
MTG vs. Radar

Over the last five years as technology has improved, maintenance budgets and number of personnel have shrunk. Thus, the use of Radar tank gauging (RTG) has increased. The benefits of reduced maintenance from non obtrusive technology as compared to mechanical technology with moving parts is good, but is largely due to the neglect or lack of preventative maintenance with mechanical or servo gauges.

It should be kept in mind that Radar technology is not a cure all for tank gauging. It still requires proper installation to achieve maximum benefit. If it is being used for inventory accuracy (1/16" or better, API Chapter 3.1B), it must be used with a properly designed stilling well or standpipe. These structural devices provide a reference point from the bottom of the tank and are not subject to roof movement or shell expansion and contraction.

If the radar is mounted directly to the roof, you will lose the accuracy benefit when used for inventory. The use of most process radar units will result in a further loss of inventory accuracy, with most process radars not being designed with temperature input or sufficient strapping table inputs.

Temperature measurement is required with all level gauges in order to calculate volume (API Chapter 7.4). While GSI can supply you a radar unit with 1/32" (1mm) level accuracy, if you don't use a multiple spot temperature device you will lose inventory accuracy. A one (1) degree Fahrenheit inaccuracy in temperature measurement will result in an error of 0.08% of tank volume, or on a 40 ft. tank a level error of roughly 6/16". This is a much greater issue than even a 1/16" difference in level measurement technologies. Note: The use of an accurate multiple spot temperature device will require installation of a second device, wiring, etc.

Radar tank gauges provide level. Multiple spot temperature devices in combination with radar provide good volume (when supplied with accurate strapping tables and proper installation, i.e., stilling well). MTG or Mass Tank Gauge Technology is a probe that installs from the roof (not attached), but rests on the floor of the tank (No Reference Point Movement), and MTG has no moving parts. Being a mass device, it measures the weight of the product to determine the volume and isn't subject to the temperature error inherent with level technologies. MTG supplies a real time profile of the tank, i.e., Mass, Level, Free Water, 2nd Interface, Multiple spot temperature, multiple density strata, Vapor temperature, Vapor pressure, Mass leak detection, and much more from one single device. MTG is price competitive with inventory radar with temperature averaging. MTG installs in service, is available with optional kits for installation on External floating or Internal floating roofs.

Radar gauging is Quantitative when correctly done; the MTG is Quantitative, Qualitative, and Environmentally oriented. The MTG will provide information on the quality of the product (Water, Density, etc.). It provides information such as Vapor Temperature & Pressure for emissions reporting, Mass leak detection, multiple sensors providing multiple alarms (pressure, level, temperature, etc.). Please see the chart on page 2.

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	Radars (Inventory)	MTG - Mass Tank Gauge
Maintenance Cost:		
No Moving Parts	Yes	Yes
Self Calibrating	Yes	Yes
Self Diagnostics	Yes	Yes
Multiple primary sensors	No	Yes
Remote Config. / Trouble Shooting	No	Yes
Installation Cost:		
Stilling Well	Add, needed for accuracy	Not required, Bottom Referenced
Tank entries required	Multiple with temperature	One, 4" flange
Hot work / taps	Option dependent	Not required
Instruments to install	Radars, Temp., Options	MTG
Voltage required (Electrical)	110Vac ?	12 - 24Vdc
Wiring connections	Multiple, more with options	Single
Communications / Integration	MODBUS RTU	MODBUS RTU, Options
User configurable register map	No	Yes
Alternative communications	Not offered in literature	Radio, Satellite, Cellular, TCP/IP
Equipment Cost:		
Local display / Interface	Add	Add
* Radar	Base	
** Temperature Averaging Probe	Add	
*** Water Bottom	Add	
**** Density (Single Transducer)	Add	
	Radars Total	
* MTG - Mass Tank Gauge		MTG Total
Data provided: (Primary Instrument)		
Mass	Additional Instrument	YES
Level	Yes	Yes
Multiple Spot Temperatures	Additional Instrument	Yes
Multiple Density Strata	No	Yes
Free Water (Interface)	Additional Instrument	Yes
* % of Water in Product	No	Yes
2nd Interface	No	Yes
* % of Water in Emulsion	No	Yes
Vapor Pressure	Additional Instrument	Yes
Vapor Temperature	Additional Instrument	Yes
Leak detection (Mass)	No	YES
Alarm - Multiple Level Sensors	No	Yes
Alarm - Mass	No	Yes
Alarm - Multiple Spot Temperatures	No	Yes
Alarm - Multiple Pressure Points	No	Yes
Alarm - Multiple Density Strata	No	Yes
Alarm - Vapor Pressure	No	Yes
Alarm - Vapor Temperature	No	Yes
Real-time Tank Profile	No	YES
* = Crude Oil Service		