



U.S. Department  
of Transportation

**Pipeline and Hazardous  
Materials Safety  
Administration**

1200 New Jersey Avenue, SE  
Washington, D.C. 20590

FEB 19 2009

Mr. Michael F. Leavitt  
Durham, Jones & Pinegar, P.C.  
193 East 200 North, Third Floor  
St. George, Utah 84770-2879

Ref. No.: 08-0289

Dear Mr. Leavitt:

This responds to your letter regarding the highway transportation of a small bulk delivery tank containing oxygen, refrigerated liquid for home delivery for healthcare purposes. Your client, Rotech Healthcare, Inc., (Rotech) received a citation from the Utah Highway Patrol (UHP) concerning a violation of § 173.24 of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Specifically, you ask if your client's understanding is correct that venting is permissible to reduce internal pressure that may develop by the evolution of gas from the contents under certain conditions.

Based on the information enclosed with your letter, the tank conforms to the requirements in § 173.320. Under § 173.320, atmospheric gases (e.g., oxygen, nitrogen, carbon dioxide) and helium in Dewar flasks, insulated cylinders, insulated portable tanks, insulated cargo tanks, and insulated tank cars, designed and constructed so that the pressure in such packagings will not exceed 25.3 psig under ambient temperature conditions during transportation are not subject to the requirements of the HMR when transported by motor vehicle or railcar except as specified in paragraphs (a)(1), (a)(2), and (a)(3) of this section. Thus, as stated in § 173.320(a)(1), the design of the tank must allow venting through the pressure control valve to prevent any buildup of any internal pressure.

I hope this information is helpful. If we can be of further assistance, please contact us.

Sincerely,

Charles E. Betts  
Chief, Standards Development  
Office of Hazardous Materials Standards



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 Michael F. Leavitt  
 Attorney at Law  
 mike.leavitt@utahlaw.com

November 11, 2008

Via U.S. Mail and Email (Edward.mazzullo@dot.gov)

Edward Mazzullo  
 UNITED STATES DEPARTMENT OF TRANSPORTATION  
 1200 New Jersey Avenue SE  
 Washington DC, 20590

**Re: Request for Written Interruption  
 49 CFR § 173.24**

Dear Mr. Mazzullo:

This firm represents a company called Rotech Healthcare, Inc., which is engaged in the business of, among other things, transporting oxygen over roadways to individuals in their homes for healthcare purposes. Mr. David Clark, a hazardous materials inspector for the Department of Transportation, suggested that we contact you concerning a citation issued from the Utah Highway Patrol ("UHP") to one of Rotech's drivers concerning the alleged violation of 49 C.F.R. §173.24 entitled "General Requirements for packagings and packages."

On or about February 28, 2008, Rotech's driver, Van Gudmundson, was traveling on a highway in Utah when he was pulled over for a routine vehicle examination by a UHP officer. Mounted in Mr. Gudmundson's truck was a small bulk delivery tank filled with oxygen, refrigerated liquid UN1073. The tank is equipped with an "over the road" relief valve, which is designed, by the manufacturer, to open and release oxygen into the air during transit any time the pressure in the tank reaches 25.3 psi.

Mr. Gudmundson had already receive a warning from the same UHP officer. On this occasion, Mr. Gudmundson received a citation from the UHP officer under 49 C.F.R. §173.24. The officer justified the citation by claiming that, under that regulation, the tank is releasing a "hazardous material" into the environment during transit. . It is Rotech's understanding that under 49 C.F.R. §173.24 part (g), venting is permissible to reduce internal pressure which may develop by the evolution of gas from the contents under certain conditions. The vessels used by Rotech meet these conditions so therefore it is their contention that the valves should and must be used to reduce the internal pressure while in transit. A copy of the manufacturers manual has been provided for your convenience. Rotech has been unable to persuade the

UHP officer or his supervisor that the officer's interpretation of these regulations is incorrect. Consequently, criminal misdemeanor charges are pending for the use of the pressure release valve in the manner which clearly seems to be required by the regulation.

In addition, Rotech has been cited and paid a fine in the past in Maine for not using the equipped over-the-road relief valve while the vehicle was in transit. This inconsistency among state transportation inspectors has left Rotech at a loss as to how it should proceed in the state of Utah. Currently, it is not activating these valves in Utah out of concern of getting another citation. Again these over-the-road relief valves were designed, by the manufacturer, specifically to be used to reduce the internal tank pressure while in transit. It seems clear that not having the release valve activated poses a greater danger to the public than merely releasing a non-poisonous, non-flammable gas into the atmosphere during transit. The UDOT officer and his superiors, however, do not agree, based on the fact that these valves are hand-activated. What they fail to realize is that the valves, even though they are hand-activated, have an incorporated automatic reseating relief valve that is used to maintain the internal pressure of the vessel below 25.3 psi while in transit.

