

# PRODUCT SUBMITTALS

## 301EM-EXPANSION MODULE

WITH 301IRFS INFRARED AND/OR S301D2 SENSOR

**Honeywell**

### ORDERING INFORMATION

- 301EM Expansion Module w/3-24VDC Outputs, Relays (4), 4-20mA (4), Network
- 301EM-RFS Expansion Module w/3-24VDC Outputs, Relays (4), 4-20mA (4), Strobe Light, Network
- 301EM-RFSA Expansion Module w/3-24VDC Outputs, Relays (4), 4-20mA (4), Strobe Light & Horn, Network
- 301IRFS Refrigerant Gas Sensor
- S301D2 Toxic or Combustible Gas Sensor
- EMBG Emergency Break Glass Switch

### 301EM SPECIFICATIONS

<b>Standard Outputs:</b>	4 DPDT relays 3 Outputs at 24 Vdc @ 250 mA each 4@20 mA for each sensor RS-485: Modbus - Vulbus (For VA201C &VA301C Integration)
<b>Audible Alarm:</b>	65 dBA @ 3 foot (1 m)
<b>Display:</b>	Backlit LCD
<b>Visual Indicators:</b>	Green LED: Normal operation Red LEDs: Alarm A, B and C Yellow LED: Fault/service alarm Amber LED: Tx (When Transmitting to the VA301EM)
<b>Maximum distance between VA301EM and Controller:</b>	Up to 2000 feet (600 m) T-tap: 65 ft. (20 m) maximum per t-tap 130 ft. (40 m) total
<b>Relay Output Rating:</b>	5A, 30Vdc or 250Vac (resistive load)
<b>Circuit Protection:</b>	Long Time-Lag Polyswitch Type TT
<b>Overvoltage Category:</b>	II
<b>Power Requirement:</b>	22-27 Vac, 50 or 60 Hz, 29-38Vdc, 2.0 A max @ 24 Vdc
<b>Operating Environment:</b>	Indoor Use
<b>Operating Temperature Range:</b>	32°F to 100°F (0 to 40°C)
<b>Operating Humidity Range:</b>	0 to 95% RH (non-condensing)
<b>Operating Altitude:</b>	Up to 9843 feet (3,000 m)
<b>Enclosure:</b>	ABS - Polycarbonate
<b>Pollution Degree:</b>	2
<b>Transmitter Size:</b>	7.99" (H) x 11.02"(W) x 2.76" (D) (20.3 x 28 x 7 cm)
<b>Transmitter Weight:</b>	2.26 lbs (1.02 kg)
<b>Certification</b>	UL 1244 - Fourth edition, October 2000 CSA C22.2 No 205-M1983 (R1999)

### OPTIONS

- RFS Strobe:** STAS flashing LED, 24VAC/VDC
- RFSA Strobe/Horn:** 105dBA, 4-28V, 2800Hz (RFSA)  
Min. Voltage 80 dB(A) min. @ 2 FT and 6 Vdc  
Max Voltage 90 dB(A) min. @ 2 FT and 28 Vdc
- EMBG** Emergency Break Glass Switch

# PRODUCT SUBMITTALS

## 301EM-EXPANSION MODULE

WITH 301IRFS INFRARED AND/OR S301D2 SENSOR



### SENSING TECHNOLOGY

#### SENSOR 301IRFS

Gases Detected:

- R-11
- R-12
- R-22
- R-123
- R-125
- R-134a
- (other) \_\_\_\_\_

**Sensing Technology:** Honeywell infrared sensor  
**Measurement Range:** 0-1000 PPM  
**Resolution:** 1 PPM  
**Response Time (T90):** 60 seconds  
**Cold to Start:** 15 minutes  
**Operating Environment:** Indoor Use  
**Distance between 301EM and Sensor:** Up to 200 feet (60 m)  
**Operating Temperature Range:** 32°F to 100°F (0 to 40°C)  
**Operating Humidity Range:** 0 to 95% RH (non-condensing)  
**Operating Altitude:** Up to 9843 feet (3,000 m)  
**Enclosure:** ABS - Polycarbonate  
**Size:** 4.02" (H) x 11.02"(W) x 2.48" (D)  
(10.2 x 28 x 6.3 cm)  
**Weight:** 2.33 lbs (0.603 kg)

