



DELTA SEPARATIONS
Hard(ware) science for craft botanical extraction

CUP 15 OPERATING AND SERVICE MANUAL



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Table of Contents will come later: Great!!

1. Safety

Please read and follow all safety and use instructions.

ONLY TRAINED PROFESSIONALS WITH A COMPLETE OPERATIONAL UNDERSTANDING OF THE EQUIPMENT—AND A FULL UNDERSTANDING OF THE RISKS ASSOCIATED WITH ALCOHOL USE—SHOULD BE AUTHORIZED TO USE THE EQUIPMENT. THE USE OF Alcohol HAS RISKS. ANY MISUSE OF THIS EQUIPMENT CAN RESULT IN SEVERE INJURY, INCLUDING BUT NOT LIMITED TO DEATH, DISABILITY AND PROPERTY DAMAGE.

Safety Notices

CAUTION

A **CAUTION** notice indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or damage to the equipment. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A **WARNING** notice indicates a hazardous situation which, if not avoided, could result in death or serious injury.

DANGER

A **DANGER** notice indicates an immediate hazard which, if not avoided, will result in death or serious injury.

IT IS THE OPERATOR'S SOLE RESPONSIBILITY TO USE EQUIPMENT IN A SAFE MANNER. OPERATOR ASSUMES ALL RISK ASSOCIATED WITH THE USE OF THIS EQUIPMENT AND AGREES THE EQUIPMENT IS ONLY TO BE UTILIZED FOR LAWFUL PURPOSES.

Ethyl Alcohol Safety Information

Emergency Overview

OSHA Vacated PELs: Alcohol: 1000 ppm TWA; 1900 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

First Aid Measures

Eyes: Get medical aid. Gently lift eyelids and flush continuously with water for at least 15 minutes.

Skin: Get medical aid. Wash clothing before reuse. Flush skin with plenty of soap and water.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cups of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation.

General Information: Containers can build up pressure if exposed to heat and/or fire. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Vapors will burn if involved in a fire. Flammable liquid can release vapors that form explosive mixtures at temperatures above the flashpoint. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Do NOT use straight streams of water.

Flash Point: 16.6° C (61.88° F)

Auto-ignition Temperature: 363° C (685.40° F)

Explosion Limits, Lower: 3.3 vol %

Explosion Limits, Upper: 19.0 vol %

NFPA Rating: (estimated) Health: 2; Flammability: 3; Instability: 0

DANGER

This equipment uses high-proof alcohol. Alcohol is a flammable liquid. Improper use may cause alcohol to discharge, resulting in an unsafe work environment. Use a properly-rated CFM fume hood, personal protective equipment (PPE), and appropriate detectors.

DANGER

Inhalation of high concentrations of Alcohol vapor may affect the central nervous system. This is characterized by nausea, headache, dizziness, unconsciousness and coma. It may cause respiratory tract irritation. In high concentrations, it may cause narcotic effects. Please read the Alcohol Safety Data Sheet for further safety information.

WARNING

Operator must follow all precautions and safety guidelines to ensure their own safety, the safety of other personnel, and the protection of property.

WARNING

Always visually monitor fill levels, tanks, valves, and hoses for leakage. While the system is protected with pressure relief valves, care should be taken to ensure overfilling does not occur.

WARNING

All hoses may contain alcohol under slight pressure. Wear proper personal protective equipment (PPE) such as safety goggles and gloves when disconnecting hoses and working around alcohol.

WARNING

Imbalance of the basket may cause major damage to the bearing and shaft assembly and put the operator at risk. Proper weight loading is critical. The improper use of the CUP or unapproved modifications may result in serious injury.

WARNING

Before opening the lid manually, be sure that the basket has completely stopped spinning.

WARNING

Component wear varies depending on the amount of usage. Inspect all nuts, bolts, and gaskets before each use. If there is any question about the integrity of a component, replace it immediately.

CAUTION

Make certain all safety devices are functioning properly before operating the equipment.

CAUTION

The alcohol detector must be used always in and around the extraction zone.

CAUTION

Never apply pressure or vacuum to the system chamber.

CAUTION

Never apply more than 10 psi and 15 mmHg to the system jacket.

CAUTION

It is important to have the manual relief valve open during filling to allow the displacement of the head pressure.

CAUTION

The facility must provide adequate ventilation/exhaust, as determined by the Engineer of Record, to maintain the local atmosphere below 25% of the Lower Flammability Limit (LFL).

CAUTION

Alcohol vapor is heavier than air and can settle in low places.

CAUTION

DO NOT use or store equipment or containers where they could be exposed to high temperatures. Relief valves can open allowing alcohol to escape. DO NOT artificially heat equipment or containers above 125°F.

CAUTION

This system is NOT equipped with an overfill prevention device. Ensure proper fill levels prior to operation.

CAUTION

All system containers must be checked for accidental pressurization. Depressurize prior to opening.

CAUTION

DO NOT allow children to tamper with or play near the equipment.

2. Basic Operation

System Introduction

The *CUP 15-Series Alcohol Extraction System* provides the ability to extract targeted botanical compounds from a diverse plant species. This unique separation technology combines closed-loop alcohol extraction with mechanical centrifugation, ensuring high-purity, fractional extractions. The system isolates compounds by controlling key process variables, including solvent residence times, rpm control, agitation force, and temperature.

Functional Overview

The process below is illustrated in *Figure 2-1*.

