

# “A”-Series Gas Meters

## Commercial Diaphragm Meters

- ▶ Lightest 400, 800, & 1000 class meters
- ▶ AMR Compatible
- ▶ Eliminates Costs of duplicate inventory
- ▶ Superior accuracy over all flow rates
- ▶ Easy Handling
- ▶ Long Life

### Features

- 3-chamber design
- Wearless orbital valve
- One piece, seamless, convoluted diaphragm
- Lubrication-free bearings
- EZ-VU Adjustment Port
- Parts commonality
- Instrumentation compatible
- Easy Turn (ET) top for simple installation



### Applications

Ideally suited for light and higher capacity commercial metering requirements such as dry cleaners, restaurants, schools, hospitals and hotels. The 400A, 800A, & 1000A meters retrofit to any meter set within its capacity range.

### Description

Actaris' "A"-Series commercial diaphragm meters comprise a range of positive displacement gas measurement devices with capacities of 400 to 1000 ft<sup>3</sup>/hr. These meters use proven, time-tested diaphragm meter technology in a 3-chamber design to provide accurate measurement across their respective flow ranges. Long-life and low maintenance are assured by the combination of a self-lapping orbital valve, single convolution diaphragms, and lubrication-free bearings. Careful attention to design makes them compact and lightweight for their capacity ratings.

### ▶ Compact Without Compromise

The "A"-Series meters dispel old notions about large diaphragm meters. Compact size can co-exist with long life. Weight can diminish without compromising durability. Diaphragm meter accuracy is available across the complete range from small to large commercial metering applications. Actaris "A"-Series meters give you the physical size you need, without compromising our tradition for highly accurate meters that are a good value. This customer-driven design makes for easier handling in the shop and in the field.

### ▶ Easier to Install

The 'ET' Easy Turn design allows 2 to 3 times more wrench swing than the competition – as much as a full 120 degrees for meters mounted directly against a wall – making the Actaris 675A, 800A, and 1000A 'ET' gas meters the easiest and safest to install in North America.

### ▶ Instrumentation Compatible

The "A"-Series meters are designed to be fully compatible with all volume and temperature-integrating instruments available today.

### ▶ Setting the Standard

When you combine all of the "A"-Series customer-driven features with Actaris' tradition for highly accurate meters and good value, it is easy to see why these outstanding meters should have a place in your measurement operation.

### ▶ The "A" Series meters meet the following standards:

- Industry Canada: AG-0298, AG-0385
- State of New York Department of Public Service: 91-G-0507, 96-G-0885
- ANSI B109.1, ANSI B109.2

# 400A:

## ► The compact performer for light commercial metering

Actaris' 400A meter is the most compact and lightweight 400-class meter on the market today. Maintaining the use of a wearless orbital valve, single convolution diaphragms, and lubrication-free bearings, the 400A delivers maximum initial and sustained accuracy.

## ► Designed to fit

Available with either Sprague standard 6-25/32" or 8-1/4" center-to-center hubs, and with a reduced height of 14-22/32" the 400A can replace any existing 400-class meter with no need for expensive, time-consuming piping rework.

## ► Ideally suited to light commercial and high-capacity domestic metering requirements, the Actaris 400A offers:

- 45% reduction in size from previous model.
- The top and top gasket are the same as previous meter.
- Lightest, narrowest 400-class meter on the market.
- Fewer moving parts than any other 400-class meter.

