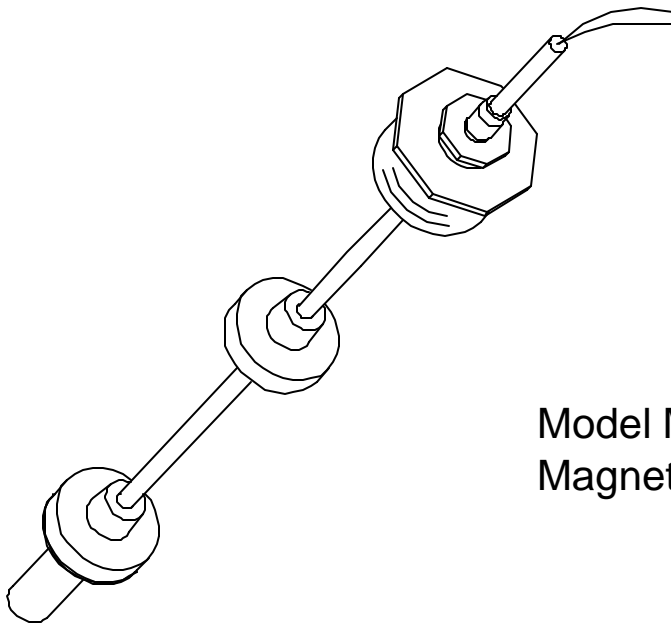


## TMS Series MP46x Flex Probes\*

### Installation Instructions



Model MP461, MP462 And MP463  
Magnetostrictive Flex Probes

Installation For: MODEL TMS2000  
and MODEL TMS3000

**\* NOTE:**

*BEFORE USING THIS BULLETIN, VERIFY MODEL NUMBER ON PROBE LABEL IS MP46x.  
"X" CAN BE NUMBER 1, 2, OR 3.*

TEL: (631) 293-8450  
FAX: (631) 293-8533  
PNEUMERCATOR TECHNICAL SUPPORT  
1 (800) 209-7858

**General System Overview** : Figure 1 shows a block diagram of how the system should be configured for installation. It is supplied as a guide to planning the installation.