#### SENSOR S301D2

**Sensing technology:**

- Electrochemical (toxic) \_\_\_\_\_
- Catalytic combustion (combustible) \_\_\_\_\_
- Diffusion fuel cell (oxygen) \_\_\_\_\_

Specify gas

**Distance between 301EM and Sensor:** Up to 500 feet (160 m) (toxic and combustible)  
**Operating Temperature Range:** Toxic: -40°F to 100°F (-40 to 40°C)  
**Combustible:** -40°F to 122°F (-40 to 50°C)  
**Operating Humidity Range:** 0% to 95% RH, Non-Condensed  
**Operating Altitude:** Up to 9843 feet (3,000 m)  
**Enclosure:** Class 1, Division 1, Groups B, C, D

# PRODUCT SUBMITTALS

## 301EM-EXPANSION MODULE

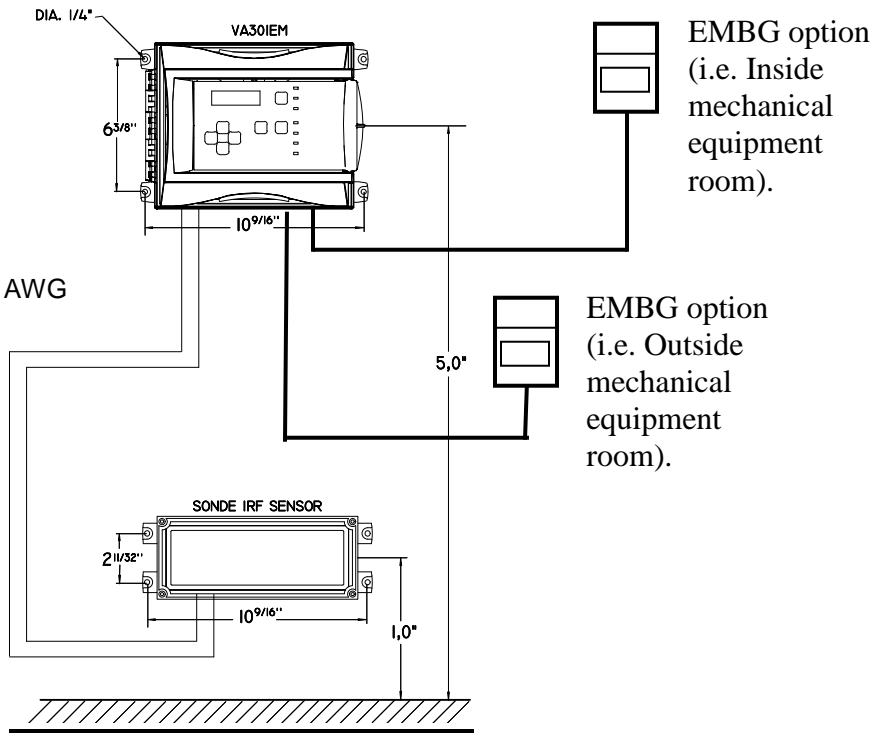
WITH 301IRFS INFRARED AND/OR S301D2 SENSOR