Mr. Clark mentioned that Rotech should request a "Written Interruption" from the United States Department of Transportation concerning this matter and forward it to the officer here in Utah responsible for the citation and the prosecutor responsible for this case. He noted that you would be the appropriate person to contact for this.

Any assistance from you would be greatly appreciated. Rotech has a pre-trial conference on this matter on December 1, 2008. We are hopeful you can help us resolve this issue before then.

Very truly yours,

**DURHAM JONES & PINEGAR, P.C.**



Michael F. Leavitt

MFL/mbm

cc: David Clark (via email)  
Kim Lee (via email)

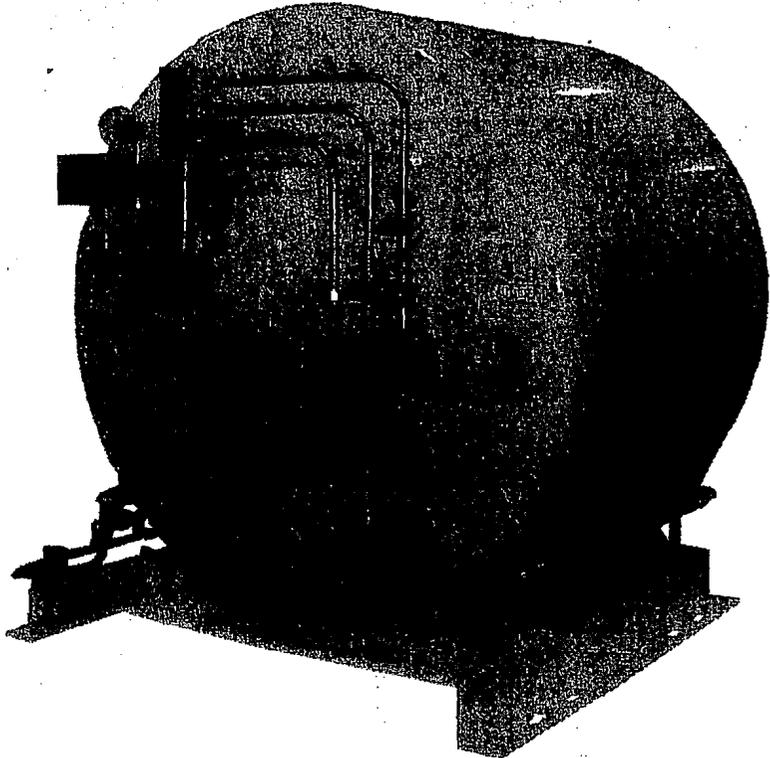
# MODS

## Medical Oxygen/Nitrogen Delivery System



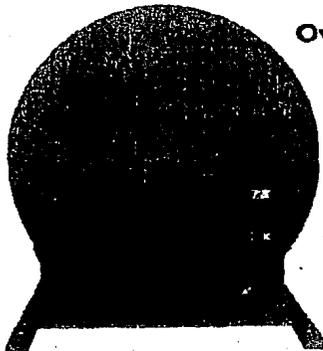
The MODS-120, 190 and 300 are Medical Oxygen Delivery Systems designed for economical transportation and delivery of liquid oxygen. Improved plumbing design facilitates driver DOT compliance and efficiency of operations.

The MODS provide consistent fast and efficient reservoir fills, especially when used in conjunction with other Caire liquid system products. While the MODS fast fill process makes it the perfect delivery tank for high density fill routes, its low evaporation rate makes it also ideal for rural distribution.



**Design allows fast filling** from the bulk tank and into home reservoirs. Dual fill valves on the MODS allow one valve to be dedicated to the Bulk Tank and the other dedicated to the Home Delivery Unit.

