



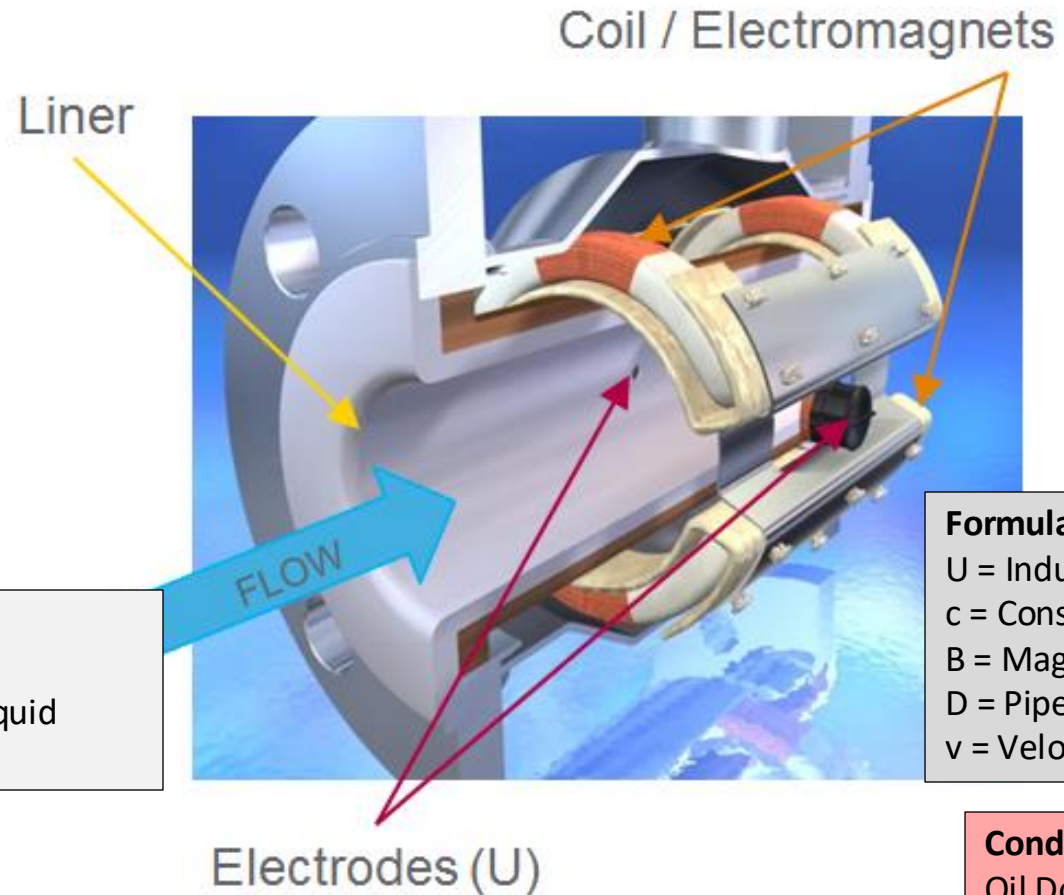
Schneider, Flow [Mag]

SCHNEIDER MAG METERS

Metering Technology	Clean liquid	Dirty liquid	Corrosive liquid	Low conductivity < 5 µS/cm	High (> 150°C) Temperature	Low (< -40°C) Temperature	Low velocity	High viscosity	Abrasive slurries	Fibrous slurries	Clean Gas	Dirty Gas	Steam	Semi-filled pipe
Coriolis	Good	Good	Limited	Good	Limited	Good	Good	Good	Limited	Good	Good	Limited	No	Limited
Electro Magnetic	Good	Good	Good	No	Limited	Limited	Good	Good	Good	Good	No	No	No	Limited
Vortex	Good	Limited	Limited	Good	Good	Limited	No	No	No	No	Good	Limited	Good	No
Integral Flow (dP)	Good	Limited	Limited	Good	Good	Limited	No	No	No	No	Good	Limited	Limited	No
Orifice Plate (dP)	Good	Limited	Limited	Good	Good	Limited	No	No	No	No	Good	Limited	Good	No
Averaging Pitot tube (dP)	Good	Limited	Limited	Good	Good	Limited	No	No	No	No	Good	Limited	Good	No
Venturi (dP)	Good	Good	Limited	Good	Good	Limited	No	No	Limited	Limited	Good	Good	Good	No
V-Cone (dP)	Good	Good	Limited	Good	Good	Limited	No	No	Limited	Limited	Good	Good	Good	No
Wedge (dP)	Good	Good	Limited	Good	Good	Limited	No	No	Good	Good	Good	Good	Good	No
Flow Nozzles (dP)	Good	Limited	Limited	Good	Good	Limited	No	No	No	No	Good	Good	Good	No
Thermal Mass	Good	Limited	Limited	Good	Limited	No	Good	Limited	Limited	Limited	Good	Limited	Good	No
Positive Displacement	Good	No	Limited	Good	Limited	Limited	Good	Limited	No	No	Good	Limited	No	No
Turbine	Good	No	Limited	Good	Limited	Limited	No	No	No	No	Good	Limited	Good	No
Ultrasonic (transit time)	Good	Limited	Limited	Good	No	Limited	Limited	Limited	No	No	Good	Limited	No	No
Ultrasonic (doppler)	No	Good	Limited	Good	No	Limited	Limited	Limited	Limited	Limited	No	Limited	No	No
Ultrasonic (multibeam)	Good	Limited	Limited	Good	No	Limited	Limited	Limited	No	No	Good	Good	Limited	No
Variable Area	Good	No	Limited	Good	Limited	No	No	No	No	No	Good	No	No	No

SCHNEIDER MAG METERS

How Does It Work?



Faraday's Law of Induction

Any Conductive Material
Passed thru a Magnetic Field
Will induce a Voltage
Proportional to the Velocity
Of the Moving Conductor

Two Sensing Electrodes

Set at Right Angles to the Magnetic Field
Detect the Voltage Generated across the Flowing Liquid
Directly Proportional to Flowrate of the Media

Formula: $U = c * B * D * v$

U = Induced Voltage

c = Constant [meter factor]

B = Magnetic Flux Density [Wb/m^2]

D = Pipe Diameter [m]

v = Velocity of Conductor [m/s]

Conductive Liquid is a MUST!!

Oil Does NOT work!!

SCHNEIDER MAG METERS

Broad Portfolio to Support Many Applications

Mid-Tier Flange

WWW, P&P, M&M,
Power

Water abstraction, purification, desalination, drinking water distribution networks, leakage detection, irrigation, industry water, cooling water, wastewater, sewage and sludge, sea water



9500A

Top-Tier Flange

P&P, Chemical, M&M,
O&G, Pharma, WWW

Clean liquids, slurries with high solids content, abrasive and aggressive media



9700A

PFA-lined Wafer

Energy / HVAC, WWW, Agriculture, Process

Mixing, batching, dosing, filtration, pump control, water flow monitoring, water circulation and treatment, foam mixing, heat transfer and cooling systems raw water, process water, wastewater, salt water, heated / cooled water, mud, slurry, sludge, manure



8400A

Ceramic-lined Wafer

Chemical, M&M, F&B, WWW

Dosing of additives, chemical injection, acids, alkaline,



IMT30A

low-tier



IMT31A

mid-tier



IMT33A

top-tier

Specialty/Hygienic Flange

F&B, Pharma, Cosmetics

Blending, dosing, batching, soft drinks, beer, wine, food products, pharmaceuticals, acids, alcohols



9600A

Battery Powered

Water distribution, District metering

Measurement of potable water, raw water and irrigation water, distribution network monitoring, pressure and water quality control, Pressure and pumping stations, District Metering Areas for leak detection, Water consumption and billing



6500W/IMT65W

SCHNEIDER MAG METERS

9700A: O&G Workhorse



Commodity Priced

For Demanding Applications

Harsh Environments
Aggressive Media

Key Features

Welded Construction = Extended Lifetime
Reliable Measurement under
 High Temperatures
 High Solids content
No moving parts!!

Specifications

Sizes: 3/8" to 80"
Liners: PFA, PTFE, ETFE, PU and Soft Rubber
Electrodes: Hastelloy [std], SSt, Titanium, Tantalum, Platinum
Low Noise Electrodes: Conductive Rubber, Tungsten Carbon



Key Applications

Anywhere in Clean or Produced Water
From Well to SWD Injection

Not Affected By

Density
Viscosity
Flow Profile

What To Look For?