**Hex Bushing** - In the valve cover to provide self alignment and ensure consistent orbiting of the valve cover.

**Mainshaft and Tangent Crank** - One-piece construction minimizing assembly variations.

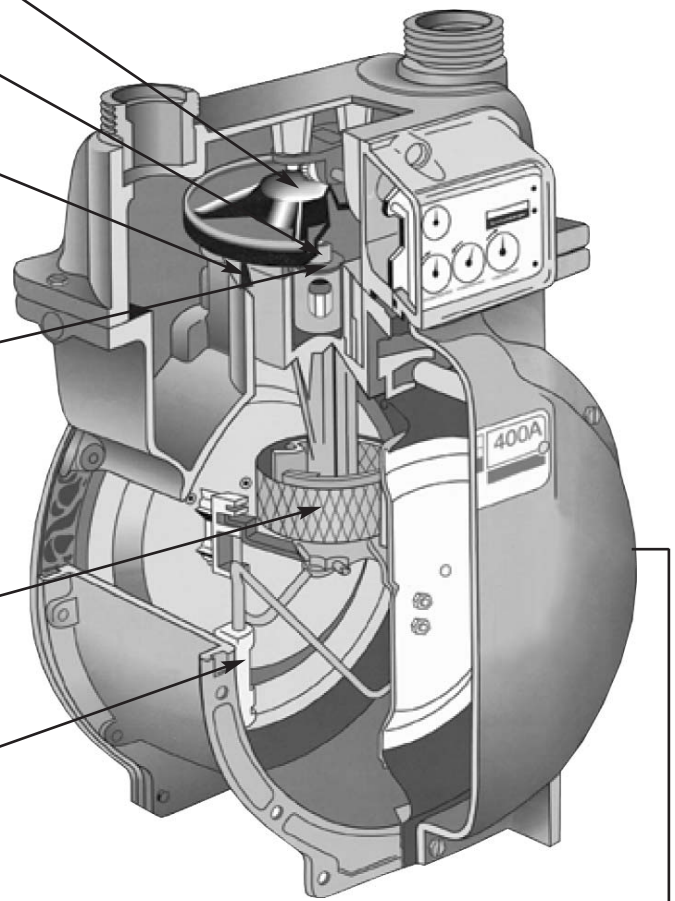
**Web-free Valve Seat** - Enables mainshaft and tangent crank to be replaced without removing the valve seat.

**Lubrication Free Bearings** - Ensure long maintenance-free operation.

**Temperature Compensation (optional)** - Located in the main measurement chamber for more prompt response to changes in temperature.

**Carrier Bracket** - Engineered with tongue and groove design allowing for consistent and precise positioning of carrier wires and reducing wire bending adjustment.

**EZ-VU Adjustment Port**



# 675A, 800A, 1000A:

## ► Diaphragm accuracy for higher capacity metering applications

The larger members of the "A"-series combine accuracy and long life in a compact meter. Thanks to modern engineering and production techniques, the Actaris 1000A, for example, weighs 28 percent less than our previous 1000-class meter. Its height has been cut by 29 percent, creating a leaner, tighter meter. This new smaller size adds up to big advantages in easier shipping, handling and installation - at just 19" from base to hub, these meters can be applied wherever capacities of 675-1000 ft<sup>3</sup>/h are needed.

