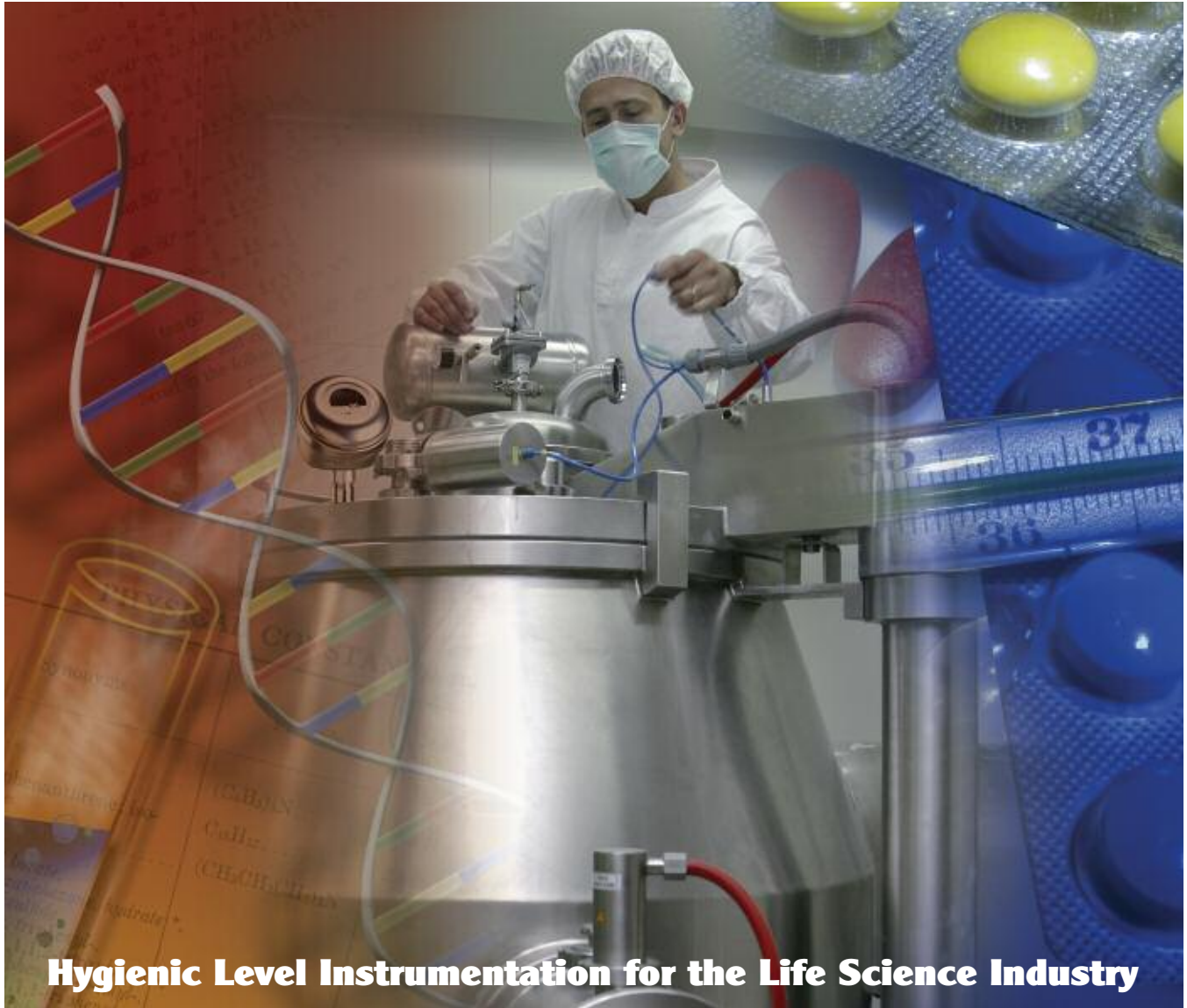




INDUSTRY APPLICATIONS SERIES

LIFE SCIENCE INDUSTRY



Hygienic Level Instrumentation for the Life Science Industry

Magnetrol[®]

Life Science Solutions

Hygiene by Design

If your business strives to maintain the highest standards in sterility, then level and flow instruments from Magnetrol's Life Science Solutions will optimize your operation's performance.



Now in business for over 75 years, Magnetrol International provides level and flow instrumentation wherever hygienic processing is required. The company's Life Science Solutions initiative specializes in hygienic product solutions throughout the pharmaceutical and bio-technology industries where product quality is maintained through the design and implementation of effective hygienic level and flow instrumentation.

