



*Alternative Fuels*

August 29, 2008

## Liquid Controls — Alternative Fuels Update



There is increasing public awareness of the need to reduce the consumption of non-renewable petroleum fuels as they become scarcer, costlier, and more at risk to supply disruption. The easiest and quickest way to reduce consumption of non-renewable fuels is through the broader usage of what are called “alternative” fuels. Alternative fuels are those fuel mixtures that use of some percentage of domestic “renewable” hydrocarbon products, such as ethanol, vegetable oil derivative, or other renewable hydrocarbon product. Metering these alternative fuels represents a growing opportunity for the LC distribution partners and our shared customers.

### *Biodiesel and Ethanol Lead the Way*

**Biodiesel:** Biodiesel is defined as mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats which conform to ASTM D67521 specifications for use in diesel engines. 100% Biodiesel is not raw vegetable oil, but a derivative product comprised of methyl esters obtained by chemical treatment (transesterification) of vegetable oil. A common source of biodiesel product is soy beans.

A biodiesel blend (also referred to as “BXX”) is a mixture of some percentage of biodiesel with petro-diesel. Hence, a B10 biodiesel blend is 10% biodiesel and 90% petro-diesel. B20 has been tested by industry bodies and is ideal for burning in oil-fired home heating furnaces and boilers, without modification to the heating equipment. A recent article published in the February 2006 issue of Oilheating states: “After working with various biodiesel blends, B20 can be used in an oil burner just like #2 oil without any changes. Comparative readings, long term duration tests as well as cold oil tests are almost identical to #2 oil.” Increasing use of B20 for home heating is likely in the coming months. The recommended meter for biodiesel blends up to B100 is the Liquid Controls Class 1 meter with Buna seals.

**Ethanol:** Ethanol, derived from grain fermentation (typically corn), is typically mixed with conventional gasoline. This fuel mixture is best handled with an Liquid Controls anodized aluminum meter, used to meter pure alcohol for many years. The recommended meter for Ethanol is the Liquid Controls Class 16 meter with Viton seals.

An ethanol blend (also referred to as “EXX”) is a mixture of some percentage of ethanol with gasoline. The most common blend is E10 or 10% ethanol and 90% gasoline. This mixture is readily available at most gas stations and does not require any special adaptations or modifications to vehicle engines. However, E85 does require specially modified engines and cannot be utilized by all vehicles. Although the number of service stations selling E85 is somewhat limited at this time, the number of production and distribution capabilities is growing rapidly. Broader utilization of this product is anticipated in the future for automotive use. Even small percentages of ethanol mixed with gasoline reduce our dependence on non-renewable petroleum.

## Positive Displacement Meter Recommendations

The following meter models are available, covering the full range of flow

### BIODIESEL

#### Class 1 meters:

<u>Maximum Nominal Flow Rate</u>	<u>Meter Model</u>	<u>Meter Class</u>
60 GPM / 227 LPM	M5	Class 1
100 GPM / 380 LPM	M7 / MS7	Class 1
150 GPM / 550 LPM	M10	Class 1
200 GPM / 757 LPM	M15 / MS15	Class 1
300 GPM / 1,136 LPM	M25	Class 1
350 GPM / 1,325 LPM	M30 / MS30	Class 1
450 GPM / 1,700 LPM	M40	Class 1
600 GPM / 2,271 LPM	M60	Class 1
700 GPM / 2,650 LPM	MS75	Class 1
1,000 GPM / 3,785 LPM	MS120	Class 1



### ETHANOL

#### Class 16 meters:

<u>Maximum Nominal Flow Rate</u>	<u>Meter Model</u>	<u>Meter Class</u>
60 GPM / 227 LPM	M5	Class 16
100 GPM / 380 LPM	M7 / MS7	Class 16
200 GPM / 757 LPM	M15 / MS15	Class 16
350 GPM / 1,325 LPM	M30 / MS30	Class 16
600 GPM / 2,271 LPM	M60*	Class 16
700 GPM / 2,650 LPM	MS75	Class 16

\* Not show in current price list

**Class 1 meters for Biodiesel** are available with our recommended standard Buna (Nitrile) seals. Optional seal materials are available including Viton and PTFE.

**Class 16 meters for Ethanol** are available with our recommended standard seals Viton. Also available, PTFE seal materials.

**Note:** There have been several inquiries regarding the use M10, 25 and 40 class 16 meters for ethanol. Unfortunately, Liquid Controls can not supply these meters for ethanol applications.

It is true that the volume displacement of the metering chambers between an M7 / M10, a M15 / M25, and a M30 / M40 is the same. But in order to allow the M10, M25 and M40 to run at higher flow rates, carbon inserts are added to the bearing plates. These carbon inserts allow "lubricating" products, such as diesel, fuel oil, and aviation fuel, to run at a higher flow rate (Class 1 or 2 only). Because ethanol is a "non-lubricating" fluid, it requires the use of carbon inserts in order to meet the standard flow rates through M7, M15 and M30 class 16 meters. If flow rates higher than an M30 are required for ethanol, Liquid Controls recommends a M60 or MS75 class 16 meter.

All meters shown are available with electronic registers, POD pulsers or mechanical registration.

## Turbine Meter Recommendations

### Liquid Controls Sponsler, Inc.

The Liquid Controls Sponsler SP-series of turbine meters are ideal for alternative fuels applications. SP-series turbine meters are available in a wide range of sizes and flow ranges, and they can be equipped with a Sponsler brand transmitter or electronic register that suits your loading and unloading applications. Contact us today!

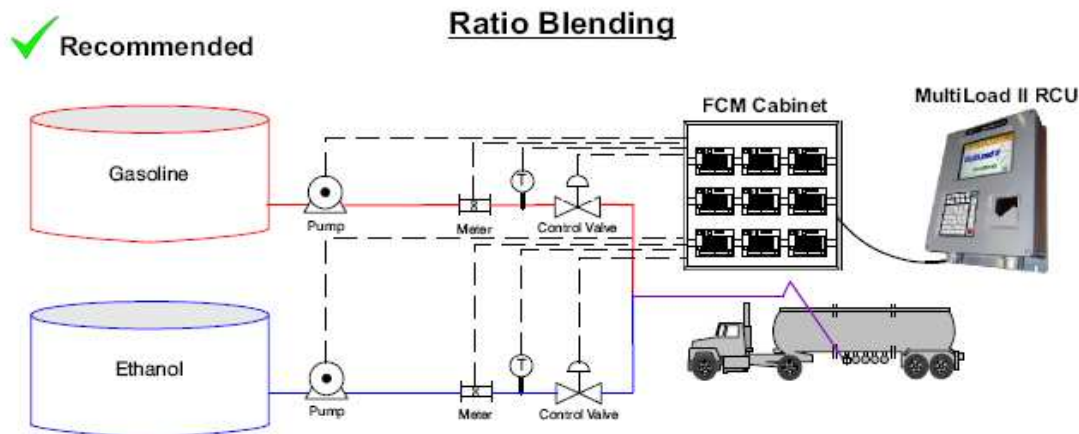


Biodiesel Recommendations	Ethanol Recommendations
• 304/316 Stainless steel body / flanges	• 304/316 Stainless steel body / flanges
• 304/316 Stainless steel internals	• 304/316 Stainless steel internals
• 17-4 PH rotor	• 430L/Duplex Stainless steel rotor
• 440C SS metal ball/Carbide sleeve bearings	• Fluorosint/Teflon/Kynar/Graphite sleeve bearings

## Toptech Systems for Blending Alternative Fuels

### Toptech MultiLoad II Ratio Blending

MultiLoad II can be configured to handle up to 6 component ratio blending. Toptech recommends ratio blending at the load rack, because ratio blending is the only current method where ethanol expansion is not a factor in balancing rack throughput to tank balances. A ratio blending system has a MultLoad RCU installed on each bay at the load rack and an FCM panel installed at each bay to handle the discrete I/O. The MultiLoad serves as the driver interface, card reader, and electronic preset. By ratio blending the gasoline and ethanol onto the truck, there are two isolated points of custody transfer: straight gasoline and straight ethanol. Most importantly, volume expansion occurs after the point of custody transfer and is not a factor when balancing rack throughput to tank balances.



## *Toptech Systems—Alternative Fuels Applications*

### *Toptech BPA Ideally Scaled to Manage Alternative Fuels Wholesale Distribution Facilities*

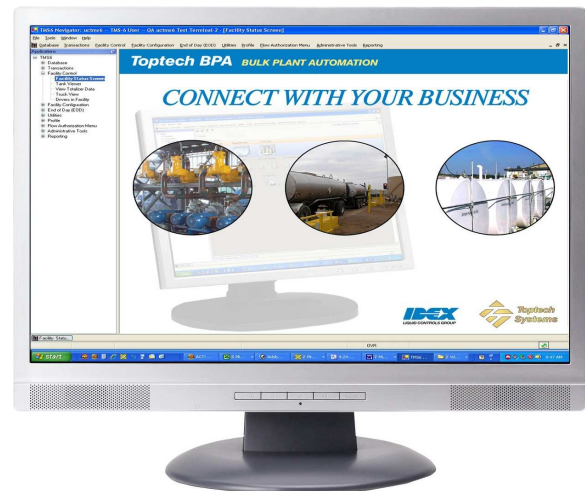


**BPA (Bulk Plant Automation)** is designed to give bulk plant operators the same high level of control that terminal operators have enjoyed for many years. Toptech has designed a system to provide valuable features to increase efficiency, maximize revenue, gain tighter control over inventory and virtually eliminate billing errors.

Due to the lack of pipeline available for alternative fuels, much of the supply of alternative fuels is distributed from bulk plants. Many of these bulk plants have made significant investments to accommodate for the storage and distribution of Ethanol and Biodiesel. Unfortunately, many facilities simply can't justify the investment for a full-blown terminal automation system, and many of the smaller automation packages don't offer the flexibility and features required to have a significant impact on their operations.

BPA is a different type of automation system. BPA offers a robust feature set which includes: Graphical Tank Inventory Levels, Transaction Logging, Automated BOL Printing and Comprehensive Reporting Suite. In addition, BPA can be easily upgraded with other tools such as: Allocation Control, Commingled Stock Accounting, Access Control and Security and Credit Control.

Because BPA is built on the same core technology as TMS6; it integrates seamlessly with other Toptech products, such as: MultiLoad II (Load Rack Control), TDS (3<sup>rd</sup>-party Data Exchanges, and TopHAT (Multi-site Host System). BPA can fit into nearly any existing infrastructure and interface with a variety of third-party equipment making it a great investment for any bulk loading facility.



## **LIQUID CONTROLS GROUP**

**CORKEN · FAURE HERMAN · LIQUID CONTROLS · SAMPI · SPONSLER · TOPTECH SYSTEMS**

The Liquid Controls Group (LCG) is a collection of highly regarded solution providers brought together to offer an extensive line of flowmeters, pumps, and control systems. Our extensive line of Pumps, Compressors, Meters, Registers, Presets and Automation Software combine to provide our customers a comprehensive selection of products to move, measure, and dispense high-value fluids and gases. For more information on the products listed, please contact us at:

.....

Liquid Controls      847-295-1050 (phone), 847-295-1057 (fax), 800-458-5262 (toll free), info@lcmeter.com  
 Liquid Controls Sponser    864-647-2065 (phone), 864-647-1255 (fax), 800-258-1165 (toll free)  
 Toptech System      407-332-1774 (phone), 407-332-1802 (fax), toptech@toptech.com