CONTROL DRAWING
INTRINSICALLY SAFE SYSTEM

REV	DESCRIPTION	BY	DATE	ECO
B	1)ADDED MAG PLUS1 SERIES 2) ADDED UNLESS OTHERWISE NOTED	TKR	09/12/12	CN-05364
C	ADDED SURGE PROTECTION TO MAG PROBE AND SURGE PROTECTION NOTES. MAG PLUS1 TEMP RANGE WAS −20°C	TB	2013/03/05	CN-06112

NON-HAZARDOUS LOCATION

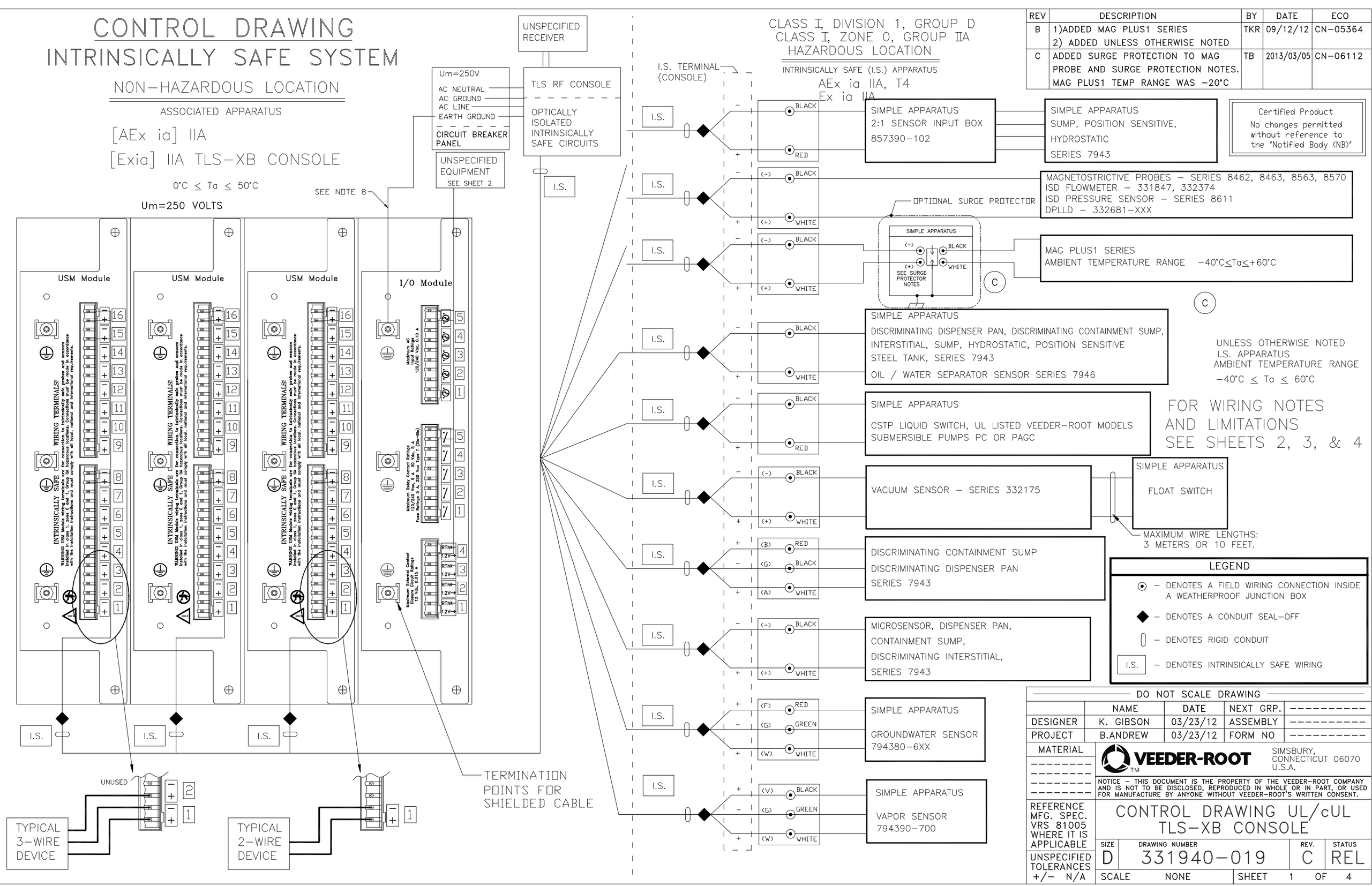
ASSOCIATED APPARATUS

[AEx ia] IIA

[Exia] IIA TLS-XB CONSOLE

0°C ≤ Ta ≤ 50°C

Um=250 VOLTS



DO NOT SCALE DRAWING

	NAME	DATE	NEXT GRP.	----------
DESIGNER	K. GIBSON	03/23/12	ASSEMBLY	----------
PROJECT	B.ANDREW	03/23/12	FORM NO	----------

MATERIAL

VEEDER-ROOT™ SIMSBURY, CONNECTICUT 06070 U.S.A.

NOTICE – THIS DOCUMENT IS THE PROPERTY OF THE VEEDER-ROOT COMPANY AND IS NOT TO BE DISCLOSED, REPRODUCED IN WHOLE OR IN PART, OR USED FOR MANUFACTURE BY ANYONE WITHOUT VEEDER-ROOT'S WRITTEN CONSENT.