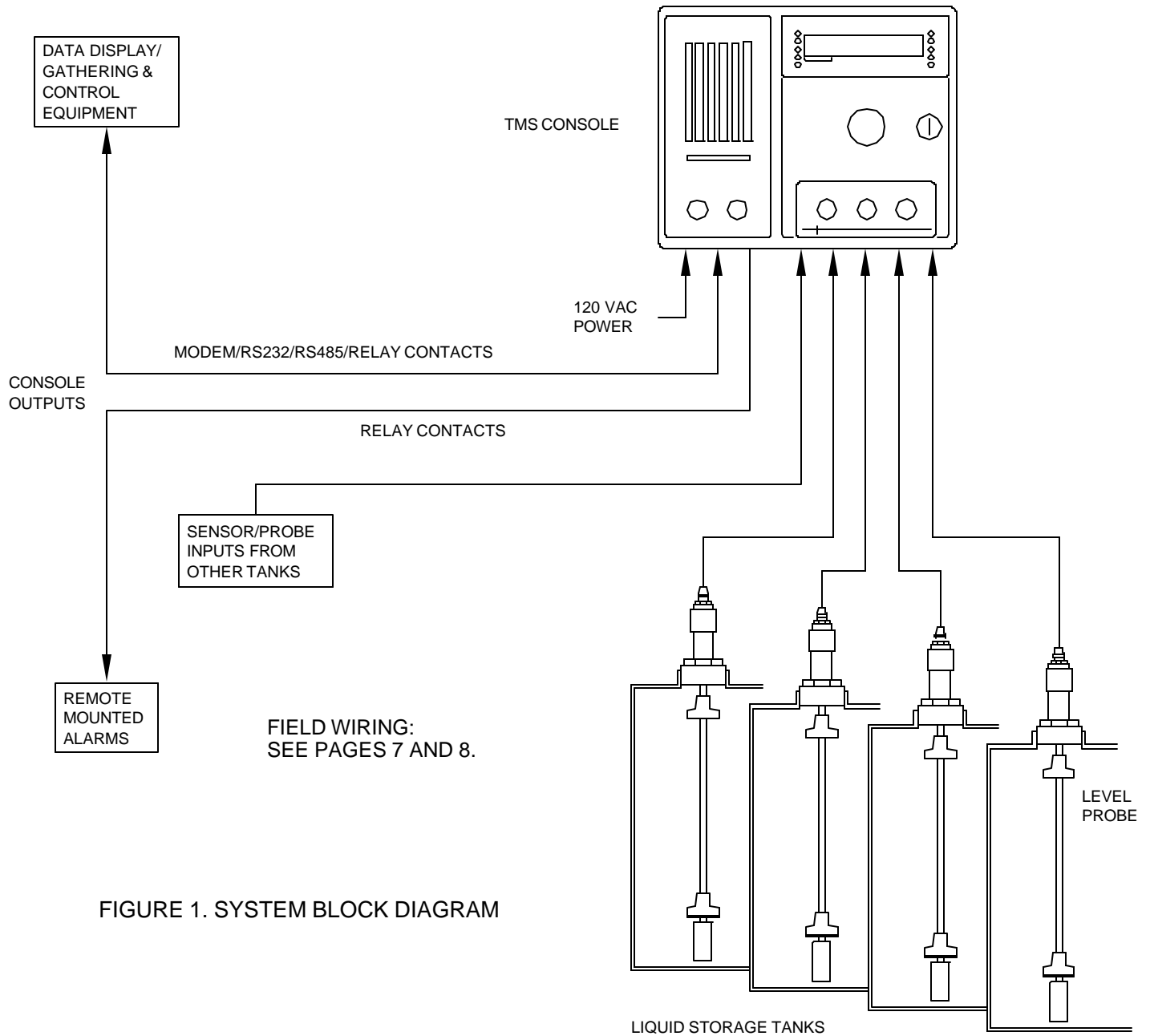


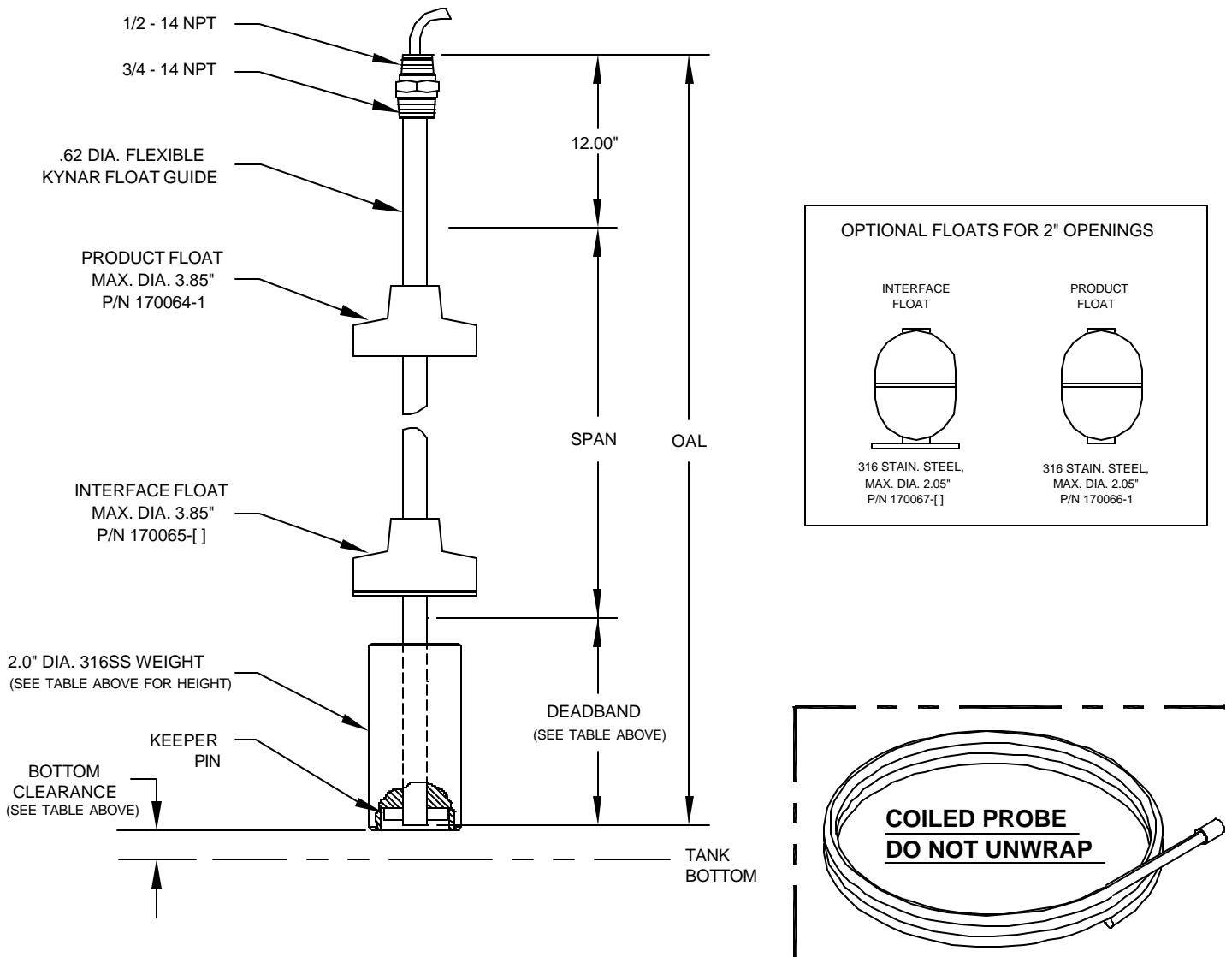
FIGURE 1. SYSTEM BLOCK DIAGRAM

**WARNING: THE TMS CONSOLE IS DESIGNED AND APPROVED TO SAFELY INTERFACE TO PROBES OR SENSORS LOCATED IN EXPLOSIVE ENVIRONMENTS WHEN INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. ABSOLUTELY NO MODIFICATIONS ARE PERMITTED. USE ONLY THE PROVIDED CONDUIT ENTRIES, AND ONLY FOR THEIR DESIGNATED PURPOSES. ANY CONSOLE MODIFICATIONS SHALL ABSOLUTELY VOID ALL WARRANTIES, AND MAY RESULT IN PERSONAL INJURY OR PROPERTY LOSS.**

**Applications:** Flex Probes are designed for use in certain chemical applications, large vertical tanks or tanks that have a low ceiling clearance or other obstruction that prevents installation of a rigid probe.

**Product Description:** The MP46x Series consists of (3) separate models, distinguished by the probe's overall length, as shown in table below. The probes are available with either (1) or (5) thermistors for optional temperature sensing and are supplied with (1) interface float and (1) product float for level control (May be supplied without interface float for additional gauging of tank bottom).

