

# UNIVERSAL® Flow Meters

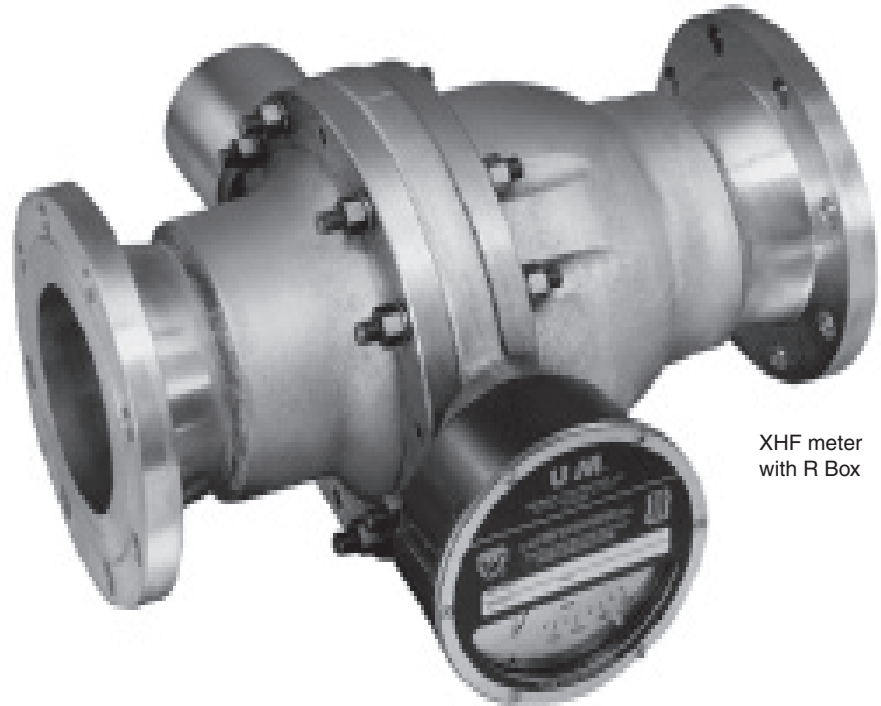
## An Extra-Large Vane Style For Liquids

FOR APPLICATIONS OF AIR OR  
GASES CONSULT FACTORY

 CSA Certified NRTL/C

 CE Marked (as noted)

**NIST** Traceable Calibration  
Certificate Available



XHF meter  
with R Box

### DESCRIPTION

These variable-area flow meters have a spring-loaded swinging vane. Mounting is in-line and in any position. Straight pipe runs before or after are not required on the 4-inch meter. The 6 and 8-inch sizes at 1000 GPM and 8-inch size at 1500 GPM require 2 pipe diameters straight run before and after the meter. The all-mechanical sensing system directly drives the pointer and remote signaling devices. They handle shocks or flow surges beyond their rated capacities.

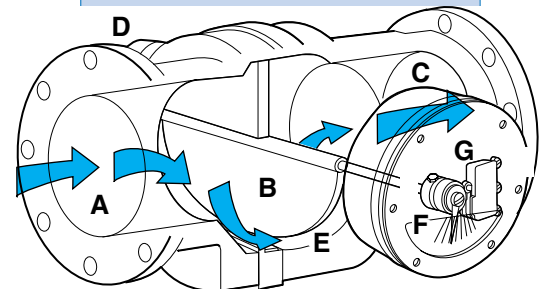
The swinging vane can be manually operated with a factory supplied wrench to verify or adjust switch points, or to free the vane should it become lodged by debris in the fluid.

### CALIBRATION

All flow meters are individually calibrated for fluids with the viscosity you specify (up to 3000 SSU/650 centipoise). We also compensate for specific gravity. For NIST Traceability please consult factory.

### CONSTRUCTION MATERIALS

The meter body, moving parts, and seals are offered in a variety of materials to suit a wide range of applications: water, synthetic and petroleum based oils, paint, some corrosives, solvents, and air and gases. Meter bodies are available in aluminum, carbon steel or nickel-plated carbon steel, 316 stainless steel, or aluminum bronze. We offer internal moving parts in 316 stainless steel. Choices of materials for seals: Buna N, EPR, Viton®, and Kalrez™ (Kalrez can be combined with others). Please consult the factory for compatibility of materials with your application.



