

ELECTRONIC METER REGISTER

NON-HAZARDOUS AREA

CONTROL DRAWING
INTRINSICALLY SAFE SYSTEM

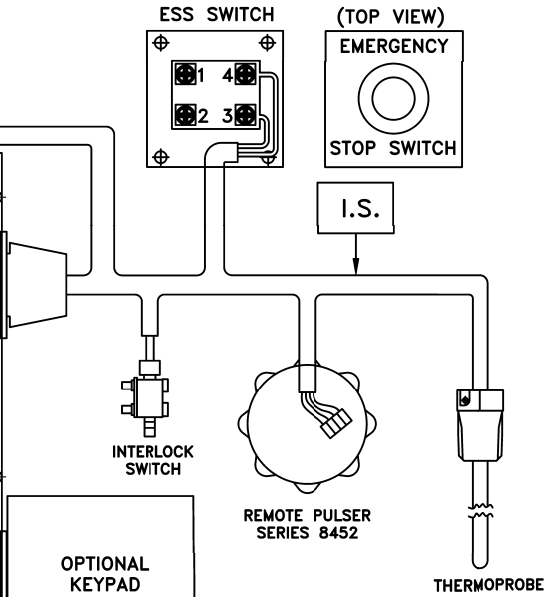
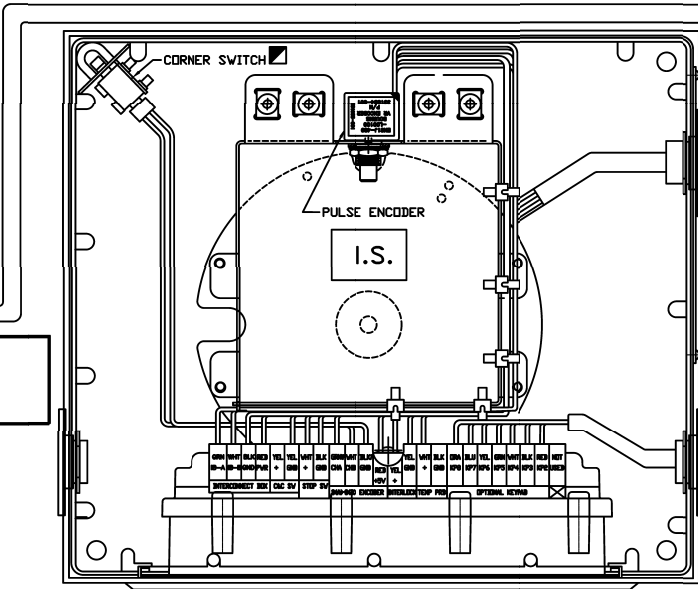
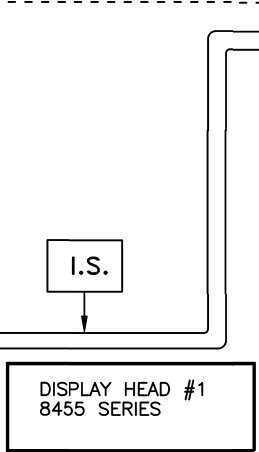
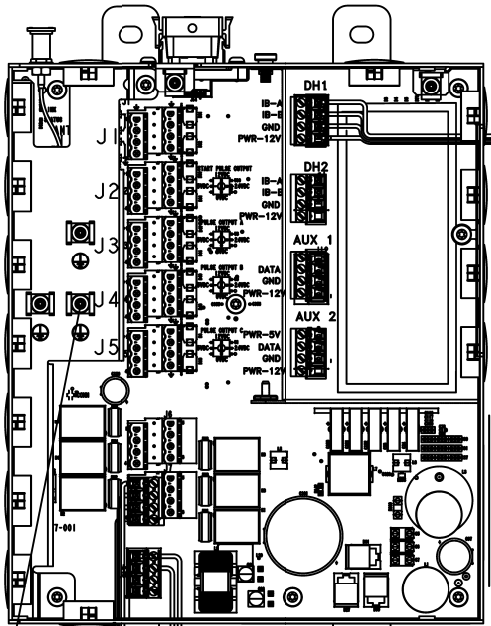
AMBIENT TEMPERATURE RANGE
-40°C ≤ T_a ≤ 60°C

REV	DESCRIPTION	BY	DATE	ECO
A	INITIAL RELEASE	TB	2017/02/01	CN-14986
B	WAS 12/24 VDC; WAS 7649; ADDED NOTE; ADDED REMOTE C+C SWITCH DETAILS	K.G.	2018/08/01	CN-20403

ASSOCIATED APPARATUS
[Exia] IIA
[AEx ia] IIA
-25°C ≤ T_a ≤ +40°C

HAZARDOUS AREA
INTRINSICALLY SAFE (I.S.) APPARATUS
CLASS I, DIVISION 1, GROUP D
CLASS I, ZONE 0, GROUP IIA
Ex ia IIA
AEx ia IIA T4