Hygienic Optimized Solutions

The profitability and product quality of all Life Science industries is dependent upon their sustaining the highest standards in cleanliness and sterility. Magnetrol's hygienic products are designed to help our customers optimize these processes with controls that are engineered to meet the highest standards in performance and hygiene.

Bio-pharmaceutical sanitation regimens destroy residual organisms in process equipment like reactors and fermentors, and prevents product contamination between production batches. All Life Science industries rely on the aggressive cleaning processes of Clean-in-place (CIP) and Steam-in-place (SIP) to achieve their sanitation goals.

Magnetrol's hygienic products—whether the hygienic component is the media contact surface of the instrument (such as its probe), or the entire instrument (both probe and housing)—can be described as:

- Manufactured from materials selected for their microbial resistance. Stainless steel materials are processed to a surface smoothness that reduces the possibility of bacterial adhesion.
- Seamless product designs without indentations or incorrect radii where bacteria harbor.
- Product designs that foster the draining away of cleaning solutions and other liquids.
- Products which can be specified to withstand aggressive chemicals and steam cleaning.

Hazardous Location Approvals

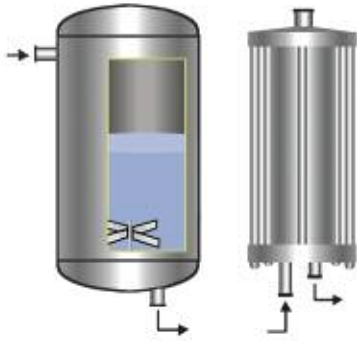
Level instruments for applications such as solvent or alcohol recovery may require explosion-proof (XP) approvals. Due principally to the robust construction of its electronics housing, an XP instrument has been certified to withstand an internal explosion without allowing hot gases or flames to escape from the housing to trigger an explosion in the surrounding atmosphere. The single-compartment Eclipse (page 4) with its seamless deep-drawn housing favorable to CIP and SIP procedures, is an intrinsically-safe device. In applications where XP approval and a hygienic probe are required, the twin-compartment Eclipse (page 7) with its 7XF hygienic probe is an ideal solution.

International Resources

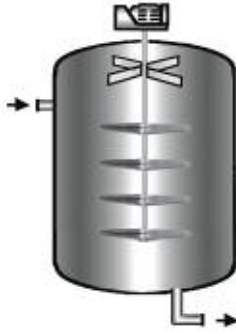
Magnetrol's hygienic instruments, as well as its non-hygienic industrial instruments, provide you with measurement solutions that are in the forefront of level and flow technology, solutions that have earned an industry-wide reputation for robust construction, trouble-free set-up and operation, and a fast return on investment. You'll also appreciate the engineering resources of an international organization that can be brought to bear on your application to ensure the best, practical measurement solution for your hygienic process. ■

Examples of Leading Life Sciences Level Applications

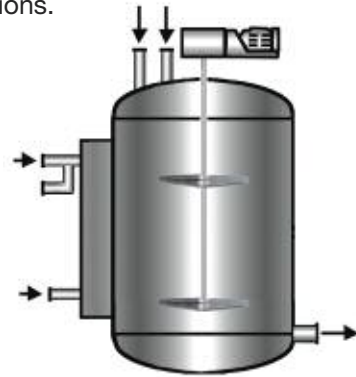
Magnetrol's hygienic products are ideal for these Life Sciences level and flow applications.



