BM SERIES METERS®

PRECISION POSITIVE DISPLACEMENT METERS

THE LEADER IN ACCURATE,
LONG-LIFE, FUEL METERING

INDUSTRY LEADING ACCURACY
(+/- .05%*)

115 TO 3870 LPM
(30 TO 1022 USGPM) FLOW RATES

* subject to meter size

Avery-Hardoll®

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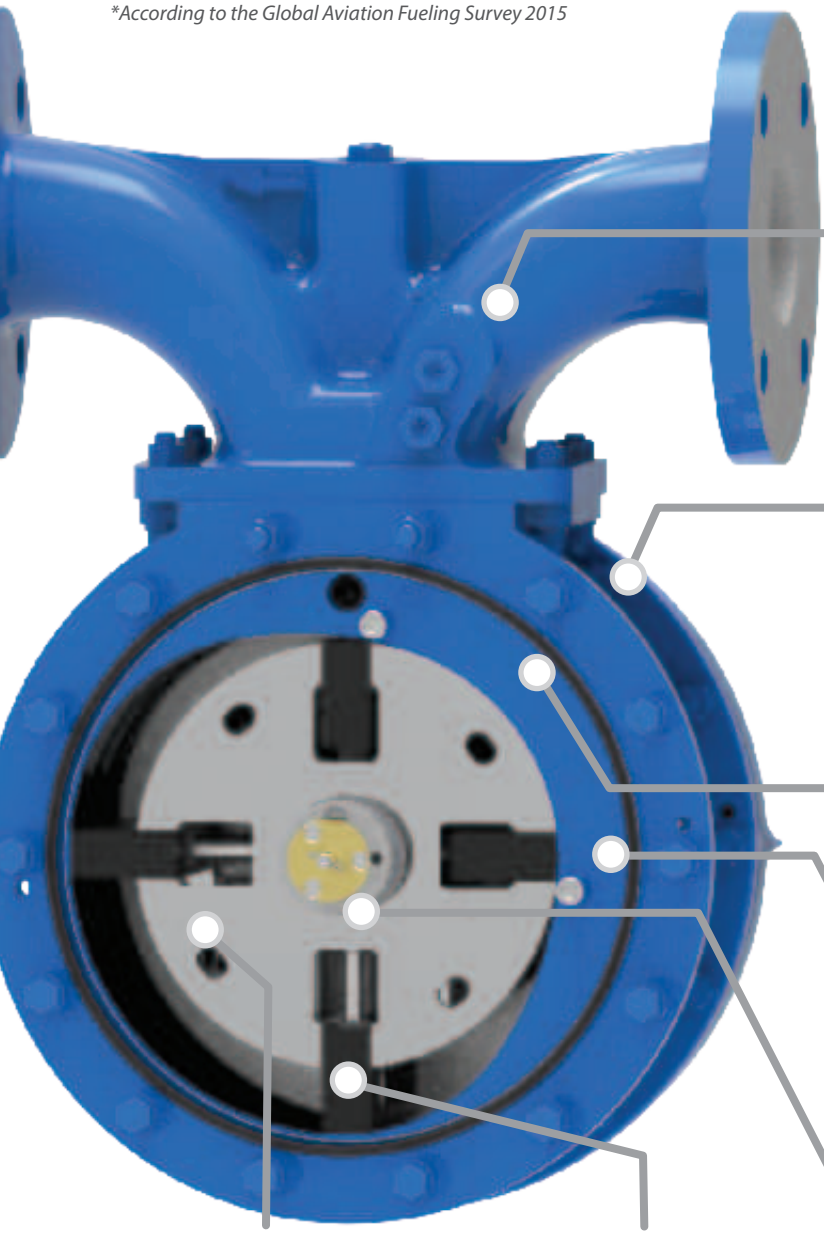
FEATURES & BENEFITS

THE MOST ACCURATE AVIATION FUEL METERS IN THE WORLD

Avery-Hardoll BM Series flowmeters are precision made, positive displacement, liquid measuring instruments that maintain the higest level of accuracy over a lifetime of operation. Simplicity of design and accuracy has resulted in the Avery-Hardoll BM Series meters to being **the most preferred meters by aviation fueling operators and airlines** in internatonal markets.*

**According to the Global Aviation Fueling Survey 2015*



Fabricated Steel, Cast Iron or Cast Aluminum Manifolds

Machined Aluminum Front and Rear covers

Precision machined housing for perfect seal and maxiumum measurement accuracy

Working pressure: 150 psi (10.3 bar)

Hydrostatic test pressure: 300 psi (20.7 bar)

