FGD1

Refrigerant Gas Detector
Non-Dispersive Infrared (NDIR)

Installation and Operating Instructions

Nov. 11, 2003

UNPACKING

After opening the package and removing the equipment and components, make sure that you have all the items described on the order form or packing slip.

DESCRIPTION

In continuing with its commitment towards cutting-edge technology and customer satisfaction, Vulcain introduces a breakthrough innovation in Refrigerant Gas Monitoring.

The result of extensive research and design, the 301IRF uses the latest in infrared technology. The remote sensor allows for accurate monitoring of the lowest gas concentration. This sensor can be placed at a distance of up to 100 feet from the transmitter.

The transmitter is equipped with a backlight LCD display and keypad that can be placed at eye level and in a different location from the refrigerant gas reading area. Thus allowing the monitoring from a safe and remote location.

Furthermore, it offers 4-20mA output, relay outputs, Modbus communication, audible alarm options and it is compatible with our VA-201C controller (Vulbus).

INSTALLATION GUIDELINES

- Make sure to locate the monitor and sensing assembly(ies) in an area easily accessible to a technician.
- Avoid any location where the monitor could be subject to vibrations.
- Avoid any location close to noisy equipment.
- Avoid any location where temperature changes occur rapidly.
- Verify all the requirements and existing regulations which may affect the choice of location.

DETERMINING THE NUMBER OF TRANSMITTERS

The number of transmitters required is determined by a unit's radius of surveillance. Using Table 1 below, the number of units can be easily evaluated.

Table 1

Gas Detected	Radius of Surveillance	Area Covered
All refrigerant gases	23 feet (7m)	1,660 square feet (154 square metres)

SURFACE-MOUNT INSTALLATION

Table 2

Gas Detected		Relative Density (air = 1)	Recommended Height
R-11 R-12 R-22 R-123 R-125 R-134A	Refrigerants	5.04 4.2 3.11 5.27 4.14 3.52	1 foot (30 cm) from floor

RANGE AND ALARM LEVELS

Table 3

Gas Detected		Range	Alarm A	Alarm B
R-123	Refrigerant	0 - 1000 PPM	50 PPM	500 PPM
R-11 R-12 R-22 R-125 R134a	Refrigerants Q1	0 - 1000 PPM	250 PPM	500 PPM

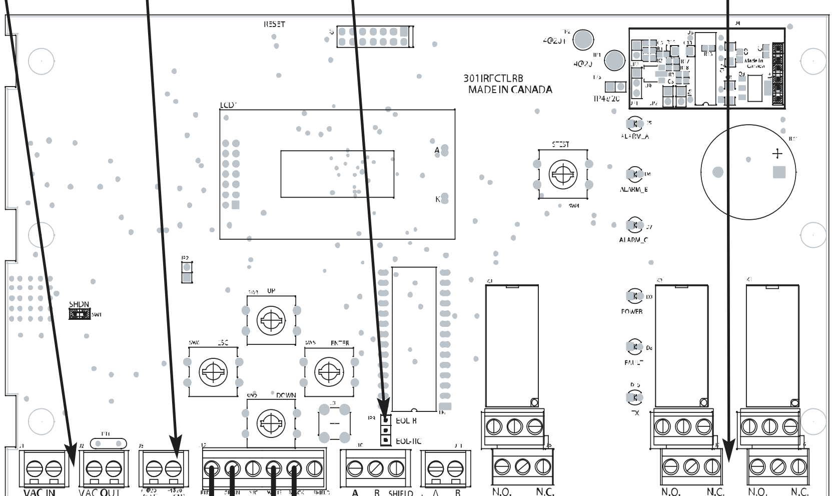
ELECTRICAL WIRING

Power:
Input J1
and output J2
17 to 27 Vac,
24 to 38 Vdc,
600 mA

4-20 mA:
Output J5
See details in section 4-20 mA LOOP CONFIGURATION

End of line:
JP3 To determine a transmitter to be the last in the network, place the jumper in an upright position aligned at the top.

