+ NUFLO 1502 WECO Union

High-pressure liquid turbine flowmeter

APPLICATIONS

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

BENEFITS

+ Rugged enough to withstand continual rig-up and rig-down
+ Accurate and repeatable measurement
+ Quick installation
+ Minimized maintenance requirements
+ Long service life, even in severe applications

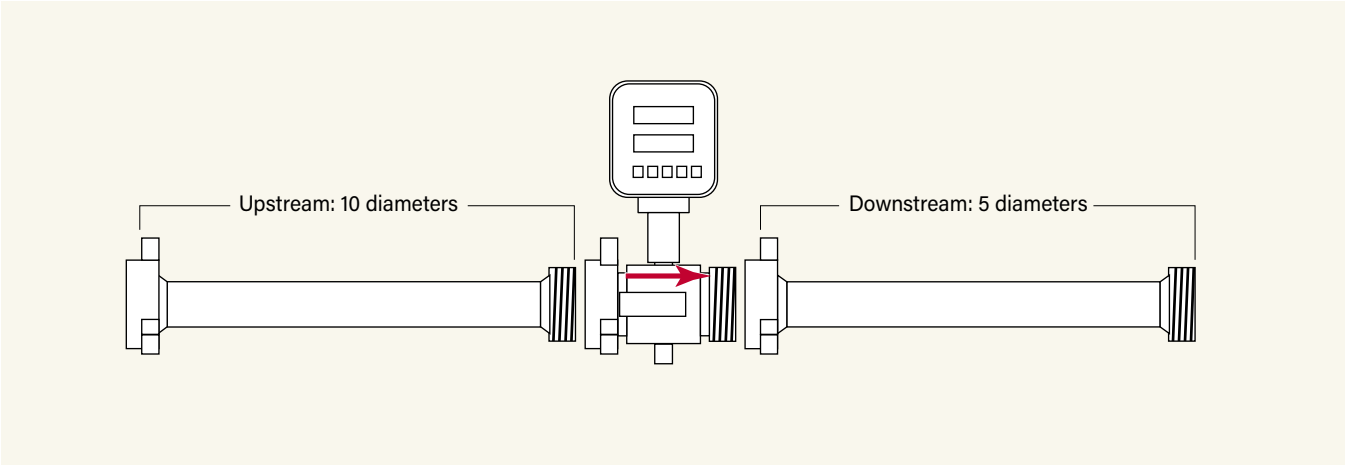
The NUFLO 1502 WECO Union* high-pressure liquid turbine flowmeter incorporates a tungsten carbide shaft and bearings to withstand rugged oilfield conditions while maintaining operational and measurement integrity.

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 finishes enable the metering of 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.

NUFLO 1502 WECO Union high-pressure liquid turbine flowmeter

Specifications	
Accuracy, %	±1.0 standard grade
Repeatability, %	±0.05
End connections	2-in, 3-in, or 4-in 1502 WECO Union (10K sour service or 15K sweet service)
	3-in 2002 WECO Union (20K sweet service)
Magnetic pickups	×2 for local and remote monitoring
Temperature range (magnetic pickup), degF [degC]	Standard: –67 to 250 [–55 to 121]
	Medium: –67 to 450 [–55 to 232] (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)

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



Straight pipe must be installed upstream and downstream of the flowmeter

Meter Options

+ Binderless carbide shaft for enhanced corrosion resistance to selected chemicals
+ Silver-brazed shaft to withstand temperatures to 450 degF [232 degC] 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
+ Internal sets for measuring high-pressure gases, including nitrogen and carbon dioxide

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-in 1502 treating iron—must be installed upstream and downstream of the flowmeter.
+ Valves or chokes should be located downstream of the flowmeter.

Linear Flow Range†,‡,§

Flowmeter Size§, in [mm]	Flow Rate			Nominal‡ Calibration Factor, Pulses/galUS [Pulses/1,000/m³]	Maximum Output Frequency, Pulses/s	ΔP at Maximum Flow‡, psi [kPa]
	galUS/min	m³/h	bbl/d			
1 [25]	5–50	1.14–11.36	170–1,700	900 [238]	750	20 [138]
1.50[38]	15–180	3.41–40.88	515–6,000	325 [86]	975	16 [110]
2 [51]	40–400	9.09–90.85	1370–13,700	55 [14.5]	365	22 [152]
3 [76]	80–800	18.16–181.66	2750–27,500	57 [15.2]	760	20 [138]
4 [102]	100–1,200	22.71–272.55	3400–41,000	30 [7.9]	600	10 [69]

† The linear flow range of liquids with nonlubricating characteristics is limited to the upper 60% of rating.
‡ Based on water.
§ Consult a Sensia 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. Flowmeters can be overranged by 10% for short periods without significant effect. Traceability of pressure-containing components available on request.