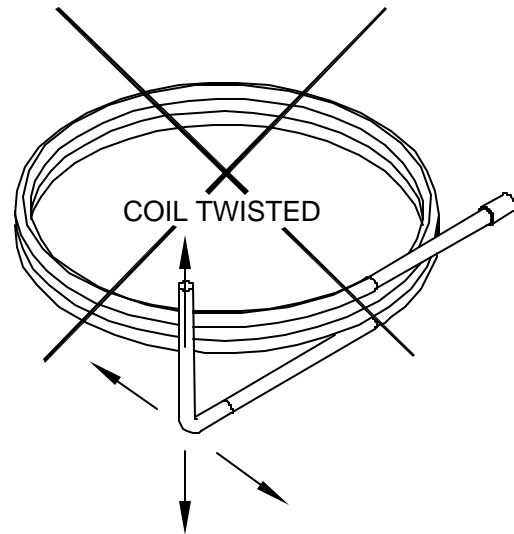
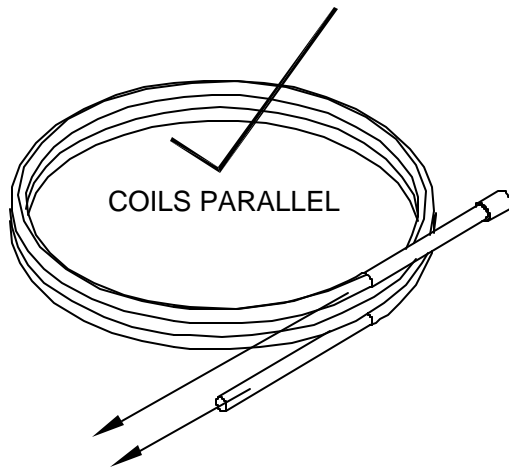
MODEL NO.	OAL (IN.) (Overall Length)	BOTTOM CLEARANCE (IN.)	BOTTOM DEADBAND DIMENSION (IN.)	WEIGHT HEIGHT (IN.)	HEIGHT (ABOVE TANK) FOR OPENING TYPES ON PAGE 5
MP461	151 - 216	2.00	6.00	4.25	12 INCHES MINIMUM SEE PAGE 6
MP462	217 - 288	2.00	6.00	4.25	
MP463 SEE NOTE BELOW	289 - 480	3.00	8.00	6.25	
	481 - 600	4.00	9.00	7.25	



**Unpacking:** **DO NOT LIFT THE PROBE BY IT'S ELECTRICAL CABLE!** Remove the probe and it's associated parts from the shipping crate(s) and inspect them for physical damage. **IMPORTANT: DO NOT CUT THE TIE WRAPS AND UNCOIL THE PROBE!** Advise PNEUMERCATOR and the shipping company immediately if any parts are missing or damaged. Consult the factory if you are not sure that the parts you received are suitable for your application.

**NOTE:** Installation is only recommended with temperatures exceeding 40°F. For cooler temperatures, the probe needs to be warmed inside a building. This will help prevent tube cracks and probe damage during installation.

**WARNING: WHILE HANDLING THE PROBE AND DURING INSTALLATION, KEEP THE COILS PARALLEL ! DO NOT LIFT ONE COIL SEPARATELY FROM THE OTHER COILS. DO NOT TWIST THE COILS. DO NOT BEND THE TOP 2 FEET OF THE PROBE.**



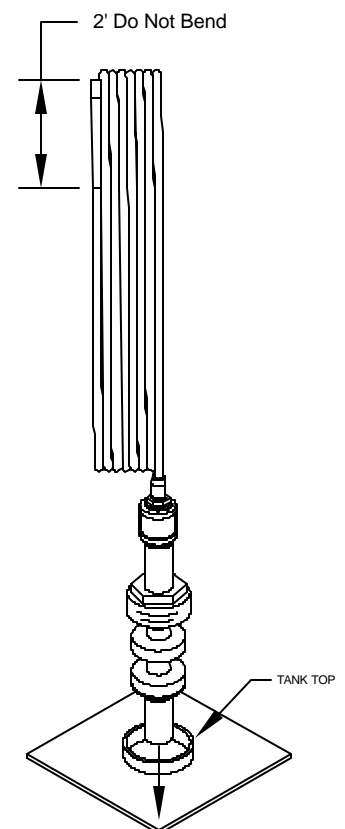
**NOTE:** Installation must be done by 2 qualified personnel, familiar with local wiring codes and explosion hazard electrical practices.

**INSTALLATION:** Without unwrapping it, carry the flex probe over your shoulder, and have the second installer carry the other components, to the top of the tank.

