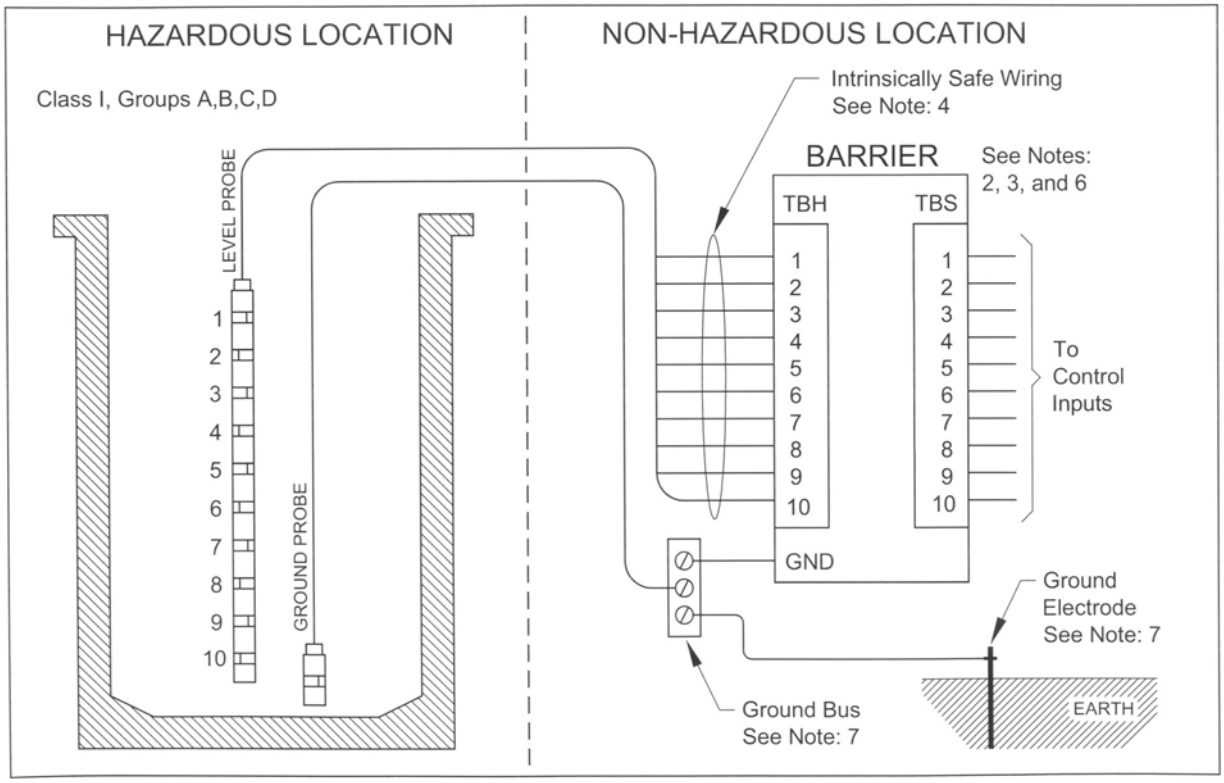
LEVEL PROBE

Control Drawing No. 0304 Page 2 of 2 UNGROUNDED TANK APPLICATION



Notes for Control Drawing 0304 Page 2 of 2:

1. Level Probe Entity Parameters: Vmax = 30.3 V Imax = 88.6 mA Pmax = 672 mW Ci = 6 nF Li = 20 µH
2. The Barrier output current must be limited by a resistor such that the output voltage versus current plot is a straight line drawn between the open-circuit voltage and the short-circuit current.
3. The Barrier must be third party listed as providing intrinsically safe circuits for the application, and have Voc not exceeding Vmax, Isc must not exceeding Imax, and Po of the Barrier must be less than or equal to the Pmax of the Level Probe, as shown in Table 1.
4. The capacitance and inductance of the cable from the Level Probe to the Barrier shall be calculated and must be included in the system calculations as shown in Table 1. Cable capacitance, Ccable, plus intrinsically safe equipment capacitance, Ci, must be less than the marked capacitance, Ca, shown on the Barrier used. The same applies for inductance (Lcable, Li and La respectively). Where cable capacitance and inductance per foot are not known, the following values shall be used: Ccable = 60 pF/ft, Lcable = 0.2 µH/ft.
5. If Po of the Barrier is not known, it may be calculated using the formula Po = (Voc * Isc)/4.
6. The Barrier must be installed in accordance with its manufacturer's control drawing and Article 504 of the National Electric Code (ANSI/NFPA 70) for installation in the United States, or Section 18 of the Canadian Electrical Code for installations in Canada.
7. The hazardous location Ground Probe and the Barrier ground must be connected to the ground bus in the power distribution panel. The ground bus must be connected to a suitable ground electrode per the National Electric Code (ANSI/NFPA 70) or other local codes, as applicable. The resistance of the ground path from the Barrier to the ground electrode must be less than 1 Ohm.
8. This associated apparatus (Barrier) must not be used in combination with another associated apparatus unless permitted by the associated apparatus certification.