REFERENCE MFG. SPEC. VRS 81005 WHERE IT IS APPLICABLE

UNSPECIFIED TOLERANCES +/− N/A

CONTROL DRAWING UL/cUL
TLS-XB CONSOLE

SIZE	DRAWING NUMBER	REV.	STATUS
D	331940-019	C	REL

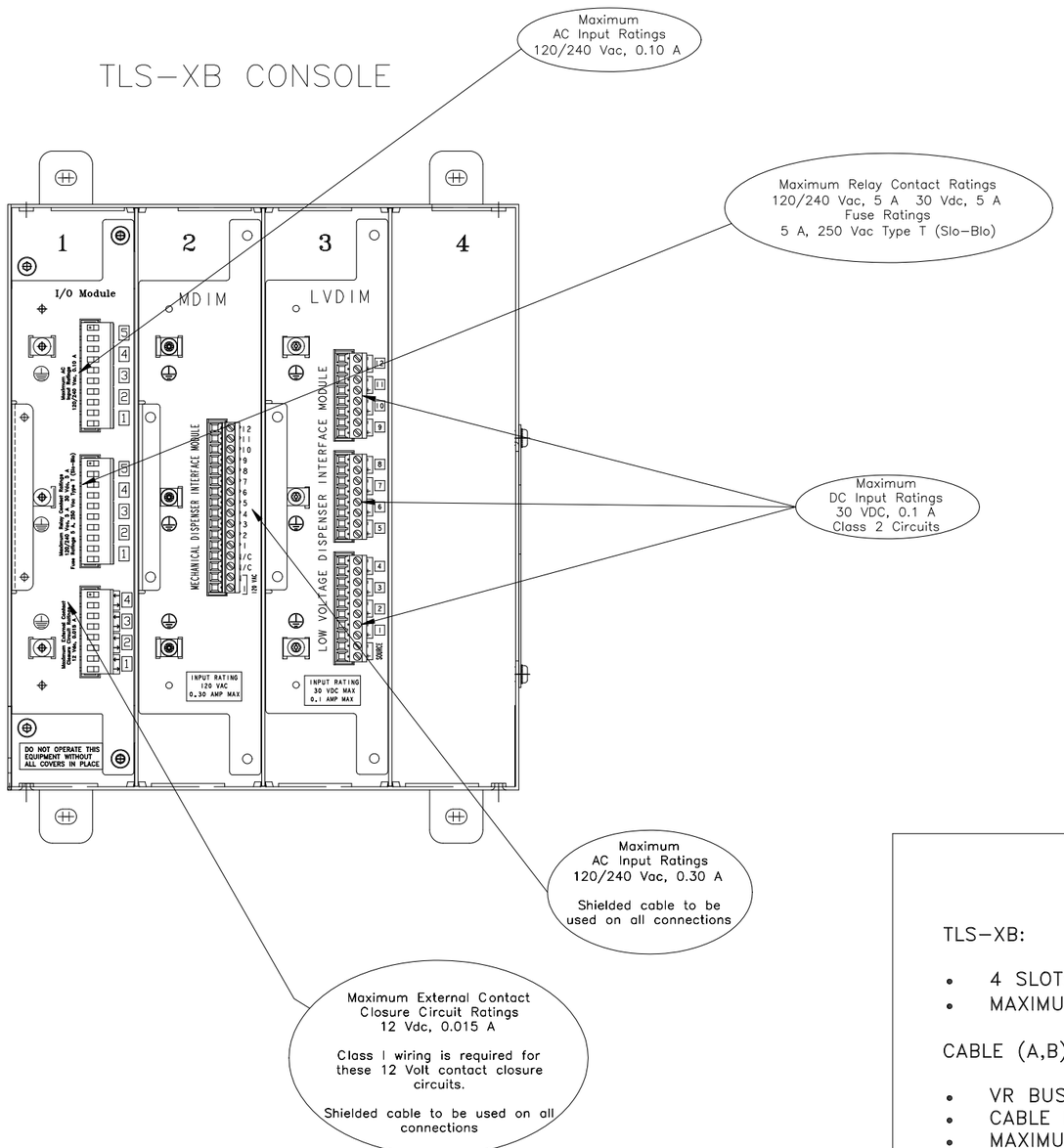
SCALE NONE SHEET 1 OF 4

DESCRIPTION

THIS CONTROL DRAWING DESCRIBES THE INTRINSICALLY SAFE EQUIPMENT AND ASSOCIATED APPARATUS THAT TOGETHER FORM AN INTRISICALLY SAFE SYSTEM.