1. Confirm the OAL of the probe and bottom clearance against your mounting height. The probes OAL can be found on the yellow tag attached to the probe. It is the last 3 digits of the catalog number after the "L". example" 7100K182T1XF2L 202. From the table on page 3, note the required bottom clearance and mounting height. Select nipple length to achieve the required mounting height and bottom clearance.
2. Keeping the probe over your shoulder, have the second installer cut ONLY the tie wrap at the end of the tube with a hole through it, marked #1.
3. Install the appropriate equipment on the end of the probe in the order (6-10) and orientation shown on the preceding page, making sure to support the end of the probe to keep it from twisting.
4. With the probe still coiled and resting on your shoulder, carefully feed through the tank opening, cutting the tie wraps only when necessary. They have been sequentially marked in the order that they must be cut.

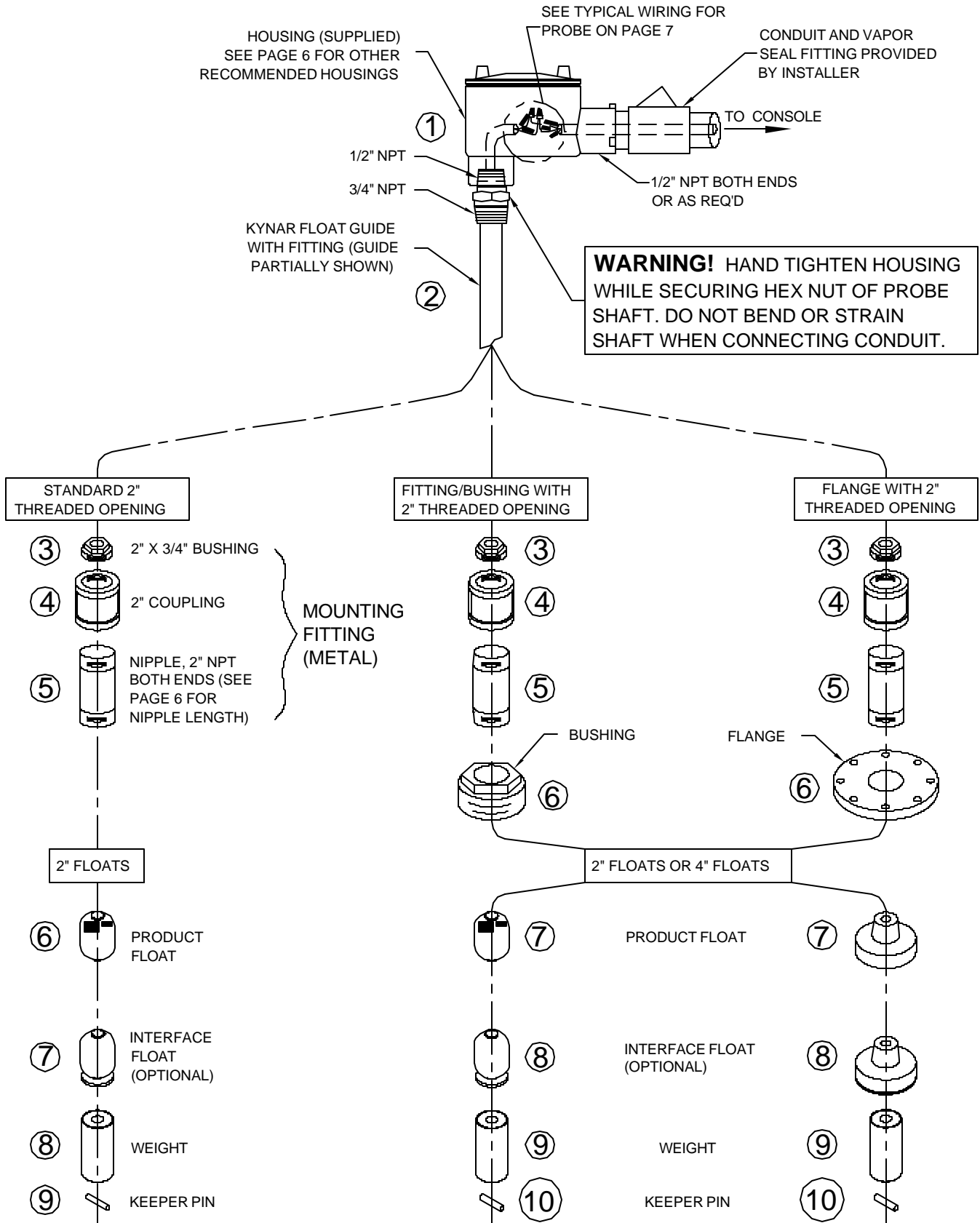
**THE TOP 2 FEET OF THE PROBE HAS ELECTRONIC COMPONENTS MOUNTED INSIDE. DO NOT BEND THE TOP 2 FEET OF THE PROBE.**

