Model L2610

**NULL-KOTE™ Self-Diagnostic Analog Level Transmitter**

Electronic, RF Impedance sensing, with the innovative NULL-KOTE™ system, which ignores product build-up on the probe

**Features**

<table>
<thead>
<tr>
<th>Widest Range of Applications – the ideal two-wire level transmitter, it will operate in conjunction with process materials which range from low dielectric (insulating) products, such as refined oils, to conductive slurries; even sticky materials that tend to cling to the sensor.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NULL-KOTE™ Circuitry</strong> – Makes the sensor immune to adverse effects of conductive coating build up.</td>
</tr>
<tr>
<td><strong>Designed to Survive</strong> – RF immune, vibration-proof, and conformal coated (tropicalized) circuit boards for additional protection – at no extra cost.</td>
</tr>
<tr>
<td><strong>Ten-Year Warranty</strong> – The only level instruments available with this unique assurance of quality.</td>
</tr>
<tr>
<td><strong>Wide Temperature Range</strong> – Standard process temperature range: -300 to + 500 F (-184 to + 260 C)</td>
</tr>
</tbody>
</table>

**Description**

PRINCO’s L2610 NULL-KOTE™ analog RF level transmitter can be used to measure the level of virtually any process material, from low dielectric (insulating) products, such as refined oils, to conductive slurries – even viscous materials that cling to the probe.

Advanced NULL-KOTE™ circuit design means accurate readings even when conductive materials build up on the probe. Superior temperature stability and noise immunity, conformally coated circuit boards, self-diagnostics and factory precalibration means accurate, reliable, easy-to-install level instrumentation.

The L2610’s 4-20 mA dc output signal is proportional to the process level. Zero and span adjustments are non-interacting. Our Easy-On probe gives you reliable, automatic connection when the probe is screwed into the electronics housing.

The need for continuous level measurement is nearly universal in the process industries. Today’s processing plants must operate at peak efficiency, minimize labor and material costs, insure on-time delivery of product and eliminate spills of even marginally hazardous materials.

Explosion-Proof/Weatherproof Housing Standard–

Class I, II, III, Div.1, Groups C, D, E, F & G; NEMA 4X

Factory Precalibrated – Field calibration, if needed, is quick and easy. No interaction between span and zero.

Easy to Install – Probe and electronics install as single unit. No cable, delicate connectors, or separate enclosure.

Built-In Self Diagnostics – provides assurance that the system is working properly.

Easy-On Probe Connection – Automatically provides simple, fast installation and reliable operation without wires, connectors, or terminal strips. Simply screw probe into the housing.

**The only 10 Year Warranty**

The longest in the industry!
L2610 Specifications

Type
Self-diagnostic, NULL-KOTE™, RF Impedance sensing, level to current transmitter.

Span Range
From 20 pF to 40,000 pF. Probe lengths from 1 inch to 150 feet, depending upon application.

Output Signal
4 to 20 mA dc.

Power Requirements
Standard Models:
95/135 VAC, 50-60 Hz, 5 Watts
22/27 VDC, 2.2 Watts

Optional Model:
230 VAC

Operating Temperature Range
-30 to 150°F (-34 to 66°C)

Temperature Stability
±0.015% per 1°F

Linearity/Accuracy
±0.5% typical

Repeatability
±0.1%

Remote Mounting
Consult factory.

Electronics Housing
Explosion-proof
Class I, II, III, Div. 1, Groups C, D, E, F, & G
NEMA 4X

NOTE:
Explosion-proof cases must be installed to satisfy National Electrical Code, Section 501, and applicable local codes.

Probes
Probes used with the L2610 are designated as the L100 Series.

A variety of types and construction materials are available: flexible (cable type) or rigid, heavy or light duty Teflon™ or Kynar™ sheathing, NPT hub or flanged mounted, single or dual construction.

All probes are manufactured to the exact length required.

