

WIRING DRAWING - TANK MANAGEMENT SYSTEM (TMS3000)

INTERNAL TOP VIEW
(SHOWN OVERSIZED FOR CLARITY)

WARNING
AVERTISSEMENT

NO COMPONENT SUBSTITUTION IS PERMITTED.

LA SUBSTITUTION DE COMPOSANT N'EST PAS AUTORISÉE

I.S. WIRING - P.I.C

GROUP 2

GROUP

I.S. SLOT #

STANDARD PROBE INTERFACE CARD (P.I.C.)

4-PROBE/8-SENSOR INPUTS

⚠ IMPORTANT NOTES - READ CAREFULLY BEFORE INSTALLATION

UNLESS OTHERWISE SPECIFIED:
(NOTES 3-8 DO NOT APPLY TO THIS PAGE)

1. CONSOLE MOUNTING: MOUNT AS CLOSE AS PRACTICAL TO DIVIDING BOUNDARY BETWEEN THE HAZARDOUS AND NON-HAZARDOUS AREAS. NEVER MOUNT INSIDE THE HAZARDOUS AREA.
 2. INTRINSICALLY SAFE INPUT WIRING: INSTALLATIONS SHALL COMPLY WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (ANSI/NFPA 70) AND THE CANADIAN ELECTRICAL CODE (CEC). NON-INTRINSICALLY SAFE WIRING CANNOT BE RUN IN CONDUIT OR OPEN RACEWAYS TOGETHER WITH INTRINSICALLY SAFE WIRING.
 - a. THE MAGNETOSTRICTIVE PROBE INPUTS AND THE SENSOR INPUTS ARE TWO DIFFERENT INTRINSICALLY SAFE CIRCUITS AND MUST BE INSTALLED IN SEPARATE CABLES OR IN ONE CABLE WHICH HAS SUITABLE INSULATION. REFER TO NEC ARTICLE 504-30 (b) OR CEC APPENDIX F6.3 FOR ADDITIONAL INFORMATION.
 - b. I.S. ELECTRO-OPTIC/DRY CONTACT AND MAGNETOSTRICTIVE-PROBE ENTITY PARAMETERS: (between ground and any ungrounded contact) $U_o = 29.4$ Volts; $I_o = 0.149$ Amps; $C_o = 0.88\mu F$; $L_o = 10$ mH.
 - c. IF THE ELECTRICAL PARAMETERS OF THE CABLE ARE UNKNOWN, THE FOLLOWING VALUES MAY BE USED. Capacitance = $60 \mu F/ft$; Inductance = $0.20 \mu H/ft$.
 - d. IN ORDER TO DETERMINE THE SUITABILITY OF THE CONNECTION BETWEEN THE TMS3000 AND INTRINSICALLY SAFE DEVICES, THE TOTAL PARAMETERS FOR EACH INTRINSICALLY SAFE SENSOR INPUT CIRCUIT MUST BE DETERMINED.

First the C_c and L_c of each cable is calculated using length and the manufactures specified parameters or the values given in note (c). The C_c and L_c for each intrinsically safe circuit is then determined by adding the C_c and L_c for all cables used in each sensor input circuit. The C_i and L_i for each intrinsically safe circuit is then determined by adding the C_i and L_i for all devices connected to each sensor input circuit.
 - e. TMS3000
- | | | I.S. EQUIPMENT | |
|-------|--------|----------------|---|
| U_o | $\leq$ | U_{imax} | (smallest U_{imax} of any I.S. device in circuit) |
| I_o | $\leq$ | I_{imax} | (smallest I_{imax} of any device in circuit) |
| C_o | $\geq$ | $C_i + C_c$ | (using C_i and C_c totals for each circuit) |
| L_o | $\geq$ | $L_i + L_c$ | (using C_i and C_c totals for each circuit) |
9. SHIELDED PROBE FIELD CABLE IS REQUIRED. THE SHIELD WIRE MUST BE CONNECTED TO THE PROBE SHIELD TERMINAL IN THE CONSOLE I.S. COMPARTMENT AND SHOULD BE CUT BACK AND LEFT UNTERMINATED AT THE PROBE JUNCTION BOX.
 10. SHIELDED SENSOR FIELD CABLE IS NOT REQUIRED, BUT IF USED, THE SHIELD WIRE MUST BE CONNECTED TO THE SENSOR GROUND TERMINAL IN THE CONSOLE I.S. COMPARTMENT AND SHOULD BE CUT BACK AND LEFT UNTERMINATED AT THE SENSOR JUNCTION BOX.

