TPZ
Operation Manual

Estevan Meter
www.estevanmeter.com
(306) 634-5304

321 Imperial Avenue
Box 355
Estevan, Saskatchewan
S4A 2A4

Manufactured in Canada

Ph (306)634-5304
Fax (306)634-5887

Web Site www.estevanmeter.com

E-Mail reception@estevanmeter.com

TPZ Manual WARRANTY STATEMENT

WARRANTY: Estevan Meter Services warrants all equipment of its own manufacture to be free of defects in material and workmanship for a period of twelve (12) months from date of shipment. Estevan Meter Services' sole obligation hereunder shall be expressly limited to repair or exchange free of charge, F.O.B. Estevan, Saskatchewan, Canada, of such defective equipment (alternatively, Estevan Meter Services will, at its option, refund the purchase price). Estevan Meter Services' obligation under this warranty is limited to the above and does not apply to exchange or repairs which are required as a result of improper installation, misuse, maladjustment, abnormal operating conditions, or lack of routine maintenance. Nor does the warranty include the furnishing of service for maintenance or problems arising from the foregoing causes. No claims for labour, installation, removal, transportation, or other expenses will be recognized. Notwithstanding any stipulation of the purchaser to the contrary, all other obligations, representations, warranties and conditions, express or implied, statutory or otherwise, including any implied warranties or conditions of merchantability, quality or fitness are hereby excluded and Estevan Meter Services shall not be liable for any loss, cost or damages, of any kind whatsoever, whether consequential, indirect, special or otherwise, arising out of or in connection with the equipment or any defect therein, even if caused by the negligence of, Estevan Meter Services, its employees or agents. The provisions hereof relating to the warranty and limitations hereon and limitation of liability shall continue to be enforceable between the parties notwithstanding termination of the within agreement for any reason including fundamental breach. Equipment not of, Estevan Meter Services manufacture will carry the vendor's or manufacturer's standard warranty.

Estevan Meter
Est. 1967

321 Imperial Avenue
Box 355
Estevan, Saskatchewan
S4A 2A4

Ph (306)634-5304
Fax (306)634-5887

TABLE OF CONTENTS

Estevan Meter
Est. 1967

321 Imperial Avenue
Box 355
Estevan, Saskatchewan
S4A 2A4

Ph (306)634-5304
Fax (306)634-5887

1.0 System Description

This patented system contains a digital pulse generator, composed of two phototransistors, generating digital pulses in response to rotation of the optical disc. Rotation of the optical disc is in direct response to vertical movement of the float. Two pulse lines exist, one for each direction of fluid movement. Pulses are transmitted into an electronic counter (e.g. Omron Display), 4-20mA Converter, or Estevan Meter Services' 3500 series controller via instrument cable. Each unit consistently indicates the fluid level in the vessel as well as provides the user with programmable set points for alarms, auto dial call-out, emergency shut down; pump start/stop, and timer back up. The controllers are also capable of computer communications through built-in RS-232 (3500) port.

To ensure consistent accuracy, this system provides positive contact with the fluid at all times. Using this technique changes in fluid density, vapour pressures, rapidly fluctuating fluid, or extreme temperatures have no negative effect on the accuracy.

TPZ liquid level measurement systems are constructed of minimal mechanical components. All components are made of high strength, non-corrosive, wear resistant materials.

1.1 Patent Numbers

4 983 855
1 321 892

1.2 Specifications

- Transmitter is CSA approved (LR8319)
  - Class I, Groups C & D
  - Class II, Groups E, F, & G
- Power supply: Solar power, 12vdc, 24vdc, 120vac, 240vac
- PLC compatible

1.3 Typical Applications

- Tank farms containing any number of tanks up to 75 feet high (call factory for heights greater than 75 feet)
- Single tank applications
- Portable test tanks
- Rig/mud tanks (monitor mounted in doghouse rig floor mount)

Estevan Meter
Est. 1967

321 Imperial Avenue
Box 355
Estevan, Saskatchewan
S4A 2A4

Ph (306)634-5304
Fax (306)634-5887

1.4 Installation

- Minimal time
- In service installation

1.5 Lubrication

Oil bathed, twin compartment, double sealed to eliminate possibilities of H2S contamination.

2.0 Tank Transmitter Kit

2.1 Overview/Description

The 3310-transmitter kit is the heart of the TPZ system. It contains the digital pulse generator connected to the float through the stainless steel nylon coated measuring line. The transmitter is mounted external to the tank, usually within 12-14 inches of the thief hatch on the supplied mounting bracket. Internal to the tank is the float, stabilizer bracket, stabilizer weight, and stabilizer line. The transmitter is of stainless steel construction for resistance to H2S and other corrosive elements. It is sealed, thus preventing H2S leakage. Four (4) wires provide power and ground connection as well as a pulse up and pulse down line. The pulse lines have been tested to a wiring run of 1000ft. Consult factory if additional assistance is required.

Below is a view of the transmitter as it is installed in the tank. The installation notes (2.2) refer to components in it.

2.2 Installation

The following notes apply to in-service and new tank installations.

1. Cut enough stainless wire or nylon line to reach from the top of the tank to the bottom and back. Allow about 8 extra feet for installation. Thread wire equally through both sides of lead stabilizer weight and know the rope in the middle of the weigh to hold the weigh half way along the rope run.

