

PT-500Y Series

Submersible Pressure Sensors

User Manual



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NOTE: Find additional product documents, specifications, accessories, and more on the PT-500Y online product page.
Go to: apgsensors.com/product/pt-500

INTRODUCTION

Thank you for purchasing a PT-500Y submersible pressure transmitter from APG. We appreciate your business! Please take a few minutes to familiarize yourself with your PT-500Y and this manual.

PT-500Y submersible pressure transmitters offer reliability in harsh industrial conditions and hazardous locations. The PT-500Y is certified intrinsically safe for hazardous areas in the US and Canada by CSA. The small size, integrated electronics, wide operating temperature range, and durability make the PT-500Y the perfect instrument for static and dynamic pressure measurement.

Reading your label

Every APG instrument comes with a label that includes the instrument's model number, part number, serial number, and a wiring pinout table. Please ensure that the part number and pinout table on your label match your order.

WARRANTY AND WARRANTY RESTRICTIONS

This product is covered by APG's warranty to be free from defects in material and workmanship under normal use and service of the product for 24 months. For a full explanation of our Warranty, please visit <https://apgsensors.com/warranty-returns/>. Contact Technical Support to receive a Return Material Authorization before shipping your product back.

Repair and Returns

Should your PT-500Y series pressure transmitter require service, please contact the factory via phone, email, or online chat. We will issue you a Return Material Authorization (RMA) number with instructions. You can also go to <https://apgsensors.com/warranty-returns/> and click the "Return & Repair Form" button at the bottom of the page.

- Phone: 888-525-7300
- Email: sales@apgsensors.com
- Online chat at www.apgsensors.com

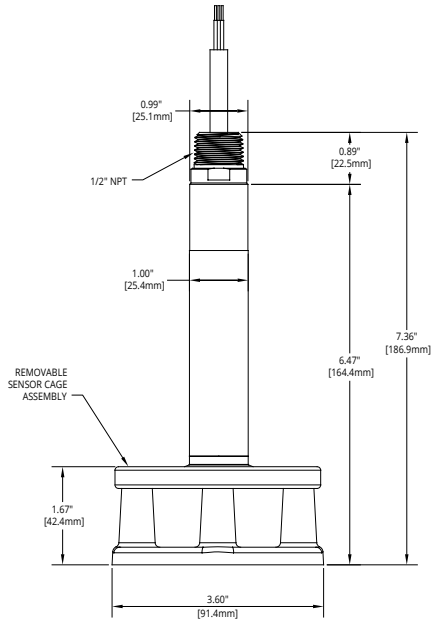
Please have your PT-500Y's part number and serial number available.

NOTE: APG recommends sending your unit in for NIST calibration services at least once a year, though frequency may vary by sensor, regulation, or application. Contact our Technical Support to schedule a service.

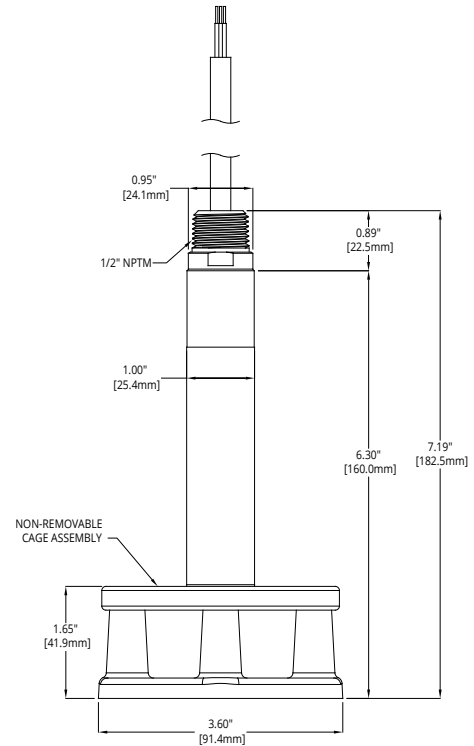
NOTE: APG recommends replacing your liquid ingress prevention accessory at least once a year. To learn more, contact our Technical Support.

CHAPTER 1: DIMENSIONS AND WIRING

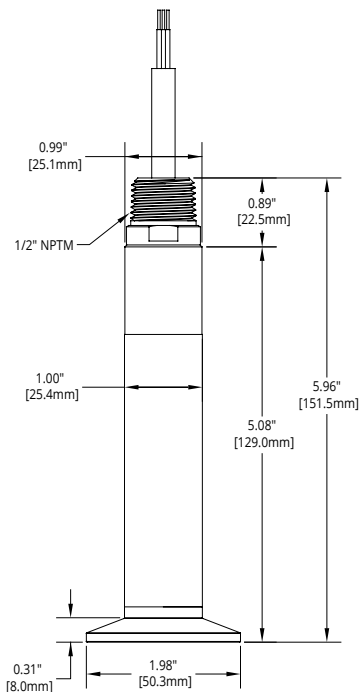
Dimensions



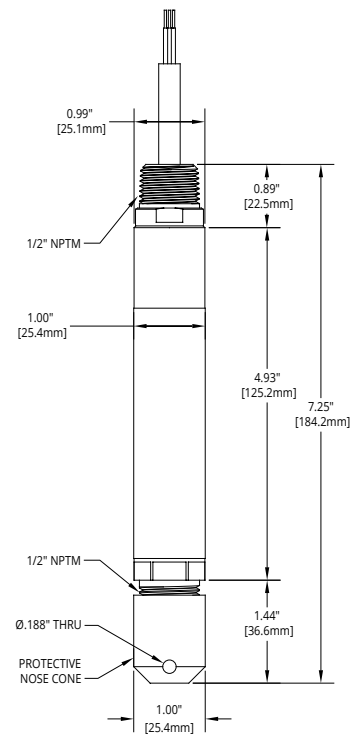
PT-500Y with Reusable Cage



PT-500Y with Welded Anti-sag Cage



PT-500Y with Tri-clover Sanitary Fitting



PT-500Y with Removable Plastic Nose Cone

Hazardous Location Ratings

The following electrical ratings and approvals are also listed on the label. Please refer to the Certificate of Compliance on our website for further details.