Level Probe Part Number: LP - ___ - ___ - ___

Probe Length (inches)
Number of Electrodes 1, 2, 3, or 10
Cable Length (feet)

Ground Probe Part Number: LP - 7 - 1 - Cable Length

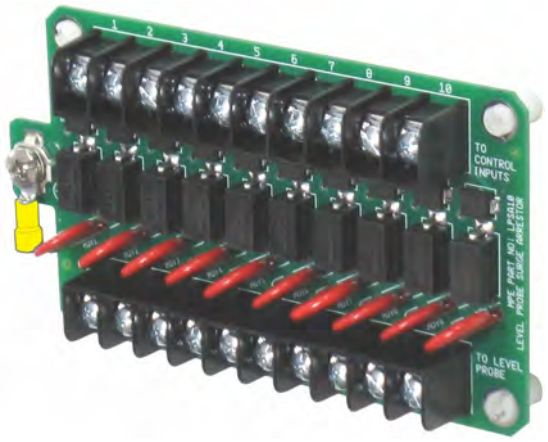
Table 1

Level Probe		Barrier
Vmax	≥	Vt
Imax	≥	It
Pmax	≥	Po
Ci + Ccable	≤	Ca
Li + Lcable	≤	La

Revision Date: 7-13-10

Order from: C A Briggs Company; 622 Mary Street; Suite 101 - Warminster, PA 18974
Phone: 267-673-8117 - Fax: 267-673-8118; E-Mail: Sales@cabriggs.com - www.cabriggs.com

LEVEL PROBE SURGE ARRESTOR



TYPICAL APPLICATIONS

For use with MPE's level control devices that have conductance probe inputs for level measurement.

DESCRIPTION

The Level Probe Surge Arrestor provides transient surge protection for the control inputs of any of MPE's pump control devices that have conductance probe inputs for level measurement.

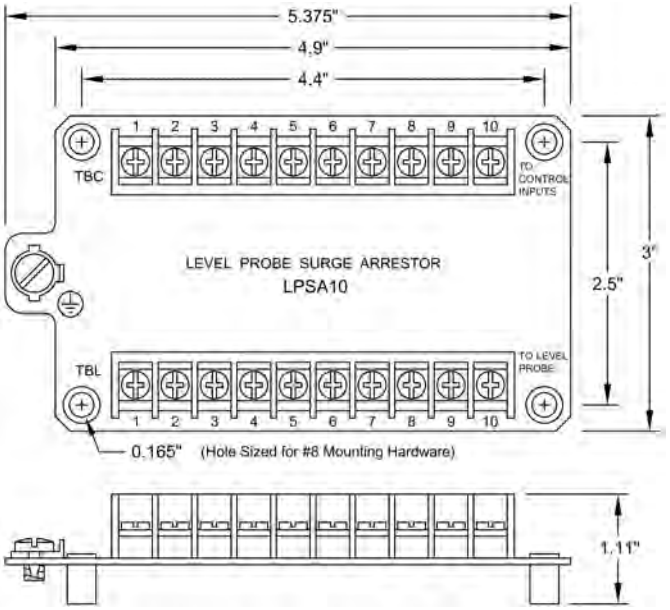
The unit has ten channels and may be used with any of MPE's ten electrode conductance probes (Level Probes), but can also be used with single electrode, or three electrode probes.

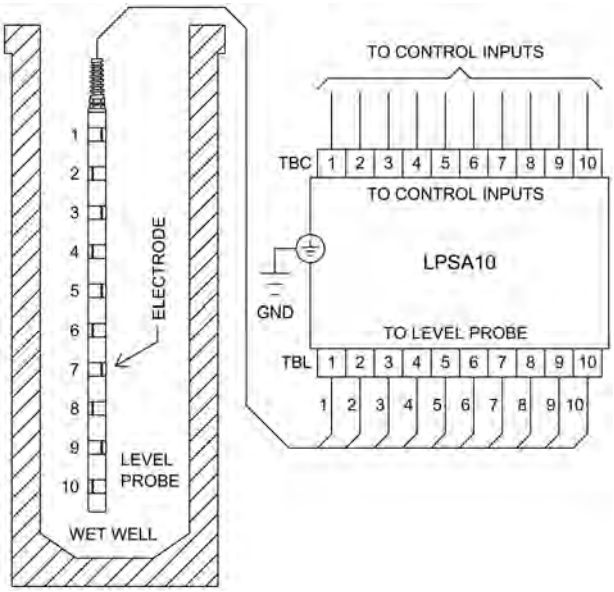
Each channel has an MOV (Metal-Oxide Varistor) that is capable of shunting large transient currents to ground (up to 1000 Amps).

Following each MOV is a TVS (Transient Voltage Suppressor Diode) capable of limiting the voltage going to the controls inputs from going beyond ±26V.

Between each MOV and TVS is a 100 Ω, 5 Watt wirewound resistor that protects the TVS from excessive voltages and currents not stopped by the MOV.

The grounding terminal on the LPSA10 must be connected to the control panel ground by a 12 AWG wire.





SPECIFICATIONS

Rated Operating Voltage:	±12 V
Maximum Operating Voltage:	±15 V
Maximum Clamping Voltage:	±26 V
Maximum Clamping Current:	±1000 A
Internal Resistance:	100 Ω (per sensor)
Operating Temp:	-20 to +65 °C
Storage Temp:	-45 to +85 °C

ORDERING INFORMATION

Part Number: **LPSA10**

Order from: C A Briggs Company; 622 Mary Street; Suite 101 - Warminster, PA 18974
Phone: 267-673-8117 - Fax: 267-673-8118; E-Mail: Sales@cabriggs.com - www.cabriggs.com

LEVEL PROBE CONVERTER

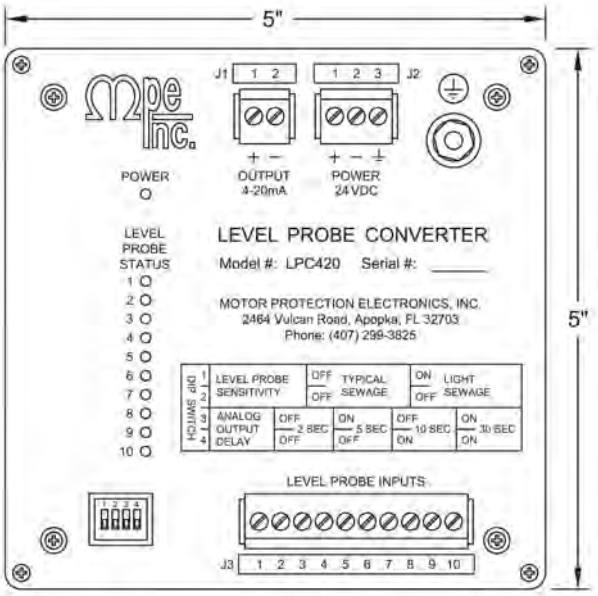
MADE IN THE U.S.A.

