Specification

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24VDC Power Supply with Battery Backup System for Jupiter and Satellite Gas Detection Systems

1. Scope

This specification describes the Series HVS9022.00 24 VDC Power Supply with Battery Backup System for the **Jupiter** and **Satellite** Gas Detection Systems by Halogen Valve Systems, Inc. This system has been designed for gas detector installations that need or accept 24 VDC up to 0.200 mA. The system is powered by 115/230 VAC at 50-60 cps. This system can provide the required output for up to three days with the use of a single internal 12 VDC – 8 Ah backup power source.

2. Description

The **24VDC Power Supply** with Battery Powered Backup provides an uninterrupted 24 VDC power source for up to four (4) Jupiter gas detection systems and one Satellite gas detector. The battery charging circuit in the system is designed to maintain a full charge on the battery in order to provide 24 VDC output in the event of an AC power loss.

The control panel is constructed of specific materials selected for use around toxic gas. There is a Viton formed sealing ring between the control box and its cover surface to provide a NEMA-4x rating for the control system.

The control panel's internal DC power system is powered by 115/230 VAC. Backup power for the system is provided by a self-contained 12-volt battery that is continuously monitored by a microprocessor. A small amount of the internal DC power is used to display the status of the system and charge the battery. The remaining system power provides the 24VDC output.

In the event the AC power is lost, the battery is designed to provide an output of 24 VDC for up to 3 days. The system will provide a closed contact when the battery fails.

3. Power Supply Components

3.1 Microprocessor

Microprocessor-based electronics monitors for signal and fault conditions, processes input signals for the sensor and provides outputs in the form of display codes and a SCADA output signals.

3.2 Self-Diagnostics

The 24 VDC Power Supply malfunction indications shall be a visible signal indicated on the membrane panel located on the face of the control panel. The system conditions that are monitored shall be:

- Loss of AC Supply
- Low Battery
- Internal DC Fault
- Bad Battery

Internal contact relays on the circuit board will also indicate system problems as they occur by closing.

3.3 Optional – SCADA Serial Port

An optional RS232 serial port can be provided to give the local SCADA system a large variety of additional information. Most of the items controlled by the microprocessor are available at a BAUD rate of 9600. The ASCII characters generated represent the faults that are repeated at specific system timing cycles while the fault persists. .

3.4 Optional – Satellite Detector

An optional Satellite Gas Detector can be connected directly to the 24 VDC Power Supply. A ppm set point switch is provided in whole number increments for the operating range of the gas sensor. With this option activated, an output relay can be connected directly to the input of an emergency gas shutoff system. The Satellite Gas Detector can also provide a 4 to 20 mA. output signal through the terminals on the circuit board. This information can be directly connected to a SCADA system from the Power supply.

4. Environmental Design

This unit shall be capable of operating within a temperature range of 32°F to 112°F (0°C to 40°C). The unit shall operate within a humidity range of 15% to 90% relative humidity, non-condensing and a pressure range of +/- 10% atmospheric.

5. Electrical Design

The input voltage shall be 95 to 260 VACS and the input current shall be less than 1.0 amps. Cable requirements shall be 14 to 20 AWG for cable runs from the power supply to the gas detectors. The output voltage shall be 24 Volts at 0.20 mA.

The unit shall be capable of receiving power through cable running up to 2000 feet from the power supply. The alarm and malfunction relays shall be SPDT contacts with electrical ratings 24V AC/DC at 100 mA.

An optional communications interface shall be based on the RS-232 standard and shall allow one-way communication at a data rate of 9600 BAUD.

5.1 LED Displays

This Power Supply system uses bright LED displays to indicate Charger Mode, Battery Status and Power Source for the Power Supply. Thirteen (13) different power condition codes allow operators to quickly analyze power conditions or problems so that immediate corrective action can be taken.

5.2 Input/Output

A. Output Voltage---------- 24 ± 3 VDC
Output Current ---------- 0.200 amps
Input Voltage range ----------95-260 VAC
Input current ----------≤2.0 amps
Battery ---------- 12.7 Volts nominal
Battery Amperage ----------8.0 AH
Relay Rating ---------- 0.1 amps @ 24 VDC
Relay Contacts ---------- SPST

B. Optional: RS232 Serial Interface Port

C. Optional Relay Interface Module

5.3 Optional Relay Output.

The **Relay Interface Module** can be used by the Power Supply controller to provide a closed contact rated at 115/230 VAC at 5 amps from the **Signal** and **Fault** relays on the circuit board. This could be necessary if no SCADA system is available and warning signals are required to alert the staff of potential problems. These two relays are provided as momentary relays, but as an option, they can be changed to latching relays.

5.4 Malfunctions Monitored

There are two dry contact output relays rated at 24 VDC @ 100 mA on the circuit board. The **Signal** relay can indicate that the internal 24 VDC power is out of range or if the12 VDC battery is in the critical range (below 11.5 VDC). The **Fault** relay can indicate that there is no battery connected or the battery voltage is in low range (11.51 to 12.1 VDC).

6. Optional Detector Gases

The optional Satellite shall accept the following sensors and meet these Gas Detection Performances:

Gas Name	Formula	Range-ppm	Time-sec.
Ammonia	NH_3	0-50/100	T90<90
Chlorine	Cl_2	0-10/20	T90<60
Carbon Monoxide	CO	0-100	T90<30
		0-500	T90<30
Ozone	O_3	0-1	T90<90
Sulfur Dioxide	SO_2	0-20	T90<10
Chlorine Dioxide	ClO_2	0-3	T90<60

7. Warranty

This system shall have a two-year warranty on the electronics, one-year on the12 VDC lead-acid battery. The manufacturer shall warrant this system to be free from defects in workmanship and material under normal use and service within the warranty period from the date of shipment.