2. Using the transmitter mounting bracket as a template, place the bracket within easy reach of the access hatch on tank, mark the three ½" holes. Mounting bracket should be oriented to cause the transmitter to be mounted as vertical as possible. Drill the 3 holes in tank top taking all appropriate safety

Estevan Meter
Est. 1967
321 Imperial Avenue
Box 355
Estevan, Saskatchewan
S4A 2A4
Ph (306)634-5304
Fax (306)634-5887

measures required by local conditions. This will likely call for the use of hand tools and lubricating fluid.

NOTE: This step may be omitted if the holes have been pre-drilled during tank fabrication.

3. Loosely fasten mount bracket and gasket by a nit and bolt through the hole at one end of bracket. The 2 outside holes are for fastening to the tank while the center hole is for the transmitter line to access the tank. Loosely fasten the stabilizer support bracket to the second outside hole of the mounting bracket. This will require nuts and washers on the threaded rod both inside and outside the tank.
4. Lower the stabilizer weight into the tank carefully, ensuring no twisting. Tie cables off to a handrail or otherwise prevent from falling into tank.
   NOTE: The stabilizer weight is not required if stabilizer tabs are welded into the floor of the tank.
5. Thread the loose ends of the stabilizer cable through the guide ferrules on the float. Ensure that the mounting lug on the float is oriented to the top of tank. Tie off the float with a line to prevent it falling to the bottom of tank.
6. Stabilizer ropes now have to be secured to the bracket. Feed the rope through the holes in the stabilizer bracket. The object is to have the weight held about one (1) inch off the bottom of the tank to provide tension to the stabilizer wires. Tie a knot in the rope so it is off the bottom of the tank approx. 1”.
7. Check that the stabilizer installation is correct without twists in the cables and with good tension on the cables. Tighten the nuts at both ends of the stabilizer bracket.
8. Install the transmitter by feeding the transmitter line through the center hole through the 1.5-inch NPT coupling and screwing transmitter to the mounting bracket until it is as tight as possible. (Do not tighten the transmitter via the electrical housing on the front of the transmitter.) Connect the transmitter line to the mounting lug on the installed float. The line is only required to pass through the bracket; the metal T will prevent the line coming back off the float. Untie the tether holding the float and gently lower to the bottom of the tank or onto the tank contents.
9. Using a funnel, pour 4-5 litres of UNIVIS into the transmitter spool compartment. Access is by removal of the plug on top.

The mechanical installation is now complete and ready for the electrical installation.

