



Installation and Maintenance Instructions

144TA/444TA Series Audible Tank Alarms

IMPORTANT: Please read these warnings and use the assembly instructions completely and carefully before starting. Failure to do so may cause product failure, or result in environmental contamination due to liquid leakage into the soil, creating hazardous spill conditions.

IMPORTANT: Check to make sure the unit is intact and undamaged and all parts have been supplied. Never substitute parts for those supplied. Doing so may cause product failure.

WARNING-DANGER: Using electrically operated equipment near gasoline or gasoline vapors may result in a fire or explosion, causing personal injury and property damage. Be sure that the working area is free from such hazards, and always use proper precautions.

Notice: OPW products must be used in compliance with applicable federal, state, and local laws and regulations. Product selection should be based on physical specifications and limitations and compatibility with the environment and material to be handled. All illustrations and specifications in this literature are based on the latest production information available at the time of publication. Prices, materials, and specification are subject to change at any time, and models may be discontinued at any time, in either case, without notice or obligation.

Standard Product Warranty

OPW warrants that products sold by it are free from defects in materials and workmanship for a period of one year from the date of manufacture by OPW (ECO products two years from date of manufacture.) Proof of purchase may be required. As the exclusive remedy under this limited warranty, OPW, will at its sole discretion, repair, replace, or issue credit for future orders for any product that may prove defective within the one year date of manufacture period (repairs, replacements, or credits may be subject to prorated warranty for remainder of the original warranty period, complete proper warranty claim documentation required.) This warranty shall not apply to any product that has been altered in any way, which has been repaired by any party other than a service representative authorized by OPW, or when failure is due to misuse, or improper installation or maintenance. OPW shall have no liability whatsoever for special, incidental or consequential damages to any party, and shall have no liability for the cost of labor, freight, excavation, clean up, downtime, removal, reinstallation, loss of profit, or any other cost or charges.

For any product certified to California 2001 standards, OPW warrants that product sold by it are free from defects in material and workmanship for a period of one year from date of manufacture or one year from date of registration of installation not to exceed 15 months from date of manufacture by OPW.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND SPECIFICALLY THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES, WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.

Preventative Maintenance:

- 1.) Test system prior to each fill-up.
- 2.) Replace battery module if Low battery Indicator is on. Use only the appropriate OPW P/N listed in replacement parts
- 3.) If wiring is damaged, replace as necessary following NEC, NFPA and any other applicable local, State, and federal requirements.

Alarm Technical Information:

Hazardous Location Approval:

Class I, Groups C & D

Maximum Voltage: 7.2 Volts

Maximum Current: 8 ma. per input (32 ma. total)

Maximum Internal Capacitance: 23 uF

Maximum Internal Inductance: 33 mH

Maximum Ambient Temperature Rating: 60 deg C

Maximum Surface Temperature Classification:

T4 Surface Code

Wiring limitations: 1000 foot maximum between the

144TA/444TA unit and any remote switch for each

channel of the alarm. This assumes that maximum

capacitance for any input is 60 nanoFarads and that the

maximum inductance is 0.2 milliHenry per input (UL-913 A7.3)

Note: This device is designed to work independently and should not be wired in parallel with another device, except as defined in the following Instructions.

Requirements for devices wired to the 144TA/444TA:

- Attached wiring and devices must be classed Intrinsically Safe
- No voltage or current source
- Maximum capacitance: 60 nanoFarads (.06 uF) per input
- Maximum inductance: 200 microHenrys (.2 mH) per input

Float Switch Technical Information:

Minimum liquid specific gravity: 0.45. Stem material:

Stainless Steel. Float Material: Closed Cell Buna-N (UL

Approved) for gasoline services. Max Pressure: 150 psi @ 70 deg F. Thread: 1/8" NPT.