**Plumbing conveniently located** for operator use.



**Oversize cryogenic valves** prevent freezing.

**Low evaporation rate.**

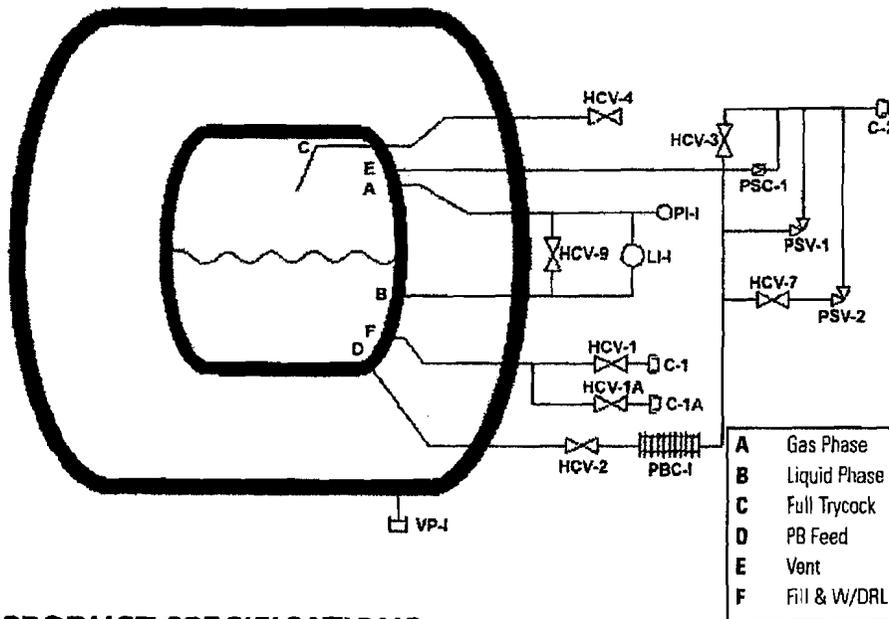
**Design for easy DOT compliance.**

**Convenient truck mounting.**

**MODS system has 1" stainless steel plumbing** which utilizes the fast fill procedure allowing this unit to fill all low pressure liquid equipment in  $1/4$  to  $1/2$  of the time required when using other systems.

# MODS

## Medical Oxygen/Nitrogen Delivery System



### Tag Definition

<b>C-1</b>	Connection, Fill & Withdrawal
<b>C-1A</b>	Connection, Fill & Withdrawal
<b>C-2</b>	Connection Vent Stack
<b>HCV-1</b>	Valve, Fill & Withdrawal
<b>HCV-1A</b>	Valve, Fill & Withdrawal
<b>HCV-2</b>	Valve, Pressure Build
<b>HCV-3</b>	Valve, Vent
<b>HCV-4</b>	Valve, Full Trycock
<b>HCV-7</b>	Valve, Road Relief
<b>HCV-9</b>	LI-1, Equalization Valve
<b>LI-1</b>	Level Indicator, Inner Vessel
<b>PBC-1</b>	Pressure Build Coil
<b>PSE-1</b>	Pressure Safety Element, INR
<b>PSV-1</b>	Pressure Safety Valve, INR
<b>PSV-2</b>	Pressure Safety Valve, Road
<b>PI-1</b>	Pressure Indicator Gauge
<b>VP-1</b>	Vacuum Port

### PRODUCT SPECIFICATIONS

	MODS-120 Oxygen Nitrogen	MODS-190 Oxygen Nitrogen	MODS 300 Oxygen Nitrogen
Dimensions	42" w x 45" h x 57" d	42" w x 45" h x 70" d	42" w x 45" h x 100" d
Weight	1100 lbs. Empty 2100 lbs. Full - 1800 lbs Full	1200 lbs. Empty 2900 lbs. Full - 2400 lbs Full	1600 lbs. Empty 4400 lbs Full - 3600 lbs Full
Capacity (Net)	111 Gal	179 Gal	297 Gal
Max. Working Pressure	100 psig	100 psig	100 psig
Evaporation Rate	1.60% O2/Day - 2.6% N2/Day	1.35% O2/Day - 2.16% N2/Day	0.70% O2/day - 1.08% N2/Day

### Ordering Information

Tank	11818705	11814721	11848234
Vent Kit	11864277	11864277	11864277
Mount Kit	10591449	10591449	10591449
Service Kit	11830211 - 11830237	11830211 - 11830237	11830211 - 11830237

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# OPERATING INSTRUCTIONS FOR ULTRA SERIES LIQUID DELIVERY SYSTEM

## INTRODUCTION

The container system consists of a stainless steel inner vessel safely supported within a carbon steel outer vessel. The inner cylinder is wrapped in a highly efficient insulation material and the annular space between the vessels is evacuated to provide vacuum insulation reducing heat transfer and product evaporation. Loss of this vacuum will result in diminished insulation and loss of product.

## MATERIAL HANDLING SAFETY

Material Safety Data Sheets for the product to be stored in the vessel should be read and understood by all personnel using the vessel for filling, storage, or discharge before operating the vessel. It is critical that all cautions and warnings related to such product be strictly adhered to and proper safety equipment should be used at all times.

