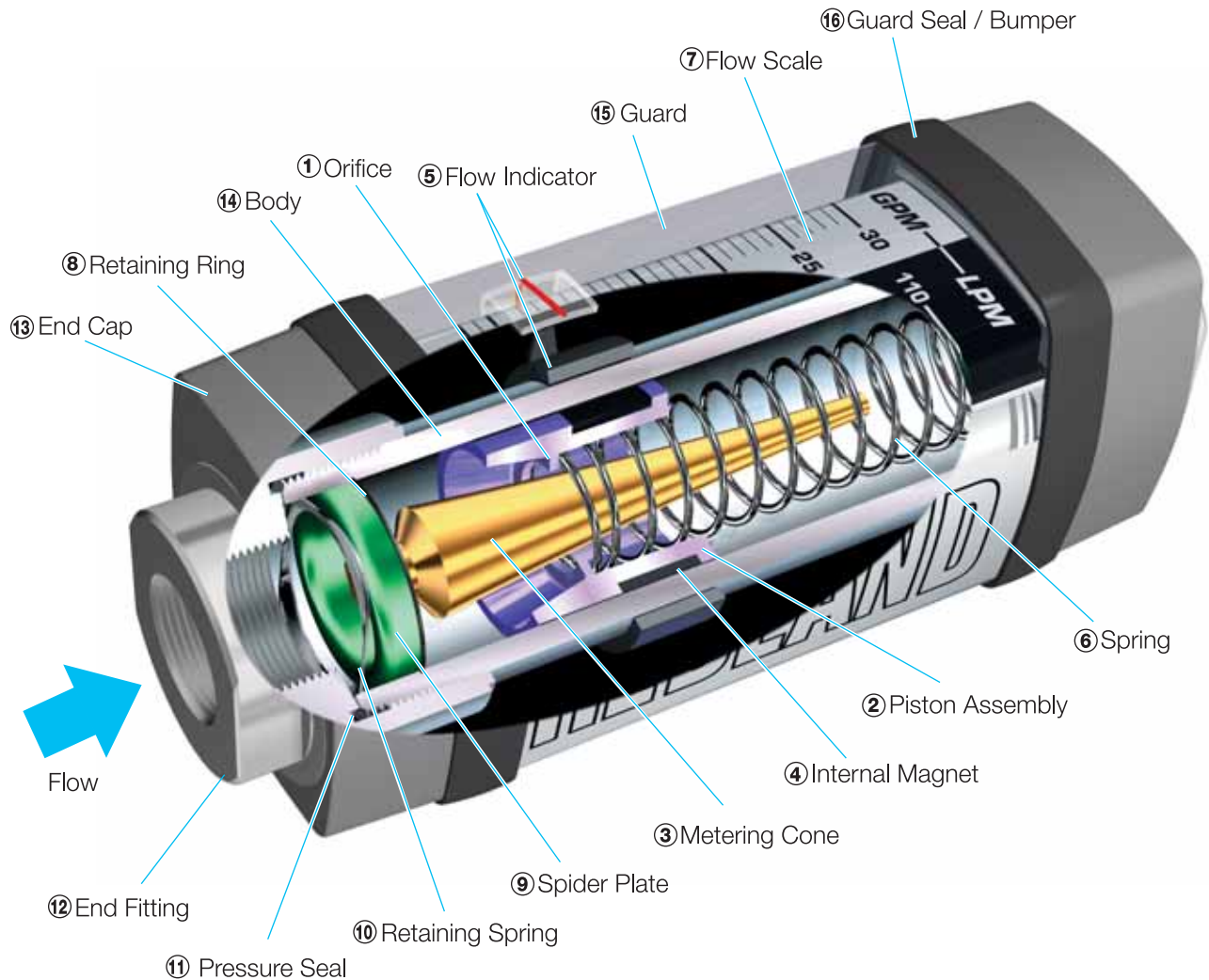


General Design Features



OPERATING PRINCIPLE

The Hedland flow meter is a variable area instrument. A precision machined, sharp-edged Orifice ① located within the Piston Assembly ②, forms an annular opening with the contoured Metering Cone ③. The Piston Assembly carries a cylindrical PPS/Ceramic Magnet ④ that is magnetically coupled to an external Flow Indicator ⑤ that moves precisely, in direct response to movement of the Piston. A calibrated Spring ⑥ opposes flow in the forward direction. This spring decreases viscosity sensitivity and allows the flow meter to be used in any position, including inverted.

Bi-directional flow capability: If required, a reverse flow by-pass option is available and is depicted on individual product pages. Note that flow is measured in the forward direction only.

Operates in any position: The Hedland in-line flow meter's unique spring-loaded variable area design allows meters to be installed in any position without affecting accuracy. An optional inverted flow scale is also available.

Easier to read linear scale: This flow meter is the most readable product in its class. Brightly colored indicators move over the graduated, linear Flow Scale ⑦ which contains bold, easy-to-read numerals and gauge marks. This enhanced resolution virtually eliminates parallax problems associated with competitive, direct reading flow meters.

360° Rotatable guard/scale: Hedland's unique design allows the meter to be installed in any orientation without regard to scale direction. Once the meter is permanently installed, the guard/scale can be rotated 360° to optimize readability.

Rugged construction: Flow meters are available in anodized aluminum, brass, T303 and T316 stainless steel, with SAE, NPTF, BSPP, and Code 61 and Code 62 4-bolt flanged ports. This easy-to-read flow meter is a reliable and trouble-free flow rate indicator, monitoring a variety of liquids and gases (including aggressive chemicals), under a wide range of pressures, temperatures and rigorous conditions encountered in industrial applications.

No flow straighteners or special piping: The Hedland design does not require special plumbing or accessories to stabilize turbulent flow. Flow meters can be installed immediately adjacent to 90-degree elbows or other components to provide greatest system design flexibility, while saving installation time and money.

Relatively insensitive to shock and vibration: This unique design is inherently less sensitive to shock and vibration than other variable area flow meters. The new, improved coupling forces between the internal and external magnets greatly reduce the chance of decoupling the flow indicator under high flow and pressure transients. The magnetic coupling also eliminates the need for mechanical linkages that wear, loosen and leak over the functional life of competitive meters.

3500/6000 PSI Flow Meters

For Petroleum Fluids

- Direct reading
- Install in any position
- 360° rotatable guard/scale
- Easier-to-read linear scale
- No flow straighteners or special piping required
- Relatively insensitive to shock and vibration
- Good viscosity stability
- Temperature up to 240 °F
- Accuracy $\pm 2\%$ full scale
- Repeatability $\pm 1\%$
- Special scales available
- Calibrated for .876 S.G.



SPECIFICATIONS:

MATERIALS:

2024 - T351 Anodized aluminum body, piston and cone

C360 Brass body, piston and cone

T303 Stainless body, 2024 - T351 Anodized aluminum piston and cone

COMMON PARTS:

Spider Plate: T316 SS

Spring: T302 SS

Fasteners: T303 SS

Pressure Seals: Viton®

Guard: Polycarbonate

Retaining Ring: SAE 1070/1090 Carbon Steel

Retaining Spring: SAE 1070/1090 Carbon Steel

Indicator and Internal Magnet: PPS / Ceramic

Guard Seal / Bumper: Buna N

Scale Support: 6063 - T6 Aluminum

End Caps: Nylon ST

THREADS: SAE J1926/1, NPTF ANSI B2.2, BSPP ISO1179, Code 61 and Code 62: SAEJ518

TEMPERATURE RANGE: -20 to +240 °F (-29 to +116 °C) for higher temp. meters, see page 13

PRESSURE RATING:

Aluminum / Brass Operating: 3,500 psi/241 bar max. (800 psi/55 bar max. for 3" series) with a 3:1 safety factor.

For High Cycle Applications: See page 7

Stainless Steel Operating: 6,000 psi/414 bar max. (5,000 psi/345 bar max. for 3/4" to 1-1/2" series) with a 3:1 safety factor.

For High Cycle Applications: See page 7

PRESSURE DROP: See Ordering Information Table, page 10.

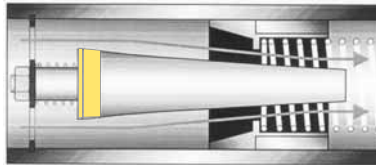
For detailed differential pressure charts, see page 55.

ACCURACY: $\pm 2\%$ of full scale

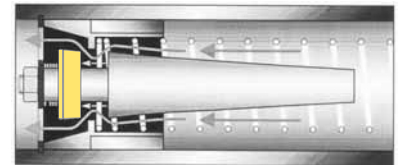
REPEATABILITY: $\pm 1\%$

REVERSE FLOW BY-PASS OPTION:

Features a two-piece cone that responds to flow in the primary flow direction in the same manner as the standard design. Flow in the reverse direction causes the lower cone shuttle to shift, moving it below the sharp-edged piston orifice. This shift creates a gap which allows the fluid to flow freely in the reverse direction.



Normal Flow Direction



Reverse Flow By-Pass

DIMENSIONS:

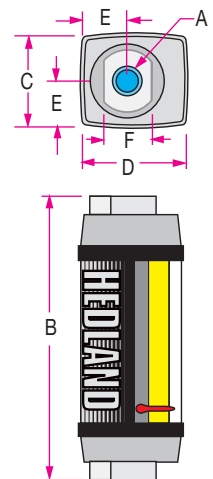
A	B	C	D	E	F
NOMINAL PORT SIZE	LENGTH in (mm)	WIDTH in (mm)	DEPTH in (mm)	OFFSET in (mm)	FLATS in (mm)
1/4 (SAE 6)	4.8 (122)	1.68 (43)	1.90 (48)	.84 (21)	.88 (22)
1/2 (SAE 10)	6.6 (168)	2.07 (53)	2.40 (61)	1.04 (26)	1.25 (32)
3/4 (SAE 12)	7.2 (183)	2.48 (63)	2.85 (72)	1.24 (32)	1.50 (38)
1 (SAE 16)	7.2 (183)	2.48 (63)	2.85 (72)	1.24 (32)	1.75 (44)
1-1/4 (SAE 20)	12.2 (310)	4.12 (105)	4.72 (120)	2.06 (52)	2.75 (70)
1-1/2 (SAE 24)	12.2 (310)	4.12 (105)	4.72 (120)	2.06 (52)	2.75 (70)

NOTE: Dimensions for 1-1/2" Code 62, 3" and 3" Code 61 can be found on page 72.

Weights for all sizes can be found on page 73.

⊗3 inch models have Celcon® piston/piston ring

Celcon is a registered trademark of Hoechst Celanese Corp. Viton is a registered trademark of DuPont Dow Elastomers



3500/6000 PSI Flow Meters

For Petroleum Fluids

ORDERING INFORMATION:

NOMINAL PORT SIZE ²	FLOW RANGE		PRESSURE DROP			MODEL NUMBER <i>(see example below)</i>			MATERIAL			OPTIONS
	GPM	LPM	50% FLOW PSI (BAR)	100% FLOW PSI (BAR)	REVERSE 100% FLOW PSI (BAR)	SAE	NPTF	BSPP ³	ALUMINUM 3500 PSI	BRASS 3500 PSI	STAINLESS	REVERSE FLOW
1/4" SAE 6	.02 - 0.2	0.1 - 0.75	3.5 (.24)	4.0 (.28)		H200 * - 002 - †	H201 * - 002 - †	H202 * - 002 - †	A	B	S	6000 PSI Not Available
	.05 - 0.5	0.2 - 1.9	3.0 (.21)	5.0 (.35)		H200 * - 005 - †	H201 * - 005 - †	H202 * - 005 - †				
	0.1 - 1.0	0.5 - 3.75	4.0 (.28)	9.0 (.62)		H200 * - 010 - †	H201 * - 010 - †	H202 * - 010 - †				
	0.2 - 2.0	1 - 7.5	6.0 (.41)	13 (.90)		H200 * - 020 - †	H201 * - 020 - †	H202 * - 020 - †				
1/2" SAE 10	0.1 - 1.0	0.5 - 3.75	2.0 (.14)	2.75 (.19)	5.2 (.36)	H600 * - 001 - †	H601 * - 001 - †	H602 * - 001 - †	A	B	S	6000 PSI RF
	0.2 - 2.0	1 - 7.5	2.0 (.14)	3.0 (.21)	9.6 (.66)	H600 * - 002 - †	H601 * - 002 - †	H602 * - 002 - †				
	0.5 - 5.0	2 - 19	3.0 (.21)	6.0 (.41)	4.8 (.33)	H600 * - 005 - †	H601 * - 005 - †	H602 * - 005 - †				
	1 - 10	5 - 38	4.0 (.28)	9.5 (.66)	23.0 (1.6)	H600 * - 010 - †	H601 * - 010 - †	H602 * - 010 - †				
	1 - 15	4 - 56	6.5 (.45)	18.5 (1.3)	55.2 (3.8)	H600 * - 015 - †	H601 * - 015 - †	H602 * - 015 - †				
3/4" SAE 12	0.2 - 2.0	1 - 7.5	1.0 (.07)	2.0 (.14)	2.9 (.20)	H700 * - 002 - †	H701 * - 002 - †	H702 * - 002 - †	A	B	S	5000 PSI RF
	0.5 - 5.0	2 - 19	2.5 (.17)	3.5 (.24)	5.3 (.37)	H700 * - 005 - †	H701 * - 005 - †	H702 * - 005 - †				
	1 - 10	5 - 38	3.5 (.24)	9.0 (.62)	8.8 (.61)	H700 * - 010 - †	H701 * - 010 - †	H702 * - 010 - †				
	2 - 20	10 - 76	4.0 (.28)	9.0 (.62)	18.0 (1.24)	H700 * - 020 - †	H701 * - 020 - †	H702 * - 020 - †				
	3 - 30	10 - 115	7.0 (.48)	16.5 (1.1)	45.1 (3.11)	H700 * - 030 - †	H701 * - 030 - †	H702 * - 030 - †				
1" SAE 16	0.2 - 2.0	1 - 7.5	1.0 (.07)	2.0 (.14)	2.9 (.20)	H760 * - 002 - †	H761 * - 002 - †	H762 * - 002 - †	A	B	S	5000 PSI RF
	0.5 - 5.0	2 - 19	2.5 (.17)	3.5 (.24)	5.3 (.37)	H760 * - 005 - †	H761 * - 005 - †	H762 * - 005 - †				
	1 - 10	5 - 38	3.5 (.24)	9.0 (.62)	8.8 (.61)	H760 * - 010 - †	H761 * - 010 - †	H762 * - 010 - †				
	2 - 20	10 - 76	4.0 (.28)	9.0 (.62)	18.0 (1.24)	H760 * - 020 - †	H761 * - 020 - †	H762 * - 020 - †				
	3 - 30	10 - 115	7.0 (.48)	16.5 (1.1)	45.1 (3.11)	H760 * - 030 - †	H761 * - 030 - †	H762 * - 030 - †				
	4 - 40	15 - 150	9.0 (.62)	24 (1.7)	87.5 (6.04)	H760 * - 040 - †	H761 * - 040 - †	H762 * - 040 - †				
1-1/4" SAE 20	3 - 30	10 - 110	3.0 (.21)	4.0 (.28)	4.8 (.33)	H800 * - 030 - †	H801 * - 030 - †	H802 * - 030 - †	A	B	S	5000 PSI RF
	5 - 50	20 - 190	3.5 (.24)	7.0 (.48)	12.5 (.86)	H800 * - 050 - †	H801 * - 050 - †	H802 * - 050 - †				
	10 - 75	40 - 280	5.0 (.35)	10.5 (.72)	31.9 (2.2)	H800 * - 075 - †	H801 * - 075 - †	H802 * - 075 - †				
	10 - 100	50 - 380	6.5 (.45)	15 (1.0)	39.0 (2.7)	H800 * - 100 - †	H801 * - 100 - †	H802 * - 100 - †				
	10 - 150	50 - 560	10.5 (.72)	27.5 (1.9)	110 (7.6)	H800 * - 150 - †	H801 * - 150 - †	H802 * - 150 - †				
1-1/2" SAE 24	3 - 30	10 - 110	3.0 (.21)	4.0 (.28)	4.8 (.33)	H860 * - 030 - †	H861 * - 030 - †	H862 * - 030 - †	A	B	S	5000 PSI RF
	5 - 50	20 - 190	3.5 (.24)	7.0 (.48)	12.5 (.86)	H860 * - 050 - †	H861 * - 050 - †	H862 * - 050 - †				
	10 - 75	40 - 280	5.0 (.35)	10.5 (.72)	31.9 (2.2)	H860 * - 075 - †	H861 * - 075 - †	H862 * - 075 - †				
	10 - 100	50 - 380	6.5 (.45)	15.0 (1.0)	39.0 (2.7)	H860 * - 100 - †	H861 * - 100 - †	H862 * - 100 - †				
	10 - 150	50 - 560	10.5 (.72)	27.5 (1.9)	110 (7.6)	H860 * - 150 - †	H861 * - 150 - †	H862 * - 150 - †				
1-1/2" Code 62	3 - 30	10 - 110	3.0 (.21)	4.0 (.28)	4.8 (.33)	H808 * - 030 - †			A	B	S	5000 PSI RF
	5 - 50	20 - 190	3.5 (.24)	7.0 (.48)	12.5 (.86)	H808 * - 050 - †						
	10 - 75	40 - 280	5.0 (.35)	10.5 (.72)	31.9 (2.2)	H808 * - 075 - †						
	10 - 100	50 - 380	6.5 (.45)	15 (1.0)	39.0 (2.7)	H808 * - 100 - †						
	10 - 150	50 - 560	10.5 (.72)	27.5 (1.9)	110 (7.6)	H808 * - 150 - †						
3"	10 - 200	50 - 750	11 (.76)	17 (1.1)			H901 * - 200 - †	H902 * - 200 - †	A	B	S	800 PSI Not Available
	20 - 300	100 - 1100	11 (.76)	18 (1.2)			H901 * - 300 - †	H902 * - 300 - †				
3" Code 61	10 - 200	50 - 750	11 (.76)	17 (1.1)		H909 * - 200 - †			A	B	S	800 PSI Not Available
	20 - 300	100 - 1100	11 (.76)	18 (1.2)		H909 * - 300 - †						

NOTE: RF option is not available with standard brass flow meters.

²Fractional sizes apply to NPTF and BSPP.

³3 inch models have BSPT (BS21) threads

(example) H 701 A - 030 - RF



PETROLEUM TEST KITS
PAGE 11



HIGH TEMP. FLOW METERS
PAGE 13



FLOW-ALERT FLOW SWITCHES
PAGES 39 and 41



FLOW TRANSMITTERS
PAGE 43



Flo-Check [®] / *USB*

Hydraulic System Analyzer (Bi-directional)



This new product can be used as a stationary or portable tester for both industrial or mobile hydraulic system diagnostics and analysis of the prognostic health of a hydraulic system. It is equipped with state-of-the-art flow, pressure and temperature sensors. These sensors record the operating parameters of the system transferring them to an electronic interface module that is connected to the user's laptop via the USB port. An intuitive Windows[®] software utility configures the displayed information into various engineering units. A real-time graphical and digital interface provides instantaneous readings and trends for all three measurement parameters and also permits data to be saved for export into a spreadsheet program – such as Excel[®] or Corel[®] Quattro[®] Pro.

Notable Features of the System

- Sensor power is drawn from the computer's USB port, so no external electrical power connections or batteries are required.
- The sensor is sampled every 100 microseconds – or 10,000 times per second. As a result, system **damaging fast transient pressure spikes** will be captured and their magnitude displayed.
- User adjustable alarm settings permit “out of range” readings to be flagged and recorded.
- The Flo-Check Hydraulic Analyzer is designed for hydraulic systems operating to 200 GPM (750 LPM), pressures to 6,000 PSI (400 bar) and temperatures to 300 °F (150 °C).

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