

# PRODUCT LINE

## QUICK REFERENCE



## TDR



### Genesis™ Model ED1 & ED2 Multiphase Detector

**Description:** 24 VDC multiphase detector with up to four (4) 4-20mA outputs for convenient control of top level, top of emulsion, water level, and sediment.

**Measurement Principle:**  
Time Domain Reflectometry (TDR)

**Applications:**  
All interface measurement and control applications, including separators and desalters, containing emulsion layers.

- Features:**
- Explosion Proof and Non-Incendive approvals
  - Concurrent top-down and bottom-up signal generation
  - Level measurement not affected by changing media characteristics.
  - 4-button keypad and graphic LCD display allow for convenient viewing of configuration parameters and echo curves
  - Proactive diagnostics
  - Probe designs up to +200 °C/70 bar (+400 °F/1000 psi)
  - No moving parts

**Options:**  
Main electronics can be remote-mounted up to 100 feet (30 meters) away from the probe, enlarged coaxial or Pentarod probe designs, HART® digital communications

## GUIDED WAVE RADAR



### Eclipse® Model 706 GWR Transmitter

**Description:** An advanced 24 VDC loop powered transmitter with proactive diagnostics and superior signal strength. Not affected by foam, turbulence, and varying media conditions.

**Measurement Principle:**  
Guided Wave Radar Time Domain Reflectometry (TDR)

**Applications:**  
Ideal for difficult, low dielectric, high temperature process applications, high pressure steam, or simple storage applications.

- Features:**
- No calibration necessary
  - General Purpose, Intrinsically Safe, Explosion Proof and Non-Incendive approvals
  - Increased signal strength
  - Superior Signal-to-Noise Ratio
  - Proactive Diagnostics
  - Broad offering of overflow-capable probes
  - Full vacuum to 6250 psi (430 bar); -320 to +850 °F (-196 to +450 °C)
  - SIL 2/3 Certified with SFF = 93% (FMEDA available upon request)

**Options:**  
Graphic LCD allows the viewing of waveforms; HART®, FOUNDATION fieldbus™, Profibus PA and Modbus digital communications; broad probe offering with numerous process connections

## RADAR



### Pulsar® Model R80 Radar Transmitter

**Description:** An advanced loop-powered 4–20 mA level transmitter with proactive diagnostics provides accurate measurement even in shifting dielectric and varying media.

**Measurement Principle:**  
Frequency Modulated Continuous Wave (FMCW)

**Applications:**  
Liquids, slurries and solids, hydrocarbons to water-based media, silos, high temperature/high pressure process or storage vessels.

- Features:**
- 80 GHz frequency offers smaller beam angle and improved resolution
  - Up to 1000 psi (70 bar); up to 400 °F (200 °C)
  - Quick connect/disconnect antenna coupling allows vessel to remain sealed
  - Coated Isolation antennas for corrosive applications
  - Intuitive false target setup
  - Unique Commissioning and Optimization Wizards
  - Proactive Diagnostics

**Options:**  
Graphic LCD; HART®, digital communications; Wide variety of horn antenna configurations



### Pulsar® Model R86 Radar Transmitter

**Description:** An advanced loop-powered 4–20 mA level transmitter with proactive diagnostics provides accurate measurement even in shifting dielectric and varying media.

**Measurement Principle:**  
Pulse Burst Radar

**Applications:**  
Liquids and slurries, hydrocarbons to water-based media, high temperature/high pressure process or storage vessels.

- Features:**
- 26 GHz frequency offers smaller beam angle and improved resolution
  - Full vacuum to 2320 psi (160 bar); -100 to +750 °F (-70 to +400 °C)
  - Quick connect/disconnect antenna coupling allows vessel to remain sealed
  - Wide range of HTHP antennas, with extensions
  - Coated Isolation antennas for corrosive applications
  - Intuitive false target setup
  - Unique Commissioning and Optimization Wizards
  - Proactive Diagnostics

**Options:**  
Graphic LCD; HART®, FOUNDATION fieldbus™ and Profibus PA digital communications; Wide variety of horn antenna configurations, all-plastic antenna, antenna extensions

## THERMAL DISPERSION

## ULTRASONIC



### Thermatel® Models TD1/TD2 Flow/Level Switch

**Description:** Reliable flow/level/interface switch detects changes in heat transfer due to changes in media or flow rate.