3-WIRE SENSOR EXAMPLES (SEE NOTE 10)

NON-HAZARDOUS AREA
(SEE NOTE 1 ABOVE)

HAZARDOUS AREA
CLASS I, DIVISION 1, GROUP D
CLASS I, ZONE 0, GROUP IIA

I. S. GROUND INTERCONNECTIONS

NON-INTRINSICALLY SAFE WIRING	INTRINSICALLY SAFE WIRING
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I.S. SLOTS: For optional P.I.C or S.I.C (P.I.C shown)

VAPOR SEAL FITTING(S) AS REQ'D

JUNCTION BOX(ES) AS REQ'D

WIRING MUST BE DONE IN WATERTIGHT RATED BOX/HOUSING

PROBE EXAMPLE

3-WIRE SENSOR EXAMPLE

FIELD CABLE
(SEE NOTE 9)

TO CONSOLE
(AS SHOWN ABOVE)

FIELD CABLE
(SEE NOTE 1)

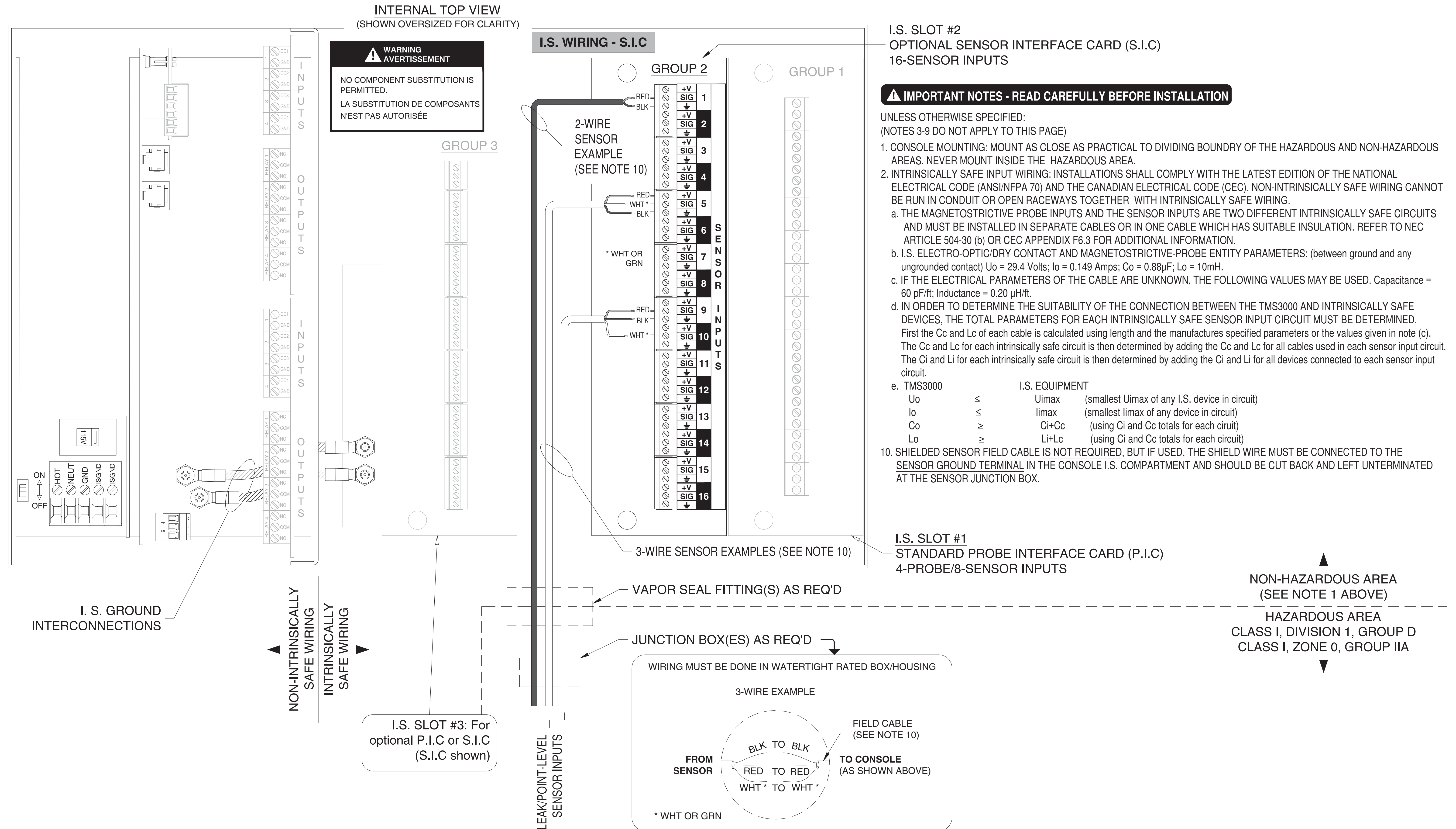
TO CONSOLE
(AS SHOWN ABOVE)

