

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

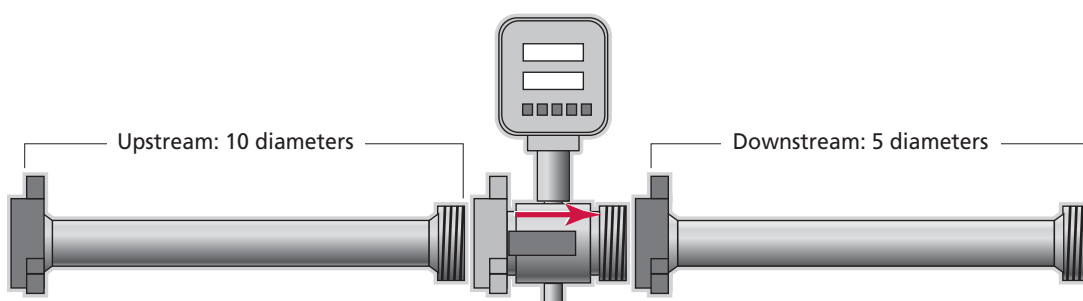
- Binderless carbide shaft for enhanced corrosion resistance to selected chemicals
- Silver brazed shaft to withstand temperatures to 450° F (232° C) and chemicals that attack bearing bonding materials
- Nickel-plated rotors for enhanced corrosion resistance to selected chemicals (especially acids that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



Linear Flow Range ^{1,2,3}

| Flow Meter Size ³ in | mm | GPM | m ³ /HR | BPD | Nominal ² Calibration Factor | | Maximum Output Frequency Pulses/Sec | ΔP at Maximum Flow ² | |
|------------------------------------|-----|------------|--------------------|---------------|---|------------------------------|--|---------------------------------|-----|
| | | | | | Pulses/Gal | Pulses x 1000/m ³ | | 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.

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LOCATIONS

North and South America

14450 JFK Blvd.
Houston, TX 77032
USA
Tel 1 281 582 9500
ms-us@c-a-m.com

Europe, Africa, Caspian and Russia

3 Steyning Way
Southern Cross Trading Estate
Bognor Regis
West Sussex PO22 9TT
England, UK
Tel 44 1243 826741
ms-uk@c-a-m.com

Asia Pacific

Suite 16.02 Menara AmFirst
No. 1 Jalan 19/3
46300 Petaling Jaya
Selangor Darul Ehsan
Malaysia
Tel 603 7954 0145
ms-kl@c-a-m.com

Middle East

Level 9, Al Jazira Club Tower A
PO Box 47280, Muroor Road
Abu Dhabi
United Arab Emirates
Tel 971 2 596 8400
ms-uk@c-a-m.com

OTHER LOCATIONS

ALGERIA

CANADA

CHINA

INDIA

MALAYSIA

RUSSIA

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www.c-a-m.com/measurement