

PLT11 High Temperature Liquid Level Transducer

Corrosion Resistant Submersible Titanium or SS316L housing, rated to 105 °C



IP68

TITANIUM · SS316L

4–20 MA

105 °C

DESCRIPTION

The PLT11 is a fully sealed submersible level transmitter for hot and corrosive liquids. A piezoresistive sensing element and dedicated 4–20 mA signal circuit are housed in a high-strength titanium or SS316L body, paired with a chemical-resistant PTFE or FEP cable, for stable hydrostatic level measurement up to 105 °C.

The cable-to-housing joint is tightly sealed for long-term submersion in any liquid compatible with the wetted materials. A vent tube in the cable references the sensor to atmosphere, so the output tracks liquid depth, not barometric changes.

FEATURES

- Standard ranges from 15 ft to 600 ft H₂O; custom depths available
- 2-wire 4–20 mA loop output, 9–32 VDC supply
- Accuracy ±0.5% FS · linearity ±0.25% FS typical
- Long-term stability ±0.2% FS per year
- Operating temperature –20 to 105 °C
- Fully sealed IP68 housing — titanium or SS316L
- Vented PTFE, FEP, PE or PU cable
- Corrosion resistant for aggressive liquids
- Factory calibrated for water depth; custom media calibration

APPLICATIONS

- Water & wastewater treatment
- Water, fuel & storage tanks
- Wells, reservoirs, ponds & rivers
- Hydrological exploration & irrigation
- Power plants & mining
- Chemical & pharmaceutical processing
- Hot process & cooling water

MAXIMUM ENVIRONMENTAL RATINGS

Operating Temperature	–20 to 105 °C · –4–221 °F	Level Range	15 to 600 ft H ₂ O
Compensated Temperature	–20 to 85 °C	Supply Voltage	9 to 32 VDC
Ingress Protection	IP68 (continuous submersion)	Housing	Titanium or SS316L

Electrical & performance specifications

V+ = 24 VDC, 25 °C unless otherwise noted.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS
Supply voltage	V_s	9	24	32	VDC
Output (2-wire loop)	I_{OUT}	4	—	20	mA
Accuracy (Note 1)	—	-0.5	—	0.5	%FS
Linearity (Note 2)	—	—	0.25	0.5	%FS
Repeatability	—	-0.05	—	0.05	%FS
Thermal error, full scale	—	—	0.02	—	%FS/°C
Response time (Note 3)	t_R	—	10	—	ms
Long-term stability	—	—	±0.2	—	%FS/yr
Compensated temperature	—	-20	—	85	°C
Operating temperature	—	-20	—	105	°C
Level range	—	15	—	600	ft H ₂ O
Ingress protection	IP68				—

1) Includes linearity, hysteresis and repeatability at 25 °C. 2) Best-fit straight line. 3) Time to 90% of a full-scale step.

Electrical connections

WIRE COLOR	CONNECTION
Red	V+ · loop supply (+)
Black	0 V · loop return / OUT+
Vent tube	Atmospheric reference – keep open and dry

WIRING NOTES

The PLT11 is a 2-wire loop-powered transmitter: the output current flows in the same pair that supplies power. Place the receiver's sense resistor in the return (black) leg. Terminate the cable in a dry enclosure so moisture cannot enter the vent tube.

Standard measuring ranges

ORDER CODE	DEPTH (FT H ₂ O)	≈ PSI
15	0–15	6.5
20	0–20	8.7
25	0–25	10.8
30	0–30	13.0
35	0–35	15.2
60	0–60	26.0
150	0–150	65.0
300	0–300	130
600	0–600	260

Factory calibration is for fresh water at 4 °C (1 ft H₂O ≈ 0.4335 PSI). Contact the factory for other media densities.

Package, media & installation

Package

The sensing element and electronics are sealed in a titanium (option T) or SS316L (option S) housing with a flush diaphragm, then potted for IP68 continuous submersion. Titanium is recommended for chlorides, salt water and other corrosive liquids.

Level ranges

Standard depths run from 15 ft to 600 ft H₂O. Custom depths and calibrations for non-water media are available for OEM customers.