Estevan Meter
Est. 1967

321 Imperial Avenue
Box 355
Estevan, Saskatchewan
S4A 2A4

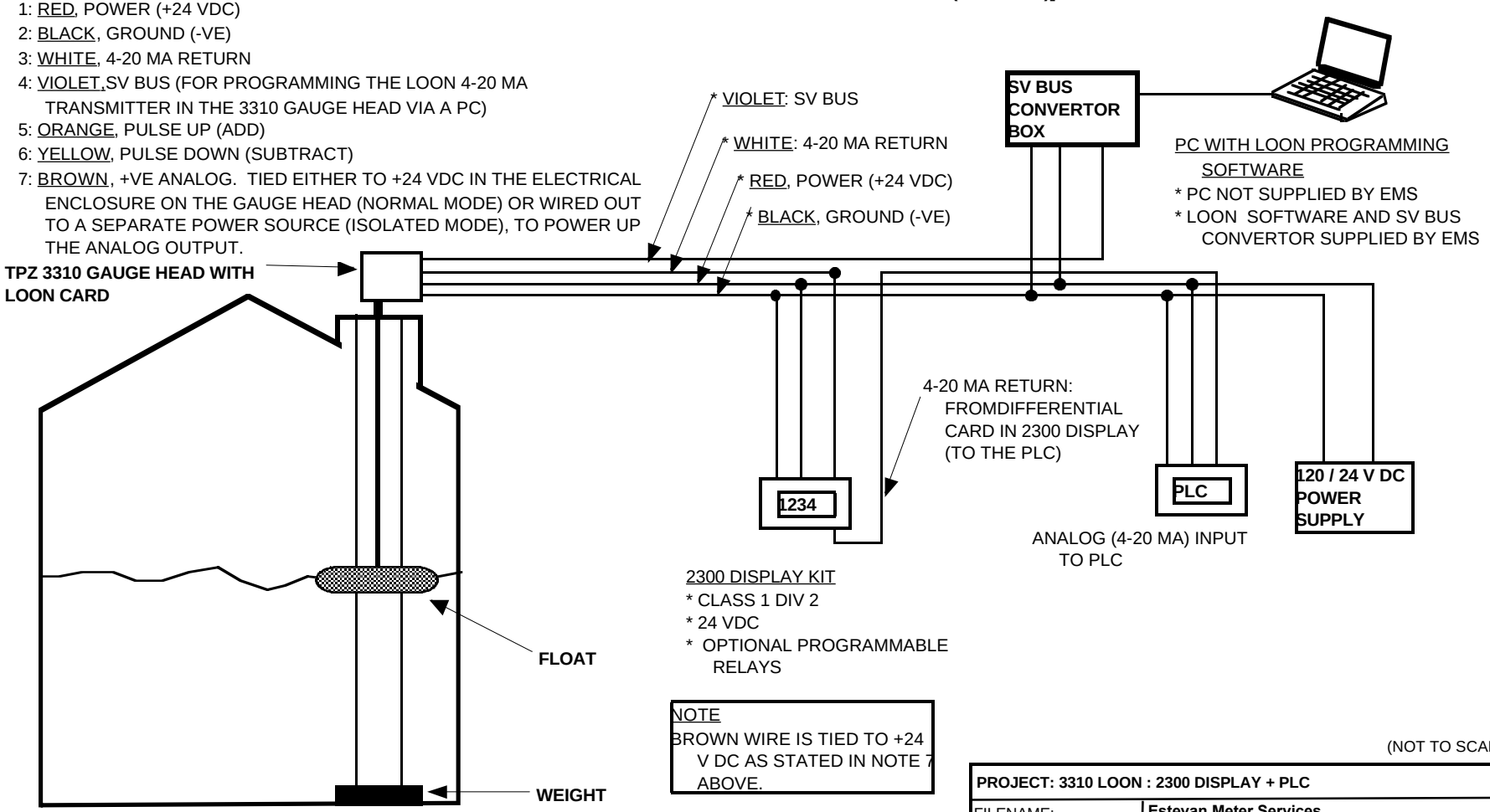
Ph (306)634-5304
Fax (306)634-5887

TPZ 3310 Loon: 4-20 mA to 2300 Display and then to PLC

WIRING FROM 3310 GAUGE HEAD-->WIRES FOR LOON 4-20 MA OUTPUT(TWISTED PAIR SHIELDED INSTRUMENT CABLE). WIRE COLORING FOR ALL WIRES SHOWN BELOW. ONLY WIRES 1 TO 4 ARE REQUIRED FOR NON-ISOLATED 4-20 MA OUTPUT. WIRE #7 (IE. #3 AND #7) ALSO REQUIRED IF CONNECTING THE 4-20 MA AS ELECTRICALLY ISOLATED. WIRES #5, #6 CONNECT TO OMRON DISPLAY.

1: RED, POWER (+24 VDC)
2: BLACK, GROUND (-VE)
3: WHITE, 4-20 MA RETURN
4: VIOLET,SV BUS (FOR PROGRAMMING THE LOON 4-20 MA TRANSMITTER IN THE 3310 GAUGE HEAD VIA A PC)
5: ORANGE, PULSE UP (ADD)
6: YELLOW, PULSE DOWN (SUBTRACT)
7: BROWN, +VE ANALOG. TIED EITHER TO +24 VDC IN THE ELECTRICAL ENCLOSURE ON THE GAUGE HEAD (NORMAL MODE) OR WIRED OUT TO A SEPARATE POWER SOURCE (ISOLATED MODE), TO POWER UP THE ANALOG OUTPUT.

NOTE: EMS RECOMMENDS THAT A BATTERY BACK UP SYSTEM OR UPS BE INSTALLED ON THE POWER SUPPLY LINE. BATTERY BACK UP IS RECOMMENDED TO ENSURE THE GAUGE HEAD ELECTRONICS DO NOT LOOSE TRACK OF THE FLOAT POSITION IN THE EVENT OF A POWER SUPPLY LOSS [EITHER LONG TERM (HRS, DAYS) OR SHORT TERM (SECONDS)].



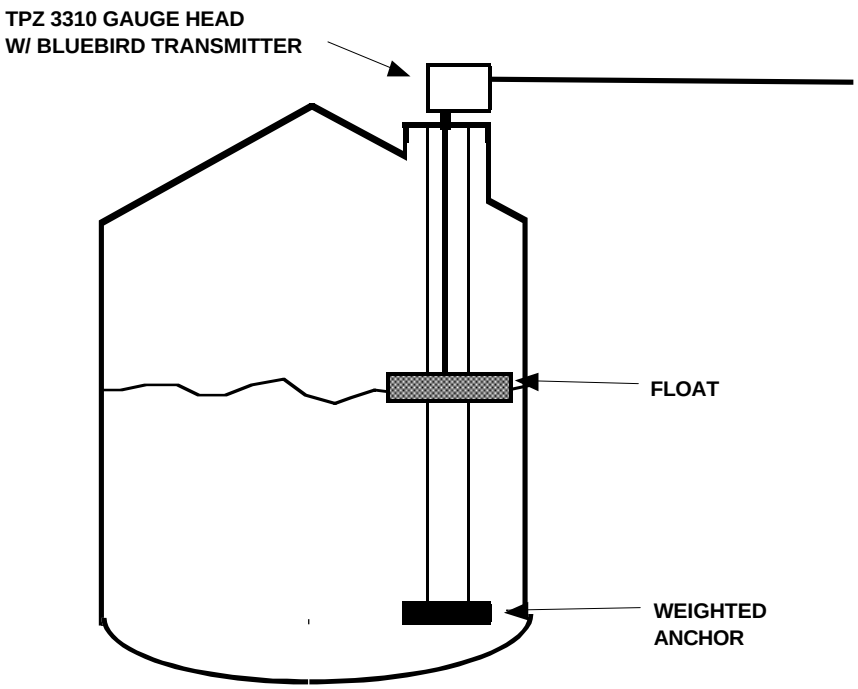
2300 DISPLAY KIT
* CLASS 1 DIV 2
* 24 VDC
* OPTIONAL PROGRAMMABLE RELAYS

NOTE
BROWN WIRE IS TIED TO +24 V DC AS STATED IN NOTE 7 ABOVE.

