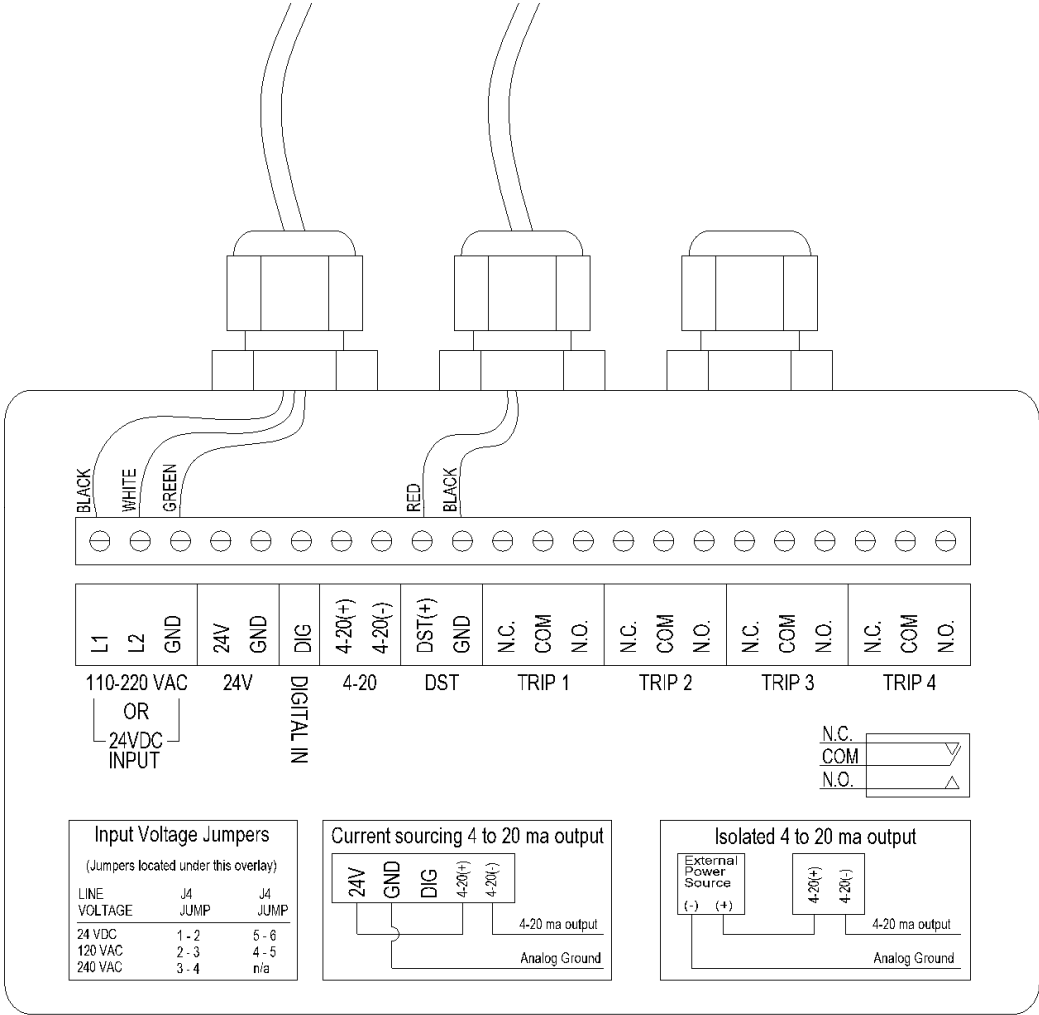


Calibration Instructions for New Style AGP Ultrasonic System - Sii Part # 34701515
 Note: System is pre-calibrated at factory. Use only if re-calibration is required.

SII Trim/Installation/Set-Up Procedure for Ultrasonic Level Sensor Assembly
 P/N 34701515

1. Locate all parts listed on routing information.
2. Mark location for tank fitting and control box. Have QA approve marked locations as meeting drawing/customer requirements.
3. Install fitting as per standard procedure for the fitting listed.
4. Install scrap HDPE plate on tank to allow mounting of control box by:
 - a. Sand area on tank that is larger than scrap HDPE plate so all welding will be done on freshly sanded surfaces.
 - b. Sand scrap HDPE plate so all welding will be done on freshly sanded surfaces.
 - c. Clean any loose sanded material.
 - d. Extrusion weld scrap HDPE plate to tank in proper location with a minimum of 1/4" fillet weld on all 4 sides of plate.
5. Align control box centered on scrap HDPE plate and attach with screws provided.
6. Temporarily install the ultrasonic level sensor in the tank fitting.
7. Install sensor cord/wires for testing/set-up of the level sensor assembly as per the wiring diagram below.
8. Install factory test power cord/wires for testing/set-up of the level sensor assembly as per the wiring diagram below.



