

## EXECUTIVE ORDER G-70-191-AA

### EXHIBIT 2

#### SPECIFICATIONS FOR THE HEALY ORVR PHASE II VAPOR RECOVERY SYSTEM

##### Nozzle

1. A vapor collection boot shall be installed on the nozzle at the base of the spout, as shown in Exhibit 2, Figure 2B-1. Any nozzle with a vapor collection boot which is missing, or which has one half of the mini-boot faceplate or greater missing is defective and shall be immediately removed from service.
2. The Healy Model 600 ORVR / 800 nozzle has an integral vapor valve which prevents the loss of vapor from the underground storage tanks, ensures proper operation of the system and prevents the ingestion of air into the system. Any nozzle with a defective vapor valve shall be immediately removed from service. The integrity of the system shall be restored by replacing the nozzle or otherwise closing the vapor path as soon as practicable.
3. Nozzles shall be 100 percent performance checked at the factory, including checks of all shutoff mechanisms and of the integrity of the vapor path. The maximum allowable leak rate for the nozzle vapor path shall not exceed the following:

0.038 CFH at a pressure of two inches water column (2" WC), and  
CFH at a vacuum of eighty-three inches water column (approx. 3 psi).
4. Verification of the integrity of the vapor valve can be performed on installed nozzles by use of the following test.
  - a. Seal all nozzles on a dispenser in plastic bags, using tape or other means to secure the bag around the base of the nozzle. Any plastic bag large enough to enclose the nozzles and having a thickness of no greater than 2 mils can be used. 12 " X 20" X 2mil. thick bags are available in California from the California Air Resources Board by calling (800) 952-5588.
  - b. Initialize the dispenser for fueling. **Do not dispense any fuel.** The Healy/Franklin VP-1000 vane pump engages upon dispenser activation and provides approximately 3 psi vacuum to all nozzle points on the dispenser simultaneously.
  - c. With the dispenser initialized, observe all bagged nozzles for approximately 30 seconds. Any nozzle where the bag can be seen visually collapsing has a defective vapor valve and shall be removed from service immediately.
  - d. Disengage the dispenser, remove the bags from all of the nozzles and re-hang the nozzles.

### **Dispensing Rate**

The dispensing rate for installations of this system shall not exceed 10.0 gallons per minute at any time. This shall be determined as specified in Exhibit 3 or as specified in TP-201.5 or any alternative test method approved in writing by the Executive Officer.

### **Inverted Coaxial Hoses**

1. The maximum length of the hose assembly shall be 15 feet measured from the dispenser outlet casting to the base of the nozzle.
2. The length of hose, which may be in contact with the island and/or ground when the nozzle is properly mounted on the dispenser, is limited to six inches (6") per loop.

### **Breakaway Couplings**

Breakaway couplings are optional but, if installed, only CARB-certified breakaways with a valve, which closes the vapor path when separated, may be used.

### **Healy ORVR Phase II Vapor Recovery System**

1. The Healy ORVR Phase II Vapor Recovery System shall consist of an integrated vapor recovery unit made up of an electronic (computerized) control unit and a one-eighth (1/8) hp alternating current electric motor that drives a variable speed rotary vane pump. The VP-1000 Vapor Recovery Vane Pump has been sized to satisfy the recovery needs of one dispenser, with two hoses, pumping either individually or simultaneously. Healy Systems supplies a unique regulation valve, built into the faceplate of the pump assembly, to assure that proper levels of vacuum are maintained. The actual vapor recovery rate is determined by a valve in the nozzle which senses product flow.

The A/L ratio of the system shall be 1.10 plus or minus 0.10 (1.00 to 1.20). Any fueling point not capable of demonstrating compliance with this performance standard shall be deemed defective and removed from service. The A/L ratio shall be determined by using the CARB-approved procedure TP-201.5. Note: A CARB certified spout adapter / sleeve unique to the Healy 600 ORVR / 800 nozzle must be used in order to obtain accurate results. See Exhibit 2 Figure 2C-1. Alternative test procedures may be used if they are determined by the Executive Officer, in writing, to yield comparable results.

NOTE: Test Procedure TP-201.5 returns air rather than vapor to the storage tank, and normally causes an increase in storage tank pressure which may result in vent emissions. This is a temporary condition due to the test and should not be considered an indication of malfunction or noncompliance.