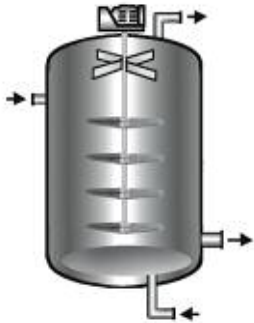
Buffer Prep Bubble Trap



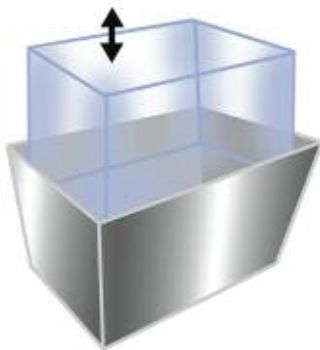
Media Prep



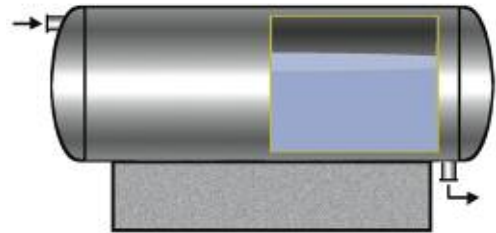
Bioreactor



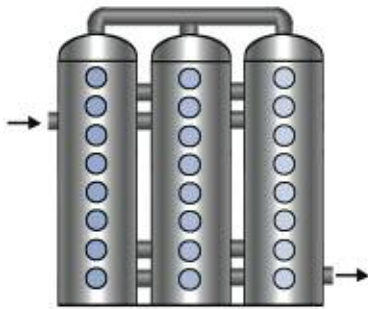
Fermentation



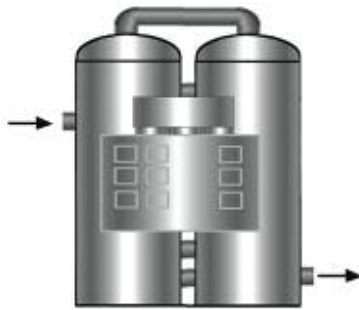
Single Use Systems
(Disposable Bioprocess Bag)



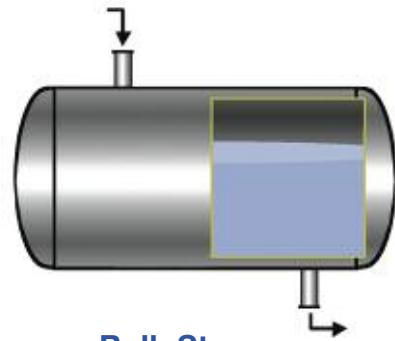
Solvent Tanks



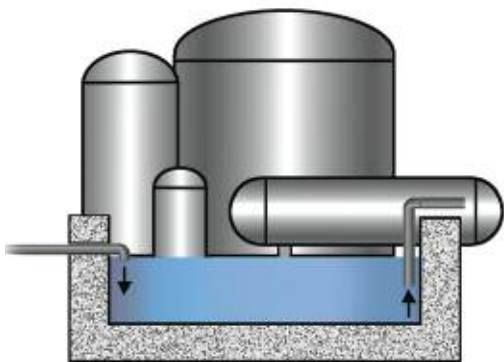
Filtration Systems



Sanitized Water Production



Bulk Storage



Waste Treatment

Leading Life Sciences Flow Applications



Air/Compressed Air



Process/Waste Gas



Tank Blanketing



Pump Protection

Ultra-compact, hygienic transmitter delivers unsurpassed performance



Enhanced Eclipse® Model 705 Liquid Level Transmitter for Hygienic Applications (Simulated display)

APPLICATIONS:

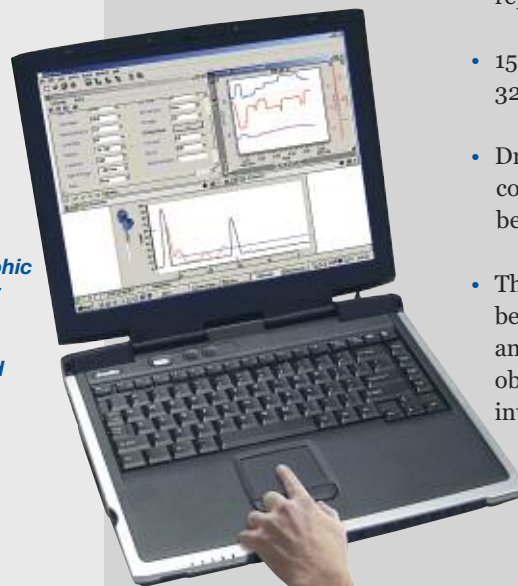
- Virtually all hygienic level measurement and control applications including CIP applications
- Liquids or slurries; hydrocarbons and water-based media with a dielectric of 1.9–100

HYGIENIC MODEL 705 FEATURES:

- Two-wire, 24 VDC, loop-powered for level, interface, or volume measurement
- HART® or optional FOUNDATION fieldbus™ and PROFIBUS digital communications
- Performance not process dependent; changing specific gravity and dielectric constant have little effect on accuracy
- No level change needed for configuration; no field calibration necessary
- 20-point custom strapping table for volumetric or flow measurement
- Low dielectric measurement capability
- Can reliably measure to the very top and bottom of the probe (subject to media dielectric properties) and, therefore, into the vessel bottom, minimizing retained volumes that cannot be measured
- Probes available in 316 ss, AL6XN and Hastelloy® C22®
- IS and Non-Incendive approvals
- 2-line × 8-character LCD and 3-button keypad
- HART version is suitable for SIL 2 loops; Safe Failure Fraction of 91%. FEMEDA report available upon request
- 15 R_a electropolish probe finish; 32 R_a housing finish
- Dry Validation Capability: Save calibration costs and downtime with our proven “test bench” approach
- The single rod probe can have multiple bends, allowing the rod to be profiled to any vessel shape, avoid internal vessel obstructions and extend measurement into the vessel bottom