9. Double check connections and power up the unit.
10. Record reading given by control box. This is the distance from the sensor to the bottom of the tank in inches. Write this down for use later.
11. The control box is partially preprogrammed for most of the inputs necessary. The list of programmed parameters is shown on page 3.
12. SII personnel has to set the parameters for mode numbers 12, 13, 24, 25, 29, 30, 31, and 45.
 - a. Press M-UP or M-DN buttons to access each mode. To cycle through the modes, press and hold either M-UP or M-DN as necessary.
 - b. Press V-UP or V-DN to display the selected mode. To change the selected mode value, press and hold down the V-UP or V-DN button as necessary to set the proper value. Enter the new value by pressing either of the mode keys. The display will then show the box output reading. The end desired result is a display of liquid level in hundreds of gallons.
13. Go to mode 12 and enter "Tank Overflow Height".
 - c. Tank Overflow Height for this setting is defined as distance from maximum fluid height to sensor face. This can be the "full" tank level as with Captor tanks; the sidewall gallonage of a vertical tank (most industrial tanks) or a level defined by the sales drawing for the order. If any of these distances is less than 12" from the sensor face, set the Tank Overflow Height at 12" from the sensor face.
 - d. The maximum fluid height can not be less than a level 12" from the sensor face as this is the sensor blanking distance minimum.
14. Go to mode 13. Enter the Tank Bottom Height.
 - a. This is the distance from the sensor face to the bottom of the tank bottom. This should be the value recorded from step #10. This can also be determined by measuring the tank actual distances.
15. Go to mode 24. Enter the same value as entered in mode 12. Value can not be less than 12" (sensor blanking distance minimum).
16. Go to mode 25. Enter the same value as entered in mode 13. Value can not be more than 300" (maximum range of sensor).
17. Determine the value of hundreds of gallons per inch.
 - a. Determine gallonage at Tank Overflow (full) Height. Divide gallonage by inches of height and divide that answer by 100.
 - b. Value of hundreds of gallons per inch can be done by the chart below.
 1. This number may have to be adjusted slightly to compensate for tank bottom warpage, thickness and shrinkage variations.

Tank Dia.	Hundred gallon/inch	Tank Dia.	Hundred gallon/inch
36	0.0428	90	0.2705
40	0.0530	95	0.3017
42	0.0586	96	0.3081
48	0.0767	102	0.3468
60	0.1202	108	0.3856
64	0.1367	120	0.4795
72	0.1733	142	0.6712
86	0.2480		

MODE/DESCRIPTION/PARAMETERS – APG 1006 SETTINGS FOR SNYDER INDUSTRIES, INC.

Operation

- 1 Units = 1
- 2 Decimal Point = 0.0 – 1 decimal place
- 3 Operating Mode = 2
- 4 Sensitivity = 75%
- 5 Blanking = 12.0
- 6 Pulses = 16

Filtering

- 7 Sample Rate = 250
- 8 Samples Averaged = 20
- 9 Out-of-Range Sample = 10
- 10 Out-of-Range Span = 6.0
- 11 Loss of Echo Delay = 20

Relay

- 12 Begin Trip 1 = 0 – set by SII for tank range – tank overflow height
- 13 End Trip 1 = 0 - set by SII for tank range – tank bottom height
- 14 Trip 1 Type = 4
- 15 Begin Trip 2 = 0
- 16 End Trip 2 = 0
- 17 Trip 2 Type = 6
- 18 Begin Trip 3 = 0
- 19 End Trip 3 = 0
- 20 Trip 3 Type = 6
- 21 Begin Trip 4 = 0
- 22 End Trip 4 = 0
- 23 Trip 4 Type = 6

Analog

- 24 4 mA Distance = 12 – to be set by SII for tank overflow height but not less than 12”
- 25 20 mA Distance = 300 - to be set by SII for tank bottom height but not more 300”
- 26 4 mA Calibration = factory default
- 27 20 mA Calibration = factory default