TYPICAL APPLICATIONS

For use with any 10 electrode conductance probe where an analog 4-20mA level signal is required.

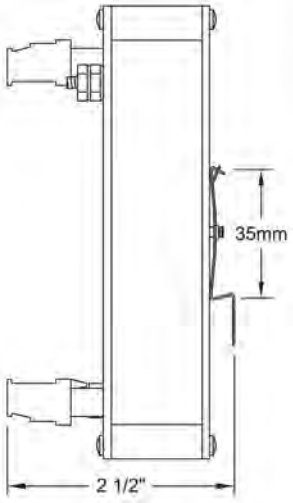
DESCRIPTION

The Level Probe Converter senses liquid level and provides a 4-20mA analog output for use by a pump controller or PLC to control liquid level. The unit monitors the ten electrodes on a Level Probe, and provides an analog signal that is proportional to level. All setup is easily done using the four DIP switches on the unit. The Sensitivity of the unit must be set for the type of liquid being detected (see table below). The Analog Output Delay setting provides control over how fast the analog output transitions from one level output value to another. It takes 10 times the Analog Output Delay setting value to go from 4 mA to 20 mA, when the electrodes are covered quickly. When the electrodes are slowly covered one at a time, the Analog Output Delay is used to provide a smooth transition as the level goes from electrode to electrode.



DIP SWITCH						
1	LEVEL PROBE SENSITIVITY	OFF	TYPICAL SEWAGE	ON	LIGHT SEWAGE	
2		OFF		OFF		
3	ANALOG OUTPUT DELAY	OFF	2 SEC	ON	5 SEC	OFF 10 SEC ON; ON 30 SEC ON
4		OFF		OFF		

NUMBER OF ELECTRODES COVERED	ANALOG OUTPUT
NONE	4.0 mA
1	5.6 mA
2	7.1 mA
3	8.8 mA
4	10.4 mA
5	12.0 mA
6	13.6 mA
7	15.2 mA
8	16.8 mA
9	18.4 mA
10	20.0 mA



SPECIFICATIONS

Supply Voltage:	24 VDC ± 10%
Supply Current:	75 mA max
Analog Output:	Non-Isolated 4-20 mA Maximum Load 600 Ω
Sensor Output Voltage:	±8 V Square Wave @ 60 Hz
Sensor Output Current:	0.8 mA max (per sensor)
Operating Temp:	-20 to +65 °C
Storage Temp:	-45 to +85 °C
Enclosure:	Aluminum, Din Rail Mounted