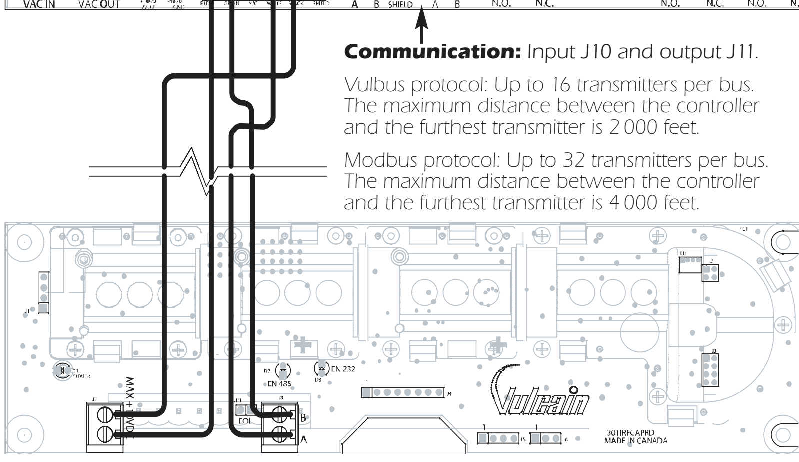
Relay Output:
J6, J7, J8
5 A, 30 Vdc
or 250 Vac
(resistive load)



Communication: Input J10 and output J11.

Vulbus protocol: Up to 16 transmitters per bus. The maximum distance between the controller and the furthest transmitter is 2 000 feet.

Modbus protocol: Up to 32 transmitters per bus. The maximum distance between the controller and the furthest transmitter is 4 000 feet.



SPECIFICATIONS

Gases detected :	R-11, R-12, R-22, R-123, R-125 and R-134a (other mixes also available)
Sensing technology:	Vulcain dual infrared sensor
Measurement range:	0-1000 ppm
Resolution:	1ppm
Response time:	60 seconds
Cold to start:	10 minutes
Optional outputs:	4-20 mA 3 DPDT relays RS-485
Optional audible alarm:	65 dBA @ 3 ft.
Display :	Backlight LCD
Visual indicators:	Green LED: Normal operation Red LEDs: Alarms A, B and C Yellow LED: Fault Yellow LED: Tx (Activated in network mode)
Relay Output Rating:	5A, 30Vdc or 250Vac (resistive load)
Power requirement:	17-27 Vac, 24-38Vdc, 600mA@24Vdc
Operating Temperature Range:	32°F to 100°F (0 to 40°C)
Operating Humidity Range:	0 to 95% RH (non-condensing)
Enclosure:	ABS
Size:	Transmitter 7.99” (H) x 11.02” (W) x 2.76” (D) Sensor 4.02” (H) x 11.02” (W) x 2.48” (D)
Weight:	Transmitter 2.26 lbs (1.02 kg) Sensor 2.33 lbs (0.603 kg)

PERIODIC INSPECTIONS AND CALIBRATION

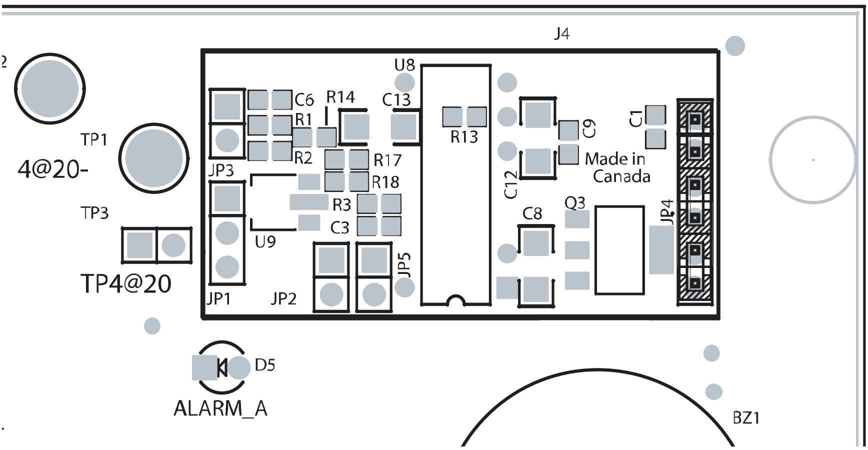
This unit requires calibration. The calibration frequency will be a function of the operating conditions, including operating under extreme temperatures, exposure to contaminants or gas concentrations. A calibration inspection must be included as part of a routine maintenance to ensure proper operation of the gas detection unit.