Replacement Parts:

Float Switch ASSY P/N: 44TA-LLFS

1. Wire Fitting P/N: H15412M

2. Float Switch P/N: H15411M

3. SST Tube P/N: C05295M

Items to Convert to a Low Level Alarm:

1. 1/8" SST Nipple P/N: 202430

2. SST Tube P/N: C05295M

Battery Module P/N:

1. 444TA-0100: H15937M

2. 144TA-0100

- **NOTE:** When replacing the battery for the 144TA-0100, open the alarm box and locate the OPW number on the black battery module. If the number reads "C05346" then use the replacement part H15615M. If the number reads "144TA-0100" then use the replacement part 202891.

DOCUMENT CONTROL NUMBERS:

200216 → 144TA

200056 → 444TA

Important: Leave these Installation Instructions with the Station Operator.

INSTALLATION INSTRUCTIONS – 144TA/444TA Tank Alarm



CONFORMS TO ANSI / UL 913

CERTIFIED TO CAN / CSA STD C22.2 No. 157-92

US CONTROL NUMBER – 3069072

NOTE: As defined in article 501 – Class 1 Locations of the National Electric Code, this apparatus and its interconnect wiring are intrinsically safe. Under normal conditions this apparatus and its wiring cannot release sufficient energy to ignite a specific ignitable atmospheric mixture by opening, shorting, or grounding.

WARNING: Interconnect wiring between the switch and the alarm unit must be kept totally isolated and separate from any other wiring. This wiring must not share any junction box, conduit, raceway, or fixtures with circuits other than those defined by NEC as being intrinsically safe for all class 1 locations.

LOCATION: NEC ARTICLE 501-3-CLASS 1 Locations exempt intrinsically safe enclosures in paragraph 501-3(b)(1)(c), and therefore may be placed in the most convenient location but must be within reach to the operator and within audible range.

MOUNTING: Since a general purpose NEMA 4X enclosure is used to protect the alarm circuits and batteries, any mounting holes, conduit, or fasteners must be sealed in order to maintain the weatherproof integrity of the enclosure. All penetrations into enclosure must be made at the bottom of alarm unit.

Instructions for Remote Fill Installation

Step 1 – Sensor Installation

If using OPW 44TA-LLFS Float Switch Sensor, skip to Step 2. If using other 3rd Party Approved Intrinsically safe sensors install them according to their manufacturers' installation instructions and per NEC and NFPA, then move to step 11.

Step 2 – Minimum Ullage Size

Determine type and size of tank. Follow the below calculations for Horizontal or Vertical tanks; or use provided Tank Charts to determine required ullage (I). (See Tank Charts on pg 6) Record answers as (I) on the Float Tube Worksheet.

Horizontal Tank Calculations

For 90% Product Height

Multiply the tank diameter (inches) x 0.8435

Example for 27 (inch) Diameter Tank: Product Level @ 90% = 27 (inches) x 0.8435 = 22.78 (inches)

For 95% Product Height

Multiply the tank diameter (inches) x 0.903

Example for 27 (inch) Diameter Tank: Product Level @ 95% = 27 (inches) x 0.903 = 24.38 (inches)

NOTE: Round the answer down to the nearest 1/8 (inch) increment.

Vertical Tank Calculations

For 90% Product Height

Multiply the tank height (inches) x 0.9

For 95% Product Height

Multiply the tank height (inches) x 0.95

Example for 8 (feet) tall vertical tanks: Product Level @ 95% = 96 (inches) x 0.95 = 91.2 (inches)

NOTE: Round the answer down to the nearest 1/8 (inch) increment.

Step 3 – See Fig. 1

Measure from the top of the tank inlet to the inside of the top of the tank and record this as value (A)

Thread adaptor into tank inlet, hand tighten, then measure exposed / unexposed threads (B) that are above/below tank surface.

Record A + B as (II).

Remove adaptor from tank inlet.

NOTE: If you are mounting on a riser pipe (B), add riser height to exposed thread (II).

