VIKING®

TECHNICAL DATA

SUPERVISORY PRESSURE SWITCH
ESFR COLD STORAGE SYSTEM

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

1. DESCRIPTION

The Viking Supervisory Pressure Switch is a programmable electronic digital pressure switch. It is used in several areas of the ESFR Cold Storage System, which is pressurized with propylene glycol/water solution. The pressure switches are designed to initiate an electric signal at a predetermined low pressure setting or a predetermined high pressure setting to maintain system antifreeze solution pressure:

- On the system riser to control the solenoid valve (normally closed operation).
- On the CS-1 pump unit to control the pump (normally closed operation).
- On the Automatic Pressure Control System (normally open operation).

Viking Supervisory Pressure Switches are SPDT pressure transducer switches that are field adjustable and programmable for normally open or normally closed circuits. Each switch on the system is required to be programed with different settings. Refer to the ESFR Cold Storage System Manual for pressure settings of the various applications within the ESFR Cold Storage System.

A. Features

1. The pressure sensor detects the system pressure.
2. Shows the current system pressure on the LED display.
3. Generates 1 output signal according to the set output configuration.

2. LISTINGS AND APPROVALS

c(UL)us **cULus Listed:** Category NKPZ

3. TECHNICAL DATA

Specifications

Dimensions: 1-7/8” (48 mm) W x 4-3/4” (120 mm) H (See Figure 2)
Pressure Connection: ¼” female NPT
Electrical Connection: ½” UNF-Connector, angled design; Wrench Flats: 30 mm
Setting Range: Switch-on point 4-363 PSI (.28 - 25.0 bar); Switch-off point 2-362 PSI (.14 - 24.9 bar)
Maximum System Pressure: 175 PSI (12 bar)
Permissible Overload Pressure: 1450 PSI (100.0 bar)
Bursting Pressure: 5075 PSI (349.9 bar)
Voltage: 85-265 AC (45-65 HZ)
Current Rating: 2.5A @ 68 °F (20 °C), 1.5A @ 113 °F (45 °C), 1A @ 140 °F (60 °C), 0.25A @ 158 °F (70 °C)
Current Consumption: < 10 mA
Protection: IP65, Protection Class: II
Operating Temperature: -13 °F (-25 °C) to 176 °F (80 °C)
Not for use in hazardous locations
Tamper Resistance: The unit can be electronically locked to prevent unwanted adjustment of the set parameters.

Viking Technical Data may be found on The Viking Corporation’s Web site at http://www.vikinggroupinc.com. The Web site may include a more recent edition of this Technical Data Page.

WARNING! AVOID STATIC AND DYNAMIC OVERPRESSURE EXCEEDING THE GIVEN OVERLOAD PRESSURE. EVEN IF THE BURSTING PRESSURE IS EXCEEDED ONLY FOR A SHORT TIME, THE UNIT CAN BE DESTROYED AND POSSIBLY CAUSE INJURY. INDICATION OF THE CURRENT SYSTEM PRESSURE AS FROM 1% OF THE VALUE OF THE MEASURING RANGE. DISPLAY “0” DOES NOT INDICATE THE SYSTEM IS FREE OF PRESSURE!

Material Standards

Stainless Steel (303S22), ceramics; FPM (Viton)
Housing: EPDM/X (Santoprene), FPM (Viton), PA, Pocan, PC (Macrolon), Stainless Steel (304S15)
Connector: Body - TPU (urethane); Nut - Brass, nickel plated;

Ordering Information

Switch P/N - 13057
Cable P/N - 13231

4. INSTALLATION

Before installing or removing the pressure switch, make sure that no pressure is applied to the system.

1. Refer to current Viking ESFR Cold Storage System Manual and schematic drawings to determine the appropriate locations for installing the Viking Supervisory Pressure Switch.

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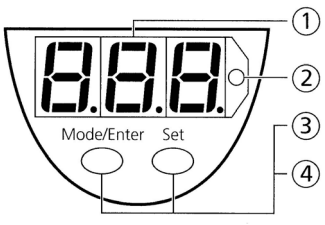
2. When installing the switch, apply Teflon tape sealant to the male threads only. Install the Supervisory Pressure Switch in the ¼" NPT connection. Use a wrench applied to the wrench flats to tighten the unit. Do not over-tighten. Mount the switch in the upright position (threaded connection down).
3. Refer to the ESFR Cold Storage System Manual for pressure settings of the switch at various locations within the ESFR Cold Storage System. To raise or lower the settings of the switch, refer to Pressure Switch Set-Up below.
4. To wire the unit proceed as follows:
   a. De-energize electrical circuits involved.
   b. Connect cable (Viking Part No. 13213) to the ½" conduit opening provided.
   c. Connect electrical circuitry for the signaling device and auxiliary equipment being controlled by the switch. Refer to the wiring diagrams. Wire all devices to national and local codes and requirements of the Authority Having Jurisdiction.
5. Energize the circuits.