(NOT TO SCALE)

PROJECT: 3310 LOON : 2300 DISPLAY + PLC	
FILENAME: LOON4.CWK	**Estevan Meter Services (306) 634-5304**
PAGE: 1 OF 1	DESIGNER: GJM DATE:

WIRING FOR BLUEBIRD CARD ON TPZ 3310 LEVEL GAUGE



WIRING FROM 3310 GAUGE HEAD-->WIRES FOR BLUEBIRD.
WIRE COLORING FOR ALL WIRES SHOWN BELOW. WIRES #1 , #2 CONNECT TO 24 V DC POWER SUPPLY. WIRES #4, #5 PROVIDE PULSE OUTPUT FOR CONNECTION TO 3300 CONTROLLER, OMRON DISPLAY, OR 4-20 MA CONVERTOR UNIT. IF BLUEBIRD IS CONFIGURED WITH EXTENDED PULSE THEN WIRES #4, #5 CAN BE CONNECTED TO LOW SPEED DIGITAL INPUT CARDS ON PLC FOR TOTALIZING ON THE PLC. WIRE #3 IS THE COMMUNICATION WIRE BETWEEN THE BLUEBIRD AND THE RAVEN 4300 CONTROLLER.

1: RED, POWER (+24 VDC)
2: BLACK, GROUND (-VE)
3: VIOLET,SV BUS (FOR PROGRAMMING THE BLUEBIRD)
4: ORANGE, PULSE UP (ADD)
5: YELLOW, PULSE DOWN (SUBTRACT)

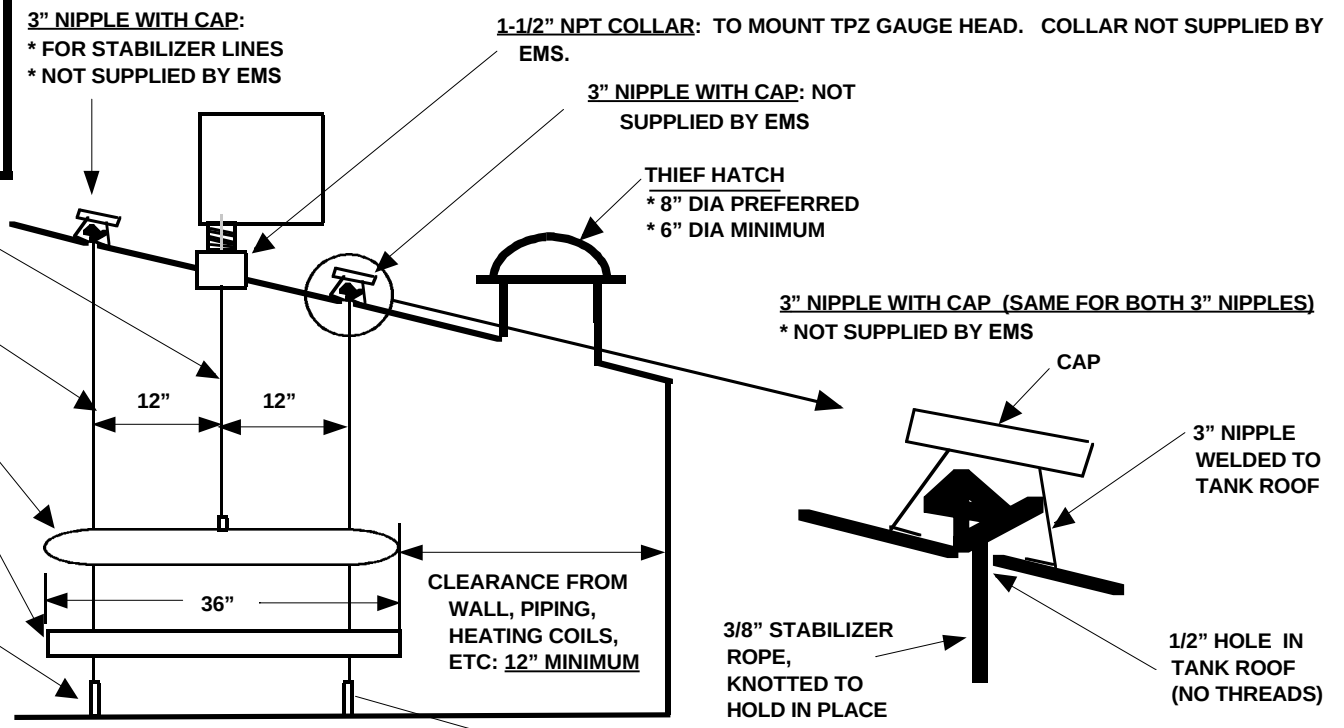
* RECOMMENDED WIRE GAUGE: 16 TO 18 AWG, SHIELDED, TWISTED PAIR.

NOTE: EMS RECOMMENDS THAT A BATTERY BACK UP SYSTEM OR UPS BE INSTALLED ON THE POWER SUPPLY LINE. ALTERNATIVELY, A RECHARGEABLE GEL CELL BATTERY CAN ALSO BE INSTALLED IN THE 3310 GAUGE HEAD FOR EACH GAUGE. BATTERY BACK UP IS REQUIRED TO ENSURE THE GAUGE HEAD ELECTRONICS DO NOT LOOSE TRACK OF THE FLOAT POSITION IN THE EVENT OF A POWER SUPPLY LOSS. POWER LOSS CAN BE EITHER LONG TERM (HRS, DAYS) OR SHORT TERM (SECONDS).