### REMOTE SENSOR INSTALLATION

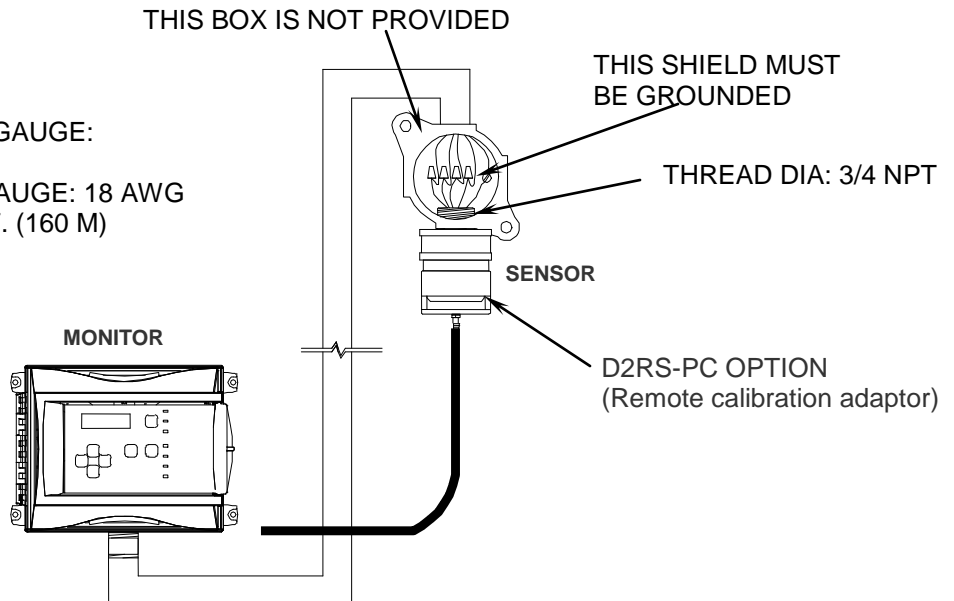
**301IRFS REMOTE SENSOR**

COMMUNICATION CABLE GAUGE:  
24 AWG BELDEN # 9841  
POWER SUPPLY CABLE GAUGE: 14 AWG  
MAXIMUM LENGTH: 200 FT. (60 M)



**S301D2 REMOTE SENSOR**

COMMUNICATION CABLE GAUGE:  
24 AWG BELDEN # 9841  
POWER SUPPLY CABLE GAUGE: 18 AWG  
MAXIMUM LENGTH: 500 FT. (160 M)



THE MONITOR AND CALIBRATION TUBING MUST BE ACCESSIBLE TO MAINTENANCE SERVICES.

# PRODUCT SUBMITTALS

## 301EM-EXPANSION MODULE

WITH 301IRFS INFRARED AND/OR S301D2 SENSOR



### TABLES

Range and Alarm Level

Gas Detected		Range	Alarm A	Alarm B	Alarm C
CO	Carbon Monoxide	0 - 250 PPM	25 PPM	200 PPM	220 PPM
NO <sub>2</sub>	Nitrogen Dioxide	0 - 10 PPM	0.72 PPM	2 PPM	9 PPM
H <sub>2</sub>	Hydrogen	0 - 100% LEL	25% LEL	50% LEL	90% LEL
CL <sub>2</sub>	Chlorine	0 - 15 PPM	0.5 PPM	1 PPM	13.5 PPM
SO <sub>2</sub>	Sulfur Dioxide	0 - 10 PPM	2 PPM	5 PPM	9 PPM
H <sub>2</sub> S	Hydrogen Sulfide	0 - 50 PPM	10 PPM	15 PPM	45 PPM
HCL	Hydrogen Chloride	0 - 25 PPM	3 PPM	4 PPM	22.5 PPM
HCN	Hydrogen Cyanide	0 - 50 PPM	5 PPM	9 PPM	45 PPM
ETO	Ethylene Oxide	0 - 20 PPM	1 PPM	5 PPM	18 PPM
O <sub>2</sub>	Oxygen	0 - 25% Vol.	19.5% Vol.	22% Vol.	22.5% Vol.
R-12 3	Refrigerant Q1	0 - 1,000 PPM	50 PPM	500 PPM	900 PPM
R-11					
R-12					
R-22					
R-12 5					
R134A					
COMB	Combustibles	0 - 100% LEL	25% LEL	50% LEL	90% LEL

Recommended Height

Detected Gas		Relative Density (air = 1)	Installation Height
CO	Carbon Monoxide	0.968	3 - 5 ft. (1 - 1.5 m) from floor
*NO <sub>2</sub>	Nitrogen Dioxide	1.58 (cold)	1 - 3 ft. (30 cm to 1 m) from ceiling
H <sub>2</sub>	Hydrogen	0.07	1 ft. (30 cm) from ceiling
CL <sub>2</sub>	Chlorine	2.50	1 ft. (30 cm) from ceiling
H <sub>2</sub> S	Hydrogen Sulfide	1.19	1 foot (30 cm) from floor
O <sub>2</sub>	Oxygen	1.43	3 - 5 ft. (1 - 1.5 m) from floor
HCL	Hydrogen Chloride	1.30	1 foot (30 cm) from floor
HCN	Hydrogen Cyanide	0.932	1 ft. (30 cm) from ceiling
ETO	Ethylene Oxide	1.50	1 foot (30 cm) from floor
SO <sub>2</sub>	Sulfur Dioxide	2.25	1 foot (30 cm) from floor
R 11	Refrigerants	5.04	1 foot (30 cm) from floor
R 12		4.20	
R 2 2		3.11	
R 12 3		5.27	
R 12 5		4.14	
R 13 4 A		3.52	
COMB	Most combustibles are heavier than air, with the exception of methane, hydrogen, ethylene and acetylene. For gases that are heavier than air, sensors should be installed approximately 30 cm (1 foot) from the floor. For combustibles that are lighter than air, sensors should be installed 30 cm (1 foot) from the ceiling, close to the potential leak source.		