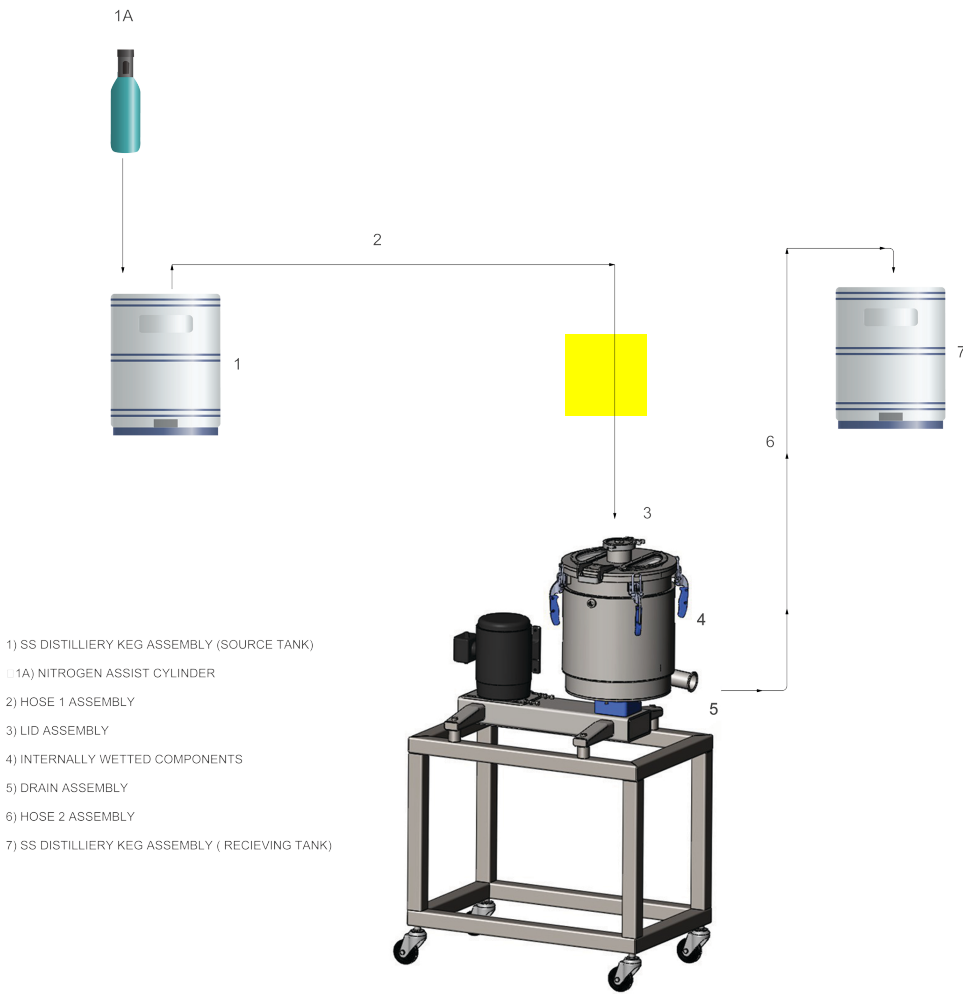
1. The *CUP 15* is loaded with a predetermined amount of plant material.
2. Alcohol is pushed out of the source keg **(1)** using compressed nitrogen (with regulator) **(1A)** into the CUP chamber **(3)**.
3. Secondary Option (not shown) Alcohol is transferred out of the source keg **(1)** using a pneumatic transfer pump powered by either a remote air compressor or inert compressed gas.
4. The *CUP* chamber **(3)** is filled with alcohol to operator specifications.
5. The plant material/alcohol then undergo a bi-directional agitation aimed at removing the target compounds.
6. When agitation is complete, the discharge valve **(5)** is opened, and the tincture is diverted to a bulk crude reservoir **(7)** for future processing.
7. The spent plant solids are spun dry using centripetal force to remove 98% of the remaining alcohol tincture trapped within the plant material.
8. The system is then opened and unloaded by retrieving the filter bag from the basket.
9. The process can be repeated until complete.

This method provides the safest, most economically efficient way to batch-process biomass using alcohol.

Figure 2-1. Flow Diagram



**CUP 15 FLOW DIAGRAM
(KEGS WITH COMPRESSED GAS)**



- 1) SS DISTILLIERY KEG ASSEMBLY (SOURCE TANK)
- 1A) NITROGEN ASSIST CYLINDER
- 2) HOSE 1 ASSEMBLY
- 3) LID ASSEMBLY
- 4) INTERNALLY WETTED COMPONENTS
- 5) DRAIN ASSEMBLY
- 6) HOSE 2 ASSEMBLY
- 7) SS DISTILLIERY KEG ASSEMBLY (RECEIVING TANK)

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3. Technical Specifications

Table 3-1 shows the specifications for the CUP 15.

CAUTION

Never apply pressure or vacuum to the system chamber.

CAUTION

Never apply more than 10 psi and 15 mmHg to the system jacket.

CAUTION

The facility must provide adequate ventilation/exhaust, as determined by the Engineer of Record, to maintain the local atmosphere below 25% of the Lower Flammability Limit (LFL).