Class I, Div. 1, Groups C, D T4, Ex ia
Class I, Zone 0, AEx ia IIB T4 Ga
Ex ia IIB T4 Ga
Ambient Range: $-40^{\circ}\text{C} < T_{\text{amb}} < +80^{\circ}\text{C}$
Maximum Working Pressure: 10,000 psi

PT-500Y-L1xxxx (mA output)
 $V_{\text{max}}, U_i = 28 \text{ VDC}$
 $I_{\text{max}}, I_i = 110 \text{ mA}$
 $P_{\text{max}}, P_i = 0.77 \text{ W}$
 $C_i = 0.042 \mu\text{F}$
 $L_i = 0.32 \mu\text{H}$

Install in accordance with drawing 9002803, Sheet 1. See Appendix A.

Conditions of Acceptability

1. The "x" in the Model designations may be any alpha-numeric character, to denote minor mechanical options, not affecting safety.
2. These devices must be connected to a NRTL approved safety barrier (located in a safe area).
3. The equipment must be connected to a certified class 2 SELV power supply.
4. The devices meet an ingress protection rating minimum of IP20. The devices shall be installed with sensor body fully submerged in process fluid or attached to equipment via integrated process connection threads.

Hazardous Location Warnings

WARNING - EXPLOSION HAZARD

- DO NOT DISCONNECT OR OPEN EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR AREA IS KNOWN TO BE NON-HAZARDOUS.
- MUST BE CONNECTED TO A CLASS 2 SELV POWER SUPPLY.
- SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
- ENSURE DEVICE IS GROUNDED BEFORE USE.

AVERTISSEMENT - RISQUE D'EXPLOSION

- NE PAS DECONNECTER OU OUVRIR L'ÉQUIPEMENT SAUF S'IL EST DECONNECTÉ OU PLACÉ DANS UNE ZONE NON DANGEREUSE.
- DOIT ÊTRE CONNECTÉ À UNE ALIMENTATION ÉLECTRIQUE SELV DE CLASSE 2.
- LE REMPLACEMENT DE COMPOSANTS PEUT COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE.
- VÉRIFIER QUE L'ÉQUIPEMENT EST MIS À LA TERRE AVANT UTILISATION.

ⓘ IMPORTANT: Your PT-500Y MUST be installed according to drawing 9002803 to meet listed hazardous approvals. Faulty installation will invalidate safety approvals and ratings.

Electrical Pinout Table and Supply Power Table

PT-500Y Pin Out Table

Pigtail	4-20 mA	Voltage	Modbus RTU
Red	+ Power/Signal	+ Power	+ Power
Black	- Power/Signal	- Power	- Power
Green	—	+ Out	B (TX -)
White	—	- Out	A (TX+)
Shield Drain	Case Gnd	Case Gnd	Case Gnd

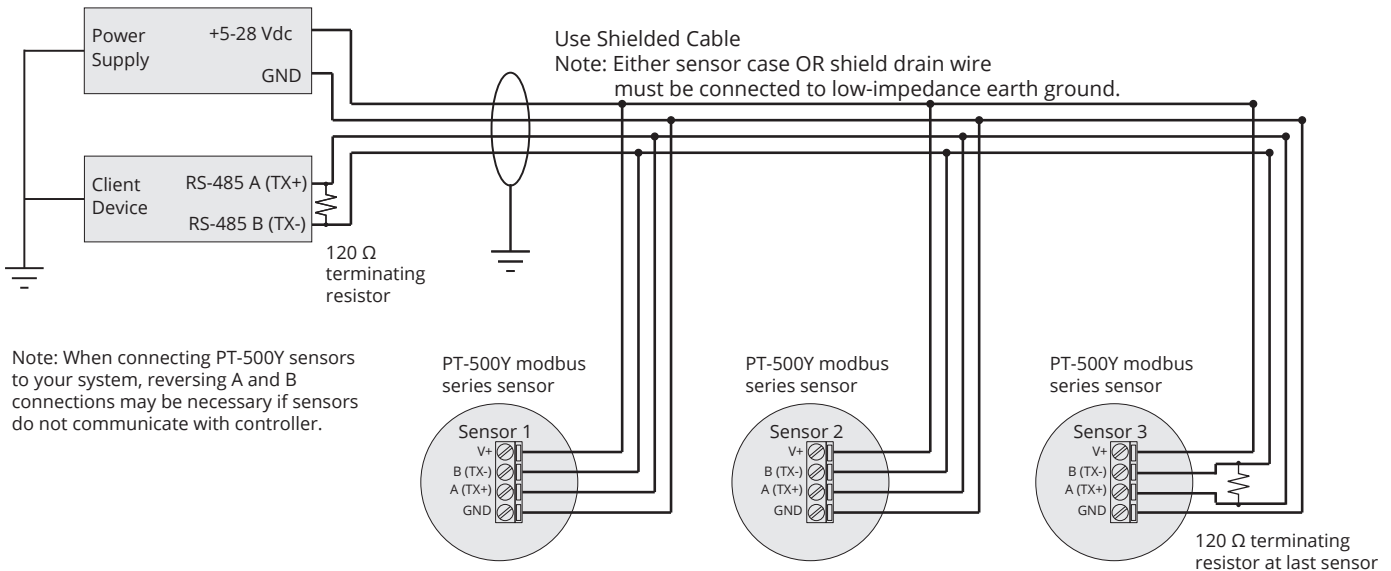
Note: Either transducer case OR shield drain wire must be physically connected to low-impedance earth ground.

