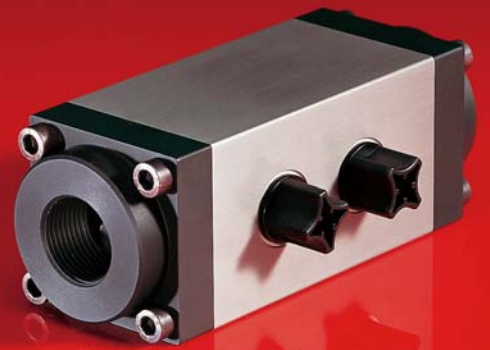


KRAL Volumeter® - OME Series  
Economy Flowmeters

**KRAL**



## OME A unique concept for economical flow measurement



### Operating Conditions and Materials

<input type="checkbox"/> Flow Range:	0.03 to 40 gpm
<input type="checkbox"/> Max. Pressure:	600 psi
<input type="checkbox"/> Temperature Range:	-4 to 210 °F
<input type="checkbox"/> Viscosity Range:	1 to 1x10 <sup>6</sup> cSt
<input type="checkbox"/> Liquid:	chemically neutral, lightly lubricative, clean, non-abrasive
<input type="checkbox"/> Accuracy:	±0.1% of rate
<input type="checkbox"/> Casing:	anodized aluminum
<input type="checkbox"/> Screws:	nitrided steel
<input type="checkbox"/> Bearings:	bearing steel
<input type="checkbox"/> Seals:	Viton®

#### Favorable Price

In the international marketplace, you are faced with severe price pressure. Savings can start when purchasing individual components.

We recognized that not all our customers needed the wide pressure and temperature capabilities of our original series. That is why we created the patented OME design, to provide an excellent flowmeter value for the large segment of our customers with lower flow, pressure and temperature requirements.

#### Optimum Design

The reengineered design of the OME is optimized for efficient production. The aluminum housing can be completely machined on one machine without repositioning or retooling. This reduces manufacturing time dramatically.

Instead of the standard pole wheel, flow pulses are taken from the spindle directly, thus reducing the number of parts in the meter.

By using an aluminum housing, fewer parts, and precision machining, the OME is just what you need... not less, not more.

#### High Measuring Accuracy

The KRAL philosophy has always been to offer the highest measurement accuracy possible. Our OME series continues this tradition.

The basic measuring chamber, made from the spindles and the inner-diameter of the casing, is the same throughout our line of flowmeters. The OME sensor location at the spindles does not affect the measuring chamber.

ISO 9001 quality assurance and calibration of each meter assures nearly 100% consistency of our meters.

#### The Spindle Advantage

Positive-displacement flow measurement using spindles is a proven and effective approach. Our spindle profile demonstrates high accuracy over a wide range of both flow and viscosity.

Spindles are unaffected by meter installation and require no flow conditioning for accurate measurement. Along with an extremely compact design, our meters require very little installation space.

All KRAL Volumeters can measure bi-directionally, which can simplify otherwise complex measurement tasks.

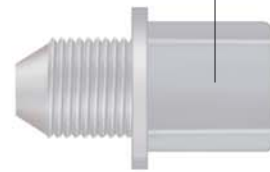
The OME: Customers with lower flow, pressure, and temperature requirements will welcome the favorable price.

No flow conditioning or straight piping is necessary upstream or downstream of the meter.

Precision measuring chamber for high measurement accuracy.

Optional second sensor for bi-directional measurement.

Precision spindles for wide flow and viscosity ranges.



Installation at any angle and direction.

Extremely compact design.

Flow pulses are taken directly from spindles with no affect on measuring chamber.

Output is industry standard square or sine wave.