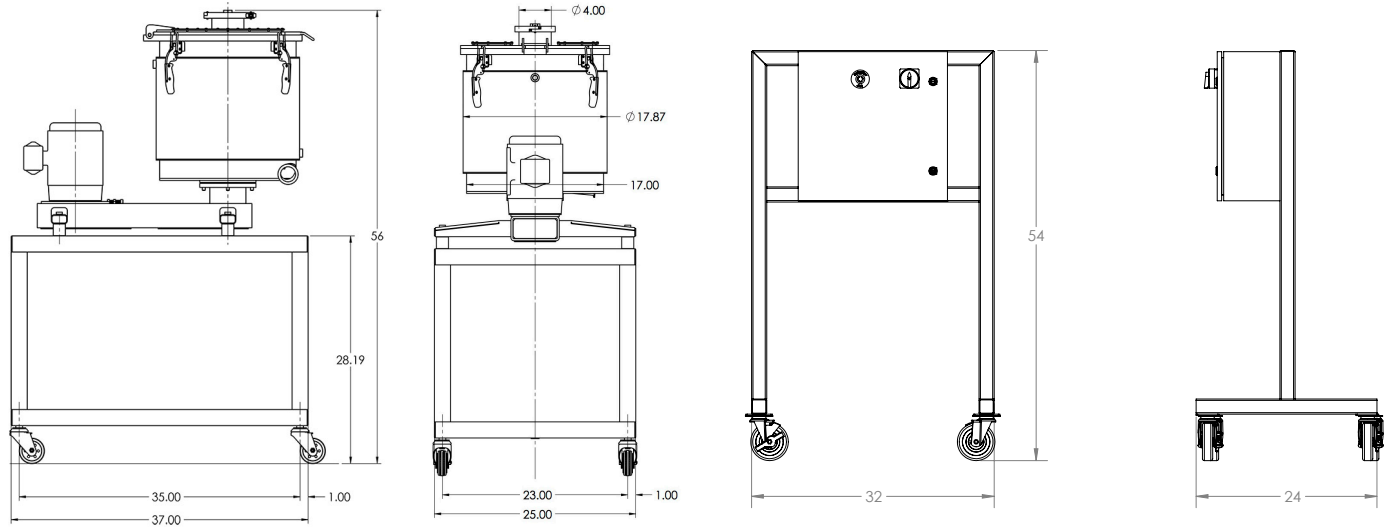
Table 3-1. Technical Specifications

CUP 15 Technical Specifications	
Maximum speed	1200 rpm
Basket capacity	8 lbs. to 12 lbs. (Depending on mill size)
Maximum temp	60° C
Minimum temp	-40° C
Maximum pressure	*Not recommended
Vacuum	*Not recommended
Control system	SIEMENS Programmable Logic Control
Speed set range	50-1200 rpm
Speed set step	10 rpm
Timer set range	1-99 minutes and hold position
Timer set step	1 minute
Motor	2HP Exp. Hazloc C1D2 certified
Supply Values	230 V / 60 Hz - NEMA L6-30R plug
Power Consumption	2500 W

Physical Characteristics

Figure 3-1 and Table 3-2 show the physical characteristics of the CUP 15.

Figure 3-1. CUP 15 Physical Characteristics:



Width = 35 inches Depth = 25 inches

Table 3-2. Physical Characteristics :

CUP 15 Physical Characteristics	
System External Dimensions (W x D x H) inches	CUP 15 Footprint: 37" W x 25" D x 56" H Drive Panel Footprint: 32" W x 24" D x 54" H
Net / Packed weight (kg)	600 Lbs. / 270 kg

4. Installation and Setup

Lifting and Transport

All lifting and transport must be done using proper handling equipment. The system must always remain in a vertical upright position and never leaned or turned over on its side.

Unpacking the Crate

Remove the packing cardboard, plastic wrap and the secondary packing straps around the centrifuge.

Manufacturer-Provided Items

Items provided with the system are listed below. Please ensure everything is included and intact.

- Main Control Panel
- CUP System
- Mesh Bags
- Lid Assembly Fittings
- Drain Port Assembly Fittings
- (2) Distillery Hoses and fittings. One long Hose (Fill Hose) and One Short Hose (Drain Hose)
- System Parts Components and Packing List
- System Manual

System Placement

Prior to installing the system:

- Check that no damage to the system or casters has occurred during transport.
- Check that system placement area is level and suitable for positioning. Double-check that all four casters are on level ground.
- Leave sufficient space around system for an unobstructed work area.
- Verify that the system is placed in a properly ventilated area that has been approved by your local fire marshal.

Power Requirements

The CUP 15 requires a dedicated 230 V, 60 Hz, 30 amp circuit. Please ensure that all receptacles (NEMA L6-30R) match the required power ratings (see *Figure 4-1*).

NOTE: Always plug the system into correctly grounded receptacles.

