



## TECHNICAL DATA

### AUTOMATIC PRESSURE CONTROL SYSTEM - 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 ESFR Cold Storage System utilizes a closed piping system filled with pressurized propylene glycol and water solution maintained from a pressure pump system that controls and maintains the desired solution pressure. In cold storage areas where temperature can fluctuate, over-pressurization of the system can occur and cause the pressure relief valve (PRV) to operate when the set point is reached. Normal operation of the PRV includes operation at 90-105% of the set point and closing at 80% of the set point. The Automatic Pressure Control System (APCS) is designed to maintain a safe operating pressure below the set point of the PRV and above the maximum residual or static pressure of water supply system or maximum set pressure of the system pressure switch. As the temperature of the freezer increases, the pressure will also increase in a warmup situation of the freezer area. If the pressure increases over the set point of the PRV the possibility of solution flow could occur. The CS-1 Tank and Pump Package is designed to maintain normal system static pressure at a recommended 50 PSI (3.5 bar) above the Easy Riser® Check Valve. This supervisory pressure is required to eliminate all air in system piping and detect possible leaks in system piping.

The APCS includes an electronic digital pressure switch that includes a normally open SPST switch that is set to close at a pressure below the PRV set point and open above the static water supply or shut-off pressure of the riser system. A normally closed pressure switch is to be installed on the non-interruptible alarm port of the conventional trim on the deluge valve. A normally closed solenoid valve is to be installed on the cold storage Viking alarm test line at the ¼" connection provided. A 115-220 VAC, (50 or 60 Hz) GFI protected electrical power supply is to be provided directly to the switch. The output of the pressure switch on the Easy Riser® Check Valve is to be routed through the alarm pressure switch on the non-interruptible alarm port of the deluge valve and connected to the solenoid valve. As the digital pressure switch closing set point is reached due to system pressure increase upon warmup of the freezer area, the digital switch will directly open the solenoid valve and release antifreeze solution back to the system reclaim tank. When the digital pressure reaches the lower setting, the switch will open, shutting off power to the solenoid valve and stopping flow of antifreeze.

The pressure switch on the deluge valve will make the APCS inoperable when the detection system causes the deluge valve to open. This prevents water flow from the APCS.

#### PARTS LIST - AUTOMATIC PRESSURE CONTROL SYSTEM KIT PART NO. 13289

DESCRIPTION	QTY	PART NO.
¼ NC SOLENOID VLV	1	13288
PRESSURE SWITCH	1	13057
STRAINER	1	01488A
TEE ¼", BRASS	1	14BRT
NIPPLE, ¼" X 2", BRASS	3	142BRNIP
CABLE	1	13231

## 2. INSTALLATION

The Viking ESFR Cold Storage Easy Riser® Check Valve Trim includes a ¼" additional connection for installation of the ¼" solenoid valve and strainer to discharge antifreeze back to the reservoir of antifreeze solution (see Figure 1). The electronic pressure switch is a digital SPDT pressure transducer switch that requires setting of the operation high pressure and shut off pressure. The pressure setting is required to be made at zero pressure to the switch. See the procedure for setting the pressure switch. The wiring diagram shown in Figure 2 should be used for installation of the switches and solenoid valve. In order to wire the pressure switches and solenoid valve to the power supply, a NEMA 4 junction box and conduit components are required from the junction box to the solenoid valve. A special cable included with the package is required for connection to the digital switch. The pressure switch shall be installed between the system side pressure gauge valve and the 4" long ¼" nipple provided on the Easy Riser® Check Valve Trim (see Figure 1). The waterflow alarm pressure switch is to be installed on the deluge valve trim.

The electric power supply required is 115-220 VAC, 50 or 60 Hz GFI protected. The supply wire from digital switch to solenoid valve shall be wired through the non-interrupted N.C. alarm pressure switch. See Figure 2 diagram. To verify operation and correct wiring of the system, close the system isolation valve downstream of the Easy Riser® Check Valve. With a hydro pump or other pump capable of pressure and flow, increase the pressure to the set point and verify the switch and valve opens at correct pressure and shuts off at correct pressure. The flow rate of the solenoid valve is approximately 6-7 gpm (22-26 Lpm) at 200 PSI (13.8 bar) differential.