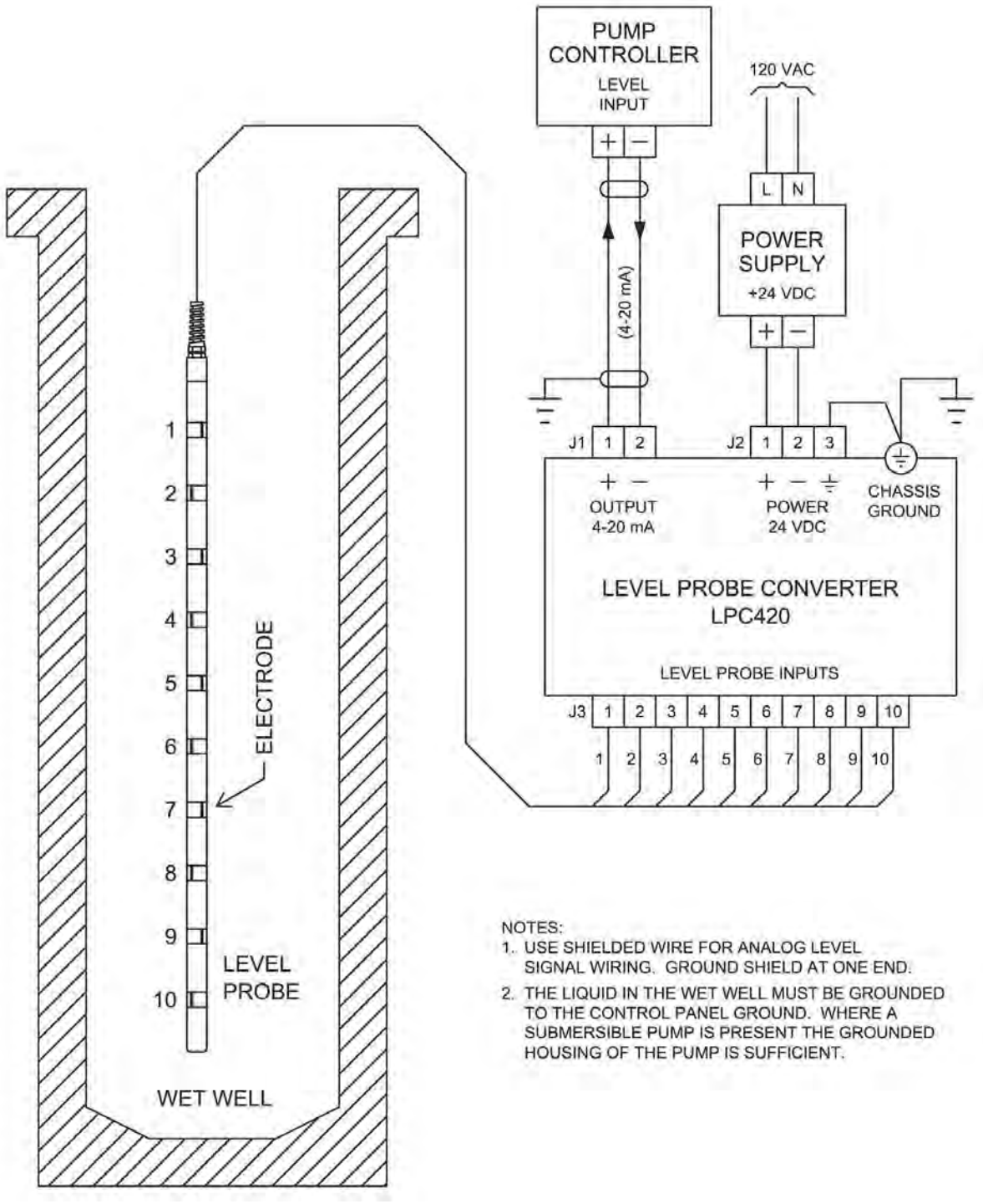
ORDERING INFORMATION

Model Number: **LPC420**

Order from: **C A Briggs Company**; 622 Mary Street; Suite 101 - Warminster, PA 18974
Phone: 267-673-8117 - Fax: 267-673-8118; E-Mail: Sales@cabriggs.com - www.cabriggs.com

LEVEL PROBE CONVERTER

CONNECTION DIAGRAM



NOTES:
1. USE SHIELDED WIRE FOR ANALOG LEVEL SIGNAL WIRING. GROUND SHIELD AT ONE END.
2. THE LIQUID IN THE WET WELL MUST BE GROUNDED TO THE CONTROL PANEL GROUND. WHERE A SUBMERSIBLE PUMP IS PRESENT THE GROUNDED HOUSING OF THE PUMP IS SUFFICIENT.

LEVEL PROBE CONVERTER

REVERSE MOUNT

MADE IN THE U.S.A.

PANEL MOUNT VEIW

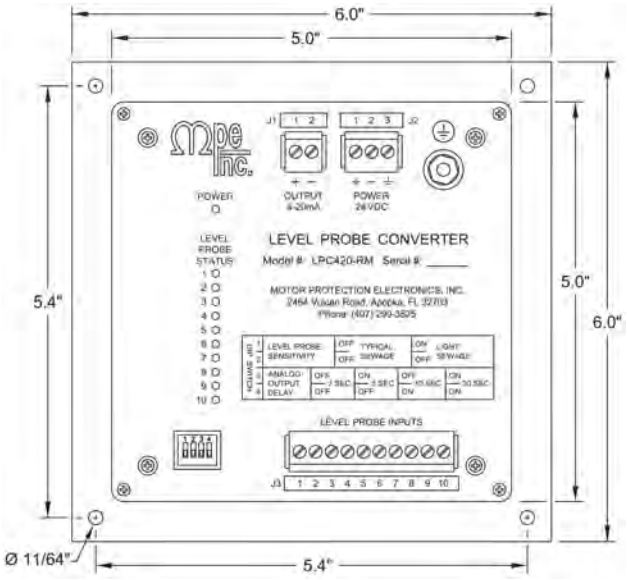
TYPICAL APPLICATIONS

For use with any 10 electrode conductance probe where an analog 4-20mA level signal and a panel mounted level display are required.

DESCRIPTION

The Reverse Mount LPC420 allows for viewing of the level display with the deadfront door closed, as well as open. Settings and connections are made on rear of unit.

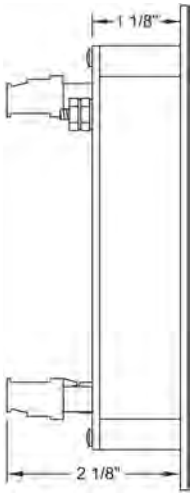
The Level Probe Converter senses liquid level and provides a 4-20mA analog output for use by a pump controller or PLC to control liquid level. The unit monitors the ten electrodes on a Level Probe, and provides an analog signal that is proportional to level. All setup is easily done using the four DIP switches on the unit. The Sensitivity of the unit must be set for the type of liquid being detected (see table below). The Analog Output Delay setting provides control over how fast the analog output transitions from one level output value to another. It takes 10 times the Analog Output Delay setting value to go from 4 mA to 20 mA, when the electrodes are covered quickly. When the electrodes are slowly covered one at a time, the Analog Output Delay is used to provide a smooth transition as the level goes from electrode to electrode.



REAR VEIW

DIP SWITCH					
1	LEVEL PROBE SENSITIVITY	OFF	TYPICAL SEWAGE	ON	LIGHT SEWAGE
2		OFF		OFF	
3	ANALOG OUTPUT DELAY	OFF	2 SEC	ON	5 SEC
4		OFF		OFF	
		OFF	10 SEC	ON	30 SEC
		ON		ON	

NUMBER OF ELECTRODES COVERED	ANALOG OUTPUT
NONE	4.0 mA
1	5.6 mA
2	7.1 mA
3	8.8 mA
4	10.4 mA
5	12.0 mA
6	13.6 mA
7	15.2 mA
8	16.8 mA
9	18.4 mA
10	20.0 mA