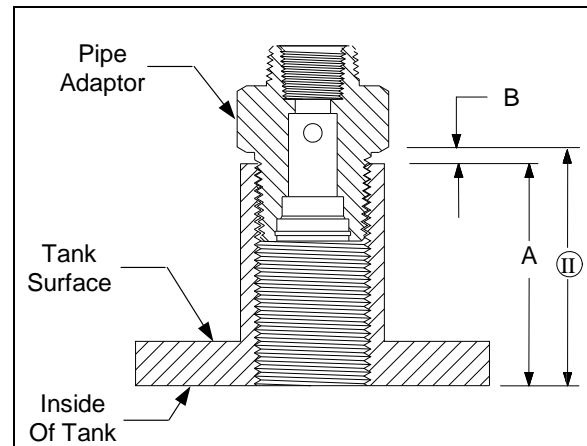


Figure 1

Step 4 – See Fig. 2

Thread float switch assembly into float drop tube, hand tighten, and measure exposed thread.

Record this value as C.

Add 1.19 inches to C and record this value as (III).

Step 5

Use the following equation to determine required float drop tube length:

For High Level:
 Required Length = Tank Diameter – I + II - III + 1.5 inches
 (See Float Tube Worksheet)

For Low Level:
 Required Length = I + II – III +1.5 inches
 (See Float Tube Worksheet)

For larger tanks it may be necessary to use multiple pieces of the 36" SST Tubing (Part Number C05295M) threaded together with 1/8" SST Nipples (Part Number 202430) to obtain the length required. See Figure 3. Once the necessary length has been determined, thread together the tubing and then cut the tubing assembly to the required length and deburr.

WARNING: Chamfer and De-burr the end of the pipe before proceeding. Failure to do so may result in cut o-rings.

NOTE: Both ends of tube are threaded. Either end may be cut.

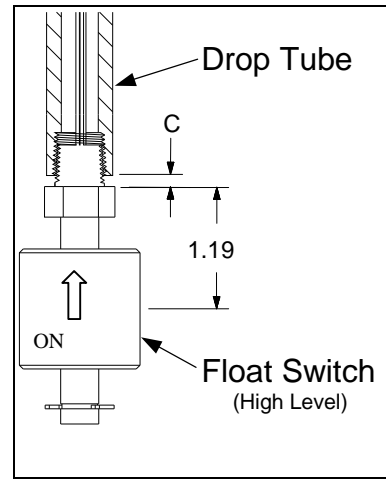


Figure 2

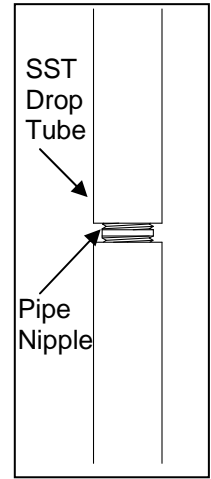


Figure 3

FLOAT TUBE WORKSHEET									
TANK TYPE									
Horizontal / Vertical Tanks - See Step 2									
Horizontal May Also Use Tank Chart (Page 6)									
			Riser Pipe Height	<input type="text"/>	(A)	<input type="text"/>	(C)	Switch Thread Reveal	
			Adaptor Thread Reveal	+	<input type="text"/>	(B)	+	1.19	(D) Fluid Level
High Level	Float Drop Tube Length =	Tank Diameter or Tank Height	<input type="text"/>	-	Minimum Ullage (I)	<input type="text"/>	+	<input type="text"/>	(II) - <input type="text"/>
									(III) + 1.5 = <input type="text"/> Inches
Low Level	Float Drop Tube Length =		Minimum Ullage (I)	<input type="text"/>	+	<input type="text"/>	(II) - <input type="text"/>	(III) + 1.5 = <input type="text"/> Inches	

Step 6

NOTE: Apply proper thread sealant (i.e. Teflon tape) to float switch threads before tightening. Attach float switch to float drop tube by running the two (2) switch wires through the tube and tightening the switch into the tube threads.

Step 7 – See Fig. 4

Lubricate the outside of the cut end of the drop tube.