5. Before you screw the mounting fitting (nipple, coupling and bushing) in, verify that the weight will not hit the bottom of the tank when the probe is mounted.
6. Screw the mounting fitting into the threaded tank opening, the tank fitting or secure the flange.

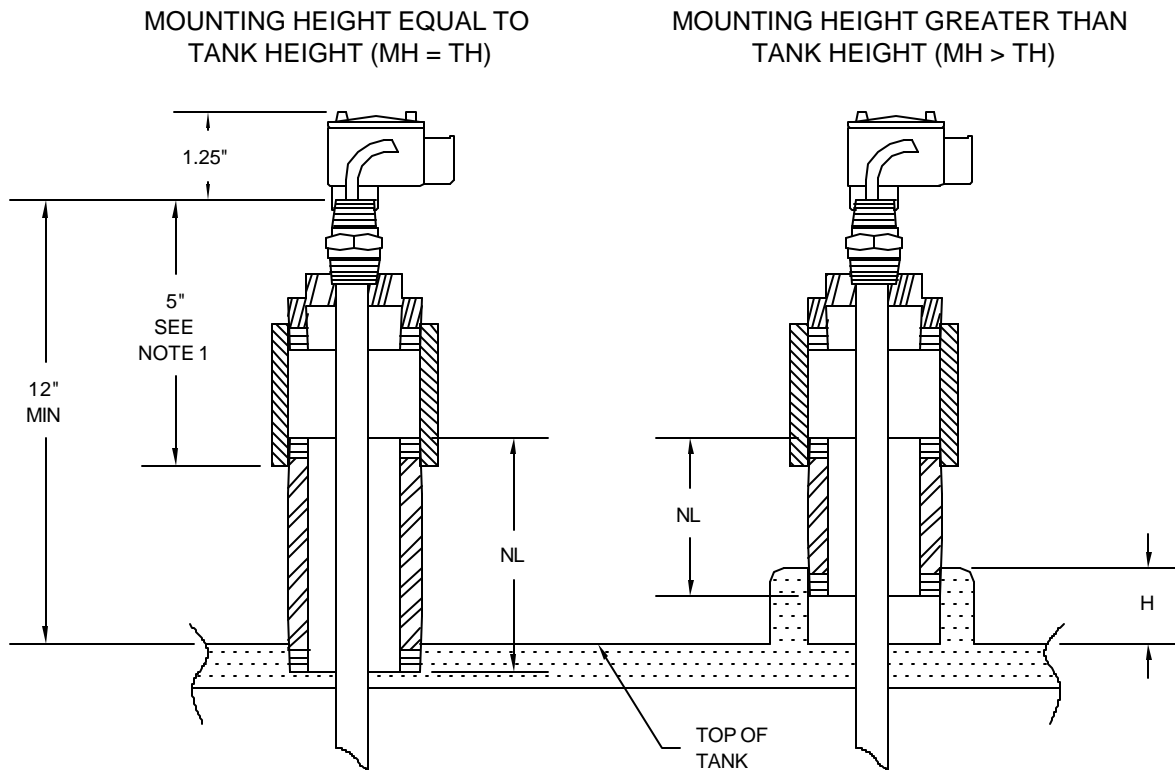


# PARTS NECESSARY FOR INSTALLATION

**NOTE:** TANK OPENING SHOULD BE THE SAME AS OR GREATER THAN FLOAT SIZE. PROBE MOUNTING LOCATION SHOULD BE SELECTED TO MINIMIZE EFFECT FROM TURBULENCE.