Figure 4-1. CUP 15 Grounding Receptacles

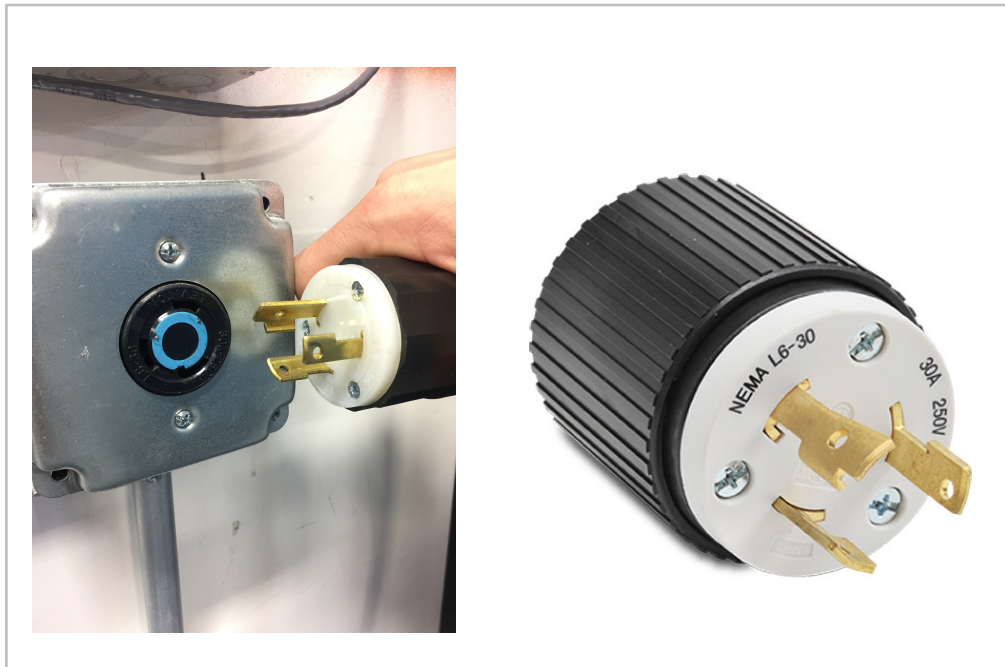


Figure 4-2 shows properly wired grounding straps and their placement.

NOTE: Grounding straps should be wired by a licensed electrician.

Figure 4-2. System Grounding Straps



Environmental Safety

*This section includes safety **recommendations** that apply specifically to the CUP 15 system. Verify that the area is set up properly before installing the system.*

The CUP 15 has been designed to operate safely under the following environmental conditions:

- Indoor use only
- Maximum relative humidity of 75%
- Ambient temperatures of 5°C to 32°C
-

Fire Suppression

Install an automatic fire suppression system with 155° auto discharge heads, according to Local and State building codes. The manual release handle should be accessible outside the containment area, and accessible when the extraction area is closed. Install two Alcohol detectors in the work area. Place a 10 lb. manual fire extinguisher with appropriate ratings within the extraction area.

Lighting

Area should be well lit with a properly rated configuration. Clearly mark exits with a lighted sign, and install emergency lights/battery backup in case of any power failures.

Ventilation

The ventilation system's purpose is to keep accidental liquid and vapor release concentrations low enough to prevent ignition. The exhaust ventilation system should comply with AHJ requirements and should be capable of capturing any solvent vapors, if released.

Fans must be able to extract enough air to match the vapors of a spill ½ the normal working volume (simulating a failure in either the recovery or source container of most of the systems in use, including rotary evaporators, Buchner funnels, etc) for double the amount of time it would take a worker to safely contain the spill using appropriate tools and procedures.

Sanitary areas should be fitted with properly rated HEPA HVAC fan and filter equipment to control contaminants.

Ignition Prevention

No open flame devices will be allowed in the fume hood area. Smoking is not permitted in the work area and 'No Smoking' signs should be posted.

No appliances with pilot lights are permitted.

No appliances with the possibility of creating open sparks (i.e., open contacts/relays on most refrigerators, chillers, etc.) are permitted.

No handheld electrical tools may be operated during extraction operations.

Static Control

To reduce the possibility of static electricity sparks, antistatic mats can be placed around extraction and distillation equipment. Equipment will be grounded using grounding straps provided and shall conform to NEC/NFPA guidelines to help prevent static electricity and discharges.

Placement and Types of Electrical Equipment

When possible, locate all electrical outlets, switches, light fixtures, electric appliances and equipment outside the extraction equipment area. All devices should be wired according to NEC & local AHJ.

Use low voltage circuits inside the containment area to help prevent sparks from high voltage devices.

Gas Detection and Monitoring

Since the proposed extraction process utilizes alcohol for solvent extraction, presence of alcohol vapor will be monitored in the work area. Monitoring systems will provide readout and/or a signal that indicates that dangerous levels of flammable vapor have been reached. An additional fixed monitor will be placed in the inlet of the exhaust air fan to monitor alcohol vapor evacuation. Gas detection devices will be calibrated on a weekly interval.

Preparing the CUP 15 for Operation

The CUP arrives factory-tested and inspected for liquid leaks and manufacturing flaws. However, shipping and/or frequent moving of the system can loosen components. It is the operator's responsibility to check for leaks and damage prior to operation. It is advised to perform a 'liquid run' check with alcohol (no material) in order to clean the system while inspecting for leaks.

CAUTION

Operator must learn and become familiar with all procedural operations and liquid transfer mechanics prior to use (e.g., system flow diagram, plumbing schematic, liquid transfer operations, and/or pneumatic pump assembly).

Safety Check Prior to Operation

Before using the system, perform the following system inspection.

1. Open the lid and visually inspect the system, basket assembly and lid seal for cleanliness and wear and tear. Check the inner basket bolts with a torque wrench using 15 foot-pounds.
2. Confirm the main system panel is plugged into a correctly rated 230V / 30 amp receptacle NEMA L6-30R 250V.
3. Make sure the grounding straps have been installed correctly and electrically tested using a technician's meter.
4. Check for any blockages within the hoses, connection fittings, valves, and drain assembly.
5. Inspect all tanks, kegs, fittings and seals for damage or leaks.
6. Make sure all alcohol detectors are functioning properly and ready for use.
7. Make sure all pressure devices are set to correct parameters.
8. Make sure the ventilation / fume hood is turned on.