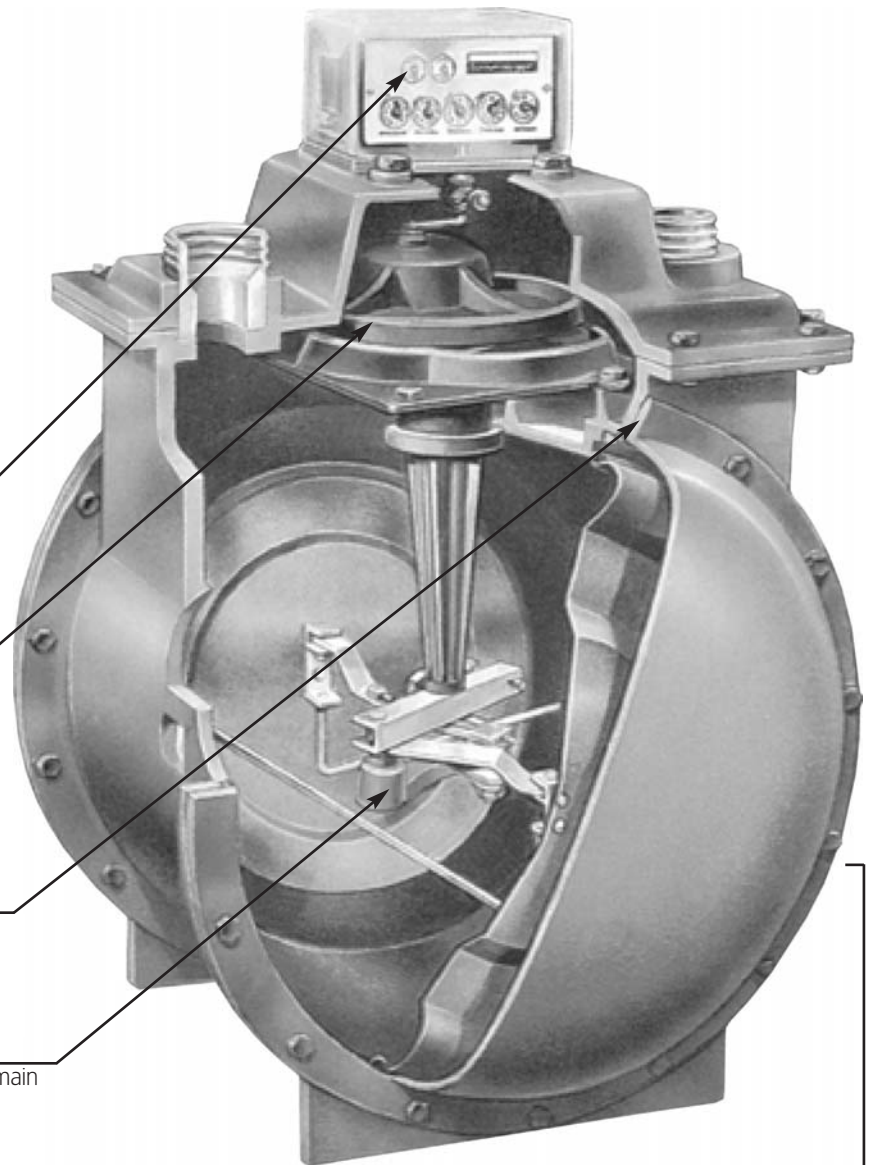
Actaris 800A and 1000A meters will retrofit into any of your current meter sets. Costs are controlled by eliminating inventory tracking of different-sized meters in the same capacity range.

## ► Easier to install, easier to use

These high performance meters offer advantage after installation, too. They all feature a top-mounted index drive for full instrumentation compatibility. In addition, the index can be rotated to 180° for installations where it is more convenient to install the meter backwards.

## ► Actaris 675A, 800A, and 1000A meters offer these advantages for commercial metering applications:

- Reduced size and weight compared to previous models
- Fully compatible with volume and temperature-integrating instruments



▮ **Reversible top-mount index** - Ensures easy installation where the meter inlet and outlet need reversing.

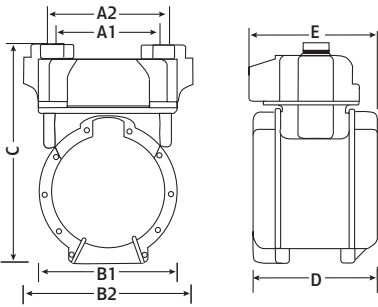
▮ **Self-dressing orbital valve and seat** - Contribute to superior valve wear, leading to improved accuracy and repeatability over the life of the meter.

▮ **"O"-Ring diaphragm seal** - Ensures consistent sealing throughout wide environmental temperature variations. Neoprene gasket material makes repairs simple - eliminates the need for costly cork gasket removal.