Technical and specification information is available at magnetrol.com



PACTware™ PC software and the new Field Device Tool create a graphic interface whereby all functionality can be visualized quickly, safely and conveniently



Compact, hygienic level switches excel in difficult liquid level applications

**Echotel®
Models
960 and 961
Liquid Level
Switches for
Hygienic
Applications
(Housing cover
shown removed)**



Model 960 Only



Technical and specification information is available at magnetrol.com



Pulsed Signal technology combined with Echotel's time-delay circuitry allow Echotel hygienic switches to operate in challenging process environments that include turbulent, aerated liquids.

960/961 FEATURES:

- Pulsed signal technology for superior performance in difficult process conditions
- Excellent immunity from sources of electrical noise interference
- Extensive self-testing of electronics, transducer, piezoelectric crystals, and EM noise
- Adjustable time delay for turbulent liquids
- Tip-sensitive transducer measures level to within 1/4" of the vessel's bottom
- Deep drawn 304 stainless steel housing
- 20 Ra surface finish transducers (electropolish optional)

EXCLUSIVE 960 FEATURES:

- Features AS-i® (Actuator Sensor-Interface) output, a digital bus communications for high or low single point level measurement
- AS-i is a versatile, low-cost cabling solution that is a digital replacement for traditional hard wiring of field devices. The AS-i bus system provides a digital serial interface with a single unshielded two-wire cable for power and data transfer

EXCLUSIVE 961 FEATURES:

- Relay output or mA current shift output
- Intrinsic safety approvals with the 2-wire loop-powered version

APPLICATIONS:

- High level alarm
- Low level alarm
- Flow alarm
- Overfill protection
- Pump protection
- Leak detection



Hygienic high and low level alarm applications

A hygienic control with the versatility of a flow, level or interface switch

TD2 MEASUREMENT PRINCIPLE:

The Thermatel sensor consists of two RTD elements. One is the reference and the second is heated to a temperature above the process temperature.

The electronics detect the temperature difference between the two elements. The temperature difference is greatest in air, then decreases when cooling occurs due to a change in media. An increase in the flow rate further decreases the temperature difference

TD2 FEATURES:

- Continuous diagnostics with fault indication, temperature compensation narrow hysteresis and fast response time
- Easy, quick calibration
- Not affected by temperature, pressure or viscosity
- Non-linear mA output signal can be used for trending, diagnostics and repeatable flow/level indication
- No moving parts make it virtually maintenance-free
- Viewable alarm status window

TD2 APPLICATIONS:

- General hygienic flow/level switch applications include foam detection, CIP operations and Water For Injection (WFI) systems
- As a level switch, the TD2 can be used in applications where a high viscosity liquid might plug up an ultrasonic unit's transducer gap

6



Thermatel TD2 Level, Flow or Interface Switch for Hygienic Applications
(Housing cover shown removed)



Technical and specification information is available at magnetrol.com



As a level switch, Thermatel provides superior performance in thick liquid applications which can plug other measurement devices



General hygienic flow switch applications include foam detection, CIP operations and Water For Injection (WFI) systems.

Magnetrol can also fulfill your non-hygienic instrumentation needs.
Contact your Life Science Solutions representative for details on these instruments:

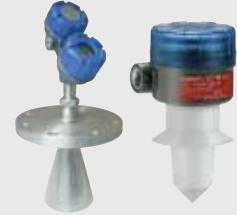
Guided Wave Radar

Eclipse® and Horizon™ transmitters are two-wire, loop-powered, 24 VDC level transmitters based on Guided Wave Radar (GWR) technology. Available in coaxial, twin rod and single rod probes, these leading-edge transmitters provide measurement performance well beyond that of many traditional technologies. Available with HART®, FOUNDATION fieldbus™ and PROFIBUS® outputs



Thru-Air Radar

Pulsar® and Model R82 Pulse Burst Radar level transmitters are the latest generation of loop-powered, 24 VDC, liquid level transmitters. They offer lower power consumption, faster response time and are easier to use than most loop-powered radar transmitters. Pulsar is available in a dielectric rod or horn antenna style.



Float & Displacer

Float-actuated switches are available in top-mount and side-mount styles for high or low level alarm, interface, and pump control applications. Top-mounting displacer type level switches offer the industrial user a wide choice of alarm and control configurations. Displacer based electronic and pneumatic transmitters offer 4-20 mA or HART output.