Fluid enters at **A**, passes around the semi-circular vane **B**, exits at outlet **C**. The vane resists the flow because of the spring **D**. The further the vane is pushed the larger the passageway **E** becomes. This minimizes pressure drop. The vane shaft turns to operate the pointer **F** and remote signal devices such as the switch **G**.

**EXAMPLE: XHF – O I B 800 GM – 32W – 32V1.0 –**

**SERIES**

Extra high vane style

= **XHF**

**HOUSING & FLANGE MATERIAL**

- Aluminum = **D**
- Carbon steel = **M**
- Carbon steel (nickel plated) = **J**
- Aluminum (hard coat) = **E**
- Stainless steel (316) = **I**
- Alum. bronze/CS flgd. = **O**
- Alum. bronze/S.S. flgd. = **S**
- Alum./Brass Center Section = **Q**

**INTERNAL PARTS**

Stainless steel (316)  
(other materials on request)

= **I**

**SEAL MATERIAL**

- Buna N = **B**
- EPR (not avail. on petroleum base fluid) = **E**
- Viton® = **F**
- Kalrez™ (dynamic) and Teflon (static) = **T**
- Kalrez (dynamic) and Buna N (static) = **A**
- Kalrez (dynamic) and EPR (static) = **H**
- Kalrez (dynamic) and Viton (static) = **K**

**FLUID CHARACTERISTICS**

Viscosity number, followed by a 'V' (for SSU), a 'C' (for centipoise), or a 'CS' (for centistokes), plus the fluid specific gravity. (**32V1.0** would mean water.) For dual viscosity give two numbers separated by a slash (example: 320/500V1.0).

Check with the factory for compatibility of construction materials with the fluid involved.

**MAX FLOW RATING**

Gallons Per Minute		GPM	
Calibration	Minimum Reading	Maximum Reading	
20	50	-	<b>500</b>
20	50	-	<b>600</b>
25	50	-	<b>800</b>
25	50	-	<b>1000</b>
50	300	-	<b>1500</b>
Liters Per Minute		LPM	
Calibration	Minimum Reading	Maximum Reading	
100	200	-	<b>2000</b>
100	200	-	<b>2500</b>
100	200	-	<b>3000</b>
100	200	-	<b>3500</b>
200	1200	-	<b>5600</b>
Cubic Meters Per Hour		CMH	
Calibration	Minimum Reading	Maximum Reading	
10	10	-	<b>120</b>
10	10	-	<b>140</b>
10	10	-	<b>180</b>
20	20	-	<b>220</b>
20	70	-	<b>340</b>

Note: Custom scales are available in any units and increments on special order.

**PORT CONNECTION**

150-lb ANSI Weld-Neck Flanges

Size	Max. Flow	Symbol
Inches	MM (GPM) (LPM)	
4	101.6 800 3024	<b>32W</b>
6	152.4 1400 3785	<b>48W</b>
8	203.2 1500 5677	<b>64W</b>

Flanges are ANSI steel; stainless units have stainless flanges. (Refer to page 129 for additional flange information)

**SCALE CALIBRATIONS**

- Calibrated in gallons per minute = **GM**
  - Calibrated in liters per minute = **LM**
  - Calibrated in imperial gallons per minute = **IGM**
  - Dual scales (GPM and LPM) = **GLM**
  - Cubic meters per hour = **CMH**
- For specific calibration increments and other units of measurement consult factory

Consult factory for compatibility of construction materials with the fluid involved.

**R 1 W R - ST - 400D**

**FLOW DIRECTION**

- R** = Left to right
- L** = Right to left
- U** = Up
- D** = Down

**SERVICE**

- W** = Weatherproof (Type 4)
- X** = Weatherproof, corrosion proof (Type 4X)

**INITIAL SWITCH SETTING**

**No symbol** = Lowest possible  
 Or, give setting(s) in GPM, LPM, etc. Also a symbol to indicate that accuracy is desired during increasing flow (**U**) or decreasing flow (**D**). (**400D** would mean that switch will actuate when flow rate decreases to 100 GPM.) Settings are field adjustable.

**SPECIAL OPTIONS**

- HT** = High-temp, 400°F for A & R Box (300°F for transmitter options GT, RT & TT Boxes)
  - ST** = Stainless steel ID tag
  - PC\*** = Pin connector with 3-6 pins, mini and micro style available
  - FL\*** = Fault light(s)
  - TG** = Tempered glass window
- Note:** These options are described more fully in "Options for Vane and Piston style flowmeters."