\* May differ in certain applications. Hot NO<sub>2</sub> from exhaust systems is lighter than ambient air.

# PRODUCT SUBMITTALS

## 301EM-EXPANSION MODULE

WITH 301IRFS INFRARED AND/OR S301D2 SENSOR

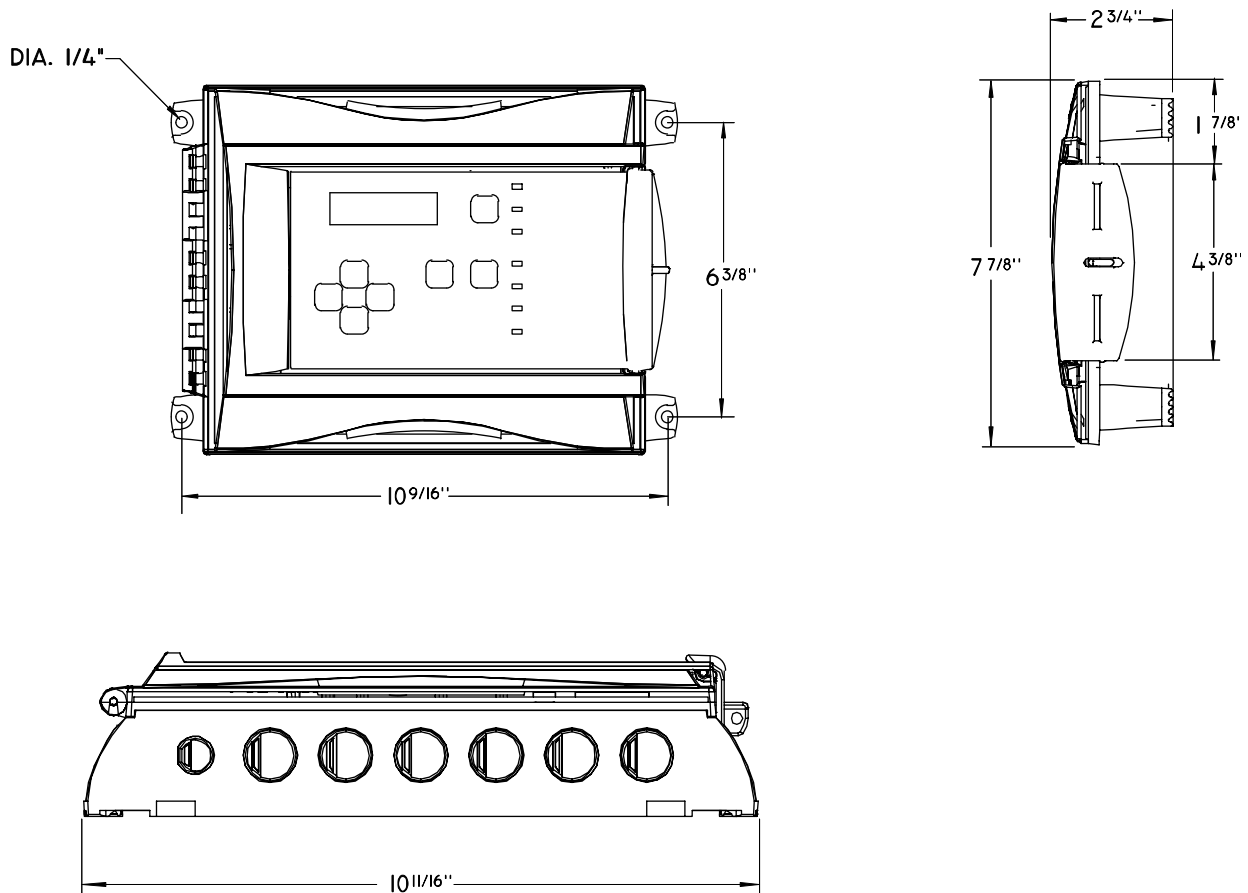


### INSTALLATION GUIDELINES

These guide lines **must be strictly observed** to assure that the equipment will work properly. If they are not applied, Vulcain will not recognize any liability in case of improper operation:

- Make sure to locate all units easily accessible for proper service.
- Avoid any location where units could be subject to vibrations.
- Avoid any location close to any electromagnetic interference.
- Avoid any location where there are large temperature swings.
- Verify local requirements and existing regulations witch may affect the choice of location.

### SURFACE-MOUNT INSTALLATION



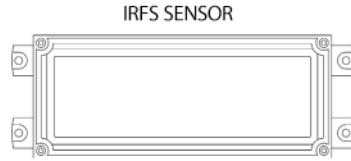
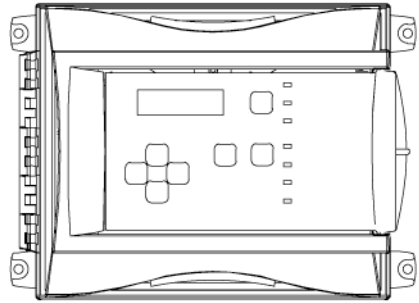
# PRODUCT SUBMITTALS

## 301EM-EXPANSION MODULE

WITH 301IRFS INFRARED AND/OR S301D2 SENSOR



### PCB WIRING DETAILS 301EM



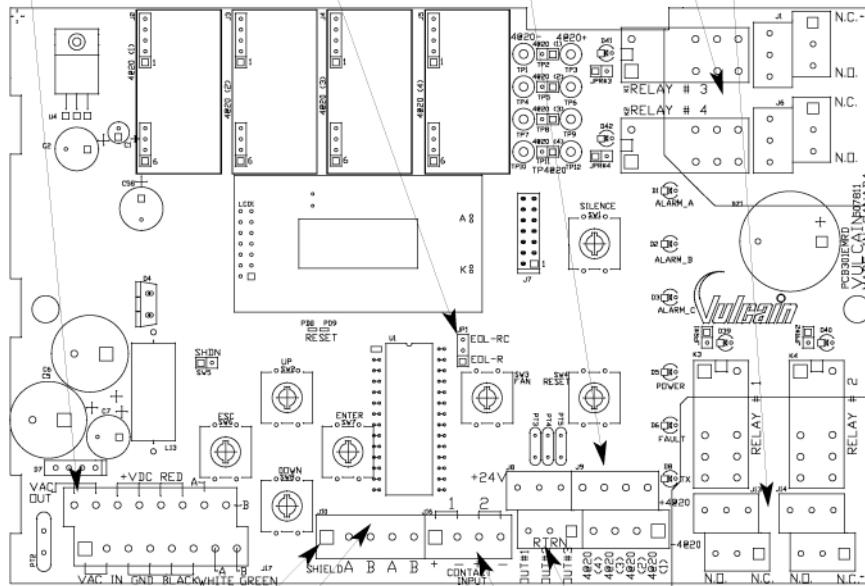
S301D2 SENSOR  
(Remote calibration adaptor)

Power:  
J17  
22 to 27 Vac,  
29 to 38 Vdc,  
2.0 A max

End of line:  
JP1 To determine a transmitter  
to be the last in the network,  
place the jumper in an upright  
aligned with the top

Relay Output:  
J13, J14, J1, J6  
5A, 30 Vdc  
or 250 Vac  
(resistive load)

4@20 mA: B



Communication Shield

Input Contact: J16  
Input for manual switch

Communication: J10  
Length of line: Up to 2000 feet (600 m) from controller  
T-tap: 65 ft. (20 m) maximum per t-tap  
130ft. (40 m) total  
From controller or previous unit  
To next unit if applicable.

Output 24 Vdc: B  
Three 24 Vdc outputs (can be use to  
activate horn, strobe, etc.)