(NOT TO SCALE)

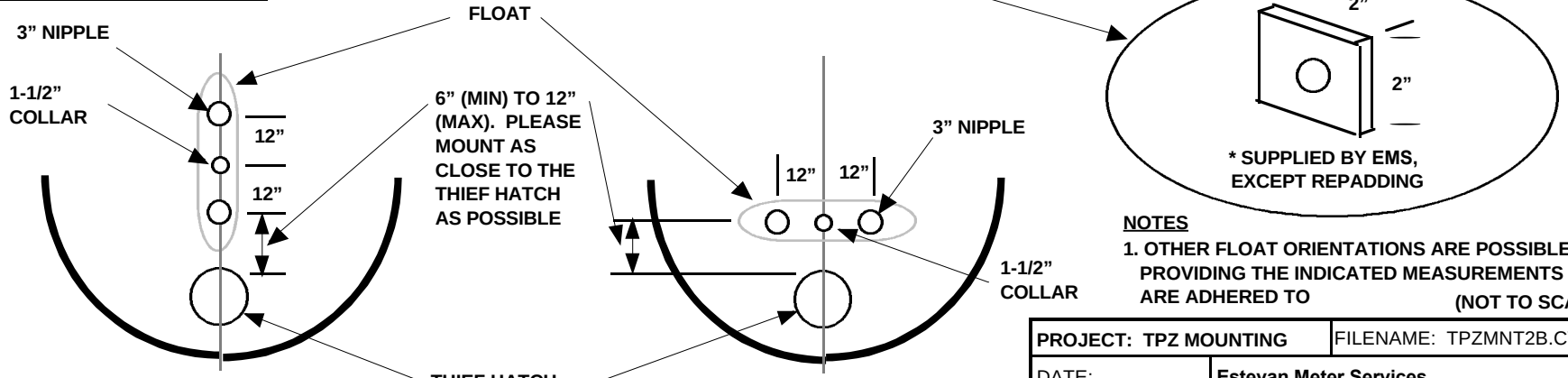
PROJECT: BLUEBIRD TRANSMITTER WIRING DIAGRAM	
FILENAME: BLUE_WIR.CWK	**Estevan Meter Services (306) 634-5304**
PAGE: 1 OF 1	DESIGNER: GJM DATE:

TPZ 3310 MOUNTING TEMPLATE #2B



SIDE VIEW OF TANK TOP

PLAN VIEW OF TANK TOP



ORIENTATION #1: FLOAT RADIALLY MOUNTED

ORIENTATION #2: FLOAT TANGENTIALLY MOUNTED

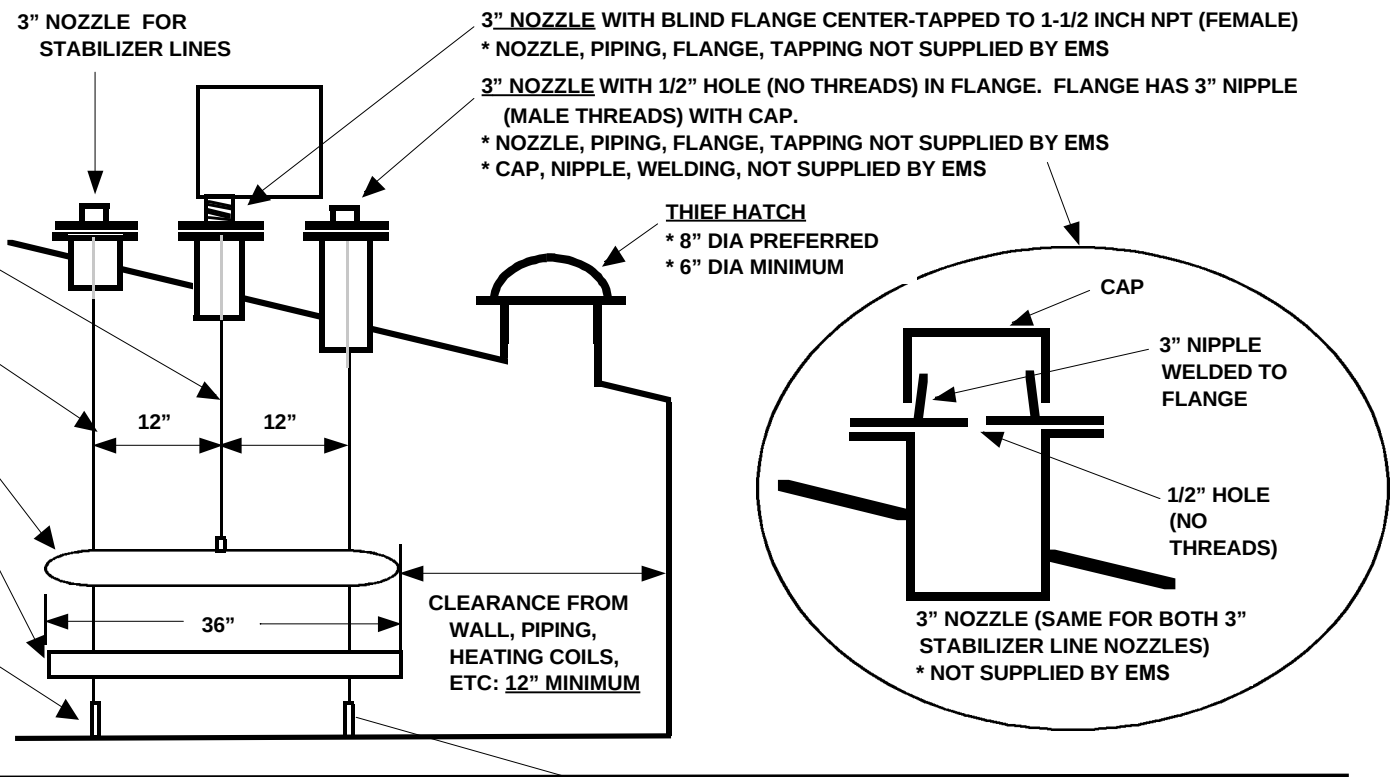
NOTES

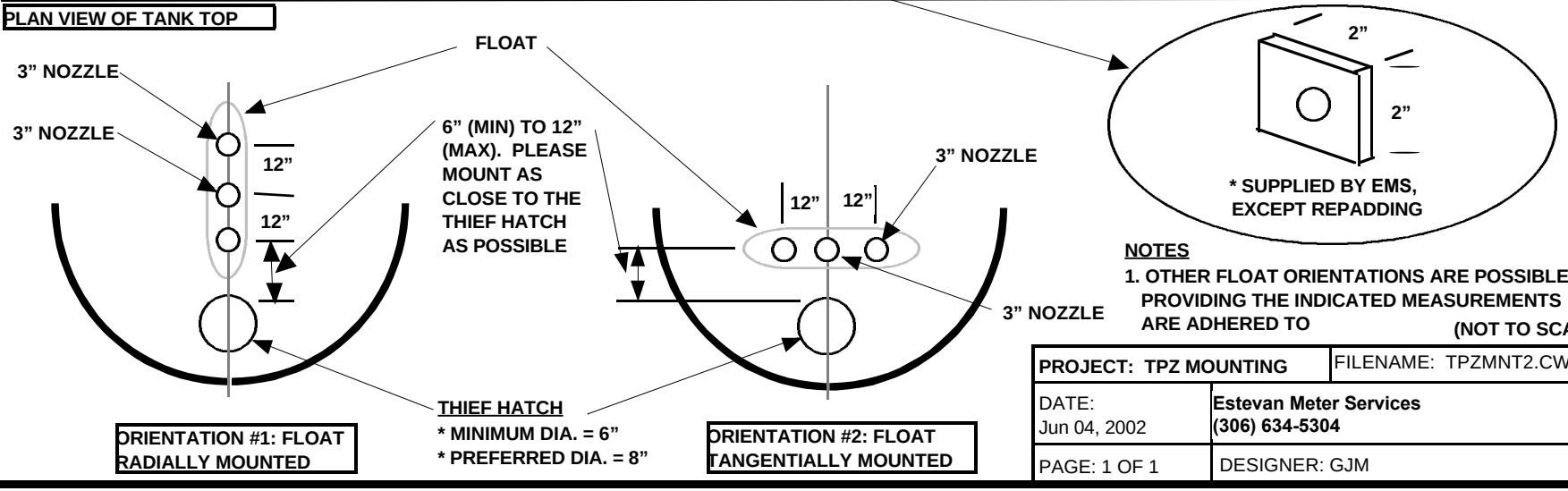
1. OTHER FLOAT ORIENTATIONS ARE POSSIBLE PROVIDING THE INDICATED MEASUREMENTS ARE ADHERED TO

(NOT TO SCALE)

PROJECT: TPZ MOUNTING	FILENAME: TPZMNT2B.CWK
DATE: Jun 04, 2002	**Estevan Meter Services (306) 634-5304**
PAGE: 1 OF 1	DESIGNER: GJM