2. The Healy ORVR Phase II Vapor Recovery System with the Healy/Franklin Electric VP 1000 Vapor Pump, (Exhibit 2 Figure 2B-2) shall have the following electronic protective features:
  - High Power Level Control. The system shall automatically sense conditions that cause high power levels and shall shut down. Conditions causing high power levels include the following: locked rotor condition of the motor, shorted motor windings, fluid in pump cavity for more time than required to clear a blockage and pump overload conditions. If any of these conditions exist, a signal shall be sent to the VP1000 vane pump interface module located inside the dispenser. The system shall then restart automatically. This “shut down send signal wait-restart” cycle will occur three times. After the third cycle failure, it shall not restart automatically. Instead, an error signal is sent to the interface module, (High Power Level Failure), which will then disable the entire dispenser from dispensing product.
  - Low Power Level Control. The system shall automatically sense conditions that cause low power levels and shall shut down. Conditions causing low power levels include the following: broken rotor, free running motor shaft-no load conditions. If any of these conditions exist, a signal shall be sent to the VP1000 vane pump interface module located inside the dispenser. The system shall then restart automatically. This “shut down send signal wait-restart” cycle will occur three times. After the third cycle failure it shall not restart automatically. Instead, an error signal is sent to the interface module, (Low Power Level Failure), which will then disable the entire dispenser from dispensing product.
  - Verification that the Healy/Franklin VP1000 vane pump is operating correctly can be determined by conducting A/L testing as specified in TP-201.5 or an alternative test method approved in writing by the Executive Officer. Any dispenser where a 0.0 A/L is measured on all fueling points on both sides of the dispenser indicates a failure of the electronic shut-down features of the VP-1000 vane pump. A measured A/L of 0.0 on only one fueling point on one side of a dispenser may be due to hanging hardware problems and may not be indicative of a vane pump problem.

### **Dispenser Specifications**

1. The Healy ORVR Phase II Vapor Recovery System can be installed on any CARB-certified balance vapor ready dispenser. Conversion kits as specified in Exhibit 1 can be used to retrofit non-vapor-ready dispensers. All dispensers must also comply with the following:
  - a) Electronically compatible with the Healy ORVR Phase II Vapor Recovery System with the Healy/Franklin Electric VP 1000 Vapor Pump, which must be capable of displaying the electronic protective features as specified in this Exhibit.

- b) Tested for compliance with air to liquid ratio limits contained in this Exhibit. The test shall be conducted in accordance with TP 201.5, or an alternative test method approved in writing by the Executive Officer.

### **Pressure/Vacuum Valves for Storage Tank Vents**

1. At least one pressure/vacuum (P/V) valve shall be installed on tank vents. Manifolding of vent lines to minimize the number of P/V valves and potential leak sources is recommended, provided the manifold is installed at a height not less than 12 feet above the driveway surface used for Phase I tank truck filling operations. At least one P/V valve shall be installed on manifolded vents. The P/V valve shall be a CARB-certified valve as specified in Exhibit 1. The outlets shall vent upward and be located to eliminate the possibility of vapor accumulating or traveling to a source of ignition or entering adjacent buildings.
2. The P/V valve is designed to open at a pressure of approximately three inches water column (3" WC). Storage tank pressures which exceed 3" WC for more than a short time may indicate a malfunctioning pressure/vacuum vent valve.

### **Vapor Recovery Piping Configurations, (Figures 2A-1 - 2A-5)**

**Note: Figures 2A-1-2A-5 show general vapor plumbing piping layouts and are not to be used as specifications.**

1. All vapor return and vent lines shall be a minimum 2" diameter from the dispensers to the first main manifold. All lines after the first manifold and back to the underground storage tanks shall be a minimum 3" diameter.

Exception: Smaller vapor lines are not recommended but if pre-existing, may be used providing the pressure drop criteria specified below are met.

2. The maximum allowable pressure drop through the system shall never exceed one-half inch (0.5") water column at 60 SCFH. The pressure drop shall be measured from the dispenser riser to the UST with pressure/vacuum valves installed and with the popped Phase I vapor connection open.
3. All vapor return and vent lines shall slope a minimum of 1/8" per linear foot. A slope of 1/4" per linear foot or more is recommended whenever feasible.

Exception: When it is not possible to achieve the necessary minimum slope from the dispenser risers back to the underground storage tanks due to the topography of a new site or due to upgrading of an existing site, low-point condensate traps or knock-out pots can be utilized as long as the following conditions are met:

- a. The condensate traps must be self-evacuating.
  - b. The entire system must remain vapor tight.
  - c. Access must be provided for inspection purposes. The condensate traps must be maintained in good working order.
  - d. The maximum pressure drop through the system with the condensate traps in place shall not exceed 0.5" WC at 60 SCFH.
4. All vapor return and vent piping shall be installed in accordance with the manufacturer's instructions and all applicable regulations.