PT-500Y Supply Power Table

	4-20 mA	0-5 VDC	0-10 VDC	mV/V	Modbus RTU
Power Supply	9-28 VDC	9-28 VDC	14-28 VDC	10 VDC*	5-28 VDC

* mV/V output calibrated to 10 VDC input

Modbus System Wiring



Note: When connecting PT-500Y sensors to your system, reversing A and B connections may be necessary if sensors do not communicate with controller.

CHAPTER 2: INSTALLATION AND REMOVAL PROCEDURES AND NOTES

Tools Needed

- Wrench sized appropriately for your PT-500Y's process or conduit connection.
- Thread tape or sealant compound for threaded connections.

Physical Installation Notes

The PT-500Y should be installed in an area—indoors or outdoors—which meets the following conditions:

- Ambient temperature between -40°C and 80°C (-40°F to +176°F)
- Relative humidity up to 100%
- Altitude up to 2000 meters (6560 feet)
- IEC-664-1 Conductive Pollution Degree 1 or 2
- IEC 61010-1 Measurement Category II
- No chemicals corrosive to stainless steel (such as NH₃, SO₂, Cl₂ etc.)
- Ample space for maintenance and inspection
- Class 2 SELV power supply

Mounting Instructions

Your PT-500Y can be mounted in three ways: via NPT process connection, free-hanging suspension, or conduit mounted. Mounting your pressure transducer is easy if you follow a few simple steps:

- Never over-tighten the sensor. This can compress the diaphragm, changing how it reacts to pressure. In all cases, tighten the sensor as little as possible to create an adequate seal. On straight threads, tighten only until you feel the o-ring compress — making sure you don't damage or extrude the o-ring.
- Always use thread tape or sealant compound on tapered threads. Wrap thread tape in the opposite direction of the threads so it does not unravel as you screw the sensor into place. Unravelling can cause uneven distribution and seal failure. For straight threads use an o-ring.
- Always start screwing in your sensor by hand to avoid cross-threading. Thread failure can be a problem if you damage threads by over-tightening them or by crossing threads.
- For suspension mounting the PT-500Y, drill a 3/16" hole into a 1/2" NPTF to 1/2" NPTF hex coupler and secure it to the 1/2" NPTM coupler fitting of the PT-500Y. Attach a .060" diameter 316L SS cable of desired length to the hex coupler and secure the steel cable according to your application requirements.

NOTE: If your PT-500Y has a vent tube, do not seal, cover, or close the vent tube with anything other than an APG-provided venting cap or desiccant drying cartridge (See Figure 3.2 and 3.3). Unapproved seals or covers will prevent proper sensor operation.

Electrical Installation

- Check the pinout table on your PT-500Y against your order.
- Check that your electrical system wiring matches the pinout table on your PT-500Y.
- For instruments with connectors, make the connection.

i IMPORTANT: For lightning transient/surge protection to be effective, either PT-500Y case OR shield drain wire, but not both, must be physically connected to low-impedance earth ground.

i IMPORTANT: Your PT-500Y MUST be installed according to drawing 9002803 to meet listed hazardous approvals. Faulty installation will invalidate safety approvals and ratings.

Removal Instructions

Removing your PT-500Y from service must be done with care. It's easy to create an unsafe situation, or damage your sensor, if you are not careful to follow these guidelines:

- For sensors installed via NPT process connection, make sure the pressure is completely removed from the line or vessel. Follow any and all procedures for safely isolating any media contained inside the line or vessel.
- Remove the sensor with an appropriately sized wrench (per your process connection).
- For suspended sensors, retrieve the sensor from the vessel. Follow any and all procedures for safely isolating any media contained inside the line or vessel.
- Carefully clean the sensor's fitting and diaphragm of any debris (see General Care) and inspect for damage.
- Store your sensor in a dry place, at a temperature between -40° F and 176° F.

⚠ DANGER: Removing your process connected PT-500Y Pressure Transmitter while there is still pressure in the line could result in injury or death.

CHAPTER 3: MAINTENANCE

General Care

Your PT-500Y series pressure transmitter is very low maintenance and will need little care as long as it is installed correctly. However, in general, you should:

- For process connected sensors, keep the transmitter and the area around it generally clean.
- Avoid applications for which the transmitter was not designed, such as extreme temperatures, contact with incompatible corrosive chemicals, or other damaging environments.
- Inspect the threads whenever you remove the transmitter from duty or change its location.
- Avoid touching the diaphragm. Contact with the diaphragm, especially with a tool, could permanently shift the output and ruin accuracy.
- Clean the diaphragm or the diaphragm bore only with extreme care. If using a tool is required, make sure it does not touch the diaphragm.

IMPORTANT: Any contact with the diaphragm can permanently damage the sensor. Use extreme caution.

NOTE: APG recommends sending your unit in for NIST calibration services at least once a year, though frequency may vary by sensor, regulation, or application. Contact our Technical Support to schedule a service.

Zero Adjust (4-20mA, 0-5 VDC, 0-10 VDC series only)

The zero output (4mA or 0 VDC) can be adjusted by holding a magnet perpendicular to the can, approximately 1-1/2" from the top or bottom of the can.

Holding the magnet close to the top of the can increases the output (See Figure 3.1). Holding the magnet close to the bottom of the can decreases the output (See Figure 3.2).

If the zero output values do not change right away, hold the magnet in place near the top of the can until the values change, for up to two minutes. If there is no change, repeat the procedure near the bottom of the can. If there is still no change, consult the factory.