# PRODUCT SUBMITTALS

## 301EM-EXPANSION MODULE

WITH 301IRFS INFRARED AND/OR S301D2 SENSOR

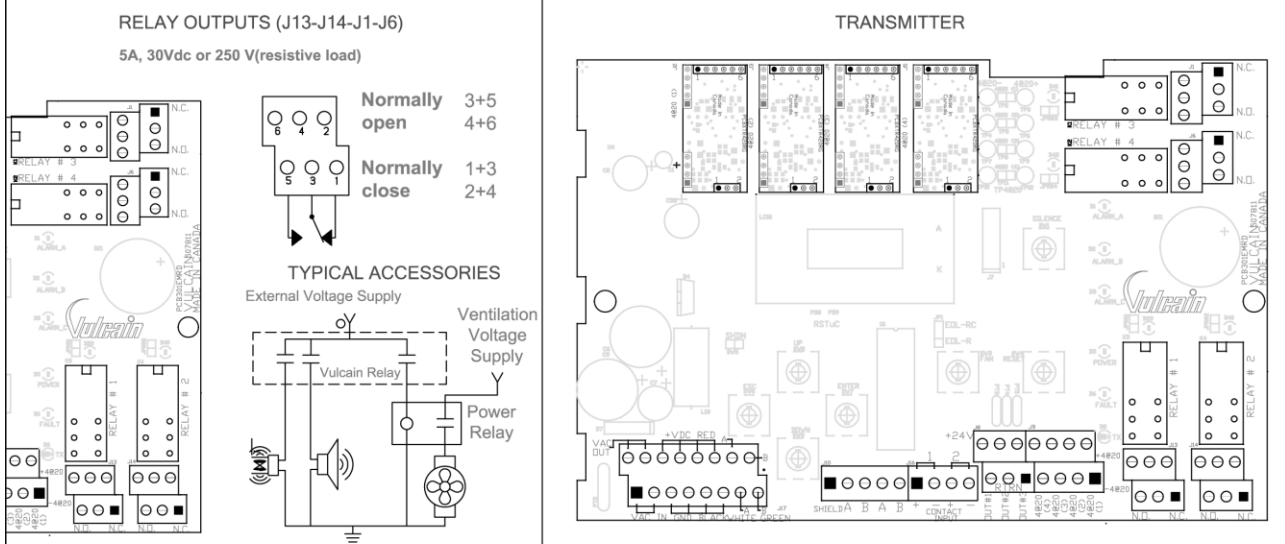


### WIRING DETAILS

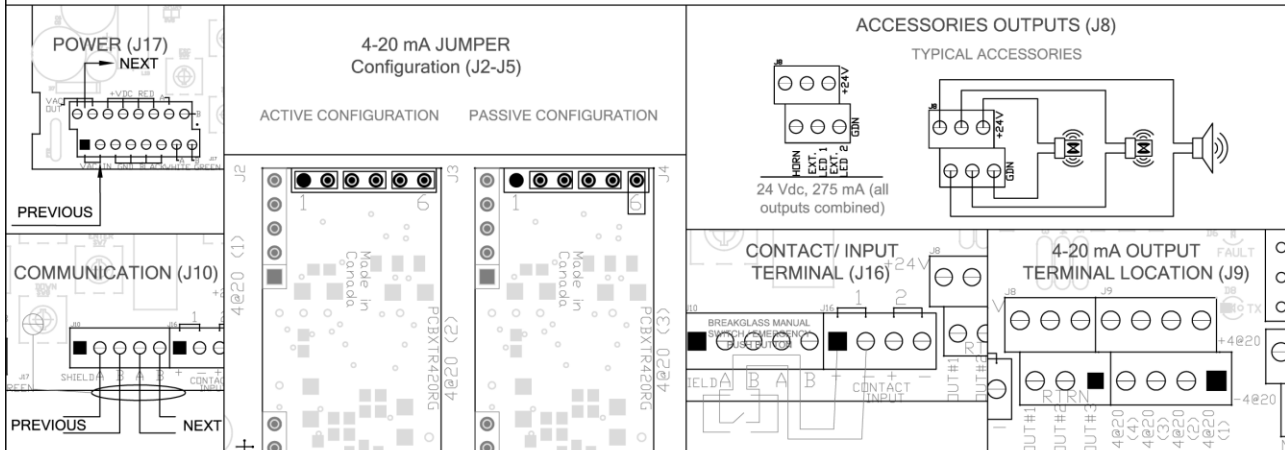
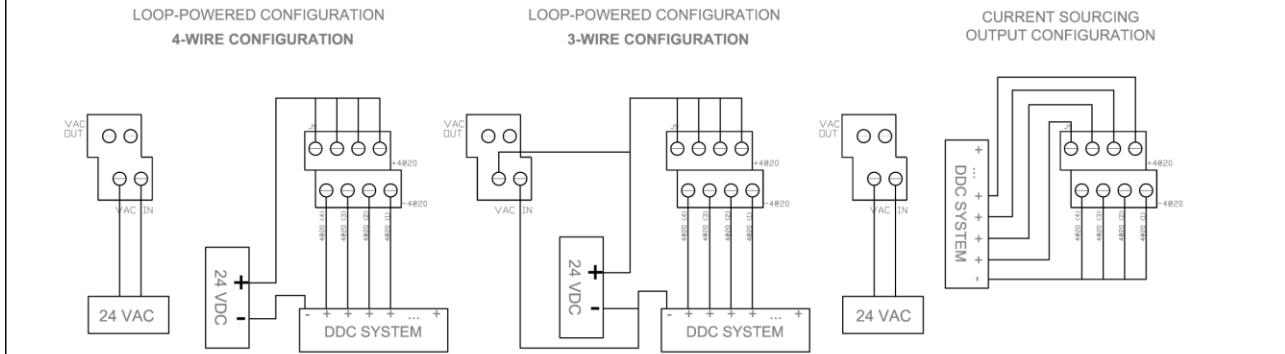