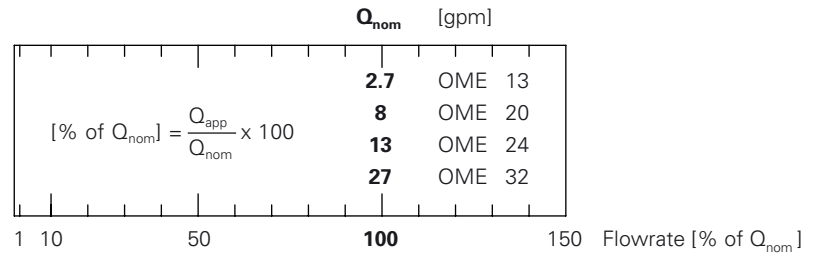
Various connections available, including:  
- Pipe thread  
- ANSI, SAE, JIS, and DIN flange  
- Custom



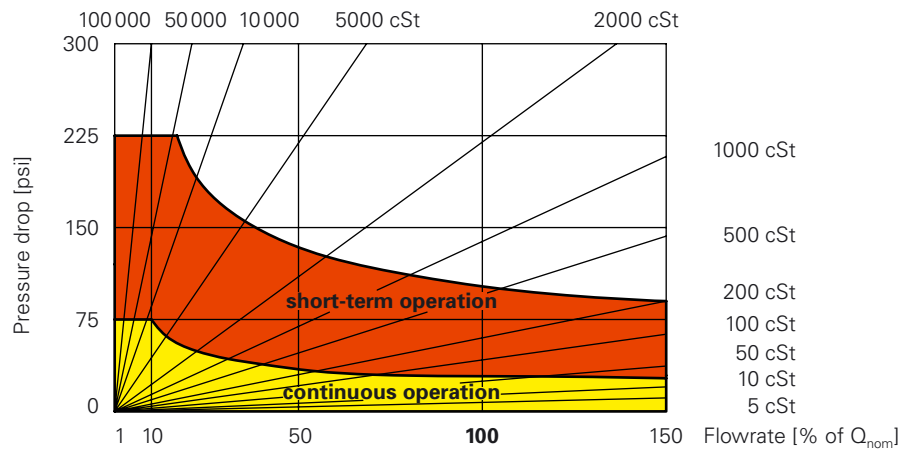
**The following questions can assist you in selecting an OME meter.**

	Explanation	Instructions	Notes
<p><b>Which size is suitable for the flow range to be measured?</b></p>	<p>The selection of the correct size ensures a long service life, high measuring accuracy and an excellent cost-utilization ratio.</p>	<p>From the <b>Size</b> table, select a size, OME 13 - 32, whose nominal flow rate, <math>Q_{nom}</math>, is near that of your application, <math>Q_{app}</math>. Then calculate flowrate in [% of <math>Q_{nom}</math>] using the equation shown at right.</p>	<p>The value of flowrate [% of <math>Q_{nom}</math>] is used in the following diagrams. Draw a line downward from this value to intersect the same value in the other diagrams. Moving the line left or right shows the effects of meter size on load rating and linearity.</p>
<p><b>Does the selected unit have the required service life?</b> <b>What is the pressure drop?</b></p>	<p>Service life and pressure drop are important factors in selecting a meter size. Verify that your selection will meet your expectations of service life and pressure drop. For increased service life and reduced pressure drop, select a larger size. This will reduce the flowrate [% of <math>Q_{nom}</math>] for a given application.</p> <p>For meters larger than size 32, the OMG Series of Universal flowmeters is available.</p>	<p>In the <b>Load Rating</b> diagram, find the intersection point of the viscosity [cSt] and flowrate [% of <math>Q_{nom}</math>] for your application. To the left of this point, find the pressure drop for the nominal flow of your application. The color range where the point lies signifies either continuous operation (yellow) or short-term operation (red). A point in the white range is not a recommended load rating for an OME.</p>	<p>The range of short-term operation can be purposely used for short times, such as a load reserve or safety factor.</p>
<p><b>What is the measuring accuracy of the selected unit?</b></p>	<p>High accuracy is expected from PD meters. The OME delivers excellent accuracy over a wide range of flows. For the highest accuracy, linearization is possible. The KRAL BEM 4U can linearize the meter's performance curve for a defined viscosity.</p>	<p>With the viscosity [cSt] and flowrate [% of <math>Q_{nom}</math>] you can obtain the meter accuracy curve from the <b>Linearity</b> diagram. Yellow range signifies: The device operates within the range of maximum accuracy of <math>\pm 0.1\%</math> of rate. Orange range signifies: The meter accuracy is within the limits of <math>\pm 0.3\%</math> of rate.</p>	<p>The OME begins measuring at an extremely low flowrate, due to very low slippage past the spindles. As viscosity increases, so does the linear region of the accuracy curve.</p>