Unvented PT-500Y transmitters do not automatically adjust to changes in barometric pressure. We recommend that PT-500Y transmitters be zeroed upon receipt, and after major weather events.



Figure 3.1



Figure 3.2

NOTE: Span calibration must be done at the factory for all analog models.

Vent Tube Drying

Condensation in the vent tube can damage the electronics in your sensor, resulting in unreliable readings. APG offers two methods of preventing vent tube condensation: a venting cap, and a desiccant drying cartridge.

The venting cap is a PVC tube with a hydrophobic patch that allows moisture to pass out of the tube without allowing water in (See Figure 3.3). The cap is sealed by an o-ring, and is easily installed in the field.

The desiccant drying cartridge with vent tube adapter absorbs any moisture in the vent tube to keep vapor from condensing (See Figure 3.4). The installation of the desiccant drying cartridge is quick and easy. Common installation methods are cable tie, Velcro, and cable clamps.

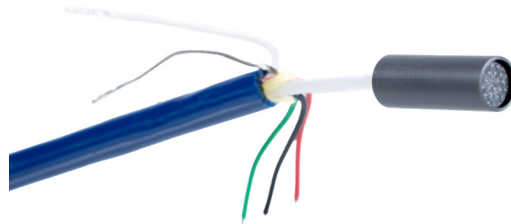


Figure 3.3



Figure 3.4

NOTE: Desiccant crystals change from blue to pink as they become saturated. Cartridge must be replaced when all crystals have saturated.

IMPORTANT: Do NOT use desiccant cartridge in the presence of vapors or liquids containing phosphate esters, synthetic lubricants, hydrocarbon solvents, methanol, acetone, lacquer solvents, or other organics.

NOTE: APG recommends replacing your liquid ingress prevention accessory at least once a year. To learn more, contact our Technical Support.

CHAPTER 4: PROGRAMMING

Modbus Programming

PT-500Y L5/L31 Modbus series sensors use standard Modbus RTU protocol (RS-485). The sensors can only operate as server devices. Sensor default transmission settings are **9600 Baud, 8 Bits, 1 Stop Bit, No Parity**, and require a minimum delay of 300 ms between transactions to return the contents of all registers. Commands returning fewer registers will require shorter delays. See PT-500Y Modbus Register Lists.

NOTE: For more information about Modbus RTU, please visit www.modbus.org.

NOTE: For APG Modbus programming instructions, or to download APG Modbus software, please visit <https://www.apgsensors.com/resources/product-resources/software-downloads/>

PT-500Y Modbus Register Lists

The registers listed below are reference addresses. To convert a reference address to an offset address, remove the first digit then subtract one.

Example 1: Reference address = 30300 → Offset register = 299

Example 2: Reference address = 40400 → Offset register = 399

Input Registers (0x04)

Register	Returned Data
30299	Model Type
30300	Pressure (L5 – PSI; L31 – mmH ₂ O)
30301	N/A
30302	Temperature Reading (in °C, signed)
30303-30304	Calculated (raw)
30305-30306	Calculated (float)
30307	Firmware Version
30308	Battery Voltage
30309	Trip 1 Status
30310	Trip 2 Status
30311	N/A

NOTE: The Calculated (raw) Readings will be returned without a decimal place. In order to obtain the true result, the Decimal (Calculated) register 40404 value setting must be taken into account.

30299—Model Type

Returns the model type for the device.

9 = L5

10 = L31

30309-30310—Trip Status

Returns the current trip and alarm status. See Alarm Parameter section for more details.

bits [15:8] = Alarm Status

bits [7:0] = Trip Status

Holding Registers (0x03) – PT-500Y L5 pressure series

Register	Function	Value Range
40400	Device Address	1 to 247
40401	Units	0-16
40402	Application Type	0 or 8
40403	N/A	
40404	Decimal (Calculated)	0 – 3
40405	N/A	N/A
40406	N/A	N/A
40407	Zero Offset	-15,000 – 30,000 PSI
40408	Pressure Decimal	0 – 3
40409	N/A	N/A
40410	N/A	N/A
40411	Parameter Default	0 = No; 1 = Restore Defaults
40412	Averaging	0 – 10
40413	N/A	N/A
40414	N/A	N/A
40415	Sample Rate	10 to 1000 milliseconds
40416	N/A	N/A
40417	N/A	N/A
40418	N/A	N/A
40419	Baud Rate	0 – 5 (2400, 9600, 19200, 57600, 115200)
40420	Parity	0 – 2 (none, even, odd)
40421	Stop Bit	0 – 1 (0 = 1 stop bit; 1 = 2 stop bits)
40422-40423	N/A	N/A
40424-40425	N/A	N/A
40426-40427	N/A	N/A
40428-40429	N/A	N/A
40430	Trip 1 Pressure	-15,000 – 30,000 PSI
40431	Trip 1 Window	0 – 30,00 PSI
40432	Trip 1 Type	0 – 29
40433	Trip 2 Pressure	-15,000 – 30,000 PSI
40434	Trip 2 Window	0 – 30,00 PSI
40435	Trip 2 Type	0 – 29
40436-40437	Multiplier	0.0010 – 99.9999 (float)
40438-40439	Description	A – Z, 0 – 9, /, ., +, * (16 char)
40446	Temperature Offset	-20 – 20
40447-40448	N/A	N/A
40449-40450	N/A	N/A
40451-40452	N/A	N/A
40453-40454	N/A	N/A