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>ELEMENT CONFIGURATION</th>
<th>TYPE</th>
<th>VESSEL CONNECTION</th>
<th>INSULATION OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>L101</td>
<td>Single</td>
<td>Rigid</td>
<td>1” NPT</td>
<td>B, KP, KS, TP, TS</td>
</tr>
<tr>
<td>L104</td>
<td>Single</td>
<td>Rigid</td>
<td>1”, 2”, 3” OR 4” TRI-CLAMP™</td>
<td>B, KP, KS, TP, TS</td>
</tr>
<tr>
<td>L102</td>
<td>Dual Concentric</td>
<td>Rigid</td>
<td>1½” NPT</td>
<td>B, KP, KS, TP, TS</td>
</tr>
<tr>
<td>L107</td>
<td>Dual Concentric</td>
<td>Rigid</td>
<td>1” NPT</td>
<td>B, KS, TP, TS</td>
</tr>
<tr>
<td>L109</td>
<td>Single</td>
<td>Flexible</td>
<td>1” NPT</td>
<td>KW, TW</td>
</tr>
<tr>
<td>L113</td>
<td>Dual Parallel</td>
<td>Flexible</td>
<td>1” NPT</td>
<td>KW, TW</td>
</tr>
<tr>
<td>L115</td>
<td>Dual Parallel</td>
<td>Flexible</td>
<td>3” Flange</td>
<td>KW, TW</td>
</tr>
<tr>
<td>L116</td>
<td>Dual Parallel</td>
<td>Flexible</td>
<td>3” Flange</td>
<td>KW, TW</td>
</tr>
<tr>
<td>L127</td>
<td>Dual Parallel</td>
<td>Rigid</td>
<td>3” Flange</td>
<td>B, KP, KS, TP, TS</td>
</tr>
<tr>
<td>L128</td>
<td>Dual Parallel</td>
<td>Rigid</td>
<td>3” Flange</td>
<td>KP, KS, TP, TS</td>
</tr>
</tbody>
</table>

KP = Kynar® Pipe (60 mil Kynar over carbon steel)
KS = Kynar Sheath (17 mil Kynar over 316 SS rod)
KW = Kynar Wire (20 mil Kynar over 316 SS wire rope)
B = Bare (No insulation)
TP = Teflon® Pipe (60 mil PFA Teflon over 316 SS rod)
TS = Teflon Sheath (17 mil Teflon over 316 SS rod)
TW = Teflon Wire (12 mil Teflon over copper wire)

10-YEAR WARRANTY
All PRINCO level control instruments are backed by a 10-year warranty. PRINCO will repair or replace, at our option, any instrument that fails under normal use for up to 10 years after purchase.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Probe</th>
<th>Pressure Rating (PSI) at Temperature Indicated (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>-300</td>
</tr>
<tr>
<td>L101, L102, L104, L107, L109, L113</td>
<td>Teflon or Bare</td>
<td>1250</td>
</tr>
<tr>
<td></td>
<td>Kynar</td>
<td>N/A</td>
</tr>
<tr>
<td>L115, L116, L127, L128</td>
<td>Teflon or Bare</td>
<td>275¹</td>
</tr>
<tr>
<td></td>
<td>Kynar</td>
<td>N/A</td>
</tr>
</tbody>
</table>

¹ Rating of Carbon Steel 150 lb. flange. For higher ratings, consult factory.
Features

Widest Range of Applications –
the ideal two-wire level transmitter, it will operate in conjunction with process materials which range from low dielectric (insulating) products, such as refined oils, to conductive slurries; even sticky materials that tend to cling to the sensor.

NULL-KOTE™ Circuitry –
Makes the sensor immune to adverse effects of conductive coating build up.

Designed to Survive –
RF immune, vibration-proof, and conformal coated (tropicalized) circuit boards for additional protection – at no extra cost.

Ten-Year Warranty –
The only level instruments available with this unique assurance of quality.

Simple Two-Wire Connection –
means low installation cost and compatibility with most process control systems.

Polarity Reversal Protection

Factory Mutual System Approval
Intrinsically Safe –
when used with appropriate power source or PRINCO S939 barriers.

Explosion-Proof/Weatherproof Housing –
Class I, II, III, Div.1, Groups C, D, E, F & G - NEMA 4X

Factory Precalibrated –
Field calibration, if needed, is quick and easy. No interaction between span and zero.

Easy to Install –
Probe and electronics install as single unit. No cable, delicate connectors, or separate enclosure.

Built-In Self Diagnostics –
provides assurance that the system is working properly.

Easy-On Probe Connection –
Automatically provides simple, fast installation and reliable operation without wires, connectors, or terminal strips. Simply screw probe into the housing.

Description

PRINCO's L2631 NULL-KOTE™ two-wire RF level transmitter can be used to measure the level of virtually any process material, from low dielectric (insulating) products, such as refined oils, to conductive slurries – even viscous materials that cling to the probe.

Advanced NULL-KOTE™ circuit design means accurate readings even when conductive materials build up on the probe. Superior temperature stability and noise immunity, conformally coated circuit boards, self-diagnostics and factory precalibration means accurate, reliable, easy-to-install level instrumentation.

The L2631's 4-20 mA dc output signal is proportional to the process level. Zero and span adjustments are non-interacting. Our Easy-On probe gives you reliable, automatic connection when the probe is screwed into the electronics housing.

The need for continuous level measurement is nearly universal in the process industries. Today's processing plants must operate at peak efficiency, minimize labor and material costs, insure on-time delivery of product and eliminate spills of even marginally hazardous materials.