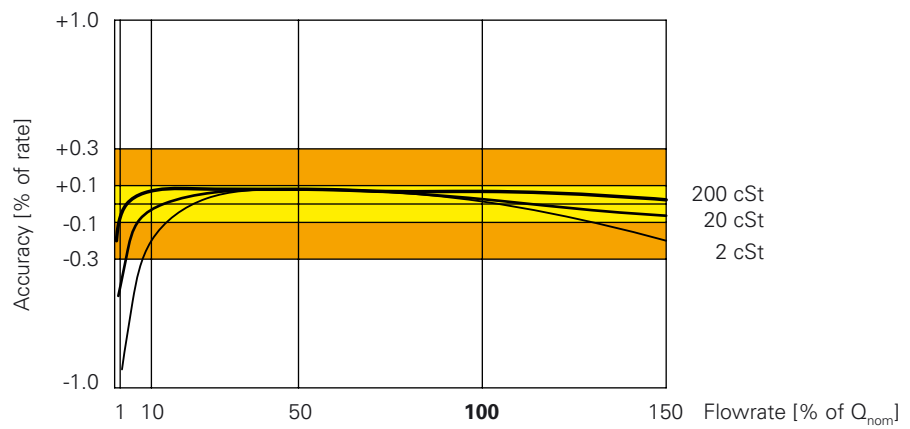
## Size



## Load Rating



## Linearity



**Are the precision and sturdiness of the KRAL Volumeter® fully utilized?**

The OME combines service life and accuracy to produce a measuring range of incredible magnitude. Since normal flow conditions are never static, a wide range of acceptable viscosities and flows is important for precise measurement.

The **Measuring Range** diagram provides a visual impression of the wide measurement range available with a KRAL Volumeter.

① This is where accurate operation of the OME starts.

② The OME can be operated continuously up to this line.

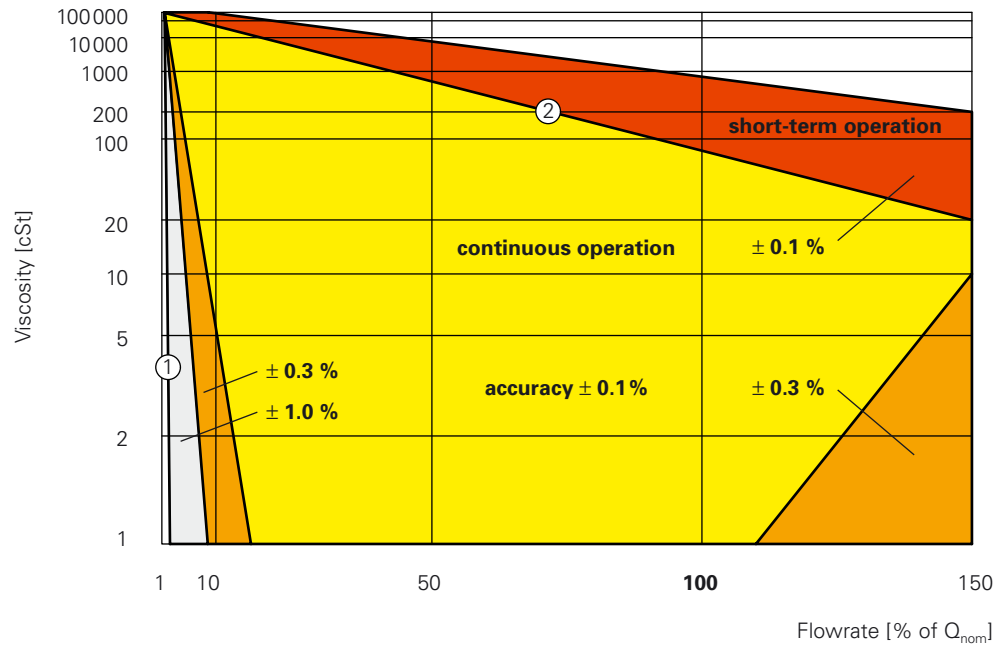
Notice the wide range of conditions where the OME will measure with an accuracy of  $\pm 0.1\%$  of rate.

