



Molten Metal Level Measurement for Continuous Casters



**The Dependable & Cost Efficient
Way to Ensure Consistent Surface
Quality on Cast Slabs, Blooms and Billets**

GPE

an *L&J TECHNOLOGIES*

company

Molten Metal Level Measurement For Continuous Casters

The Dependable and Cost-Efficient Way to Assure Consistent Surface Quality on Cast Slabs, Blooms and Billets.

GPE Controls assures you of consistent surface quality on your continuous casting by automatically controlling the level of molten metal in your continuous casting operations.

In manually controlled continuous casting operations, the amount of molten metal entering your mold from the tundish car can continuously shift from too high to too low. This inconsistency can result in surface defects in your cast slabs, blooms and billets.

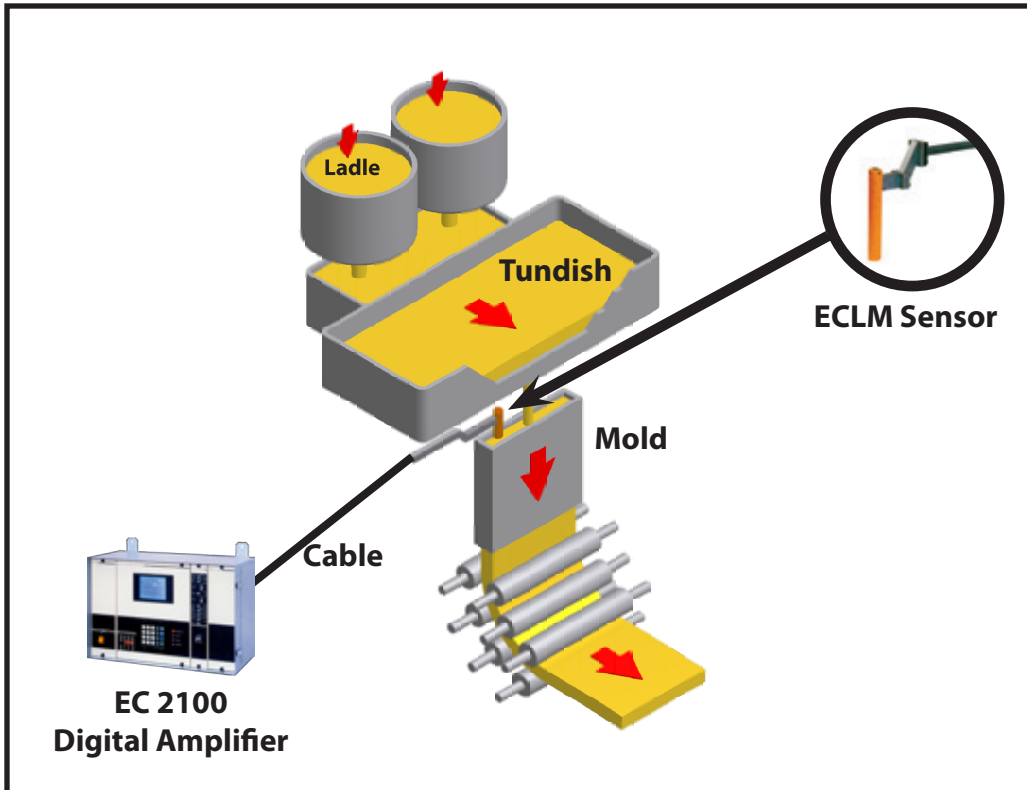
Even conventional methods of automatic level control – utilizing thermocouple and radioactive isotope (RI) methods – lack precision, resulting in poor surface quality. These methods may also require costly shutdowns of your operation for frequent maintenance and repair.

Now, GPE Controls offers a new, yet already proven automatic Molten Metal Level-Measurement System that is precise, simple to install, easy and inexpensive to maintain and safe to operate. With this new system, you can depend on consistently excellent surface quality.



World Headquarters in Hillside, IL

Continuous Casting Schematic



For over 70 years, GPE has been designing, manufacturing and servicing a comprehensive line of control systems used extensively in the metals industry to produce, process and finish steel, copper, aluminum and other similar media. These systems also control products originating from the continuous casting operations and the large equipment used in the processing of iron ore.

1. Eddy Current molten metal level meter (ECLM) is easily mounted directly above the mold, to provide accurate, non-contact level monitoring. Installs quickly and easily, to existing or new continuous casting operations, without equipment modification or lengthy process shutdown. Sensor can be installed on tundish car, floor or mold.

2. A sensor block contains a sensor head which uses the eddy current principle to measure the metal level in the mold. The sensor's primary coil receives a current which generates a high frequency magnetic field. In response, an eddy current is generated in the metal and an induced voltage is produced in the sensor's two secondary coils. Mold level variations cause changes

in the induced voltage. Thus, the secondary coil voltages are used to gauge level. Two secondary coils are used rather than one to minimize the effects of the sides of the mold. To withstand extremely high temperatures of the molten metal, both primary and secondary coils are air cooled and refractory protected. Coil temperature is continuously monitored by a self-contained integrated circuit device.

3. The sensor block is connected to the EC 2100 Digital Amplifier through a special cable provided with the sensor. The amplifier output is a 4-20mA signal to the PLC in linear proportion to the level.

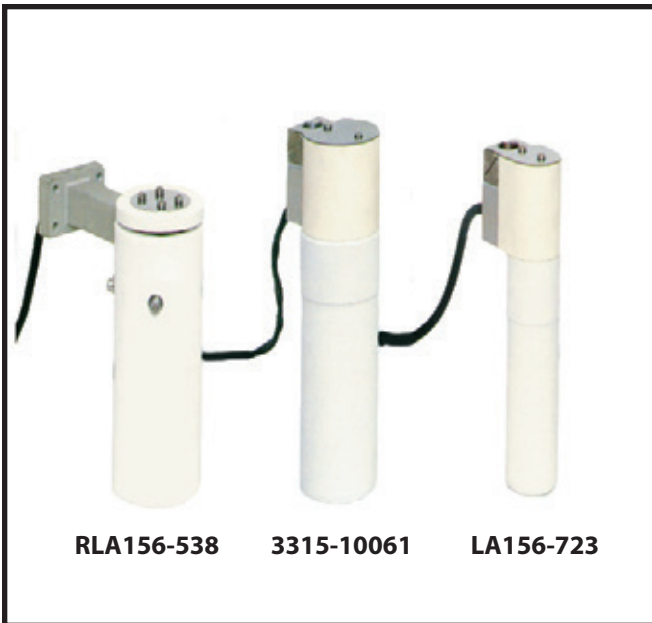


Measuring Devices

Available Sensor Heads

Application Table

Sensor Head Model	Former Part Number	Measurement Range	Service Temperature	Dimensions (O.D. x H) (mm)	Weight (Sensor)	Recommended Application
LA156-723	SB-028	0-100 mm	60°C	28 mm x 190 mm	0.5 Kg	Billet, Bloom, Slab
3315-10061	SB-3035A	0-150 mm	60°C	35 mm x 170mm	0.6 Kg	Billet, Bloom, Slab
RLA 156-538	SB-305A	0-200 mm	60°C	51 mm x 185 mm	1.0 Kg	Slab



One point calibration and memorized strand configurations minimize down time when changing sensors

Measurement Accuracy of 1 mm

Sensor Head Models

- Highly Sensitive and Accurate
- Air-Cooled
- Resolution Of ± 0.1 Mm
- Simple Installation
- Variety of Heads Available

Benefits

- Simple Installation of the Sensor Heads Reduces Set-up Time
- Air-cooled Coils Allow the Sensors to withstand Extremely High Temperatures
- This Enhances the Detection of Level Changes by the Availability to Position the Sensor Directly above the Molten Metal
- High Quality Materials Assures Trouble-free Performance
- Unaffected by Mold Powder



Sensor & Sensor Arm (typical)



***LCD Display
simplifies mold
setup and provides
immediate check for
input parameters
without additional PC
interfaces***

Test our Sensor & Amplifier with our Trial/ Lease Program and witness improved quality of casts.

Contact us for a site evaluation to determine temporary placement of the trial sensor.

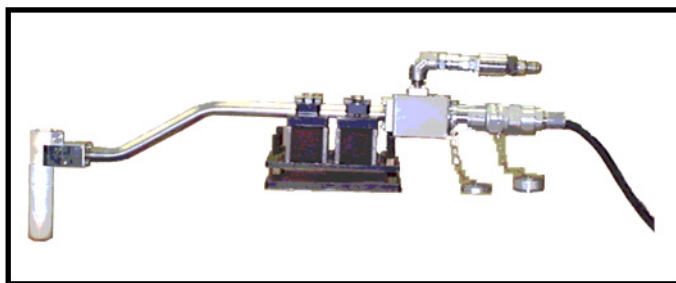
We can provide sensor arms and robotics designed specifically for cast or floor mounting or placement on your tundish car

EC 2100 Digital Amplifier

- Highly Sensitive and Accurate (+/- 1mm)
- Unaffected by Mold Powder
- Increased Functions and Alarms
- Simple Sensor Installation
- Up to 10 Strands Memorized
- Faster, Simplified Mold Setup
- Easy Conversion from Analog to Digital

Benefits

- Reduces Down Time due to Simplified Setup
- Settings are Made from a Keyboard and Readout from an LCD
- Display Showing Configuration and Adjustment Values to Use
- Peace of Mind knowing the Parameters are Set Properly by Viewing Them on LCD
- Exhibits Low Susceptibility to Electromagnetic Excitation and Temperature
- High Quality, Corrosion Resistant Materials are used throughout to Produce Trouble Free Performance
- Technical Service and Support available from GPE's Trained Service Technicians



Sensor Assembly shown with magnetic support



Outstanding Surface Quality

The GPE control system eliminates surface defects in cast slabs, blooms, and billets typically found with manually controlled operations, and even with some conventional automatic systems.

Precision Accuracy

Accurate readings mean accurate control responses, ensuring the exact, consistent flow of metal into your mold... the single most essential factor in achieving surface quality. GPE's measurement accuracy of 1mm or less is superior to other conventional systems, whose accuracy may vary by as much as ± 10 mm.

Superior Measurement Capability

A key to the GPE system is the level meter's sensor. It is positioned directly over the molten metal, using a linear proportional signal to detect any fluctuations in the molten metal level. It is in no way affected by the presence of mold powder, which distorts measurement in most other systems. The result is a wider and more accurate measurement range than with any other system.

Fast Response

The GPE system continuously measures mold level and instantaneously responds to level changes. Other automatic systems take longer to respond. Faster response helps ensure better control, accuracy and on going consistency. The GPE measuring system has a resolution of about 0.1mm, while the resolution in a radioactive isotope (RI) system is about 2.0mm.

Easy To Operate

Because the GPE system is fully automatic, your operators no longer need to rely on less-than accurate visual measurements to determine mold level. Manual adjustment of flow control is also eliminated. Easier to operate than other methods, GPE's system provides superior performance and requires less maintenance. A system alarm alerts you to problems in your continuous casting operation, and a manual override allows hands on control without disrupting your operation.



GPE Support and Service

Modular design allows GPE experts to develop and engineer a system that meets your specific needs. We can provide installation support for your staff or handle the job from start to finish. Service and maintenance programs can be tailored to ensure optimum performance and operation.

Effective Cost Control

Simplified, yet precise control circuitry significantly cuts your costs of level control. Because the GPE system is more dependable than others, and needs little or no supervision, you enjoy impressive labor and dollar savings.



Simplified Process

Consistent surface quality allows for direct rolling and hot charging. So, you can process your slabs, blooms, and billets without cooling, inspection, or conditioning. You save energy as well as time and labor.

Safety

The GPE Molten Metal Level Measurement System removes workers from close contact with the mold's intense heat. And because the system operates electromagnetically, there is no danger of radioactivity, as there is with radioactive isotope (RI) systems. For additional safety, GPE also offers an early warning alarm for breakthrough and breakouts. The result is an improved, safer work place.

ECLM Digital/Analog Comparison

This Chart compares the EC2100 Digital Amplifiers to the 600/700 series Analog Amplifiers

Parameter	Digital	Analog
Measuring Range	200mm	150mm
Accuracy	+/- 1mm	+/- 3mm
Response Time	Faster due to signal processing	---
Mold Oscillation Filters	3 types available	1 type available
Electromagnetic Stirrers Adjustment	Automatic adjustment	No automatic adjustment
Mold Set-Ups	10 mold set-ups can be stored	No storage capability
Initial Calibration and One Point Calibration	Simplified using menu-driven key pad entries displayed on built-in PC-style screen No DVM required for adjustment as voltages are displayed OPC action viewed in real time on display	No keypad or display Requires DVM for adjustment No display
Checking of Input Parameters	Immediately verified using keypad and display	No keypad or display
Sensor Changes	Pre-programmed profiles simplify changes	No pre-programming
Data Recording	3 fields and 6 events	No data recording
Alarms	Displayed on screen	No display
Level Measurement and Other Parameters	Real time display on screen in numerical and graphical format	No display

Upgrading to the EC 2100 Digital Amplifiers from the 600/700 Analog Amplifiers is seamless. Merely unplug the analog amplifier and plug in the new EC2100 Digital Amplifier.

Trade-In Program

Inquire about our Analog Amplifier Trade-In Program, with purchase of EC 2100 Digital Amplifier.

Not quite ready to upgrade to Digital? Inquire about our refurbished analog amplifiers.

The Product Development team provides the latest advances in technology and proven application experience.

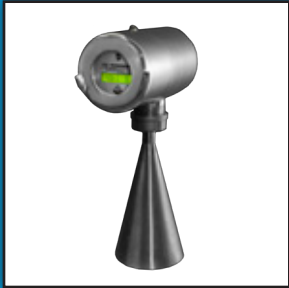
Installation, operations and maintenance training are all available from the L&J Service Engineering Group.

GPE ECLM sensors and amplifiers are installed in more slab casters in North, Central and South America than any other Mold Level Device.



L&J Technologies offers a complete line of products that provide solutions for hundreds of Industrial and commercial applications. Visit us online at www.ljtechnologies.com

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 Temperature, Density &
 Inventory Management

SHAND&JURS



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 Detonation Arresters &
 Fittings

DELAVAN



Point/Multi-Point Level
 Controls, Continuous
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 Flow Indicators

GPE



Mold Level & Strip
 Guiding Measurement
 & Control Systems for
 Metals/Steel Industries

OMNIROL



Liquid Level Switches

Durlam



FRP Conservation
 Valves, Vents and
 Hatches

Locations

World Headquarters
 5911 Butterfield Road
 Hillside, IL 60162
 Phone: 708-236-6000
 Fax: 708-236-6006

Houston Office
 Houston, TX
 Phone: 281-821-0322
 Fax: 281-821-1796

Singapore Office
 Phone: 65-6293-1355
 Fax: 65-6293-1357