Electrical Connection:

The unit must only be connected by a certified electrician. The national and international regulations for the installation of electrical equipment must be observed. Caution: For the output circuit, the same protective measures as for the supply circuit must be taken. A 115 VAC (60 HZ) or 220 VAC (50 HZ) electrical power supply is to be provided directly to the switch when used for APCS. Alternatley, connect to the CS-1 panel as shown is Figure 4. When used for system control, direct connection to the switch must be made with Viking cable PN 13231.

Figure 1: Controls and Visual Indication



1	LED display	Display of the system pressure, display of parameters and parameter values.
2	LED red	Switching status; lights if the output has switched
3	Mode/Enter button	Selection of the parameters and acknowledgment of the parameter values.
4	Set button	Setting of the parameter values (scrolling by holding pressed; incremental by pressing briefly)

Pressure Switch Set-Up: (Refer to Figure 1)

1. After the switch has been installed on the system, connect to the power supply. Turn on power supply. The pressure switch needs to be set-up without any pressure against it.
2. The pressure switch should have a digital reading displaying 0.0.
3. Depress the Mode/Enter button several times. The first variable to be defined is EF.
4. Depress the Set button. The value that will appear is HI.
5. Depress the Mode/Enter button several times until the value that appears is dS1.
6. Depress the Set button. The value that appears is the factory or previously set value. Depress the Set button and hold until the value changes (5 seconds). Set the value to 0.
7. Depress the Mode/Enter button to return to dS1.
8. Depress the Mode/Enter button to change the value to dr1.
9. Depress the Set button. The value that appears is the factory or previously set value. Depress the Set button and hold until the value changes (5 seconds). Set the value to 0.
10. Depress the Mode/Enter button to return to dr1.
11. Depress the Mode/Enter button several times to change the value to Uni.
12. Depress the Set button. The value that appears is the factory or previously set value. Depress the Set button and hold until the value changes (5 seconds). Set the value to PSI.
13. Depress the Mode/Enter button to return to Uni.
14. Wait (15 seconds) until the switch will display EF.
15. Depress the Mode/Enter button several times until the valve SP1 appears.
16. If the switch has returned itself to run mode (displaying 0.0 or 0) then depress the Mode/Enter button and the value SP1 appears.
17. Depress the Set button. The value that appears is the factory or previously set value. Depress the Set button and hold until the value changes (5 seconds). Set the value to maximum system pressure that is desired.

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18. Depress the Mode/Enter button to return to SP1.
19. Depress the Mode/Enter button to change the display value to rP1.
20. Depress the Set button. The value that appears is the factory or previously set value. Depress the Set button and hold until the value changes (5 seconds). Set the value to minimum system pressure that is desired.
21. Depress the Mode/Enter button to return to rP1.
22. Depress the Mode/Enter button to change the display value to OU1.
23. Depress the Set button. The value that appears is the factory or previously set value. Depress the Set button and hold until the value changes (5 seconds). Set the value to Hnc (for system Riser & Pump Unit) or Hno (on the Automatic Pressure Control System).
24. Depress the Mode/Enter button to return to OU1.
25. Wait (15 seconds) and the switch will return to normal operation mode.
26. The switch is now properly set for operation.
27. Other values that may be set or reviewed.
    a. H1 and LO can be set at desired value.
    b. COF should only be adjusted if the pressure reading is absolutely determined to be inaccurate.
    c. CAr should only be used if there is a value in COF.
    d. DAP should always be set at 0 to ensure that the system shuts down the solenoid as soon as the pressure is obtained. DiS should be set at d1, d2, or d3.
28. LOCKING/UNLOCKING - The unit can be electronically locked to prevent unwanted adjustment of the set parameters; Press (in Run mode) both setting buttons for 10 seconds. As soon as the indication goes out, the unit is locked or unlocked. Units are delivered from the factory in the unlocked state. With the unit in the locked state, “Loc” is indicated briefly when you try to change parameter values.

5. OPERATION

Modes of Operation:

1. Run Mode (normal operating mode): When the supply voltage has been applied, the unit is in the Run mode. It monitors and switches the output according to the set parameters. The display shows the current system pressure. The red LED indicates the switching state of the output.
2. Display Mode (indication of parameters and the set parameter values): When the “Mode/Enter” button is pressed for a short time, the unit passes to the Display mode. Internally it remains in the operating mode. The parameter names are scrolled with each pressing of the “Mode/Enter” button. When the “Set” button is pressed for a short time, the corresponding parameter value is displayed for approximately 15 seconds. Then the unit returns to the Run mode.
3. Programming Mode (setting of the parameter values): The unit passes to the programming mode when after the selection of a parameter value (Display mode) the “Set” button is pressed until the display of the parameter value is changed. Internally the unit remains in the operating mode. It continues its monitoring function with the existing parameters until the change has been terminated. The parameter value can be changed by pressing the “Set” button and confirm by pressing the “Mode/Enter” button. The unit returns to the Run mode when no button has been pressed for 15 seconds.