LEFT SIDE VEIW

SPECIFICATIONS

Supply Voltage:	24 VDC ± 10%
Supply Current:	65 mA max
Analog Output:	Non-Isolated 4-20 mA Maximum Load 600 Ω
Sensor Output Voltage:	±8 V Square Wave @ 60 Hz
Sensor Output Current:	0.8 mA max (per sensor)
Operating Temp:	-20 to +65 °C
Storage Temp:	-45 to +85 °C
Enclosure:	Aluminum, Panel Mounted

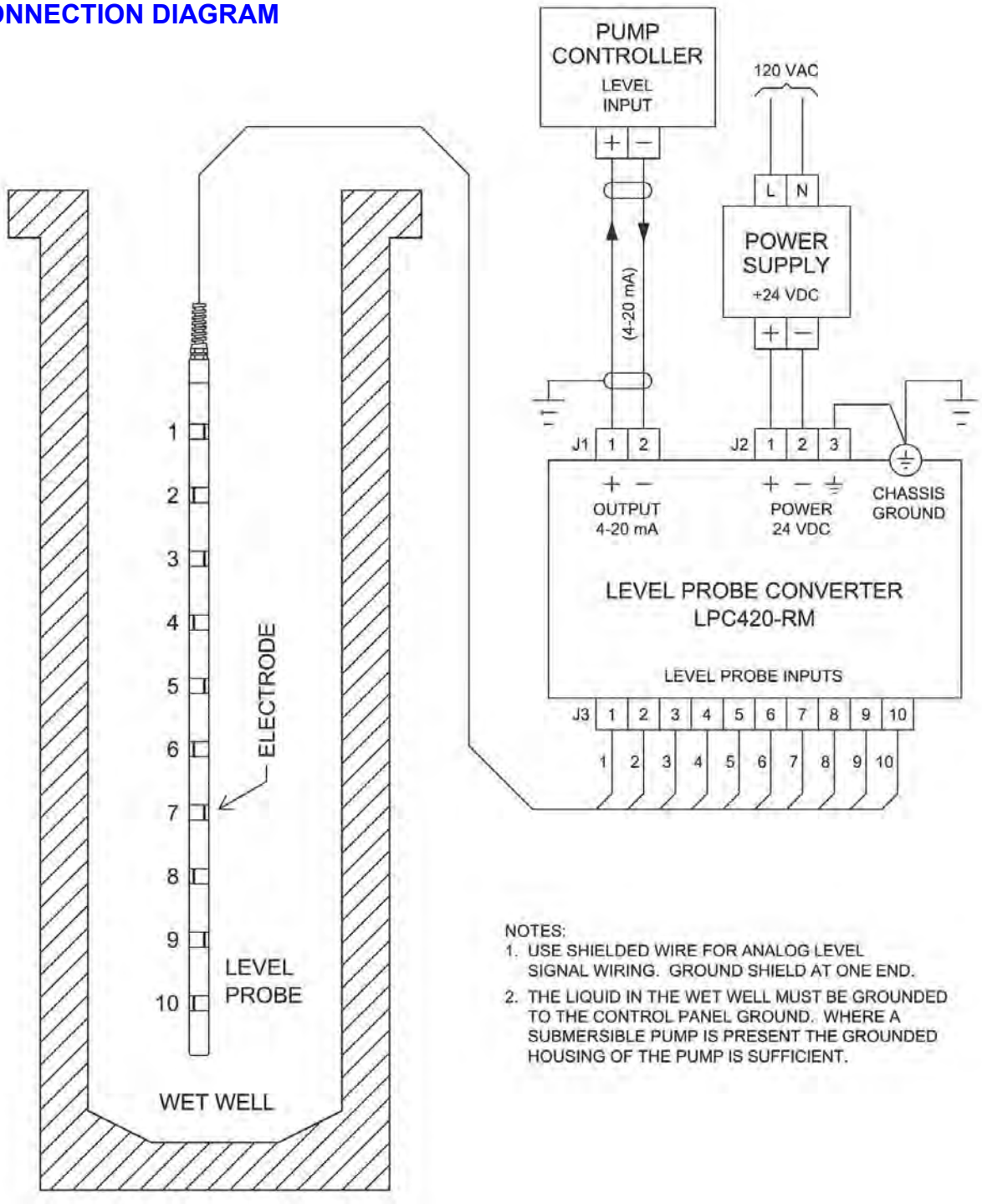
ORDERING INFORMATION

Model Number: **LPC420-RM**

Order from: **C A Briggs Company**; 622 Mary Street; Suite 101 - Warminster, PA 18974
Phone: 267-673-8117 - Fax: 267-673-8118; E-Mail: Sales@cabriggs.com - www.cabriggs.com

LEVEL PROBE CONVERTER

CONNECTION DIAGRAM



NOTES:
1. USE SHIELDED WIRE FOR ANALOG LEVEL SIGNAL WIRING. GROUND SHIELD AT ONE END.
2. THE LIQUID IN THE WET WELL MUST BE GROUNDED TO THE CONTROL PANEL GROUND. WHERE A SUBMERSIBLE PUMP IS PRESENT THE GROUNDED HOUSING OF THE PUMP IS SUFFICIENT.

LEVEL PROBE CONVERTER w/ RELAYS

MADE IN THE U.S.A.

TYPICAL APPLICATIONS

For use with any 10 electrode conductance probe where an Analog 4-20mA level signal and Relay Outputs are required.

c UL us LISTED

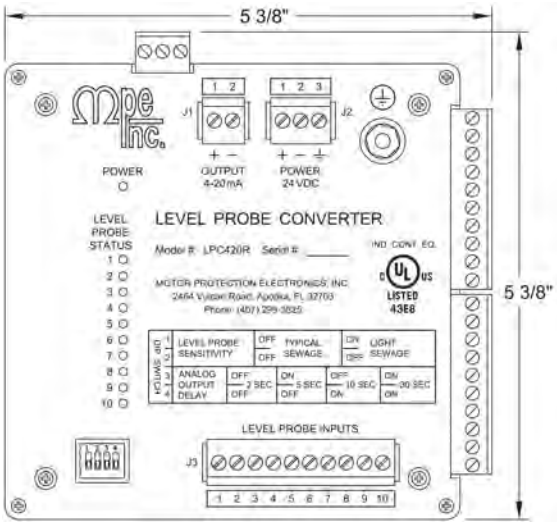
UL FILE # E101681

DESCRIPTION

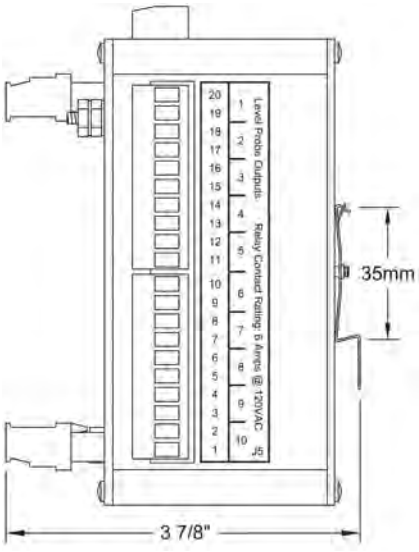
The Level Probe Converter senses liquid level and provides a 4-20mA analog output for use by a pump controller or PLC to control liquid level. The unit monitors the ten electrodes on a Level Probe, and provides an analog signal that is proportional to level. The unit also provides 10 Relay Outputs with contacts that close as the liquid covers the respective Level Probe electrodes. The Relay Outputs may be used for pump control, level alarms or telemetry.

All setup is easily done using the four DIP switches on the unit. The Sensitivity of the unit must be set for the type of liquid being detected (see table below). The Analog Output Delay setting provides control over how fast the analog output transitions from one level output value to another. It takes 10 times the Analog Output Delay setting value to go from 4 mA to 20 mA, when the electrodes are covered quickly. When the electrodes are slowly covered one at a time, the Analog Output Delay is used to provide a smooth transition as the level goes from electrode to electrode.

DIP SWITCH						
1	LEVEL PROBE SENSITIVITY	OFF	TYPICAL SEWAGE	ON	LIGHT SEWAGE	
2		OFF		OFF		
3	ANALOG OUTPUT DELAY	OFF	2 SEC	ON	5 SEC	OFF 10 SEC ON; ON 30 SEC ON
4		OFF		OFF		



NUMBER OF ELECTRODES COVERED	ANALOG OUTPUT
NONE	4.0 mA
1	5.6 mA
2	7.1 mA
3	8.8 mA
4	10.4 mA
5	12.0 mA
6	13.6 mA
7	15.2 mA
8	16.8 mA
9	18.4 mA
10	20.0 mA



SPECIFICATIONS

Input Power:	120 VAC ± 10% 7.7 VA max or 24 VDC ± 10% 160 mA max
Analog Output:	Non-Isolated 4-20 mA Maximum Load 600 Ω
Relay Outputs:	6 A @ 120 VAC
Sensor Output Voltage:	±8 V Square Wave @ 60 Hz
Sensor Output Current:	0.8 mA max (per sensor)
Operating Temp:	-20 to +65 °C
Storage Temp:	-45 to +85 °C
Enclosure:	Aluminum, Din Rail Mounted

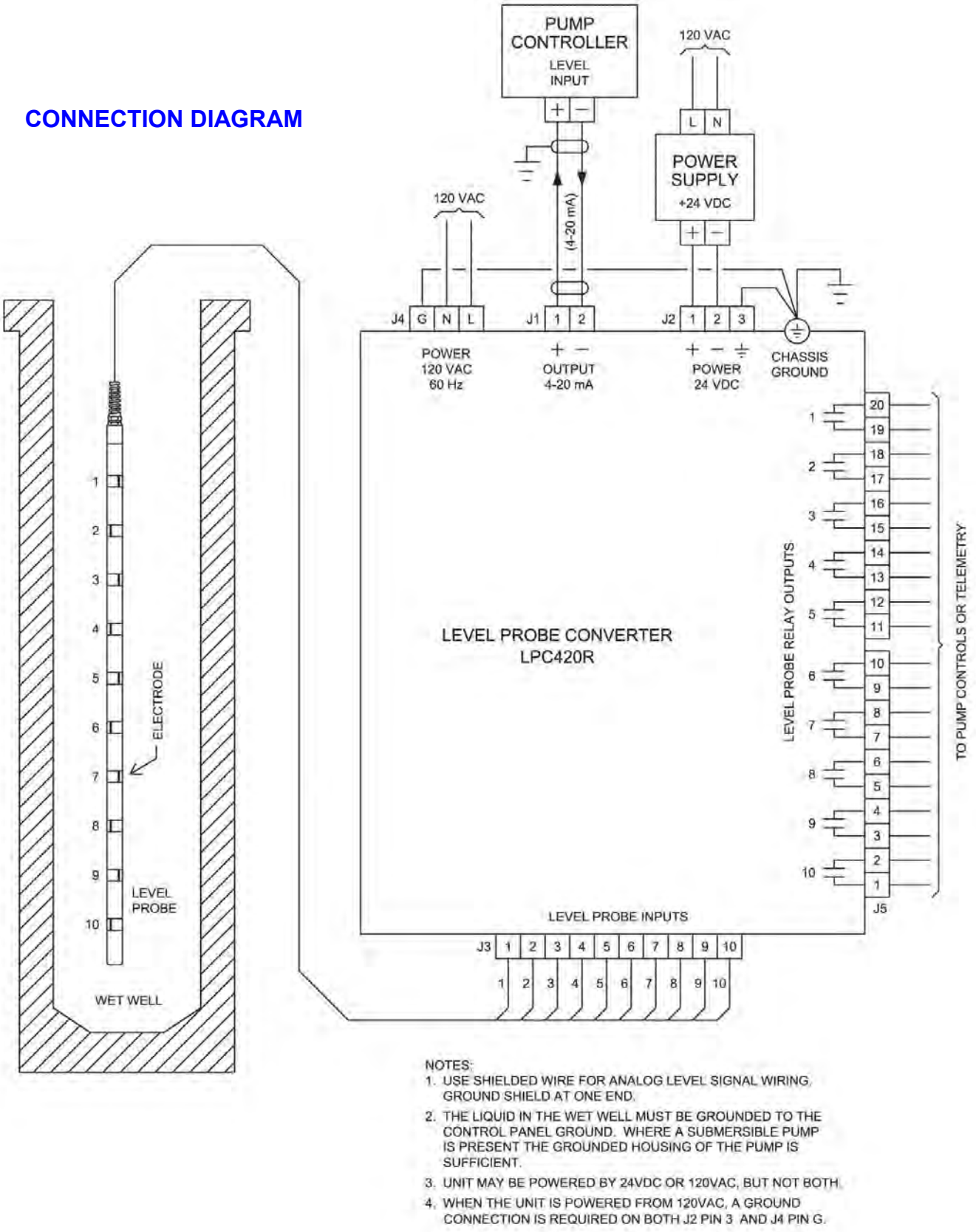
ORDERING INFORMATION

Model Number: **LPC420R**

Order from: **C A Briggs Company**; 622 Mary Street; Suite 101 - Warminster, PA 18974
Phone: 267-673-8117 - Fax: 267-673-8118; E-Mail: Sales@cabriggs.com - www.cabriggs.com

LEVEL PROBE CONVERTER w/ RELAYS

CONNECTION DIAGRAM



NOTES:

1. USE SHIELDED WIRE FOR ANALOG LEVEL SIGNAL WIRING. GROUND SHIELD AT ONE END.
2. THE LIQUID IN THE WET WELL MUST BE GROUNDED TO THE CONTROL PANEL GROUND. WHERE A SUBMERSIBLE PUMP IS PRESENT THE GROUNDED HOUSING OF THE PUMP IS SUFFICIENT.
3. UNIT MAY BE POWERED BY 24VDC OR 120VAC, BUT NOT BOTH.
4. WHEN THE UNIT IS POWERED FROM 120VAC, A GROUND CONNECTION IS REQUIRED ON BOTH J2 PIN 3 AND J4 PIN G.

Order from: **C A Briggs Company**; 622 Mary Street; Suite 101 - Warminster, PA 18974
Phone: 267-673-8117 - Fax: 267-673-8118; E-Mail: Sales@cabriggs.com - www.cabriggs.com

LEVEL PROBE CONVERTER w/ RELAYS

REVERSE MOUNT

PANEL MOUNT VEIW

TYPICAL APPLICATIONS

For use with any 10 electrode conductance probe where an analog 4-20mA level signal, relay outputs and a panel mounted level display are required.

c UL us LISTED

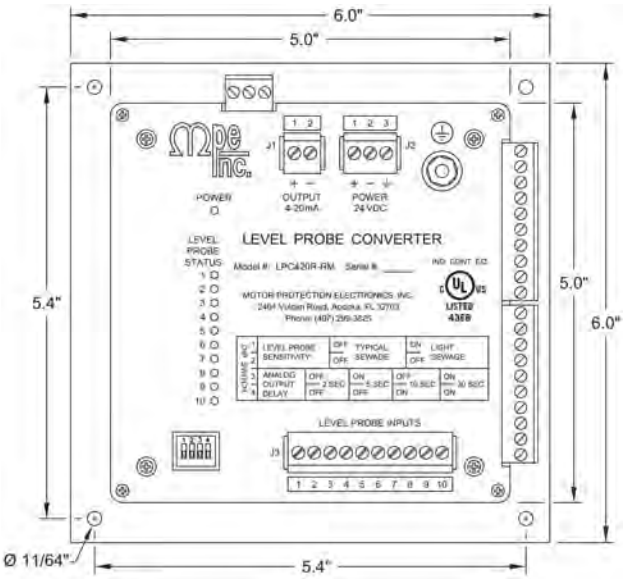
UL FILE # E101681

DESCRIPTION

The Reverse Mount LPC420 allows for viewing of the level display with the deadfront door closed, as well as open. Settings and connections are made on rear of unit.

The Level Probe Converter senses liquid level and provides a 4-20mA analog output for use by a pump controller or PLC to control liquid level. The unit monitors the ten electrodes on a Level Probe, and provides an analog signal that is proportional to level. The unit also provides 10 Relay Outputs with contacts that close as the liquid covers the respective Level Probe electrodes. The Relay Outputs may be used for pump control, level alarms or telemetry.

All setup is easily done using the four DIP switches on the unit. The Sensitivity of the unit must be set for the type of liquid being detected (see table below). The Analog Output Delay setting provides control over how fast the analog output transitions from one level output value to another. It takes 10 times the Analog Output Delay setting value to go from 4 mA to 20 mA, when the electrodes are covered quickly. When the electrodes are slowly covered one at a time, the Analog Output Delay is used to provide a smooth transition as the level goes from electrode to electrode.