Holding Registers (0x03) – PT-500Y L31 level series

Register	Function	Value Range
40400	Device Address	1 to 247
40401	Units	1 = Feet, 2 = Inches, 3 = Meters
40402	Application Type	0 – 11
40403	Volume Units	1 – 7
40404	Decimal (Calculated)	0 – 3
40405	N/A	N/A
40406	N/A	N/A
40407	Zero Offset	-32,768 mm to 32,767 mm
40408	N/A	N/A
40409	N/A	N/A
40410	Specific Gravity	1 – 2,000
40411	Parameter Default	0 = No; 1 = Restore Defaults
40412	Averaging	0 – 10
40413	N/A	N/A
40414	N/A	N/A
40415	Sample Rate	10 to 1000 milliseconds
40416	N/A	N/A
40417	N/A	N/A
40418	N/A	N/A
40419	Baud Rate	0 – 5 (2400, 9600, 19200, 57600, 115200)
40420	Parity	0 – 2 (none, even, odd)
40421	Stop Bit	0 – 1 (0 = 1 stop bit; 1 = 2 stop bits)
40422-40423	N/A	N/A
40424-40425	N/A	N/A
40426-40427	N/A	N/A
40428-40429	N/A	N/A
40430	Trip 1 Level	0 – 65,535 (mm)
40431	Trip 1 Window	0 – 65,535 (mm)
40432	Trip 1 Type	0 – 29
40433	Trip 2 Level	0 – 65,535 (mm)
40434	Trip 2 Window	0 – 65,535 (mm)
40435	Trip 2 Type	0 – 29
40436-40437	Parameter 1	0 – 1,000,000 (mm)
40438-40439	Parameter 2	0 – 1,000,000 (mm)
40440-40441	Parameter 3	0 – 1,000,000 (mm)
40442-40443	Parameter 4	0 – 1,000,000 (mm)
40444-40445	Parameter 5	0 – 1,000,000 (mm)
40446	Temperature Offset	-20 – 20
40447-40448	N/A	N/A
40449-40450	N/A	N/A
40451-40452	N/A	N/A
40453-40454	N/A	N/A

PT-500Y Modbus Sensor Parameters – L5 pressure series

40401 – Units

Determines the units of measure for the calculated reading.

0 = PSI	5 = mmH2O [†]	10 = mmHG [‡]	14 = inSW
1 = BAR	6 = cmH2O [†]	11 = cmHG [‡]	15 = ftSW
2 = mBAR	7 = mH2O [†]	12 = inHG [‡]	16 = mSW
3 = kPa	8 = inH2O [†]	13 = kg/cm ²	
4 = MPa	9 = ftH2O [†]		

[†] All H2O pressure measurements @ 20° C.

[‡] All HG pressure measurements @ 0° C.

40402 – Application Type

Determines the units of measure for the calculated reading.

0 = Standard (units selected in 40401 are displayed)

8 = Custom (Units selected in 40401 are NOT factored into calculated output in Application Type 8. The multiplier in 40436-40437 must also include any unit conversion from PSI desired. Use ASCII characters in 40438-40439 to hold a label or description for the measurement.)

PT-500Y Modbus Sensor Parameters – L31 level series

40401 – Units

Determines the units of measure for the calculated reading when Application Type is set to 0, 1, or 7.

1 = Feet 2 = Inches 3 = Meters

40402 – Application Type

Determines the type of calculated reading performed by the sensor.

- 0 = Distance
- 1 = Level
- 2 = Standing Cylindrical Tank with or without Hemispherical Bottom
- 3 = Standing Cylindrical Tank with or without Conical Bottom
- 4 = Standing Rectangular Tank with or without Chute Bottom
- 5 = Horizontal Cylindrical Tank with or without Spherical Ends
- 6 = Spherical Tank
- 7 = Pounds (Linear Scaling)
- 8 = N/A
- 9 = Vertical Oval Tank
- 10 = Horizontal Oval Tank
- 11 = Strapping Chart

40403 – Volume Units

Determines the units of measure for the calculated reading when Application Type is set to 2-6 or 9-11.

- | | |
|-------------------------------|-------------------------|
| 1 = Feet ³ | 5 = Liters |
| 2 = Million Feet ³ | 6 = Inches ³ |
| 3 = Gallons | 7 = Barrels |
| 4 = Meters ³ | |

PT-500Y Web / Independent Modbus Alarm Parameters

PT-500Y sensors interfaced with an LOE web-enabled client sensor can be configured to generate website alarms via levelandflow.com. Refer to the LOE user manual (available on <https://www.apgsensors.com/resources/product-resources/user-manuals/>) for more information.

PT-500Y sensors do not have physical, or electronic, trip outputs. Via LOE web-enabled device, Holding Registers 40430 – 40435 can be configured to create outputs in Input Registers 30309 and 30310 that will trigger alarms through web interfaces. These registers can also be configured/monitored via RS-485 Modbus programming, but APG Modbus software cannot be used to generate such alerts or alarms.

40430 – Trip 1 Value

40433 – Trip 2 Value

Sets the distance to the trip position closest to the sensor face.

40431 – Trip 1 Window

40434 – Trip 2 Window

Sets the distance from the first trip position to the trip position farthest from the sensor face.

40432 – Trip 1 Type

NOTE: All values entered into Trip Values or Windows parameters must be based upon the raw reading in register 30300, not the calculated reading in 30303-30304.

40435 – Trip 2 Type

Sets the Trip Type for web outputs or independently-configured Modbus outputs. Trip Types are configured with two independent digits: the first for Alarm Type (1, or 2), and the second for Trip Condition (0-5, 7, or 9).

Alarm Type

1_ – Active Alarm

Designates the active trip point as an alarm condition. To initiate an alarm whenever the Trip Type _3 is active (on), Trip Type would be set to **13**.

Alarm Type

2_ – Inactive Alarm

Designates an inactive trip point as an alarm condition. To initiate an alarm whenever the Trip Type _3 is inactive (off), Trip Type would be set to **23**.

Trip Condition

_0 – Near

Near activates the trip status whenever the target surface is closer than the Trip Value setting.