Ultrasound

Echotel contact and non-contact ultrasonic level transmitters and switches are available in a range of models to provide users with the features and options suitable for their specific application. The Models 961 single point and 962 dual point switches are available with relay or current shift electronics.



Thermal Dispersion

Thermatel® Models TA1 and TA2 Mass Flow Transmitters provide reliable mass measurement for air and gas flow applications. Thermatel switches provide a high level of performance in flow, level and interface applications for air, gas and liquids. A hygienic version of the TD2 switch is available for sterile, Clean-In-Place applications.



Visual Indication

Atlas™, Aurora® and Jupiter® are magnetically coupled liquid level indicators precision engineered and manufactured to provide accurate, reliable, and continuous visual level indication. Aurora provides redundant control with both float and Eclipse Guided Wave Radar. Jupiter offers a float-based level indicator with a magnetostrictive transmitter.



Magnetostriction

The Enhanced Jupiter® magnetostrictive transmitter provides a 4-20 mA output proportional to the level being measured or FOUNDATION fieldbus™ output. May be externally mounted to a MLI or inserted directly into the process vessel.



Vibrating Rod

Solitel® Vibrating Rod Level Switches provide reliable level detection of powders and bulk solids. This compact, integral switch is suitable for high or low level detection in hoppers or silos.



RF Capacitance

Kotron® RF Capacitance level switches and transmitters are available in nine different models to provide a wide range of features to suit a large array of applications and process media.





LIFE SCIENCE INDUSTRY

AN INDUSTRY GUIDE TO LEVEL MEASUREMENT AND CONTROL FROM MAGNETROL

Other industry and special application brochures from Magnetrol include:

- **Chemical**
- **Flue Gas Desulfurization**
- **Interface Level Measurement**
- **Mass Flow Measurement**
- **Nuclear Power**
- **Oil & Gas Field Processing**
- **Petroleum Refining**
- **Power Generation**
- **Pulp & Paper Mills**
- **Tank Bridle Level Measurement**
- **Understanding Safety Integrity Level (SIL)**
- **Water & Wastewater**

PLEASE NOTE: The instruments recommended in these brochures are based on field experience with similar applications and are included as a general guide to level and flow control selection. Because all applications differ, however, customers should determine suitability for their own purposes.

ProcessHQ, Inc.

21935 Plummer Street
Chatsworth, CA 91311
818 341-1782 (voice)
818 475-1589 (fax)
info@processHQ.com



Magnetrol

Worldwide Level and Flow Solutionssm

CORPORATE HEADQUARTERS

5300 Belmont Road • Downers Grove, Illinois 60515-4499 USA

Phone: 630-969-4000 • Fax: 630-969-9489

magnetrol.com • info@magnetrol.com

EUROPEAN HEADQUARTERS

Heikensstraat 6 • 9240 Zele, Belgium

Phone: 052 45.11.11 • Fax: 052 45.09.93

BRAZIL: Av. Dr. Mauro Lindemberg Monteiro • 185-Jd. Santa Fé, Osasco • São Paulo CEP 06278-010

CANADA: 145 Jardin Drive, Units 1 & 2 • Concord, Ontario L4K 1X7

CHINA: Room #8008 • Overseas Chinese Mansion • 129 Yan An Road (W) • Shanghai 200040

DEUTSCHLAND: Alte Ziegelei 2-4 • D-51491 Overath

DUBAI: DAFZA Office 5AE 722, P.O. Box 293671 • Dubai, United Arab Emirates

INDIA: C-20 Community Centre • Janakpuri, New Delhi 110 021

ITALIA: Via Arese, 12 • 20159 Milano

SINGAPORE: No. 48 Toh Guan Road East #05-123 • Enterprise Hub • Singapore 608586

UNITED KINGDOM: Regent Business Centre • Jubilee Road • Burgess Hill, West Sussex RH15 9TL

Magnetrol and Magnetrol logotype, Aurora, Echotel, Eclipse, Horizon, Jupiter, Kotron, Modulevel, Pulsar, Solitel, and Thematel are registered trademarks of Magnetrol International.

HART is a registered trademark of the HART Communication Foundation. Hastelloy C22 are registered trademarks of Haynes International. PACTware is a trademark of the PACTware Consortium.

AS-Interface and AS-i are registered trademarks of AS International. PROFIBUS is a registered trademark of PROFIBUS International.

Copyright © 2009 Magnetrol International. All rights reserved. Printed in the USA.

Bulletin: 41-173.1 • Effective: May 2009