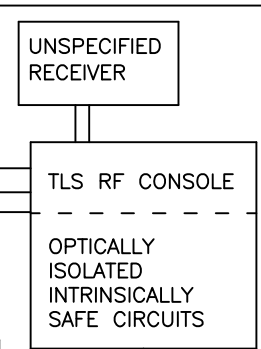
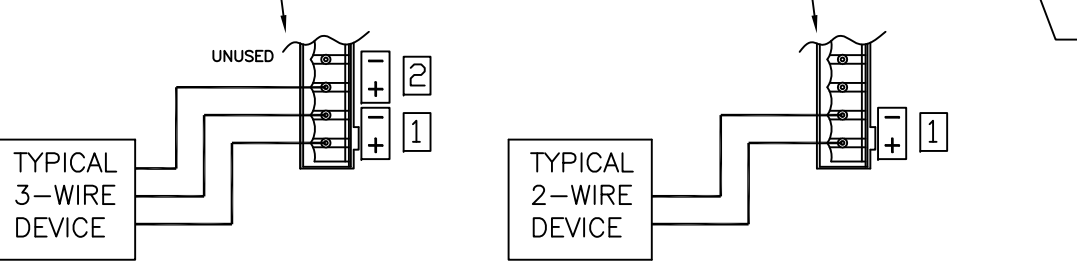
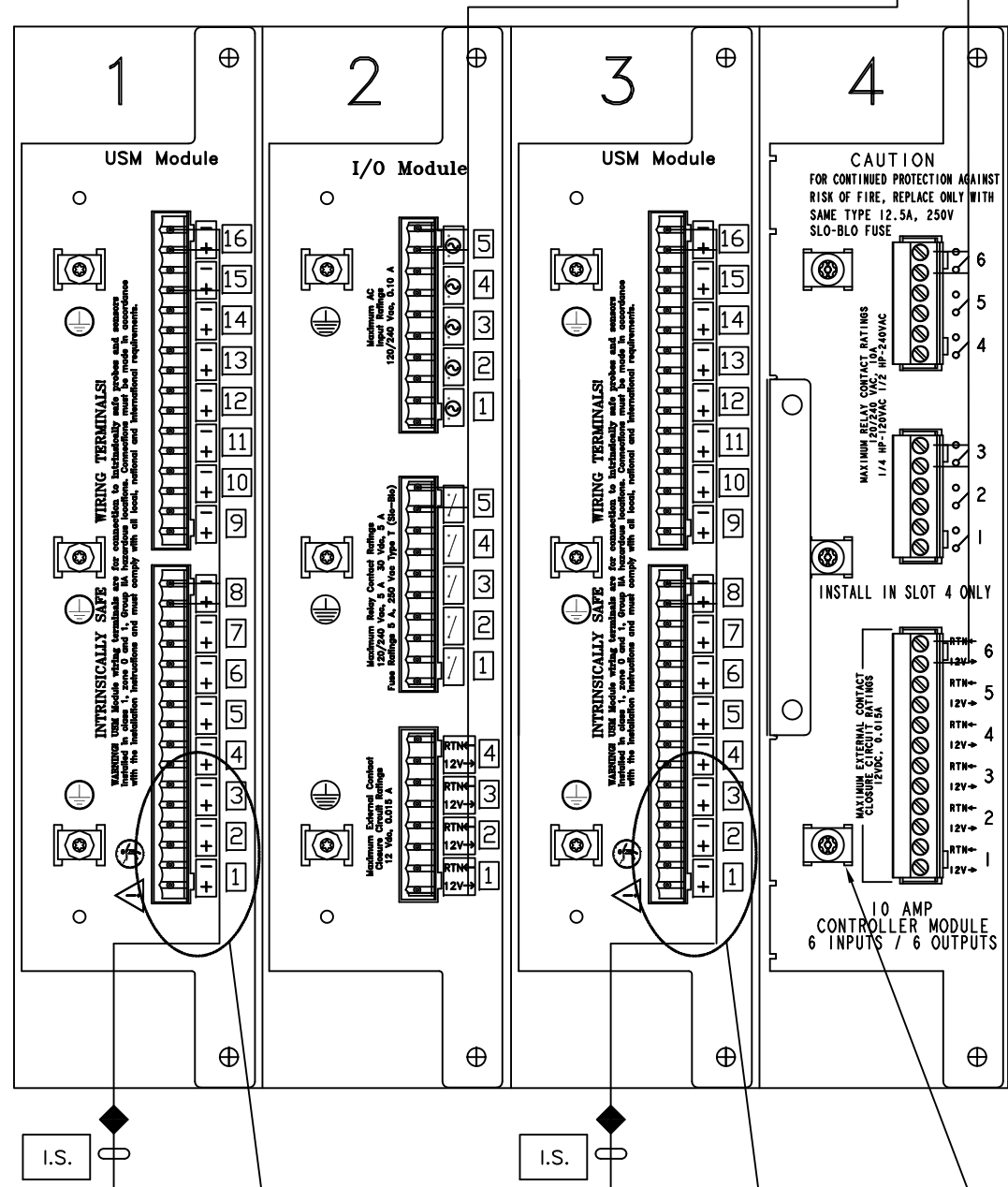