Trip Condition

_1 – Exclusive

Exclusive activates the trip status whenever the target surface is closer than the Trip Value setting OR beyond the Trip Value + Trip Window setting.

Trip Condition

_2 – Hysteresis Near

Hysteresis Near activates the trip status whenever the target surface moves closer than the Trip Value setting. The trip status remains activated until the target surface moves beyond the Trip Value + Trip Window setting. The trip status remains off until the target surface moves closer than the Trip Value setting again.

Trip Condition

_3 – Far

Far activates the trip status whenever the target surface is beyond the Trip Value setting.

Trip Condition

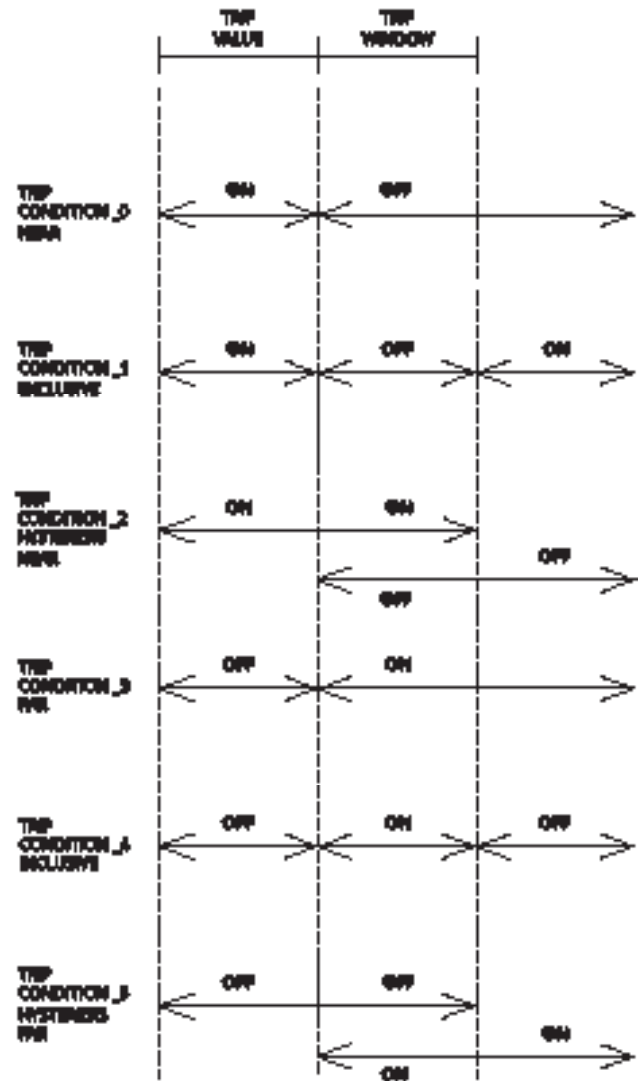
_4 – Inclusive

Inclusive activates the trip status whenever the target surface is beyond the Trip Value setting AND closer the Trip Value + Trip Window setting.

Trip Condition

_5 – Hysteresis Far

Hysteresis Far activates the trip status whenever the target surface moves beyond the Trip Value + Trip Window setting. The trip status remains activated until the target surface moves closer than the Trip Value setting. The trip status remains off until the target surface moves beyond the Trip Value + Trip Window setting again.



Trip Condition _____

_6 – Trip disabled

Trip Condition _____

_7 – N/A

Trip Condition _____

_8 – N/A

Trip Condition _____

_9 – Rate of Change

Rate of Change activates the trip status whenever a user-defined maximum rate of level change (change in distance or level divided by elapsed time) is exceeded. Trip Value (Holding Register 40430 or 40433) defines the distance and Trip Window (Holding Register 40431 or 40434) defines the time.

PT-500Y Modbus Application Parameters – L31 level series

Application 0 – Distance

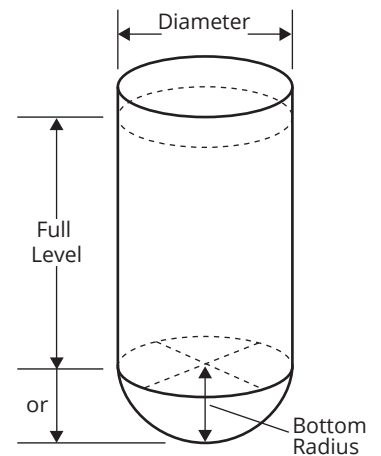
Register	Function	Value Range
40400	Device Address	1 to 247
40401	Units	1 = Feet, 2 = Inches, 3 = Meters
40402	Application Type	0
40403	Volume Units	—
40404	Decimal (Calculated)	0 – 3

Application 1 – Level

Register	Function	Value Range
40400	Device Address	1 to 247
40401	Units	1 = Feet, 2 = Inches, 3 = Meters
40402	Application Type	1
40403	Volume Units	—
40404	Decimal (Calculated)	0 – 3

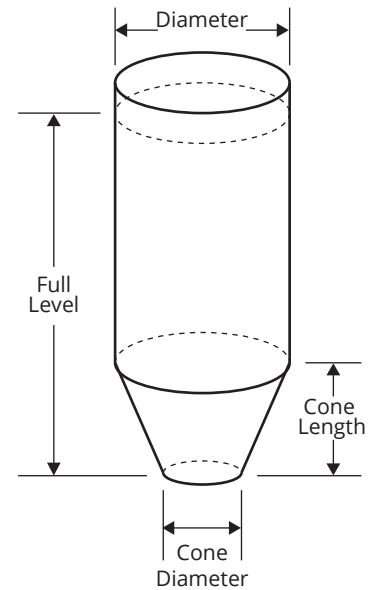
Application 2 – Volume of Standing Cylindrical Tank ± Hemispherical Bottom