**WARNING-** Do not operate this vessel in a closed compartment or confined area unless the vent stack is ducted to the outside. Do not open the fill/withdrawal or the full trycock valve if in a confined area. The trycock should have an extension piped to it which directs gas and/or liquid outside the compartment and away from the operator.

**WARNING-** All transfer lines used with this vessel should be equipped with a relief valve.

**WARNING-** Do not remove, disable, or otherwise interfere with the operation of any safety devices on this vessel.

**CHANGING SERVICE-** The UltraSeries Delivery Vessels are suitable for carrying liquid oxygen, nitrogen or argon. However, if changing service, purge according to DOT regulations. Minor component changes may also be necessary.

## SAFETY DEVICES

- 1) **Relief Valve (RV)** There is an automatically reseating relief valve protecting the inner vessel from over pressure. This valve is not to be set at a pressure exceeding the rated normal operating limit of the vessel.
- 2) **Rupture Disk (RD)** Also referred to as a "head safety", this rupture disk is a backup safety device designed to protect the inner vessel from over pressure should the relief valve (RV) fail to open prior to pressure reaching the rupture disk set point. This is a "one-time" use device with a frangible membrane that must be replaced in the event of activation. The pressure rating of the head safety is not to exceed 1.5 times the normal operating limit of the vessel.
- 3) **Road Relief Valve (RRV)** This device is designed to be opened in the event that the vessel is used for transporting cryogenic liquids. The Road Relief Valve is set at less than 25.3 psi and is an automatically reseating relief valve with operation similar to that of the Relief Valve (RV). The valve to this device may be closed when the vehicle containing the vessel is stationary for the purpose of increasing overall pressure to off-load liquid. The Road Valve (V-7) must be open and pressure relieved to less than the set point any time the vehicle is in motion.
- 4) **Vacuum Rupture Disk** This "one-time" frangible disk device is affixed to the external vessel and it designed to provide free relief of pressure in the event that liquid or gas may be released into the annular space between the inner and outer vessel.

There is a common vent line connecting the Relief Valve (RV), Rupture Disk (RD), and Road Relief Valve (RRV). If the tank is installed in a closed container or vehicle, this line is to be piped directly to an external vent to assure gases do vent directly into the vehicle.

NOTE- VK-1T Vent Kits are available from West Cryogenics, Inc.

## **GAUGES**

A pressure gauge is provided indicating the inner vessel pressure. There is also a liquid level gauge indicating the approximate level of liquid in the vessel. These are two isolation valves between vessel and these gauges allowing the gauges to be replaced without emptying the vessel. Both valves should be open during normal operation.

## **PRESSURE BUILDING SYSTEM**

The vessel is equipped with an external pressure building system to assist in liquid discharge. This system consists of the Pressure Building Coil (PBC) and a Pressure Building Valve (V-1). When V-1 is opened, liquid is able to travel through the system. The Relief Valve (RV) provides control to prevent pressure from exceed the operating limits of the vessel. If the Road Relief Valve (RRV) is left open then it will serve as the primary regulator keeping pressure below 25.3 psi. Pressure may also be manually relieved by opening the Vent Valve (V-2).

To increase pressure, open the Pressure Building Valve (V-1) and be sure the Vent (V-2) is closed. If pressure greater than 25.3 psi is required the Road Valve (V-7) must also be closed. The Pressure Building Valve (V-1) should be closed anytime the vessel is not being used for discharge or is in transit. When discharge operation is complete, the Pressure Building Valve (V-1) should be closed and the Vent Valve (V-2) should be opened to manually relieve pressure to below 25psi prior to reopening the Road Valve (V-7).

## **FILLING**

**NOTE-** Prior to filling, it is important to consult DOT regulations or your local supplier for the maximum allowable liquid load consistent with your working pressure.

The UltraSeries Delivery Vessels are fitted with two (2) Liquid Valves (V-4) as standard equipment. Both valves can be used for fill or discharge of cryogenic liquids as needed.

These vessels can be filled from a pressurized liquid source using the following procedure:

- 1) An extension should be in place on the full trycock (Fill) valve (V-3) to discharge out of the vehicle and away from the operator.
- 2) Connect the liquid source to the Fill/ Drain Valve (V-4) using a suitable transfer line. Be sure the Road Relief Isolation Valve is closed.

**WARNING-** It is critical that all transfer lines connected to the vessel be fitted with a relief valve to prevent trapping of liquid or gas in the transfer line. Expanding gases from vaporizing liquid create rapid increases in pressure resulting in violent rupture of the transfer line. This rupture can lead to serious injury or death to individuals struck by the line or debris thrown from the line.