TPZ 3310 MOUNTING TEMPLATE #2





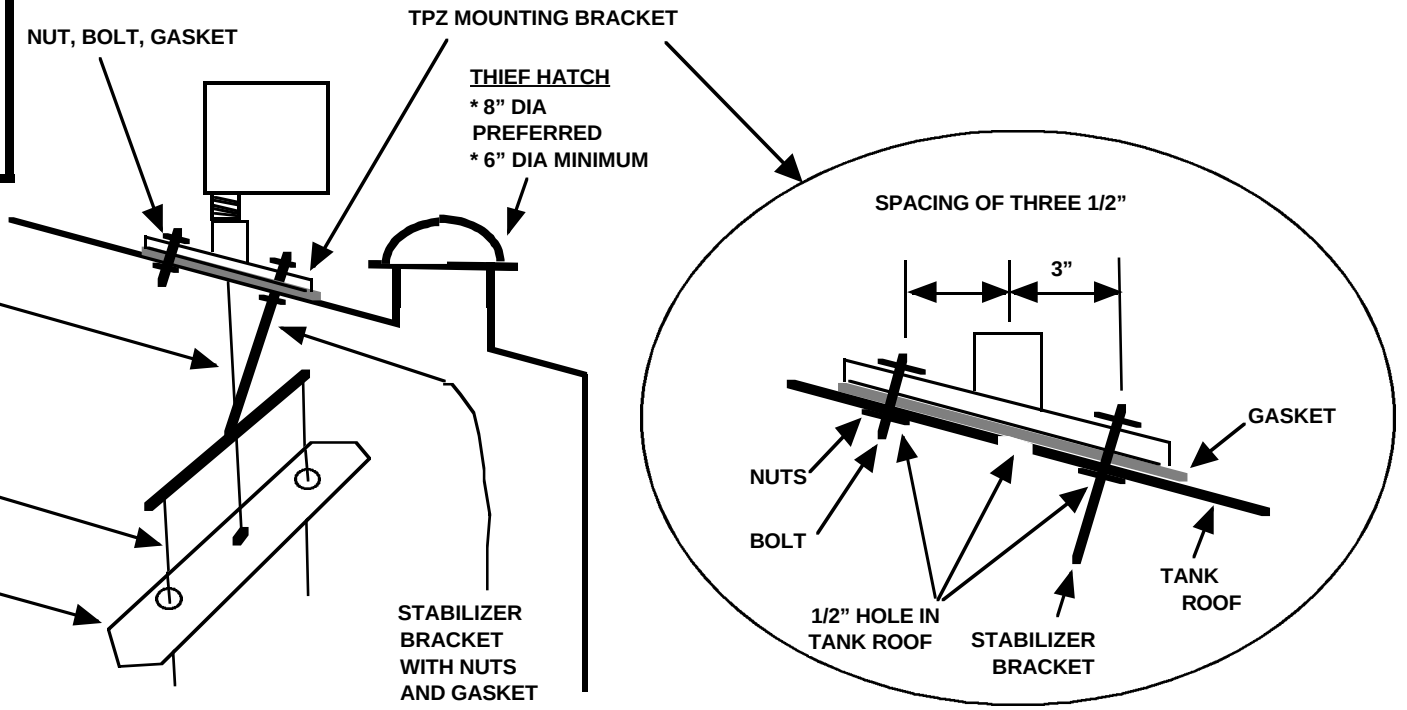
NOTES

1. OTHER FLOAT ORIENTATIONS ARE POSSIBLE PROVIDING THE INDICATED MEASUREMENTS ARE ADHERED TO

(NOT TO SCALE)

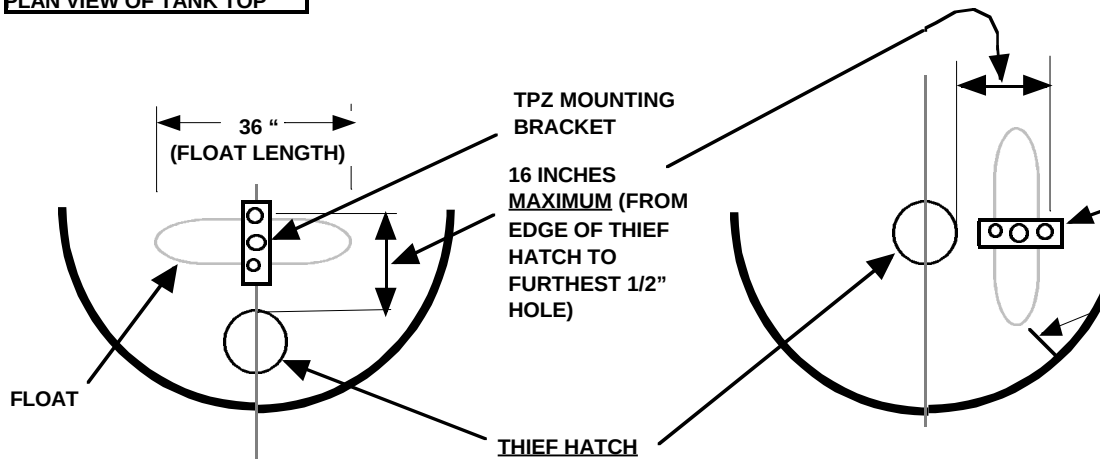
PROJECT: TPZ MOUNTING	FILENAME: TPZMNT2.CWK
DATE: Jun 04, 2002	Estevan Meter Services (306) 634-5304
PAGE: 1 OF 1	DESIGNER: GJM

TPZ 3310 MOUNTING TEMPLATE #1



SIDE VIEW OF TANK TOP

PLAN VIEW OF TANK TOP



ORIENTATION #1: FLOAT TANGENTIALLY MOUNTED

ORIENTATION #2: FLOAT RADIALLY MOUNTED

NOTES

1. OTHER FLOAT ORIENTATIONS ARE POSSIBLE PROVIDING THE INDICATED MEASUREMENTS ARE ADHERED TO

(NOT TO SCALE)

