HART and 4 mA to 20 mA output
- Only available for Control box A-L-Z

0: Display
1: One SPDT (3 wire)
1B: One high vibration SPDT (3 wire)
2: Two SPDT (3 wire)
2B: Two high vibration SPDT (3 wire)
3: One SPDT (4 wire)
4: Two SPDT (4 wire)
61: One SPDT (3 wire) high temperature
62: Two SPDT (3 wire) high temperature
7: One SPDT hazardous location
- Only available for R-box configurations

17: One DPDT hazardous location
- Only available for R-box configurations

18: Two SPDT hazardous location
- Only available for R-box configurations

19: Two DPDT hazardous location
- Only available for R-box configurations

71: One SPDT (3 wire) gold contact
72: Two SPDT (3 wire) gold contact
53: One SPDT (3 wire) hermetically sealed
54: Two SPDT (3 wire) hermetically sealed

Service
N: Oil and dust tight (Type 12)
W: Weatherproof (Type 4)
X: Weatherproof, corrosion proof (Type 4X)

SN	-D	I	B	30LM		-2	-1	C	1.00		-A	X0	N	R		

Flow Direction
R: Left to right
L: Right to left
U: Up
D: Down

Special Options
HT: High Temp 400 °F (300 °F for transmitter options) (contact factory for requirements)
ST: Stainless Steel ID tag
TG: Safety Glass Window
E: Manual override
DS: Dual spring for reading lower flow rates on high flow units
Z86: Clearance vane for better particulate tolerance
Z67: Stainless Steel Bowl Bolts
F: Foot mount bracket
W: Wall Mount bracket
Z17: Epoxy Coating Exterior SN-MN-LN
Z25: 3000 psi option 3:1 safety meter
NIST: NIST Certificate

Switch Setting
BLANK: Lowest possible setting (typically 10 % of maximum flow) Desired set point is assumed to be in flow units already selected.
D: Down/Decreasing Flow
U: Up/Increasing Flow