- 3) Open the Fill/Drain Valve (V-4) and the Full Trycock (Fill) Valve (V-3).
- 4) To begin the transfer, open the liquid source valve. Pressure at the vessel may be relieved manually using the Vent Valve (V-2) by opening to reduce pressure or closing to increase pressure.

**WARNING-** A cold stream of gas will exit from the full trycock extension. Keep clear of the exiting stream.

- 5) When the container is filled, liquid will start to exit from the Full Trycock (Fill) Valve (V-3) extension. At that point, shut off the liquid source valve.
- 6) Shut off the Fill/Drain Valve (V-4) and the Full Trycock (Fill) Valve (V-3). Open the Vent Valve (V-2) to relieve pressure from the vessel.
- 7) Disconnect the transfer line.
- 8) Open the Road Relief Valve (RRV) prior to transporting the filled vessel.

## WITHDRAWAL

The UltraSeries Delivery Vessels are fitted with two (2) Liquid Valves (V-4) as standard equipment. Both valves can be used for fill or discharge of cryogenic liquids as needed.

Transferring liquid from the UltraSeries vessel is accomplished by the following procedure:

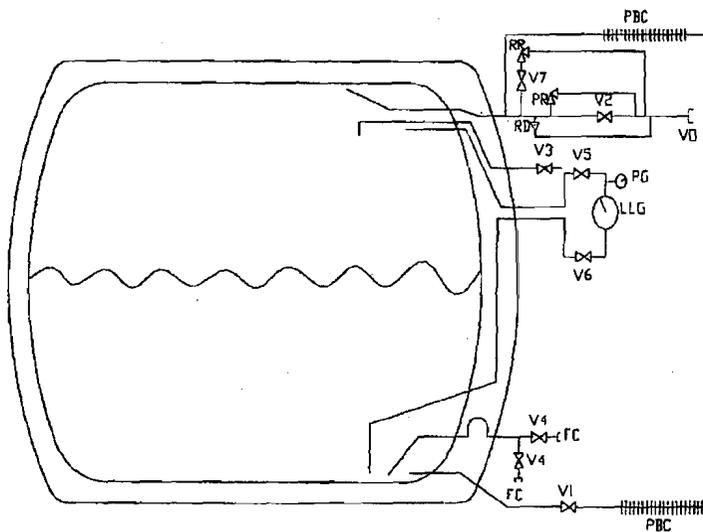
- 1) Be sure the Vent Valve (V-2) and Full Trycock (V-3) are closed
- 2) Check the pressure gauge to see that the vessel pressure is appropriate for the intended application. If additional pressurization is required, open the Pressure Building Valve (V-1) to operate the external pressure building coil. If less pressure is needed, open the Vent Valve (V-2) to lower pressure.
- 3) Attach a suitable transfer line to the Fill/Drain Valve (V-4).

**WARNING-** It is critical that all transfer lines connected to the vessel be fitted with a relief valve to prevent trapping of liquid or gas in the transfer line. Expanding gases from vaporizing liquid create rapid increases in pressure resulting in violent rupture of the transfer line. This rupture can lead to serious injury or death to individuals struck by the line or debris thrown from the line.

- 4) Open the Fill/ Drain Valve (V-4) as far as necessary to obtain the desired flow rate.
- 5) When the transfer is complete, close the Fill/Drain Valve (V-4).
- 6) While at the same location, the Pressure Building Valve (V-1) may be left open until fill operations are complete. To prevent excessive venting of gas, the Pressure Building Valve (V-1) should be closed prior to opening the Road Valve (V7) for transit.

**CAUTION-** Before operating this vessel, please consult your supplier for the product MSDS and applicable "Precautions for the safe handling and storage of liquefied gases" for additional precautions and good practice regarding cryogenics.

## WC210/WC290 ULTRA FLOW SCHEMATIC



### NOMENCLATURE

ITEM	DESCRIPTION
V1	PRESSURE BUILD VALVE
V2	VENT VALVE
V3	FULL TRYCOCK
V4	FILL/ DRAIN VALVE
V5	LOW PRESSURE GAUGE VALVE
V6	HIGH PRESSURE GAUGE VALVE
V7	ROAD VALVE
RR	ROAD RELIEF
PR	PRIMARY RELIEF
RD	RUPTURE DISC (MAIN SAFETY)
VO	VENT OUTLET FITTING
LLG	LIQUID LEVEL GAUGE
PG	PRESSURE GAUGE
FC	FILL CONNECTOR
PBC	PRESSURE BUILDING COIL