Accurate, reliable, continuous level measurement is a vital part of their operation.

In millions of installations, spanning more than 85 years of experience, PRINCO process instruments have provided accurate, dependable, long lived service for all types of industries.

The only
10 Year Warranty
The longest in the industry!
L2631 Specifications

**Type**
Self-diagnostic, NULL-KOTE™, RF Impedance sensing two-wire, level to current transmitter.

**Span Range**
From 20 pF to 50,000 pF. Probe lengths from 1 inch to 200 feet, depending upon application.

**Output Signal**
4 to 20 mA dc.

**Power Requirements**
24 Vdc typical.
48 Vdc maximum.

**Operating Temperature Range**
-30 to 150°F (-34 to 66°C)

**Temperature Stability**
±0.015% per 1°F

**Probes**
Probes used with the L2631 are designated as the L100 Series.

A variety of types and construction materials are available: flexible (cable type) or rigid, heavy or light duty Teflon™ or Kynar™ sheathing, NPT hub or flanged mounted, single or dual construction.

All probes are manufactured to the exact length required.

**Linearity/Accuracy**
±0.5% typical

**Repeatability**
±0.1%

**Remote Mounting**
Consult factory.

**Electronics Housing**
Expansion-proof
Class I, II, III, Div. I, Groups C, D, E, F, & G
NEMA 4X

**Intrinsic Safety**
Model L2631-IS is intrinsically safe when used with appropriate power source or PRINCO S939 safety barriers.

**NOTE:**
Explosion-proof cases must be installed to satisfy National Electrical Code, Section 501, and applicable local codes.

<table>
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<tr>
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<td>1&quot; NPT</td>
<td>B, KP, KS, TP, TS</td>
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<tr>
<td>L104</td>
<td>Single</td>
<td>Rigid</td>
<td>1&quot;, 2&quot;, 3&quot; OR 4&quot;</td>
<td>B, KP, KS, TP, TS</td>
</tr>
<tr>
<td>L102</td>
<td>Dual Concentric</td>
<td>Rigid</td>
<td>1½&quot; NPT</td>
<td>B, KP, KS, TP, TS</td>
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<td>Dual Concentric</td>
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<td>L109</td>
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<td>Flexible</td>
<td>3&quot; NPT</td>
<td>KW, TW</td>
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<td>Rigid</td>
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KP = Kynar® Pipe (60 mil Kynar over carbon steel)
KS = Kynar Sheath (17 mil Kynar over 316 SS rod)
KW = Kynar Wire (20 mil Kynar over 316 SS wire rope)
B = Bare (No insulation)
TP = Teflon® Pipe (60 mil PFA Teflon over 316 SS rod)
TS = Teflon Sheath (17 mil Teflon over 316 SS rod)
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**Pressure Rating (PSI) at Temperature Indicated (F)**

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<tbody>
<tr>
<td></td>
<td>L101, L102, L104, L107, L109, L113</td>
<td>1250 1250 1250 550 450 350 0</td>
</tr>
<tr>
<td></td>
<td>L115, L116, L127, L128</td>
<td>275 275 275 225 210 180 0</td>
</tr>
</tbody>
</table>

1. Rating of Carbon Steel 150 lb. flange. For higher ratings, consult factory.

10-YEAR WARRANTY
All PRINCO level control instruments are backed by a 10-year warranty. PRINCO will repair or replace, at our option, any instrument that fails under normal use for up to 10 years after purchase.
LOW COST - OEM
Two-Wire Level Transmitter
with NULL-KOTE™ Technology

Instrumentation designed with the user in mind.

Features

Simple Two-Wire Connection – Means low installation cost, low power requirements and compatibility with virtually any control system.

NULL-KOTE™ Circuitry – Makes the sensor immune to adverse effects of conductive coating build up.

Designed to Survive – RF immune, vibration-proof, and conformal coated circuit board (tropicalized) provide additional protection.

Easy to Install & Set-up - Mount the electronics to your equipment, connect the sensor in the tank, and wire the output to your monitor. Although field calibration is straightforward, factory precalibration is available.

Description

The model L2632 Low Cost OEM NULL-KOTE™ two-wire RF level transmitter makes high performance level monitoring very affordable for a wide variety of equipment. Ideal for application in: beverage bottling machines, car wash equipment, vending machines, automatic filling stations, and many more. The unit can be customized to enable measurement of virtually any specific material, from low dielectric (insulating) products, such as refined oils, to conductive slurries – even viscous materials that cling to the sensor. A custom sensor is designed specifically for each application.

The output of the model L2632 is a standard 4-20 mA dc current that is directly proportional to the process level. The advanced NULL-KOTE™ circuit design means accurate readings even when conductive materials build up on the sensor. Superior temperature stability, noise immunity and conformal circuit board coating assure accurate, reliable, easy-to-install level measurement.