5. No product shall be dispensed from any fueling point associated with a vapor line which is disconnected and open to the atmosphere. If vapor lines are manifolded, this includes all fueling points in the facility.
6. All vapor return and vent lines shall be installed in accordance with the manufacturer's instructions and all applicable regulations. The vapor return lines shall be manifolded below grade at the tanks using a minimum 3" diameter line.

Exception: For installations with a vapor return line directly to only one tank, and for which a manifold on the tank vents will be used to provide part of the vapor return path to other tanks, the vent manifold may be used as an alternative to the underground manifold only in existing installations where the vapor piping is already installed, and shall not be used in "new" installations where vapor piping is being installed. For installations with dedicated vapor piping directly to each tank, the vent manifold is approved for both new and existing installations and an additional tank manifold below grade is optional but not required.

7. The dispenser shall be connected to the riser with either flexible or rigid material which is listed for use with gasoline. The dispenser-to-riser connection shall be installed so that any liquid in the lines will drain toward the storage tank. The internal diameter of the connector, including all fittings, shall not be less than one-half inch (1/2").

#### **Inverted Coaxial Hose Adapters**

1. Inverted coaxial hose adapters shall be 100 percent performance checked at the factory to verify the integrity of the vapor path.

#### **Underground Storage Tank (UST) Pressure**

**WARNING:** Phase I fill caps should be opened with caution because the storage tank may be under pressure.

#### **Phase I System**

1. The Phase I system shall be a CARB-certified system which is in good working order and which demonstrates compliance with the static pressure decay test criteria as specified in the most current version of TP-201.3. Coaxial Phase I systems shall not be used with new installations of the Healy ORVR Phase II Vapor Recovery System. Replacement of storage tanks at existing facilities, or modifications which cause the installation of new or replacement Phase I vapor recovery equipment, are considered new installations with regard to this prohibition. An exception to this prohibition may be made for coaxial Phase I systems CARB-certified after January 1, 1994, as compatible for use with Phase II systems which require pressure/vacuum vent valves.

Where installation of the Healy ORVR Phase II Vapor Recovery System is made by retrofitting previously installed equipment, local districts may elect to allow existing coaxial Phase I systems to remain in use for a specifically identified period of time provided the following conditions are met:

- the existing coaxial Phase I system is a poppeted, CARB-certified system capable of demonstrating compliance with the static pressure decay test as specified above; and
  - installation of the Phase II system requires no modification of the UST(s) and/or connections.
2. Spill containment manholes which have drain valves shall demonstrate compliance with the static pressure decay criteria with the drain valves installed as in normal operation. Manholes with cover-actuated drain valves shall not be used. The local district may require the removal of drain valves provided an alternate method of draining the spill container is specified (i.e., a hand pump maintained at the facility and/or on the product delivery trucks).
  3. Phase I deliveries shall be accomplished so as to ensure that there is at least one vapor connection between the cargo tank compartment headspace and the storage tank associated with the product delivery. There shall be no more than two product hoses used with one vapor hose connected, and no more than three product hoses used with two vapor hoses connected.
    - the Phase I vapor return hose is connected to the delivery tank and to the delivery elbow before the elbow is connected to the facility storage tank;
    - the delivery tank is opened only after all vapor connections have been made, and is closed before connection of any vapor return hoses;
    - the existing coaxial Phase I equipment is in good working order and has demonstrated compliance with static pressure decay test criteria when tested with all fill caps removed; and
    - the vapor return hose is disconnected from the facility storage tank before it is disconnected from the delivery tank.
  4. Storage tank vent pipes, manhole covers and spill containment bucket covers shall be maintained any color which minimizes solar gain and has a reflective effectiveness of 55% or greater. Reflectivity can be determined by visual comparison of the paint with paint color cards obtained from a paint manufacturer who uses the "Master Pallet Notation" to specify the paint color (i.e., 58YY 88/180 where the number in italics is the paint reflectivity). Example colors having a reflective ness of 55% or greater include yellow, light gray, aluminum, tan, red iron oxide, cream or pale blue, light green, glossy gray, light blue, light pink, light cream, white, silver, beige, tin plate or mirrored finish. Spill containment bucket covers that are color coded for product identification are exempted from this requirement.

**Exception:** Insulated manhole covers such as those manufactured out of a composite material and injected with foam insulation are exempt from the color requirement.