

- Absolute encoding eliminates recalibration**
- Infrared hand-held field calibration**
- Level, temperature, and optional discrete/analog I/O's**
- Plug-in data highway modules**
- 1/32" repeatability**
- Ground Level Display eliminates tank climbing**

## The L&J Engineering Model MCG 2000SSI... for the Next Millennium and Beyond

### Compact, Yet Powerful

L&J has uniquely designed the MCG 2000SSI series of Encoder/Transmitters to require only one PC board! The elimination of unnecessary mechanical parts coupled with the latest in microprocessor technology, communicates level, spot or average temperature, controls pumps and valves, and enables field calibration at the unit or a remote ground level display.

### Patented Technology

L&J utilizes the patented "In-line" absolute, optic encoder. Infrared emitters and detectors convert the mechanical shaft position into a digital signal. No wires or brushes are used; virtually eliminating the possibility of wear. To further simplify the mechanics, a machined gear train is used to couple the gauge shaft to the encoder disks. This configuration is completely unaffected by power failures. When power is restored, the transmitter will accurately reflect the current level; even if it has changed. No additional calibration is required.

### Optional I/O Points

Discrete I/O points can be added to control valves and pumps or signal alarms (4 programmable alarm contacts). Analog I/O points, two fully programmable outputs, transmit process data such as flow and density. Routines are available for calculating density from analog pressure inputs.

### Versatility

The MCG 2000SSI is engineered to mount easily to all popular models of mechanical gauges. In addition to the entire Shand & Jurs series of tape gauges, mounting kits for many competitors' models are available. Special conversion kits, for non-standard units, are available, upon request. Emulation modules have been developed for all major protocols. These newly-designed intelligent modules incorporate both the proper electrical and protocol information. Each have a resident microprocessor and memory and can be replaced on-site, without replacing the P.C. Board. This facilitates the transition from one data highway to another.

### Flexibility

The MCG 2000 is available in two versions. The MCG 2000 SSI enables complete onsite programming and setup using the intrinsically safe MCG 2150 handheld, infrared calibrator. This can be performed without removal of the explosion proof housing. The basic MCG 2000SS is typically used for simple level only applications where a digital display is not required.

## Applications

**Converts mechanical level measurements into electronic data**

**Transmits process data such as temperature (spot or average), pressure and alarms**

**Controls valves and pumps**

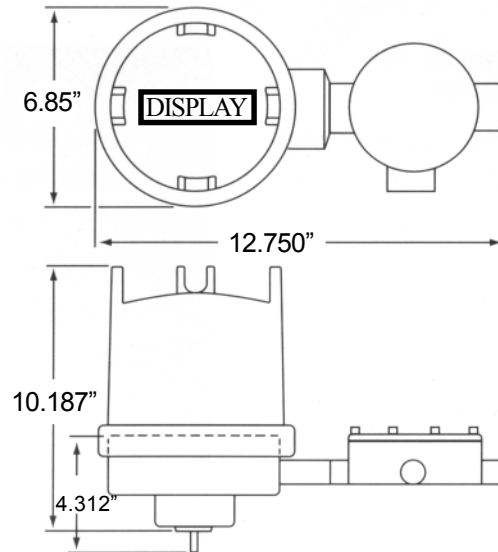
**Installed in bulk liquid storage vessels for the Petroleum, Petrochemical, Chemical, Pharmaceutical, Food & Beverage, and Water Treatment Industries**

### SPECIFICATIONS

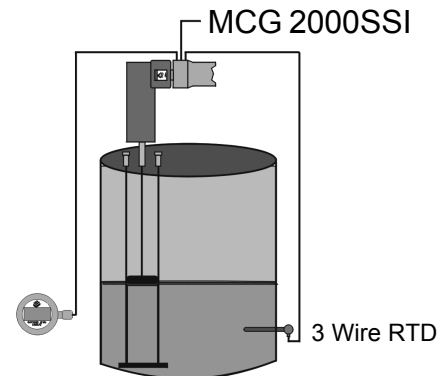
<b>Accuracy:</b> (Over Full Range)	1/16th" (1.6mm) Std. 1/32nd" (0.8mm) Opt.
<b>Range:</b>	0-96 Feet (0-29M)
<b>Repeatability:</b>	1/16th" (1.6mm) Std. 1/32nd" (0.8mm) Opt.
<b>Shaft Rotation:</b>	Selectable - Clockwise or Counterclockwise
<b>Digital Conversion:</b>	Absolute Optic Encoding
<b>Calibration:</b>	Feet and 1/16th" Feet and 1/32", Millimeter
<b>Transmitted Signal:</b>	30V DC Pulse, 11 Bit Words with Error Checking
<b>Static Power Consumption:</b>	35V DC, 20mA (Tankway) Back Light off
<b>Power Options:</b>	110 VAC, 220 VAC, 24 VAC, 48 VAC, 48 VDC
<b>Temp. Inputs:</b>	Platinum or Copper
<b>Temperature Sensing:</b>	3 Wire RTD (spot), 2 Average Temp. (Opt.)*
<b>Temperature Accuracy:</b>	0.5° F (0.3° C)
<b>Temperature Resolution:</b>	0.1° F (0.06° C)
<b>Baud Rate:</b>	300-9600 Selectable
<b>Lightning Protection:</b>	Comprehensive Surge Protection
<b>Control Option:</b>	2 Points (Valves and/or pumps)
<b>I/O Option:</b>	3 4-20mA Output 3 4-20mA Input 4 Programmable Dry Contacts
<b>Field Wires:</b>	4-Field Wires, (Tankway) 20AWG Minimum
<b>Safety Approvals:</b>	Explosion Proof/*Intrinsically Safe Class I, Div. 1, Groups C&D UL (SS/SSI), CSA (SS) EEx d IIB T6 BASEEFA (SS) CENELEC (SS)
<b>Parallel (optional):</b>	Binary - BCD - Graycode
<b>Protocol:</b>	Plug in modules to emulate most other manufacturers' protocols

\*Requires MCG 2350 accessory

### DIMENSIONS



(CAN BE SIDE-MOUNTED)



L & J Tankway

### INFORMATION REQUIRED TO ORDER:

**MCG 2000 (S) or (I) - XX - YY - ZZ - AA - BB**

COUPLING/APPROVAL   
 INPUTS AND TEMP.   
 SWITCHES   
 OUTPUT   
 CONTROL POINTS/POWER

*All designs subject to change. Certified dimensions  
and specifications available upon request.*

#### MCG 2000SS ENCODER / TRANSMITTER

Includes: 2 Discrettes for Independent HI Alarms,  
Lightning Protection, Digital Output Using 4-Wire  
Data Highway, Absolute Optical Encoding

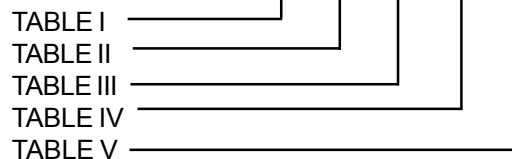
#### MCG 2000SSI ENCODER / TRANSMITTER

Includes: 2 Discrettes for Independent HI Alarms,  
Lightning Protection, Digital Output Using 4-Wire  
Data Highway, Absolute Optical Encoding, Infrared  
Remote Capabilities

#### MODEL NUMBER SELECTION:

The model number will have a base number, **MCG 2000S** (for the MCG 2000SS) or **MCG 2000I** (for the MCG 2000SSI), followed by 10 digits. These digits will represent 5 option tables.

**MCG 2000 (S) or (I) - XX - YY - ZZ - AA - BB**



#### TABLE I - COUPLING / APPROVAL

- 0X** - Standard coupling with UL or CSA approval
- 1X** - Standard coupling with BASEFFA approval
- 2X** - Metric coupling with UL or CSA approval
- 3X** - Metric coupling with BASEFFA approval
  
- X1** - Varec
- X2** - GPE (92020, 92021, 92030)
- X3** - GPE (92006, 92153, 92154)
- X4** - GPE (8000, 2935)
- X5** - Protectoseal
- X6** - Varec (9504) No Housing
- X7** - Varec - (1600, 1800, 1900) No Housing
- X8** - Special
- X9** - GPE No Housing

**TABLE II - INPUTS AND TEMPERATURE**

- 00** - None
- 02** - Average Temperature\*
- 03** - (Reserved)
- 05** - 4-20mA Input (non-isolated)
- 10** - GPE 31422, 31423, TP 600
- 11** - Spot Temperature
- 14** - Spot Temperature w/ Barriers
- 17** - 4-20mA with Spot Temperature
- 36** - 4-20mA with Average Temperature w/ Barriers\*

*Calibration Type (Pl or Cu) is software-selectable in this model. The default is Platinum.  
 \*Requires MCG 2350 Average Temperature and a MCG 350 Average Temperature bulb (Ordered Separately)*

**TABLE III - SWITCHES**

- 00** - None
- 01** - Two CAM Switches
- 02** - Three CAM Switches
- 03** - Four CAM Switches
- 04** - Five CAM Switches
- 05** - Six CAM Switches
- 11** - Two CAM Switches (DPDT)
- 12** - Three CAM Switches (TPDT)
- 13** - Reserved
- 20** - 2 Relays, 1 Amp @ 125 VAC (alarm relay) (Hi & HiHi only)
- 21** - 4 Relays, 1 Amp @ 125 VAC (alarm relay) (Lo, LoLo, Hi, HiHi)

**TABLE IV - OUTPUT**

- 00** - L&J Tankway
- 01** - 4-20mA Output in Place of L&J Tankway
- 02** - L&J Tankway and 4-20mA Output
- 03** - L&J Tankway and Ground Level Display
- 04** - Parallel Output in Place of L&J Tankway
- 06** - 4-20mA Level and 4-20mA Temp
- 07** - L&J Tankway and Parallel
- 08** - Varec 1800, 1900 (4-Wire, 1/2 Duplex)
- 09** - Varec 1600, (20 Wire Matrix)
- 10** - GPE 31422, 31423 Protocols
- 11** - Honeywell CLM Mod Buss on L&J Tankway
- 12** - RGL/NMC Interface **13** - 4-20mA and Ground Level Display
- 14** - Honeywell CLM Mod Buss on 485 Highway
- 15** - Enraf Interface
- 16** - Varec (HART Bus) 4100MFT
- 17** - Varec (HART Bus) and 4-20mA Output
- 29** - TI (Ti-Way) Protocol
- 30** - TI (CIM) Protocol
- XX** - Special Protocols and emulations available

**TABLE V- CONTROL POINTS/POWER**

- 0X** - 48 VDC Standard L&J Tankway
- 1X** - 24 VDC
- 2X** - 48 VAC
- 3X** - 110 VAC
- 4X** - 220 VAC
  
- X0** - None (2 Discrete Ins, Standard)
- X1** - One Pump or Valve (2 Relays, 2 DI's & 2 DO's)
- X2** - Two Points (1 Pump/1 Valve; or 2 Pumps or 2 Valves)
- X3** - Four Points (8 Relays, 8 Discrete Ins)

**Note:** For ease of installation, the following may be desired:

- MCG 2100 Field Calibrator
- MCG 2150 Hand-Held Calibrator