TLS-XB CONSOLES ARE IDENTIFIED BY FORM NUMBERS 8603. A TLS-XB CONSOLE CANNOT BE CONNECTED IN PARALLEL WITH ANTOHER TLS-XB OR ANY OTHER ASSOCIATED APPARATUS. TLS-XB CONSOLES MUST BE INSTALLED IN INDOOR NON-HAZARDOUS AREAS.

TLS-XB CONSOLE



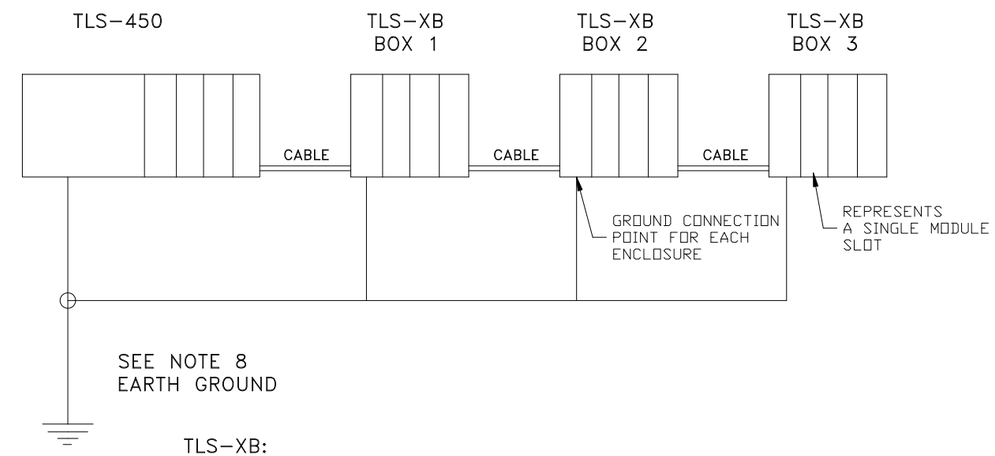
TLS-XB:

- 4 SLOTS PER BOX
- MAXIMUM OF 2 EXPANSION BOXES PER 8601/TLS4 SYSTEM

CABLE (A,B):

- VR BUS, POWER, GROUND, AND RESET
- CABLE LENGTH 150 FEET MAXIMUM FOR ALL 2 BOXES TOGETHER
- MAXIMUM DC OUTPUT RATINGS; 30VDC, 0.75A, CLASS 2 CIRCUITS