CONTROL DRAWING INTRINSICALLY SAFE SYSTEM

NON-HAZARDOUS LOCATION
ASSOCIATED APPARATUS

TLS-450/450 PLUS CONSOLE
0°C ≤ Ta ≤ 40°C



UNSPECIFIED EQUIPMENT
SEE SHEET 2

CAUTION
FOR CONTINUED PROTECTION AGAINST
RISK OF FIRE, REPLACE ONLY WITH
SAME TYPE 12.5A, 250V
SLO-BLO FUSE

MAXIMUM RELAY CONTACT RATINGS
1/4 HP-120VAC 1/2 HP-240VAC

INSTALL IN SLOT 4 ONLY

MAXIMUM EXTERNAL CONTACT
CURRENT: 0.015A

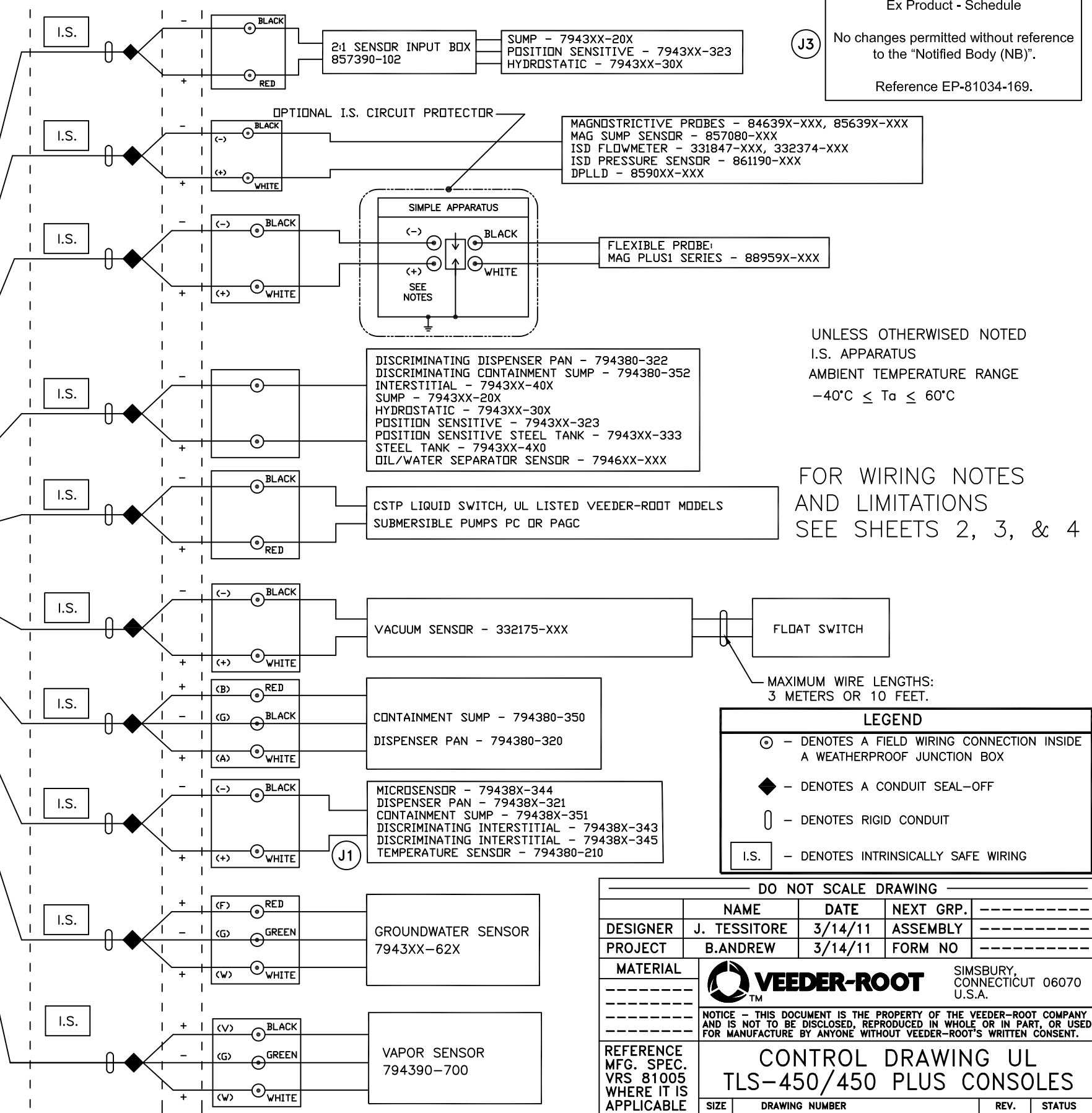
10 AMP
CONTROLLER MODULE
6 INPUTS / 6 OUTPUTS

