



## Inventory Control by Servo Gauging



# Safe, Reliable and Efficient Tank Gauging



Safety, reliability and efficiency are universal concerns in the world of tank storage and intermediate storage. As prices and performance demands increase, the concept of total cost of ownership is an important topic.

This also applies to systems for tank gauging purposes. These systems determine the extent to which inventory management, completion of customs formalities and safety on and around the storage tanks can be assured.

## Proven Technology

Honeywell Enraf servo tank gauging systems offer optimized operations, enhanced safety, and a high degree of accuracy and reliability.

Combinations with other Honeywell Enraf products and architectures such as SmartRadar FlexLine, temperature, density measurement, hydrostatic or hybrid tank measurement systems and inventory management systems help optimize your plant further.

Outstanding advantages of Honeywell Enraf servo systems include robust, compact and modular construction, small number of moving parts, proven

track record and numerous optional add-ons. Honeywell Enraf servo gauging technology provides a tailored solution that can be totally configured to meet your needs.

All Honeywell Enraf instruments and systems combine the latest technology with decades of know-how and experience reflected in user-friendly programmability for fast and simple startup. The systems are approved worldwide by national weights and measures authorities and by customs and excise services.

Honeywell Enraf servo systems form part of a diverse range of products and solutions for tank gauging purposes. The servo systems combine modern technology with a robust and proven operating principle. Like other Honeywell Enraf products, the tank gauging systems are based on open platforms, and feature modular construction, easy installation and simple maintenance.



# Robust and Multifunctional

Honeywell Enraf servo systems deliver optimized measurement performance in any environment. Characteristic features are robust design and modular construction which allow customers to add precisely those functionalities that their specific operating environment demands.

## Industry Approvals

Servo tank gauging systems by Honeywell Enraf have set the standard for officially certified automatic tank gauging systems such as those approved by the API, ISO, OIML and NMI. Whereas the API (American Petroleum Institute) and ISO (International Standardisation Organisation) codes are concerned principally with the installation and operation of automatic tank gauging systems, the OIML (International Organisation of Legal Metrology) and NMI (Netherlands Metrology Institute) focus on the performance requirements relating to those systems. For this purpose a method has been developed for the purpose of verifying system conformance.

Honeywell Enraf tank gauging systems receive type approval in conformity with national legislation and/or in accordance with the OIML recommendations. The automatic gauging systems and their accuracy are tested both before and after installation to assure reliability, reproducibility, sensitivity and integrity of the instruments. These instruments easily exceed the requirements for overfill protection equipment and therefore are approved to be used in any kind of safety system.



## Measurement functions of servo gauging systems include:

- Product level
- Interface levels
- Product and/or gas temperature using spot/average temperature or temperature profile
- Density measurement and density profile
- Direct water bottom measurement or via capacitive probes
- Vapour pressure using pressure transmitters
- Average continuous density connecting one or more HART pressure transmitters
- Free programmable NO/NC alarm relay contact output to be used in safety and overfill protection systems
- Measurement range up to 150 m
- Working pressure up to 40 bar



## Reliable Measurement Principle

Servo tank gauging systems by Honeywell Enraf are based on a proven measurement concept.

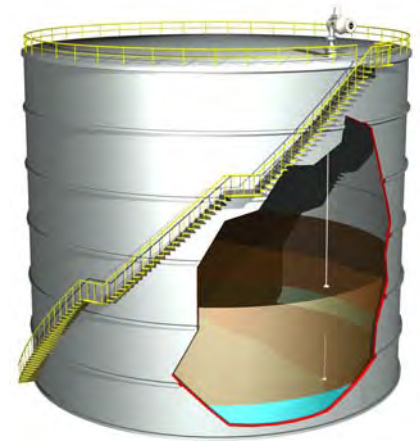
Level measurement is performed by a displacer, a strong and flexible measuring wire, a measuring drum, force transducer and servo motor.

The weight of the displacer ensures that the wire is constantly tensioned, even on turbulent liquid surfaces, avoiding measurement errors due to displacer drifting.

The level measurement is performed by lowering the displacer on the measurement wire down into the liquid, in which it will be partly immersed because the displacer has a greater density than the liquid. In accordance with Archimedes' principle, the weight of the displacer will now diminish by the weight of displaced product. The weight of the displacer less the weight of displaced product – the apparent weight – then serves as unit of measurement to determine the position of the displacer and measure the level of the liquid.

The heart of the Honeywell Enraf servo gauging system is a highly accurate and advanced force transducer, which continuously measures the apparent weight of the displacer. The weight corresponding to the apparent weight of the displacer can be simply programmed by software settings. In the equilibrium state, the weight of the partly immersed displacer will be in balance with the programmed weight as measured by the force transducer.

When the storage tank is emptied, as the liquid level starts to fall, the upward force on the displacer will decrease. The force transducer will actuate the servo controller so that the measuring drum unwinds, allowing the displacer to descend until it again becomes partly immersed in the liquid and its apparent weight corresponds to the programmed weight.



## Measuring Interface Levels

Besides measuring the liquid level, Honeywell Enraf's 854 XTG and 854 ATG gauges can also be used for measuring the interface level between two liquids. For this purpose, the servo motor, actuated by an interface command, lowers the displacer to the point where its apparent weight corresponds to the programmed interface setpoint of the second liquid. This functionality is particularly useful to determine the sediment level or the interface level between water and tank liquid or between two liquids.

## Intelligent Software

Honeywell Enraf servo gauges are fully microprocessor controlled tank level gauges. All instrument functions are driven by means of intelligent software, which filters out possible imperfections thereby optimizing measurement accuracy.

In addition, the software compensates for hydrostatic deformation of the tank. This method, without a standpipe, ensures an extremely high degree of accuracy.





# Honeywell Enraf provides an integrated solution to meet all terminal management needs, however large or small.

Honeywell Enraf provides an integrated solution that delivers value from conception to implementation for all types of distribution and bulk terminals, such as refinery off-sites, biofuel storage and distribution, petrochemical storage and loading facilities, and marine, rail and truck loading terminals.

Honeywell Enraf's solutions are totally integrated and scalable, so whether you are building a new facility, or expanding or upgrading an existing one, Honeywell Enraf can help reduce overall project risk, accelerate production schedules and improve your business performance through solutions that drive safety, reliability and efficiency.



## Simple Installation and Fast Startup

Servo gauging systems by Honeywell Enraf have been developed with a view to simplicity of installation. Electrical cabling and mechanical installation are quick and simple to perform. The systems are attached by means of a 2" mounting flange.

In order to simplify the startup, calibration and servicing procedures as much as possible, the portable Honeywell Enraf terminal can be interfaced with an optical infrared port. This ingenious device enables these jobs to be performed quickly while bypassing the central system.

## Solutions for Your Application

Not one application is the same. Honeywell Enraf's extensive experience in tank gauging and inventory management provides the solution to fit your application. Honeywell Enraf has the people, skills and domain expertise to manage projects from planning to startup, and throughout the technology lifecycle. Honeywell Enraf provides the knowledge to integrate project management, operations, automation, information management and maintenance – all in a safe and secure environment. Honeywell Enraf's global expertise and local project implementation and services infrastructure is unmatched in the industry, helping customers to achieve faster startups and improved performance.

## For More Information

To learn more about Honeywell Enraf's Terminal Automation Solutions, contact your Honeywell Enraf account manager or visit [www.honeywell.com/ps](http://www.honeywell.com/ps)

## Honeywell Enraf

Delftechpark 39

2628 XJ Delft

The Netherlands

Tel.: +31 (0)15 2701 100

**Honeywell** Enraf