# CALCULATING NIPPLE LENGTH



**FORMULA** (ALL MEASUREMENT IN INCHES) : **NL = OAL - MH + BC - 4**

WHERE: NL = NIPPLE LENGTH

OAL = PROBE OVERALL LENGTH (SEE PROBE LABEL)

MH = TANK MOUNTING HEIGHT MEASURED FROM INNER BOTTOM TO TOP OF THREADED OPENING OR TH + H.

TH = TANK HEIGHT MEASURED FROM INNER BOTTOM TO TANK ROOF.

H = THE HEIGHT FROM TOP OF TANK TO WHERE NIPPLE WILL BE INSTALLED.

BC = PROBE BOTTOM CLEARANCE FROM TABLE ON PAGE 3.

**NOTE:**

1. THIS DIMENSION IS 5" WHEN STANDARD METAL 2" X 3/4" BUSHING (TYPICALLY 1 3/8" OVERALL HT) AND 2" COUPLING (TYPICALLY 2 1/2" OVERALL HT) IS USE IN MOUNTING ASSEMBLY.

**NIPPLE LENGTH CALCULATION EXAMPLE 1:**

OAL (from probe label) = 419"      MH = 403"

BC (from table on page 3) = 3"

$$NL = 419 - 403 + 3 - 4 = 15"$$

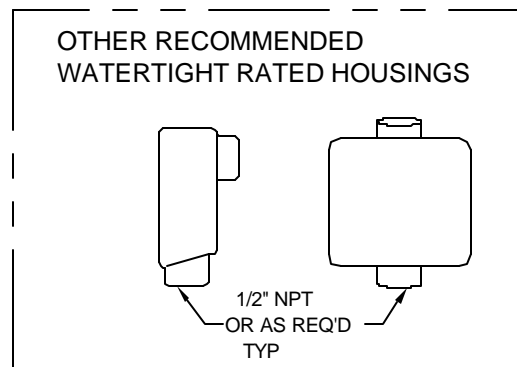
**NIPPLE LENGTH CALCULATION EXAMPLE 2:**

OAL (from probe label) = 537"      TH = 512"      H = 5"

BC (from table on page 3) = 4"

$$MH = 512 + 5 = 517"$$

$$NL = 537 - 517 + 4 - 4 = 20"$$



**Wiring:** Intrinsically Safe Input wiring: Wire and install in accordance with Article 504 of National Electric Code ANSI/NFPA 70. Non-Intrinsically Safe Wiring can not be run in conduit or open raceways together with intrinsically safe wiring.