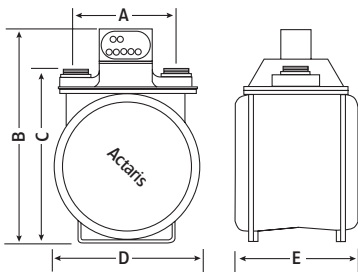
▮ **Temperature compensation** - (option) is located in the main measurement chamber for more prompt response to temperature changes.

▮ **EZ-VU Adjustment Port**

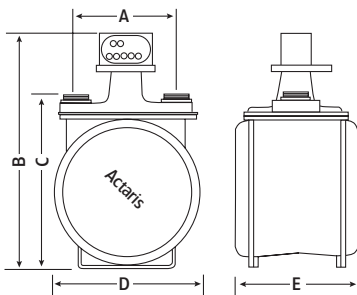
► 400A



► 675A, 800A, 1000A



► 675A ET, 800A ET, 1000A ET



## Specifications

Meter Classification	400A	675A	800A	1000A
Hub Center-to-Center	6-25/32" or 8-1/4"	10"	11"	11"
Meter Type	Non-temperature compensated or temperature compensated			
Index Type	4 circle dial (ft <sup>3</sup> ) • Standard 7', 14', 2 PSIG 4 digit direct read (ft <sup>3</sup> ) 5 digit direct read (ft <sup>3</sup> or m <sup>3</sup> ) 7 digit direct read (m <sup>3</sup> )	5 circle dial (ft <sup>3</sup> ) • Standard 7', 14" 5 digit direct read (ft <sup>3</sup> ) 6 digit direct read (m <sup>3</sup> ) 7 digit direct read (m <sup>3</sup> )		
Meter M.A.O.P.	10 PSIG (25 PSIG option)	25 PSIG		
Hub Sizes	#4 Sprague Standard 20LT, 30LT, 45LT	#4 Sprague Standard 30LT, 45LT	#5 Sprague Standard 30LT, 45LT, 60LT, 100LT	#5 Sprague Standard 45LT, 60LT, 100 LT
Surface Treatment	ASA 49 Gray Polyester Powder Coating			
Standard Packaging	60 per skid	Single Pack 18 per skid		

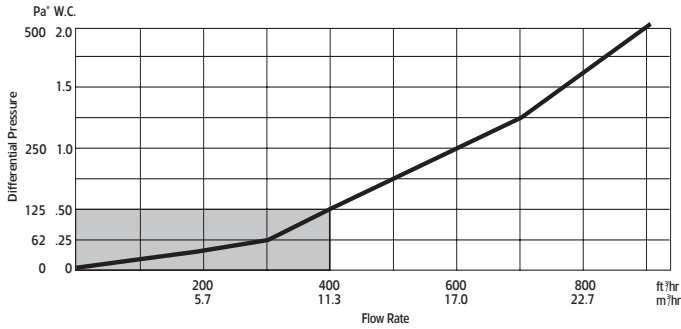
## Dimensions

Model	Imperial - Inches							lbs
	A1	A2	B1	B2	C	D	E	Wt
400A	6.78"	8.25"	9.5"	10.9"	14.71"	8.71"	9"	12.3
	A	B	C	D	E	Wt		
675A	10"	23.2"	18.6"	15.6"	13.3"	43		
800A	11"	23.2"	18.6"	15.6"	13.3"	43		
1000A	11"	23.2"	18.6"	15.6"	13.3"	43		
675A ET	10"	24.8"	18.6"	15.6"	13.3"	43		
800A ET	11"	24.8"	18.6"	15.6"	13.3"	43		
1000A ET	11"	24.8"	18.6"	15.6"	13.3"	43		

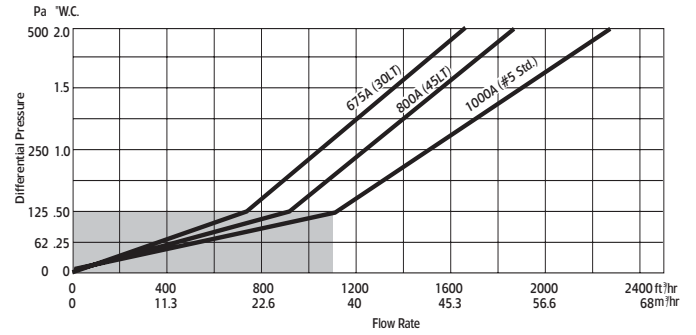
Model	Metric - mm							kg
	A1	A2	B1	B2	C	D	E	Wt
400A	172	210	241	277	374	221	229	5.6
	A	B	C	D	E	Wt		
675A	254	589	472	396	338	19.5		
800A	279	589	472	396	338	19.5		
1000A	279	589	472	396	338	19.5		
675A ET	254	630	472	396	338	19.5		
800A ET	279	630	472	396	338	19.5		
1000A ET	279	630	472	396	338	19.5		

## Capacity & Pressure Loss Charts\*

### 400A

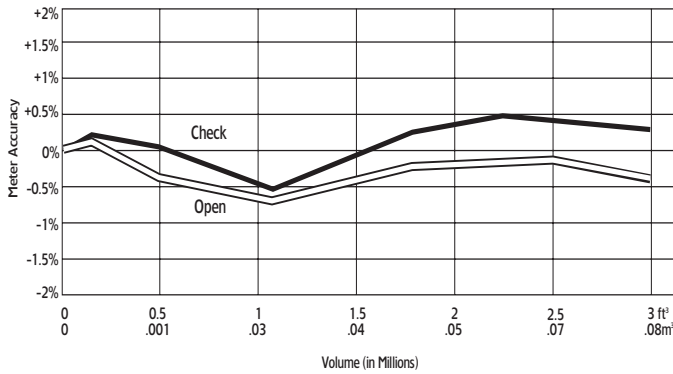


### 675A, 800A, 1000A

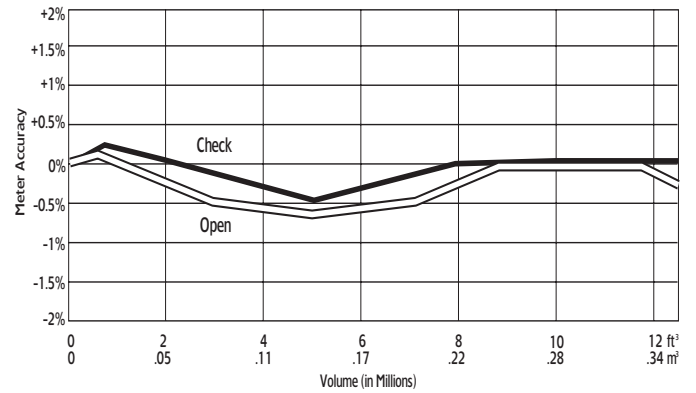


## Accelerated Life Test\*

### 400A Running at 800 ft³/hr (22.6 m³/hr)



### 675A Running at 900 ft³/hr (25.5 m³/hr)



\*Individual meter performance may vary from data shown.

► Actaris products are manufactured at Actaris' Owenton, KY facility where our workers take pride in delivering quality products with the utmost concern for customer satisfaction.

# High Pressure Capacity Data\*

Based On: 0.60 Sp. Gr. Gas; 60°F; 14.73 psia base & 14.4 psia atmospheric pressure