**Measurement Principle:**  
Thermal dispersion

#### Applications:

Flow switch for liquids and gases. Popular for pump protection to detect low flow rates. Also used for level/interface detection.

#### Features:

- Continuous diagnostics with fault detection
- Temperature compensation
- mA output signal on TD2 permits flow monitoring and diagnostics
- Temperatures to +850 °F (+450 °C), pressure to 6000 psi (410 bar)
- Adjustable set point and time delay

#### Options:

Relay type, input voltage, integral or remote mounting, window to view LEDs, probe types and probe process connections

### Thermatel® Model TA2 Mass Flow Transmitter

**Description:** An easy-to-use, economical, continuous gas flow meter to manage energy costs or meet environmental regulations.

**Measurement Principle:**  
Thermal mass/dispersion

#### Applications:

Combustion air, compressed air, natural gas, flare gas, aeration lines, digester/biogas/LFG, low flow/low pressure.

#### Features:

- Direct mass flow measurement
- Calibration verification in the field prevents sending unit back to the factory
- Strong signal at low flows and low pressures
- High turndown ratio
- Rotatable head and display for ease of viewing and proper installation

#### Options:

2-line × 16-character display, HART® and FOUNDATION fieldbus™ digital communications, probe length, process connection, Hot Tap, temperature output and pulse output, remote electronics

### Echotel® Model 910 Level Switch

**Description:** Integral mount, low cost ultrasonic level switch with worldwide safety approvals.

**Measurement Principle:**  
Ultrasonic

#### Applications:

Clean liquids, wastewater, hydrocarbons, foods and pharmaceuticals, solvents, seal pot level.

#### Features:

- Tip sensitive gap style
- Integral mount unit with dual conduit hubs
- Field selectable high or low level fail-safe
- 8-amp DPDT gold flash or 5-amp DPDT hermetically sealed relay
- Vertical or horizontal mount
- No calibration required
- Two-year warranty

#### Options:

Housings, process connections, input power, relay type, and actuation length

### Echotel® Models 961/962 Level Switches

**Description:** Universally applied liquid level switch with advanced self-test capabilities, time delay and pulsed signal technology for superior performance in difficult applications.

**Measurement Principle:**  
Ultrasonic

#### Applications:

Water-based liquids, hydrocarbons, chemicals, low/high level detection, overflow protection, seal pot level.

#### Features:

- Suitable for use in Safety Integrity Level (SIL) 2 loops
- Adjustable time delay for turbulent aerated liquids
- Tip-sensitive transducer
- Advanced self-test technology with malfunction alarm output
- Integral or remote mount electronics
- Pulsed signal technology
- Available for single (961) or dual point (962) liquid level detection.
- Plastic probes available

#### Options:

Housing materials, input power, output signal, integral or remote mounting and actuation length

### Echotel® Model 355 Transmitter

**Description:** Loop-powered, integral mount, ultrasonic transmitter for level, volume, or open channel flow.

**Measurement Principle:**  
Non-Contact 60 kHz ultrasonic

#### Applications:

Open channel flow, simpler level measurement with less vapors, foam and agitation.

#### Features:

- Two-wire, loop-powered
- 4–20 mA with HART®
- PACTware PC program
- 20' (6 m) measurement range
- Temperature compensated echo rejection profile
- Dynamic baseline noise compensation
- Open channel flow equations
- Resettable and non-resettable flow totalizers

#### Options:

Cast aluminum or Lexan enclosure, polypropylene or Kynar® Flex transducer



## Float Type Top Mount Level Switch

**Description:** A simple and reliable float switch designed for top mounting on virtually any process or storage vessel.

**Measurement Principle:**  
Buoyancy

### Applications:

Virtually any tank or vessel; condensate receivers, cooling towers, interface detection

### Features:

- Single or tandem float configurations
- Rugged reliability
- Wide selection of switches
- Actuating depths of up to 48" (1219 mm)
- Simple operation
- Maintenance-free
- Variety of process connections

### Options:

Single or tandem units, tank connection type and float size, NACE construction, electric or pneumatic switch mechanisms, guide cages



## External Cage Tuffy® Float Type Level Switch

**Description:** A highly reliable level switch in an external cage and designed to be mounted outside the process vessel.

**Measurement Principle:**  
Buoyancy

### Applications:

Clean liquids or interface in scrubbers, feedwater heater, flair pots, day tanks, accumulators, knockout drums, etc.