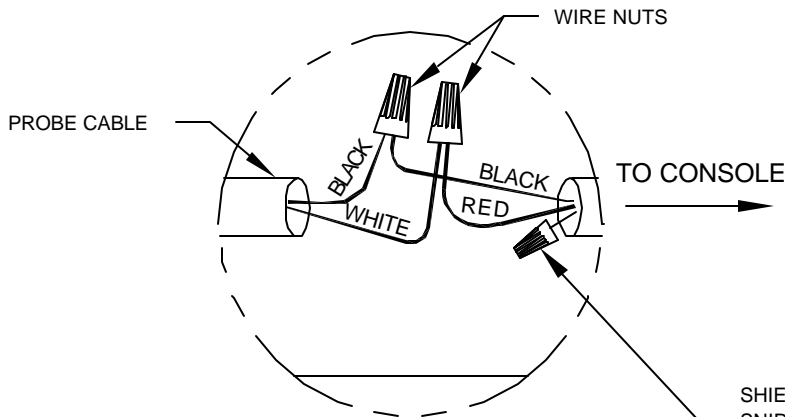


**CABLE SELECTION:**

Use Belden 8441, or Alpha 1736C or any equivalent 2-conductor, 22 awg shielded, twisted-pair cable, refer to TMS installation manual for more cable selection information. The shield wire must be connected to the PROBE SHIELD TERMINAL in the console I.S. compartment and terminate at the junction box, where it must be isolated. (See probe wiring below)

**TYPICAL WIRING FOR PROBE**

NOTE: WIRING MUST BE DONE IN WATERTIGHT RATED BOX/HOUSING.

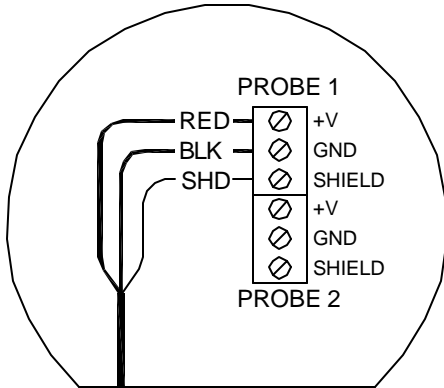


\* SEAL WIRE SPLICES AND CABLE SHEATH ENDS WITH SUITABLE WATERPROOFING SEALANT; OR USE ENCLOSED EPOXY SPLICE KIT PCO PART NUMBER 10518-2.

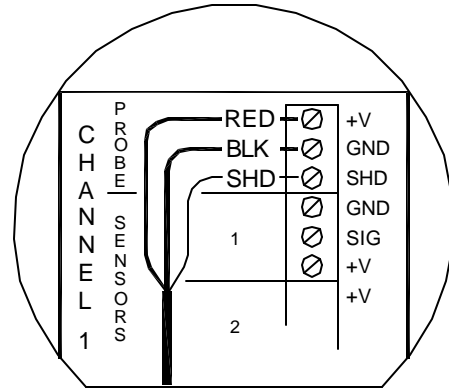
**WARNING!** DO NOT BEND OR STRAIN MOUNTED HOUSING WHEN CONNECTING CONDUIT OR AT ANY OTHER TIME.

**Wiring continued:**

**TYPICAL WIRING FOR TMS CONSOLES**



TMS2000 PROBE INPUT WIRING



TMS3000 PROBE INPUT WIRING

**Programming:** Information necessary for programming this probe can be found on the tag attached to the probe. One side of the tag has certification information and the other side has information needed to program the TMS console to enable this probe. Copy the information from the tag on the probe onto this sheet and onto the tank worksheet in the TMS Operation Manual for referencing when programming the TMS. If you have more than 6 probes, make a copy of this sheet.

PROBE NAME, LOCATION OR DESCRIPTION: \_\_\_\_\_  
 SERIAL NO. \_\_\_\_\_  
 P/N 7100 K \_\_\_\_\_  
 Probe Cal. Factor: \_\_\_\_\_  
 Probe Type: MP46\_\_  
 Probe Length: \_\_\_\_\_

PROBE NAME, LOCATION OR DESCRIPTION: \_\_\_\_\_  
 SERIAL NO. \_\_\_\_\_  
 P/N 7100 K \_\_\_\_\_  
 Probe Cal. Factor: \_\_\_\_\_  
 Probe Type: MP46\_\_  
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 Probe Type: MP46\_\_  
 Probe Length: \_\_\_\_\_

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PROBE NAME, LOCATION OR DESCRIPTION: \_\_\_\_\_  
 SERIAL NO. \_\_\_\_\_  
 P/N 7100 K \_\_\_\_\_  
 Probe Cal. Factor: \_\_\_\_\_  
 Probe Type: MP46\_\_  
 Probe Length: \_\_\_\_\_