Run wires through bottom of tank adaptor and firmly insert float drop tube into the tank fitting. Secure the drop tube firmly with the supplied set screw.

Step 8 – See Fig. 5

Run the two (2) switch wires through the wire fitting, and fasten fitting securely into tank fitting. Make sure to apply proper thread sealant (i.e. Teflon tape) to the wire fitting before tightening.

WARNING: DO NOT over-tighten plastic wire fitting. Over-tightening may cause stripping of threads.

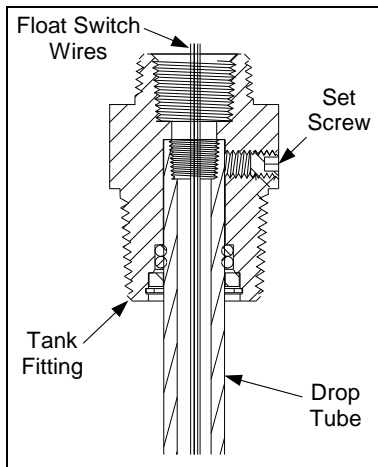


Figure 4

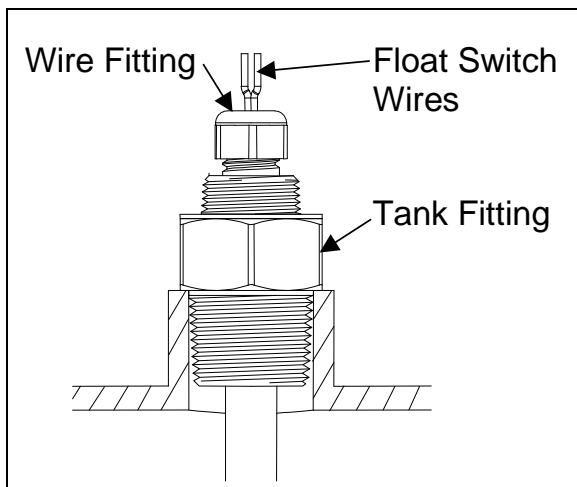


Figure 5

Step 9

Apply proper thread sealant (i.e. Teflon tape) to tank fitting, and thread into tank opening.

Step 10 (444TA ONLY)

Repeat steps 2-9 up to three times to utilize all four available switches if applicable.

Instructions to Convert to Low Level:

Step 1

Remove the retaining ring and reverse the float switch. An arrow points in the alarm on direction. (See Figure 5.5)

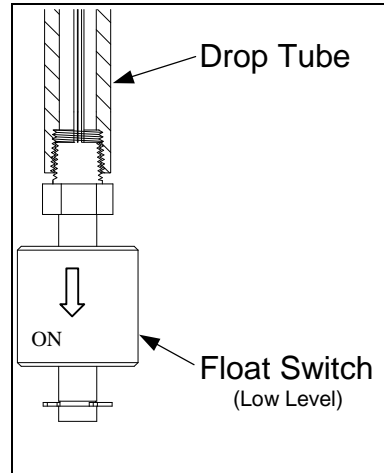


Figure 5.5

Step 2

Reattach the retaining ring and complete assembly.

Box Mounting Instructions:

Step 1

Mount enclosure back to remote fill spill container or other desired location using the blind holes in the enclosure.

NOTE: Make sure to use screws that do not puncture the blind holes in the enclosure to keep the enclosure's weather resistant integrity.

Step 2 – See Fig. 6

Run wiring to remote alarm location (per NFPA 30A Automotive and Marine Service Station Code for Electrical Equipment – Chapter 7).