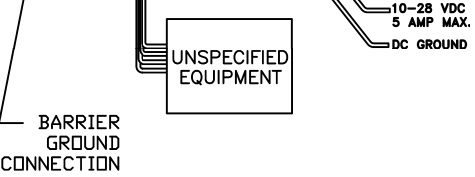
EMR4 (IB)
INTERCONNECTION BOX
8457 SERIES



☑ CORNER SWITCH METER MOUNT ONLY,
SEE SHEET 3 FOR REMOTE DISPLAY
C+C SWITCH

I.S. INDICATES
INTRINSICALLY SAFE
CONNECTIONS

NOTES: SEE SHEET 2
WIRE TABLE: SEE SHEET 2
I.S. CABLE AND WIRE: SEE SHEET 3



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

DO NOT SCALE DRAWING			
NAME	DATE	NEXT GRP.	
DESIGNER T. BREEN	2017/02/01	ASSEMBLY	
PROJECT B. ANDREW	2017/02/01	FORM NO	
MATERIAL	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	CONTROL DRAWING UL/cUL EMR4		
UNSPECIFIED TOLERANCES +/- 0.005	SIZE D	DRAWING NUMBER 331940-021	REV. B STATUS REL
	SCALE NONE	SHEET 1	OF 3

DESCRIPTION

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

THE EMR4 IB IS IDENTIFIED BY FORM NUMBER 8457. AN EMR4 IB CANNOT BE CONNECTED IN PARALLEL WITH ANOTHER EMR4 IB OR ANY OTHER ASSOCIATED APPARATUS. EMR4 IB MUST BE INSTALLED IN INDOOR NON-HAZARDOUS AREAS.

THE I.S. WIRING TERMINALS PROVIDE WIRING FOR THE CONNECTION OF INTRINSICALLY SAFE APPARATUS.

THE ELECTRONICS LOCATED IN THE BARRIER CIRCUIT FORMS AN INTRINSICALLY SAFE ENERGY LIMITED SYSTEM. DISPLAY HEADS CONNECTED TO THE OUTPUT TERMINALS OF THE I.S. CIRCUITS ARE CONSIDERED INTRINSICALLY SAFE APPARATUS AND ARE APPROVED FOR USE IN CLASS I, DIVISION 1, GROUP D AND CLASS I, ZONE 0 OR A CLASS I, ZONE 0, GROUP IIA HAZARDOUS (CLASSIFIED) LOCATIONS.

WARNINGS

SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

THE EMR DISPLAY HEAD, REMOTE DISPLAY HEAD, KEYPAD, PULSE ENCODER, THERMOPROBE, ESS SWITCH AND CORNER SWITCH CONTAIN ALUMINUM. CARE MUST BE TAKEN TO AVOID IGNITION HAZARDS DUE TO IMPACT OR FRICTION.

LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SECURITE INTRINSEQUE
 LA TÊTE D’AFFICHAGE EMR, LA TÊTE D’AFFICHAGE À DISTANCE, LE CLAVIER, L’ENCODEUR D’IMPULSIONS, LE THERMOPROBE, L’INTERRUPTEUR ESS ET L’INTERRUPTEUR D’ANGLE CONTIENNENT DE L’ALUMINIUM. LES SOINS DOIVENT ÊTRE EFFECTUÉS POUR ÉVITER LES DANGERS D’INFLAMMATION DUS À UNE IMPACT OU À UNE FRICTION.

WIRING NOTES

INTERCONNECTING CABLE SHALL HAVE A MINIMUM RESISTANCE OF 6.35mΩ PER FOOT.

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

EMR4 IB BOXES MUST BE INSTALLED IN AN INDOOR, NON-HAZARDOUS AREA IN ACCORDANCE WITH THE CONTROL DRAWING AND THE INSTALLATION INSTRUCTIONS. AN EMR4 IB CAN BE CONNECTED TO ANY INTRINSICALLY SAFE APPARATUS AS DESCRIBED ON SHEET ONE OF THIS DOCUMENT. MULTIPLE SOURCES OF POWER, ADDITIONAL EMR4 IB BOXES OR OTHER ASSOCIATED APPARATUS, CANNOT BE CONNECTED TO THE SAME INTRINSICALLY SAFE APPARATUS.

INTRINSICALLY SAFE (I.S.) WIRING MUST BE INSTALLED IN ACCORDANCE WITH ARTICLE 504 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 DEVICES TO THE EMR4 IB IS LIMITED TO A TOTAL OF 1,000 FEET PER DISPLAY HEAD.

EACH CABLE (OR I.S. WIRING), USED TO CONNECT INTRINSICALLY SAFE DEVICES TO THE EMR4 IB, MUST BE RATED 100 PICOFARAD/FOOT (OR LESS CAPACITANCE PER FOOT) AND MUST BE RATED 0.2 MICROHENRY/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 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 EMR4 IB MUST NOT USE OR GENERATE MORE THAN 250V RMS OR DC WITH RESPECT TO EARTH GROUND.

LIMITATIONS

A MAXIMUM OF TWO INTRINSICALLY SAFE APPARATUS (DISPLAY HEADS) MAY BE CONNECTED TO THE DISPLAY HEAD CONNECTIONS LOCATED IN THE ASSOCIATED APPARATUS (INTERCONNECTION BOX).