If unit span or zero cannot be adjusted, the sensor may be approaching its end-of-life and must be replaced.

4-20 mA LOOP CONFIGURATION

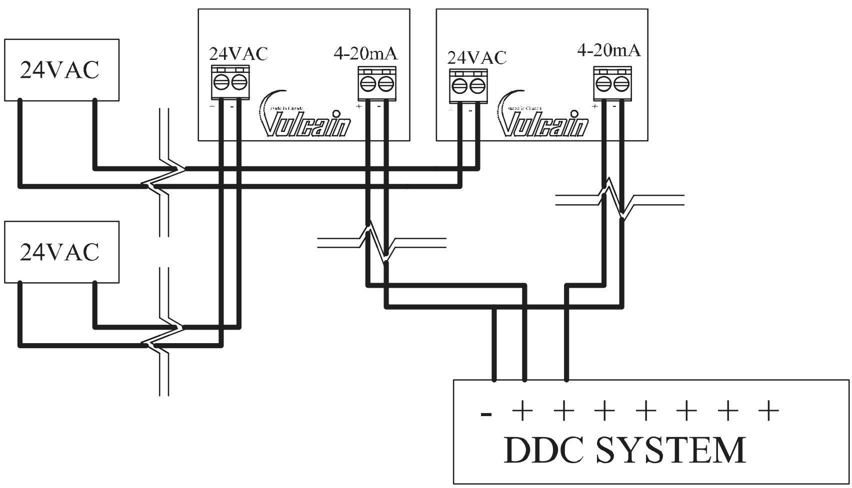
4-20 mA CURRENT SOURCING OUTPUT CONFIGURATION

The transmitter supplies the loop current. The maximum impedance supported by the loop is 400 ohms. Set jumpers on JP4 at 1-2, 3-4 and 5-6.



WARNING
A dedicated power supply must be used with each unit. Considerable damage may occur if this condition is not strictly followed.

Current Sourcing Output Configuration



4-20 mA OUTPUT LOOP-POWERED OPERATION (Factory Setting)

The 4-20 mA output is factory set for loop-powered operation and requires a power source of 12 Vdc to 30 Vdc. The overall impedance depends on the voltage supplied at the 4-20 mA loop. Set jumpers on JP4 at 2-3, 4-5 and 6 for this type of configuration.