Instrument grade machined rotor for perfect balance

Precision carbon vanes for maximum measurement accuracy

Stainless steel bearings for maximum operational life

DIMENSIONAL DRAWINGS

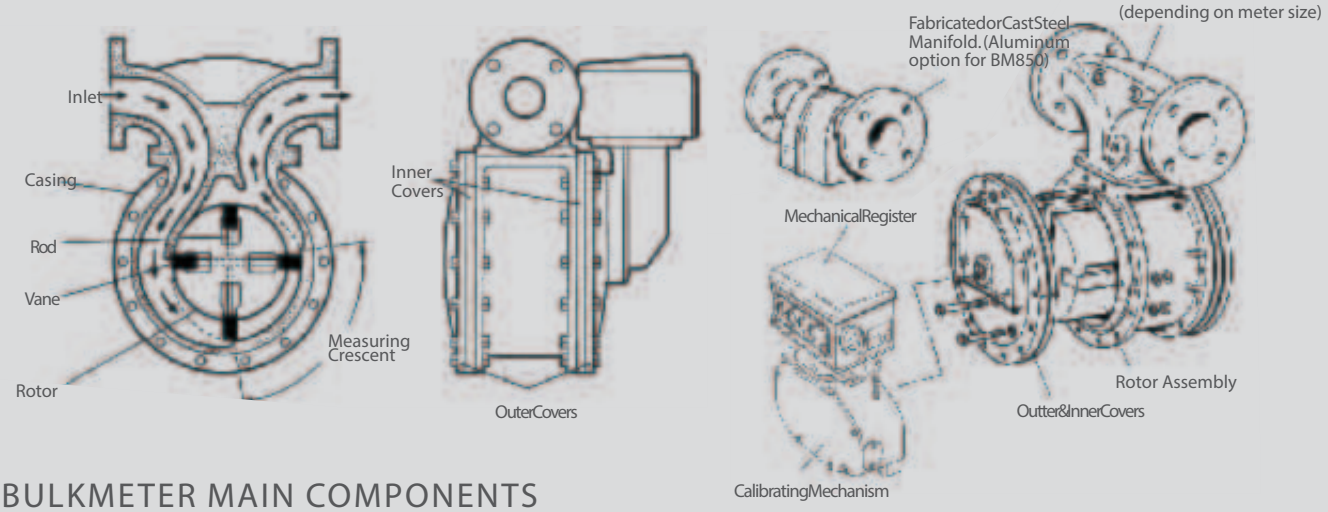
MECHANICAL METER ASSEMBLY DIAGRAM AND CROSS-SECTION

AVAILABLE MODELS (INCLUDING DM SERIES)

BM Series bulkmeters are manufactured in three basic sizes with different ratings identified by a series number. The series numbers, sizes, flow rates, and a brief description of each series of meter are shown below.

TYPES OF FLOWMETERS

Series Number	Manifold		Flow Rate		General Description
	Inches	Millimeters	USGPM	Liters / Min	
BM250	2½	63	30 - 301	115 - 1140	Single Capsule Meters
BM950	3	76	34 - 361	130 - 1370	
BM450	3	76	52 - 541	200 - 2050	Double Capsule Meters
BM550	4	102	58 - 602	220 - 2280	
BM350	4	102	66 - 660	250 - 2500	
BM650	4	102	79 - 792	300 - 3000	Triple Capsule Meters
BM850	6	152	102 - 1022	387-3870	Triple Capsule Meter w/Aluminum Manifold for Aviation Applications
DM Series	4	102	66 - 660	250 - 2500	All Steel Meter, single body Intermittent flow rate 800 USGPM or 3000 Liters/Min



BULKMETER MAIN COMPONENTS

- The BM Series bulkmeters consist of three main assemblies: the manifold, body assembly and rotor assembly
- The higher rating of the larger meters is achieved by bolting two or three body capsules together and fitting double or triple rotor assemblies with a larger manifold to suit
- A calibrating mechanism and mechanical register are also attached to the front end cover
- The calibrating mechanism can be replaced by a front cover incorporating a pulse transmitter when required for electronic systems, such as MASTERLOAD II™ or MASTERLOAD III™ registers

BM METERS SPECIFICATIONS

PRECISION POSITIVE DISPLACEMENT BULK FUEL METERS

Single Capsule Meter

Shown as bare shafted

Meter Series	Pipeline Size	Flow Rate			Flanges	
		USGPM	lpm	M^3/h	Conform To	Material
BM250	2½" (63mm)	30 to 301	115 to 1140	7 to 68	ANSI 150 FF or RF	Ductile Iron Steel
BM950	3" (76mm)	34 to 361	130 to 1370	8 to 82	ANSI 150 FF or RF	Ductile Iron Steel

