

Since the early 1960's INVALCO WS Series Turbine Meters have been certified as meeting 3-A Sanitary Standard 28-03 for metering milk and milk products. The WS Series Meters are also ideal for food and beverage applications including De-Ionized water, wine, and many others. 3-A/FDA approved cemented tungsten carbide sleeve bearings and shaft are standard for excellent continuous non-lubricating service.

Features/Benefits

- **Rotor Supports** - have up and downstream straightening vanes to enhance accuracy.
- **Helical Cast Rotor** - in a heavy duty stainless steel (CD4MCu) design for durability and long service life.
- **Cemented Tungsten Carbide** - required for 3-A compliance and are excellent for non-lubricating service.
- **Stainless Steel Body and Wetted Parts** - provide years of corrosion free service.
- **Electropolished/Super Passivated Rotor and Support** - to insure clean flow conditions.

Options

- **Journal Bearings, Shaft, and Thrust Balls** - Tungsten Carbide for longer life in non 3-A applications.
- **1 Inch MNPT Electrical Housing Adapter** - to facilitate meter mounted electronics or conduit.
- **Journal Bearings of Rulon 641** for non 3-A compliant meters.

Capacity Table

	Flow Range		Nominal K-Factor	
	GPM	LPM	P/GAL	P/L
1/2" ²	1.5-6.0	5.5-22	11,000	2,965
3/4"	1.5-15	5.7-57	4,605	1,216
3/4" E	3.2-32	12-120	1,875	495
1"	6.5-65	24.6-246	953	252
1-1/2"	17.5-175	66.2-662	341	90
2"	33-330	124.9-1,249	185	49
3"	60-600	222-2225	50	14



3-A Sanitary Style Liquid Turbine Meter

General Specifications

Linearity¹

±0.5% Over-stated Range.

Repeatability^{1,2}

±0.05%.

Maximum Overrange

125% of flow rate for intermittent periods.

Response Time

1/2" to 2" Meter: 2-5 milliseconds for step change in flowrate.

3" Meter: 10-25 milliseconds for step change in flowrate.

Frequency Output

1/2" to 2" - 100 Hz to 1,000 Hz.

3" - 50 Hz to 500 Hz.

Voltage Output

1/2" to 2" = 100 mV @ 100 Hz to 1.5 V (RMS) @ 1,000Hz.

3" = 80 mV @ 50 Hz to 800 mV (RMS) @ 500 Hz.

Pressure Rating - PSI

Tri-Clamp End Connections are limited to 250 psi @ 375°F maximum.

**Other pressures available - Consult Factory.

¹ With adequate flow conditioning.

² 1/2" meter non-3A compliant.

Installation

Vertical or horizontal (any direction).

Materials of Construction

Body: 316 Stainless Steel (polished).

Rotor: CD4MCu.

Bearings/Rotor Shaft:

Standard: Tungsten Carbide³/Tungsten Carbide.

Optional: Rulon⁴/316 Stainless Steel.

Rotor Supports: 316 Stainless Steel (polished)

Retaining Ring: 316 Stainless Steel

Temperature Range

Magnetic Pick-Up Coils (Order Separately):

Standard: -40°F to 228°F (-40°C to 109°C).

Optional: Hi/Low Temperature -450°F to 450°F (-267°C to 232°C).

Preamp/Magnetic Pick-Up Coils:

-40°F to 185°F (-40°C to 85°C).

Meter with Bearing Structure of:

Standard: Tungsten Carbide -20°F to 275°F (-29°C to 135°C).

Optional: Rulon/Stainless Steel -20°F to 250°F (-29°C to 121°C).

For other temperatures consult factory.

Pick-Up Coil (Order Separately)

DC Resistance: 975Ω.

Inductance: 400 mH

Mating Connector: 10SL-4S or Wire Leads.

Preamp Magnetic Pick-Up (Order Separately)

Housing: Stainless Steel.

Power Requirement:

Supply voltage: +4.5 to 28 Vdc.

Current: ≤5mA @ 12 Vdc.

Output Signal:

Square wave,

0 to supply voltage, 5Hz to 12kHz.