Yellow range signifies: Best combination of accuracy and service life.

Orange range signifies: The meter is suitable for continuous operation with an accuracy of  $\pm 0.3\%$  of rate.

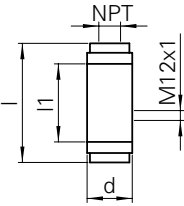
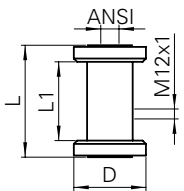
Red range signifies: Short-term Operation. The accuracy will be within  $\pm 0.1\%$  of rate.

**Measuring Range**




The measuring range diagram is copyright protected internationally.

Technical data		OME 13	OME 20	OME 24	OME 32
<b>Flow</b>					
$Q_{max}$	gpm	4	12	20	40
<b><math>Q_{nom}</math></b>	<b>gpm</b>	<b>2.7</b>	<b>8</b>	<b>13</b>	<b>27</b>
$Q_{min}$	gpm	0.027	0.08	0.13	0.27
<b>Pressure</b>					
$p_{max}$	psi	600	600	600	600
<b>Temperature</b>					
$t_{min} \dots t_{max}$	°F	-4 to 210	-4 to 210	-4 to 210	-4 to 210
<b>Viscosity</b>					
$v_{min} \dots v_{max}$	cSt	1 to 1x10 <sup>6</sup>	1 to 1x10 <sup>6</sup>	1 to 1x10 <sup>6</sup>	1 to 1x10 <sup>6</sup>
<b>K factor</b>					
K	pulses/gal	4595	1215	723	295
<b>Frequency</b>					
f at $Q_{nom}$	Hz	207	162	157	133


Dimensions/Weights		OME 13	OME 20	OME 24	OME 32	
		<b>NPT inch</b>	<b>1/2"</b>	<b>3/4"</b>	<b>1"</b>	<b>1"</b>
<b>p</b>	psi	600	600	600	600	
<b>l</b>	inch	4.33	5.70	6.50	7.87	
<b>d</b>	inch	1.77x1.77	2.16x2.16	2.36x2.36	2.75x2.75	
<b>l1</b>	inch	2.56	3.74	4.13	5.51	
<b>wt</b>	lb	1.3	2.4	4.0	6.0	
		<b>ANSI Class</b>	<b>1/2"</b> 150/300	<b>3/4"</b> 150/300	<b>1"</b> 150/300	<b>1"</b> 150/300
<b>L</b>	inch	4.13/4.13	5.31/5.71	6.3/6.3	7.68/7.68	
<b>D</b>	inch	3.50/3.75	3.87/4.62	4.25/4.87	4.25/4.87	
<b>L1</b>	inch	2.56/2.56	3.74/3.74	4.13/4.13	5.51/5.51	
<b>wt</b>	lb	2.4/2.6	3.5/4.2	5.3/5.7	7.3/7.7	

## KRAL Electronics

### Sensor Selection

You have the choice between a PNP sensor for standard applications and an -sensor for use in explosive areas.