Wetted parts

Titanium or SS316L housing and diaphragm. Cable jacket in PTFE, FEP, polyethylene (PE) or polyurethane (PU).

Installation

Lower the sensor to the bottom of the measured range and suspend it by the cable or a cord grip — do not let it rest on sediment. In turbulent or flowing water, install it in a stilling well.

Stability

An oil-filled, media-isolated piezoresistive element inside a rigid stainless body keeps mechanical stress off the die. Users can expect drift of no more than $\pm 0.2\%$ FS per year, including at elevated temperature.

Media

Suited to hot water, salt water, oils and corrosive liquids compatible with the selected housing and cable. Verify compatibility for strong acids, bases and solvents.

Cable

A 2-conductor, 18 AWG cable with integral vent tube. Specify the cable length at order. For temperatures above 80 °C or chemical exposure, choose PTFE or FEP.

High temperature

Rated for operation to 105 °C and compensated -20 to 85 °C. The cable jacket sets the temperature limit: PE and PU are for use to 80 °C only.

Application example — municipal wastewater



$\pm 0.5\%$

Accuracy FS

600 ft

Max standard depth

$\pm 0.2\%$

Stability FS / year

105 °C

Max operating temp

4–20 mA output details

OUTPUT	TRANSFER FUNCTION	SUPPLY	WIRING
4–20 mA	$I_{out} = 4 + 16 \times (H / H_{FS}) \text{ mA}$	9–32 VDC	2-wire loop

H = liquid height above the diaphragm; H_{FS} = calibrated full-scale depth.

Converting output to depth

Depth is linear with loop current. With a 0–30 ft unit, 12 mA corresponds to 15 ft of water above the diaphragm. Add the sensor's mounting height above the tank floor to get total liquid level.

$$H = H_{FS} \times (I_{out} - 4 \text{ mA}) / 16 \text{ mA}$$

LEVEL	OUTPUT
0% (dry / at diaphragm)	4.0 mA
25%	8.0 mA
50%	12.0 mA
75%	16.0 mA
100% (full scale)	20.0 mA

Loop load resistance

The transmitter needs at least 9 V across its terminals at 20 mA. Maximum total loop resistance — receiver sense resistor plus cable — is:

$$R_{max} (\Omega) = (V_{supply} - 9 \text{ V}) / 0.020 \text{ A}$$

SUPPLY	MAX LOOP RESISTANCE
12 VDC	150 Ω
15 VDC	300 Ω
24 VDC	750 Ω
32 VDC	1,150 Ω

A 250 Ω sense resistor converts the loop to 1–5 V at the receiver.

APPLICATION NOTES

Current loops are immune to voltage drop along the cable, so long runs to the surface do not affect accuracy. Use a single ground point at the receiver. Fit surge protection on long outdoor runs exposed to lightning.