### Features:

- Sealed or flanged float cages
- Pressures to 3700 psi (255 bar) and temperatures over +1000 °F (+540 °C)
- Single or multiple actuation levels
- Carbon steel or stainless steel cage materials
- Floats for SGs as low as 0.32

### Options:

Electric or pneumatic switches, ASME B31.1, B31.3 or NACE construction, exotic materials of construction, wide variety of process connections



## Float Type Level Switch

**Description:** A compact, highly reliable level switch designed for horizontal mounting into a process vessel or an external cage.

**Measurement Principle:**  
Buoyancy

### Applications:

Clean liquids or interface in virtually any tank or vessel, including storage tanks and process vessels

### Features:

- Available in narrow and wide adjustable differential models
- Float and trim parts in 316 SS or Hastelloy C
- Pressures to 2630 psi (181 bar) and temperatures to +900 °F (+482 °C)
- Explosion proof enclosure with variety of agency approvals
- Ease of wiring in enlarged switch housing

### Options:

Pneumatic switch model, ASME B31.3 or NACE construction, wide variety of process connections, cast iron and aluminum switch housings



## Modulevel® Model E4 Displacer Level Transmitter

**Description:** Loop powered, two-wire, displacer transmitter utilizing a range spring and LVDT combination to measure total level or interface level.

**Measurement Principle:**  
Buoyancy

### Applications:

Feedwater heaters, scrubbers, receivers, separators, boilers, condensate drip pots, interface measurement

### Features:

- No calibration required
- Range spring suppresses effects of turbulence
- Pressures up to 348 bar (5050 psig); Temperatures up to +445 °C (+835 °F)
- HART® communication with DD and DTM for use with PACTware™
- Retrofit transmitters without breaking the process seal
- SIL 2 Suitable
- Variety of chambers (cages) available
- Full range of hazardous approvals

### Options:

External chambers; integral or remote mount electronics; displacer hanger cable; SG ranges 0.23–2.20; ASME or NACE constructions; selectable displacer lengths



## Top Mount Displacer Type Level Switch

**Description:** Highly reliable one-, two- or three-stage level switches offering wide and narrow level differentials.

**Measurement Principle:**  
Buoyancy

### Applications:

Foaming, surging or agitated liquids, dirty or clean liquids, heavy oils or slurries in sumps, storage tanks or process vessels, overflow prevention

### Features:

- Field-adjustable levels and differential
- Variety of displacer, cable and wetted parts materials
- Ease of installation
- Variety of narrow and wide level differential combinations
- Suitable for use in liquids with SG from 0.40 to 2.40

### Options:

Proof-er® ground-checker, floating rooftop/liquid dual detection, extended displacer cable, customer specific levels and differential arrangements, pneumatic or electric switches



**Atlas™**  
**Magnetic Level Indicator**

**Description:** The standard, high-performance magnetic level indicator suitable for a wide range of process conditions.

**Measurement Principle:**  
Buoyancy, magnetic coupling

**Applications:**  
Feedwater heaters, boilers, oil-water separators, flash drums, surge tanks, gas chillers

- Features:**
- Broad range of chamber configurations
  - Fabricated non-magnetic chambers
  - ASME and EN flanges
  - Precision manufactured float
  - Flag or shuttle type indicator
  - Reveal™ wide view indicator

**Options:**  
Custom span, process connections, scale units of measure, high temperature and cryogenic insulation, clamp-on reed, micro and pneumatic switches

**Aurora®**  
**Magnetic Level Indicator**

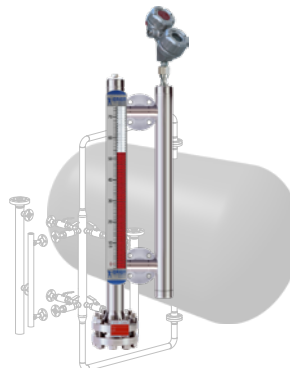
**Description:** Unique combination of magnetic level indication with guided wave radar results in a truly redundant level control instrument.