### VA301EM WIRING DETAILS

1005 Matte\_Local G,  
3rossard, Quebec,  
J4Y 2P4  
Tel. :1-800-563-2967  
Fax.:1-888-967-9938  
[www.vulcaininc.com](http://www.vulcaininc.com)



### 4-20 mA CONFIGURATION



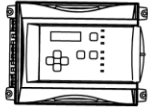
D	CREATION DU DOCUMENT	MUTH MIHAI	18 mars 2005	TITRE	VA301EM WIRING DETAILS	PAGE	1/2
REV NO	DESCRIPTION	PAR	DATE	APPROUVE PAR / DATE	DESSIN NO.	ÉCHELLE	
	RÉVISION			J.C.			

# PRODUCT SUBMITTALS

## 301EM-EXPANSION MODULE

WITH 301IRFS INFRARED AND/OR S301D2 SENSOR

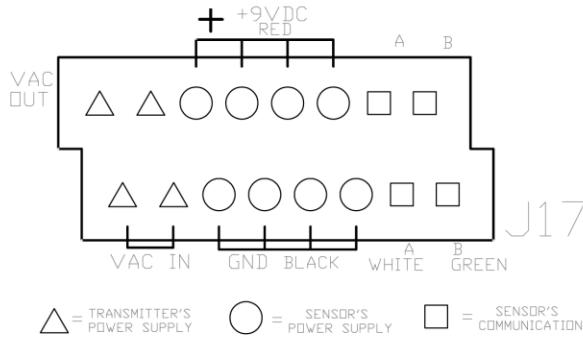
### WIRING DETAILS - SENSORS CONNECTION



#### VA301EM SENSORS WIRING DETAILS

4005 Matte, Local G,  
Brossard, Quebec,  
J4Y 2P4  
Tel. :1-800-563-2967  
Fax: :1-888-967-9938  
[www.vulcaininc.com](http://www.vulcaininc.com)