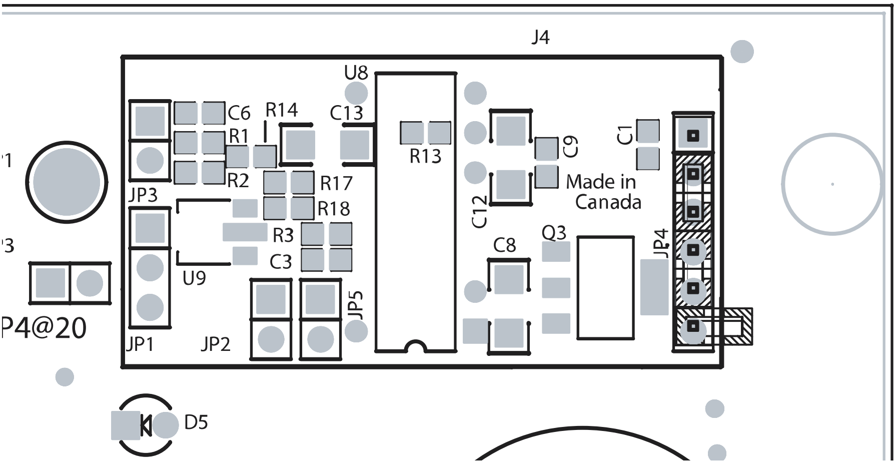


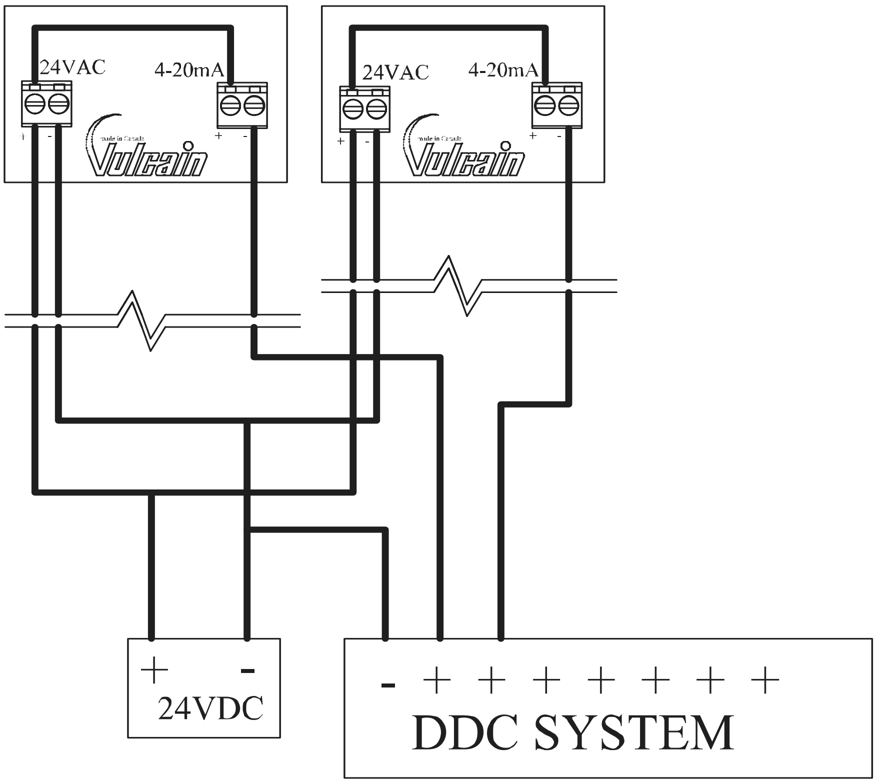
Table 4
Permitted Impedance in the 4-20 mA Loop

Voltage Source Applied	Total Impedance
12 Vdc	400 Ohms
16 Vdc	600 Ohms
20 Vdc	800 Ohms
24 Vdc	1,000 Ohms
30 Vdc	1,300 Ohms

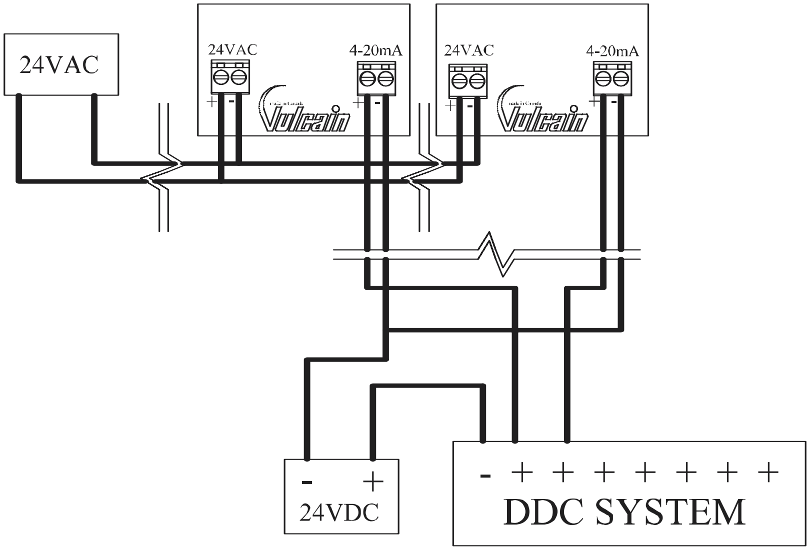
Electrical Wiring

The 4-20 mA output is factory set for loop-powered operation and allows for a 3-wire configuration when powered with 24 Vdc.

3-wire configuration



4-wire configuration



USER INTERFACE

When power is initially applied, the unit will display the software's model and revision numbers.

PREVENTIVE MAINTENANCE

It is recommended to contact Greystone after the first year of operation to carry out a verification and necessary adjustments to the unit. From the second year of operation and on, it is recommended that the units be verified twice a year.

GREYSTONE
ACCURACY BY DESIGN
Greystone Energy Systems Inc.
150 English Drive, Moncton, NB
Canada E1E 4G7

(506) 853-3057 Fax: (506) 853-6014
e-mail: mail@greystoneenergy.com
www.greystoneenergy.com