Mechanical dimensions – inches

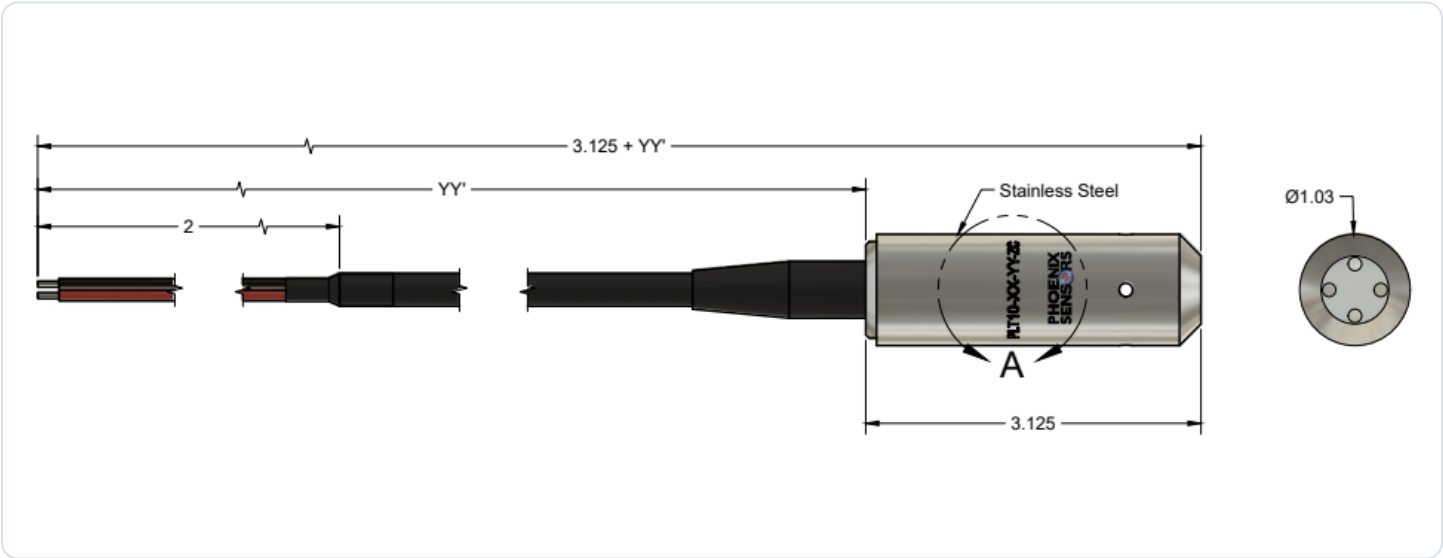


Fig. 1 – PLT11 outline: housing ≈ 4.5 in long × Ø0.95 in. Overall length = housing + cable length (YY).

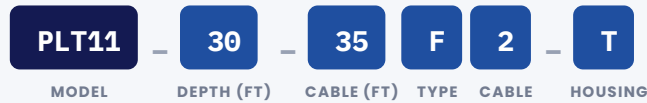
FEATURE	DETAIL
Housing & diaphragm	Titanium (T) or SS316L (S)
Cable	2 × 18 AWG + vent · PTFE / FEP / PE / PU
Conductors	Red (Supply +) · Black (Supply -)
Cable length	Specified at order (YY, feet)
Ingress protection	IP68

TOLERANCES (INCHES)

X ± 0.5 · X.X ± 0.15
X.XX ± 0.010 · X.XXX ± 0.005

Suspend by the cable or a cord grip. Do not kink the cable or pinch the vent tube.

Ordering information — part-number configuration



Model	H ₂ O depth (XX)	Cable length (YY)	Type (Z)	Cable material (C)	Housing (H)
PLT11	15 = 15 ft 20 = 20 ft 25 = 25 ft 30 = 30 ft 35 = 35 ft 60 · 150 · 300 · 600	Length in feet e.g. 20 = 20 ft Custom lengths available	F = Flush diaphragm C = Custom	0 = PE 1 = PU 2 = PTFE 3 = FEP 4 = Custom	T = Titanium S = SS316L

Standard part numbers

PART NUMBER	DEPTH (FT H ₂ O)	TYPE	CABLE LENGTH (FT)	CABLE · HOUSING
PLT11-15-20F2-T	15	Flush	20	PTFE · Ti
PLT11-20-25F2-T	20	Flush	25	PTFE · Ti
PLT11-25-30F2-T	25	Flush	30	PTFE · Ti
PLT11-30-35F2-T	30	Flush	35	PTFE · Ti
PLT11-35-40F2-T	35	Flush	40	PTFE · Ti

SPECIFY WITH YOUR ORDER

Custom calibration depth or media density · Non-standard cable length · Housing material · Connector termination. Custom cable lengths and calibration depths are available for OEM customers; additional charges may apply.

Configure your PLT11

Custom depths, cable lengths and terminations for OEM volumes. Talk to an engineer to spec your part.

REQUEST A QUOTE

sales@phoenixsensors.com
(480) 462-1810

Notice: Phoenix Sensors LLC reserves the right to make changes to the product contained in this publication. Phoenix Sensors LLC assumes no responsibility for the use of any circuits described herein, conveys no license under any patent or other right, and makes no representation that the circuits are free of patent infringement. While the information in this publication has been checked, no responsibility is assumed for inaccuracies. Phoenix Sensors LLC does not recommend the use of any of its products in life-support applications where the failure or malfunction of the product can reasonably be expected to cause failure of a life-support system or to significantly affect its safety or effectiveness. Products are not authorized for use in such applications.