In millions of installations, spanning more than 85 years of experience, PRINCO process instruments have provided accurate, dependable, long lived service for all types of applications and industries.

www.PrincoLevelControls.com
L2632 Specifications

Type

NULL-KOTE™, OEM RF Impedance sensing two-wire, level to current transmitter.

Span Range

From 20 pF to 50,000 pF

Custom sensing probe will be designed specifically for your application. Sensor lengths available from as short as 4 inches to as long as 200 feet, application dependent.

Power Requirements

24 Vdc typical
48 Vdc maximum

Output Signal

4 to 20 mA dc

Linearity/Accuracy

±0.5% typical

Repeatability

±0.1%

Operating Temperature Range

-30 to 150°F (-34 to 66°C)

Temperature Stability

±0.015% per 1°F

APPLICATIONS

Car Wash Equipment

Automatic Fillers

Brewery Equipment

Bottling Machines

Printing presses

Agricultural Machinery

...and many more.

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Southampton, PA 18966-4095, U.S.A.
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FAX (215) 355-7766
www.PrincoLevelControls.com
**Model L3520**

**NULL-KOTE™ RF Impedance High-Perform-X™ Point Level Controllers**

Excellent sensitivity and stability
Innovative NULL-KOTE™ circuitry
Ignores product build-up on the probe

**Features**

**Universal** – Wide Range of Point Level Applications – detects the level of powders, granules, conductive or non-conductive liquids … even the sticky ones.

**NULL-KOTE™ Circuitry** – Makes the sensor immune to adverse effects from conductive coating build-up.

**High Sensitivity and Stability** – For critical low response applications.

**Designed to Survive** – RF immune, vibration-proof, all circuit boards are conformally coated (tropicalized) for extra protection - at no extra cost.

**Ten-Year Warranty** – The only level instruments available with this unique assurance of quality.

**Easy-On Probe Connection** – Automatically provides simple, fast installation and reliable operation without wires, connectors, or terminal strips. Simply screw probe into the housing.

**Unique Status Indicator** – (two color) Shows presence or absence of material and also indicates power “on”.

**Heavy Duty Relay** – 10A 115 Vac resistive contacts

**High or Low Fail-Safe** – Field selectable.

**Factory Mutual Approval** – Class I, II, III, Div.1, Groups C, D, E, F, & G/NEMA 4X

**Wide Temperature Range** – Standard process temperature: -300 to 500°F (-184 to 260°C).

**ROLLOCK™ PROBES** – No part of the probe can fall into the process or be blown from the mounting. No re-tightening of seals required.

**Time-Delay Included** – 0-30 second delay - no extra cost

**Description**

PRINCO’s High-Perform-X™ L3520 Series level controllers give you the optimum combination of reliability, sensitivity, features, and cost.

Conformal coated electronics, NULL-KOTE™ circuitry, explosion-proof/weatherproof enclosures, ROLLOCK™ probe construction and our unique 10 Year Warranty means the ultimate in reliability.

Excellent sensitivity, coupled with stability of 1 picofarad over the entire operating range, gives you a true set and forget installation.

With Factory Mutual Approval, 10 amp control relay contacts, 0-30 second time delay, coarse and fine sensitivity adjustments, field selectable hi-lo failsafe, and our exclusive probe status indicator, you get all the features you need at a price which makes the L3520 Series an outstanding value.

In thousands of installations, spanning more than 4 decades of experience, PRINCO process instruments have provided accurate, dependable, long lived service for all types of industries, worldwide.

**The only 10 Year Warranty**

The longest in the industry!
**L3520 Specifications**

**Type**
Point (on/off) level control, radio frequency (RF), impedance sensing, NULL-KOTE™ circuitry.

**Sensitivity**
0.15pF to 1000 pF capacitance.

**Operating Temperature**
-40 to 150°F (-40 to 66°C).

**Temperature Stability**
Less than .1 pF/20 F.

**Delay Time/Mode**
0 to 30 second/delay on and off.

**Fail-Safe Mode**
Fail-Safe low level or high level. Field changeable.

**Dead Band**
10:1 adjustable range to 1000 pF maximum.

**Power Requirements**
Standard Models:
95/135 Vac, 50-60 Hz, 1.3 watts 12/34 Vdc, <1 watt
Optional Model:
230 Vac

**NULL-KOTE™ Point Level Probes**

Model L853, L854, L855, L857, L861, L862, and L863 probes are Factory Mutual Approved Explosion-proof Class I, II, & III, Division 1, Groups A, B, C, D, E, F, & G for use with all L3500 series controllers.