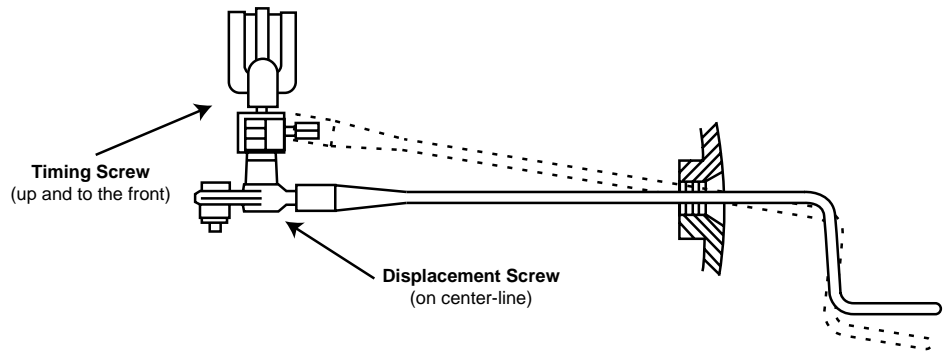
Meter Pressure PSIG	Index Rate Factor	Diff. Press. $\Delta P$ "W.C."	#240 Cap. SCFH	#175 Cap. SCFH	Actaris Meter Models			#800 Cap. SCFH	#1000 Cap. SCFH		
					#250 Cap. SCFH	#400 Cap. SCFH	#675 Cap. SCFH				
14.73 psia	1.00	2.00	460	540	610	860	1325	1540	2040		
1	.989	2.04	470	560	630	890	1370	1630	2110		
2	.974	2.10	500	585	660	930	1435	1720	2210		
3	.960	2.17	520	610	690	970	1500	1805	2310		
4	.945	2.22	540	635	720	1015	1565	1890	2410		
5	.932	2.28	565	660	750	1055	1625	1970	2505		
6	.921	2.32	To find the actual index rate or speed at any pressure, multiply the index rate factor for the pressure times the 2" w.c. rating of the meter.			1095	1690	2055	2600		
7	.909	2.38				1135	1750	2135	2695		
8	.900	2.43				1175	1810	2215	2790		
9	.890	2.49				1215	1870	2295	2885		
10	.881	2.54				1255	1930	2370	2975		
11	.874	2.60				1290	1980	2400	3065		
12	.865	2.64				1330	2050	2475	3155		
13	.855	2.68				1365	2110	2550	3245		
14	.849	2.73				1405	2165	2630	3335		
15	.841	2.78	1440	2220	2705	3425					
			<p><b>Example:</b></p> <p>The maximum capacity of a #675 meter at 15 PSIG is 2220 SCFH. The maximum allowable index rate to produce that flow is:</p> <p><math>.841 \times 1325 = 1114</math> ACFH with a 2.78" w.c. <math>\Delta P</math></p>			1480	2280	2775	3510		
16	.834	2.82				1515	2335	2850	3595		
17	.827	2.87				1550	2390	2925	3680		
18	.820	2.90				1585	2445	2995	3765		
19	.815	2.95				1620	2500	3070	3850		
20	.808	2.98									
21	.803	3.03				1655	2555	3090	3935		
22	.797	3.07				1695	2610	3160	4020		
23	.791	3.11				1725	2665	3230	4100		
24	.786	3.15	1760	2715	3300	4185					
25	.782	3.20	1795	2770	3370	4265					

\*Tested in accordance with ANSI B109.1 1973, Gas Displacement Meter Standard. Individual meter performance may vary from data shown.

## 3-CHAMBER METER ADJUSTMENT

The timing and displacement adjustments are the same on all Actaris 3-chamber style meters. The 400A, 800A, & 1000A have a handhole cover on the right side enabling viewing of the adjustment mechanism. To adjust the meter, remove the handhole cover on the right side of the meter.

A single tool that accommodates two different screw heads for the timing and displacement screws is used to adjust the meters. When adjusting the 400A with the handhole cover, use proving wrench part number 80003601. When adjusting the 675A, 800A, & 1000A use proving wrench part number 550430.



### Step 1 Timing Adjustment

Made by removing the handhole cover on the right side of the meter and rotating the timing screw 1/2 turn for each 1% change in “open” proof needed to match the “check” reading. Do not reprove the meter. Go on the Step 2.

### Step 2 Volume Adjustment

Made by rotating the displacement screw one turn for every 1% change in “check” needed to match target accuracy. The handhole cover can then be replaced and the meter reproved to verify adjustment.