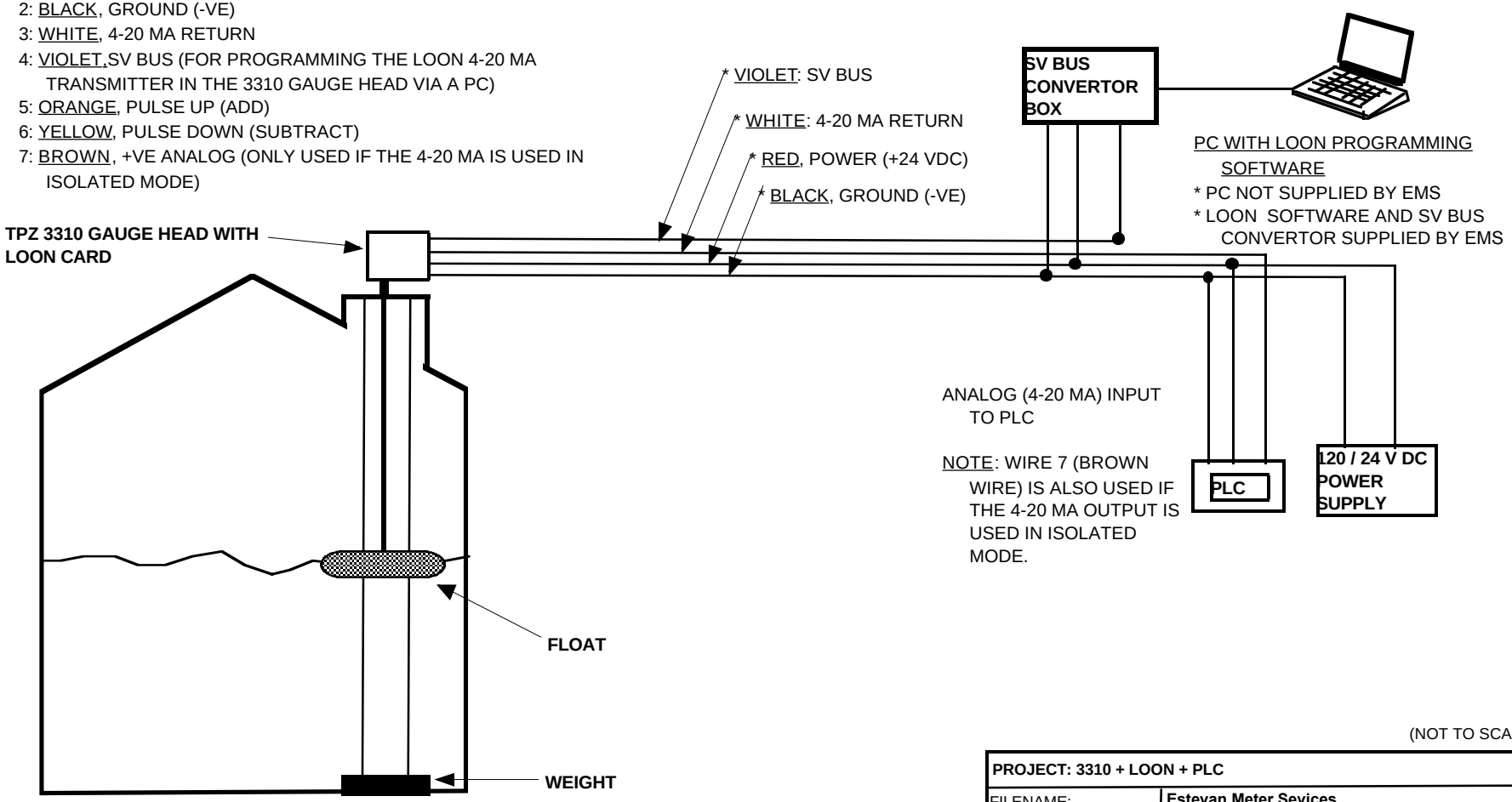
PROJECT: TPZ MOUNTING	FILENAME: TPZMNT1.CWK
DATE: Jun 04, 2002	Estevan Meter Services (306) 634-5304
PAGE: 1 OF 1	DESIGNER: GJM

TPZ 3310: Loon to PLC

WIRING FROM 3310 GAUGE HEAD-->WIRES FOR LOON 4-20 MA OUTPUT(TWISTED PAIR SHIELDED INSTRUMENT CABLE). WIRE COLORING FOR ALL WIRES SHOWN BELOW. ONLY WIRES 1 TO 4 ARE REQUIRED FOR NON-ISOLATED 4-20 MA OUTPUT. WIRE #7 (IE. #3 AND #7) ALSO REQUIRED IF CONNECTING THE 4-20 MA AS ELECTRICALLY ISOLATED. WIRES #5, #6 CONNECT TO OMRON DISPLAY.

1: RED, POWER (+24 VDC)
2: BLACK, GROUND (-VE)
3: WHITE, 4-20 MA RETURN
4: VIOLET,SV BUS (FOR PROGRAMMING THE LOON 4-20 MA TRANSMITTER IN THE 3310 GAUGE HEAD VIA A PC)
5: ORANGE, PULSE UP (ADD)
6: YELLOW, PULSE DOWN (SUBTRACT)
7: BROWN, +VE ANALOG (ONLY USED IF THE 4-20 MA IS USED IN ISOLATED MODE)

NOTE: EMS RECOMMENDS THAT A BATTERY BACK UP SYSTEM OR UPS BE INSTALLED ON THE POWER SUPPLY LINE. BATTERY BACK UP IS RECOMMENDED TO ENSURE THE GAUGE HEAD ELECTRONICS DO NOT LOOSE TRACK OF THE FLOAT POSITION IN THE EVENT OF A POWER SUPPLY LOSS [EITHER LONG TERM (HRS, DAYS) OR SHORT TERM (SECONDS)].



(NOT TO SCALE)

PROJECT: 3310 + LOON + PLC	
FILENAME: LOON2.CWK	**Estevan Meter Sevices (306) 634-5304**
PAGE: 1 OF 1	DESIGNER: GJM DATE: