



Instruction Manual

Machine Type: MOBEL PUMP CART
10-2007 rev 1

Customer:

Serial No:

Order No.

Operation and maintenance in accordance with these instructions is a condition of the guarantee.

This manual is copyrighted and is supplied solely for the purpose of operating and maintenance of the machine; it must not be provided to or made available to third parties. Manufacture of any parts based on this manual is expressly forbidden.

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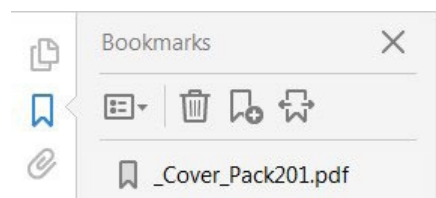
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About this Manual

The purpose of this guide is to help you understand this electronic manual.

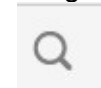
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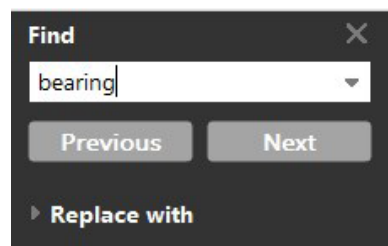
Following this page is a Table of Contents. Clicking on an item in the Table of Contents will take you to the relevant page.

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Preface

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The warnings, precautions, and instructions discussed in this manual cannot cover all possible conditions and situation that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product but must be supplied by the operator.

Audience and Purpose

This guide is intended for use by individuals who install, operate, or maintain the MOBILE PUMP CART (MPC). It gives an overview of the technology and operation of the CART.

Intended Use in a CO₂ System

United Science designed the MPC for use as an indoor bulk CO₂ supply that is capable of delivering liquid or gas to a process.

Contacting United Science

Contact United Science with technical feedback or technical questions regarding the use, transportation, removal, or disposal of any United Science product. You can reach us via the internet, telephone, or conventional mail.

Technical Support

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Safety Symbols and Warnings

	DANGER Failure to observe DANGERS can result in possible death or a very serious injury.
	WARNING Failure to observe WARNINGS can result in a very serious injury.
	CAUTION Failure to observe CAUTIONS can result in damage to equipment
	NOTICE Refers to a potentially harmful situation which if not heeded might lead to damage to the CART or its environment.





Symbol	Reference	Description
	ANSI Z535.4	Compressed gas warning
	ISO 3864	Safety Glasses required
	ANSI Z535.4	Disconnect power supplies before cleaning or servicing
		This symbol alerts you to a wide range of potential dangers
		This symbol advises you of danger from electricity or electric shock

Symbol	Reference	Description
		This symbol indicates a protective conductor terminal.
<div data-bbox="256 401 914 1033"> <p>CARBON DIOXIDE</p> <p>CAUTION: HIGH PRESSURE LIQUID AND GAS. CAN CAUSE RAPID SUFFOCATION. CAN INCREASE RESPIRATION AND HEART RATE. MAY CAUSE FROSTBITE.</p> <p>Avoid Breathing Gas. Store and use with adequate ventilation. Do not get liquid in eyes, on skin or clothing. Cylinder temperature should not exceed 125°F (52°C). Use equipment rated for cylinder pressure. Use a back flow prevention device in the piping. Close valve after each use and when empty. Use in accordance with...(Refer to applicable safety literature).</p> <p>FIRST AID IF INHALED: Remove to fresh air. If not breathing, give respiration. If breathing is difficult, give oxygen. Call a physician. IN CASE OF FROSTBITE: Obtain Medical attention immediately. DO NOT REMOVE THIS PRODUCT LABEL (or equivalent wording)</p> </div>		CUSTOM Label notifying users of the dangers of carbon dioxide.
		NFPA 704 Triangle Hazard Identification System




Identified Hazards

Safety Hazard Symbol Notice

Documentation needs to be consulted in all cases where the symbol is used to find out the nature of the potential hazard and any actions which must be taken.


	WARNING Eye Protection - To avoid eye injury from possible failure of seals or fittings, wear eye protection while near the device. Requirement: Wear eye protection while near the device.
	WARNING Frostbite Hazard - To avoid injury associated with coming into contact with extremely cold surfaces, exercise caution when accessing any CO ₂ recycler component, the internal and external surfaces of which can become extremely cold during normal operation.
	WARNING Rapid Decompression Hazard - To avoid frostbite and other injuries associated with the sudden release of rapidly expanding fluids, observe these precautions: <ul style="list-style-type: none"> • Depressurize the system before attempting to change or work with the bulk fluid supply. • Exercise caution when opening fittings, to avoid being sprayed by rapidly expanding solvents. • Fit supply lines made only of materials that can suitably withstand the highest pressure that the system can generate.
	NOTICE General CO ₂ Safety - CO ₂ and organic solvents that are used to extract and clean biomass or other media may pose several unique hazards including the risk of asphyxiation, freezing, rapid expansion, electric shock, and toxicity. Consult this manual, your organization standard operating procedures, and CGA and IGC guidelines for CO ₂ usage, personal protective equipment, and toxicity warnings.

Other Safety Notifications

	WARNING Carbon Dioxide Handling - User must be familiar with the dangers of carbon dioxide. CO ₂ becomes toxic at levels above 10,000 ppm with an exposure limit of 5000 ppm over an 8-hour period.
	WARNING Frostbite hazard can occur from release of pressurized CO ₂ to atmosphere or contact with accumulated dry ice at a leak site. Gloves and glasses required.
	WARNING Asphyxiation hazard caused by displacement of oxygen. Requirement: Engineered room venting shall comply with local codes and mechanical engineering design and compliance with installation instructions. Requirement: Detection of ambient CO ₂ level and alarm at permissible exposure limit (5000 ppm over 8 hours) Requirement: Customer shall install safety CO ₂ detection and oxygen sensing devices to detect and alarm a potential hazard. Requirement: Equipment must be connected to earth ground to prevent shock.

OSHA, the Occupational Safety and Health Administration agency has set a Permissible Exposure Limit for CO₂ of 5000 ppm or 0.5%. The American Conference of Governmental Industrial Hygienists (ACGIH) has also set a Threshold Limit Value of 5000 ppm. This represents the time-weighted average (TWA) CO₂ concentration that personnel may be exposed to during a normal eight-hour workday. Additionally, the ACGIH recommends a maximum Short-Term Exposure Limit of 30000 ppm (3%) for 15 minutes.

Where the potential exists for exposure to CO₂ above the allowed limits, monitoring devices and good ventilation are recommended to maintain oxygen levels at 19.5% and less than 5000 ppm CO₂.

	WARNING Proper Handling, Storage, and Disposal of Chemicals - Familiarize yourself with proper handling, storage, and disposal of all chemicals used with your system. Refer to the Material Safety Data Sheet (MSDS) for each coolant or chemical and know its chemical properties.
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Equipment Misuse Notice

The Mobile CO₂ Pump Cart is designed to refill the extractLAB CO₂CAGE. If equipment is used in a manner not specified by its manufacturer, protections against personal injury inherent in the equipment's design can be rendered ineffective.

Personal Protective Equipment

NOTICE: Wear appropriate personal protective equipment when working with any type of hazardous chemical.

Our MOBILE PUMP CART Includes:

Applicable Fill Methods and Safety Guidelines:

- AIGA 069_10 fill-method or equivalent
- CO₂ is Non-Recycling
- NFPA 55 Guidelines for indoor use recommended
- CGA G-6.3 and M-4 Standards Apply
- CGA single line fill method
- Proper signage and CO₂ alarms required for indoor use

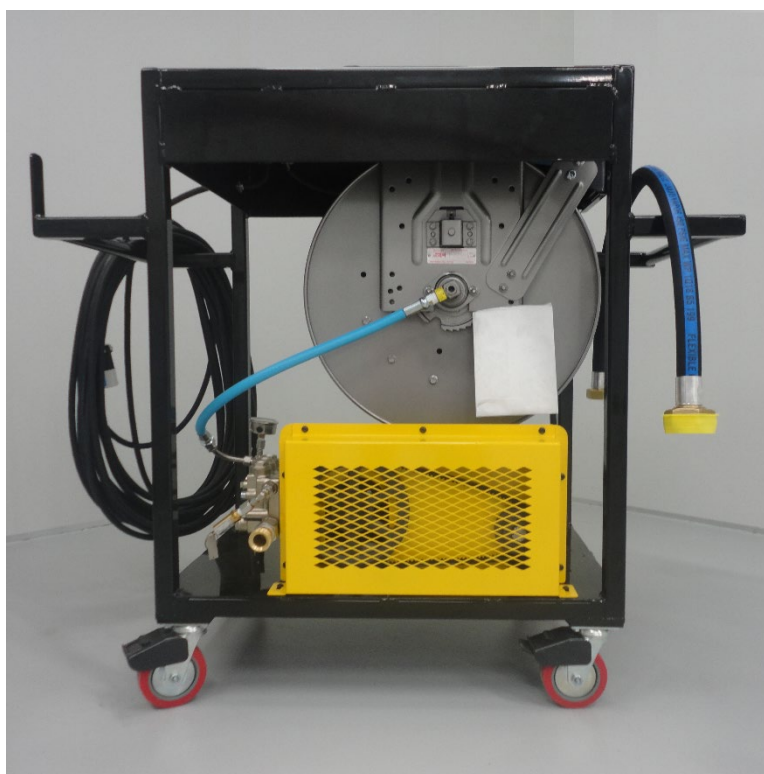


Figure 1

Filling Procedure:

1. Attach the long ½" blue line *Figure 2* on the cart to the CO2CAGE at the inlet and be sure to use the nylon CGA 320 washer.
2. Open the inlet valve on the CO2CAGE.
3. Ensure the 1" CGA fitting on the 5' hose *Figure 3* is securely connected to the inlet of the MPC. Connect the other end to the truck or bulk system.
4. Close the purge/vent valves on the MPC.
5. Place the switch on the MPC is in the OFF position then connect the power cord on the MPC to the dedicated receptacle *Figure 4* on the CO2CAGE.
6. Slowly open the feed valve on the bulk system or truck to begin priming the MPC system. If leaks are heard or seen close the valve and address the leaks, then open the feed valve. It may be necessary to purge air from the blue ½" line. This can be done by opening the CO2CAGE purge valve and waiting until a solid stream of white CO2 exits the valve or leave it barely cracked until the pump is pumping, then close it.
7. Turn the CO2CAGE fill function ON in the touch panel, then turn the pump cart switch ON.
8. Observe the gauge on the pump cart. It should reach roughly 900 psi within a few minutes. If it does not, use the upper purge/vent valve on the pump cart to further prime the pump by venting.
9. The pump and high pressure lines will vibrate when pumping properly and you will be able to observe an increase of about 20 lbs/minute on the CO2CAGE display.
10. The CO2CAGE should automatically turn off power to the pump cart when the cage is full. If the feet are not properly reading the weight of the cage then you could potentially under or over-fill the cage. If the pressure in the cage is near 1,000 psi you stop the pump and consider the CO2CAGE to be full.
11. When the CO2CAGE is full or when you are done filling, turn off and unplug power to the pump. Make sure both the switch on the pump cart and the fill function on the HMI are turned off.
12. Close the feed valve on the truck or the bulk system.

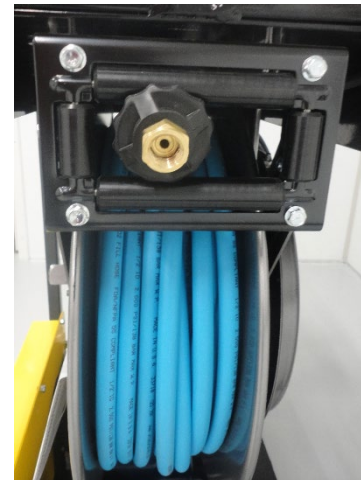


Figure 2



Figure 3



Figure 4

13. Slowly open the purge / vent valves *Figure 5* to relieve the pressure in the lines.
14. Once the pressure has been relieved disconnect from the truck or bulk system and prepare the cart the next use or for storage.




Figure 5

Specifications

MOBILE PUMP CART Specifications

Attribute	Specification
Height	49"
Length	52"
Width	24"
Cord Length	12'
Plug Type	HBL2621S
Control Type	PLC, Manual Switch
Motor	
Output HP	5Hp
Frequency	60Hz
Current	23-21 A
Volts	208-240
Phase	1
Pump	
Maximum RPM	1750 PRM
Fill Hose Length	100 ft.
Fill Hose Connection Type	Standard CGA 320
Feed Hose Length	5 ft.
Feed Hose Connection Type	1-1/2" F CGA
Est. Flow Rate	> 15 lbs/min

Table for Customer Interface

Process Connections	Description	Picture
CO ₂ CAGE Inlet	CGA 320 male	

Calibration

Calibration Routines	Reference	Calibration Frequency
CO ₂ Meter	CO ₂ Company	Yearly

Troubleshooting

Symptom	Cause	Action
Leakage at connections	Loose fittings	Tighten nuts if connections leak near them.
Pump does not begin to fill.	Pump lost prime	Use the purge valve to prime the pump
Slow flow rate	Low bulk supply	Ensure the bulk supply is not empty for near empty.
No power at Pump	Disconnected Power	Check plugs, breaker, switch and HMI panel.

*Appendix**Part List:*

Description	Part Number
Fill Hose 100 ft.	70-3231
OEM Oil (2.5 gallon)	70-3245
Food Grade Alternative Oil (1 quart)	70-3246
Plunger Rod Oil Seal Kit (3/3)	70-3247
Crankshaft Seal	70-3248
Check Valve Kit (6/6)	70-3249
Pump Seal Kit (3/3)	70-3250
Complete Pump Seal Assembly Kit	70-3251
Dip Stick	70-3252
Pump Repair Toolkit V-packaging	70-3253
Inlet Hose (5 ft)	70-3229
450 PSI Relief Valve	80-0304
1500 PSI Relief Valve	80-0285
Motor Belt	80-0312
Hose Reel Seal Kit	70-3235
CGA 320 Nylon Washer	80-0307

External Reference Documents

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