SYSTEM DIAGRAM

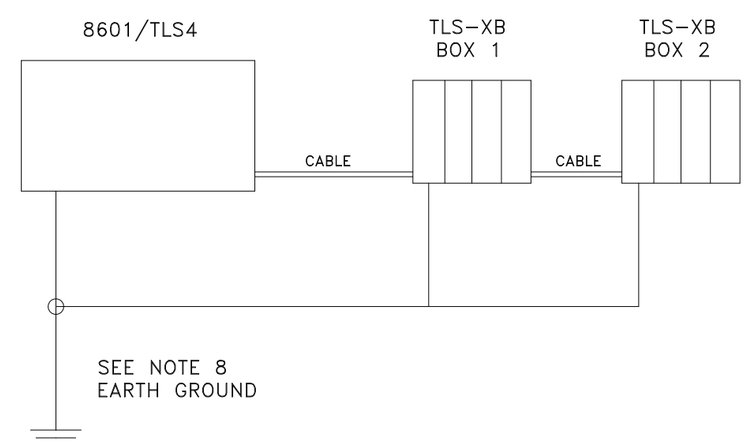


TLS-XB:

- 4 SLOTS PER BOX
- MAXIMUM OF 3 EXPANSION BOXES PER TLS-450 SYSTEM

CABLE (A,B):

- VR BUS, POWER, GROUND, AND RESET
- CABLE LENGTH 150 FEET MAXIMUM FOR ALL 3 BOXES TOGETHER
- MAXIMUM DC OUTPUT RATINGS; 30VDC, 1.0A, CLASS 2 CIRCUITS



VEEDER-ROOT TM
SIMSBURY, CONNECTICUT 06070 U.S.A.

NOTICE – THIS DOCUMENT IS THE PROPERTY OF THE VEEDER-ROOT COMPANY AND IS NOT TO BE DISCLOSED, REPRODUCED IN WHOLE OR IN PART, OR USED FOR MANUFACTURE BY ANYONE WITHOUT VEEDER-ROOT'S WRITTEN CONSENT.

CONTROL DRAWING UL/cUL
TLS-XB CONSOLE

SIZE	DRAWING NUMBER	REV.	STATUS
D	331940-019	C	REL

SCALE NONE | SHEET 2 OF 4

WARNINGS

SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
IT IS INTENDED THAT THE TLS-XB IS CONTINUOUSLY POWERED.

WIRING NOTES

INTRINSICALLY SAFE (I.S.) WIRING MUST BE INSTALLED IN ACCORDANCE WITH ARTICLE 504-20 OF THE NEC (NATIONAL ELECTRICAL CODE), ANSI/NFPA 70 OR OTHER APPLICABLE LOCAL CODES. ALL OTHER WIRING MUST BE INSTALLED ACCORDING TO LOCAL CODES.

THE MAXIMUM CABLE LENGTH ALLOWED, USED TO CONNECT ANY INTRINSICALLY SAFE DEVICE TO THE TLS-XB CONSOLE IS LIMITED TO A TOTAL OF 24,000 FEET PER USM (UNIVERSAL SENSOR MODULE).

EACH CABLE (OR I.S. WIRING), USED TO CONNECT INTRINSICALLY SAFE DEVICES TO THE TLS-XB CONSOLE, MUST BE RATED 100 PF/FOOT (OR LESS CAPACITANCE PER FOOT) AND MUST BE RATED 0.2 μH/FOOT (OR LESS INDUCTANCE PER FOOT).

I.S. GROUNDING POINTS MUST BE CONNECTED TO A SUITABLE GROUND ELECTRODE THROUGH LESS THAN ONE OHM DC RESISTANCE TO THE EARTH GROUND BUS AT THE DISTRIBUTION PANEL IN ACCORDANCE WITH THE NEC/CEC OR OTHER LOCAL CODES.

CABLES (OR I.S. WIRING) USED TO CONNECT SEPARATE I.S. DEVICES TO THE ASSOCIATED APPARATUS MUST HAVE SUITABLE INSULATION AS REQUIRED BY ARTICLE 504.30(B) OF THE NEC.

ASSOCIATED APPARATUS MUST BE INSTALLED IN ACCORDANCE TO THIS CONTROL DRAWING AND ARTICLE 504 OF THE NEC OR SECTION 18 OF THE CEC.

THE MAXIMUM SAFE AREA VOLTAGE (Um) OF THIS EQUIPMENT IS 250V RMS OR DC. PERIPHERAL EQUIPMENT CONNECTED TO THE TLS-XB CONSOLE MUST NOT USE OR GENERATE MORE THAN 250V RMS OR DC WITH RESPECT TO EARTH GROUND.