##### TERMINAL DESCRIPTION (SCHEMATIC)



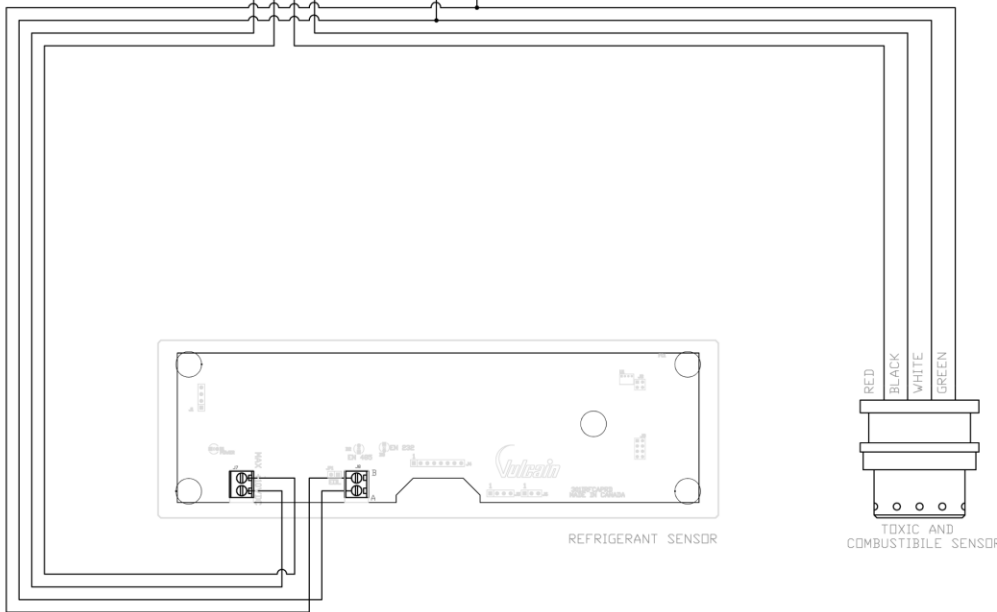
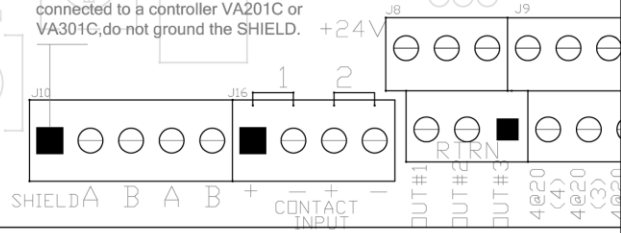
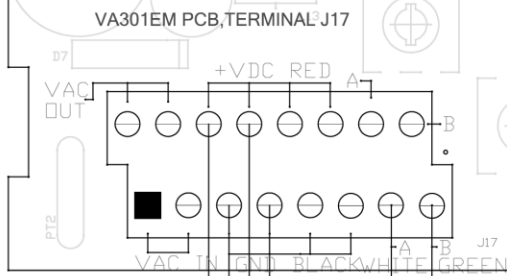
**NOTE :** Each sensor (up to 4) needs to be supplied with separate wires and needs to be connected directly on the VA301EM. However same communication terminals can be shared.

**SENSOR'S POWER SUPPLY J7**  
Cable Gauge: 14 AWG  
Maximum length: 200ft(61m)

**SENSOR'S COMMUNICATIONS**  
Cable Gauge: 24 AWG  
Maximum length: 200ft(61m)

**WIRE COLOUR CODE MUST BE RESPECTED**

SHIELD must be grounded to mechanical ground.  
In Network mode, the SHIELD is connected to a controller VA201C or VA301C, do not ground the SHIELD.



D	CRÉATION DU DOCUMENT	MUTH MIHAI	20 mars 2005	TITRE	VA301EM SENSORS WIRING DÉTAILS	PAGE	2/2
REV NO	DESCRIPTION	PAR	DATE	APPROUVE PAR / DATE	J.C.	DESSIN NO.	ÉCHELLE
	RÉVISION						



# PRODUCT SUBMITTALS

## 301EM-EXPANSION MODULE

WITH 301IRFS INFRARED AND/OR S301D2 SENSOR



### WARRANTY AND LIMITS OF LIABILITY

Honeywell warrants to the original purchaser that its product and the component parts thereof will be free from defects in workmanship and materials for a period of one year from the date of purchase. Without any charge and at its option, Honeywell will repair or replace defective products or components upon their delivery to its Repair and Service Department. This warranty does not apply in the event of misuse or abuse of the product, or as a result of unauthorized alterations or repairs. Honeywell shall not be liable for any consequential damages, including and without limitation, damages resulting from loss of use. Every precaution for accuracy has been taken in the preparation of this manual. However, Honeywell neither assumes responsibility for any omissions or errors that may appear, nor liability for any damages that may result from the use of the products in accordance with the information contained in this manual. To obtain warranty service, return the product, along with a complete description of the defect, transportation prepaid. Honeywell assumes no risk for damage in transit. Following warranty repair, the product will be returned to the buyer, transportation prepaid.