Volume

- 28 Tank Type = 1
- 29 Mult Above = 1 – to be set to hundred gal/in above decimal by SII
- 30 Mult Below = 0 - to be set to hundred gal/in below decimal by SII
- 31 Span = 300.0 – to be set by SII after getting initial reading from level system (system set to read inches default)
- 32 Tank Length = 120.0 – factory default
- 33 Sphere. Length = 24.0 – factory default
- 34 Tank Radius = 60.0 – factory default

Calibration

- 35 Temp Comp = 0
- 36 Distance Offset = 0.0
- 37 Offset Polarity = 0
- 38 Calibration Above = 1
- 39 Calibration Below = 0

Utilities

- 40 Input Select = 0
- 41 Reset = 0
- 42 Software Version = 8 – factory default

Extended Range

- 43 Range Select = 0
- 44 Max. Range = 35

Extended Range

- 45 AutoSense = 1

18. Go to mode 29. Set the part of the number determined in step 17 that is to the left of the decimal point. That number should be zero for all tanks less than approximately 168" diameter.
19. Go to mode 30. Set the part of the number determined in step 17 that is to the right of the decimal point. Please use 4 digits accuracy.
20. Go to mode 31. Set tank height from the sensor face to the bottom of the tank (this may need to be adjusted slightly to get a zero reading when the tank is empty due to tank bottom warpage variations). This setting should be the number determined in step #10 and entered in mode 13.
21. Go to mode 45. Set the value to 1 for autosensing.
22. Exit mode and review tank reading. The unit should now be showing the gallonage of the empty tank. This number should be zero. The number must not be less than zero and not more than 0.2. If it is outside this range, adjustments to settings are necessary. Please review for error and adjust as necessary.
23. Remove sensor from tank top and check for Tank Overflow Height settings used in mode 12. Verify that it is correct and that the unit is operating correctly.
24. If the settings check in steps 22 and 23, then unplug the power cord from the control box, disconnect power and sensor cords, package sensor for shipment, remove and package control box for shipment (for non-insulated tanks only – If this is an insulated tank installation, leave the control box mounted to the tank and follow foamed tank procedures). Make sure all decals and operators manuals for sensor and control box are packaged and sent with the unit. Print and send a copy of the mode/description page with the control box. Make sure to write the settings used in modes set by SII. Print and send a copy of the wiring diagram page with the control box. These two pages are included on pages 5 and 6.

MODE/DESCRIPTION/PARAMETERS – APG 1006 SETTINGS FOR SNYDER INDUSTRIES, INC.

Operation

- 1 Units = 1
- 2 Decimal Point = 0.0 – 1 decimal place
- 3 Operating Mode = 2
- 4 Sensitivity = 75%
- 5 Blanking = 12.0
- 6 Pulses = 16

Filtering

- 7 Sample Rate = 250
- 8 Samples Averaged = 20
- 9 Out-of-Range Sample = 10
- 10 Out-of-Range Span = 6.0
- 11 Loss of Echo Delay = 20

Relay

- 12 Begin Trip 1 = 0 - – tank overflow height
- 13 End Trip 1 = 0 - – tank bottom height
- 14 Trip 1 Type = 4
- 15 Begin Trip 2 = 0
- 16 End Trip 2 = 0
- 17 Trip 2 Type = 6
- 18 Begin Trip 3 = 0
- 19 End Trip 3 = 0
- 20 Trip 3 Type = 6
- 21 Begin Trip 4 = 0
- 22 End Trip 4 = 0
- 23 Trip 4 Type = 6

Analog

- 24 4 mA Distance = 12 - tank overflow height but not less than 12”
- 25 20 mA Distance = 300 - tank bottom height but not more 300”
- 26 4 mA Calibration = factory default
- 27 20 mA Calibration = factory default

Volume

- 28 Tank Type = 1
- 29 Mult Above = 1 – to be set to hundred gal/in above decimal
- 30 Mult Below = 0 - to be set to hundred gal/in below decimal
- 31 Span = 300.0 - (system set to read inches default)
- 32 Tank Length = 120.0 – factory default
- 33 Sphere. Length = 24.0 – factory default
- 34 Tank Radius = 60.0 – factory default

Calibration

- 35 Temp Comp = 0
- 36 Distance Offset = 0.0
- 37 Offset Polarity = 0
- 38 Calibration Above = 1
- 39 Calibration Below = 0

Utilities

- 40 Input Select = 0
- 41 Reset = 0
- 42 Software Version = 8 – factory default

Extended Range

- 43 Range Select = 0
- 44 Max. Range = 35

Extended Range

- 45 AutoSense = 1

Ultrasonic Level Sensor Control Box wiring diagram for P/N 34701515