These probes are three element devices, which employ a bare sensor rod, guard section, and NPT mounting hub. All wetted parts are type 316 stainless steel or Teflon®.

L800 Series point level probes use PRINCO’s unique ROLLOCK™ construction. Featuring rolled seals and welded assembly, the ingenious ROLLOCK™ design locks all elements of the probe in position and insures that no part of the probe can fall into the process or be blown from the mounting.

See PRINCO’s Point Level Probe Bulletin for complete information.

**Electronics Housing**
Explosion-proof: NEMA 4X
Class I, II, III, Div. 1, Groups C, D, E, F, & G

**Agency Approval**
Factory Mutual Research Corporation System Approved when used with PRINCO probes listed below.

**NOTE:**
Explosion-proof cases must be installed to satisfy National Electrical Code, Section 501, and applicable local codes.

**MODEL L3520**

**Test Function**
Pushbutton tests control relay.

**Relay Contacts**
DPDT (2 form C) rated at 10A, 115 Vac or 26 Vdc resistive.

**MODEL 3521**

**Self-Check Function**
Locally or remotely operated self-check.

**Relay Contacts**
Two sets: One data set SPDT (Form C) rated “dry” (0 mA) to 2A, and one power set SPDT (Form C) rated at 10A, 115 Vac or 26 Vdc resistive.

**10-YEAR WARRANTY**
All PRINCO level control instruments are backed by a 10-year warranty. PRINCO will repair or replace, at our option, any instrument that fails under normal use for up to 10 years after purchase.

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FAX (215) 355-7766
WWW.PRINCOINSTRUMENTS.COM
Features

Widest Range of Applications – the ideal analog level transmitter. It can be field configured to handle virtually all process materials. If your requirements change, the L3610 is easy to re-configure or re-range in the field.

High Sensitivity and Stability – For critical low response applications.

NULL-KOTE™ Circuitry – Makes the sensor immune to adverse effects of conductive coating build up.

Designed to Survive – RF immune, vibration-proof, and conformal coated (tropicalized) circuit boards for additional protection – at no extra cost.

Ten-Year Warranty – The only level instruments available with this unique assurance of quality.

Wide Temperature Range –
Standard process temperature range: -300 to +500 F (-184 to +260 C)

Factory Precalibrated – Field calibration, if needed, is quick and easy. No interaction between span and zero.

Easy to Install – Probe and electronics install as single unit. No cable, delicate connectors, or separate enclosure.

Built-In Self Diagnostics – provides assurance that the system is working properly.

Easy-On Probe Connection – Automatically provides simple, fast installation and reliable operation without wires, connectors, or terminal strips. Simply screw probe into the housing.

Modular Design – Allows easy troubleshooting and repair.

Factory Mutual System Approval – Class I, II, III, Div.1, Groups C, D, E, F, & G/NEMA 4X

Description

PRINCO’s L3610 NULL-KOTE™ Analog RF transmitter can be field configured to measure the level of virtually any process material, from electrically insulated products, such as refined oils, to conductive slurries – even viscous materials that cling to the probe.

Advanced NULL-KOTE™ circuitry assures accurate readings even when conductive materials build up on the probe.

Superior temperature stability and noise immunity, conformal coated circuit boards, self-diagnostics and pre-calibration provides for accurate, reliable, and easy-to-install level instrumentation.

Our Easy-On probe gives you reliable, automatic connection when the probe is screwed into the electronics housing.

A complete selection of FM approved systems can be assembled using the L100 series probes illustrated on PRINCO’s FM Probe Data Sheet #9501.

Today’s processing plants must operate at peak efficiency, minimize labor and material costs, insure on-time delivery of product and eliminate spills of even marginally hazardous materials.

Accurate, reliable, continuous level measurement is a vital part of their operation.

In millions of installations, spanning 85 years of experience, PRINCO process instruments have provided accurate, dependable, long lived service for all types of industries.

The only

10 Year Warranty
The longest in the industry!
Probes

Probes used with the L3610 are designated as the L100 Series.

A variety of types and construction materials are available: flexible (cable type) or rigid, heavy or light duty Teflon™ or Kynar™ sheathing, NPT hub or flanged mounted, single or dual construction.

All probes are manufactured to the exact length required.