Once the system has been cleaned, inspected and the operator is familiar with the liquid transfer process, the operator may proceed to extract in the CUP.

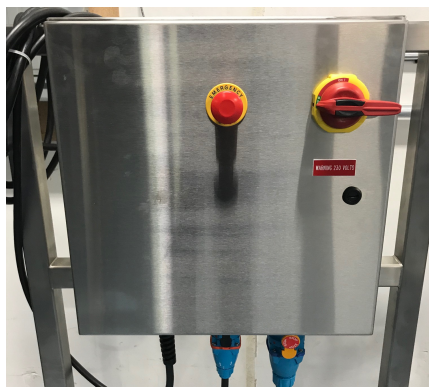
Precautions and Limitation of Use

Please pay special attention to the following:

- Never attempt to open the lid while the basket is spinning.
- Make sure the system placement is on flat, level ground.
- Always power off the main panel when not in use for longer than 60 minutes.
- Never overload the system or use system without a balanced load
- Ensure proper material loading and balancing of filter bags.
- Only use the system as described in this manual.

5. Control Panel Overview

There are two control panels provided as part of the CUP 15. The **Operator Control Panel** is mounted to the motor of the centrifuge platform and is used for direct operation of the equipment within the extraction zone. The **Main Control Panel** is mounted on a separate modular frame that is tethered outside of the extraction zone. Both panels have been designed and built in accordance with Class 1 Div 2 standards, with Operator Panel UL certified for use within C1D2 hazardous locations.



Please Note : Always make sure the main “drive” panel is located outside of the extraction zone. The system “Operator panel” is attached to the mainframe of system and is rated for use within C1D2 environments. The Main operator panel is located outside of the C1D2 HAZ zone. There is a 20 ft of cord tethering main drive panel to the system. (Image placeholder here)

Spray Wash Mode

The Spray Wash Cycle is selected on the HMI where the Cycle Time and RPM Set Speed are configured to the operator specifications. Push START to run the cycle.

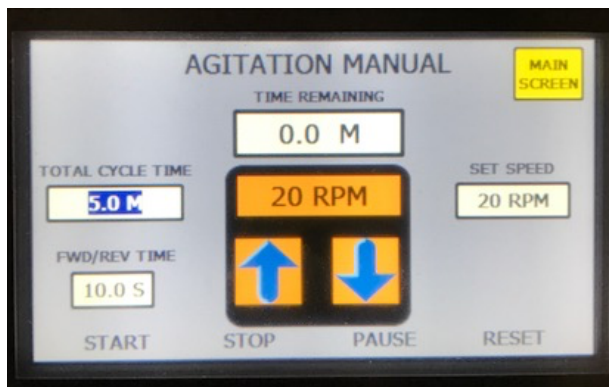
Figure 5-5. Spray Wash Cycle



Agitation Wash Mode

The Agitation Wash Cycle is selected on the HMI where the Cycle Times and Set Speeds are set to the technician's specifications. Push START to run the cycle.

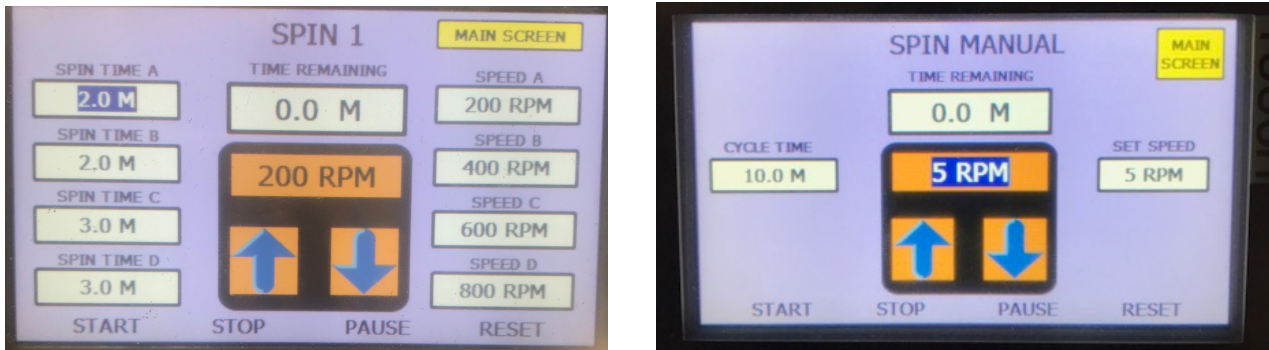
Figure 5-6. Agitation Wash Cycle



Spin Dry Mode

The Spin Dry mode is selected on the HMI and the sequenced spin times and with corresponding rpms are set. Push START to run the cycle.

Figure 5-7. Spin Dry Cycles (Auto and Spin Manual)



RPM Control

All cycles can utilize the manual RPM control

Figure 5-4. RPM Display



Speed Control Value Increase Key

Use the up arrow to increase the basket RPMs during the cycle.

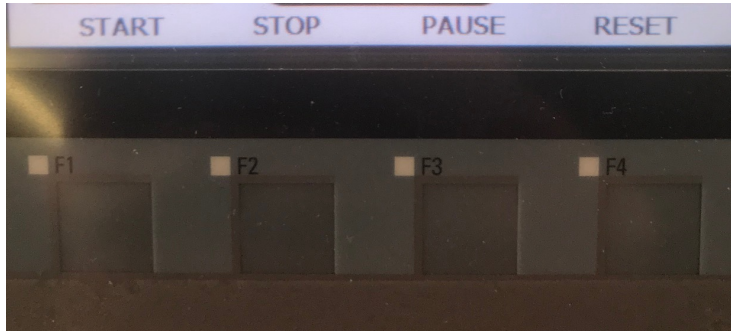
Speed Control Value Decrease Key

Use the down arrow to decrease the basket RPMs during the cycle.

Please Note: By holding Arrow key for longer than 3 sec, RPMs integers will rapidly increase.

START / STOP / PAUSE / RESET Keys

Use the F1-F4 buttons to *Start, Stop, and Pause* the cycle program; or *Reset* to return to the cycle parameters after the system's fault screen is flashing.



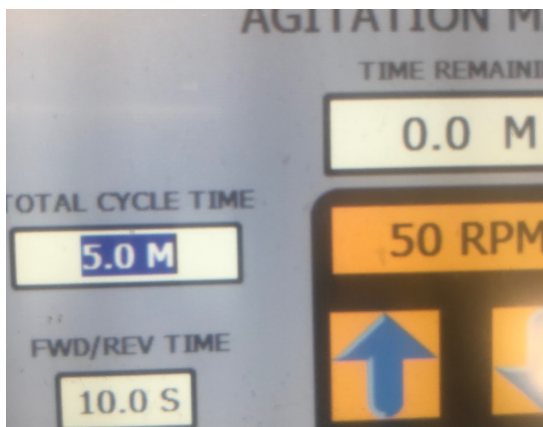
Fault Screen

(Need Image and fault procedure)

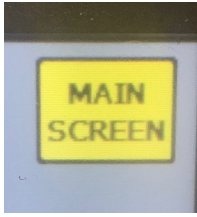
Changing Parameters

In order to change the RPM, cycle times, or other parameters within each mode, touch the parameter box you want to change and enter a number that is between the Min and Max boundary of that parameter. Press the "Enter" key when done.

Please Note: Each parameter's control boundary is factory set.



“Main Screen” Button



Press the Main Screen Button to return to the “Main” system menu

Main Control Panel

The Main Control Panel includes the Power switch to the system drive, motor and operator control panel. There is also an Emergency Stop button as shown below.

Figure 5-8. Main Control Panel



6. Basic Extraction Process

This chapter introduces a basic extraction process. Depending on materials used and desired tincture, the details within each step of the process may be different.

Before Extracting

ONLY TRAINED PROFESSIONALS WITH A COMPLETE OPERATIONAL UNDERSTANDING OF THE EQUIPMENT—AND A FULL UNDERSTANDING OF THE RISKS ASSOCIATED WITH ALCOHOL USE—SHOULD BE AUTHORIZED TO USE THE EQUIPMENT. THE USE OF Alcohol HAS RISKS. ANY MISUSE OF THIS EQUIPMENT CAN RESULT IN SEVERE INJURY, INCLUDING BUT NOT LIMITED TO DEATH, DISABILITY AND PROPERTY DAMAGE.

DANGER

This equipment uses high-proof alcohol. Alcohol is a flammable liquid. Improper use may cause alcohol to discharge, resulting in an unsafe work environment. Use a properly-rated CFM fume hood, personal protective equipment (PPE), and appropriate detectors.

WARNING

Operator must follow all precautions and safety guidelines to ensure their own safety, the safety of other personnel, and the protection of property.

Extraction Overview

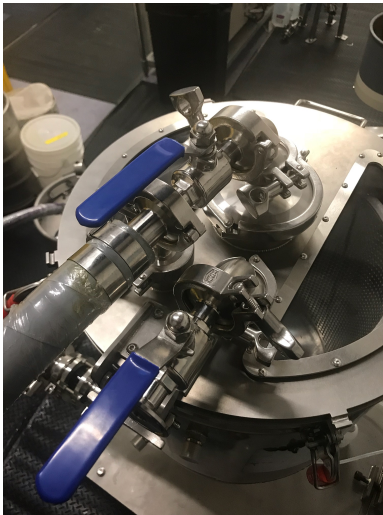
Here is an overview of the extraction process. Each step is explained in more detail in the following paragraphs.

1. System Inspection and power up
2. Chilling the Alcohol (optional)
3. Freezing the Biomass (optional)
4. Material Preparation (Grinding and Milling)
5. System Loading
6. Alcohol Filling
7. Spray Wash Cycle
8. Agitated Wash Cycle
9. System Draining
10. Spin Drying Cycle
11. Unloading the system
12. Cleaning the system

Powering Up the System

Prior to powering up the system:

- Verify that the valves are set to the “OPEN” position and the system drain valve is closed.
 - o Lid inlet: Open
 - o Lid vent valve: Open
 - o System discharge valve: Closed



- Verify that the inner basket bolts are torqued to 15 foot-pounds
- Check for any loose fittings or damaged seals
- Turn the Main Panel switch to ON
- The operator panel will begin its power-up sequence. **Please note:** The system PLC and HMI power up sequence usually takes about 1 - 2 min and should rest on the main “MODE” menu screen.