TERMINATION
POINTS FOR
SHIELDED CABLE

CLASS I, DIVISION 1, GROUP D
CLASS I, ZONE 0, GROUP IIA
HAZARDOUS LOCATION
INTRINSICALLY SAFE (I.S.) APPARATUS

REV	DESCRIPTION	BY	DATE	ECO
J	1) ADDED TEMPERATURE SENSOR 2) REMOVED CSA C22.2 No.157 3) UPDATED AGENCY STAMP	NRP	2016/11/22	CN-13844

Ex Product - Schedule
No changes permitted without reference to the "Notified Body (NB)".
Reference EP-81034-169.



UNLESS OTHERWISE NOTED
I.S. APPARATUS
AMBIENT TEMPERATURE RANGE
-40°C ≤ Ta ≤ 60°C

FOR WIRING NOTES
AND LIMITATIONS
SEE SHEETS 2, 3, & 4

LEGEND	
⊙	- DENOTES A FIELD WIRING CONNECTION INSIDE A WEATHERPROOF JUNCTION BOX
◆	- DENOTES A CONDUIT SEAL-OFF
⌋	- DENOTES RIGID CONDUIT
I.S.	- DENOTES INTRINSICALLY SAFE WIRING

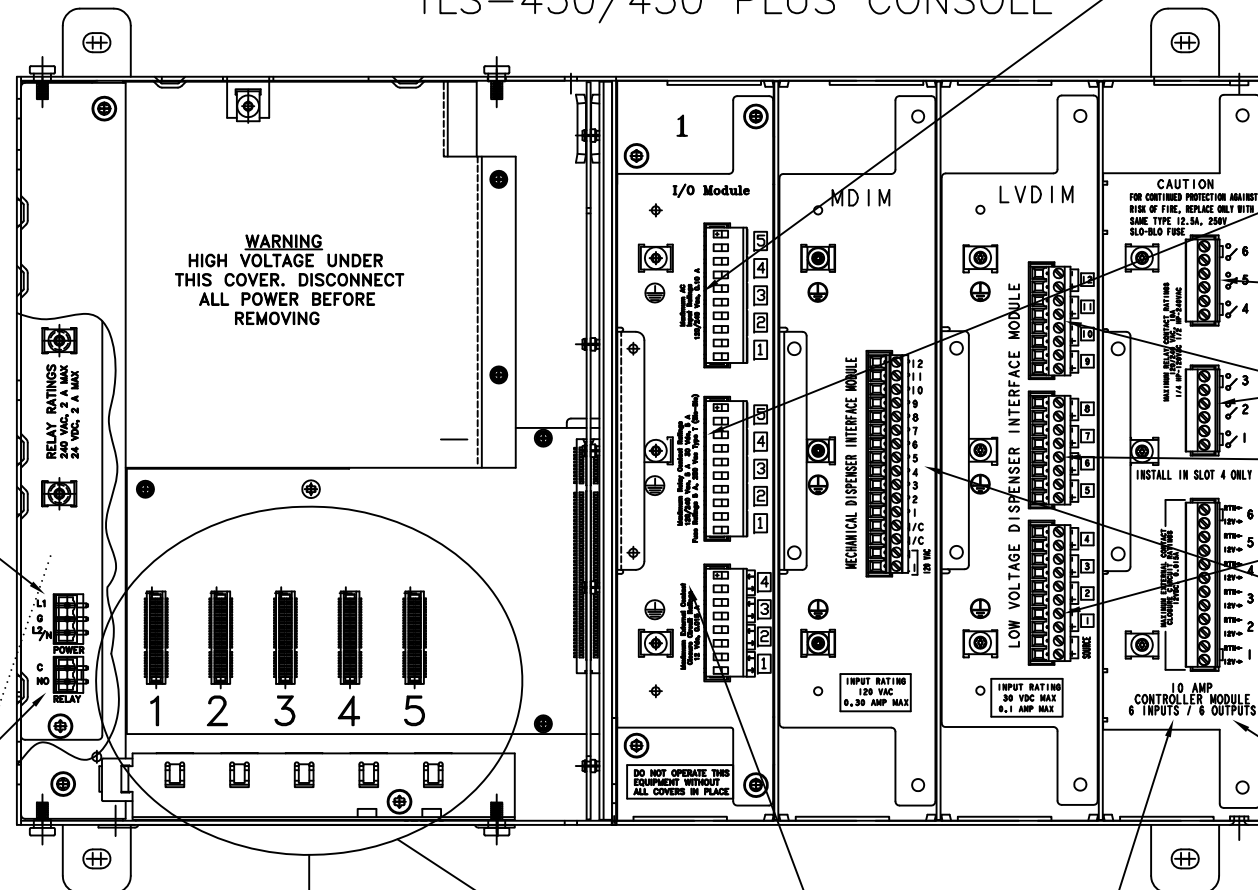
DO NOT SCALE DRAWING				
DESIGNER	NAME	DATE	NEXT GRP.	
J. TESSITORE	J. TESSITORE	3/14/11	ASSEMBLY	
B.ANDREW	B.ANDREW	3/14/11	FORM NO	
MATERIAL	SIMSBURY, CONNECTICUT 06070 U.S.A.			