### Industry Standard Signals

The BEG 40 sensor supplies PNP square wave signal. The BEG 41 -sensor produces a Namur signal. Both of these can be processed by standard industrial interfaces.

### Local Display

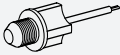
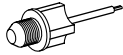



For local display of flowrate and total, the BEM 2U flow computer is an effortless solution. The compact and rugged unit can be mounted in many ways, is able to operate on battery power, and arrives ready for quick installation.

### Flow Management



For an easy to understand display and a stand-alone automation system, such as differential measurement, mass measurement or batching, the friendly BEM 4U is pre-programmed as a perfect complement to the OME.

Sensors		BEG 40	BEG 41
<b>Size</b> M12x1			 
<b>System</b>		PNP square wave inductive	Namur sine wave inductive
<b>Material</b>		PBTP	PBTP
<b>Pressure</b> $p_{max}$	psi	600	600
<b>Temperature</b> $t_{min} \dots t_{max}$	°F	-22 to 210	-22 to 170



## Success with the KRAL Volumeter® OME

### OME for OEM



KRAL is a supplier to many original equipment manufacturer (OEM) accounts. These customers look for high flow measurement accuracy and consistent delivery.

With an optimized design, OME flowmeters can be manufactured quickly and delivered on-time in large quantities.

Our customers enjoy the simplicity and lightweight design of the OME. Installation is simple because of the meter's compact and lightweight design. Without the need for upstream or downstream straight piping, OEM customers can place the meters within complicated systems easily.

### Gasoline Application



Liquid: gasoline  
Flow: 0.01 to 1.3 gpm  
Pressure: 600 psi  
Temperature: -4 to 170 °F  
Viscosity: 1.14 cSt  
Measuring instrument:  
OME 13

An automotive industry supplier needed the best possible solution for testing the flow through automotive fuel pumps during production. The advancements in automotive design required high measurement accuracy of low viscosity fuel over a wide measurement range.

Our Economy flowmeters fulfilled these requirements and are now an integrated part of our customer's production system.

### Liquid Blending

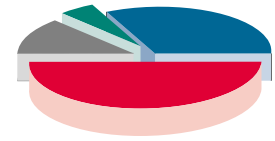


Liquid: changing  
Flow: 0.52 to 13 gpm  
Pressure: 230 psi  
Temperature: -4 to 140 °F  
Viscosity: 0.5 to 10 cSt  
Measuring instrument:  
OME 24

Blending liquids is a complicated task for a flowmeter. First, a wide flow range needs to be measured accurately. For custody transfer purposes, no loss of accuracy is tolerated. Second, with different liquids and temperatures, the flowmeter must measure accurately over a wide range of viscosities. Third, the measuring chamber must be small to minimize inadvertent mixing of dissimilar products

Our customer found the simple solution in the OME series. The wide flow and viscosity ranges allowed just one compact OME to replace two or three other meters.

### Quality and Consistency



- 32,5 % Master grade
- 50 % Skilled workers
- 12,5 % Apprentices
- 5 % Support staff

Our ISO 9001 certified production system guarantees maximum quality and reliable delivery.

Over 30% of our manufacturing staff are qualified as master grade machinists, compared to the European average rate of 2-3%. The high precision of our products requires this skill level and demonstrates our commitment to providing the best products possible.

Even for large orders, 100% of KRAL Volumeters are calibrated at the factory.



KRAL-USA, Inc.  
East: P.O. Box 2990, 901A Matthews-Mint Hill Road (28105), Matthews NC 28106, USA, Tel: (704) 814-6164, Fax: (704) 814-6165  
West: 700 E. Redlands Blvd. Suite U. #209, Redlands, CA 92373, USA, Tel: (909) 335-8765, Fax: (909) 335-8755  
[www.kral-usa.com](http://www.kral-usa.com)