# TECHNICAL DATA

## AUTOMATIC PRESSURE CONTROL SYSTEM - 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

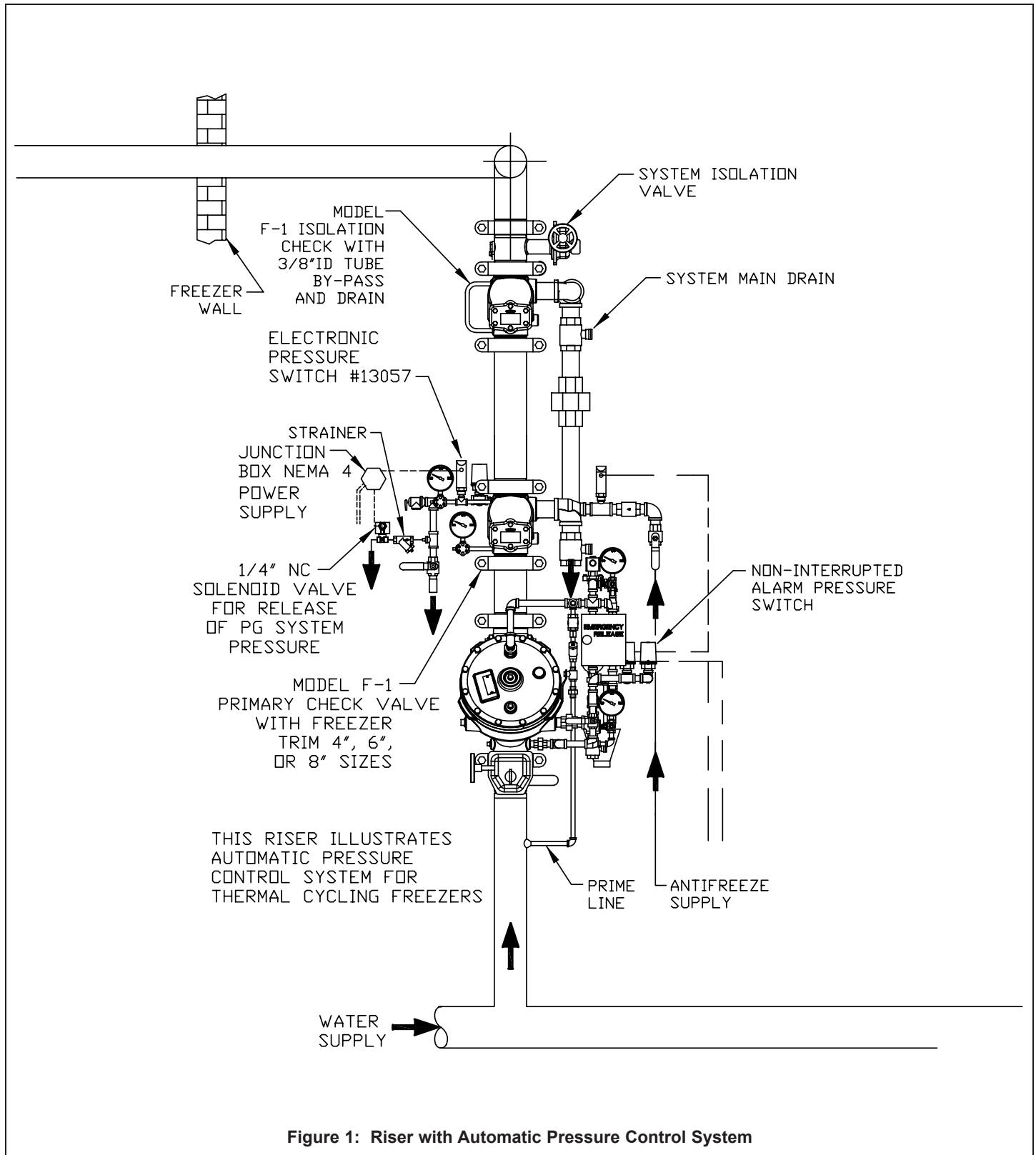


Figure 1: Riser with Automatic Pressure Control System

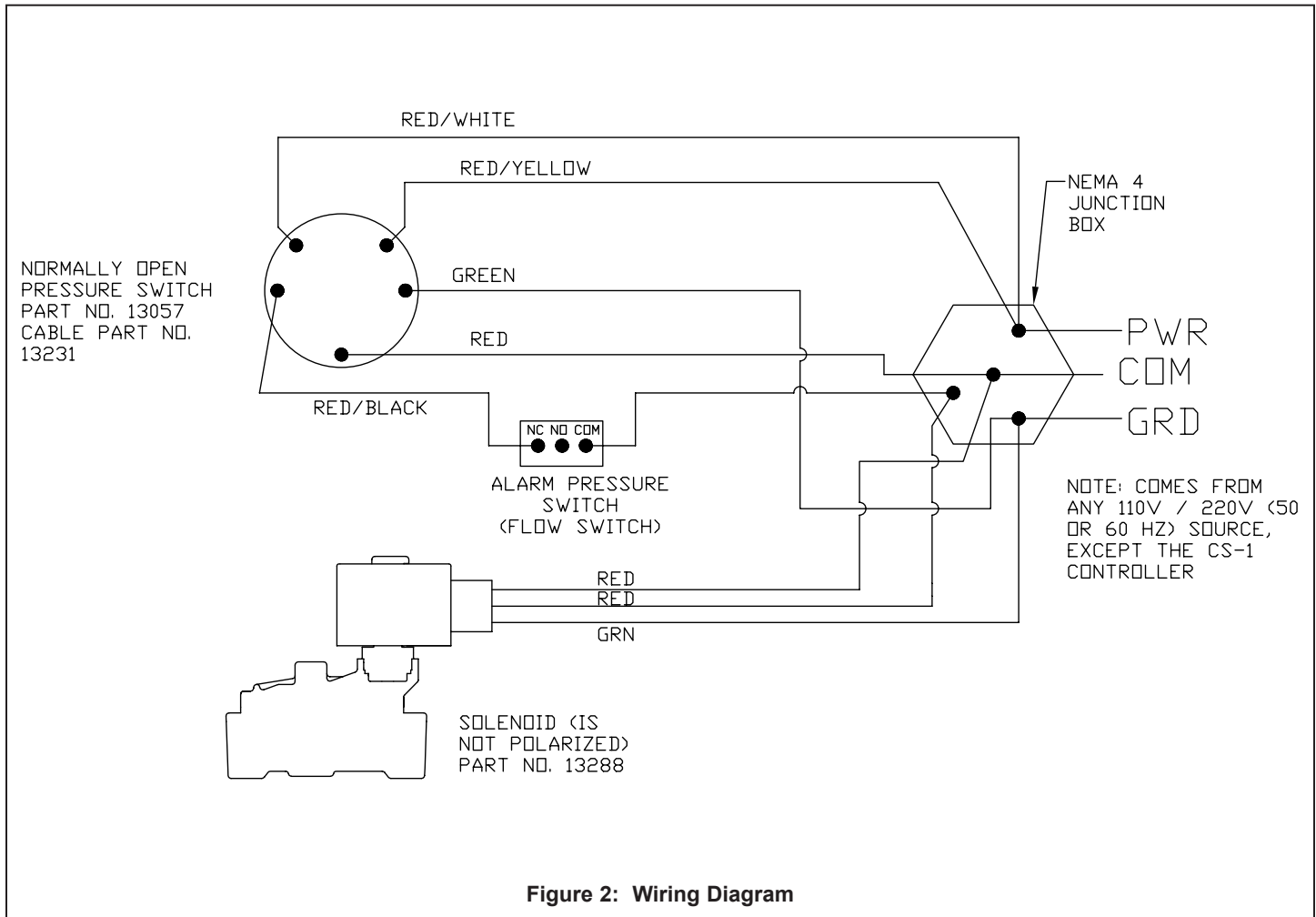
# VIKING®

## TECHNICAL DATA

### AUTOMATIC PRESSURE CONTROL SYSTEM - ESRF 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



### 3. PRESSURE SWITCH SETTING PROCEDURE

#### Pressure Switch Set-Up for Pressure Relief Solenoid Actuation Control:

1. Connect to 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.



## TECHNICAL DATA

### AUTOMATIC PRESSURE CONTROL SYSTEM - 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

14. Wait (15 seconds) until the switch will display EF.
15. Depress the Mode/Enter button several times until the value 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.
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 Hno.
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.

#### 4. AVAILABILITY AND SERVICE

The Viking Automatic Pressure Control System is available through a network of Domestic, Canadian, and International Distributors. See The Viking Corporation Web site for your closest distributor or contact The Viking Corporation.

#### 5. GUARANTEES

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