6. INSPECTIONS, TESTS AND MAINTENANCE

Operate and test the Supervisory Pressure Switch after installation, prior to start-up, and periodically as required in the Viking technical data pages, by the installation standards, and/or the Authority Having Jurisdiction. Quarterly testing of Pressure Supervisory Switches is recommended. Refer to ESFR Cold Storage System data page 45a-j for testing requirements and procedures. The owner is responsible for maintaining the fire-protection system and devices in proper operating condition. For minimum maintenance and inspection requirements, refer to NFPA 25 and Viking’s ESFR Cold Storage System Manual. For auxiliary equipment controlled by operation of the switch, take the steps necessary to prevent unwanted operation or shutdown of those devices when testing. Any system maintenance that involves placing a control valve or detection system out of service may eliminate the fire-protection capabilities of that system. Prior to proceeding, notify all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected areas.

Supervisory Switch Adjustment:

Consult the ESFR Cold Storage System technical data pages for recommended pressure settings for each location where the Supervisory Pressure Switch is installed on the system. The switches are factory set. If adjustment is necessary, proceed according to the instructions given below.

1. If the unit is in the locked state, “Loc” is indicated briefly when you try to change parameter values, press (in Run mode) both setting buttons for 10 seconds. As soon as the indication goes out, the unit is unlocked.
2. To adjust the set points, refer to the Pressure Switch Set-Up in Section 4.

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3. Verify pressure settings of the switch.
4. Test for proper operation of the device.
5. The unit can be electronically locked to prevent unwanted adjustment of the set parameters; Press (in Run mode) both setting buttons for 10 seconds. As soon as the indication goes out, the unit is locked. With the unit in the locked state, “Loc” is indicated briefly when you try to change parameter values.
6. Reset all necessary equipment and place the system in service. Refer to the ESFR Cold Storage System technical data pages.

8. AVAILABILITY

The Viking Supervisory Pressure Switch is available through a network of domestic and international distributors. See the Viking Corp. Web site for closest distributor or contact The Viking Corporation.

9. GUARANTEES

For details of warranty, refer to Viking’s current list price schedule or contact Viking directly.