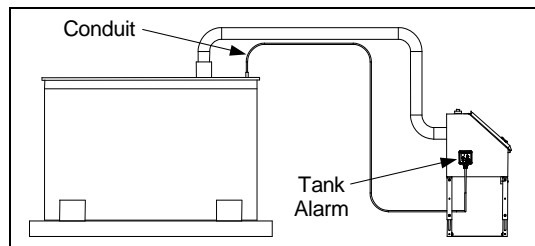


Figure 6A-144TA Installation

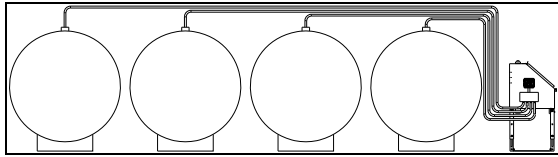


Figure 6B-444TA Installation

NOTE: Junction box(es) and conduit (not supplied) are required for running to a remote fill. Installation needs to follow Article 501 Class I locations in the NEC code.

Step 3

Insert electrical conduit from junction box through one of the two holes in the bottom of the enclosure only.

Step 4

Trim wires to approx. 10-12 inches long. Use wire strippers to strip back approx. ¼” of thread insulation. Secure the wires to two (2) inputs on one of the four terminal blocks available, and note which block goes to which sensor.

NOTE: Wire orientation in terminal block is not important.

Step 5

Repeat steps 12-14 for each of the sensors that will be in use.

Step 6

Fasten lid assembly to rear enclosure using the four (4) provided plastic screws.

Step 7

Test alarm following the “Instructions for Testing Tank Alarm”.

Step 8 –See Figure 7

For the 444TA use a sharpie or equivalent style marker to write which alarm goes to which tank or operation on the upper label shown in Figure 7. When finished, apply the clear cover to the label. (See Figure 7)

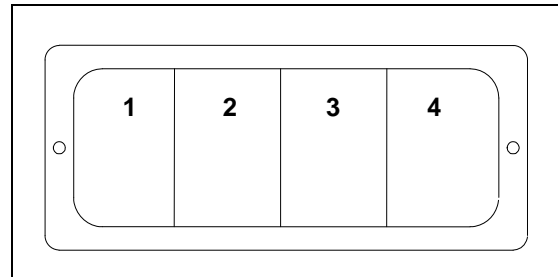


Figure 7

Instructions for Testing Tank Alarm

Step 1

Push switch down. An audio signal should be heard and a red flashing LED should be visible. Release switch.

Step 2

Lift float up and down, allowing system to sound alert, and repeat several times.

Step 3

Repeat steps 1 and 2 for each float switch that is attached to alarm. Test each alarm separately.

Low Battery Indicator

A yellow LED will be displayed when battery power is low and the test switch is activated. Replace battery module as necessary, using only the replacement battery module supplied by OPW. (See Replacement Parts on page 1)

HORIZONTAL TANK CALCULATIONS

HORIZONTAL TANK DIAMETER (in.)	PRODUCT LEVEL AT:		HORIZONTAL TANK DIAMETER (in.)	PRODUCT LEVEL AT:	
	90% (in)	95% (in)		90% (in)	95% (in)
30	25.3	27.1	126	106.3	113.8
34	28.7	30.7	130	109.7	117.4
38	32.1	34.3	134	113	121
42	35.4	37.9	138	116.4	124.6
46	38.8	41.5	142	119.8	128.2
50	42.2	45.2	146	123.2	131.8
54	45.6	48.8	150	126.5	135.5
58	48.9	52.4	154	129.9	139.1
62	52.3	56	158	133.3	142.7
66	55.7	59.6	162	136.7	146.3
70	59	63.2	166	140.1	149.9
74	62.4	66.8	170	143.5	153.5
78	65.8	70.4	174	146.9	157.1
82	69.2	74	178	150.3	160.7
86	72.5	77.7	182	153.7	164.3
90	75.9	81.3	186	157.1	167.9
94	79.3	84.9	190	160.5	171.5
98	82.7	88.5	194	163.9	175.1
102	86	92.1	198	167.3	178.7
106	89.4	95.7	202	170.7	182.3
110	92.8	99.3	206	174.1	185.9
114	96.2	102.9	210	177.5	189.5
118	99.5	106.6	214	180.9	193.1
122	102.9	110.2	218	184.3	196.7



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