* WHT OR GRN



PNEUMERCATOR

WIRING DRAWING - TANK MANAGEMENT SYSTEM (TMS3000)



WIRING DRAWING - TANK MANAGEMENT SYSTEM (TMS3000)

NON I.S. WIRING - AC INPUT

INTERNAL TOP VIEW
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COMMUNICATIONS SLOT
Optional MODBUS Card shown

Refer to Installation Manual
for other card options

NON I. S. SLOTS
Optional 4X4 Relay I/O
Cards shown (Slot #1 on top)

Refer to Installation Manual
for other card options

SEE
NOTE 6

115/230 VAC
50/60Hz
(SEE NOTES 4-6)

TO EARTH GROUND
(SEE NOTE 3)

MODBUS
COMMUNICATIONS

PORT "A" RS-232
COMMUNICATIONS

* PORT B NOT AVAILABLE IF PRINTER IS USED

NON I. S. DRY CONTACT
OUTPUT (SEE NOTE 7)

NON I. S. DRY CONTACT
INPUT (SEE NOTE 8)

RS-485
COMMUNICATIONS

PORT "B" RS-232 *
COMMUNICATIONS

NON-INTRINSICALLY
SAFE WIRING

INTRINSICALLY
SAFE WIRING

NON-HAZARDOUS AREA
(SEE NOTE 1 ON PAGE 1)

HAZARDOUS AREA
CLASS I, DIVISION 1, GROUP D; ZONE 0, GROUP IIA

⚠ IMPORTANT NOTES - READ CAREFULLY BEFORE INSTALLATION

UNLESS OTHERWISE SPECIFIED:
(NOTES 1,2, 9 & 10 DO NOT APPLY TO THIS PAGE)

3. WARNING: TO INSURE INTRINSIC SAFETY, A 12 AWG/4.0 MM² WIRE MUST BE CONNECTED TO EACH "ISGND" TERMINAL. EACH WIRE MUST THEN BE CONNECTED TO THE SYSTEM EARTH GROUND (GROUND BUSS BAR) IN THE SAME SERVICE PANEL AS TMS POWER. A GROUNDING ROD, COLDWATER PIPE OR OTHER CONNECTION SHOULD NOT BE USED. THE RESISTANCE BETWEEN THE EARTH GROUND TERMINAL BLOCK AND EARTH GROUND SHALL BE LESS THAN 1 OHM.
4. CONSOLE CANNOT BE CONNECTED TO EQUIPMENT THAT USES OR GENERATES MORE THAN 250 VOLTS WITH RESPECT TO EARTH.
5. POWER TO THE TMS3000 CONSOLE SHOULD BE PROPERLY WIRED TO A SEPARATE DEDICATED 115/230 VAC CIRCUIT BREAKER.
6. SWITCH MUST BE SET TO 115 VAC FOR 115 VAC OPERATION AND 230 VAC FOR 230 VAC OPERATION.
7. DRY CONTACT SWITCH OUTPUT WIRING: WIRE TO COMMON AND EITHER NORMALLY OPEN OR NORMALLY CLOSED FOR DESIRED SWITCH CONTACT. OUTPUT RATED 10 AMPS AT 120 VAC, 6 AMPS AT 240 VAC (VOLTAGE MUST BE LESS THAN 120 VAC OR 240 VAC RESPECTIVELY).
8. NEC CLASS 2 CIRCUITS.