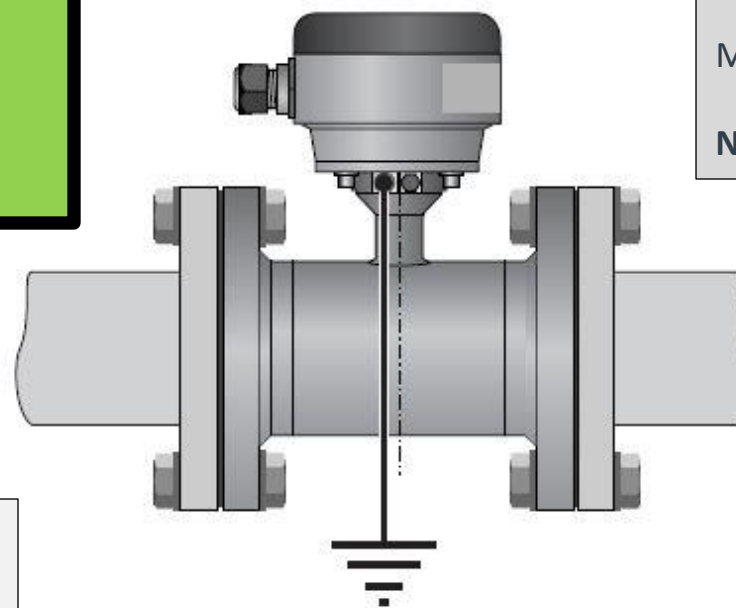
High Solids Content [up to 70%]
Noisy Applications
Produced Water Applications

Why Eliminate Ground Rings?

- Cost Adder
- Very Costly for Large Meters
- Corrosive Fluids requiring Titanium or Tantalum
- Creates Another Leak Path
- Simplifies installation

Only Available with Magflow IMT33A

- Virtual Reference = Virtual Grounding
- Internal Compensation of the Fluid's Potential
- No Need for Grounding Rings IF:
 - Fluid Conductivity $\geq 200 \mu\text{S/cm}$
 - Line Sizes $\geq \text{DN10, } 3/8''$



How Is It Done?

- Provides complete **isolation** of
- Flow converter's input amplifier and coil power circuits
- Measurement circuit **'floats'** at liquid's potential
- Sensing only induced voltage caused by fluid velocity
- No earth connection** to liquid is required

SCHNEIDER MAG METERS

Full Suite of Liners



PTFE Teflon [9700A]

Most Widely Used Material
Very high temperature capability [-40...+356°F]
Excellent anti-stick characteristics reduce build-up
Inert to a wide range of acids and bases
Chemical and process industry

PFA [9700A, 8400A, 9600A]

Better shape accuracy than PTFE
Better abrasion resistance
Better vacuum strength
-40...+356°F
Approved in **F&B, Pharma and Cosmetic industry**
Chemical and Process industry

ETFE [9700A]

Excellent chemical resistance
Better abrasion resistance than PTFE
Resistant to full vacuum retained liner
-40...+248°F
Chemical and Process industry

Polyurethane [9700A]

General Purpose
Cannot be used with strong acids or bases
Cannot be used at high temperatures
Maximum process temperature is 65°C/149°F

Hard Rubber [9500A]

Inexpensive General Purpose Liner
Wide range of corrosion resistance
23...+176°F
Main application in the **Water & Wastewater industries**

Ceramic [8500A]

Highly recommended for very abrasive and/or corrosive applications
High temperatures up to 180°C / 356°F
Used extensively in the **Chemical and Process industry**

Soft Rubber Linatex [9700A]

Excellent abrasion resistance particularly to large particles
Limited chemical resistance
23...+140°F
Ideal for **mining slurries, drilling applications**

SCHNEIDER MAG METERS

What is Your Required Flowrate?

9700 Series Mag Flowmeter Nominal Flow Rates

Maximum flow velocity Range 0-32.8 ft/s

Sizes up to 80-in available!

Line Size	gal /min		bbl / hr		bbl /day	
	Min	Max	Min	Max	Min	Max
Inches	gpm	gpm	bbl/hr	bb/hr	bbl/day	bbl/day
3/8	0	12.440	0	18	0	427
1/2	0.00	28	0.00	40	0	964
1	0	78	0	112	0	2,681
1 1/2	0.00	200	0.00	286	0	6,862
2	0	313	0	447	0	10,727
2 1/2	0.00	529	0.00	756	0	18,137
3	0	801	0	1,144	0	27,465
4	0.00	1,252	0.00	1,789	0	42,931
6	0	2,817	0	4,024	0	96,579
8	0.00	5,009	0.00	7,155	0	171,725
10	0	7,825	0	11,179	0	268,286
12	0.00	11,269	0.00	16,099	0	386,366
14	0	15,337	0	21,910	0	525,840
16	0.00	20,034	0.00	28,620	0	686,880
18	0	25,354	0	36,220	0	869,280
20	0.00	31,303	0.00	44,719	0	1,073,246
24	0	45,077	0	64,396	0	1,545,497