Register	Function	Value Range
40400	Device Address	1 to 247
40401	Units	—
40402	Application Type	2
40403	Volume Units	1 – 7
40404	Decimal (Calculated)	0 – 3
40405	Max Level	(factory set)
40406	Full Level	0 – 65,535 mm
40436-40437	Tank Diameter	0 – 1,000,000 (mm)
40438-40439	Radius of Bottom Hemisphere	0 – 1,000,000 (mm)



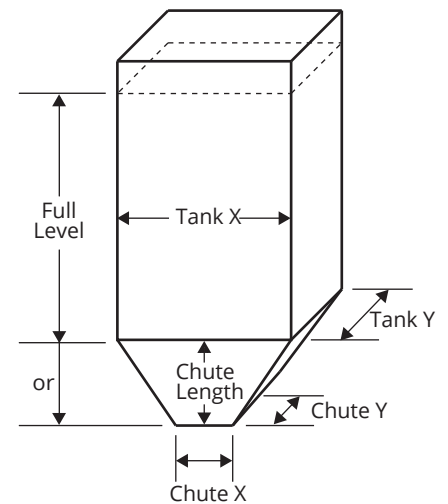
Application 3 – Volume of Standing Cylindrical Tank ± Conical Bottom

Register	Function	Value Range
40400	Device Address	1 to 247
40401	Units	—
40402	Application Type	3
40403	Volume Units	1 – 7
40404	Decimal (Calculated)	0 – 3
40405	Max Level	(factory set)
40406	Full Level	0 – 65,535 mm
40436-40437	Tank Diameter	0 – 1,000,000 (mm)
40438-40439	Cone Diameter(at bottom of cone)	0 – 1,000,000 (mm)
40440-40441	Length (height) of Cone	0 – 1,000,000 (mm)



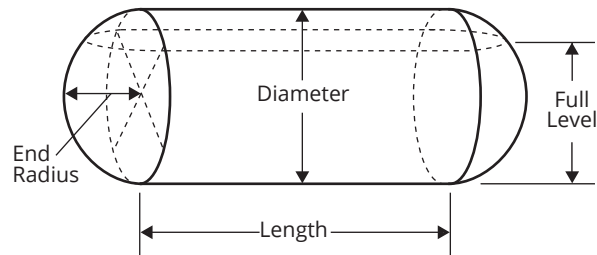
Application 4 – Volume of Standing Rectangular Tank ± Chute Bottom

Register	Function	Value Range
40400	Device Address	1 to 247
40401	Units	—
40402	Application Type	4
40403	Volume Units	1 – 7
40404	Decimal (Calculated)	0 – 3
40405	Max Level	(factory set)
40406	Full Level	0 – 65,535 mm
40436-40437	Tank X Dimension	0 – 1,000,000 (mm)
40438-40439	Tank Y Dimension	0 – 1,000,000 (mm)
40440-40441	Chute X Dimension	0 – 1,000,000 (mm)
40442-40443	Chute Y Dimension	0 – 1,000,000 (mm)
40444-40445	Length (height) of Chute	0 – 1,000,000 (mm)



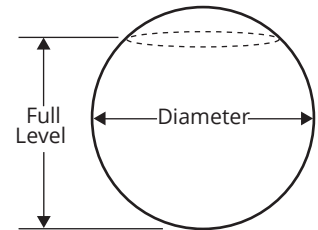
Application 5 – Volume of Horizontal Cylindrical Tank ± Hemispherical Ends

Register	Function	Value Range
40400	Device Address	1 to 247
40401	Units	—
40402	Application Type	5
40403	Volume Units	1 – 7
40404	Decimal (Calculated)	0 – 3
40405	Max Level	(factory set)
40406	Full Level	0 – 65,535 mm
40436-40437	Tank Length	0 – 1,000,000 (mm)
40438-40439	Tank Diameter	0 – 1,000,000 (mm)
40440-40441	Radius of End Hemispheres	0 – 1,000,000 (mm)



Application 6 – Volume of Spherical Tank

Register	Function	Value Range
40400	Device Address	1 to 247
40401	Units	—
40402	Application Type	6
40403	Volume Units	1 – 7
40404	Decimal (Calculated)	0 – 3
40405	Max Level	(factory set)
40406	Full Level	0 – 65,535 mm
40436-40437	Tank Diameter	0 – 1,000,000 (mm)

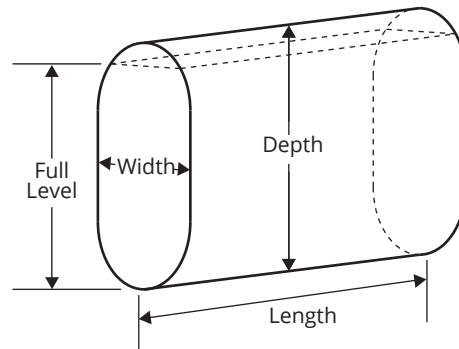


Application 7 – Pounds (Linear Scaling)

Register	Function	Value Range
40400	Device Address	1 to 247
40401	Units	1 = Feet, 2 = Inches, 3 = Meters
40402	Application Type	7
40403	Volume Units	—
40404	Decimal (Calculated)	0 – 3
40405	Max Level	(factory set)
40406	Full Level	0 – 65,535 mm
40436-40437	Multiplier (linear scalar)	0 – 1,000,000 (1000 = 1.000)

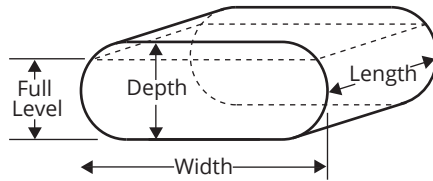
Application 9 – Volume of Vertical Oval Tank