**STANDARD CONTROL BOX & READOUT (switches)**

**R Box**

**High resolution pointer and scale for more accurate reading, optional switches**

- R0** = Scale & pointer only
- R1** = One SPDT (3wire), CE
- R2** = Two SPDT (3 wire), CE
- R3** = One SPDT (4 wire)
- R4** = Two SPDT (4 wire)
- R53** = One SPDT (3 wire) hermetically sealed
- R54** = Two SPDT (3 wire) hermetically sealed
- R61** = One SPDT (3 wire) high temperature
- R62** = Two SPDT (3 wire) high temperature
- R71** = One SPDT (3wire) gold contact
- R72** = Two SPDT (3wire) gold contact

**X Box**

**Hazardous location indication and switches**

- X7** = One SPDT hazardous location
- X7C** = One SPDT, CE
- X17** = One DPDT hazardous location
- X17C** = One DPDT, CE
- X30** = One SPST hazardous location proximity
- X31** = Two SPST hazardous location proximity

**G Box**

**Transmitter with digital display or remote display (standard), open collector alarms (optional)**

- GTL0** = internal 4-20 mA transmitter with two open collector alarms
- GTLZ0** = intrinsically safe 4-20 mA transmitter (no alarms)
- GP0** = G Box with remote transmitter. This requires a remote display and transmitter to be ordered as a separate line item. Model UT-PM-DTLCD.

**Note:** G Box requires "W" service selection (weatherproof). G Box has a terminal strip but can be used with pin connectors ordered as Special Options as described above. Select PC5M for GTL and PC3M for GTLZ or GP.

**SPECIAL OFFERINGS**

**RT Box**

**High resolution pointer and scale for more accurate reading, 4-20 mA Transmitter, optional high amp mechanical switch**

- RT0** = Scale & pointer only
- RT1** = One SPDT (3wire), CE
- RT53** = One SPDT (3 wire) hermetically sealed
- RT61** = One SPDT (3 wire) high temperature
- RT71** = One SPDT (3wire) gold contact

**TT Box**

**4-20 mA Transmitter with pointer & scale, optional high amp mechanical switch, separate junction boxes for switch & transmitter**

- TT0** = Scale & pointer only
- TT1** = One SPDT (3wire), CE
- TT3** = One SPDT (4 wire)
- TT53** = One SPDT (3 wire) hermetically sealed
- TT61** = One SPDT (3 wire) high temperature
- TT71** = One SPDT (3wire) gold contact

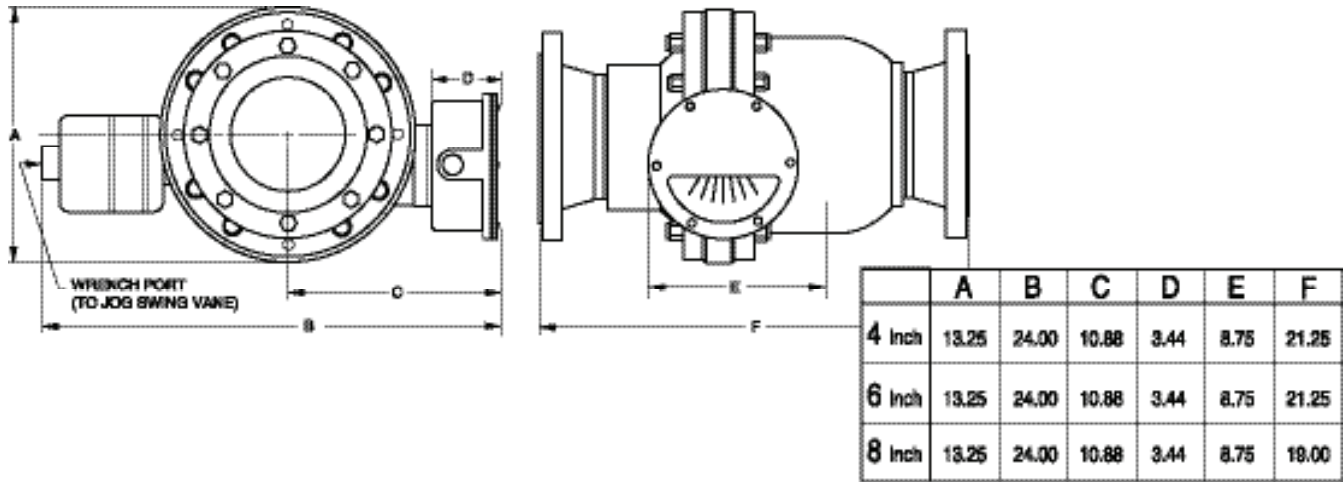
**TTL Box**

**4-20 mA Transmitter with digital display, optional high amp mechanical switch, separate junction boxes for switch & transmitter**