Chilling the Alcohol (Optional)

Organic Alcohol is pre-chilled in an Explosion Proof freezer to the desired the temperature. The system is equipped with an insulation jacket with 1/2 “ MNPT ports. Cap one port and place a valve on the other. Note: If running cold alcohol method we recommend pulling a mild vacuum 15 inches Hg (not full vacuum) on the system’s insulation jacket. This is to help keep heat transfer to a minimum.

Preparing the Material

1. Prepare the wet or dry botanical material by pre-freezing material in a freezer. Mill biomass to an even, medium-coarse grind (1/4" mill size) prior to being loaded into the filter bag. (We will add image to show mill size)
2. Note the input weight of the material to be loaded into the primary filter bag.

WARNING

Imbalance of the basket may cause major damage to the bearing and shaft assembly and put the operator at risk. Proper weight loading is critical. The improper use of the CUP or unapproved modifications may result in serious injury.

Loading the Filter Bag

CAUTION

An unbalanced basket can cause major damage to the bearing assembly and excessive wear on the system. Proper loading of the filter bag is VERY important. Always make sure that you pack the material evenly as you go, by layering and lightly packing each layer. Repeat until the material is evenly loaded. AVOID STEMS AND STICKS AND UNEVEN LOADS WHENEVER POSSIBLE. THE MORE HOMOGENEOUS THE PLANT MATERIAL THE BETTER.

1. Load the wet or dry material into the primary filter bag. Load the filter bag evenly so that the material is equally distributed.

Loading the System Basket

1. Gently place the preloaded filter bag into the system basket keeping the material equally distributed as shown in *Figure 6-1*.

Figure 6-1. Loading the System Basket



2. Close the lid and securely fasten all lid clamps before proceeding. Refer to *Figure 6-2*.

Figure 6-2. Loading the System Basket



Filling the Chamber with Alcohol

The CUP uses a pneumatic liquid transfer pump or nitrogen assist to move the alcohol from the source tank to the system chamber. When using a pneumatic pump, the following procedures should be followed.

Verify that the hose from the source tank to the pump inlet is properly connected.

1. Verify that the hose assembly from the pump outlet to the system lid is properly connected.
2. Set your air compressor regulator between 60 - 90 psi or applicable pump specifications. Let the air compressor reach the desired pressure in the tank before use.
3. Connect the air compressor hose to the transfer pump.
4. Open the alcohol source tank valve and slowly turn the pump throttle valve to begin the liquid transfer into the system.
5. Monitor the air flow to the pump to ensure the flow is consistent with the manufacturer's recommendations for safe pump operation.

Recommendations on moving fluids into CUP15 using nitrogen assist (Compressed Air) and system kegs (Not peer reviewed)

1. Close all valves on on Keg Dip Tube manifold. (See image)



2. Attach regulator to nitrogen tank. Tighten using wrench. (See image)



3. Attach 1/4" hose pressure hose to Nitrogen tank regulator. Tighten using wrench. (See image)



4. Attach the other end of 1/4" pressure hose to keg manifold. Make sure mini ball valve is closed. Tighten hose to JIC fitting using wrench. (See image)



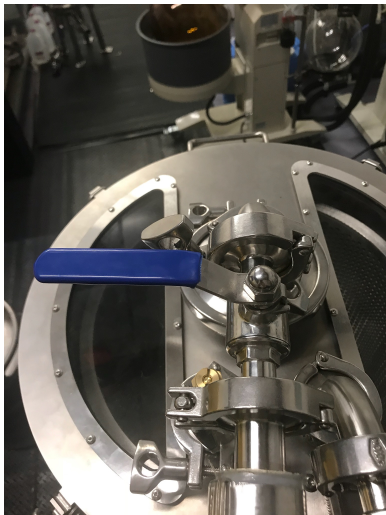
4. Open main valve on nitrogen tank. Right gauge will show tank pressure. (See image)



5. Slowly turn the knob on regulator until 20 PSI shows on left gauge. (See image)



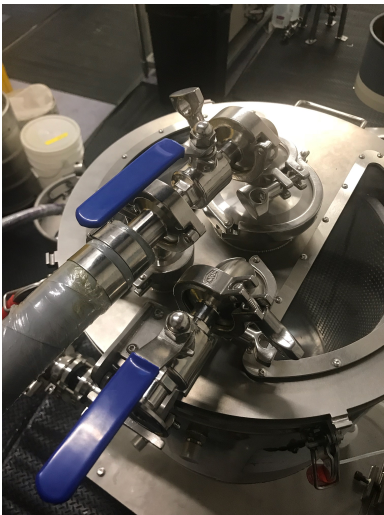
6. Ensure the lid "inlet" valve is in the closed position. Close system drain valve. (See image)



7. Open ¼” ball valve on Keg to pressurize the keg (See image)



8. Make sure lid **vent** valve is open; Open the **inlet** valve and begin filling. The “Inlet valve is attached to the center of the lid with the 4” Triclamp . (See image) View liquid fill levels through the lid sight glass and close the inlet valve when the desired fill level is achieved usually 1” above the material bag.



WARNING *Never fill system while the lid VENT valve is closed.* Always monitor the filling procedure and close inlet valve when liquid is coming to an end (you will see sputtering). Always visually monitor fill levels, tanks, valves, and hoses for leakage. While the system is protected with pressure relief valves, care should be taken to ensure overfilling or pressurization of CUP chamber does not occur.