REFERENCE MFG. SPEC. VRS 81005 WHERE IT IS APPLICABLE	NOTICE - THIS DOCUMENT IS THE PROPERTY OF THE VEEDER-ROOT COMPANY AND IS NOT TO BE DISCLOSED, REPRODUCED IN WHOLE OR IN PART, OR USED FOR MANUFACTURE BY ANYONE WITHOUT VEEDER-ROOT'S WRITTEN CONSENT.			
UNSPECIFIED TOLERANCES +/- N/A	CONTROL DRAWING UL TLS-450/450 PLUS CONSOLES			
SIZE D	DRAWING NUMBER	REV.	STATUS	
	331940-008	J	REL	
SCALE NONE	SHEET 1 OF 4			

DESCRIPTION

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

TLS-450/450 PLUS CONSOLES ARE IDENTIFIED BY FORM NUMBERS 8600. A TLS-450/450 PLUS CONSOLE CANNOT BE CONNECTED IN PARALLEL WITH ANOTHER TLS-450/450 PLUS OR ANY OTHER ASSOCIATED APPARATUS. TLS-450/450 PLUS CONSOLES AND OPTIONAL EXPANSION BOXES MUST BE INSTALLED IN INDOOR NON-HAZARDOUS AREAS.

TLS-450/450 PLUS CONSOLE



AC POWER INPUT CONNECTOR
120/240 Vac,
50/60 Hz,
2A maximum

OVERFILL ALARM RELAY CONNECTOR
120/240 Vac,
2A maximum

Maximum AC Input Ratings
120/240 Vac, 0.10 A

Maximum Relay Contact Ratings
120/240 Vac, 5 A 30 Vdc, 5 A
Fuse Ratings
5 A, 250 Vac Type T (Slo-Blo)

Maximum Relay Contact Ratings
120/240 Vac, 10 A, 1/4 HP-120 VAC
1/2 HP-240 VAC
Fuse Ratings
12.5 A, 250 V Type T (Slo-Blo)