THE AMBIENT TEMPERATURE RANGE FOR THE INTERCONNECT BOX IS -25°C TO +40°C. THE AMBIENT TEMPERATURE FOR THE DISPLAY HEAD, EMERGENCY STOP SWITCH, THERMOPROBE, CORNER AND/OR C&C SWITCH, INTERLOCK SWITCH ROTARY PULSE ENCODER, AND KEYPAD IS -40°C TO +60°C. AMBIENT TEMPERATURE FOR THE REMOTE PULSER IS -25°C TO +70°C.

WIRE TABLE		PULSE ENCODER WIRE CONNECTIONS OR OPTIONAL REMOTE PULSER		KEYPAD CABLE CONNECTIONS		INTERLOCK SWITCH AND CORNER SWITCH CABLE CONNECTIONS	
IB BOX CABLE CONNECTIONS		SIGNAL	WIRE COLOR	SIGNAL	WIRE COLOR	SIGNAL	WIRE COLOR
PWR	RED	+5V	RED	KP2	RED	GND	YELLOW
GND	BLACK	GND	BLACK	KP3	BLACK	CCS	YELLOW
IB-B	WHITE	CHB	WHITE	KP4	WHITE		
IB-A	GREEN	CHA	GREEN	KP5	GREEN		
				KP6	YELLOW		
				KP7	BLUE		
				KP8	ORANGE		
ESS (OPTIONAL) SWITCH CONNECTIONS		THERMOPROBE (OPTIONAL) CABLE CONNECTIONS					
SIGNAL	WIRE COLOR	SIGNAL	WIRE COLOR				
GND	BLACK	TP	BLACK				
ESS	WHITE	TP	WHITE				

FOR I.S. CABLE AND WIRE DESCRIPTIONS SEE SHEET 3

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

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CONTROL DRAWING
UL/cUL EMR4

SIZE	DRAWING NUMBER	REV.	STATUS
D	331940-021	B	REL
SCALE	NONE	SHEET	2 OF 3

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

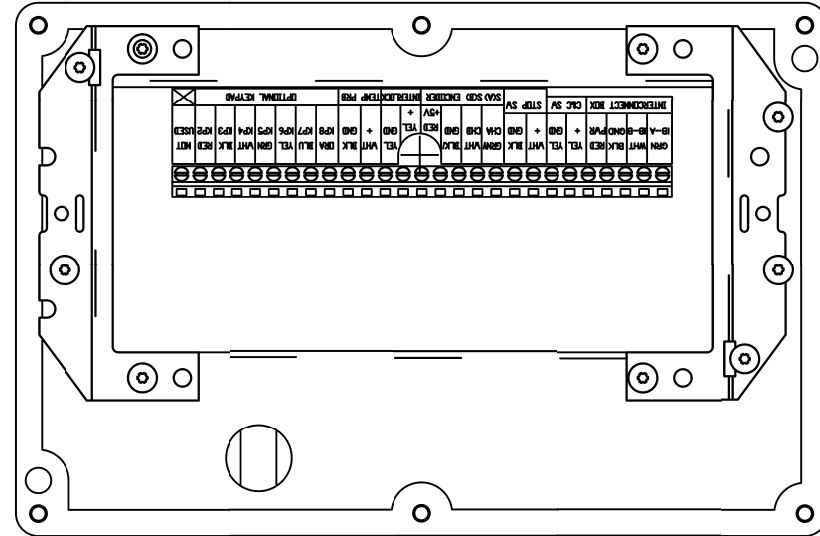
UL 1238 CONTROL EQUIPMENT FOR USE WITH FLAMMABLE LIQUID DISPENSING DEVICES.

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



REMOTE DISPLAY HEAD
(BODY REMOVED FOR CLARITY)
WIRING IDENTICAL TO DISPLAY HEAD

EMR4 I.S. CABLE AND WIRE DESCRIPTIONS

SIMPLE APPARATUS	MAXIMUM LENGTH	TYPE
THERMOPROBE	7,620 mm 25 FT	EXTERNAL CABLE, 2 CONDUCTOR
REMOTE PULSER	10,668 mm 35 FT	EXTERNAL CABLE, 4 CONDUCTOR
CORNER, C+C, OR INTERLOCK SWITCH	7,620 mm 25 FT	INTERNAL WIRE, 2 CONDUCTOR
OPTIONAL KEYPAD	915 mm 3 FT	INTERNAL WIRE, 7 CONDUCTOR
EMERGENCY STOP SW	7,620 mm 25 FT	EXTERNAL CABLE, 2 CONDUCTOR
DISPLAY HEAD OR REMOTE DISPLAY HEAD	305 METERS 1000 FT	EXTERNAL CABLE, 4 CONDUCTOR

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CONTROL DRAWING UL/cUL EMR4

SIZE	DRAWING NUMBER	REV.	STATUS
D	331940-021	B	REL

SCALE NONE SHEET 3 OF 3