

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

# CONTROL DRAWING INTRINSICALLY SAFE SYSTEM

$-40^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$

REV	DESCRIPTION	BY	DATE	ECO
A	INITIAL RELEASE	TB	7/8/09	CN-00683
B	CHANGE TO DESCRIPTION; ADDED NOTE 7; ADDED SH-2; ADDED MAG PLUS1	KG	12/06/11	CN-04266
C	ADDED SURGE PROTECTION TO MAG PROBE AND SURGE PROTECTOR NOTES MAG PLUS1 TEMP RANGE WAS $-20^{\circ}\text{C}$	TB	2013/03/07	CN-06112

## DESCRIPTION

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

THE CURRENT LIMITATION LOCATED IN THE TLS-RF BATTERY PACK FORMS AN INTRINSICALLY SAFE ENERGY LIMITED SYSTEM WHEN CONNECTED TO THE TLS-RF TRANSMITTER.

TLS-RF TRANSMITTERS ARE IDENTIFIED BY PART NUMBERS 332235-XXX. A TLS-RF TRANSMITTER CANNOT BE CONNECTED IN PARALLEL WITH ANOTHER TLS-RF TRANSMITTER OR ANY OTHER APPARATUS.

THE ELECTRONICS LOCATED IN THE BARRIER CIRCUIT OF THE TLS-RF TRANSMITTER FORMS AN INTRINSICALLY SAFE ENERGY LIMITED SYSTEM. ONLY THE PROBE OR THE SENSOR INDICATED ON THIS DRAWING CAN BE CONNECTED TO THE OUTPUT TERMINALS OF THE TLS-RF TRANSMITTER IN ORDER FOR IT TO BE CONSIDERED AN INTRINSICALLY SAFE APPARATUS AND APPROVED FOR USE IN CLASS I, GROUP D OR CLASS 1, ZONE 0, GROUP IIA HAZARDOUS (CLASSIFIED) LOCATIONS.