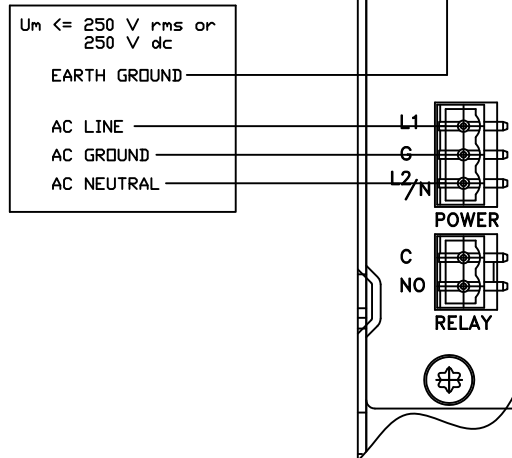
Maximum DC Input Ratings
30 VDC, 0.1 A
Class 2 Circuits

Maximum AC Input Ratings
120/240 Vac, 0.30 A

Each Console is Limited to a Maximum of One 10 Amp Dispenser Controller Module. FOR USE IN SLOT 4 ONLY

Maximum External Contact Closure Circuit Ratings
12 Vdc, 0.015 A
Class 1 wiring is required for these 12 Volt contact closure circuits.

CIRCUIT BREAKER PANEL



TLS-450 CONSOLE

COMM MODULES	PERMISSIBLE SLOT(S)
SITEFAX MODEM MODULE	1, 2 OR 3
USB MODULE	5 ONLY
USB/ETHERNET MODULE	5 ONLY
ETHERNET MODULE	4 OR 5
SINGLE SERIAL PORT MODULE	1, 2 OR 3
DUAL SERIAL PORT MODULE	1, 2 OR 3
ELECTRONIC DISPENSER INTERFACE MODULE (EDIM)	1, 2 OR 3
CURRENT LOOP DISPENSER INTERFACE MODULE (CDIM)	1, 2 OR 4

NOTE: Limited single port capability in slot 3.

TLS-450 PLUS CONSOLE

COMM MODULES	PERMISSIBLE SLOT(S)
SITEFAX MODEM MODULE	1, 2 OR 3
USB/WIRELESS MODULE	5 ONLY
ETHERNET INTERFACE MODULE	4 ONLY
SINGLE SERIAL PORT MODULE	1, 2 OR 3
DUAL SERIAL PORT MODULE	1, 2 OR 3
ELECTRONIC DISPENSER INTERFACE MODULE (EDIM)	1, 2 OR 3
CURRENT LOOP DISPENSER INTERFACE MODULE (CDIM)	1, 2 OR 4

NOTE: Limited single port capability in slot 3.

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

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CONTROL DRAWING UL
TLS-450/450 PLUS CONSOLES

SIZE	DRAWING NUMBER	REV.	STATUS
D	331940-008	J	REL
SCALE	NONE	SHEET	2 OF 4

WARNINGS

SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

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-450/450 PLUS 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-450/450 PLUS CONSOLE, MUST BE RATED 100 PF/FOOT (OR LESS CAPACITANCE PER FOOT) AND MUST BE RATED 0.2 μ H/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 (U_m) OF THIS EQUIPMENT IS 250V RMS OR DC. PERIPHERAL EQUIPMENT CONNECTED TO THE TLS-450/450 PLUS 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-450/450 PLUS 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 GROUP IIA HAZARDOUS (CLASSIFIED) LOCATIONS.



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.

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-450/450 PLUS 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.

IN SLOT 4 ONLY, ONE AND ONLY ONE 10 AMP CONTROLLER MODULE MAY BE INSTALLED IN A TLS-450/TLS-450PLUS CONSOLE. TLS-450/TLS-450PLUS CONSOLES WITHOUT A 10 AMP CONTROLLER MODULE, MAY USE ANY OTHER MODULE TYPE IN SLOT 4.

I.S. CIRCUIT PROTECTION

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 INTRINSICALLY SAFE (I.S.) CIRCUIT PROTECTOR MUST BE A SIMPLE APPARATUS ONLY (NFPA 70, CLAUSE 504.2) SUITABLE TO THE AUTHORITY HAVING JURISDICTION.



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CONTROL DRAWING UL
TLS-450/450 PLUS CONSOLES

SIZE	DRAWING NUMBER	REV.	STATUS
D	331940-008	J	REL
SCALE	NONE	SHEET	3 OF 4

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

J2



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CONTROL DRAWING UL
TLS-450/450 PLUS CONSOLES

SIZE	DRAWING NUMBER	REV.	STATUS
D	331940-008	J	REL
SCALE	NONE	SHEET	4 OF 4