Running the Spray Wash Cycle (For Ethanol Shatters and Sauces)

From the Operator Control Panel, select the desired Spray Wash Cycle. The Spray Wash Cycle is used to remove lighter desirables and surface compounds within the plant matrix. Alcohol is sprayed through the spray nozzles and into the rotating basket holding the plant material. Under centripetal force, the alcohol quickly passes through the plant material stripping many of easily removed compounds from the plant. This user controlled variable allows the operator to choose the residence time of the solvent against the plant material. **(Use Delta's open top bags)**

Running the Agitation Wash Cycle (For Ethanol Bulk Crude to Distillate) - *Preferred Method*

From the Operator Control Panel, select the desired Agitation Wash Cycle. The Agitation Wash Cycle is used to fully remove bulk target compounds. Alcohol is transferred into the system and flooded to 1" above material bag. It then undergoes a bi-directional agitation aimed at removing all targeted plant compounds. **(Use Delta's closed zipper bags)**

Draining the System

Upon completion of the wash cycles, open the discharge valve and drain the system. The tincture is diverted to a properly rated storage reservoir for further processing. Make sure at least the majority of the liquid has been drained before proceeding to Spin Dry.

Running the Spin Dry Cycle

From the Operator Control Panel, select the desired Spin Dry Cycle and set parameters; Press start.

Please note: *The Spin-Dry 1 and 2 recipes allow the operator to pre-program the drying sequence. Select the RPMs and duration time for each step.*

The "Spin-Dry Manual mode" allows operator full control over the RPM's; like a throttle for speed control.

WARNING NEVER LEAVE THE SYSTEM UNATTENDED DURING THE SPIN-DRY CYCLE. OPERATOR SHOULD KEEP CLOSE WATCH AT ALL TIMES. MONITORING THE SYSTEM FOR EXCESSIVE VIBRATION IS REQUIRED. IF EXCESSIVE VIBRATION OCCURS AT ANY POINT, IMMEDIATELY PUSH THE LARGE "E" STOP BUTTON ON THE FRONT OF THE OPERATOR PANEL AND RESUME WITH LOWER RPM'S UNTIL THE BATCH IS COMPLETE.

WARNING SPIN-DRY 1 AND 2: NEVER SET SPIN SPEED "D" HIGHER THAN 800 RPM. IF THE BALANCE OF THE BASKET IS NOT CAUSING EXCESSIVE VIBRATION WHEN CYCLE REACHES 800 RPM, GENTLY WALK THE SPEED PAST 800 USING THE RPM ARROW. NEVER EXCEED 800 IF VIBRATION IS IN QUESTION.

WARNING DURING SPIN-DRY CYCLE, IT IS IMPORTANT TO REMOVE MOST OF THE LIQUID AT LOWER RPMS (200 - 600). THIS KEEPS THE SYSTEM FROM OVERLOADING AND CRITICALLY VIBRATING AT HIGHER RPMS. NEVER INCREASE RPMS FASTER THAN THE LIQUID CAN BE REMOVED FROM THE MATERIAL. MAINTAIN A MINIMUM OF 5 MINUTES AT THE LOWER RPMS BEFORE REACHING 800 LIMIT.

The Spin Dry Cycle uses centripetal force to remove 98% of the remaining alcohol tincture trapped within the plant material after the washing process is complete. Unloading the System

Upon completion of the Spin Dry Cycle, unload the system by opening the lid and removing the filter bag from the basket.

You may now clean your components and prepare for your next run.

Cleaning the System

The system should be wiped down after every use and must be cleaned if a spill has occurred. All accessories and working surfaces must be cleaned if a spill occurs.

Suitable cleaning agents are alcohol, isopropanol, limonene and warm water. Only use non-abrasive cleaning utensils and never use abrasive cleaning products.

7. System Maintenance & Support

Periodic maintenance is essential for safe and proper operation of the CUP system. Replace worn components immediately.

CAUTION

Using third party replacement components voids your warranty and invalidates the engineering peer review of this equipment.

WARNING

Component wear varies depending on the amount of usage. Inspect all nuts, bolts, and gaskets before each use. If there is any question about the integrity of a component, replace it immediately.

Refer to *Table 7-1* for the recommended inspection and replacement schedule for the components listed.

Contact Delta Separations at 707-222-6066 craftscience@deltaseparations.com for more information on maintenance specifications, replacement parts and support questions.

Table 7-1. System Maintenance Schedule

Component	Inspection Interval	Maintenance / Replacement Schedule
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Component	Inspection Interval	Maintenance / Replacement Schedule
Drive Belt	Monthly	12 – 18 months
Shaft Seals	N/A	4 – 12 months (Depending on Use)
Drive Bearings	N/A	4 – 12 months (Depending on Use)
Basket Bolts	N/A	6 – 12 months
Hoses	Before each use	6 – 12 months
Lid Gasket	Before each use	6 – 12 months
Tri-Clamp Gasket	Before each use	6 – 12 months
Sanitary Clamp Bolts / Nuts	Before each use	12 – 18 months
Pressure Relief Valve	N/A	N/A
Ball Valves	Before each use	12 – 18 months

8. Troubleshooting (Coming Soon)

In the meantime, please call us directly if you experience any problems with your CUP system. Delta Separations at 707-222-6066 or email craftscience@deltaseparations.com