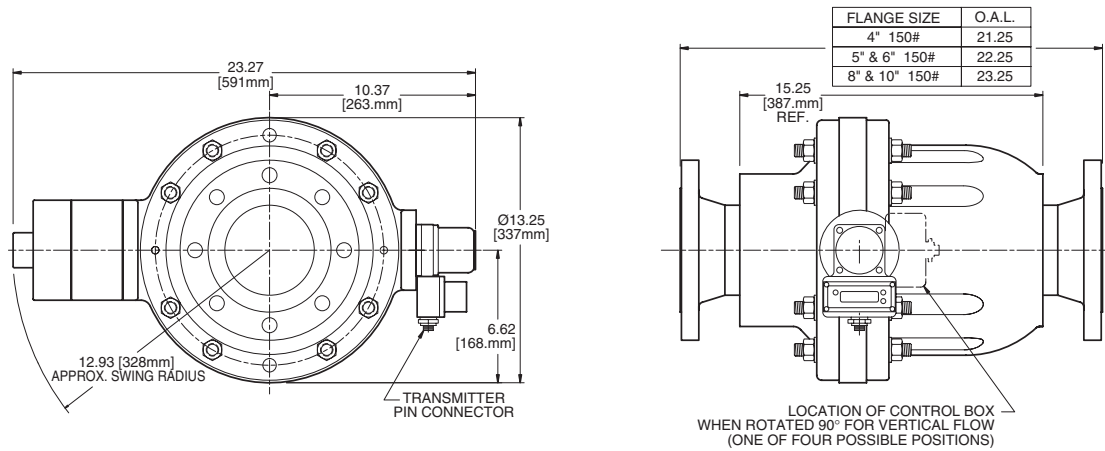
- TTL0** = Scale & pointer only
- TTL1** = One SPDT (3wire), CE
- TTL3** = One SPDT (4 wire)
- TTL53** = One SPDT (3 wire) hermetically sealed
- TTL61** = One SPDT (3 wire) high temperature
- TTL71** = One SPDT (3wire) gold contact

**DIMENSIONS, XHF SERIES (approximate) in inches**

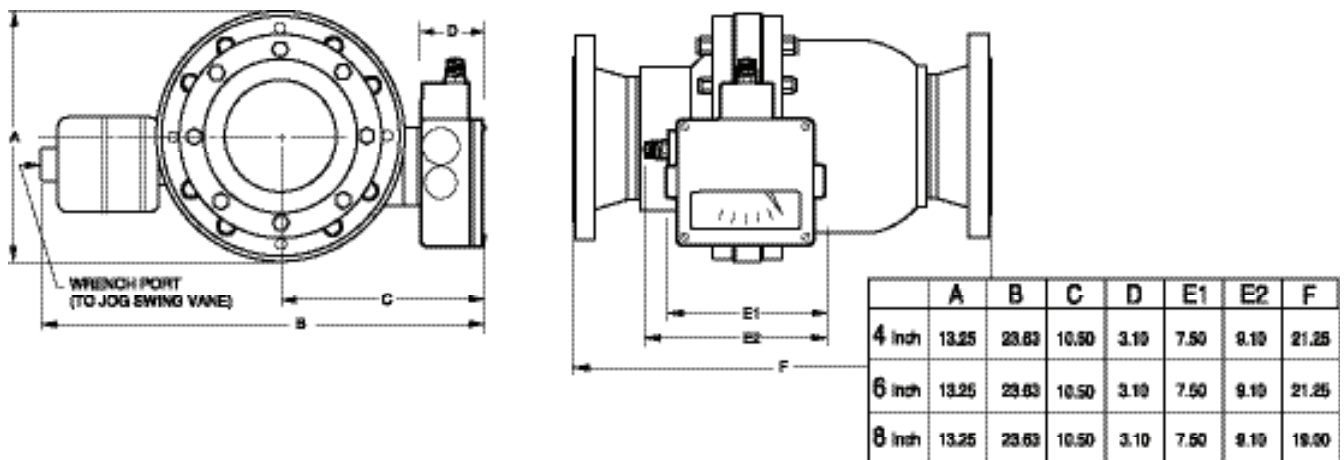
**STANDARD OFFERING: Control Box "R"**



**STANDARD OFFERING: Control Box "G"**

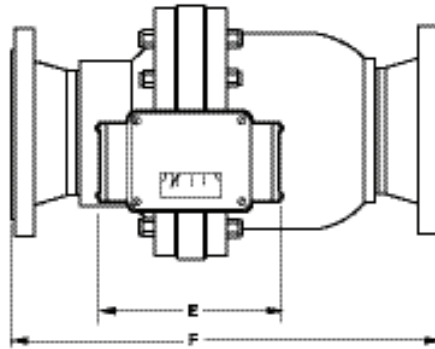
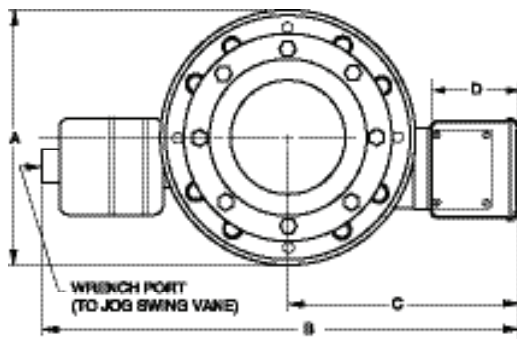


**STANDARD OFFERING: Control Box "X"**



## DIMENSIONS, XHF SERIES (approximate) in inches

### SPECIAL OFFERING: Control Box "T"



	A	B	C	D	E	F
4 Inch	13.25	25.63	11.50	4.19	8.0	21.25
6 Inch	13.25	25.63	11.50	4.19	8.0	21.25
8 Inch	13.25	25.63	11.50	4.19	8.0	19.00

### ENGINEERING DATA

**Maximum fluid temperature:**  
200°F (95°C)

**Optional max. fluid temperature:**  
400°F (205°C)

**Maximum ambient temperature:**  
150°F (65°C)  
CSA listed only to 105°F (40°C)

**Maximum operating pressure**  
(3:1 safety factor):  
300 PSI (20.69 BAR)

**Readout accuracy, full scale:**  
±2%

### FLOW & PRESSURE DROP

Meters with maximum flows to 800 GPM (3000 LPM) impose a pressure drop that increases with flow from 1.9 to 3.8 PSI (avg. 2.2). Flows greater than 800 GPM are made possible by having a dual spring modification (which raises the pressure drop). The pressure drop at maximum flow is 5.5 PSI.

### SPECIAL OPTIONS

**High temperature:** (option HT) requires seals of Viton®, EPR, Kalrez™ or Teflon (compatible with fluid). A thermal barrier (heat-resistant cloth) is added between the housing and the control box, which must be used with service option "W" (weatherproof) or "X" (corrosion resistant). A metal scale is provided.

**Identification tag:** (option ST) customer-supplied information is stamped on a stainless steel tag that is attached to the nameplate.

**Multi-pin connector:** (option PC) the male half of a Brad-Harrison type multi-pin connector is pre-wired to switch(es), potentiometer or transmitter for quick and easy field installation. Maximum current for multi-pin connectors is 7 amps. Refer to available output types for additional ordering information, page 124.

**Fault light:** (option FL) a red LED in nameplate indicates when a flow limit has been reached by internal switch contact. Helpful with multiple meters. Add to end of symbol: **1** (1 light), **2** (2 lights), **A** (AC), **D** (DC), i.e. **FL2D**. Only available with service

option "W" weatherproof enclosures or "X" corrosive service. Requires switch option and switch setpoint. For optional LED colors, consult factory.

**CE marked switches:** (option CE) SPDT 3-wire switch for general purpose use. Standard on switches 1, 1B, 2 and 2B, optional on 3, 4, 61, 62, 71 and 72.

**Tempered-glass window:** (option TG) replaces the standard window. A tempered-glass window is employed where airborne solvents or high-ambient temperatures are common.

**Transmitter-calibrated potentiometer:** (option TC) the voltage signal from the potentiometer is recorded and filed at the factory for future reference. When a remote transmitter is ordered, the data recorded is used for calibration without requiring that the flow meter be returned to the factory.

**Remote Transmitter Calibration:** (option RX) coordinates specific meter with its matching remote transmitter (ordered separately) for proper factory calibration.



### Universal Flow Monitors, Inc.

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