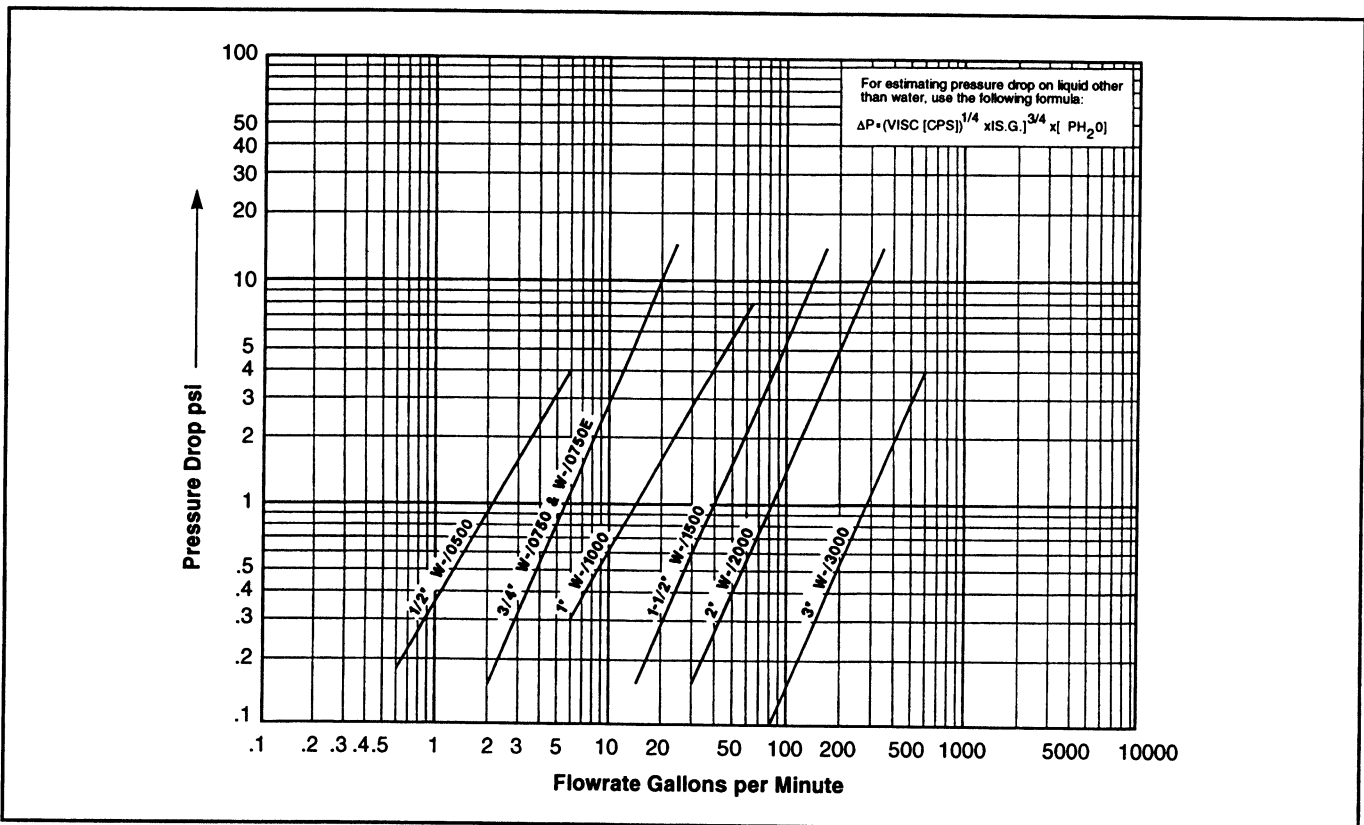
30% to 70% Duty cycle.

NPN with 10KΩ pull-up to supply voltage.

Mating Connector: 10SL-3P or Wire Leads.

RF Nonmagnetic Pickup (Order Separately)

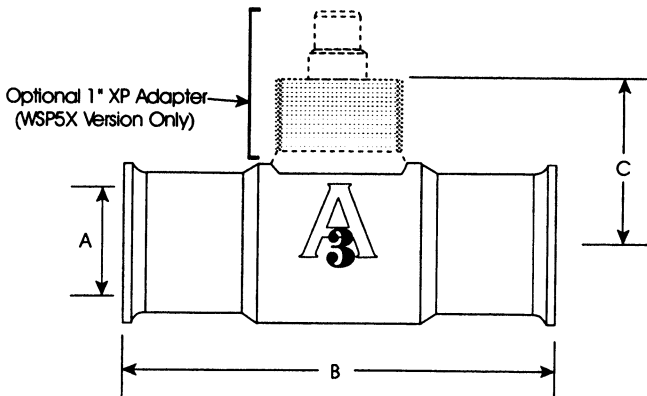
Consult factory for details.



3 GE 883 or equivalent 5% type
4 Virgin PTFE and fillers.

Dimensions

Inches (mm)



WS Series 3A Sanitary				
Meter Size	A (Bore)	B	C	Sanitary Clamp Size
1/2" ²	.5" (13)	2.8" (70)	1.7" (43)	3/4"
3/4"	.6" (15)	3.3" (82)	1.8" (46)	1-1/2"
1"	.9" (22)	3.6" (90)	1.8" (46)	1-1/2"
1-1/2"	1.3" (33)	4.6" (116)	2.3" (58)	1-1/2"
2"	1.8" (45)	6.6" (153)	2.6" (66)	2"
3"	3.1" (79)	10.0" (253)	2.9" (73)	3"

Note: Dimensions - Inches to the nearest tenth (millimeters to the nearest whole mm), each independently dimensioned from respective engineering drawings.

Ordering Information

The following guide defines the correct turbine meter for a given application and the respective catalog code. This code is part of the ordering information and should be included on the Request for Quote or Purchase Order.

		WSP5	X	0750	E		
Body Style					Rotor Selection		
WSP5	3A Sanitary Meter Body with Tri-Clamp End Connections				E	Extended Flow Range (3/4" Rotor Size Only, See Capacity Table Page 1)	
W5	Non 3A Meter with Carbide Bearing/Shaft						
WFP5	Non 3A Meter with Polymer Bearing						
Pick-Up Adapter					Meter Size		
X	1" MNPT Pick-Up Adapter for Conduit or Electronic Housing.				0500	1/2" ² Meter Size - 3/4" Tri-Clamp	
					0750	3/4" Meter Size - 1-1/2" Tri-Clamp	
					1000	1" Meter Size - 1-1/2" Tri-Clamp	
					1500	1-1/2" Meter Size - 1-1/2" Tri-Clamp	
					2000	2" Meter Size - 2" Tri-Clamp	
					3000	3" Meter Size - 3" Tri-Clamp	

For special requests not covered under this modeling system, please contact factory for assistance.



www.fmcinvalco.com

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

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