**Measurement Principle:**  
Buoyancy, magnetic coupling and micropower impulse radar

**Applications:**  
Feedwater heaters, vacuum tower bottoms, alkylation units, oil-water separators, deaerators, boiler drums

- Features:**
- True redundancy through use of two independent technologies
  - Reveal™ wide view indicator
  - Built to ASME B31.1, B31.3, PED, ASME U, UM, S Stamp, NACE construction available
  - All metallic pressure boundary materials
  - Pressures to 4500 psi (310 bar)
  - SGs as low as 0.25
  - Temperatures to +800 °F (+425 °C)

**Options:**  
Remote mounted electronics, custom span, process connections, scale units of measure, high temperature and cryogenic insulation, clamp-on reed, micro and pneumatic switches



**Gemini™**  
**MLI with Modular Instrumentation Bridle**

**Description:** Unique, fully customized design of Modular Instrumentation Bridle (MIB) designed to best incorporate different instrumentation packages and maximize performance to reduce total cost of ownership (TOC).

**Applications:**  
Feedwater heaters, boilers, oil-water separators, flash drums, surge tanks, gas chillers, etc.

- Features:**
- Refer to ORI-210 brochure for details.
  - True redundancy through use of two independent technologies

**Options:**  
Full customization



**Jupiter®**  
**Model JM4 Magnetostrictive Transmitter**

**Description:** Highly accurate level measurement device that can be directly inserted into a tank or externally mounted to any one of our MLIs.

**Measurement Principle:**  
Time-of-flight measurement utilizing a magnetostrictive wire which interacts with a float

**Applications:**  
Separators, surge tanks, gas chillers, bio-therapeutics, pharmaceuticals, process vessels and more

- Features:**
- Full graphic local user interface and local waveform capture
  - 4-20 mA output
  - Rotatable and Removable transmitter head
  - Ergonomic dual compartment enclosure
  - Simple set-up and configuration
  - Smart Probe technology
  - Easy attachment to an MLI or modular bridle instrumentation
  - Direct insertion for a wide variety of vessels and applications

**Options:**  
HART® or FOUNDATION fieldbus™ communications; Hastelloy® or Monel® materials of construction; Threaded or flanged process connections; External Jupiter® models can be top- or bottom-mounted to an MLI



## Leadership

Since 1930, our talented and diverse workforce has been delivering differentiated technology solutions. Today AMETEK LMS products serve industries in over 100 countries. Our market leadership is sustained by a strong ongoing commitment to advance the state-of-the-art in level and flow technologies.

## Solutions

Because process environments are so diverse, AMETEK LMS has created numerous technology groups to address the broad range of control challenges. Each technology group features products that are highly configurable enabling our customers to have the most exacting solution for their specific process requirements.

## Innovation

We cultivate innovation through sustained R&D commitment. Products are engineered not only to perform accurately and reliably, but to be easy to install, calibrate, and maintain as well. Turning these better ideas into better products is realized in the ISO-certified manufacturing environment using leading-edge fabrication systems.

## International

A key factor in maintaining innovation and market leadership has been our development of a global information and distribution network. It's a network of technology experts poised to lend assistance to our customers anywhere in the world anytime. You can always count on AMETEK LMS for products that are engineered to the highest standards of excellence in the industry.

## VISION STATEMENT

*To be the customer's first call  
when performance matters.*

**AMETEK LMS designs, manufactures, markets and services level and flow instrumentation for the process industries worldwide**