Register	Function	Value Range
40400	Device Address	1 to 247
40401	Units	—
40402	Application Type	9
40403	Volume Units	1 – 7
40404	Decimal (Calculated)	0 – 3
40405	Max Level	(factory set)
40406	Full Level	0 – 65,535 mm
40436-40437	Tank Length	0 – 1,000,000 (mm)
40438-40439	Tank Depth	0 – 1,000,000 (mm)
40440-40441	Tank Width	0 – 1,000,000 (mm)



Application 10 – Volume of Horizontal Oval Tank

Register	Function	Value Range
40400	Device Address	1 to 247
40401	Units	—
40402	Application Type	10
40403	Volume Units	1 – 7
40404	Decimal (Calculated)	0 – 3
40405	Max Level	(factory set)
40406	Full Level	0 – 65,535 mm
40436-40437	Tank Length	0 – 1,000,000 (mm)
40438-40439	Tank Depth	0 – 1,000,000 (mm)
40440-40441	Tank Width	0 – 1,000,000 (mm)

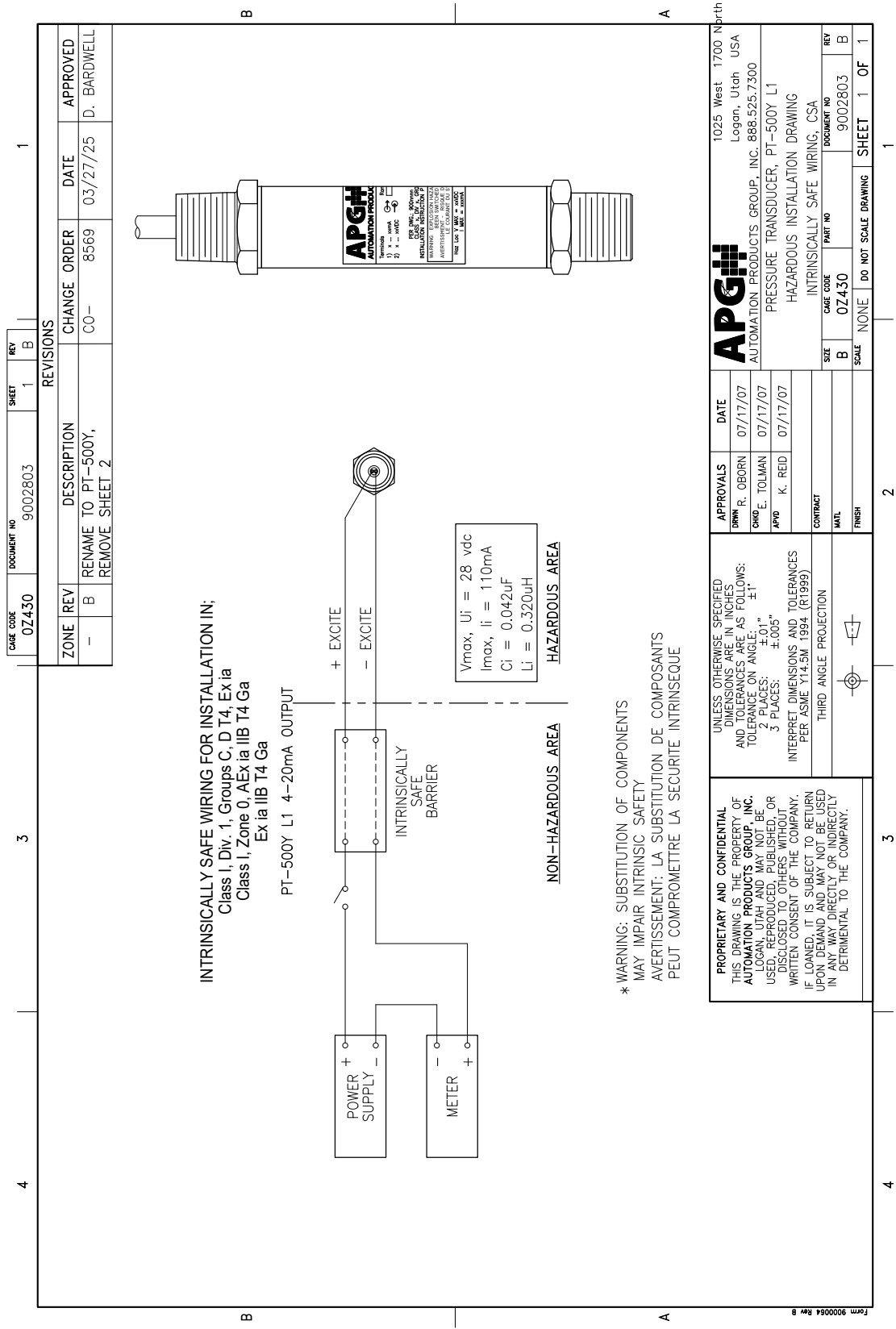


Application 11 – Strapping Chart (Polynomial Values)

Register	Function	Value Range
40400	Device Address	1 to 247
40401	Units	1 = Feet, 2 = Inches, 3 = Meters
40402	Application Type	11
40403	Volume Units	1 – 7
40404	Decimal (Calculated)	0 – 3
40405	Max Level	(factory set)
40406	Full Level	0 – 65,535 mm
40436-40437	X ³ Coefficient	0 – 1,000,000
40438-40439	X ² Coefficient	0 – 1,000,000
40440-40441	X ¹ Coefficient	0 – 1,000,000
40442-40443	X ⁰ Coefficient	0 – 1,000,000

APPENDIX A: HAZARDOUS LOCATION INSTALLATION

Intrinsically Safe Wiring Diagram (4-20 mA Output)





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