INSIDE THE MODULE AREA OF BOTH THE TLS-XB CONSOLE, ANY COMBINATION OF UP TO FOUR MODULES MAY BE INSTALLED. MDIM, LVDIM AND I/O MODULES PROVIDE WIRING TERMINALS FOR THE CONNECTION OF EQUIPMENT INSTALLED IN NON-HAZARDOUS LOCATIONS. THE USM (UNIVERSAL SENSOR MODULE) PROVIDES WIRING TERMINALS FOR THE CONNECTION OF INTRINSICALLY SAFE APPARATUS.

THE ELECTRONICS LOCATED IN THE BARRIER CIRCUIT OF THE USM MODULE FORMS AN INTRINSICALLY SAFE ENERGY LIMITED SYSTEM. PROBE AND SENSORS CONNECTED TO THE OUTPUT TERMINALS OF THE USM MODULE ARE CONSIDERED INTRINSICALLY SAFE APPARATUS AND ARE APPROVED FOR USE IN CLASS I, GROUP D OR CLASS I ZONE **0** HAZARDOUS (CLASSIFIED) LOCATIONS.

LIMITATIONS

A MAXIMUM OF 2 TLS RF CONSOLES AND UP TO 16 INTRINSICALLY SAFE DEVICES MAY BE CONNECTED TO THE USM MODULE LOCATED IN A TLS-XB CONSOLE.

MAGNETOSTRICTIVE PROBE – ENCLOSURE CONTAINS ALUMINUM. CARE MUST BE TAKEN TO AVOID IGNITION HAZARD DUE TO IMPACT OR FRICTION.

VAPOR FLOW METERS, PART NUMBERS 331847-001 AND 332374-001 ARE ONLY SUITABLE FOR USE INSIDE THE BASE OF A FLAMMABLE LIQUID DISPENSER WHEN FACTORY INSTALLED BY THE RESPECTIVE ORIGINAL EQUIPMENT MANUFACTURER.

VAPOR FLOW METERS, PART NUMBERS 331847-002 AND 332374-002 ARE SUITABLE FOR IN-THE-FIELD INSTALLATIONS, WHEN MOUNTED INSIDE FLAMMABLE LIQUID DISPENSERS THAT ARE EVALUATED AS A PART OF A LISTED BY REPORT RETROFIT KIT.

LISTED VAPOR PRESSURE SENSORS, PART NUMBERS 861190-001, 861190-002 AND 861190-003 ARE SUITABLE FOR USE INSIDE THE BASE OF A FLAMMABLE LIQUID DISPENSER WHEN INSTALLED BY THE RESPECTIVE ORIGINAL EQUIPMENT MANUFACTURER. VAPOR PRESSURE SENSORS, PART NUMBERS 861190-001, 861190-002 AND 861190-003 ARE ALSO SUITABLE FOR USE WHEN MOUNTED TO THE VAPOR VENT STACK THAT IS USED FOR VENTING FLAMMABLE VAPORS.

VAPOR PRESSURE SENSORS, PART NUMBER 861190-001, 861190-002 AND 861190-003 ARE SUITABLE FOR IN-THE-FIELD INSTALLATIONS, WHEN MOUNTED INSIDE FLAMMABLE LIQUID DISPENSERS THAT ARE EVALUATED AS A PART OF A LISTED BY REPORT RETROFIT KIT.

SURGE PROTECTION

(C)

SURGE PROTECTION COMPONENTS MUST BE GAS TUBE TYPE, UL RECOGNIZED, CATEGORY CODE VZC42, PER UL 1449 AND WITH AN Imax RATING OF AT LEAST 10kA 8/20us OR GREATER WHEN INSTALLED AT THE TANK ENTRY.

CONNECT THE SURGE PROTECTOR IN ACCORDANCE WITH NFPA 780, CLAUSE 4.18.3.2.

CONSULT THE LOCAL AUTHORITY HAVING JURISDICTION PRIOR TO INSTALLING ANY SURGE PROTECTION DEVICES. SOME INSTALLATIONS MAY REQUIRE A 5 FOOT SPACING DISTANCE BETWEEN SURGE PROTECTOR AND ANY TANK ACCESS POINT OR VENT. REFERENCE NFPA 30.

THE SURGE PROTECTION DEVICE MUST BE A SIMPLE APPARATUS ONLY (NFPA 70, CLAUSE 504.2) SUITABLE TO THE AUTHORITY HAVING JURISDICTION.