Operating Temperature Range
-300 to 500°F (-184 to 260°C)

FM APPROVED PROBES FOR L3610

<table>
<thead>
<tr>
<th>Model</th>
<th>Mtg.</th>
<th>Sheathing</th>
</tr>
</thead>
<tbody>
<tr>
<td>L101</td>
<td>1&quot; NPT</td>
<td>B TS TP</td>
</tr>
<tr>
<td>L102</td>
<td>2&quot; x 150 lb. Fl.</td>
<td>B TS TP</td>
</tr>
<tr>
<td>L120</td>
<td>3&quot; x 150 lb. Fl.</td>
<td>B TS TP</td>
</tr>
<tr>
<td>L124</td>
<td>3&quot; x 150 lb. Fl.</td>
<td>B TS TP</td>
</tr>
<tr>
<td>L127</td>
<td>3&quot; x 150 lb. Fl.</td>
<td>B TS TP</td>
</tr>
<tr>
<td>L128</td>
<td>3&quot; x 150 lb. Fl.</td>
<td>B TS TP</td>
</tr>
<tr>
<td>L180</td>
<td>2&quot; x 150 lb. Fl.</td>
<td>B TS TP</td>
</tr>
<tr>
<td>L184</td>
<td>3&quot; x 150 lb. Fl.</td>
<td>B TS TP</td>
</tr>
<tr>
<td>L187</td>
<td>3&quot; x 150 lb. Fl.</td>
<td>B TS TP</td>
</tr>
<tr>
<td>L188</td>
<td>3&quot; x 150 lb. Fl.</td>
<td>B TS TP</td>
</tr>
</tbody>
</table>

B=Bare    TS=Teflon Sheathed    TP=Teflon Pipe    KS=Kynar Sheathed    KP=Kynar Pipe

For additional information on FM Approved probes, see PRINCO Data Sheet 9501.

For other probes, refer to PRINCO Continuous Probe Selection Bulletin.

10-YEAR WARRANTY

All PRINCO level control instruments are backed by a 10-year warranty. PRINCO will repair or replace, at our option, any instrument that fails under normal use for up to 10 years after purchase.
Model L4610 Smart 1™

SMART NULL-KOTE™
RF Impedance Level Transmitter

Features

Microprocessor based

Universal
PRINCO’s RF Impedance technology is ideal for the widest range of applications, from non-conductive, low dielectrics, to highly conductive materials which leave a thick coating on the sensor probe.

Digital NULL-KOTE™ –
Microprocessor controlled for the most effective cancellation of conductive coatings.

Auto Gain Adjust –
SMART 1™ handles ranges up to 50,000 picofarads.

Designed to Survive
RF immune, vibration-proof, and factory precalibrated - at no extra cost.

High Sensitivity & Stability
For critical low response applications.

Microprocessor based

Easy-On Probe
Automatically provides simple, fast installation and reliable operation without wires, connectors, or terminal strips.

Easy to Install
Integral electronics install as single unit. No special cable, delicate connectors, or separate enclosure.

Easy to Configure
• Tank shape ~ volume output
• Level & volume units
• Normal/reverse acting
• Level/volume proportional
• Damping
• Maintenance
• Polling address

Description

Princo’s SMART 1™ (L4610) is a HART™ level transmitter that can be used for most liquid and light bulk solid applications.

All features are accessible through the HART™ compliant Model 275 HART™ hand held with Princo Device Description (DD) or from any HART™ protocol compliant system.

The SMART 1™ has built-in 20 point linearization for the measurement of level and volume in any shape vessel.

Easy installation, set-up, and maintenance reduces overall operating costs substantially.

A complete level system consists of the SMART 1™ used in conjunction with the appropriate L100 series probe.

The only
10 Year Warranty
The longest in the industry!
Series L4610 Specifications

**Type**
Intelligent, microprocessor based, Digital, RF Impedance sensing, level transmitter.

**Output**
- 4 to 20 mA (Point-to-Point)
- 4 mA (Multidrop)
- Hart® Protocol

**Linearity / Accuracy**
± 0.5% typical

**Load**
250 ... 750 ohms

**Hart® Protocol**
Simultaneous transmission of 4-20 mA dc signal (500 ohm load) and digital FSK signal on one twisted pair. Digital series bit stream permits two-way communication, but does not affect or alter 4-20 mA analog signal.

**Span Range**
Probe lengths from 1 inch to 200 feet, depending upon application. (From 5 pF to 3,000 pF)

**Power Requirements**
- 14 to 30 VDC
- Reverse voltage protection

**Temperature Range**
- Process (Probe dependent)
  - -58°F to + 450°F
  - (- 50°C to + 232°C)
- Ambient (Electronics)
  - + 4°F to + 158°F
  - (- 20°C to + 70°C)

**Agency Approval**
Factory Mutual Research Corporation System Approved. See table below.

**Remote Mounting**
Consult factory.

**Probes**
Probes used with the L4610 are designated as the L100 Series.

A variety of types and construction materials are available: flexible (cable type) or rigid, heavy or light duty Teflon™ or Kynar™ sheathing, NPT hub or flanged mounted, single or dual construction.

All probes are manufactured to the exact length required.