Double Capsule Meter

Shown with AH pulser

Meter Series	Pipeline Size	Flow Rate			Flanges	
		USGPM	lpm	M^3/h	Conform To	Material
BM450	3" (76mm)	52 to 541	200 to 2050	12 to 123	ANSI 150 FF or RF	Ductile Iron Steel
BM550	4" (76mm)	58 to 602	220 to 2280	14 to 136	ANSI 150 FF or RF	Ductile Iron Steel
BM350	4" (102mm)	66 to 660	250 to 2500	15 to 150	ANSI 150FF or RF	Ductile Iron Steel
		740	2800	168	Intermittent Use	

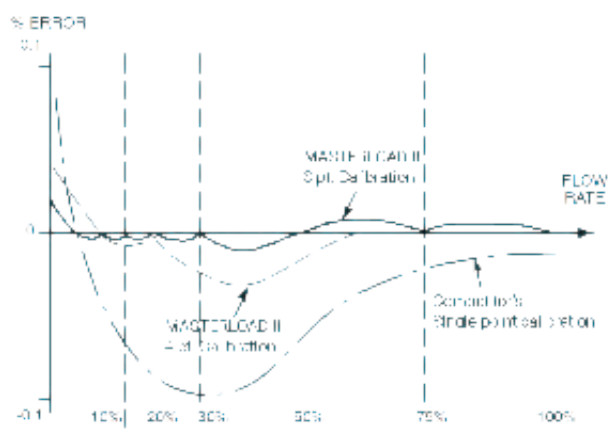
Triple Capsule Meter

Shown with mech. register

Meter Series	Pipeline Size	Flow Rate			Flanges	
		USGPM	lpm	M^3/h	Conform To	Material
BM650	4" (102mm)	79 to 792	300 to 3000	18 to 160	ANSI 150FF or RF	Steel
BM750	6" (152mm)	79 to 792	300 to 3000	18 to 160	ANSI 150FF or RF	Steel
BM850	6" (152mm)	102 to 1022	387 to 3870	23 to 232	ANSI 150FF or RF	Aluminum FF Only
					Aviation Fuels	

ELECTRONIC REGISTER CALIBRATION

While conventional meters are calibrated at only one flow rate, MASTERLOAD II™ and MASTERLOAD III™ calibrates a range of flow rates to provide the highest level of accuracy allowing flexibility to configure each system to suit the requirements of their specific application.



ELECTRONIC AND MECHANICAL OPTIONS

BM950 with POD pulser

BM950 with POD pulser and MASTERLOAD.iQ

BM950 with LC Mechanical Calibrator and Register

PHYSICAL CHARACTERISTICS

DIMENSIONS AND CALIBRATION TESTING

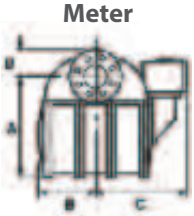
Single Capsule Meter

BM	Flange Bolt Holes			Manifold Overall Dimensions		Meter Dimensions								Approx. Weight of Basic Meter	
	No. Off	Size				A		B		C		D			
		mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	kg.	lbs.
250	4 4	19 19	.75 .75	356 400	14 15.75	408 427	16.1 16.8	107 107	4.2 4.2	285 285	11.2 11.2	89 89	3.5 3.5	70	54
950	4 4	19 19	.75 .75	356 400	14 15.75	408 427	16.1 16.8	107 107	4.2 4.2	285 285	11.2 11.2	95 95	3.75 3.75	70	54

Double Capsule Meter

BM	Flange Bolt Holes			Manifold Overall Dimensions		Meter Dimensions								Approx. Weight of Basic Meter	
	No. Off	Size				A		B		C		D			
		mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	kg.	lbs.
450	4 4	19 19	.75 .75	400 400	15.75 15.75	405 427	15.9 16.8	170 170	6.7 6.7	348 348	13.7 13.7	95 95	3.75 3.75	100	220
350 550	8 8	19 19	.75 .75	400 400	15.75 15.75	420 427	16.5 16.8	170 170	6.7 6.7	348 348	13.7 13.7	115 115	4.5 4.5	112	247

Triple Capsule Meter

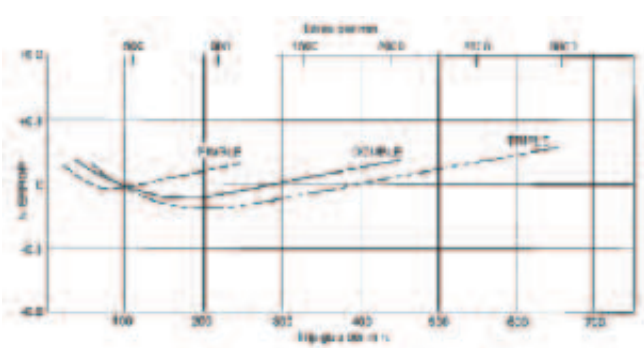


BM	Flange Bolt Holes			Manifold Overall Dimensions		Meter Dimensions								Approx. Weight of Basic Meter	
	No. Off	Size				A		B		C		D			
		mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	kg.	lbs.
650	8	19	.75	400	15.75	427	16.8	233	9.2	411	16.2	115	4.5	126	278
850	8	22	.875	400	15.75	427	16.8	233	9.2	411	16.2	140	5.5	136	300

MECHANICAL CALIBRATION

Calibration adjustment is stepless, with no necessary gear changing. All meters are tested at a range of flow rates before dispatch. Test certificates available upon request.

- Fluid used for testing: Kerosene
- Specific gravity: at 15°C = 0.8
- Viscosity at 15°C = 2.4 centistokes.



Typical accuracy curves for the basic meter build (10:1 turndown)

WORKING SPECIFICATIONS

- Maximum working pressure: 150 psi (10.3 bar)
- Test pressure: 300 psi (20.7 bar)
- Temperature range: -40°C to 100°C
- Volume per revolution:
  - 2.27 litres / 0.60 USG (single capsule)
  - 4.54 litres / 1.20 USG (double capsule)
  - 6.82 litres / 1.80 USG (triple capsule)
- Typical accuracy: +/- 0.05%
- Repeatability: 0.02%

PERFORMANCE

PERFORMANCE AND PRESSURE DROP CALCULATIONS

PRESSURE DROP CHART (PSI)

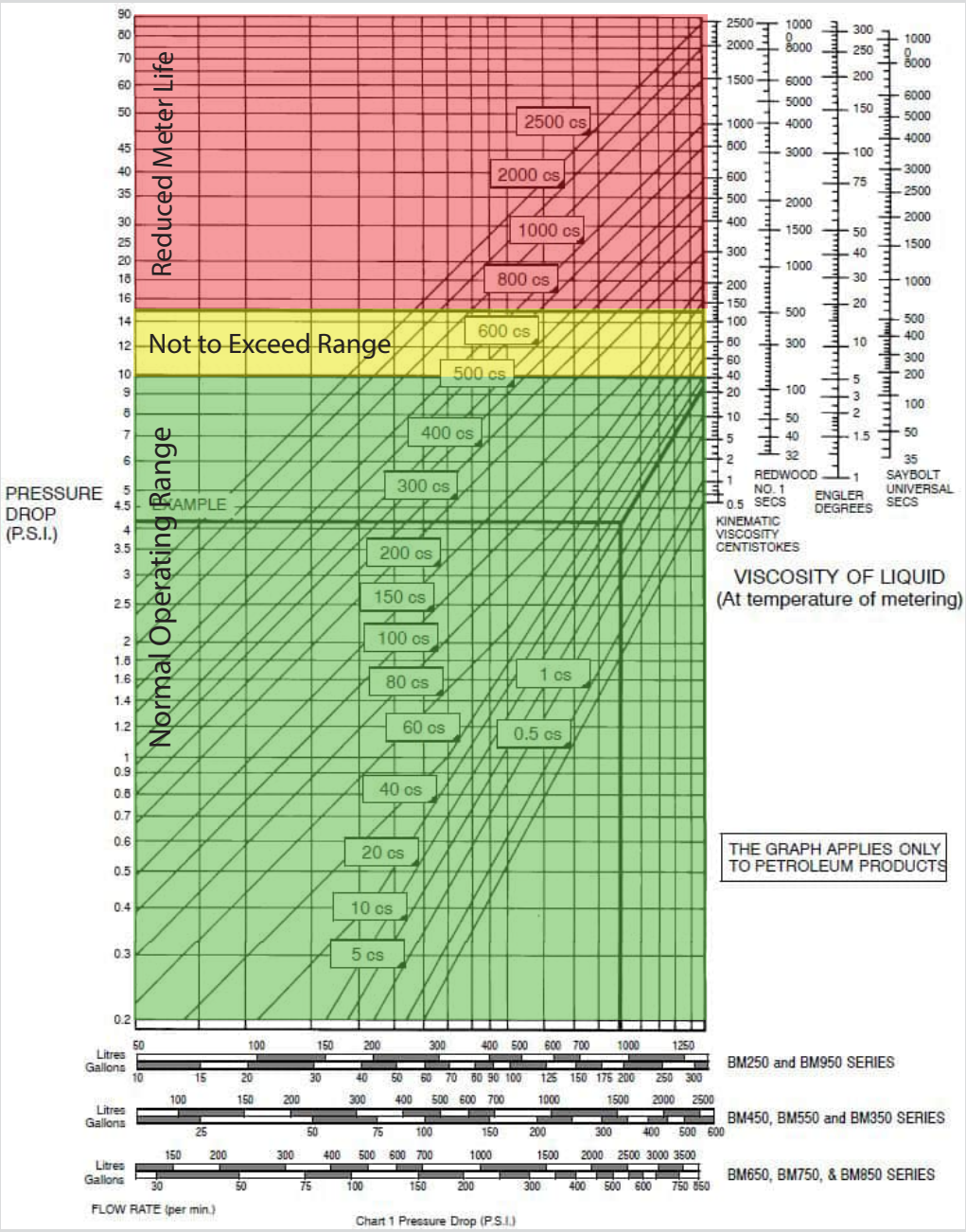


Chart 1 Pressure Drop (P.S.I.)

VISCOUS PRODUCTS

Avery-Hardoll bulkmeters can be used on all petroleum products of all viscosities. However, there is an increase in pressure drop with more viscous fuels, which under normal circumstances will limit the maximum flow rate obtainable.

It is recommended that the pressure drop through a bulkmeter should not exceed 15 psi (1 bar), above which the load on the bearings will start to cause wear.

Consequently when using products with viscosities above 100 centistokes (at operating conditions), it is necessary to reduce the maximum permitted flow rate. As a guide, it is suggested that the pressure drop through the meter should not exceed 10 psi (0.7 bar) for continuous running at maximum speed or 15 psi (1 bar) for continuous running at half speed.

The low pressure drop for the BM Series of Avery-Hardoll bulkmeters is displayed on the left.

REGISTRATION & ACCESSORIES

ELECTRONICS REGISTRATION

MASTERLOAD.iQ™ REGISTER

- ATEX ZONE 2 approved register
- Configurable screens and user prompts
- dP, DENSITYiQ, water detection with SENSEiQ
- Wireless communication via Bluetooth and Wi/Fi

MASTERLOADx.iQ™ REGISTER

- ATEX ZONE 1 approved register
- Configurable screens and user prompts
- dP, DENSITYiQ, water detection with SENSEiQ technology
- Wireless communication via Bluetooth and Wi/Fi

ACCESSORIES

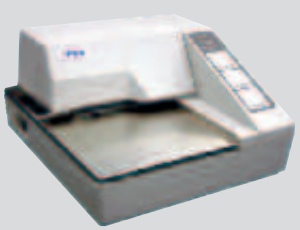
FUELiQ Android Application
for ultimate control of fueling data

Temperature Volume
Compensation (TVC)

Differential Pressure Transducer

2 Channel LC POD pulser

Large Digital Remote Display



Paper Receipt Printer

Avery-Hardoll®

BULK FUEL FLOWMETERS

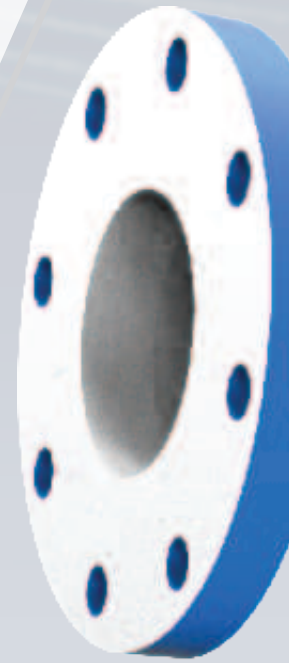
Avery-Hardoll flowmeters are precision made, positive displacement, liquid measuring instruments; considered the most accurate aviation fuel flowmeters in the world.

ELECTRONIC REGISTRATION

MASTERLOAD.iQ™ the latest innovation in electronic registration approved to ATEX Zone 2 hazardous areas.

MASTERLOADx.iQ™ is the ATEX Zone 1 extension to MASTERLOAD.iQ for Zone 1 hazardous areas.

To learn more about Avery-Hardoll products, visit: **AveryHardoll.com**



LIQUID CONTROLS®

Liquid Controls offers a full range of:

- M Series Meters
- MS Series Meters
- Electronic Registration
- Valves
- Air Eliminators & Strainers
- Fueling Accessories
- Wireless Data Management

Liquid Controls proudly manufactures the Avery-Hardoll and LC brand meters and is the leading manufacturer of positive displacement flowmeters and fuel data management systems in the world.

To learn more about what LC can offer you visit: **LCMeter.com**

IDEX

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