WARNING: IN INSTALLATION AND USE OF THIS PRODUCT, COMPLY WITH ALL ELECTRICAL CODES. IN ADDITION, TURN OFF POWER AND TAKE OTHER NECESSARY PRECAUTIONS DURING INSTALLATION, SERVICE AND REPAIR TO PREVENT PERSONAL INJURY, PROPERTY LOSS AND EQUIPMENT DAMAGE.

WARNING: DISCONNECT ALL POWER BEFORE MAKING ANY CONNECTIONS TO PREVENT DEATH, SERIOUS INJURY, EXPLOSION, OR ELECTRICAL SHOCK. CONSOLE MUST NEVER BE OPERATED UNLESS THE FRONT COVER IS CLOSED OVER THE BARRIER TERMINALS IN THE INTRINSICALLY SAFE AREA.

VEEDER-ROOT™ SIMSBURY, CONNECTICUT 06070 U.S.A.

NOTICE – THIS DOCUMENT IS THE PROPERTY OF THE VEEDER-ROOT COMPANY AND IS NOT TO BE DISCLOSED, REPRODUCED IN WHOLE OR IN PART, OR USED FOR MANUFACTURE BY ANYONE WITHOUT VEEDER-ROOT'S WRITTEN CONSENT.

CONTROL DRAWING UL/cUL
TLS-XB CONSOLE

SIZE	DRAWING NUMBER	REV.	STATUS
D	331940-019	C	REL

SCALE NONE | SHEET 3 OF 4

STANDARDS APPLIED

AEx ia, GROUP IIA T4:

UL 60079–0, ELECTRICAL APPARATUS FOR EXPLOSIVE GAS ATMOSPHERES – PART 0: GENERAL REQUIREMENTS

UL 60079–11, EXPLOSIVE ATMOSPHERES – PART 11: EQUIPMENT PROTECTION BY INTRINSIC SAFETY "I"

CLASS I, ZONE 0 IIA

Ex ia, GROUP IIA T4:

CSA C22.2 # 60079–0, ELECTRICAL APPARATUS FOR EXPLOSIVE GAS ATMOSPHERES – PART 0: GENERAL REQUIREMENTS

CSA C22.2 # 60079–11, EXPLOSIVE ATMOSPHERES – PART 11: EQUIPMENT PROTECTION BY INTRINSIC SAFETY "I"

OR ALTERNATIVELY EVALUATED IN CONJUNCTION WITH AN APPROVED AND COMPATIBLE ASSOCIATED APPARATUS ie, ASSOCIATED APPARATUS BEARS THE UL/cUL MARK AND THE SYSTEM IS INSTALLED IN ACCORDANCE WITH APPROVED INSTALLATION INSTRUCTIONS.

CLASS I, DIVISION 1, GROUP D

UL 1238 CONTROL EQUIPMENT FOR USE WITH FLAMMABLE LIQUID DISPENSING DEVICES.

UL 913 INTRINSICALLY SAFE APPARATUS

CSA C22.2 No.0 CANADIAN ELECTRICAL CODE, PART II

CSA C22.2 No.0.4M BONDING AND GROUNDING OF ELECTRICAL EQUIPMENT (PROTECTIVE GROUNDING)

CSA C22.2 No.142–M PROCESS CONTROL EQUIPMENT

CSA C22.2 No.157 INTRINSICALLY SAFE AND NONINCENDIVE EQUIPMENT FOR USE IN HAZARDOUS LOCATIONS, CONSUMER AND COMMERCIAL PRODUCTS.

VEEDER-ROOT™
SIMSBURY,
CONNECTICUT 06070
U.S.A.

NOTICE – THIS DOCUMENT IS THE PROPERTY OF THE VEEDER–ROOT COMPANY AND IS NOT TO BE DISCLOSED, REPRODUCED IN WHOLE OR IN PART, OR USED FOR MANUFACTURE BY ANYONE WITHOUT VEEDER–ROOT'S WRITTEN CONSENT.

CONTROL DRAWING UL/cUL
TLS–XB CONSOLE

SIZE	DRAWING NUMBER	REV.	STATUS
D	331940–019	C	REL

SCALE NONE | SHEET 4 OF 4