**10-YEAR WARRANTY**
All PRINCO level control instruments are backed by a 10-year warranty. PRINCO will repair or replace, at our option, any instrument that fails under normal use for up to 10 years after purchase.

---

**Model Number**

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Element Configuration</th>
<th>Type</th>
<th>Vessel Connection</th>
<th>Insulation Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>L104</td>
<td>Single</td>
<td>Rigid</td>
<td>1&quot;, 2&quot;, 3&quot; OR 4&quot;</td>
<td>B, KP, KS, TP, TS</td>
</tr>
<tr>
<td>L102</td>
<td>Dual Concentric</td>
<td>Rigid</td>
<td>1½&quot; NPT</td>
<td>B, KP, KS, TP, TS</td>
</tr>
<tr>
<td>L107</td>
<td>Dual Concentric</td>
<td>Rigid</td>
<td>&quot; NPT</td>
<td>B, KS, TP, TS</td>
</tr>
<tr>
<td>L109</td>
<td>Single</td>
<td>Flexible</td>
<td>1&quot; NPT</td>
<td>KW, TW</td>
</tr>
<tr>
<td>L113</td>
<td>Dual Parallel</td>
<td>Flexible</td>
<td>1&quot; NPT</td>
<td>KW, TW</td>
</tr>
<tr>
<td>L115</td>
<td>Dual Parallel</td>
<td>Flexible</td>
<td>3&quot; Flange</td>
<td>KW, TW</td>
</tr>
<tr>
<td>L116</td>
<td>Dual Parallel</td>
<td>Flexible</td>
<td>3&quot; Flange</td>
<td>KW, TW</td>
</tr>
<tr>
<td>L127</td>
<td>Dual Parallel</td>
<td>Rigid</td>
<td>3&quot; Flange</td>
<td>B, KP, KS, TP, TS</td>
</tr>
<tr>
<td>L128</td>
<td>Dual Parallel</td>
<td>Rigid</td>
<td>3&quot; Flange</td>
<td>KP, KS, TP, TS</td>
</tr>
</tbody>
</table>

TW = Teflon Wire (12 mil Teflon over copper wire)  
KP = Kynar® Pipe (60 mil Kynar over carbon steel)  
KS = Kynar Sheath (17 mil Kynar over 316 SS rod)  
KW = Kynar Wire (20 mil Kynar over 316 SS wire rope)  
B = Bare (No insulation)  
TP = Teflon® Pipe (60 mil PFA Teflon over 316 SS rod)  
TS = Teflon Sheath (17 mil Teflon over 316 SS rod)  
KW = Kynar Wire (20 mil Kynar over 316 SS wire rope)

**Pressure Rating (PSI) at Temperature Indicated (ºF)**

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Probe</th>
<th>Pressure Rating (PSI) at Temperature Indicated (ºF)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-300</td>
<td>40</td>
</tr>
<tr>
<td>L101, L102, L104, L107, L109, L113</td>
<td>Teflon or Bare</td>
<td>1250</td>
</tr>
<tr>
<td>Kynar</td>
<td>N/A</td>
<td>1000</td>
</tr>
<tr>
<td>L115, L116, L127, L128</td>
<td>Teflon or Bare</td>
<td>273</td>
</tr>
<tr>
<td>Kynar</td>
<td>N/A</td>
<td>273</td>
</tr>
</tbody>
</table>

1. Rating of Carbon Steel 150 lb. flange. For higher ratings, consult factory.
Model L4620 Smart 2™

Instrumentation designed with the user in mind.

TWO-WIRE SMART RF Impedance Level Transmitter

Features

Universal
PRINCO’s RF Impedance technology is ideal for a wide range of applications, from non-conductive, dielectrics, to highly conductive materials.

Easy-On Probe
Automatically provides simple, fast installation and reliable operation without wires, connectors, or terminal strips.

Easy to Install
Integral electronics install as single unit. No special cable, delicate connectors, or separate enclosure.

Easy to Configure
- Tank shape ~ volume output
- Level & volume units
- Normal/reverse acting
- Level/volume proportional
- Damping
- Maintenance
- Polling address

Microprocessor based

Designed to Survive
RF immune, vibration-proof, and factory precalibrated - at no extra cost.

High Sensitivity & Stability
For critical low response applications.

Operational Modes

Stand Alone Operation
Easy Calibration
Push-Button Empty & Fill

Remote Operation Via Hart® Protocol
Hart® interface
Monitor actual level and volume in engineering units
Monitor output current range (% range, level or volume proportional) milliamps or as a percentage.

Description

Princo’s SMART 2™ (L4620) is a two-wire HART™ level transmitter that can be used for most liquid and light bulk solid applications.

All features are accessible through the HART™ compliant Model 275 HART™ hand held with Besta Device Description (DD) or from any HART™ protocol compliant system.

