NUFLO 1502 WECO Union Liquid Turbine Flow Meter

The NUFLO™ 1502 WECO® union liquid turbine flow meter incorporates a tungsten-carbide shaft and bearings to withstand the rugged conditions of the oilfield environment. Over the years, this flow meter has earned a reputation for withstanding severe punishment while maintaining operational and measurement integrity. WECO union turbine flow meters indicate flow rate and measure total throughput of a liquid line.

As liquid flows through the meter and over the rotor, the rotor turns at a speed that is directly proportional to the flow rate. A magnetic pickup senses the rotor blades as they pass and generates an electrical (sine wave) signal. Then, these electrical pulses are transmitted to the flow measurement readout equipment. Optional rotor configurations and/or finishes allow erosive or corrosive fluids such as mud or cement slurries and acids. The meter should be flushed with clean water following the use of any erosive or corrosive fluids.

Specifications

Accuracy:	± 1.0% Standard Grade
Repeatability:	± 0.05%
End Connections:	2", 3", 4" 1502 WECO Union (10K sour service, or 15K sweet service) 3" 2002 WECO Union (20K sweet service)
Magnetic Pickups:	x 2 for local and remote monitoring
Temperature Range (magnetic pickup):	
	Standard -67° F to 250° F (-55° C to 121° C) Medium -67° F to 450° F (-55° C to 232° C) (requires high-temperature magnetic pickup)
Mating Output Connection:	AN3106A-10SL-4S
Compliances:	CSA Certified Hazardous Locations Class I, Group A, B, C, D CE-marked for Pressure Equipment Directive (PED)

Applications

- High-pressure water injection trials
- Scale inhibitor treatments
- Well cleanouts with coil tubing
- Tubing valve opening/closing
- Mud/cementing operations (displacement volume monitoring)
- Flowback of treatment fluids

Materials of Construction

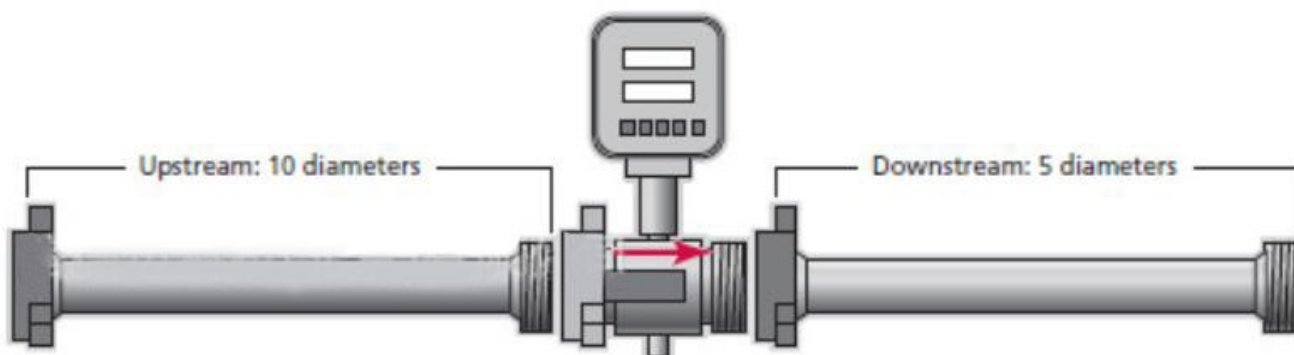|	
Meter Body:	A286 stainless steel
Meter Vanes:	316L stainless steel
Rotor Shaft and Bearings:	Tungsten carbide
Union Nut:	Carbon steel
Magnetic Pickup Receptacle:	316L stainless steel

Meter Options

- Binderless carbide shaft for enhanced corrosion resistance to selected chemicals
- Silver brazed shaft to withstand temperatures to 450° F (232° C) and chemicals that attack bearing bonding materials
- Nickel-plated rotors for enhanced corrosion resistance to selected chemicals (especially acids that corrode ferrous materials)
- Modified rotors for cement slurry or mud applications

Benefits

- Rugged enough to withstand continual rig up/down
- Accurate and repeatable measurement
- Economical solution for turbine flow meter applications
- WECO union for quick installation
- Minimum maintenance
- Long service life, even in severe applications

Installation

- The meter should be installed with the arrow on the meter body corresponding to flow direction of the line
- A length of straight pipe – usually a pup joint of 2", 3" or 4" 1502 treating iron – must be installed upstream and downstream of the flow meter
- Valves or chokes should be located downstream of the flow meter

Upstream: 10 diameters — Downstream: 5 diameters

Linear Flow Range [1,2,3]

Flow Meter Size[3] in	mm	GPM	m³/HR	BPD	Nominal[2] Calibration Factor		Maximum Output Frequency	ΔP at Maximum Flow[2]	
					Pulses/Gal	Pulses x 1000/m³	Pulses/Sec	psi	kPa
1"	25	5 - 50	1.14 - 11.36	170 - 1700	900	(238)	750	20.0	138
1-1/2"	38	15 - 180	3.41 - 40.88	515 - 6000	325	(86)	975	16.0	110
2"	51	40 - 400	9.09 - 90.85	1370 - 13,700	55	(14.5)	365	22.0	152
3"	76	80 - 800	18.16 - 181.66	2750 - 27,500	57	(15.2)	760	20.0	138
4"	102	100 - 1200	22.71 - 272.55	3400 - 41,000	30	(7.9)	600	10.0	69

[1] The linear flow range of liquids with non-lubricating characteristics is limited to the upper 60% of rating.

[2] Based on water.

[3] Consult a Cameron representative for liquid applications with viscosity above 5 centistokes.

Note: The meter will remain accurate at flow rates higher than its rating, but bearing wear and pressure drop across the meter can shorten the life span of the meter. Flow meters can be over-ranged by 10% for short periods without significant damage.

Traceability of pressure-containing components available on request.