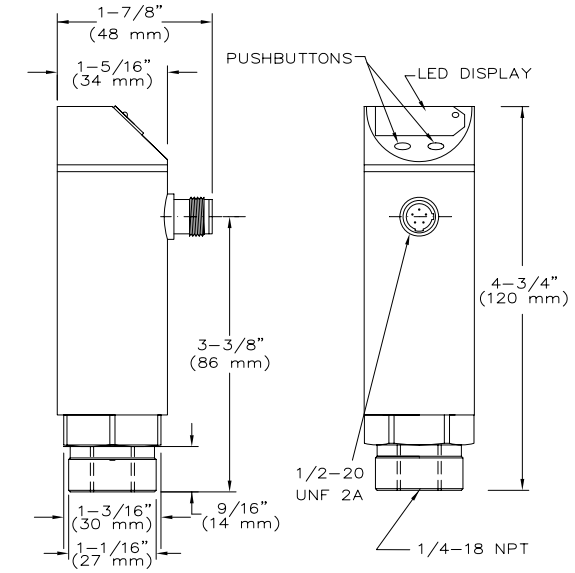

Figure 2: Dimensions

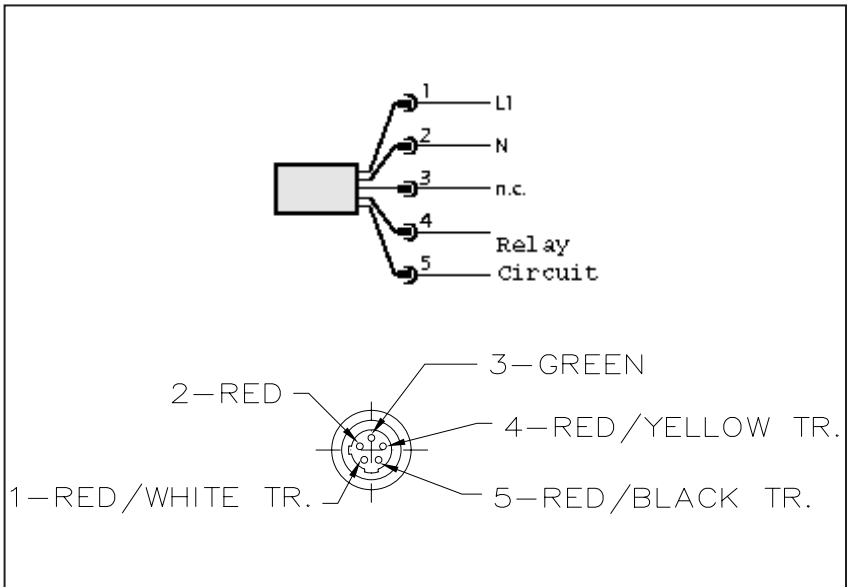

Figure 3: Wiring Diagram: Viking Cable P/N 13231

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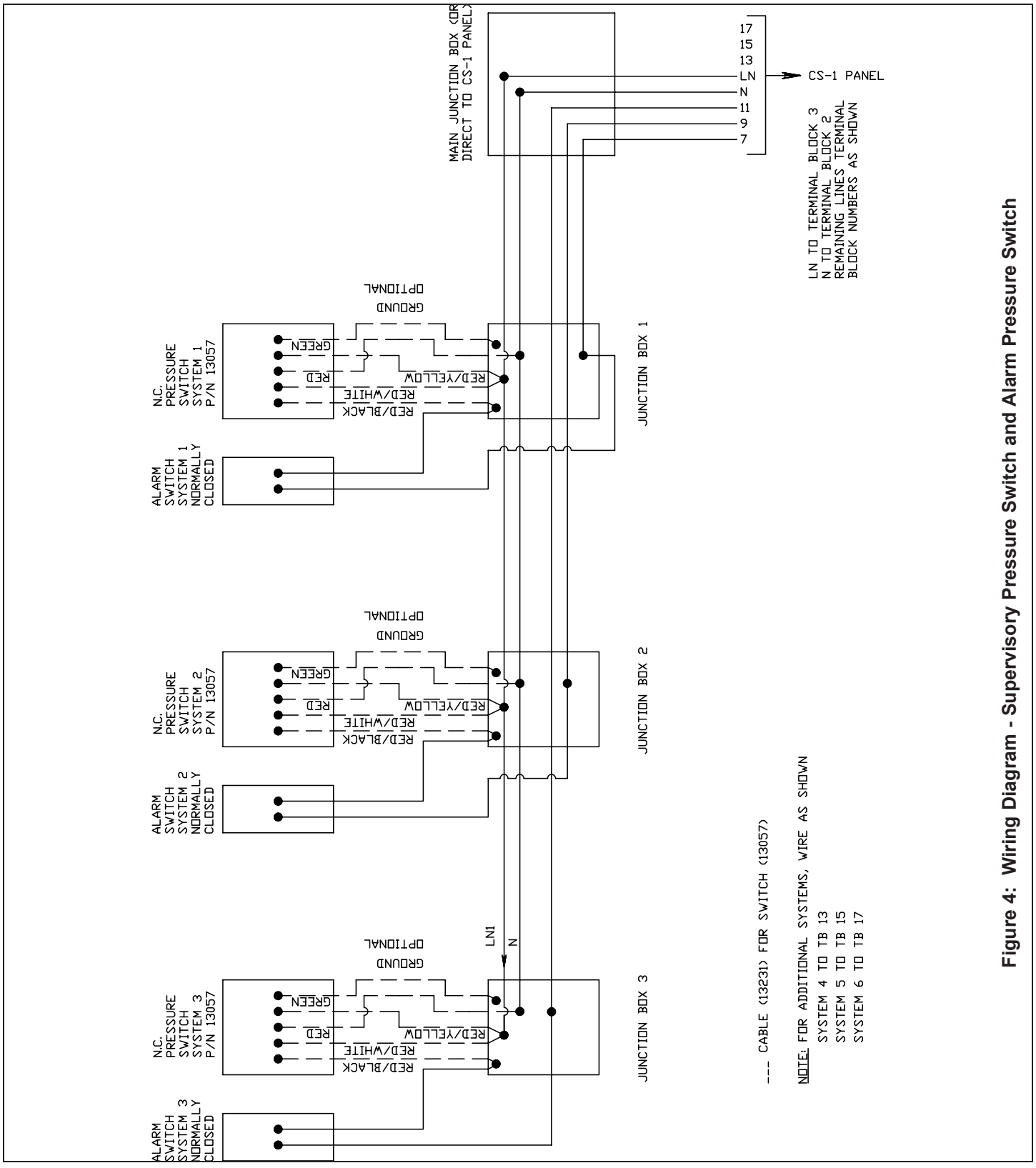

Figure 4: Wiring Diagram - Supervisory Pressure Switch and Alarm Pressure Switch

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