REAR VEIW

DIP SWITCH								
1	LEVEL PROBE SENSITIVITY	OFF	TYPICAL SEWAGE	ON	LIGHT SEWAGE			
2		OFF		OFF				
3	ANALOG OUTPUT DELAY	OFF	2 SEC	ON	5 SEC	OFF	10 SEC	ON	30 SEC
4		OFF		OFF		ON		ON	

NUMBER OF ELECTRODES COVERED	ANALOG OUTPUT
NONE	4.0 mA
1	5.6 mA
2	7.1 mA
3	8.8 mA
4	10.4 mA
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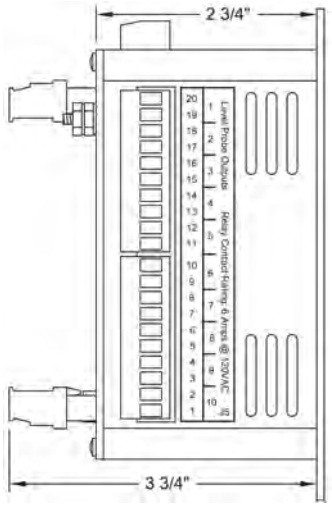

LEFT SIDE VEIW

SPECIFICATIONS

Input Power:	120 VAC ± 10% 7.7 VA max or 24 VDC ± 10% 160 mA max
Analog Output:	Non-Isolated 4-20 mA Maximum Load 600 Ω
Relay Outputs:	6 A @ 120 VAC
Sensor Output Voltage:	±8 V Square Wave @ 60 Hz
Sensor Output Current:	0.8 mA max (per sensor)
Operating Temp:	-20 to +65 °C
Storage Temp:	-45 to +85 °C
Enclosure:	Aluminum, Panel Mounted

ORDERING INFORMATION

Model Number: **LPC420R-RM**

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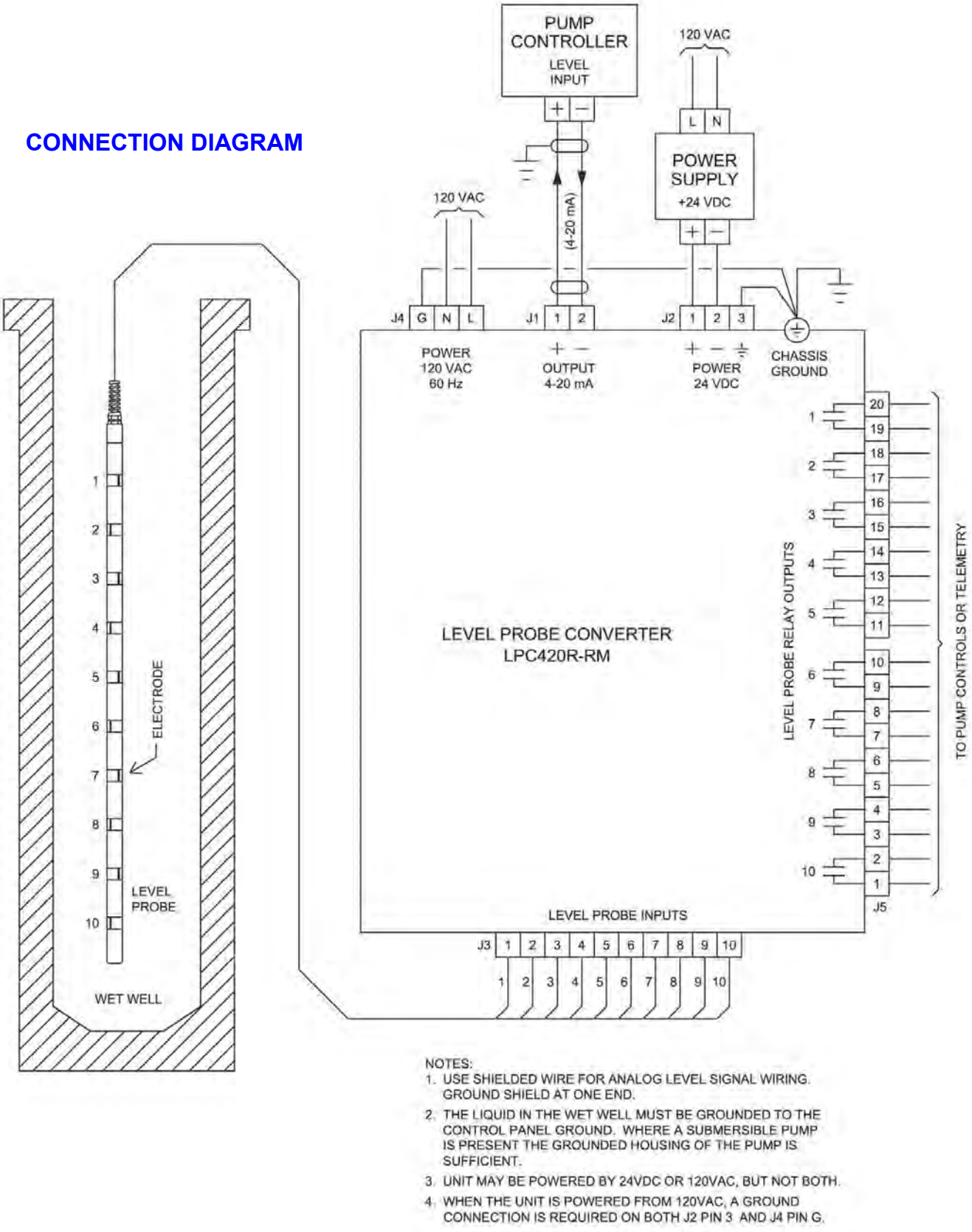
Phone: 267-673-8117 - Fax: 267-673-8118; E-Mail: Sales@cabriggs.com - www.cabriggs.com

LEVEL PROBE CONVERTER w/ RELAYS

CONNECTION DIAGRAM



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