### Adjustment Rule:

Bring Open to Check, and Check to Spec.

<b>Timing Screw:</b>	<b>Changes Spread</b>	1/2 Turn = 1%
	Clockwise (+)	
	Counterclockwise (-)	
<b>Displacement Screw:</b>	<b>Changes Open &amp; Check</b>	1 Turn = 1%
	Clockwise (+)	
	Counterclockwise (-)	
<b>Example:</b>	Target (% Accuracy)	Open = 100.0%, Check = 100.0%
	Reading (% Accuracy)	Open = 102.5%, Check = 101.0%
Proper Adjustment for Timing Screw = 3/4 Turn Counterclockwise		
Proper Adjustment for Displacement Screw = 1 Turn Counterclockwise		

### ► EZ-VU adjustment system

Adjusting our meters just got even easier! The EZ-VU adjustment system consists of a larger port opening, a clear Lexan port cover, and an adjustment tool with an integral light. The larger opening, combined with the illuminated tool, lets you see where the displacement and speed screws are located. The Lexan port seal, through which the adjustment tool passes, allows adjustment and proving without removal and replacement of the handhold plate.

## Correction factors for non-natural gas applications:

The A-Series may be used to control gases other than natural gas. To determine the capacity of the A-Series for gases other than natural gas, it will be necessary to multiply the values within the capacity tables by a correction factor.

The table below lists the correction factors for some of the more common gases:

Gas Type	Specific Gravity	Correction Factor (CF)
Air	1.00	0.77
Butane	2.01	0.55
Carbon Dioxide (Dry)	1.52	0.63
Carbon Monoxide (Dry)	0.97	0.79
Natural Gas	0.60	1.00
Nitrogen	0.97	0.79
Propane	1.53	0.63
Propane-Air-Mix	1.20	0.71

To calculate the correction factor for gases not listed on the table above, it will be necessary to know the specific gravity of the gas and use it in the formula listed below:

$$\text{Correction Factor (CF)} = \sqrt{\frac{S.G._1}{S.G._2}}$$

### Where:

SG<sub>1</sub> = Specific Gravity of the gas in which the capacity is published.

SG<sub>2</sub> = Specific Gravity of the gas to be controlled.

## Limited Warranty

Actaris U.S. Gas, Inc., 970 Highway 127 North, Owenton, Kentucky 40359-9302, warrants this gas product against defects in materials and workmanship for the earlier of one (1) year from the date the product is shipped by Actaris or a period of one year from the date the product is installed by Actaris at the original purchaser's site. During such one-year period, provided that the original purchaser continues to own the product, Actaris will, at its sole option, repair any defects, replace the product or repay the purchase price.

This warranty will be void if the purchaser fails to observe the procedures for installation, operation or service of the product as set forth in the Operating Manual and Specifications for the product or if the defect is caused by tampering, physical abuse or misuse of the product.

### ► Ordering Information

1. Capacity of installation (BTU/hr, scfh, etc.)
2. Metering pressure
3. Units (Standard or Metric)
4. Hub size
5. Index style
6. Temperature compensation
7. Tamper seals

**• ACTARIS SPECIFICALLY DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING THOSE OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. UNDER NO CIRCUMSTANCES WILL ACTARIS BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND WHATSOEVER.**

- Actaris' liability for any claim of any kind, including negligence and breach of warranty for the sale and use of any product covered by or furnished, shall in no case exceed the price allocable to the product or part thereof which gives rise to the claim.
- In the event of a malfunction of the product, consult your Actaris Service Representative or Actaris U.S. Gas, Inc., 970 Highway 127 North, Owenton, Kentucky 40359-9302.

**See Actaris Terms and Conditions of Sale for the full and complete terms of the limited warranty.**

### ► Reference Information:

- Installation Procedure

### Actaris U.S. Gas, Inc.

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