The SMART 2™ has built-in 20 point linearization for the measurement of level and volume in any shape vessel.

The unit is PTB, SEV (CENELEC) approved for intrinsic safety (EEx ia [IC T6) which enables operation in hazardous locations.

Easy installation, set-up, and maintenance reduces overall operating costs substantially.

A complete level system consists of the SMART 2™ used in conjunction with the appropriate L100 series probe.

www.PrincoLevelControls.com
Series L4620 Specifications

Type
Intelligent, microprocessor based, Digital, RF Impedance sensing, level transmitter.

Output
4 to 20 mA (Point-to-Point)
4 mA (Multidrop)
Hart® Protocol

Linearity / Accuracy
± 0.5% typical

Load
250 ... 750 ohms

Hart® Protocol
Simultaneous transmission of 4-20 mA dc signal (500 ohm load) and digital FSK signal on one twisted pair. Digital series bit stream permits two-way communication, but does not affect or alter 4-20 mA analog signal.

Span Range
Probe lengths from 1 inch to 200 feet, depending upon application.
(From 5 pF to 3,000 pF)

Power Requirements
14 to 30 VDC
Reverse voltage protection

Temperature Range
Process (Probe dependent)
- 58°F to + 450°F
( - 50°C to + 232°C)
Ambient (Electronics)
+ 4°F to + 158°F
( - 20°C to + 70°C)

Approvals
PTB, SEV (CENELEC)
EEx ia IIC T6, Zone 0

Electronics Housing
Explosion-proof Class I, II, III, Div. 1, Groups C, D, E, F, & G NEMA 4.

Remote Mounting
Consult factory.

Probes
Probes used with the L4620 are designated as the L100 Series.

A variety of types and construction materials are available: flexible (cable type) or rigid, heavy or light duty Teflon™ or Kynar™ sheathing, NPT hub or flanged mounted, single or dual construction.

All probes are manufactured to the exact length required.

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>ELEMENT CONFIGURATION</th>
<th>TYPE</th>
<th>VESSEL</th>
<th>INSULATION OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>L101</td>
<td>Single</td>
<td>Rigid</td>
<td>1” NPT</td>
<td>B, KP, KS, TP, TS</td>
</tr>
<tr>
<td>L104</td>
<td>Single</td>
<td>Rigid</td>
<td>1”, 2”, 3” or 4” TRI-CLAMP™</td>
<td>B, KP, KS, TP, TS</td>
</tr>
<tr>
<td>L102</td>
<td>Dual Concentric</td>
<td>Rigid</td>
<td>1½” NPT</td>
<td>B, KP, KS, TP, TS</td>
</tr>
<tr>
<td>L107</td>
<td>Dual Concentric</td>
<td>Rigid</td>
<td>1” NPT</td>
<td>B, KS, TP, TS</td>
</tr>
<tr>
<td>L109</td>
<td>Single</td>
<td>Flexible</td>
<td>1” NPT</td>
<td>KW, TW</td>
</tr>
<tr>
<td>L113</td>
<td>Dual Parallel</td>
<td>Flexible</td>
<td>1” NPT</td>
<td>KW, TW</td>
</tr>
<tr>
<td>L115</td>
<td>Dual Parallel</td>
<td>Flexible</td>
<td>3” Flange</td>
<td>KW, TW</td>
</tr>
<tr>
<td>L116</td>
<td>Dual Parallel</td>
<td>Flexible</td>
<td>3” Flange</td>
<td>KW, TW</td>
</tr>
<tr>
<td>L127</td>
<td>Dual Parallel</td>
<td>Rigid</td>
<td>3” Flange</td>
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</tr>
<tr>
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TS = Teflon Sheath (17 mil Teflon over 316 SS rod)

10-YEAR WARRANTY
All PRINCO level control instruments are backed by a 10-year warranty. PRINCO will repair or replace, at our option, any instrument that fails under normal use for up to 10 years after purchase.

Model Number | Probe     | Pressure Rating (PSI) at Temperature Indicated (°F) |
-------------|-----------|------------------------------------------|
| L101, L102, L104, L107, L109, L113 | Teflon or Bare | 1250  | 1250 | 1250 | 550 | 450 | 350 | 0 |
| Kynar | N/A | 1000 | 1000 | 250 | 0 | N/A | N/A |
| L115, L116, L127, L128 | Teflon or Bare | 275 | 275 | 275 | 225 | 210 | 180 | 0 |
| Kynar | N/A | 275 | 275 | 275 | 225 | 210 | 180 | N/A | N/A |

1. Rating of Carbon Steel 150 lb. flange. For higher ratings, consult factory.

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FAX (215) 355-7766
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