## WARNINGS

SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

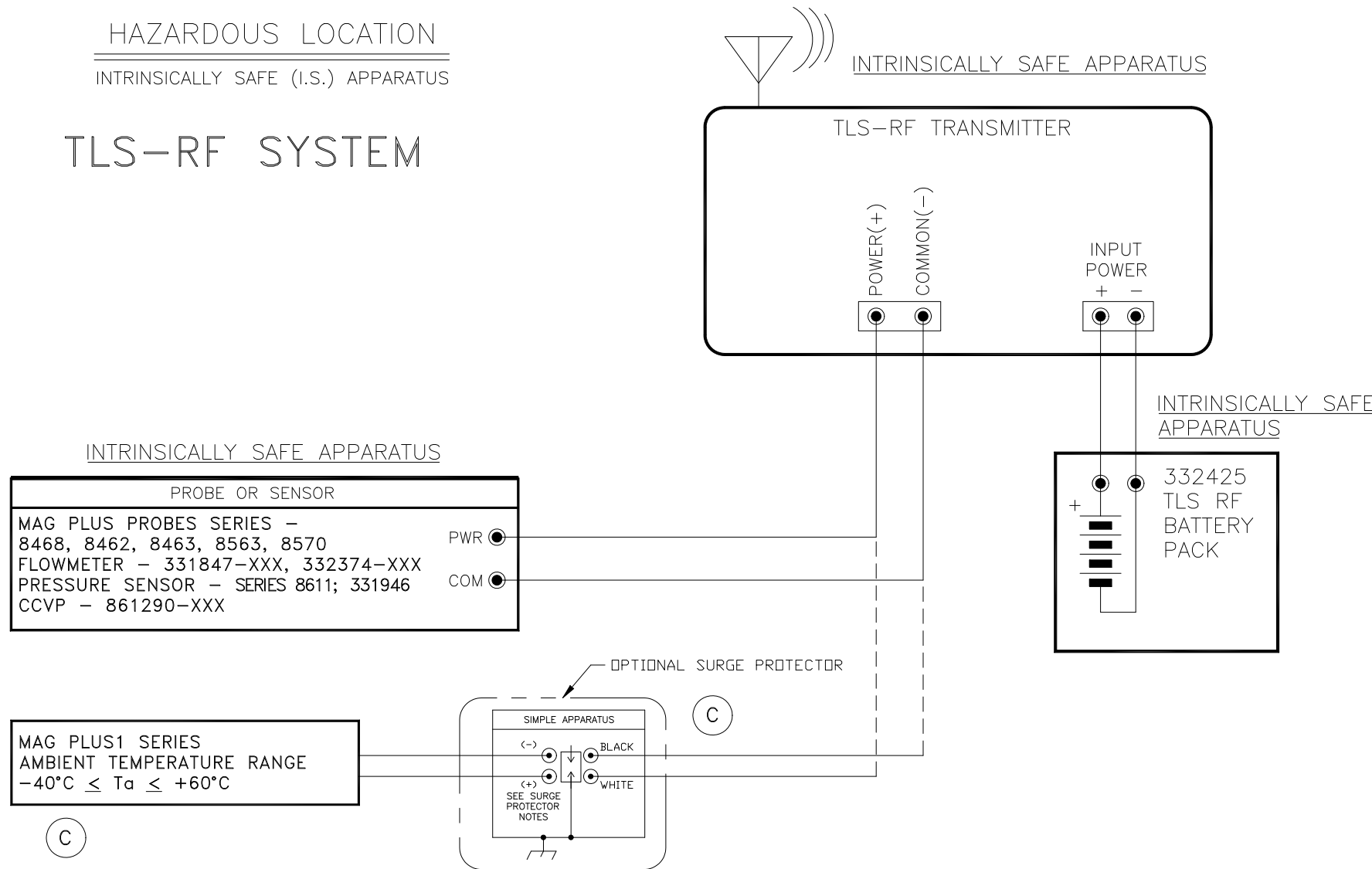


WARNING: IN INSTALLATION AND USE OF THIS PRODUCT, COMPLY WITH ALL ELECTRICAL CODES. IN ADDITION, TAKE THE NECESSARY PRECAUTIONS DURING INSTALLATION, SERVICE AND REPAIR TO PREVENT PERSONAL INJURY, PROPERTY LOSS AND EQUIPMENT DAMAGE.

## HAZARDOUS LOCATION

INTRINSICALLY SAFE (I.S.) APPARATUS

## TLS-RF SYSTEM



SEE SHEET 2 FOR ADDITIONAL WIRING AND LIMITATIONS

## NOTES:

1. THE MAXIMUM CABLE LENGTH CONNECTING THE BATTERY PACK TO THE TLS-RF TRANSMITTER SHALL NOT EXCEED 45.72 METERS OR 150 FEET.
2. THE TOTAL CABLE INDUCTANCE, COMBINING ALL OF THE CABLE USED TO CONNECT THE INTRINSICALLY SAFE DEVICE TO THE RF TRANSMITTER, MUST NOT EXCEED 0.2mH.
3. EACH CABLE (OR WIRING) USED TO CONNECT I.S. DEVICES TO THE TLS-RF TRANSMITTER MUST NOT EXCEED A CAPACITANCE OF 328 pf/METER OR 100 pf/FOOT.
4. THE TOTAL CABLE CAPACITANCE, COMBINING ALL OF THE CABLE USED TO CONNECT THE INTRINSICALLY SAFE DEVICE TO THE TLS-RF TRANSMITTER, MUST NOT EXCEED 0.1μF.
5. EACH CABLE MUST NOT EXCEED AN INDUCTANCE OF 0.656 μH/METER OR 0.2 μH/FOOT.
6. THE L/R RATIO OF THE CABLE MUST NOT EXCEED 200 μH/OHM.
7. EACH CABLE, OR I.S. WIRING, USED TO CONNECT THE INTRINSICALLY SAFE APPARATUS MUST HAVE SUITABLE INSULATION AS REQUIRED BY ARTICLE 504.30(B) OF THE NEC.

Certified Product  
No changes permitted without reference to the "Notified Body (NB)"

DO NOT SCALE DRAWING				
DESIGNER	NAME	DATE	NEXT GRP.	-----
BREEN	BREEN	7/8/09	ASSEMBLY	-----
PROJECT	B. ANDREW	7/8/09	FORM NO	-----
MATERIAL	SIMSBURY, CONNECTICUT 06070 U.S.A.			
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REFERENCE MFG. SPEC. VRS 81005 WHERE IT IS APPLICABLE	CONTROL DRAWING UL/cUL TLS-RF SYSTEM			
UNSPECIFIED TOLERANCES +/- 0.005	SIZE D	DRAWING NUMBER 331940-012	REV. C	STATUS NFP
SCALE	NONE	SHEET 1	OF 2	

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

THE TLS-RF SYSTEM MUST BE INSTALLED IN ACCORDANCE TO THIS CONTROL DRAWING AND ARTICLE 504 OF THE NEC OR SECTION 18 OF THE CEC.

## LIMITATIONS

THE MAXIMUM NUMBER OF A SPECIFIC DEVICE TYPE IS LIMITED TO ONE DEVICE

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 SENSORTS, PART NUMBERS 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 I<sub>max</sub> RATING OF AT LEAST 10kA 8/20<sub>us</sub> 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.

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.



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### CONTROL DRAWING UL/cUL TLS-RF SYSTEM

SIZE	DRAWING NUMBER	REV.	STATUS
D	331940-012	C	NFP
SCALE	NONE	SHEET	2 OF 2