Crude Oil



Natural Gas



Petroleum Refining



Chemical



Power Generation



Nuclear Power



Water & Wastewater



Renewable Energy



Life Science



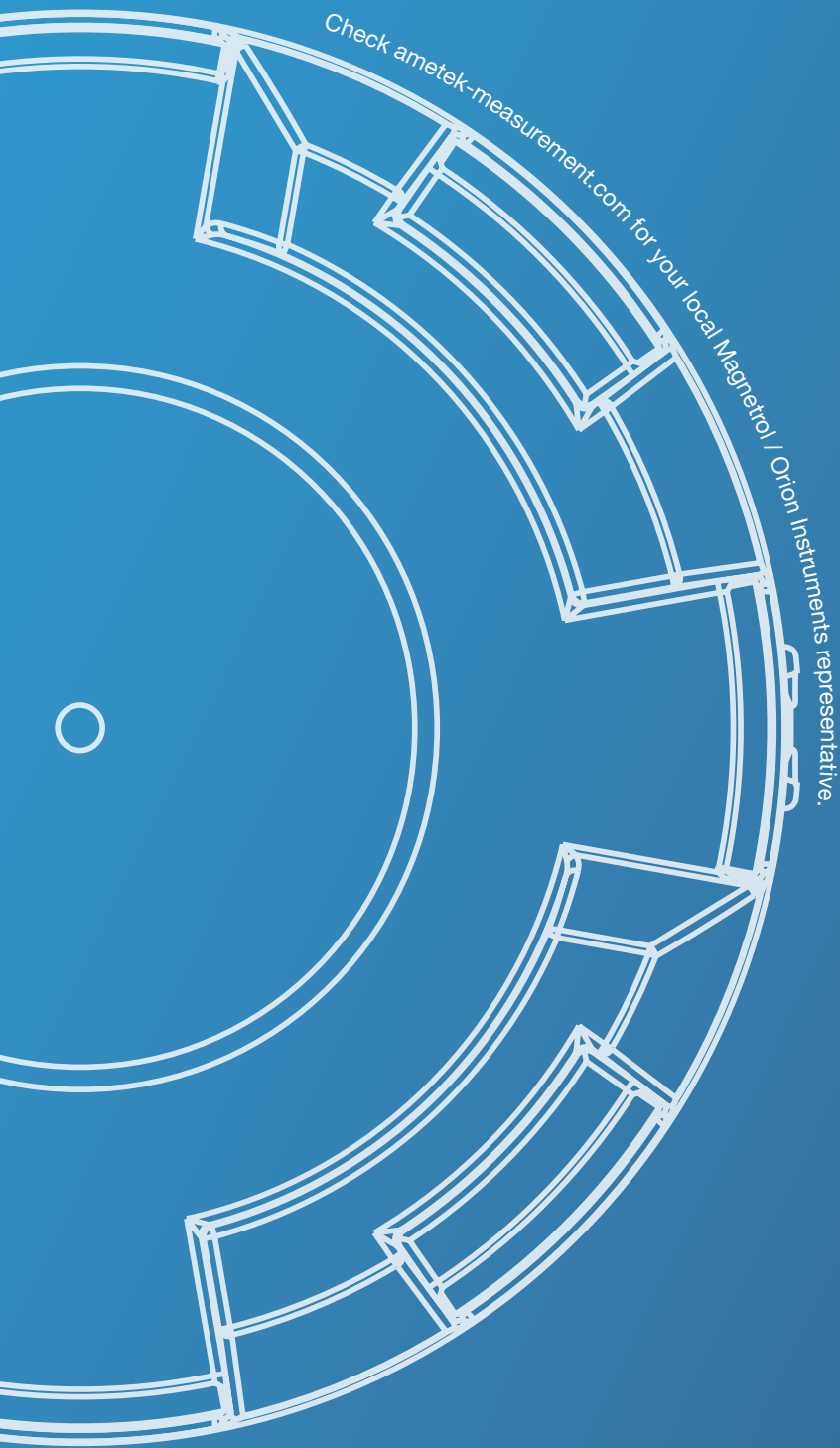
Food & Beverage



Pulp & Paper



Bulk Solids



Check [ametek-measurement.com](http://ametek-measurement.com) for your local Magnetrol / Orion Instruments representative.

#### U.S. MANUFACTURING FACILITY

705 Enterprise Street  
Aurora, Illinois 60504-8149 USA  
Tel: +1-630-969-4000  
[info.magnetrol@ametek.com](mailto:info.magnetrol@ametek.com)

#### EUROPEAN MANUFACTURING FACILITY

Heikensstraat 6  
9240 Zele, Belgium  
Tel: +32-(0)52-45.11.11  
[info.magnetrolbe@ametek.com](mailto:info.magnetrolbe@ametek.com)

#### CHINA MANUFACTURING FACILITY

1F of Building 4 (MAG), No.155 PuHui Road, Jiu Ting  
Song Jiang District  
Shanghai 201615  
Tel. +86-21-3763-2111  
[il-aur-rfqchina@ametek.com](mailto:il-aur-rfqchina@ametek.com)

#### UAE MANUFACTURING FACILITY

PO Box 261454 - LIU FZS1-BA03  
Jebel Ali Free Zone (JAFZA), Dubai, United Arab Emirates  
Tel: +971 4 8806345  
[MUAInfo@ametek.com](mailto:MUAInfo@ametek.com)

[ametek-measurement.com](http://ametek-measurement.com)

